FLORA OF AUSTRALIA

Volume 49
Oceanic Islands 1

FLORA OF AUSTRALIA

Volume 49 is one of two volumes in the series covering the vascular floras of Australia's offshore island territories. It covers Norfolk Island and Lord Howe Island, both in the Tasman Sea. Volume 50, published recently, covers Christmas Is., Cocos (Keeling) Is., Ashmore Reef and Cartier Is., all in the Indian Ocean; the Coral Sea Islands; and Macquarie Is., Heard Is. and the McDonald Islands, all in the Southern Ocean.

An introduction to the geography, physical features, climate, history of human habitation and vegetation is provided for each island, as well as a checklist of the species recorded on each island.

To avoid duplication, since the islands have many species in common, the key to the families includes the families present on either or both islands. The descriptive text also treats the families, genera and species sequentially, rather than by individual island.

This volume, including 136 families, 455 genera and 706 species and subspecific taxa, was written almost entirely by Mr Peter Green, formerly a botanist at the Royal Botanic Gardens, Kew, and now in productive retirement. Other contributors are R.O.Belcher (*Senecio*), J.Williams (*Parsonsia*) and M.Tindale (*Phymatosorus*). A number of artists and photographers from Australia, England, New Zealand and the United States have contributed to the illustrations and colour plates.

Cover: *Ungeria floribunda* Schott & Endl. A species of the Sterculiaceae family endemic to Norfolk Is. Painting by Glenn Douran.

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FLORA OF AUSTRALIA

Ungeria floribunda Schott & Endl. A species of the Sterculiaceae family endemic to Norfolk Is. Painting by Glenn Douran.

AUSTRALIAN BIOLOGICAL RESOURCES STUDY, CANBERRA

FLORA OF AUSTRALIA

Volume 49
Oceanic Islands 1

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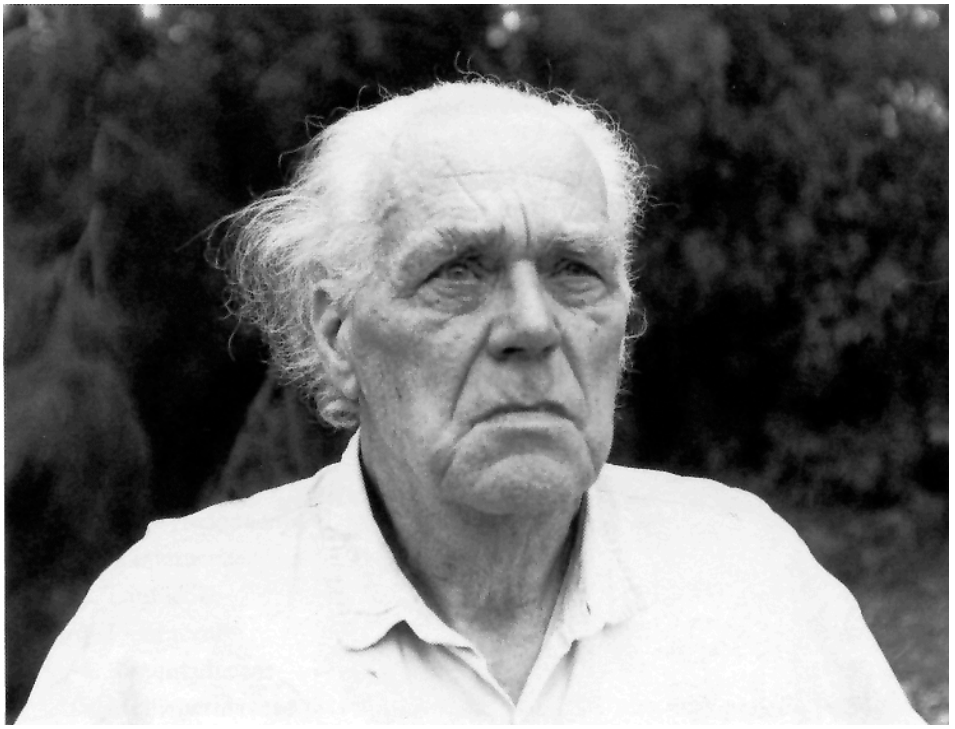

This volume is dedicated to Ru Hoogland.

Ruurd Dirk Hoogland was born in Leeuwarden in The Netherlands, receiving his university training at Groningen and Leiden. He was awarded his Ph.D. in 1952 for a revision of *Dillenia*.

In the same year he joined CSIRO Division of Land Research and Regional Survey as a botanist with the New Guinea Survey Group. Coming from a major European herbarium, he knew the value of a comprehensive systematic library and played a key role in the development of the Canberra herbarium library. In the field, he followed L.J.Brass's methods of collecting and preparing tropical material, and was instrumental in training other field botanists in the collection of high quality specimens. He also encouraged the practice of collection with replicates, and these were promptly distributed to other herbaria around the world. Ru's influence in these aspects of herbarium practice were crucial in the early development of what is now the Australian National Herbarium, and laid a firm foundation for its high international status. From 1968 until 1979 he was a Research Fellow with the Taxonomy Unit in the Australian National University's Research School of Biological Sciences, pursuing his taxonomic studies of Dilleniaceae and other families. In his retirement he returned to Leiden briefly before settling in Paris, where he continues his taxonomic pursuits, most recently as co-author of the landmark volume *Family Names in Current Use for Vascular Plants, Bryophytes, and Fungi* (*Regnum Vegetabile* 126, 1993).

Ru has long been interested in the floristics of oceanic islands, and particularly in the floras of Norfolk and Lord Howe Islands. He has visited, studied the vegetation and collected on both islands (Norfolk Is. three times; Lord Howe Is. once). His extensive collections are attested by the large number of his specimens cited in this work. Although he had an ambition to write a Flora of the two islands, when Peter Green began the work Ru generously and unselfishly made available his very extensive notes, indices *etc.* on the plants of the islands. He was joint author, with the late Professor John Turner and Dr C.N.Smithers, of *The Conservation of Norfolk Island*, the Special Publication of the Australian Conservation Foundation in 1968. His influence on the development of this volume has therefore been substantial, and it is appropriate to dedicate it to him.

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FLORA EDITORIAL COMMITTEE

The Committee was established in 1980.

INTRODUCTION

The Australian political region includes a number of islands in the Indian Ocean, the Coral Sea, the Tasman Sea and the Southern Ocean. For practical reasons, a decision was taken early in planning the *Flora of Australia* to exclude these islands from the main work and cover them in a single volume. Such a work would be used more easily than a treatment spread through 48 volumes. In 1982 an opportunity arose that encouraged ABRS to begin preparation of an island volume. Peter Green (Royal Botanic Gardens, Kew), who for many years had researched the flora of Lord Howe and Norfolk Islands, retired and offered to write up this work for the *Flora*. At that time, coincidentally, a checklist of the vascular plants of Christmas Island (Indian Ocean), was at a late stage of preparation. This was also being prepared at Kew, by Leonard Forman, in association with a resident on the island, David Powell. Contributors were arranged for the other islands, support for flora text preparation being provided through the ABRS grants program. As research progressed, it became evident that the number of species on the islands would be too great for a single volume, and it was decided to place Lord Howe and Norfolk Islands in one volume (Volume 49) and the remainder in Volume 50. Volume 50 was published on 29 July 1993, and publication of the current volume completes the account of the floras of the Australian Oceanic Islands.

A further decision taken early in planning was to combine the taxonomic treatments into a single text, rather than treat each island or island group separately. The reason for this arrangement is economic. In the case of the present work, the two floras have many species in common and we wished to avoid duplication of text. It is hoped that users will find the combined treatment of interest when comparing the floras of the islands.

The arrangement in this volume is as follows. The introductory chapter covers such aspects as the history of the islands, geographical location (including maps), physical features, climate, vegetation and floristics. Also in this section are checklists of the species recorded for each island group. There is then a single key to the families of plants occurring on both islands. The descriptive text follows, arranged in the Cronquist System (see endpapers), with keys to genera and species in the usual way. All keys are designed to assist determination of plants occurring on the islands and therefore often use characters (especially vegetative) that may not be useful with species from other regions.

Scope and presentation of the *Flora*

This volume covers Norfolk and Lord Howe Islands, including their associated islets. Thus Norfolk Island includes Nepean Island and Philip Island, while Lord Howe Island includes the Admiralty Group, Mutton Bird Island, Blackburn (Rabbit) Island and Balls Pyramid.

The text is entirely the work of Peter Green, with the exception of *Senecio*, contributed by Robert Belcher, the formal description of *Parsonsia howeana* written by John Williams, and the formal description of *Phymatosorus pustulatus* subsp. *howensis* written jointly by Mary Tindale and Peter Green.

Only vascular plants are treated – ferns, fern allies, pines and flowering plants. The introductory chapter provides references to checklists and descriptions of the much more poorly researched non-vascular plants. Descriptions and discussions are concise and are supplemented by important references, synonymy relevant to the islands, information on type collections, published illustrations, and notes on distribution, habitat and uses.

Descriptions of families and genera cover the taxa as a whole rather than only those species present on the islands, since in many cases only one or a few taxa are represented. Descriptions of species are based on material from the islands, except where that available was inadequate, in which case other material or published works have been used.

Type citations under taxa in the main body of the text reflect the authors' belief in their current status (holotype, isotype, syntype, etc) and where they are held. In cases where the

type specimen has not been examined, this is indicated by *n.v.* These type statements are not to be interpreted as lectotypifications. Where lectotypifications have been made previously, these are cited with *fide*, followed by a reference to the author and place of publication (or, sometimes, to a secondary reference). Any formal lectotypifications required for this volume, as in previous parts of the *Flora*, are confined to the Appendix.

No attempt has been made to provide a full synonymy. Basionyms are cited consistently, but the synonyms given are only those which have been applied in print to plants from Norfolk or Lord Howe Islands. Nor has any attempt been made to cite the references in which these synonyms have appeared, except in the case of misapplied names (given in square brackets), when the references given often represent only a selection. Taxa which are considered to have been incorrectly attributed to the islands in the past are discussed in notes under each family.

As in other volumes of the *Flora of Australia*, no attempt has been made to cite all the collections that have been examined during the compilation of this treatment. Generally, a limited selection has been cited, aimed to give some idea of a taxon's distribution on the islands, while bearing in mind the wisdom of including those collections which are represented in more than one herbarium. The herbaria which are cited are only those which contain the actual specimens seen. Often unexamined duplicates exist in other herbaria.

The inclusion of common names has posed a problem. Many of the plants have undoubted island names, particularly for the better known trees, like *Scalybark*, *Ironwood* or *Bastard Oak*, but a large proportion of the plants growing wild are introduced herbs which rarely have local common names. There are exceptions like 'William Taylor' (*Ageratina riparium*). In Australia or New Zealand these aliens have often been given names which originated locally or in Britain, names which frequently appear in mainland Floras. Should they be copied into this Flora in order to provide 'common' and alternative names to the Latin scientific ones? A compromise has been reached whereby those particular extra-island names which seem to have become known to the inhabitants are included.

Thanks to the observations carried out by Ian Hutton over several years, the times of flowering of the most prominent Lord Howe Island plants are known. Where they have been recorded by him mention is made of the appropriate months under the respective species. Unfortunately no such observations seem to have been made for the plants of Norfolk Island.

In choosing the subjects for black and white illustration, the practice has been to select those plants which appear not to have been previously illustrated, or ones which have only been once or rarely figured, perhaps in an obscure publication. This selection has nevertheless been tempered by a desire to illustrate as wide a range of families as possible.

Acknowledgments
(Australian Biological Resources Study)

The editorial team are grateful for the forbearance and patience shown by Peter Green and the other contributors during the production of this *Flora*. We trust that the work involved is reflected in the quality of the product.

The cover painting was prepared on Norfolk Island by Glenn Douran from live material. Collection of this material, and much other local liaison work, was carried out by Margaret Christian, whose help has been much appreciated. Line drawings were prepared by eight artists (Eleanor Catherine, Ann Farrer, Mark Fothergil, Tim Galloway, Christine Grey-Wilson, Pat Halliday, Lynn Lesko and David Mackay) in Australia, New Zealand and England. Colour photographs were provided by Peter Coyne, Peter Green, John Hicks, Ian Hutton, Tony Rodd and Ian Telford. The maps were drawn by Tracey Rand.

The directors and staff of Australian and overseas institutions have assisted preparation of the volume with loans of specimens and advice. A particular acknowledgement is due to the Royal Botanic Gardens, Kew, for providing space and facilities to Peter Green.

We particularly thank the referees, who read the manuscript carefully, often under considerable pressure.

The leading role in editing of this volume has been taken by Annette Wilson, under the general direction of Tony Orchard, with conscientious assistance and collaboration from Laurie Adams, Katy Mallett, Jane Mowatt, Tracey Rand, Ken Thomas and Helen Thompson. Barbara Barnsley undertook the compilation of the figures and captions, and Helen Thompson formatted the text to camera ready stage.

Initial planning of the volume was undertaken by the first Executive Editor of the *Flora of Australia*, Alex George, under successive managers of the Flora program, Alison McCusker, Roger Hnatiuk and Helen Hewson.

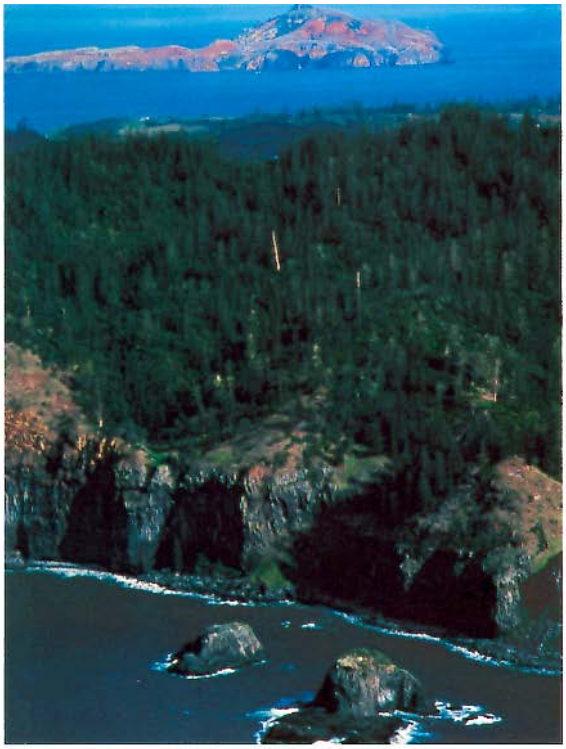
Acknowledgments
(Peter Green)

Sincere thanks are offered to many people who have assisted me in diverse ways. To the Director of the Arnold Arboretum in 1963, Dr Richard A. Howard, I shall always be indebted for his encouragement and the provision of financial assistance which enabled me to make my first visit to the two islands. Then, in 1971, I am grateful for assistance from the Bentham-Moxon Trust that financed my second visit (after taking part in an expedition to the New Hebrides, now Vanuatu). Lastly, I am grateful to the Australian Biological Resources Study for a grant for three years immediately following my retirement, which enabled me to make a third visit to the two islands. In the field, I am particularly grateful for the help I have received during each of my visits on Norfolk Island from Owen and Beryl Evans, and during the 1985 visit, the support with accommodation and transport provided by the staff of the Australian National Parks and Wildlife Service, especially through Neil Hermes, at that time Conservator on the Island, and subsequently from Margaret Christian. I wish to express my thanks to the Directors and Curators of the several herbaria which have offered me hospitality or have loaned specimens for study at Kew. Many colleagues have helped me through correspondence, often giving me the advantage of their knowledge and experience with various groups. I am particularly indebted to R.D.Hoogland, to W.R.Sykes on matters relating to Norfolk Island, to Ian Hutton for matters concerning Lord Howe Island and to R.O.Belcher for tackling the difficult and critical species of *Senecio*. L.A.S.Johnson, on the eve of my official retirement, encouraged me to take up the task of writing this Flora, for which encouragement I shall always be grateful. But there are many others to whom I should like to express my appreciation and thanks for help received: R.M.Barker, B.G.Briggs, P.J.Brownsey, T.C.Chambers, R.J.Chinnock, B.J.Conn, H.E.Connor, J.G.Conran, J.W.Dawson, the late Hj. Eichler, P.I.Forster, J.C.Game, the late F.R.Fosberg, R.O.Gardner, N.Gillett, T.G.Hartley, R.J.F.Henderson, H.J.Hewson, S.W.L.Jacobs, N.S.Lander, M.Lazarides, C.F.Puttock, A.N.Rodd, J.H.Ross, M.D.Tindale, J.Thompson, P.Smith and K.L.Wilson. C.E.Jarvis has kindly assisted me with information about the typification of Linnaean taxa. Finally, particular thanks to Glenn Douran for the cover picture of *Ungeria* and to each of the artists, listed after the title page, whose line drawings enliven this volume.

Figure 1. Lord Howe Island
Photograph — I.Hutton.

Figure 2. Lord Howe Island with *Howea forsteriana* forest.
Photograph — I.Hutton.

Figure 3. Lord Howe Island. View from Mt Gower towards Mt Lidgbird with *Metrosideros nervulosa* in foreground.
Photograph — I.Hutton.



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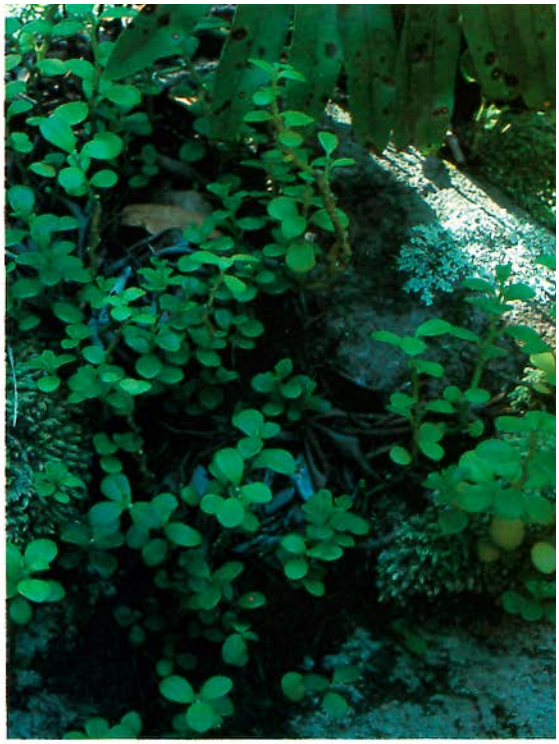
Photograph — P.Coyne.

Figure 5. Norfolk Island. View from Mt Pitt towards Phillip Island. *Cyathea brownii* in foreground.
Photograph — A.Rodd.

Figure 6. Phillip Island.
Photograph — P.Coyne.

Figure 7. Norfolk Island with *Araucaria heterophylla* forest.
Photograph — J.Hicks.



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Photograph — I.Hutton.

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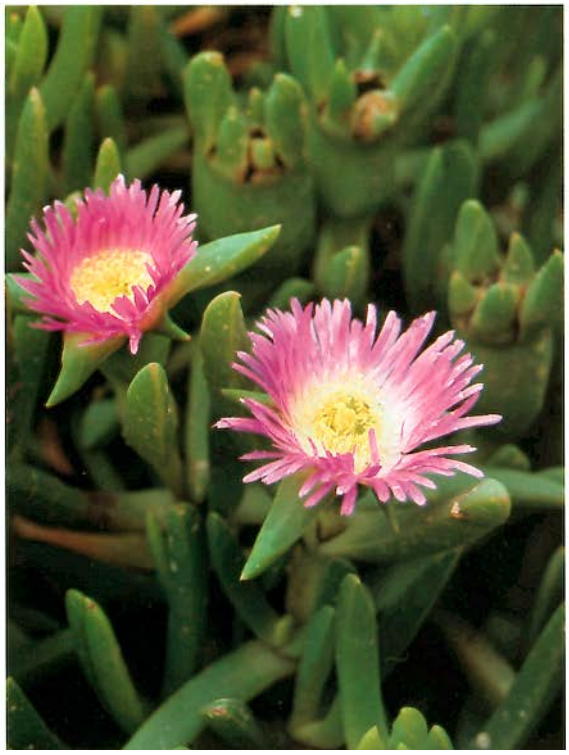

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Photograph — I.Hutton.

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Photograph — I.Hutton.

Figure 31. *Exocarpus homalocladus*. (L.H.Is.)
Photograph — I.Hutton.

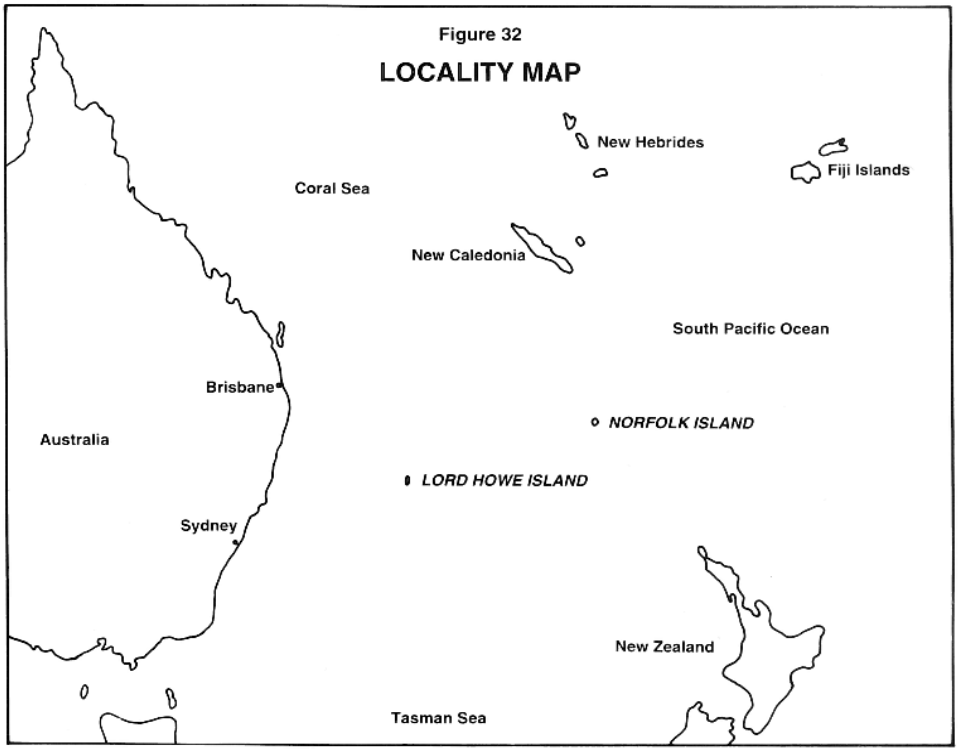
NORFOLK ISLAND & LORD HOWE ISLAND

P.S.Green

Both Norfolk Island and Lord Howe Island are true oceanic islands, with all this implies in terms of climate and biological isolation. Norfolk Island (29°04'S, 167°56'E) is almost exactly midway between New Zealand and New Caledonia, each approximately 625 km away, while Lord Howe Island (31°28'S, 159°09'E) lies about 580 km from the nearest point on the Australian coast, near Port Macquarie, and about 900 km from Norfolk Island to the north-east.

Geologically, both islands are of volcanic origin and both lie on submarine ridges: the Norfolk Island Ridge which stretches from New Zealand to New Caledonia, and the Lord Howe Rise which extends from New Zealand to the west of New Caledonia. Today, both islands represent the eroded remains of what must have been larger areas of land surface, although how big these were at different periods remains a matter for speculation. That they have ancient connections is borne out by the presence of endemic genera, and a link with Gondwanaland is indicated by some of the endemic species such as *Dietes robinsoniana.* Details of their geological history may be obtained from Jones & McDougall (1973) for Norfolk Island and from McDougall *et al.* (1981) for Lord Howe Island. Information on the soils of Norfolk Island may be obtained from Stephens & Hutton (1954) and from Hutton & Stephens (1956).

This Flora only covers the vascular plants of the islands. Other groups have often been less well collected and knowledge of them is less comprehensive. It is understood that work on the lichens and fungi, at least on Lord Howe Island, is under way. Although I make no attempt to provide a bibliography for these groups on the islands, Pickard (1973) should be



turned to for mosses, liverworts, lichens and algae of Lord Howe Island, with Ramsay (1984) for a more recent account of the mosses of that island. I know of no such bibliography for Norfolk Island, although for mosses Streimann and Curnow (1989) should be consulted. A catalogue of the marine and freshwater red algae of Lord Howe Island has been published recently by Millar & Kraft (1993). The same authors have a catalogue of the brown algae in press in the same journal, and a catalogue of the green algae in preparation.

No attempt has been made to analyse the floristic affinities of the floras of the two islands; this is beyond the immediate scope of this work. However, even without an analysis certain trends become apparent when studying the flora. Floristically the two islands are very close, and share some endemic taxa. They are both more closely related to New Zealand and New Caledonia than to Australia, and there exists a slight but evident link between Lord Howe Island and Vanuatu. The area of Australia with the closest affinities appears to be south-eastern Queensland, as might be expected from the subtropical environment (especially of the nearer island, Lord Howe).

This Flora contains only those plants which are indigenous to the islands or have become naturalised. In this context, to be considered as naturalised, a plant has to be growing and, above all, reproducing itself without human aid. It may have been introduced accidentally as seed (a contaminant of fodder perhaps), or may have spread, by means of unaided distribution, from a tree or other plant that was originally cultivated. Plants which are garden discards, or survive in the now uncultivated remnants of a former garden, without reproducing themselves by natural means, are not included. An interesting analysis of exotics on Lord Howe Island from 1853 to 1981 has been carried out by Pickard (1984), covering both intentional and accidental introductions.

Restricting the entries to these two classes of indigenous or naturalised, the total number of vascular plant taxa recorded for the two islands taken together is 706. Of these, 345 are indigenous (with 149 endemic, *i.e.* 44.9%) and 361 are introductions (51.1% of the total). Taken separately, there are 445 vascular plants on Norfolk Island, 171 of which are indigenous (including 47 endemic, 27.5%) and 274 naturalised (61.6% of the total), while on Lord Howe Island there are 459 taxa, 241 of them indigenous (105 being endemic, 43.6%) and 218 naturalised (47.5%). This high degree of endemism is further emphasised by the presence of several endemic genera: *Ungeria* and *Streblorrhiza* on Norfolk Island, and *Negria*, *Lordhowea*, *Howea*, *Lepidorrhachis* and *Hedyscepe* on Lord Howe Island, and by the remarkable arborescent members of the Amaranthaceae and Gesneriaceae, *Achyranthes arborescens* and *Negria rhabdothamnoides*.

NORFOLK ISLAND

The main island is somewhat obliquely pear-shaped, about 7.5 × 8.5 km, and occupies an area of 34.6 sq km. The highest points are Mt Pitt (316 m), and its immediate neighbour Mt Bates (308 m). The coast is mainly characterised by steep cliffs, but there are a few places where the sea may be easily approached, notably at Sydney Bay, near the capital, Kingston.

The climate is subtropical and oceanic, with an average annual rainfall of about 1300 mm, but 1960 mm were recorded in 1989 and only 784 mm in 1976. It has been estimated that the forest in the National Park receives about 20% more rain than areas at lower altitudes (Ovington, 1984). The wettest months are from April to August, but there are considerable extremes, some months affected by drought, others by high humidity and rain. Maximum daily temperatures range from about 17°C to about 25°C, while minimum nightly temperatures range from about 13°C to about 20°C. The warmest months are from January to March (28.4°C having been recorded in March 1990) and the coolest are July and August (the lowest temperature recorded was 6.2°C in July 1953). Winds can be very strong, often laden with salt-spray. Appreciable winds blow on roughly two out of every three days, west- to south-westerlies predominate during the winter and north-easterlies to south-easterlies during the summer. (For more details, especially in relation to the National Park, see Ovington, 1984)

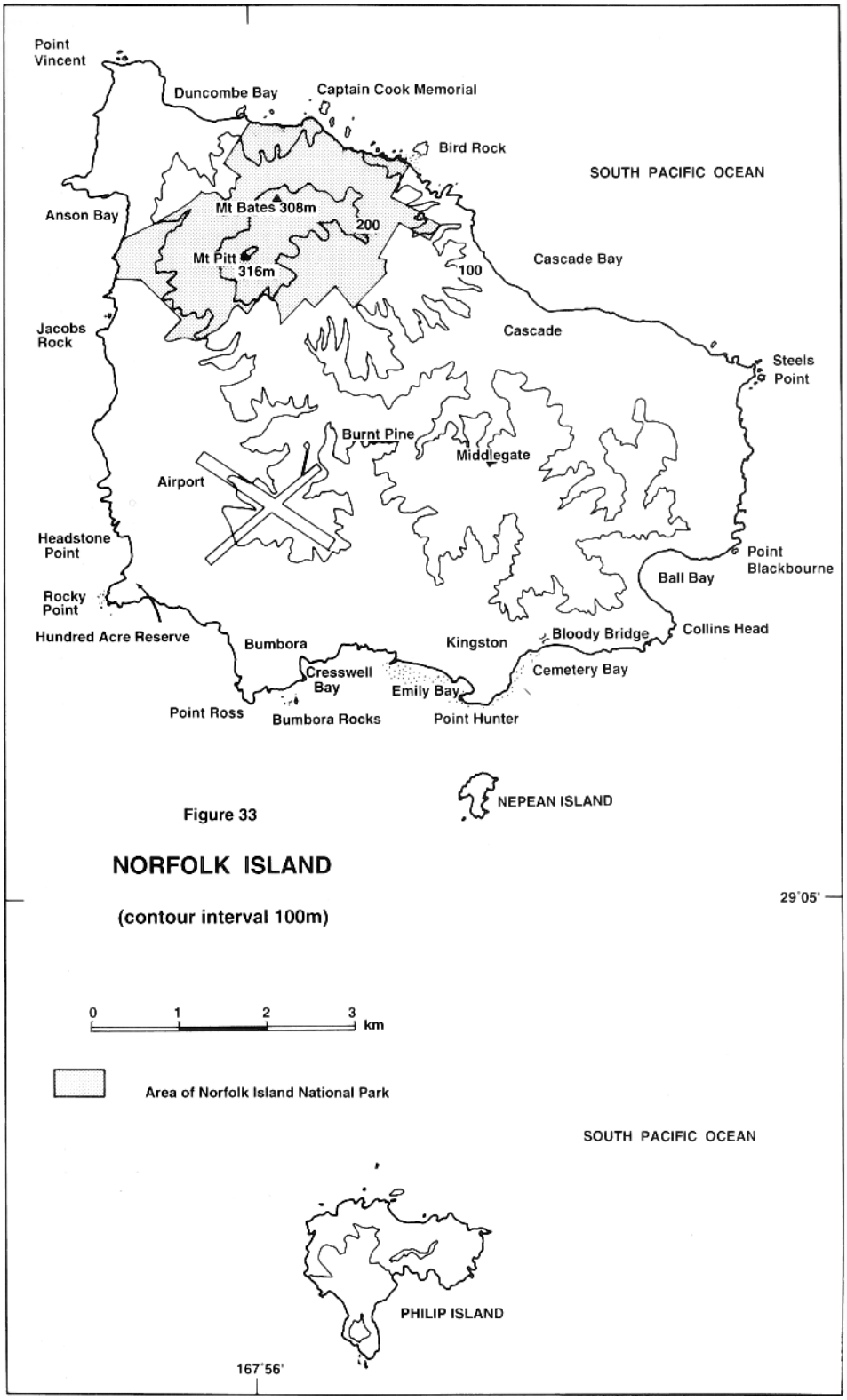


Figure 33

NORFOLK ISLAND

(contour interval 100m)

When discovered by Captain James Cook in 1774, on his second voyage of exploration in the *Resolution* (Hoare, 1969; Hoare in Nobbs, 1988), the island was covered by forest, which today is limited to the highest land. Although it was uninhabited when discovered, it seems clear that it had earlier been visited by Polynesians, for stone tools and flakes chipped off such tools have been discovered. Archaeological investigations suggest that the visits took place on at least two occasions, one between AD1000 and 1400 and the other between 1400 and 1774, the latter probably nearer the end of that period, for remains of a canoe were found which would not have been preserved for long. That this latter visit was of some duration is indicated by the fact, according to Philip Gidley King, the island's first Commandant, that when the island was occupied in 1774 'a great quantity of plantain trees' (bananas) was discovered (Fidlon & Ryan, 1980) - presumably planted by the Polynesians as a source of food during their stay.

It is noteworthy that Norfolk Island, by only one month in 1788, became the second earliest European settlement in that part of the world. Cook had previously noted and reported on the presence on the island of pines and native flax. Such resources were of great importance in the days of sailing ships. The provision of masts and spars to replace those lost in storms was vital, as could be the chance to replace canvas for damaged and torn sails. Instructions had therefore been given to Arthur Phillip (who commanded the First Fleet to Australia and became Governor of the settlement at Port Jackson) to settle Norfolk Island without delay. On 15 February 1788, only 10 days after the disembarkation at Port Jackson, the *Supply*, under the command of Henry Lidgbird Ball, sailed for Norfolk Island with a party of marines, 7 freemen and 15 convicts. Philip Gidley King was Superintendent of the settlement, with instructions to clear land and commence the cultivation of native flax (*Phormium tenax*), as well as grain and vegetables. More convicts were soon sent from Port Jackson and the population of the island amounted to 62 by November 1788.

Two years later, in March 1790, a large party of convicts, with marines to guard them, was dispatched to Norfolk Island. This marked the establishment of the First Penal Settlement, which lasted until 1814. The island then remained uninhabited for ten years, until in 1825 the arrival of a new party of soldiers and convicts commenced the Second Penal Settlement, during which the island became notorious for its extreme and brutal treatment of prisoners (Hughes, 1987, especially chapter 13). During these two periods of settlement widespread clearance of the native forest took place until little remained, perhaps only one fifth of the original cover. In 1856 it was decided once again to close the penal settlement, and in June of that year the remaining convicts were transferred to Port Arthur in Tasmania.

By that time the crowded inhabitants of another, even smaller and more remote island, Pitcairn Island (the descendants of the *Bounty* mutineers) badly needed a new home with more space. They were granted the occupancy of Norfolk Island and arrived there on 8 June 1856, a date now known to the present inhabitants as Bounty Day, observed as a public holiday.

The history of present day Norfolk Island may be said to have commenced with the arrival of the Pitcairn Islanders. The Pitcairners cultivated the land which had been cleared by the convicts, and agriculture became the financial mainstay of the island. Trade with the mainland in a number of crops developed, one crop passing to another as the markets changed or a particular crop was hit by disease: arrowroot, potatoes, onions, lemons for preserved peel and juice, bean seed and bananas, to mention the most important. The traces of the lemon crop are still to be seen as scattered trees throughout much of the island, although to judge by early reports, *e.g.* Backhouse (1843) lemons had become naturalised before this. For quite a while whaling was an important industry on the island, but it has now ceased. The population gradually grew in numbers until, during the last few decades, considerable increases took place. These followed the wartime construction of the airfield, the arrival and settlement of 'mainlanders' and the development of tourism. Today the main industry is tourism, and for this the endemic flora and fauna is a major attraction. It is hoped that this *Flora* will not only raise people's level of interest, but will also inform and assist tourists intrigued by the plants they see.

VEGETATION

In 1788 the island was covered with dense subtropical forest, with the Norfolk Island Pine (*Araucaria heterophylla*) particularly abundant on the lower levels and slopes. These were the areas of more fertile soil and were cleared by the settlers. It has been estimated that a quarter of the island's native cover was cleared during the first convict settlement, with the remaining clearance taking place during the second such settlement. Early reports by George Caley, a botanist who visited the island in 1806, and others, remarked on the dense cover, and the number of large and tangled climbers (*Jasminum simplicifolium* subsp. *australiense*, *Millettia australis* and *Zehneria baueriana* for example). They also noted the absence of grasses, due perhaps to the widespread and dense tree cover (*Oplismenus hirtellus*, as an inhabitant of shady forest floors, is an exception among grasses). The pines reached to about 70 m in height, overtopping the tallest of the other trees, which grew to 10 or 20 metres. The palm *Rhopalostylis baueri* characterised the steeper slopes, and tree-ferns, *Cyathea australis* subsp. *norfolkensis* and *C. brownii* (the latter having in the past been recorded as reaching 24 m in height), in the deeper gullies. Native flax, *Phormium tenax*, was stated to be abundant on the cliffs overlooking the sea, a habitat it occupies today, although less extensively than formerly. It was noted too that the vegetation on the higher slopes around Mounts Bates and Pitt was dwarfed and less luxuriant, no doubt reflecting the steeper terrain and poorer soils. A good depiction of the undisturbed, more luxuriant, high forest as it appeared in the 1840s is shown in a drawing by James Backhouse (1843, p. 265). This is reproduced as figure 4 in Holloway (1977), who incidentally provides a good and readable account of the environment, vegetation and phytogeography of the island, in a work primarily devoted to the island's Lepidoptera. Smithers & Disney (1968), in a paper on the distribution of birds on the island, recognise five original or primary native habitats (and a number of secondary ones induced by human activities); a pine association, a tree-fern/palm association, a sandy beach habitat, a rocky shore habitat and the cliffs.

The major remnant of the native forest today constitutes the Norfolk Island National Park, formerly the Mount Pitt Reserve. This is an area of about 460 hectares looked after by the Australian Nature Conservation Agency (ANCA), formerly known as the Australian National Parks and Wildlife Service (ANPWS). Their published plan for the Park (Ovington, 1984), setting out their conservation measures, also provides considerable background information on climate, soils etc. Fortunately, in addition to the park there are a few other, smaller areas which have been fenced off from the wandering cattle; in these patches native trees and other indigenous plants persist. Gilmore & Helman (1989) have identified three types of plant communities in the subtropical forest on the island: palm and tree fern forest in the valleys and moister slopes; hardwood forest on the intermediate and semi-shaded areas; and *Araucaria* dominated forest on the drier and more exposed sites. The boundaries of these areas are not clear-cut, however, for they merge and interdigitate. They note infestation by woody weeds, especially by *Psidium cattleianum*, red guava, on the south-eastern perimeter of the Park, and by *Olea europaea* subsp. *cuspidata*, African olive, towards the northern and western fringes.

With the shift in the main economy of the island from agriculture to tourism, much farmland has been abandoned. In these areas introduced weeds, often woody ones like *Solanum mauritianum*, *Lantana camara* and *Schinus terebinthifolius*, have become dominant, crowding out all other plants and preventing any possible regeneration of native species, even where some indigenous trees, taller than the alien scrub, still remain.

Most of these introduced weeds are unpalatable to the cattle which by tradition are allowed to roam freely throughout the island. The reduction in available grassland that has taken place, in relation to the number of these cattle, has often resulted in severe overgrazing, leading to erosion and degradation of the habitat. As a consequence the introduced weeds spread and establish themselves more easily: in the case of the guava, *Psidium cattleianum*, the fruits of which are sought after by the cattle, the seeds are deposited in a pat of instant fertiliser.

Severe dieback amongst mature native pines (*Araucaria heterophylla*) has been a concern during the last decade or so. The trees lose their vigour, become laden with lichens (a

symptom and consequence of ill-health, not the cause) and eventually die. Forest pathologists have investigated the phenomenon (see Benson 1980). It has been estimated that more than half the mature pine trees on the island are dead or moribund. This is especially true of trees on abandoned farmland, old pastures and areas with dense alien weeds. It appears that the dieback is not caused by any disease, and the condition of the trees is put down to overmaturity (yet, without the compensation of seedling replacement because of grazing by cattle), coupled with poor, nutrient-deficient soils, and competition with introduced pasture species and shrubs. Soil water stress during spells of low rainfall may also be a factor, aggravated by the increased demands for water made by the increased number of people on the island (particularly during the summer tourist season, when rainfall is at its lowest and seasonal drought can occur).

Nepean Island is a small island about 1 km south of Point Hunter, the southernmost point of the main island. It was originally covered with 200 or more pines, with an understorey of coarse 'grasses' (presumably including members of the sedge family such as Moo-oo, *Cyperus lucidus*). A drawing of c. 1840 shows that there were only one dead and one living pine on the island then. Calcarenite rock was quarried there and the remains of ramps etc. that were constructed for handling the stone blocks may be the best clue to the fate of the pines. Today the vegetation of Nepean Island consists of grass and herbs, with many introduced species. A few white oaks, *Lagunaria patersonia*, prostrated by the wind, are the only woody plants that have survived there.

Philip Island is an 'L'-shaped island approximately 2 km × 2 km in size. It lies about 6 km to the south of Kingston and is uninhabited and much eroded. To judge from early accounts, it was never as heavily forested as the main island. Alan Cunningham, who was marooned there by absconding convicts in 1830, recorded a dense cover of small trees in the interior with the thorny *Capparis nobilis* making any traverse of the island difficult. Even in the early years of last century the red soil of the summit area (280 m) was noted and could be seen from a distance, for the steep slopes facilitated a rapid runoff after rain, and its vegetation cover must have been poor. Following the introduction of pigs and goats, originally released on the island to provide fresh meat, and rabbits, the vegetation of the island was almost totally destroyed. The pigs and goats were eradicated some considerable time ago, during the early years of the Pitcairn Islanders' settlement, but the rabbits, although noted as being there as early as the 1830s, persisted until recent times. Only a very few plants, unpalatable to rabbits, survived. These were mostly introduced weeds. Without a plant cover the island became severely eroded. Each heavy storm of rain washed more of the subsoil and soft volcanic tuff into the sea. Now, thanks to the efforts of the staff of ANPWS and a few islanders the rabbits have also been exterminated and, partly through natural means, and partly by planting native species and the broadcasting of native seed from Norfolk Island to speed up the development of a plant cover, the island is rapidly becoming revegetated. Noteworthy has been the reappearance of the endemic *Elymus multiflorus* var. *kingianus* and *Abutilon julianae*, both thought to have been extinct.

The first collections of Norfolk Island plants were made by a landing party on 11 November 1774, when Cook discovered the island. A member of this party was Georg Forster who later described these first collections (Forster, 1786). However, the first comprehensive collection was made by the famous botanical artist, Ferdinand Bauer, during his eight month stay on the island in 1804 and 1805. His collections, now in Vienna, formed the basis of the first Flora, S.F.L.Endlicher's *Prodromus Florae Norfolkicae* (1833). George Caley visited the island in 1806, but his collections from there, in the Natural History Museum of London (BM), seem remarkably few in number. Allan Cunningham, botanist and explorer (Superintendent of the Botanic Gardens, Sydney, from 1836 to 1838) made an extensive collection on Norfolk Island in 1830, followed by James Backhouse in 1835, during a visit on behalf of the Quakers to look into the treatment and condition of prisoners (Backhouse, 1843). Towards the end of that century Isaac Robinson, a resident on the island, made collections for the Botanic Gardens at Sydney, N.S.W. These were further added to during a visit by J.H.Maiden, the Director of the Gardens, in November 1902, who was accompanied by J.L.Boorman. The collections thus obtained formed the basis of the next Flora (Maiden, 1904). In 1912 R.M.Laing spent some weeks on Norfolk Island, while visiting his relatives

there, and this led to the publication of yet a further Flora (Laing, 1915). After that few collections appear to have been made until my first visit there in October 1963. Since then, extensive collecting has taken place during visits by W.R.Sykes, R.D.Hoogland and M.Lazarides, as well as further visits by myself in 1971 and 1985, and even more recent visits by a number of other botanists. It may be considered that the vascular plants of the island are now well known; the many collections have formed the basis for entries relating to Norfolk Island in this volume.

The fauna of Norfolk Island is notable for its birds, both sea birds in abundance and a number of endemic and native land birds. A good account of these is given by Schodde *et al.* (1983). There is a project to build up the population of the almost extinct, endemic green parrot, *Cyanoramphus novaezelandiae cookii* (G.R.Gray), constituting an attempt to prevent any further loss of endemic fauna. The eggs of the whale-bird or sooty tern, *Sterna fuscata* Linnaeus, are collected in quantity from Philip Island in November every year, and are considered, by those with the acquired taste, to be an island delicacy. Providing the collection of eggs ceases before the end of the laying season there appears to be no serious danger to the bird population. There are no native mammals, except for a bat *Chalinolobus gouldii* (Gray), now rarely seen, and the Polynesian rat, *Rattus exulans* (Peale), which was presumably introduced by early Polynesian visitors prior to Cook's discovery of the island. The black or ship rat, *Rattus rattus* (Linnaeus), has escaped into the forest and until exterminated will continue to kill ground-nesting and other birds. They also damage certain plants like the endemic *Freycinetia*, the inflorescence of which they find palatable, rarely leaving them untouched or with the ability to set seed. The only native reptile is a gecko, *Christinus guentheri* (Boulenger), endemic to the Norfolk and Lord Howe island groups, but now, in the Norfolk Island fauna, restricted to Philip and Nepean Islands and some other offshore islets. Of the invertebrate fauna, much remains to be investigated. A list of those known at the time is given by Turner *et al.* (1968) and an extensive account of the Lepidoptera is provided by Holloway (1977).

NORFOLK ISLAND SPECIES LIST

(e = endemic taxon; * = naturalised taxon)

MAGNOLIOPHYTA (flowering plants)

DICOTYLEDONAE

ACANTHACEAE
* *Hypoestes phyllostachya* Baker

AIZOACEAE
Carpobrotus glaucescens (Haw.) Schwantes
Tetragonia implexicoma (Miq.) Hook.f.
Tetragonia tetragonioides (Pall.) Kuntze

AMARANTHACEAE
e *Achyranthes arborescens* R.Br.
Achyranthes aspera L.
* *Alternanthera sessilis* (L.) R.Br. ex DC.
* *Amaranthus blitum* L.

ANACARDIACEAE
* *Schinus terebinthifolius* Raddi

APIACEAE
* *Apium graveolens* L.
* *Centella asiatica* (L.) Urb.
* *Ciclospermum leptophyllum* (Pers.) Sprague
* *Daucus glochidiatus* (Labill.) Fischer
* *Torilis nodosa* (L.) Gaertn.

APOCYNACEAE
e *Alyxia gynopogon* Roem. & Schult.
e *Melodinus baueri* Endl.
* *Vinca major* L.

ARALIACEAE
* *Delarbrea paradoxa* Vieill.
e *Meryta angustifolia* (Endl.) Seem.
e *Meryta latifolia* (Endl.) Seem.
* *Tetrapanax papyrifer* (Hook.) K.Koch

ASCLEPIADACEAE
* *Gomphocarpus physocarpus* E.Mey.
Tylophora biglandulosa (Endl.) F.Muell.

ASTERACEAE
* *Ageratina riparia* (Regel) R.M.King & H.Rob.
* *Ageratum conyzoides* L.
* *Arctotheca calendula* (L.) Levyns
* *Argyranthemum frutescens* (L.) Webb ex Sch.Bip.
* *Aster subulatus* Michx.
* *Bidens pilosa* L.
* *Carduus tenuiflorus* Curtis
* *Centaurea melitensis* L.
* *Conyza bonariensis* (L.) Cronquist

* *Conyza sumatrensis* (Retz.) E.Walker
Cotula australis (Sieber ex Spreng.) Hook.f.
* *Crassocephalum crepidioides* (Benth.) S.Moore
* *Erechtites valerianifolia* (Wolf) DC.
* *Erigeron karvinskianus* DC.
Euchiton involucratus (G.Forst.) Holub
* *Facelis retusa* (Lam.) Sch.Bip.
* *Galinsoga parviflora* Cav.
* *Gamochaeta purpurea* (L.) Cabrera
* *Hypochaeris glabra* L.
* *Hypochaeris radicata* L.
* *Picris hieracioides* L.
Pseudognaphalium luteoalbum (L.) Hilliard & B.L.Burtt
e *Senecio australis* Willd.
e *Senecio evansianus* Belcher
e *Senecio hooglandii* Belcher
* *Sigesbeckia orientalis* L.
* *Silybum marianum* (L.) Gaertn.
* *Soliva pterosperma* (Juss.) Less.
* *Sonchus oleraceus* L.
* *Tagetes minuta* L.
* *Taraxacum officinale* Weber
* *Tragopogon porrifolius* L.
Wollastonia biflora (L.) DC.

BASELLACEAE
* *Anredera cordifolia* (Ten.) Steenis

BORAGINACEAE
* *Cynoglossum australe* R.Br.
* *Echium plantagineum* L.

BRASSICACEAE
* *Brassica juncea* (L.) Czern.
* *Brassica napus* L.
* *Capsella bursa-pastoris* (L.) Medik.
* *Cardamine hirsuta* L.
* *Coronopus didymus* (L.) Sm.
* *Lepidium bonariense* L.
* *Lobularia maritima* (L.) Desv.
* *Matthiola incana* (L.) R.Br.
* *Rapistrum rugosum* (L.) Bergeret
* *Rorippa nasturtium-aquaticum* (L.) Hayek
* *Sisymbrium officinale* (L.) Scop.
* *Sisymbrium orientale* L.

CAESALPINIACEAE
Caesalpinia bonduc (L.) Roxb.
* *Caesalpinia decapetala* (Roth) Alston
* *Caesalpinia major* (Medik.) Dandy & Exell
* *Chamaecrista rotundifolia* (Pers.) Greene
* *Senna septemtrionalis* (Viv.) H.S.Irwin & Barneby

CAMPANULACEAE
Lobelia anceps L.f.
* *Pratia purpurascens* (R.Br.) E.Wimm.
Wahlenbergia gracilis (G.Forst.) A.DC.

CAPPARACEAE
e *Capparis nobilis* (Endl.) F.Muell. ex Benth.

CAPRIFOLIACEAE
* *Lonicera japonica* Thunb. ex Murray

CARYOPHYLLACEAE
* *Cerastium fontanum* subsp. *vulgare* (Hartm.) Greuter & Burdet
* *Cerastium glomeratum* Thuill.
* *Paronychia brasiliana* DC.
* *Petrorhagia velutina* (Guss.) P.W.Ball & Heyward
* *Polycarpon tetraphyllum* (L.) L.
* *Sagina apetala* Ard.
* *Silene gallica* L.
* *Stellaria media* (L.) Vill.

CASUARINACEAE
* *Casuarina glauca* Sieber ex Spreng.

CELASTRACEAE
Elaeodendron curtipendulum Endl.

CHENOPODIACEAE
* *Atriplex semibaccata* R.Br.
* *Chenopodium album* L.
* *Chenopodium ambrosioides* L.
* *Chenopodium murale* L.
Sarcocornia quinqueflora (Bunge ex Ung.-Sternb.) A.J.Scott

CONVOLVULACEAE
e *Calystegia affinis* Endl.
Calystegia soldanella (L.) R.Br.
Dichondra repens J.R.Forst. & G.Forst.
* *Ipomoea alba* L.
* *Ipomoea cairica* (L.) Sweet
* *Ipomoea indica* (Burm.) Merr.
Ipomoea pes-caprae subsp. *brasiliensis* (L.) Ooststr.

CUCURBITACEAE
* *Cucumis anguria* L.
Diplocyclos palmatus subsp. *affinis* (Endl.) P.S.Green
Sicyos australis Endl.
Zehneria baueriana Endl.

EUPHORBIACEAE
* *Acalypha wilkesiana* Müll.Arg.
Baloghia inophylla (G.Forst.) P.S.Green
e *Euphorbia norfolkiana* Boiss.
Euphorbia obliqua Endl.
* *Euphorbia peplus* L.
* *Euphorbia prostrata* Aiton
Excoecaria agallocha L.
Homalanthus populifolius Graham

* *Phyllanthus tenellus* Roxb.
* *Ricinus communis* L.
FABACEAE
Canavalia rosea (Sw.) DC.
* *Castanospermum australe* A.Cunn. ex Mudie
* *Crotalaria agatiflora* Schweinf.
* *Desmodium incanum* DC.
* *Desmodium tortuosum* (Sw.) DC.
* *Erythrina caffra* Thunb.
* *Erythrina speciosa* Andrews
* *Glycine microphylla* (Benth.) Tindale
* *Indigofera suffruticosa* Mill.
* *Lablab purpureus* (L.) Sweet
* *Lotus angustissimus* L.
* *Lupinus cosentinii* Guss.
* *Medicago lupulina* L.
* *Medicago polymorpha* L.
* *Melilotus indicus* (L.) All.
Millettia australis (Endl.) Benth.
* *Pueraria lobata* (Willd.) Ohwi
e *Streblorrhiza speciosa* Endl.
* *Teline monspessulana* (L.) K.Koch
* *Trifolium campestre* Schreb.
* *Trifolium dubium* Sibth.
* *Trifolium glomeratum* L.
* *Vicia hirsuta* (L.) Gray
* *Vicia sativa* subsp. *nigra* (L.) Ehrh.
* *Vicia tetrasperma* (L.) Schreb.
Vigna marina (Burm.) Merr.
FRANKENIACEAE
* *Frankenia pulverulenta* L.
FUMARIACEAE
* *Fumaria muralis* Sond. ex W.Koch
GENTIANACEAE
* *Centaurium tenuiflorum* (Hoffmanns. & Link) Fritsch ex Jansen
GERANIACEAE
* *Erodium moschatum* (L.) L'Hér. ex Aiton
* *Geranium dissectum* L.
* *Geranium solanderi* Carolin
* *Pelargonium australe* Willd.
ICACINACEAE
Pennantia endlicheri Reissek
LAMIACEAE
* *Marrubium vulgare* L.
* *Mentha × piperita* L.
* *Mentha spicata* L.
* *Salvia coccinea* Etl.
* *Salvia verbenaca* L.
* *Stachys arvensis* (L.) L.
LINACEAE
* *Linum marginale* A.Cunn.
* *Linum trigynum* L.
LORANTHACEAE
Ileostylus micranthus (Hook.f.) Tiegh.
LYTHRACEAE
* *Lythrum hyssopifolia* L.
MALVACEAE
* *Abutilon grandifolium* (Willd.) Sweet
e *Abutilon julianae* Endl.
Hibiscus diversifolius Jacq.
e *Hibiscus insularis* Endl.
* *Hibiscus pedunculatus* L.f.
Hibiscus tiliaceus L.
Lagunaria patersonia (Andrews) G.Don subsp. *patersonia*
* *Malva parviflora* L.
* *Malvastrum coromandelianum* (L.) Garcke
* *Modiola caroliniana* (L.) G.Don
* *Pavonia hastata* Cav.
* *Sida carpinifolia* L.f.
* *Sida rhombifolia* L.
MELIACEAE
Dysoxylum bijugum (Labill.) Seem.
* *Melia azedarach* L.
MIMOSACEAE
* *Acacia dealbata* Link
* *Acacia parramattensis* Tindale
* *Paraserianthes lophantha* (Willd.) I.C.Nielsen
MORACEAE
Streblus pendulinus (Endl.) F.Muell.
MYOPORACEAE
e *Myoporum obscurum* Endl.
MYRSINACEAE
e *Rapanea ralstoniae* P.S.Green
MYRTACEAE
* *Eucalyptus botryoides* Sm.
* *Eucalyptus fibrosa* F.Muell.
* *Eugenia uniflora* L.
* *Metrosideros kermadecensis* W.R.B.Oliv.
* *Psidium cattleianum* Sabine var. *cattleianum*
* *Psidium cattleianum* var. *littorale* (Raddi) Fosberg
* *Psidium guajava* L.
NYCTAGINACEAE
Pisonia brunoniana Endl.
OCHNACEAE
* *Ochna serrulata* (Hochst.) Walp.
OLEACEAE
Jasminum simplicifolium subsp. *australiense* P.S.Green
* *Ligustrum lucidum* W.T.Aiton
* *Ligustrum sinense* Lour.
Nestegis apetala (Vahl) L.A.S.Johnson

* *Olea europaea* subsp. *cuspidata* (Wall. ex G.Don) Cif.
ONAGRACEAE
* *Oenothera affinis* Cambess.
* *Oenothera rosea* L'Hér. ex Aiton
* *Oenothera stricta* Ledeb. ex Link subsp. *stricta*
* *Oenothera tetraptera* Cav.
OROBANCHACEAE
* *Orobanche minor* Sm.
OXALIDACEAE
Oxalis corniculata L.
* *Oxalis debilis* Kunth
PAPAVERACEAE
* *Argemone subfusiformis* Ownbey
* *Papaver somniferum* L.
PASSIFLORACEAE
Passiflora aurantia G.Forst.
* *Passiflora edulis* Sims
PHYTOLACCACEAE
* *Phytolacca octandra* L.
* *Rivina humilis* L.
PIPERACEAE
Macropiper excelsum subsp. *psittacorum* (Endl.) Sykes
Peperomia tetraphylla Hook. & Arn.
Peperomia urvilleana A.Rich.
PITTOSPORACEAE
e *Pittosporum bracteolatum* Endl.
* *Pittosporum crassifolium* Banks & Sol. ex A.Cunn.
* *Pittosporum undulatum* Vent.
PLANTAGINACEAE
* *Plantago debilis* R.Br.
* *Plantago lanceolata* L.
* *Plantago major* L.
PLUMBAGINACEAE
Plumbago zeylanica L.
POLYGALACEAE
* *Polygala myrtifolia* L.
POLYGONACEAE
* *Fallopia convolvulus* (L.) Á.Löve
Muehlenbeckia australis (G.Forst.) Meisn.
Persicaria decipiens (R.Br.) K.L.Wilson
* *Rumex brownii* Campd.
* *Rumex conglomeratus* Murray
PORTULACACEAE
* *Portulaca oleracea* L.
PRIMULACEAE
* *Anagallis arvensis* L.
Samolus repens var. *stricta* Cockayne
PROTEACEAE
* *Grevillea robusta* A.Cunn. ex R.Br.
* *Hakea salicifolia* (Vent.) B.L.Burtt
* *Hakea sericea* Schrad.
RANUNCULACEAE
e *Clematis dubia* (Endl.) P.S.Green
* *Ranunculus muricatus* L.
* *Ranunculus parviflorus* L.
* *Ranunculus repens* L.
* *Ranunculus sessiliflorus* R.Br. ex DC.
ROSACEAE
* *Eriobotrya japonica* (Thunb.) Lindl.
* *Rhaphiolepis umbellata* (Thunb.) Makino
* *Rubus fruticosus* L.
RUBIACEAE
* *Coffea arabica* L.
e *Coprosma baueri* Endl.
e *Coprosma pilosa* Endl.
* *Pentas lanceolata* (Forssk.) Deflers
* *Sherardia arvensis* L.
RUTACEAE
* *Citrus jambhiri* Lush.
e *Melicope littoralis* (Endl.) T.G.Hartley
Sarcomelicope simplicifolia (Endl.) T.G.Hartley subsp. *simplicifolia*
Zanthoxylum pinnatum (J.R.Forst. & G.Forst.) W.R.B.Oliv.
SANTALACEAE
Exocarpos phyllanthoides Endl. var. *phyllanthoides*
SAPINDACEAE
Dodonaea viscosa (L.) Jacq. subsp. *viscosa*
SAPOTACEAE
Pouteria costata (Endl.) Baehni
SCROPHULARIACEAE
* *Calceolaria tripartita* Ruiz & Pav.
* *Misopates orontium* (L.) Raf.
* *Verbascum thapsus* L.
* *Verbascum virgatum* Stokes
* *Veronica arvensis* L.
* *Veronica persica* Poir.
* *Veronica plebeia* R.Br.
SOLANACEAE
* *Brugmansia suaveolens* (Humb. & Bonpl. ex Willd.) Bercht. & J.Presl
* *Datura stramonium* L.
* *Lycium ferocissimum* Miers
* *Nicandra physalodes* (L.) Gaertn.
* *Nicotiana tabacum* L.
* *Petunia × hybrida* Vilm.
* *Physalis peruviana* L.
* *Solandra maxima* (Sessé & Moç.) P.S.Green
Solanum americanum subsp. *nutans* (R.J.F.Henders.) R.J.F.Henders.
Solanum aviculare G.Forst.
e *Solanum bauerianum* Endl.

* *Solanum linneanum* Hepper & P.Jaeger
* *Solanum mauritianum* Scop.
STERCULIACEAE
e *Ungeria floribunda* Schott & Endl.
THYMELAEACEAE
e *Wikstroemia australis* Endl.
TILIACEAE
* *Triumfetta rhomboidea* Jacq.
ULMACEAE
*Celtis paniculata (*Endl.) Planch.
URTICACEAE
e *Boehmeria australis* Endl. var. *australis*
* *Boehmeria nivea* (L.) Gaudich.
e *Elatostema montanum* Endl.
Parietaria debilis G.Forst.
* *Pilea microphylla* (L.) Liebm.
* *Urtica urens* L.
VERBENACEAE
* *Lantana camara* L.
* *Verbena bonariensis* L.
* *Verbena litoralis* Kunth
VIOLACEAE
e *Melicytus latifolius* (Endl.) P.S.Green
e *Melicytus ramiflorus* subsp. *oblongifolius* (A.Cunn.) P.S.Green
Viola betonicifolia subsp. *novaguineensis* D.M.Moore
VISCACEAE
e *Korthalsella disticha* (Endl.) Engl.

MONOCOTYLEDONAE
AGAVACEAE
e *Cordyline obtecta* (Graham) Baker
Phormium tenax J.R.Forst. & G.Forst.
ARACEAE
* *Colocasia esculenta* (L.) Schott
* *Xanthosoma sagittifolium* (L.) Schott
* *Zantedeschia aethiopica* (L.) Spreng.
ARECACEAE
e *Rhopalostylis baueri* H.Wendl. & Drude var. *baueri*
CANNACEAE
* *Canna indica* L.
COMMELINACEAE
Commelina cyanea R.Br.
CYPERACEAE
Bolboschoenus fluviatilis (Torr.) Soják
Carex breviculmis R.Br.
Carex inversa R.Br.
e *Carex neesiana* Endl.
* *Cyperus albostriatus* Schrad.
* *Cyperus gracilis* R.Br.
* *Cyperus involucratus* Rottb.
Cyperus lucidus R.Br.
* *Cyperus rotundus* L.
Eleocharis acuta R.Br.
Isolepis inundata R.Br.
Isolepis nodosa (Rottb.) R.Br.
e ?*Isolepis sp.*
* *Kyllinga brevifolia* Rottb.
* *Pycreus polystachyos* (Rottb.) P.Beauv.
Schoenoplectus validus (J.Vahl) Á.Löve & D.Löve
IRIDACEAE
* *Anomatheca laxa* (Thunb.) Goldblatt
* *Ferraria crispa* Burm.
* *Gladiolus × hortulanus* L.H.Bailey
* *Homeria flaccida* Sweet
* *Sisyrinchium micranthum* Cav.
* *Tritonia lineata* (Salisb.) Ker Gawl.
JUNCACEAE
* *Juncus articulatus* L.
* *Juncus bufonius* L.
Juncus continuus L.A.S.Johnson
LILIACEAE
* *Alstroemeria pulchella* L.f.
* *Asparagus aethiopicus* L.
* *Asparagus plumosus* Baker
Crinum asiaticum var. *pedunculatum* (R.Br.) Fosberg & Sachet
e *Dianella intermedia* Endl.
* *Nothoscordum borbonicum* Kunth
LIMNOCHARITACEAE
* *Hydrocleys nymphoides* (Humb. & Bonpl. ex Willd.) Buchenau
ORCHIDACEAE
Bulbophyllum argyropus (Endl.) Rchb.f.
e *Dendrobium brachypus* (Endl.) Rchb.f.
e *Dendrobium macropus* (Endl.) Rchb.f. ex Lindl. subsp. *macropus*
Microtis unifolia (G.Forst.) Rchb.f.
Oberonia titania Lindl.
e *Phreatia limenophylax* (Endl.) Benth.
Phreatia paleata Rchb.f.
Taeniophyllum muelleri Lindl. ex Benth.
Tropidia viridifusca Kraenzl.
PANDANACEAE
e *Freycinetia baueriana* Endl. subsp. *baueriana*
POACEAE
Agrostis avenacea J.F.Gmel.
* *Aira cupaniana* Guss.
* *Ammophila arenaria* (L.) Link
* *Anthoxanthum odoratum* L.
* *Arundo donax* L.
* *Avena sativa* L.
* *Axonopus fissifolius* (Raddi) Kuhlm.
* *Bothriochloa macra* (Steud.) S.T.Blake
* *Briza maxima* L.
* *Briza minor* L.

* *Bromus catharticus* Vahl
* *Bromus diandrus* Roth
* *Bromus hordeaceus* L.
* *Bromus scoparius* L.
* *Catapodium rigidum* (L.) C.E.Hubbard
Cenchrus caliculatus Cav.
* *Chloris gayana* Kunth
Cymbopogon refractus (R.Br.) A.Camus
* *Cynodon dactylon* (L.) Pers.
* *Dactylis glomerata* L.
Dichelachne crinita (L.f.) Hook.f.
Dichelachne micrantha (Cav.) Domin
* *Digitaria ciliaris* (Retz.) Koeler
Digitaria setigera Roth ex Roem. & Schult.
* *Echinochloa crusgalli* (L.) P.Beauv.
Echinopogon ovatus (G.Forst.) P.Beauv.
* *Eleusine indica* (L.) Gaertn.
Elymus multiflorus var. *kingianus* (Endl.) Connor
Elymus rectisetus (Nees) Á.Löve & Connor
* *Eragrostis brownii* (Kunth) Nees ex Wight
* *Hordeum murinum* L. subsp. *glaucum* (Steud.) Tzvelev
* *Hordeum murinum* L. subsp. *leporinum* (Link) Arcang.
* *Lolium perenne* L.
* *Lolium rigidum* Gaudin var. *rigidum*
* *Lolium rigidum* var. *rottboellioides* Heldr. ex Boiss.
* *Melinis minutiflora* P.Beauv.
Microlaena stipoides (Labill.) R.Br.
Oplismenus hirtellus (L.) P.Beauv.
Panicum effusum R.Br.
* *Panicum maximum* Jacq.
* *Paspalum dilatatum* Poir.
Paspalum scrobiculatum L.
* *Pennisetum clandestinum* Hochst. ex Chiov.
* *Pennisetum purpureum* Schumach.
* *Phalaris minor* Retz.
* *Poa annua* L.
* *Poa pratensis* L.
* *Rhynchelytrum repens* (Willd.) C.E.Hubbard
* *Rostraria cristata* (L.) Tzvelev
* *Setaria palmifolia* (J.König) Stapf
* *Setaria pumila* subsp. *pallidefusca* (Schumach.) B.K.Simon
* *Setaria verticillata* (L.) P.Beauv.
* *Sorghum arundinaceum* (Desv.) Stapf
* *Spinifex sericeus* R.Br.
* *Sporobolus africanus* (Poir.) Robyns & Tournay
Sporobolus virginicus (L.) Kunth
* *Stenotaphrum secundatum* (Walter) Kuntze
* *Vulpia bromoides* (L.) Gray
* *Vulpia myuros* f. *megalura* (Nutt.) Stace & R.Cotton
PONTEDERIACEAE
* *Eichhornia crassipes* (Mart.) Solms
SMILACACEAE
Geitonoplesium cymosum (R.Br.) A.Cunn. ex R.Br.
TYPHACEAE
Typha orientalis C.Presl

PINOPHYTA
ARAUCARIACEAE
e *Araucaria heterophylla* (Salisb.) Franco
CUPRESSACEAE
* *Cupressus lusitanica* Mill.

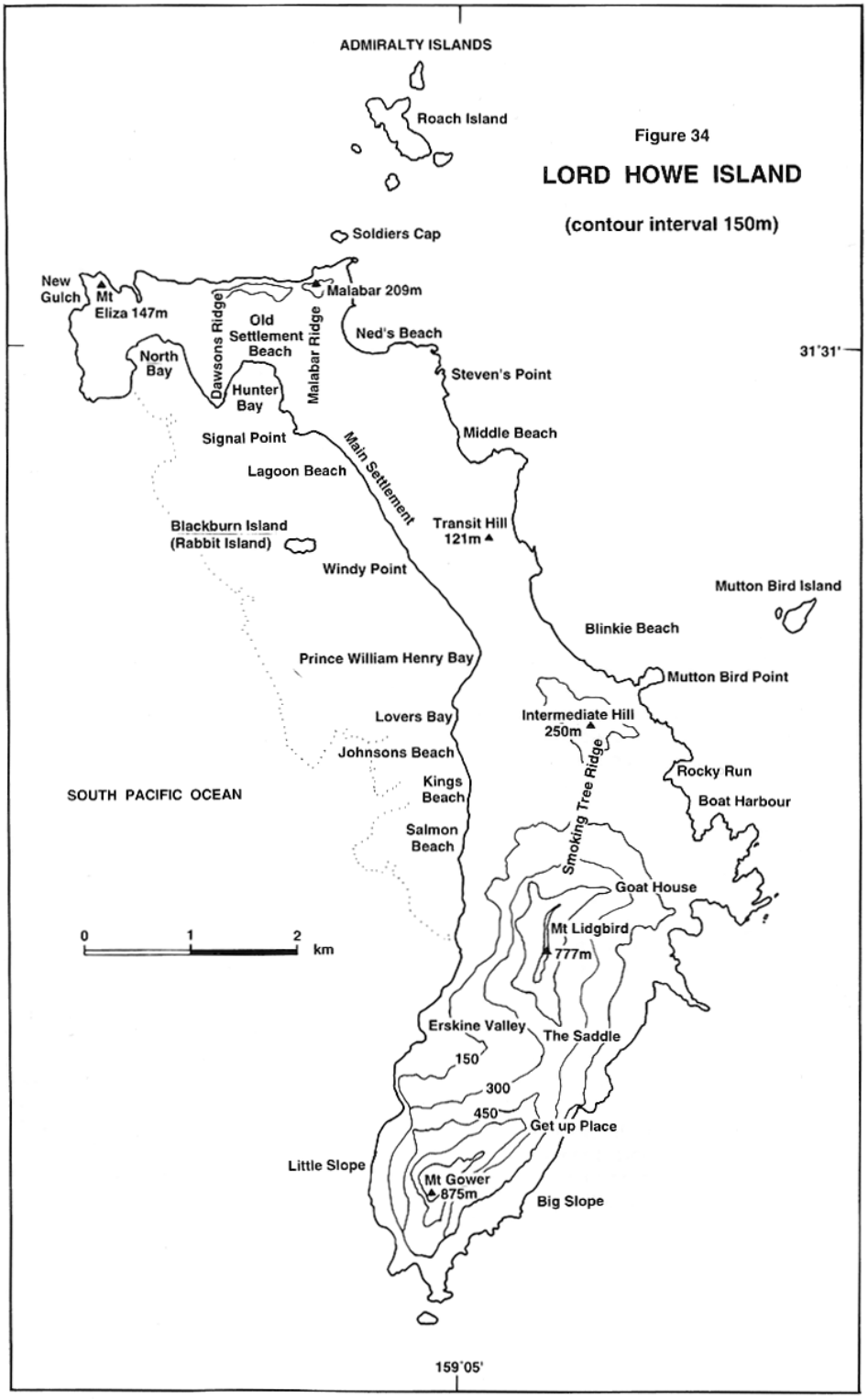
PTERIDOPHYTA
ADIANTACEAE
Adiantum diaphanum Blume
Adiantum pubescens Schkuhr.
Cheilanthes distans (R.Br.) Mett.
Cheilanthes sieberi Kunze
ASPLENIACEAE
Asplenium australasicum (J.Sm.) Hook. f. *australasicum*
Asplenium australasicum f. *robinsonii* (F.Muell.) P.S.Green
Asplenium difforme R.Br.
e *Asplenium dimorphum* Kunze
Asplenium polyodon G.Forst.
ATHYRIACEAE
Diplazium assimile (Endl.) Bedd.
Diplazium australe (R.Br.) N.A.Wakef.
Lunathyrium japonicum (Thunb.) Sa.Kurata
BLECHNACEAE
Blechnum norfolkianum (Heward) Maiden
Doodia aspera R.Br.
Doodia media R.Br.
CYATHEACEAE
e *Cyathea australis* subsp. *norfolkensis* Holttum
e *Cyathea brownii* Domin
DAVALLIACEAE
Arthropteris tenella (G.Forst.) J.Sm. ex Hook.f.
Nephrolepis cordifolia (L.) C.Presl

DENNSTAEDTIACEAE
Histiopteris incisa (Thunb.) J.Sm.
Hypolepis dicksonioides (Endl.) Hook.
Hypolepis tenuifolia (G.Forst.) Bernh. ex C.Presl
Pteridium esculentum (G.Forst.) Cockayne
DRYOPTERIDACEAE
Arachniodes aristata (G.Forst.) Tindale
e *Lastreopsis calantha* (Endl.) Tindale
HYMENOPHYLLACEAE
e *Cephalomanes bauerianum* (Endl.) P.S.Green
Crepidomanes endlicherianum (C.Presl) P.S.Green
Crepidomanes saxifragoides (C.Presl) P.S.Green
LYCOPODIACEAE
Lycopodiella cernua (L.) Pic.Serm.
MARATTIACEAE
Marattia salicina Sm.
OPHIOGLOSSACEAE
Ophioglossum petiolatum Hook.
POLYPODIACEAE
Phymatosorus pustulatus (G.Forst.) M.F.Large subsp. *pustulatus*
Pyrrosia confluens (R.Br.) Ching
PSILOTACEAE
Psilotum nudum (L.) P.Beauv.
e *Tmesipteris norfolkensis* P.S.Green
PTERIDACEAE
e *Pteris kingiana* Endl.
Pteris tremula R.Br.
e *Pteris zahlbruckneriana* Endl.
SELAGINELLACEAE
* *Selaginella kraussiana* (Kunze) A.Braun
THELYPTERIDACEAE
Christella dentata (Forssk.) Brownsey & Jermy
Christella parasitica (L.) H.Lév.
Macrothelypteris torresiana (Gaudich.) Ching
VITTARIACEAE
Vittaria elongata Sw.

LORD HOWE ISLAND

This is an island with a close phytogeographical affinity to Norfolk Island, but very different in its topography, history and present day pressures, especially those of population. Approximately 16.56 sq km in size, it is crescent-shaped, about 11 km long and between 0.6 and 2.8 km wide. The bow of the crescent contains the world's most southerly coral reef and lagoon, dominated by two precipitous mountains, Mt Gower (875 m) and Mt Lidgbird (777 m), which occupy the island's southern half. These mountains, and much of the rest of the island, are covered by the endemic forest, which is relatively untouched, especially on the southern mountains. The northern end rises to Malabar (209 m) and Mt Eliza (147 m), and between these and Mt Lidgbird lie Intermediate Hill (250 m) and Transit Hill (121 m) with more or less flat land between. Near the northern end lie seven small islands, the Admiralty Group. These are uninhabited, and Roach Island, the largest, is only about 600 m long by 100 m wide. Projecting out of the sea, about 23 km to the south-east, is the sharply pointed, much eroded, rugged stack, Balls Pyramid. Of volcanic origin, and 551 m high, its rocky surface supports few plants but many sea birds.

As with Norfolk Island, the climate of Lord Howe Island is oceanic. Winters are cool and wet, with rainfall more or less uniform throughout. The summers are mild or warm; the rainfall is less regular and commonly in the form of short, fairly heavy showers. A notable climatic feature is the strong winds, laden with salt-spray. On the ridges plants that would be small trees in a sheltered locality grow to only a metre or so high, pruned by the wind. In summer the prevailing winds are moderate easterlies, those in winter are fresh to strong westerlies. August is the windiest month, but there is wind on most days throughout the year with only four or five completely still days. Rainfall is mainly in the months March to October, c. 180 mm falling in June and July, and c. 120 mm in each of the summer months. The rain comes mostly in showers, although in winter frontal systems can bring rain bands that may last for a day or more. Rainfall in the inhabited, northern part of the island, where records have been kept, is much less than in the southern mountainous half. Because of their altitude, Mounts Gower and Lidgbird are commonly shrouded in cloud, with a consequential


ADMIRALTY ISLANDS
Roach Island
Figure 34
LORD HOWE ISLAND
(contour interval 150m)
Soldiers Cap
New Gulch
Mt Eliza 147m
Malabar 209m
Dawsons Ridge
Old Settlement Beach
Malabar Ridge
Ned's Beach
North Bay
Hunter Bay
Steven's Point
31°31'
Signal Point
Middle Beach
Main Settlement
Lagoon Beach
Blackburn Island (Rabbit Island)
Transit Hill 121m
Windy Point
Mutton Bird Island
Blinkie Beach
Prince William Henry Bay
Mutton Bird Point
Lovers Bay
Intermediate Hill 250m
Johnsons Beach
Smoking Tree Ridge
Rocky Run
Kings Beach
SOUTH PACIFIC OCEAN
Boat Harbour
Salmon Beach
Goat House
0
1
2
km
Mt Lidgbird 777m
Erskine Valley
The Saddle
150
300
450
Get up Place
Little Slope
Mt Gower 875m
Big Slope
159°05'

heavier rainfall, perhaps 15–20% more. However, because the wind direction varies the mountains do not cast a rain shadow. The mean average rainfall recorded in the lowlands is about 1650 mm, but there can be wide variation from one year to another with what may be called a drought year occurring approximately once in every ten. The temperature range, as might be expected of an oceanic island at the latitude of Lord Howe Island, is moderate. The daily average maximum is about 25°C in summer and 18°C in winter. July and August are the coldest months with an average minimum of 13° and no frost. The highest temperature ever recorded was 29.5°C and the lowest 6°C.

Geologically, Lord Howe Island marks the heavily eroded remains of volcanic activity on the western rim of the Lord Howe Rise. It appears that the present land mass represents the remains of two spells of volcanic activity. The earlier, about 6.9 million years ago, gave rise to the northern and central hills, while the later activity took place about 6.3 million years ago and produced the basalt flows which constitute the two high mountains of Mt Gower and Mt Lidgbird. The near horizontal strata of these two mountains shows that the outflow of lava must have originally occupied an area much greater than that of the present island. The rocks which make up the low land at the feet of and between these hills and mountains consist of calcarenite which has arisen from coral sand, perhaps deposited and stratified several times in the Pleistocene. They contain fossils of birds' bones and eggs, land and marine snails, as well as the remarkable, extinct and endemic horned turtle, *Meiolania platyceps Owen*. In flat and low areas the substrate is one of alluvial origins. Although McDougall *et al.* (1981) may be turned to for a detailed geological account of the island, a succinct and informative one is provided by Hutton (1986).

Lord Howe Island was named after Richard, Earl Howe, First Lord of the Admiralty at the time the island was discovered on 17 February 1788. It was sighted at a considerable distance from HMS Supply, under the command of Lieutenant Henry Lidgbird Ball, which was carrying the settlers destined for Norfolk Island. At first it was thought that two islands had been seen, but Ball could not divert his ship to examine 'them' more closely. However, on his return voyage to Port Jackson he sailed closer, discovering that what, at a distance, had been taken for two islands were in fact two tall mountains standing at one end of an otherwise small island. (He also discovered the tall pinnacle of rock, about 23 km to the south-east of Lord Howe Island, now called Ball's Pyramid). Ball sent a boat ashore and the island was found to be quite uninhabited, and unlike Norfolk Island, no signs of habitation have been discovered since. The first people to settle on the island were three men from New Zealand with their Maori wives and two Maori 'boys'. They were landed in June 1834 and erected their home in the area of Hunter Bay, now known as the Old Settlement. Passing vessels, especially whalers, called to replenish their stocks of water, wood etc. and these early settlers, and those who followed them, set up a trading post for these necessities as well as potatoes, vegetables, fish and meat. The population was never large, and although in the 1850s thought was given to establishing a penal settlement on Lord Howe Island, this never materialised. In 1869 a Water Police Magistrate was sent to the island to investigate the report of a murder, which turned out to be a case of justifiable homicide. He took with him a number of officials, including Charles Moore, Director of the Botanic Gardens, Sydney, N.S.W., who was able to investigate the flora. A report of the homicide, the vegetation and the island as a whole was published as a result of this visit (Hill, 1870). The population of the island at that time was 35. Later, in 1882, John Bowie Wilson was sent with others to inquire into the cause of various complaints then being made by the islanders. His report (Wilson, 1882) contained the first photographs ever taken there and included a report on the vegetation by J.Duff of the Botanic Gardens, Sydney. The population had increased, but not very greatly. It was reported that there were 29 children on the island and the appointment of a schoolmaster was urged upon the Government. In 1913 the Lord Howe Island Board of Control was set up, controlling the affairs of the island until the present Lord Howe Island Board was established in 1954. The first Board was mainly set up to sort out and regulate the palm seed industry. This had started in the 1880s when it was discovered that the lowland palms on the island were admirably suited for cultivation in the fashionable conservatories of houses in Britain, Europe and America where they were, and are still, known as Kentia palms. The trade arose and flourished, providing income at a time when there were no longer any visits from whalers and other ships. The trade continues to this day, although now in the

form of sprouted seedlings exported by air rather than the seeds themselves. Tourism is now an important part of the island economy, although the human population of the island has remained relatively small, in contrast to that of Norfolk Island. A limit on the number of tourists present at any one time is maintained, again in contrast to Norfolk Island. This is greatly advantageous in respect to the environment, considering the pressures a large population can exert on an island's ecosystem.

VEGETATION

The vegetation of Lord Howe Island was comprehensively analysed and mapped by John Pickard and the results subsequently published in Pickard (1983a), which should be consulted for details. He recognised 32 units arranged in 10 formations with a number of subformations and alliances. Mueller-Dombois (in press) has simplified the analysis, recognising nine categories. **(1)** Lowland subtropical rainforest, which includes five of Pickard's alliances, among which the most important are the *Drypetes*/*Cryptocarya* forest with *Drypetes deplanchei* subsp. *affinis* and *Cryptocarya triplinervis* dominant, and the palm forest dominated either by *Howea forsteriana* or *H. belmoreana*. **(2)** Submontane rainforest with two types distinguished: *Cryptocarya* forest with *C. gregsonii* dominant and submontane palm forest dominated by *Hedescepe canterburyana*. **(3)** Cloud-forest and scrub, with two types distinguished: *Zygogynum*/*Dracophyllum* cloud forest and scrub, found on the summit plateau of Mt Gower and the summit ridge of Mt Lidgbird, dominated by *Z. howeanum* and *D. fitzgeraldii*, and the *Dracophyllum*/*Metrosideros* scrub on the uppermost slopes of the two mountains, dominated by *D. fitzgeraldii* and *M. nervulosa*. **(4)** Lowland swamp forest, mangrove scrub and seagrass vegetation, all disjunct with restricted sites; the swamp forest (found in two or three spots) dominated by *Lagunaria patersonia*; the mangrove scrub, again in very restricted sites in two or three places on the west coast of the island with either *Aegiceras corniculatum* or *Avicennia marina* subsp. *australasica*; and the seagrass meadow with two species, *Halophila ovalis* and *Zostera capricorni* growing extensively in the sheltered lagoon. **(5)** Coastal scrub and cliff vegetation, in which Pickard recognised four alliances which could be considered under the headings *Melaleuca* scrub, *Cassinia* scrub, *Atriplex cinerea* dwarf scrub and cliff vegetation with *Melaleuca howeana* and *Cassinia tenuifolia* on steep slopes. **(6)** Inland scrub and herbland consisting of three communities: *Macropiper* submontane scrub, *Dodonaea* scrub at mid altitudes to 33 m and mixed fern and herb communities between 80 and 500 m, mostly at the base of inland cliffs. **(7)** Off-shore island vegetation consisting of an *Ipomoea*/*Carpobrotus* community on Roach Island, a *Poa poiformis* community on several of the islets of the Admiralty Group and some small wind-exposed headlands on the main island. **(8)** Shoreline and beach vegetation, varying according to the substrate: calcareous sand, basalt boulders or calcarenite/coral boulders. **(9)** Disturbed vegetation, particularly noticeable on land abandoned after use in agriculture, with various introduced weeds, including the two species of *Psidium* and *Chrysanthemoides monilifera*, and agricultural grasses which, because of their habit, tend to prevent any regeneration by native trees or shrubs. Using an analysis of pollen grains trapped in moss, Dodson (1982) has recognised a number of vegetational types on the island and shown how these have been affected by the activities of the first settlers. Among other things he suggests that *Avicennia* (now reduced to between six and nine individuals) would at one time have had a larger representation, which is particularly interesting in the light of the recent discovery of a submerged tree stump in the lagoon which, after anatomical examination, turns out to be *Avicennia*. Pickard (1982) published a study of some limited communities on a series of different aged landslides constituting the Little Slope, an area at the bottom of cliffs on the somewhat inaccessible southern rim of the island. He coupled with this observations on the effects of goats and rats on these communities.

A phenomenon which has frequently been noted in the lowland and submontane forests is that of canopy dieback. On the island, notable for its strong winds, this is not a new occurrence but has been exacerbated by the clearance of sheltering plants, exposing the trees growing in the forest behind to the often salt-laden wind. Three species in particular provide outer protection; shrubs or small trees of *Melaleuca howeana*, *Cassinia tenuifolia* or *Myoporum insulare* are all resistant to wind and salt-spray, especially the *Melaleuca*. By contrast, two trees which seem particularly susceptible to wind are *Cleistocalyx fullagarii*

and *Ficus macrophylla* subsp. *columnaris*. In fact, the rapid reduction in the number and extent of the latter, and the often unhealthy state of the trees, was noted as long ago as 1882 (Duff, in Wilson 1882). It seems significant that the native fig, *Ficus macrophylla* subsp. *columnaris*, noted as abundant by those who first visited the island, declined in numbers very rapidly as soon as the lowland forest was opened up to wind by the early settlers clearing land for the cultivated crops.

The first botanical collections on Lord Howe Island were made by J.MacGillivray and W.G.Milne, naturalists on the voyage of H.M.S. *Herald* in 1854. The brief visit in 1869 by Charles Moore led to the publication of the first list of the island's plants (Moore in Hill, 1870). The next collections were those of the professional plant collector of the Botanic Gardens, Melbourne, Vic., J.P.Fullagar, in 1873 and 1874, which, with earlier collections of Moore, provided the types of many of the endemic species described by F. von Mueller or jointly by him with Moore. The records gathered up to that time were the basis of the first more or less comprehensive list of the flora by F. von Mueller (1875), which was expanded by W.B.Hemsley (1896). In 1882 John Duff, at that time on the staff of the Botanic Gardens, Sydney, N.S.W., visited the island and made a short report on its vegetation (Duff in Wilson, 1882). Then in 1898 J.H.Maiden spent nine days there and was able to supplement the previous records (Maiden, 1898). In 1911 the Rev. W.W.Watts visited Lord Howe Island, especially to look at the ferns and mosses, and in 1917, following a short stay, W.R.B.Oliver published the most comprehensive account of the flora up to that date (Oliver, 1917). Few botanical visits seem to have been made following this, until the years 1962 and 1963 when coincidentally A.C.Beauglehole, R.D.Hoogland and I quite independently visited and made collections. Other visits were made in 1965 by M.M.J. van Balgooy and in 1968 by R.J.Chinnock. In 1970, following a call to protect the flora and fauna of the island, a thorough biological survey was undertaken (Recher & Clark, 1974) and over the next few years a systematic investigation of the vegetation and flora was undertaken by J.Pickard and A.N.Rodd, then of the Royal Botanic Gardens, Sydney (Pickard, 1983a; Rodd & Pickard, 1983). I made two further visits, in 1971 and 1985, and this *Flora* is based upon the observations and collections then made, supplemented by those made by others. Notable among these are the remarkable new and recent discoveries by Ian Hutton made during, and following, his two periods of residence on the island.

The fauna of Lord Howe Island contains only one native mammal, a small and probably extinct insectivorous bat *Vespadelus pumilus* Gray. There are a gecko, *Christinus guentheri* (Boulenger), and a skink, *Pseudemoia lichenigerum* (O'Shaughnessy), which, due to the depredations of introduced rats, are also rare, except on Blackburn Island (Rabbit Is.) and the offshore islets, including Balls Pyramid (where they grow to a larger size). Notes and a survey of some groups of the invertebrate fauna, terrestrial molluscs, annelid worms and butterflies, are given in Recher & Clark (1974). Much work remains to be done in all invertebrate groups however. The outstanding part of the island's fauna is the sea-birds. Details of the avifauna, together with excellent illustrations, can be found in Hutton (1990). The best known endemic bird is the flightless woodhen, *Gallirallus sylvestris* (Sclater), which by the late 1960s had been reduced to a population of about 16 adults. Thanks to a scientific study of the bird started in 1970 and a brilliant captive breeding programme commenced in late 1979, the population has greatly increased and the birds have been released throughout the island. In 1988, 182 birds were counted and the total population was probably over 200. Two other remarkable endemic birds of the island are now extinct. There was a white gallinule, *Porphyrio albus* (White), which stood about 50 cm high, and a white-throated pigeon, *Columba vitiensis godmanae* (Mathews), about 40 cm long. Like the woodhen, they were flightless, but being without fear of man were hunted to extinction by ships' landing parties. Early accounts speak of large numbers of the latter bird, but, by as early as 1853, they were only occasionally to be seen. The greatest menace to the remaining ground nesting birds has come from the rats that came ashore from the beached *Makambo* in 1918. The rats also eat palm seeds, severely reducing the quantity of seeds available, a significant blow to the islanders, since the collection and export of these has for many years been their chief source of income. There are still some rats on the island despite the present control measures. They continue to damage the vegetation, eating palm fronds and seeds, as well as the fruits, roots, shoots and bark of some other plants. The other introduced animals

which have seriously affected the flora are pigs and goats. These were presumably liberated on the island by mariners in early years to provide a source of fresh meat for their next visit to the island, a common practice in the days of sailing ships and before refrigeration. Fortunately, the feral pigs were eradicated in the late 1970s or early 1980s, but the goats, while drastically reduced in number, still remain. An account of their effect on the vegetation has been provided by Pickard (1976), and they have now been cleared from the northern hills, but to eliminate them from the steep, broken ground in the southern part of the island is not easily done. Nevertheless, their extermination should be one of the aims of those responsible for conservation on the island.

LORD HOWE ISLAND SPECIES LIST

(e = endemic taxon; * = naturalised taxon)

MAGNOLIOPHYTA

DICOTYLEDONAE

AIZOACEAE
- *Carpobrotus glaucescens* (Haw.) Schwantes
- *Tetragonia implexicoma* (Miq.) Hook.f.
- *Tetragonia tetragonioides* (Pall.) Kuntze
- *Sesuvium portulacastrum* (L.) L.

AMARANTHACEAE
- *Achyranthes aspera* L.
- * *Amaranthus blitum* L.

APIACEAE
- * *Apium graveolens* L.
- e *Apium prostratum* subsp. *howense* P.S.Short
- * *Centella asiatica* (L.) Urb.
- * *Ciclospermum leptophyllum* (Pers.) Sprague
- * *Hydrocotyle bonariensis* Lam.
- *Hydrocotyle hirta* R.Br. ex A.Rich.
- * *Torilis nodosa* (L.) Gaertn.

APOCYNACEAE
- e *Alyxia lindii* F.Muell.
- *Alyxia ruscifolia* R.Br.
- e *Alyxia squamulosa* C.Moore & F.Muell.
- *Ochrosia elliptica* Labill.
- e *Parsonsia howeana* J.B.Williams
- * *Vinca major* L.

ARALIACEAE
- *Polyscias cissodendron* (C.Moore & F.Muell.) Harms
- * *Tetrapanax papyrifer* (Hook.) K.Koch

ASCLEPIADACEAE
- *Marsdenia rostrata* R.Br.
- e *Marsdenia tubulosa* F.Muell.
- *Tylophora biglandulosa* (Endl.) F.Muell.

ASTERACEAE
- * *Ageratina adenophora* (Spreng.) R.M.King & H.Rob.
- * *Ageratum conyzoides* L.
- * *Aster subulatus* Michx.
- * *Bidens pilosa* L.
- e *Brachyscome segmentosa* C.Moore & F.Muell.
- e *Cassinia tenuifolia* Benth.
- * *Centaurea melitensis* L.
- * *Chrysanthemoides monilifera* subsp. *rotundata* (DC.) Norl.
- * *Cirsium vulgare* (Savi) Ten.
- * *Conyza bonariensis* (L.) Cronquist
- * *Conyza parva* Cronquist
- * *Conyza sumatrensis* (Retz.) E.Walker
- *Cotula australis* (Sieber ex Spreng.) Hook.f.
- * *Delairea odorata* Lem.
- *Euchiton involucratus* (G.Forst.) Holub
- * *Gaillardia × grandiflora* Van Houtte
- * *Galinsoga parviflora* Cav.
- * *Gamochaeta purpurea* (L.) Cabrera
- * *Hypochaeris radicata* L.
- * *Lactuca saligna* L.
- * *Leucanthemum × superbum* (Bergmans ex J.W.Ingram) D.H.Kent
- e *Lordhowea insularis* (Benth.) B.Nord.
- e *Olearia ballii* (F.Muell.) Hemsl.
- e *Olearia elliptica* subsp. *praetermissa* P.S.Green
- e *Olearia mooneyi* (F.Muell.) Hemsl.
- *Pseudognaphalium luteoalbum* (L.) Hilliard & B.L.Burtt
- * *Roldana petasitis* (Sims) H.Rob. & Brettell
- * *Senecio elegans* L.
- e *Senecio howeanus* Belcher
- e *Senecio pauciradiatus* Belcher
- * *Silybum marianum* (L.) Gaertn.
- * *Sonchus asper* subsp. *glaucescens* (Jord.) Ball
- * *Sonchus megalocarpus* (Hook.f.) J.M.Black
- * *Sonchus oleraceus* L.
- * *Taraxacum officinale*
- *Wollastonia biflora* (L.) DC.

BASELLACEAE
* *Anredera cordifolia* (Ten.) Steenis
BIGNONIACEAE
Pandorea pandorana subsp. *austrocaledonica* (Bureau) P.S.Green
BRASSICACEAE
* *Cakile edentula* (Bigelow) Hook.
* *Capsella bursa-pastoris* (L.) Medik.
* *Coronopus didymus* (L.) Sm.
* *Lepidium africanum* (Burm.f.) DC.
* *Lepidium bonariense* L.
e *Lepidium howei-insulae* Thell.
e *Lepidium nesophilum* Hewson
* *Lobularia maritima* (L.) Desv.
* *Sisymbrium officinale* (L.) Scop.
CAESALPINIACEAE
Caesalpinia bonduc (L.) Roxb.
* *Caesalpinia major* (Medik.) Dandy & Exell
* *Senna septemtrionalis* (Viv.) H.S.Irwin & Barneby
* *Senna pendula* var. *glabrata* (Vogel) H.S.Irwin & Barneby
CAMPANULACEAE
Lobelia anceps L.f.
* *Pratia purpurascens* (R.Br.) E.Wimm.
Wahlenbergia gracilis (G.Forst.) A.DC.
e *Wahlenbergia insulae-howei* Lothian
CARYOPHYLLACEAE
* *Arenaria serpyllifolia* L.
* *Cerastium fontanum* subsp. *vulgare* (Hartm.) Greuter & Burdet
* *Cerastium glomeratum* Thuill.
* *Polycarpon tetraphyllum* (L.) L.
* *Sagina apetala* Ard.
* *Silene gallica* L.
* *Stellaria media* (L.) Vill.
CASUARINACEAE
* *Casuarina glauca* Sieber ex Spreng.
CELASTRACEAE
Elaeodendron curtipendulum Endl.
CHENOPODIACEAE
Atriplex cinerea Poir.
* *Atriplex prostrata* Boucher ex DC.
* *Chenopodium murale* L.
Sarcocornia quinqueflora (Bunge ex Ung.-Sternb.) A.J.Scott
CONVOLVULACEAE
e *Calystegia affinis* Endl.
Calystegia soldanella (L.) R.Br.
* *Ipomoea alba* L.
* *Ipomoea cairica* (L.) Sweet
Ipomoea pes-caprae subsp. *brasiliensis* (L.) Ooststr.
CRASSULACEAE
* *Bryophyllum pinnatum* (Lam.) Oken
Crassula sieberiana (Schult. & Schult.f.) Druce subsp. *sieberiana*
CUCURBITACEAE
Sicyos australis Endl.
ELAEOCARPACEAE
e *Elaeocarpus costatus* M.Taylor
EPACRIDACEAE
e *Dracophyllum fitzgeraldii* C.Moore & F.Muell.
Leucopogon parviflorus (Andrews) Lindl.
EUPHORBIACEAE
Baloghia inophylla (G.Forst.) P.S.Green
e *Drypetes deplanchei* subsp. *affinis* (Pax & K.Hoffm.) P.S.Green
* *Euphorbia cyathophora* Murray
* *Euphorbia peplus* L.
* *Euphorbia prostrata* Aiton
Euphorbia psammogeton P.S.Green
* *Euphorbia supina* Raf.
Homalanthus populifolius Graham
* *Phyllanthus tenellus* Roxb.
* *Ricinus communis* L.
FABACEAE
Canavalia rosea (Sw.) DC.
e *Carmichaelia exsul* F.Muell.
* *Erythrina × sykesii* Barneby & Krukoff
* *Lathyrus latifolius* L.
* *Medicago lupulina* L.
* *Medicago polymorpha* L.
* *Melilotus indicus* (L.) All.
Mucuna gigantea (Willd.) DC.
e *Sophora howinsula* (W.R.B.Oliv.) P.S.Green
* *Trifolium dubium* Sibth.
* *Trifolium glomeratum* L.
* *Trifolium repens* L.
* *Trifolium subterraneum* L.
Vicia sativa subsp. *nigra* (L.) Ehrh.
Vigna marina (Burm.) Merr.
FLACOURTIACEAE
e *Xylosma maidenii* Sleumer
e *Xylosma parvifolium* Jessup
FUMARIACEAE
* *Fumaria bastardii* Boreau
* *Fumaria muralis* Sond. ex W.Koch
GENTIANACEAE
* *Centaurium tenuiflorum* (Hoffmanns. & Link) Fritsch ex Jansen
GERANIACEAE
* *Geranium molle* L.
* *Pelargonium australe* Willd.
GESNERIACEAE
e *Negria rhabdothamnoides* F.Muell.
GOODENIACEAE
Scaevola taccada (Gaertn.) Roxb.

GROSSULARIACEAE
e *Corokia carpodetoides* (F.Muell.) L.S.Sm.
LAMIACEAE
* *Lamium amplexicaule* L.
* *Mentha spicata* L.
Plectranthus graveolens R.Br.
* *Prunella vulgaris* L.
* *Salvia coccinea* Etl.
* *Stachys arvensis* (L.) L.
e *Westringia viminalis* B.J.Conn & Tozer
LAURACEAE
* *Cinnamomum camphora* (L.) J.Presl
e *Cryptocarya gregsonii* Maiden
Cryptocarya triplinervis R.Br.
LOGANIACEAE
e *Geniostoma huttonii* B.J.Conn
e *Geniostoma petiolosum* C.Moore & F.Muell.
LYTHRACEAE
* *Lythrum hyssopifolia* L.
MALVACEAE
Hibiscus diversifolius Jacq.
* *Hibiscus mutabilis* L.
Hibiscus tiliaceus L.
e *Lagunaria patersonia* (Andrews) G.Don subsp. *patersonia*
* *Malva parviflora* L.
* *Malvastrum coromandelianum* (L.) Garcke
* *Modiola caroliniana* (L.) G.Don
* *Sida rhombifolia* L.
MELIACEAE
e *Dysoxylum pachyphyllum* Hemsl.
MELIANTHACEAE
* *Melianthus major* L.
MENISPERMACEAE
Stephania japonica var. *timoriensis* (DC.) Forman
MORACEAE
e *Ficus macrophylla* subsp. *columnaris* (C.Moore) P.S.Green
* *Morus alba* L.
e *Trophis scandens* subsp. *megacarpa* (P.S.Green) P.S.Green
MYOPORACEAE
Myoporum insulare R.Br.
MYRSINACEAE
Aegiceras corniculatum (L.) Blanco
e *Rapanea mccomishii* Sprague
e *Rapanea myrtillina* Mez
e *Rapanea platystigma* (F.Muell.) Mez
MYRTACEAE
e *Cleistocalyx fullagarii* (F.Muell.) Merr. & L.M.Perry
e *Leptospermum polygalifolium* subsp. *howense* Joy Thomps.
e *Melaleuca howeana* Cheel
e *Metrosideros nervulosa* C.Moore & F.Muell.
e *Metrosideros sclerocarpa* J.W.Dawson
* *Psidium cattleianum* Sabine var. *cattleianum*
* *Psidium guajava* L.
NYCTAGINACEAE
Boerhavia tetrandra G.Forst.
* *Mirabilis jalapa* L.
Pisonia brunoniana Endl.
OLEACEAE
e *Chionanthus quadristamineus* F.Muell.
Jasminum didymum G.Forst. subsp. *didymum*
Jasminum simplicifolium subsp. *australiense* P.S.Green
* *Ligustrum sinense* Lour.
Olea paniculata R.Br.
ONAGRACEAE
Epilobium billardierianum subsp. *cinereum* (A.Rich.) Raven & Engelhorn
* *Oenothera drummondii* Hook.
* *Oenothera stricta* Ledeb. ex Link subsp. *stricta*
OXALIDACEAE
Oxalis corniculata L.
* *Oxalis debilis* Kunth
PAPAVERACEAE
* *Papaver rhoeas* L.
* *Papaver somniferum* L.
PASSIFLORACEAE
* *Passiflora edulis* Sims
e *Passiflora herbertiana* subsp. *insulae-howei* P.S.Green
PIPERACEAE
Macropiper excelsum subsp. *psittacorum* (Endl.) Sykes
e *Macropiper hooglandii* I.Hutton & P.S.Green
Peperomia tetraphylla Hook. & Arn.
Peperomia urvilleana A.Rich.
PITTOSPORACEAE
e *Pittosporum erioloma* C.Moore & F.Muell.
* *Pittosporum undulatum* Vent.
PLANTAGINACEAE
e *Plantago hedleyi* Maiden
* *Plantago lanceolata* L.
* *Plantago major* L.
POLYGONACEAE
Muehlenbeckia complexa (A.Cunn.) Meisn.
* *Rumex brownii* Campd.
* *Rumex crispus* L.
PORTULACACEAE
* *Portulaca oleracea* L.
PRIMULACEAE
* *Anagallis arvensis* L.
PROTEACEAE
* *Grevillea robusta* A.Cunn. ex R.Br.

PUNICACEAE
* *Punica granatum* L.
RANUNCULACEAE
Clematis glycinoides DC.
* *Ranunculus parviflorus* L.
* *Ranunculus sessiliflorus* R.Br. ex DC.
ROSACEAE
* *Cotoneaster glaucophyllus* Franch.
* *Duchesnea indica* (Andrews) Focke
* *Eriobotrya japonica* (Thunb.) Lindl.
* *Prunus persica* (L.) Batsch
RUBIACEAE
e *Atractocarpus stipularis* (F.Muell.) Puttock
* *Coffea arabica* L.
e *Coprosma huttoniana* P.S.Green
e *Coprosma inopinata* I.Hutton & P.S.Green
e *Coprosma lanceolaris* F.Muell.
e *Coprosma prisca* W.R.B.Oliv.
e *Coprosma putida* C.Moore & F.Muell.
e *Psychotria carronis* C.Moore & F.Muell.
* *Richardia stellaris* (Cham. & Schltdl.) Steud.
* *Sherardia arvensis* L.
RUTACEAE
* *Citrus jambhiri* Lush.
e *Melicope contermina* C.Moore & F.Muell.
e *Melicope polybotrya* (C.Moore & F.Muell.) T.G.Hartley
Sarcomelicope simplicifolia (Endl.) T.G.Hartley subsp. *simplicifolia*
Zanthoxylum pinnatum (J.R.Forst. & G.Forst.) W.R.B.Oliv.
SANTALACEAE
e *Exocarpos homalocladus* C.Moore & F.Muell.
SAPINDACEAE
Dodonaea viscosa subsp. *burmanniana* (DC.) J.G.West
e *Guioa coriacea* (Radlk.) Radlk.
SAPOTACEAE
Pouteria myrsinoides subsp. *reticulata* (Baill.) P.S.Green
SCROPHULARIACEAE
* *Verbascum virgatum* Stokes
* *Veronica arvensis* L.
* *Veronica persica* Poir.
SOLANACEAE
* *Datura stramonium* L.
* *Lycium ferocissimum* Miers
Nicotiana forsteri Roem. & Schult.
* *Nicotiana tabacum* L.
* *Petunia × hybrida* Vilm.
* *Physalis ixocarpa* Brot. ex Hornem.
* *Physalis peruviana* L.
* *Solanum americanum* subsp. *nutans* (R.J.F.Henders.) R.J.F.Henders.
Solanum aviculare G.Forst.
e *Solanum bauerianum* Endl.
* *Solanum mauritianum* Scop.
* *Solanum nigrum* L.
STERCULIACEAE
* *Brachychiton acerifolius* (A.Cunn. ex G.Don) Macarthur & Moore
SYMPLOCACEAE
e *Symplocos candelabrum* Brand
THYMELAEACEAE
e *Pimelea congesta* C.Moore & F.Muell.
TROPAEOLACEAE
* *Tropaeolum majus* L.
ULMACEAE
e *Celtis conferta* subsp. *amblyphylla* (F.Muell.) P.S.Green
URTICACEAE
e *Boehmeria calophleba* C.Moore & F.Muell.
e *Elatostema grande* (Wedd.) P.S.Green
Parietaria debilis G.Forst.
* *Urtica urens* L.
VALERIANACEAE
* *Centranthus ruber* (L.) DC.
VERBENACEAE
Avicennia marina subsp. *australasica* (Walp.) J.Everett
* *Lantana camara* L.
* *Verbena brasiliensis* Vell.
VIOLACEAE
e *Melicytus novae-zelandae* subsp. *centurionis* P.S.Green
VISCACEAE
e *Korthalsella emersa* Barlow
Korthalsella rubra (Tiegh.) Engl. subsp. *rubra*
WINTERACEAE
* *Alternanthera bettzichiana* (Regel) Voss
e Zygogynum howeanum (F.Muell.) Vink

MONOCOTYLEDONAE
AGAVACEAE
* *Agave americana* L.
* *Furcraea foetida* (L.) Haw.
* *Sanseviera trifasciata* Hort. ex Prain
ALOACEAE
* *Aloe ciliaris* Haw.
* *Aloe maculata* All.
ARACEAE
* *Colocasia esculenta* (L.) Schott
ARECACEAE
e *Howea belmoreana* (C.Moore & F.Muell.) Becc.

e *Howea forsteriana* (C.Moore & F.Muell.) Becc.
e *Hedyscepe canterburyana* (C.Moore & F.Muell.) H.Wendl. & Drude
e *Lepidorrhachis mooreana* (F.Muell.) O.F.Cook
CANNACEAE
* *Canna × generalis* L.H.Bailey
COMMELINACEAE
* *Callisia fragrans* (Lindl.) Woodson
Commelina cyanea R.Br.
* *Tradescantia fluminensis* Velloso
* *Tradescantia spathacea* Sw.
* *Tradescantia zebrina* Hort. ex Bosse
CYPERACEAE
Baumea juncea (R.Br.) Palla
Bulbostylis densa (Wall.) Hand.-Mazz.
Carex breviculmis R.Br.
Carex brunnea Thunb. ex Murray
Carex inversa R.Br.
Carex pumila Thunb. ex Murray
* *Cyperus eragrostis* Lam.
* *Cyperus involucratus* Rottb.
Cyperus lucidus R.Br.
* *Cyperus rotundus* L.
Gahnia xanthocarpa (Hook.f.) Hook.f.
Isolepis nodosa (Rottb.) R.Br.
* *Kyllinga brevifolia* Rottb.
e *Machaerina insularis* (Benth.) T.Koyama
* *Pycreus polystachyos* (Rottb.) P.Beauv.
e *Uncinia debilior* F.Muell.
FLAGELLARIACEAE
Flagellaria indica L.
HYDROCHARITACEAE
Halophila ovalis (R.Br.) Hook.f.
IRIDACEAE
* *Crocosmia × crocosmiiflora* (Lemoine ex Morren) N.E.Br.
e *Dietes robinsoniana* (C.Moore & F.Muell.) Klatt
* *Gladiolus × hortulanus* L.H.Bailey
* *Romulea rosea* var. *australis* (Ewart) M.P. de Vos
* *Sisyrinchium micranthum* Cav.
JUNCACEAE
* *Juncus aridicola* L.A.S.Johnson
* *Juncus bufonius* L.
* *Juncus pallidus* R.Br.
e *Luzula longiflora* Benth.
JUNCAGINACEAE
Triglochin striata Ruiz & Pav.
LILIACEAE
* *Agapanthus praecox* subsp. *orientalis* (F.M.Leight.) F.M.Leight.
* *Alstroemeria pulchella* L.f.
* *Asparagus aethiopicus* L.
* *Asparagus asparagoides* (L.) Druce
* *Asparagus plumosus* Baker
* *Chlorophytum comosum* (Thunb.) Jacques
Crinum asiaticum var. *pedunculatum* (R.Br.) Fosberg & Sachet
e *Dianella intermedia* Endl.
* *Gloriosa superba* L.
* *Hippeastrum puniceum* (Lam.) Voss
* *Lilium formosanum* A.Wallace
* *Narcissus tazetta* L.
* *Nothoscordum borbonicum* Kunth
ORCHIDACEAE
Bulbophyllum argyropus (Endl.) Rchb.f.
Calanthe triplicata (Willemet) Ames
Corybas barbarae D.L.Jones
e *Dendrobium macropus* subsp. *howeanum* (Maiden) P.S.Green
e *Dendrobium moorei* F.Muell.
Microtis unifolia (G.Forst.) Rchb.f.
e *Plectorrhiza erecta* (Fitzg.) Dockrill
Pterostylis curta R.Br.
Pterostylis obtusa R.Br.
Pterostylis pedunculata R.Br.
PANDANACEAE
e *Pandanus forsteri* C.Moore & F.Muell.
POACEAE
Agrostis aemula R.Br.
* *Agrostis gigantea* Roth
* *Arundinaria simonii* f. *variegata* (Hook.f.) Rehder
* *Avena barbata* Pott ex Link
* *Avena byzantina* K.Koch
* *Axonopus compressus* (Sw.) P.Beauv.
* *Briza maxima* L.
* *Briza minor* L.
* *Bromus catharticus* Vahl
* *Bromus diandrus* Roth
* *Bromus hordeaceus* L.
* *Catapodium rigidum* (L.) C.E.Hubbard
e *Chionochloa howensis* Jacobs
* *Chloris gayana* Kunth
* *Chloris truncata* R.Br.
* *Cynodon dactylon* (L.) Pers.
* *Dactylis glomerata* L.
Dichelachne crinita (L.f.) Hook.f.
* *Digitaria ciliaris* (Retz.) Koeler
* *Digitaria sanguinalis* (L.) Scop.
* *Digitaria violescens* Link
* *Echinochloa crusgalli* (L.) P.Beauv.
Echinopogon ovatus (G.Forst.) P.Beauv.
* *Eleusine indica* (L.) Gaertn.
Elymus multiflorus var. *kingianus* (Endl.) Connor

* *Eragrostis cilianensis* (All.) Link ex Vignolo
* *Hordeum murinum* subsp. *glaucum* (Steud.) Tzvelev
* *Hordeum murinum* subsp. *leporinum* (Link) Arcang.
* *Imperata cylindrica* var. *major* (Nees) C.E.Hubb. & R.E.Vaughan
* *Lagurus ovatus* L.
Lepturus repens (G.Forst.) R.Br.
* *Lolium rigidum* Gaudin var. *rigidum*
* *Lolium rigidum* var. *rottboellioides* Heldr. ex Boiss.
* *Melinis minutiflora* P.Beauv.
Microlaena stipoides (Labill.) R.Br.
Oplismenus hirtellus (L.) P.Beauv.
* *Paspalum dilatatum* Poir.
Paspalum distichum L.
Paspalum vaginatum Sw.
* *Pennisetum clandestinum* Hochst. ex Chiov.
* *Phalaris aquatica* L.
* *Phalaris canariensis* L.
Phragmites australis (Cav.) Trin. ex Steud.
* *Poa annua* L.
Poa poiformis (Labill.) Druce
* *Poa pratensis* L.
* *Polypogon monspeliensis* (L.) Desf.
* *Rostraria cristata* (L.) Tzvelev
* *Rottboellia coelorachis* G.Forst.
Rytidosperma racemosum (R.Br.) Connor & Edgar
Rytidosperma unarede (Raoul) Connor & Edgar
* *Setaria palmifolia* (J.König) Stapf
* *Setaria verticillata* (L.) P.Beauv.
Spinifex sericeus R.Br.
* *Sporobolus africanus* (Poir.) Robyns & Tournay
Sporobolus virginicus (L.) Kunth
* *Stenotaphrum secundatum* (Walter) Kuntze
* *Stipa ramosissima* (Trin.) Nees
* *Vulpia bromoides* (L.) Gray

SMILACACEAE
Geitonoplesium cymosum (R.Br.) A.Cunn. ex R.Br.
Smilax australis R.Br.

TYPHACEAE
Typha domingensis Pers.

ZOSTERACEAE
Zostera capricorni Asch.

PINOPHYTA

ARAUCARIACEAE
* *Araucaria heterophylla* (Salisb.) Franco

PTERIDOPHYTA

ADIANTACEAE
Adiantum aethiopicum L.
Adiantum hispidulum Sw.
Adiantum pubescens Schkuhr.
Cheilanthes distans (R.Br.) Mett.
Cheilanthes sieberi Kunze
Pellaea falcata (R.Br.) Fée
Pellaea paradoxa (R.Br.) Hook.

ASPLENIACEAE
Asplenium australasicum (J.Sm.) Hook. f. *australasicum*
e *Asplenium milnei* Carruth.
Asplenium polyodon G.Forst.
e *Asplenium pteridoides* Baker
e *Asplenium surrogatum* P.S.Green

ATHYRIACEAE
e *Diplazium melanochlamys* (Hook.) T.Moore

BLECHNACEAE
Blechnum contiguum Mett.
e *Blechnum fullagarii* (F.Muell.) C.Chr.
e *Blechnum geniculatum* T.C.Chambers & P.A.Farrant
e *Blechnum howeanum* T.C.Chambers & P.A.Farrant
Blechnum patersonii (R.Br.) Mett.
Doodia aspera R.Br.
Doodia caudata (Cav.) R.Br.
Doodia media R.Br.

CYATHEACEAE
e *Cyathea brevipinna* Baker ex Benth.
e *Cyathea howeana* Domin
e *Cyathea macarthurii* (F.Muell.) Baker
e *Cyathea robusta* Holttum

DAVALLIACEAE
Arthropteris tenella (G.Forst.) J.Sm. ex Hook.f.
Nephrolepis cordifolia (L.) C.Presl

DENNSTAEDTIACEAE
Histiopteris incisa (Thunb.) J.Sm.
Hypolepis elegans Carruth.

DRYOPTERIDACEAE
Arachniodes aristata (G.Forst.) Tindale
e *Lastreopsis nephrodioides* (Baker) Tindale
* *Phanerophlebia falcata* (L.f.) Copel.
e *Polystichum moorei* H.Christ
e *Polystichum whiteleggei* Watts

GLEICHENIACEAE
Sticherus lobatus N.A.Wakef.

GRAMMITIDACEAE
e *Grammitis diminuta* (Baker) Copel.
e *Grammitis nudicarpa* Copel.

e *Grammitis wattsii* Copel.
HYMENOPHYLLACEAE
Cephalomanes atrovirens C.Presl
e *Cephalomanes bauerianum* (Endl.) P.S.Green
e *Hymenophyllum howense* Brownlie
e *Hymenophyllum moorei* Baker
LYCOPODIACEAE
Huperzia varia (R.Br.) Trev.
MARATTIACEAE
e *Marattia howeana* (W.R.B.Oliv.) P.S.Green
OPHIOGLOSSACEAE
Botrychium australe R.Br.
Ophioglossum coriaceum A.Cunn.
Ophioglossum pendulum L.
Ophioglossum petiolatum Hook.
Ophioglossum reticulatum L.
OSMUNDACEAE
e *Leptopteris moorei* (Baker) H.Christ
POLYPODIACEAE
Platycerium bifurcatum (Cav.) C.Chr.
e *Phymatosorus pustulatus* subsp. *howensis* Tindale & P.S.Green
Phymatosorus scandens (G.Forst.) Pic.Serm.
Pyrrosia confluens (R.Br.) Ching
PSILOTACEAE
Psilotum nudum (L.) P.Beauv.
Tmesipteris truncata (R.Br.) Desv.
PTERIDACEAE
e *Pteris microptera* Mett. ex Kuhn
Pteris tremula R.Br.
THELYPTERIDACEAE
Christella dentata (Forssk.) Brownsey & Jermy

CONSERVATION

Although it was necessary in the mid 1960s to sound the alarm and call for conservation measures to protect the flora and fauna of both islands, the message was fortunately received, heard and acted upon.

Norfolk Island. First, an investigation on Norfolk Island by the late Professor J.S.Turner, accompanied by C.N.Smithers and R.D.Hoogland, on behalf of the Australian Conservation Foundation, resulted in the publication of an admirable report (Turner *et al.*, 1968). This in turn eventually led to the establishment of the Norfolk Island National Park and the involvement of ANPWS (now known as ANCA), thus ensuring a future for the existing native plants and animals. In 1987, at the invitation of that Service, W.R.Sykes, of the Botany Division of DSIR, New Zealand, accompanied by I.A.E.Atkinson, carried out a survey of the rare and endangered plants on the island, resulting in a report and recommendations for the conservation and management of 14 selected species (Sykes & Atkinson, 1988). Briefer recommendations were made for a number of other plants. More recently Gilmore and Helman (1989) have produced a consultative report on the vegetation of the National Park. On Philip Island the Wildlife Service also undertook the extermination of the rabbits, and brought it to a successful conclusion. Already the island has become green and two plants, once thought to be extinct, have reappeared.

Lord Howe Island. Investigation into the situation on Lord Howe Island began a year or two later than that of Professor Turner *et al.*, when the Lord Howe Island Board instigated a biological and environmental survey of the island which resulted in a detailed and valuable report (Recher & Clark, 1974). The Board thus became well informed on the island's natural environment and its rare and endemic plants. Conservation is taken seriously by the Board, and the New South Wales National Parks and Wildlife Service has a ranger stationed on the island. The international significance and importance of Lord Howe Island has also resulted in its citation under the UNESCO World Heritage List, and this, with the conservation measures being taken, leads to the hope that its flora and fauna may no longer be endangered. However, in conservation, constant vigilance is necessary, especially for the rare or threatened species (Pickard, 1983b).

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KEY TO FAMILIES

1 Plants with flowers or cones, reproducing by seeds (*cf.* p. 39)

2 Seeds developed in an ovary; usually with a perianth of sepals and/or petals (*cf.* p. 39) **(*MAGNOLIOPHYTA*)**

3 Embryo with 2 seed-leaves (cotyledons); leaves with reticulate venation (except Epacridaceae); sepals and/or petals usually in multiples of 4 or 5 (3 in Menispermaceae, Papaveraceae and Polygonaceae) (*cf.* p. 37) **(*DICOTYLEDONAE*)**

4 Epiphytic hemi-parasites

5 Stems, other than basal internodes, flattened, photosynthetic, without evident leaves (*Korthalsella*) **54. VISCACEAE**

5: Leaves well-developed (*Ileostylus*) **53. LORANTHACEAE**

4: Not epiphytic hemi-parasites

6 Tree with pendent roots which become woody and trunk-like; fruit a fig (*Ficus*) **9. MORACEAE**

6: Habit and fruit otherwise

7 Flowers lacking both sepals and petals

8 Stems jointed, ridged; leaves reduced to whorls of scale-like teeth at each node; trees (*Casuarina*) **11. CASUARINACEAE**

8: Stems and leaves not so

9 Plants without normal leaves; stems succulent and jointed; growing by the sea (*Sarcocornia*) **15. CHENOPODIACEAE**

9: Plants with normal leaves; stems not succulent and jointed; habitat various

10 Inflorescence and infructescence densely spicate; fruit crowded, fleshy or berry-like drupes **3. PIPERACEAE**

10: Inflorescence and infructescence not densely spicate; fruit a capsule or drupe, not crowded together

11 Ovary superior; styles 2 or 3; leaves and stems often producing white latex **57. EUPHORBIACEAE**

11: Ovary inferior or semi-inferior; style 1; leaves and stems without latex **56. MYRTACEAE**

7: Flowers with either sepals or petals, or both

12 Flowers without petals or petaloid sepals (*cf.* p. 29)

13 Leaves of mature plants reduced, scale-like; shoots flattened, photosynthetic; true leaves only in the juvenile stage (*Exocarpos*) **52. SANTALACEAE**

13: Leaves not as above

14 Leaves all radical; herbs; inflorescences on radical peduncles bearing a cylindrical to globose spike (*Plantago*) **79. PLANTAGINACEAE**

14: Leaves and inflorescences not all radical

15 Leaves with evident stipules (caducous in Ulmaceae, ochreae in Polygonaceae and sometimes obscure in Urticaceae)

16 Stipules forming a persistent sheath round stem (ochrea); herbaceous climber or densely branched, tangled or climbing shrubs **20. POLYGONACEAE**

16: Stipules not so; herbs, shrubs or trees

17 Fruit an achene

18 Style absent; stigmas sessile, brush-like — **10. URTICACEAE**

18: Styles 2, unbranched (*Paronychia*) — **19. CARYOPHYLLACEAE**

17: Fruit a ±fleshy drupe or drupelets, or a capsule

19 Fruit a capsule; shrubs or herbs

20 Flowers unisexual, sometimes in cyathea (*Euphorbia*); shrubs or herbs, often with white latex — **57. EUPHORBIACEAE**

20: Flowers bisexual; herbs, without latex — **19. CARYOPHYLLACEAE**

19: Fruit ±fleshy, usually red when ripe; shrubs, trees or woody climbers

21 Anthers not incurved in bud nor enclosed in a fig; ovary with 2 or more ovules — **57. EUPHORBIACEAE**

21: Anthers incurved in bud; ovary with 1 ovule

22 Flowers borne in panicles, sometimes dense; plants never with latex (*Celtis*) — **8. ULMACEAE**

22: Flowers in short spikes or catkins; plants often with latex — **9. MORACEAE**

15: Leaves without stipules, or stipules minute

23 Trees or shrubs, 2 m tall or more

24 Calyx calyptrate; corolla fused with the calyx or free, both shed upon anthesis — **50. MYRTACEAE**

24: Calyx not calyptrate, evident throughout anthesis

25 Fruit a drupe or berry, ±fleshy, or leathery

26 Flowers unisexual, plant dioecious; stamens numerous (*Xylosma*) — **27. FLACOURTIACEAE**

26: Flowers bisexual, sometimes functionally unisexual; stamens 2 or 9

27 Sepals 4; stamens 2, with anthers dehiscing laterally; drupes red, yellow or purple (*Nestegis*) — **80. OLEACEAE**

27: Sepals 6; stamens 9, with anthers dehiscing by upturned flaps; drupes black — **2. LAURACEAE**

25: Fruit a capsule or dry utricle

28 Leaves alternate; stems with tough fibres; flowers unisexual (*Boehmeria*) — **10. URTICACEAE**

28: Leaves opposite; stems without tough fibres; flowers bisexual (*Achyranthes*) — **16. AMARANTHACEAE**

23: Herbs or subshrubs, to 1 m tall

29 Fruit a capsule or silicula; seeds 1–many per locule

30 Fruit a capsule; sepals 4 or 5 — **19. CARYOPHYLLACEAE**

30: Fruit a silicula; sepals 4 — **33. BRASSICACEAE**

29: Fruit a 1-seeded nutlet, achene or utricle

31 Leaves with cystoliths or stinging hairs; staminal filaments inflexed in bud — **10. URTICACEAE**

31: Leaves without cystoliths or stinging hairs; staminal filaments not inflexed in bud

32 Perianth herbaceous, without bracts or with two bracteoles enclosing seed — **15. CHENOPODIACEAE**

32: Perianth membranous-chaffy, subtended by a membranous-chaffy bract and 2 bracteoles — **16. AMARANTHACEAE**

12: Flowers with petals and/or petaloid sepals

33 Petals or petaloid sepals free, sometimes adhering laterally or connate basally, but not forming a definite tube (*cf.* p. 34)

34 Flowers actinomorphic, sometimes appearing slightly zygomorphic (*cf.* p. 33)

35 Ovary superior (*cf.* p. 32)

36 Leaves alternate or basal (*cf.* p. 31)

37 Leaves simple, entire or variously lobed (*cf.* p. 31)

38 Flowers with a corona of filiform appendages; stems with axillary tendrils (*Passiflora*) — **30. PASSIFLORACEAE**

38: Flowers not so; stems without axillary tendrils

39 Shrubs, trees or woody climbers

40 Climbers (*Capparis*) — **32. CAPPARACEAE**

40: Erect shrubs or trees

41 Perianth of 1 apparent whorl, petaloid or sepaloid

42 Fruit a 2- or 3-winged capsule (*Dodonaea*) — **61. SAPINDACEAE**

42: Fruit a 1-seeded nut or drupe

43 Much-branched, tangled shrub, usually to c. 1 m across; fruit a nut (*Muehlenbeckia*) — **20. POLYGONACEAE**

43: Shrub or tree to 10 m tall; fruit a 1-seeded drupe (*Pennantia*) — **56. ICACINACEAE**

41: Perianth in 2 or more whorls, with both petals and sepals

44 Fruit ±fleshy, a drupe, drupelets or berry

45 Flowers with 5 stamens, rudimentary in female flowers (*Melicytus*) — **28. VIOLACEAE**

45: Flowers with 8–many stamens

46 Petals fimbriate; flowers pendulous; fruit a drupe, blue when ripe (*Elaeocarpus*) — **23. ELAEOCARPACEAE**

46: Petals entire; flowers not pendulous; fruit not a blue drupe

47 Petals yellow; fruit of 4 or 5 drupelets, black when ripe, contrasting against the surrounding red reflexed sepals (*Ochna*) — **22. OCHNACEAE**

47: Petals pink or white; fruit not as above

48 Petals 8–12, narrow, in 2 or 3 series; fruit 3–6 follicles 8–13 mm long, greyish black (*Zygogynum*) — **1. WINTERACEAE**

48: Petals 5, in 1 series

49 Leaves gland-dotted; fruit a large berry (a lemon) (*Citrus*) — **64. RUTACEAE**

49: Leaves not gland-dotted; fruit a fleshy drupe (a peach) (*Prunus*) — **41. ROSACEAE**

44: Fruit dry, a capsule, schizocarp, siliqua or silicula

50 Sepals and petals 4; fruit a siliqua or silicula; stamens usually 6, sometimes 2 or 4 — **33. BRASSICACEAE**

50: Sepals and petals 5; fruit a capsule or schizocarp; stamens not 6

51 Stamens numerous, united around style or ovary stalk

52 Fruit a schizocarp, or an ovoid capsule lined with irritating hairs — **26. MALVACEAE**

52: Fruit a capsule on an accrescent androgynophore, star-shaped in cross section (*Ungeria*) — **25. STERCULIACEAE**

51: Stamens 1–15, free

53 Capsule smooth or variously rugose, dehiscing to reveal reddish or black seeds in a viscous, resinous pulp (*Pittosporum*) — **39. PITTOSPORACEAE**

53: Capsule densely tomentose, with hooked bristles; seeds not as above (*Triumfetta*) — **24. TILIACEAE**

39: Herbs or herbaceous climbers

54 Climbers

55 Leaves peltate; flowers unisexual; petals green (*Stephania*) — **5. MENISPERMACEAE**

55: Leaves broadly ovate, cordate to sagittate-cordate, not peltate; flowers bisexual; petals white or greenish white

56 Leaves somewhat fleshy, broadly ovate to cordate; stems usually bearing tubers; flowers pure white, fragrant (*Anredera*) — **18. BASELLACEAE**

56: Leaves not fleshy, sagittate-cordate; stems never bearing tubers; flowers greenish white, not fragrant (*Fallopia*) — **20. POLYGONACEAE**

54: Non-climbers

57 Stamens numerous

58 Stamens with filaments connate into a tube around style — **26. MALVACEAE**

58: Stamens free

59 Fruit a group of achenes; petals and sepals 5 (*Ranunculus*) — **4. RANUNCULACEAE**

59: Fruit a capsule, dehiscing by apical pore-like valves; sepals 2 or 3; petals 4–6 — **6. PAPAVERACEAE**

57: Stamens 2–10

60 Perianth in a single whorl

61 Fruit a red or orange berry (*Rivina*) — **12. PHYTOLACCACEAE**

61: Fruit a trigonous nut — **20. POLYGONACEAE**

60: Perianth in 2 whorls; petals sometimes falling early

62 Procumbent annual with stems ascending; flowers solitary in upper leaf axils (*Lythrum*) — **46. LYTHRACEAE**

62: Erect annuals, biennials or perennials; inflorescence racemose, corymbose or a terminal panicle

63 Fruit a ±globose capsule, dehiscing by 10 valves; stamens 5 (*Linum*) **58. LINACEAE**

63: Fruit a siliqua or silicula, usually dehiscing by 2 valves; stamens 6, sometimes 2 or 4 **33. BRASSICACEAE**

37: Leaves compound, trifoliolate or pinnate

64 Plants herbaceous

65 Fruit a 'strawberry', with achenes scattered on the surface of a red, swollen, conical receptacle (*Duchesnea*) **41. ROSACEAE**

65: Fruit a capsule, beaked mericarps or achenes on a small receptacle, not as above

66 Fruit a ring of mericarps; leaves pinnately or palmately divided **66. GERANIACEAE**

66: Fruit a capsule, siliqua or achene; leaves 3-foliolate, pinnately or palmately divided

67 Leaves pinnately divided; fruit a siliqua **33. BRASSICACEAE**

67: Leaves 3-foliolate or palmately divided; fruit a capsule or achene

68 Terminal leaflet stalked or leaves palmately divided; flowers yellow; fruit a group of achenes (*Ranunculus*) **4. RANUNCULACEAE**

68: All leaflets sessile; flowers yellow or pink; fruit a capsule (*Oxalis*) **65. OXALIDACEAE**

64: Plants woody

69 Stamens numerous

70 Leaves palmate; stems thorny; fruit a collection of black, fleshy drupelets (*Rubus*) **41. ROSACEAE**

70: Leaves bipinnate; stems not thorny; fruit a legume **42. MIMOSACEAE**

69: Stamens 4–15

71 Stamens connate into a tube **63. MELIACEAE**

71: Stamens free

72 Fruit a lobed capsule; leaves pinnate with 2–8 leaflets (*Guioa*) **61. SAPINDACEAE**

72: Fruit a 1-seeded follicle or drupe; leaves imparipinnate with 5–9 leaflets

73 Fruit a small red drupe; rachis of leaf often winged; leaves not gland-dotted (*Schinus*) **62. ANACARDIACEAE**

73: Fruit of 1 or 4 follicles; leaf rachis not winged; leaves gland-dotted (*Zanthoxylum*) **64. RUTACEAE**

36: Leaves opposite or appearing whorled

74 Trees, shrubs or climbers

75 Climbers; fruit a plumose achene (*Clematis*) **4. RANUNCULACEAE**

75: Trees or shrubs; fruit not a plumose achene

76 Stamens numerous; fruit a 3-celled capsule; stems producing red latex (*Baloghia*) **57. EUPHORBIACEAE**

76: Stamens 2–8; fruit drupaceous, follicular or nutlets; latex absent

77 Flowers with a single perianth whorl on top of a tubular hypanthium — **47. THYMELAEACEAE**

77: Flowers with both sepals and petals

78 Stamens 4 or 8; leaves gland-dotted; fruit of 4 follicles or a somewhat fleshy or leathery drupe — **64. RUTACEAE**

78: Stamens 5; leaves not gland-dotted; fruit a drupe turning black when ripe (*Elaeodendron*) — **55. CELASTRACEAE**

74: Herbs

79 Leaves pinnately or palmately divided; fruit beaked — **66. GERANIACEAE**

79: Leaves entire; fruit not beaked

80 Leaves ±fleshy

81 Leaves to 1 mm broad; petals very small, c. 1 mm long, whitish (*Crassula*) — **40. CRASSULACEAE**

81: Leaves 2–15 mm broad; perianth lobes 6–9 mm long, green outside, reddish within (*Sesuvium*) — **14. AIZOACEAE**

80: Leaves not fleshy

82 Leaves glabrous above, densely white puberulous below, fasciculate on short shoots; stamens 6 (*Frankenia*) — **29. FRANKENIACEAE**

82: Leaves not as above; stamens usually 3–5, 8 or 9 — **19. CARYOPHYLLACEAE**

35: Ovary inferior or semi-inferior

83 Climbers; with tendrils — **31. CUCURBITACEAE**

83: Herbs, shrubs or trees; without tendrils

84 Perianth a single petaloid whorl

85 Plant ±succulent; perianth yellow (*Tetragonia*) — **14. AIZOACEAE**

85: Plant not succulent; perianth white, pinkish white, reddish or yellowish green — **69. APIACEAE**

84: Perianth of both sepals and petals in 2 or more whorls, at least at anthesis

86 Prostrate or semiprostrate, succulent herbs

87 Leaves triquetrous; petals numerous, magenta (*Carpobrotus*) — **14. AIZOACEAE**

87: Leaves flat, oblanceolate to obovate; petals 4–6, yellow (*Portulaca*) — **17. PORTULACACEAE**

86: Herbs or woody plants, not prostrate, semiprostrate or succulent

88 Stamens 15 or more

89 Leaves 1–3 mm broad; fruit a capsule — **50. MYRTACEAE**

89: Leaves at least 8 mm broad; fruit a capsule or fleshy

90 Petals 2–2.5 cm long, orange-red, crumpled in bud; fruit a pomegranate (*Punica*) — **48. PUNICACEAE**

90: Petals not more than 2 cm long, usually much less, or obscure, not crumpled in bud; fruit a capsule or fleshy

91 Young leaves stipulate, not gland-dotted — **41. ROSACEAE**

91: Young leaves without stipules, usually gland-dotted — **50. MYRTACEAE**

88: Stamens 8 or fewer

92 Herbs

93 Leaves simple; sepals and petals 4; stamens 8 — **49. ONAGRACEAE**

93: Leaves simple or compound; sepals obscure; petals 5; stamens 5 — **69. APIACEAE**

92: Trees or shrubs

94 Leaves simple, to 6 cm long; much branched shrub; flowers yellow (*Corokia*) — **51. GROSSULARIACEAE**

94: Leaves compound, or if simple then 15 cm or more long on few, stout branches; flowers white — **68. ARALIACEAE**

34: Flowers clearly zygomorphic

95 Herbs

96 Leaves all radical, narrowly triangular-hastate; flowers purple (*Viola*) — **28. VIOLACEAE**

96: Leaves on stems, not triangular-hastate; flowers not purple (reddish purple in *Vicia sativa* (Fabaceae))

97 Leaves entire or lobed

98 Leaves peltate, somewhat succulent; flowers red, orange or yellow (*Tropaeolum*) — **67. TROPAEOLACEAE**

98: Leaves almost entire, shallowly or obscurely lobed, not peltate or succulent; flowers pink with darker spots and lines (*Pelargonium*) — **66. GERANIACEAE**

97: Leaves 2- or 3-foliolate or pinnately divided

99 Sepals 2, free; petals 4; stamens 6; fruit a 1-seeded nutlet (*Fumaria*) — **7. FUMARIACEAE**

99: Sepals 5, connate; petals 5; stamens 10; fruit a legume

100 Petals ±similar; upper petal enclosed by the 2 laterals in bud (*Chamaecrista*) — **43. CAESALPINIACEAE**

100: Petals dissimilar; upper petal exterior to the 2 laterals in bud, the 2 lower forming a 'keel' — **44. FABACEAE**

95: Trees, shrubs or woody climbers

101 Leaves simple — **59. POLYGALACEAE**

101: Leaves compound, trifoliolate or pinnate

102 Sepals conspicuously pouched; stamens 4, free; fruit a 4-lobed bladder (*Melianthus*) — **60. MELIANTHACEAE**

102: Sepals not conspicuously pouched; stamens 10, with filaments connate; fruit a legume

103 Petals ±similar; upper petal enclosed by 2 lateral petals in bud — **43. CAESALPINIACEAE**

103: Petals dissimilar; upper petal external to the 2 lateral in bud, the lower 2 forming a 'keel' — **44. FABACEAE**

33: Petals or petaloid sepals connate, forming a tube, sometimes short

104 Inflorescence a capitulum of florets, surrounded by an involucre of bracts; style with 2 stigmatic arms; ovary inferior — **92. ASTERACEAE**

104: Inflorescence not so arranged

105 Ovary superior or semi-inferior (*cf.* p. 37)

106 Flowers actinomorphic (*cf.* p. 36)

107 Leaves alternate or radical

108 Leaves all radical; inflorescence cylindrical or ovoid, borne on a radical peduncle; petals inconspicuous, scarious or membranous (*Plantago*) **79. PLANTAGINACEAE**

108: Leaves not all radical; inflorescence not as above; petals or petaloid sepals usually showy, white or coloured

109 Habit trailing or climbing, or creeping and often rooting at nodes

110 Stamens opposite corolla lobes; leaves not more than 1.5 cm broad, soft, decumbent or trailing, glabrous herbs (*Samolus*) **38. PRIMULACEAE**

110: Stamens alternate with corolla lobes; leaves more than 2.5 cm broad; herbs, shrubs or trees

111 Calyx and petals forming a narrow tube; calyx sticky-glandular (*Plumbago*) **21. PLUMBAGINACEAE**

111: Calyx not forming a narrow tube, nor sticky-glandular; corolla cup-shaped, funnel-shaped, salverform or campanulate

112 Corolla 16–24 cm long, golden yellow with 5 purple stripes (*Solandra*) **74. SOLANACEAE**

112: Corolla 0.2–12 cm long, white, pink, purple, blue or greenish yellow **75. CONVOLVULACEAE**

109: Habit ±erect, not trailing or climbing, nor creeping and rooting at nodes

113 Herbs

114 Stamens opposite corolla lobes; soft, glabrous herbs (*Anagallis*) **38. PRIMULACEAE**

114: Stamens alternate with corolla lobes; erect herbs, glabrous or hairy

115 Fruit of 4 nutlets, rugose or with hooked hairs **76. BORAGINACEAE**

115: Fruit a capsule or berry, with 3 or more ovules per locule

116 Leaves densely grey or whitish woolly; flowers yellow; some staminal filaments hairy **81. SCROPHULARIACEAE**

116: Leaves glabrous or pubescent, but not woolly; flowers not yellow; staminal filaments all glabrous **74. SOLANACEAE**

113: Shrubs, trees or wiry-stemmed scandent shrubs

117 Leaves with veins ±parallel, sessile or only shortly petiolate **34. EPACRIDACEAE**

117: Leaves with pinnate and reticulate venation, petiolate

118 Flowers unisexual; perianth bright red; fruit a group of follicles (*Brachychiton*) **25. STERCULIACEAE**

118: Flowers bisexual; perianth not bright red; fruit a berry or drupe

119 Stamens alternate with corolla lobes; ovary 2-locular with 2 to many ovules; fruit a berry or capsule **74. SOLANACEAE**

119: Stamens opposite corolla lobes; ovary 1–5 (–6)-locular; fruit a berry, capsule or drupe, 1–5 (–6)-seeded

120 Resin canals, often linear, in leaves, calyx and corolla; shoots without latex; ovary 1-locular **37. MYRSINACEAE**

120: Resin canals absent; shoots with watery white latex; ovary 1–5 (–6)-locular **35. SAPOTACEAE**

107: Leaves opposite or ternate

121 Perianth in a single whorl, with petaloid calyx connate for 3 mm or more

122 Erect herbs to small trees, not succulent; perianth lobes not fleshy, concolorous; fruit an achene, nut or drupe

123 Perianth a united petaloid calyx, without a hypanthium; stamens hypogynous; fruit a single 'achene' enclosed within the persistent calyx **13. NYCTAGINACEAE**

123: Perianth lobes borne on a hypanthium; stamens inserted within or at the mouth of the hypanthium; fruit a nut or drupe **47. THYMELAEACEAE**

122: Prostrate or decumbent, succulent herbs (sometimes woody at base); perianth lobes fleshy, green outside, reddish within; fruit a circumscissile capsule (*Sesuvium*) **14. AIZOACEAE**

121: Perianth of sepals and petals, in 2 or more whorls

124 Herbs

125 Leaves succulent; calyx somewhat inflated-tubular, 2.5–4.5 cm long (*Bryophyllum*) **40. CRASSULACEAE**

125: Leaves not succulent; calyx not inflated, less than 1 cm long

126 Stamens 4; flowers in verticillasters; fruit of 4 nutlets **78. LAMIACEAE**

126: Stamens 5; flowers not in verticillasters; fruit a capsule or follicular

127 Stamens opposite corolla lobes; fruit a circumscissile capsule, globose (*Anagallis*) **38. PRIMULACEAE**

127: Stamens alternate with corolla lobes; fruit a fusiform capsule or follicle

128 Stems 4-angled in cross-section; fruit a fusiform capsule; flowers rose pink (*Centaurium*) **71. GENTIANACEAE**

128: Stems rounded in cross-section; fruit follicular; flowers variously coloured, not rose pink

129 Creeper with little or no latex; flowers solitary, 3–5 cm diam.; anthers free (*Vinca*) **72. APOCYNACEAE**

129: Twining climber or erect herb, with abundant white latex; inflorescences few–many-flowered; anthers connate in a corona **73. ASCLEPIADACEAE**

124: Woody plants

130 Stamens 2 or 4

131 Growing on the shore-line, rooted in salt water; ovary 4-celled, each 1-ovulate; fruit a 1-seeded capsule (*Avicennia*) **77. VERBENACEAE**

131: Habitat not in salt water; ovary 2-locular, with 1 ovule per locule; fruit a drupe or berry **80. OLEACEAE**

130: Stamens 5

132 Fruit a capsule with seeds embedded in pulp; leaves stipulate; stems without latex (*Geniostoma*) **70. LOGANIACEAE**

132: Fruit a berry, a drupe, or follicular; seeds with a silky-hairy tuft, not embedded in pulp; leaves without stipules; stems with white latex

133 Stamens free, with anthers surrounding a thickened style-head; pollen not in pollinia **72. APOCYNACEAE**

133: Stamens united in a corona; pollen in pollinia (*Gomphocarpus*) **73. ASCLEPIADACEAE**

106: Flowers zygomorphic

134 Plants without chlorophyll; root parasites (*Orobanche*) **83. OROBANCHACEAE**

134: Plants with chlorophyll, green; not parasitic

135 Flowers with a single perianth whorl, petaloid; stamens with filaments adherent to perianth (*Grevillea*) **45. PROTEACEAE**

135: Flowers with both sepals and petals, in 2 or more whorls

136 Trees, shrubs or woody climbers

137 Trees

138 Leaves alternate; flowers white with mauve or purple spots; fruit ±fleshy, ripening mauve or purple (*Myoporum*) **82. MYOPORACEAE**

138: Leaves in whorls of 3; flowers yellow with red spots; fruit a beaked, green or brownish capsule (*Negria*) **84. GESNERIACEAE**

137: Shrubs or woody climbers

139 Leaves pinnate; corolla tube funnel-shaped, curved; corolla lobes cream with purple markings (*Pandorea*) **86. BIGNONIACEAE**

139: Leaves simple; corolla not as above

140 Leaves linear, 1–2.2 mm broad; stamens 2 (*Westringia*) **78. LAMIACEAE**

140: Leaves at least 10 mm broad, usually much broader; stamens 4 or 5

141 Stems square in cross-section; corolla tube narrowly cylindrical, about 1 cm long; corolla lobes red, orange, yellow or pink, rarely white (*Lantana*) **77. VERBENACEAE**

141: Stems rounded in cross-section; corolla funnel-shaped, large, 16–24 cm long, golden yellow (*Solandra*) **74. SOLANACEAE**

136: Herbs

142 Leaves marked with pink spots or blotches; inflorescence a spike with flowers subtended by a pair of unequally sized, reduced leaves (*Hypoestes*) **85. ACANTHACEAE**

142: Leaves and flowers not as above

143 Fruit a capsule **81. SCROPHULARIACEAE**

143: Fruit of four nutlets

144 Inflorescence with flowers in verticillasters; corolla usually strongly bilabiate **78. LAMIACEAE**

144: Inflorescence a terminal spike, dense at least at first; corolla not strongly bilabiate

145 Corolla salverform with a narrow tube less than 1 cm long; stamens 4 (*Verbena*) **77. VERBENACEAE**

145: Corolla funnel-shaped, 2–3 cm long; stamens 5 (*Echium*) **76. BORAGINACEAE**

105: Ovary inferior

146 Flowers actinomorphic

147 Leaves opposite with interpetiolar stipules; fruit usually a capsule or drupe **89. RUBIACEAE**

147: Leaves alternate, without stipules

148 Stamens numerous; flowers white with yellow tips; fruit a small drupe or berry turning bluish when ripe (*Symplocos*) **36. SYMPLOCACEAE**

148: Stamens 5 or less; flowers blue, yellow or sometimes white or greenish; fruit a capsule, berry or pepo

149 Climbers with tendrils; flowers yellow, white or greenish **31. CUCURBITACEAE**

149: Erect or caespitose herbs; flowers blue (*Wahlenbergia*) **87. CAMPANULACEAE**

146: Flowers zygomorphic

150 Herbs

151 Corolla split to base, without a spur; stamens 5; fruit a capsule or berry **87. CAMPANULACEAE**

151: Corolla 2-lipped, spurred; stamen 1; fruit with a pappus (*Centranthus*) **91. VALERIANACEAE**

150: Shrubs or woody climbers

152 Corolla split to base; spreading shrub; fruit fleshy, white (*Scaevola*) **88. GOODENIACEAE**

152: Corolla 2-lipped; twining climber; fruit a black berry (*Lonicera*) **90. CAPRIFOLIACEAE**

3: Embryo with 1 seed-leaf (cotyledon); leaves usually with parallel venation; sepals and/or petals when present in multiples of 3 **(*MONOCOTYLEDONAE*)**

153 Marine plants, growing in shallow water

154 Leaves oblong-elliptic, 5–15 mm broad (*Halophila*) **94. HYDROCHARITACEAE**

154: Leaves linear, 1.5–3 (–5) mm broad (*Zostera*) **96. ZOSTERACEAE**

153: Terrestrial, or fresh or brackish water plants (epiphytic or lithophytic in Orchidaceae)

155 Trees with pinnate leaves — **97. ARECACEAE**

155: Herbs or, if trees or shrubs, then with simple leaves

156 Flowers unisexual in dense spikes with male and female flowers in separate groups, the female below the male

157 Spike subtended by a large spathe — **99. ARACEAE**

157: Spike without a spathe

158 Spikes slender, up to 10 cm long, less than 1 cm diam.; flowers crowded but distinct, subtended by a glume (*Uncinia*, *Carex*) — **103. CYPERACEAE**

158: Spikes cylindrical, 8 cm or more long, 2–3 cm diam.; flowers innumerable, densely crowded (*Typha*) — **105. TYPHACEAE**

156: Flowers not so arranged

159 Trees with simple leaves

160 Lower part of trunk with prominent prop-roots; flowers unisexual, in dense heads (*Pandanus*) — **98. PANDANACEAE**

160: Without prominent prop-roots; flowers bisexual, in panicles (*Cordyline*) — **111. AGAVACEAE**

159: Woody shrubs, climbers or, mostly, herbs

161 Sepaloid and petaloid perianth lacking

162 Climbers; inflorescence subtended by 3 fleshy spathes (*Freycinetia*) — **98. PANDANACEAE**

162: Non-climbers; inflorescence not so subtended

163 Leaves with a ligule at junction of blade and sheath; stems ±rounded, not triangular in cross-section

164 Flowers in spikelets with several spirally arranged overlapping glumes; style 1 with 3 stigmatic branches (*Gahnia*) — **103. CYPERACEAE**

164: Flowers in spikelets with 2 basal glumes; styles 3, free — **104. POACEAE**

163: Leaves without a ligule at junction of blade and sheath; stems usually triangular in cross-section — **103. CYPERACEAE**

161: Sepaloid and petaloid perianth present, sometimes somewhat inconspicuous

165 Aquatic plant, completely free-floating; petioles forming swollen floats (*Eichhornia*) — **107. PONTEDERIACEAE**

165: Terrestrial or sometimes epiphytic or lithophytic plants, or, if aquatic, rooted in soil

166 Ovary inferior

167 Flowers actinomorphic

168 Stamens 3 — **109. IRIDACEAE**

168: Stamens 6

169 Leaves not rigid and spine-tipped — **108. LILIACEAE**

169: Leaves rigid, spine-tipped — **111. AGAVACEAE**

167: Flowers irregular or zygomorphic

170 Flowers irregular, not strictly bilaterally symmetrical (*Canna*) — **106. CANNACEAE**

170: Flowers zygomorphic

171 Androecium with separate anthers, not fused with gynoecium into a column **109. IRIDACEAE**

171: Androecium fused with gynoecium into a column **113. ORCHIDACEAE**

166: Ovary superior

172 Stamens numerous; aquatic plant with roots permanently immersed (*Hydrocleys*) **93. LIMNOCHARITACEAE**

172: Stamens 3 or 6; if a plant of wet habitats, roots not permanently immersed

173 Climbers or non-woody scramblers

174 Leaves with apical tendrils

175 Flowers c. 2 mm long, whitish, in many-flowered panicles (*Flagellaria*) **101. FLAGELLARIACEAE**

175: Flowers 5–8 cm long, red or yellow, solitary in leaf-axils (*Gloriosa*) **108. LILIACEAE**

174: Leaves without apical tendrils; tendrils, if present, petiolar

176 Leaves narrowly lanceolate-elliptic to broadly ovate-orbicular, 6–80 mm broad **112. SMILACACEAE**

176: 'Leaves' (cladodes), linear to ovate, less than 1–12 mm broad; true leaves reduced to scales (*Asparagus*) **108. LILIACEAE**

173: Herbaceous or somewhat woody plants, not climbing

177 Perianth of 2 distinct whorls; inner whorl petaloid **100. COMMELINACEAE**

177: Perianth segments all similar

178 Perianth segments green and sepaloid or chaffy

179 Ovary 6-locular, 3 fertile alternating with 3 sterile; fruit follicular (*Triglochin*) **95. JUNCAGINACEAE**

179: Ovary 1- or 3-locular; fruit a loculicidal capsule **102. JUNCACEAE**

178: Perianth segments white or coloured, petaloid

180 Leaves ±soft, not fibrous **108. LILIACEAE**

180: Leaves tough, fibrous

181 Margins of leaves sharply toothed (*Aloe*) **110. ALOACEAE**

181: Margins of leaves entire **111. AGAVACEAE**

2: Seeds borne in cones, naked, without ovary wall, sepals or petals **(*PINOPHYTA*)**

182 Adult leaves spirally arranged, broadly ovate, 4–7 mm long; female cones massive, 7.5–10 cm long, shattering (*Araucaria*) **114. ARAUCARIACEAE**

182: Adult leaves in 4 rows, closely appressed, 1.5–2 mm long; female cones globose, about 1.5 cm diam., not shattering (*Cupressus*) **115. CUPRESSACEAE**

1: Plants without flowers, reproducing by spores **(*PTERIDOPHYTA*)**

183 Plants lacking definite roots (rootstock consists of rhizomes with rhizoids); sporangia of 2- or 3-chambered synangia associated with a leaf-like or bract-like structure **118. PSILOTACEAE**

183: Plants with definite roots; sporangia not forming 2- or 3-chambered synangia

184 Sporangia in 'cones'; leaves to 1.5 cm long, with a single midvein

185 Vegetative leaves similar at any given point along branch, without ligules; sporangia producing spores of 1 size **116. LYCOPODIACEAE**

185: Vegetative leaves of 2 sizes at any one point along branch, ligulate; sporangia producing spores of 2 sizes (*Selaginella*) **117. SELAGINELLACEAE**

184: Sporangia not in 'cones'; leaves (fronds) usually more than 1.5 cm long, with several veins

186 Sporangia immersed in a simple spike or borne on a branched stalk, held above the leaf; young fronds not circinate **119. OPHIOGLOSSACEAE**

186: Sporangia on surface or margin of a frond; young fronds circinate

187 Sporangia coalescent into oval to oblong, rounded synangia; stipe robust with a pair of fleshy stipules at base (*Marattia*) **120. MARATTIACEAE**

187: Sporangia not united into synangia; base of stipe without fleshy stipules

188 Sporangia not grouped into sori; leaves very thin; growing in cloud-forest (*Leptopteris*) **121. OSMUNDACEAE**

188: Sporangia grouped into sori; leaves thin or otherwise; habitat various

189 Plant with stout trunk 1 m or more tall (tree-ferns); fronds usually more than 1.5 m long (*Cyathea*) **129. CYATHEACEAE**

189: Plant without a stout trunk, not a tree-fern

190 Fronds composed of forked pairs of branches with a dormant bud in the crutch of the fork, with the branches bearing pinnules (*Sticherus*) **126. GLEICHENIACEAE**

190: Fronds simple or variously pinnate

191 Fronds delicate, very thin (without stomata); sori marginal at the ends of veins, with indusial flaps or cup-like **122. HYMENOPHYLLACEAE**

191: Fronds not or scarcely delicate (with stomata); sori lacking a marginal flap-like or cup-like indusium, if marginal, protected by the recurved pouch-shaped margin of the lamina or a linear indusium

192 Epiphyte with basal nest-fronds and erect or pendulous forked fertile fronds (*Platycerium*) **127. POLYPODIACEAE**

192: Epiphytic, terrestrial or lithophytic ferns; basal nest-fronds never developed; sterile and fertile fronds variable

193 Fronds simple to 1-pinnate

194 Fronds simple and entire, sometimes somewhat sinuate

195 Fronds dimorphic; fertile fronds linear, 2–4 mm broad (*Blechnum*) **136. BLECHNACEAE**

195: Fronds not dimorphic; fertile fronds not differentiated

196 Sori linear, with or without indusia

197 Fronds narrow, 3–5 mm broad, strap-shaped, borne along a creeping rhizome; sori without indusia, in a groove along lamina margin (*Vittaria*) **124. VITTARIACEAE**

197: Fronds broader, 6–20 cm broad, forming a 'crown' from around the top of the erect rhizome apex; indusiate (*Asplenium*) **132. ASPLENIACEAE**

196: Sori rounded to elongate, sometimes coalescing, without indusia

198 Rhizome long-creeping; lamina glabrous or densely covered with stellate hairs; fronds sometimes variable on the same plant; habitat various (*Pyrrosia*) **127. POLYPODIACEAE**

198: Rhizome short; lamina glabrous or hispid; fronds ±uniform; small epiphytes in cloud-forest (*Grammitis*) **128. GRAMMITIDACEAE**

194: Fronds pinnatifid, pinnatisect or 1-pinnate

199 Fronds pinnatifid or pinnatisect; lobes joined along rachis

200 Sterile and fertile fronds dimorphic; sori continuous, covering lower surface of linear lobes of fertile fronds (*Blechnum*) **136. BLECHNACEAE**

200: Sterile and fertile fronds similar; sori rounded, often slightly immersed (*Phymatosorus*) **127. POLYPODIACEAE**

199: Fronds 1-pinnate; lobes not joined along main rachis

201 Pinnae deeply cut

202 Sori round; indusia kidney-shaped; pinnae ±symmetrical at base (*Christella*) **130. THELYPTERIDACEAE**

202: Sori elongate; indusia ±linear or consisting of slightly curved flaps; pinnae symmetrical or clearly asymmetrical at base

203 Rhizome short, not creeping; rhizome and stipe with clathrate scales; indusia never double (*Asplenium*) **132. ASPLENIACEAE**

203: Rhizome creeping; scales not clathrate; indusia sometimes double, back to back (especially on basal pinnae) (*Lunathyrium*) **134. ATHYRIACEAE**

201: Pinnae not deeply cut, ±entire, variously serrate

204 Fertile and sterile fronds dimorphic; fertile fronds with linear lobes covered beneath with continuous sori **136. BLECHNACEAE**

204: Fertile and sterile fronds similar; sori continuous or discrete

205 Sori ±rounded, or with kidney-shaped indusia

206 Pinnae appearing sessile, strongly auricled at their base, otherwise symmetrical, not falcate; sori in a submarginal row; fronds tufted (*Nephrolepis*) **135. DAVALLIACEAE**

206: Pinnae clearly stalked, without auricles, falcate or not; sori scattered or in a submarginal row; fronds tufted or not

207 Sori scattered over undersurface of pinnae; fronds tufted; pinnae distinctly falcate (*Phanerophlebia*) **133. DRYOPTERIDACEAE**

207: Sori in a submarginal row; fronds borne along a long creeping rhizome; stipe articulate with rhizome; pinnae not falcate (*Arthropteris*) **135. DAVALLIACEAE**

205: Sori linear or oblong

208 Frond margins ±entire; sori continuous along margins of pinnae (*Pellaea*) **123. ADIANTACEAE**

208: Frond margin toothed to some degree; sori not marginal

209 Margins of pinnae sharply toothed; sori parallel to costae; fronds hard to the touch; scales not clathrate (*Doodia*) **136. BLECHNACEAE**

209: Margins of pinnae to some degree serrate but not sharply so; sori at an angle to costae (if almost parallel then frond margins doubly serrate); fronds not hard to the touch; scales clathrate (*Asplenium*) **132. ASPLENIACEAE**

193: Fronds 2-pinnate (at least at base of frond) to 4-pinnate

210 Sori circular or kidney-shaped

211 Sori marginal, covered by a kidney-shaped flap

212 Pinnules petiolulate (sometimes only shortly so); upper pinnules sometimes sessile; rachis not grooved (*Adiantum*) **123. ADIANTACEAE**

212: Pinnules sessile; rachis grooved above (*Hypolepis*) **131. DENNSTAEDTIACEAE**

211: Sori on undersurface of lamina, or if marginal then indusium not flap-like

213 Basal pinnules ±equal in size on both sides of costae

214 Rachis without scales; indusia minute, very early caducous; sori appearing to lack indusia (*Macrothelypteris*) **130. THELYPTERIDACEAE**

214: Rachis with few to many scales; indusia 0.5–2 mm diam., peltate, often deciduous; young sori with evident indusia **133. DRYOPTERIDACEAE**

213: Basal pinnules unequal in size, the lower one of an opposite pair larger than the upper (*Arachnoides*) **133. DRYOPTERIDACEAE**

210: Sori elongate or linear

215 Sori marginal and protected by a marginal flap

216 Fronds widely spaced along underground rhizome, not clustered at apex **131. DENNSTAEDTIACEAE**

216: Fronds borne close together, usually clustered at apex of rhizome

217 Fronds narrow, up to 30 cm tall, 1–3 (–4) cm broad, usually in dryish habitats; pinnae often curled up (*Cheilanthes*) **123. ADIANTACEAE**

217: Fronds 30–200 cm tall, 20 cm or more broad; usually in a mesic habitat; pinnae not curled up (*Pteris*) **125. PTERIDACEAE**

215: Sori not marginal

218 Fronds 2-pinnate (if 3-pinnate, pinnules linear, wholly fertile); scales clathrate (*Asplenium*) **132. ASPLENIACEAE**

218: Fronds 3-pinnate (if 2-pinnate, pinnules deeply cut); scales not clathrate (*Diplazium*) **134. ATHYRIACEAE**

MAGNOLIOPHYTA

DICOTYLEDONAE

1. WINTERACEAE

Trees or shrubs. Leaves alternate, simple, entire, gland-dotted, without stipules. Flowers actinomorphic, bisexual or unisexual. Calyx free or ±united, 2–6-lobed. Corolla lobes 4–many, in 1–3 series, imbricate. Stamens 10–many, in 2–5 series, free. Ovary superior; carpels usually free, 1–several; styles short; ovules 1–many. Fruit follicular or baccate.

A family of c. 7 genera and 120 species, ranging from Malaysia to eastern Australia, New Zealand, the Pacific, Central and South America and Madagascar; 1 genus native on Lord Howe Is.

A.C.Smith, Taxonomic notes on the Old World species of Winteraceae, *J. Arnold Arbor*. 24: 119–164 (1943).

ZYGOGYNUM

Zygogynum Baill., *Adansonia* 7: 298 (1867); from the Greek *zygos* (a yoke) and *gynos* (a female), in allusion to the connate carpels in the type species.

Type: *Z. vieillardii* Baill.

Bubbia Tiegh., *J. Bot.* (*Morot*) 14: 278, 293 (1900). T: *B. howeana* (F.Muell.) Tiegh.

Evergreen trees or shrubs. Leaves entire, penninerved. Inflorescence terminal, bracteate. Flowers solitary or in few-flowered dichasia, bisexual, pedicellate. Calyx calyptrate, soon rupturing, persistent. Petals an outer whorl of 4, basally connate or free, and (1 or) 2 inner whorls each of 4, free. Stamens 10–many; filaments somewhat enlarged. Carpels 2–several, free or connate; stigma sessile, elongated; ovules 6–many per carpel. Fruit follicular, usually with some ovules abortive.

A genus of c. 35 species from the Moluccas and New Guinea to Australia (Qld) and New Caledonia; 1 species endemic on Lord Howe Is.

W.Vink, The Winteraceae of the Old World IV, The Australian species of *Bubbia*, *Blumea* 28: 311–328 (1983), & V, *Exospermum* links *Bubbia* to *Zygogynum*, *Blumea* 31: 39–55 (1985).

Zygogynum howeanum (F.Muell.) Vink, *Blumea* 31: 53 (1985)

Drimys howeana F.Muell., *Fragm.* 7: 17 (1869); *Bubbia howeana* (F.Muell.) Tiegh., *J. Bot.* (*Morot*) 14: 293 (1900). T: Lord Howe Is., *C.Moore 23*; holo: MEL. The epithet alludes to the island on which this plant grows.

Drimys insularis Baill. ex F.Muell., *Fragm.* 9: 76 (1876), *nom. nud.*

Bubbia muelleri Tiegh., *loc. cit.* T: Lord Howe Is., *C.Moore 43*; holo: MEL; iso: K.

Illustrations: H.F.Recher & S.S.Clark, *Environm. Survey Lord Howe Is.* 22 (1974); I.Hutton, *Lord Howe Is.* 144 (1986).

Shrub or small tree to 13 m tall. Leaves thickish, dark green, glaucous beneath; petiole 10–20 mm long; lamina narrowly oblanceolate to obovate-oblong, 5–15 (–25) cm long, 1–5 (–7) cm broad, narrowly cuneate at base, rounded to obtuse apically. Inflorescence 3–many-flowered. Petals 8–14, narrow, 7–12 mm long, white, in (2 or) 3 series. Stamens 10–30. Carpels 3–6. Fruit oblong-ellipsoidal or obovoid, 8–13 mm long, 6–10 mm broad, 5–8 mm thick, greyish black and somewhat fleshy when ripe. Seeds 5–17, obovoid to subreniform, 5 mm long, 3

mm broad, 2 mm thick, almost smooth. *Hot Bark.* Figs 8, 35A–B.

Lord Howe Is. An endemic species which is almost confined to forests at the southern end of the Island, from relatively low altitudes to the tops of Mts Lidgbird and Gower. Flowers June–Dec.

L.H.Is.: Goat House track, *I.R.H.Telford 7068 & M.D.Crisp* (CBG); E side of Mt Lidgbird, *J.C.Game 69/178* (K); Erskine Valley, *I.R.H.Telford 7092 & M.D.Crisp* (CBG); top of Mt Gower, *P.S.Green 1594 & 1598* (A, K).

2. LAURACEAE

Trees (elsewhere shrubs or rarely parasitic climbing herbs), often aromatic. Leaves usually alternate, evergreen, entire; lamina penninerved or triplinerved, generally finely reticulate, frequently glaucous beneath; stipules absent. Inflorescences paniculate, usually terminal or axillary. Flowers small, actinomorphic, usually bisexual, 3-merous. Perianth of 6 sepals, apetalous. Stamens usually 9, with 3 or 6 often sterile, in 3 often dissimilar whorls, inner whorl usually staminodal; anthers dehiscent by valves opening from base upwards; filaments of fertile stamens usually gland-bearing. Ovary usually superior, 1-locular; ovule 1. Fruit baccate or drupaceous, naked or subtended to enclosed by an accrescent perianth tube; embryo with large fleshy cotyledons.

A family of c. 32 genera and 2000 or more species, worldwide in distribution but almost confined to the tropics and subtropics; 1 genus native and 1 naturalised on the Islands.

In addition to the members of this family detailed below, the Avocado Pear (*Persea americana* Mill.) is widely cultivated on Norfolk Is., where it is one of the most successful fruit-tree crops.

G.Bentham, Laurineae, *Fl. Austral.* 5: 293–315 (1870); A.C.Smith, Lauraceae, *Fl. Vit. Nova* 2: 113–141 (1981); B.P.M.Hyland, A revision of Lauraceae in Australia (excluding *Cassytha*), *Austral. Syst. Bot.* 2: 135–367 (1989).

KEY TO GENERA

Leaves with hairs (tufted acarodomatia) in axils of lower primary veins beneath, or glabrous without acarodomatia; fruit enclosed within accrescent perianth tube, except for a small apical orifice	**1. CRYPTOCARYA**
Leaves with glabrous pit-acarodomatia in axils of lower primary veins beneath; fruit seated on a flat 'cup' developed from perianth tube	**2. CINNAMOMUM**

1. CRYPTOCARYA

Cryptocarya R.Br., *Prodr.* 402 (1810); from the Greek *cryptos* (hidden) and *caryon* (a nut) – the fruit being enclosed in the accrescent perianth tube.

Type: *C. glaucescens* R.Br.

Evergreen trees. Leaves alternate; lamina reticulate, penninerved or triplinerved, usually coriaceous. Inflorescence terminal or axillary. Flowers bisexual; perianth tube campanulate, accrescent in fruit to envelop developing ovary. Stamens 9, in 3 whorls; inner whorl with 2 glands on each filament; staminodes 6. Ovary with a short style and inconspicuous stigma. Fruit ±ovoid, with an apical orifice.

A genus of between 200 and 250 species, found in tropical and subtropical regions throughout the world; 2 species native to Lord Howe Is.

Leaves ovate or suborbicular, rounded at apex, reticulate-penninerved, with 5 or 6 primary nerves on each side of midrib; fruit ellipsoidal or ovoid, 4–6 cm long **1. C. gregsonii**

Leaves elliptic, acute, triplinerved from base with 1 primary nerve above on each side of midrib; fruit ovoid, 1–1.5 cm long **2. C. triplinervis**

1. Cryptocarya gregsonii Maiden, *Proc. Linn. Soc. New South Wales* 27: 347 (1902), as *gregsoni* (J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 135, t. 3 (1898), as Black Plum)

T: Lord Howe Is., *J.H.Maiden*; holo: NSW. Named after Jesse Gregson of Newcastle, N.S.W., botanical friend of Maiden.

Illustrations: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 135, t. 3 (1898); I.Hutton, *Lord Howe Is.* 128 (1986).

Small tree to 12 m tall. Young stems slightly angled. Leaf lamina thick, ovate to suborbicular, 3–8 cm long, rounded at apex, penninerved, with 5 or 6 primary nerves on each side of midrib, glabrous. Inflorescences in axils of upper leaves of shoots, few-flowered. Flowers 5 mm diam., green. Fruit ellipsoidal-ovoid, 4–6 cm long, 3.5 cm broad, 2.5 cm thick, black and fleshy when ripe. *Black Plum*, *Native Blackbutt*. Figs 11, 35C.

Lord Howe Is. An uncommon endemic species which is locally abundant in southern mountainous areas of the Island, from 300 m altitude to the top of Mt Gower. Flowers Nov.–early Feb.

L.H.Is.: slopes of Mt Lidgbird, *J.D.McComish 194* (K); Mt Gower track near The Saddle, *I.Hutton 69* (CBG); N slope of Mt Gower, *M.M.J. van Balgooy 114* (CANB); Mt Gower, *C.Moore 24* (K).

2. Cryptocarya triplinervis R.Br., *Prodr*. 402 (1810)

T: Queensland, *R.Brown*; holo: BM. The epithet alludes to the three prominent nerves on the leaves.

Tetranthera sp., C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 7, 8 (1870).

Illustrations: W.R.Elliot & D.L.Jones, *Encycl. Austral. Pl.* 3: 127 (1984); I.Hutton, *Lord Howe Is.* 128 (1986); G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 137 (1990).

Tree 5–16 m tall. Young stems ±rounded. Leaf lamina elliptic, 3–10 cm long, acuminate, slightly glossy, triplinerved from base, with 1 primary nerve on each side of midrib; tufted acarodomatia in axils of 2 basal nerves. Flowers 3 mm diam., dull, yellow-green. Fruit globular-ovoid, 1–1.5 cm long, 0.8–1 cm diam., slightly flattened laterally, black, shining. *Blackbutt*.

Lord Howe Is. One of the most common trees at lower altitudes throughout the Island, also native in Australia (Qld, N.S.W.). Flowers Nov.–early Feb. The plant on Lord Howe Is. appears to be var. *triplinervis*. According to W.R.Sykes (*Ann. J. Roy. New Zealand Inst. Hort*. 8: 53, 1980) 'there are a few wild [adventive] trees of *Cryptocarya triplinervis*' in the Hundred Acre Reserve on Norfolk Is., presumably descended from ones which were planted in the Reserve. I have seen no specimens from this Island.

L.H.Is.: along Malabar Ridge, *A.C.Beauglehole 5825* (MEL); E end of Neds Beach, *G.Uhe 1251* (K); Transit Hill, *P.S.Green 1642* (A, K); *s. loc., P.S.Green* 2049 (K); between Mountain Inn and Deep Ck, *J.C.Game 69/318* (K).

2. CINNAMOMUM

Cinnamomum Schaeff., *Bot. Exped*. 74 (1760); from the classical Greek name for cinnamon.

Type: *C. zeylanicum* Blume

Evergreen trees, often with aromatic bark and leaves; terminal buds with imbricate scales. Leaves alternate (or elsewhere opposite), usually 3-nerved. Inflorescence terminal or axillary. Flowers bisexual. Perianth tube short, accrescent. Stamens 9 in 3 whorls; inner whorl eglandular, with 4-locular anthers; filaments of outer whorl biglandular; staminodes

conspicuous. Fruit subtended by a small swollen cupule, globose.

A genus of c. 250 species distributed from China and India to Australia and the Pacific; 1 species naturalised on Lord Howe Is. and possibly Norfolk Is.

***Cinnamomum camphora** (L.) J.Presl, *Prir. Rostlin* 2: 36, 47–56, t. 8 (1825)

Laurus camphora L., *Sp. Pl.* 1: 369 (1753). T: Japan, *coll. unknown*; lecto: LINN 518/7, *fide* A.J.G.H.Kostermans in J.Bosser *et al.*, *Fl. Masc.* 153: 13 (1982); IDC microfiche 177/2.268/2. The epithet comes from camphor, of which this species is the source.

Illustrations: M.C.Neal, *Gardens Hawaii* 2nd edn, 362 (1965); W.-C.Chen, *Sylva Sinica* 1: 742, fig. 300/2–7 (1983); G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 144 (1990).

Tree to 12 m or more. Leaves with petioles slender, half as long as lamina; lamina elliptic, 5–10 cm long, acuminate, 3-nerved from base, penninerved above, with pit-acarodomatia in axils of 2 basal nerves. Fruit black. All parts smelling of camphor. *Camphor Laurel*.

Norfolk Is., Lord Howe Is. A native of China and southern Japan, widely cultivated in the tropics, which has become naturalised on the Islands. On Norfolk Is. according to W.R.Sykes (*Annual J. Roy. New Zealand Inst. Hort.* 8: 53, 1980) it occurs in the Hundred Acre Reserve, where it 'spreads extensively from suckers' - presumably from planted trees. I have seen no collections from this Island.

L.H.Is.: adjacent to Morepark Garden, *J.Pickard 3456* (NSW).

For Lord Howe Is. this species has been listed (J.Pickard in H.F.Recher & S.S.Clark, *Environm. Survey Lord Howe Is.* 80, 1974) among plants which are recommended to be declared noxious weeds.

3. PIPERACEAE

Herbs, shrubs, climbers or small trees. Stems often articulated and nodes swollen, with vascular bundles scattered in cross-section. Leaves usually alternate, sometimes opposite or verticillate, entire, pinnately or palmately nerved; stipules adnate to petiole or absent. Inflorescences axillary or leaf-opposed, densely spicate. Flowers small, reduced, usually unisexual, without perianth, subtended by a minute, often peltate, bract. Stamens 1–10, usually free. Ovary superior, 1-locular; ovule 1, basal; style short; stigmas terminal, 1–5. Fruit a berry-like drupe, free, coalescent or fused with bracts or inflorescence axis.

A family of c. 8 genera and 2000 or more species, found throughout the tropics and subtropics; 2 genera native on Norfolk and Lord Howe Islands.

G.Bentham, Piperaceae, *Fl. Austral.* 6: 203–206 (1873); F.A.W.Miquel, *Syst. Piperac.* 1–575 (1843–1844); A.C.P. de Candolle, *Piperacearum Clavis Analyticum, Candollea* 1: 65–415 (1923); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Piperaceae, *Fl. Java* 1: 167–174 (1963); A.C.Smith, Piperaceae, *Fl. Vit. Nova* 2: 56–75 (1981).

KEY TO GENERA

Shrubs to 4 m tall with swollen nodes; leaves 6–20 cm broad; flower spikes 4–16 cm long **1. MACROPIPER**

Fleshy herbs 10–30 cm tall; leaves (0.5–) 1–2 cm broad; flower spikes 1–6 cm long **2. PEPEROMIA**

Figure 35. A–B, WINTERACEAE: *Zygogynum howeanum*. **A**, habit (P.Green 1594, K); **B**, fruit from a single flower (P.Green 1598, K). **C**, LAURACEAE: *Cryptocarya gregsonii*, habit (C.Moore 24, K). **D–E**, RANUNCULACEAE: *Clematis dubia*. **D**, habit, in young fruit; **E**, male flower (**D–E**, J.Backhouse 623, K). **F**, PIPERACEAE: *Macropiper excelsum* subsp. *psittacorum*, habit (P.Green 1402, K). Scale bars = 2 cm. Drawn by P.Halliday.

1. MACROPIPER

Macropiper Miq., *Bull. Sci. Phys. Nat. Néerl.* 1839: 447, 449 (1839); literally, 'large *Piper*', probably because of the often larger leaves.

Type: *M. latifolium* (L.f.) Miq.

Shrubs with swollen nodes, rarely small trees. Leaves alternate, subpalmately nerved; petioles vaginate; stipules adnate, papery. Inflorescence axillary, with 1–many per axil, unisexual. Flowers numerous, crowded on a slender rachis, subtended by a peltate bract. Stamens 3 (sometimes 2 or 4). Ovary with a minute style or stigmas sessile; stigmas 3 (sometimes 2 or 4). Fruit fleshy, free or coalescent.

A genus of c. 10 species distributed in the Pacific area from the Bonin Islands to the Solomon Islands, Lord Howe Is., New Zealand, the Marquesas and Rapa; 2 species native to the Islands.

A.C.Smith, The genus *Macropiper* (Piperaceae), *Bot. J. Linn. Soc.* 71: 1–38 (1975).

Fruit yellow or orange; individual drupelets coalescent, dimpled at apices; leaves (5–) 8–10 (–15) cm long, (6–) 8–10 (–17) cm broad, with 5–7 (–9) principal nerves **1. M. excelsum**

Fruit red; individual drupelets not coalescent, rounded-conical at apices; leaves (7–) 10–14 (–18) cm long, (8–) 12–16 (–20) cm broad, with 7–9 (–11) principal nerves **2. M. hooglandii**

1. Macropiper excelsum (G.Forst) Miq., *Syst. Piperac. 221 (1843)*

subsp. **psittacorum** (Endl.) Sykes, *New Zealand J. Bot.* 30: 233 (1992)

Piper psittacorum Endl., *Prodr. Fl. Norfolk.* 37 (1833); *Macropiper psittacorum* (Endl.) Miq., *Syst. Piperac.* 221 (1843); *Piper excelsum* var. *psittacorum* (Endl.) C.DC. in A.L.P.P. de Candolle, *Prodr.* 16(1): 355 (1869); *Macropiper excelsum* var. *psittacorum* (Endl.) Laing, *Trans. & Proc. New Zealand Inst.* 47: 22 (1915); *Macropiper excelsum* f. *psittacorum* (Endl.) A.C.Sm., *Bot. J. Linn. Soc.* 71: 33 (1975). T: Norfolk Is., *F.L.Bauer*; holo: W. The epithet means of the parrots, probably inferring a liking for the fruits by parrots.

Piper excelsum var. *major* Cheeseman, *Man. Fl. New Zealand* 595 (1906); *Macropiper excelsum* var *majus* (Cheeseman) Allan, *Fl. New Zealand* 1: 173 (1961). T: Kermadec Islands, *J.MacGillivray 970*, & *loc. id.*, 1887, *T.F.Cheeseman*; syn: AK *n.v.*; isosyn: K.

Illustrations: A.B.Graf, *Exotica* 12th edn, 2: 1945 (1985); I.Hutton, *Lord Howe Is.* 136 (1986); P.S.Green, *Kew Bull.* 48: 317, fig. 3A (1993).

Shrub to 1.5 m tall, branching from base. Leaves slightly aromatic and peppery; petioles grooved, 2–5 (–7) cm long; lamina broadly ovate to suborbicular, (5–) 8–10 (–15) cm long, (6–) 8–10 (–17) cm broad, basally cordate to rounded passing through a shallow 'V'-shape onto petiole, slightly but distinctly acuminate; principal nerves 5–7 (– 9). Spikes solitary or usually paired; male spikes to 16 cm long; female spikes 4–8 cm long. Ovary ovoid; stigmas 4 (rarely 3); subtending peltate scales c. 1.5–2 mm diam. Fruiting spike yellow to orange, sweet, 1.2–1.4 cm diam. Fruit fleshy, coalescent, with dimpled apex. Seeds ellipsoidal, c. 2 mm long, grooved with 4 (rarely 3) furrows, hard, peppery. *Kava* (L.H.Is.), *Pepper Tree*. Fig. 35F.

Norfolk Is., Lord Howe Is. A plant of forest and forest margins, usually found at lower altitudes on Lord Howe Is. Flowers July–Oct. Subsp. *psittacorum* vis confined to Lord Howe, Norfolk, and Kermadec Islands and some islands off the north coast of New Zealand.

N.Is.: Mt Pitt Rd near junction with Mission Rd, *M.Lazarides 8041* (CANB, K); Mt Bates, track to Red Rd, *P.S.Green 1402* (A, K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW). **L.H.Is.:** Transit Hill, near Pine Trees Guest House, *M.M.J. van Balgooy 1082* (NSW); S base of Transit Hill, *L.A.S.Johnson & A.N.Rodd 1289* (K, NSW); N ridge of Mt Gower, *J.Pickard 3568* (NSW).

Macropiper excelsum subsp. *excelsum* occurs in New Zealand and the Chatham Islands.

2. Macropiper hooglandii I.Hutton & P.S.Green, *Kew Bull*. 48: 316 (1993)

T: Lord Howe Is., *I.Hutton 621*; holo: K. Named in honour of Dr Ruurd (Ru) Dirk Hoogland who, since 1963, has contributed extensively to our knowledge of the flora of these Islands.

Illustration: P.S.Green, *Kew Bull*. 48: 317, fig. 3B (1993).

Shrub 2 (–4) m tall, branching from base. Leaves strongly aromatic and peppery; petiole ±rounded, 3–9 (–12) cm long; lamina cordate, (7–) 10–14 (–18) cm long, (8–) 12–16 (–20) cm broad, cordate at base passing through a distinct 'V'-shape onto petiole, rounded at apex with a short somewhat obscure point; principal nerves 7–9 (–11). Spikes 1–3; male to 10 cm long; female 4–6 cm long. Ovary ovoid; stigmas 3 (rarely 4); subtending peltate scales c. 3 mm diam. Fruiting spike 0.7–1 cm diam., red. Fruit fleshy, not coalescing, rounded-conical at apex. Seeds globose, slightly 3-angled, 1.5 mm long, hard, pungent-peppery. *Kava*. Fig. 9.

Lord Howe Is. Endemic and locally common as an understorey plant in damp, shaded conditions, on basaltic soil, from the summits of the mountains down to c. 50 m in creeks.

L.H.Is.: terraces on Mt Lidgbird, above Round Face, *J.Pickard 1445* (NSW); Mt Lidgbird, corner of SW spur in NW facing cliff base, *A.N.Rodd 1781* (NSW); Waterfall Run, *J.Pickard 3393* (NSW); Mt Gower track, *I.Hutton 621* (K); summit of Mt Gower, 1908, *C.Hedley & W.S.Dunn* (NSW).

2. PEPEROMIA

Peperomia Ruiz & Pav., *Fl. Peruv. Prodr*. 8 (1794); the name means resembling *Piper*.

Type: *P. secunda* Ruiz & Pav.

Perennial fleshy herbs. Leaves opposite, alternate or whorled; usually palmately or pinnately nerved; petiolate; stipules absent. Flowers crowded in slender spikes, minute, bisexual; subtending bracts peltate. Stamens 2. Ovary sessile. Fruit usually less than 1 mm long.

A pantropical and subtropical genus of 1000 or more species, especially well represented in Central and South America; 2 native species on Norfolk and Lord Howe Islands. It is sometimes placed in a separate family, the Peperomiaceae.

Peperomia leptostachya Hook. & Arn. was listed by R.Tate (*Macleay Mem. Vol*. 217, 1893) as occurring on Norfolk and Lord Howe Islands, but this seems to be an error, for there are no collections of it from either of these Islands, and the record has never been substantiated.

A.C.Smith, Peperomiaceae, *Fl. Vit. Nova* 2: 75–97 (1981).

Leaves in whorls of 4 **1. P. tetraphylla**

Leaves alternate **2. P. urvilleana**

1. Peperomia tetraphylla Hook. & Arn., *Bot. Beechey Voy*. 97 (1832)

T: Hawai'i; holo: ?E *n.v.* The epithet comes from the Greek *tetra-* (four) and *phyllos* (a leaf), referring to the leaves occurring in whorls of four.

Piper reflexum L.f., *Suppl. Pl.* 91 (1781); *Peperomia reflexa* (L.f.) A.Dietr., *Sp. Pl.* 6th edn, 1: 180 (1831), *non* Kunth (1815). T: South Africa, *C.P.Thunberg*; holo: ?S *n.v.*

Piper tetraphyllum G.Forst., *Prodr*. 5 (1786). T: 'Society Islands' [New Zealand or Norfolk Island ?], *J.R.& G.Forster*; syn: K.

Piper aemulum Endl., *Prodr. Fl. Norfolk*. 36 (1833); *Peperomia aemula* (Endl.) Endl., *Ann. Weiner Mus. Naturgesch*. 1: 164 (1836); *Peperomia reflexa* var. *aemula* (Endl.) C.DC. in A.L.P.P. de Candolle, *Prodr*. 16(1): 451 (1869). T: Norfolk Is., *F.L.Bauer*; holo: W *n.v.*, probably destroyed; iso: K.

Peperomia reflexa f. *norfolkensis* Miq., *Syst. Piperac*. 172 (1843). T: Norfolk Is., *F.L.Bauer*; holo: B *n.v.*, probably destroyed; iso: K.

[*Peperomia affinis auct. non* Domin ex F.M.Bailey: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 39: 383 (1914)]

Illustrations: F.M.Bailey, *Compr. Cat. Queensland Pl*. 424 (1913), as *P. reflexa*; B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 45, fig. 17b–h (1983); G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 148, t. 8 (1990).

Spreading herb to 20 cm tall. Leaves 4 at each node; petiole 1–3 mm long, hairy; lamina rhomboid or rhomboid-elliptic, (15–) 20–40 mm long, (8–) 12–30 mm broad, apically blunt, 3-nerved, hairy, at least below. Spikes terminal, 1–2 cm long. Fruit ovoid, reddish. *Four-Leaved Peperomia*.

Norfolk Is., Lord Howe Is. Widespread on both Islands, although rarer on Norfolk Is. Characteristic of shady woods and forest, on mossy rocks or tree stumps, and epiphytic on branches. Also known from the North Is. of New Zealand, Australia (Qld, N.S.W.), and from southern China and India through Malesia and Africa to Central and South America.

N.Is.: foot of Mt Pitt, *J.D.McComish 74* (K); Red Rd, towards Mt Bates, *P.S.Green 1378* (A, K); *s. loc.*, *I.Robinson 121* (MEL). **L.H.Is.:** SE lower slopes of Malabar, *P.S.Green 1540* (A, K); E slope of Intermediate Hill, *L.A.S.Johnson & A.N.Rodd 1306* (K, NSW); *s. loc.*, *C.Moore 59* (K, MEL).

2. Peperomia urvilleana A.Rich. in J.S.C.Dumont d'Urville, *Voy. Astrolabe* 1: 356 (1832)

T: Tasman Bay, New Zealand, *J.S.C.Dumont d'Urville*; holo: ?P *n.v.* Named after the collector of the type material, Capt. J.S.C.Dumont d'Urville (1790–1842), who commanded the *Astrolabe* on its voyage of exploration, 1826–1829.

Piper adscendens Endl., *Prodr. Fl. Norfolk.* 36 (1833); *Peperomia baueriana* Miq., *Syst. Piperac.* 120 (1843), *nom. illeg.*; *Peperomia adscendens* (Endl.) K.Schum., *Notizbl. Königl. Bot. Gart. Berlin* 1: 47 (1895), *non* C.DC. (1866). T: Norfolk Is., 1804–1805, *F.L.Bauer*; holo: W *n.v.*, probably destroyed; iso: K.

Piper simplex Endl., *op. cit.* 37; *Peperomia endlicheri* Miq., *loc. cit.*, *nom. illeg.*, *non* (Ham.) D.Dietr. (1839). T: Norfolk Is., 1804–1805, *F.L.Bauer*; holo: ?W *n.v.*, probably destroyed.

Illustration: T.G.Yuncker, *Bernice P. Bishop Mus. Bull.* 143: 18 (1937), as *P. endlicheri*.

Spreading herb to 30 cm tall. Leaves alternate; petiole 2–10 mm long, glabrous; lamina obovoid-elliptic, (4–) 8–15 mm long, (3–) 6–10 mm broad, apically obtuse, generally rounded, 3-nerved, glabrous, glossy above. Spikes terminal or occasionally axillary, 2–6 cm long. Fruit ovoid, brownish. *Two-Leaved Peperomia*. Fig. 10.

Norfolk Is., Lord Howe Is. This species is also characteristic of shady woods and forest, on mossy rocks and tree stumps, or epiphytic on trees. On Norfolk Is. it is now rather rare. It is also native to the Solomon Islands, Vanuatu, New Caledonia, New Zealand, the Kermadec Islands, Fiji and Samoa.

N.Is.: N slope of Mt Bates, *P.S.Green 1421* (A, K); foot of Mt Pitt, *J.D.McComish 74A* (L); *s. loc.*, *A.Cunningham 39, 41 & 79* (K). **L.H.Is.:** E slopes of Intermediate Hill, *L.A.S.Johnson & A.N.Rodd 1305* (K, NSW); base of W face of Mt Lidgbird, *P.S.Green 1672* (A, K); *s. loc.*, *J.P.Fullagar* (K, MEL).

4. RANUNCULACEAE

Herbs or woody climbers. Leaves alternate, rarely opposite, rarely stipulate. Inflorescence racemose or paniculate or flowers solitary. Flowers hypogynous, actinomorphic, usually bisexual. Perianth petaloid or of distinct sepals and petals, usually 5 of each, imbricate or valvate. Stamens usually numerous, free; anthers 2-locular. Ovary superior. Carpels usually numerous and free (or reduced to one); receptacle often conical. Fruit of achenes or follicles.

A family of c. 50 genera and 800 species; cosmopolitan in distribution but mainly northern temperate; 1 genus native and 1 naturalised on Norfolk and Lord Howe Islands.

G.Bentham, Ranunculaceae, *Fl. Austral.* 1: 4–15 (1863); H.H.Allan, Ranunculaceae, *Fl. New Zealand* 1: 139–172 (1961); C.J.Webb *et al.*, Ranunculaceae, *Fl. New Zealand* 4: 1001–1039 (1988).

RANUNCULACEAE

KEY TO GENERA

Vines, somewhat woody, climbing by prehensile petioles; leaves opposite	**1. CLEMATIS**
Herbs; leaves basal or cauline, usually alternate	**2. RANUNCULUS**

1. CLEMATIS

Clematis L., *Sp. Pl.* 1: 543 (1753); *Gen. Pl.* 5th edn, 242 (1754); a Greek name for several climbing plants, from *klema*, a vine twig.

Type: *C. vitalba* L.

Climbers, somewhat woody. Leaves opposite, simple or trifoliolate; petioles prehensile, twisting around supports while young and soft. Inflorescence paniculate. Flowers bisexual or unisexual. Perianth segments petaloid, usually 4, valvate. Styles persistent, becoming feathery in fruit.

A genus of c. 250 species, mainly temperate; 1 species on each of Norfolk and Lord Howe Islands.

Leaves usually simple; perianth segments 5–9 (–11) mm long (N.Is.)	**1. C. dubia**
Leaves trifoliolate; perianth segments 10–17 (–20) mm long (L.H.Is.)	**2. C. glycinoides**

1. Clematis dubia (Endl.) P.S.Green, *Kew Bull.* 45: 245 (1990)

Ripogonum dubium Endl., *Prodr. Fl. Norfolk.* 30 (1833). T: Norfolk Is., 1804–1805, *F.L.Bauer*; holo: W *n.v.*, destroyed; neo: Norfolk Is., *A.Cunningham 17*, K, *fide* P.S.Green, *Kew Bull.* 45: 245 (1990). So named because of its dubious assignment to *Ripogonum* when known only in a vegetative state.

Clematis cocculifolia A.Cunn., *Ann. Nat. Hist.* 4: 260 (1840); *C. aristata* subsp. *cocculifolia* (A.Cunn.) Kuntze, *Verh. Bot. Vereins. Prov. Brandenb.* 26: 156 (1885). T: Norfolk Is., *A.Cunningham 17* & *17 bis*; syn: K.

[*Clematis indivisa auct. non* Willd.: R.Heward, *Lond. J. Bot.* 1: 124 (1842)]

[*Clematis glycinoides auct. non* DC.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 694, 771 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 26 (1915); J.S.Turner *et al.*, *Conservation Norfolk Is.* 34 (1968)]

Young stems finely ridged. Leaves simple, unifoliolate, rarely trifoliolate, glabrous, broadly ovate to suborbicular, 5–11 cm long, 4–10 cm broad, truncate to usually cordate, entire (juvenile leaves coarsely serrate) obtuse to somewhat acute, palmately 3–5-veined. Inflorescence unisexual, axillary, 3–10 cm long, 2–5 cm broad, puberulous. Perianth segments ligulate, 5–9 (–11) mm long, white, with a few scattered dorsal hairs. Anthers with a short apiculum. Ovaries and achenes hairy. *Clematis*. Fig. 35D–E.

Norfolk Is. An endemic species, formerly widespread and recorded as reaching the tops of the trees, but now rather rare and rarely flowering.

N.Is.: side of track from Mt Pitt to Mt Bates, *P.Ralston 16* (A); upper slopes of Mt Pitt, *G.Uhe 1176* (K); Mt Pitt, *W.Laing s.n.* (CHR); *s. loc.*, *J.D.McComish 87 & 158* (K); *s. loc.*, *J.Backhouse 623* (K).

Very occasionally a trifoliolate leaf is produced and a specimen of such a plant gave rise to the erroneous record of *C. glycinoides* for Norfolk Is.

2. Clematis glycinoides DC., *Syst. Nat.* 1: 145 (1817)

T: Port Jackson, Australia, *J.Banks*; holo: BM. So named because of a similarity in habit to *Glycine* in the Fabaceae.

Illustrations: A.M.Blombery, *Austral. Native Pl.* 2nd edn, 29, fig. 10C (1977); I.Hutton, *Lord Howe Is.* 137 (1986); B.G.Briggs & R.O.Makinson in G.J.Harden, *Fl. New South Wales* 1: 158 (1990).

Young stems finely ridged. Leaves trifoliolate, glabrous or with a few scattered simple hairs; leaflets ovate to broadly lanceolate, 4–7 (–9) cm long, 2–5 (–6) cm broad, rounded to

subcordate at base, entire or dentate, especially when juvenile, acute to slightly acuminate, palmately 5–7-veined. Inflorescences unisexual, terminal or axillary, 7–15 cm long, 4–8 cm broad, slightly pubescent. Perianth segments ligulate, 10–17 (–20) mm long, white, dorsally pubescent. Anthers with a short apiculum. Ovaries and achenes hairy.

Lord Howe Is. A frequent climber at lower altitudes, also native in Australia (eastern Qld, N.S.W., Vic.). Flowers Sept.–Nov.

L.H.Is.: The Clear Place, *P.S.Green 1911* (K); Transit Hill, *A.C.Beauglehole 5773* (CANB); Goat House, *I.Hutton 191* (CBG); *s. loc.*, *J.D.McComish 16* (K).

This species is very close to *C. pickeringii* A.Gray of Fiji and New Caledonia, and to *C. dubia* of Norfolk Is.

2. RANUNCULUS

Ranunculus L., *Sp. Pl.* 1: 548 (1753); *Gen. Pl.* 5th edn, 243 (1754); the name is the diminutive of the Latin *rana* (a frog) – several species of the genus are amphibious.

Type: *R. auricomus* L.

Annual or perennial herbs, terrestrial or aquatic. Leaves usually alternate, basal or cauline, simple or usually compound and palmately lobed or divided to bipinnatisect. Flowers solitary or in cymose panicles, actinomorphic, bisexual. Sepals 3–5, green, free. Petals 5 or more (sometimes fewer, rarely absent), usually yellow (elsewhere sometimes white or red), with a basal nectariferous pit, covered by a scale or naked. Stamens usually numerous. Carpels few to usually many, each 1-ovulate. Fruit a head of achenes.

A genus of 250 or more species, cosmopolitan in distribution, but mostly temperate; 4 species naturalised on the Islands.

1 Perennial herb with creeping stolons; flowers large, 2–3 cm diam.; achenes smooth **1. R. repens**

1: Annual herbs, ±erect, without stolons; flowers small, 0.1–2 cm diam.; achenes with spines on each face

2 Pedicels usually 1 cm long or more, up to 3 cm long in fruit; flowers 1–2 cm diam.; achenes 5–7 mm long, strongly beaked, 10–20 spines present on each face **2. R. muricatus**

2: Pedicels usually less than 1 cm long, up to 1 cm long in fruit; flowers c. 1–5 mm diam.; achenes 1–3 mm long

3 Flowers and fruit pedicellate; flowers 3–5 mm diam.; achenes 2.5–3 mm long, distinctly beaked; 40–50 small spines on each face **3. R. parviflorus**

3: Flowers and fruit sessile or very shortly pedicellate; flowers 1–4 mm diam.; achenes c. 1–2 mm long, ±rounded, with only a small beak; 20–30 small spines on each face **4. R. sessiliflorus**

1. *Ranunculus repens L., *Sp. Pl.* 1: 554 (1753)

T: Europe, *coll. unknown;* lecto: LINN 715.52, *fide* L.Benson, *Amer. Midl. Naturalist* 52: 336 (1954); IDC microfiche 177/2.370/11. Epithet from the Latin *repo* (I creep), in allusion to its creeping habit.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 1: t. 30 (1948); B.A.Auld & R.W.Medd, *Weeds* 212 (1987); B.G.Briggs & R.O.Makinson in G.J.Harden, *Fl. New South Wales* 1: 164 (1990).

Perennial, 10–60 cm tall, with strong runners rooting at nodes. All leaves trifoliolate, triangular-ovate, 2–13 cm long, pilose; petiole with sheathing base; lobes divided or cut into 3-toothed segments; middle leaflet distinctly stalked; upper leaves becoming linear, sessile, ±entire. Inflorescence 1–3 or more-flowered. Flowers 2–3 cm diam. Sepals pilose, not reflexed. Petals 5, broadly obovate, 9–14 mm long, golden yellow, glossy. Receptacle hairy. Achenes 2–3 mm long, rounded, flattened; margin ridged; faces smooth; beak curved, c. 1 mm long. *Creeping Buttercup*.

Norfolk Is. An introduced weed which thrives in damp soil. A native of Europe and northern Eurasia.

N.Is.: *s. loc., W.Laing s.n.* (CHR).

2. *Ranunculus muricatus L., *Sp. Pl.* 1: 555 (1753)

T: Europe, *coll. unknown*; lecto: LINN 715.66, *fide* L.Benson, *Amer. Midl. Naturalist* 52: 349 (1954); IDC microfiche 177/2.371/7. The epithet means covered with short, hard tubercles like the point on the shell of the mollusc, *Murex*, in reference to the tubercules on the achenes.

Illustrations: Hj.Eichler in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 349, fig. 197D (1986); B.A.Auld & R.W.Medd, *Weeds* 212 (1987); B.G.Briggs & R.O.Makinson in G.J.Harden, *Fl. New South Wales* 1: 165 (1990).

Annual, 10–40 cm tall, ±glabrous. Leaf petioles with sheathing base; lamina of basal leaves subcircular, 2–4 cm long, truncate to cordate, crenate-dentate to 3-lobed; upper leaves deeply divided into 3 dentate lobes. Flowers solitary, leaf-opposed, 1–2 cm diam. Pedicels usually 1 cm long or more, up to 3 cm in fruit; Sepals somewhat deflexed, ±membranous. Petals 5, obovate-cuneate, 5–9 mm long, yellow. Receptacle thinly pilose. Achenes ovoid, 5–7 mm long, flattened; margins strongly ridged and thickened, green when fresh; faces densely muricate-echinate with 10–20 spines present on each face, brownish; beak curved at tip, 2–3 mm long.

Norfolk Is. A weed of Mediterranean origin. Fairly common in damp, open sites.

N.Is.: near the summit, Mt Pitt, *W.R.Sykes NI 722* (CHR); Bloody Bridge, *P.S.Green 1428* (A); New Cascade Rd, *W.R.Sykes NI 170* (CHR); Ball Bay, *W.R.Sykes NI 427* (CHR); *s. loc., J.D.McComish 38* (K).

3. *Ranunculus parviflorus L., *Syst. Nat.* 10th edn, 1087 (1759)

T: Europe, *coll. unknown*; lecto: LINN 715.67, *fide* L.Benson, *Amer. Midl. Naturalist* 52: 348 (1954); IDC microfiche 177/2.371/8. The epithet is from the Latin *parvus* (small) and *flos* (a flower), in reference to the size of the flowers.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 1: t. 33 (1948); R.Melville, *Kew Bull.* 11: 285, fig. 7 (1956); Hj.Eichler in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 349, fig. 197G (1986).

Annual, 10–40 cm tall, spreading to suberect, with long, softly pilose hairs. Basal leaves with lamina rounded-cordate, 1.5–3 cm long, yellowish green, ±3–5-lobed, with lobes bluntly toothed; upper leaves with fewer lobes or entire. Flowers solitary, leaf-opposed, 3–5 mm diam. Pedicels usually less than 1 cm long, up to 1 cm long in fruit. Sepals reflexed, pilose. Petals 2–5, narrowly obovate, 1.5–2 mm long, pale yellow. Receptacle glabrous. Achenes few, 2.5–3 mm long, ovoid; margin narrow; faces covered with 40–50 shortly hooked tubercules; beak short, curved.

Norfolk Is., Lord Howe Is. A weed of gardens and similar cultivated or open ground, native in the Mediterranean area.

N.Is.: *s. loc.*, Nov. 1902, *J.H.Maiden & J.L.Boorman s.n.* (NSW); *s. loc., J.D.McComish 38A p.p.* (NSW). **L.H.Is.:** near Transit Hill, *P.S.Green 1618* (A, K); Main Settlement, *A.C.Beauglehole 5537* (CANB, MEL, NSW); Moseley Park, *A.C.Beauglehole 5538* (MEL); *s. loc., J.D.McComish 110* (K).

4. *Ranunculus sessiliflorus R.Br. ex DC., *Syst. Nat.* 1: 301 (1817)

T: around Port Jackson, Australia, *R.Brown*; holo: ?G *n.v.*; iso: BM. So named because of its sessile flowers.

Illustrations: R.Melville, *Kew Bull.* 11: 283, fig. 5/1–15 (1956); Hj.Eichler in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 351, fig. 198G (1986); B.G.Briggs & R.O.Makinson in G.J.Harden, *Fl. New South Wales* 1: 166 (1990).

Annual, 5–30 cm tall, branching from base, somewhat pilose. Basal leaves subreniform, 5–15 mm long, slightly broader than long, palmatisect; lobes with 3–5 subacute teeth; upper leaves reduced. Flowers solitary, leaf-opposed, 1–4 mm diam., sessile, or lower flowers with very short pedicels usually less than 1 cm long, up to 1 cm in fruit. Calyx lobes 3 or 4, pilose. Petals 1 or 2, ±spathulate, 0.5–2 mm long, pale yellow. Receptacle glabrous. Achenes few, ±orbicular, 1–2 mm long, flattened; marginal ridge narrow; tubercules small, shortly hooked,

20–30 on each face; beak short, slightly curved.

Norfolk Is., Lord Howe Is. A weed of damp soil, native in all Australian states. It was at first reported from Lord Howe Is. as a 'known misidentification of *R. parviflorus*' (A.N.Rodd & J.Pickard, *Cunninghamia* 1: 279, 1983), but was later collected there by J.Pickard.

N.Is.: Harpers Rd, *P.Ralston 48* (A, K); New Cascade Rd, *W.R.Sykes NI 174* (CHR); *s. loc., J.D.McComish 38/A p.p.* (K); *s. loc., A.Hicks 358* (K, MEL); *s. loc.,* 1902, *J.H.Maiden & J.L.Boorman* (NSW). **L.H.Is.:** Middle Beach Common, above Valley Garden, *J.Pickard 2703* (NSW).

5. MENISPERMACEAE

Shrubs or herbs, usually climbing, rarely trees, usually dioecious. Leaves alternate, simple or rarely trifoliolate, without stipules. Inflorescence various, axillary or borne on older wood. Flowers small, unisexual, usually actinomorphic. Sepals free, in 1–4 series, imbricate, outer ones smaller. Petals smaller than sepals or minute or absent. Male flowers: stamens (2 or) 3, 6, or many, opposite petals, free or united. Female flowers with or without staminodes; ovary superior; carpels 3 or 6, rarely 1 or many, free, sessile or stalked; ovules 2, becoming 1 by abortion. Fruit achenes or drupes. Seed and embryo usually curved; stylar scar becoming basal.

A mostly tropical family of c. 70 genera and 500 species; 1 genus native to Lord Howe Is.

G.Bentham, Menispermaceae, *Fl. Austral.* 1: 54–59 (1863); L.Diels, Menispermaceae, *Pflanzenr.* 46: 1–345 (1910); L.L.Forman, Menispermaceae, *Fl. Males.* ser. I, 10: 157–253 (1986).

STEPHANIA

Stephania Lour., *Fl. Cochinch.*, 2: 608 (1790); from the Greek *stephanos* (a crown), in allusion to the united anther filaments forming a crown.

Type: *S. rotunda* Lour.

Climbers, often woody; roots often tuberous. Leaves with petiole usually swollen at both ends; lamina peltate, palmately nerved. Inflorescence axillary or from older leafless stems, of 1–many, pedunculate, umbellate cymes, sometimes condensed into a head. Male flowers actinomorphic: sepals 6 or 8 in 2 series, usually ±obovate; petals 3 or 4, usually obovate, with involute margins; stamens 2–6, joined in a peltate synandrium and dehiscing transversely. Female flowers actinomorphic or (elsewhere) zygomorphic: sepals 1–8; petals 2–4, as in the male; style short or absent; stigma shortly lobed or laciniate. Fruit drupaceous, fleshy, obovoid, with style-scar near base. Seeds curved.

A genus of c. 40 species from the Old World tropics; 1 species native on Lord Howe Is.

Stephania japonica var. **timoriensis** (DC.) Forman, *Kew Bull.* 11: 55 (1956)

Cocculus japonicus var. *timoriensis* DC., *Prodr.* 1: 96 (1824). T: Timor, *coll. unknown*; holo: G *n.v.*; photo seen (IDC microfiche 800/2-48). Named after the island of Timor, the suffix *-ensis* indicating origin.

Cissampelos hernandifolia Willd., *Sp. Pl.* 4: 861 (1806); *Stephania hernandiifolia* (Willd.) Walp., *Repert. Bot. Syst.* 1: 96 (1842). T: 'India orientali', *W.Roxburgh s.n.*; holo: ?B *n.v.*

Cocculus forsteri DC., *Syst. Nat.* 1: 517 (1818); *Stephania forsteri* (DC.) A.Gray, *U.S. Expl. Exped., Phan.* 1: 36 (1854). T: *s. loc.* [Tahiti ?], *J.R. & G.Forster*; holo: not located.

[*Stephania discolor auct. non* (Blume) Spreng.: W.B.Hemsley, *Ann. Bot.* (*London*) 10: 231 (1896); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 694 (1904)]

Illustrations: E.E.Henty, *Harmful Pl. Papua New Guinea* t. 37 (1980); I.Hutton, *Lord Howe Is.* 130 (1986).

Slender, herbaceous climber with tuberous root. Leaves glabrous; lamina broadly triangular-ovate, 4–11 cm long and broad, rounded, truncate or slightly emarginate at base, acute or acuminate at apex, palmately 5–9-nerved. Inflorescence axillary, compound, of umbellate cymose clusters, 2–8 cm long, puberulous. Male flowers green; sepals 6 or 8, 0.75–1.25 mm long; petals 3 or 4, 0.5–1 mm long; synandrium c. 1 mm long. Female flowers with sepals and petals similar to those of male; ovary c. 1 mm long. Fruit ±sessile, fleshy, ±orbicular, c. 5 mm diam., red. Seed horseshoe-shaped with dorsal rows of bony ridges. Fig. 36C.

Lord Howe Is. An uncommon climber in lowland, moist forest. Also native to East Bengal, the southern Malesian islands, northern Australia, and south-western New Guinea to New Caledonia, Samoa and Tahiti.

L.H.Is.: Hells Gate, *G.Uhe 1259* (K); Transit Hill, *P.S.Green 1634 & 1695* (A, K); near Salmon Beach, *P.S.Green 2328* (K); *s. loc.*, *C.Moore 26* (K, MEL).

6. PAPAVERACEAE

Annual or perennial herbs exuding milky, coloured or watery sap when cut. Leaves spirally arranged, usually lobed or dissected, without stipules. Inflorescence cymose or flowers solitary. Flowers hypogynous, actinomorphic, bisexual. Sepals 2 (or 3), caducous. Petals free, 4 (–6), overlapping, often crumpled in bud. Stamens free, usually numerous. Ovary superior; carpels 2 (or more), united, 1-locular; ovules numerous, parietal. Fruit a capsule opening by valves or pores. Seeds numerous, small.

A family of c. 25 genera and 200 species; distributed worldwide but particularly northern temperate in representation; 2 genera naturalised on the Islands.

C.G.G.J. van Steenis, *Fl. Males.* ser. I, 5: 114–117 (1954).

KEY TO GENERA

Sepals 3; petals 6; leaves spiny	**1. ARGEMONE**
Sepals 2; petals 4; leaves glabrous or pilose but not spiny	**2. PAPAVER**

1. ARGEMONE

Argemone L., *Sp. Pl.* 1: 508 (1753); *Gen. Pl.* 5th edn, 225 (1754); the Greek name for a poppy-like plant which was reputed to cure cataract (Greek *argemon*) of the eye.

Type: *A. mexicana* L.

Annual herbs, some becoming subshrubby, prickly, with yellow sap. Leaves pinnatifid, spiny, usually glaucous; rosulate leaves petiolate; cauline leaves sessile. Flowers solitary or in leafy cymes. Sepals 2 or 3, free, usually cucullate with a sharp terminal spine. Petals 4–6, crumpled in bud. Stamens numerous. Style short; stigma 3–6-lobed, discoid. Capsule ±ellipsoidal, dehiscing from above by 4–6 valves.

A genus of c. 28 species from South America, the West Indies and southern North America, with one species from Hawai'i; 1 species naturalised on Norfolk Is.

***Argemone subfusiformis** Ownbey, *Brittonia* 13: 97 (1961)

T: Argentina, *T.Meyer 4243*; holo: ?GH *n.v.* So named from its subfusiform capsules.

[*Argemone mexicana auct. non* L.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 763 (1904)]

Illustrations: G.B.Ownbey, *Brittonia* 13: 100, figs 12–14 (1961); H.R.Toelken in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 365, fig. 203A (1986); S.W.L.Jacobs in G.J.Harden, *Fl. New South Wales* 1: 171 (1990).

Rosulate herb becoming subshrubby, to 1 m tall. Basal leaves petiolate, 7–20 cm long, glaucous; lamina pinnatisect, irregularly lobed and toothed, each lobe and tooth ending in a sharp spine; cauline leaves becoming sessile and clasping stem. Inflorescence a leafy, cymose panicle; pedicels c. 1 cm long. Sepals 3, cucullate, with a strong terminal spine and dorsal spines. Petals 6, 2.5–4 cm long, cream to pale yellow. Capsule ellipsoidal-fusiform, 3–4.5 cm long, strongly spiny. Seeds globose, 1.5–2 mm diam., black, reticulate. *Mexican Poppy*.

Norfolk Is. A weed of open ground which is assignable to subsp. *subfusiformis*. It is native to western South America but also adventive in Australia, and perhaps elsewhere, under the name *A. mexicana*.

N.Is.: near Headstone Point, *W.R.Sykes NI 507* (CHR); vicinity of Emily Bay, *G.Uhe 1210* (K).

In a recent typed list of Norfolk Is. plants (unpublished) this species was incorrectly referred to as *A. ochroleuca* Sweet.

2. PAPAVER

Papaver L., *Sp. Pl.* 1: 506 (1753); *Gen. Pl.* 5th edn, 224 (1754); the Latin name for poppies.

Type: *P. somniferum* L.

Annual or perennial herbs with white (or yellow) sap. Leaves simple and toothed to pinnately divided, sometimes hispid; lower leaves rosulate, petiolate; cauline leaves sessile. Flowers solitary or in leafy cymes. Sepals 2, free, caducous. Petals 2+2, fugacious, crumpled in bud. Stamens numerous. Stigmas 4–20, sessile, in radial ridges forming a broad disc. Capsule ovoid to obovoid or subglobose, dehiscing by pore-like valves just below the persistent stigmatic disc.

A genus of c. 100 species; cosmopolitan but mostly from the Northern Hemisphere; 2 species naturalised on the Islands.

Leaves glabrous, glaucous, dentate to pinnately lobed; sepals glabrous; capsule 2–5 cm diam. **1. P. somniferum**

Leaves pilose, not glaucous, pinnately cut or divided; sepals with patent hairs; capsule 0.7–1 cm diam. **2. P. rhoeas**

1.*Papaver somniferum L., *Sp. Pl.* 1: 508 (1753)

T: locality unknown, *coll. unknown*; lecto: LINN 669.8, *fide* S.M.H.Jafri & M.Qaiser in E.Nasir & S.I.Ali, *Fl. W. Pakistan* 61: 20 (1974); IDC microfiche 177/2.348/16. The epithet means sleep-producing and alludes to the plant's ancient use as the source of Opium.

Illustrations: G.Hegi, *Ill. Fl. Mitt.-Eur.* 2nd edn, 4(1): t. 123/2 (1958); G.M.Cunningham *et al.*, *Pl. W New South Wales* 314 (1981), as Opium Poppy; S.W.L.Jacobs in G.J.Harden, *Fl. New South Wales* 1: 172 (1990).

Annual herb, simple or branched, erect to 150 cm tall, glabrous. Leaves undulate, glaucous, glabrous; lower leaves lanceolate, 8–20 cm long, 5–8 cm broad, irregularly and bluntly pinnately lobed; upper leaves stem-clasping. Flowers 10–18 cm diam. Sepals glabrous. Petals red, pink, pale lilac or white, usually with a dark basal blotch. Stigmatic rays 8–15. Capsule subglobose, 2–5 cm diam., glabrous. *Opium Poppy*.

Norfolk Is., Lord Howe Is. An occasional escape from cultivation in wasteland. Probably a native of Eurasia.

N.Is.: *s. loc.*, *P.Ralston 87* (A). **L.H.Is.:** W of Stevens Point, *A.C.Beauglehole 5539* (MEL).

This species has been cultivated for centuries as a source of opium, poppy seed, and poppy seed oil, and as an ornamental. Individual plants may have single or double flowers.

2.*Papaver rhoeas L., *Sp. Pl.* 1: 507 (1753)

T: not designated. The epithet is the Greek name for this poppy, from the colour of the flower, which resembles that of *rhoia* (the Pomegranate).

Illustrations: G.Hegi, *Ill. Fl. Mitt.-Eur.* 2nd edn, 4(1): 44, fig. 27f, t. 123/5 (1958); H.R.Toelken in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 367, fig. 204E (1986); S.W.L.Jacobs in G.J.Harden, *Fl. New South Wales* 1: 172, t. 11 (1990).

Annual herb, usually branched, ascending or erect to 60 cm tall, with stiff spreading hairs. Leaves green (not glaucous), pilose; basal leaves petiolate; lamina 5–20 cm long, once or twice pinnately cut or divided, with segments narrowly toothed, acute, bristle-pointed; cauline leaves pinnately cut or divided, with central lobe lanceolate. Flowers solitary in leaf axils, 6–10 cm diam.; pedicels with stiff patent hairs. Sepal hairs patent. Petals cuneate-orbicular, 2–4 cm broad, scarlet or crimson, with or without a black basal spot. Stigmatic rays 8–12. Capsule subglobose to broadly obovoid, 0.7–1 cm diam.

Lord Howe Is. An occasional to rare weed on the Island. Originally native in southern Europe, now weedy throughout the temperate regions of the world.

L.H.Is.: Lagoon Rd, *A.C.Beauglehole 5540* (MEL).

7. FUMARIACEAE

Annual or perennial herbs, sometimes climbing, with colourless sap. Stems brittle. Leaves alternate, usually deeply divided, often compoundly so. Inflorescence a raceme or spike. Flowers zygomorphic, bisexual. Sepals 2, small, caducous. Petals 2+2, free, or inner pair ±joined; outer pair often saccate or spurred. Stamens 6, joined in 3s on opposite sides of ovary. Ovary superior, 1-locular with 2 parietal placentas; ovules numerous or solitary. Fruit a capsule or nutlet.

A family of c. 17 genera and 450 species, mostly in the northern temperate region, with a few in southern Africa; 1 genus naturalised on Norfolk and Lord Howe Islands.

FUMARIA

Fumaria L., *Sp. Pl.* 2: 699 (1753); *Gen. Pl.* 5th edn, 314 (1754); derived from the medieval Latin *fumus terrae* (smoke of the earth), the origin of which is debatable.

Type: *F. officinalis* L.

Annual herbs, sprawling or climbing, glabrous, ±glaucous. Leaves pinnately compound. Inflorescence leaf-opposed, racemose, bracteate. Flowers pink or white with dark tips to inner petals; upper petal spurred. Ovule solitary. Fruit a nutlet with, when dry, 2 apical pits.

A genus of c. 60 species, mainly from Europe, the Mediterranean region and western Asia, with a few from eastern Asia and the tropical African mountains; 2 species naturalised on the Islands. A number are widespread as weeds.

Raceme rachis ±equal to or shorter than peduncle, 7–15-flowered; sepals 3–5 mm long, dentate at base **1. F. muralis**

Raceme rachis longer than peduncle, 15–25-flowered; sepals 2–3 mm long, finely serrate **2. F. bastardii**

1. *Fumaria muralis Sond. ex W.Koch, *Syn. Fl. Germ. Helv.* 2nd edn, 1017 (1845)

T: Hamburg, Germany, July 1844, *O.W.Sonder s.n.*; lecto: MEL 1584466; syn: MEL *n.v.*; *fide* N.G.Walsh, *Muelleria* 7: 496 (1992). The epithet means of walls, from the Latin *murus* (a wall) and *-alis* (pertaining to).

[*Fumaria officinalis auct. non* L.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 763 (1904)]

Illustrations: B.E.V.Parham & A.S.Healy, *Common Weeds New Zealand* 28 (1976); V.H.Heywood, *Fl. Pl.*

World 53, fig. 3 (1978); G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 174 (1990).

Annual scrambling herb. Leaves 3–8 cm long, glaucous; segments distant, deeply cuneate. Racemes 3–8 cm long, 7–15-flowered; peduncle equalling or longer than raceme. Sepals ovate, 3–5 mm long, acute, dentate at base. Petals 8–12 mm long, pink with blackish red tips. Fruit ±spherical, c. 2 mm diam., minutely apiculate, smooth when dry. *Fumitory*.

Norfolk Is., Lord Howe Is. A weed of cultivated ground and open soil; originally a native of Europe and North Africa.

N.Is.: Steels Point, *P.S.Green 1885* (K); Kingston, *G.Uhe 1135* (K). **L.H.Is.:** Old Settlement Beach, *A.C.Beauglehole 5541* (MEL).

The plant growing on the Islands appears to be subsp. *muralis*.

2. *Fumaria bastardii Boreau, *Rev. Bot. Recueil Mens.* 2: 359 (1847)

T: France, Creuse, Paris, Blois, & Angers, *several collectors*; syn: ?ANG *n.v.* Named after Toussaint Bastard (1784–1846), French botanist who wrote on the flora of Maine-et-Loire.

Illustrations: H.R.Toelken in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 369, fig. 205B (1986); C.J.Webb *et al.*, *Fl. New Zealand* 4: 716, fig. 71B (1989); G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 174 (1990).

Annual herb, ±erect. Leaves 3–8 cm long, glaucous; segments broadly oblong to oblanceolate. Racemes 3–8 cm long, 15–25-flowered; peduncle shorter than raceme. Sepals ovate, 2–3.5 mm long, finely serrate. Petals 9–12 mm long, pink with blackish red tips. Fruit ±spherical, 2–2.5 mm diam., rugose when dry.

Lord Howe Is. A weed from Europe now widely naturalised in temperate areas.

L.H.Is.: 0.4 km N of 'Pine Trees', *L.A.S.Johnson & A.N.Rodd 1207* (NSW).

8. ULMACEAE

Trees or shrubs, without latex. Leaves alternate, simple, often serrate, base often asymmetrical; stipules usually small, caducous. Flowers small, usually clustered, bisexual, or unisexual by abortion. Perianth sepaloid, 4–8-lobed, imbricate or valvate. Stamens equal in number to perianth lobes and opposite them, erect or incurved in bud; filaments free. Ovary superior, of 2 connate carpels, 1 (or 2)-locular; style with 2 divergent lobes, stigmatic on their inner faces; ovules solitary, pendulous. Fruit a samara or drupe.

A family of c. 16 genera and 200 species, widely distributed, but mostly found in the Northern Hemisphere; 1 genus native on Norfolk and Lord Howe Islands.

G.Bentham, Tribe Celtideae in Urticeae, *Fl. Austral.* 6: 155–160 (1873); E.Soepadmo, Ulmaceae, *Fl. Males.* ser. I, 8: 31–76 (1974); A.C.Smith, Ulmaceae, *Fl. Vit. Nova* 2: 156–166 (1981); H.J.Hewson, Ulmaceae, *Fl. Australia* 3: 4–13 (1989).

CELTIS

Celtis L., *Sp. Pl.* 2: 1043 (1753); *Gen. Pl.* 5th edn, 467 (1754); an old Latin plant name applied arbitrarily by Linnaeus to this genus.

Type: *C. australis* L.

Trees or shrubs. Leaves usually oblique, serrate or entire, 3-nerved at base. Flowers usually in cymose panicles; trees dioecious or (elsewhere) with upper flowers female or bisexual, pedicellate, lower flowers male, pedicellate or sessile. Receptacle hairy. Perianth lobes 4 or 5 (rarely 6), imbricate, membranous, caducous. Stamens with filaments incurved in bud. Style lobes entire or deeply divided. Fruit a drupe, somewhat fleshy, often crowned by the remains

of the stigma.

A genus of c. 50–60 species, mainly pantropical but extending to the temperate regions; 1 native species on each of Norfolk and Lord Howe Islands.

Leaves lanceolate, narrowly acute to usually acuminate, chartaceous (N.Is.) **1. C. paniculata**

Leaves elliptic, rounded, leathery (L.H.Is.) **2. C. conferta**

1. Celtis paniculata (Endl.) Planch., *Ann. Sci. Nat. Bot.* ser. 3, 10: 305 (1848)

Solenostigma paniculata Endl., *Prodr. Fl. Norfolk.* 42 (1833). T: Norfolk Is., 1804–1805, *F.L.Bauer*; holo: W *n.v.*, probably destroyed; iso: K. The epithet alludes to the paniculate inflorescence.

Illustrations: J.Banks & D.Solander, *Ill. Austral. Pl. Cook's Voy.* 3: t. 298 (1905); G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 341 (1990).

Tree to 20 m tall, dioecious; base of trunk buttressed in mature trees. Leaves chartaceous; petiole 1–2 cm long; lamina lanceolate to broadly lanceolate, (5–) 7–10 cm long, (2–) 3–4.5 cm broad, acute to somewhat rounded at base, only slightly oblique, entire, (narrowly acute to) acuminate; with 3–7 pairs of primary veins above 3 basal veins, glabrous. Inflorescence paniculate, axillary, 1–2 (–3) cm long. Male flowers green; perianth lobes membranous, 1 mm long and broad, with pale, scarious margins; anthers rounded, 1 mm long. Female flowers green; perianth lobes membranous, 1–2 mm long, with pale, scarious margins; ovary 1 mm long, soon lengthening, truncate at apex with 2 broad, forked stigmatic lobes. Drupe fleshy, ellipsoidal, 8–10 mm long, blue-black; style persistent. *Whitewood*. Fig. 36A.

Norfolk Is. An occasional but widespread tree. Also known from Australia (north-eastern N.S.W., south-eastern Qld) and New Caledonia. Plants that have been recorded under this name from Vanuatu, the Solomon Islands, Fiji and further afield represent different species or subspecies.

N.Is.: Cascade Reserve, *R.D.Hoogland 11162* (CANB, K); Rocky Point, *P.S.Green 1444a & b* (A, K); Philip Is., *P.S.Green 1492* (A); *s. loc., A.Cunningham 45*(*140*) (K).

2. Celtis conferta Planch. in A.L.P.P de Candolle, *Prodr.* 17: 183 (1873)

subsp. **amblyphylla** (F.Muell.) P.S.Green, *J. Arnold Arbor.* 67: 120 (1986)

Celtis amblyphylla F.Muell., *Fragm.* 9: 76 (1875). T: Lord Howe Is., *C.Moore & J.P.Fullagar*; holo: ?MEL *n.v.*; iso: K. The epithet comes from the Greek *ambly-* (blunt) and *phyllos* (a leaf), in allusion to the blunt or rounded apices of the leaves.

Illustrations: W.R.Elliot & D.L.Jones, *Encycl. Austral. Pl.* 3: 5 (1984); I.Hutton, *Lord Howe Is.* 143 (1986).

Trees to 16 m tall, dioecious. Leaves leathery; petiole 0.5–1 cm long; lamina elliptic, (3–) 5–9 cm long, (1.5–) 2–4 cm broad, acute to slightly rounded-obtuse at base and often slightly oblique, entire, rounded at apex, with 4 or 5 primary veins on each side of midrib above 3 basal veins and reticulate, glabrous; juvenile leaves lanceolate, pinnatisect-dentate. Inflorescence dense, in axils of upper leaves, 3–5 mm long. Perianth lobes membranous, 1–2 mm long, margins scarious. Anthers rounded, 1–1.5 mm long. Ovary 1 mm long, apically truncate with 2 forked stigmatic lobes. Drupe fleshy, globular, 6–7 mm long, purple; style persistent. Endocarp conical, 5.5–6 mm long, deeply pitted. *Cotton-Wood*.

Lord Howe Is. An endemic subspecies widespread in the lowland forests. Flowers Dec.–early Feb.

L.H.Is.: along Malabar Ridge, *A.C.Beauglehole 5811* (MEL, NSW); Neds Beach, 1920, *J.L.Boorman* (BRI, NSW); end of Little Slope, *J.Pickard 2826* (NSW); Roach Is., *J.C.Game 69/273b* (K); *s. loc., J.D.McComish 111* (K, NSW).

Celtis conferta subsp. *conferta*, the other subspecies, is confined to New Caledonia.

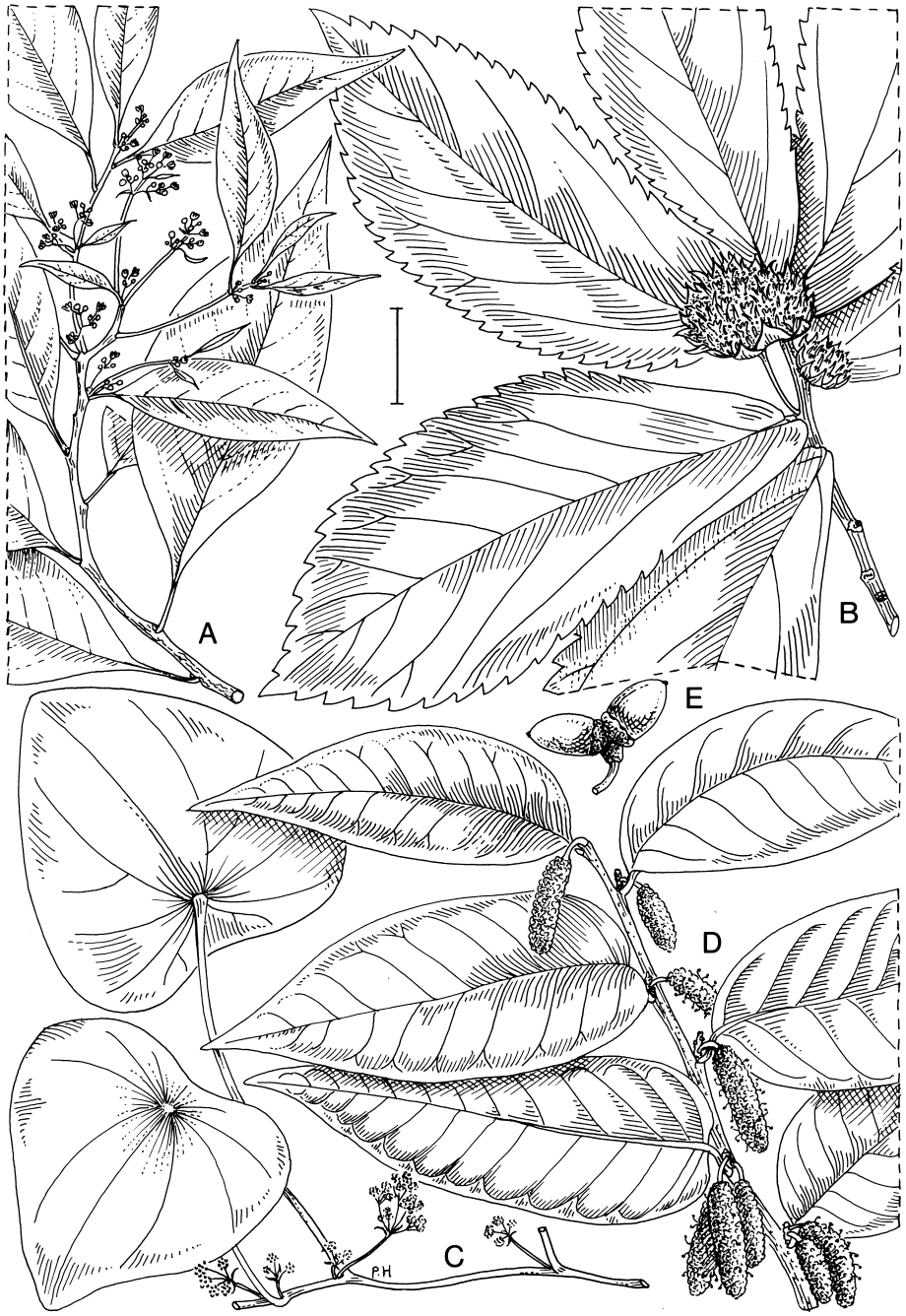

Figure 36. A, ULMACEAE: *Celtis paniculata*, habit, male shoot (R.Hoogland 11162, K). **B**, URTICACEAE: *Elatostema grande*, habit (J.Game 69/287, K). **C**, MENISPERMACEAE: *Stephania japonica* var. *timoriensis*, habit (P.Green 1695, K). **D–E**, MORACEAE: *Trophis scandens* subsp. *megacarpa*. **D**, habit, male shoot (C.Moore 61, K); **E**, fruit (J.McComish 35, K). Scale bar = 2 cm. Drawn by P.Halliday.

9. MORACEAE

Trees, shrubs or climbers, rarely herbs, monoecious or dioecious, usually with milky sap. Leaves alternate, deciduous or evergreen, simple, stipulate. Flowers small, apetalous, in heads, spikes, catkins, expanded disks or hollow receptacles. Perianth sepaloid or rarely absent, with 4 (sometimes 8) segments, free or joined. Male flowers with stamens equal in number to perianth lobes or fewer, with or without a pistillode. Female flowers with a 1-locular, superior or (elsewhere) often inferior ovary; ovule 1; styles 1 or 2, with 1 or 2, usually filiform, stigmatic arms. Fruits of small achenes or drupelets, often aggregated or united, in or with the perianth or receptacle, into fleshy syncarps.

A family of c. 50 genera and 1500 species, mostly pantropical but extending to temperate regions; 3 native genera and 1 naturalised on the Islands. As well as the genera treated below the family also includes among its cultivated members the Breadfruit, *Artocarpus*.

G.Bentham, Tribes Artocarpeae & Moreae in Urticaceae, *Fl. Austral*. 6: 160–182 (1873); E.J.H.Corner, The classification of Moraceae, *Gard. Bull. Singapore* 19: 187–252 (1962); A.C.Smith, Moraceae, *Fl. Vit. Nova* 2: 167–209 (1981); W.-L.Chew, Moraceae, *Fl. Australia*, 3: 15–68 (1989).

KEY TO GENERA

1 Climbers; fruits with 1–few drupelets projecting from a ±fleshy receptacle **2. TROPHIS**

1: Trees or shrubs; fruits not as above

2 Flowers numerous and small, hidden and enclosed within a globose fig; branches with pendent roots developing into trunks on reaching the ground **4. FICUS**

2: Flowers not enclosed within a fig; without pendent roots

3 Leaves distinctly scabrous, lanceolate to broadly lanceolate; fruiting perianth not fleshy, drupelet becoming so **1. STREBLUS**

3: Leaves not scabrous, narrowly to broadly ovate; fruiting perianth juicy-fleshy **3. MORUS**

1. STREBLUS

Streblus Lour., *Fl. Cochinch*. 599, 614 (1790). From the Greek *streblos* (twisted), in allusion to the contorted branches on the tree first described.

Type: *S. asper* Lour.

Trees or shrubs, monoecious or dioecious, sometimes spiny, usually with white or watery latex. Leaves distichous, evergreen, denticulate, serrate or entire, usually with cystoliths. Inflorescence axillary, pedunculate, cymose, racemose, spicate, capitate or of a solitary female flower. Male flowers usually 4-merous; perianth lobes valvate, free or shortly joined; stamens inflexed in bud; pistillode present. Female flowers 4-merous; perianth lobes decussate, imbricate, free or shortly joined. Drupelets aggregated, rather large, thinly fleshy with base often thickened and fleshy. Seed large; endocarp thin.

A genus of c. 22 species from Madagascar, SE Asia and Malesia to eastern Australia, New Zealand and across the Pacific to the Society Islands, with 1 species native on Norfolk Is.

Streblus pendulinus (Endl.) F.Muell., *Fragm.* 6: 192 (1868)

Morus pendulina Endl., *Prodr. Fl. Norfolk.* 40 (1833); *Pseudomorus brunoniana* var. *pendulina* (Endl.) Bureau, *Ann. Sci. Nat. Bot.* ser. 5, 11: 372 (1869); *Pseudomorus pendulina* (Endl.) Stearn, *J. Arnold Arbor.* 28: 427 (1947). T: Norfolk Is., *F.L.Bauer*; holo: W *n.v.*, probably destroyed. So named from the pendulous male catkins.

Boehmeria castaneaefolia A.Cunn. ex Loudon, *Hort. Brit.* 2nd edn, Suppl. 1: 583 (1832), *nom. nud.*

Psuedomorus brunoniana var. *pendulina* subvar. *castaneaefolia* Bureau 'variation' *scabra* Bureau, *op. cit.* 373. T: Norfolk Is., *A.Cunningham 30*; holo: ?G *n.v.*

Illustrations: A.C.Smith, *Fl. Vit. Nova* 2: 199, fig. 59 (1981); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 925, t. 130 (1990).

Tree (or shrub) to 6 m tall, usually dioecious, without spines, exuding a white latex when damaged. Leaves discolorous; petiole 3–10 mm long; lamina variable, lanceolate to broadly lanceolate, (3–) 7–10 (–15) cm long, 2–3.5 (–5) cm broad, longer and irregularly pinnatisect when juvenile, acute to narrowly rounded at base, with finely crenate-serrate margins, acute (to subacuminate), distinctly scabrous, especially on upper surface. Male flowers in catkins 20 cm long. Female flowers solitary or few in a spike 5–10 mm long; style and stigma lobe slender, tapering. Fruit fleshy, somewhat globular, c. 5 mm long, red. *Isaac Wood, Siah's or Sia's Backbone.* Fig. 37B.

Norfolk Is. Widespread over the Island but perhaps becoming less common. Also native in New Guinea and Micronesia, Vanuatu, New Caledonia, Fiji, Rapa and Hawai'i.

N.Is.: Cascade Reserve, *R.D.Hoogland 11161* (CANB, K); Mt Pitt Reserve, *M.Lazarides 8092* (CANB, K); Mt Pitt Rd, *P.S.Green 1407* (A); c. 2 miles [3.2 km] NE of Cemetery at Kingston, *G.Uhe 1102* (K).

Very close to and possibly conspecific with *S. brunonianus* (Endl.) F.Muell. of eastern Australia. The name Siah's Backbone (after Josiah Adams) is reputed to allude to the pliability and toughness of the wood. The rough leaves are said to have been used as a substitute for sandpaper.

2. TROPHIS

Trophis P.Browne, *Civ. Nat. Hist. Jamaica* 357 (1756); from the Greek *trophe* (nourishment) in allusion to the use of the foliage of the type species as fodder for cattle.

Type: *T. americana* L.

Malaisia Blanco, *Fl. Filip.* 789 (1837). T: *M. tortuosa* Blanco

Trees, shrubs or woody climbers, dioecious, with white latex. Stipules small, free. Inflorescence axillary, solitary or 2–4 together; male spicate, many-flowered; female capitate. Male flowers with 3 or 4 perianth segments; stamens 3 or 4, inflexed in bud; pistillode small. Female flowers with 4 connate perianth lobes forming a tubular or collar-shaped perianth; ovary free or adnate to perianth; style with 2 filiform branches. Fruit of 1–4 drupelets, their bases immersed in the receptacles and enlarged fleshy perianths. Endocarp membranous to woody.

A genus of 9 species from tropical America, Madagascar, SE Asia, New Caledonia and Australia, 1 species native on Lord Howe Is.

C.C.Berg has recently given good reasons for considering the genus *Malaisia* to be synonymous with *Trophis* (*Proc. Kon. Ned. Akad. Wetensch. C* 91: 349, 1988).

Trophis scandens (Lour.) Hook. & Arn., Bot. Beechly Voy. 214 (1837)

subsp. **megacarpa** (P.S.Green) P.S.Green, *Kew Bull.* 48: 316 (1993)

Malaisia scandens subsp. *megacarpa* P.S.Green, *J. Arnold Arbor.* 67: 113 (1986). T: Lord Howe Is., *J.D.McComish 35*; holo: K. The epithet comes from the Greek *mega* (big) and *carpos* (fruit), in allusion to the larger fruits in this subspecies.

'Morus sp.', C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 4 (1870).

[*Malaisia tortuosa auct. non* Blanco: G.Bentham, *Fl. Austral*. 6: 180 (1873); W.B.Hemsley, *Ann. Bot*. 10: 251 (1896)]

[*Malaisia scandens auct. non* (Lour.) Planch.: W.R.B.Oliver, *Trans. & Proc. New Zealand Inst*. 49: 133 (1917); A.N.Rodd & J.Pickard, *Cunninghamia* 1: 272 (1983)]

Illustration: I.Hutton, *Lord Howe Is.* 130 (1986).

Woody climber; stems scabrid. Leaves coriaceous, stiff, discolorous; lamina ovate or ovate-lanceolate, (5–) 8–11 (–17) cm long, (3–) 4–5 (–7) cm broad, rounded to subcordate at base, long-acuminate to acute, with 8–11 primary veins on each side of midrib, reticulate-veined, especially below. Male catkins 1–3 cm long, 5–6 mm broad. Female inflorescences often 3 or 4 together, c. 4 mm diam. Ovary free. Drupelet solitary, 12–14 mm long, bright red. Fig. 36D–E.

Lord Howe Is. This is an endemic subspecies, common in the lowland forest. Flowers July–Oct.

L.H.Is.: along Malabar Ridge, *A.C.Beauglehole 5809* (MEL); near Nichols house, *C.Moore 61* (K, MEL); summit ridge of Mt Lidgbird, *J.Pickard 1471* (NSW); Erskine Valley, *P.S.Green 1648* (K); *s. loc.*, *J.D.McComish 35* (K, NSW).

Trophis scandens subsp. *scandens* is widely distributed from China, Malesia and eastern and northern Australia to New Caledonia and across the Pacific to Fiji and Tonga. *Trophis scandens* (as *M. tortuosa*) was incorrectly recorded from Norfolk Is. by R.Tate (*Macleay Mem. Vol*. 219, 1893); the record has never been substantiated.

3. MORUS

Morus L., *Sp. Pl*. 2: 986 (1753); *Gen. Pl*. 5th edn, 424 (1854); the original Latin name for this, the *Mulberry*.

Type: *M. nigra* L.

Trees or shrubs, monoecious, deciduous. Leaves serrate. Inflorescences axillary, unisexual, shortly spicate. Male flowers 4-merous; filaments inflexed in bud; small pistillode present. Female flowers with 4 imbricate perianth lobes; staminodes absent; style with 2 linear branches. Fruit a group of drupelets enclosed in the enlarged, fleshy perianths. Endocarp thin.

A genus of c. 7 species from temperate and tropical regions of America, tropical Africa and warm temperate and tropical Asia; 1 species naturalised on Lord Howe Is. For centuries *M. nigra* (Mulberry) has been cultivated for its fruit and *M. alba* as food for silkworms.

***Morus alba** L., *Sp. Pl*. 2: 986 (1753)

T: China, *coll. unknown*; lecto: LINN 1112.1, upper left specimen *n.v.*, *fide* C.K.Rao & C.E.Jarvis, *Taxon* 35: 705 (1986); IDC microfiche 177/2.662/19. Epithet from the Latin *albus* (white), in reference to the fruit.

Illustrations: G.Hegi, *Ill. Fl. Mitt.-Eur*. 3rd edn, 3: 271, fig. 119, t. 87, fig. 2 (1981); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 60, fig. 6G (1983); G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 347 (1990).

Tree or large shrub to 12 m tall. Leaves narrowly to broadly ovate, 5–12 cm long, 3–10 cm broad, (cuneate to) truncate to cordate at base, dentate-serrate, acute or very shortly acuminate, palmately 3-veined with 2 or 3 primary veins above on each side of midrib, glabrous above, glabrous or slightly pilose below on veins. Male and female catkins 5–20 mm long, on pubescent peduncles 5–10 mm long. Fruits fleshy, when ripe whitish to purplish. *White Mulberry*.

Lord Howe Is. A widely cultivated native of China which has escaped and become naturalised. It has also been reported from Norfolk Is. but only as planted and not apparently naturalised.

L.H.Is.: Middle Beach Rd, *G.Uhe 1343* (K); Valley of Shadow, *P.S.Green 1912* (K).

4. FICUS

Ficus L., *Sp. Pl.* 2: 1059 (1753); *Gen. Pl.* 5th edn, 482 (1754); the original Latin name for the fig.

Type: *F. carica* L.

Trees, shrubs or climbers, monoecious, with milky latex. Leaves spirally arranged, distichous or opposite, evergreen or (elsewhere) sometimes deciduous; stipules enveloping the bud, caducous, leaving an annular scar; lamina simple or palmately lobed, usually containing cystoliths. Inflorescence an enclosed fleshy receptacle or 'fig', axillary or cauliflorous. Flowers very small on inner surface of fig, male, female or gall-flowers, with 2–6 perianth lobes; male flowers with stamens equal in number to and opposite perianth lobes or fewer; female flowers with a single style, becoming lateral; gall-flowers with an empty ovary which develops if infected by a gall-wasp. Fruit drupelets held within the usually fleshy fig.

A large pantropical and subtropical genus containing c. 1000 species; 1 species native on Lord Howe Is.

E.J.H.Corner, Check-list of *Ficus* in Asia and Australasia with keys to identification, *Gard. Bull. Singapore* 21: 1–186 (1965).

The cultivated Fig, *F. carica* L., a native of south-western Asia and the Mediterranean region, has been reported from Lord Howe Is. (J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 152, 1898), but only as a cultivated plant. *Ficus prolixa* G.Forst. has been planted on Norfolk Is. as an ornamental.

Ficus macrophylla Desf. ex Pers., Syn. Pl 2: 609 (1807)

subsp. **columnaris** (C.Moore) P.S.Green, *J. Arnold Arbor.* 67: 112 (1986)

Ficus columnaris C.Moore & F.Muell. in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 2 (1870). T: Lord Howe Is., *C.Moore 56*; holo: MEL; iso: K. So named after the column-like trunks which develop from the pendent roots.

[*Ficus rubiginosa auct. non* Desf. ex Vent.: G.Bentham, *Fl. Austral.* 6: 168 (1873)]

Illustrations: J.Hutchinson, *Evol. Phyl. Fl. Pl.* 161, fig. 132 (1969), as *F. macrophylla*; I.Hutton, *Lord Howe Is.* 130 (1986).

Large tree to 20 m tall with many thick trunks and pendent roots which on reaching the ground form new trunks; base of old trunks buttressed. Leaves alternate, coriaceous; lamina narrowly elliptic-ovate, 8–17.5 cm long, 4.5–10 cm broad, rounded to obtuse at base, entire, acute (to obtuse), glossy green above, yellowish brown below; venation reticulate (especially below) with c. 10–12 parallel primary veins on each side of the midrib, joining to form a submarginal vein, intermediate parallel veins and a network of smaller ones. Fruit globose, c. 1.5 cm diam., pilose when young; peduncle 9–11 mm long, pilose. *Banyan*. Figs 12, 37A.

Lord Howe Is. Endemic. Still fairly common at lower altitudes on the Island but rarer than formerly due to susceptibility to exposure and wind. Individual trees can cover areas of up to 1 or 2 hectares.

L.H.Is.: North Head, *J.Game 69/228* (K); Transit Hill, *G.Uhe 1316* (K); Salmon Beach, *M.M.J. van Balgooy 1110* (K); lower slopes of W side of Mt Lidgbird, *P.S.Green 1971* (K); *s. loc.*, *C.Moore 56* (K, MEL).

An endemic subspecies of the Moreton Bay Fig, *F. macrophylla* subsp. *macrophylla* (of north-eastern N.S.W. and south-eastern Qld) from which it differs in its 'banyan' habit, and somewhat smaller leaves and fruits. Trees of subsp. *macrophylla* have been planted on Norfolk Is.

10. URTICACEAE

Herbs, shrubs or soft-wooded trees, without latex, often with stinging hairs. Leaves simple, opposite or alternate, often with stinging hairs, usually with prominent cystoliths in epidermis, usually stipulate. Inflorescence usually axillary, cymose, sometimes paniculate, often condensed. Flowers small, actinomorphic, usually unisexual; perianth sepaloid or (elsewhere) absent. Male flowers 4- or 5-merous; stamens opposite perianth lobes; filaments inflexed in bud, springing outwards elastically at anthesis; rudimentary ovary usually present. Female flowers with 2–4 free or united perianth lobes; staminodes scale-like or absent; ovary superior, free or adnate to perianth, with 1 basal ovule; style undivided. Fruit usually an achene, rarely drupaceous, often enclosed in the accrescent perianth.

A worldwide family of c. 50 genera and 1000 or more species; 3 native and 2 naturalised genera are present on the Islands.

G.Bentham, Tribe Euurticeae in Urticeae, *Fl. Austral*. 6: 182–192 (1873); A.C.Smith, Urticaceae, *Fl. Vit. Nova* 2: 209–251 (1981); W.-L.Chew, Urticaceae, *Fl. Australia*, 3: 68–93 (1989).

KEY TO GENERA

1 Stinging hairs present; leaves opposite **1. URTICA**

1: Stinging hairs not present; leaves opposite or alternate

2 Herbs, if subshrubby then soft and fleshy; leaves opposite or alternate, entire or serrate

3 Leaves opposite, less than 1 cm long **2. PILEA**

3: Leaves alternate, more than 1 cm long, usually much more

4 Margin of leaves toothed; lamina outline oblique, length 7–18 cm **3. ELATOSTEMA**

4: Margin of leaves entire; lamina outline symmetric, length less than 5 cm, usually 1–3.5 cm **5. PARIETARIA**

2: Trees or shrubs; leaves alternate, serrate **4. BOEHMERIA**

1. URTICA

Urtica L., *Sp. Pl*., 2: 983 (1753); *Gen. Pl*. 5th edn, 423 (1754); the original Latin name for the Stinging Nettle (from *uro*, I sting).

Type: *U. dioica* L.

Annual or perennial herbs, usually monoecious, usually with stinging hairs. Leaves opposite, petiolate, serrate or incised; stipules free or joined between petiole bases. Inflorescence axillary, paniculate or condensed. Flowers unisexual; perianth with 4 imbricate lobes, equal in the male, in unequal pairs in the female. Ovary erect; stigma usually sessile. Achene compressed, usually enclosed in the persistent perianth.

A genus of c. 50 species, cosmopolitan, but chiefly northern temperate in distribution; 1 species naturalised on Norfolk Is. and doubtfully present on Lord Howe Is.

Although both *U. incisa* Poir. and *U. urens* L. have been recorded as introduced to Lord Howe Is., they have not been re-collected from that Island in recent years and are presumably now extinct there (A.N.Rodd & J.Pickard, *Cunninghamia* 1: 278, 1983).

***Urtica urens** L., *Sp. Pl.* 2: 984 (1753)

T: Europe, *coll. unknown; n.v.*; lecto: LINN 1111.5, *fide* A.Ghafoor, *Fl. Libya* 47: 12 (1977); IDC microfiche 177/2.661/15. The epithet means stinging, from the Latin *uro* (I sting).

Illustrations: B.E.V.Parham & A.J.Healy, *Common Weeds New Zealand* 95 (1976); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, l: 119, fig. 95 (1986); G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 353 (1990).

Erect annual to 60 cm tall, monoecious. Stems 4-angled, hispid. Leaf lamina broadly ovate, 1.5–5 cm long, 1–3.5 cm broad, broadly cuneate to truncate at base, deeply serrate, with blunt apex and scattered stinging hairs. Flowers in axillary racemes 1–1.5 cm long, mixed male and female; perianth lobes membranous, c. 1 mm long, green; filaments and ovary c. 1 mm long; stigmas penicillate, minute. Achenes c. 1.5 mm long, enveloped by the persistent perianth. *Stinging Nettle*.

Norfolk Is., Lord Howe Is. A weed of disturbed ground, native to Europe, the Mediterranean region and south-western Asia.

N.Is.: prison ruins, Kingston, *G.Uhe 1130* (K); Philip Is., *P.S.Green 1489* (A). **L.H.Is.:** *s. loc.*, 1937, *J.D.McComish* (NSW).

2. PILEA

Pilea Lindl., *Collect. Bot.* t. 4 (1821); from the Latin *pileus* (a cap), in allusion to the shape of one of the perianth lobes in the type species.

Type: *P. muscosa* Lindl. = *P. microphylla* (L.) Liebm.

Annual or perennial herbs or subshrubs, dioecious or monoecious, without stinging hairs. Leaves opposite, entire or incised, usually 3-nerved, with cystoliths present; stipules joined in pairs or obscure. Inflorescence axillary, in lax or dense cymes. Male flowers 4 (or 5)-merous; stamens 4 (or 5), opposite perianth lobes, inflexed in bud. Female flowers with 3 perianth lobes, 1 longer than the others; ovary erect; stigma sessile, penicillate. Achenes compressed, usually enveloped in the perianth.

A genus of c. 250 species worldwide in tropical and warm temperate regions; 1 species naturalised on Norfolk Is.

***Pilea microphylla** (L.) Liebm., *Kongel. Danske Vidensk. Selsk. Skr., Naturvidenske Math. Afd. ser.* 5, 2: 302 (1851)

Parietaria microphylla L., *Syst. Veg.* 10th edn, 2: 1308 (1759). T: Jamaica, *coll. unknown*; lecto: LINN 1220.8, *fide* I.Friis, *Kew Bull.* 44: 596 (1989); IDC microfiche 177/2.710/11. Epithet from the Greek *micros* (small) and *phyllos* (a leaf), because of the small leaves.

Illustrations: J.Hutchinson, *Fam. Flowering Pl., Dicot.* 1: 230, fig. 169 (1926), as *P. muscosa*; V.H.Heywood, *Fl. Pl. World* 98, fig. la–d (1985); G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 354 (1990).

Low or procumbent herb, monoecious, much branched, somewhat succulent, glabrous. Leaves with lamina elliptic to obovate, 1.5–5 mm long, entire, subacute to obtuse, one of each pair smaller than the other. Inflorescence few-flowered, globose. Male flowers 4-merous. Female flowers with 1 perianth lobe larger than the other 2 and cucullate, almost 1 mm long, enclosing the developing achene. Achenes enclosed in persistent perianth. *Artillery Plant*.

Norfolk Is. Recently recorded as a garden weed on bare soil. A native of the West Indies and tropical America.

N.Is.: garden in New Cascade Rd, *W.R.Sykes NI 659* (CHR).

Sometimes called the Artillery Plant because of the explosive way it throws out pollen when the inflexed stamens suddenly straighten at anthesis.

3. ELATOSTEMA

Elatostema J.R.Forst. & G.Forst., *Char. Gen.* 105, t. 53 (1775); from the Greek *elatos* (elastic) and *stemon* (a thread), in allusion to the manner in which the staminal filaments spring out at anthesis.

Type: *E. sessile* J.R.Forst & G.Forst.

Annual or perennial herbs or subshrubs, monoecious or dioecious, without stinging hairs. Leaves alternate (through the absence or early shedding of the minute opposite leaf of a pair); lamina oblique and unequal-sided, often 3-nerved at base, usually with cystoliths; stipules joined between petiole bases. Inflorescences densely cymose or of clustered heads. Male flowers 4- or 5-merous; stamens equal in number to perianth lobes; ovary rudimentary. Female flowers with 3–5 subequal perianth lobes; staminodes scale-like or absent; stigma sessile, penicillate, caducous. Achenes flattened, ellipsoidal or ovoid. Perianth persistent.

A genus of 200 or more species from the Old World tropics; 1 native species each on Norfolk and Lord Howe Islands.

Leaves broadly and obliquely oblanceolate-elliptic, with marginal teeth 3–6 mm long, usually strongly strigose on petioles and midrib below; male inflorescences capitate (L.H.Is.) **1. E. grande**

Leaves obliquely oblanceolate or falcate-oblanceolate, shallowly crenulate-dentate on margins with teeth at most 1 mm long, glabrous on petioles and midrib; male inflorescences shortly paniculate (N.Is.) **2. E. montanum**

1. Elatostema grande (Wedd.) P.S.Green, *Kew Bull.* 45: 254 (1990)

Elatostema sessile var. *grande* Wedd., *Monogr. Urticacées*. 295 (1856); *E. reticulatum* var. *grande* (Wedd.) Benth., *Fl. Austral.* 6: 184 (1873). T: Lord Howe Is., *W.G.Milne 17*; syn: P. The epithet is from the Latin *grandis* (large), in reference to the comparatively large leaves and inflorescences.

[*Elatostema nemorosum auct. non* Seem.: C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 4 (1870)]

Illustration: W.R.Elliot & D.L.Jones, *Encycl. Austral. Pl.* 3: 392 (1984).

Fleshy, perennial herb, straggling to 50 cm, monoecious. Leaves with petiole strigose; lamina broadly and obliquely oblanceolate-elliptic, 8–18 cm long, 3.5–9 cm broad, unequal at base, serrate with teeth 3–6 mm long, acute to subacuminate in outline, nearly glabrous to usually strongly strigose, especially on midrib below, with abundant linear cystoliths in upper and lower epidermis. Inflorescences rounded; male 1.5–2.5 cm diam. on peduncles 1–6 cm long; female 1–1.5 cm diam., sessile; involucral bracts strigose. Figs 15, 36B.

Lord Howe Is. An endemic species, widespread in the southern forested areas, but not common, generally preferring mesic habitats. Perhaps less common now due to the depredations of feral pigs.

L.H.Is.: W slopes of Smoking Tree Ridge, *R.D.Hoogland 8731* (NSW); Rocky Run, *J.C.Game 69/287* (K); top of Mt Gower, *P.S.Green 1602* (K); N end of Little Slope, *J.Pickard 2787* (K, NSW); *s. loc.*, *C.Moore 41* (K, MEL).

2. Elatostema montanum Endl., *Prodr. Fl. Norfolk.* 39 (1833)

T: Norfolk Is., *F.L.Bauer*; holo: W *n.v.*, probably destroyed. Named after Mt Pitt, whence it was first collected.

Procris montana (Endl.) Steud., *Nomencl. Bot.* 2nd edn, 1: 398 (1840)

[*Procris cephalida auct. non* Comm. ex Poir.: B.Seemann, *Fl. Vit.* 241 (1868)]

Fleshy, succulent-stemmed, perennial herb or subshrub, straggling to 1 m, monoecious. Leaf lamina falcate or obliquely oblanceolate, 7–15 cm long, 2–5 cm broad, unequal at base, shallowly crenulate-dentate, especially in upper half, with teeth up to 1 mm long, acuminate at apex, glabrous; cystoliths abundant, linear and very short in lower epidermis, very short and pointed in upper epidermis. Male inflorescence shortly paniculate, 1–2 cm long. Female inflorescence shortly pedunculate, depressed-globose.

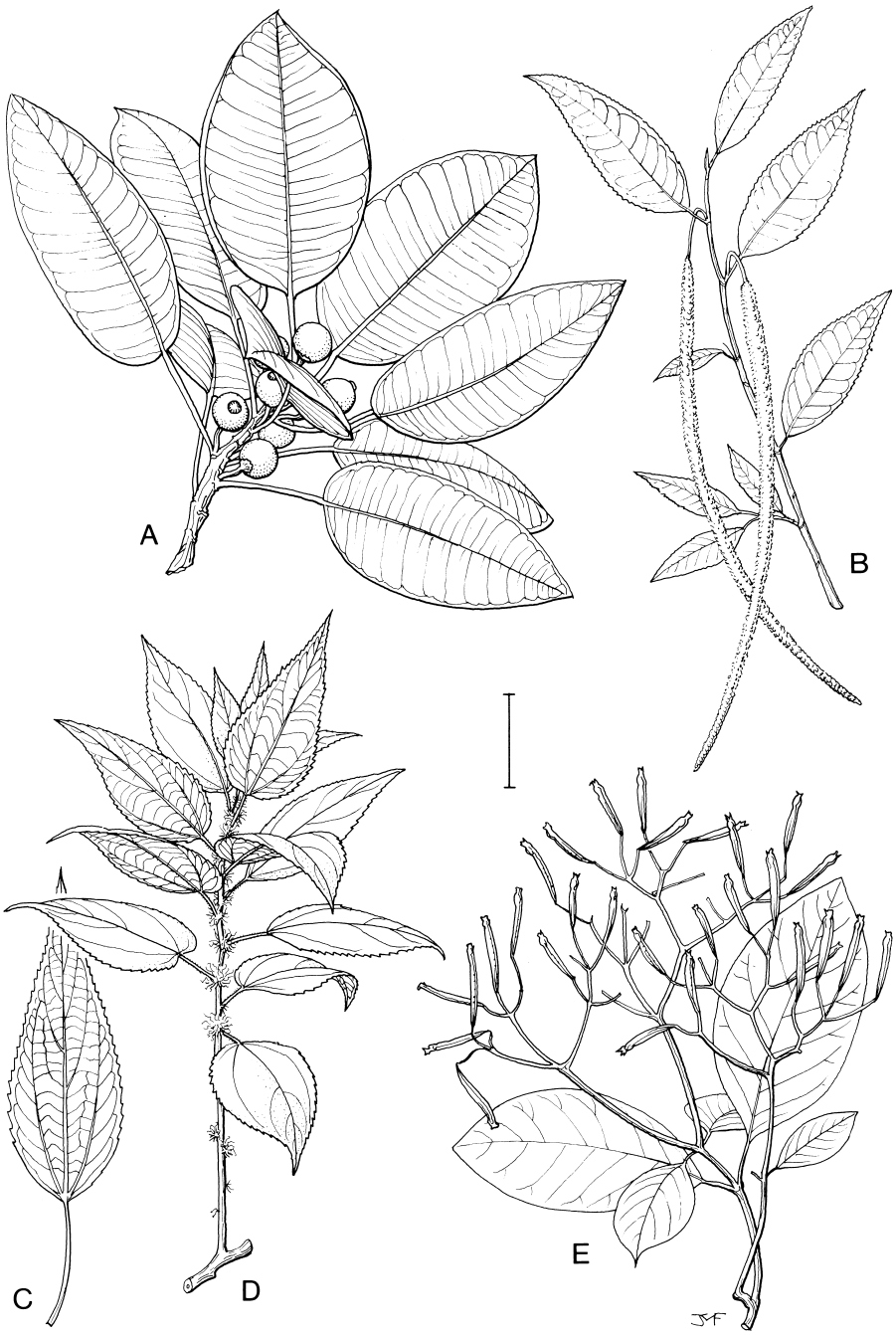

Figure 37. A–B, MORACEAE. **A**, *Ficus macrophylla* subsp. *columnaris*, habit (M.van Balgooy 1110, K). **B**, *Streblus pendulinus*, habit (J.McComish 23, K). **C–D**, URTICACEAE. **C**, *Boehmeria calophleba*; leaf (J.Game 69/202, K). **D**, *Boehmeria australis* var. *australis*, habit (R.Hoogland 11287, K). **E**, NYCTAGINACEAE: *Pisonia brunoniana*, habit (J.McComish 1B, K). Scale bar = 5 cm. Drawn by M.Fothergill.

Norfolk Is. Endemic and confined to a few damp, shaded localities in the National Park. Endangered.

N.Is.: Mt Pitt Reserve, *W.R.Sykes NI 308 & NI 309* (CHR); *loc. id., M.Lazarides 8087* (CANB, K, NSW); *s. loc., J.D.McComish 48* (K).

4. BOEHMERIA

Boehmeria Jacq., *Enum. Syst. Pl.* 9 (1760); named in honour of Georg Rudolph Boehmer (1723–1803), Professor of Anatomy, Botany and Therapy at the University of Wittenberg, Germany.

Type: *B. ramiflora* Jacq.

Shrubs or small trees, monoecious or dioecious, without stinging hairs. Leaves alternate or (elsewhere) opposite and ±unequal; lamina toothed, 3-nerved at base, with punctiform cystoliths; stipules usually lateral and free, caducous. Flowers usually unisexual; clustered or fascicled, with clusters often combined into spikes or panicles. Male flowers 4 (or 5)-merous; perianth lobes valvate, often shortly corniculate below the apex; ovary rudimentary. Female flowers with a ±tubular, 2–4-toothed perianth, hispid; staminodes absent; stigma filiform, pilose on one side, semi-persistent in fruit. Fruit an achene, enclosed in the dried perianth.

A genus of c. 100 species, pantropical in distribution but extending into the warm subtropics; 2 native and 1 naturalised species on the Islands.

1 Leaves narrowly to broadly ovate, white or pale beneath; main veins densely pilose or pubescent beneath (N.Is.)

2 Inflorescence compact, rounded; main veins densely pubescent beneath, with hairs mostly less than 0.5 mm long; marginal teeth 1–2 mm long at broadest part of leaf **1. B. australis**

2: Inflorescence lax, branched; main veins pilose beneath, with hairs c. 0.5–1 mm long; marginal teeth (2–) 3–7 mm long at broadest part of leaf **3. B. nivea**

1: Leaves lanceolate, sometimes broadly so, white beneath; main veins sparsely pilose beneath (L.H.Is.) **2. B. calophleba**

1. Boehmeria australis Endl., *Prodr. Fl. Norfolk.* 38 (1833)

var. **australis**

T: Norfolk Is., *F.L.Bauer*: holo: W *n.v.*, probably destroyed; iso: K. The epithet means southern, alluding to its Southern Hemisphere origin.

Procris splendens Lindl., *Veg. Kingd.* 260, fig. 175 (1846). T: as for *B. australis* Endl.

Illustrations: S.F.L.Endlicher, *Icon. Pl.* t. 86 (1839); J.Lindley, *Veg. Kingd.* 260, fig. 175 (1846), as *Procris splendens*.

Tree to 5 m tall, monoecious. Leaves with petiole 2–10 cm long; lamina narrowly to broadly ovate, (5–) 8–12 (–16) cm long, (3.5–) 4.5–7 (–10) cm broad, rounded to somewhat cordate at base, serrate with teeth 1–2 mm long at broadest part of leaf, acute to slightly acuminate, with 3 main and 2 smaller basal palmate nerves, with clearly reticulate, densely pubescent veins below, pale below. Flowers in unisexual, sessile, axillary clusters; clusters compact and rounded. Male flowers 4-merous; perianth lobes 2 mm long, joined at base, pilose. Female flowers with a pilose, ellipsoidal perianth; style 3–6 mm long. *Nettletree*. Fig. 37D.

Norfolk Is. Endemic; more or less confined to the National Park and possibly endangered.

N.Is.: Mt Pitt, *J.D.McComish 42* (K); saddle between Mt Pitt and Mt Bates, *R.D.Hoogland 11287* (CANB, K); Mt Bates, track leading to Red Rd, *P.S.Green 1404* (A, K); *s. loc., A.Cunningham 16 & 17* (K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW).

Boehmeria australia var. *dealbata* (Cheesem.) W.R.Sykes occurs on the Kermadec Islands. The species is near to *B. calophleba* of Lord Howe Is. (see W.R.Sykes, *Kermadec Islands*

Flora 148–149, 1977).

2. Boehmeria calophleba C.Moore & F.Muell. in F.J.H. von Mueller, *Fragm.* 8: 11 (1872)

T: Lord Howe Is., *C.Moore* [*21 & 45*]; syn: ?MEL *n.v.*; isosyn: K. The epithet comes from the Greek *calos* (beautiful) and *phlebos* (a vein), in allusion to the attractive pattern made by the venation on the undersides of the leaves.

Illustration: I.Hutton, *Lord Howe Is.* 143 (1986).

Shrub or small tree to 6 m tall, monoecious. Leaves with petiole 0.5–3 (–6) cm long; lamina lanceolate to broadly lanceolate, (3–) 6–9 (–15) cm long, (1.5–) 2.5–4 (–5) cm broad, broadly rounded-cuneate at base, serrate, acute to slightly acuminate, with 3 main basal palmate nerves and 2 weak subsidiary ones, with very clearly reticulate sparsely pilose veins below, with intravenal areas covered by dense white tomentum. Flowers in small, unisexual, sessile, axillary clusters. Male flowers 4-merous; perianth lobes 1 mm long, joined at base, pilose. Female flowers with a pilose, ellipsoidal perianth; style 2–4 mm long. Figs 14, 37C.

Lord Howe Is. Endemic; not common but locally abundant in moist forested areas on the southern parts of the Island, and forming an association with *Macropiper* on the north-western slopes of Mt Lidgbird. Flowers mid Nov.–mid Apr.

L.H.Is.: near base of Mt Lidgbird, *C.Moore 21* (K, MEL); E slopes of Mt Lidgbird, *P.S.Green 1688* (A, K); Dinner Run, *J.C.Game 69/202* (K); S spur of Mt Lidgbird, *A.N.Rodd 1772* (K, NSW); N end of Little Slope, *J.Pickard 2760* (K, NSW).

3. *Boehmeria nivea (L.) Gaudich., *Voy. Uranie* 499 (1830)

Urtica nivea L., *Sp. Pl.* 2: 985 (1753). T: China, not designated. The epithet is from the Latin *niveus* (of the snow or snowy), in reference to the white undersides of the leaves.

Illustrations: H.F.Macmillan, *Trop. Planting & Gardening* 5th edn, 406 (1962); M.C.Neal, *Gardens Hawaii* 2nd edn, 316, fig. 131d (1965); Anon., *Encycl. Brit.* 15th edn, 8: 406 (1974).

Shrub to 3 m tall. Leaves with petiole (2–) 4–12 cm long; lamina broadly ovate, (4–) 6–12 (–15) cm long, (3–) 4–10 (–12) cm broad, acute to rounded at base, truncate, coarsely serrate with teeth (2–) 3–7 mm long at broadest part of leaf and terminal 'tooth' of apex forming an acumen, with main palmate veins somewhat asperous above, reticulate below with veins densely pilose, white between the veins. Inflorescence lax, paniculate, 5–10 cm long; flowers clustered. Male flowers 4-merous; perianth lobes c. 1 mm long, united at base, almost glabrous. Female flowers with pilose, ellipsoidal perianth; style c. 1 mm long.

Norfolk Is. On the Island possibly an escape from cultivation. A native of China.

N.Is.: Rocky Point Reserve, *R.O.Gardner 5869* (AUCK, K).

This species is known as *Ramie* or *China Grass*, and is cultivated in some countries for its fibres. There is also a variety from SE Asia.

5. PARIETARIA

Parietaria L., *Sp. Pl.* 2: 1052 (1753); *Gen. Pl.* 5th edn, 471 (1754); from the Latin *parietarius* (of walls), itself from *paries* (a wall), alluding to the main habitat of the type species.

Type: *P. officinalis* L.

Annual or perennial herbs, without stinging hairs. Leaves alternate, entire; stipules usually absent. Inflorescence axillary, clustered, cymose, bracteate. Flowers mostly bisexual, sometimes unisexual, small, greenish. Perianth 4-lobed, deeply divided in male and bisexual flowers (sometimes elongating in fruit), cylindrical in female flowers. Stamens 4. Stigma penicillate, caducous. Fruit an achene enclosed in persistent perianth, usually shining.

A cosmopolitan genus of c. 20 species; 1 species native on Norfolk and Lord Howe Islands.

Parietaria debilis G.Forst., *Prodr*. 73 (1786)

Urtica debilis (G.Forst.) Endl., *Prodr. Fl. Norfolk*. 37 (1833); *Freirea debilis* (G.Forst.) Jarm., *Trudy Bot. Inst. Acad. Nauk S.S.S.R., Ser. 1, Fl. Sist. Vyssh. Rast*. 5: 328 (1941). T: New Zealand, *J.R. & G.Forster*; syn: BM. Epithet is Latin for weak or feeble, in reference to the habit.

Illustrations: G.M.Cunningham *et al*., *Pl. W New South Wales* 210 (1981); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 66, fig. 7G (1983); G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 352 (1990).

Diffuse, weak annual herb. Stipules caducous. Leaves with lamina broadly ovate, (0.5–) 1–3.5 (–5) cm long, 0.4–3 (–4.5) cm broad, rounded to truncate and 3-nerved at base, obtuse to bluntly acuminate, with punctate cystoliths and scattered pilose hairs; often with smaller accessory leaves in axils. Inflorescence congested, (1–) 3–5-flowered; central flower bisexual with 1 bract; other flowers bisexual or male with 3 or more ciliate bracts. Perianth pilose, enlarging in fruit. Achene compressed-ovoid, 1–1.5 mm long, glossy. *Pellitory*.

Norfolk Is., Lord Howe Is. On the Islands particularly characteristic of moist coastal cliffs. Although stated by J.S.Turner *et al*. (*Conservation of Norfolk Is*. 33, 1968) to be fairly widespread, this species appears to be uncommon on Norfolk Is. On Lord Howe Is. it is classed as rare and vulnerable (although locally common) by J.Pickard, *Biolog. Conserv*. 27: 138 (1983). It also occurs in the montane parts of Africa, in tropical Asia and South America, and in Australia and New Zealand.

N.Is.: The Razorback, Philip Is., 1985, *N.Hermes & D.Greenwood* (K); *s. loc., A.Cunningham 81* (K); *s. loc., J.D.McComish 220* (K). **L.H.Is.:** E end of North beach, *J.D.Hoogland 8687* (CANB); Middle Bay, *P.S.Green 1698* (A, K); *s. loc., J.P.Fullagar 85* (K, MEL).

11. CASUARINACEAE

Evergreen trees or shrubs, dioecious or monoecious. Branchlets slender, grooved, jointed, deciduous. Leaves tooth-like, whorled at nodes, with bases joined to form a short sheath. Inflorescences short, catkin-like, of alternating whorls of scale-like bracts, each with 2 lateral bracteoles and a single, unisexual flower; flowers wind pollinated. Male flowers of 1 or 2 scale-like perianth segments and 1 stamen. Female flowers without perianth; carpels 2, united, with 2, rarely 4, ovules. Fruit a 'cone', with pairs of woody bracteoles which open to release a l-seeded samara.

A family of 1 or 4 genera, depending on the classification followed, and c. 80 species. Native to Australia, SE Asia and the islands of the Pacific; 1 genus naturalised on Norfolk Is.

G.Bentham, Casuarineae, *Fl. Austral*. 6: 192–202 (1873); L.A.S.Johnson, Notes on Casuarinaceae II, *J. Adelaide Bot. Gardens* 6: 73–87 (1982); S.J.Midgeley, J.W.Turnbull & R.D.Johnston (eds), *Casuarina Ecology, Management & Utilization*, (1983); K.L.Wilson & L.A.S.Johnson, Casuarinaceae, *Fl. Australia* 3: 100–174 (1989).

CASUARINA

Casuarina L., *Amoen. Acad*. 143 (1759); named after the cassowary (*Casuarinus*) because the long, drooping branchlets were supposed to resemble its feathers.

Type: *C. equisetifolia* L.

Trees or shrubs. Branchlets with 4–19 grooves and an equal number of tooth-like leaves per node. Bracts of fruiting 'cones' broad and evident, or thin and inconspicuous beneath each pair of bracteoles; bracteoles thin or thick, with or without a dorsal appendage; samaras dark and shiny or pale and dull.

A genus of c. 17 species according to K.L.Wilson & L.A.S.Johnson, *loc. cit.*, traditionally treated in a more aggregate sense; the species naturalised on the Islands is retained by them in *Casuarina*.

***Casuarina glauca** Sieber ex Spreng., *Syst. Veg.* 16th edn, 3: 803 (1826)

T: New South Wales, *F.W.Sieber 425*; holo: B *n.v.*; iso: K, (BM, C, FI, L, LE, MEL, P, PR, S *n.v.*, *fide* K.L.Wilson & L.A.S.Johnson, *op cit.* 107). So named because of the glaucous appearance of the foliage.

Illustrations: L.F.Costermans, *Native Trees & Shrubs SE Australia* 148, 149 (1981); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 103 (1984); K.L.Wilson & L.A.S.Johnson in G.J.Harden, *Fl. New South Wales* 1: 509, t. 28 (1990).

Tree 5–20 m tall, frequently with root-suckers. Branchlets 10–35 cm long, 0.9–1.5 mm diam., glabrous, with 12–17 longitudinal ridges and with tooth-like leaves at nodes; median nodes of branchlets 8–20 mm apart. Leaves 0.5–0.9 mm long. Male catkins 1–4 cm long, c. 4 mm diam. Fruiting 'cones' cylindrical to subglobose, 9–18 mm long, 8–13 mm diam.; bracteoles prominent; peduncles 3–12 mm long.

Norfolk Is., Lord Howe Is. A native of Australia (eastern N.S.W. and Qld) which has been introduced on the Islands and, with its tendency to sucker, has become naturalised. The plants on Norfolk Is. are reported to be male only.

N.Is.: hill overlooking Kingston Wharf, *G.Uhe 1229* (K). **L.H.Is.:** North Bay, *I.Hutton 592* (K); corner of Mulley Drive and Lagoon Rd, *I.Hutton 593* (K).

12. PHYTOLACCACEAE

Perennial herbs, shrubs or trees. Leaves alternate, simple; stipules usually absent. Inflorescences terminal, axillary or leaf-opposed, racemose or spicate, bracteate. Flowers actinomorphic, bisexual or unisexual. Perianth segments 4 or 5, persistent, usually green or white. Stamens 4–many, hypogynous, free; anthers 2-locular; staminodal or absent in female flowers. Ovary superior; carpels 1 or more, free or basally connate; ovule basal, usually solitary. Fruit a berry, drupe, achene, nut or capsule. Seeds often arillate.

A family of c. 18 genera from tropical and warm temperate regions, mainly American; 2 genera introduced to Norfolk Is.

G.Bentham, Phytolaccaceae, *Fl. Austral.* 5: 142–150 (1870); H.Walter, Phytolaccaceae, *Pflanzenr.* 39: 1–154 (1909); A.Heimerl, Phytolaccaceae, *Nat. Pflanzenfam.* 2nd edn, 16c: 135–164 (1934); C.A.Backer, Phytolaccaceae, *Fl. Males.* ser. I, 4: 227–232 (1951); H.J.Hewson, Phytolaccaceae, *Fl. Australia* 4: 1–5 (1984).

KEY TO GENERA

Perianth lobes 5; stamens and carpels usually 8	**1. PHYTOLACCA**
Perianth lobes 4; stamens 4; carpel 1	**2. RIVINA**

1. PHYTOLACCA

Phytolacca L., *Sp. Pl.* 1: 441 (1753); *Gen. Pl.* 5th edn, 200 (1754); from the Greek *phyton* (a plant) and later Latin *lacca* (the dye of the lac insect), alluding to the stain obtained from the fruits of some species in this genus.

Type: *P. americana* L.

Herbs, shrubs or trees. Leaves entire, usually petiolate, without stipules. Inflorescence terminal or usually leaf-opposed, usually racemose. Flowers usually bisexual. Perianth segments usually equal and free. Stamens 5–30, in 1 or 2 series on a fleshy hypogynous disk. Ovary depressed-globose, of 5–16 free or connate carpels. Fruit a fleshy berry.

A genus of c. 25 species, mostly from tropical America; 1 species naturalised on Norfolk Is.

***Phytolacca octandra** L., *Sp. Pl.* 2nd edn, 1: 631 (1762)

T: Mexico, *coll. unknown*; lecto: LINN 607.1, *fide* J.Nowicke, *Ann. Missouri Bot. Gard.* 55: 13 (1969); IDC microfiche 177/2.314/10. The epithet comes from the Greek *octo* (eight) and *andros* (a man, here a stamen), referring to the staminal number.

Illustrations: B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 69, fig. 35b (1983); H.J.Hewson, *Fl. Australia* 4: 3, fig. 1A (1984); B.A.Auld & R.W.Medd, *Weeds* 200 (1987).

Tap-rooted herb to 2 m or more tall. Leaves with petiole 1–4 cm long; lamina lanceolate or elliptic-lanceolate, 5–20 cm long, acute to attenuate at base, acute or subacuminate at apex. Racemes leaf opposed, dense, 5–15 cm long; peduncles 5–15 mm long; pedicels c. 1 mm long. Flowers bisexual. Perianth segments 5, c. 3 mm long, white or tinged red. Stamens usually 8. Carpels usually 8. Fruit a juicy berry, depressed-globose, purplish black. *Inkweed*.

Norfolk Is. A common weed, introduced many years ago; native to tropical central America.

N.Is.: Anson Bay Rd, *M.Lazarides 8049* (CANB, K); Rocky Point, *P.S.Green 1449* (A).

2. RIVINA

Rivina L., *Sp. Pl.* 1: 121 (1753); *Gen. Pl.* 5th edn, 57 (1754); named after Augustus Quirinus Rivinus (Bachmann) (1652–1723), Professor of Botany and Therapy at Leipzig University.

Type: *R. humilis* L.

Herbs, somewhat woody towards base. Leaves entire, petiolate, without stipules. Inflorescence terminal or axillary, racemose. Flowers bisexual. Perianth segments 4, free. Stamens 4, free. Ovary 1-locular, subglobose. Fruit a berry.

A genus of 3 species, or 1 variable one, according to one's interpretation of the variability; all of them native in tropical America; 1 species naturalised on Norfolk Is.

***Rivina humilis** L., *Sp. Pl.* 1: 121 (1753)

T: Jamaica, Barbados, Herb. Hort. Cliff. 35, *Rivina*; lecto: BM *n.v.*, *fide* D.O.Wijnands, *Bot. Comelins* 172 (1983). The epithet comes from the Latin *humus* (ground) with the suffix *-ilis* indicating a quality, in this case low or of the ground.

Illustrations: R.M.Polhill, *Fl. Trop. E. Africa*, Phytolaccaceae 7 (1971); B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 69, fig. 35a (1983); G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 176 (1990).

Herb to 1 m tall, sometimes taller, puberulous, sometimes sparsely so. Leaf petioles 1–5 cm long; lamina lanceolate to ovate, (3–) 5–9 (–12) cm long, obtuse to rounded at base, subacuminate. Inflorescence many-flowered, 4–8 cm long, lengthening in fruit; pedicels 1–2 mm long. Perianth 1–1.5 mm long, white, turning green in fruit, persistent and slightly accrescent. Ovary 0.75 mm long. Fruit globose or pyriform, 3–4 mm diam., orange or red.

Norfolk Is. A native of tropical America now naturalised in one or two localities.

N.Is.: Duncombe Bay, *W.R.Sykes NI 217* (CHR); Rocky Point, *P.S.Green 1453* (A); *loc. id.*, *R.D.Hoogland 11143* (CANB).

13. NYCTAGINACEAE

Herbs, shrubs, trees or climbers. Leaves alternate or opposite, sometimes whorled, simple, entire; stipules absent. Inflorescence basically cymose, variously modified, bracteate. Flowers actinomorphic, bisexual or unisexual. Perianth petaloid, 5–10 segments united into a tube; lower part persistent, upper part sometimes caducous. Stamens 1–many, free or basally connate, hypogynous, usually unequal. Ovary superior; 1-locular with 1 basal ovule. Fruit an achene enclosed in persistent perianth base; sometimes glandular.

A mainly tropical and subtropical family, especially from the Americas, with c. 30 genera and 300 species; 2 native genera and 1 introduced on the Islands. In addition, *Bougainvillea glabra* Choisy, and perhaps other species or hybrids, is cultivated on the Islands and sometimes planted on roadside banks.

G.Bentham, Nyctagineae, *Fl. Austral.* 5: 276–281 (1870); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Nyctaginaceae, *Fl. Java* 1: 269–272 (1963); J.F.Stemmerik, Nyctaginaceae, *Fl. Males*. ser. I, 6: 450–468 (1964); R.D.Meikle & H.J.Hewson, Nyctaginaceae, *Fl. Australia* 4: 5–18 (1984).

KEY TO GENERA

1 Shrub or tree; inflorescence paniculate; leaves broadly elliptic, 7–20 cm or more long; perianth 6–10 mm long, greenish **3. PISONIA**

1: Herb; flowers clustered

2 Plant erect; leaves triangular, usually 5–9 cm long or more; perianth 4.5–6.5 cm long, white, pink, red, yellow or variegated **1. MIRABILIS**

2: Plant ±decumbent; leaves bluntly ovate, 1–4 cm long; perianth 2–3 mm long, white, pink or lilac **2. BOERHAVIA**

1. MIRABILIS

Mirabilis L., *Sp. Pl.* 1: 177 (1753); *Gen. Pl.* 5th edn, 82 (1754); the name means wonderful and was, according to Linnaeus, applied to this genus for five reasons, not the least, and sarcastically, because the variability of the type species had led earlier botanists to describe so many species.

Type: *M. jalapa* L.

Erect herbs (sometimes subshrubs), with tuberous roots. Stem nodes swollen. Leaves opposite, equal within pairs. Inflorescence terminal, corymbose, 1–many-flowered. Flowers bisexual, subtended by a 5-lobed involucre; pedicels usually less than 0.5 mm long. Perianth trumpet-shaped, constricted above ovary, slightly 5-lobed, white to red, purple or yellow. Stamens 3–6, free or basally connate, exserted. Style exserted. Fruit ribbed or tubercular, not viscid.

A genus of c. 60 species, mostly from tropical America; 1 species naturalised on Lord Howe Is.

***Mirabilis jalapa** L., *Sp. Pl.* 1: 177 (1753)

T: 'India', Herb. Hort. Cliff. 53, *Mirabilis* 1η; lecto: BM *n.v.*, *fide* C.E.Jarvis *et al.*, *Regnum Veg*. 127: 67 (1993). The epithet alludes to the Mexican city of Jalapa, from which the drug jalap came, and of which this plant was incorrectly thought to be the source.

Illustrations: V.H.Heywood, *Fl. Pl. World* 69, fig. 2 (1978); B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 71, fig. 37c (1983); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 97, fig. 12D (1983).

Herb to 60 cm tall, sometimes more. Leaves with petiole 1–4 cm long; lamina triangular, (4–) 5–9 (–15) cm long, (2–) 3–7 (–9) cm broad, truncate to slightly cordate at base, long-acute to slightly acuminate at apex. Flowers 3–7, clustered; pedicels 0.5–6 mm long. Perianth 4.5–6.5 cm long; limbs spreading, funnel-shaped, 2.5–4 cm diam., white, pink, red, yellow or variegated, scented; opening towards evening, closing early next morning. Stamens 5 or 6, exserted 8–15 mm beyond tube. Style length equal to stamens. Fruit subglobular, 7–8 mm long, black.

Lord Howe Is. An introduced plant first recorded by J.H.Maiden (*Proc. Linn. Soc. New South Wales* 23: 150, 1898), and repeated by W.R.B.Oliver (*Trans. & Proc. New Zealand Inst.* 49: 157, 1917), but said by A.N.Rodd & J.Pickard (*Cunninghamia* 1: 278, 1983) to have

appeared to have died out. A native of tropical America, often grown as an ornamental in gardens.

L.H.Is.: *s. loc.*, 1898, *J.H.Maiden & J.L.Boorman* (NSW); *s. loc.*, 1929, *J.L.Boorman* (NSW).

2. BOERHAVIA

Boerhavia L., *Sp. Pl.* 1: 3 (1753); *Gen. Pl.* 5th edn, 4 (1754); named in honour of Herman Boerhaave (1668–1738), a famous Professor of Medicine, Botany and Chemistry at the University of Leiden, in the Netherlands.

Type: *B. erecta* L.

Annual or perennial herbs, erect or prostrate, glabrous or hairy; hairs glandular, often glandular-viscid. Leaves opposite, somewhat unequal in each pair, often fleshy, grading into inflorescence bracts above. Inflorescence axillary or falsely terminal, a few-flowered cymose glomerule or umbel. Flowers bisexual, relatively small. Perianth tubular-campanulate; upper part 5-lobed, caducous. Stamens 1–4 (–6), included or shortly exserted. Ovary subsessile. Fruit ellipsoidal or obpyriform, with 3–5 ribs, often densely glandular; ribs usually producing mucus when wet.

A genus of from few to c. 40 species according to the authority followed; most species American, but with one, the following, a widely distributed Pacific strand-plant.

Boerhavia tetrandra G.Forst., *Fl. Ins. Austr.* 2 (1786)

T: Society Islands, *J.R. & G.Forster*; syn: BM, K. The epithet comes from the Greek *tetra* (four) and *andros* (man), referring here to the four stamens in the flower.

[*Boerhavia diffusa auct. non* L.: F.J.H. von Mueller, *Fragm.* 9: 77 (1875); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 248 (1896); S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 170 (1981)]

[*Boerhavia repens auct. non* L.: W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 136 (1917)]

Illustrations: A.W.Whistler, *Coastal Fl. Trop. Pacific* 53 (1980); R.D.Meikle & H.J.Hewson, *Fl. Australia* 4: 11, fig. 3A, D (1984).

Perennial herbs, decumbent or prostrate, to 40 cm long, glabrous or glandular-hairy. Leaves with petiole 0.5–2 cm long; lamina fleshy, bluntly ovate, 1–4 cm long. Inflorescence axillary, often compound, with the basic unit a crowded, many-flowered glomerule; peduncle 3–10 cm long. Flowers subsessile. Perianth base sparsely glandular; upper part campanulate, 2 mm long, white, pink or lilac. Stamens 4 (rarely 3), c. 1 mm long. Style 2 mm long. Fruit fusiform, 3.5–5 mm long, glandular-hairy, 3–5-ribbed; ribs not producing mucus.

Lord Howe Is. A widespread Pacific strand-plant, once collected on the Island (see below). It is rather inadequately vouchered by this poor specimen, and there is a chance it might actually be the related *B. albiflora* Fosb. Although not recorded recently it is always possible that seed might be washed up again some day.

L.H.Is.: near the beach, *C.Moore 51* (MEL).

3. PISONIA

Pisonia L., *Sp. Pl.* 2: 1026 (1753); *Gen. Pl.* 5th edn, 451 (1754); named after Willem Piso, a 17th century Dutch physician of Leiden and then Amsterdam, who travelled widely and wrote basic works on tropical medicine.

Type: *P. aculeata* L.

Unarmed shrubs or trees, or spiny climbers. Leaves opposite, alternate or subverticillate. Inflorescence axillary or terminal. Flowers bisexual or unisexual. Perianth campanulate to funnel-shaped, 5 (–10)-lobed; upper part usually coloured, caducous. Stamens (2–) 5–13 (–40), mostly exserted. Style longer than ovary. Fruit smooth or ribbed; ribs 5 or 6, often glandular-viscid.

A genus of c. 35 species, pantropical and subtropical, but predominantly American; 1 species native on Norfolk and Lord Howe Islands.

W.R.Sykes, The Parapara, *Pisonia brunoniana* (Nyctaginaceae), *New Zealand J. Bot.* 25: 459–466 (1987).

Pisonia brunoniana Endl., *Prodr. Fl. Norfolk*. 43 (1833)

Calpidia brunoniana (Endl.) Heimerl, *Oesterr. Bot. Z.* 63: 283 (1913); *Ceodes brunoniana* (Endl.) Skottsb., *Acta Horti Gothob*. 2: 231 (1926); *Heimerlia brunoniana* (Endl.) Skottsb., *Svensk Bot. Tidskr*. 30: 738 (1936); *Heimerliodendron brunonianum* (Endl.) Skottsb., *Svensk Bot. Tidskr*. 35: 364 (1941). T: Norfolk Island, *F.L.Bauer*; holo: W *n.v.*, probably destroyed; iso: K. Named after Robert Brown (1773–1858), famous British botanist who sailed as naturalist on Lieutenant M.Flinders' exploration of Australia, 1801–1805.

Pisonia sinclairii Hook.f., *Fl. Nov.-Zel*. 1: 209 (1853). T: New Zealand, *A.Sinclair s.n.*; syn: K, and *W.Colenso s.n.*; syn: K.

[*Pisonia inermis auct. non* Jacq.: B.Seemann, *Fl. Vit*. 195 (1866), *p.p.*]

[*Pisonia umbellifera auct. non* (J.R.Forst. & G.Forst.) Seem.: W.B.Hemsley, *Ann. Bot.* (*London*) 10: 248 (1896); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 133 (1898); J.S.Turner *et al*., *Conservation Norfolk Is*. 33 (1968); A.N.Rodd & J.Pickard, *Cunninghamia* 1: 273 (1983)]

Illustrations: L.B.Moore & J.B.Irwin, *Oxford Book New Zealand Pl*. 61 (1978); J.T.Salmon, *Native Trees New Zealand* 130 (1980); A.Eagle, *Trees Shrubs New Zealand* 2nd edn, 1: fig. 49 (1986).

Spreading, generally crooked tree to 6 m or more tall; wood soft with brittle branches. Leaves opposite or ternate, glabrous, glossy; petiole 1–5 cm long; lamina broadly elliptic to slightly obovate, (7–) 10–20 (–30) cm long, (4–) 6–8 (–11) cm broad, acute or obtuse at base, narrowed onto the petiole, entire, obtuse to rounded at apex. Inflorescence paniculate, many-flowered, leafy-bracteate. Flowers unisexual. Perianth plicate, greenish white, puberulous; male 6–7 mm long; female 8–10 mm long. Stamens 6–8, slightly exserted. Fruit narrowly ellipsoidal, 2–3 cm long; ribs 5, very viscid. *Wai-Wai*, *Birdcatcher* (N.Is.), *Pump-Wood* (L.H.Is.). Fig. 37E.

Norfolk Is., Lord Howe Is. In lowland forest, especially near the sea. Flowers July–Jan. This species is also found on the northern coasts of the North Is., New Zealand, the Kermadecs and Hawai'i.

N.Is.: Steels Point, *M.Lazarides 8027* (CANB, K); Rocky Point, *P.S.Green 1456* (A); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW). **L.H.Is.:** SE lower slopes of Malabar, *P.S.Green 1543* (A, K); E end of Neds Beach, *G.Uhe 1246* (K); Lagoon Rd, *L.A.S.Johnson & A.N.Rodd 1216* (K, NSW).

This species is distinct from *P. umbellifera* (J.R.Forst. & G.Forst.) Seem., within which it was included in *Fl. Australia* 4: 18 (1984), see W.R.Sykes, *loc. cit.* Closely related species occur in Australia and on most Pacific islands. Although a mechanism for seed dispersal, the sticky fruits, when ripe, have been known to ensnare small birds which, unable to escape, die of starvation.

14. AIZOACEAE

Annual or perennial herbs or low shrubs, erect or prostrate, usually succulent. Leaves opposite or rarely alternate, simple, flat, terete or triquetrous, fleshy. Inflorescence terminal or axillary; flowers solitary, clustered or in thyrses. Flowers actinomorphic, usually bisexual. Sepals (3–) 4–8, equal or usually unequal, sometimes petaloid. Petals numerous, in 1–several series, rarely absent. Stamens (1–) 4–many. Ovary inferior, semi-inferior or superior; locules 1–many; ovules 1–many per locule. Fruit a capsule opening in a variety of ways or indehiscent.

A family of c. 150 genera and 2400 species, cosmopolitan but mainly from southern Africa; 3 genera native on the Islands.

Many species of this family are cultivated in collections of succulent plants, especially

those related to or generally referred to as *Mesembryanthemum*.

Morphologically, the many 'petals' in some members of this family (*e.g. Carpobrotus*) are considered to be petaloid staminodes.

G.Bentham, Ficoideae *p.p.*, *Fl. Austral.* 3: 322–334 (1866); H.Herre (ed.), *The Genera of the Mesembryanthemaceae* (1971); A.Prescott & J.Venning, Aizoaceae, *Fl. Australia* 4: 19–62 (1984).

KEY TO GENERA

1 Leaves opposite, three-angled or rounded in cross-section, many times longer than wide

2 Flowers 4–6 cm diam., daisy-like with numerous magenta petals; fruit indehiscent, fleshy **1. CARPOBROTUS**

2: Flowers 1–2.5 cm diam., with 5 fleshy perianth lobes pink to ±purple on the inside; fruit a circumscissile capsule **3. SESUVIUM**

1: Leaves alternate, ±flat, ovate-rhomboid; flowers c. 1 cm diam., yellow inside; fruit a horned or fleshy capsule **2. TETRAGONIA**

1. CARPOBROTUS

Carpobrotus N.E.Br., *Gard. Chron.* ser. 3, 78: 433 (1925); from the Greek *karpos* (fruit) and *brotos* (edible), referring to the edible fruits.

Type: *C. edulis* (L.) N.E.Br. ex E.Phillips

Prostrate, succulent perennials, rooting at nodes, glabrous. Leaves opposite, triquetrous, very succulent, basally connate, ensheathing stem. Flowers solitary, terminal, bisexual. Sepals 5, with 2 larger than others, triquetrous and opposite, smaller 3 with membranous margins. Petals numerous, yellow, pink, purple or white. Stamens numerous. Ovary inferior; locules and styles 6–14; placentation parietal. Fruit indehiscent, fleshy. Seeds numerous.

A genus of 20–30 species distributed along the coasts of south-western North America and western South America, South Africa and Australia; 1 species native on both Islands.

Carpobrotus glaucescens (Haw.) Schwantes, *Gartenflora* 77: 69 (1928)

Mesembryanthemum glaucescens Haw., *Syn. Pl. Succ.* 236 (1812). T: Botany Bay, Australia, *S.T.Blake 19677*; neo: BRI, *fide* S.T.Blake, *Contr. Queensland Herb.* 7: 23 (1969). So named because of the glaucescent bloom on the leaves.

[*Mesembryanthemum australe auct. non* Aiton: S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 72 (1833); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 137 (1917); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 45: 564 (1920)]

[*Mesembryanthemum aequilaterale auct. non* Haw.: C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 3 (1870); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 705 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 26 (1915); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 137 (1917)]

Illustrations: V.Scarth-Johnson, *Wildfl. Warm E. Coast* 77 (1967); S.T.Blake, *Contr. Queensland Herb.* 7: 47, 48, figs 4, 5 (1969); S.W.L.Jacobs & J.Highet in G.J.Harden, *Fl. New South Wales* 1: 198 (1990).

Stems prostrate, to 2 m long. Leaves 3–10 cm long, 0.8–1.5 cm broad, slightly glaucous; adaxial and lateral faces flat, becoming convex towards base; keel crenulate in upper part, smooth below. Flowers 4–6 cm diam.; pedicels 1–3 cm long. Petals magenta, white at base. Stamens 300–400, in 5 or 6 series. Styles 7–10. Fruit ellipsoidal, 2–3 cm long, reddish, tasting like salty strawberry jam. *Pigface, Iceplant*.

Norfolk Is., Lord Howe Is. Very common on coastal cliffs. Also native in Australia (southern Qld, coastal N.S.W.).

N.Is.: Rocky Point, *P.S.Green 1473* (A); Kingston, *P.S.Green 2446* (K). **L.H.Is.:** S end of Middle Beach, *J.Pickard* in *A.N.Rodd 1425* (K, NSW); E end of Neds Beach, *G.Uhe 1268* (K).

2. TETRAGONIA

Tetragonia L., *Sp. Pl.* 1: 480 (1753); *Gen. Pl.* 5th edn, 215 (1754); from the Greek *tetra* (four) and *gonia* (an angle), in allusion to the shape of the fruit in these plants.

Type: *T. fruticosa* L.

Succulent herbs or subshrubs, trailing or erect. Leaves alternate, entire, ±fleshy. Flowers bisexual, axillary, solitary or in small clusters, sessile or pedicellate. Perianth lobes 3–5. Stamens 1–many; staminodes absent. Ovary inferior or semi-inferior; locules and styles 2–10; ovule apical, 1 per locule. Fruit indehiscent, dry or succulent; endocarp hard, winged, horned or spiny.

A genus of 50–60 species from eastern Asia, Australia, New Zealand, the Pacific, temperate South America and Africa, especially southern Africa; 2 native species on Norfolk and Lord Howe Islands. It is sometimes separated into its own family, the Tetragoniaceae.

Fruit succulent, subglobose, 5–8 mm long, not horned	**1. T. implexicoma**
Fruit dry, subglobose to top-shaped, c. 12 mm long, horned	**2. T. tetragonioides**

1. Tetragonia implexicoma (Miq.) Hook.f., *Fl. Tasman.* 1: 148 (1856)

Tetragonella implexicoma Miq. in J.G.C.Lehmann, *Pl. Preiss.* 1: 246 (1845), as *amplexicoma*. T: Rottnest Island, W. Australia, *J.A.L.Preiss 2393*; holo: ?U *n.v.*; ?iso: K. The epithet comes from the Latin *implexus* (tangled) and *coma* (foliage, originally hairs of the head), in allusion to the tangled nature of the type material.

Tetragonia expansa var. *strongylocarpa* Endl., *Prodr. Fl. Norfolk.* 73 (1833); *T. strongylocarpa* (Endl.) W.R.B.Oliv., *Trans. & Proc. New Zealand Inst.* 49: 137 (1917). T: Norfolk Island, *F.L.Bauer*; holo: W *n.v.*, probably destroyed.

Tetragonia trigyna Banks & Sol. ex Hook.f., *Handb. N. Zeal. Fl.* 84 (1864). T: North Island, New Zealand, *J.Banks & D.Solander*; holo: BM.

Illustrations: L.B.Moore & J.B.Irwin, *Oxford Book New Zealand Pl.* 45, fig. 1 (1978), as *T. trigyna*; A.Prescott, *Fl. Australia* 4: 43, fig. 11e (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 205, fig. 119 (1986).

Prostrate or scrambling herb or subshrub, to 3 m long. Leaves alternate but often clustered, fleshy, papillose; petiole 3–15 mm long; lamina ovate-rhomboid to lanceolate to almost linear, 2–5 cm long. Flowers solitary; pedicels slender, 5–30 mm long. Perianth lobes 4, oblong, c. 3 mm long, papillose-hairy outside, yellow inside. Stamens 12–20. Ovary semi-inferior; locules and styles 2 (rarely 3). Fruit subglobose, 5–8 mm long, red, succulent. *Native Spinach, New Zealand Spinach.* Fig. 20.

Norfolk Is., Lord Howe Is. Common in coastal areas on Norfolk Is., for example on slopes in open forest, perhaps less common or even extinct on Lord Howe Is. Also found on the southern coasts of Australia and those of New Zealand, including the Kermadec Islands.

N.Is.: near Ball Bay, *P.S.Green 2401* (K); *s. loc., J.D.McComish 52* (K). **L.H.Is.:** *s. loc., J.D.McComish 118* (K).

2. Tetragonia tetragonioides (Pall.) Kuntze, *Revis. Gen. Pl.* 1: 264 (1891)

Demidovia tetragonioides Pall., *Enum. Hort. Demidof* 150, t. 1 (1781); *Tetragonia expansa* Murray, *Commentat. Soc. Regiae Sci. Gott.* 6: 13 (1783), *nom. illeg.*; *Tetragonia expansa* var. *cornuta* (Gaertn.) Endl., *Prodr. Fl. Norfolk.* 72 (1833), *nom. illeg.* T: cultivated in the garden of A.Demidof; holo: not traced. The epithet, first used in *Demidovia*, means like *Tetragonia*.

Illustrations: B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 73, fig. 38e (1983); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 205, fig. 120 (1986); S.W.L.Jacobs & J.Highet in G.J.Harden, *Fl. New South Wales* 1: 194, t. 14 (1990).

Annuals or perennials, prostrate or decumbent, ±papillose and vesicular-scaly. Leaves with petiole 3–20 mm long; lamina thick, ovate-rhomboid to lanceolate, (1–) 2–6 (–10) cm long, narrowing into petiole at base. Flowers solitary, sessile or with pedicels to 2 mm long. Perianth lobes 5, oblong, 2 mm long, green and papillose outside, yellow inside. Stamens 10 or more. Ovary semi-inferior, papillose; locules and styles 5–10. Fruit subglobose to top-shaped, c. 12 mm long, dry, leathery, bony, with 2 large and a number of smaller, straight or curved horns, sometimes strongly angled and barely horned. *Native Spinach*, *New Zealand Spinach*. Fig. 39B.

Norfolk Is., Lord Howe Is. A native of coastal cliffs, stabilised sand and similar habitats near the sea. Also known from New Zealand, the Kermadec Islands, Australia, New Caledonia, some of the islands of the Pacific and south-western South America.

N.Is.: Emily Bay, *I.R.H.Telford 7207* (CBG); Rocky Point, *P.S.Green 1470* (A); *s. loc., J.D.McComish 52A* (K). **L.H.Is.:** E end of Neds Beach, *G.Uhe 1258* (K); the Clear Place, *M.D.Crisp 4475 & I.R.H.Telford* (CBG); Blinky Beach, *P.S.Green 1626* (A).

Adventitious buds sometimes develop on the persistent perianth and develop into small, but sometimes fertile, flowers.

3. SESUVIUM

Sesuvium L., *Syst. Nat.* 10th edn, 1052, 1058 & 1371 (1759); the derivation of the name is unknown, although it has been suggested that it may be in memory of the Sesuvii, a Gallic tribe of Roman Gaul. (I.R.H.Telford, *Fl. Australia* 50: 107, 1993).

Type: *S. portulacastrum* (L.) L.

Perennial herbs or subshrubs, prostrate or ascending, succulent, glabrous. Leaves opposite, fleshy, entire. Flowers axillary, solitary or clustered. Perianth lobes 5, narrowly triangular, connate at base; apices slightly hooded with a subapical, dorsal mucro. Stamens 5–many. Ovary superior; locules and styles 2–5; ovules numerous, axile. Capsule circumscissile.

A genus of c. 8 species, characteristic of tropical and subtropical saline habitats, with one species, the following, pantropical in maritime situations, including on Lord Howe Is.

Sesuvium portulacastrum (L.) L., *Syst. Nat.* 10th edn, 1058 (1759)

Portulaca portulacastrum L., *Sp. Pl.* 1: 446 (1753). T: Curaçao; lecto: t. 212 in P.Hermann, *Parad. Bat.* (1698), *fide* O.Wijnands, *Bot. Commelins* 175 (1983). The epithet is derived from the generic name *Portulaca* plus the Latin suffix *-astrum* which indicates a diminutive of some sort.

Illustrations: A.W.Whistler, *Coastal Fl. Trop. Pacific* 60 (1980); A.Pescott, *Fl. Australia* 4: 43, fig. 11N–O (1984); S.W.L.Jacobs & J.Highet in G.J.Harden, *Fl. New South Wales* 1: 193 (1990).

Herb, prostrate or decumbent, somewhat woody at base. Stems often reddish, up to 1 m long. Leaf lamina linear to narrowly elliptic, 2–7 cm long, 0.2–1.5 cm broad, connate at base, smooth, succulent. Flowers solitary. Perianth tube 3 mm long; lobes fleshy, triangular, 6–9 mm long, green outside, pink, lavender, or reddish purple inside. Stamens numerous; anthers purple. Ovary ovoid; locules and styles 3. Seeds shining, black.

Lord Howe Is. Growing in rocky habitats near the sea, but not common. In such habitats it is pantropical and subtropical.

L.H.Is.: Neds Beach, *M.D.Crisp 4568 & I.R.H.Telford* (CBG); E end of Neds Beach, *G.Uhe 1239* (K).

15. CHENOPODIACEAE

Herbs (rarely shrubs or trees), glabrous or with vesicular hairs, often halophytic. Leaves usually alternate, sometimes opposite and reduced, simple; stipules absent. Inflorescence cymose, spicate or paniculate, or reduced to a solitary axillary flower. Flowers actinomorphic, bisexual or unisexual, usually small, greenish. Perianth usually 2–5-lobed, rarely absent, often persistent and accrescent in fruit. Stamens usually equal in number to and opposite perianth lobes. Ovary superior, rarely semi-superior, 1-locular; 1-ovulate; stigmas usually 2 or 3. Fruit usually a nutlet or achene, often utricular, rarely a berry.

A cosmopolitan family of c. 120 genera and 1400 or more species, especially adapted for xerophytic and halophytic habitats; 1 native and 2 introduced genera on Norfolk and Lord Howe Islands.

Theleophyton (*T. billardierei* (Moq.) Moq.) was erroneously recorded for Norfolk Is. in J.C.Willis, *Dict. Fl. Pl. & Ferns* 7th edn, 1116 (1966) because of a specimen from Philip Is. in Victoria, not Philip Is. just south of Norfolk Is.

Although *Rhagodia baccata* (Labill.) Moq. (as *R. billardierei* R.Br.) was recorded from Lord Howe Is. by Charles Moore (in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 4, 1870), and, on the strength of this, repeated by W.B.Hemsley and by W.R.B.Oliver in their accounts of the flora, it seems never to have been recollected. The record was doubted by A.N.Rodd & J.Pickard (*Cunninghamia* 1: 278, 1983). No specimen to support such a record has been traced and it is strongly suspected that the report of *Rhagodia* was a misidentified field record of *Atriplex cinerea* Poir.

G.Bentham, Chenopodiaceae, *Fl. Austral.* 5: 150–208 (1870); P.G.Wilson, Chenopodiaceae, *Fl. Australia* 4: 81–317 (1984).

KEY TO GENERA

1 Plants with obvious, petiolate leaves; stems not articulate

2 Flowers unisexual; female without perianth, enclosed in a pair of ±rhomboid bracteoles; seeds vertical — **1. ATRIPLEX**

2: Flowers bisexual or female; female with 5 perianth lobes, not enclosed by a pair of bracteoles; seeds usually horizontal — **2. CHENOPODIUM**

1: Plants with fleshy, cylindrical, articulated stems fused with much modified, opposite leaves — **3. SARCOCORNIA**

1. ATRIPLEX

Atriplex L., *Sp. Pl.* 2: 1052 (1753); *Gen. Pl.* 5th edn, 472 (1754); the ancient Latin name for one of the species.

Type: *A. hortensis* L.

Annual or perennial herbs or small shrubs, monoecious or dioecious, usually covered with vesicular hairs which on collapse give a farinose or scaly covering. Leaves usually alternate, flat, entire, toothed or lobed, often hastate. Flowers unisexual, small, in axillary spicate or paniculate clusters. Male flowers with (3–) 5 perianth lobes; bracts and bracteoles absent; stamens (3–) 5. Female flowers without perianth; bracteoles 2, free or fused in lower half, entire or dentate, accrescent and sometimes developing appendages in fruit; stigmas 2. Seeds vertical, lenticular.

A genus of 200–250 species distributed throughout the world, especially in temperate and warm temperate regions, and particularly characteristic of saline habitats; 2 species

naturalised and 1 native on the Islands.

1 Annuals; leaves triangular to hastate **1. A. prostrata**

1: Perennials; leaves oblong-elliptic to narrowly lanceolate

2 Plant prostrate or decumbent, to c. 20 cm tall; male flowers in small glomerules 2–3 mm diam. in upper axils **2. A. semibaccata**

2: Plant spreading to erect, to 1 m tall or more; male flowers in dense, prominent glomerules 3–7 mm diam., forming dense terminal spikes or panicles **3. A. cinerea**

1. *Atriplex prostrata Boucher ex DC. in J.B.A.P. de M. de Lamarck & A.P. de Candolle, *Fl. Franç*. 3rd edn, 3: 387 (1805)

T: France, *J.A.G.Boucher de Crèvecoer*; holo: ?G *n.v.*, IDC microfiche 800/2.2150/6. So named from its frequently prostrate habit.

[*Atriplex hastata auct. non* L.: A.N.Rodd & J.Pickard, *Cunninghamia* 1: 276 (1983)]

Illustrations: G.Hegi, *Fl. Ill. Mitt.-Eur*. 2nd edn, 3(2): t. 97, fig. 3 (1979); H.D.Wilson, *Stewart Is. Pl*. 151, fig. 196 (1982), both as *A. hastata*; S.W.L.Jacobs in G.J.Harden, *Fl. New South Wales* 1: 213 (1990).

Annual herb, prostrate to erect, to 50 cm or more tall, monoecious, ±farinose. Leaves opposite or alternate, petiolate; lamina triangular to hastate, 1–2.5 (–3) cm long, diminishing in size upwards, truncate at base with lobes, where present, spreading, entire to ±dentate on margins, obtuse to acute. Inflorescence paniculate-spicate; male and female flowers mixed, in glomerules. Fruiting bracteoles sessile, ovate-triangular to rhombic, 3–6 mm long, free or shortly united at base, entire or shortly dentate, dorsally smooth.

Lord Howe Is. Perhaps a relatively recent introduction, not having been recorded before 1970. A native of Europe which has spread widely as a ruderal.

L.H.Is.: near North Beach, *A.N.Rodd 1747* (K, NSW); behind Old Settlement Beach, *L.A.S.Johnson & A.N.Rodd 1233* (NSW); mouth of Big Ck, *J.Pickard 3364* (NSW).

2. *Atriplex semibaccata R.Br., *Prodr*. 406 (1810)

T: Port Jackson, Australia, *R.Brown*; holo: BM; iso: K. The epithet alludes to the partially baccate, or succulent, fruit in some populations of this species.

Illustrations: G.M.Cunningham *et al*., *Pl. W New South Wales* 245 (1981); P.G.Wilson in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 250, fig. 151L (1986); S.W.L.Jacobs in G.J.Harden, *Fl. New South Wales* 1: 212 (1990).

Perennial herbs, prostrate or decumbent, to c. 20 cm tall, monoecious. Branches slender, hard, spreading from a taproot. Leaves alternate; petiole 0.6–2 mm long; lamina thin, oblong-elliptic, 1–3 cm long, acutely attenuate at base, entire to sinuate-dentate, rounded to obtuse at apex, glabrous above, scaly to glabrescent below. Male flowers in small glomerules, 2–3 mm diam., in upper axils. Female flowers in scattered, axillary clusters or solitary. Fruiting bracteoles attenuate into a 0.5 mm pedicel, rhomboid-triangular, c. 2 mm broad (to 5 mm elsewhere), united at base, entire or with 1 or more small marginal teeth, dorsally strongly reticulate (somewhat succulent in parts of southern Australia).

Norfolk Is. Fairly recently recorded from Duncombe Bay, and possibly a recent arrival there. Native to southern Australia.

N.Is.: Duncombe Bay, *W.R.Sykes NI 635* (CHR); *loc. id.*, *P.S.Green 2430* (K).

3. Atriplex cinerea Poir. in J.B.A.P. de M. de Lamarck, *Encycl.* Suppl. 1: 471 (1811)

T: Australia; *J.J.H. de Labillardière*; holo: ?P *n.v.* The epithet means ashen or ash-coloured, from *cinis* (ashes), in allusion to the colour of the leaves.

Atriplex cinerea var. *typica* Aellen, *Bot. Jahrb Syst*. 68: 392 (1938), *nom. inval.*

Atriplex cinerea f. *appendiculata* Aellen, *op. cit*. 394. T: Lord Howe Island, *J.MacGillivray 716*; holo: K.

Illustrations: W.R.Elliot & D.L.Jones, *Encycl. Austral. Pl.* 2: 255 (1982); P.G.Wilson, *Fl. Australia* 4: 93,

fig. 21Q (1984); S.W.L.Jacobs in G.J.Harden, *Fl. New South Wales* 1: 211 (1990).

Shrub, spreading to erect, to 1 m tall, dioecious or monoecious. Leaves alternate; petiole 1–2 mm long; lamina lanceolate to narrowly lanceolate, elliptic or narrowly elliptic, 2.5–8 cm long, acute to attenuate at base, entire, acute with a blunt tip, scurfy-grey on both surfaces. Male flowers in dense wine-red glomerules, 3–7 mm diam., forming dense, terminal, interrupted or continuous spikes or panicles. Female flowers solitary or in small clusters in upper axils. Fruiting bracteoles subsessile, rhomboid, 4–7 mm long, dorsally smooth or with small appendages.

Lord Howe Is. Here and there near the sea in stabilised sand *etc.* on Lord Howe Is. Also native around the south coast of Australia from W.A. to southern N.S.W.

L.H.Is.: Stevens Point, *A.C.Beauglehole 5993* (CANB); Middle Beach, *P.S.Green 1697* (A, K); *R.D.Hoogland 8636 & 8637* (CANB); *loc. id., J.Pickard* in *A.N.Rodd 1417* (K, NSW); Neds Beach, *M.D.Crisp 4567 & I.R.H Telford* (CBG).

The record of *A. cinerea* from Norfolk Is. rests solely on the strength of the von Hügel specimen cited by Aellen at Vienna (*Bot. Jahrb. Syst.* 68: 392, 1938) which was destroyed at the end of World War II. In the absence of any other supporting collections, and in view of the fact that von Hügel collected in Australia as well, it is possible that this specimen had been mislabelled.

2. CHENOPODIUM

Chenopodium L., *Sp. Pl.* 1: 218 (1753); *Gen. Pl.* 5th edn, 103 (1754); from the Greek *chen* (goose) and *podion* (little foot), derived from the folkname *Goosefoot*, alluding to the shape of the leaves in some species.

Type: *C. album* L.

Annual or perennial herbs, rarely shrubby, mealy with vesicular hairs which on collapse form a farinose or scaly covering, or with glandular hairs, or glabrous. Stems usually angled, striped white, red or green. Leaves alternate, flat, entire, lobed or toothed. Flowers bisexual or female, sessile, usually in glomerules, arranged in dense spikes or panicles; bracteoles absent. Perianth lobes 2–5, incurved, greenish, usually connate at base. Stamens (1–) 2–5. Ovary superior; stigmas 2 or 3 (–5). Fruit indehiscent; pericarp thin. Seed usually horizontal; testa variously sculptured.

A cosmopolitan but mostly temperate genus of c. 150 species; 3 species naturalised on the Islands.

1 Plant with yellowish glands, especially on underside of leaves, aromatic; leaves lanceolate to elliptic, coarsely serrate or incised **3. C. ambrosioides**

1: Plant ±farinose, at least on younger parts, not glandular

2 Leaf margins entire or shallowly dentate; panicles ±narrow; seeds with a blunt keel; pericarp relatively easily removed from seeds by rubbing **1. C. album**

2: Leaf margins coarsely dentate with ascending, acute teeth; panicles much branched; seeds acutely keeled; pericarp difficult to remove by rubbing **2. C. murale**

1. *Chenopodium album L., *Sp. Pl.* 1: 219 (1753)

T: Europe, *coll. unknown*; lecto: LINN 313.8 *n.v., fide* J.P.M.Brenan, *Fl. Trop. E. Africa*, Chenopodiaceae 6 (1954); IDC microfiche 177/2.171/11. Often called White Goosefoot, the epithet, *album* (white), was applied to this species, in contrast to *C. rubrum*, Red Goosefoot or *C. viride*, Green Goosefoot.

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 259 (1981), as Fat hen; B.A.Auld & R.W.Medd, *Weeds* 148 (1987); S.W.L.Jacobs in G.J.Harden, *Fl. New South Wales* 1: 220, t. 12 (1990).

Erect annual to c. 1 m tall, ±grey-farinose throughout. Stem green or red tinged; side branches often rather short. Leaf lamina variable, rhombic-ovate to lanceolate, with upper leaves narrower, 1.5–8 cm long, cuneate (to truncate) at base, entire or shallowly dentate,

acute. Inflorescences terminal and axillary, of relatively narrow panicles of aggregated glomerules. Perianth lobes 5, 0.5–2.5 mm long, dorsally keeled, green, farinose. Pericarp easily detached from seeds. Seed horizontal, 1–1.6 mm diam., bluntly keeled; testa glossy black, generally smooth with faint radial furrows.

Norfolk Is. A weed of disturbed soils, recorded only recently and possibly a relatively new arrival. A native of Europe and now a worldwide weed in temperate and warm temperate regions.

N.Is.: near Steels Point, *W.R.Sykes NI 498* (CHR); Bumbora Rd, *W.R.Sykes NI 833* (CHR).

2. *Chenopodium murale L., *Sp. Pl.* 1: 219 (1753)

T: Europe, *coll. unknown*; lecto: LINN 313.6 *n.v.*, *fide* J.P.M.Brenan, *Fl. Trop. E. Africa*, Chenopodiaceae 7 (1954); IDC microfiche 177/2.171/8. The epithet means connected with walls, from the Latin *murus* (a wall) and the suffix *-alis*.

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 261 (1981), as Nettle-leaf Goosefoot; B.A.Auld & R.W.Medd, *Weeds* 149 (1987); S.W.L.Jacobs in G.J.Harden, *Fl. New South Wales* 1: 220 (1990).

Erect annual to c. 1 m tall, somewhat farinose. Stems green, much branched. Leaf lamina variable, usually rhombic-ovate, 2–9 cm long, narrowly to broadly cuneate at base, coarsely dentate with ascending acute teeth, acute. Inflorescences terminal and axillary, of compact cymes in much branched panicles to c. 5 cm long. Perianth lobes 5, 0.5–1 mm long, bluntly keeled towards apex. Pericarp not easily detached from seed. Seeds horizontal, 1–1.5 mm diam., acutely keeled; testa black, somewhat glossy, closely and minutely pitted.

Norfolk Is., Lord Howe Is. A common weed of waste places. Said to be a native of Europe and Asia but now a weed of cultivated ground and waste places worldwide.

N.Is.: Rocky Point, *P.S.Green 1450* (A); Philip Is., *P.S.Green 1495* (A); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW). **L.H.Is.:** above Middle Beach, *A.N.Rodd 1453* (K, NSW); S end of Blinky Beach, *L.A.S.Johnson & A.N.Rodd 1296* (K, NSW).

3. *Chenopodium ambrosioides L., *Sp. Pl.* 1: 219 (1753)

T: Lusitania, [Portugal], *coll. unknown*; lecto: LINN 313.13 *n.v.*, *fide* J.P.M.Brenan, *Fl. Trop. E. Africa*, Chenopodiaceae 10 (1954); IDC microfiche 177/2.171/8. The epithet means resembling *Ambrosia*, an unrelated genus of plants.

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 259 (1981), as Mexican Tea; B.A.Auld & R.W.Medd, *Weeds* 148 (1987); S.W.L.Jacobs in G.J.Harden, *Fl. New South Wales* 1: 218 (1990).

Annual or short-lived perennial to c. 1 m tall, variably hairy, with numerous sessile yellow glands, especially on undersides of leaves, strongly aromatic. Stems green, much branched. Leaf lamina variable, lanceolate to elliptic or narrowly elliptic, 2–10 cm long, cuneate at base, coarsely serrate or incised, ±acute. Inflorescence a much branched panicle of small, sessile glomerules, spicate along ultimate branches. Perianth lobes 3–5, variably connate, rarely keeled, glandular. Seeds horizontal or oblique, 0.5–1 mm diam., bluntly keeled; testa glossy dark brown, almost smooth with minute, irregular, shallow pits.

Norfolk Is. A weed of waste places, native to tropical America but now widespread in weedy habitats.

N.Is.: Emily Bay, *W.R.Sykes NI 577* (CHR); W end of Duncombe Bay, *W.R.Sykes NI 638* (CHR); *s. loc.*, *J.D.McComish 170 & 170A* (NSW).

At one time a collection from Norfolk Is. was misidentified and reported as *C. pumilio* R.Br. in an unpublished, locally distributed typed list.

3. SARCOCORNIA

Sarcocornia A.J.Scott, *Bot. J. Linn. Soc*. 75: 366 (1977); from the Greek *sarx* (flesh) and *cornu* (a horn), in allusion to the fleshy, horn-like shoots.

Type: *S. perennis* (Mill.) A.J.Scott

Perennial herbs or subshrubs. Stems cylindrical, succulent, articulated. Leaves opposite, much reduced, basally connate and fused to the fleshy internodes. Inflorescence terminal, a spike-like thyrse of sessile, 3–12-flowered cymules sunk into cavities in axis. Flowers bisexual or unisexual by abortion. Perianth lobes 3 or 4, 2 lateral and 1 adaxial (and sometimes 1 abaxial), all united; apex truncate, exposed, the orifice a vertical slit. Stamens 2. Fruiting perianth spongy, separating from the axis; pericarp membranous. Seed ovate or orbicular.

A cosmopolitan genus of halophytes containing c. 15 species; 1 species native to Norfolk and Lord Howe Islands.

Sarcocornia quinqueflora (Bunge ex Ung.-Sternb.) A.J.Scott, *Bot. J. Linn. Soc*. 75: 368 (1977)

Salicornia quinqueflora Bunge ex Ung.-Sternb., *Vers. Syst. Salicorn*. 59 (1866). T: South Australia, *F.Mueller*; lecto: K, *fide* P.G.Wilson, *Nuytsia* 3: 71 (1980). The epithet comes from the Latin *quinque* (five) and *flos* (a flower), alluding to the group of five flowers at the nodes in the inflorescence.

Salicornia australis Sol. ex F.Muell., *Fragm*. 7: 15 (1869). T: South Australia, *R.Brown*; holo: BM.

Illustrations: J.Galbraith, *Field Guide Wild Fl. SE Australia* t. 58/1 (1977), as *Salicornia quinqueflora*; P.G.Wilson, *Fl. Australia* 4: 279, fig. 49A, B (1984); S.W.L.Jacobs in G.J.Harden, *Fl. New South Wales* 1: 239, t. 12 (1990).

Erect or decumbent subshrub, to 50 cm tall. Branches slender, of cylindrical (to narrowly obovoid) articulated nodes, 5–15 mm long, 2–4 mm diam. Inflorescence spikes 20–40 mm long, 4–5 mm diam. in fruit; cymules 5–9-flowered in a single row. Perianth with a small adaxial lobe and a minute abaxial lobe. Seed circular with acute, sometimes slightly hooked hairs. *Samphire*. Fig. 18.

Norfolk Is., Lord Howe Is. On coralline rocks beside the sea, within the splash-zone. Although known from Lord Howe Is. for some time, it was only relatively recently discovered by Peter Coyne on the southernmost tip of Philip Is., off Norfolk Is., an area which can only be approached from the sea. It is also native along the coasts of southern and eastern Australia, New Zealand and New Caledonia.

N.Is.: Gannet Point, Philip Is., 1982, *P.Coyne* (K). **L.H.Is.:** North Bay, *P.S.Green 1581* (K); opposite South Entrance, *G.Uhe 1331* (K).

The plant on the Islands appears to be subsp. *quinqueflora*.

16. AMARANTHACEAE

Herbs or shrubs, rarely trees. Leaves alternate or opposite, simple, exstipulate. Inflorescence axillary or terminal, of racemes, spikes, fascicles, panicles or flowers solitary. Flowers small, bisexual or unisexual, usually with a scarious bract and sessile within 2 scarious bracteoles. Perianth lobes (2–) 3–5, free or shortly connate, imbricate, usually scarious. Stamens (2–) 3–5, opposite perianth lobes, free or united below to form a tube, often alternating with pseudostaminodes. Ovary superior, 1-locular; ovules 1–many; styles 1–3 (–8). Fruit usually a utricle, sometimes baccate, indehiscent, irregularly dehiscent or circumscissile. Seeds l–many, often lenticular.

A family of c. 70 genera and 800 species, mainly tropical or warm temperate, especially from Africa and America; 1 native and 2 introduced genera on the Islands.

Centrostachys aquatica (R.Br.) Wall. was recorded for Norfolk Is. by Moquin-Tandon (in A.L.P.P. de Candolle, *Prodr.* 13(2): 321, 1849) in error, through misinterpreting an earlier observation by R.Brown. This error was repeated by others, but the species has never occurred on the Island.

G.Bentham, Amarantaceae, *Fl. Austral.* 5: 208–258 (1870); C.A.Backer, Amaranthaceae, *Fl. Males.* ser. I, 4: 69–98 (1949); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Amaranthaceae, *Fl. Java* 1: 232–239 (1963); A.Kanis, A review of the Amaranthaceae in Papuasia, *Contr. Herb. Austral.* 1: 1–18 (1972); C.G.G.J. van Steenis, Amaranthaceae, *Fl. Males.* ser. I, 6: 915 (1972); A.Kanis, Further Notes on the Amaranthaceae in Papuasia, *Contr. Herb. Austral.* 7: 8 (1974); C.C.Townsend, Amaranthaceae, in M.D.Dassanayaka & F.R.Fosberg (eds), *Revis. Handb. Fl. Ceylon* 1: 1–57 (1980).

KEY TO GENERA

1	Leaves alternate	**1. AMARANTHUS**
1:	Leaves opposite	
2	Inflorescences terminal spikes	**2. ACHYRANTHES**
2:	Inflorescences axillary, dense, ±globose	**3. ALTERNANTHERA**

1. AMARANTHUS

Amaranthus L., *Sp. Pl.* 2: 989 (1753); *Gen. Pl.* 5th edn, 427 (1754); from the Greek *a-* (not) and *maraino* (fade away), in allusion to the 'everlasting' nature of the flowers in some species.

Type: *A. caudatus* L.

Annuals or rarely perennials, monoecious (or dioecious). Leaves alternate, entire. Inflorescence terminal or axillary, clustered, spicate or paniculate. Flowers each subtended by 2 small bracteoles within a bract; bracteoles membranous, often spinescent. Perianth lobes (2–) 3 or 4 (–5), free, subequal, membranous, persistent. Stamens as many as perianth lobes, free; pseudostaminodes absent; anthers 2-locular. Ovary ovoid or oblong; styles short; stigmatic branches 2 or 3 (–4). Fruit dry, membranous, indehiscent, irregularly dehiscent or circumscissile, enclosed in persistent perianth. Seed solitary, vertically compressed, usually glossy.

A genus of c. 60 species from the tropics and warm temperate regions, worldwide; 1 species naturalised on Norfolk and Lord Howe Islands.

*Amaranthus blitum L., *Sp. Pl.* 2: 990 (1753)

T: Europe; holo: LINN 1117.74, *n.v.*; photo seen (IDC microfiche 177/2.665/6). The epithet is the old Greek and Roman name for this weed.

[*Amaranthus viridis auct. non* L.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 766 (1904); A.N.Rodd & J.Pickard, *Cunninghamia* 1: 275 (l983)]

Illustrations: E.E.Henty & G.H.Pritchard, *Weeds New Guinea & Control* 57 (1973); C.C.Townsend, *Fl. Trop. E. Africa,* Amaranthaceae 24, fig. 4/2, 32, fig. 5/3–4 (1985); S.W.L.Jacobs & L.Lapinpuro in G.J.Harden, *Fl. New South Wales* 1: 252 (1990), as *A. viridis*.

Erect or spreading annual, monoecious. Leaves glabrous; petiole slender, often equalling lamina; lamina broadly elliptic, or broadly ovate to ovate-rhomboid, 1–6 (–10) cm long, cuneate at base, apically broad, usually retuse or emarginate, prominently veined below with midrib usually prolonged into a small mucro. Inflorescence a terminal spike of flower clusters and short, spicate clusters in upper leaf axils; male and female flowers intermixed. Bracteoles shorter than perianth. Flowers green. Perianth lobes 3 (–5), ±narrowly oblong-spathulate, 1–2 mm long, acute. Fruit indehiscent or rupturing irregularly, subglobose,

1.25–1.5 mm long. Seeds round, compressed, 1–1.75 mm in diam., dark brown to black.

Norfolk Is., Lord Howe Is. A weed of disturbed ground, originally from southern Europe.

N.Is.: Kingston, buildings E of the church, *R.O.Gardner 5769* (AK); Kingston, the prison ruins, *P.S.Green 2445* (K); Melanesian Mission Creek, *P.S.Green 2444* (K). **L.H.Is.:** Lagoon Rd, Windy Point–Blinky Beach, *J.Pickard 2952* (NSW); W of Stevens Point, *A.C.Beauglehole 5522* (MEL); *s. loc., J.D.McComish 198* (NSW).

With fruits 1–1.5 mm long, if subspecies are recognised, it appears that it is subsp. *polygonoides* (Moq.) Probst that is represented on both Islands.

2. ACHYRANTHES

Achyranthes L., *Sp. Pl.* 1: 204 (1753); *Gen. Pl.* 5th edn, 96 (1754); from the Greek *achyron* (chaff) and *anthos* (flower), in allusion to the chaffy nature of the flowers.

Type: *A. aspera* L.

Herbs or shrubs, rarely trees. Leaves opposite, usually entire. Inflorescences terminal and axillary, spicate, many-flowered, often elongating after flowering. Flowers bisexual, each subtended by 2 bracteoles within a bract; bract scarious, persistent; bracteoles spiny, basally winged, deflexed after anthesis. Perianth lobes 4 or 5, ±equal, free, spreading during anthesis, afterwards erect, membranous, 1–3 (–5)-nerved; midrib often aristate in fruit. Stamens 2–5; filaments connate basally into a cup; pseudostaminodes short, broad; anthers 2-locular. Ovule solitary, pendulous; style short, slender; stigma capitate. Fruit a utricle, dry, indehiscent, falling with perianth and bracteoles.

A genus of 6 species, widely distributed in the warm temperate and tropical regions; 2 native species on the Islands.

Arborescent, to c. 9 m tall (N.Is.)	**1. A. arborescens**
Herbaceous or somewhat woody only at base, to c. 1 m tall (N.Is., L.H.Is.)	**2. A. aspera**

1. Achyranthes arborescens R.Br., *Prodr.* 417 (1810)

Centrostachys arborescens (R.Br.) Standl., *J. Wash. Acad. Sci.* 5: 75 (1915). T: Norfolk Island, *F.L.Bauer*; holo: K. So named because of the arborescent or tree-like habit.

Soft-wooded trees to 9 m tall. Leaf petiole 5–15 mm long, slender, with appressed hairs; lamina elliptic to slightly oblanceolate, (3–) 5–8 (–10) cm long, (1–) 2–3.5 (–4) cm broad (juvenile foliage larger), acute at base and attenuate onto petiole, irregularly very shallowly crenate, ciliolate, finely acute-acuminate, with appressed hairs on midrib beneath. Inflorescences terminal on side branches, 2–4 cm long, pilose; bracts ovate, 2.5–3 mm long, with margin broadly scarious in lower part, acute to aristate; bracteoles 3.5–5 mm long, with margins similar to bracts, clearly aristate, slightly recurved. Perianth lobes 4, lanceolate, 6–8 mm long, very acute, brownish red, outer 2 very slightly longer. Stamens 4; filament bases narrow, connate; pseudostaminodes 1 mm long. *Soft-Wood, Chaff-Tree.* Fig. 38F.

Norfolk Is. Endemic and now confined to small populations in a very few forested valleys. An endangered species.

N.Is.: SE Mt Bates, 1973, *O.Evans* (K); *loc. id., P.S.Green 2449* (K); between Palm Glen and Red Rd, *M.Lazarides 8096* (CANB, K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW); *s. loc., J.D.McComish 26* (K).

Apart from *A. mangarevica* Suess., from Mangareva Is., Polynesia, which is not quite as tall, this is the only truly arborescent member of the family.

Figure 38. A, MALVACEAE: *Abutilon julianae*, habit (I.Telford 10445 & K.Groeneveld, K). **B–C**, ELAEOCARPACEAE: *Elaeocarpus costatus*. **B**, flower; **C**, habit (**B–C**, J.McComish 106, K). **D–E**, STERCULIACEAE: *Ungeria floribunda*. **D**, habit; **E**, fruit (**D–E**, J.McComish 29, K). **F**, AMARANTHACEAE: *Achyranthes arborescens*, habit (A.Cunningham 89, K). Scale bars = 2 cm. Drawn by P.Halliday.

2. Achyranthes aspera L., *Sp. Pl.* 1: 204 (1753)

T: Ceylon [Sri Lanka]; lecto: Herb. Hermann No. 105 vol. 2: 69, right-hand specimen, BM, *fide* C.C.Townsend in E.Nasir & S.I.Ali *Fl. W. Pakistan* 71: 35 (1974). The epithet refers to the rough asperous nature of the infructescence.

Achyranthes canescens R.Br., *Prodr.* 417 (1810); *A. aspera* var. *canescens* (R.Br.) Drake, *Ill. Fl. Ins. Pacif.* 271 (1892). T: tropical Australia, *R.Brown*; holo: BM.

Illustrations: E.E.Henty & G.H.Pritchard, *Weeds New Guinea & Control* 54 (1973); A.W.Whistler, *Coastal Fl. Trop. Pacific* 52 (1980); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 138, fig. 17F (1983).

Perennial herb or subshrub, to c. 1 m tall. Leaves with petiole 0.3–2.5 cm long; lamina elliptic to broadly ovate, (2–) 3–7 (–9) cm long, (1.5–) 2.5–4.5 (–6) cm broad, rounded to cuneate at base, entire, densely ciliate, obtuse to acute at apex, somewhat appressed pilose to sericeous above and especially below. Inflorescence terminal, 5–15 cm long, elongating with anthesis; bract broadly ovate, 1.5–3 mm long, strongly aristate; bracteoles slightly longer. Perianth lobes 5, narrowly lanceolate, 4–6 mm long, white, pale green or tinged reddish; tips of bract and bracteoles becoming pungent, hardened and slightly reflexed. Stamens 5, filament bases broad, connate; pseudostaminodes ciliate. *Chaff-Flower*. Fig. 17.

Norfolk Is., Lord Howe Is. Probably native on coastal cliffs and similar habitats but becoming invasive and weedy on disturbed soil. Widespread throughout the world in tropical and warm temperate regions.

N.Is.: Steels Point, 1973, *O.Evans* (K); Rocky Point, *P.S.Green 1446* (A); s. *loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW). **L.H.Is.:** Middle Beach, *A.N.Rodd 1452* (K, NSW); Roach Is., *J.C.Game 69/274e* (K): N ridge of Mt Gower, *P.S.Green 1650* (A, K).

Treated here as one variable species, because the varieties and subspecies which have been recognised from time to time seem to overlap. They appear distinct in the Americas but merge in the Old World.

3. ALTERNANTHERA

Alternanthera Forssk., *Fl. Aegypt.-Arab.* 28 (1775); from the Latin *alternans* (alternating) and *anthera* (anther) because the stamens alternate with the pseudostaminodes.

Type: *A. achyranthes* Forssk.

Annual or perennial herbs. Leaves opposite, entire. Inflorescences axillary, of sessile or pedunculate heads or short spikes. Flowers small, bisexual, each subtended by 2 bracteoles within a persistent bract; bracteoles persistent or not. Perianth lobes 5, free, equal or unequal, persistent. Stamens 2–5, sometimes without anthers; filaments connate at base into a cup or tube; anthers 1-locular; pseudostaminodes large or small. Ovary with 1 pendulous ovule; style short; stigma capitate. Fruit an indehiscent utricle, thin-walled or corky. Seed lenticular.

A genus of c. 200 species, especially from warm temperate and tropical regions of the New World; 1 species naturalised on Norfolk Is.

***Alternanthera sessilis** (L.) R.Br. ex DC., *Cat. Pl. Horti Monsp.* 77 (1813)

Gomphrena sessilis L., *Sp. Pl.* 1: 225 (1753). T: Ceylon [Sri Lanka]; lecto: Herb. Hermann 2: 78, BM, *fide* J.A.Mears, *Taxon* 29: 89 (1980). The epithet refers to the sessile inflorescences.

Illustrations: E.E.Henty & G.H.Pritchard, *Weeds New Guinea & Control* 56 (1973); E.L.Hazelwood & G.G.Motter, *Handb. Hawaiian Weeds* 2nd edn, 137 (1983); C.C.Townsend, *Fl. Trop. E. Africa*, Amaranthaceae 123, fig. 29/11–14 (1985).

Annual or usually perennial herb, decumbent, usually much branched. Young stems with 2 opposite longitudinal rows of crisped hairs on alternate sides between nodes. Leaf lamina narrowly lanceolate to elliptic to obovate, 1–4 (–6) cm long, 0.4–1 (–1.5) cm broad, acute at base, attenuate onto petiole, acute at apex. Inflorescence sessile, 1–4 globose spikes c. 5 mm

diam.; bracts c. 1 mm long, scarious, white, persistent; bracteoles similar. Perianth lobes ovate-lanceolate, 1.5–2.5 mm long, white or tinged with pink, scarious, acute-subacuminate. Stamens 5, 2 bearing anthers; pseudostaminodes small, shortly filamentous. Fruit laterally compressed. Seed c. 1 mm diam., brown, shining.

Norfolk Is. A likely introduced weed; included here because of the record by R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 25 (1915), but no material from the Island has been seen and it is now probably extinct. Widespread through the tropics and subtropics.

N.Is.: *s. loc., W.Laing* (*fide* R.M.Laing *loc. cit.*).

17. PORTULACACEAE

Annual or perennial herbs or subshrubs, often succulent. Leaves opposite or alternate; stipules scarious or represented by bundles of hairs, or lacking. Inflorescences axillary or terminal, usually cymose or flowers solitary. Flowers bisexual, actinomorphic. Sepals 2, free or basally united. Petals (2–) 5 or 6 (–8), imbricate, free or basally connate. Stamens as many as petals and opposite them, or more, free or epipetalous. Ovary superior, half inferior or inferior, 1-locular; ovules l–many, basal; style usually divided or lacking; stigmas 2–5 or more. Fruit a capsule, valvate or circumscissile, rarely indehiscent. Seeds globose or reniform.

A family of c. 20 genera and 400 or more species; cosmopolitan, mostly from America; 1 genus introduced on Norfolk and Lord Howe Islands.

C.A.Backer & R.C.Bakhuizen van den Brink Jr, Portulacaceae, *Fl. Java* 1: 216–218 (1963); R.Geesink, Portulacaceae, *Fl. Males.* ser. I, 7: 121–133 (1971).

PORTULACA

Portulaca L., *Sp. Pl.* 1: 445 (1753); *Gen. Pl.* 5th edn, 204 (1754); the Roman name for the type species, which occurs in the Mediterranean region.

Type: *P. oleracea* L.

Annual or perennial herbs, usually succulent. Leaves opposite or alternate, mostly subsessile; stipules scarious or reduced to tufts of hairs. Inflorescence axillary or terminal; flowers clustered or solitary. Sepals shortly adnate to lower part of ovary. Petals 4–6 (sometimes 8), free or basally connate, usually obovate. Stamens 4–many. Ovary half-inferior; ovules 2–many; style with 2–several stigmatic arms. Capsule circumscissile.

A genus of 100 or more species, throughout tropical and warm temperate parts of the world; 1 species naturalised on Norfolk and Lord Howe Islands.

***Portulaca oleracea** L., *Sp. Pl.* 1: 445 (1753)

T: Spain, Herb. Linn. No 625.1; lecto: LINN, *fide* R.Geesink in *Blumea* 17: 292 (1969); IDC microfiche 177/2.316/11. The epithet comes from the Latin *olus eris* (vegetables or greens), alluding to the use of this plant from ancient times as a pot-herb.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 106, fig. 13H (1983); J.G.West in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 217, fig. 135 (1986); B.A.Auld & R.W.Medd, *Weeds* 210 (1987).

Semi-prostrate succulent annual. Leaves alternate to subopposite; petiole short; axillary hairs to 1 mm long; lamina oblanceolate to obovate, (0.5–) 1–3 cm long, sometimes less, cuneate at base, obtuse to very slightly retuse. Inflorescences terminal; clusters sessile with 1–several flowers, overtopped by subapical branches. Sepals ovate to lanceolate, c. 5 mm long, slightly hooded. Petals 4–6, oblanceolate to obovate, c. 5 mm long, yellow, soon caducous. Stamens 6–15. Style 1–2 mm long; stigmatic branches 4–6, 1–2 mm long. Capsule ovoid, 3–7 mm

long. Seeds numerous, ovoid, c. 1 mm diam., shiny black, finely reticulate. *Portulaca*.

Norfolk Is., Lord Howe Is. A common weed of open and cultivated ground. Probably originally from the Mediterranean region but now spread worldwide in warm temperate and tropical areas.

N.Is.: Point Hunter, *W.R.Sykes NI 187* (CHR). **L.H.Is.:** W end of airstrip, *J.Pickard 2853* (NSW).

18. BASELLACEAE

Perennial climbers with slender twining stems from a tuberous root or rhizome. Leaves alternate, simple, entire, somewhat succulent; stipules absent. Inflorescence axillary or terminal, a raceme, spike or panicle, with each flower subtended by a small bract and 2–4 bracteoles; bracteoles sometimes petaloid. Flowers bisexual, actinomorphic. Sepals 5, petaloid, almost free to basally connate, usually persistent. Petals absent. Stamens 5, inserted at base of and opposite sepals; filaments short, free. Ovary superior, 1-locular with 1 basal ovule; style simple or 3-branched. Fruit indehiscent, a drupe, utricle or berry, surrounded by fleshy, persistent calyx and bracteoles.

A small pantropical family of 4 genera and c. 15 species; 1 genus introduced on Norfolk and Lord Howe Islands.

C.G.G.J. van Steenis, Basellaceae, *Fl. Males*. ser. I, 5: 300–304 (1957); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Basellaceae, *Fl. Java* 1: 239–240 (1963); B.Verdcourt, Basellaceae, *Fl. Trop. E. Africa*, Basellaceae: 1–4 (1968); A.C.Smith, Basellaceae, *Fl. Vit. Nova* 2: 280–281 (1981).

ANREDERA

Anredera Juss., *Gen. Pl*. 84 (1789); the meaning and origin of this name is unknown.

Type: *A. spicata* J.F.Gmel.

Branched vines with glabrous annual shoots from a fleshy rhizome. Leaves slightly succulent, sessile or petiolate. Inflorescence axillary, racemose or spicate, simple or branched; bracts persistent or caducous; bracteoles 2 pairs at pedicel apex; lower pair small, connate; upper pair petaloid, boat-shaped, often dorsally keeled. Sepals basally connate, becoming patent at anthesis, later becoming somewhat thickened and enclosing the fruit. Style variously 3-lobed; stigmas terminal. Fruit a globose utricle, enclosed in persistent sepals; pericarp fleshy or ±dry.

A genus of 5–10 species from warm temperate to tropical America; 1 species naturalised on Norfolk and Lord Howe Islands.

***Anredera cordifolia** (Ten.) Steenis, *Fl. Males*. ser. I, 5: 303 (1957)

Boussingaultia cordifolia Ten., *Ann. Sci. Nat., Bot.* ser. 3, l9: 355 (1853). T: cultivated, Naples; holo: ?NAP *n.v*. The epithet comes from the Latin *cordatus* (heart-shaped) and *folium* (a leaf), referring to the shape of the leaves.

Illustrations: V.H.Heywood, *Fl. Pl. World* 76, fig. 1 (1985); B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 76, fig. 41 (1983); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 218, fig. 136A (1986).

Slender perennial climber to 3 m or more, bearing tubers on roots and stems. Leaves with petiole 1–1.5 cm long; lamina broadly ovate to cordate, 2–10 cm long, acute to blunt at apex, variably fleshy. Racemes to 20 cm long, simple or with 2 or 3 branches, drooping, many-flowered; bracts narrow, c. 1.5 mm long; lower bracteoles 0.5–1 mm long, cupulate; upper bracteoles broadly elliptic to suborbicular, 1.5–2 mm long. Flowers white, fragrant; pedicels 1.5–3 mm long. Sepals elliptic-oblong to broadly elliptic, 1.5–3 mm long. Stamens white,

reflexed at apex, spreading at anthesis. Style white, variably split into 3 stigmatic arms. Fruit not known. *Madeira Vine* (L.H.Is.).

Norfolk Is., Lord Howe Is. An escape from cultivation, easily spreading and propagating itself by means of the stem tubers. Said to be a native of tropical America, it seems that only one clone is in cultivation worldwide as it is not known to set seed.

N.Is.: New Cascade Rd, *W.R.Sykes NI 608* (CHR); near Emily Bay, old cemetery, *W.R.Sykes NI 797* (CHR). **L.H.Is.:** E end of Old Settlement Beach, *A.N.Rodd 1715* (NSW).

19. CARYOPHYLLACEAE

Annual or perennial herbs, rarely small shrubs. Leaves opposite, rarely alternate or whorled, simple, entire, with or without stipules. Inflorescence usually terminal, usually bracteate, cymose. Flowers usually bisexual, actinomorphic. Sepals 4 or 5, free or connate. Petals free, 5 (rarely 4), imbricate, sometimes absent. Stamens usually twice as many as sepals, rarely fewer. Ovary superior, 1-locular; ovules usually numerous, placentation basal or free-central; styles and stigmas (1–) 2–5, free or basally united. Fruit a capsule, dehiscing with as many or twice as many teeth as styles, rarely an indehiscent achene or berry. Seeds usually sculptured; embryo curved.

A family of c. 80 genera and 2000 species; cosmopolitan, but especially to be found in the temperate and warm temperate parts of the Northern Hemisphere; 7 genera are introduced on the Islands.

G.Bentham, Caryophylleae, *Fl. Austral.* 1: 153–167 (1863).

KEY TO GENERA

1 Leaves without scarious stipules

2 Sepals free

3 Capsule valves or teeth 6, 8 or 10, twice as many as the styles; sepals 5; leaves broader than linear-subulate

4 Capsules with 6 or 10 apical teeth

5 Petals entire; capsules flask-shaped — **1. ARENARIA**

5: Petals deeply emarginate (very rarely absent); capsules narrowly cylindrical, somewhat curved — **3. CERASTIUM**

4: Capsules divided to below middle into 6 valves; petals very deeply bifid — **2. STELLARIA**

3: Capsules divided almost to base into 4 valves; styles 4; sepals 4; leaves linear-subulate — **4. SAGINA**

2: Sepals united, forming a subcylindrical tube

6 Inflorescence a spike-like monochasium, sometimes 1-flowered in small plants; capsule teeth 6 — **7. SILENE**

6: Inflorescence capitate, enclosed in scarious bracts, often reduced to 1 flower; capsule teeth 4 — **8. PETRORHAGIA**

1: Leaves with scarious stipules

7 Perennials; leaves narrowly elliptic to narrowly oblanceolate; fruit indehiscent or breaking open irregularly from the base — **5. PARONYCHIA**

7: Annuals; leaves obovate to suborbicular; fruit a dehiscent capsule — **6. POLYCARPON**

1. ARENARIA

Arenaria L., *Sp. Pl.* 1: 423 (1753); *Gen. Pl.* 5th edn, 193 (1754); from the Latin *arena* (sand) and the suffix *-arium* (indicating a container or the site of some activity), in allusion to the usual habitat for these plants.

Type: *A. serpyllifolia* L.

Annual, biennial or perennial herbs. Leaves opposite, ±linear to orbicular; stipules absent. Inflorescence a few to many-flowered cyme. Bracts with scarious margins. Sepals (4 or) 5, free. Petals (4 or) 5, usually entire, white or rarely pink. Stamens (8–) 10. Styles (2–) 3 (–5). Fruit a conical or cylindrical capsule, dehiscing with (4–) 5 (–10) narrow, acute teeth. Seeds numerous, reniform, smooth or tuberculate.

A genus of c. 150 species, especially from the Northern Hemisphere; 1 species naturalised on Lord Howe Is.

*Arenaria serpyllifolia L., *Sp. Pl.* 1: 423 (1753)

T: Europe; lecto: Herb. Clifford 173, *Arenaria* No 2, BM, *fide* C.E.Jarvis *et al.*, *Regnum Veg.* 127: 20 (1993). The epithet means leaves (Latin *folia*) like those of *Thymus serpyllum*, a wild thyme.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 5: t. 42 (1951); K.Chorney in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 220, fig. 137 (1986); A.Doust in G.J.Harden, *Fl. New South Wales* 1: 274 (1990).

Annual, rarely biennial herbs. Stems erect or ascending, 3–15 cm tall or more, usually branched at the base, puberulous, eglandular. Lower leaves slightly petiolate, upper sessile; lamina broadly ovate to ovate-lanceolate, 3–6 mm long, acute or acuminate, (rarely 1) 3- or 5-veined. Cyme diffuse, elongating in fruit; pedicels usually longer than sepals. Sepals 5, ovate, 2–4 mm long, acute, 3- or 5-veined; inner sepals scariously margined. Petals 5, elliptic, c. 1.5–3 mm long, entire, white. Stamens 10 (or fewer). Styles 5. Capsule flask-shaped, distinctly wider at base, slightly longer than sepals, dehiscing with 6 teeth. Seeds c. 0.5 mm diam., tuberculate, dark brown.

Lord Howe Is. An introduced weed, especially characteristic of sandy soils. A native of Europe, now a cosmopolitan weed

L.H.Is.: Old Settlement, *P.S.Green 2045* (K).

2. STELLARIA

Stellaria L., *Sp. Pl.* 1: 421 (1753); *Gen. Pl.* 5th edn, 193 (1754); the Latin name for plants with star-like flowers, from *stella* (a star).

Type: *S. holostea* L.

Annual or perennial herbs. Stems often fragile. Leaves opposite, glabrous or ciliate, sessile or petiolate; stipules absent. Inflorescence cymose, rarely 1- or 2-flowered. Bracts herbaceous or scarious. Sepals 5, free. Petals (4 or) 5 or absent, usually very deeply bifid, white or greenish. Stamens 10 (8 in 4-merous flowers) or fewer. Styles 3. Fruit a globose or cylindrical capsule, opening by 6 valves. Seeds 4–10, ovate, flattened, tuberculate or papillose.

A genus of c. 130 species; cosmopolitan, but found especially in temperate regions; 1 species naturalised on Norfolk and Lord Howe Islands.

*Stellaria media (L.) Vill., *Hist. Pl. Dauphiné* 3: 615 (1779)

Alsine media L., *Sp. Pl.* 1: 272 (1753). T: Europe, Herb. Linn. 388.1; lecto: LINN, *fide* W.B.Turrill, *Fl. Trop. E. Africa*, Caryophyllaceae 24 (1956); IDC microfiche 177/2.208/9. The epithet means middling or intermediate (in size).

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 307 (1981), as Chickweed; K.Chorney in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 234, fig. 148 (1986); B.A.Auld & R.W.Medd, *Weeds* 147 (1987).

Annual herb; stems weak, decumbent or ascending, with a single line of hairs down each internode. Lower leaves petiolate; lamina ovate, 3–20 mm long, acute-subacuminate. Upper leaves ±sessile; lamina ovate to broadly lanceolate-elliptic, to 30 mm long or more. Inflorescence terminal, flowers in axils of leaf-like bracts; pedicels slender. Sepals lanceolate, 3–7 mm long, scarious on margins, dorsally pilose. Petals slightly shorter or slightly longer than sepals, deeply bifid. Stamens (1–) 3–5 (–10) or sometimes absent. Capsule narrowly ovoid, divided to below middle into 6 valves, equal to or somewhat longer than sepals; fruiting pedicels curved downwards. Seeds 9–13 mm diam., dark reddish brown, tuberculate. *Chickweed*.

Norfolk Is., Lord Howe Is. A common weed of cultivated and disturbed soil. An early introduction from Europe, this species is probably, with *Poa annua* L., the most widespread of all weeds in the temperate and warm temperate regions of the whole world.

N.Is.: NE of the cemetery, Kingston, *G.Uhe 1112* (K); Garnet Point, *P.S.Green 2398* (K). **L.H.Is.:** opposite the War Memorial, *A.N.Rodd 1479* (K, NSW); above Hells Gate, E end of Neds Beach, *G.Uhe 1260* (K).

3. CERASTIUM

Cerastium L., *Sp. Pl.* 1: 437 (1753); *Gen. Pl.* 5th edn, 199 (1754); from the Greek *kerastes* (horned), in allusion to the shape of the capsules.

Type: *C. arvense* L.

Annual or perennial herbs, sometimes woody at base, usually hairy; hairs glandular or eglandular. Leaves opposite, entire, sessile; stipules absent. Inflorescences cymose, sometimes reduced to a solitary flower. Bracts herbaceous with scarious margins. Sepals 5, free, with scarious margins. Petals 5, rarely absent, usually bifid or emarginate, white. Stamens 10, sometimes 5, or rarely fewer. Styles 5 (sometimes 3–6). Fruit a capsule, ±cylindrical, exceeding sepals, usually curved, dehiscing by twice as many teeth as styles. Seeds numerous, spherical or reniform, tuberculate.

A genus of c. 100 species, cosmopolitan, but particularly northern temperate; 2 species naturalised on Norfolk and Lord Howe Islands.

Perennial, with decumbent non-flowering shoots; eglandular; sepal hairs not overtopping apex **1. C. fontanum**

Annual, all shoots erect or ascending, flowering; glandular; sepal hairs overtopping apex **2. C. glomeratum**

1. *Cerastium fontanum Baumg., *Enum. Stirp. Transsilv.* 1: 425 (1816)

subsp. **vulgare** (Hartm.) Greuter & Burdet, *Willdenowia* 12: 37 (1982)

Cerastium vulgare Hartm., *Handb. Skand. Fl.* 182 (1820). T: Sweden, *C.J.Hartman*; holo: ?UPS *n.v.* The epithet, from the Latin *vulgaris*, means common.

Cerastium fontanum subsp. *triviale* (Spenn.) Jalas, *Suom. Elain-ja Kasvit. Seuran Van. Tiedon* 18: 63 (1963). T: Germany, *F.C.L.Speener s.n.*; holo: ?FB *n.v.*

[*Cerastium vulgatum auct. non* L.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 149 (1898); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 763 (1904), *p.p.*; W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 157 (1917)]

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 5: t. 25 (1951), as *C. vulgatum*; G.Hegi, *Ill. Fl. Mitt.-Eur.* 2nd edn, 3(2): t. 102, fig. 2 (1969); C.J.Webb *et al.*, *Fl. New Zealand* 4: 478, fig. 49B (1989).

Perennial, with erect flowering shoots to 45 cm tall, and short, basal, decumbent, tufted, non-flowering shoots, ±hairy, eglandular. Leaves 1–2.5 cm long or more, grey-green, densely hairy; those on vegetative shoots oblanceolate, blunt, narrowed to a stalk-like base; on fertile shoots in distant pairs, elliptic to lanceolate-ovate, acute, sessile. Inflorescence dense, becoming lax in fruit; pedicels short. Sepals narrowly ovate, 5–7 mm long, scarious on margin, eglandular, densely pilose beneath; hairs not overtopping apex. Petals equalling or

slightly exceeding sepals. Stamens (5–)10. Styles 5. Capsule narrowly cylindrical, 10–14 mm long, curved. Seeds almost 1 mm diam., reddish brown, bluntly tuberculate.

Norfolk Is., Lord Howe Is. A widespread weed of grassland or roadsides and similar disturbed land. A native of Europe now widespread in temperate areas.

N.Is.: *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW); *s. loc., J.D.McComish 182 & 213* (NSW). **L.H.Is.:** Neds Beach Rd, *J.Pickard 2674* (NSW); near the War Memorial, *A.N.Rodd 1477a* (NSW).

2.* Cerastium glomeratum Thuill., *Fl. Env. Paris* 2nd edn, 2: 226 (1799)

T: France, *?J.L.Thuillier*; holo: ?G *n.v.* The epithet means gathered into a round mass, from the Latin *glomus* (a ball of yarn), presumably alluding to the dense inflorescence.

[*Cerastium vulgatum auct. non* L.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 763 (1904), *p.p.*]

Illustrations: B.E.V.Parham & A.J.Healy, *Common Weeds New Zealand* 40 (1976); K.Chorney in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 221, fig. 158 (1986); B.A.Auld & R.W.Medd, *Weeds* 143 (1987).

Annual, erect or ascending to c. 45 cm tall. Leaves ±sessile; lamina 0.5–2.5 cm long, generally yellowish green, pilose and glandular, at least above; lower leaves obovate-oblanceolate; upper leaves ovate to elliptic-ovate, apiculate. Inflorescence a compact cymose cluster; pedicels short. Sepals lanceolate, 4–5 mm long, very acute, narrowly scarious on margin, dorsally pilose and glandular; apical hairs overtopping apex. Petals equalling or slightly shorter than sepals, rarely absent. Stamens 10. Styles 5. Capsule narrowly cylindrical, about twice the length of sepals, curving slightly upwards. Seeds c. 0.5 mm diam., pale brown, finely tuberculate.

Norfolk Is., Lord Howe Is. A common weed of disturbed soil, waste places *etc.* A native of Europe now a widespread weed.

N.Is.: Harpers Rd, *P.Ralston 59* (A, K); *loc. id., P.Ralston 77c* (A); mouth of Rocky Point stream, *P.S.Green 1472* (A); Kingston, *P.S.Green 1881* (K). **L.H.Is.:** vicinity of War Memorial, *A.N.Rodd* 1477 (NSW).

4. SAGINA

Sagina L., *Sp. Pl.* 1: 128 (1753); *Gen. Pl.* 5th edn, 62 (1754); the name in Latin means food, fodder, and *Sagina spergula* (now called *Spergula arvensis*) was once grown as a fodder crop.

Type: *S. procumbens* L.

Small annual or perennial herbs. Leaves opposite, subulate to linear-lanceolate, slightly connate in pairs; stipules absent. Inflorescence terminal or axillary, a few-flowered pedunculate cyme, or flowers solitary. Bracts herbaceous. Sepals 4 or 5, free. Petals 4 or 5, sometimes absent, often minute, entire, white. Stamens as many or twice as many as sepals. Styles 4 or 5. Fruit an ovoid capsule, 4- or 5-valved, splitting to base. Seeds numerous.

A genus of c. 25 species from northern temperate regions and mountains in the tropics; 1 species naturalised on Norfolk and Lord Howe Islands.

*Sagina apetala Ard., *Animadv. Bot. Specim. Alt.* 2: 22 (1764)

T: Italy, *P.Arduino*; holo: PAD ?destroyed, *n.v.* So named as this species appears to have no petals.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 5: t. 53 (1951); K.Chorney in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th. edn, 1: 228, fig. 143A (1986); A.Doust in G.J.Harden, *Fl. New South Wales* 1: 273 (1990).

Annual herb with a usually evanescent basal cluster of leaves and decumbent-ascending flowering shoots to c. 10 cm long, often less. Leaves linear-subulate, 2–10 mm long, ciliate towards base, long-mucronate. Flowers solitary, small; pedicels filiform, ±erect. Sepals usually 4, ovate, 1–2 mm long, blunt, hooded at apex, spreading horizontally in fruit. Petals usually 4, minute, early caducous. Stamen 4. Styles 4. Capsule 4-valved, slightly longer than sepals. Seeds subreniform, 0.3–0.4 mm long, brown, shallowly tuberculate. *Pearlwort.*

Norfolk Is., Lord Howe Is. An introduced weed of bare soils, paths, lawns *etc.* Native to

Europe, it is now widespread.

N.Is.: Emily Bay, *P.S.Green 1876* (K); *s. loc.*, crevices between stone steps of an old building, *J.D.McComish 237* (K). **L.H.Is.:** 'Blue Lagoon', *J.Pickard 2684* (NSW).

5. PARONYCHIA

Paronychia Hill in G.L.Scott, *Suppl. Chamber's Cyclop*. 2: Paronychia (1753); from the Greek *para* (near) and *onyx* (finger-nail), in allusion to the old herbal use of these plants to cure whitlows.

Type: *P. argentea* Lam.

Perennial or sometimes annual herbs, erect to procumbent, sometimes slightly woody at base. Leaves opposite, rarely apparently alternate, or whorled, elliptic to linear; stipules scarious, usually conspicuous, splitting with age. Inflorescence of axillary, rarely terminal clusters; bracts scarious, usually silvery, often concealing flowers. Sepals 5, free, often hooded or awned. Petals 5, minute or absent. Stamens (2–) 5. Styles 2, bifid. Fruit an achene, indehiscent or the membranous pericarp rupturing near base.

A genus of c. 50 or more species, almost cosmopolitan but none native in Australasia; 1 species naturalised on Norfolk Is. In the past it has been classified in a separate family, the Illecebraceae.

***Paronychia brasiliana** DC. in J.B.A.P. de M. de Lamarck, *Encycl*. 5: 23 (1804)

T: Montevideo, *P.Commerson*; holo: ?G *n.v*. Named as coming from Brazil.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 114, fig. 14D (1983); B.A.Auld & R.M.Medd, *Weeds* 144 (1987); A.Doust in G.J.Harden, *Fl. New South Wales* 1: 261 (1990).

Prostrate perennial with taproot, much branched, to c. 20 cm long. Leaves opposite, sessile; stipules conspicuous, silvery, scarious, 2–4 mm long, very finely acuminate; lamina narrowly elliptic to narrowly oblanceolate, 3–10 mm long, basally attenuate, acute and mucronate at apex, strigose. Flowers ±sessile, in axillary clusters. Sepals 1–1.5 mm long, hooded, with erect dorsal awn near apex. Petals vestigial or absent. Stamens 5. Styles short. Fruit indehiscent or breaking open irregularly from base, subglobose, c. 1 mm long. Seed solitary, yellowish brown, smooth.

Norfolk Is. An introduced weed of gardens and poor grassland. A native of South America, now a weed in southern and eastern Australia

N.Is.: Ball Bay, *W.R.Sykes NI 580* (CHR); between Stockyard Ck and Cascade Ck, *P.S.Green 2412* (K).

6. POLYCARPON

Polycarpon L., *Syst. Nat*. 10th edn, 2: 881, 1360 (1759); from the Greek *polys* (many) and *carpos* (fruit), alluding to the many seeds produced by these plants.

Type: *P. tetraphyllum* (L.) L.

Annual or perennial small herbs, usually much branched. Leaves opposite or appearing whorled, obovate to orbicular; stipules scarious. Inflorescence a terminal cymose cluster; bracts scarious. Sepals 5, free, keeled, hooded. Petals 5, shorter and narrower than sepals, white. Stamens 3–5 (sometimes 1); filament bases ±united. Styles 3, connate at base. Fruit a capsule, dehiscing by 3 valves almost to base. Seeds numerous.

A cosmopolitan genus of c. 16 species; 1 species naturalised on Norfolk and Lord Howe Islands.

***Polycarpon tetraphyllum** (L.) L., *Syst. Nat.* 10th edn, 2: 881 (1759)

Mollugo tetraphyllum L., *Sp. Pl.* 1: 89 (1753). T: Italy; lecto: Herb. Cliff. 28 *Mollugo* 2, BM, *fide* B.L.Burtt & P.Lewis, *Kew Bull.* 7: 339 (1952). The epithet comes from the Greek *tetra* (four) and *phyllon* (a leaf), because the leaves are often in apparent whorls of four.

Illustrations: N.T.Burbidge & M.Gray, *Fl. Austral. Cap. Terr.* 165, fig. 152 (1970); K.Chorney in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 227, fig. 142 (1986); A.Doust in G.J.Harden, *Fl. New South Wales* 1: 265 (1990).

Annual, erect, spreading or decumbent. Stems much branched, 5–15 cm long. Leaves opposite, or upper ones especially in whorls of 4; stipules deltoid, 1.5–3 mm long, scarious, white; lamina obovate to suborbicular, 0.4–1.5 cm long, rounded to subacute. Inflorescence a much branched cyme, lax or rather congested; bracts resembling stipules; pedicels short. Sepals unequal, c. 2–2.5 mm long, scarious on margin, strongly keeled, apiculate-hooded. Petals membranous, narrowly oblong, c. 1 mm long, emarginate. Stamens 3 (–5), c. 0.5 mm long. Ovary ovoid, 0.5–1 mm long; styles very short. Capsule ovoid, 1.5–2 mm long. Seeds curved, 0.4–0.5 mm long, pale brown, tuberculate. *Four-Leaf Allseed.*

Norfolk Is., Lord Howe Is. A widespread introduced weed of cultivated and wasteland, which probably originated in the Mediterranean region and is now almost worldwide in warm temperate areas.

N.Is.: Bloody Bridge, *P.S.Green 1430* (A, K); Philip Is., *P.S.Green 1481* (A); *s. loc., W.Laing* (CHR). **L.H.Is.:** SE lower slopes of Malabar, *P.S.Green 1549* (A, K); S of Blinky Beach, *L.A.S.Johnson & A.N.Rodd* 1298 (K, NSW); Mt Gower track just before entering Erskine Valley, *G.Uhe 1325* (K).

7. SILENE

Silene L., *Sp. Pl.* 1: 416 (1753); *Gen. Pl.* 5th edn, 193 (1754); the Greek name for another plant, applied by Linnaeus to this genus.

Type: *S. anglica* L.

Annual, biennial or perennial herbs, or rarely small shrubs. Leaves opposite, entire, sessile or petiolate; stipules absent. Inflorescence basically cymose but variable. Sepals connate; calyx cylindrical, ovoid or inflated, with 5 short teeth. Petals 5, with a distinct limb and claw, usually bifid or emarginate, usually with coronal scales at base of limb. Stamens 10. Ovary 1-locular at least in the upper part; styles 3 (–5). Fruit a capsule opening by twice as many teeth as there are styles. Seeds numerous, reniform.

A genus of perhaps 500 species, mostly from the Northern Hemisphere but also from southern Africa and the tropical African mountains; 1 species naturalised on Norfolk and Lord Howe Islands.

***Silene gallica** L., *Sp. Pl.* 1: 417 (1753)

T: France, not designated. The epithet means from Gallia, the Latin for France.

Illustrations: N.T.Burbidge & M.Gray, *Fl. Austral. Cap. Terr.* 169, fig. 158 (1970); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 1l4, fig. 14I (1983); K.Chorney in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 230, fig. 145 (1986).

Annual herb, erect to 45 cm tall, simple or branching, often glandular-sticky. Leaves with indistinct petiole; lamina of lower leaves obovate, 2–10 cm long, obtuse to subacute; lamina of upper leaves elliptic to oblanceolate. Inflorescence a spike-like monochasium, sometimes 1-flowered in small plants. Flowers erect; bracts leafy; pedicels lengthening in fruit. Calyx ovoid-cylindrical, 6–8 mm long, with 10 conspicuous hairy nerves; teeth linear-subulate, 2.5 mm long, ciliate. Petals emarginate, 7–8 mm long, pink or white, with or without a crimson spot at base; coronal scales narrow, 1–3 mm long. Stamens 3–5 mm long. Styles 3, c. 2 mm long. Capsule ovoid, 6–9 mm long, enclosed by calyx. Seeds numerous, reniform, 1 mm long, dark brown, ridged-papillose.

Norfolk Is., Lord Howe Is. A weed of cultivated, waste and sandy ground, native to western

and southern Europe and the Mediterranean region.

N.Is.: ruins of old prison, Kingston, *P.S.Green 1435* (A). **L.H.Is.:** Lagoon Rd, Old Settlement, *A.C.Beauglehole 5532* (MEL); Kings Beach area, *A.C.Beauglehole 5533* (MEL); *s. loc., J.D.McComish 125* (K).

The variant with crimson spots near the base of the limbs of the petals has been called var. *quinquevulnera* (L.) Mert. & Koch, but its claims to varietal recognition are doubtful.

8. PETRORHAGIA

Petrorhagia (Ser. ex DC.) Link, *Handbuch* 2: 235 (1829); from the Greek *petros* (a rock) and *rhagus* (a rent), alluding to a supposed habit of these plants as rock-breakers.

Type: *P. saxafraga* (L.) Link

Annual or perennial herbs. Leaves opposite, narrow, entire or minutely serrulate, stipules absent. Inflorescence paniculate or capitate, sometimes reduced to 1 flower; bracts usually present, enclosing the calyx. Sepals connate; calyx cylindrical, with 5 teeth. Petals 5, with or without a claw; coronal scales absent. Stamens 10. Ovary incompletely 4-locular; styles 2. Fruit a capsule opening by 4 teeth. Seeds numerous, slightly compressed.

A genus of 25 species, distributed from the Macronesian Islands to Pakistan, but mainly in south-eastern Europe and the Mediterranean region; 1 species naturalised on Norfolk Is.

***Petrorhagia velutina** (Guss.) P.W.Ball & Heyward, *Bull. Brit. Mus.* (*Nat. Hist.*) *Bot.* 3: 166, t. 15c (1964)

Dianthus velutinus Guss., *Pl. Rar.* 166, t. 32 (1826); *Index Sem. Hort. Boccadifalco* 1826 (1826), *n.v.* T. Italy, *G.Gussone*?; holo: ?NAP *n.v.* The epithet means velvety, presumably alluding to the hairy middle stem internodes.

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 302 (1981), as Velvet Pink; K.Chorney in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 224, fig. 141G (1986); A.Doust in G.J.Harden, *Fl. New South Wales* 1: 268 (1990).

Annual herb to 60 cm tall. Stems usually unbranched, glabrous or ±densely glandular-pubescent on the middle internodes. Leaves sessile, linear to linear-oblanceolate, 20–40 (–50) mm long, 1–2 (–5) mm broad, bases of paired leaves joined by a leaf sheath at least as long as broad. Inflorescence capitate, often reduced to 1 flower; bracts forming an involucre, broadly ovate, 7–12 mm long, 4.5–8.5 mm broad, acute or mucronate, scarious. Calyx 8–14 mm long; ribs 3-veined; teeth obtuse, sometimes bifid. Petals narrowly obcordate, 11–16 mm long, sometimes bifid, pink or purple. Capsule c. 5 mm long. Seeds obliquely ovoid, c. 1 mm long, papillose.

Norfolk Is. A roadside weed, presumably recently and accidentally introduced. A native of the Mediterranean region.

N.Is.: Burnt Pine, behind Bond Store, *N.Gillett D4* (Herb. Gillett).

20. POLYGONACEAE

Herbs, shrubs and climbers, rarely trees. Leaves cauline and sometimes basal, usually alternate, simple; stipules membranous or scarious, often united around stem to form a sheath or ochrea. Inflorescence terminal or axillary, racemose, spicate, paniculate or flowers solitary or clustered in leaf axils. Flowers small, bisexual or unisexual, actinomorphic. Perianth 3–6-merous, sepaloid or petaloid, free or basally connate, persistent, often enlarging and changing in fruit. Stamens usually 6–9; filaments free or united. Ovary superior, 1-locular, with 1, erect, basal ovule; styles 2–4, free or basally connate. Fruit an achene or nut, trigonous or biconvex, compressed, angled or winged, often enclosed in the persistent perianth.

POLYGONACEAE

A family of c. 40 genera and 800 species; cosmopolitan, but mainly northern temperate in distribution; 2 native and 2 introduced genera on the Islands.

G.Bentham, Polygonaceae, *Fl. Austral.* 5: 261–276 (1870); B.H.Danser, Die Polygonacean Niederlandisch-Ostindiens, *Bull. Jard. Bot. Buitenzorg*, ser. 3, 8: 117–261 (1927); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Polygonaceae, *Fl. Java* 1: 219–226 (1963); A.C.Smith, Polygonaceae, *Fl. Vit. Nova* 2: 296, 305–307 (1981).

KEY TO GENERA

1 Perianth segments 5, equal or subequal, the inner 3 not markedly enlarging in fruit

2 Herbs, prostrate to erect; perianth not enlarged or winged in fruit — **1. PERSICARIA**

2: Herbaceous or slightly woody climber or scrambler

3 Annual, herbaceous climber or scrambler; fruiting perianth winged — **2. FALLOPIA**

3: Perennial, woody scrambler or climber, somewhat shrubby; fruiting perianth enlarged, fleshy — **3. MUEHLENBECKIA**

1: Perianth segments 6, unequal, inner 3 enlarging in fruit — **4. RUMEX**

1. PERSICARIA

Persicaria Hill in G.L.Scott, *Suppl. Chamber's Cyclop.* 2: Persicaria (1753); a medieval name for one of the species, in allusion to the leaves shaped like those of the peach (*Persica*).

Type: *P. maculosa* Gray

Annual or perennial herbs; stems often rooting at nodes. Leaves cauline, not basal at flowering time; ochrea tubular, entire, often torn by growth, often ciliate, pale brown to hyaline, glabrous or pubescent. Inflorescence spicate or capitate, dense to lax. Flowers usually bisexual. Perianth lobes 4 or 5, somewhat petaloid, not winged, persistent but not enlarging in fruit. Stamens 4–8, filaments free. Styles 2 or 3, rarely connate at base, elongate, capitate. Nut biconvex or trigonous, enclosed by the persistent perianth.

A genus of c. 150 species, cosmopolitan, but mainly northern temperate; 1 species possibly native to Norfolk Is.

K.L.Wilson, *Polygonum sensu lato* (Polygonaceae) in Australia, *Telopea* 3: 177–182 (1988).

Persicaria decipiens (R.Br.) K.L.Wilson, *Telopea* 3: 178 (1988)

Polygonum decipiens R.Br., *Prodr.* 420 (1810). T: Port Jackson, New South Wales, *R.Brown*; lecto: BM, *fide* K.L.Wilson, *loc. cit.* The Latin epithet means deceiving or deceptive, presumably in allusion to its similarity to other species.

[*Polygonum minus auct. non* Huds.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 767 (1904)]

Illustrations: K.Chorney in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 178, fig. 98H (1986), as *Polygonum salicifolium*; B.A.Auld & R.W.Medd, *Weeds* 205 (1987); K.L.Wilson in G.J.Harden, *Fl. New South Wales* 1: 282 (1990).

Annual or perennial glabrous herb; stems decumbent, rooting at lower nodes. Leaves with petiole 1–5 mm long; lamina narrowly lanceolate, 5–14 cm long, 0.7–2.5 cm broad, ±cuneate at base, ciliate, acute to long acuminate, glabrous or with scattered hairs on midrib; ochrea 3–15 mm long, obliquely truncate, with cilia 2–5 mm long, sometimes scattered strigose. Inflorescence terminal and in upper 1 or 2 leaf axils, spicate, slender, often paired, 3–5 (–7) cm long; peduncles slender. Flowers bisexual, several at each node, ±pink; pedicels jointed. Perianth lobes 5, 1.5–3 mm long, obtuse. Nut trigonous, 1.5–2 mm long; apex shortly acuminate.

Norfolk Is. Possibly an indigenous plant of damp and wet places or an early introduction, having been collected by J.Backhouse in 1835. This is perhaps the most widespread species in the genus, occurring from the Mediterranean to SE Asia, Africa and Australia.

N.Is.: Broken Bridge Ck, *P.Ralston 40* (A, K); Cascade Valley, *P.S.Green 2418* (K); *s. loc., J.Backhouse 703* (K).

If classified in the genus *Polygonum* the correct name for this species is *P. salicifolium* Brouss. ex Willd.

2. FALLOPIA

Fallopia Adans., *Fam. Pl.* 2: 277, 557 (1763); named in honour of Gabriel Fallopio (1523?–1563), Professor of Anatomy at Pisa and Padua.

Type: *F. scandens* (L.) Holub

Perennial or annual herbs, twining or decumbent, sometimes woody at base. Leaves cauline, petiolate; ochrea entire, truncate, membranous. Inflorescence spike-like to paniculate. Flowers bisexual; pedicels jointed. Perianth lobes 5, ±petaloid, outer 3 somewhat larger, keeled or winged, enlarging in fruit. Stamens 8; filaments free. Styles 3, connate at base, short; stigmas subsessile, ±capitate or divided. Fruit a trigonous nut, enclosed in the persistent perianth.

A genus of c. 9 species from the northern temperate region; 1 species naturalised on Norfolk Is.

*Fallopia convolvulus (L.) Á.Löve, *Taxon* 19: 300 (1970)

Polygonum convolvulus L., *Sp. Pl.* 1: 364 (1753). T: Europe, not designated. The epithet comes from the Latin *convolvo* (I twine around), in allusion to this plant's habit.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 91, fig. 11G (1983); B.A.Auld & R.W.Medd, *Weeds* 203 (1987); K.L.Wilson in G.J.Harden, *Fl. New South Wales* 1: 284 (1990).

Scrambling and twining annual, to c. 1 m tall; stems slender, glabrous or scabridulous on longitudinal ribs. Leaves with slender petiole to c. 5 cm long; lamina sagittate-cordate, (1.5–) 2–6 (–8) cm long, (1–) 1.5–3.5 (–4) cm broad, acuminate-acute; ochrea c. 5 mm long, brownish, soon torn. Inflorescence terminal and axillary, solitary, loosely racemose-spicate to somewhat fasciculate, slender, to c. 10 cm long. Flowers 1–4 in axils of bracts, greenish white; bracts short, membranous. Perianth lobes 1–3 mm long, outer 3 with keels that develop as narrow wings in fruit; pedicels 1–3 mm long. Nut triquetrous, 3–4 mm long, blackish.

Norfolk Is. A rare weed, native to temperate Eurasia, now widely naturalised.

N.Is.: Harpers Rd, *P.Ralston 72* (A).

3. MUEHLENBECKIA

Muehlenbeckia Meisn., *Pl. Vasc. Gen.* 1: 316 & 2: 227 (1841); named after Heinrich Gustav Muehlenbeck (1798–1845), physician of Mulhouse in France who investigated the flora of Alsace.

Type: *M. australis* (G.Forst.) Meisn.

Perennial woody scramblers, climbers or erect shrubs, dioecious or (elsewhere) polygamous. Leaves cauline, linear to orbicular, sometimes deciduous; ochrea membranous. Inflorescence fascicled, racemose-spicate or paniculate. Perianth lobes 5, sepaloid, united at base, membranous, green, whitish or yellowish; outer ones usually becoming enlarged, white and succulent in fruit. Male flowers with 8 stamens; ovary vestigial. Female flowers with 8 barren or vestigial filaments; ovary trigonous; styles 3. Fruit a nut, enclosed in the enlarged and persistent perianth.

A Southern Hemisphere genus of c. 20 species from New Guinea, Australia, New Zealand and S America; 1 native species on each of Norfolk and Lord Howe Islands.

Leaf lamina 2–8 cm long; inflorescence paniculate (N.Is.) **1. M. australis**

Leaf lamina 0.5–2 cm long; inflorescence clustered or spicate (L.H.Is.) **2. M. complexa**

1. Muehlenbeckia australis (G.Forst.) Meisn., *Pl. Vasc. Gen.* 2: 227 (1841)

Coccoloba australis G.Forst., *Prodr.* 29 (1786); *Polygonum australe* (G.Forst.) A.Rich. in J.S.C.Dumont d'Urville, *Voy. Astrolabe* 1: 178 (1832), *non* Pers. (1805); *Polygonum forsteri* Endl., *Ann. Wiener Mus. Naturgesch.* 1: 166 (1836). T: New Zealand, *J.R.& G.Forster*; syn: BM. So named from its austral, or southern, occurrence.

Muehlenbeckia adpressa (Labill.) Meisn., *Pl. Vasc. Gen* 2: 227 (1841). T: Australia, *J.J.H. de Labillardière*; holo: ?Fl *n.v.*

Illustrations: A.L.Poole & N.M.Adams, *Trees & Shrubs New Zealand* 55 (1963); L.B.Moore & J.B.Irwin, *Oxford Book New Zealand Pl.* 51, fig. 2a–i (1978); A.Eagle, *Eagle's Trees & Shrubs New Zealand* 2nd edn, t. 45 (1986).

Climber to 4 m tall, much branched, dioecious, glabrous; bark grey. Leaves alternate, chartaceous; petiole 1–2.5 cm long; lamina broadly ovate (pandurate in juvenile plants), 2–8 cm long, 1–3 cm broad, truncate to very shallowly subcordate at base, abruptly acuminate at apex. Inflorescence axillary or terminal, paniculate, (2–) 5–10 cm long. Perianth lobes greenish. Nut trigonous, 3–4 mm long, black. *Shrubby Creeper, Pohuehue*. Fig. 39F.

Norfolk Is. Widespread in the native forest from sea-level to the upper slopes of Mt Pitt. Also native to New Zealand.

N.Is.: top and upper slopes of Mt Pitt, *G.Uhe 1155* (K); top of Mt Bates, *P.Ralston 30* (A, K); Steels Point, *P.S.Green 1888* (K); *s. loc., A. Cunningham 86* (K); *s. loc.*, 1904, *I.Robinson* (BM, K, NSW).

2. Muehlenbeckia complexa (A.Cunn.) Meisn., *Fl. Vasc. Gen.* 2: 227 (1841)

Polygonum complexum A.Cunn., *Ann. Nat. Hist.* 1: 455 (1838). T: Bay of Islands, New Zealand, *A.Cunningham*; holo: K. So named from its usual habit, a complex tangle of branches.

Muehlenbeckia sp.; S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 176 (1981)

[*Muehlenbeckia axillaris auct. non* (Hook.f.) Walp.: G.Bentham, *Fl. Austral.* 5: 275 (1870); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 135 (1917)]

Illustrations: L.B.Moore & J.B.Irwin, *Oxford Book New Zealand Pl.* 51, fig. 3 (1978); A.Eagle, *Eagle's Trees & Shrubs New Zealand* t. 46 (1986); I.Hutton, *Lord Howe Is.* 137 (1986).

Much branched tangled shrub or low climber, usually to c. 1 m across, dioecious; stem puberulous when young; bark reddish brown. Leaves alternate, coriaceous to subchartaceous; petiole 2–5 (–10) mm long; lamina broadly oblong to ovate or suborbicular (subpanduriform in juvenile plants), 0.5–2 cm long, 0.3–1.5 cm broad, truncate to rounded or subcordate at base, rounded to obtuse at apex. Inflorescence axillary or terminal, clustered or usually spicate. Flowers small, yellowish green. Perianth lobes 2–3 mm long, connate for c. lower third, enlarged in fruit to 5–6 mm long. Nut trigonous, c. 2 mm long, black. Fig. 39E.

Lord Howe Is. Usually forming densely tangled, more or less prostrate, windswept bushes c. 1 m or more across near the sea, or, in more sheltered places, climbing to c. 4 m. Also native to New Zealand.

L.H.Is.: Kims Lookout, *P.S.Green 2309* (K); Neds Beach, *M.M.J. van Balgooy 1046* (K); Goat House, *J.Pickard 3432* (NSW); summit ridge of Mt Lidgbird, *J.Pickard 1458* (NSW); top of Little Slope, *J.Pickard 2812* (NSW).

Figure 39. A, MALVACEAE: *Lagunaria patersonia* subsp. *patersonia*, habit (1902, J.Maiden & J.Boorman, K). **B**, AIZOACEAE: *Tetragonia tetragonioides*, habit (G.Uhe 1258, K). **C–D**, EPACRIDACEAE: *Leucopogon parviflorus*. **C**, habit; **D**, flower (**C–D**, J.Game 69/197, K). **E–F**, POLYGONACEAE. **E**, *Muehlenbeckia complexa*, habit (P.Green 2309, K). **F**, *Muehlenbeckia australis*, habit (P.Green 1888, K). Scale bars: **A–C**, **E**, **F** = 2 cm; **D** = 5 mm. Drawn by P.Halliday.

4. RUMEX

Rumex L., *Sp. Pl.* 1: 333 (1753); *Gen. Pl.* 5th edn, 156 (1754); a name used by Roman writers, usually translated as sorrel, which is *R. acetosa*.

Type: *R. patientia* L.

Biennial or perennial (rarely annual or subshrubby) herbs. Leaves radical and cauline, mostly longer than broad; ochrea usually tubular. Inflorescences branched racemes or spikes; flowers usually in whorls, subtended by small ochreae. Flowers bisexual (elsewhere sometimes unisexual), greenish, often reddish later; pedicels jointed, usually deflexed in fruit. Perianth lobes 6, in 2 whorls, sepaloid; outer 3 usually spreading or reflexed in fruit; inner 3 enlarged, enclosing achene, usually developing a dorsal tubercule and often marginal teeth. Stamens 6. Styles 3, short; stigmas usually fimbriate or penicillate. Fruit a trigonous nut enclosed in the 3 enlarged and persistent inner perianth lobes.

A genus of c. 200 species, especially in the northern temperate regions; 3 species naturalised on the Islands.

K.H.Rechinger, *Rumex* (Polygonaceae) in Australia: a reconsideration, *Nuytsia* 5: 75–122 (1984).

1 Inner perianth lobes entire in fruit, with a dorsal callosity

2 Inflorescence interrupted, with whorls separate and distinct; branches divaricate; fruiting inner perianth lobes oblong with a callosity exceeding half their length (N.Is.) **1. R. conglomeratus**

2: Inflorescence not interrupted, whorls contiguous; branches nearly erect; fruiting inner perianth lobes rounded-triangular with a callosity up to half their length (L.H.Is.) **2. R. crispus**

1: Inner perianth lobes with hooked teeth in fruit, without a callosity (N.Is., L.H.Is.) **3. R. brownii**

1. *Rumex conglomeratus Murray, *Prodr. Stirp. Gott.* 52 (1770)

T: Europe; not designated. So named from its conglomerate fruit.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 86, fig. 10E (1983); B.A.Auld & R.W.Medd, *Weeds* 208 (1987); K.L.Wilson in G.J.Harden, *Fl. New South Wales* 1: 290 (1990).

Perennial to c. 50 cm or more tall, glabrous, usually branching in lower half; branches flexuous, spreading at an angle of 30°–90°. Petioles of lower leaves as long as laminas; basal and lower laminas narrowly oblong-ovate to oblong, 10–25 cm long, 2.5–3.5 cm broad, diminishing upwards, basally truncate to slightly cordate, ±undulate-crisped. Inflorescence open, branching divaricately, with numerous, distant, many-flowered whorls; lower whorls subtended by reduced leaves. Perianth lobes oblong, 2–3 mm long, obtuse, outer lobes narrowly so, not reflexed; inner lobes enlarged in fruit, entire, each developing an ovoid, dorsal callosity more than half its length. Nut 1.5–2 mm long, dark brown.

Norfolk Is. A weed of damp pastures *etc.* in Australia, New Zealand and N America. A native of Europe, the Mediterranean region and south-western Asia.

N.Is.: Rocky Point, *P.S.Green 1462* (A); near Kingston, Watermill Dam, *W.R.Sykes NI 178* (CHR); near Emily Bay, *W.R.Sykes* NI783 (CHR).

2. *Rumex crispus L., *Sp. Pl.* 1: 335 (1753)

T: not designated. The epithet alludes to the crisped margins of the leaves.

Illustrations: C.Lamp & F.Collet, *Weeds Australia* 274 (1979); B.A.Auld & R.W.Medd, *Weeds* 208, 209 (1987); K.L.Wilson in G.J.Harden, *Fl. New South Wales* 1: 290 (1990).

Perennial to c. 1 m tall, erect, glabrous; branches relatively short, at an angle of 30° or less to stem. Petioles of basal leaves shorter than laminas; basal and lower laminas narrowly lanceolate to lanceolate or oblong, 10–30 cm or more long, 1.5–6 cm broad, diminishing

upwards, basally cuneate (to narrowly truncate), undulate and crisped. Inflorescence dense; branches ±patent, with numerous many-flowered contiguous whorls; lower whorls with reduced subtending leaves. Perianth lobes 1–2 mm long, obtuse; outer lobes oblong; inner lobes ovate, enlarging in fruit to bluntly ovate-triangular, subcordate, entire, strongly raised reticulate, each (or sometimes only one) with a dorsal, rounded callosity about one third its length. Nut 2.5–3 mm long, brown.

Lord Howe Is. An introduced weed, native to Europe, N Africa and south-western Asia. Also introduced in Australia, New Zealand and N America.

L.H.Is.: Mosely Park, *A.C.Beauglehole 5514* (MEL).

3. *Rumex brownii Campd., *Monogr. Rumex* 64, 81 (1819)

T: Port Jackson, New South Wales, *R.Brown*; holo: BM. Named after Robert Brown (1773–1858), naturalist on Lieutenant M.Flinders' voyage of exploration around Australia in *H.M.S. Investigator*, 1801–1803.

Illustrations: B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 85, fig. 47f–g (1983); B.A.Auld & R.W.Medd, *Weeds* 207 (1987); K.L.Wilson in G.J.Harden, *Fl. New South Wales* 1: 291 (1990).

Perennial to c. 1 m tall, glabrous; branches few, spreading to erect. Petioles of basal leaves often as long as laminas; basal and lower laminas lanceolate, oblong-lanceolate to almost hastate, (basal laminas usually subpandurate), 5–20 cm long, 2–7 cm broad, diminishing upwards, basally truncate to cordate, slightly crisped. Inflorescence open, with relatively few-flowered, distant whorls, without subtending leaves. Perianth lobes 1–1.5 mm long, acute; outer lobes developing a terminal hook; inner lobes enlarging in fruit, becoming reticulate and developing marginal hooks and a hooked tip, without a callosity. Nut c. 2 mm long, brown. *Swamp Dock*.

Norfolk Is., Lord Howe Is. A relatively common weed of gardens, waste places *etc*. Native to eastern Australia, New Zealand and New Guinea, an introduced weed elsewhere, including Europe and south-western Australia.

N.Is.: Harpers Rd, Cascade, *P.Ralston 51* (A, K); road to Mt Pitt, *G.Uhe 1195* (K), vicinity of Bloody Bridge, *G.Uhe 1122* (K); Rocky Point, *P.S.Green 1457* (A). **L.H.Is.:** North Head, *J.C.Game 69/224a* (K); SE lower slopes of Malabar, *P.S.Green 1573* (A, K).

21. PLUMBAGINACEAE

Perennial herbs or shrubs, sometimes climbers. Leaves alternate or rosulate, simple; stipules absent. Inflorescence terminal or axillary, spicate or racemose to paniculate. Flowers bisexual, actinomorphic, 5-merous, ±sessile, usually subtended by 3 bracteoles. Calyx united, often persistent, usually ribbed, angled or winged, sometimes with small secondary lobes. Corolla sympetalous, often deeply lobed; lobes contorted in bud. Stamens 5, opposite corolla lobes. Ovary superior, 1-locular, often 5-lobed; ovule solitary; styles 5 or with 5 stigmatic branches, opposite sepals, sometimes heterostylous. Fruit an indehiscent nut or tardily circumscissile, often enclosed within persistent calyx.

A family of c. 20 genera and 450 species; cosmopolitan, but especially characteristic of maritime or semi-arid habitats; 1 genus native on Norfolk Is.

G.Bentham, Plumbagineae, *Fl. Austral.* 4: 265–268 (1869); C.G.G.J. van Steenis, Plumbaginaceae, *Fl. Males.* ser. I, 4: 107–112 (1949); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Plumbaginaceae, *Fl. Java* 2: 443–445 (1965); A.C.Smith, Plumbaginaceae, *Fl. Vit. Nova* 2: 307–309 (1981).

PLUMBAGO

Plumbago L., *Sp. Pl.* 1: 151 (1753); *Gen. Pl.* 5th edn, 75 (1754); from the Latin *plumbum* (lead) and *-ago* (denoting a resemblance to or property of), because the leadwort, *P. europaea*, with leaden-coloured flowers, was once used to treat lead poisoning.

Type: *P. europaea* L.

Herbs or shrubs. Leaves alternate, petiolate or sessile; petiole sometimes auriculate. Inflorescence terminal or axillary, spicate or racemose; flowers ±sessile within 3 bracteoles. Calyx tubular, 5-ribbed and -toothed, with sessile or stalked glands. Corolla narrowly tubular; lobes 5, spreading. Stamens hypogynous, shortly connate at base. Style 1, stigmatic branches filiform. Fruit basally circumscissile, often splitting upward into 5 valves.

A genus of c. 10 species distributed in tropical and warm temperate regions of the world; 1 species native to Norfolk Is.

Plumbago zeylanica L., *Sp. Pl.* 1: 151 (1753)

T: Ceylon [Sri Lanka]; lecto: LINN 216.2, *fide* R.A.Dyer in *Fl. Southern Africa*. 26: 17 (1963); IDC microfiche 177/2.119/2. The epithet is the Latin form of Ceylon or Sri Lanka, from which this species was collected in early times.

Illustrations: R.Erickson *et al.*, *Fl. & Pl. Western Australia* 159, fig. 504 (1973); B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 86, fig. 48a (1983); G.J.Harden, *Fl. New South Wales* 1: 374 (1990).

Somewhat scandent or creeping shrub to 1 or 2 m; stems wiry, glabrous, longitudinally ridged. Leaves glabrous; petiole 2–12 mm long, often winged, base amplexicaul, sometimes auriculate; lamina ovate, ovate-lanceolate or elliptic, 2.5–8 cm long, 1–5 cm broad, cuneate, apically acute to acuminate. Flowers scented; pedicels 1–2 mm long; outer bracteole ovate to lanceolate, 4–6 mm long; inner 2 bracteoles 1–3 mm long, with dense stalked glands. Calyx 8–10 mm long, with dense stalked glands, sticky; teeth c. 1.5 mm long. Corolla white; tube 18–28 cm long; lobes obovate, 6–10 mm long, apiculate. Stamens blue, included. *Native Plumbago*.

Norfolk Is. Rare, growing near the sea. R.M.Laing (*Trans. & Proc. New Zealand Inst.* 47: 33, 1915) doubted its indigenous status and thought it a garden escape. However, along with other native plants, it was drawn by the convict J.Doody in the 1790s (his No. 12, now in the Mitchell Library, Sydney), and its habitat seems entirely consistent with an indigenous status. It is also native to subtropical Africa, Asia and Australia and most of the Pacific.

N.Is.: Duncombe Bay, *M.Lazarides 8061* (CANB, K); *loc. id.*, *P.S.Green 2431* (K).

22. OCHNACEAE

Trees or shrubs, rarely herbs. Leaves alternate, simple or rarely pinnate, stipulate. Inflorescence various. Flowers bisexual, actinomorphic. Sepals 3–10, usually 5, usually persistent, often coloured red in fruit. Petals 5 (sometimes to 10), contorted in bud, fugacious. Stamens 5–many, free, hypogynous; staminodes sometimes present in 1–3 series; anthers basifixed, dehiscing longitudinally or by apical pores. Ovary superior, 1–15-locular; ovules l–many, axile, or if 1-locular then parietal; style simple; stigmas 1–5. Fruit of berries or drupelets on an enlarged receptacle. Seeds l–many.

A pantropical family of c. 35 genera and 450 species, extending into subtropical areas; 1 genus introduced on Norfolk Is.

OCHNA

Ochna L., *Sp. Pl.* 1: 513 (1753); *Gen. Pl.* 5th edn, 229 (1754); this was the Greek name for the wild pear, the leaves of which the type species of this genus resemble.

Type: *O. jabotapita* L.

Trees or shrubs. Leaves shortly petiolate, serrate to ciliate, rarely entire; stipules small. Inflorescence compound or reduced to a single flower; bracts caducous; pedicels articulated. Sepals 5, greatly enlarged and turning red in fruit. Petals 5, rarely more, yellow or white. Stamens numerous in 2 or more whorls, free. Carpels (4–) 5–15, 1-ovulate; styles slender, gynobasic, basally united. Fruit of 1–several, free, black drupelets with fleshy mesocarp, inserted on an enlarged, red receptacle.

A genus of c. 85 species from the tropics of the Old World; 1 species naturalised on Norfolk Is.

***Ochna serrulata** (Hochst.) Walp., *Repert. Bot. Syst.* 5: 400 (1846)

Diporidium serrulatum Hochst., *Flora* 27: 304 (1844). T: Natal, *C.F.F. von Krauss 473*; iso: K. The epithet alludes to the serrulate, or small-toothed, margins to the leaves.

Illustrations: R.A.Buchanan, *Common Weeds Sydney Bushland* 48 (1981), as *O. atropurpurea*; B.A.Auld & R.W.Medd, *Weeds* 191 (1987); G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 490, t. 27 (1990).

Evergreen shrub to c. 2 m tall; stems with dense, raised lenticels. Leaves simple; petiole c. 1 mm long; lamina elliptic, 2.5–8 cm long, 1–2 cm broad, acute to obtuse at base and apex, finely and sharply serrulate, with raised reticulate venation above and below. Flowers axillary, usually solitary; pedicels 1–1.5 cm long. Sepals ovate, c. 1 cm long and green at anthesis, 1.5 cm long and deep red in fruit. Petals 5, obovate, 1 cm long, cuneate, bright yellow. Stamens c. 20, anthers dehiscing by pores. Drupelets 4 or 5, obloid-ovoid, c. 1 cm long. *Mickey Mouse Plant*.

Norfolk Is. A native of S Africa which was introduced to subtropical gardens and has now escaped. It appears to have become naturalised relatively recently on Norfolk Is., and is reported to be spreading and a cause of concern (*fide* W.R.Sykes, *Annual J. Roy. New Zealand Inst. Hort.* 8: 55, 1980). Recorded as an alien on Lord Howe Is. by J.Pickard (*J. Biogeogr.* 11: 207, 1984), but no material from there has been seen or found in NSW herbarium.

N.Is.: Mission Rd, Botanic Gardens, *W.R.Sykes NI 707/87* (CHR).

CLUSIACEAE

The genus *Calophyllum*, presumably as *C. inophyllum* L., was recorded from Lord Howe Is. by C.Moore (*Trans. Roy. Soc. New South Wales* 5: 31, 33, 1872). However, no material to support this record has ever been seen, and J.H.Maiden in his observations on the vegetation of this Island (*Proc. Linn. Soc. New South Wales* 23: 123, 1898) rejects it, and (*op. cit.* 126) gives an explanation of how, through an incorrectly applied vernacular name, it could have been thought by Moore to occur on the Island.

23. ELAEOCARPACEAE

Trees or large shrubs. Leaves usually alternate, simple; stipules small, caducous. Inflorescences usually axillary, racemose-paniculate. Flowers bisexual, actinomorphic. Sepals (4 or) 5, valvate, usually free. Petals (4 or) 5, usually valvate, usually free, usually

laciniate or lobed at apices. Disc usually present. Stamens numerous, free, inserted on disc where present; anthers basifixed, dehiscent by apical pores. Ovary superior, with (1–) 2–many locules; ovules 2–many per cell; style simple. Fruit a capsule or drupe.

A tropical or subtropical family of c. 9 genera and c. 600 species; 1 genus native on Lord Howe Is.

G.Bentham, Tiliaceae, *Fl. Austral.* 1: 267–282 (1863).

ELAEOCARPUS

Elaeocarpus L., *Sp. Pl.* 1: 515 (1753); *Gen. Pl.* 5th edn, 230 (1754); from the Greek *elaia* (the olive) and *karpos* (fruit), in allusion to the resemblance of fruits of the first known species to those of the olive.

Type: *E. serratus* L.

Trees or shrubs. Leaves spirally arranged, often crowded towards ends of branches, usually crenate or serrate, often with domatia in axils of primary veins beneath. Inflorescences axillary or on branches below leaves, racemose. Sepals 4 or 5, free or basally connate. Petals 4 or 5, valvate, fimbriate or lobed at apices. Stamens numerous, inserted on disc; anthers usually aristate or pilose. Ovary 2–5-locular, with 2 or more ovules per cell; style filiform or subulate. Fruit a drupe, fleshy or somewhat fibrous; endocarp hard, usually pitted or variously rugose.

A genus of 350–400 species, distributed from Madagascar and Mauritius to eastern Asia, through Malesia to Australia, New Zealand and the Pacific; 1 endemic species on Lord Howe Is.

Elaeocarpus costatus M.Taylor, *Bull. Misc. Inform. Kew* 1939: 178 (1939)

T: Lord Howe Island, *J.D.McComish 106*; holo: K. So named from the presence of costae, or ribs, on the endocarp of the fruit.

Elaeocarpus sp., F.Mueller, *Fragm.* 9: 77 (1875); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 232 (1896); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 27: 347 (1902); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 39: 381 (1914).

Illustrations: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 27: t. 15 (1902); I.Hutton, *Lord Howe Is.* 33, 122 (1986).

Tree to c. 8 m tall. Leaves with petiole 1–1.5 cm long with an evident basal pulvinus; lamina lanceolate-elliptic, 6–9 cm long, 2.5–3 cm broad, acute at base and apex, crenate-dentate and each tooth apiculate when young, raised reticulate; primary veins 3 or 4 on each side of midrib, with evident domatia in axils of lower veins below. Inflorescence axillary, c. 3 cm long, 8–10-flowered; flowers pendant. Sepals 5, narrowly lanceolate, 5–6 mm long, finely appressed tomentose dorsally. Petals 5, 8 mm long, white, apically fimbriate. Stamens numerous, 4–5 mm long; anthers linear with 2, long, apiculate appendages. Ovary conical, 2–2.5 mm long, villous; style apiculate, 4 mm long. Drupe ovoid, 2 cm long, blue when ripe. Fig. 38B–C.

Lord Howe Is. A rare endemic, found at all altitudes in the southern part of the Island. Flowers mid Feb.–Mar.

L.H.Is.: below Goat House, *A.N.Rodd 1830* (NSW); Erskine Ck, *I.Hutton LH2* (K); *loc. id.*, *I.R.H.Telford 7090* (CBG); *loc. id.*, *A.C.Beauglehole 5810* (MEL); summit of Mt Gower, *J.D.McComish 106A* (K).

Often recognised by the occasional leaf which has turned a bright red.

24. TILIACEAE

Trees or shrubs, rarely herbs, often with stellate indumentum. Leaves alternate, rarely opposite, simple, stipulate. Inflorescence compound, basically cymose, rarely flowers few or solitary. Flowers bisexual, actinomorphic, sometimes with an epicalyx. Sepals (3–) 5, free or basally connate, usually valvate. Petals usually as many as sepals, imbricate or contorted, rarely absent. Stamens (5–) 10–many, free or shortly united in 5 or 10 fascicles; anthers dehiscing longitudinally or with apical pores. Ovary superior, 2–10-celled, each with l–many axile ovules; style simple; stigma capitate or lobed. Fruit a berry, drupe, capsule or schizocarp.

A worldwide family, but mostly occurring in the tropics and subtropics, containing c. 50 genera and 600 or more species; 1 genus introduced on Norfolk Is.

G.Bentham, Tiliaceae, *Fl. Austral.* 1: 267–282 (1863); M.Burret, Beiträge zur Kenntnis der Tiliaceen, *Notizbl. Bot. Gart. Berlin* 9: 592–880 (1926); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Tiliaceae, *Fl. Java* 1: 388–396 (1963).

TRIUMFETTA

Triumfetta L., *Sp. Pl.* 1: 444 (1753); *Gen. Pl.* 5th edn, 203 (1754); named after Giovanni Battista Triumfetti (1658–1708), one-time Professor of Botany and Director of the Botanical Garden in Rome.

Type: *T. lappula* L.

Shrubs or herbs with stellate indumentum. Leaves alternate, entire or 3–5-lobed, margins serrate or dentate. Inflorescence leaf-opposed or axillary, of shortly pedunculate, spicate or cymose clusters. Sepals 5, free, cucullate and usually apiculate. Petals 5, rarely absent, basally thickened, inserted around a 5-glandular disc. Stamens numerous, rarely 5 or 10, free, inserted inside disc; anthers longitudinally dehiscent. Ovary 2–5-celled, tuberculate or setose; ovules 2 per locule. Fruit a capsule, somewhat globose, dehiscent or indehiscent, echinate or setose; bristles often hooked.

A pantropical and subtropical genus of c. 150 species; 1 species naturalised on Norfolk Is.

***Triumfetta rhomboidea** Jacq., *Enum. Syst. Pl.* 22 (1760)

T: Caribbean; not designated. So named in allusion to the commonly rhomboid shape of the leaves.

Illustrations: E.E.Henty & G.H.Pritchard, *Weeds New Guinea* 154 (1973); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 59, fig. 8K (1986); G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 319 (1990).

Shrub or woody herb to c. 1 m tall; bark tough and fibrous. Leaves with petiole up to 10 cm long; lamina narrowly to broadly ovate or rhomboid, often ±3-lobed, 2–12 cm long, 1.5–10 cm broad, usually obtuse to cuneate-rounded at base, margin serrate, ±acuminate at apex, 3–7-nerved from base, stellately pubescent. Flowers in short axillary clusters with small inflorescence leaves. Sepals linear, c. 5 mm long, with a sub-apical horn, pubescent. Petals linear-oblanceolate, c. 4 mm long, yellow. Stamens 10–15. Ovary 2- or 3-celled, setose or echinate. Capsule ±globose, densely tomentose; bristles hooked, almost glabrous.

Norfolk Is. Possibly a recent introduction to judge from the one collection made in 1980, but with the potential of becoming a serious weed. Originally from somewhere in the Old World perhaps, but now a pantropical weed.

N.Is.: Friendship House, *W.R.Sykes NI 604* (CHR).

25. STERCULIACEAE

Trees or shrubs, rarely herbs, often with stellate indumentum. Leaves alternate, rarely opposite, simple or digitately compound, stipulate; petiole often apically pulvinate. Inflorescence various, usually axillary, basically cymose. Flowers bisexual or unisexual, actinomorphic, often with an epicalyx. Sepals 3–5, usually connate, valvate. Petals 5, sometimes reduced or absent, free or adnate to base of staminal tube, contorted in bud. Stamens usually in 2 whorls, the outer staminodal, free or usually joined into a tubular column, often on an androgynophore. Ovary superior, 1–5 united or free carpels, rarely 10–12-celled; ovules 1–many in each carpel or cell, axile. Fruit usually separating as dehiscent follicles, or indehiscent.

A pantropical and subtropical family of c. 70 genera and possibly 1000 or more species; 1 endemic genus on Norfolk Is. and 1 introduced on Lord Howe Is.

G.Bentham, Sterculiaceae, *Fl. Austral.* 1: 224–267 (1863); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Sterculiaceae, *Fl. Java* 1: 401–415 (1963).

KEY TO GENERA

Leaves broadly elliptic or obovate, evergreen; flowers deep pink (N.Is.) **1. UNGERIA**

Leaves commonly lobed, deciduous at time of flowering; flowers bright red (L.H.Is.) **2. BRACHYCHITON**

1. UNGERIA

Ungeria Schott & Endl., *Melet. Bot.* 27 (1832); named after Franz Joseph Andreas Nicolas Unger (1800–1870), one-time Professor of Botany at Graz and at Vienna.

Type: *U. floribunda* Schott & Endl.

Trees. Leaves alternate, simple, long-petiolate; stipules caducous. Inflorescence terminal, cymose-paniculate. Flowers bisexual, actinomorphic or appearing slightly zygomorphic. Epicalyx absent. Calyx 5-lobed, valvate. Petals free, imbricate-contorted, inserted at base of androgynophore. Stamens numerous, united into a short tube at apex of columnar androgynophore and surrounding ovary; anthers sessile, in 5 groups. Ovary borne on apex of androgynophore, lobed, 5-celled; cells 1-ovulate. Fruit a capsule, 5-lobed, star-shaped in transverse section, borne on accrescent androgynophore.

An endemic, monospecific genus related to the East Asiatic genus *Reevesia* Lindl.

1. Ungeria floribunda Schott & Endl., *Melet. Bot.* 31 (1832)

T: Norfolk Island, *F.L.Bauer*; holo: W. So named from the abundant flowers in the inflorescence.

Kleinhofia ? elliptica A.Cunn. ex Heward, *London J. Bot.* 1: 113 (1842), *nom. nud.*

Illustrations: H.W.Schott & S.F.L.Endlicher, *Melet. Bot.* t. 4 (1832); A.C.F.H.C.Schnizlein, *Iconogr. Fam. Regnum Veg.* 3: t. 210 (1857–1865).

Tree to 15 m tall. Leaves broadly ovate, elliptic or obovate, 6–12 cm long, 4–8 cm broad (to 18 × 12 cm in juvenile plants, sometimes as small as 5 × 3 cm in adult plants), rounded obtuse at base, entire, broadly obtuse to rounded apically, densely stellate-pubescent, especially below and when young; venation raised above and below, with 3 or 4 primary veins on each side of midrib. Inflorescence 3–7 cm long, usually many-flowered. Sepals densely pubescent, somewhat persistent; tube 8–10 mm long; lobes 4–6 m long. Petals somewhat spathulate, 16–20 mm long, deep pink; limb reflexed at anthesis. Androgynophore 2.5 cm long, curved and accrescent, becoming 3–4 cm long in fruit. Anthers light brown. Fruit ellipsoidal, 3–4 cm long, 2–2.5 cm broad. *Bastard Oak*. Frontispiece, Fig. 38D–E.

Norfolk Is. Endemic. An occasional tree in the forested parts of the Island, especially in areas of dense canopy.

N.Is.: shaded woods on Cascade Rd, *A.Cunningham 10* (K); W slopes of Mt Pitt, *J.D.McComish 29* (K); Mt Bates towards Red Rd, *P.S.Green 1391* (A, K); *loc. id., W.R.Sykes NI 642* (CHR).

2. BRACHYCHITON

Brachychiton Schott & Endl., *Melet. Bot*. 34 (1832); from the Greek *brachys* (short) and *chiton* (a tunic), in allusion to characteristics of the seedcoat.

Type: *B. paradoxus* Schott & Endl.

Trees, often with swollen trunks, monoecious. Leaves alternate, simple, entire or lobed, often deciduous in flower. Inflorescence axillary, paniculate. Epicalyx lacking. Calyx 5-lobed, petaloid, campanulate, valvate. Petals absent. Male flowers with stamens united into an androphore bearing 10–30 anthers at upper end. Female flowers with 5 free carpels on a short gynophore with 10–30 staminodes below carpels; ovules numerous; styles coherent at first, separating later. Fruit of 5 (or fewer by abortion) stalked woody follicles. Seeds numerous.

An Australian genus of c. 30 species, also reaching Papua New Guinea. The species below is often cultivated as an ornamental with the name *Flame Tree* and has become naturalised on Lord Howe Is.

***Brachychiton acerifolius** (A.Cunn. ex G.Don) Macarthur & Moore, *Cat. Coll. Bois Indig*. 6 (1855)

Sterculia acerifolium A.Cunn. ex G.Don, *Gen. Syst*. 1: 517 (1831). T: New South Wales; neo: Illawarra ?, without date, *A.Cunningham s.n*., K; *fide* G.P.Guymer, *Austral. Syst. Bot*. 1: 225 (1988). The epithet means leaves like those of a maple (*Acer*).

Illustrations: W.D.Francis, *Austral. Rain-forest Trees* 3rd edn, 286, 287 (1970); A.M.Blombery, *Austral. Native Pl*. 2nd edn, 184, fig. 108C (1977); G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 312 (1990).

Tree to 35 m tall. Leaves glabrous, somewhat coriaceous, deciduous at flowering; lamina in more juvenile foliage palmately 5 (or 7)-lobed, the lobes sometimes slightly lobed, sometimes broadly ovate when fully mature, 9–25 cm long, slightly cordate to obtuse at base, acute to blunt at apex. Calyx 1.5–2 cm long, bright red, glabrous. Stamens 10–20. Follicles 10–12 cm long.

Lord Howe Is. Although recorded (see *Pickard 3455* below) from the edge of an old deserted garden, numerous saplings were noted. As a result this plant has been recorded as a naturalised, non-native species by A.N.Rodd & J.Pickard, *Cunninghamia* 1: 278 (1983). It has also been introduced to cultivation on Norfolk Is. (see W.R.Sykes, *Annual J. Roy. New Zealand Inst. Hort*. 8: 54, 1980) but so far it does not seem to have become naturalised there. A native of Australia (Qld, N.S.W.).

L.H.Is.: adjacent to Morepark Garden, portion 47, *J.Pickard 3455* (NSW).

26. MALVACEAE

Herbs, shrubs or trees, with mucilaginous sap, usually stellate hairy. Leaves alternate, simple or lobed or divided, stipulate. Inflorescence axillary, basically cymose in apparent racemes or panicles, or flowers solitary. Flowers usually bisexual (elsewhere rarely unisexual), actinomorphic, often subtended by a whorl of free or basally connected bracts (epicalyx). Sepals (3–) 5, connate. Petals 5, free above, adnate at bases to staminal column, convolute in bud. Stamens numerous, united into a column around style; anthers 1-locular. Ovary superior, locules usually 3–many; ovules 1–many per locule. Fruit a capsule or schizocarp.

A worldwide family of c. 100 genera and 2000 species; 8 genera introduced or native on

the Islands.

G.Bentham, Malvaceae, *Fl. Austral.* 1: 184–224 (1863); J. van Borssum Waalkes, Malesian Malvaceae Revised, *Blumea* 14: 1–213 (1966).

KEY TO GENERA

1 Fruit a discoid schizocarp; herbs or shrubs

2 Epicalyx present; of 2 or more lobes

3 Shrub to 2 m tall; epicalyx lobes 4 or more; upper leaves hastate-lanceolate; flowers rose-coloured with dark 'eye' **6. PAVONIA**

3: Annual or perennial herbs, creeping or erect to 1 m tall; epicalyx lobes 2 or 3

4 Outline of leaves ±orbicular; pedicels 10 mm long or more; flowers white, pink or reddish orange

5 Flowers white or pink; petioles ±equalling laminas; fruit of 9–11, 1-seeded mericarps **1. MALVA**

5: Flowers reddish orange; petioles longer than laminas; fruit of 15–25, 2- or 3-seeded mericarps **5. MODIOLA**

4: Outline of leaves ovate to lanceolate or elliptic; pedicels 2–5 mm long; flowers pale orange or yellow **2. MALVASTRUM**

2: Epicalyx absent

6 Leaves lanceolate, elliptic or oblanceolate, usually 1–3 cm broad; mericarps 1-seeded **3. SIDA**

6: Leaves broadly ovate, usually 3–15 cm broad; mericarps 3–9-seeded **4. ABUTILON**

1: Fruit a capsule; shrubs, subshrubs or trees

7 Epicalyx lobes 5–12; young stems variously stellate-hairy; petals glabrous or pubescent externally **7. HIBISCUS**

7: Epicalyx reduced to a ridge surrounding base of calyx; young stems densely covered with scurfy scales; petals densely scaly externally **8. LAGUNARIA**

1. MALVA

Malva L., *Sp. Pl.* 2: 687 (1753); *Gen. Pl.* 5th edn, 308 (1754); an ancient Latin name for these plants.

Type: *M. sylvestris* L.

Annual or perennial herbs. Leaves with petiole conspicuous; lamina entire or palmately lobed or divided; margin crenate or serrate. Flowers axillary, solitary or clustered; epicalyx segments 2 or 3, free or adnate to calyx base. Calyx 5-lobed. Petals emarginate or deeply notched, white, pink or purplish. Staminal column shorter than petals. Carpels 9–15, each 1-ovulate; style branches as many as carpels. Fruit a discoid schizocarp; mericarps numerous, indehiscent, surrounding central axis of receptacle.

An Old World genus of c. 30 species, mostly from the Mediterranean region, with species now naturalised throughout the world, including 1 on Norfolk and Lord Howe Islands.

***Malva parviflora** L., *Demonstr. Pl.* 18 (1753)

T: 'Barbaria'; lecto: LINN 870.17, *fide* H.Riedl in K.H.Rechinger, *Fl. Iran., Malvaceae*: 23 (1976); IDC microfiche 177/2.464/15. The epithet comes from the Latin *parvus* (small) and *flos* (a flower).

[*Malva rotundifolia auct. non* L.: S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 76 (1833); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 763 (1904)]

Illustrations: W.R.Barker in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 839, fig. 439B (1986); C.J.Webb *et al.*, *Fl. New Zealand* 4: 852, fig. 84D (1988); A.S.Mitchell & E.H.Norris in G.J.Harden, *Fl. New South Wales* 1: 325 (1990).

Annual or short lived perennial herb, prostrate or erect to 1 m. Stems sparsely hairy. Leaves with petiole 1.5–10 cm long; lamina orbicular-reniform, with 5–7 broadly rounded lobes, 1–9 cm diam., undulate to crenate, glabrous to sparsely hairy. Flowers clustered, 10 mm long or more; epicalyx lobes linear, 1–4 mm long. Calyx 3–5 mm long; lobes broad, acute, accrescent and spreading in fruit. Petals inconspicuous, 3–7 mm long, pink or white. Mericarps 9–11, glabrous or hairy, strongly dorsally reticulate, slightly winged on margins. *Mallow*.

Norfolk Is., Lord Howe Is. Originally a native of the Mediterranean region and SW Asia, now widespread as a weed. Evidently an early arrival on Norfolk Is.

N.Is.: near Steels Point, *W.R.Sykes NI 485* (CHR); *s. loc.*, 1804, *F.L.Bauer* (W); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW); *s. loc.*, *R.M.Laing* (CHR). **L.H.Is.:** Goat House Cave, *J.Pickard* in *A.N.Rodd 1331* (K, NSW); *s. loc.*, *J.D.McComish 100* (NSW).

2. MALVASTRUM

Malvastrum A.Gray, *Mem. Amer. Acad. Arts* ser. 2, 4: 21 (1849); from *Malva*, and *-aster*, a suffix indicating some resemblance.

Type: *M. wrightii* A.Gray

Annual or perennial herbs or subshrubs. Leaves simple, rarely shallowly lobed, coarsely toothed, petiolate. Inflorescence terminal, of racemes or congested spikes, or axillary, flowers solitary. Epicalyx of 3 linear segments. Calyx 5-lobed, broadly campanulate. Petals rotate, slightly longer than calyx, orange or yellow. Staminal column shorter than petals. Carpels 5–15, each with 1 ovule. Fruit a discoid schizocarp; mericarps dehiscent or indehiscent, reniform, with 1–3 apical awns or unarmed.

A genus of 14 species distributed in the tropics and warm temperate regions, especially of the New World; 1 species naturalised on Norfolk and Lord Howe Islands.

S.R.Hill, A monograph of the genus *Malvastrum* A.Gray (Malvaceae: Malveae), *Rhodora* 84: 1–83, 159–246 & 317–409 (1982).

***Malvastrum coromandelianum** (L.) Garcke, *Bonplandia* 5: 295 (1857)

Malva coromandeliana L., *Sp. Pl.* 2: 687 (1753); *Malva tricuspidata* W.T.Aiton, *Hort. Kew* 2nd edn, 4: 210 (1812), *nom illeg.*; *Malvastrum tricuspidatum* (W.T.Aiton) A.Gray, *Pl. Wright.* 1: 16 (1852), *nom. illeg.* T: cultivated; lecto: LINN 870.3, *fide* J. van Borssum Waalkes, *Blumea* 14: 152 (1966); IDC microfiche 177/2.463/20. The epithet refers to the Coromandel Coast in southern India, whence this species was once thought to come.

Illustrations: S.R.Hill, *Rhodora* 84: 325 (1982); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 892, t. 125 (1990); A.S.Mitchell & E.H.Norris in G.J.Harden, *Fl. New South Wales* 1: 326 (1990).

Annual or perennial herb, 5–100 cm tall, becoming woody towards base. Leaf lamina ovate to lanceolate, 2–6 cm long, 1–5 cm broad, truncate to cuneate at base, coarsely serrate to dentate, acute. Flowers axillary, solitary or clustered; pedicels 2–5 mm long. Epicalyx segments linear to lanceolate. Calyx 5–7 mm long, accrescent. Petals obliquely emarginate, c. 1–1.5 cm long, pale yellow or orange. Staminal column 2–2.5 mm long. Fruit reddish brown; mericarps 10–14, curved, c. 2 mm high, upper part with erect hairs, dorsally angled with apical awn c. 1 mm long and 2 median awns c. 0.5 mm long. *Little Jack*.

Norfolk Is., Lord Howe Is. A pantropical weed of American origin, now common, especially beside tracks and roads.

N.Is.: *s. loc.*, *R.M.Laing* (CHR). **L.H.Is.:** Transit Hill, *P.S.Green 1635* (A, K); NW side of Transit Hill, *L.A.S.Johnson & A.N.Rodd 1265* (K, NSW); Anderson Rd, behind Middle Beach, *G.Uhe 1338* (K).

3. SIDA

Sida L., *Sp. Pl.* 2: 683 (1753); *Gen. Pl.* 5th edn, 306 (1754); a name applied to this genus by Linnaeus; originally a Greek name used by Theophrastus for a water-lily.

Type: *S. alnifolia* L.

Annual or perennial herbs or subshrubs. Leaves toothed or lobed, usually petiolate. Inflorescence axillary, with flowers solitary or clustered, or appearing spicate or paniculate by reduction of upper leaves. Epicalyx absent. Calyx 5-lobed, broadly campanulate, angular. Petals yellow or orange to reddish. Staminal column usually shorter than petals. Carpels 5–10 (rarely more), each 1-ovulate. Fruit a discoid schizocarp; mericarps indehiscent or opening by 2 apical valves.

A genus of c. 200 species distributed throughout the tropics, subtropics and warm temperate parts of the world; 2 species naturalised on the Islands. *Sida zahlbruckneri* Rech., *Repert. Spec. Nov. Regni Veg.* 4: 228 (1907) was described from Lord Howe Is. in error. The specimen upon which it was based was collected from the Isle of Pines, New Caledonia (see P.S.Green, *J. Arnold Arbor.* 51: 206, 1970).

Flowers in axillary clusters; pedicels c. 1 mm long; leaves (4–) 5–8 cm long, lanceolate to almost elliptic, almost glabrous below **1. S. carpinifolia**

Flowers usually solitary in axils; pedicels 10–30 mm long; leaves (1–) 2–4 (–6) cm long, rhombic to elliptic or oblanceolate, cinereous, with dense stellate hairs below **2. S. rhombifolia**

1. *Sida carpinifolia L.f., *Suppl. Pl.* 307 (1781)

T: Madeira, *F.Masson*; holo: BM. So named because of the resemblance of its leaves to those in the genus *Carpinus*.

[*Sida rhombifolia auct. non* L.: R.M.Laing, *Proc. & Trans. New Zealand Inst.* 47: 30 (1915), *p.p.*]

Illustrations: N.J.Jacquin, *Icon. Pl. Rar.* 1: t. 135 (1783); N.L.Britton, *Fl. Bermuda* 236 (1918); W.Marais, *Fl. Masc.* 51: 12, t. 3/1, t. 3/2 (1989).

Erect perennial herbs or subshrubs to 1.5 m tall. Stems with scattered simple hairs, 1–2 mm long. Leaves with petiole 4–6 mm long; lamina lanceolate to almost elliptic, (4–) 5–8 cm long, (1–) 1.5–3 cm broad, rounded at base, serrate, acute, with scattered, minute stellate hairs mostly above, and longer simple hairs, glabrescent below; stipules linear, 6 mm long, 3-nerved. Inflorescence clustered, 3–8-flowered. Pedicels c. 1 mm long. Calyx accrescent; tube to 3 mm long; lobes 2 mm long. Petals 1–1.5 cm long, yellow. Carpels 6–10. Mericarps indehiscent, with 2, slender, apical awns, 1.5–2 mm long. *Big Jack* (*fide* R.M.Laing, *loc. cit.*).

Norfolk Is. Introduced some time ago and described by R.M.Laing, on the specimen cited below, as 'a most abundant weed'. It is presumed to be native in America, and has proved to be a weed on various oceanic islands, *e.g.* Mauritius and several islands in the Hawai'ian chain.

N.Is.: near Steels Point, *W.R.Sykes NI 493* (CHR); *s. loc.*, *R.M.Laing* (CHR).

This species was treated as a subspecies of *S. acuta* Burm.f. by van Borssum Waalkes in his revision of the Malesian Malvaceae (*Blumea* 14: 188, 1966), but on a number of characters it seems distinct enough to be considered a species. However, the relationship between these two species, and *S. stipulata* Cav., needs further investigation.

2. *Sida rhombifolia L., *Sp. Pl.* 2: 684 (1853)

T: cultivated, Hort. Cliff. 346 *Sida* 1; lecto: BM, *fide* J. van Borssum Waalkes, *Blumea* 14: 196 (1966). The epithet refers to the often rhombic shape of the leaves.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 76 (1986); B.A.Auld & R.W.Medd, *Weeds* 9, 186 (1987); A.S.Mitchell & E.H.Norris in G.J.Harden, *Fl. New South Wales* 1: 337 (1990).

Perennial herb to subshrub, 1 m tall. Stems with small, scattered, stellate hairs. Leaves with

petiole 2–5 mm long; lamina rhombic to elliptic or oblanceolate, (1–) 2–4 (–6) cm long, 0.7–1.5 (–2.5) cm broad, narrowly to broadly acute at base, entire at base and bluntly serrate to apex, acute to obtuse, cinereous below with dense, minute, stellate hairs, scattered stellate-hairy to glabrous above; stipules linear, 3–5 mm long. Flowers usually solitary; pedicels 1–3 cm long. Calyx strongly ribbed, accrescent; tube to 5 mm long; lobes 1 mm long. Petals c. 1 cm long, yellow or yellowish orange. Carpels 8–12. Mericarps indehiscent, with or without an apical awn c. 1 mm long. *Big Jack*.

Norfolk Is., Lord Howe Is. A weed of wasteland *etc.*, now pantropical and of uncertain origin.

N.Is.: vicinity of Mt Bates, *G.Uhe 1226* (K); *s. loc., R.M.Laing* (CHR). **L.H.Is.:** 0.4 km N of 'Pine Trees', *L.A.S.Johnson & A.N.Rodd 1208* (NSW); portion 77, adjoining cemetery, *J.Pickard 2678* (NSW); S end of golf course, portion 119, *J.Pickard 3464* (NSW); *s. loc., J.D.McComish 65* (K).

The leaf shape in *Johnson & Rodd 1208* may indicate that it belongs to subsp. *retusa* (L.) Borss.Waalk. (*Blumea* 14: 198, 1966), if one recognises that subspecies. The other four collections from Lord Howe Is., however, represent subsp. *rhombifolia*. Presumably based on this collection, S.W.L.Jacobs & J.Pickard (*Pl. New South Wales* 145, 1981) and A.N.Rodd & J.Pickard (*Cunninghamia* 1: 277, 1983) record *Sida rhombifolia* subsp. ?*retusa* from Lord Howe Is.

4. ABUTILON

Abutilon Mill., *Dict. Gard. Abr.* 4th edn, (1754); the name is based on one used, possibly for mulberries, by Ibn-Sina (980–1037), known in the West as Avicenna, the famous Islamic scholar; alternatively it is also said to be derived from the Greek *a* (a prefix of negation), *bous* (oxen) and *tilos* (diarrhoea), as a supposed cure for this complaint in cattle.

Type: *A. theophrasti* Medik.

Annual or perennial herbs, shrubs or rarely small trees, often softly hairy. Leaves simple or palmately divided, usually cordate at base; usually petiolate. Inflorescence axillary, with flowers solitary or apparently in loose, terminal panicles by reduction of upper leaves; pedicels usually articulated. Epicalyx absent. Calyx 5-lobed, usually campanulate. Petals rotate to campanulate, usually yellow, sometimes orange, red or white. Staminal column usually much shorter than petals. Carpels 5–40, in a single whorl, each with 3–9 ovules. Fruit a discoid schizocarp, often breaking up tardily; mericarps follicular, rounded to aristate at apex.

A tropical and subtropical genus of perhaps 150 species, mainly found in the New World; 1 endemic and 1 naturalised species on Norfolk Is.

Young stems soft with dense, closely appressed, stellate hairs; petals less than 1 cm long, shorter than calyx **1. A. julianae**

Young stems with long, spreading, simple hairs 2–4 mm long, as well as minute stellate hairs; petals 1.5–2.5 cm long, longer than calyx **2. A. grandifolium**

1. Abutilon julianae Endl., *Prodr. Fl. Norfolk.* 75 (1833)

T: Norfolk Island, Philip Island, 1804–1805, *F.L.Bauer*; holo: W. The identity of Juliana, after whom this species was named, has not been discovered.

Subshrub, c. 1 m tall or more. Young stems softly covered with dense, closely appressed, stellate hairs. Leaves with petiole 2–8 cm long; lamina broadly ovate, 3–9 cm long, 2.5–7 cm broad, cordate, slightly irregularly serrate, densely appressed stellate-hairy below, becoming almost glabrous above. Flowers solitary; pedicels 5–15 mm long. Calyx 5–10 mm long, densely stellate-hairy, lobed to c. half way. Petals shorter than calyx, yellow. Staminal column exserted, c. twice length of calyx. Mericarps (*fide* S.F.L.Endlicher, *loc. cit.*) 20, pilose, 3-seeded. Fig. 38A.

Norfolk Is. An endemic species, stated by R.M.Laing (*Trans. & Proc. New Zealand Inst.* 47:

30, 1915) to be 'evidently rare and in danger of extermination', and now apparently extinct on Norfolk Is. itself, although diligently searched for. It was rediscovered, however, on Philip Is., following the extermination of the rabbits there. Said by R.M.Laing (*loc. cit.*) to occur in 'rocky cliffs' and by A.Cunningham (*fide* specimen cited below) as 'growing in open situations among grass'.

N.Is.: [back of Mt Pitt], *R.M.Laing* (CHR); *s. loc.*, 1830, *A.Cunningham 135* (K); Philip Is., 1985, *N.Hermes & D.Greenwood* (K); *loc. id.*, *I.R.Telford 10445 & K.Groeneveld* (CBG, K).

2. *Abutilon grandifolium (Willd.) Sweet, *Hort. Brit.* 53 (1826)

Sida grandifolia Willd., *Enum. Pl.* 724 (1809). T: cultivated; holo: B *n.v.*; IDC microfiche 7440.912/4. So called because the leaves were large for the genus *Sida*.

Illustrations: C.J.Webb *et al.*, *Fl. New Zealand* 4: 823, fig. 79A (1988); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 867, t. 121 (1990); A.S.Mitchell & E.H.Norris in G.J.Harden, *Fl. New South Wales* 1: 334 (1990).

Subshrub, 0.5–2 m tall. Young stems covered with stellate as well as simple hairs, 2–4 mm long. Leaves with petiole 3–10 cm long; lamina broadly ovate, 5–18 cm long, 4–15 cm broad, deeply cordate, dentate, softly hairy with stellate and simple hairs below, less densely so above. Flowers solitary or sometimes 2–6; peduncles and pedicels together to 10 cm long. Calyx 10–20 mm long, appressed stellate hairy, with or without long, simple hairs; tube shorter than lobes. Petals 1.5–2.5 cm long, yellow or orange-yellow. Staminal column shorter than calyx. Schizocarp 12–15 mm tall, very dark brown; mericarps c. 10, slightly inflated, densely hairy, shortly beaked, 3–6-seeded.

Norfolk Is. A weed, native to tropical America, now widespread in the tropics.

N.Is.: near the Melanesian Mission, *P.Ralston 28* (A); chapel grounds, Melanesian Mission, *W.R.Sykes NI 619* (CHR); around the airport, 1970, *O.Evans* (CHR); Garnet Point, *P.S.Green 2397* (K); *s. loc.*, 1946, *H.H.Allan* (NSW).

It has often, but incorrectly, been called *A. mollissimum* (Cav.) Sweet, a name that belongs to another species.

5. MODIOLA

Modiola Moench, *Methodus* 619 (1794); from the Latin *modiolus* (the hub of a wheel), alluding to the shape of the fruit.

Type: *M. multifida* Moench, *nom. illeg.* = *M. caroliniana* (L.) G.Don

Creeping, perennial herbs. Stems sparsely hirsute with simple or 2-branched hairs. Leaves palmately lobed or dissected; petiolate. Flowers solitary, axillary. Epicalyx segments 3, free. Calyx 5-lobed, campanulate. Petals slightly longer than sepals. Staminal tube subpyramidal, shorter than petals. Carpels 15–25, each with 1 ovule. Fruit a flat, discoid schizocarp; mericarps dorsally 2-awned, sparsely hairy, very dark brown when ripe, divided into an upper, 2-valved, dehiscent portion and a lower indehiscent cell.

A monotypic genus, native to warm temperate and tropical America, from the U.S.A. to Argentina, naturalised on Norfolk and Lord Howe Islands.

*Modiola caroliniana (L.) G.Don, *Gen. Hist.* 1: 466 (1831)

Malva caroliniana L., *Sp. Pl.* 2: 688 (1753); *Modiola multifida* Moench, *Methodus* 620 (1794), *nom. illeg.* T: Carolina; lecto: LINN 870.15, *fide* P.A.Fryxell, *Syst. Bot. Monogr.* 25: 306 (1988); IDC microfiche 177/2.464/13. The epithet alludes to the State of Carolina, the type locality.

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 482 (1981); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 839, fig. 439E (1986); A.S.Mitchell & E.H.Norris in G.J.Harden, *Fl. New South Wales* 1: 325 (1990).

Herb, rooting at nodes, tips ascending. Leaves with petiole longer than lamina, 2–7 cm long; lamina ±orbicular in outline, 1.5–5 cm diam., subcordate at base, irregularly crenate and shallowly lobed in young plants and lower leaves of older plants, to deeply palmately 5–7-

lobed in mature leaves, with scattered stellate hairs above and below. Pedicels shorter than petioles but at least 10 mm long. Epicalyx segments oblanceolate, 3–5 mm long, with long hairs. Calyx 5–7 mm long, with long hairs; lobes equal to or longer than tube. Petals 6–8 mm long, orange to reddish orange. Schizocarp c. 1 cm diam., setaceous; mericarps wrinkled.

Norfolk Is., Lord Howe Is. A common weed of pastures, roadsides, waste places *etc.*

N.Is.: vicinity of Emily Bay, *G.Uhe 1216* (K); *s. loc.*, *R.M.Laing* (CHR); *s. loc.*, *J.D.McComish 22A* (K). **L.H.Is.:** above Neds Beach, *A.C.Beauglehole 6098* (CANB, NSW); lowland S of Lovers Bay, *J.Pickard* in *A.N.Rodd 1444* (NSW); Rocky Run Valley, *J.Pickard 2844* (NSW).

6. PAVONIA

Pavonia Cav., *Diss.* 2: App. 2 (1786); named after José Antonio Pavón (1754–1844), Spanish botanist and traveller in South America, especially Peru.

Type: *P. paniculata* Cav.

Annual or perennial herbs or shrubs, often softly stellate-pubescent. Leaves variously shaped, often lobed; petiolate. Inflorescence axillary, with flowers solitary or paired, or appearing racemose due to reduction of upper leaves. Epicalyx segments 4 or more, free or basally connate. Calyx 5-lobed, campanulate. Petals large, white or brightly coloured. Staminal tube long or short. Carpels 5, in a single whorl, each 1-ovulate. Fruit a discoid schizocarp; mericarps indehiscent, trigonous, usually keeled or winged.

A genus of 200 or more species, distributed throughout the tropics and subtropics, especially in South America; 1 species naturalised on Norfolk Is.

***Pavonia hastata** Cav., *Diss*. 3: 138, t. 47, fig. 2 (1787)

T: Montevideo, Uruguay, *P.Commerson*; holo: ?P-JU *n.v.*; so named from the hastate (shaped like an arrowhead) leaves.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 71, fig. 9B (1986); B.A.Auld & R.W.Medd, *Weeds* 186 (1987); A.S.Mitchell & E.H.Norris in G.J.Harden, *Fl. New South Wales* 1: 327, t. 18 (1990).

Shrub to c. 2 m tall, much branched. Young stems densely covered with minute stellate hairs. Leaves with petiole 0.7–2 cm long; lamina of lower leaves suborbicular, grading to hastate-lanceolate in upper leaves, (1–) 2–5 cm long, (0.7–) 1.3–2 cm broad, ±truncate at base, coarsely crenate, apically blunt, densely stellate-hairy below, less so above. Flowers solitary, sometimes cleistogamous; pedicels 1–2 cm long. Epicalyx lobes elliptic to ovate, 4–6 mm long. Calyx 6–8 mm long, densely stellate-hairy; lobes slightly longer than tube. Petals 15–25 mm long, rose-coloured with a darker 'eye'. Schizocarp c. 6 mm diam.; mericarps reticulately veined, dorsally winged, without awns, pubescent to glabrous.

Norfolk Is. Occasionally on roadsides or as a garden escape. Native to South America, from southern Brazil to Argentina.

N.Is.: garden escape, *s. loc.* 1962, *E.Ralston* (NSW); cultivated by B.Evans from seed collected from near Steels Point, *P.S.Green 2408* (K).

7. HIBISCUS

Hibiscus L., *Sp. Pl.* 2: 693 (1753); *Gen. Pl.* 5th edn, 310 (1754); the Greek name for the *Marsh-Mallow*.

Type: *H. syriacus* L.

Herbs, shrubs or trees, variously pubescent. Leaves simple or palmately lobed, entire or usually toothed, petiolate. Flowers showy, axillary and solitary or in apparently terminal racemes or corymbs by reduction of upper leaves; pedicels usually articulate. Epicalyx segments 3–many, free or basally connate. Calyx 5-lobed, campanulate to suburceolate. Petals yellow, white, orange, red or purple. Staminal tube short or long. Carpels 5, in a flat

whorl, sometimes each divided vertically to give 10 cells, each with 3 or more ovules. Fruit a loculicidally dehiscent capsule.

A genus of 200 or more species, distributed worldwide except in the cooler temperate regions; 3 native and 2 naturalised species on the Islands. Often cultivated for their attractive flowers, especially the many cultivars of *H. rosa-sinensis* L.

1 Leaves mainly entire; epicalyx cupulate; flowers usually yellow with maroon at base **1. H. tiliaceus**

1: Leaf margins variously serrate, dentate or crenate; epicalyx lobes only basally connate; flowers yellow, white, pink or reddish

2 Flowers in apparently terminal racemes or corymbs

3 Stems prickly, with dense stellate hairs; inflorescence an apparent raceme; flowers almost sessile, yellow with a maroon 'eye' **2. H. diversifolius**

3: Stems not prickly, with dense or scattered stellate hairs; inflorescence corymbose; pedicels 3–15 cm long; flowers white or pink, fading to deep rose **3. H. mutabilis**

2: Flowers solitary in leaf axils; leaves usually 2–5 cm long

4 Upper leaves 3-lobed, the central lobe longest and obovate-oblanceolate; pedicels longer than leaves, 4–12 cm long; flowers rose **4. H. pedunculatus**

4: Leaves ovate (lobed only in immature plants); pedicels shorter than leaves, 0.7–1 cm long; flowers greenish yellow with a deep purple 'eye' **5. H. insularis**

1. Hibiscus tiliaceus L., *Sp. Pl.* 2: 694 (1753)

T: India, Herb. Hermann III fol. 51 No. 258; lecto: BM, *fide* J. van Borssum Waalkes, *Blumea* 14: 31 (1966).

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 71, fig. 9E (1986); J.Brock, *Top End Native Pl.* 223 (1988); A.S.Mitchell & E.H.Norris in G.J.Harden, *Fl. New South Wales* 1: 329 (1990).

Small tree to c. 10 m tall (or more), often sprawling. Young stems covered with soft, dense, minute stellate hairs. Leaves with lamina rather thick, unlobed, broadly ovate to orbicular, (5–) 10–20 (–30) cm long, cordate, entire, shortly acuminate, softly and densely stellate-hairy below, sparsely so above. Flowers solitary or few, cymose; pedicels articulate. Epicalyx cupular; lobes 8–12, acute, shorter than tube. Calyx 1.5–2.5 cm long; lobes narrowly triangular, shorter than tube, with a flat, narrow gland on the midvein. Petals 4–7 cm long, yellow, usually maroon at base, fading to dark red, drying to greenish. Capsule ±ovoid, 1.5–2.5 cm long, shortly beaked. *Norfolk Hibiscus* (N.Is.), *Kurrajong* (L.H.Is.). Fig. 16.

Norfolk Is., Lord Howe Is. Native on the Islands but distributed worldwide in the tropics and subtropics, especially in coastal areas. Flowers Nov.–Apr. on Lord Howe Is.

N.Is.: Anson Bay, *W.R.Sykes NI 453* (CHR); *loc. id.*, *R.M.Laing s.n.* (CHR). **L.H.Is.:** E side of Old Settlement Bay, *G.Uhe 1308* (K); Old Settlement Beach, *I.Hutton 113* (CBG); W of Transit Hill, *A.C.Beauglehole 5839* (MEL); *s. loc.*, 1920, *J.L.Boorman* (BRI, NSW).

2. Hibiscus diversifolius Jacq., *Collectanea* 2: 307 (1789)

T: East Indies; neo: N.J.Jacquin, *Icon. Pl. Rar.* 3: t. 551 (1792), designated by P.A.Fryxell, *Syst. Bot. Monogr.* 25: 208 (1988). So named because the leaves are of diverse shape.

Illustrations: E.R.Rotherham *et al.*, *Fl. & Pl. New South Wales & S Queensland* 90, t. 271 (1975); B.A.Auld & R.W.Medd, *Weeds* 184 (1987); A.S.Mitchell & E.H.Norris in G.J.Harden, *Fl. New South Wales* 1: 329 (1990).

Subshrub, or shrub, to 2 m or more. Stems and petioles with conical prickles 1–2 mm long and dense, fine stellate hairs. Leaves with lamina ovate to orbicular in outline, entire or palmately 3–5-lobed, 3–10 cm long, truncate to subcordate at base, irregularly dentate-serrate, scattered hispid hairy above and more densely so below. Flowers in apparently terminal racemes; pedicels c. 1–2 mm long. Epicalyx segments 7–12, narrowly lanceolate, 8–12 mm long, shortly united at base, hispid. Calyx 7–25 mm long, hispid; lobes narrowly

triangular, longer than tube. Petals 4–5 cm long, yellow with a maroon base. Capsule ovoid, 2–3 cm long, densely hispid.

Norfolk Is., Lord Howe Is. Possibly indigenous on both Islands, or an early introduction on Norfolk Is. (doubt has been cast on its often supposed native status in New Zealand – see R.O.Gardner, *Newslett. Auckland Bot. Soc.* 210 (2); 42, 1985). Its true area of native distribution is uncertain, but it is widespread today in tropical and subtropical areas. It is now said to be extinct on Lord Howe Is. (A.N.Rodd & J.Pickard, *Cunninghamia* 1: 279, 1983).

N.Is.: valley at bottom of Douglas Drive, 1969, *O.Evans* (K); low area along Douglas Drive, *G.Uhe 1186* (K); Mission Pond, *R.M.Laing* (CHR); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW); *s. loc.*, 1804, *F.L.Bauer* (K, W). **L.H.Is.:** track leading from West Bay to Middle Rd, 1920, *J.L.Boorman* (NSW).

3.* Hibiscus mutabilis L., *Sp. Pl.* 2: 694 (1753)

T: cultivated; lecto: LINN 875.20, *fide* J. van Borssum Waalkes, *Blumea* 14: 67 (1966); IDC microfiche 177/2.468/5. The epithet means changeable, in reference to the colour change as the flowers age.

Illustrations: S.Edwards, *Bot. Reg.* 7: t. 589 (1821); M.C.Neal, *Gardens Hawaii* 555, fig. 216f (1966); Anon., *Hong Kong Shrubs* 2nd edn, 44 (1976).

Shrub or small tree to 4 m tall. Stems and petioles with dense stellate and glandular hairs. Leaf lamina very broadly ovate to orbicular in outline, palmately but shallowly 3–7-lobed, 5–15 cm long; lobes triangular, shallowly serrate-crenate, acute, discolorous, stellate-pubescent above and below. Flowers solitary or usually in apparently terminal, few-flowered corymbs; pedicels 3–15 cm long. Epicalyx lobes 8–12, linear-lanceolate, 0.5–2 cm long. Calyx 3–4 cm long; lobes broadly triangular, slightly longer than tube, stellate-hairy. Petals 5–6 cm long, white or pink, fading to deep rose. Capsule globose, c. 2 cm long, pilose. Seeds long-pilose.

Lord Howe Is. A native of China, widely cultivated and occasionally becoming naturalised.

L.H.Is.: E side of Old Settlement Bay, *G.Uhe 1309* (K).

4. *Hibiscus pedunculatus L.f., *Suppl. Pl.* 309 (1781)

T: southern Africa, not designated. So called because of the pedunculate flowers.

Illustrations: J.M.Wood, *Natal Pl.* 6(2): t. 533 (1910); B.Jeppe, *Natal Wild Fl.* t. 38d (1975); Anon., *Wild Fl. S. Africa* 82, t. 253 (1980).

Shrub to 3 m tall. Young stems and petioles hispid with dense, stellate hairs. Leaves slightly hispid above and below with simple and stellate hairs; lamina of lower leaves almost orbicular with 3–5 shallow lobes, 2–5 (–7) cm long and broad, ±truncate at base, dentate, rounded to bluntly acute at apex; lamina of upper leaves deeply 3-lobed, with central lobe obovate-oblanceolate, longer than lateral lobes. Flowers solitary, declinate; pedicels 4–12 cm long, slightly longer than leaves. Epicalyx lobes 8–10, linear to narrowly oblanceolate, 7–15 mm long. Calyx campanulate, 10–15 mm long, divided halfway; lobes lanceolate-triangular, acute. Petals 3–4 cm long, rose pink. Capsule ovoid, c. 1 cm long, hispid, 5-celled, each cell terminating in an awn 1–2 mm long.

Norfolk Is. A native of S Africa sometimes cultivated and then often escaping from gardens.

N.Is.: *s. loc.*, *R.M.Laing* (CHR); *s. loc.*, *J.D.McComish 20* (K).

5. Hibiscus insularis Endl., *Prodr. Fl. Norfolk.* 74 (1833)

T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W; iso: K. The epithet alludes to its occurrence on an island.

Illustrations: R.A.Howard, *J. Arnold Arbor.* 45: 486 (1964); B.Everard & B.D.Morley, *Wild Fl. World* t. 147A (1970); N.Hermes, *Austral. Nat. Hist.* 22: 274 (1987).

Shrub to 2.5 m tall (taller in cultivation). Young stems with scattered to numerous, but not densely contiguous, fine stellate hairs. Leaves with lamina ovate, (2–) 3–5 cm long, (1.5–) 2–4 cm broad, acute to subtruncate at base, irregularly crenate, obtuse to rounded at apex, sub-coriaceous, with scattered small stellate hairs above and below; juvenile leaves deeply

lobed. Flowers solitary; pedicels 0.7–1 cm long, shorter than leaves. Epicalyx lobes 5, broadly ovate, c. 10 mm long, rounded to broadly acute. Calyx campanulate, c. 2 cm long; lobes triangular, c. 1/3 length of tube, acute. Petals 6–7 cm long, pale yellow with a greenish tinge, deep purple at base, turning purple on fading. Capsule ovoid-globose, 1.5 cm long, glabrous. *Philip Island Hibiscus*. Figs 19, 40A.

Norfolk Is. Endemic on Philip Is. where there were 13 plants in 1939 (*fide* J.D.McComish, below) and only 8, just surviving, in 1963. Listed as endangered by J.Leigh *et al*., *Rare Threatened Austral. Pl.* 124 (1981). Cultivated on Norfolk Is.

N.Is.: Philip Is., *P.S.Green 1480* (A, K); *loc. id.*, *J.D.McComish 84A* (K); *loc. id.*, 1804, *F.L.Bauer* (K, W); Norfolk Is., cult., *M.Lazarides 8026* (CANB, K).

8. LAGUNARIA

Lagunaria (DC.) Rchb., *Consp. Regn. Veg*. 202 (1828); named after Andreas de Laguna (1494–1560), Spanish physician and botanist noted for his commentary on the works of Dioscorides.

Type: *L. patersonia* (Andrews) G.Don

Trees, with young stems and most other parts densely covered with minute, scurfy, often fringed, adpressed scales. Leaves entire, petiolate. Flowers solitary in axils of upper leaves. Epicalyx cupular and splitting, caducous, or reduced to a ridge surrounding base of calyx. Calyx cupular, with 5, short, broadly triangular lobes. Corolla rotate, densely stellate-scaly pubescent on outside, glabrous within. Staminal column c. half length of corolla. Ovary 5-locular, each locule 2-ovulate. Fruit a loculicidal capsule, eventually also septicidal.

A monospecific genus of two subspecies, one found on Norfolk and Lord Howe Islands and the other in Queensland. It is often grown as a small ornamental tree in warm temperate and subtropical regions.

Lagunaria patersonia subsp. **patersonia**

Hibiscus patersonia Andrews, *Bot. Repos*. 4: t. 286 (1803); *Lagunaea patersonia* (Andrews) Sims, *Bot. Mag*. 20: t. 769 (1804); *Lagunaea squamea* Vent., *Jard. Malmaison* 1: t. 42 (1804), *nom. illeg*.; *Solandra squamea* (Vent.) Poir. in J.B.A.P. de M. de Lamarck, *Encycl*. 7: 225 (1806), *nom. illeg*.; *Lagunea patersonia* (Andrews) Pers., *Syn. Pl*. 2: 259 (1807). T: specimens unknown; lecto: H.C.Andrews, *Bot. Repos*. t. 286 (1803), *fide* P.S.Green, *Kew Bull*. 45: 241 (1990).

Lagunaria patersonia var. *typica* Domin, *Biblioth. Bot*. 89: 409 (1928), *nom. inval*.

Illustrations: W.B.Turrill, *Bot. Mag*. 179: t. 342 (1959); H.Oakman, *Austral. Pl*. 3: 273 (1966); A.S.Mitchell & E.H.Norris in G.J.Harden, *Fl. New South Wales* 1: 321, t. 18 (1990).

Tree to 20 or more m tall. Leaves subcoriaceous; lamina elliptic to broadly elliptic or lanceolate, (4–) 5–7 (–9) cm long, (1.3–) 2–3.5 (–5) cm broad, obtuse to acute at base, entire, obtuse to rounded, covered with fringed, appressed scales, very dense below, scattered above. Flowers with pedicels 1–2 cm long. Epicalyx reduced to a ridge surrounding base of calyx. Calyx 12–15 mm long, densely scaly; lobes 2–3 mm long, broadly triangular. Petals elliptic-lanceolate, 4–4.5 cm long, densely scaly dorsally, glabrous within, pink to rose-lilac, yellow towards base. Capsule spherical, 2–3 cm long; septae lined with irritating hairs c. 1 mm long. *White Oak, Norfolk Hibiscus* (N.Is.), *Sally Wood* (L.H.Is.). Figs 22, 39A.

Norfolk Is., Lord Howe Is. Endemic. Widespread on Norfolk Is., second only to the Norfolk Island Pine (*Araucaria heterophylla*) in frequency. Flowers Nov.–Feb.

N.Is.: c. 3.2 km NE of cemetery, Kingston, *G.Uhe 1110* (K); near Ball Bay, *R.D.Hoogland 6655* (CANB); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW). **L.H.Is.:** SE end of Old Settlement Beach, *J.Pickard & A.N.Rodd 1491a* (NSW); S end of Mosely Park, *R.D.Hoogland 8724* (CANB, NSW); Erskine Valley, *A.C.Beauglehole 6095* (CANB).

Lagunaria patersonia subsp. *bracteatus* (Benth.) P.S.Green occurs in Australia (eastern

Qld), and is quickly distinguished from subsp. *patersonia* by its caducous, cupular epicalyx.

27. FLACOURTIACEAE

Trees or shrubs, rarely climbers. Leaves usually alternate, simple; stipules present or caducous. Inflorescence various, axillary or terminal, or flowers solitary. Flowers bisexual or unisexual, actinomorphic. Sepals imbricate or valvate, free or united. Petals imbricate or valvate, free, alternating with sepals, or weakly differentiated from them, or absent. Disc often present. Stamens as many as petals or more; filaments free or connate in groups opposite petals. Ovary superior, rarely semi-inferior, 1-locular with 2–10 parietal placentas, sometimes deeply intruding, each 2–many-ovulate; styles as many as placentas, free or connate. Fruit various. Seeds often arillate.

A family of c. 90 genera and 1000 or more species, mostly tropical and subtropical; 1 genus native on Lord Howe Is.

G.Bentham, Bixineae, *Fl. Austral.* 1: 105–108 (1863); A.Cronquist, *An Integrated System of Classification of Flowering Plants* 349 (1981); L.W.Jessup, Flacourtiaceae, *Fl. Australia* 8: 66–84 (1982).

XYLOSMA

Xylosma G.Forst., *Fl. Ins. Austr.* 72 (1786); from the Greek *xylon* (wood) and *osme* (scent), in allusion to the scented wood in many members of this genus.

Type: *X. orbiculatum* (J.R.Forst. & G.Forst.) G.Forst.

Trees or shrubs, dioecious (elsewhere rarely monoecious). Leaves alternate, entire or serrate to crenate, often somewhat coriaceous; stipules minute or caducous. Inflorescence axillary, of few-flowered racemes or fascicles, or flowers solitary. Flowers small, each subtended by a small, semipersistent bract; pedicels articulated. Sepals 4–8, imbricate, shortly connate, not petaloid. Petals absent. Disc fleshy, lobed or entire. Male flowers with numerous stamens; anthers subglobose, basifixed; abortive ovary present or absent. Female flowers with superior, sessile, 1-locular ovary; placentas 2–6, each with 2–few ovules; styles connate and short or absent; stigmas 2–6. Fruit a slightly fleshy or leathery berry. Seeds few, with a thin aril.

About 100 species from tropical and subtropical America, SE Asia, Australia and the Pacific; 2 endemic species on Lord Howe Is.

L.W.Jessup, A revision of *Xylosma* G.Forst. (Flacourtiaceae) in Australia, *Austrobaileya* 2: 77–79 (1984).

Leaves usually to 1.2 cm long, rarely more; stamens c. 12; montane species **1. X. parvifolium**

Leaves usually more than 3 cm long; stamens 25–30; lowland species **2. X. maidenii**

1. Xylosma parvifolium Jessup, *Austrobaileya* 2: 78 (1984)

T: Mt Gower, Lord Howe Island, *coll. unknown*; holo: MEL 582311, *n.v.*, *fide* L.W.Jessup, *loc. cit.* Epithet from the Latin *parvus* (small) and *folium* (leaf), in reference to the small leaves.

Xylosma ovatum var. *parvifolium* F.Muell. ex Sleumer, *Notizbl. Bot. Gart. Berlin-Dahlem* 14: 297 (1938). T: 'New South Wales and Queensland', '*F.Mueller*'; holo: B, ?destroyed *n.v.*; iso: ?K.

Xylosma sp. *A*, S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 130 (1981).

Illustrations: L.W.Jessup, *Austrobaileya* 2: 79, fig. 1C, D (1984); I.Hutton, *Lord Howe Is.* 127 (1986).

Shrub to 2m tall, young shoots minutely puberulous. Leaves with petiole 2–3 mm long, reddish brown, minutely puberulous; lamina elliptic-ovate, 0.4–1.2 (–3) cm long, 0.4–0.8 (–1.5) cm broad, acute to obtuse-rounded at base, serrate, obtuse at apex, with 2 or 3 primary

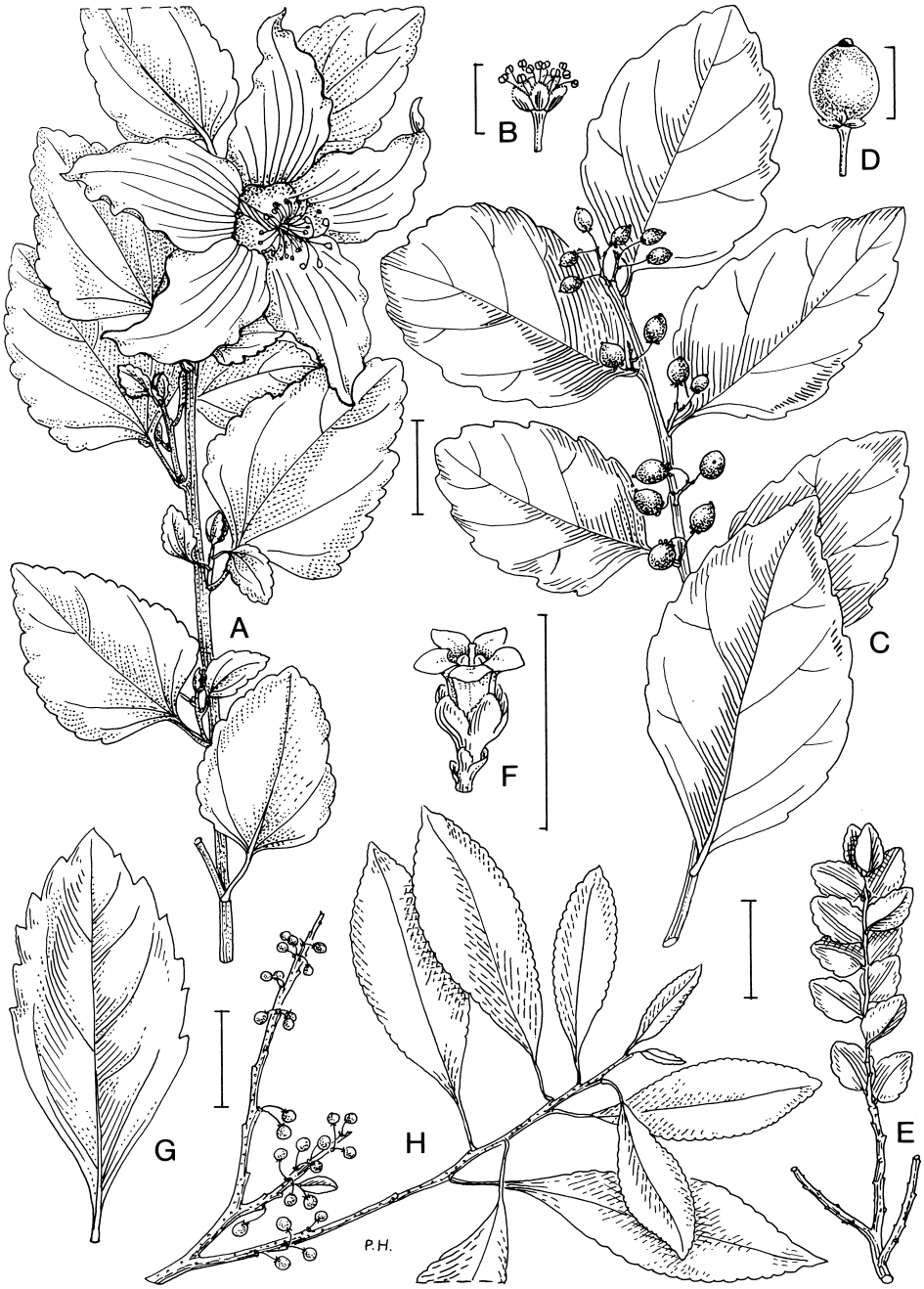

Figure 40. A, MALVACEAE: *Hibiscus insularis*, habit (J.McComish 84A, K). **B–E**, FLACOURTIACEAE. **B–D**, *Xylosma maidenii*. **B**, male flower (J.McComish 112, K); **C**, habit (J.Fullagar, K); **D**, fruit (J.Fullagar, K). **E**, *Xylosma parvifolium*, habit (?J.Fullagar, K). **F–H**, VIOLACEAE. **F–G**, *Melicytus novae-zeylandae* subsp. *centurionis*. **F**, flower (C.Moore 64, K, after M.Smith); **G**, leaf (L.Johnson & A.Rodd 1270, K). **H**, *Melicytus ramiflorus* subsp. *oblongifolius*, habit (M.Lazarides 8073, K). Scale bars; **A**, **C**, **E**, **G**, **H** = 2 cm; **B**, **D**, **F** = 5 mm. Drawn by P.Halliday.

veins on each side of midrib. Flowers solitary or up to 3 (–5) in racemes. Sepals 5, obovate, c. 1 mm long, entire and glabrous on margins. Male flowers with c. 12 stamens; filaments 2–2.5 mm long. Female flowers with ovary ovoid-globose, 2 mm long; styles 2, 0.25 mm long. Fruit ovoid-globose, 3 mm long, slightly fleshy, purple. Seeds 2. Fig. 40E.

Lord Howe Is. Endemic to the upper slopes of Mt Gower. Flowers Dec.–May.

L.H.Is.: Mt Gower track, *I.Hutton 616 & 617* (K); Mt Gower, *comm. F.Mueller* (K); *s. loc., C.Moore 6* (K).

2. Xylosma maidenii Sleumer, *Notizbl. Bot. Gart. Berlin-Dahlem* 14: 294 (1938)

T: Lord Howe Island, '1888', *J.H.Maiden*; holo: B, ?destroyed, *n.v.* Named after Joseph Henry Maiden (1859–1925), Director of the Royal Botanic Gardens, Sydney from 1896–1924, who collected on Lord Howe Is. in 1898.

[*Xylosma ovatum auct. non* Benth.: S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 130 (1981)]

Illustrations: L.W.Jessup, *Austrobaileya* 2: 79, fig. 1A, B (1984); I.Hutton, *Lord Howe Is.* 126 (1986).

Small tree to 5 m tall. Young shoots glabrous. Leaves with petiole 5–12 mm long, glabrous, yellow-orange; lamina ovate to elliptic, (3–) 4–6 (–10) cm long, (1.5–) 2–3 (–4) cm broad, obtuse or acute at base, entire or crenate-dentate, very shortly acuminate, acute or obtuse at apex, reticulate with 3 (or 4) primary veins on each side of midrib. Flowers axillary or borne below leaves, solitary or shortly racemose, to 8-flowered. Sepals 4 or 5, oblong-ovate, 1–2 mm long, pubescent along margins, green. Male flowers with 25–30 stamens; filaments 2.5–3 mm long. Female flowers with ovoid-globose ovary, c. 2 mm long; styles 2, 0.25 mm long. Fruit ovoid-globose, 5 mm long, slightly fleshy, purple. Seeds 2–4. Fig. 40B–D.

Lord Howe Is. Endemic. Occurs in forests at lower altitudes. Flowers Dec.–May.

L.H.Is.: S base of Malabar Ridge, *A.N.Rodd 1700* (K, NSW); summit of Transit Hill, *P.S.Green 2347* (K); N side of Intermediate Hill, *J.Pickard* in *A.N.Rodd 1346* (K, NSW); near Smoking Tree, *M.M.J. van Balgooy 1069* (CANB, NSW); *s. loc., J.D.McComish 112 & 117A* (K, NSW).

Very close to *X. ovatum* Benth. of central-eastern Qld, Australia.

28. VIOLACEAE

Herbs, shrubs or small trees. Leaves usually alternate, simple, entire or variously dissected, usually stipulate. Inflorescence axillary, of racemes or fascicles, or flowers solitary. Flowers usually bisexual, often cleistogamous, actinomorphic or zygomorphic. Sepals 5, imbricate, free or shortly united, persistent. Petals 5, imbricate or contorted, usually free; anterior petal usually spurred. Stamens 5, hypogynous, alternating with petals; filaments very short; anthers free or connivent around ovary, introrse, with connective often produced into a membranous appendage. Ovary superior, 1-locular with 3 (–5) parietal placentas, each with 1–many ovules; style simple. Fruit a capsule or berry. Seeds often arillate.

A cosmopolitan family of c. 22 genera and 900 species; 2 genera native on the Islands.

G.Bentham, Violarieae, *Fl. Austral.* 1: 98–105 (1863); H.Melchior, Violaceae (*Viola* by W.Becker), *Nat. Pflanzenfam.* 2nd edn, 21: 329–377 (1925); M.Jacobs & D.M.Moore, *Fl. Males.* ser I, 7: 179–212 (1971); L.G.Adams & A.S.George, Violaceae, *Fl. Australia* 8: 91–110 (1982).

KEY TO GENERA

Shrubs or trees; flowers unisexual, actinomorphic; fruit a berry	**1. MELICYTUS**
Herbs; flowers bisexual, strongly zygomorphic; fruit a capsule	**2. VIOLA**

1. MELICYTUS

Melicytus J.R.Forst. & G.Forst., *Char. Gen. Pl.* 123, t. 52 (1776); from the Greek *meli* (honey) and *kytos* (a container, jar), in allusion to the staminal nectaries in these plants.

Type: *M. ramiflorus* J.R.Forst. & G.Forst.

Trees or shrubs. Leaves alternate; stipules inconspicuous. Inflorescences axillary or borne below the leaves, fasciculate, often few-flowered. Flowers functionally unisexual, actinomorphic; pedicels with a pair of minute bracts. Calyx lobes subequal. Petals equal. Stamens free or united, rudimentary in female flowers; filaments short; anthers free, ovoid, with a dorsal, scale-like nectary and connective usually produced into a membranous appendage. Ovary rudimentary in male flowers; placentas 3–5, each with several ovules; style with ±sessile stigmas. Fruit a berry.

A genus of 14 species, from New Zealand, Vanuatu, Fiji, Tonga and Samoa and with 2 endemic species on Norfolk Is. and 1 endemic on Lord Howe Is. These species are sometimes included in the segregate genus *Hymenanthera* R.Br., and this was the concept followed in *Fl. Australia* 8: 109 (1982). Here they are included in *Melicytus*, following E.J.Beuzenberg, *New Zealand J. Sci. (Wellington)* 4: 337–349 (1961).

E.A.Kellog & A.L.Weitzman, A note on the oceanic species of *Melicytus* (Violaceae), *J. Arnold Arbor.* 66: 491–502 (1985).

1 Leaf margins crenate, sometimes obscurely so; petioles 2–20 mm long

2 Leaf margins obscurely crenate; petioles slender, (5–) 10–15 (–20) mm long; calyx c. 0.5 mm long (N.Is.) **1. M. ramiflorus**

2: Leaf margins distinctly crenate; petioles 2–5 mm long; calyx c. 1 mm long (L.H.Is.) **2. M. novae-zelandae**

1: Leaf margins entire; petioles 3–10 mm long (N.Is.) **3. M. latifolius**

1. Melicytus ramiflorus J.R.Forst. & G.Forst., *Char. Gen. Pl.* 124 (1775)

subsp. **oblongifolius** (A.Cunn.) P.S.Green, *J. Arnold Arbor.* 51: 220 (1970)

Hymenanthera oblongifolia A.Cunn., *London J. Bot.* 1: 124 (1842); *Hymenanthera dentata* var. *oblongifolia* (A.Cunn.) Kirk, *Trans. & Proc. New Zealand Inst.* 28: 511 (1890). T: Norfolk Island, *A.Cunningham 42* (*127**); holo: K. So named from its oblong leaves.

[*Melicytus ramiflorus auct. non* J.R.Forst. & G.Forst.: J.D.Hooker, *Handb. N. Zeal. Fl.* 17 (1867), *p.p.*; J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 697 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 32 (1915)]

[*Hymenanthera dentata auct. non* R.Br. ex DC.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 697 (1904)]

Slender shrub or tree to 5 m tall. Young stems glabrous. Leaves chartaceous, glabrous; petiole (5–) 10–15 (–20) mm long; lamina elliptic to narrowly elliptic or narrowly oblanceolate, (4–) 5–9 (–10) cm long, (1.5–) 2–3.5 (–5) cm broad, narrowly cuneate at base, obscurely crenate, acute to shortly subacuminate at apex, with 7–9 primary veins on each side of midrib. Inflorescence axillary, 5–15-flowered; pedicels slender, 2–7 mm long. Calyx lobes triangular, 0.5 mm long, shortly connate. Petals oblong, 1–1.2 mm long, rounded, slightly erose. Stamens sessile; anthers free, ovate, 0.7 mm long; connective with a small dorsal flap c. 3.5 mm long. Ovary conical, c. 1 mm long; stigmas slightly 4- or 5-lobed. Berry spheroidal, 3–4 mm diam., mauve when ripe. *Whiteywood*. Fig. 40H.

Norfolk Is. A not uncommon endemic.

N.Is.: Mt Pitt Reserve, *M.Lazarides 8073* (CANB, K); Saddle between Mt Pitt and Mt Bates, *R.D.Hoogland 11361* (CANB, K); c. 3.2 km NE of the Kingston cemetery, *G.Uhe 1101* (K); *s. loc., J.Backhouse 641* (K).

Melicytus ramiflorus subsp. *ramiflorus* is endemic to New Zealand, with closely related species or subspecies in Vanuatu, Fiji, Tonga and Samoa.

2. Melicytus novae-zelandae (A.Cunn.) P.S.Green, *J. Arnold Arbor.* 51:219 (1970)

subsp. **centurionis** P.S.Green, *J. Arnold Arbor.* 51: 219 (1970)

T: Lord Howe Island, *J.D.McComish 166*; holo: K. Named after the military Captain James Doran McComish (1881–1948), who studied the flora and collected extensively on Lord Howe Is. in the 1930s.

Illustration: I.Hutton, *Lord Howe Is.* 143 (1986).

Shrub or small tree to 5 m. Young stems glabrous. Leaves chartaceous, glabrous; petiole 2–5 mm long; lamina oblanceolate-elliptic, 4–7 cm long, 1.5–2.7 cm broad (sometimes as small as 3.5 × 1.2 cm), narrowly cuneate at base, crenate to serrate with (3–) 5 or 6 (–8) teeth per side, acute to rounded at apex, with (4–) 5 or 6 (–7) primary veins on each side of midrib. Inflorescence axillary or on stems below leaves, 1- or 2-flowered; pedicels 1.5–2 mm long. Calyx lobes c. 1 mm long, rounded, erose. Petals oblong, 2.5–4 mm long, rounded, greenish yellow, tips ±reflexed at anthesis. Stamens free, with a dorsal membrane of 5 lanceolate lobes, 2 mm long. Ovary narrowly ovoid, 2.5 mm long; style with 2 recurved lobes. Berry globular, 6 mm long, purple; style persistent. Fig. 40F–G.

Lord Howe Is. Endemic and rare in the forest at intermediate altitudes. Flowers mid Aug.–mid Oct.

L.H.Is.: between Kims Lookout and the cliff above Old Gulch, *I.Hutton 166* (CBG); NE of North Beach sheds, 1971, *J.Pickard* (NSW); NW side of Transit Hill, *L.A.S.Johnson & A.N.Rodd 1270* (K, NSW); near Whitings Gate, 1944, *M.Nicholls* (K, NSW); Old Kings Cave, Erskine Valley, 1971, *J.Pickard* (NSW).

3. Melicytus latifolius (Endl.) P.S.Green, *J. Arnold Arbor.* 51: 218 (1970)

Hymenanthera latifolia Endl., *Prodr. Fl. Norfolk.* 70 (1833). T: Norfolk Island, 1804–1805, *F.Bauer*; holo: W; iso: K. Named from the Latin *latus* (broad) and *folius* (a leaf), in allusion to this plant's broad leaves.

Suttonia ?tenuifolia Hook.f., *Fl. Antarct.* 1: 52 (1844). T: Norfolk Island, *A.Cunningham 43*; holo: K.

Illustration: S.F.L.Endlicher, *Iconogr. Gen. Pl.* t. 108 (1840).

Tree 4 (–7) m tall. Young stems glabrous. Leaves rather stiff, glabrous; petiole 3–10 mm long; lamina elliptic, (3–) 5–7 (–9) cm long, (1.3–) 2–3 (–4) cm broad, broadly to narrowly acute at base, entire, acute to rounded, with 4 or 5 (–6) primary veins on each side of midrib. Inflorescence axillary or borne below leaves, 1–4 flowered; pedicels 1–3 mm long. Calyx c. 1 mm long; lobes rounded, very slightly erose. Petals 3–4 mm long, lanceolate; tips rounded, ±reflexed. Stamens connate; dorsal membrane produced into 5 lanceolate lobes c. 2 mm long. Ovary bottle-shaped, 2.5–3 mm long; style nearly 1 mm long; stigma slightly 2-lobed. Berry spheroidal, c. 5 mm diam. *Norfolk Island Mahoe*.

Norfolk Is. Endemic, now rare and endangered. The comment in J.S.Turner *et al.*, *The Conservation of Norfolk Island* 35 (1968) that this plant was 'fairly common in the forests of Mt Pitt Reserve' was probably intended for *M. ramiflorus* subsp. *oblongifolius*.

N.Is.: upper slopes of Mt Pitt, *J.D.McComish 45* (K); Mt Pitt Reserve, *M.Lazarides 8097* (CANB, K); valley S of Mt Bates, *P.S.Green 1897* (K); *s. loc.*, *J.Backhouse 6208* (K).

2. VIOLA

Viola L., *Sp. Pl.* 2: 933 (1753); *Gen. Pl.* 5th edn, 402 (1754); the Latin name for the *Violet*.

Type: *V. odorata* L.

Annual, biennial or perennial herbs, rarely shrubby, often stoloniferous. Leaves alternate, cauline or in a basal rosette; stipules free or adnate to petiole, persistent. Flowers solitary, bisexual, zygomorphic; pedicels bibracteate; small cleistogamous flowers often present. Sepals connate at base, prolonged into a flattened basal appendage. Petals free, unequal; lateral pair often bearded; anterior petal saccate or spurred. Stamens subsessile, coherent around ovary; anterior pair spurred; connective often with appendage. Ovary 1-locular, with 3 parietal placentas, each with many ovules; style straight or basally geniculate; stigma capitate or lobed. Fruit a loculicidal capsule, elastically dehiscent, with 3 boat-shaped valves.

A mainly temperate genus of c. 300–500 species; 1 species native on Norfolk Is. Often cultivated as Violets or Pansies.

Viola betonicifolia Sm. in A.Rees, *Cycl. 37: No. 7 (1817)*

subsp. **nova-guineensis** D.M.Moore, *Feddes Repert. Spec. Nov. Regni Veg.* 68: 82 (1963)

T: Papua New Guinea, *R.D.Hoogland & R.Pullen 5337*; holo: CANB *n.v.*; iso: LAE *n.v.*, *fide* D.M.Moore, *loc. cit.* So named after the country from which the type had been collected.

Illustrations: Anon., *Dars-et* (*This is it*) [1] (1976), subsp. *nova-guinensis*; J.W.Wrigley, *Austral. Nat. Pl.* t. opposite p. 97 (1979); T.A.James in G.J.Harden, *Fl. New South Wales* 1: 437 (1990), the latter 2 being of subsp. *betonicifolia*.

Perennial herb. Stems short, erect, without stolons. Leaves radical; petiole 2–9 cm long; lamina narrowly triangular-hastate, 3–8 cm long, 1–2.5 cm broad, hastate at base and decurrent onto petiole, shallowly crenate, especially in lower half, acute at apex; stipules linear. Pedicel 6–12 cm long or more; bracts subulate, borne below middle. Sepals ovate to lanceolate, 3–6 mm long, blunt; basal appendage c. 1 mm long. Petals 8–15 mm long, purplish violet, darker veined, yellow or whitish towards base; lateral pair bearded inside. Stamens 2 mm long; appendage 1 mm long. Style clavate, geniculate near base. Capsule narrowly ellipsoidal, c. 1 cm long, acute. Seeds ovoid, c. 1 mm diam. *Wild Violet*.

Norfolk Is. Uncommon in open, grassy woodland. Also occurring in Australia (central-eastern Qld) and Papua New Guinea. Its native status on Norfolk Is. has been doubted, but being subsp. *nova-guineensis*, it is most unlikely to have been introduced.

N.Is.: Ball Bay, 1943, *F.C.Allan* (CHR); *s. loc.*, 1835, *J.Backhouse* (K); *s. loc.*, *J.D.McComish 51* (K); *s. loc.*, *R.M.Laing* (CHR).

Viola betonicifolia subsp. *betonicifolia* occurs widely in eastern Australia, from S.A. and Tas. to parts of Qld.

29. FRANKENIACEAE

Salt tolerant herbs or small shrubs, rarely annuals; salt glands usually present. Leaves simple, opposite, often small and revolute, pairs united by small stipular sheaths. Inflorescence axillary, of short cymes or flowers solitary. Flowers small, usually bisexual, actinomorphic. Calyx 4–7-lobed, tubular, pleated. Petals 4–7, imbricate, usually free, often spathulate, usually ligulate, usually white, pink or rarely red. Stamens 4–24, usually 6, in 2 unequal whorls. Ovary superior, 1-locular, with 1–4 parietal or basal placentas, each with 1–many ovules; styles elongate, branches filiform, equal in number to placentas. Fruit a loculicidal capsule, enclosed in persistent calyx. Seeds small.

A family of 3 or 4 genera and c. 100 species, with a sporadic but cosmopolitan distribution characteristic of saline habitats; 1 genus introduced to Norfolk Is.

G.Bentham, Frankeniaceae, *Fl. Austral.* 1: 149–153 (1863); V.S.Summerhayes, *J. Linn. Soc., Bot.* 48: 337–387 (1930); B.Barnsley, Frankeniaceae, *Fl. Australia* 8: 112–146 (1982); M.Whalen, *Fl. South Australia* 2: 873–881 (1986).

FRANKENIA

Frankenia L., *Sp. Pl.* 1: 331 (1753); *Gen. Pl.* 5th edn, 154 (1754); named after Johan Frankenius (1590–1661), Professor of Anatomy and Botany at Uppsala, Sweden.

Type: *F. laevis* L.

Perennial or annual herbs or small shrubs. Branches differentiated into long and short shoots.

Leaves appearing fasciculate on short shoots. Inflorescence of axillary or terminal cymes, or flowers solitary. Flowers bisexual, sessile, bracteolate. Calyx 4–6-lobed, usually ciliate. Petals 4–6, free, spathulate and clawed. Stamens 4–8. Style branches and placentas 1–3 (–4), each with 1–many ovules.

A genus of c. 60 species, characteristic of saline or gypsaceous soils, especially in the Old World; 1 naturalised species on Norfolk Is.

***Frankenia pulverulenta** L., *Sp. Pl.* 1: 332 (1753)

T: Europe, not designated. The epithet means powdered, as though with dust, in allusion to the white salty encrustations which can occur on plants of this species.

[*Frankenia pauciflora auct. non* DC.; J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 697 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 31 (1915)]

Illustration: M.A.Whalen in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 879, fig. 456B (1986).

Prostrate, much-branched annual herbs. Branches glabrous or pubescent. Leaves with lamina obovate to elliptic, 2–6 mm long, 1–2.5 mm broad, flat or slightly revolute, glabrous above, densely white puberulous below. Flowers solitary and axillary, or in terminal or axillary cymes; bracts and bracteoles similar to leaves. Calyx narrowly cylindrical, 3.5–4 mm long, strongly ribbed, pulverulent with ribs glabrous; lobes 5, c. 1 mm long, acute. Petals 5, narrowly spathulate, c. 4 mm long, pink to mauve. Stamens 6. Ovary narrowly ovoid, c. 1.5 mm long; placentas 3, each with c. 10 ovules; style c. 2 mm long, with 3 branches. Seeds c. 0.5 mm long, papillose.

Norfolk Is. Introduced, but only found near the sea. A native of the Mediterranean, eastwards to central Asia and the Punjab. It is significant that R.M.Laing (*loc. cit.*) stated that he had only seen it 'between the cobble stones on the approach to the pier'; in Australia it is naturalised near ports.

N.Is.: Kingston Pier, *R.M.Laing* (CHR); *loc. id., J.D.McComish 15* (K); S of the golf course, Kingston, *D.M.Henderson* (E); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW).

30. PASSIFLORACEAE

Herbaceous or woody climbers, with simple, axillary tendrils, sometimes trees or shrubs. Leaves usually alternate, usually simple, often lobed, rarely compound, stipulate. Inflorescence axillary, 1–many-flowered, cymose or racemose. Flowers usually bisexual, actinomorphic, often with a well-developed gynophore or androgynophore; hypanthium saucer-shaped to cylindrical. Sepals 5 (less often 3–8). Petals 5 (sometimes 3–8 or absent). Corona present between corolla and gynophore, consisting of 1 or more whorls of filaments or scales. Stamens 5 (or 4–10, rarely more), at base of hypanthium or united with gynophore. Ovary superior, rarely subsessile, 1-locular; placentas (2–) 3 (–5), parietal; ovules numerous; styles 1–3 (–5). Fruit a berry or capsule. Seeds 1–many, with a pulpy aril.

A mainly tropical and subtropical family of c. 20 genera and 600 species, mostly distributed in the Americas and Africa; 1 genus native to the Islands.

G.Bentham, Passifloreae, *Fl. Austral.* 3: 310–313 (1866); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Passifloraceae, *Fl. Java* 1: 288–292 (1963); W.J.J.O. de Wilde, Passifloraceae, *Fl. Males.* ser. I, 7: 405–434 (1972); D.R.Satterthwait, Passifloraceae, *Fl. Australia* 8: 147–158 (1982).

PASSIFLORA

Passiflora L., *Sp. Pl.* 1: 955 (1753); *Gen. Pl.* 5th edn, 410 (1754); so-called from a symbolic association of the flower parts with Christ's Passion.

Type: *P. incarnata* L.

Herbaceous or woody tendrillar climbers. Leaves alternate, usually variously lobed, usually with glands on petiole, and often on lamina. Flowers often showy, usually solitary or paired, sessile or pedicellate, usually with a simple tendril; hypanthium cupular to cylindrical. Sepals usually 5, usually free, sometimes petaloid. Petals usually 5. Corona of 1–several whorls, usually filamentous, sometimes tubercular, and usually with a membranous inner corona. Stamens 5; filaments adnate to gynophore to form androgynophore, free in upper part; anthers versatile. Ovary usually with 3 parietal placentas; styles 3; stigmas capitate. Fruit a many-seeded, succulent berry.

A genus of c. 350 species, mostly from tropical and subtropical America; 2 native species and 1 naturalised on the Islands. Often grown for their unusually shaped and attractive flowers. *Passiflora edulis* is widely grown, sometimes commercially, for its fruit from which the juice is often extracted to make a drink. *Passiflora quadrangularis* L. is the Grenadilla and *P. ligularis* Juss. the Sweet Grenadilla, both often grown for their edible fruit.

P.S.Green, *Passiflora* in Australasia and the Pacific, *Kew Bull.* 26: 539–558 (1972).

1 Margin of leaves entire; central lobe broadest at its base

2 Central lobe of leaf usually obtuse or rounded; flowers creamy white turning to orange-pink or red (N.Is.) **1. P. aurantia**

2: Central lobe of leaf acute; flowers orange-yellow to greenish (L.H.Is.) **2. P. herbertiana**

1: Margins of leaves serrate; central lobe broadest about its middle; flowers white marked with green and violet (N.Is., L.H.Is.) **3. P. edulis**

1. Passiflora aurantia G.Forst., *Fl. Ins. Austral.* 62 (1786)

Murucuia aurantia (G.Forst.) Pers., *Syn. Pl.* 2: 222 (1806). T: New Caledonia, 1774, *J.R. & G.Forster*; syn: BM. The epithet means orange-coloured, in allusion to the supposed colour of the flowers.

Passiflora glabra J.C.Wendl., *Coll. Pl.* 1: 55, t. 17 (1805); *Passiflora adiantum* Willd., *Enum. Pl.* 698 (1809), *nom. illeg.* T: cultivated, Hanover; holo: ?GOET *n.v.*

Passiflora adiantifolia Ker Gawl., *Bot. Reg.* 3: t. 233 (1817), *nom. illeg.*; *Disemma adiantifolia* (Ker Gawl.) DC., *Prodr.* 3: 333 (1828); *Distemma adiantifolia* (Ker Gawl.) Lem., *Ill. Hort.* 14, Misc: 57 (1867), *nom. illeg.* T: not traced.

Murucuia baueri Lindl., *Coll. Bot.* t. 36 (1821); *Disemma baueriana* Endl., *Prodr. Fl. Norfolk.* 66 (1833), *nom. illeg.*; *Disemma baueri* (Lindl.) G.Don, *Gen. Hist.* 3: 56 (1834); *Disemma baueriana* (Endl.) Lem., *loc. cit.*, *nom. illeg.*; *Passiflora baueriana* (Endl.) Mast., *Trans. Linn. Soc. London* 27: 634 (1871), *nom. illeg.* T: Norfolk Island, *F.L.Bauer*; holo: W.

Illustrations: J.B.Ker Gawler, *Bot. Reg.* 3: t. 233 (1817), as *Passiflora adiantifolia*; J.Lindley, *Coll. Bot.* t. 26 (1821), as *Murucuja baueri*; D.R.Satterthwait, *Fl. Australia* 8: 151, fig. 34A (1982).

Herbaceous climber, glabrous. Leaves with petiole glabrous, eglandular; lamina 3-lobed to c. half way, (2–) 3–6 (–7) cm long, (2.5–) 3.5–6.5 (–7.5) cm broad, rounded to subauriculate at base, entire; lobes rounded, often broadly so, sometimes slightly emarginate, or margins of lobes with c. 3 rounded crenations in young plants; venation reticulate, with 1–6 laminal glands where reticulations from lobes meet. Flowers solitary, creamy white, darkening to orange-red with age. Calyx lobes 5, 2–5 cm long. Petals 5, 1.5–2.5 cm long. Corona 1–2 cm long; outer whorl of numerous filiform lobes; inner whorl plicate, ±crenulate. Androgynophore 2.5–4 cm long. Ovary glabrous. Fruit ellipsoidal, 3–4 cm long, purplish (*fide* J.D.McComish 55). *Norfolk Island Passionfruit*.

Norfolk Is. A rare, sporadically occurring native in the forest.

N.Is.: near Mt Bates, O.Evans in M.Lazarides 8100 (CANB); near summit of Mt Pitt, J.D.McComish 55 (K); s. loc., A.Cunningham 123 (K); s. loc., J.Backhouse 675 (K).

Plants with 2 glands on the petioles are found in Papua New Guinea, Australia (Qld), Vanuatu and New Caledonia. D.R.Satterthwait in *Fl. Australia* 8: 150 (1982) recognises 2 varieties, var. *aurantia* and var. *pubescens*. The latter resembles the Norfolk Is. plant in lacking glands on the petioles, but has pubescent stems and tendrils, unlike the Norfolk Is. plant where they are glabrous. If the species is considered throughout its range the status of the variants is unclear and scarcely worthy of taxonomic recognition (see Green, *op. cit.*, 1972). The less-entire, juvenile foliage on young plants long confused the question as to whether there were 1 or 2 species on the Island.

2. **Passiflora herbertiana** subsp. **insulae-howei** P.S.Green, *Kew Bull*. 26: 552 (1972)

T: Lord Howe Island, *C.Moore 11*; holo: K. Named after the island on which this subspecies is endemic.

[*Passiflora herbertiana auct. non* Ker Gawl.: F.J.H. von Mueller, *Fragm.* 9: 68, 77 (1875); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 237 (1896); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 144 (1917)]

Illustration: I.Hutton, *Lord Howe Is.* 136 (1986).

Herbaceous climber, glabrous. Leaves with petiole with two glands at top; lamina 3-lobed in upper half or sometimes ±entire and ovate, (3–) 4–8 (–11) cm long, (2.5–) 5–8 (–12) cm broad, rounded-truncate at base, entire; lobes ±triangular, acute to slightly acuminate; central lobe acute; venation reticulate with a few laminal glands, especially between junction of lobes. Flowers solitary, orange-yellow to greenish (*fide* I.Hutton). Calyx lobes 5, 2.5–3 cm long, shortly united. Petals 5, c. 1 cm long. Corona c. 0.5–1 cm long; outer whorl of filiform lobes; inner plicate. Androgynophore 3 cm long. Ovary glabrous. Fruit ellipsoidal, 4–5 cm long. Fig. 41E.

Lord Howe Is. Endemic, rare and endangered.

L.H.Is.: Middle Beach Common, *P.S.Green 2031* (K); *s. loc., C.Moore 11* (K).

Passiflora herbertiana subsp. *herbertiana* occurs in forests along the eastern coast of Australia from N.S.W. to northern Qld.

3 ***Passiflora edulis** Sims, *Bot. Mag*. 45: t. 1989 (1818)

T: cultivated; not designated.

Illustrations: D.R.Satterthwait, *Fl. Australia* 8: 151, fig. 34G (1982); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 2: 1008, t. 143 (1990); G.J.Harden in G.J.Harden, *Fl. New South Wales* 434 (1990).

Herbaceous climber with woody base. Leaves with petiole 1.5–2 cm long, with 2 glands towards top; lamina deeply 3-lobed or sometimes entire, 5–15 cm long, 6–17 cm broad, rounded to slightly cordate at base, rounded sinus between lobes, serrate, acute at apices of lobes, without laminal glands. Flowers solitary, green on outside, white and violet inside; pedicels with 3 ovate, serrate bracts 1–2 cm long near top. Calyx lobes 5, c. 3 cm long, dorsally horned below tip. Petals 5, c. 2.5 cm long. Outer corona of 2 whorls of numerous threads 2–3 cm long, green at base, violet towards middle and white in upper part; inner corona short, membranous. Androgynophore c. 2 cm long. Ovary glabrous. Fruit c. 5 cm long, brownish purple (or yellow in f. *flavicarpa*). *Passionfruit*.

Norfolk Is., Lord Howe Is. A native of Brazil.

N.Is.: upper slope of Mt Pitt, *G.Uhe 1159* (K). **L.H.Is.:** Boat Harbour, *R.D.Hoogland 8778* (CANB); near top of Mt Gower, *A.C.Beauglehole 5799* (CANB).

This species is widely cultivated for its fruit. It is much liked by fruit-eating birds and often spread by them into the wild.

31. CUCURBITACEAE

Climbing or trailing herbs, base sometimes woody, usually monoecious or dioecious, mostly scabrid; spiral tendrils commonly present, simple or branched, stipular in position. Leaves alternate, simple or often palmately lobed or compound. Inflorescences axillary or terminal. Flowers usually unisexual, actinomorphic. Hypanthium present, cupular to tubular. Calyx usually 5-lobed. Petals usually 5, free or usually united, usually white or yellow. Stamens usually basically 5, often apparently 3, 2 double (2-locular), 1 single (1-locular), variously united; anthers usually curved or flexuous. Ovary inferior, usually 1–7-locular; ovules 1-many per locule, usually parietal. Fruit a berry, pepo or capsule. Seeds 1–many, usually large, ±compressed.

A family of c. 120 genera and 850 species, widely distributed in the tropics, but some representatives extending to temperate regions; 3 genera native and 1 introduced on the Islands. This family contains the pumpkins, marrows or squashes, melons, cucumbers, choko and various gourds.

G.Bentham, Cucurbitaceae, *Fl. Austral.* 3: 313–322 (1866); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Cucurbitaceae, *Fl. Java* 1: 292–307 (1963); C.Jeffrey, *The Cucurbitaceae of E. Asia* (1980); I.R.H.Telford, Cucurbitaceae, *Fl. Australia* 8: 158–198 (1982).

KEY TO GENERA

1 Inflorescence fasciculate; fruit few- to many-seeded, 1.5–7 cm long

2 Leaves palmately divided

3 Lobes of leaf acute to subacuminate; pedicels of fruit less than 1 cm long; ripe fruit red with white longitudinal stripes, smooth — **1. DIPLOCYCLOS**

3: Lobes of leaf obtuse to rounded; pedicels of fruit more than 1 cm long; ripe fruit yellow-green, covered with curved spines — **3. CUCUMIS**

2: Leaves entire or rarely shallowly lobed — **2. ZEHNERIA**

1: Inflorescence pedunculate; fruit 1-seeded, 0.7–1.2 cm long, covered with soft, barbed bristles — **4. SICYOS**

1. DIPLOCYCLOS

Diplocyclos (Endl.) Post & Kuntze, *Lex. Gen. Phan.* 178 (1903); from the Greek *diplos* (double) and *kyklos* (a circle or ring), in reference to the double groove around the edge of the seed.

Type: *D. palmatus* (L.) C.Jeffrey

Climbing perennial herbs, monoecious, pubescent or glabrous. Tendrils 2-branched. Leaves palmately lobed. Male flowers in axillary fascicles or short, few- to many-flowered, racemose clusters; hypanthium short and broad; calyx 5-lobed; corolla deeply 5-lobed, white to yellow; stamens 3; anthers free, locules flexuous. Female flowers solitary or in axillary clusters, often co-axial with males; perianth similar to males; ovary ovoid; ovules relatively few; stigma 3-lobed. Fruit a fleshy indehiscent berry, red with white longitudinal stripes. Seeds few, with a thick double margin.

A genus of 4 or possibly 5 species, 1 widespread in the Old World tropics, including Norfolk Is., the others in tropical Africa.

Diplocyclos palmatus (L.) C.Jeffrey, *Kew Bull.* 15: 352 (1062)

subsp. **affinis** (Endl.) P.S.Green, *Kew Bull.* 45: 238 (1990)

Bryonia affinis Endl., *Prodr. Fl. Norfolk.* 68 (1833); *Bryonopsis affinis* (Endl.) Cogn. in A.L.P.P. de Candolle, *Monogr. Phan.* 3: 479 (1881). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W. So-called because of its affinity to *Bryonia laciniosa* L., now thought to be a synonym of *D. palmatus*; Latin: *affinis* (similar to or related).

Bryonopsis pancheri (Naudin) Naudin, *Ann. Sci. Nat. Bot.* ser. 5, 6: 30 (1866). T: New Caledonia, *J.A.I.Pandier s.n.*; holo: ?P *n.v.*; iso: K.

Illustrations: W.R.Elliot & D.L.Jones, *Encycl. Austral. Pl.* 3: 290 (1984); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 114, fig. 14B (1986); G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 444, t. 25 (1990).

Perennial climber with fleshy rootstock. Stems to several metres long, glabrous. Leaves scabrous; lamina (5–) 6–13 cm long, (6.5–) 8–14 cm broad, cordate at base; lobes 3–5, lateral lobes usually shallowly 2-lobed, narrowly lanceolate-elliptic, subserrate with small apiculate teeth, acute to subacuminate. Male flowers in 2–8-flowered fascicles mixed with 0–4 female flowers; calyx lobes subulate, 0.5–1 mm long; corolla lobes ovate, 5–10 mm long, white to greenish yellow. Female flowers with pedicels 1–5 mm long; staminodes 1 mm long; ovary 3–4 mm long. Fruit solitary or clustered, ellipsoidal, 2–2.5 cm long, red with c. 7 longitudinal white stripes. Seeds 5 mm long, ellipsoidal, beaked. *Native Cucumber*.

Norfolk Is. Rare, but said to appear after clearance. Also native in New Caledonia, Vanuatu, Solomon Islands, Papua New Guinea and eastern Australia.

N.Is.: near Anson Bay, *J.D.McComish 132* (K); *loc. id.*, 1982, *B. & O.Evans* (K); *s. loc.*, *J.Backhouse 621* (K).

Diplocyclos palmatus subsp. *palmatus* occurs in tropical Africa and Malesia.

2. ZEHNERIA

Zehneria Endl., *Prodr. Fl. Norfolk.* 69 (1833); named after Joseph Zehner of Vienna, dexterous natural history artist and skilful observer.

Type: *Z. baueriana* Endl.

Annual or perennial climbers, monoecious or dioecious, sometimes with older stems woody. Tendrils simple. Leaves unlobed or rarely shallowly lobed. Male flowers axillary, in fascicles, racemes or pedunculate heads, rarely solitary; hypanthium campanulate; calyx 5-lobed, small; corolla 5-lobed, white or yellow; stamens 3; anthers with straight or curved locules. Female flowers in fascicles or racemes or solitary; perianth similar to males; staminodes 3; ovary subglobose to fusiform; ovules few to many; stigma usually 3-lobed. Fruit a fleshy berry, globose to fusiform, red or white. Seeds few to many, compressed, with a narrow raised margin

A genus of c. 30 species throughout the Old World tropics and subtropics; 1 species native to Norfolk Is.

Zehneria baueriana Endl., *Prodr. Fl. Norfolk.* 69 (1833)

T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W; iso: K. Named in honour of Ferdinand Lucas Bauer (1760–1826), Austrian botanical artist on Lieutenant M.Flinders' voyage of exploration around Australia, who also collected on Norfolk Is. in 1804 and 1805.

Illustration: S.F.L.Endlicher, *Iconogr. Gen. Pl.* t. 116, t. 117 (1838).

Large perennial dioecious climber, climbing to tree-tops. Lower stems somewhat woody and corky. Leaves unlobed or rarely shallowly lobed; lamina broadly ovate, (4–) 6–10 cm long, (3–) 5–8 cm broad, cordate at base, finely denticulate, acute at apex, scabrous above. Male flowers in c. 10-flowered fascicles; pedicels 1–5 mm long; hypanthium c. 2 mm long; calyx lobes triangular, c. 0.5 mm long; corolla lobes ovate, c. 2 mm long, acute, minutely papillose within. Female flowers in 1–8-flowered fascicles; pedicels 0–6 mm long; calyx and corolla similar to male; staminodes filamentous; ovary fusiform, 6 mm long; style c. 2 mm long with

3 bilobed stigmas. Berry narrowly ellipsoidal, 1.5–2 cm long, red, fleshy. Seeds ovate, with a narrow margin. *Native Cucumber, Giant Cucumber*. Fig. 41F–G.

Norfolk Is. A locally common climber in the forest and one of the major lianes with corky rope-like stems; also occurring in New Caledonia.

N.Is.: near the 'Botanic Garden', *P.S.Green 2392* (K); Mt Pitt, *I.R.Telford 7179* (CBG); *s. loc.*, 1968, *P.Ralston* (K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW); *s. loc., J.D.McComish 119* (K).

It has been suggested that this species is part of *Z. mucronata* (Bl.) Miq., which occurs from Taiwan through Malesia to tropical Australia and eastwards to the Society Islands. However, the almost sessile and ellipsoidal fruit seems to distinguish it, and until the whole complex has been carefully revised it seems best to maintain *Z. baueriana* as a separate species.

3. CUCUMIS

Cucumis L., *Sp. Pl.* 2: 1011 (1753); *Gen. Pl.* 5th edn, 442 (1754); the ancient Latin name for the cucumber.

Type: *C. sativus* L.

Annual, trailing or climbing herbs, monoecious or rarely dioecious, usually hispid. Tendrils simple. Leaves simple to deeply palmately lobed. Flowers small to medium sized; hypanthium usually campanulate. Male flowers solitary or in few-flowered fascicles; stamens 3, free; filaments short; 2 anthers bilobed, the other 1-lobed, with locules triplicate; abortive ovary gland-like. Female flowers usually solitary; perianth similar to males; staminodes 3, subulate; ovary globose or ellipsoidal, papillose, with 3–5 placentas and numerous ovules; style short; stigmas 3–5-lobed. Fruit fleshy, indehiscent, globose to cylindrical, usually with a firm wall. Seeds numerous, ovoid to ellipsoidal, compressed, emarginate.

An Old World tropical genus of c. 30 species, including *C. melo* L. the cantaloupe or honeydew melon and *C. sativus* L. the cucumber. One species naturalised on Norfolk Is.

*Cucumis anguria L., *Sp. Pl.* 2: 1011 (1753)

T: cultivated; lecto: LINN 1152.6, *fide* C.Jeffrey, *Fl. Trop. E. Africa* 104 (1967), IDC microfiche 177/2, 679/10.

Illustrations: J.D.Hooker, *Bot. Mag.* 96: t. 5817 (1870); A.B.Graf, *Exotica* 12th edn, 1: 931 (1985); G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 446 (1990).

Trailing or climbing herb to c. 3 m long, monoecious, densely scabrid. Leaves with lamina broadly ovate-cordate in outline, 4–10 cm long, 5–11 cm broad, deeply 3–5-lobed; lobes with rounded sinuses between, finely denticulate, obtuse. Male inflorescence 1–10-flowered; pedicels 4–30 mm long; hypanthium campanulate, c. 3 mm long; calyx lobes subulate, 1.5–2 mm long; corolla lobes ovate, 5–6 mm long, apiculate, yellow; anther connective extended into a papillose apex c. 0.5 mm long. Female flowers solitary; pedicels 1–10 cm long, accrescent; ovary c. 8 mm long, densely hispid; style short with 3 subsessile stigmas. Fruit broadly ellipsoidal, 4–7 cm long, covered with soft, curved prickles, ripening to yellow-green with darker longitudinal bands. Seeds 4–6 mm long.

Norfolk Is. A rare escape from cultivation. A native of Africa, but with an edible variety cultivated in tropical America.

N.Is.: Duncombe Bay, 1970, *O.Evans* (K).

4. SICYOS

Sicyos L., *Sp. Pl.* 2: 1013 (1753); *Gen. Pl.* 5th edn, 443 (1754); the ancient Greek name for the cucumber.

Type: *S. angulata* L.

Climbing or trailing, annual or perennial herbs, monoecious, glabrous, hispid or with glandular hairs. Tendrils 2–5-branched. Leaves palmately lobed. Male flowers solitary or in

branched racemes, whorled or subcapitate; calyx of 5 small lobes; hypanthium shallowly campanulate; corolla (3–) 5-lobed, very shortly united, white or greenish; stamens 3 (sometimes 2–5); filaments united into a central column; anthers united and capitate or rarely free; locules flexuous. Female flowers few to many, subsessile in pedunculate heads or solitary, smaller than males, without staminodes; ovary ovoid, 1-ovulate. Fruit dry, indehiscent, often beaked, usually bristly. Seed ovoid, compressed.

A genus of c. 50 species, mostly native in the Americas, but also in Australia, New Zealand, Hawai'i and the SW Pacific, with 1 species native to Norfolk and Lord Howe Islands.

Sicyos australis Endl., *Prodr. Fl. Norfolk*. 67 (1833)

T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W. The epithet refers to the occurrence of this species in the south.

[*Sicyos angulata auct. non* L.: J.D.Hooker, *Fl. Nov.-Zel.* 1: 72 (1852); R.M.Laing, *Trans. & Proc. New Zealand Inst*. 47: 38 (1915); J.S.Turner *et al*., *Conservation Norfolk Is*. 56 (1968)]

Illustrations: L.M.Cranwell, *Botany Auckland* 2nd edn, 67 (1943); M.Johnson, *New Zealand Fl. Pl*. 116 (1968); G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 447 (1990).

Annual herbaceous climber. Stems glabrescent or sparsely scabrous. Tendrils 2- or 3-branched. Leaves with lamina broadly ovate to almost orbicular in outline, (3–) 5–10 (–12) cm long and broad, 3–7 (usually 5)-lobed, sometimes shallowly so, broadly cordate at base, dentate, acute. Male racemes 10–20-flowered; peduncle 3–6 (–9) cm long; pedicels 2–5 mm long, glandular-hairy; calyx lobes subulate, 0.5 mm long; corolla lobes ±triangular, 3 mm long, greenish white. Female inflorescence capitate, 7- or 8-flowered; peduncle 5–15 mm long, often in same axil as male; ovary 2–3.5 mm long, with barbed soft spines and glandular hairs. Fruit ovoid, 7–12 mm long, armed with barbed, soft bristles. Seeds 5–7 mm long.

Norfolk Is., Lord Howe Is. Also known from eastern Australia, northern New Zealand and the Kermadec Islands. Although recorded from Norfolk and Lord Howe Islands this species has not been seen in recent years and may be extinct there.

N.Is.: *s. loc.*, 1898, *I.Robinson* (NSW). **L.H.Is.:** *s. loc.*, 'Government Botanist, Melbourne' [*J.P.Fullagar* ?] (K).

The genus *Sicyos* is in need of revision and *S. australis* is part of the *S. angulata* and *S. laciniata* group.

32. CAPPARACEAE

Trees or shrubs, frequently climbers, rarely herbs. Leaves alternate, simple or digitately compound; stipules reduced to spines or knobs, or absent. Inflorescences axillary or terminal, racemose, rarely flowers solitary, bracteate or ebracteate. Flowers usually bisexual, actinomorphic or sometimes slightly zygomorphic. Sepals 4 (sometimes 2–6), usually in 2 whorls, equal or unequal. Petals 4 (sometimes 2 or absent), imbricate, free, sometimes clawed. Stamens 1–many; filaments free or basally adnate to a gynophore. Ovary superior, usually raised on a gynophore, 1–3 (–6)-locular; placentas parietal; ovules 1–many. Fruit a berry or capsule, dehiscent or indehiscent, usually stipitate. Seeds 1–many, often reniform.

A family of c. 45 genera and 700 species from the tropics and subtropics, worldwide, especially in the drier parts. One genus native on Norfolk Is.

G.Bentham, Capparideae, *Fl. Austral.* 1: 89–98 (1863); F.Pax & K.Hoffmann, Capparidaceae, *Nat. Pflanzenfam.* 2nd edn, 17b: 146–223 (1936); M.Jacobs, Capparaceae, *Fl. Males.* ser. I, 6: 61–105 (1960); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Capparaceae, *Fl. Java* 1: 181–185 (1963); M.Jacobs, The genus *Capparis* (Capparaceae) from the Indus to the Pacific, *Blumea* 12: 385–541 (1965); H.J.Hewson, Capparaceae, *Fl. Australia* 8: 207–231 (1982).

CAPPARIS

Capparis L., *Sp. Pl.* 1: 503 (1753); *Gen. Pl.* 5th edn, 222 (1754); the ancient Greek name, derived from *kabar*, the Arabic name for *C. spinosa*, the source of capers.

Type: *C. spinosa* L.

Shrubs, frequently sprawling or climbing, rarely trees. Leaves simple, entire; stipules reduced to spines or absent. Flowers usually solitary or sometimes in racemes, bisexual; bracts soon falling. Sepals 4; outer pair usually ±concave, enveloping the bud. Petals 4, unequal, not clawed, delicate; lower pair free; upper pair coherent at base. Stamens usually numerous, 6–200, spreading, exceeding petals; anthers small. Gynophore equal to or longer than stamens. Ovary 1-locular; placentas 2–6 (–10); ovules usually numerous. Fruit a globose or ellipsoidal berry, often borne on the thickened and lengthened gynophore; pericarp leathery to corky. Seeds numerous, embedded in pulp.

A genus of c. 250 species, distributed in the tropics and subtropics, worldwide; 1 species endemic on Norfolk Is.

M.Jacobs, The genus *Capparis* (Capparaceae) from the Indus to the Pacific, *Blumea* 12: 385–541 (1965).

Capparis nobilis (Endl.) F.Muell. ex Benth., *Fl. Austral.* 1: 95 (1863)

Busbeckia nobilis Endl., *Prodr. Fl. Norfolk.* 64 (1833). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W. So named from the notable or noble flowers of this species.

Capparis citrina A.Cunn. ex Heward, *London J. Bot.* 1: 115 (1842), *nom. nud.*; *C. nobilis* var. *citrina* [A.Cunn. ex Heward] Domin, *Repert. Spec. Nov. Regni Veg.* 11: 201 (1912). T: Norfolk Island, *A.Cunningham 11*; holo: K.

Capparis 'elegans' Pax in H.G.A.Engler & K.A.E.Prantl, *Nat. Pflanzenfam.* III 2: 231 (1891), error for *C. nobilis*.

Capparis nobilis var. *typica* Domin, *loc. cit.*, *nom. inval.*

Illustrations: K.Domin, *Biblioth. Bot.* 89: 133 (1926); Anon., *Dars-et* (*This is it*) [10] (1976).

Tall scrambling or climbing perennial shrub, glabrous. Spines recurved, 2–3 mm long. Leaves with lamina elliptic to lanceolate, 5–12 cm long, 3–5 cm broad, ±acute at base, acute at apex, glabrous. Inflorescence terminal, to c. 10-flowered; pedicels 1–2 cm long, accrescent. Outer sepals boat-shaped, c. 2 cm long, coriaceous; inner pair ovate, 1.5 cm long, with membranous margin. Petals oblanceolate, c. 3 cm long, somewhat crenulate at apex, pale yellow. Stamens numerous, c. 4 cm long; filaments cream; anthers 2 mm long. Gynophore c. 5 cm long, irregularly curled in bud; ovary narrowly ovoid; stigmas flat. Fruit pointed-spherical (lemon-shaped), c. 7 cm long, verrucose. *Devil's Guts*. Fig. 41A–C.

Norfolk Is. Endemic. A fairly common, tall climber in the forest. Said to grow occasionally as a spreading bush, and then without spines.

N.Is.: Barny Duffys, *P.Ralston 12* (K); Jonaniggerbunnit, Philip Is., *W.R.Laing s.n.* (CHR).

33. BRASSICACEAE

Annual, biennial or perennial herbs, rarely subshrubs. Leaves alternate, simple or pinnate, entire to deeply dissected, stipules absent. Inflorescence racemose, corymbose or paniculate, rarely flowers solitary, usually without bracts. Flowers hypogynous, bisexual, actinomorphic. Sepals 4, decussate, free. Petals 4, rarely absent, usually clawed, usually spreading above claw, free. Stamens usually 6, free, usually 4 in a whorl with 2 shorter ones outside. Ovary superior, sessile, 2-locular by a false, usually persistent septum; placentation parietal; ovules 1–many per locule; stigma usually 2-lobed. Fruit a siliqua or silicula, (or lomentoid elsewhere), rarely indehiscent. Seeds sometimes mucilaginous when moistened; embryo

Figure 41. A–C, CAPPARACEAE: *Capparis nobilis*. **A**, habit (Nov. 1938, J.McComish, K); **B**, habit (J.McComish 12, K); **C**, young fruit (A.Cunningham 121, K). **D**, BRASSICACEAE: *Lepidium howei-insulae*, habit (P.Green 1696, K & Sep. 1883, W.Milne, K). **E**, PASSIFLORACEAE: *Passiflora herbertiana* subsp. *insulae-howei*, habit (P.Green 2031, K, & C.Moore 11, K). **F–G**, CUCURBITACEAE: *Zehneria baueriana*. **F**, habit (Dec. 1968, P.Ralston, K); **G**, male flower cluster (P.Green 2392, K). Scale bars: **A–F** = 2 cm; **G** = 1 cm. Drawn by P.Halliday.

variously folded.

A family of c. 375 genera and 3200 species, mostly from the northern temperate regions, but some more cosmopolitan, including widespread weeds. On Norfolk Is. 9 genera introduced, 4 of which are also on Lord Howe Is. On Lord Howe Is. 5 genera introduced. A further genus with endemic and naturalised species occurs on Lord Howe Is. with naturalised species on Norfolk Is.

G.Bentham, Cruciferae, *Fl. Austral.* 1: 63–88 (1863); O.E.Schulz, Cruciferae, *Nat. Pflanzenfam.* 2nd edn, 176: 227–658 (1936); J.G.Vaughan, A.J.Macleod & B.M.G.Jones, *The Biology and Chemistry of the Cruciferae* (1976); H.J.Hewson, Brassicaceae (Cruciferae), *Fl. Australia* 8: 231–357 (1982).

KEY TO GENERA

1 Fruit distinctly beaked

2 Fruit cylindrical, dehiscent by 2 longitudinal valves (N.Is.) **1. BRASSICA**

2: Fruit of 2, unequal, indehiscent segments

3 Petals yellow; fruit 5–10 mm long; weedy (N.Is.) **2. RAPISTRUM**

3: Petals white, pink or lavender; fruit 15–22 mm long; strand plant (L.H.Is.) **3. CAKILE**

1: Fruit without a beak

4 Fruit not or scarcely longer than broad, a silicula

5 Fruit flattened at right angles to septum or indehiscent, apex ±notched; leaves divided or at least toothed

6 Locule of fruit 1-seeded; silicula ovate, elliptic, suborbicular or hemispherical

7 Fruit dehiscent; inflorescence terminal **4. LEPIDIUM**

7: Fruit indehiscent, breaking into two, 1-seeded segments; inflorescence axillary or leaf-opposed **5. CORONOPUS**

6: Locule of fruit several-seeded; silicula broadly triangular or obcordate **6. CAPSELLA**

5: Fruit flattened parallel to septum, dehiscent, not notched; leaves entire, greyish with appressed hairs **7. LOBULARIA**

4: Fruit much longer than broad, a siliqua

8 Seeds in 2 rows per locule; petals white; marsh or water plants (N.Is.) **9. RORIPPA**

8: Seeds in 1 row per locule; petals yellow, white or various shades of pink or purple; terrestrial plants

9 Leaves densely tomentose, usually entire; petals c. 2.5 cm long, pink or purplish (rarely white) (N.Is.) **10. MATTHIOLA**

9: Leaves glabrous or sparingly hairy, pinnate or pinnatifid; petals 0.2–1 cm long, white or yellow

10 Petals white, 2–3 mm long; basal leaves pinnate (N.Is.) **8. CARDAMINE**

10: Petals yellow, 3–10 mm long; basal leaves pinnatifid **11. SISYMBRIUM**

1. BRASSICA

Brassica L., *Sp. Pl.* 2: 666 (1753); *Gen. Pl.* 5th edn, 299 (1754); the classical name for several kinds of cabbage.

Type: *B. oleracea* L.

Annual, biennial or perennial herbs, rarely somewhat woody, glabrous or with simple hairs. Leaves simple or variously pinnatifid. Inflorescence racemose, without bracts. Sepals erect or suberect, the inner pair saccate at base. Petals clawed, yellow or rarely white. Stamens 6. Style short; stigma capitate or slightly 2-lobed. Fruit a siliqua, pedicellate, linear, terete or somewhat flattened, with a conical beak, dehiscent, 0–3-seeded; valves 2, with prominent mid-vein; beak conical. Seeds in 1 row per locule, mucous.

A mainly Eurasian genus of perhaps 30 species, especially in the Mediterranean region; 2 species naturalised on Norfolk Is. Taxonomically complex because many of the species have long been cultivated, hybridised and selected. The genus contains many important vegetables including cabbage, broccoli and turnips, and is used as a feed for stock and a source of vegetable oil *e.g.* rape seed.

Upper stem leaves stem-clasping; fruit 5–10 cm long **1. B. napus**

Upper stem leaves petiolate; fruit 2.5–5 cm long **2. B. juncea**

1. *Brassica napus L., *Sp. Pl.* 2: 666 (1753)

T: cultivated; lecto: LINN 844.10, *fide* B.Jonsell, *Fl. Trop. E. Africa,* Cruciferae: 7 (1982); IDC microfiche 177/2.446/18. Epithet is Latin for a turnip.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 3: 48 (1949); W.M.Curtis & D.I.Morris, *Stud. Fl. Tasmania* 2nd edn, 1: 34, fig. 11B (1975); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 207, fig. 31E (1983).

Annual or biennial herb to 1.5 m tall, usually with a strong taproot. Stems erect, scarcely branched. Leaves glaucous. Lower leaves petiolate; lamina lyrate-pinnatifid, 5–20 cm long; nerves sparingly bristly. Upper leaves stem-clasping, sessile; lamina oblong-lanceolate. Inflorescence convex, corymbose. Sepals half-spreading, 5–7 mm long. Petals obovate, 10–14 mm long, pale yellow. Outer stamens curved inwards at base. Siliqua obliquely erect, 5–10 cm long, obscurely 4-angled; beak 5–20 mm long, tapering, seedless; tip narrower than persistent stigma. Seeds ±spherical, 1.5–2.5 mm wide, blue-black. *Turnip*, *Wild Mustard*.

Norfolk Is. An occasional escape from cultivation. A Eurasian species, with many cultivated forms.

N.Is.: *s. loc.*, *R.M.Laing* (CHR).

2. *Brassica juncea (L.) Czern., *Conspec. Pl. Chark.* 8 (1859)

Sinapis juncea L., *Sp. Pl.* 2: 668 (1753). T: 'Asia'; lecto: LINN 845.11, *fide* B.Jonsell, *Fl. Trop. E. Africa,* Cruciferae: 5 (1982); IDC microfiche 177/2.448/7. The epithet means resembling *Juncus*, but the application is not clear.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 207, fig. 31B (1983); H.J.Hewson in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 382, fig. 209F (1986); L.Retter & G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 462 (1990).

Annual herb to c. 1 m tall. Stems erect, branched. Leaves glaucous, glabrous or sparsely hispid. Lower leaves petiolate; lamina lyrate-pinnatifid, with a large terminal and 1–2 pairs of smaller lateral lobes, 10–20 cm long. Upper leaves petiolate; lamina smaller, tending to entire. Inflorescence with flowers and buds at same level. Sepals half-spreading, 4–5 mm long. Petals obovate, 6–10 mm long, pale yellow. Lateral stamens spreading. Siliqua erect-ascending, 2.5–5 cm long, obscurely 4-angled, slightly contracted between seeds; beak 5–10 mm long, seedless, tapering; tip narrower than persistent stigma. Seeds ±spherical, 1–2 mm wide, yellow or reddish brown. *Indian Mustard*.

Norfolk Is. A weed of agricultural land. Native in Asia and apparently escaped from cultivation.

N.Is.: near Steels Point, *W.R.Sykes NI 495* (CHR).

2. RAPISTRUM

Rapistrum Crantz, *Cl. Crucif. Emend.* 105 (1769), *nom. cons.*; from the Latin *rapa* (a turnip) and *-astrum* (denoting an incomplete resemblance).

Type: *R. hispanicum* (L.) Crantz

Annual or biennial herbs, bristly hairy. Lower leaves lyrate-pinnatifid. Upper leaves often entire. Inflorescence a dense corymb, elongating greatly in fruit, without bracts. Sepals half-spreading, the inner pair slightly saccate. Petals shortly and slenderly clawed, yellow. Stamens 6. Style distinct; stigma 2-lobed or retuse. Fruit a silicula, pedicellate, 2-jointed, indehiscent; lower segment cylindrical, 0–2-seeded; upper segment larger, ±spherical, ribbed, 1-seeded, beaked.

A small genus of 2–4 species, native to Europe, the Mediterranean and south-western Asia; 1 species naturalised on Norfolk Is.

A.N.Rodd in H.F.Recher & S.S.Clark, *Environmental Survey of Lord Howe Is.* 23 (1973), listed *Rapistrum* possibly as an introduced alien to Lord Howe Is. This has not been confirmed and no material has been seen.

*Rapistrum rugosum (L.) Bergeret, *Phytonom. Univ.* 3: 171 (1784)

Myagrum rugosum L., *Sp. Pl.* 2: 640 (1753). T: southern Europe, not designated. Epithet is Latin for wrinkled, in reference to the fruit.

Illustrations: H.J.Hewson in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 409, fig. 220A (1986); B.A.Auld & R.W.Medd, *Weeds* 136 (1987); L.Retter & G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 465, pl. 26 (1990).

Annual or biennial herb, usually much branched, erect, to c. 60 cm tall. Lamina of lower leaves 8–20 cm long, with a large, terminal lobe, irregularly to coarsely dentate, hispid. Sepals 4–5 mm long. Petals narrowly obovate, 6–11 mm long, yellow with dark veins. Silicula erect or appressed, 5–10 mm long, hairy or glabrous; lower segment cylindrical, 2.5–3.5 mm long, striate; upper segment globose, 2–4 mm long, rugose, ribbed, sometimes hispid; beak tapering, 1–3 mm long; pedicel 2–5 mm long. Seeds ±spherical; upper seeds c. 2 mm diam.; lower seeds c. 1 mm diam. *Turnip Weed*.

Norfolk Is. An occasional weed. Native to the Mediterranean and south-western Asia.

N.Is.: Mission Rd, *G.Uhe 1207* (K).

3. CAKILE

Cakile Mill., *Gard. Dict.* Abr. 4th edn (1754); said, probably incorrectly, to have been derived from an Arabic name, because attributable to Serapion, the 9th century Arabic physician.

Type: *C. maritima* Scop.

Annual or biennial, succulent herbs, glabrous, glaucous. Leaves entire to pinnatifid. Inflorescence a short corymb, elongating greatly in fruit, without bracts. Sepals erect, subsaccate. Petals clawed, white to purplish, obtuse or retuse at apex. Stamens 6. Stigma sessile, entire. Fruit a silicula, 2-jointed, corky, indehiscent; lower segment cylindrical or obconical, persistent, 1-seeded, stalk-like if abortive; upper segment wider, beaked, 1-seeded, caducous.

A genus of 7 species, native to the Northern Hemisphere, mostly maritime; 1 species naturalised on Lord Howe Is.

J.E.Redman, Systematics and evolution of the genus *Cakile* (Cruciferae), *Contr. Gray Herb.* 205: 3–146 (1974).

***Cakile edentula** (Bigelow) Hook., *Fl. Bor.-Amer.* 1: 59 (1830)

Bunias edentula Bigelow, *Fl. Boston.* 157 (1814). T: Massachusetts, *J.Bigelow 43*; lecto: Herb. Smith 1136.7 LINN, *fide* J.E.Redman, *Contr. Gray Herb.* 205: 118 (1974). Epithet is Latin for toothless, in reference to the shallow lobes of the leaves.

[*Cakile maritima auct. non* Scop.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 123 (1898); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 27 (1915); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 157 (1917)]

Illustrations: H.J.Hewson, *Fl. Australia* 8: 253, fig. 48B–E (1982); H.J.Hewson in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 384, fig. 210B (1986); L.Retter & G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 466 (1990).

Succulent herb to 60 cm tall, decumbent, branched from base. Basal leaves with lamina obovate to oblanceolate, shallowly lobed, fleshy; lamina of upper leaves smaller, bluntly serrate, fleshy. Inflorescence racemose, much elongated and thickened in fruit; pedicels 1.5–5 mm long. Sepals 3.5–5 mm long. Petals obovate, 4.5–8 mm long, white, pink or lavender. Silicula 15–22 mm long; upper segment ovoid, acuminate to a narrow beak, 4-angled or 8-ribbed, persistent if lower segment seedless; lower segment ±cylindrical to slightly obconical, smaller.

Lord Howe Is. An introduced strand plant in shingle or sand at top of beaches. A native of eastern North America.

L.H.Is.: North Bay, *P.S.Green 1586* (A, K); beach near War Memorial, *P.S.Green 1916* (K); Blinky Beach Bay, *J.C.Game 69/113* (K); *s. loc., J.D.McComish 191* (K).

Although recorded from Norfolk Is. by J.H.Maiden (*Proc. Linn. Soc. New South Wales* 28: 695, 1904) no material from there has been seen, and R.M.Laing (*Trans. & Proc. New Zealand Inst.* 47: 27, 1915) commented that it was 'almost certainly introduced and adventive'. It is quite possible that seed of this species could from time to time wash up on the shore, germinate and flower, yet not persist.

4. LEPIDIUM

Lepidium L., *Sp. Pl.* 2: 643 (1753); *Gen. Pl.* 5th edn, 291 (1754); a diminutive from the Greek *lepis* (a scale), in reference to the scale-like valves of the fruit.

Type: *L. latifolium* L.

Annual, biennial or perennial herbs or subshrubs, glabrous or with simple hairs. Leaves entire, toothed, pinnatifid or pinnate. Inflorescence usually racemose, crowded, elongating greatly in fruit, without bracts. Flowers small. Sepals erect or spreading, not saccate. Petals variously shaped, sometimes clawed, sometimes absent, white or yellow. Stamens 2, 4 or 6. Style short; stigma entire, emarginate. Fruit a silicula flattened at right angles to septum, dehiscent, not beaked, usually notched; valves strongly keeled or winged. Seeds obovoid to ellipsoidal, mucous, 1 per locule.

A cosmopolitan genus of c. 150 species; 2 endemic and 2 naturalised species on Lord Howe Is., 1 of which is also naturalised on Norfolk Is.

H.J.Hewson, The genus *Lepidium* L. (Brassicaceae) in Australia, *Brunonia* 4: 217–308 (1982); H.J.Hewson, *Kew Bull.* 45: 237–238 (1990).

1 Some leaves pinnatifid or pinnatisect

- **2** Stamens usually 6; fruiting pedicels c. 5 mm long — **1. L. howei-insulae**
- **2:** Stamens usually 2; fruiting pedicels 2–3 mm long — **3. L. bonariense**

1: Leaves not pinnatifid or pinnatisect

- **3** Petals well-developed, longer than sepals; stamens 4 — **2. L. nesophilum**
- **3:** Petals much reduced, shorter than sepals; stamens 2 — **4. L. africanum**

1. Lepidium howei-insulae Thell., *Neue Denkschr. Schweiz. Naturf. Ges.* 41: 291 (1906)

T: Lord Howe Is., *J.P.Fullagar*; holo: ?P *n.v.*; iso: K. Named after Lord Howe Is., where it is endemic.

[*Lepidium foliosum auct. non* Desv.: G.Bentham, *Fl. Austral.* 1: 86 (1863); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 123 (1898); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 39: 379, 381 (1914)]

[*Lepidium ruderale auct. non* L.: W.B.Hemsley, *Ann. Bot.* (*London*) 10: 231 (1896); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 157 (1917)]

Perennial subshrub to c. 1 m tall. Stems sometimes partially creeping. Leaf lamina linear, remotely pinnatisect, 2–6 (–10) cm long, 2–4 mm broad, acute to subapiculate, fleshy, glabrous; lobes opposite, remote, linear, 2–4 per side, 1–15 mm long. Sepals ovate, c. 1 mm long, green with white margins. Petals 1.5 mm long, white. Stamens usually 6. Infructescence elongate, racemose; pedicels spreading, c. 5 mm long. Silicula ellipsoidal, 4–5 mm long, acute; valves keeled. Seeds ellipsoidal, slightly oblique, 1.5 mm long. *Mustard & Cress*. Fig. 41D.

Lord Howe Is. Endemic, with a scattered distribution on rocky ledges and in sandy pockets near the sea. Also recorded from Balls Pyramid.

L.H.Is.: Middle Bay, *P.S.Green 1696* (A, K, NSW); Flagstaff (Signal Point), *L.A.S.Johnson & A.N.Rodd* 1223 (K, NSW); *s. loc.*, *J.H.Maiden* (K, NSW); *s. loc.*, *C.Moore 54* (K, MEL).

2. Lepidium nesophilum Hewson, *Kew Bull.* 45: 237 (1990)

T: Lord Howe Is., 17 Feb. 1987, *M.D.Crisp 4533 & I.R.H.Telford*; holo: CBG; iso: NSW. The epithet is derived from the Greek *nesos* (island) and *-philus* (loving), in reference to its occurrence on Lord Howe Is.

Lepidium oleraceum 'var. ?nov.', A.N.Rodd & J.Pickard, *Cunninghamia* 1: 271 (1983).

Perennial herb or subshrub, erect to decumbent, glabrous. Stem trailing to 1.5 m. Leaf lamina narrowly oblanceolate to lanceolate or elliptic, 3–12 cm long, 0.5–2 cm broad, attenuate at base, entire or serrate in upper half only with slightly larger subapical teeth, acute; upper leaf lamina linear, reduced, entire. Sepals ovate, 1.5–2 mm long, green with white margins. Petals 1.5–2.5 mm long, white. Stamens 4. Infructescence elongate; pedicels 4–10 mm long. Silicula ovate-elliptic, 3–4 mm long; apex with a very reduced wing and notch; valves keeled. Seeds ellipsoidal, c. 2 mm long.

Lord Howe Is. A local endemic, on basalt rocky ledges at low elevations.

L.H.Is.: base of W face of Mt Lidgbird, *P.S.Green 1673* (A, K); S end of Lower Rd, *I.R.H.Telford 10310 & I.Hutton* (AD, BISH, BRI, CBG, MEL, NSW); *loc. id.*, *A.N.Rodd 3594* (NSW).

3. *Lepidium bonariense L., *Sp. Pl.* 2: 645 (1753)

T: South America, not designated. The epithet means 'of Buenos Aires' (Argentina).

Illustrations: H.J.Hewson, *Brunonia* 4: 278, fig. 19 (1982); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 212, fig. 32N (1983); B.A.Auld & R.W.Medd, *Weeds* 134 (1987).

Annual or biennial herb to 50 cm tall. Stems erect, branched, puberulous. Basal leaves petiolate; lamina 2–3-pinnatisect, 3–10 cm long, 1–4 cm broad, pubescent; lobes linear, to 2 mm wide. Stem leaves reduced in size upwards, becoming sessile; lamina pinnatifid to deeply serrate, apiculate, pubescent. Inflorescence dense. Sepals ovate, 0.5 mm long. Petals linear, shorter than sepals or absent, white. Stamens usually 2. Infructescence racemose, elongate; pedicels 2–3 mm long. Silicula broadly elliptic to suborbicular, 2.5–3.5 mm long, glabrous, upper half slightly winged, notched at apex; valves slightly keeled. Seeds broadly ellipsoidal, 1.5 mm long. *Peppercress*.

Norfolk Is., Lord Howe Is. An occasional weed. Native of South America and now a widespread weed of disturbed soil, wasteland and roadsides.

N.Is.: Cuttings Corner, near Stockyard Rd, *W.R.Sykes NI 1074* (CHR). **L.H.Is.:** W slopes of Mt Eliza, *B.Conn 3567* (NSW); Skyline Drive, *I.R.H.Telford 10371* (K, NSW); lower slopes of Malabar Ridge, S of Malabar, just N of Neds Beach, *B.Conn 3564* (NSW).

4. *Lepidium africanum (Burm.f.) DC., *Syst. Nat.* 2: 552 (1821)

Thlaspi africanus Burm.f., *Fl. Indica*: *Prodr. Fl. Cap.* 17 (1768). T: South Africa, *N.Burman*; holo: ?G *n.v.* So named after the continent from which it was first described.

Illustrations: H.J.Hewson, *Fl. Australia* 8: 281, fig. 52C–E (1982); H.J.Hewson in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 399, fig. 215A (1986); L.Retter & G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 471 (1990).

Annual to perennial herb or subshrub, to 75 cm tall, branched in upper part, finely appressed pubescent or glabrous. Stems erect. Leaf lamina narrowly lanceolate-linear to lanceolate or oblanceolate, 1.5–6 cm long, 0.1–0.8 cm broad, attenuate at base, entire to irregularly serrate, acute, sometimes sparsely ciliate; basal leaves ephemeral; stem leaves reduced in size upwards. Inflorescence dense. Sepals ovate, 0.6–0.8 mm long. Petals thread-like, shorter than sepals or absent. Stamens 2. Infructescence racemose, elongate; pedicels 2–3 mm long, finely puberulous. Silicula flattened-ellipsoidal, 2–3 mm long, 1.5–2 mm broad, slightly winged at apex, notched; valves keeled. Seeds ellipsoidal, reddish brown, 1–1.25 mm long.

Lord Howe Is. Occasional on the Island. Native throughout eastern Africa, now a widespread weed of warm temperate to tropical regions.

L.H.Is.: ridge between Kims Lookout and Malabar, *A.N.Rodd* (NSW).

5. CORONOPUS

Coronopus Zinn, *Cat. Pl. Hort. Gott.* 325 (1757), *nom. cons.*; a name first given to another plant, but derived from the Greek *korone* (a crow) and *pous* (a foot), in allusion to the shape of the basal leaves.

Type: *C. ruellii* All.

Annual or perennial herbs, with decumbent to suberect stems. Leaves 1–2-pinnatisect or entire. Inflorescence racemose, axillary or leaf-opposed. Flowers small. Sepals ±spreading, slightly concave, equal. Petals very small, sometimes absent, white. Stamens 2, 4 or 6. Stigma ±sessile. Fruit a silicula, small, compressed at right angles to septum, indehiscent or breaking into two, 1-seeded, hemispherical segments, not beaked.

A genus of 10 species, native to the Mediterranean, south-eastern Africa and South America, but because of weedy species, now almost cosmopolitan; 1 species naturalised on Norfolk and Lord Howe Islands.

*Coronopus didymus (L.) Sm., *Fl. Brit.* 2: 691 (1800)

Lepidium didymum L., *Mant. Pl.* 1: 92 (1767); *Senebiera didyma* (L.) Pers., *Syn. Pl.* 2: 185 (1806). T: England?; lecto: LINN 824.16, *fide* B.Jonsell, *Fl. Trop. E. Africa*, Cruciferae: 24 (1982); IDC microfiche 177/2.429/9. The epithet comes from the Greek *didymos* (double or twin), in reference to the paired segments of the fruit.

Illustrations: H.J.Hewson, *Fl. Australia* 8: 289, fig. 53A–D (1982); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 216, fig. 33B (1983); B.A.Auld & R.W.Medd, *Weeds* 133 (1987).

Annual or perennial herb, with short basal rosette then procumbent to ascending shoots to 40 cm tall, glabrous to pilose, foetid if crushed. Rosette leaves petiolate; lamina 6–10 cm long, pinnatisect, with 3–5 pairs of pinnatifid or dentate lobes. Stem leaves with lamina 2–4 cm long, reducing to entire and sessile. Racemes exceeding the leaves; pedicels 1–2 mm long. Sepals 0.5–1 mm long. Petals shorter than sepals or absent. Stamens 2 (or 4). Silicula c. 1.5 mm long, 2–2.5 mm broad, bilobed, emarginate above and below, constricted at septum, pitted or warted; segments globose. Seeds ovoid or hemispherical. *Swinecress*.

Norfolk Is., Lord Howe Is. A common weed of disturbed soil and open wasteland. Originally from Europe.

N.Is.: Harpers Rd, *P.Ralston 56* (A, K); *s. loc.*, *R.M.Laing* (CHR). **L.H.Is.:** behind Old Settlement Beach, *L.A.S.Johnson & A.N.Rodd 1232* (NSW); N end of Little Slope, *J.Pickard 2744* (NSW); *s. loc.*, 1898, *J.H.Maiden* (NSW); *s. loc.*, *J.D.McComish 197* (NSW).

6. CAPSELLA

Capsella Medik., *Pfl.-Gatt.* 85 (1792); the name is the Latin for a little box, in reference to the fruit.

Type: *C. bursa-pastoris* (L.) Medik.

Annual or perennial herbs with simple or stellate hairs. Radical leaves in a rosette; lamina usually deeply pinnatifid. Cauline leaves reduced; lamina dentate to entire. Inflorescence corymbose becoming racemose. Sepals erect, not saccate. Petals scarcely clawed, white or reddish, sometimes absent. Stamens 6. Stigma capitate. Fruit a silicula, triangular to obcordate, keeled, strongly flattened at right angles to septum, distinctly notched, up to 12 seeds per locule.

A genus of c. 5 species, mostly native of temperate Europe and the Mediterranean. One species, a cosmopolitan weed, naturalised on Norfolk and Lord Howe Islands.

*Capsella bursa-pastoris (L.) Medik., *Pfl.-Gatt.* 85 (1792)

Thlaspi bursa-pastoris L., *Sp. Pl.* 2: 647 (1753). T: Europe; lecto: LINN 825.15, *fide* B.Jonsell, *Fl. Trop. E. Africa*, Cruciferae: 29 (1982); IDC microfiche 177/2.430/18. The epithet comes from the Latin *bursa* (a purse) and *pastoralis* (of the shepherd), in allusion to the shape of the fruits.

Illustrations: H.J.Hewson, *Fl. Australia* 8: 293, fig. 54E–F (1982); H.J.Hewson in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 384, fig. 210E (1986); L.Retter & G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 473, pl. 26 (1990).

Erect annual herb, unbranched or branching from the base, 10–40 cm tall, glabrous to hispid. Rosette leaf lamina 3–13 cm long, irregularly toothed or lyrate-pinnatifid to entire, petiolate. Cauline leaves less variable, sessile, stem-clasping. Inflorescence densely corymbose at first, lengthening greatly in fruit; pedicels spreading, lengthening to 2 cm in fruit. Sepals 1–2 mm long. Petals oblanceolate, 2–3 mm long, white or tinged reddish purple, rarely absent. Silicula obtriangular-obcordate, 4–9 mm long, 4–7 mm wide, deeply or shallowly notched at apex, reticulate veined. Seeds ovoid-ellipsoidal, c. 1 mm long. *Shepherd's Purse*.

Norfolk Is., Lord Howe Is. A common weed of roadsides, cultivated land or disturbed soil. Originally from Europe.

N.Is.: Harpers Rd, *P.Ralston 63* (A, K). **L.H.Is.:** 'Pine Trees' hotel grounds, *A.N.Rodd NSW123154* (K, NSW); *s. loc.*, *C.Moore 49* (K).

7. LOBULARIA

Lobularia Desv., *J. Bot.* (*Desvaux*) 3: 162 (1814), *nom. cons.*; the name is a diminutive of the Greek *lobos* (a pod), referring to the small fruits.

Annual or perennial herbs, usually with medifixed hairs. Leaves narrow, almost entire. Inflorescence rounded-corymbose, without bracts except for lowest flowers. Sepals ±spreading, not saccate. Petals small, white, rarely red or purplish. Stamens 6. Stigma capitate. Fruit a silicula, ovate to suborbicular, flattened parallel to septum, not beaked, dehiscent; valves with slender midrib. Seeds 1–8 per locule.

A genus of 5 species from the Macaronesian islands, the Mediterranean and Arabia; 1 widely cultivated species naturalised on Norfolk and Lord Howe Islands.

*Lobularia maritima (L.) Desv., *J. Bot.* (*Desvaux*) 3: 162 (1814)

Clypeola maritima L., *Sp. Pl.* 2: 652 (1753). T: not designated. The epithet refers to the plant's original maritime habitat.

Illustrations: H.J.Hewson, *Fl. Australia* 8: 307, fig. 56A–C (1982) H.J.Hewson in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 405, fig. 218E (1986); L.Retter & G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 475 (1990).

A much branched, annual or short-lived perennial herb to c. 30 cm tall. Leaves sessile; lamina linear-lanceolate to lanceolate, 1.5–5 cm long, entire, tapering to base and apex, greyish, ±clothed with appressed hairs. Inflorescence corymbose-globose, lengthening greatly in fruit; lowest flowers sometimes with a leafy bract. Flowers fragrant. Sepals 1.5–2 mm long, hairy. Petals suborbicular, clawed, c. 2 mm long, white, pink or purple. Silicula suborbicular-elliptic, 2.5–3.5 mm wide, with persistent style, 1 seed per locule; valves glabrous or thinly pilose. Seeds ellipsoidal, c. 1 mm long, narrowly winged. *Sweet Alyssum*.

Norfolk Is., Lord Howe Is. An escape from gardens, especially thriving in sandy soil. A native of the Mediterranean and Macaronesia.

N.Is.: around ruin of old prison, Kingston, *P.S.Green 1437* (A); *loc. id., G.Uhe 1128* (K). **L.H.Is.:** Lagoon Beach, near Government House, *L.A.S.Johnson & A.N.Rodd 1211* (K, NSW).

8. CARDAMINE

Cardamine L., *Sp. Pl.* 2: 654 (1753); *Gen. Pl.* 5th edn, 295 (1754), the name for a cress-like plant mentioned by Dioscorides, from the Greek *kardia* (heart) and *damao* (to subdue), because of its supposed medical properties.

Type: *C. pratensis* L.

Annual or perennial herbs, glabrous or hirsute. Leaves simple or variously divided, trifoliolate or pinnate. Inflorescence racemose, sometimes somewhat contracted, ebracteate. Sepals usually erect, sometimes spreading, equal or nearly so, with inner pair slightly saccate. Petals clawed, white or pinkish. Stamens 4 or 6. Stigma entire or slightly 2-lobed. Fruit a siliqua, linear, not beaked, dehiscing by the valves opening suddenly and coiling spirally from the base throwing the seeds; veins indistinct. Seeds in 1 row per locule.

A genus of c. 160 species, cosmopolitan but chiefly temperate, often in damp habitats; 1 species naturalised on Norfolk Is.

*Cardamine hirsuta L., *Sp. Pl.* 2: 655 (1753)

T: Europe, not designated. The epithet refers to the slightly hairy or hirsute leaves in this species.

Illustrations: B.E.V.Parham & A.J.Healy, *Common Weeds New Zealand* 31 (1976); H.J.Hewson in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 386, fig. 211C (1986); L.Retter & G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 476 (1990).

Slender, annual herb to 30 cm, ±erect, branching from base. Leaves pinnate. Basal leaves ±rosulate; lamina with scattered straight hairs; pinnae 3–7 pairs, obovate-orbicular; terminal pinna larger, orbicular-reniform. Cauline leaves reduced; lobes narrow, oblanceolate. Inflorescence corymbose-racemose, elongating in fruit. Sepals 1.5 mm long, scarious on margins. Petals spathulate, 2–3 mm long, white. Stamens 4. Siliqua linear, erect, (10–) 15–20 (–25) mm long, sometimes tinged purplish, young siliquas overtopping unopened flowers. Seeds slightly winged, reddish brown.

Norfolk Is. A recently arrived garden weed, in outdoor flower pots and in moist situations. A native of Europe.

N.Is.: New Cascade Rd, *R.O.Gardner 5788* (AK).

9. RORIPPA

Rorippa Scop., *Fl. Carniol.* 520 (1760); the Latinised form of the old Saxon name *Rorippen*, application uncertain.

Type: *R. sylvestris* (L.) Besser

Annual, biennial or perennial herbs, some aquatic, glabrous or with simple hairs. Leaves simple to pinnate. Inflorescence crowded, corymbose. Sepals erect or ±spreading, inner pair saccate. Petals clawed, white or yellow. Stamens 4 or 6. Stigma capitate to slightly 2-lobed.

Fruit a siliqua, often slightly curved, dehiscent, not beaked; valves convex, with a slender or indistinct midrib. Seeds few to many, in 1 or 2 rows per locule.

A cosmopolitan genus of c. 70 species; 1 species naturalised on Norfolk Is.

Here treated in a broad sense to include *Nasturtium* R.Br. *Rorippa palustris* (L.) Besser, was recorded for Norfolk Is. by A.Cunningham (in R.Heward, *London J. Bot*. 1: 124, 1842), as *Nasturtium sylvestre*, 'wet ravines and running streams'. It has apparently not been found since, and no specimens of this species have been found among the Cunningham collections examined. R.M.Laing (*Trans. & Proc. New Zealand Inst.* 47: 26, 1915) suggested that it had probably been introduced temporarily and then disappeared.

***Rorippa nasturtium-aquaticum** (L.) Hayek, *Sched. Fl. Stiriac*. 22 (1905)

Sisymbrium nasturtium-aquaticum L., *Sp. Pl.* 2: 657 (1753); *Nasturtium officinale* R.Br. in W.T.Aiton, *Hortus Kew*. 2nd edn, 4: 110 (1812). T: Sweden; lecto: LINN 836.1, *fide* B.Jonsell, *Fl. Trop. E. Africa*, Cruciferae: 57 (1982); IDC microfiche 177/2.437/6. The epithet means the *Water Nasturtium*; *Nasturtium* comes from the Latin *nasus* (a nose) and *torqueo* (to twist), in allusion to the sharp scent when bruised and the pungent flavour of these herbs.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 212, fig. 32B (1983); H.J.Hewson in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 412, fig. 221D (1986); L.Retter & G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 479 (1990).

Semiaquatic herb. Stems hollow, rooting at lower nodes. Leaves pinnate; lamina 2–12 cm long, glabrous; lobes broadly elliptic, 1–5 pairs; terminal lobe broadly ovate to orbicular. Sepals 2–3 mm long. Petals broadly ovate, 5–6 mm long, white. Stamens 6. Siliqua ellipsoidal, 10–18 mm long, c. 2–2.5 mm broad, abruptly contracted at apex; pedicels spreading to slightly reflexed. Seeds in 2 rows per locule, almost spherical, c. 1 mm diam., coarsely reticulate. *Watercress*.

Norfolk Is. An introduced plant now found naturalised in streams. A native of Europe, the Mediterranean and central Asia.

N.Is.: Bumbora, *W.R.Sykes NI 845/87* (CHR); Bloody Bridge, *W.R.Sykes NI 652* (CHR); *s. loc.*, *W.R.Laing* (CHR).

It is possible that the species on the Island might be *Rorippa microphyllum* (Boenn.) Hyland, which may be distinguished by its narrower fruits, with seeds in a single row, but in several years of observation plants at Kingston have never set fruit.

10. MATTHIOLA

Matthiola R.Br. in W.T.Aiton, *Hortus Kew*. 2nd edn, 4: 119 (1812), *nom. et orth. cons.*; named in honour of Pietro Andrea Gregorio Mattioli (1500–1577), Italian Renaissance botanist and physician and author of a commentary on the works of Dioscorides.

Type: *M. incana* (L.) R.Br.

Annual, biennial or perennial herbs, often woody at base, usually densely pubescent. Leaves entire to pinnatifid. Inflorescence usually open, racemose. Sepals erect, the inner pair saccate. Petals long-clawed, purplish or pink, sometimes white. Stamens 6. Stigma bilobed, each lobe with a dorsal swelling or erect horn-like appendage. Fruit a siliqua, linear, usually ±flattened, dehiscent, not beaked; valves conspicuously or obscurely 1-veined. Seeds in 1 row per locule, ±orbicular, usually compressed.

A genus of c. 55 species, native to Europe, south-western Asia, the Mediterranean and the Macaronesian islands; 1 species naturalised on Norfolk Is.

***Matthiola incana** (L.) R.Br. in W.T.Aiton, *Hortus Kew*. 2nd edn, 4: 119 (1812)

Cheiranthes incanus L., *Sp. Pl.* 2: 662 (1753). T: Europe, not designated. The epithet means hoary, white, in reference to the pale grey leaves.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 3: 2 (1949); H.J.Hewson in J.P.Jessop & H.R.Toelken, *Fl. S*

Australia 4th edn, 1: 405, fig. 218H (1986).

Robust perennial herb to 50 cm tall, woody at base with conspicuous leaf scars. Leaves crowded towards ends of branches; lower leaves petiolate, upper leaves sessile; lamina linear-lanceolate, 3–12 cm long, entire, rarely sinuate, densely and shortly stellate-tomentose. Flowers sweetly scented. Sepals narrowly oblong to linear, 9–13 mm long, densely tomentose outside. Petals obovate, c. 2.5 cm long, various shades of pink and purple or white. Stamens unequal; anthers linear, c. 5 mm long. Stigmatic lobes enlarging to 2–3 mm long in ripe fruit. Siliqua linear, flattened, 4.5–13 cm long; valves densely tomentose, 1-veined. Seeds compressed, c. 3 mm long, winged. *Stock.*

Norfolk Is. Originally a garden escape, now naturalised in the Kingston area and elsewhere. A native of southern Europe, the Mediterranean and the Macaronesian islands.

N.Is.: old prison settlement, Kingston, *G.Uhe 1144* (K); Cresswell Bay, *P.S.Green 1474* (A).

11. SISYMBRIUM

Sisymbrium L., *Sp. Pl.* 2: 657 (1753); *Gen. Pl.* 5th edn, 296 (1754); an old Greek name, *sisymbrion*, of uncertain application.

Type: *S. altissimum* L.

Annual, biennial or perennial herbs, glabrous or with simple hairs. Leaves usually lyrate-pinnatisect to pinnate. Inflorescence racemose, elongating in fruit, usually ebracteate. Flowers usually small. Sepals spreading, sometimes slightly saccate, equal. Petals clawed, yellow, sometimes white. Stamens 6. Fruit a siliqua, linear, elongate, dehiscent, not beaked; valves usually with a prominent midrib and 2 weaker lateral veins. Seeds not winged, c. 10 to numerous, in 1 row per locule, mucous.

A genus of c. 80 species, mainly Eurasian, but also from the Mediterranean, South Africa, North America and the Andes; 2 species naturalised on Norfolk Is., 1 of which also naturalised on Lord Howe Is.

Siliqua erect, 1–2 cm long; pedicels closely appressed to stem	**1. S. officinale**
Siliqua spreading, 4–10 cm long; pedicels spreading	**2. S. orientale**

1. *Sisymbrium officinale (L.) Scop., *Fl. Carniol.* 2nd edn, 2: 26 (1772)

Erysimum officinale L., *Sp. Pl.* 2: 660 (1753). T: Europe; lecto: LINN 837.1, *fide* B.Jonsell, *Fl. Trop. E. Africa*, Cruciferae: 66 (1982); IDC microfiche 177/2.441/9. The epithet means pertaining to drugs and medicines and indicates that the plant was 'officinal' *i.e.* used as a herbal medicine.

Illustrations: H.J.Hewson, *Fl. Australia* 8: 331, fig. 57F–G (1982); H.J.Hewson in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 414, fig. 222D (1986); B.A.Auld & R.W.Medd, *Weeds* 138, 139 (1987).

Annual or biennial herb, to 90 cm tall, hispid-hairy. Stems erect. Rosette leaves petiolate; lamina deeply pinnatifid, variably 3–5-lobed, dentate; terminal lobe larger, ovate-triangular, often lobed. Cauline leaves diminishing upwards, becoming sessile. Pedicels 1.5–2 mm long, hirsute. Sepals c. 2 mm long, hirsute. Petals c. 3 mm long, slightly unequal, pale yellow. Infructescence narrow, rigid, without bracts. Siliqua narrowly conical, 1–2 cm long, hairy, erect, appressed to stem. Seeds 1–1.5 mm long.

Norfolk Is., Lord Howe Is. A common and widespread weed of disturbed and open ground. Native to Europe.

N.Is.: Stockyard Rd, near Steels Point, *W.R.Sykes* NI162 (CHR); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW). **L.H.Is.:** *s. loc.*, 1920, *J.L.Boorman* (NSW); *s. loc.*, *J.D.McComish 169* (NSW).

2. *Sisymbrium orientale L., *Cent. Pl. II* 24 (1756)

T: from the 'orient'; *n.v.*; lecto: LINN 836.43, *fide* B.Jonsell, *Fl. Trop. E. Africa*, Cruciferae: 64 (1982); IDC microfiche 177/2.439/20. So named as occurring in the East, the Orient.

Illustrations: H.J.Hewson, *Fl. Australia* 8: 331, fig. 57J (1982); H.J.Hewson in J.P.Jessop & H.R.Toelken, *Fl.*

S. Australia 4th edn, 1: 414, fig. 22 (1986); B.A.Auld & R.W.Medd, *Weeds* 139 (1987).

Annual herb, 25–100 cm tall, sparingly to densely soft hairy. Stems somewhat flexuose. Rosette leaves not persistent, petiolate; lamina pinnatifid with 4 or 5 lateral lobes, terminal lobe broadly triangular. Cauline leaves diminishing upwards; hastate or sagittate to lanceolate; lateral lobes 1–4, narrow; terminal lobe larger. Inflorescence ±erect, ebracteate; pedicels 3–5 mm long, elongating to 10 mm in fruit. Sepals 4–5 mm long, hairy. Petals 6–10 mm long, yellow, fading to white. Siliqua linear-cylindrical, spreading, straight or slightly curved, (4–) 6–10 cm long. Seeds c. 1 mm long.

Norfolk Is. Widespread as a weed of disturbed ground including roadsides. Native to the Mediterranean and south-western Asia.

N.Is.: vicinity of Emily Bay, *G.Uhe* 1211 (K); *s. loc.*, *P.Ralston 69* (A).

34. EPACRIDACEAE

Evergreen shrubs or rarely small trees. Leaves alternate, rarely opposite, often crowded, usually stiff and coriaceous, usually sessile, usually entire; venation basically palmate, subparallel; stipules absent. Inflorescence a bracteate spike or spike-like raceme, rarely paniculate or single-flowered. Flowers usually actinomorphic, usually bisexual. Sepals 4 or 5, imbricate, persistent. Corolla tubular, campanulate or urceolate, (4 or) 5-lobed, usually imbricate, sometimes valvate, rarely petals free. Stamens (4 or) 5, usually epipetalous, sometimes free and hypogynous; anthers 1-locular. Ovary superior, 1–10-locular; ovules 1–many per locule; placentation axile or apical. Fruit a loculicidal capsule or a 1–5-seeded drupe. Seeds small.

A family of c. 30 genera and 400 species, almost confined to the Southern Hemisphere and especially numerous in Australia; 2 native genera on Lord Howe Is., 1 endemic.

G.Bentham, Epacrideae, *Fl. Austral.* 4: 142–265 (1869).

KEY TO GENERA

Shrub to c. 3 m tall; flowers in dense, axillary clusters of small spikes 1.5–2 cm long **1. LEUCOPOGON**

Much-branched tree to 13 m tall; flowers in dense, terminal panicles 10–15 (–20) cm long **2. DRACOPHYLLUM**

1. LEUCOPOGON

Leucopogon R.Br., *Prodr.* 541 (1810), *nom. cons.*; from the Greek *leukos* (white) and *pogon* (a beard), in allusion to the dense, white hairs on the inside of the corolla lobes in many species.

Shrubs, rarely small trees. Leaves sessile or shortly petiolate; lamina entire, aristate or with a thickened tip, usually glabrous. Inflorescence clustered, solitary or spicate, each flower with 1 bract and 2 bracteoles borne close to calyx; bract and bracteoles usually ovate to orbicular. Sepals ovate to orbicular, glabrous or ciliolate. Corolla tube usually shorter than lobes, glabrous outside, usually densely puberulous near throat inside or sometimes glabrous; lobes 5, valvate. Stamens 5, epipetalous near top of corolla tube; filaments short. Ovary 2–5 (sometimes 8)-locular; ovule 1 per locule; placentation axile. Fruit a drupe.

A genus of c. 150 species distributed from Malesia and Australia to New Caledonia and Vanuatu, but mainly in Australia; 1 species occurs on Lord Howe Is.

Sometimes treated as a subgenus of *Styphelia*.

Leucopogon parviflorus (Andrews) Lindl., *Bot. Reg*. 18: t. 1560 (1833)

Styphelia parviflora Andrews, *Bot. Repos*. 4: t. 287 (1803). T: cultivated, not designated. Epithet from the Latin *parvus* (little) and *flos* (a flower), in reference to the small flowers.

Styphelia richei Labill., *Nov. Holl. Pl.* 1: 44, pl. 60 (1805); *Leucopogon richei* (Labill.) R.Br., *Prodr*. 541 (1810). T: Australia, *C.A.G.Riche*; holo: ?P *n.v.*

Illustrations: E.R.Rotherham *et al*., *Fl. & Pl. New South Wales & S Queensland* 22, t. 19 (1975); J.M.Powell *et al*. in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 1024, fig. 506C (1986); I.Hutton, *Lord Howe Is*. 123 (1986).

Erect shrub to 1 (rarely 3) m tall. Stems glabrous. Leaves crowded; lamina narrowly to very narrowly elliptic, slightly convex or flat, (10–) 15–25 (–40) mm long, (2–) 3–4 (–5) mm broad, stiff, narrowly attenuate at base and apex, with a small apical callus; venation almost parallel. Inflorescence terminal and in upper leaf axils, dense clusters of spikes 1.5–2 cm long. Flowers sweetly scented. Sepals ovate, 1.5 mm long, acute. Corolla tube ±cylindrical, c. 2 mm long; lobes 1.5 mm long, triangular, reflexed, densely white-hairy within. Anthers c. 1.5 mm long, with a short tip 0.5 mm long. Ovary c. 1 mm long, 4- or 5-locular; style not exserted. Fruit spheroidal, c. 3 mm diam. Fig. 39C–D.

Lord Howe Is. Locally common in lowland areas. Also found in southern and eastern Australia and northernmost New Zealand, especially in coastal areas. Flowers July–Oct.

L.H.Is.: between North Bay and Old Settlement, *G.Uhe 1289* (K); ridge above Dawson Point, *J.Pickard* in *A.N.Rodd 1447* (K, NSW); *loc. id., J.C.Game 69/197* (K); *loc. id., C.Moore 63* (K); track to Goat House, *P.S.Green 1678* (A, K).

2. DRACOPHYLLUM

Dracophyllum Labill., *Voy. Rech. Pérouse* 2: 211, t. 40 (1800); from the name of the genus *Dracaena* and Greek *phyllos* (a leaf), from the resemblance of the leaves to those of *Dracaena*, the Dragon Tree (Greek - *drakon*).

Type: *D. verticillatum* Labill.

Erect or prostrate shrubs or sometimes small trees. Leaves usually crowded and imbricate, towards ends of branches, simple; lamina linear, the base enclosing the stem and leaving a characteristic annular scar, coriaceous; veins parallel. Inflorescence terminal, simple or compound-racemose; bracts and bracteoles persistent or caducous. Sepals 5, persistent, coriaceous. Corolla tubular or campanulate; lobes imbricate, 5. Stamens 5, attached in middle of corolla tube, sometimes ±sessile. Ovary 5-locular; ovules many; placentation axile. Fruit a loculicidal capsule.

A genus of c. 45 species in eastern Australia, New Zealand and New Caledonia; 1 species endemic on Lord Howe Is.

Dracophyllum fitzgeraldii C.Moore & F.Muell. in F.J.H. von Mueller, *Fragm*. 7: 27 (1869)

T: Lord Howe Is., *R.D.Fitzgerald 43*; holo: MEL. Named after Robert David Fitzgerald (1830–1892), a surveyor who visited and collected on Lord Howe Is. in 1869, but is perhaps best known for his large, two volume *Australian Orchids*, which he illustrated himself.

Illustrations: H.F.Recher & S.S.Clark, *Environm. Survey Lord Howe Is*. 26 (1974); I.Hutton, *Lord Howe Is*. 123 (1986).

A spreading, much-branched tree to 13 m tall. Leaves closely imbricate at ends of branches; lamina linear, 15–20 (–30) cm long, 1–1.5 cm broad at base, coriaceous, striate with numerous parallel veins, base sheathing the stem and, on falling, leaving an annular scar, usually somewhat recurved, obscurely serrate, gradually tapered to finely acute apex. Inflorescence 10–15 (–20) cm long, densely paniculate, many-flowered, pubescent; bracts and bracteoles caducous. Sepals lanceolate, 3–4 mm long, obtuse or acute, ±pubescent,

ciliate. Corolla white; tube 4 mm long; lobes ±triangular, 2 mm long, becoming recurved. Capsule spheroidal, 2–3 mm long, brown. *Fitzgerald*. Figs 29, 42H–I.

Lord Howe Is. Endemic in the montane areas, from the Goat House and Erskine Valley to the tops of Mt Gower and Mt Erskine. Flowers mainly Jan.

L.H.Is.: near the Goat House, *J.C.Game 69/248* (K); N spur of Mt Gower, *L.A.S.Johnson & A.N.Rodd 1366* (K, NSW); summit of Mt Gower, *P.S.Green 1656* (A, K); top of mountain [Mt Gower], *C.Moore 58* (K, MEL).

Related to species in Australia (northern Qld) and New Caledonia.

35. SAPOTACEAE

Trees or shrubs with latex. Leaves alternate, simple, without stipules; lamina entire, usually coriaceous. Inflorescence axillary or borne below leaves, cymose or clustered, sometimes flowers solitary, bracteate. Flowers actinomorphic, usually bisexual. Calyx 4- or 5-lobed, basally united or free. Corolla gamopetalous, (4–) 5–10 (–12)-lobed, imbricate. Stamens 5–10 (–12), attached to corolla tube, usually opposite the lobes, alternating with 1–5 sometimes petaloid staminodes. Ovary superior, 3–5 (–6)-locular; ovule 1 per locule; placentation axile; style 1; stigma capitate or slightly lobed. Fruit a berry. Seeds ±laterally compressed, with a hard, smooth testa, roughened or sculptured in scar area.

A pantropical or subtropical family of c. 60 genera and 900 species; 1 genus occurs on Norfolk and Lord Howe Islands.

G.Bentham, Sapotaceae, *Fl. Austral.* 4: 277–285 (1869); .H.J.Lam, The Sapotaceae of the Dutch East Indies and surrounding countries, *Bull. Jard. Bot. Buitenzorg* ser. 3, 7: 2–289 (1925); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Sapotaceae, *Fl. Java* 2: 189–194 (1965); A.C.Smith, Sapotaceae, *Fl. Vit. Nova* 2: 744–782 (1981); T.D.Pennington, *The Genera of Sapotaceae* (1991).

POUTERIA

Pouteria Aubl., *Hist. Pl. Guiane* 1: 85 (1775); from the native Guyanese tribal name for this plant, *Pourama-pouteri*.

Type: *P. guianensis* Aubl.

Trees or shrubs. Leaves sometimes crowded towards ends of branches. Flowers solitary or clustered, axillary or borne below leaves, bisexual. Calyx 5 (rarely 4)-lobed, imbricate or quincuncial, persistent in fruit. Corolla shortly tubular or cup-shaped, 5-lobed; tube usually shorter than lobes; nectarial disk surrounding ovary base. Stamens usually 5, usually attached near middle of corolla tube; staminodes usually 5, inserted between stamens in sinuses between corolla lobes. Ovary 5-locular; style simple; stigma small. Seeds 1–5, laterally compressed; scar narrow, ±full length of seed.

A genus of c. 300 species in the tropics of America, Asia, Australia and the Pacific; 1 species occurs on Norfolk Is., another on Lord Howe Is.

Generic limits in the Sapotaceae have been unclear, and the following species have previously been treated in the genus *Planchonella*, but Dr T.D.Pennington, *loc. cit.*, has revised the whole family on a world basis and his treatment is followed here.

Leaves oblanceolate, (6–) 7–11 (–14) cm long, with 14–20 primary veins on each side of midrib (N.Is.) **1. P. costata**

Leaves elliptic-rhombic (to broadly obovate), 4–8 cm long, with 5–8 primary veins on each side of midrib (L.H.Is.) **2. P. myrsinoides**

1. **Pouteria costata** (Endl.) Baehni, *Candollea* 9: 304 (1942)

Achras costata Endl., *Prodr. Fl. Norfolk.* 49 (1833); *Sapota costata* (Endl.) A.DC. in A.L.P.P. de Candolle, *Prodr.* 8: 175 (1844); *Sideroxylon costatum* (Endl.) F.Muell., *Syst. Census Austral. Pl.* 1: 92 (1882); *Sersalisia costata* (Endl.) Domin, *Biblioth. Bot.* 89: 508 (1929); *Planchonella costata* (Endl.) H.J.Lam, *Blumea* 5: 5 (1942); *Planchonella costata* var. *austro-montana* H.J.Lam, *op. cit.* 6; *Pouteria costata* var. *austro-montana* (H.J.Lam) Baehni, *op. cit.* 305. T: Norfolk Is., *F.L.Bauer*; holo: W; iso: K. Epithet from the Latin *costatus* (ribbed), in reference to the raised primary nerves, prominent in the leaves.

Mimusops laurina A.Cunn. in R.Heward, *London J. Bot.* 1: 113 (1842), *nom. inval.*

Illustration: S.Endlicher, *Iconogr. Gen. Pl.* 7: t. 83 (1839).

Small tree to 15 m tall, with sticky, white latex. Leaf lamina oblanceolate, 6–11 (–14) cm long, 3–5.5 cm broad, cuneate at base, rounded or sometimes slightly retuse at apex, entire, coriaceous; venation reticulate, 14–20 primary veins on each side of midrib. Flowers 1 or 2 (sometimes 3), clustered, axillary. Calyx 5-lobed (rarely 4), quincuncial, ovate, 3–4 mm long, appressed pilose. Corolla tube 3–4 mm long; lobes (4 or) 5, broadly oblong, 1.5–2 mm long, rounded-truncate, finely erose. Stamens and staminodes 5 (rarely 4), linear or narrowly triangular, 1.5 mm long. Ovary conoid, appressed pilose; style c. 2 mm long, persistent. Fruit ovoid-ellipsoidal, 2–2.5 cm long, 2-seeded. Seeds smooth, slightly obliquely ellipsoidal, flattened, 1.7 cm long; scar linear, 15 mm long. *Bastard Ironwood*. Fig. 42A–C.

Norfolk Is. Uncommon, occurring locally in forested areas. Also in the northern parts of North Is., New Zealand, where it has been called *P. novo-zelandica*. Formerly, but incorrectly, recorded from other Pacific islands.

N.Is.: Mt Pitt, 1968, *B. & O.Evans* (K); upper slopes of Mt Pitt, *R.D.Hoogland 11355* (K); *s. loc.*, *A.Cunningham 96* (K); *s. loc.*, *J.D.McComish 55 & 59* (K).

2. **Pouteria myrsinoides** (A.Cunn. ex Benth.) Baehni, *Candollea* 9: 303 (1942)

subsp. **reticulata** (Baill.) P.S.Green, *Kew Bull.* 45: 251 (1990)

Sideroxylon reticulatum Baill., *Bull. Mens. Soc. Linn. Paris* 2: 891 (1890); *Planchonella reticulata* (Baill.) Pierre ex Dubard, *Ann. Mus. Col. Marseilles* II, 10: 45 (1912). T: New Caledonia, *B.Balansa 1827*; holo: ?P *n.v.* The epithet refers to the reticulate venation on the leaves.

Achras howeana F.Muell., *Fragm.* 9: 72, 77 (1875); *Sideroxylon howeanum* (F.Muell.) F.Muell., *Syst. Census Austral. Pl.* 92 (1882); *Planchonella howeana* (F.Muell.) Pierre, *Not. Bot.* 36 (1890); *Sersalisia howeana* (F.Muell.) Domin, *Biblioth. Bot.* 89: 508 (1929); *Pouteria howeana* (F.Muell.) Baehni, *op. cit.* 306. T: Lord Howe Is., *J.P.Fullagar s.n.*; lecto: MEL, *fide* P.S.Green, *Kew Bull.* 45: 251 (1990); isolecto: K.

[*Achras australis auct. non* R.Br.: G.Bentham, *Fl. Austral.* 4: 282 (1868), *p.p.*]

[*Pouteria australis auct. non* (R.Br.) Baehni: C.Baehni, *op. cit.* 308, *p.p.*]

[*Planchonella myrsinoides auct. non* (A.Cunn. ex Benth.) Blake ex Francis: P. van Royen, *Blumea* 8: 297 (1957), *p.p.*]

Illustrations: P. van Royen, *Blumea* 8: 284, fig. 14 (1957); I.Hutton, *Lord Howe Is.* 141 (1986).

Tree or small tree to 6 (rarely 10) m tall, with a watery, white latex; shoot tips with appressed, reddish hairs. Leaf lamina elliptic-rhombic (to broadly obovate), 4–8 cm long, 2–4 cm broad, cuneate at base, obtuse-rounded or slightly retuse at apex, entire, coriaceous, reticulate, 5–8 primary veins on each side of midrib. Flowers 2–6, clustered, axillary. Calyx 5-lobed, quincuncial, free, broadly ovate, 4–5 mm long, appressed pilose. Corolla tube 5–7 mm long; lobes 5, obovate, 2 mm long, truncate to very slightly retuse. Stamens 5; staminodes 5, subulate, blunt, c. 1 mm long. Ovary conoidal, c. 2 mm long, pilose; style persistent, simple, c. 8 mm long, with 1–1.5 mm exserted. Fruit ovoid-ellipsoidal, 1.3–1.5 cm long, apex attenuate into persistent style. Seeds 1–3, obliquely ovoid-ellipsoidal, flattened, 1.5–2 cm long; scar slightly shorter than seed. *Axe-handle Wood*.

Lord Howe Is. A common tree at lower elevations. Also occurs in New Caledonia.

L.H.Is.: ridge between Old Settlement and North Bay, *P.S.Green 1926* (K); N side of Transit Hill, *A.N.Rodd 1275* (K, NSW); Transit Hill, *M.M.J. van Balgooy 1006* (K, NSW); E side of Intermediate Hill, *J.C.Game 69/009* (K); *s. loc.*, 1920, *J.L.Boorman* (BRI, NSW).

Pouteria myrsinoides subsp. *myrsinoides*, which is very closely related, is found in north-

eastern Qld. It differs in the leaves and young shoots being only sparsely hairy or glabrate and the leaves more acute.

EBENACEAE

C.Moore, *Gard. Chron*. 28: 969 (1869), *J. Bot*. 7: 303 (1869), lists, among the plants of Lord Howe Is., 'a Maba'. However, this record has never been substantiated and no material of this genus has been seen from Lord Howe Is.

36. SYMPLOCACEAE

Trees or shrubs. Leaves alternate, simple, without stipules. Inflorescence axillary or terminal, basically racemose. Flowers actinomorphic, bisexual or rarely unisexual. Calyx 5 (rarely 4)-lobed, imbricate or valvate, ±adnate to ovary. Corolla gamopetalous, deeply divided; lobes (3–) 5 (–11), quincuncial. Stamens 15 or more (rarely as few as 4), often in 5 clusters, alternate with corolla lobes, epipetalous, free or filaments basally connate; anthers short, bilocular. Ovary inferior to semi-inferior, 2–5-locular; ovules 2 (rarely 3 or 4) per locule; placentation axile; style slender; stigma small. Fruit a berry or drupe, 1–5-locular, 1 seed per locule.

A tropical or subtropical monogeneric family with 250 or more species from the Americas and SE Asia to Australia and Melanesia; 1 genus endemic on Lord Howe Is.

G.Bentham, *Symplocos* in Styracaceae, *Fl. Austral.* 4: 292–293 (1869); H.P.Nooteboom, Symplocaceae, *Fl. Males.* ser. I, 8: 205–274 (1978); H.P.Nooteboom, A revision of the Australian species of *Symplocos* (Symplocaceae), *Brunonia* 4: 309–326 (1981).

SYMPLOCOS

Symplocos Jacq., *Enum. Syst. Pl.* 5, 24 (1760); from the Greek *symplokos* (twisted together, intertwined, or a combination), in reference to the united stamens in the genus.

Type: *S. martinicensis* Jacq.

Trees or shrubs. Leaves usually coriaceous, often drying yellowish. Inflorescence axillary or terminal, racemose or spicate. Flowers clustered or sometimes solitary. Calyx usually 5-lobed, shortly campanulate, adnate to ovary. Corolla usually divided nearly to base; lobes usually 5. Stamens usually in clusters alternating with corolla lobes; filaments usually connate into a tube adnate to corolla. Ovary inferior to semi-inferior. Fruit a berry or drupe, crowned by the persistent calyx.

A genus of 250 or more species; 1 species endemic to Lord Howe Is.

H.P.Nooteboom (*Revision of Symplocaceae of the Old World, New Caledonia Excepted*, 1977 and A revision of the Australian species of *Symplocos* (Symplocaceae), *Brunonia* 4: 309–326, 1981) has taken an over-broad view of the representatives in SE Asia, Australia and Melanesia, recognising 4 subspecies and some 30 varieties (including the plant described below), all within one species, *S. cochinchinensis* (Lour.) S.Moore. Admittedly, there is a complex surrounding this species, but the plant described below appears distinct in a number of sound characters and seems best treated as a species in its own right.

Symplocos candelabrum Brand in H.G.A.Engler, *Pflanzenr.* 6: 39 (1901)

Symplocos cochinchinensis var. *candelabrum* (Brand) Noot., *Brunonia* 4: 323 (1982). T: Lord Howe Is., *J.H.Maiden*; holo: B, destroyed; iso: BM, BRI. The epithet may allude to a candelabrum-like array of stamens in the flower.

[*Symplocos stawellii auct. non* F.Muell.: F.J.H. von Mueller, *Fragm.* 9: 77 (1875); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 242 (1898); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 148 (1898)]

[*Symplocos cochinchinensis* var. *montana auct. non* (C.T.White) Noot.: H.P.Nooteboom, *Revis. Symplocos Old World* 160 (1975), *p.p.*]

[*Symplocos cochinchinensis* var. *stawellii auct. non* (F.Muell.) Noot.: H.P.Nooteboom, *op. cit.* 162, *p.p.*]

Illustration: I.Hutton, *Lord Howe Is.* 142 (1986).

Tree to c. 13 m tall. Leaf lamina elliptic-lanceolate, (5–) 8–13 (–18) cm long, (2–) 3.5–5 (–7) cm broad, acute to acuminate, coriaceous, glabrous, turning yellow-green on drying; basal margin inrolled, entire or obscurely serrate in upper part. Inflorescence axillary, racemose or spicate, 2–6 cm long, c. 12-flowered; pedicels 0–5 mm long. Calyx obconical; lobes 4 or 5, ciliolate. Corolla 6–7 mm long; tube c. 0.5 mm long; lobes white with yellow tips. Stamens numerous, c. 6 mm long. Ovary c. 1.5 mm long; style simple, c. 6 mm long. Fruit cylindrical-obpyriform, 10–14 mm long, c. 3-seeded, flat at apex, crowned with calyx scars, bluish when ripe. Fig. 44D.

Lord Howe Is. Endemic, growing at intermediate elevations in the montane forest of the southern part of the Island. Flowers May and June.

L.H.Is.: N side of Intermediate Hill, *I.Hutton 131* (CBG); N side of Erskine Valley, *A.C.Beauglehole 5820* (MEL); Erskine Valley, *A.N.Rodd 1760* (K, NSW); slopes of Mt Lidgbird, *J.D.McComish 107* (K); ascent of Mt Gower, *P.S.Green 1987* (K).

In *Symplocos* the delimitation of species is not easy, but this plant seems quite distinct on a number of characters, not least in the inrolled margin of the lamina adjacent to the petiole which appears as though it may be an extra-floral nectary and seems not to be present in any of the related species.

37. MYRSINACEAE

Trees or shrubs, sometimes climbers. Leaves alternate, simple, with linear or punctate resin glands, without stipules. Inflorescence various, terminal or axillary, sometimes borne below leaves, bracteate. Flowers actinomorphic, usually bisexual, sometimes functionally unisexual. Calyx (3–) 4 or 5 (–6)-lobed, usually connate at base, resin-glandular, persistent. Corolla gamopetalous, (3–) 4 or 5 (–6)-lobed, rotate or tubular, usually contorted, rarely petals free. Stamens as many as and opposite corolla lobes, epipetalous; anthers opening lengthwise or by apical slits or pores. Ovary usually superior, rarely semi-inferior, 1-locular; ovules few to many; placenta often surrounding the ovules. Fruit a berry, drupe or capsule.

A pantropical and subtropical family, sometimes reaching warm temperate areas, of c. 35 genera and 1250 species; 2 genera on Lord Howe Is., 1 of which also on Norfolk Is.

Most members are characterised by the presence of resin canals in the tissues of all parts, sometimes visible in the leaves, especially when young or when held to the light, usually clearly visible, for example, as pink or brownish streaks or spots in the corolla.

Suttonia tenuifolia Hook.f. was described from Norfolk Is. but it was a misidentification of *Melicytus latifolius* (Endl.) P.S.Green of the Violaceae.

G.Bentham, Myrsineae, *Fl. Austral.* 4: 272–277 (1869); C.Mez, Myrsinaceae, *Pflanzenr.* 9 (IV, 236): 1–437 (1902); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Myrsinaceae, *Fl. Java* 2: 194–203 (1965).

KEY TO GENERA

Pedicels of flowers 5–15 mm long; fruit cylindrical, curved; growing in salty or brackish water	**1. AEGICERAS**
Pedicels of flowers 0–2 mm long; fruit ±spherical; not growing in such water	**2. RAPANEA**

1. AEGICERAS

Aegiceras Gaertn., *Fruct. Sem. Pl.* 1: 216, fig. 1, t. 46 (1788); from the Greek *aegos* (a goat) and *keras* (a horn), in allusion to the curved, horn-like fruits.

Type: *A. corniculatum* (L.) Blanco

Maritime trees or shrubs. Leaves coriaceous. Inflorescence umbellate or a very short subumbellate raceme, terminal or axillary. Flowers bisexual. Calyx lobes 5. Corolla lobes 5, ±equal to tube, spreading. Stamens exserted, epipetalous, basally connate; anthers dehiscing lengthwise, divided transversely into several small pit-like compartments. Ovary superior, fusiform; ovules many, only 1 developing; style subulate; stigma very small, capitate. Fruit a curved, cylindrical capsule, 1-seeded, opening by 1 or 2 longitudinal slits.

A tropical genus containing 2 species, distributed in SE Asia and Australia; 1 species native on Lord Howe Is.

Aegiceras corniculatum (L.) Blanco, *Fl. Filip.* 79 (1837)

Rhizophora corniculata L., *Herb. Amb.* 13 (1754); *Aegiceras majus* Gaertn., *Fruct. Sem. Pl.* 1: 216, t. 46 (1788); *Aegiceras fragrans* K.D.Koenig, *Ann. Bot.* 1: 131, t. 3 (1805), *nom. illeg.* T: not designated. The epithet means, like a small horn, from the Latin *cornu* (a horn), in allusion to the shape of the fruit.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 271, fig. 39A (1986); I.Hutton, *Lord Howe Is.* 131 (1986); G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 504 (1990).

Shrubs or small trees to 3 m or more tall. Leaf lamina obovate, (3–) 4–7 (–9) cm long, (2–) 2.5–4.5 (–5.5) cm broad, ±cuneate at base, entire, rounded at apex, coriaceous; petiole 5–10 mm long. Inflorescence usually 10–30-flowered, sessile or on a short peduncle to 5 mm long; pedicels 5–15 mm long. Calyx lobes closely imbricate, ovate-asymmetrical, 3–5 mm long. Corolla lobes spreading-reflexed, c. 5 mm long, acute. Anthers narrowly triangular, 3 mm long. Ovary narrowly conical; style slender, exserted. Capsule long-pointed, c. 3 cm long or more. Seed 1, which germinates before being shed. *Mangrove*.

Lord Howe Is. Very local, growing in brackish water at the entrance to one or two creeks. Flowers Sept.–Feb. Found throughout coastal India, and southern China southwards and eastwards to Papua New Guinea and tropical northern and eastern Australia.

L.H.Is.: SE corner of Mosely Park, *L.A.S.Johnson & A.N.Rodd 1318* (K, NSW); mouth of Soldiers Ck, *P.S.Green 2033* (K); *loc. id., J.C.Game 69/314* (K); *s. loc.*, 1920, *J.L.Boorman* (BRI); *s. loc., J.D.McComish 80* (K).

2. RAPANEA

Rapanea Aubl., *Hist. Pl. Guiane* 1: 121, t. 46 (1775); a name published without an explanation of its meaning, probably based on a native name.

Type: *R. guianensis* Aubl.

Small trees or shrubs, monoecious or dioecious. Leaves entire or rarely dentate, usually coriaceous with punctate or linear resin canals, sometimes obscure. Inflorescence umbellate or clustered, in the axils of leaves or leaf scars, few- to many-flowered. Flowers functionally unisexual, sometimes bisexual. Calyx lobes 4 or 5, free, usually deeply lobed, usually with linear or punctate resin canals. Corolla lobes 4 or 5, longer than tube, cup-shaped to rotate, usually with linear or punctate resin canals. Stamens not exserted, attached within corolla

tube; filaments not forming a tube, absent or very short. Ovary superior, subglobose to ovoid; ovules few; style very short; stigma capitate or fringed. Fruit a subglobose drupe, 1-seeded.

A pantropical and subtropical genus of between 150 and 200 species; 1 species endemic on Norfolk Is., 3 species endemic on Lord Howe Is.

Taxonomically difficult and by some authors united with *Myrsine*.

1 Leaves of mature plants mostly 4 cm broad or more, elliptic to broadly elliptic (N.Is.) **1. R. ralstoniae**

1: Leaves of mature plants mostly up to 3.5 cm broad, oblanceolate-elliptic to narrowly oblanceolate (L.H.Is.)

2 Leaves of mature plants up to 3 cm long (southern mountains above 400 m alt.) **2. R myrtillina**

2: Leaves of mature plants usually 3.5 cm or more long (lower elevations)

3 Shrub or small tree to 6 m tall; flowers 4-merous; pedicels 0–0.5 mm long **3. R. platystigma**

3: Tree to 15 m tall; flowers 5-merous; pedicels 2 mm long **4. R. mccomishii**

1. Rapanea ralstoniae P.S.Green, *Kew Bull.* 45: 242 (1990)

T: Norfolk Is., 1804–1805, *F.L.Bauer*; holo: W; iso: K. The epithet commemorates Mrs Pat Ralston, a resident of Norfolk Is. who tragically died of cancer in 1971, but did much to encourage interest in the plants of Norfolk Is., especially their conservation.

[*Myrsine crassifolia auct. non* R.Br.: S.L.Endlicher, *Prodr. Fl. Norfolk.* 48 (1833); A.L.P.P. de Candolle, *Prodr.* 8: 96 (1844), *p.p.*; B.Seemann, *Fl. Vit.* 149 (1866)]

[*Rapanea crassifolia auct. non* (R.Br.) Mez: C.C.Mez in H.G.A.Engler, *Pflanzenr.* 9: 365 (1902); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 33 (1915); J.S.Turner *et al.*, *Conservation Norfolk Is.* 35 (1968)]

Small tree to 6 m or more. Shoots slightly verrucose. Leaves with petiole 5–10 mm long; lamina elliptic to broadly elliptic, (5–) 7–9 (–12) cm long, (3–) 4–5 (–5.5) cm broad, rounded to acute at base, margin flat, obtuse to rounded at apex; venation finely and slightly raised-reticulate, minutely punctate-glandular above and below, sometimes obscurely so. Inflorescence clustered, 5–10-flowered; flowers subsessile, clustered. Calyx c. 1 mm long, divided to the middle; lobes 4, persistent, with linear or punctate secretory canals. Corolla 2.5 mm long; lobes 4, lanceolate-elliptic, 1.5 mm long, obtuse, reflexed at tips, with punctate or linear secretory canals. Stamens 4, c. 1 mm long. Ovary ovoid, c. 1 mm long; stigma slightly bifurcate. Fruit 4–5 mm diam. *Beech*. Fig. 42D.

Norfolk Is. Endemic and not uncommon, especially as an understorey tree in forested areas.

N.Is.: upper slopes of Mt Pitt, *G.Uhe 1156* (K); N side of Mt Bates, *P.S.Green 2382* (K); Anson Bay Rd, near Selwyn Bridge above Jacobs Rock, *M.Lazarides 8058* (CANB, K); c. 3.2 km NE of Kingston cemetery, *G.Uhe 1104* (K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW).

Confused by Mez with the Qld species, *R. crassifolia*.

2. Rapanea myrtillina Mez in H.G.A.Engler, *Pflanzenr.* 9: 370 (1902)

T: Lord Howe Is., *J.P.Fullagar*; holo: B, destroyed; iso: K, MEL. So called because of a resemblance of the leaves to those of the myrtle, *Myrtus*.

Illustration: I.Hutton, *Lord Howe Is.* 132 (1986).

Shrub to 3 m tall. Shoots smooth. Leaves with petiole 1–2 mm long; lamina oblanceolate to narrowly oblanceolate, 0.8–2.5 (–3) cm long, 0.3–1.2 cm broad, (to 3.5 × 1.5 cm in young vigorous shoots), acute at base, slightly recurved at margin, obtuse-rounded, dense punctate or shortly linear resin canals visible below, obscure above; venation finely raised reticulate, sometimes obscurely so. Inflorescence 1–3-flowered; pedicels 0.5–1 mm long. Calyx 1 mm long; lobes 4 or 5, persistent. Corolla 2–2.5 mm long; lobes 4 or 5, lanceolate, acute, cream with dark pink spots (*fide* I.Hutton, *loc. cit.*). Stamens in female flowers 0.5 mm long (male flowers not seen). Ovary globose, 1 mm long; stigma pulvinate, lobed. Fruit 3.5–4 mm diam., purple. Fig. 42F.

Lord Howe Is. A rare endemic, from the summits of Mts Gower and Lidgbird down to c. 400 m alt. Flowers late May to early July.

L.H.Is.: Mt Lidgbird, *A.N.Rodd 1778* (K, NSW); *loc. id., J.D.McComish 70/D* (K); E side of Mt Lidgbird, *I.Hutton 570* (K); Mt Gower, *A.N.Rodd 1785* (K, NSW); The Saddle, *I.Hutton 567* (K).

3. Rapanea platystigma (F.Muell.) Mez in H.G.A.Engler, *Pflanzenr.* 9: 370 (1902)

Myrsine platystigma F.Muell., *Fragm.* 8: 48 (1873). T: Lord Howe Is., *J.P.Fullagar & Lind*; holo: MEL; iso: K. The epithet is from the Greek *platys* (broad) and *stigma*, in reference to the so-called broad stigma.

Illustration: I.Hutton, *Lord Howe Is.* 132 (1986).

Shrub or small tree 3–6 m tall. Shoots frequently verrucose. Leaves oblanceolate-elliptic, (1.5–) 3.5–7 (–10) cm long, (0.6–) 1–2.5 (–3.5) cm broad, acute at base, entire, usually ±irregularly undulate at margin, rounded at apex, punctate and linear resin canals usually obscure; venation usually obscure. Inflorescence 3- or 4-flowered; flowers clustered; pedicels 0–0.5 mm long. Calyx 0.5 mm long; lobes 4, persistent. Corolla 1.5–2 mm long; tube 0.5–1 mm long in male flowers, 1.5 mm in female; lobes 4, oblong, 1–1.5 mm long, blunt or acute, reflexed, greenish white, streaked and spotted reddish brown (*fide* I.Hutton, *loc. cit.*). Stamens 4. Ovary ±globose; stigma slightly 4-angled. Fruit 3.5–4 mm diam., purple when ripe. *Honeysuckle*. Figs 23, 42E.

Lord Howe Is. Endemic, common and widespread from the lowlands to c. 400 m alt. Flowers mid Aug.–Sept.

L.H.Is.: Dawsons Ridge, *P.S.Green 1928 & 1929* (K); summit of Transit Hill, *A.N.Rodd 1851* (K, NSW); *loc. id., L.A.S.Johnson & A.N.Rodd 1277* (K, NSW); *s. loc., J.D.McComish 70 & 70A–C* (K).

A very variable species. P.S.Green, *Kew Bull.* 45: 243 (1990), referred to *Rapanea* sp. 'A' as a possible segregate taxon of *R. platystigma*, but this has not been substantiated by further observations.

4. Rapanea mccomishii Sprague, *Proc. Linn. Soc. London* 155: 289 (1944)

T: Lord Howe Is., *J.D.McComish 159*; holo: K. Named in honour of Captain James Doran McComish (1881–1948), who made numerous visits to and collected extensively on Lord Howe Is. in the 1930s.

Illustration: I.Hutton, *Lord Howe Is.* 131 (1986).

Tree to 15 m tall. Stems ±smooth. Leaves with petiole 3–6 mm long; lamina oblanceolate-elliptic, (3.5–) 5–7 (–10) cm long, (1.2–) 1.7–2.5 (–3.5) cm broad, (10–20 cm long on juvenile shoots), acute at base, slightly recurved at margin, not undulate, obtuse; venation obscure below, finely raised reticulate above. Inflorescence clustered to subumbellate, c. 4–10-flowered; pedicels 2 mm long. Calyx cup-shaped, c. 1 mm long, divided to middle; lobes 5, persistent. Corolla tube 1 mm long; lobes 5, narrowly triangular, 2 mm long, streaked and spotted. Stamens 5, in female flowers abortive (male flowers not seen). Ovary globose-conical, 1.5 mm long; stigma pulvinate. Fruit 4–5 mm diam., purple. Fig. 42G.

Lord Howe Is. Endemic. An uncommon tree, scattered at lower elevations.

L.H.Is.: W of Kims Lookout, *I.Hutton 523* (K); Smoking Tree Ridge, *A.N.Rodd 1863* (K, NSW); NW side of Mt Lidgbird, E of Salmon Beach, *A.C.Beauglehole 5786* (MEL); beyond Goat House on way to The Saddle, *I.Hutton 569* (K); Erskine Valley, *A.N.Rodd 1760* (K, NSW).

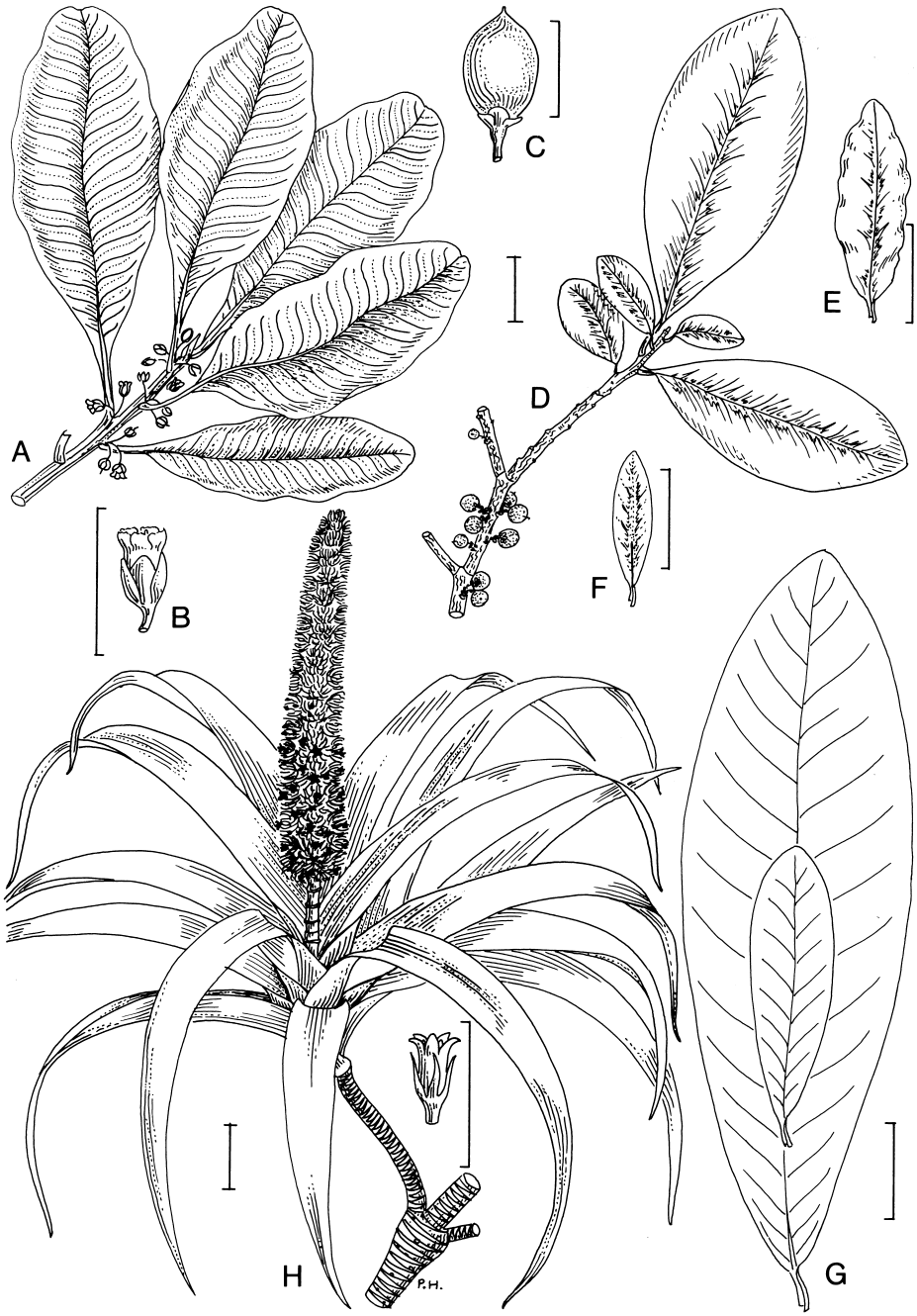

Figure 42. **A–C**, SAPOTACEAE: *Pouteria costata*. **A**, habit; **B**, flower (**A–B**, J.McComish 59A, K); **C**, fruit (A.Cunningham 20, K). **D–G,** MYRSINACEAE. **D**, *Rapanea ralstoniae*, habit in fruit (G.Uhe 1180, K). **E**, *Rapanea platystigma*, leaf (J.McComish 70B, K). **F**, *Rapanea myrtillina*, leaf (J.McComish 70D, K). **G**, *Rapanea mccomishii*, leaves (J.McComish 159 & 159A, K). **H–I**, EPACRIDACEAE: *Dracophyllum fitzgeraldii*. **H**, habit; **I**, flower (**H–I**, J.Game 69/248, K). Scale bars: **A**, **C–H** = 2 cm; **B**, **I** = 1 cm. Drawn by P.Halliday.

38. PRIMULACEAE

Annual or perennial herbs, rarely subshrubs. Leaves opposite, alternate, whorled or basal, usually simple, without stipules. Inflorescence various, axillary or apparently terminal. Flowers usually actinomorphic, bisexual, usually 5-merous. Calyx free or adnate to ovary, usually persistent. Corolla gamopetalous, tubular; lobes imbricate or contorted. Stamens as many as and opposite corolla lobes, sometimes with small, alternating staminodes, epipetalous. Ovary superior or semi-inferior, 1-locular; ovules few to many; placentation free-central; style simple; stigma capitate or truncate. Fruit usually a capsule, dehiscing by valves or circumscissile, rarely indehiscent. Seeds angular or compressed.

A family of c. 20 genera and 1000 species, cosmopolitan, but especially from the northern temperate regions; 2 genera (1 introduced) on Norfolk Is., 1 of which also introduced on Lord Howe Is.

G.Bentham, Primulaceae, *Fl. Austral.* 4: 268–272 (1869).

KEY TO GENERA

Leaves opposite; stems 4-angled; ovary superior; fruit circumscissile	**1. ANAGALLIS**
Leaves alternate; stems rounded; ovary semi-inferior; fruit a 5-valvate capsule	**2. SAMOLUS**

1. ANAGALLIS

Anagallis L., *Sp. Pl.* 1: 148 (1753); *Gen. Pl.* 5th edn, 73 (1754); a name used by the early Greek physician Dioscorides.

Type: *A. arvensis* L.

Annual or perennial herbs, often decumbent. Leaves alternate or opposite; lamina entire, glabrous. Flowers axillary, usually solitary, pedicellate, without bracts. Calyx deeply divided; lobes 5. Corolla rotate or campanulate, deeply divided; lobes 5, contorted. Stamens 5, attached near base of corolla; filaments ±connate at base, with or without staminodes. Ovary globose; ovules many; style slender. Fruit a capsule, ±spherical, circumscissile. Seeds angular.

A genus of c. 28 species, mainly European or Mediterranean, but also from Africa and South America; 1 species naturalised on Norfolk and Lord Howe Islands.

*Anagallis arvensis L., *Sp. Pl.* 1: 148 (1753)

T: Europe; lecto: LINN 208.1 *n.v., fide* R.A.Dyer in R.A.Dyer *et al., Fl. S Africa* 26: 14 (1963); IDC microfiche 177/2.117/1. The epithet means an arable field as habitat, from the Latin *arvum* (an arable field).

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 271, fig. 39C (1986); H.R.Toelken in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 1029, fig. 508A (1986); B.A.Auld & R.W.Medd, *Weeds* 210 (1987).

Decumbent annual, glabrous. Stems 4-angled, usually branched. Leaves opposite, sessile, broadly ovate or ovate-lanceolate, 8–20 mm long, 4–15 mm broad, rounded to subcordate at base, acute or almost obtuse. Flowers axillary, solitary; pedicel longer than leaves, 1–3 cm long, slender, recurved in fruit. Calyx lobes lanceolate, 3–5 mm long, sharply acuminate. Corolla 3–7 mm long, not persistent, minutely glandular-crenulate, blue, orange-red, or pink, usually with a darker purplish 'eye'. Filaments 1.5–2.5 mm long, connate at base and there pilose with dense, purplish hairs. Ovary globose, 2–3 mm long, c. 1.5 mm diam. Capsule globose, c. 5 mm diam. with persistent style. Seeds c. 1 mm long, trigonous, brown. *Pimpernel*.

Norfolk Is., Lord Howe Is. A common weed of wasteland and exposed soil, especially near the coast. Native to Europe.

N.Is.: vicinity of Emily Bay, *G.Uhe 1208* (K); Philip Is., *P.S.Green 1485* (A, K). **L.H.Is.:** Mt Eliza, *P.S.Green 1941* (K); *s. loc., J.D.McComish 74 & 98* (K).

Var. *arvensis* with scarlet flowers, var. *caerulea* Gouan with blue flowers and f. *carnea* Schrank with pink flowers, have all been recorded from Norfolk Is. and the two former varieties from Lord Howe Is. but the status of these infraspecific taxa is still not clear.

2. SAMOLUS

Samolus L., *Sp. Pl.* 1: 171 (1753); *Gen. Pl.* 5th edn, 78 (1754); the name for a plant, possibly a marsh plant, in Pliny.

Type: *S. valerandi* L.

Annual or perennial herbs, scarcely subshrubby. Stems terete, often creeping. Leaves alternate, sometimes with a basal rosette; lamina entire, glabrous. Inflorescence a terminal raceme or corymb, bracteate. Calyx 5-lobed, adnate to lower half of ovary at base; lobes persistent. Corolla tube short; lobes 5, campanulate or rotate, imbricate. Stamens 5, attached near base of corolla tube, opposite lobes; filaments free; staminodes 5, filiform or subulate, alternating with stamens. Ovary globose; ovules numerous. Fruit a capsule, ovoid or globose, dehiscing by 5 valves opposite calyx lobes. Seeds small, orbicular or angular.

A cosmopolitan genus of c. 15 species, most of them from the Southern Hemisphere, often coastal; 1 species occurs on Norfolk Is.

Samolus repens (J.R.Fortst. & G.Forst.) Pers., *Syn. Pl.* 1: 171 (1805)

var. **stricta** Cockayne, *Trans. & Proc. New Zealand Inst.* 48: 199 (1916)

T: not designated. Epithet from the Latin *strictus* (straight, drawn together), in reference to the upright shoots.

[*Samolus littoralis* var. *repens auct. non* (J.R.Forst. & G.Forst.) Endl.: S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 48 (1833), *p.p.*]

Illustration: W.R.Sykes, *Kermadec Is. Fl.* 133 (1977).

Perennial herb, glabrous. Stems rounded, trailing from a central rosette, with upright shoots 8–20 cm tall. Leaves basal or alternate; lamina narrowly elliptic or narrowly oblanceolate-spathulate, to almost linear, 5–10 (–15) mm long, 1–5 mm broad, attenuate to petiole, entire, acute to obtuse at apex. Inflorescence corymbose, usually 3- or 4-flowered; flowers in axils of bracts or reduced bract-like leaves. Calyx lobes ovate-triangular, 2 mm long, acute. Corolla tube 1–2 mm long; lobes 3.5–4 mm long, oblong, obtuse, deep to pale pink. Style 1.5–2 mm long. Fruit not seen.

Norfolk Is. On rocks and earth banks beside the sea, locally common. Native to all Australian States, New Zealand, Kermadec Is. and New Caledonia.

N.Is.: near Rocky Point, *P.S.Green 1460* (A, K); Anson Bay, *R.D.Hoogland 11296* (CANB, K); *s. loc., A.Cunningham 42* (K); *s. loc., R.M.Laing s.n.* (CHR); *s. loc., J.D.McComish 31* (K).

The Norfolk Is. plant is in some respects intermediate between true var. *stricta* of the Kermadecs and Poor Knights Is. off the New Zealand coast, and var. *repens* (see W.R.Sykes, *Kermadec Island Flora* 132–134, 1977). Further investigation of this species throughout its range from New Zealand to New Caledonia and coastal Australia is needed.

39. PITTOSPORACEAE

Evergreen trees, shrubs or climbers. Leaves alternate or whorled towards ends of branches, simple, usually entire, without stipules. Inflorescence axillary or terminal, usually cymose, corymbose or paniculate, few- to many-flowered or flowers solitary. Flowers usually bisexual, actinomorphic, rarely slightly zygomorphic, often bibracteate. Sepals 5, free or basally connate, imbricate. Petals 5, free or basally connivent, imbricate. Stamens 5, alternating with corolla lobes, sometimes basally connate; anthers dehiscing by longitudinal slits, rarely by terminal pores. Ovary superior, 1- or 2 (–5)-locular; placentation usually parietal; ovules usually numerous. Fruit a berry or loculicidal capsule. Seeds usually immersed in a viscid pulp.

A family containing 8 or 9 genera and c. 240 species. Distributed in the Old World from the tropics to the warm temperate regions, best developed in Australia; 1 genus with both native and introduced species on the Islands.

G.Bentham, Pittosporeae, *Fl. Austral.* 1: 109–128 (1863); K.Bakker & C.G.G.J. van Steenis, Pittosporaceae, *Fl. Males.* ser. I, 5: 345–362 (1957); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Pittosporaceae, *Fl. Java* 1: 279–280 (1963).

PITTOSPORUM

Pittosporum Banks ex Sol. in J.Gaertner, *Fruct. Sem. Pl.* 1: 286, t. 59 (1788); from the Greek *pitta* (pitch) and *spora* (seed), alluding to the sticky resinous pulp in which the seeds are immersed.

Type: *P. tenuifolium* Banks ex Sol.

Trees or shrubs, sometimes spiny. Leaves alternate, usually crowded towards ends of branches, entire or toothed, often revolute. Inflorescence axillary or terminal, cymose, corymbose or paniculate, few- to many-flowered or flowers solitary. Flowers bisexual or functionally unisexual, actinomorphic. Petals usually connivent into a tube, lobes spreading, imbricate or quincuncial, usually white to yellowish, sometimes reddish or purplish. Ovary usually 1- or 2-locular, glabrous or pubescent; placentation parietal; ovules numerous, in 2 rows per placenta. Fruit a loculicidal capsule, smooth or variously rugose; valves 2 (–6), coriaceous or rarely woody. Seeds numerous, reddish or blackish, embedded in a viscid resinous pulp.

A genus of perhaps 200 species from tropical to warm temperate Africa, Asia, Australia, New Zealand and the Pacific; 2 native and 2 naturalised species on the Islands.

R.C.Cooper, The Australian and New Zealand species of *Pittosporum*, *Ann. Missouri Bot. Gard.* 43: 87–188 (1956).

1 Fruit 3-valved; leaves broadest above middle, usually to 9 cm long

2 Underside of leaves glabrous; corolla lobes yellowish white or cream

3 Leaves 5 cm long or usually more; flowers yellow or cream; calyx lobes not ciliate (N.Is.) **1. P. bracteolatum**

3: Leaves up to 5 cm long; flowers white or cream with reddish lilac throat; calyx lobes densely ciliate (L.H.Is.) **2. P. erioloma**

2: Underside of leaves densely tomentose; flowers red **3. P. crassifolium**

1: Fruit 2-valved; leaves broadest in middle, usually 8 cm or more long **4. P. undulatum**

1. **Pittosporum bracteolatum** Endl., *Prodr. Fl. Norfolk.* 78 (1833)

T: Norfolk Island, *F.L.Bauer*; holo: W; iso: K. So named from the presence of bracteoles subtending the flowers.

Tree to 7 m tall. Young stems sparingly pilose. Leaves with petiole sparsely pilose; lamina oblanceolate, (5–) 7–9 (–10) cm long, 1.7–3 (–3.5) cm broad, acute at base, entire, shortly acuminate, membranous, glabrous. Inflorescence terminal, subumbellate, 3–5-flowered; bracts linear, 5–8 mm long, borne below calyx. Sepals very narrowly lanceolate, c. 1 cm long, finely acuminate, glabrous. Petals narrowly lanceolate, 12–15 mm long, free, acute, with apiculate tip, cream. Stamens c. 8 mm long. Ovary c. 5 mm long, tomentose. Capsule globose-obpyriform, 2–2.5 cm long; valves 3, thick, tomentose to glabrate. Seeds numerous, brownish black; pulp sticky, orange. *Oleander*. Fig. 43G–H.

Norfolk Is. Endemic. A fairly common tree in the forested and wooded areas.

N.Is.: between Mt Pitt and Mt Bates, *R.D.Hoogland 11219* (CANB, K); along Mission Rd, *G.Uhe 1202* (K); Steels Point, *M.Lazarides 8028* (CANB, K); c. 1.6 km NE of Bloody Bridge, *G.Uhe 1118* (K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW, W).

2. **Pittosporum erioloma** C.Moore & F.Muell., *Fragm.* 7: 139 (1871)

T: Lord Howe Island, *collector not designated*; syn: MEL. The epithet comes from the Greek *erion* (wool) and *loma* (fringe or border), in allusion to the ciliate margins of the sepals.

Illustration: I.Hutton, *Lord Howe Is.* 28, 136 (1986).

Shrub or small tree to 8 m tall. Young shoots tomentose. Leaves with petiole villous when young; lamina oblanceolate, (2.5–) 3.5–5 cm long, 0.7–1.5 cm broad, acute at base, ±recurved at margin, acute to blunt at apex, coriaceous, glabrous. Inflorescence terminal, subumbellate, 2- or 3-flowered; bracts linear, c. 2 mm long, acute, near middle of pedicel. Sepals lanceolate, 5–6 mm long, ciliate, acute, tomentose on upper surface. Petals lanceolate, 12–15 mm long, coherent at base, acute, reflexed, reddish lilac at base passing to white or cream at tips. Stamens 8–10 mm long. Ovary c. 5 mm long, tomentose. Capsule spheroidal, 1.5 cm long, slightly rugose; style persistent; valves 3, thick, tomentose. Seeds numerous, black; pulp sticky. Fig. 43I–J.

Lord Howe Is. Endemic. Common from c. 450 m altitude to the tops of the mountains, sometimes at lower elevations. Flowers mainly Aug.–Oct.

L.H.Is.: E side of Intermediate Hill, *J.Pickard* in *A.N.Rodd 2321* (NSW); Goat House, *P.S.Green 2321A* (K); summit of Mt Lidgbird, *J.Pickard 1468* (NSW); summit of Mt Gower, *L.A.S.Johnson & A.N.Rodd 1353* (K, NSW); *s. loc.*, *J.D.McComish 136* (K, NSW).

3. ***Pittosporum crassifolium** Banks & Sol. ex A.Cunn., *Ann. Nat. Hist.* 4: 106 (1839)

T: New Zealand, 1769, *J.Banks*; syn: BM & *loc. id.* 1833, *R.Cunningham*; syn: K. The epithet comes from the Latin *crassus* (thick) and *folium* (a leaf), in allusion to the thick leaves.

Illustrations: J.T.Salmon, *Native Trees New Zealand* 144, 145 (1980); J.T.Salmon, *Field Guide Native Trees New Zealand* 66, 67 (1986); B.Everard & B.D.Morley, *Wild Fl. World* t. 131E (1970).

Shrub or small tree to 9 m tall. Young stems densely whitish or buff tomentose. Leaves with petiole densely tomentose; lamina obovate to oblanceolate, (3–) 4–7 (–9) cm long, 1.3–2 (–2.5) cm broad, cuneate, revolute, bluntly acute to obtuse, coriaceous, densely whitish or buff tomentose below. Inflorescence terminal, subumbellate, 4–10-flowered; bracts absent. Sepals lanceolate to subulate, 6–7 mm long, tapered at apex, tomentose. Petals narrowly oblong, 12–15 mm long, free, obtuse, with tips strongly curled back, dark red. Stamens c. 8 mm long. Ovary 4 mm long, densely tomentose. Capsule spheroidal, c. 2 cm long, densely tomentose, rugulose; valves 3, thick, woody. Seeds numerous, black; pulp sticky.

Norfolk Is. A native of the North Is., New Zealand, now naturalised and reproducing itself in one or two places.

N.Is.: Hundred Acre Reserve, *W.R.Sykes NI 527* (CHR).

4. *Pittosporum undulatum Vent., *Descr. Pl. Nov.* t. 76 (1802)

T: cultivated; holo: ?G, not seen. So called from the undulate margins to the leaves.

Illustrations: B.Everard & B.D.Morley, *Wild Fl. World* t. 131G (1970); J.Galbraith, *Field Guide Wild Fl. SE Australia* t. 67, fig. 2 (1977); A.Fairley & P.Moore, *Native Pl. Sydney District* 111 (1989).

Shrubs or small trees to 6 m (or more) tall. Young shoots villous, becoming glabrous. Leaves elliptic, (5–) 8–11 (–14) cm long, (1.5–) 2–3.5 (–4) cm broad, acute at base, undulate, shortly acuminate, ±chartaceous, glabrous. Inflorescence terminal, subumbellate-corymbose, 4–10-flowered. Flowers fragrant; bracts linear, 1–2 mm long, variously positioned on pedicels. Sepals 8–10 mm long, sometimes united except at very tips and splitting to base into 1 or 2 portions, long-acute, ±tomentose, caducous. Petals lanceolate-oblong, 10–15 mm long, coherent, recurved at tips, creamy white. Stamens 7–10 mm long. Ovary c. 5 mm long, tomentose. Capsule slightly depressed-globose, c. 1 cm long, very slightly rugulose, yellow to orange; valves 2, slightly rugose. Seeds numerous, reddish black; pulp sticky. *Snowdrop Tree*.

Norfolk Is., Lord Howe Is. Introduced and escaped from cultivation. A native of eastern Australia, from south-eastern Qld to eastern Vic.

N.Is.: upper slopes of Mt Pitt, *G.Uhe 1157 & 1181* (K); Steels Point, *B.A.Somers 14* (CHR); *s. loc., H.C.Quintall* (CHR). **L.H.Is.:** Middle Beach Common, *P.S.Green 2032* (K); adjacent to Bowker Avenue, *J.Pickard 3330* (NSW); 0.4 km N of 'Pine Trees', *L.A.S.Johnson & A.N.Rodd 1205* (NSW).

40. CRASSULACEAE

Annual or perennial herbs, sometimes shrubby, usually succulent. Leaves opposite or alternate, simple or sometimes pinnate, usually entire, usually sessile, without stipules. Inflorescence various, basically cymose. Flowers bisexual, rarely unisexual, actinomorphic, usually 5-merous, but sometimes 3–c. 30-merous. Sepals free or united into a tube. Petals same number as sepals, free or united into a tube. Stamens as many or usually twice as many as petals, if the latter then in 2 whorls with outer whorl opposite petals. Ovary superior; carpels same number as petals, free or basally connate, tapering into style, each with a scale-like nectary at base; ovules usually numerous. Fruit usually a group of follicles, rarely a capsule. Seeds minute.

A family of c. 33 genera and 1500 species, almost cosmopolitan, but especially to be found in South Africa; 1 native genus and 1 introduced on Lord Howe Is. Many succulent representatives are in cultivation as horticultural subjects.

G.Bentham, Crassulaceae, *Fl. Austral.* 2: 450–452 (1864); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Crassulaceae, *Fl. Java* 1: 201–202 (1963); G.E.Wickens, Crassulaceae, *Fl. Trop. E. Africa* 1–66 (1987); C.J.Webb *et al.*, Crassulaceae, *Fl. New Zealand* 4: 571–583 (1988).

KEY TO GENERA

Small, ±decumbent plants with short, erect shoots; leaves simple, to 1 cm long; inflorescence axillary; flowers very small; sepals free, c. 1.5 mm long **1. CRASSULA**

Erect herbs usually 50–100 cm tall; leaves simple or pinnate, 5–20 cm long; inflorescence terminal; flowers relatively large, pendulous; calyx tubular, 2.5–4.5 cm long **2. BRYOPHYLLUM**

1. CRASSULA

Crassula L., *Sp. Pl.* 1: 282 (1753); *Gen. Pl.* 5th edn, 136 (1754); the name is the diminutive of the Latin *crassus* (thick, fat), an allusion to the succulent yet small nature of the type species.

Type: *C. perfoliata* L.

Annual or perennial herbs (in South Africa and Madagascar often shrubby). Leaves opposite, simple, usually sessile, cauline, joined at base around stem. Inflorescence terminal or axillary, loose or compact, corymbose or thyrsoid, 1–many-flowered. Flowers 3–5 (–12)-merous, bisexual. Sepals equal, free or basally slightly connate. Petals free or lower part connate into a tube; lobes often spreading and star-like. Stamens as many as and alternate with petals, free. Carpels free, each with several ovules; scales various, free. Fruit folliculate. Seeds numerous.

A genus of over 300 species, widespread in temperate, subtropical and tropical regions, the majority in South Africa; 1 species native to Lord Howe Is.

H.R.Toelken, The species of *Crassula* in Australia, *J. Adelaide Bot. Gard.* 3: 57–90 (1981); H.R.Toelken, Additions to 'the species of *Crassula* in Australia', *J. Adelaide Bot. Gard.* 6: 193–196 (1983).

Crassula sieberiana (Schult. & Schult.f.) Druce, *Bot. Soc. Exch. Club Brit. Isles* 4: 618 (1917)

subsp. **sieberiana**

Tillaea sieberiana Schult. & Schult.f., *Mant.* 3: 345 (1827). T: Australia, *F.W.Sieber 173*; holo: ?M *n.v.*; iso: K.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 220, fig. 34B (1983); H.R.Toelken in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 423, fig. 227B (1986); J.Everett & E.H.Norris in G.J.Harden, *Fl. New South Wales* 1: 525 (1990).

Small succulent herbs, annual or perennial, ±decumbent with short erect shoots. Leaves fleshy, ovate to linear-lanceolate, 3–8 (–10) mm long, 0.5–1 mm broad, acute to subacute, usually flat above and convex below, joined at base into a shallow cup around stem. Inflorescence inconspicuous, axillary, a clustered thyrse; peduncles very short, elongating in fruit to 1 cm long. Flowers 4-merous. Calyx lanceolate to linear-lanceolate, c. 1.5 mm long, acute, colourless at tip. Petals lanceolate to linear-lanceolate, a little shorter than sepals, free, acute, erect or spreading. Carpels cylindrical-conical, shorter than sepals, gradually passing into a slender style, 2-ovulate. Follicles narrowly ellipsoidal. Seeds almost smooth.

Lord Howe Is. Local in damp, sheltered spots in the southern parts of the Island; also native in southern and eastern Australia, including Tas., and in New Zealand.

L.H.Is.: Goat House, *P.S.Green 2038* (K); terrace on Mt Lidgbird, *J.Pickard 2653* (NSW); 'Lower Road', *A.N.Rodd 1392* (NSW); N end of Little Slope, *J.Pickard 2783 & 2746* (NSW).

2. BRYOPHYLLUM

Bryophyllum Salisb., *Parad. Lond.* t. 3 (1805); from the Greek *bryo* (to burst forth, to sprout) and *phyllon* (a leaf), in allusion to the plantlets that develop in the crenations on the leaf margins in the type species.

Type: *B. pinnatum* (Lam.) Oken

Perennial herbs or shrubs, usually succulent. Leaves alternate, opposite or whorled, simple and entire or toothed, to pinnate, sessile, cauline, often with plantlets developing on margin; petioles 3–6 mm long. Inflorescence usually terminal, cymose-paniculate. Flowers 4-merous, bisexual, pendulous. Calyx tubular, divided to less than halfway. Corolla tubular, cylindrical or urceolate; lobes shorter than tube, usually recurved. Stamens 8, epipetalous, exserted. Carpels 4, ±connate at base; ovules many; scales 4, adherent to base of carpels. Fruit

follicular. Seeds numerous.

A genus of c. 30 species from Madagascar to the Mascarenes; 1 species now widespread and naturalised on Lord Howe Is.

***Bryophyllum pinnatum** (Lam.) Oken, *Allg. Naturgesch.* 3 (3): 1966 (1841)

Cotyledon pinnata Lam., *Encycl.* 2: 141 (1786); *Kalanchoe pinnata* (Lam.) Pers., *Syn. Pl.* 1: 446 (1805). T: Mauritius, *P.Sonnerat*; holo: P *n.v.*, photo seen (IDC microfiche 6207/2.229/2).

Illustrations: A.B.Graf, *Exotica* 12th edn, 801, 803, 805 (1985), as *Kalanchoe pinnata*; W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 565 (1990); J.Everett & E.H.Norris in G.J.Harden, *Fl. New South Wales* 1: 528 (1990).

Perennial herb, ±glaucous. Stems hollow, erect, to 100 cm tall. Leaves opposite, succulent; petiole 2–10 cm long; lamina 5–20 cm long, 3–10 cm broad, acute to subcordate at base, marginally crenate and often bearing plantlets, rounded at apex; lowest and upper leaves simple; middle leaves usually pinnate with 3–5 (–7) leaflets; terminal leaflet largest, elliptic or broadly elliptic. Inflorescence terminal, paniculate, to 25 cm or more tall. Pedicels 1–2.5 cm long. Calyx greenish yellow streaked with red; tube 2.5–4.5 cm long, inflated; lobes almost 1 cm long. Corolla tube included within calyx, c. 3 cm long; lobes exserted, triangular, 1–1.5 cm long, acute, reddish. Stamens c. 2.5 mm long. Follicles c. 1.5 cm long, beaked.

Lord Howe Is. A garden escape, resistant to desiccation, which forms dense patches; spreading readily by rooting at nodes and also by producing plantlets on leaf margins which drop off and root. Its native origin is uncertain but is probably the Mascarene Islands, possibly Madagascar.

L.H.Is.: below Malabar, edge of Settlement, *A.C.Beauglehole 5847* (MEL); SE edge of Neds Beach Common, *A.N.Rodd 3577* (NSW).

41. ROSACEAE

Shrubs, trees or herbs, usually perennial, often armed. Leaves alternate, rarely opposite, sometimes in a basal rosette, often compound, stipulate. Inflorescence various. Flowers usually bisexual, usually actinomorphic, usually 5-merous (elsewhere sometimes 3–10-merous); receptacle often forming a concave hypanthium. Epicalyx often present. Sepals free or adnate to ovary. Petals imbricate, often caducous, rarely absent. Stamens usually numerous; filaments usually free. Ovary superior, inferior or sometimes semi-inferior; carpels 1–several, free or connate; ovules 1–several per locule; styles free or connate. Fruit a drupe, pome, or collection of drupelets, achenes or follicles, rarely a capsule, sometimes with receptacle enlarged and fleshy.

A worldwide family of c. 100 genera and 3000 species, mostly from northern temperate regions; 6 genera introduced to the Islands. It contains numerous cultivated temperate fruits, including apples, pears, plums, cherries, raspberries and strawberries, and garden ornamentals such as roses.

G.Bentham, Rosaceae, *Fl. Austral.* 2: 425–435 (1864).

KEY TO GENERA

1 Leaves compound

2 Shrub, thorny, scrambling and arching; flowers white or pink; fruit a group of juicy drupelets, black **1. RUBUS**

2: Herb, unarmed, with runners rooting at nodes; flowers yellow; fruit a swollen receptacle with scattered achenes borne on its surface, somewhat dry, red **3. DUCHESNEA**

1: Leaves simple

3 Deciduous, usually flowering before leaves; flowers solitary or paired, axillary on short shoots **2. PRUNUS**

3: Evergreen or semi-evergreen, flowering with leaves; flowers numerous, in panicles

4 Leaf margins serrate in upper half

5 Leaves (10–) 15–20 (–30) cm long, apex shortly acuminate; fruit yellow; sepals persistent **4. ERIOBOTRYA**

5: Leaves 4–9 cm long, apex rounded to broadly obtuse; fruit blue-black when ripe; sepals deciduous **5. RHAPHIOLEPIS**

4: Leaf margins entire

6 Petals 7–10 mm long; fruit blue-black; stems erect **5. RHAPHIOLEPIS**

6: Petals 2–3 mm long; fruit scarlet; stems erect then arching **6. COTONEASTER**

1. RUBUS

Rubus L., *Sp. Pl.* 1: 492 (1753); *Gen. Pl.* 5th edn, 218 (1754); the Latin name for blackberries or brambles.

Type: *R. fruticosus* L.

Shrubs or subshrubs, rarely perennial herbs, usually sprawling or climbing with arching branches, usually armed with straight or curved thorns, prickles or acicles, sometimes mixed with glandular hairs. Leaves alternate, simple, palmate or pinnate, with 3–9 leaflets; stipules free or adnate to petiole. Inflorescence axillary or terminal, racemose or paniculate, rarely flowers solitary, borne on second year shoots. Flowers bisexual, actinomorphic, 5-merous; receptacle convex. Epicalyx absent. Sepals imbricate. Petals white or pink. Stamens numerous, free. Ovary superior; carpels numerous, 2-ovulate but 1 aborting. Fruit an aggregate of 1-seeded drupelets.

A large, taxonomically complex, cosmopolitan genus of c. 250 sexual species and over 2000, usually apomictic, microspecies; 1 species naturalised on Norfolk Is. Raspberries, blackberries, loganberries *etc.* are popular and much cultivated representatives.

*Rubus fruticosus L., *Sp. Pl.* 1: 493 (1753), aggregate

T: Europe; lecto: LINN 653.9, *fide* H.E.Weber, *Bot. Jahrb. Syst.* 106: 293, fig. 1 (1986); IDC microfiche 177/2.340/20. The epithet means shrubby, from the Latin *frutex* (a shrub).

Illustrations: C.Lamp & F.Collet, *Field Guide Weeds Australia* 270, fig. 208 (1979); G.M.Cunningham *et al.*, *Pl. W New South Wales* 346 (1981); B.A.Auld & R.W.Medd, *Weeds* 217 (1987).

Scrambling shrub with arching and entangling branches, rooting at tips. Stems usually angled and furrowed, glabrous or pilose, armed. Leaves palmate with (3–) 5 leaflets; stipules filiform to linear-lanceolate; petioles and petiolules usually pilose and prickly; terminal leaflet usually obovate or ovate, usually 5–15 cm long, serrate, acute to acuminate, pilose and scattered prickly below. Inflorescence pyramidal or cylindrical, usually prickly, many-flowered. Sepals lanceolate to ovate, sometimes leafy at tip, reflexed in fruit, pilose to tomentose. Petals rounded or emarginate. Fruit black, adhering to receptacle and coming away with it. *Blackberry*.

Norfolk Is. Presumably an escape from cultivation, but with the potential to become a serious pest. A native of Europe.

N.Is.: Anson Bay, *W.R.Sykes NI 458* (CHR); *loc. id.*, *R.O.Gardner 6194* (AK, K).

This aggregate contains many facultatively apomictic microspecies. No attempt has been made to identify the collections cited above to their segregate microspecies.

2. PRUNUS

Prunus L., *Sp. Pl.* 1: 473 (1753); *Gen. Pl.* 5th edn, 213 (1754); the Latin name for a plum.

Type: *P. domestica* L.

Deciduous or evergreen trees or shrubs, sometimes spiny. Leaves alternate, simple, serrate or nearly entire; stipules free. Inflorescence various, usually on short shoots with many imbricate bracts, sometimes flowers solitary. Flowers bisexual, actinomorphic, 5-merous; receptacle concave to ±cylindrical. Epicalyx absent. Sepals deciduous. Petals white or pink to red. Stamens numerous, free. Ovary superior; carpel 1, 2-ovulate, 1 usually aborting; style 1, terminal. Fruit a drupe; pericarp fleshy; endocarp hard.

A genus of c. 200 species, mainly northern temperate, extending to tropical Asia and the Andes; 1 species naturalised on Norfolk Is. A number are cultivated, for fruit or for ornament, *e.g.* cherries, plums, almonds and apricots, as well as the species described below.

***Prunus persica** (L.) Batsch, *Beytr. Entw. Pragm. Gerd. Naturreich* 1: 30 (1801)

Amygdalus persica L., *Sp. Pl.* 1: 472 (1753). T: not designated. The epithet means Persian, the peach having reached the West from China via Persia [Iran].

Illustrations: B.E.Nicholson *et al.*, *Oxford Book Food Pl.* 73 (1969); D.E.Symon in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 451, fig. 246H (1986); G.J.Harden & A.N.Rodd in G.J.Harden, *Fl. New South Wales* 1: 549 (1990).

Deciduous, small trees up to c. 8 m tall, of open habit. Leaves with petiole 5–10 mm long, with 2 (or 3) glands in upper part or at very base of lamina; lamina lanceolate to narrowly elliptic, (5–) 7–10 (–15) cm long, (1.5–) 2–3 (–3.5) cm broad, chartaceous, acute at base, finely glandular-serrate on margin, acuminate. Flowers solitary, occasionally paired, appearing before leaves; pedicels very short; receptacle broad. Sepals oblanceolate-oblong, 3–4 mm long. Petals orbicular to broadly obovate, 10–15 mm long, rounded or shallowly emarginate, pink. Fruit globose, 5–8 cm diam., tomentose-velvety, succulent, sweet, yellow flushed red; endocarp pitted and furrowed. *Peach*.

Lord Howe Is. An escape from cultivation. Originally a native of China, the peach, and its glabrous variety the nectarine, have been cultivated for centuries.

L.H.Is.: S of Windy Point, *L.A.S.Johnson & A.N.Rodd 1320* (NSW).

3. DUCHESNEA

Duchesnea Sm., *Trans. Linn. Soc. London* 10: 372 (1811); named after Antoine Nicolas Duchesne (1747–1827), a French horticulturist famous for his 1786 book on strawberries.

Type: *D. fragiformis* Sm., *nom. illeg.* = *D. indica* (Andrews) Focke

Perennial herbs, short stemmed with long leafy runners, rooting at nodes, unarmed. Leaves in basal rosettes, or clustered or alternate along stems and runners, 3-foliolate; stipules basally adnate to petiole. Flowers solitary, bisexual, actinomorphic, 5-merous, on long pedicels; receptacle convex, somewhat spongy. Epicalyx 5-lobed, leafy. Sepals equal to or smaller than epicalyx. Petals yellow. Stamens numerous, free. Ovary superior; carpels numerous. Fruit a head of many achenes on the surface of a somewhat dry, enlarged, coloured receptacle.

A genus of 6 species from India and eastern Asia; 1 species introduced on Lord Howe Is.

***Duchesnea indica** (Andrews) Focke in H.G.A.Engler & K.A.E.Prantl, *Nat. Pflanzenfam*. 3(3): 33 (1888)

Fragaria indica Andrews, *Bot. Repos*. 7: t. 479 (1807). T: cultivated, not designated. The epithet refers to its native country.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 238, fig. 37G (1983); B.A.Auld & R.W.Medd, *Weeds* 216 (1987); G.J.Harden & A.N.Rodd in G.J.Harden, *Fl. New South Wales* 1: 535 (1990).

Perennial herb; runners rooting at nodes and tips, forming new rosettes. Leaflets obovate to ovate, cuneate to obtuse at base, coarsely serrate, rounded at apex, pilose; terminal leaflet 1–3 cm long, 0.7–2.5 cm broad, shortly petiolulate; lateral leaflets slightly smaller. Pedicels 2.5–10 cm long, slightly longer than subtending leaves. Epicalyx lobes obovate, pilose, persistent and deflexed in fruit. Sepals ovate to triangular, 5–10 mm long, acuminate, pilose, persistent in fruit. Petals narrowly ovate, c. 5 mm long, rounded to shallowly emarginate, bright yellow. Fruit up to c. 2 cm long, with achenes spread over a red, swollen, pulpy receptacle.

Lord Howe Is. Presumably a garden escape. A native of warm temperate India and China to Japan and Malesia.

L.H.Is.: track to Transit Hill, *G.Uhe 1311* (K); NW side of Transit Hill, *L.A.S.Johnson & A.N.Rodd 1266* (K, NSW); Neds Beach, *J.Pickard 2657* (NSW).

4. ERIOBOTRYA

Eriobotrya Lindl., *Trans. Linn. Soc. London* 13: 96, 102 (1821); from the Greek *erion* (wool) and *botrys* (a bunch of grapes), in allusion to the woolly, bunched group of fruits in the type species.

Type: *E. japonica* (Thunb.) Lindl.

Evergreen shrubs or small trees, unarmed. Leaves usually clustered towards ends of branches, simple, serrate or entire, sessile or shortly petiolate; stipules usually small, caducous. Inflorescence a terminal, pyramidal, bracteate panicle, usually tomentose. Flowers bisexual, actinomorphic, 5-merous, almost sessile; receptacle tubular, closed at top. Epicalyx absent. Sepals persistent. Petals white or cream. Stamens usually 20, sometimes more. Ovary inferior to semi-inferior; carpels 2–5, 2-ovulate; styles connate at base. Fruit a fleshy pome, ovoid to globular, crowned with persistent calyx. Seeds 1–few, large.

A genus of c. 27 species from the Himalayas to eastern Asia and Borneo; 1 species naturalised on Norfolk and Lord Howe Islands.

***Eriobotrya japonica** (Thunb.) Lindl., *Trans. Linn. Soc. London* 13: 102 (1821)

Mespilus japonica Thunb., *Fl. Jap*. 206 (1784). T: Japan, *C.P.Thunberg*; holo: UPS *n.v.*; IDC microfiche 1036.500/2. Named after its country of origin.

Illustrations: B.E.Nicholson *et al.*, *Oxford Book Food Pl.* 105 (1969); A.B.Graf, *Exotica* 12th edn, 2: 1997, 2001 (1985); G.J.Harden & A.N.Rodd in G.J.Harden, *Fl. New South Wales* 1: 545 (1990).

Shrub or small tree to 8 m tall, erect and spreading. Young stems densely white tomentose. Leaves with petiole 5–10 mm long; lamina oblanceolate to elliptic or narrowly so, (10–) 15–20 (–30) cm long, (4–) 5.5–7 (–9) cm broad, acute to sometimes almost auriculate at base, serrate, especially in upper half, shortly acuminate, coriaceous, densely tomentose below, becoming glabrate. Inflorescence broadly pyramidal, (5–) 10 cm long, densely tomentose, many-flowered. Flowers sessile or on pedicels to 1 mm long. Sepals adnate to receptacle; lobes 2–3 mm long, densely tomentose. Petals suborbicular, clawed, c. 7 mm long, emarginate, white or cream. Fruit broadly ellipsoidal to globose-pyriform, 4–5 cm long, yellow. *Loquat*.

Norfolk Is., Lord Howe Is. A naturalised escape from cultivation, grown for its fruit. A native of China and Japan.

N.Is.: Hundred Acre Reserve, *W.R.Sykes NI 519* (CHR); S of road to Mt Pitt, *G.Uhe 1199* (K). **L.H.Is.:** Morepark Garden, *J.Pickard 3461* (NSW).

5. RHAPHIOLEPIS

Rhaphiolepis Lindl., *Bot. Reg.* 6: t. 468 (1820); from the Greek *rhaphis* (a needle) and *lepis* (a scale), after the narrow bracts in the type species.

Type: *R. indica* (L.) Lindl.

Evergreen shrubs or small trees, unarmed. Leaves alternate, simple, entire or serrate, coriaceous; petiolate; stipules small, ±deciduous. Inflorescence terminal, racemose, corymbose or paniculate; bracts subulate, deciduous. Flowers bisexual, actinomorphic, 5-merous. Epicalyx absent. Calyx tube adnate to top of ovary; lobes deciduous after anthesis. Petals clawed, white or reddish. Stamens 15–20, inserted at base of calyx lobes. Ovary inferior; carpels 2, each 2-ovulate; styles 2, connate at base. Fruit a somewhat fleshy pome, subglobose or pyriform, often blue-black. Seeds 1–few, large.

A genus of c. 15 species from subtropical China, Korea and Japan, to Thailand, the Philippines and Borneo; 1 species naturalised on Norfolk Is.

***Rhaphiolepis umbellata** (Thunb.) Makino, *Bot. Mag.* (*Tokyo*) 16: 13 (1902)

Laurus umbellata Thunb., *Fl. Japan.* 175 (1784). T: Japan, *C.P.Thunberg*; holo: UPS *n.v.*, IDC microfiche 1036.413/18. So called because of the umbellate branching of the shoots.

Illustrations: A.B.Graf, *Exotica* 12th edn, 2: 1993 (1985); C.Brickell, *Gardeners' Encycl. Pl. & Fl.* 128 (1989).

Bushy shrub to c. 3 m tall. Young stems tomentose, soon glabrous. Leaf lamina broadly obovate to elliptic or suborbicular, 4–9 cm long, 2.5–5 cm broad, acute to obtuse at base, attenuate onto petiole, slightly recurved at margin, entire or obscurely serrate in upper part, rounded or broadly obtuse at apex, obscurely mucronulate, felted tomentose above and below when young, soon becoming glabrous. Inflorescence stiff, paniculate, 4–8 cm long, tomentose, usually 5–20-flowered. Flowers fragrant; pedicels 3–10 mm long. Calyx lobes triangular, 3–4 mm long, acute, tomentose. Petals obovate, 7–10 mm long, rounded, white. Fruit subspherical to obovoid-pyriform, 7–8 mm long, blue-black.

Norfolk Is. A native of Japan and Korea, often cultivated as an ornamental, sometimes becoming naturalised from bird-sown seed.

N.Is.: Red Rd, c. 100 m into the National Park, *R.O.Gardner 6138* (AK, K).

6. COTONEASTER

Cotoneaster Medik., *Philos. Bot.* 1: 154 (1789); from the Latin *cotonea* (the quince) and the suffix *-aster* (inferior, wild).

Type: *C. integerrimus* Medik.

Evergreen or deciduous shrubs or trees, erect or decumbent, unarmed. Leaves alternate, sometimes distichous, simple, usually entire, petiolate; stipules small, persistent or caducous. Inflorescence lateral or terminal on side shoots, cymose, corymbose or fasciculate, occasionally flowers solitary. Flowers bisexual, actinomorphic, 5-merous. Epicalyx absent. Sepals persistent. Petals erect or spreading, white or pink. Stamens c. 20, inserted at base of sepals. Ovary inferior or semi-inferior; carpels 2–5, each 2-ovulate. Fruit a small pome with 2–5 bony pyrenes and mealy flesh, red or black.

A genus of c. 50 or more species, distributed in the Old World temperate regions, especially the Himalayas and western and central China; 1 species naturalised on Lord Howe Is.

***Cotoneaster glaucophyllus** Franch., *Pl. Delavay*. 222 (1890)

T: Yunnan, China, *J.M.Delavay 3747*; holo: ?P *n.v.* The epithet comes from the Greek *glaukos* (sea-green or greyish green; botanically, with a 'bloom') and *phyllon* (a leaf), in allusion to the glaucescent undersides to the leaves.

Illustrations: O.Stapf, *Bot. Mag*. 153: t. 9171 (1929); G.J.Harden & A.N.Rodd in G.J.Harden, *Fl. New South Wales* 1: 543, 544, t. 32 (1990).

Spreading shrub to c. 3 m tall. Stems erect then arching, villous when young. Leaves alternate on long shoots, ±clustered on short shoots; stipules linear-lanceolate, 3–7 mm long, villous at first, caducous; lamina elliptic or broadly elliptic to slightly obovate, (3–) 4–5 (–7) cm long, (1.5–) 2.2–3 (–4) cm broad, ±cuneate at base, entire, acute to rounded, with a small mucro, slightly coriaceous, discolorous, glabrous above, densely villous-tomentose below, becoming glabrate. Inflorescence terminal on side shoots, corymbose, (5–) 10–20-flowered; pedicels 1–5 mm long, pubescent. Sepals c. 1.5 mm long, acute. Petals orbicular, 2–3 mm long, white. Fruit ellipsoidal-subglobose, 4–7 mm long, scarlet.

Lord Howe Is. A native of south-western China which has escaped from cultivation; now naturalised, presumably the fruit having been spread by birds.

L.H.Is.: Morepark Garden, *J.Pickard 3460* (NSW); 0.6 km NE of Johnsons Beach, *J.Pickard 3351* (NSW).

42. MIMOSACEAE

Trees, shrubs, climbers or rarely herbs. Leaves alternate, pinnate, bipinnate, sometimes reduced to scales or phyllodes, or absent; stipules present. Inflorescence axillary or terminal, a raceme, spike or head of sessile or shortly pedicellate flowers. Flowers usually small, actinomorphic, bisexual or unisexual. Sepals (3–) 5, usually valvate in bud, connate or rarely free. Petals usually (3–) 5, valvate in bud, free or basally connate. Stamens (4–) 10–many; filaments free or basally connate, ±exserted, usually conspicuous; anthers sometimes with an apical gland. Ovary superior, usually solitary, 1-locular; ovules (1–) 2–many, in 2 lateral rows; style usually long with terminal stigma. Fruit a legume (pod), often compressed. Seeds often arillate.

A family of c. 60 genera and c. 3000 species distributed worldwide in the tropics, subtropics and warm temperate regions, especially in Australia, Africa and South America; 2 genera introduced on Norfolk Is. Often, as the Mimosoideae, placed with the next 2 families as subfamilies of a broadly conceived Fabaceae, traditionally called the Leguminosae.

G.Bentham, Mimoseae, *Fl. Austral.* 2: 297–425 (1864); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Mimosaceae, *Fl. Java* 1: 547–565 (1963); B.Verdcourt, subfam. Mimosoideae, *A Manual of New Guinea Legumes* 125–266 (1979); A.J.G.H.Kostermans, Mimosaceae, in M.D.Dassanayake & F.R.Fosberg (eds), *Revis. Handb. Fl. Ceylon* 1: 459–508 (1980); O.N.Allen & E.K.Allen, *The Leguminosae, A Source Book of Characteristics, Uses and Nodulation* 812 pp. (1981); R.M.Polhill & P.H.Raven (eds), subfam. Mimosoideae, *Advances in Legume Systematics* 1: 143–190 (1981); A.C.Smith, Mimosaceae, *Fl. Vit. Nova* 3: 53–86 (1985).

KEY TO GENERA

Inflorescence of numerous, globose flower heads, 3–5 mm diam.; leaflets 2–5 mm long **1. ACACIA**

Inflorescence of 1 or 2 cylindrical spikes, 4–7 mm long; leaflets 6–10 mm long **2. PARASERIANTHES**

1. ACACIA

Acacia Mill., *Gard. Dict.* abr. 4th edn (1754); the Greek name for the thorny *Acacia nilotica* subsp. *tomentosa*, derived from the Greek *akis* (a sharp point).

Type: *A. nilotica* (L.) Delile

Trees or shrubs, occasionally scrambling or climbing, often spiny or thorny. Leaves bipinnate with numerous pinnae, often with petiolar glands, or replaced by phyllodes developed from modified petioles; stipules spinescent or otherwise. Inflorescence axillary, of spikes or heads arranged in racemes or panicles. Flowers small, bisexual or unisexual. Calyx campanulate, 4- or 5-toothed or truncate. Petals partially connate; lobes 4 or 5 (–7), shorter than tube. Stamens 30–200 or more, exserted, free or connate at base; anthers often bearing a gland. Pods variable, flat to cylindrical, straight, curved or contorted, sometimes moniliform, dehiscent or indehiscent. Seeds hard and smooth.

A genus, widespread in the tropics and subtropics, especially of Africa and Australia, containing c. 1200 species; 2 species naturalised on Norfolk Is. One of the subgenera, containing the majority of the Australian species, is sometimes recognised as a separate genus, *Racosperma*.

Acacia melanoxylon R.Br. and *A. verticillata* var. *latifolia* Benth., both native to eastern Australia, also occur on Norfolk Is. as planted trees, but only the following species appear to be regenerating themselves.

Twigs glabrous or with fine, appressed hairs; leaflets glabrous or sparsely ciliate **1. A. parramattensis**

Twigs densely white pubescent; leaflets sparingly pubescent **2. A. dealbata**

1. *Acacia parramattensis Tindale, *Contr. New South Wales Natl. Herb.* 3: 127 (1962)

T: Railway Parade, Hazelbrook, Blue Mtns, New South Wales, 2 Jan. 1960, *M.Tindale*; holo: NSW *n.v.*; iso: K. Named after the Parramatta district of Sydney where it grows.

Illustrations: A.Fairley & P.Moore, *Native Pl. Sydney District* 118, fig. 339 (1989); D.A.Morrison & S.J.Davies in G.J.Harden, *Fl. New South Wales* 2: 390, t. 24 (1991).

Shrub or tree 2–7 m tall or more. Stems glabrous or with scattered, fine appressed hairs. Leaves bipinnate; rachis usually appressed pubescent, with a nectary between or near each pair of pinnae; pinnae (6–) 8–12 (–14) pairs; leaflets 20–30 pairs, linear-oblong, (2–) 3–5 mm long, 0.5–1 mm broad, obtuse at base, rounded at apex, glabrous or sparsely ciliate. Inflorescence a simple or compound raceme of numerous 20–40-flowered globose heads. Flowers pale yellow. Pod straight, flattened, submoniliform, 6–11 cm long, 0.4–0.7 cm broad. Seeds ellipsoidal, flattened, 4–8 mm long.

Norfolk Is. Introduced to the Island by foresters and apparently regenerating where felled. A native of Australia, from the Sydney and Blue Mtns areas, N.S.W.

N.Is.: Anson Bay Rd–Mission Rd corner, *R.O.Gardner 5882* (AK) & *6227* (AK, K).

2. *Acacia dealbata Link, *Enum. Hort. Berol. Alt.* 2: 445 (1822)

T: cultivated; holo: B *n.v.*, presumably destroyed. The epithet is Latin for whitewashed, whitened, covered with a white powder.

Illustrations: D.J.E.Whibley, *Acacias S. Australia* 225 (1980); G.M.Cunningham *et al.*, *Pl. W New South Wales* 359 (1981), as Silver Wattle; D.J.E.Whibley in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 532, fig. 260B (1986).

Shrub to medium sized tree to 15 m tall or more. Young stems covered with dense, fine, white pubescence. Leaves bipinnate; rachis pubescent, with a nectary between each pair of pinnae; pinnae 6–25 pairs; leaflets 20–40 pairs, linear-oblong, 2–5 mm long, 0.5–0.7 mm broad, base symmetrical to slightly oblique, obtuse at apex, glaucous, glabrous or sparsely puberulous. Inflorescence compound, racemose to paniculate, with numerous globose heads, 25–35-flowered. Flowers mid to bright yellow, sweetly scented. Pod straight or slightly

curved, flattened, oblong, 5–10 cm long, 0.8–1.2 cm broad, slightly contracted between seeds, glabrous. Seeds ellipsoidal, c. 8 mm long, longitudinal in pod.

Norfolk Is. Cultivated as an ornamental and sometimes seeding itself. A native of Australia (N.S.W., Vic. and Tas.).

N.Is.: Douglas Drive, road cutting E of stream crossing, *R.O.Gardner 6186* (AK, K).

2. PARASERIANTHES

Paraserianthes I.C.Nielsen, *Bull. Mus. Natl Hist. Nat., B, Adansonia* 5(3): 326 (1983); from the Greek prefix *para-* (similar to) and *Serianthes*, the name of a similar, related genus.

Type: *P. lophantha* (Willd.) I.C.Nielsen

Trees or shrubs, unarmed. Leaves bipinnate; pinnae few to numerous; gland present on petiole and sometimes between pinnae; leaflets opposite; stipules linear or filiform, caducous, not spiny. Inflorescence axillary, densely spicate, cylindrical or globose. Flowers usually bisexual. Calyx campanulate to tubular, dentate to shortly 4- or 5-lobed. Corolla tubular; lobes 4 or 5. Stamens numerous; filaments long, connate at base around ovary; anthers minute. Pods flattened, linear-oblong, ±straight, dehiscent. Seeds compressed, elliptic to subcircular.

A tropical or subtropical genus of 4 species, recently recognised as separate from *Albizia*; found in W.A. and SE Asia; 1 species naturalised on Norfolk Is.

***Paraserianthes lophantha** (Willd.) I.C.Nielsen, *Bull. Mus. Natl Hist. Nat., B, Adansonia* 5(3): 326 (1983)

Acacia lophantha Willd., *Sp. Pl.* 4: 1070 (1806). T: Western Australia, *coll. unknown*; holo: B-W *n.v.*, IDC microfiche 7740 No.1388.24.

Illustrations: W.R.Elliot & D.L.Jones, *Encycl. Austral. Pl.* 2: 170 (1982); D.J.E.Whibley in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 569, fig. 302 (1986), as *Albizia lophantha*; L.Murray in G.J.Harden, *Fl. New South Wales* 2: 393 (1991).

Shrub or tree to 10 m tall. Branchlets densely pubescent. Pinnae 8–12 pairs; rachis densely pubescent, pulvinate, with a gland between pinna base and lowest pair of leaflets; leaflets 10–20 pairs, oblong, 6–10 mm long, 1–2 mm broad, ±truncate and asymmetrical at base, obtuse to acute, slightly mucronate, with 1 vein prominent, near upper margin. Inflorescence a dense, cylindrical spike, 4–7 cm long, often paired. Calyx tube c. 1 mm long; teeth triangular, c. 1 mm long. Corolla c. 5 mm long; tube slightly longer than lobes, sericeous. Filaments 10–20 mm long, cream. Pod oblong, 6–10 cm long, c. 2 cm broad; valves thin. Seeds elliptic to flattened-globose, black with a red funicle.

Norfolk Is. Native to W.A., Sumatra and Java; introduced and now reproducing itself spontaneously.

N.Is.: Hurlstone Park, W of Mt Pitt, *W.R.Sykes NI 545* (CHR); vicinity of Melanesian Mission, *G.Uhe 1191* (K).

The plant on the Island appears to be subsp. *lophantha* which is native to W.A. and also naturalised in eastern and southern Australia and New Zealand. Two other subspecies occur in Sumatra and Java.

43. CAESALPINIACEAE

Trees, shrubs, climbers or rarely herbs. Leaves alternate, pinnate or sometimes bipinnate, rarely simple or reduced to phyllodes; stipules present. Inflorescence axillary or terminal, spicate, paniculate or racemose. Flowers small to showy, bisexual or unisexual, usually ±zygomorphic. Sepals 5, imbricate in bud, free or sometimes ±connate. Petals 5, rarely fewer, imbricate in bud, free, rarely basally connate; upper petal borne within the 2 adjacent lateral petals. Stamens usually 10, rarely fewer or numerous; filaments free or basally ±connate; anthers without an apical gland. Ovary superior, solitary, 1-locular; ovules (1–) 2–many in 2 lateral rows; style usually long with terminal stigma. Fruit a legume (pod), from oblong and compressed to narrowly cylindrical. Seeds usually without an aril.

A family of c. 150 genera and 2000 species from warm temperate or especially tropical regions, worldwide; 2 introduced genera and another with native and naturalised species on the Islands. Often treated as a subfamily, Caesalpinioideae, of a broadly treated Fabaceae or Leguminosae.

Ceratonia siliqua L. has been listed as occurring on Norfolk Is., but it is there either as a planted tree or as a relic of cultivation, and does not appear to be reproducing itself.

G.Bentham, Caesalpinieae, *Fl. Austral.* 2: 276–296 (1864); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Caesalpiniaceae, *Fl. Java* 1: 523–547 (1963); B.Verdcourt, subfam. Caesalpinioideae, *A Manual of New Guinea Legumes* 11–125 (1979); O.N.Allen & E.K.Allen, *The Leguminosae, A Source Book of Characteristics, Uses and Nodulation* 812 pp. (1981); R.M.Polhill & P.H.Raven (eds), *Advances in Legume Systematics* 1: 81–142 (1981); A.C.Smith, Caesalpiniaceae, *Fl. Vit. Nova* 3: 86–141 (1985).

KEY TO GENERA

1	Leaves bipinnately compound; stamens 10, alternately long and short	**1. CAESALPINIA**
1:	Leaves pinnately compound	
2	Leaves with 3–5 pairs of leaflets; stamens 10, with 2 longer than others	**2. SENNA**
2:	Leaves with a single pair of leaflets; stamens 5, ±equal	**3. CHAMAECRISTA**

1. CAESALPINIA

Caesalpinia L., *Sp. Pl.* 1: 380 (1753); *Gen. Pl.* 5th edn, 178 (1754); named after Andrea Cesalpino (1519–1603), Italian botanist, philosopher and physician, and author of *De Plantis Libri* (1583) in which characters of fruits and flowers were first used in a classification of plants.

Type: *C. brasiliensis* L.

Trees, shrubs, scramblers or climbers, unarmed or with spines or thorns. Leaves compound, bipinnate; leaflets opposite or rarely alternate, few to many. Inflorescence terminal or axillary in upper leaves, racemose or paniculate; bracts caducous. Flowers bisexual or unisexual, somewhat zygomorphic; pedicels without bracteoles. Calyx tube short; lobes 5; lower lobe often larger and cucullate. Petals 5, subequal or upper one smaller and clawed, imbricate. Stamens 10, free, alternately long and short; lower half of filaments often pubescent or cobwebby; anthers dorsifixed, dehiscing longitudinally. Ovary subsessile or shortly stalked; ovules usually 2–10; style filiform. Pods flattened, rarely cylindrical, dehiscent or indehiscent; upper margin sometimes winged. Seeds arranged transversely in pod.

A tropical and subtropical genus of c. 100 species, mainly American; 2 naturalised species and another native on the Islands.

T.A.Hattink, A revision of Malesian *Caesalpinia*, including *Mezoneuron* (Leguminosae-Caesalpiniaceae), *Reinwardtia* 9: 1–69 (1974).

1 Fruit and ovary prickly; leaflets 1–8 cm long, 0.5–4 cm broad, mucronate; petals 7–10 mm long

2 Leaflets obtuse to subacute, 1–6.5 cm long, 0.5–3 cm broad; stipules leafy, ±persistent; seeds grey **1. C. bonduc**

2: Leaflets acuminate, 3–8 cm long, 3–4 cm broad; stipules subulate, caducous; seeds greyish yellow to brownish **2. C. major**

1: Fruit and ovary without prickles; leaflets 1–2 cm long, 0.5–1 cm broad, without a small mucro; petals 10–15 mm long **3. C. decapetala**

1. Caesalpinia bonduc (L.) Roxb., *Hort. Bengal.* 32 (1814)

Guilandina bonduc L., *Sp. Pl.* 1: 381 (1753); *Guilandina bonducella* L., *Sp. Pl.* 2nd edn, 1: 545 (1762), *nom. illeg.*; *Caesalpinia bonducella* (L.) Fleming, *Asiat. Res.* 11: 159 (1810), *nom. illeg.* T: 'India', Herb. Hermann III f. 35 No. 156; lecto: BM, *fide* J.E.Dandy & A.W.Exell, *J. Bot.* 76: 177 (1938). The epithet is the Arabic name for the hazelnut; this species has nut-like seeds.

Illustrations: E.L.Hazelwood & G.G.Motter, *Handb. Hawaiian Weeds* 2nd edn, 179 (1983); A.C.Smith, *Fl. Vit. Nova* 3: 91, fig. 20 (1985); B.Wiecek & S.McCune in G.J.Harden, *Fl. New South Wales* 2: 315 (1991).

Climber, scrambler or shrubby tree to 5 m tall, thorny. Pinnae (3–) 6–9 (–11) pairs; leaflets 6–10 (–12) pairs, elliptic-oblong, 1–6.5 cm long, 0.5–3 cm broad, obtuse to subacute, mucronate; stipules conspicuous, leafy, to 2.5 cm long, ±persistent. Inflorescence terminal, a simple or branched raceme. Flowers functionally unisexual; pedicels 2–6 mm long. Calyx lobes elliptic, 4–7 mm long, densely puberulous. Petals lanceolate to spathulate, 7–8 mm long, yellow; upper petal slightly broader than lateral petals, orange at base. Filaments 5–10 mm long. Ovary c. 3 mm long, spiny. Pods oblong-elliptic, 4.5–9 cm long, armed with dense spreading prickles. Seeds ovoid to subglobose, 15–20 mm diam., grey. *Tatary Maw* (N.Is., *fide* R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 28, 1915).

Norfolk Is., Lord Howe Is. A coastal plant (the seeds will float) widespread in the tropics. Probably now extinct on Norfolk Is.

N.Is.: *s. loc., J.Backhouse 658* (K). **L.H.Is.:** S end of Neds Beach, *A.N.Rodd 1491* (K, NSW); above Neds Beach, *A.C.Beauglehole 5778* (CANB, MEL); lagoon shore, between Signal Point and Old Settlement Beach, *A.N.Rodd 1835* (NSW); creek E of Eddies Glen, *J.Pickard 3333* (NSW).

2. *Caesalpinia major (Medik.) Dandy & Exell, *J. Bot.* 76: 180 (1938)

Bonduc majus Medik., *Theodora* 43, t. 3 (1786). T: Ambon ?; lecto: G.E.Rumphius, *Herb. Amboin.* 5: t. 48 (1747), *fide* T.A.Hattink, *Reinwardtia* 9: 39 (1974).

Caesalpinia glabra (Mill.) Merr., *Philipp. J. Sci.* 5: 54 (1910). T: cultivated; holo: ?BM *n.v.*

Illustration: W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 645, t. 87 (1990).

Climber. Stems and leaf rachis armed with thorns. Pinnae 3–8 pairs; leaflets 3–7 pairs, elliptic-oblong to elliptic-ovate, 3–8 cm long, 3–4 cm broad, acuminate, mucronate; stipules small, subulate, caducous. Inflorescence supra-axillary and terminal, a simple or branched raceme. Flowers functionally unisexual; pedicels 5–8 mm long. Calyx lobes oblong, 7–10 mm long, densely puberulous. Petals spathulate, clawed, 7–10 mm long, yellow; upper petal smaller and narrower. Filaments 6–7 mm long. Ovary c. 4–5 mm long, pubescent, spiny. Pods broadly ellipsoidal to suborbicular, slightly asymmetrical, 5–12 cm long, armed with dense spreading prickles. Seeds subglobose, 1.5–2.5 mm diam., greyish yellow to brownish.

Norfolk Is., Lord Howe Is. A widespread species in the Caribbean area, Madagascar, SE Asia and the Pacific to Hawai'i. Not recorded by W.R.B.Oliver (*Trans. & Proc. New Zeal. Inst.* 49: 94–161, 1917) or R.M.Laing (*Trans. & Proc. New Zealand Inst.* 47: 28, 1915), or earlier authors, and probably a chance introduction to the Islands.

N.Is.: *s. loc., A.R.Campbell* in *J.D.McComish 120A* (K). **L.H.Is.:** *s. loc., M.Nicholls* in *J.D.McComish 214A* (K).

3. *Caesalpinia decapetala (Roth) Alston in H.Trimen, *Handb. Fl. Ceylon* 6: 89 (1931)

Reichardia decapetala Roth, *Nov. Pl. Sp.* 212 (1821). T: India, *B.Heyne*; iso?: K *n.v.*

Illustrations: E.L.Hazelwood & G.G.Motter, *Handb. Hawaiian Weeds* 2nd edn, 181 (1983); B.A.Auld & R.W.Medd, *Weeds* 163 (1987); B.Wiecek & S.McCune in G.J.Harden, *Fl. New South Wales* 2: 315 (1991).

Sprawling shrub or climber. Stems and leaf rachis armed with recurved prickles. Pinnae 3–10 (–12) pairs; leaflets 5–12 pairs, elliptic-oblong, 1–2 cm long, 0.5–1 cm broad, rounded at apex; stipules obliquely ovate, caducous. Inflorescences axillary and terminal racemes. Flowers bisexual; pedicels 1.5–3 cm long. Calyx lobes elliptic-oblong, c. 1 cm long, densely puberulous. Petals spathulate-suborbicular, clawed, 10–15 mm long, pale yellow; upper petal smaller and narrower, with a blotch or streaked with red. Filaments 10–15 mm long. Ovary c. 8 mm long, pubescent or glabrous. Pods elliptical, 6.5–9 cm long, without prickles. Seeds ellipsoidal, slightly flattened, 8–10 mm long, black.

Norfolk Is. A native of SE Asia which has sometimes been used as a hedge plant but is now naturalised, mainly in the Melanesian Mission area.

N.Is.: Douglas Drive, *P.S.Green 1412* (A); *loc. id.*, *G.Uhe 1183* (K); Mission Cemetery track, *M.Rafferty 3 & B.Reid* (CBG); Cascade, *R.M.Laing* (CHR); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW).

2. SENNA

Senna Mill., *Gard. Dict.* abr. 4th edn (1754); the Arabic name for the type species, the Senna of Mecca.

Type: *S. alexandrina* Mill.

Trees, shrubs or herbs, not armed. Leaves pinnate or reduced to phyllodes, often with rounded or conical nectariferous glands on petiole or leaf rachises; leaflets opposite; stipules various, rarely absent. Inflorescences axillary towards ends of branches, racemose or paniculate. Flowers bisexual, zygomorphic; pedicels without bracteoles. Calyx tube short. Petals 5, yellow or rarely white. Stamens 10, free, unequal, all fertile or 3 uppermost often staminodal, 2 stamens longer than others; anthers with a terminal pore, beaked. Ovules few to many. Pods terete, angled or compressed, indehiscent or tardily dehiscent. Seeds smooth or irregularly pitted.

A tropical and subtropical genus of c. 260 species, mainly American; 2 species naturalised on the Islands. Some are shrubs or small trees widely cultivated for their attractive inflorescences and flowers. Until recently the Australian species were included in *Cassia*.

D.E.Symon, A revision of the genus *Cassia* in Australia, *Trans. Roy. Soc. S. Australia* 90: 73–146 (1966); B.R.Randell, Revision of the *Cassiinae* in Australia. 1. *Senna* sect. *Chamaefistula*, *J. Adelaide Bot. Gard.* 11: 19–49 (1988); B.R.Randell, Revision of the *Cassiinae* in Australia. 2. *Senna* sect. *Psilorhegma*, *J. Adelaide Bot. Gard.* 12: 165–272 (1989); B.R.Randell, Revision of the *Cassiinae* in Australia. 3. *Senna* sect. *Senna*, *J. Adelaide Bot. Gard.* 13: 1–16 (1990); H.S.Irwin & R.C.Barneby, *Senna*, in The American Cassiinae, *Mem. New York Bot. Gard.* 35: 64–605 (1982).

Conical nectariferous glands between several pairs of leaflets; leaflets (1.5–) 2–3 (–3.5) cm broad; apex acuminate; inflorescence ±immersed in or level with foliage; pods ascending on stiff pedicels **1. S. septemtrionalis**

Conical nectariferous glands only between lowest pair of leaflets (rarely the second pair too); leaflets (0.7–) 1–2 cm broad; apex obtuse or rounded; inflorescence exserted, not immersed in foliage; pods oblique or pendulous **2. S. pendula**

1. *Senna septemtrionalis (Viv.) H.S.Irwin & Barneby, *Mem. New York Bot. Gard*. 35: 365 (1982)

Cassia septemtrionalis Viv., *Elench. Pl.* 14 (1802). T: cultivated; 'no type known to survive but the description full and decisive', *fide* H.S.Irwin & R.C.Barneby, *loc. cit.* The epithet is a form of the Latin word for northern.

Cassia laevigata Willd., *Enum. Pl.* 441 (1809). T: cultivated; holo: B; IDC microfiche 7740, 544/16.

[*Cassia floribunda auct. non* Cav.: J.S.Turner *et al.*, *Conservation Norfolk Is*. 37 (1968); S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 95 (1981); A.N.Rodd & J.Pickard, *Cunninghamia* 1: 276 (1983)]

Illustrations: F.M.Bailey, *Weeds & Poison. Pl. Queensland* 43 (1907); B.A.Auld & R.W.Medd, *Weeds* 164 (1987), as *Cassia floribunda*.

Shrub or small tree to c. 3 m tall or more. Leaves paripinnate; conical nectariferous glands present between several pairs of leaflets; leaflets 3 or 4 (–5) pairs, lanceolate to sometimes narrowly ovate, (3.5–) 4.5–7 (–9) cm long, (1.5–) 2–3 (–3.5) cm broad, acuminate, glabrous; stipules narrowly lanceolate, caducous. Inflorescence paniculate, usually 4–10-flowered, scarcely exserted or ±immersed in leaves. Sepals unequal, ovate or suborbicular, 4–10 mm long, obtuse. Petals subequal, obovate, 12–16 mm long, shortly clawed, golden yellow; upper petal emarginate. Stamens with upper 3 staminodal; 2 lower lateral filaments dilated, 7–10 mm long. Pods ascending on stiff pedicels, ±cylindrical, 5–10 cm long, tardily dehiscent. Seeds 3.5–5 mm long, smooth or minutely pitted. *Acacia* (N.Is.).

Norfolk Is., Lord Howe Is. A native of Central America, but long established elsewhere, originally escaped from cultivation.

N.Is.: top of Mt Bates, *P.Ralston 32* (A); vicinity of Mt Bates, *G.Uhe 1223* (K); c. 1.6 km NE of Bloody Bridge, *G.Uhe 1121* (K). **L.H.Is.:** NE of Government House, *J.Pickard 3329* (NSW); N of the Hospital, *A.C.Beauglehole 5855* (NSW); *s. loc.*, 1898, *J.H.Maiden* (NSW).

Often confused with the more showy *S.* × *floribunda* (Cav.) H.S.Irwin & Barneby.

2.*Senna pendula (Willd.) H.S.Irwin & Barneby, *Mem. New York Bot. Gard.* 35: 378

var. **glabrata** (Vogel) H.S.Irwin & Barneby, *op. cit.* 382

Cassia indecora var. *glabrata* Vogel, *Gen. Cass. Syn*. 19 (1837). T: Brazil, *F.Sello*; holo: ?B *n.v.*

Cassia coluteoides Collad., *Hist. Nat. Méd. Casses* 102, t. 12 (1816). T: cultivated, Montpellier; lecto: MPU, *fide* H.S.Irwin & R.C.Barneby, *Mem. New York Bot. Gard.* 35: 382 (1982)

[*Cassia bicapsularis auct. non* (L.) Roxb.: A.N.Rodd in H.F.Recher & S.S.Clarke, *Environm. Survey Lord Howe Is*. 23 (1974)]

Illustrations: N.C.W.Beadle, *Students Fl. NE New South Wales* 3: 368, fig. 170B (1976), as *Cassia coluteiodes*; B.R.Randell in G.J.Harden, *Fl. New South Wales* 2: 319 (1991).

Shrub to 4 m tall. Leaves paripinnate; conical nectariferous glands present only between lowest pair of leaflets (rarely second pair also); leaflets 3–5 (–6) pairs, oblong to slightly oblanceolate, (1–) 2.5–5 cm long, 0.7–2 cm broad, obtuse to rounded, with a patch of persistent hairs on lower surface adjacent to base of midrib; stipules caducous. Inflorescence a raceme, 10–20-flowered or more, exserted, not immersed in leaves. Sepals unequal, obovate, 9–15 mm long. Petals unequal, obovate-ovate, 11–26 mm long, bright yellow; upper petal emarginate. Stamens with upper 3 staminodal; 2 lower lateral filaments 10–15 mm long, others shorter, all with broad beaks 1 mm long. Pods oblique or pendulous, subcylindrical, 10–15 cm long, somewhat constricted between seeds, tardily dehiscent. Seeds 4–6 mm long, smooth.

Lord Howe Is. A native of Brazil and Paraguay which has escaped from cultivation.

L.H.Is.: base of ridge to Malabar, *J.Pickard* in *A.N.Rodd 1404* (NSW).

3. CHAMAECRISTA

Chamaecrista (L.) Moench, *Methodus* 272 (1794); from the Greek *chamai* (dwarf) and the earlier generic name *Christa*.

Type: *C. nictitans* Moench

Herbs or shrubs, annual or perennial, not armed. Leaves pinnate or reduced to 1 pair; petiole and rachis usually with 1 or more concave nectariferous glands; stipules various, usually persistent. Inflorescences axillary, super-axillary or cauliflorous, racemose, 1–several-flowered. Flowers bisexual, zygomorphic; pedicels with 2 bracteoles. Calyx lobes 5, usually unequal. Petals 5, unequal, yellow, sometimes red-spotted towards base. Stamens 5 (–10), often unequal; anthers basifixed, longer than filaments, dehiscing by a terminal pore or slit. Ovules few to many. Pods flattened, linear-oblong; valves elastically coiling at dehiscence. Seeds smooth or pitted.

A genus of c. 260 species from tropical and subtropical regions of America or Africa, mostly from the New World; 1 naturalised species on Norfolk Is.

H.S.Irwin & R.C.Barneby, *Chamaecrista*, in The American Cassiinae, *Mem. New York Bot. Gard*. 35: 636–862 (1982).

***Chamaecrista rotundifolia** (Pers.) Greene, *Pittonia* 4: 31 (1899)

Cassia rotundifolia Pers., *Syn. Pl.* 1: 456 (1805). T: Brazil, ?1784, *J.Dombey*; holo: ?P-JUSS *n.v.* The epithet alludes to the rounded leaflets.

Illustration: H.S.Irwin & R.C.Barneby, *Mem. New York Bot. Gard*. 35: 792 (1982).

Herbs, ±prostrate, becoming somewhat woody towards base. Stems with long erect and short incurved hairs. Leaves with 1 pair of leaflets; petiole 2–5 mm long, without glands; leaflets obliquely obovate-elliptic, (8–) 10–15 (–20) mm long, (6–) 8–12 (–15) mm broad, oblique at base, glabrous except for minutely ciliolate margins; stipules lanceolate, 4–7 mm long, long-pilose. Flowers axillary, solitary; pedicels 1–3.5 cm long. Calyx lobes narrowly lanceolate, c. 3 mm long, pilose, finely pointed. Petals 4–5 mm long, yellow. Stamens 5, ±equal, sometimes also with 1–3 staminodes. Pods ±straight, 2–3.5 cm long, 3–4 mm broad; valves finely ciliate. Seeds oblong-truncate, 2–3 mm long.

Norfolk Is. A native of Central and South America. Not a common weed but perhaps introduced with fodder.

N.Is.: NE of the Forestry/ANPWS nursery, E of Anson Bay Rd, *R.O.Gardner 6187* (AK, K).

44. FABACEAE

Trees, shrubs, climbers or, most commonly, herbs. Leaves alternate (elsewhere rarely opposite), usually pinnate or pinnately trifoliolate, sometimes digitate, rarely simple, palmate or absent, stipulate. Inflorescence axillary or terminal, racemose or paniculate, sometimes umbellate, capitate, spicate or flowers solitary. Flowers zygomorphic, bisexual. Sepals connate, usually ±tubular, 5-toothed or -lobed, or 2-lipped, imbricate or valvate in bud. Petals 5; uppermost petal (standard) often largest, borne outside the 2 adjacent lateral (wing) petals in bud; 2 lower petals often cohering marginally to form a keel. Stamens 10, equal in length or sometimes 5 longer and 5 shorter; filaments free or often connate into a tube, often uppermost stamen ±free. Ovary superior, solitary, 1-locular; ovules (1–) 2–many in 2 lateral rows; style usually long with terminal stigma. Fruit a legume (pod), usually dehiscent, sometimes septate. Seeds with or without an aril.

A family of c. 440 genera and c. 12,000 species, found in all parts of the world, under all climates; 23 native and introduced genera on the Islands. Sometimes called the Papilionaceae and often united with the two former families into a single large family called the Fabaceae

or Leguminosae.

G.Bentham, Papilionaceae, *Fl. Austral.* 2: 7–276 (1864); R.M.Polhill & P.H.Raven (eds), *Advances in Legume Systematics* (1981).

KEY TO GENERA

1 Leaves pinnately compound, sometimes reduced to a single pair (in *Carmichaelia* shoots flattened and leaves present only on juvenile shoots)

2 Annual herb — **16. VICIA**

2: Tree, shrub or liane

3 Tree to 10 m or more; flowers yellow or orange-red

4 Flowers orange-red; leaflets 6–16 cm long; pods oblong, turgid, not winged — **1. CASTANOSPERMUM**

4: Flowers yellow; leaflets 1.3–3.5 cm long; pods moniliform with 4 wings 2 mm broad — **2. SOPHORA**

3: Shrub or woody climber; flowers white or shades of pink or purple

5 Woody climber; pods woody; leaflets 11–19, (2–) 3–5 (–6.5) cm long — **3. MILLETTIA**

5: Erect or twining shrub; pod not woody; leaflets 1–17, 1–4 cm long

6 Leaves with 7–17 leaflets; inflorescence with numerous flowers — **4. INDIGOFERA**

6: Leaves with 3–7 leaflets; inflorescence 2–8-flowered

7 Broom-like shrub; leaves only on juvenile shoots; mature shoots flattened, photosynthetic — **13. CARMICHAELIA**

7: Twining shrub; leaves on juvenile and adult shoots; shoots not flattened — **14. STREBLORRHIZA**

1: Leaves trifoliolate (or appearing so), digitate or bifoliate with terminal tendril

8 Tree or woody climber or, if a shrub, stems thorny

9 Shrub or tree to 12 m tall or more; flowers scarlet or orange-vermilion; pod 10–30 cm long — **6. ERYTHRINA**

9: Woody liane; flowers greenish white or greenish yellow; pod 8–15 cm long — **7. MUCUNA**

8: Herb or thornless shrub; erect, prostrate or climbing

10 Pods separating into transversely jointed, 1-seeded segments — **5. DESMODIUM**

10: Pods entire, dehiscent but not breaking up into segments

11 Leaves with 9–11 leaflets, digitate — **22. LUPINUS**

11: Leaves trifoliolate, or bifoliolate with a terminal tendril

12 Shrub or subshrub, perennial

13 Inflorescence terminal, many-flowered; leaflets 2–7 cm long; ovary and pod glabrous; pod inflated — **21. CROTALARIA**

13: Inflorescence on lateral shoots, 4–7-flowered; leaflets 0.7–2 cm long; ovary and pod villous; pod not inflated — **23. TELINE**

12: Annual or perennial herb

14 Perennial herb; climbing or prostrate

15 Leaves of 2 leaflets; rachis with a terminal tendril in place of terminal leaflet; stipules large and leaf-like **17. LATHYRUS**

15: Leaves with 3 leaflets; stipules not large and leaf-like

16 Flowers resupinate; pod with 2 longitudinal, dorsal ridges and 1 ventral one; maritime **8. CANAVALIA**

16: Flowers with standard petal uppermost; pod not so ridged; maritime or inland

17 Inflorescence racemose, sometimes 2–4 flowers clustered on rachis; flowers in range of blue, purple or red, if yellow then pod 3–6 cm long

18 Inflorescence with 1 flower per node; style glabrous; leaflets 0.3–0.6 cm broad **10. GLYCINE**

18: Inflorescence with 2 or more flowers per node; style pubescent along its upper side or with a tuft of small hairs immediately below the stigma; leaflets 2–3 cm or more broad

19 Style thin, not flattened; rootstock a large tuber **9. PUERARIA**

19: Style thickened, stiff, flattened, at least in part; rootstock not a large tuber

20 Leaflets stipellate; flowers white, red or purple; pods oblong-falcate, laterally flattened, 1.5–4 cm broad, covered with small, dot-like tuberculate hairs; not maritime **11. LABLAB**

20: Leaflets lacking stipels; flowers yellow; pods linear-oblong, 0.8–0.9 cm broad, slightly constricted between seeds, glabrous; maritime **12. VIGNA**

17: Inflorescence a dense head or raceme; flowers white or yellow; pods 1.5–5 mm long

21 Inflorescence a raceme; flowers yellow **19. MEDICAGO**

21: Inflorescence a dense head; flowers white **20. TRIFOLIUM**

14: Annual herb, erect or prostrate

22 Lower leaflets stipule-like; stipules absent or minute; pods linear, 1–3 cm long **15. LOTUS**

22: Lower leaflets not stipule-like; stipules small, up to 1 cm long; pods not linear, 0.2–0.5 cm long

23 Pods obliquely kidney-shaped and glabrous or pubescent, coiled and spiny **19. MEDICAGO**

23: Pods oblong, ovoid, globose-ovoid or linear-oblong

24 Inflorescence slender, spike-like; corolla caducous after flowering **18. MELILOTUS**

24: Inflorescence a dense head; corolla persistent **20. TRIFOLIUM**

1. CASTANOSPERMUM

Castanospermum A.Cunn. ex Mudie, *Pict. Australia* 149 (1829); *Veg. Subst*. 421 (1829); from the generic name *Castanea* (chestnut) and *sperma* (a seed), in allusion to the resemblance of the seeds to chestnuts in looks and ? flavour.

Type: *C. australe* A.Cunn. ex Mudie

Trees. Leaves imparipinnate; leaflets opposite or alternate; stipules absent. Inflorescence

terminal or axillary, usually cauliflorous, racemose; bracts small; bracteoles absent. Calyx campanulate-obconic, thick; lobes 5, short, broad. Petals fleshy, oblong, clawed; standard longer than wings and keel. Stamens free; anthers versatile. Ovary stalked; ovules 6 or 7; style long, glabrous, incurved; stigma small, terminal. Pod stalked, large, woody, turgid, 2-valved, spongy between seeds, dehiscent. Seeds large, subglobose.

A monotypic genus from Australia (eastern Qld, north-eastern N.S.W.), New Caledonia and Vanuatu; naturalised on Norfolk Is.

***Castanospermum australe** A.Cunn. ex Mudie, *Pict. Australia* 149 (1829); *Veg. Subst.* 421 (1829)

T: Moreton Bay, Queensland, *A.Cunningham s.n.*; lecto: BM, *fide* D.J.Mabberley, *Newslett. Austral. Syst. Bot. Soc.* 70: 15 (1992); isolecto: ?K, ?OXF. The epithet means southern.

Illustrations: W.D.Francis, *Austral. Rain-forest Trees* 3rd edn, 166, fig. 93, 167, fig. 94 (1970); B.Verdcourt, *Man. New Guinea Legumes* 284, fig. 61 (1979); G.J.Harden in G.J.Harden, *Fl. New South Wales* 2: frontcover, 402 (1991).

Tree to 30 m tall or more. Leaves dark green, glossy, glabrous; leaflets 7–19, elliptic-oblong, 6–16 cm long, 2.5–5 cm broad, acute to rounded and often slightly oblique at base, acuminate; petiolules 3–6 mm long. Racemes 4–15 cm long, 10–c. 20-flowered; pedicels 2–3 cm long. Calyx c. 1 cm long, yellow to orange-brown. Petals orange-red; standard 3–4 cm long; wings and keel c. ½ to ⅔ as long. Stamens 4–5 cm long. Pod oblong, 12–18 cm long or more, 4–6 cm diam., acute. Seeds oblong-ovoid, c. 3 cm diam., dark brown.

Norfolk Is. Introduced as an ornamental tree but now seeding itself in one or two places.

N.Is.: Orange Vale, c. 50 m above the stream crossing at Douglas Drive, *R.O.Gardner 6217* (AK, K).

2. SOPHORA

Sophora L., *Sp. Pl.* 1: 373 (1753); *Gen. Pl.* 5th edn, 175 (1754); from the Arabic *sofera* (yellowish), presumably applied to this genus because of the yellow flowers of the type species.

Type: *S. tomentosa* L.

Trees or shrubs, rarely perennial herbs. Leaves imparipinnate; leaflet pairs 4–40; stipules deltoid or absent; stipels setaceous or absent. Inflorescence axillary or terminal, paniculate or rarely racemose, few- to many-flowered; bracts minute or absent; bracteoles usually absent; pedicels swollen or jointed near base. Calyx campanulate or tubular; lobes small or prominent with upper two often united. Standard obovate to suborbicular, clawed. Stamens free or shortly connate at base; anthers versatile. Ovary shortly stipitate; ovules several to numerous; style incurved; stigma minute, terminal. Pod fleshy or coriaceous, dehiscent or ±indehiscent, terete or slightly compressed, strongly constricted between seeds, sometimes winged. Seeds ±globose; testa hard.

A genus of c. 50 species, mostly from the tropics and subtropics, sometimes reaching temperate areas; 1 species endemic on Lord Howe Is.

The following species belongs to sect. *Edwardsia* which contains 10 closely related species exhibiting a remarkable disjunct, endemic distribution.

Sophora howinsula (W.R.B.Oliv.) P.S.Green, *J. Arnold Arbor.* 51: 204 (1970)

Sophora tetraptera var. *howinsula* W.R.B.Oliv., *Trans. & Proc. New Zealand Inst.* 49: 139 (1917); *S. tetraptera* subsp. *howinsula* (W.R.B.Oliv.) Yarkovlev, *Vopr. Farmakogn.* 4: 57 (1967). T: Lord Howe Island, 1917, *W.R.B.Oliver*; holo: ?WELT *n.v.* Named after the island on which this species is endemic.

[*Edwardsia chrysophylla auct. non* Salisb.: C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 24 (1870)]

[*Sophora tetraptera auct. non* J.F.Mill.: F.J.H. von Mueller, *Fragm.* 7: 26 (1869); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 235 (1896); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 128 (1898)]

Illustrations: A.N.Rodd in H.F.Recher & S.S.Clark, *Environm. Survey Lord Howe Is.* 23 (1974); I.Hutton,

Lord Howe Is. 126 (1986).

Tree to 10 m tall. Leaves 5–10 cm long; leaflets (9–) 13–17 (–23), opposite or alternate, elliptic, (1.3–) 1.7–2.5 (–3.5) cm long, 0.6–1 (–1.3) cm broad, rounded, sometimes slightly retuse at apex. Inflorescences borne below leaves, racemose, few–20-flowered. Calyx 0.7–1 cm long and broad; lobes shallow. Petals greenish yellow turning bright yellow; standard oblong, 1.5–2 cm long; wings slightly longer; keel petals narrowly oblong, very slightly falcate, 2.5–3 cm long. Stamens free, slightly exserted. Ovary sericeous, 15–20 mm long; style exserted. Pod strongly moniliform, 7–12 cm long, pubescent, slightly warty, with 4 somewhat erose wings 2 mm broad. Seeds 5–10, ellipsoidal, 7 mm long, smooth, orange-brown. *Lignum Vitae*. Figs 27, 43A–B.

Lord Howe Is. Endemic. Scattered in the lowland hills, locally common. Flowers mid July–mid Sept.

L.H.Is.: W end of Neds Beach, *G.Uhe 1272* (K); Transit Hill, *P.S.Green 1616* (A, K); *loc cit.*, *L.A.S.Johnson & A.N.Rodd 1279* (K, NSW); Rocky Run Valley, *J.Pickard 2850* (NSW); Lower Erskine Valley, *A.Tahktajan & A.N.Rodd 1847* (K, NSW).

The timber is very hard hence the common name. Said to be grown in New Zealand gardens under the cultivar name 'Gnome'. Closely related species occur in Réunion, New Zealand, Hawai'i, Easter Is., Gough Is., Juan Fernandez and Chile.

3. MILLETTIA

Millettia Wight & Arn., *Prodr. Fl. Ind. Orient.* 263 (1834); named in honour of Dr. Charles Millett (fl. 1820–1830) of the East India Company who visited and made early collections from China, India and Ceylon.

Type: *M. rubiginosa* Wight & Arn.

Trees, shrubs or tall lianes, rarely almost herbaceous. Leaves imparipinnate; leaflets usually opposite; stipules and small stipels usually present. Inflorescence usually terminal, paniculate, sometimes appearing racemose; bracts and bracteoles caducous. Calyx tube broad, truncate or shortly toothed; upper 2 lobes usually united. Corolla white, pink, blue or violet; standard glabrous or sericeous dorsally. Stamens 9+1, connate except upper one usually free but adhering to tube; anthers dorsifixed. Ovary stalked, 3–many-ovulate; style pubescent below, glabrous above; stigma small. Pod coriaceous or woody, usually tardily dehiscent. Seeds 1–many, flattened or globose.

A tropical or subtropical genus of c. 200 species from the Old World; 1 species native on Norfolk Is.

Millettia australis (Endl.) Benth. in F.A.W.Miquel, *Pl. Jungh.* 250 (1852)

Pterocarpus australis Endl., *Prodr. Fl. Norfolk.* 94 (1833). T: Norfolk Is., *F.L.Bauer*; holo: W; iso: K. So named for its austral, or southern, distribution.

Illustrations: O.Evans in Anon., *Dars-Et* (*This is it*) [10] (1976); B.Verdcourt, *Man. New Guinea Legumes* 333, fig. 73 (1979); G.J.Harden in G.J.Harden, *Fl. New South Wales* 2: 404 (1991).

Tall, stout woody climber. Leaves 10–20 cm long; leaflets 11–19, elliptic-lanceolate, (2–) 3–5 (–6.5) cm long, 0.8–2 cm broad, glabrous; petiolules pilose, 3 mm long; stipules 1–2 mm long; stipels filiform, 2 mm long, caducous. Inflorescence a terminal panicle of somewhat pendulous racemes. Flowers resupinate, cream, flushed with purple. Calyx broadly campanulate, 5 mm long, sericeous; upper 2 lobes united; lower 3 dentate, 2 mm long. Standard ±orbicular, 10 mm long; slightly inrolled on margin, sericeous on back. Pod woody, 2–6-seeded, cylindrical, slightly constricted between seeds, 10–23 cm long, to 4 cm diam. Seeds c. 2 cm long, smooth. *Wild Wisteria*, *Samson's Sinews*. Fig. 43C–D.

Norfolk Is. Native, and intermittent in occurrence in forested areas. Also recorded from Australia (Qld, N.S.W.), New Guinea and Bougainville.

N.Is.: Longridge district, *J.D.McComish 16* (BRI, K, NSW); Mt Pitt, *G.Uhe 1182* (K); *s. loc.*, *J.Backhouse*

Figure 43. A–E, FABACEAE. **A–B**, *Sophora howinsula*. **A**, habit (P.Green 2054, K); **B**, fruit (P.Green 1616, K). **C–D**, *Millettia australis*. **C**, fruit; **D**, habit (**C–D**, J.McComish 16, K). **E–F**, *Carmichaelia exsul*. **E**, habit (J.Pickard 2645, K), **F**, fruit (J.McComish 150, K). **G–J**, PITTOSPORACEAE. **G–H**, *Pittosporum bracteolatum*. **G**, habit (M.Lazarides 8028, K); **H**, flower (A.Cunningham 26, K). **I–J**, *Pittosporum erioloma*, **I**, habit (P.Green 1990, K); **J**, fruit (J.McComish 136, K). Scale bars: **A**, **D–J** = 2 cm; **B**, **C** = 5 cm. Drawn by P.Halliday.

657 (K); *s. loc.*, 1968, *O.Evans & P.Ralston* (K).

It has been suggested (J.S.Turner *et al.*, *Conservation Norfolk Is*. 34, 1968) that the Australian material may represent a different taxon, but this is not evident from the dried material examined.

4. INDIGOFERA

Indigofera L., *Sp. Pl.* 2: 751 (1753); *Gen. Pl.* 5th edn, 333 (1754); from indigo plus the Latin *fero* (I bear), in allusion to the type species being the source of the dye indigo.

Type: *I. tinctoria* L.

Annual or perennial herbs or shrubs, often bearing medifixed hairs. Leaves alternate, simple, trifoliolate or imparipinnate; leaflets entire; stipules and sometimes stipels present. Inflorescence axillary, usually racemose or spicate; bracts caducous; bracteoles absent. Calyx campanulate; teeth subequal or lowermost longest. Petals usually pink or red; standard longer than broad, glabrous or dorsally pubescent; keel erect. Stamens 9+1, lower 9 connate, uppermost free; anthers apiculate. Ovary usually sessile; ovules (2–) numerous; style glabrous; stigma capitate, often penicillate. Pod terete, linear-obovoid, straight or curved, septate between seeds, dehiscent. Seeds (1–) 2–many.

A genus of c. 700 species, pantropical and subtropical in distribution; 1 species naturalised on Norfolk Is.

***Indigofera suffruticosa** Mill., *Gard. Dict.* 8th edn (1768)

T: Jamaica; holo: ?BM *n.v.* The epithet is the Latin for somewhat shrubby.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 291, fig. 48G (1983); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 672, t. 91 (1990).

Erect shrub to c. 2 m tall. Stems slightly angled, appressed-pilose. Leaves imparipinnate, 8–15 cm long; leaflets 7–17, elliptic-oblong to slightly obovate, 1.5–3 cm long, 0.7–1.4 cm broad, acute to obtuse at base, rounded to subacute, with a small apiculum, strigose below, glabrous or sparsely strigose above. Inflorescence a raceme 2–5 cm long. Flowers numerous. Calyx 1.5–2 mm long; lobes triangular, c. as long as tube. Flowers c. 5 mm long, pinkish; standard appressed-pilose dorsally. Ovary sessile; ovules 4–8. Pods cylindrical, deflexed, strongly curved, 1–2 cm long, appressed-pilose.

Norfolk Is. A native of tropical America, at one time grown as a source of the dye indigo and now widely naturalised. Uncommon on the Island and possibly only recently introduced, probably by accident.

N.Is.: SW lower slopes of Mt Pitt, *P.S.Green 1908* (K).

5. DESMODIUM

Desmodium Desv., *J. Bot. Agric.* 1: 122 (1813); from the diminutive of the Greek *desmos* (a band or chain), in allusion to the 'chain' of segments in the fruit.

Type: *D. scorpiurus* (Sw.) Desv.

Perennial herbs or shrubs, rarely small trees. Leaves with 1–3 (–5) leaflets, stipellate; stipules striate. Inflorescence axillary or terminal, racemose or paniculate, rarely subumbellate; primary bracts each subtending 1 or more flowers, often caducous, sometimes with secondary bracts. Calyx campanulate, 2-lipped; lower lip usually longest. Petals 5; standard obovate to orbicular. Stamens 9+1; 9 lower connate; uppermost often free to partially fused. Ovary sessile or stipitate; ovules (2–) many; style inflexed or incurved; stigma usually minute. Pods stipitate or sessile, compressed, transversely jointed, (2–) many 1-seeded segments; segments rounded to somewhat triangular, eventually separating from each other. Seeds compressed.

A genus of c. 300 species indigenous to the tropical and subtropical regions, especially eastern Asia and tropical America; 2 naturalised species on Norfolk Is.

Pods with upper margin straight; segments asymmetrically ellipsoidal; leaflets usually oblanceolate to obovate; terminal leaflet 1–3 cm long **1. D. incanum**

Pods with upper margin wavy, symmetrically contracted between segments; segments orbicular-ellipsoidal; leaflets elliptic to ovate; terminal leaflet 3–10 cm long **2. D. tortuosum**

1. *Desmodium incanum DC., *Prodr*. 2: 332 (1825)

T: West Indies; lecto: C.Plumier, *Pl. Amer*. 140, t. 149, fig. 1 (1757), *fide* D.H.Nicholson, *Taxon* 27: 369 (1978). The epithet means hoary or grey, in allusion to the grey appearance of the underside of the leaves.

Illustrations: W.Fawcett & A.B.Rendle, *Fl. Jamaica* 4 (2): 33 (1922), as *D. supinum*; P.J.Skelman, *Trop. Forage Legumes* 266, fig. 41 (1977), as *D. canum*; B.Verdcourt, *Man. New Guinea Legumes* 395, fig. 93D (1979), as *D. canum*.

Perennial herb or shrub, prostrate to erect, to 3 m tall. Stems pubescent with short, hooked and longer straight hairs. Leaves trifoliolate; leaflets oblanceolate to obovate (rarely ±elliptic), 1–3 cm long, 0.8–2 cm broad, rounded at base, subacute to rounded at apex; stipules c. 5 mm long; stipels filiform. Racemes terminal, 5–10 cm long; bracts lanceolate, 2–4.5 mm long, acuminate. Flowers usually solitary at each bracteate node, rarely paired; pedicels 3–7 mm long. Calyx c. 2 mm long, pubescent. Petals rosy purple or pink; standard obovate, c. 5 mm long, retuse. Pods stipitate, 2–4 cm long; segments 4–8, asymetrically ellipsoidal, flattened; margins straight above, curved below, 4–5 mm long, c. 3 mm broad, covered with crisped hairs.

Norfolk Is. A native of tropical America, presumably introduced with fodder plants, now widespread as a weed of pastures, rough land, *etc.*

N.Is.: Cascade Rd, *W.R.Sykes NI 381* (CHR); Mission Rd, *W.R.Sykes NI 326* (CHR); Collins Head, 1985, *D.Greenwood* (K).

This species has often gone under the synonymous name *D. canum* (J.F.Gmel.) Schinz & Thell., or been confused with the closely related *D. adscendens* (Sw.) DC.

2. *Desmodium tortuosum (Sw.) DC., *Prodr*. 2: 332 (1825)

Hedysarum tortuosum Sw., *Prodr*. 107 (1788). T: West Indies (Jamaica), *O.Swartz*; holo: ?UPS *n.v.* The epithet means twisted in different directions and alludes to the frequent shape of the pods.

Illustrations: B.Verdcourt, *Man. New Guinea Legumes* 405, fig. 94F (1979); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 312, fig. 51L (1983); W.L.Wagner *et al*., *Man. Fl. Pl. Hawai'i* 1: 668, t. 90 (1990).

Erect or straggling perennial herb or subshrub to 1 m tall or more. Stems pubescent with mixed hooked and longer straight hairs. Leaves trifoliolate; leaflets elliptic to ovate; terminal leaflet 3–10 cm long, 1–6 cm broad, acute to rounded at base, mucronulate; stipules obliquely ovate, 2–6 mm long; stipels filiform. Racemes axillary, 10–30 cm long; bracts narrowly ovate-attenuate, 3–6.5 mm long. Flowers solitary or paired; pedicels slender, 1–1.5 cm long. Calyx 1–2 mm long, pubescent. Petals white or pink to bluish mauve; standard obovate, c. 4 mm long, slightly retuse. Pods 1–3 cm long; stipe 0.5–1 mm long; segments 2–7, orbicular-ellipsoidal, 3–5 mm long, 3–4 mm broad, both margins curved, flattened, reticulate, covered with fine hooked hairs, often tortuous.

Norfolk Is. Naturalised, presumably introduced with fodder. A native of the tropical and subtropical Americas.

N.Is.: near W end of Duncombe Rd, *R.O.Gardner 6193* (AK, K).

6. ERYTHRINA

Erythrina L., *Sp. Pl.* 2: 706 (1753); *Gen. Pl.* 5th edn, 316 (1754); from the Greek *erythros* (red), referring to the colour of the flowers.

Type: *E. corallodendron* L.

Shrubs, trees or rarely perennial herbs, deciduous. Trunk and branches thorny. Leaves trifoliolate; lateral leaflets usually asymmetrical, slightly smaller than terminal leaflet; stipules small, persistent or caducous; stipels usually glandular. Inflorescence axillary or terminal, compound racemose, often pyramidal, with groups of few-flowered clusters; bracts and bracteoles caducous. Flowers usually shades of red, frequently borne when plant is leafless. Calyx truncate or variously lobed. Petals usually showy. Stamens 9+1, lower 9 connate, alternately longer and shorter, uppermost free or basally connate. Ovary stipitate, pubescent; ovules usually numerous; style incurved, glabrous; stigma small. Pods various, usually ±constricted between seeds. Seeds 1–14, usually red or orange.

A pantropical and subtropical genus of c. 115 species, with many hybrids and horticultural selections.

B.A.Krukoff & R.C.Barneby, Conspectus of the species of the genus *Erythrina*, *Lloydia* 37: 332–459 (1974).

1 Terminal leaflet 7–10 cm long; standard petal 4 cm long, spreading, reflexed **2. E. caffra**

1: Terminal leaflet (7–) 10–20 cm long; standard petal 4.5–7 cm long, not reflexed or slightly recurved

2 Leaf rachis with occasional small thorns; standard petal not reflexed, 5–7 cm long **1. E. speciosa**

2: Leaf rachis without thorns; standard petal slightly recurved, 4.5–5.5 cm long **3. E. × sykesii**

1. *Erythrina speciosa Andrews, *Bot. Repos.* 7: t. 443 (1807)

T: not designated. The epithet means showy, referring to the flowers.

Illustrations: B.A.Krukoff, *Amer. J. Bot.* 28: 684, t. 1, fig. 5a–b (1941); B.A.Krukoff & R.C.Barneby, *Lloydia* 37: 360 (1974); E.A.Menninger, *Fl. Trees World* t. 277 (1962).

Shrubs or small trees to c. 4 m tall. Terminal leaflet broadly ovate to rhombic-trullate, (12–) 15–22 cm long, often slightly broader than long, rounded-truncate at base, densely pubescent when young, glabrescent above, with occasional small thorns on midrib and main veins below; stipules caducous; stipels conoid, c. 1 mm long, glandular. Inflorescence axillary, subterminal, 15–30 cm long, many-flowered, densely pubescent. Calyx campanulate, 1–1.5 cm long, with a short spur below, becoming glabrous. Petals bright crimson; standard narrowly elliptic, 5–7 cm long, not reflexed; wings 0.5–1 cm long; keel linear, 3–4 cm long. Pods 15–30 cm long, not or only slightly constricted between seeds. Seeds ellipsoidal, c. 1 cm long, red.

Norfolk Is. A native of south-eastern Brazil, locally naturalised as an escape from cultivation.

N.Is.: Melanesian Mission area, above Mission Pool, *R.O.Gardner 6151* (AK, K); swamp near the Melanesian Mission, *W.R.Sykes NI 481* (CHR).

2. *Erythrina caffra Thunb., *Prodr. Pl. Cap.* 121 (1800)

T: South Africa, *C.P.Thunberg*; holo: UPS *n.v.*; IDC microfiche 1036.684/3. The epithet comes from the Arabic *kafir* (an unbeliever or pagan), a name usually offensively applied to black inhabitants of South Africa.

Illustrations: E.F.Hennessy, *S. African Erythrinas* 14, t. 4 (1972); E.Palmer & N.Pitman, *Trees S Africa* 2: 954 (1972); E.Palmer, *Field Guide Trees S Africa* t. 13 (1977).

Tree to 12 m tall or more. Terminal leaflet broadly ovate to deltoid-rhomboid, 7–10 cm long and broad, ±truncate at base or contracted onto petiolule, glabrous at maturity, without

thorns; stipules caducous; stipels globose, glandular, becoming ±conoid, 0.5–1 mm long. Inflorescence axillary towards ends of branches, c. 10 cm long, dense, c. 12–20-flowered; rachis brown tomentose. Calyx obliquely 2-lipped by splitting, 17–20 mm long, obscurely toothed, crisped-puberulous. Petals vermilion, orange or orange-scarlet to almost pale yellow; standard oblanceolate, 4 cm long, spreading, reflexed; wings and keel c. 1 cm long. Pod 10–15 cm long, strongly contracted between seeds. Seeds ellipsoidal, 7–9 mm long, scarlet.

Norfolk Is. A native of Natal, seeding itself from cultivation.

N.Is.: Castaway Hotel, Taylors Rd, *R.O.Gardner 6226* (AK, K).

3. *Erythrina × sykesii Barneby & Krukoff, *Lloydia* 37: 447 (1974)

T: cultivated, Queensland, *C.T.White 9073*; holo: NY *n.v.*, *fide* R.C.Barneby & B.A.Krukoff, *loc. cit*. Named in honour of William Russell Sykes (b. 1927), New Zealand botanist, who drew attention to this hybrid and who has made several visits to Norfolk Is., and numerous collections there.

[*Erythrina lysistemon auct. non* Hutch.: B.A.Krukoff, *J. Arnold Arbor*. 53: 135 (1972)]

Illustrations: B.A.Krukoff & R.C.Barneby, *Lloydia* 37: 447 (1974); G.J.Harden in G.J.Harden, *Fl. New South Wales* 2: 414 (1991).

Trees to 10 m or more tall. Terminal leaflet broadly ovate to deltoid-rhomboid, (7–) 10–20 cm long and broad, obtuse to truncate at base, sparsely pubescent, glabrescent, without thorns; stipules lanceolate, 5–10 mm long, caducous; stipels glandular, 1 mm long. Inflorescence dense, axillary, towards ends of branches, 8–30 cm long; rachis brown tomentose. Flowers numerous, usually in clusters of 3. Calyx campanulate, c. 1.5 cm long, slightly 2-lipped, crisped-pubescent. Petals orange-vermilion; standard oblanceolate, 4.5–5.5 cm long, slightly recurved; wings and keel 1.5–2.5 mm long. Pods not seen. *Coral Tree*.

Lord Howe Is. This hybrid (possibly between *E. coralloides* DC. and *E. lysistemon* Hutch.) probably arose in cultivation in Australia and is now widely cultivated there in warm temperate areas. It is also grown on Norfolk Is. and in the milder parts of New Zealand. Propagation is easy from cuttings, and the plant can also spread from branches broken off in storms *etc.*, which take root.

L.H.Is.: Blinky Beach, *G.Uhe 1335* (K); *loc. id.*, *M.M.J. van Balgooy* 1109 (NSW); *loc. id.*, *J.Pickard 1215* (NSW).

7. MUCUNA

Mucuna Adans., *Fam. Pl.* 2: 325, 579 (1763); from the Brazilian name *mucunã* for *M. urens*, with its irritating hairs.

Type: *M. urens* (L.) DC.

Woody lianes or climbing herbs, rarely erect shrubs. Leaves trifoliolate; stipules caducous; stipels often present. Inflorescence axillary or on stem below leaves, subumbellate, racemose or paniculate, usually pendulous; bracts and bracteoles caducous. Calyx 2-lipped; 2 lobes of upper lip united. Petals often showy, shades of red, yellow or cream; standard rounded, auriculate, usually smaller than other petals; keel petals usually stiffened at tip. Stamens 9+1; anthers often bearded, 5 sub-basifixed, alternating with 5 versatile or dorsifixed on shorter filaments. Ovary sessile; ovules few; style filiform; stigma small, terminal. Pods ovoid to oblong or linear, septate or filled between seeds, often ribbed, usually covered with stiff irritating hairs; valves thick. Seeds discoid, globose or oblong.

A pantropical and subtropical genus of c. 100 species, with 1 species native on Lord Howe Is.

Mucuna gigantea (Willd.) DC., *Prodr.* 2: 405 (1825)

Dolichos giganteus Willd., *Sp. Pl.* 3: 1041 (1802). T: India, H.A. van Rheede, *Hort. Malab.* 8: 63, t. 36 (1688). So named because of its relative size within *Dolichos*.

Illustrations: I.Hutton, *Lord Howe Is.* 125 (1986); J.Brock, *Top End Native Pl.* 261 (1988); C.Gardner in G.J.Harden, *Fl. New South Wales* 2: 414, t. 28 (1991).

Woody, high climbing liane. Leaves trifoliolate; petiole slender, 4–10 cm long; leaflets lanceolate to narrowly ovate, (5–) 7–11 cm long, (2.5–) 3–6 cm broad, acuminate, apiculate; lateral pair asymmetrical, slightly smaller. Pseudoracemes ±corymbose; peduncle 15–50 cm long, c. 12-flowered; rachis c. 5 cm long; pedicels 2–5 cm long. Flowers borne in 2s or 3s. Calyx broadly campanulate, 10–15 mm long. Petals greenish white or greenish yellow; standard c. 2 cm long, hooded over flower; keel narrow, c. 4 cm long, curved upwards. Pods oblong, 8–15 cm long, 3–5 cm broad, flattened, pilose with yellow irritant hairs, soon glabrescent. Seeds 2–6, discoid, 2–3 cm diam., reddish brown. Fig. 25.

Lord Howe Is. Indigenous, but not common, in the forests of the lower hills. Flowers mid May–mid June, or Oct.–Dec. Also known from East Africa, India, China, Malesia and the Pacific, including Hawai'i.

L.H.Is.: North Bay, *B.Miller 71* (NSW); *s. loc., J.D.McComish 101* (K); *s. loc., J.P.Fullagar* (K, MEL).

8. CANAVALIA

Canavalia DC., *Prodr.* 2: 403 (1825); the Latinised version of the Malabar vernacular name *Kanavali.*

Type: *C. ensiformis* (L.) DC.

Woody lianes or perennial herbs, usually climbing or trailing. Leaves trifoliolate; stipules and stipels small, caducous. Inflorescence axillary, racemose, or flowers single, paired or clustered along a nodose rachis; bracts paired, caducous; bracteoles minute. Flowers usually showy, resupinate. Calyx 2-lipped; lower 3 lobes joined to form an entire or 3-fid lip; upper pair joined, truncate or with bifid tip. Standard petal obovate, reflexed, auriculate; keel incurved, obtuse or beaked. Stamens usually all united into a tube; upper one free to near base; anthers uniform. Ovary stipitate; ovules usually numerous; style slender, curved; stigma small, terminal. Pods oblong to linear, flattened or inflated, often winged or ribbed along upper margin, usually dehiscent. Seeds ellipsoidal or ovoid to kidney-shaped, flattened.

A pantropical and subtropical genus of c. 50 species, especially in America; 1 native species on Norfolk and Lord Howe Islands.

Canavalia rosea (Sw.) DC., *Prodr.* 2: 404 (1825)

Dolichos roseus Sw., *Prodr.* 105 (1788). T: Jamaica, not designated. The epithet refers to the colour of the flowers.

Canavalia maritima Thouars, *J. Bot. Agric.* 1: 80 (1813). T: locality unknown; lecto: L. Plukenet, *Phytographia* t. 51, fig. 2 (1691), *fide* J.D.Sauer, *Brittonia* 16: 163 (1964).

Canavalia obtusifolia (Lam.) DC., *Prodr.* 2: 404 (1825). T: Santo Domingo, Herb. Lamarck; lecto: P, *fide* J.D.Sauer, *loc. cit.*

Canavalia baueriana Endl., *Prodr. Fl. Norfolk.* 91 (1833). T: Norfolk Island, *F.L.Bauer*; holo: W.

Illustrations: I.Hutton, *Lord Howe Is.* 175 (1986); J.Brock, *Top End Native Pl.* 113 (1988); C.Gardner in G.J.Harden, *Fl. New South Wales* 2: 415 (1991).

Perennial herb, creeping or climbing. Young stems appressed-pilose. Leaflets broadly elliptic to broadly ovate or obovate, 4–12 cm long, 3.5–7 cm broad, rounded at apex, often slightly emarginate, pilose when young, especially below, glabrescent. Inflorescence erect, 5–12 cm long. Flowers clustered towards apex of rachis; pedicels 2–4 mm long. Calyx 8 mm long; upper lip 4 mm long, pilose. Petals pink; standard broadly elliptic-orbicular, c. 3 cm long, rounded; wings and keel oblanceolate. Ovary sericeous; ovules c. 7. Pods linear-oblong, 7–12 cm long, 2.5 cm broad, glabrescent, with a double rib dorsally and a single ventral rib.

Seeds ellipsoidal, slightly flattened, 1.5–2 cm long, brown with darker markings. *Norfolk Island Bean*. Fig. 44E–F.

Norfolk Is., Lord Howe Is. Indigenous and locally common along the beaches. A pantropical and subtropical strand plant, also in the Kermadecs.

N.Is.: Anson Bay, *J.D.McComish 135* (K); between Cascade and Cascade Pier, *P.Ralston 8* (A, K, NSW); *s. loc.*, *R.M.Laing* (CHR). **L.H.Is.:** W end of Neds Beach, *G.Uhe 1279* (K); Lagoon Beach, *A.N.Rodd 1350* (K, NSW); Rabbit Is., *A.N.Rodd 1820* (NSW).

9. PUERARIA

Pueraria DC., *Ann. Sci. Nat.* (*Paris*) 4: 97 (1825); named after Marc Nicolas Puerari (1766–1845), Swiss botanist who worked and taught in Denmark for most of his career.

Type: *P. tuberosa* (Roxb. ex Willd.) DC.

Climbing or trailing perennial herbs. Roots sometimes tuberous. Leaves trifoliolate; stipules often extended below beyond point of insertion; stipels present. Inflorescence axillary, pseudoracemose or paniculate. Flowers clustered along nodose rachis; bracts caducous; bracteoles persistent or caducous. Calyx tube campanulate, 5-lobed; upper pair of lobes joined. Petals usually blue to purplish; standard rounded, auriculate; wings and keel petals almost equal, sometimes beaked. Stamens united into a tube; the uppermost connate to middle or rarely free. Ovary subsessile; ovules many; style filiform, curved; stigma terminal, minute. Pods linear, cylindrical or slightly flattened, usually pubescent, dehiscent with valves usually curling. Seeds compressed, suborbicular to subcylindrical.

A tropical genus of perhaps 20 species, from SE Asia and Malesia to Polynesia and Australia; 1 species naturalised on Norfolk Is.

*Pueraria lobata (Willd.) Ohwi, *Bull. Tokyo Sci. Mus.* 18: 16 (1947)

Dolichos lobata Willd., *Sp. Pl.* 3: 1047 (1802). T: India; lecto: M.Houttuyn, *Nat. Hist.* 10: 153, t. 64, fig. 1 (1779), *fide* J.Ohwi, *loc. cit.* So named from the lobed leaves.

Illustrations: B.Verdcourt, *Man. New Guinea Legumes* 486, fig. 116 (1979); C.Gardner in G.J.Harden, *Fl. New South Wales* 2: 416 (1991).

Scrambling and twining perennial herb. Rootstock a large edible tuber. Stems villous. Leaflets broadly ovate; terminal leaflet usually 3-lobed, 8–20 cm long, 5–10 cm broad, apex acuminate, appressed pilose, sometimes velutinous; lateral leaflets asymmetrical, often 2-lobed; stipules lanceolate; stipels linear. Inflorescence 10–40 cm long, lengthening with anthesis; buds borne among lanceolate-filiform, brown, caducous bracts; 2 or more flowers per inflorescence node. Calyx tube c. 2 cm long; lobes 3–8 mm long, acute, long pointed. Petals blue or purplish; standard erect, c. 2 cm long, with basal yellowish patch; wings and keel darker. Style with small tufts of hair immediately below stigma. Pods oblong, 5–13 cm long, c. 1 cm broad, densely villous. Seeds numerous, c. 5 mm long, slightly flattened.

Norfolk Is. Introduced and naturalised in the Hundred Acre Reserve. A native of SE Asia known as the *Kudzu Vine*, at one time widely cultivated for its edible roots.

N.Is.: Rocky Point area, *W.R.Sykes NI 529* (CHR).

10. GLYCINE

Glycine Willd., *Sp. Pl.* 3: 1053 (1802); from the Greek *glykys* (sweet), in allusion to the sweetness of the roots of some species.

Type: *G. clandestina* J.C.Wendl.

Climbing or trailing perennial herbs (elsewhere one species annual). Leaves digitately or pinnately trifoliolate; leaflets entire; lateral leaflets ±asymmetrical; stipules caducous; stipels present. Inflorescence axillary, rarely terminal, racemose, bracteate, cleistogamous flowers

often developed in lower axils. Calyx 5-lobed; upper pair partially joined, forming bifid lip. Petals white, blue or purple; standard suborbicular or obovate to rhomboid, auriculate. Stamens united; upper at length free; anthers uniform. Ovary few- to many-ovulate; style short, glabrous; stigma small. Pods linear to oblong, subcylindrical or flattened, dehiscent, straight or falcate. Seeds ovoid to subglobose.

A genus of c. 10 species from the Old World tropics and subtropics; 1 naturalised species on Norfolk Is. *Glycine max* (L.) Merr. is the Soya Bean.

***Glycine microphylla** (Benth.) Tindale, *Brunonia* 9: 181 (1987)

Leptolobium microphyllum Benth., *Ann. Wiener Mus. Naturgesch.* 2: 125 (1838). T: Australia, *F.L.Bauer*; lecto: W *n.v.*, *fide* M.D.Tindale, *op. cit.* 182. From the Greek *micros* (small) and *phyllos* (a leaf), in reference to the small leaflets.

[?*Glycine tabacina auct. non* J.C.Wendl.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 702 (1904)]

Illustrations: M.D.Tindale, *Brunonia* 9: 184, fig. 3 (1986); M.D.Tindale in G.J.Harden, *Fl. New South Wales* 2: 418 (1991).

Stoloniferous perennial. Stems scrambling or weakly climbing. Leaves weakly pinnately trifoliolate; central petiolule 2.5–3 mm long; laterals c. 1 mm long; leaflets variable; first formed broadly obovate, grading to narrowly elliptic in later leaves, 1.5–5 cm long, 0.3–0.6 cm broad, acute with a small terminal apiculum; lateral leaflets often smaller; stipels linear, c. 1 mm long. Inflorescence racemose, 5–13-flowered, with 1 flower per node. Cleistogamous flowers in lower leaf axils, solitary or in few-flowered clusters. Calyx 3–5 mm long; tube campanulate; teeth 5, narrowly lanceolate, 1–2 mm long. Standard petal ±orbicular, white; wing and keel petals violet. Pods ±cylindrical, 1.5–2.5 cm long, linear, straight, slightly inflated, 4–6-seeded.

Norfolk Is. Presumably introduced along with fodder plants. Native in Australia from south-eastern Qld to S.A. and Tas.

N.Is.: One Hundred Acre Reserve (Rocky Point area), *W.R.Sykes NI 515* (CHR); below Mission Rd, *W.R.Sykes NI 1037* (CHR); *s. loc.*, *J.D.McComish 9* (NSW).

11. LABLAB

Lablab Adans., *Fam. Pl.* 2: 325 (1763); the Arabic name for the Egyptian or Black Bean.

Type: *L. purpureus* (L.) Sweet

Herbs, suberect or climbing. Leaves trifoliolate, stipellate; stipules often persistent, often reflexed. Inflorescence axillary, pseudoracemose. Flowers clustered, 2–4 together on nodose rachis; bracts caducous; bracteoles absent or appressed to calyx. Calyx campanulate, 2-lipped; 2 uppermost lobes forming an entire or emarginate lip; lower lip 3-lobed. Standard petal orbicular, auriculate, with 2 inner appendages; keel narrow, bent at a right-angle. Stamens 9+1; uppermost free or loosely adnate to tube; anthers uniform. Ovary scarcely stalked; style laterally flattened, with a right-angle bend; stigma terminal. Pods oblong, slightly falcate, laterally flattened, spongy inside between seeds, tardily dehiscent, tipped by persistent style. Seeds ovoid, flattened.

A monotypic Old World genus, naturalised on Norfolk Is., widely cultivated as the Lablab or Hyacinth Bean.

***Lablab purpureus** (L.) Sweet, *Hort. Brit.* 481 (1826)

Dolichos purpureus L., *Sp. Pl.* 2nd edn, 2: 1021 (1763). T: not designated. So called after its flowers, which are frequently purple.

Illustrations: N.C.W.Beadle, *Students Fl. NE New South Wales* 3: 419, fig. 187A (1976); B.Verdcourt, *Man. New Guinea Legumes* 536, fig. 131 (1979); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 676, t. 92 (1990).

Climbing or creeping perennial herb. Stems glabrous or pubescent. Leaves digitately trifoliolate; leaflets 5–15 cm long, 3–14 cm broad, glabrous or pubescent, cuneate to truncate

at base, acute to slightly acuminate; lateral leaflets somewhat asymmetrical; stipules lanceolate, 3–5 mm long, striate; stipels linear, 3–5 mm long. Inflorescence 5–20 cm long (including peduncle). Flowers white or various shades of purple or red. Calyx 5–7 mm long. Standard petal 12–15 mm long; wing petals broadly ovate, with long claw, enclosing the narrow keel. Style thickened, stiff, pubescent along upper side. Pods 4–14 cm long, 1.5–4 cm broad, 2–5-seeded, pubescent or glabrescent and covered in small dot-like tuberculate hairs; margin prominent. Seeds 0.5–1.5 cm long, white, red or black.

Norfolk Is. A relic of cultivation. Recorded by J.H.Maiden as introduced (*Proc. Linn. Soc. New South Wales* 28: 761, 1904).

N.Is.: Hundred Acre Reserve, *W.R.Sykes NI 360* (CHR).

12. VIGNA

Vigna Savi, *Nuovo Giorn. Lett.* ser. 3, 8: 113 (1824); named after Dominico Vigna (1577–1647), Professor of botany at Pisa and author of a commentary on Theophrastus published in 1625.

Type: *V. luteola* (Jacq.) Benth. = *Dolichos luteolus* Jacq.

Prostrate or climbing herbs or subshrubs. Rootstock usually woody or tuberous. Leaves trifoliolate, rarely unifoliolate; stipules truncate, bilobed or peltate; stipels present. Inflorescence axillary or terminal, pseudoracemose or an umbel-like cluster. Flowers 1 or 2 per node; bracts and bracteoles caducous. Calyx 2-lipped; upper lip 2-lobed; lower lip 3-lobed. Standard petal usually with 1–4 appendages; keel obtuse or beaked; beak sometimes curled through 360°. Stamens 9+1, alternately longer and shorter; uppermost free; anthers usually uniform. Ovary ±sessile; style with upper part thickened, straight or curled, pubescent on upper side; apex sometimes produced into a beak. Pods usually linear, usually dehiscent. Seeds usually kidney-shaped or ±rectangular.

A pantropical genus of c. 150 species, several bearing valuable edible beans such as the Mung Bean. One native species on Norfolk and Lord Howe Islands.

Vigna marina (Burm.) Merr., *Interpr. Herb. Amboin.* 285 (1917)

Phaseolus marinus Burm. in G.E.Rumphius, *Herb. Amboin. Auctuar. Index Universalis* [16] (1755). T: East Indies; holo: G.E.Rumphius, *Herb. Amboin.* 5: 391, t. 141, fig. 2 (1747). So named from its maritime habitat.

Callicysthus volubilis Endl., *Prodr. Fl. Norfolk.* 90 (1833). T: Norfolk Is., *F.L.Bauer*; holo: W.

Vigna retusa (E.Meyer) Walp., *Linnaea* 13: 534 (1839). T: S. Africa, *J.F.Drège*; holo: ?B *n.v.*, probably destroyed.

Vigna lutea (Sw.) A.Gray, *U.S. Expl. Exp., Atlas Phan.* 1: 452 (1856). T: Jamaica, *O.Swartz*; holo: ?S *n.v.*

Illustrations: B.Verdcourt, *Man. New Guinea Legumes* 519, fig. 127 (1979); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 718, t. 98 (1990); C.Gardner in G.J.Harden, *Fl. New South Wales* 2: 422 (1991).

Trailing or climbing perennial herb to several metres long. Leaves pinnately trifoliolate; leaflets obovate, broadly elliptic or almost orbicular, 3.5–10 cm long, 2.5–8 cm broad, usually cuneate to sometimes almost rounded at base, rounded at apex, often slightly emarginate; stipules ovate, 2–2.5 mm long, striate. Inflorescence 5–15 cm long (including peduncle), 4–11-flowered. Calyx tube 2 mm long; lobes triangular, c. 1 mm long. Petals yellow, greenish in bud; standard broadly obcordate, c. 1.2 cm long; keel not beaked. Pods linear-oblong, slightly curved, 2–6-seeded, 3–6 cm long, 0.8–0.9 cm broad, glabrous, reflexed on pedicels, slightly constricted between seeds. Seeds 6–7 mm long, yellow or reddish brown.

Norfolk Is., Lord Howe Is. Native, growing in sand on beaches above the high water mark. Flowers Dec.–early July. Pantropical.

N.Is.: Anson Bay, *R.D.Hoogland 11295* (NSW). **L.H.Is.:** North Bay, *P.S.Green 1577* (A, K); W end of Neds Beach, *A.N.Rodd 1758* (K, NSW); S end of Neds Beach, *A.N.Rodd 1488* (K, NSW); Lagoon Beach, *R.D.Hoogland 8663* (NSW).

13. CARMICHAELIA

Carmichaelia R.Br., *Bot. Reg.* 11: t. 912 (1825); named after Dugald Carmichael (1774–1827), Captain in the British army who collected plants in various parts of the world where his regiment was stationed, and who wrote about Tristan da Cunha.

Type: *C. australis* R.Br.

Shrubs or small trees; habit various, often broom-like. Leaves imparipinnate, often absent in adult plant, with stems flattened and photosynthetic; stipules absent; stipels small, membranous. Inflorescences terminal and axillary racemose, simple or branched, or clustered, or sometimes flowers solitary; bracts and bracteoles small, membranous. Calyx campanulate; teeth 5, ±equal. Standard petal ±orbicular, shortly clawed; wings ±falcate; keel incurved. Stamens 9+1; uppermost free; other 9 united into a tube; anthers uniform. Ovary shortly stipitate, with slender style, persistent in fruit; stigma capitate, minute. Pods ovate to elliptic-oblong, sometimes somewhat obliquely so, usually dehiscent; valves completely or partially separating from margins. Seeds 1–12, ±kidney-shaped.

A genus of c. 40 species, all of them endemic to New Zealand except the species described below, which is endemic to Lord Howe Is.

Carmichaelia exsul F.Muell., *Fragm.* 7: 126 (1871)

T: Lord Howe Island, *C.Moore [39]*; holo: MEL; iso: K. The epithet means an exile, in allusion to this being the only species of the genus native outside New Zealand.

Illustration: I.Hutton, *Lord Howe Is.* 125 (1986).

Broom-like shrub, 1–3 m tall. Adult shoots leafless, flattened, ridged, spreading and drooping. Leaves on juvenile shoots imparipinnate; leaflets 3–5, oblong to obovate, 0.7–2 (–3) cm long, 0.4–1.5 (–2.5) cm broad, apically rounded, emarginate. Inflorescence racemose, 2–5-flowered. Flowers white with purple markings, sweetly scented. Calyx somewhat obliquely campanulate, c. 2.5 mm long; teeth c. 0.5 mm long. Standard petal orbicular, 6–7 mm long; wings and keel c. 4–5 mm long. Pods ellipsoidal, flattened, 10–12 mm long, glabrous, with thickened margins; style persistent; dehiscing by 2 valves falling away leaving seed attached to replum. Seeds kidney-shaped, 3 mm long, pale orange. Fig. 43E–F.

Lord Howe Is. Endemic and rare, on rock ledges *etc.* on the mountains above c. 400 m altitude.

L.H.Is.: Mt Lidgbird, *J.D.McComish 150* (K); *loc. id.*, *C.Moore 76* (K); N ridge of Mt Gower, *J.Pickard 2645* (K, NSW); S end of Little Slope, *J.Pickard 2819* (NSW); *s. loc.*, *C.Moore 39* (K).

14. STREBLORRHIZA

Streblorrhiza Endl., *Prodr. Fl. Norfolk.* 92 (1833); from the Greek *streblos* (twisted) and *rhiza* (a root), in allusion to the embryonic root in the seed being bent double over the cotyledons.

Type: *S. speciosa* Endl.

Twining shrubs. Stems glabrous, ridged. Leaves imparipinnate; stipules broadly triangular. Inflorescences axillary, racemose; bracts small, caducous; bracteoles minute. Calyx somewhat obliquely campanulate; teeth 5, ±equal. Standard petal ±orbicular, pink, folded forwards; wings and keel somewhat oblanceolate, acute, clawed. Stamens 9+1; uppermost free; other 9 united into a tube; anthers uniform. Ovary stalked; ovules c. 7; style slender, incurved; stigma terminal, minute. Pods elliptic-oblong; margins thickened, dehiscent, apiculate. Seeds kidney-shaped.

A monotypic genus, endemic to Philip Is., now unfortunately extinct.

Streblorrhiza speciosa Endl., *Prodr. Fl. Norfolk*. 93 (1833)

Clianthus pictus Endl., *Ann. Wiener Mus. Naturgesch.* 1: 185 (1836), *nom. illeg.*; *C. speciosus* (Endl.) Steud., *Nomencl. Bot.* 2nd edn, 1: 384 (1840); *C. carneus* Lindl., *Edward's Bot. Reg.* 27: Misc 2 & t. 51 (1841), *nom. illeg.* T: Philip Is., *F.L.Bauer*; holo: W; iso: K. The epithet means showy, alluding to the attractive flowers.

Clianthus baueri A.Cunn. ex Heward, *J. Bot.* (*Hooker*) 4: 244 (1841), *nom. nud.*

Illustration: J.Lindley, *Edward's Bot. Reg.* 27: t. 51 (1841).

Twining shrub. Leaves imparipinnate; leaflets 5–7, elliptic, 2.5–4 cm long, 1–2 cm broad, glabrous, acute to obtuse at base, apically rounded, slightly thickened and slightly emarginate. Inflorescence 3–6 cm long (including peduncle), 5–8-flowered; bracts triangular, 1 mm long, caducous; pedicels c. 5 mm long. Calyx campanulate; teeth triangular, 1–2 mm long, acute, ciliate. Standard petal 2–2.5 cm long; wings 1.5–2 cm long; keel 2–2.5 cm long, somewhat acute, clawed. Pods 4–4.5 cm long, glabrous. Seeds c. 1 cm long. *Philip Island Glory Pea*.

Norfolk Is. Endemic to Philip Is., but extinct. Thought to have been last collected by Allan Cunningham in 1830. It was in cultivation in Britain in glasshouses a century and a half ago, but has apparently died out there too.

N.Is.: Philip Is., *A.Cunningham 151* (K); *loc. id.*, *F.L.Bauer* (K, W).

15. LOTUS

Lotus L., *Sp. Pl.* 2: 773 (1753); *Gen. Pl.* 5th edn, 338 (1754); a classical Greek name, *lotos*, which has been applied to a number of plants, part of or related to this genus.

Type: *L. corniculatus* L.

Annual or perennial herbs, rarely subshrubs. Leaves pinnate; leaflets (4–) 5 (–11), appearing trifoliolate with basal pair subsessile and resembling stipules; stipules and stipels absent or, rarely, minute. Inflorescence axillary, usually umbellate, 1–many-flowered; bracts often ternate; bracteoles usually absent. Calyx with 5 usually equal teeth, rarely 2-lipped. Corolla variously coloured; standard petal obovate, clawed; keel curved, usually beaked. Stamens 9+1; uppermost free; 9 united into a tube; anthers uniform. Ovary sessile or shortly stalked; ovules numerous; style bent upwards abruptly at base; stigma terminal or lateral. Pods oblong to linear-cylindrical, not winged, usually dehiscing with twisting valves, often septate between seeds. Seeds subglobose or compressed.

A genus of c. 100 species, mostly from the northern temperate regions; 1 naturalised species on Norfolk Is.

Lotus australis Andrews has been recorded from Lord Howe Is. in error by K.Larsen & A.Zertová, *Feddes Repert.* 72: 15 (1965). The specimen they cite was collected on the Isle of Pines, New Caledonia, not Lord Howe Is.

***Lotus angustissimus** L., *Sp. Pl.* 2: 774 (1753)

T: France, Hort. Clifford. 372 *Lotus* 5; lecto: BM, *fide* C.Heyne, *Israel J. Bot.* 19: 269 (1970). The epithet is the superlative of the Latin *angustus* (narrow), alluding to the very narrow pod.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 7: t. 46 (1954); J.Z.Weber in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 2: 629, fig. 343A (1986); E.H.Norris & G.J.Harden in G.J.Harden, *Fl. New South Wales* 2: 445 (1991).

Annual herb, usually much branched. Leaves usually pilose, often densely so, rarely glabrous; leaflets 5, sessile, obovate, elliptic to lanceolate, (3–) 5–12 mm long, (2–) 3–6 mm broad, cuneate to obtuse at base, acute, usually shortly apiculate. Inflorescence 1- or 2 (rarely 3)-flowered; pedicels slender, 1–5 cm long; bracts somewhat leaf-like. Calyx narrowly campanulate, c. 6 mm long, villous; teeth subulate. Petals yellow; standard obovate, 4–4.5 mm long, slightly emarginate; keel 4–4.5 mm long, 2–3 mm broad, bent through a right-angle in the middle, shortly beaked. Pod linear, straight or slightly curved, 10–30 mm long, c. 1.5

mm broad. Seeds subglobose, c. 1 mm long, brown, smooth.

Norfolk Is. Introduced, presumably with fodder. Native to the Mediterranean region.

N.Is.: Red Rd, *P.S.Green 1360* (A).

16. VICIA

Vicia L., *Sp. Pl.* 2: 734 (1753); *Gen. Pl.* 5th edn, 327 (1754); an ancient Latin name for these plants.

Type: *V. sativa* L.

Annual or perennial herbs, often climbing by means of tendrils. Stems angled, not winged. Leaves paripinnate, rarely imparipinnate; rachis ending in a branched or simple tendril or bristle; stipules usually somewhat sagittate; stipels absent. Inflorescence axillary, racemose, clustered or solitary; bracts usually small and caducous; bracteoles absent. Calyx often asymmetrical, toothed. Corolla variously coloured; standard obovate or oblong, emarginate, clawed; keel usually shorter. Stamens 9+1; uppermost free or ±united; anthers uniform. Ovary subsessile or stipitate; style pilose or with tuft of apical hairs, rarely glabrous; stigma terminal. Pods oblong to linear, somewhat flattened, dehiscent by 2 twisting valves, not septate. Seeds 2–several, ±globose.

A genus of c. 140 species, mostly northern temperate in distribution; 3 species naturalised on the Islands.

1 Inflorescence subsessile in axil; standard 10–18 mm long; pods 3–4 cm long, 5–12-seeded **1. V. sativa**

1: Inflorescence pedunculate; standard 2–4 mm long; pods 0.6–1.5 cm long, 2–4 (–5)-seeded

2 Pods hairy, usually 2-seeded; leaflets 4–10 pairs; inflorescence (2–) 3–7-flowered **2. V. hirsuta**

2: Pods glabrous, usually 4-seeded (rarely 2–5); leaflets 3–6 pairs; inflorescence 1- or 2 (–3)-flowered **3. V. tetrasperma**

1. *Vicia sativa L., *Sp. Pl.* 2: 736 (1753)

subsp. **nigra** (L.) Ehrh., *Hannover. Mag.* 1780 (15): 229 (1780)

Vicia sativa var. *nigra* L., *Sp. Pl.* 2nd edn, 2: 1037 (1763). T: not designated. So named from the very dark brown or black pods of this variety.

Vicia sativa subsp. *angustifolia* (L.) Batt. in J.A.Battandier & L.C.Trabut, *Fl. Algér.* 1: 268 (1889). T: England, *J.Bobart s.n.*; lecto: OXF, *fide* B.Verdcourt in *Fl. Trop. E. Africa* Leguminosae, Papilionoidae 1069 (1971).

Illustrations: C.Lamp & F.Collet, *Weeds Australia* 345, t. 276 (1979), as *V. angustifolia*; J.Z.Weber in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 636, fig. 348B (1986); C.Gardner & T.A.James in G.J.Harden, *Fl. New South Wales* 2: 448 (1991), as subsp. *angustifolia.*

Annual herb, tufted, trailing or climbing. Leaflets 3–7 opposite pairs, linear to oblanceolate, (10–) 15–20 (–25) mm long, (1–) 3–5 (–6) mm broad, truncate or emarginate, mucronate; rachis prolonged into a branched tendril 2.5–5 cm long; stipules sagittate, 5–8 mm long, marginally toothed, with a dark median blotch. Inflorescence 1- or 2 (–3)-flowered, subsessile. Calyx pilose; tube 5–6 mm long; teeth ±triangular, 4–5 mm long. Petals reddish purple; standard obovate, 10–18 mm long, broadly clawed; keel shorter. Pods oblong, 3–4 cm long, 0.4–0.6 cm broad, 5–12-seeded, usually glabrous, very dark brown or black. Seeds ±globose, 2.5–4 mm diam., dark brown, often mottled.

Norfolk Is., Lord Howe Is. A native of Europe introduced along with other fodder plants, now locally common on grassy roadsides, *etc.*

N.Is.: Mt Bates, *P.S.Green 1393* (A); road to Mt Pitt, *G.Uhe 1198* (K); near junction of track to Palm Glen, *P.Ralston 65* (A, K); *s. loc.*, 1898, *I.Robinson* (NSW). **L.H.Is.:** Lagoon Beach, *A.N.Rodd 1213* (K, NSW);

W side of Mosely Park, *R.D.Hoogland 8721* (CANB, NSW).

2. *Vicia hirsuta (L.) Gray, *Nat. Arr. Brit. Pl.* 2: 614 (1821)

Ervum hirsutum L., *Sp. Pl.* 2: 738 (1753). T: Europe, Herb. Clifford 370 *Cicer* 3; lecto: BM, *fide* B.Verdcourt, *Fl. Trop. E. Africa*, Leguminosae 4: 1072 (1971). So named because of its hairy, or hirsute, pods.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 7: t. 57 (1954); B.E.V.Parham & A.J.Healy, *Common Weeds New Zealand* 93 (1976); J.Z.Weber in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 634, fig. 347A (1986).

Slender annual, trailing or climbing. Leaflets 4–10 pairs, often alternate, linear to narrowly oblong, 4–15 (–20) mm long, 1–3 (–4) mm broad, apically truncate, mucronate; rachis prolonged into a slender, branched tendril, 2–5 cm long; stipules often 4-lobed, 2–4 mm long. Inflorescence (2–) 3–7-flowered; peduncle 2–4 cm long. Calyx sparingly pilose; tube 1 mm long; teeth subulate, 1–1.5 mm long. Petals whitish; standard obovate, c. 2.5 mm long, scarcely clawed; keel c. 2 mm long, with a purple spot. Pods oblong-rhomboid, 6–10 mm long, 3–5 mm broad, usually 2-seeded, appressed-pilose, dark brown. Seeds subglobose, c. 2 mm diam., brown.

Norfolk Is. This species, too, is a native of Europe, was probably introduced with fodder plants, and is now naturalised on roadsides, *etc.*

N.Is.: Harpers Rd, *P.Ralston 68* (A, K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW).

3. *Vicia tetrasperma (L.) Schreb., *Spic. Fl. Lips.* 26 (1771)

Ervum tetraspermum L., *Sp. Pl.* 2: 738 (1753). T: not designated. So named because the pods are usually 4-seeded.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 7: t. 59 (1954); J.Z.Weber in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 637, fig. 349 (1986); C.Gardner & T.A.James in G.J.Harden, *Fl. New South Wales* 2: 449 (1991).

Slender, scrambling annual. Leaflets 3–6 pairs, usually alternate, linear to linear-oblong, 5–20 mm long, 1–3 mm broad, apically acute to obtuse, mucronulate; rachis prolonged into a usually simple tendril; stipules semisagittate, c. 2 mm long. Inflorescence 1- or 2 (–3)-flowered; peduncle 2–4 cm long. Calyx sparsely pilose, tube c. 1 mm long; teeth unequal, shorter than tube. Corolla pale blue; standard obovate, c. 4 mm long, scarcely reflexed, with a broad claw; keel c. 3 mm long, with a purple spot. Pods oblong, 10–15 mm long, 3.5 mm broad, 4 (rarely 3–5)-seeded, glabrous, light brown. Seeds subglobose, c. 2 mm diam., brown.

Norfolk Is. A native of Europe, probably introduced with seeds of cereals or fodder plants. Not common.

N.Is.: near top of Mt Pitt, *R.M.Laing* (CHR); *s. loc.*, *J.D.McComish 236* (NSW).

17. LATHYRUS

Lathyrus L., *Sp. Pl.* 2: 729 (1753); *Gen. Pl.* 5th edn, 326 (1754); a name used by Theophrastus for a pea or pulse.

Type: *L. sylvestris* L.

Annual or perennial herbs, usually climbing or straggling. Stems usually winged. Leaves pinnate. Leaflets 2–several pairs, rarely numerous, sometimes absent; rachis ending in a well-developed tendril, rarely a bristle or leaflet; rachis and petiole often flattened and leaf-like; stipules usually large, persistent; stipels absent. Inflorescence axillary, racemose; bracts small, caducous; bracteoles absent. Calyx 5-lobed; lobes subequal or upper pair shorter. Corolla often large and showy; standard usually broad. Stamens 9+1; uppermost free or connate; anthers uniform. Ovary subsessile or stipitate; style usually bearded on upper side; stigma terminal, with apex often hardened and flattened. Pods linear-oblong, cylindrical or

flattened, dehiscent. Seeds usually subglobose.

A genus of c. 150 species, mostly from the northern temperate regions, but extending into South America and Africa; 1 species naturalised on Lord Howe Is. The Sweet Pea, *L. odoratus* L., is a well-known garden plant.

***Lathyrus latifolius** L., *Sp. Pl.* 2: 733 (1753)

T: not designated. The epithet comes from the Latin *latus* (broad) and *folius* (a leaf), in allusion to the broad leaflets.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 315, fig. 52B (1983); J.Z.Weber in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 632, fig. 345B (1986); C.Gardner in G.J.Harden, *Fl. New South Wales* 2: 450 (1991).

Perennial herb, climbing and trailing. Stems broadly 2-winged, glabrous, somewhat glaucous. Leaflets 2, opposite, lanceolate to broadly lanceolate or elliptic to broadly elliptic, 3–10 (–12) cm long, 1–4 (–5) cm broad, apically obtuse to rounded, mucronulate, glaucous; petiole broadly winged; rachis ending in a branched, rarely simple, tendril; stipules lanceolate, 1.5–2.5 cm long, 0.5–1 cm broad. Inflorescence 3–14-flowered; peduncle 5–15 cm long. Calyx 8–10 mm long; teeth narrowly triangular, 3–4 mm long. Corolla magenta; standard broadly obovate, 2–3 cm long, emarginate; keel 1.5–2 cm long. Pods narrowly oblong, 5–10 cm long, 0.6–1 cm broad, 10–15-seeded, glabrous, light brown. Seeds subglobose, reticulate-rugose, c. 6 mm long.

Lord Howe Is. A native of Europe, widely cultivated and often naturalised as a garden escape.

L.H.Is.: N end of Blinky Beach, *P.S.Green 1624* (A, K); *loc. id., L.A.S.Johnson & A.N.Rodd 1288* (K, NSW).

18. MELILOTUS

Melilotus Mill., *Gard. Dict.* abr. 4th edn (1754); a name used by Theophrastus for some kind of clover, from the Greek *meli* (honey) and *lotus*, a related plant.

Type: *M. officinalis* (L.) Pall.

Annual, biennial or short-lived perennials. Leaves pinnately trifoliolate; principal nerves often terminating in a marginal tooth; stipules adnate to petiole; stipels absent. Inflorescences axillary, spike-like racemose, few- to many-flowered; bracts inconspicuous; bracteoles absent. Calyx campanulate, 5-lobed; lobes subequal, ±equalling tube. Corolla yellow or white, deciduous after anthesis. Stamens 9+1; uppermost stamen free; other 9 connate into a tube; anthers uniform. Ovary stipitate or sessile, few-ovulate; style glabrous; stigma terminal. Pods small, subglobose to ovoid, ±straight, usually indehiscent. Seeds 1 or 2 (–4).

A genus of c. 20 species from temperate and subtropical Eurasia; 1 species naturalised on Norfolk and Lord Howe Islands. Various species are grown as fodder plants, green manure or bee-plants.

***Melilotus indicus** (L.) All., *Fl. Pedem.* 1: 308 (1785)

Trifolium (*Melilotus*) *indica* L., *Sp. Pl.* 2: 765 (1753). T: not designated. So named because of its supposed origin in 'India'.

[*Melilotus albus auct. non* Desr.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 764 (1904)]

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 7: t. 21 (1954); J.Z.Weber in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 646, fig. 352B (1986); B.A.Auld & R.W.Medd, *Weeds* 168 (1987).

Erect annual to c. 60 cm tall. Stems glabrous or sparsely pilose. Leaflets 3; stipules narrowly lanceolate, up to 1 cm long; lamina oblanceolate-elliptic to obovate, 5–25 mm long, 3–10 mm broad, cuneate at base, coarsely serrate, obtuse to rounded, often slightly emarginate; terminal leaflet shortly petiolulate. Inflorescence slender, 10–many-flowered; peduncles 1–3 cm long, elongating in fruit. Calyx c. 1 mm long; lobes slightly longer than tube, usually

sparsely pilose. Corolla pale yellow; standard oblanceolate, 2–2.5 mm long; wings and keel slightly shorter. Ovary 2-ovulate. Pods globose-ovoid, 2–3 mm long, glabrous, strongly reticulate, olive-green, usually 1-seeded. Seeds 1.5–2 mm long, brown.

Norfolk Is., Lord Howe Is. A native of the Mediterranean region and south-western Asia to India, probably introduced with fodder plants, although reputedly poisonous to stock.

N.Is.: Anson Bay, *W.R.Sykes NI 325* (CHR); Old Prison Settlement, *G.Uhe 1148* (K); graveyard, *R.M.Laing* (CHR); *s. loc.*, 1898, *I.Robinson* (NSW); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW). **L.H.Is.:** E end of Old Settlement Beach, *J.Pickard 2729* (NSW).

The whole plant is sweetly scented.

19. MEDICAGO

Medicago L., *Sp. Pl.* 2: 778 (1753); *Gen. Pl.* 5th edn, 339 (1754); a name formed from *medica*, the ancient name for lucerne, *M. sativa*, which was supposedly introduced from Media, a province of Persia.

Type: *M. sativa* L.

Annual or perennial herbs, sometimes small shrubs. Leaves pinnately trifoliolate; nerves of leaflets straight, usually ending in a marginal tooth; stipules adnate to petiole; absent. Inflorescence axillary, densely racemose, few- to many-flowered; bracts small or absent; bracteoles absent. Calyx campanulate; tube short; teeth 5, subulate. Corolla usually yellow or purple, caducous after anthesis; keel shorter than wings. Stamens 9+1; uppermost free; remainder connate into a tube; anthers uniform. Ovary sessile, ovules 1–many; style glabrous; stigma obliquely subcapitate. Pod longer than calyx, kidney-shaped and strongly curved or spirally coiled, spiny or unarmed, usually indehiscent. Seeds 1–many.

A genus of c. 55 species from Europe to Central Asia, the Mediterranean region and North Africa, with a few species from South Africa; 2 species naturalised on Norfolk and Lord Howe Islands. *Medicago sativa* is the important fodder crop, Alfalfa or Lucerne.

Pod without prickles, obliquely kidney-shaped, black when ripe, 1-seeded; racemes many-flowered **1. M. lupulina**

Pod with prickles, clearly coiled, brown when ripe, several-seeded; racemes 2–8-flowered **2. M. polymorpha**

1. *Medicago lupulina L., *Sp. Pl.* 2: 779 (1753)

T: Europe, Herb. Linn. 933.10; lecto: LINN, *fide* S.I.Ali, *Taxon* 17: 540 (1968), IDC microfiche 177/2.526/6. The employment of this epithet, which means belonging to or resembling a small wolf (*lupulus*) is obscure (it was first applied to an allied clover with hop-like inflorescences, the hop plant having at one time in Germany been loosely called the willow-wolf, *lupus salicarius*).

Illustrations: B.E.V.Parham & A.J.Healy, *Common Weeds New Zealand* 84 (1976); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 685, t. 93 (1990); P.H.Weston in G.J.Harden, *Fl. New South Wales* 2: 451 (1991).

Annual or short-lived perennial herb, procumbent or ascending, ±pubescent. Leaflets obovate-cuneate, 3–20 mm long, 2.5–12 mm broad, cuneate at base, serrate in upper half, rounded, somewhat apiculate, sometimes emarginate, pubescent below, glabrous above; stipules lanceolate-cordate, acuminate, somewhat toothed. Inflorescence compact, 10–50-flowered; peduncle longer than petiole. Corolla 2–3 mm long, yellow. Pod obliquely kidney-shaped, 1.5–3 mm long, pubescent or glabrous, without spines, loosely reticulate-veined on surface, black, 1-seeded.

Norfolk Is., Lord Howe Is. Often planted in pastures as a forage plant. A native of Europe, the Mediterranean region and temperate western Asia.

N.Is.: Bumbora Rd turn-off, *W.R.Sykes NI 925 p.p.* (CHR). **L.H.Is.:** Neds Beach, *J.Pickard 2661* (NSW); just S of Salmon Beach, *G.Uhe 1330* (K); Rabbit Is., *A.N.Rodd 1801* (NSW).

2. *Medicago polymorpha L., *Sp. Pl.* 2: 779 (1753)

T: cultivated, Herb. Clifford 378, *Medicago* 118; lecto: BM, *fide* C.C.Heyn, *Bull. Res. Council Israel* 7D: 163 (1959). The epithet means variable in shape, from the Greek *poly* (many) and *morphe* (form or shape).

Medicago denticulata Willd., *Sp. Pl.* 3(2): 1414 (1802). T: Europe; syn: B *n.v.*, IDC microfiche 7440.1025/9–11.

Illustrations: C.Lamp & F.Collet, *Weeds Australia* 157 (1979); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 685, t. 92 (1990); P.H.Weston in G.J.Harden, *Fl. New South Wales* 2: 455 (1991).

Annual herb, ±prostrate, glabrous. Leaflets obovate-cuneate, 7–25 mm long, 5–23 mm broad, cuneate at base, serrate in upper half, rounded to emarginate, finely apiculate, glabrous; stipules lanceolate, acuminate, finely laciniate to toothed. Inflorescence compact, 2–8-flowered; peduncle c. equal to petiole. Corolla 3–4.5 mm long, yellow. Pod in a flat spiral of 1.5–4 turns, 4–8 mm diam., glabrous, reticulate, brown; angles spiny; spines 1.5–2.5 mm long. Seeds several.

Norfolk Is., Lord Howe Is. A native of Central and Eastern Europe and the Mediterranean region.

N.Is.: Old Prison Settlement, Kingston, *G.Uhe 1145* (K); *s. loc.*, 1898 & 1902, *I.Robinson* (NSW). **L.H.Is.:** Old Settlement Bay, *G.Uhe 1306* (K); 0.4 km N of 'Pine Tree', *L.A.S.Johnson & A.N.Rodd 1209* (K, NSW); Neds Beach Rd, *J.Pickard 2660* (NSW); *s. loc.*, 1898, *J.H.Maiden* (NSW).

The plant growing on the Islands appears to be that sometimes known as var. *vulgaris* (Benth.) Shinners.

20. TRIFOLIUM

Trifolium L., *Sp. Pl.* 2: 764 (1753); *Gen. Pl.* 5th edn, 337 (1754); an ancient Latin name applied to some trifoliolate-leaved plant, from *tris* (thrice) and *folium* (leaf).

Type: *T. pratense* L.

Annual or perennial herbs, erect or procumbent. Leaves 3 (rarely 5 or 9)-foliolate; lateral veins usually ending in a marginal tooth; stipules often sheathing petiole; stipels absent. Inflorescences axillary or terminal, usually dense heads, usually many-flowered; bracts present or absent; bracteoles sometimes connate. Flowers pedicellate or sessile. Calyx tubular or campanulate; teeth 5, equal or unequal, usually conspicuously veined. Corolla persistent, marcescent or caducous. Stamens 9+1; uppermost free; others united into a split tube, 5 or 10 filaments dilated at apex; anthers uniform. Ovary sessile or stalked; ovules 1–12; style glabrous; stigma capitate or hooked. Pod small, usually membranous, dehiscent or indehiscent, not armed, usually enclosed in calyx, sometimes in persistent corolla. Seed usually ellipsoid or ovoid.

A genus of c. 240 species from Eurasia, Africa, and North and South America, mainly northern temperate; 5 species naturalised on the Islands. Many species are important pasture and fodder plants.

M.Zohary & D.Heller, *The Genus* Trifolium (1984).

1 Corolla white, pink or purple at anthesis

- **2** Stems rooting at nodes, prostrate; flower heads 1.5–3 cm diam. **1. T. repens**
- **2:** Stems not rooting at nodes, procumbent or decumbent to ascending; flower heads not more than 1 cm diam.
  - **3** Flower heads ±sessile, many-flowered; fruit developing above ground; calyx teeth not accrescent **2. T. glomeratum**
  - **3:** Flower heads on accrescent peduncles, arching in fruit and burying the developing fruit in the surface of the ground, heads with 2–5 fertile flowers and 1 sterile flower consisting of accrescent, curved calyx teeth **5. T. subterraneum**

1: Corolla yellow at anthesis

4 Flower heads 20–40-flowered; standard petal 4–5 mm long, bent over but not folded around the developing fruit **3. T. campestre**

4: Flower heads 3–20-flowered; standard petal 2.5–3.5 mm long, folded lengthways over the developing fruit **4. T. dubium**

1.*Trifolium repens L., *Sp. Pl.* 2: 767 (1753)

T: Europe, Herb. Clifford 375.18; lecto: BM, *fide* V.E.Rudd in M.D.Dassanayake & F.R.Fosberg, *Revis. Handb. Fl. Ceylon* 1: 453 (1980). The epithet means creeping, from the Latin *repo* (I creep).

Illustrations: B.A.Auld & R.W.Medd, *Weeds* 165 (1987); C.J.Webb *et al.*, *Fl. New Zealand* 4: t. 13F (1988); P.H.Weston in G.J.Harden, *Fl. New South Wales* 2: 458, t. 30 (1991).

Perennial herb. Stems prostrate, rooting at nodes, glabrous or sparingly hairy. Leaves trifoliolate. Leaflets broadly obovate to orbicular, (6–) 10–20 (–30) mm long, (6–) 10–15 (–20) mm broad, denticulate, rounded at apex, often with light and dark markings; stipules oblong, acuminate. Inflorescence axillary, long pedunculate, ±umbellate, dense, 1.5–3 cm diam., 20–many-flowered; bracts shorter than 1–2 mm long pedicels. Calyx campanulate, 2–4 mm long, 6–10-veined; teeth narrowly triangular; 2 upper somewhat longer. Corolla white or pink, becoming brown; standard 6–12 mm long. Ovary sessile. Pods linear-oblong, 4–5 mm long, 2–5-seeded, dehiscent.

Lord Howe Is. Sown and widely naturalised. A native of Europe, western Asia and North Africa. An important pasture and fodder plant.

L.H.Is.: W of Stevens Point, *A.C.Beauglehole 5553* (MEL).

2. *Trifolium glomeratum L., *Sp. Pl.* 2: 770 (1753)

T: England, Herb. Clifford 373.3; lecto: BM, *fide* V.E.Rudd in M.D.Dassanayake & F.R.Fosberg, *Revis. Handb. Fl. Ceylon* 1: 454 (1980). The epithet alludes to the round flower heads, from the Latin *glomus* (a ball).

Illustrations: B.E.V.Parham & A.J.Healy, *Common Weeds New Zealand* 89 (1976); G.M.Cunningham *et al.*, *Pl. W New South Wales* 426 (1981); J.Z.Weber in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 654, fig. 353H (1986).

Annual herb, decumbent or ascending, not rooting at nodes, glabrous. Leaves trifoliolate. Leaflets obovate, 5–10 (–15) mm long, 3–8 (–10) mm broad, sharply serrulate, rounded to retuse, apiculate; stipules triangular, entire, mucronate. Inflorescence axillary, ±sessile, densely globose, 0.5–1 cm diam., many-flowered. Flowers sessile or subsessile; bracts c. 1 mm long. Calyx tubular, 3–4 mm long, glabrous, 10–12-veined, not accrescent; teeth subequal, shorter than tube, acuminate. Corolla pink to purplish, persistent; standard 3–5 mm long. Ovary very shortly stalked. Pods developing above ground, oblong, 2–3 mm long, 1–2-seeded, dehiscent.

Norfolk Is., Lord Howe Is. A native of southern and western Europe and the Mediterranean region, to be found in pastures and cultivated ground.

N.Is.: Douglas Drive, *P.S.Green 1410* (A); Bumbora Rd turnoff, *W.R.Sykes NI 925 p.p.* (CHR). **L.H.Is.:** Old Settlement Beach, *A.C.Beauglehole 5554* (MEL); S end of Middle Beach Common, *J.Pickard 2702* (NSW).

3. *Trifolium campestre Schreb. in J.W.Sturm, *Deutschl. Fl. Abth.* 1 (16), fol. 13–14 (1804)

T: Germany; lecto: J.W.Sturm, *Deutschl. Fl.* t. 253 (1804), *fide* M.Zohary & D.Heller, *The Genus* Trifolium 338 (1984). The epithet means of the field or open plain, alluding to this plant's normal habitat.

Illustrations: C.Lamp & F.Collet, *Weeds Australia* 324, t. 258 (1979); G.M.Cunningham *et al.*, *Pl. W New South Wales* 425 (1981); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 286, fig. 46A (1983).

Annual herb, erect or prostrate, glabrous or pubescent, not rooting at nodes. Leaves trifoliolate. Leaflets broadly to narrowly obovate to rhombic, (4–) 8–10 (–16) mm long, (2–) 4–7 (–10) mm broad, finely denticulate in upper half, rounded to slightly retuse; petiolule of

terminal leaflet 1.5–3 mm long; stipules ovate to oblong, acuminate. Inflorescence axillary and terminal, ovoid-cylindrical, dense, 7–12 mm diam., 20–40-flowered; pedicels c. 0.5 mm long, becoming deflexed, without bracts; peduncle shorter than leaves. Calyx glabrous to pilose, campanulate, c. 3 mm long, 5-veined; 2 upper teeth very short; 3 lower longer than tube, subulate. Corolla yellow, turning light brown; standard 4–5 mm long. Ovary stalked. Pod ovoid, 2–2.5 mm long, 1-seeded, dehiscent.

Norfolk Is. Presumably introduced with fodder plants, not common on the Island. A native of Europe, western Asia and North Africa.

N.Is.: New Cascade Rd, *W.R.Sykes NI 333* (CHR).

4. *Trifolium dubium Sibth., *Fl. Oxon*. 231 (1794)

T: England; holo: ?OXF *n.v.* The epithet means doubtful, presumably referring to its problematical distinctness from other species.

Trifolium minus Sm. in R.Relhan, *Fl. Cantab*. 2nd edn, 290 (1802). T: England, *H.Becke*; syn: LINN *n.v.*; photo seen (IDC microfiche 5073.592/16).

Illustrations: B.E.V.Parham & A.J.Healy, *Common Weeds New Zealand* 88 (1976); C.Lamp & F.Collet, *Weeds Australia* 325, t. 259 (1979); J.Z.Weber in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 654, fig. 353F (1986).

Annual herb, erect to decumbent, usually sparsely pubescent, not rooting at nodes. Leaves trifoliolate. Leaflets broadly obovate, 5–12 mm long, 3–7 mm broad, denticulate-crenate in upper part, truncate or retuse at apex; stipules ovate, acute. Inflorescences axillary and terminal, cylindrical to globose, 5–8 mm diam., 3–20-flowered; pedicels 0.5–1 mm long, becoming deflexed; bracts very small or absent; peduncle longer than subtending leaves. Calyx campanulate, glabrous, 1–2 mm long, 5-veined; teeth unequal; upper 2 shorter than tube, subulate. Corolla yellow, turning brown; standard 2.5–3.5 mm long, narrow, folded lengthwise over developing pod. Ovary stalked. Pod ovoid-oblong, 2–3 mm long, 1-seeded, dehiscent.

Norfolk Is., Lord Howe Is. A native of Europe, now naturalised in waste places, pastures *etc.*

N.Is.: Bumbora Rd turnoff, *W.R.Sykes NI 925 p.p.* (CHR); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW). **L.H.Is.:** near Big Creek, *A.C.Beauglehole 5552* (MEL).

5. *Trifolium subterraneum L., *Sp. Pl*. 2: 767 (1753)

T: not designated. The epithet alludes to the habit of this species of pushing the developing fruit under the surface of the ground.

Illustrations: C.Lamp & F.Collet, *Weeds Australia* 333, t. 264 (1979); G.M.Cunningham *et al.*, *Pl. W New South Wales* 427 (1981); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 286, fig. 46D (1983).

Annual herb, procumbent, villous, not rooting at nodes. Leaves trifoliolate. Leaflets broadly obovate-obcordate, 0.5–2 cm long and broad, denticulate to subentire in upper part, shallowly emarginate, villous; stipules ovate, acute. Inflorescence axillary, a dense few-flowered head, c. 1 cm diam., on an accrescent, arching peduncle. Flowers subsessile, without bracts; central flowers sterile, consisting of a calyx only, curved, accrescent; outer 2–5 flowers fertile. Calyx cylindrical, 3–4 mm long; lobes subequal, linear-subulate; calyx of inner sterile flower with a solid tube and lobes which enlarge and become recurved and wiry in fruit, pushing and anchoring the fruit head into the soil surface. Corolla white or pink, c. 1 cm long. Ovary sessile. Pod ovoid, ±glabrous, 2–3 mm long, 1-seeded, indehiscent.

Lord Howe Is. An introduced pasture plant, native to Europe, south-western Asia and North Africa.

L.H.Is.: above Old Settlement Beach, *A.C.Beauglehole 5555* (MEL).

21. CROTALARIA

Crotalaria L., *Sp. Pl.* 2: 714 (1753); *Gen. Pl.* 5th edn, 320 (1754); a name based on the Greek *krotalon* (a rattle or clapper), in allusion to the rattling of the seeds in the inflated pods of this genus, often called Rattlepods.

Type: *C. lotifolia* L.

Herbs or shrubs. Leaves simple or digitately 3 (–7)-foliolate; stipules small or absent; stipels absent. Inflorescence terminal, axillary or leaf-opposed, racemose, sometimes compound; bracts small to leaf-like, sometimes caducous; bracteoles paired, small. Calyx 5-lobed, often appearing 3-toothed by fusion of lobes, and somewhat bilabiate. Corolla usually green or yellow-green; standard suborbicular to obovate, with 2 callus-like appendages at base and a long claw; keel petals rounded to angled, usually prominently beaked. Stamens connate; sheath split open on upper side; anthers alternately large and small. Ovary usually stalked; style curved or angled, usually bearded above; stigma small. Pods usually inflated, 1–many seeded.

A genus of c. 550 species found throughout the tropics and subtropics, especially well represented in Africa; 1 naturalised species on Norfolk Is.

R.M.Polhill, *Crotalaria* in Africa and Madagascar (1983).

***Crotalaria agatiflora** Schweinf. in L.R. von Höhnel, *Rudolph-Stephanie-See* 13 (1891)

T: Kenya, *L. von Höhnel 95*; holo: B, destroyed, *n.v.* The epithet comes from *Agati*, the name of a related genus now considered part of *Sesbania*, and a supposed resemblance to its flower (*flora*).

Illustrations: B.Everard & B.D.Morley, *Wild Fl. World* t. 53D (1970); R.M.Polhill in *Fl. Trop. E. Africa*, Leguminosae 4: 852, fig. 110 (1971); C.Gardner & T.A.James in G.J.Harden, *Fl. New South Wales* 2: 520 (1991).

Woody subshrub, 1–2 m tall or more. Stems glabrous. Leaves trifoliolate; petiole 3–12 cm long; leaflets elliptic to lanceolate or ovate, 2–7 cm long, 1.5–3.5 cm broad, entire; petiolules c. 2 mm long; stipules inconspicuous, linear, caducous. Inflorescence terminal, racemose, many-flowered; pedicels 0.8–1.5 cm long; bracts foliaceous, caducous; bracteoles filiform, 1–5 mm long, persistent. Calyx glabrous, 1.5–3 cm long, appearing 3-lobed through union of upper and lateral lobes; lobes slightly longer than tube. Corolla yellow-green; standard reflexed; keel curled up into a straight, darker beak. Pod stalked, subcylindrical, inflated, 7–10 cm long, glabrous, many-seeded. Seeds smooth, pale brown.

Norfolk Is. Collected once and presumed to have been naturalised, as it is in New Zealand. A native of East Africa.

N.Is.: *s. loc.*, 1975, *F.E.T.Suckling* (CHR).

The record appears to be subsp. *agatiflora*.

22. LUPINUS

Lupinus L., *Sp. Pl.* 2: 721 (1753); *Gen. Pl.* 5th edn, 322 (1754); an ancient Latin name alleged to have been derived from *lupus* (a wolf), because it was believed that these plants ravaged or destroyed the fertility of the soil.

Type: *L. albus* L.

Annual or perennial herbs or more rarely shrubs. Leaves digitate, (1–3) 5- or more-foliolate; stipules adnate to base of petiole; stipels absent. Inflorescence a terminal or leaf-opposed raceme, few- to many-flowered, alternate or verticillate on rachis; bracts caducous; bracteoles persistent, usually fused to calyx. Calyx bilabiate, divided almost to base; lower lip shallowly 3-lobed. Corolla variously coloured; standard orbicular, usually reflexed; keel petals curved, pointed or beaked at apex. Stamens united; anthers alternately long and short. Ovary sessile; ovules 2–many; style glabrous; stigma terminal, sometimes bearded. Pods usually straight,

cylindrical, dehiscing with 2 twisting valves, usually somewhat septate and constricted between seeds. Seeds round or smooth.

A genus of c. 200 species from the Mediterranean region, and especially from North and South America; 1 species naturalised on Norfolk Is.

J.S.Gladstones, Lupins of the Mediterranean region and Africa, *Tech. Bull. Dept. Agric. W. Austral.* 26 (1974).

***Lupinus cosentinii** Guss., *Fl. Sicul. Prodr.* 2: 398 (1828)

T: Sicily, *F.Cosentini*; holo: ?NAP *n.v.* Named after Ferdinando Cosentini (1769–1840), Sicilian botanist.

Illustrations: C.A.Gardner & H.G.Elliott, *J. Dept. Agric. W. Australia* II 6: 415, t. 1 (1929), as *L. pilosus*; J.Z.Weber in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 707, fig. 283A (1986); C.Gardner in G.J.Harden, *Fl. New South Wales* 2: 523 (1991).

Annual, somewhat woody at base, branching, 20–100 cm tall. Stems villous. Leaves digitate, 9–11-foliolate; petiole 3–10 cm long; leaflets narrowly oblanceolate, 2–7 cm long, 0.3–1.5 cm broad, sericeous-villous above and below, sessile; stipules linear-subulate. Inflorescence terminal, verticillate. Flowers usually numerous; pedicels c. 3 mm long. Calyx 8–10 mm long, villous; upper lip deeply 2-lobed; lower with 3 shallow teeth. Corolla 1.2–1.5 cm long, blue with a white patch on standard; keel darker, blunt. Pods 4–5 cm long, septate and slightly contracted between seeds, 3- or 4-seeded, densely villous; style persistent. Seeds somewhat flattened, c. 8 mm diam., mottled, finely tuberculate.

Norfolk Is. A native of the central and western Mediterranean region, including North Africa; introduced to W.A. for forage and soil improvement, and probably also introduced to Norfolk Is. for this purpose.

N.Is.: along Douglas Drive, *G.Uhe 1189* (K).

Presumably this is the plant referred to on Norfolk Is. as *Lupinus* sp. by J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 762 (1904).

23. TELINE

Teline Medik., *Vorles. Churpfälz Phys.-Ökon. Ges.* 2: 342 (1786); meaning pertaining to *telis*, the ancient Greek name for the not very closely related Fenugreek, *Trigonella foenum-graecum* L.

Type: *T. medicagioides* Medik., *nom. illeg.* = *T. monspessulana* (L.) K.Koch

Shrubs or small trees, without spines. Leaves trifoliolate, usually petiolate, usually stipulate; stipels absent. Inflorescence axillary or terminal, racemose; bracts and bracteoles small, caducous. Calyx campanulate, bilabiate; upper lip 2-lobed; lower 3-toothed. Corolla usually yellow; standard broadly ovate, glabrous or ±sericeous; keel sericeous, approximately equalling standard in length. Stamens united; anthers alternately basifixed and longer or versatile and shorter. Ovary sessile or shortly stalked; style glabrous; stigma terminal. Pods narrowly oblong, somewhat flattened, sericeous to villous, 2-valved, explosively dehiscent, 2–8-seeded. Seeds smooth.

A genus of 9 species from the Mediterranean region and Macaronesia; 1 species naturalised on Norfolk Is. Some species are often grown as garden plants in warm temperate areas. This genus is frequently treated as part of *Genista* L., but the classification of the Fabaceae is actively under review.

***Teline monspessulana** (L.) K.Koch, *Dendrologie* 1: 30 (1869)

Cytisus monspessulanus L., *Sp. Pl.* 2: 740 (1753); *Genista monspessulana* (L.) L.A.S.Johnson, *Contr. New South Wales Natl. Herb.* 3: 98 (1962). T: not designated. *Monspessulus* was the Roman name for Montpellier in southern France, whence this species was first described.

Illustrations: B.E.V.Parham & A.J.Healy, *Common Weeds New Zealand* 80 (1976), as *Cytisus*

monspessulanus; W.T.Parsons, *Noxious Weeds Victoria* 196, fig. 181 (1976); C.Gardner in G.J.Harden, *Fl. New South Wales* 2: 525, t. 32 (1991); the last two as *Genista monspessulana*.

Shrub to 3 m tall, usually much branched. Shoots ribbed, pubescent, villous when young. Leaves appressed pilose, especially below; leaflets obovate-oblanceolate, 0.7–1.5 (–2) cm long, 0.3–0.7 (–1) cm broad, attenuate-acute at base, entire, obtuse (sometimes acute) at apex, apiculate; petiolules less than 1 mm long. Inflorescence terminal on side shoots, racemose, 4–7-flowered; lower bracts foliose; upper bracts reduced, entire; bracteoles subulate. Calyx pubescent, 4–7 mm long; lower teeth small. Corolla yellow; standard broadly ovate, c. 10 mm long, reflexed, glabrous; keel slightly sericeous. Ovary sessile, villous. Pod narrowly oblong, 1.5–2.5 cm long, compressed, densely villous, 3–6-seeded. Seeds black, orbicular.

Norfolk Is. An escape from cultivation, and naturalised only locally on the Island in the area of the Melanesian Mission. A native of the Mediterranean region and the Azores.

N.Is.: Douglas Drive, *G.Uhe 1185* (K).

Almost certainly this is the plant referred to as *Cytisus sp*. by J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 762 (1904).

45. PROTEACEAE

Shrubs or trees. Leaves alternate, rarely whorled, simple, pinnatifid, pinnate or bipinnate, usually coriaceous, without stipules. Inflorescence axillary or terminal, racemose, paniculate or condensed and capitate or cone-like. Flowers zygomorphic or (elsewhere) actinomorphic, usually bisexual. Perianth of usually 4 petaloid tepals, valvate, free or variously united, each with a slightly expanded limb. Corolla vestigial or absent. Stamens 4, opposite and basally adnate to limb of tepals. Ovary superior, sessile or stipitate, 1-locular; ovules l–many; style simple, often persistent, with the apex expanded as a pollen presenter; stigma small, terminal or subterminal. Fruit a follicle, nut, achene or, rarely, a drupe. Seeds sometimes winged.

A mainly Southern Hemisphere family of c. 75 genera and over 1000 species. Widespread in tropical and subtropical regions, but primarily found in Australia and South Africa, with 2 genera introduced to the Islands. *Macadamia integrifolia* Maiden & Betche has been planted on Norfolk Is. but is not naturalised as far as is known.

G.Bentham, Proteaceae, *Fl. Austral.* 5: 315–584 (1870); L.A.S.Johnson & B.G.Briggs, On the Proteaceae - the evolution and classification of a southern family, *Bot. J. Linn. Soc.* 70: 83–182 (1975); J.W.Wrigley & M.Fagg, *Banksias, Waratahs and Grevilleas and all other plants in the Australian Proteaceae family* (1989).

KEY TO GENERA

Leaves pinnatisect to bipinnatifid, sometimes bipinnate, densely silky-tomentose below; flowers orange or orange-yellow	**1. GREVILLEA**
Leaves simple, entire, glabrous or lightly pilose beneath; flowers white	**2. HAKEA**

1. GREVILLEA

Grevillea R.Br. ex Knight, *Cult. Prot.* xvii, 120 (1809); named after Hon. Charles Francis Greville (1749–1809), a noted plantsman of the time and one of the founders of the Horticultural Society of London (later the Royal Horticultural Society).

Type: *G. aspleniifolia* Knight

Trees or shrubs. Leaves alternate, entire, 1- or 2-pinnatifid or pinnate; upper and lower

surfaces contrasting in indumentum. Inflorescence usually terminal, racemose, paniculate or umbelliform. Flowers bisexual, pedicellate, borne in pairs. Perianth tube curved below limb, sometimes straight; limb subglobose. Anthers sessile in the concave limb. Ovary usually stipitate; ovules 2; style elongating faster than perianth, splitting it and becoming arched to one side but the pollen presenter held in the limb, eventually escaping and straightening; stigma small. Fruit a follicle, usually oblique, coriaceous or ±woody, valves concave inside. Seeds 1 or 2, flat, usually winged.

A genus of c. 250 species, mainly Australian, but also in New Caledonia and southern Malesia; 1 species naturalised on Norfolk and Lord Howe Islands.

*Grevillea robusta A.Cunn. ex R.Br., *Suppl. Prodr. Fl. Nov. Holl.* 24 (1830)

T: Moreton Bay, Queensland, 1827, *A.Cunningham*; holo: BM; iso: K. So named because of its height and robustness.

Illustrations: E.R.Rotherham et al., *Fl. Pl. New South Wales & S Queensland* 92, t. 279 (1975); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 607 (1984); W.R.Elliot & D.L.Jones, *Encycl. Austral. Pl.* 5: 102 (1990).

Tree to 30 m or more tall. Young shoots rusty tomentose. Leaves pinnate; pinnae 11–24, pinnatisect to bipinnatifid, sometimes bipinnate, 15–30 cm long; lobes narrowly lanceolate-elliptic or almost linear, tapered and acute at both ends, densely silky-tomentose below, puberulous to glabrous above. Inflorescence terminal or axillary, racemose, 1-sided, 2–several together, 10–16 cm long, with numerous flowers; pedicels 1–1.5 cm long. Perianth 1–1.3 cm long, glabrous, golden yellow or orange-yellow; tube 6–9 mm long. Ovary glabrous; stipe 2–2.5 mm long; style 1.5–2 cm long, persistent. Fruit oblique, boat-shaped, 1.5–2 cm long. Seeds 2, winged all around.

Norfolk Is., Lord Howe Is. A native of the rainforest areas of Qld and northern N.S.W., Australia. Frequently planted as a timber tree throughout tropical and subtropical regions, and often becoming naturalised.

N.Is.: Hundred Acre Reserve, *W.R.Sykes NI 514* (CHR). **L.H.Is.:** W end of Old Settlement, *A.C.Beauglehole 5509* (MEL).

2. HAKEA

Hakea Schrad., *Sert. Hannov.* 27 (1798); named after Baron Christian Ludwig von Hake (1745–1818), a German patron of science and a Councillor in Hannover.

Type: *H. glabra* Schrad.

Shrubs or rarely small trees. Leaves alternate, simple or compound, terete or flat, entire or toothed, often pungent; indumentum of upper and lower surfaces similar. Inflorescence axillary, rarely terminal, usually clustered, rarely elongate-racemose. Flowers bisexual. Perianth tube slender, straight, becoming curved with lobes free or remaining coherent, the limb globose. Anthers sessile at base of limb. Ovary glabrous, shortly stipitate; ovules 2; style long or short, with small pollen presenter; stigma small. Fruit a hard, woody capsule, tardily opening; valves 2, solid, with inner faces flat. Seeds 2, compressed, winged at upper end, rarely winged all around.

A genus endemic in Australia containing c. 150 species; 2 species naturalised on Norfolk Is.

Leaves flat, 5–25 mm broad, acute to blunt, not pungent; inflorescence 10–20-flowered **1. H. salicifolia**

Leaves terete, 1 mm broad, pungent; inflorescence fewer than 10-flowered **2. H. sericea**

1. *Hakea salicifolia (Vent.) B.L.Burtt, *Bull. Misc. Inform.* 1941: 33 (1941)

Embothrium salicifolium Vent., *Descr. Pl. Nouv.* t. 8 (1800). T: cultivated; holo: ?G *n.v.* So called because the leaves (*folia*) resemble those of the willow (*Salix*).

Illustrations: E.R.Rotherham *et al.*, *Fl. Pl. New South Wales & S Queensland* 57, t. 146 (1975); A.Fairley & P.Moore, *Native Pl. Sydney District*. 172 (1989); W.R.Elliot & D.L.Jones, *Encycl. Austral. Pl.* 5: 229 (1990).

Erect shrub or small tree to 5 m tall. Young shoots glabrous or with appressed silky hairs. Leaves flat; petiole 1–5 mm long; lamina narrowly elliptic, 5–11 cm long, 0.5–2.5 cm broad, long-attenuate at base, acute to blunt at apex, scattered appressed pilose above and below, becoming glabrous. Inflorescence axillary, clustered, subsessile, 10–20-flowered. Perianth 4–5 mm long, white, glabrous. Ovary subsessile; style c. 5 mm long. Fruit very woody, obliquely ovoid, 2–2.5 cm long, prominently tuberculate.

Norfolk Is. A native of Australia (eastern Qld, N.S.W.), presumably introduced to the Island as a hedge plant, now naturalised and locally common.

N.Is.: S of Bullocks Hut Rd, *R.D.Hoogland 11154* (CANB, K); near Cascade Point, *W.R.Sykes NI 386* (CHR); *s. loc.*, 1957, *E.H.Flint* (BRI).

2. *Hakea sericea Schrad., *Sert. Hannov*. 27 (1797)

T: not designated. The epithet is the Latin for silky, in allusion to the silky shoots.

Hakea sp. aff. *acicularis* R.Br., J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 747 (1904)

Illustrations: W.R.Barker in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 148, fig. 76C (1986); A.Fairley & P.Moore, *Native Pl. Sydney District* 171 (1989); W.R.Elliot & D.L.Jones, *Encycl. Austral. Pl.* 5: 231 (1990).

Shrub to 4 m tall. Young shoots pubescent. Leaves rigid, terete, 20–60 mm long, 0.6–1 mm broad, passing imperceptibly into a short petiole, sharp, acicular, glabrous except when young. Inflorescence axillary, umbel-like, (1–) 3–5 (–7)-flowered; pedicel villous, 3–4 mm long. Perianth 4–5.5 mm long, white, glabrous. Ovary subsessile; style c. 3 mm long. Fruit very woody, obliquely ovoid, 2–3 cm long, somewhat corrugated or gnarled, abruptly contracted into a short, broad beak.

Norfolk Is. A native of south-eastern Australia which was introduced as a hedge plant and has spread locally from seed.

N.Is.: Melanesian Mission area, *W.R.Sykes NI 620* (CHR).

This species is also naturalised in New Zealand, where, in places, it has become a serious weed. It was popular for hedges at first, but, being relatively short-lived, is not now so much used for this purpose.

46. LYTHRACEAE

Annual or perennial herbs, rarely shrubs or trees. Leaves opposite, whorled or alternate, simple, entire, without stipules. Flowers axillary, usually solitary, sometimes in racemes or cymes, actinomorphic or zygomorphic, bisexual, often heterostylous, with a tubular hypanthium. Sepals usually 4–6, sometimes alternate with lobes of hypanthial appendages. Petals usually 4–6, rarely absent, free, crumpled in bud, borne on edge of hypanthium. Stamens usually 8–12, sometimes fewer or more, inserted below petals in hypanthium tube. Ovary superior, (1–) 2–6-locular; ovules numerous, axile. Fruit a capsule, variously dehiscent.

A family of c. 30 genera and 600 species, mostly tropical, but cosmopolitan except for polar regions; 1 genus introduced to Norfolk and Lord Howe Islands.

G.Bentham, Lythrarieae, *Fl. Austral.* 3: 294–301 (1866); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Lythraceae, *Fl. Java* 1: 251–256 (1963); A.C.Smith, Lythraceae, *Fl. Vit. Nova* 3: 281–289 (1985); H.J.Hewson & P.L.Beesley, Lythraceae, *Fl. Australia* 18: 91–113 (1990).

LYTHRUM

Lythrum L., *Sp. Pl.* 1: 446 (1753); *Gen. Pl.* 5th edn, 205 (1754); a name used by Dioscorides; from the Greek *lythron* (gore), supposedly in allusion to the colour of the flowers in some members of this genus.

Type: *L. salicaria* L.

Annual or perennial herbs, sometimes small shrubs. Leaves alternate or opposite, rarely in whorls of three. Flowers usually solitary, sometimes in apparent spikes by reduction of leaves, actinomorphic. Hypanthium cylindrical, ribbed. Sepals 4–6, alternating with 4–6 appendages. Petals 4–6, rarely absent, usually conspicuous. Stamens 4–12, when twice as many as petals then in 2 whorls of different lengths. Ovary incompletely 2-locular; ovules numerous; stigma capitate. Capsule enclosed in the persistent hypanthium, dehiscing with 2 valves or indehiscent.

A widely distributed genus of c. 35 species; 1 species naturalised on Norfolk and Lord Howe Islands.

***Lythrum hyssopifolia** L., *Sp. Pl.* 1: 447 (1753)

T: Europe, not designated; *n.v., fide* H.J.Hewson *Fl. Australia* 18: 102 (1990). The epithet means leaves (*folia*) resembling hyssop (*Hyssopus*).

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 118, fig. 15B (1966), J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 891, fig. 461B (1986); C.J.Webb *et al.*, *Fl. New Zealand* 4: 815, fig. 78A (1988).

Procumbent annual. Stems ascending to c. 40 cm tall, 4-angled, glabrous. Leaves mostly alternate, sessile, narrowly ovate to linear-oblong, 0.5–2.5 cm long, 0.2–0.8 cm broad, rounded to subcordate at base, acute to obtuse at apex. Flowers solitary in upper leaf axils. Hypanthium narrowly obconical, 3–6 mm long, ribbed. Calyx and appendages c. 1 mm long. Petals 4–6, oblanceolate, 2.5–4 mm long, blue, red or purplish. Stamens usually 4–6, included; filaments c. 1.5 mm long. Ovary cylindrical, 1.5–2 mm long. Capsule ±as long as hypanthium, enclosed. Seeds numerous, shortly winged.

Norfolk Is., Lord Howe Is. This species is native in Australia and many other parts of the world, although here treated as introduced to Norfolk Is., as proposed by R.M.Laing (*Trans. & Proc. New Zealand Inst.* 47: 33, 1915). In view of its general distribution and often inconspicuous habit, it is just possibly a native of the Islands.

N.Is.: Melanesian Mission Creek, *P.S.Green 2447* (K); Emily Bay, *R.M.Laing* (CHR); Bloody Bridge, *R.M.Laing* (CHR); *loc. id., P.Ralston 10* (A); *loc. id., W.R.Sykes NI 651* (CHR). **L.H.Is.:** Erskine Valley, *J.McKean* in *A.C.Beauglehole 5573* (MEL).

47. THYMELAEACEAE

Trees, shrubs or rarely herbs, usually with a strong fibrous inner bark. Leaves opposite or alternate, simple, entire, without stipules. Inflorescence a terminal or axillary head, spike or raceme, or sometimes flowers solitary. Flowers actinomorphic, usually bisexual, usually with a corolla-like hypanthium. Calyx often petaloid; sepals usually 4 or 5, free or connate, imbricate. Petals small, scale-like, 4–12 or absent. Stamens as many as and alternating with sepals, or twice as many, or 2, inserted at the mouth of or within hypanthium. Ovary superior, (1 or) 2-locular; ovules pendulous, 1 per locule; style simple, terminal or lateral; stigma usually discoid. Fruit usually a drupe or nut, rarely a capsule.

A family of c. 58 genera and 720 species, almost cosmopolitan, but especially in Australia and South Africa; 1 genus native on each of Norfolk and Lord Howe Islands.

G.Bentham, Thymeleae, *Fl. Austral.* 6: 1–39 (1873); K.Heinig, Studies in the floral

morphology of the Thymeleaceae, *Amer. J. Bot.* 38: 113–132 (1951); Ding Hou, Thymeleaceae, *Fl. Males.* ser. I, 6: 1–48 (1960); L.Bunniger, Untersuchungen über die morphologishe Natur des Hypanthiums bei Myrtales – und Thymeleales-Familien II. Myrtaceae. III. Vergleich mit den Thymeleaceae, *Beitr. Biol. Pflanzen* 48: 79–156 (1972); B.L.Rye, Thymelaeaceae, *Fl. Australia* 18: 122–215 (1990).

KEY TO GENERA

Flowers white, in bracteate terminal clusters; shrub to 2 m tall; leaves imbricate, decussate, up to 2 cm long (L.H.Is.) **1. PIMELEA**

Flowers yellowish green, in a small terminal raceme; shrub or small tree to 4 m or more tall; leaves not imbricate, usually more than 3 cm long (N.Is.) **2. WIKSTROEMIA**

1. PIMELEA

Pimelea Banks & Sol. ex Gaertn., *Fruct.* 1: 186 (1788) *nom. cons.*; from the Greek *pimele* (lard, soft fat), probably in allusion to its seeds being oily.

Type: *P. laevigata* Gaertn., *nom. illeg.* = *P. prostrata* (J.R.Forst. & G.Forst.) Willd.

Herbs or shrubs. Leaves opposite-decussate or alternate. Inflorescence a terminal or axillary head, spike or cluster, usually surrounded by an involucre of 4 bracts. Flowers bisexual or unisexual. Hypanthium tubular, usually circumscissile around ovary after flowering. Sepals 4. Petal scales absent. Stamens 2, inserted at mouth of hypanthium. Ovary 1-locular by abortion; style attached laterally. Fruit a nut, or sometimes a drupe with fleshy mesocarp.

A genus of 108 species, mostly Australian but also in New Zealand, New Guinea and Timor; 1 species endemic on Lord Howe Is.

Two species of *Pimelea* have been recorded from Norfolk Is. in error: *P. laevigata* Gaertn. and *P. linifolia* Sm. (see P.S.Green, *Kew Bull.* 45: 252–253, 1990).

Pimelea congesta C.Moore & F.Muell. in F.J.H. von Mueller, *Fragm.* 8: 9 (1872)

T: Lord Howe Island, *C.Moore*; holo: MEL; iso: K. The epithet alludes to the congested inflorescence.

[*Pimelea longifolia auct. non* Banks & Sol. ex Wikstr.: G.Bentham, *Fl. Austral.* 6: 7 (1873); F.J.H. von Mueller, *Fragm.* 9: 77 (1875); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 250 (1896)]

[*Pimelea prostrata auct. non* (J.R.Forst & G.Forst.) Willd.: C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 25 (1870)]

Illustration: I.Hutton, *Lord Howe Is.* 142 (1986).

Shrub to 2 m tall, with tough red bark. Leaves decussate, closely imbricate; petiole c. 0.5 mm long, on a persistent leaf base bearing a small tuft of fibres after the leaf has been shed; lamina elliptic, (8–) 10–20 mm long, (2–) 4–6 mm broad, rounded at base, blunt at apex, coriaceous, glabrous. Inflorescence a terminal head of c. 9 flowers. Flowers bisexual. Hypanthium 1–1.5 cm long, villous-sericeous. Sepals ovate, 2 mm long, white, villous-sericeous below, glabrous above. Stamens exserted. Fruit a brown ellipsoidal nut, 2–3 mm long. Fig. 45H–I.

Lord Howe Is. Endemic. Widespread on the Island, especially on exposed ridges. Flowers mid July–mid Oct.

L.H.Is.: ridge between Old Settlement and North Bay, *P.S.Green 1935* (K); Pooles Lookout, North Hills, *J.D.McComish 96* (K); Goat House Cave, *J.Pickard 1326* (K, NSW); last part of ascent of Mt Gower, *P.S.Green 1607* (A, K); Mt Lidgbird, *C.Moore 69* (K, MEL).

Closely related to *P. longifolia* Banks & Sol. ex Wikstr. of New Zealand.

2. WIKSTROEMIA

Wikstroemia Endl., *Prodr. Fl. Norfolk.* 47 (1833); named after Johan Emanuel Wikström (1789–1856), Swedish botanist and Bergianus Professor at Stockholm.

Type: *W. australis* Endl.

Shrubs or small trees. Leaves opposite, rarely alternate. Inflorescence terminal or axillary, a cluster, raceme, spike or head, or rarely flowers solitary, without bracts. Flowers bisexual or unisexual. Hypanthium cylindrical. Sepals 4, outer pair often hooded. Petals absent. Stamens 8, sessile or subsessile, in 2 whorls within the hypanthium. Ovary 1-locular; style short, terminal. Fruit a berry-like drupe.

A genus of c. 70 species from SE Asia, Australia and Pacific islands, including Hawai'i; 1 species endemic on Norfolk Is.

The delimitation of species is difficult in some species complexes, *e.g.* those around the apomictic *W. indica* (L.) C.A.Mey. The bark of some species is used to manufacture strong paper such as that used for bank notes.

Wikstroemia australis Endl., *Prodr. Fl. Norfolk.* 47 (1833)

T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W. The epithet is the Latin for southern, because the species was described from a southern island.

Wikstroemia cunninghamii Meisn., in A.L.P.P. de Candolle., *Prodr.* 14: 545 (1857). T: Norfolk Island, *A.Cunningham 34*; holo: ?G *n.v.*; iso: K.

Illustration: S.F.L.Endlicher, *Iconogr. Gen. Pl.* t. 22 (1837).

Shrub or small tree to 4 m or more tall, with fibrous bark. Leaves opposite, glabrous; petiole 2–5 mm long; lamina elliptic (to lanceolate), (1.5–) 3–7 (–10) cm long, (1–) 2–3 (–4) cm broad, attenuate to rounded at base, rounded to acute at apex, discolorous; venation clearly reticulate. Inflorescence terminal, racemose, 3–10-flowered. Hypanthium 7–9 mm long, glabrous. Calyx lobes ovate, 3–4 mm long, yellowish green. Staminal whorls in upper half of hypanthium; upper whorl inserted just below mouth; filaments 0.5 mm long; anthers c. 1 mm long, yellow. Fruit ovoid-pyriform, 4 mm long, reddish. *Kurrajong*. Fig. 45F–G.

Norfolk Is. Endemic. Common in the forest on Mt Bates and Mt Pitt, especially the northern slopes of the former, less frequent elsewhere.

N.Is.: Red Rd, Mt Bates, *P.S.Green 1372a & b* (A, K); Palm Glen, *M.Lazarides 8081* (CANB, K); c. 1.6 km NE of Bloody Bridge, *G.Uhe 1116* (K); *s. loc.*, *A.Cunningham 34* (K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW).

48. PUNICACEAE

Small trees or shrubs. Leaves mostly opposite, subopposite or fasciculate, simple, without stipules. Flowers terminal, solitary or a few clustered, actinomorphic, bisexual, with a thick textured hypanthium. Calyx and corolla 5–7-lobed. Stamens numerous. Ovary inferior, many-locular; style 1, slender; stigma capitate. Fruit a spherical berry, crowned with persistent calyx.

A family consisting of one genus native across southern Eurasia from the Balkans to northern India and on the island of Socotra; introduced to Lord Howe Is.

PUNICA

Punica L., *Sp. Pl.* 1: 472 (1753); *Gen. Pl.* 5th edn, 212 (1754); based on the ancient Latin name, *punicum malum*, the Punic (or Carthaginian) apple.

Type: *P. granatum* L.

Small trees or shrubs, branchlets sometimes spinescent. Leaves usually opposite or fasciculate, entire. Calyx thick, adnate to top of the hypanthium; lobes 5–7, valvate. Petals 5–7, imbricate, crumpled in bud. Stamens numerous, attached over inner face of hypanthium. Ovary 7–9 (–13)-locular, with thick placentas; placentation basically axile; style simple; stigma capitate. Fruit with a leathery rind. Seeds numerous.

A genus of 2 species, one the well-known and ancient cultigen, the Pomegranate, which is naturalised on Lord Howe Is., and the other a wild species only found on the island of Socotra.

***Punica granatum** L., *Sp. Pl.* 1: 472 (1753)

T: Herb. Clifford: 184, *Punica* No 1; lecto: BM *fide* S.A.Graham, *Regnum Veg*. 127: 80 (1993). The epithet, from the Latin *granum* (seed), means many-seeded (as the common name *Pomegranate* means an apple (pome) with many seeds).

Illustrations: B.E.Nicholson *et al*., *Oxford Book Food Pl.* 95, t. 3 (1969); B.Everard & B.D.Morley, *Wild Fl. World* t. 28B (1970); B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 171, fig. 110c–d (1983).

Deciduous tree or shrub to c. 5 m tall. Leaves shortly petiolate; lamina oblanceolate to elliptic, (2–) 3–7 cm long, 0.8–2 cm broad, attenuate at base, obtuse to acute at apex. Sepals triangular, 7–8 mm long, persistent. Petals obovate, 2–2.5 cm long, crimped on margin, orange-red. Fruit spherical, c. 7 cm diam., brownish yellow flushed with red. Seeds numerous, each surrounded by a juicy translucent pulp. *Pomegranate*.

Lord Howe Is. The Pomegranate was recorded in 1898 as having been introduced to Lord Howe Is. (J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 152, 1898) and has now escaped from cultivation. It has also been recorded as introduced and cultivated on Norfolk Is. (J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 758, 783, 1904) but appears not to have become naturalised there.

L.H.Is.: hill behind 'Pine Trees' Guest House, *G.Uhe 1310* (K); NW base of Transit Hill, *L.A.S.Johnson & A.N.Rodd 1263* (K, NSW); *loc. id.*, *A.C.Beauglehole 5851* (MEL).

49. ONAGRACEAE

Herbs, sometimes shrubs, rarely trees. Leaves alternate, opposite or whorled, usually simple; stipules, if present, caducous. Inflorescence paniculate, racemose or spicate or often flowers solitary in axils of reduced upper leaves. Flowers actinomorphic, usually bisexual, usually 4- or 5-merous; floral axis produced beyond the ovary. Sepals free or connate, valvate. Petals rarely absent. Stamens as many or usually twice as many as petals, usually in 2 whorls. Ovary inferior, rarely half-inferior, 2–5-locular; ovules axile or parietal, usually numerous; style terminal, simple. Fruit a capsule, rarely indehiscent or a berry. Seeds small.

A cosmopolitan family of c. 20 genera and 650 species, especially from western North America; 1 genus native and another introduced to the Islands.

G.Bentham, Onagrarieae, *Fl. Austral.* 3: 301–308 (1866); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Onagraceae, *Fl. Java* 1: 259–265 (1963); P.H.Raven, Onagraceae, *Fl. Males.* ser. I, 8: 98–113 (1977); A.C.Smith, Onagraceae, *Fl. Vit. Nova* 3: 378–381 (1985); J.Thompson, Onagraceae, *Fl. Australia* 18: 215–243 (1990).

ONAGRACEAE

KEY TO GENERA

Cauline leaves opposite (alternate in the flowering region); seeds with terminal tuft of silky hairs	**1. EPILOBIUM**
Cauline leaves alternate; seeds without tuft of hairs	**2. OENOTHERA**

1. EPILOBIUM

Epilobium L., *Sp. Pl.* 1: 347 (1753); *Gen. Pl.* 5th edn, 164 (1754); from the Greek *epi* (upon) and *lobos* (a pod), in allusion to the 'flower' inserted on top of the ovary.

Type: *E. hirsutum* L.

Annual or usually perennial herbs, erect or creeping, sometimes woody at base. Leaves opposite, becoming alternate near inflorescence, without stipules. Flowers solitary in axils of often leaf-like bracts, 4-merous. Petals white to pink or rose-purple, usually emarginate. Stamens 8 in 2 whorls, the outer filaments longer; anthers basifixed. Ovary inferior, 4-locular; ovules numerous; stigma clavate or 4-lobed. Fruit a slender, ±cylindrical capsule, dehiscing apically by 4 valves. Seeds with an often persistent terminal tuft of hairs.

A widespread, mainly temperate genus of c. 165 species; 1 species native on Lord Howe Is.

P.H. & T.E.Raven, The genus *Epilobium* (Onagraceae) in Australasia: a systematic and evolutionary study, *Bull. New Zealand Dept. Sci. Industr. Res.* 216: 1–321 (1976).

Epilobium billardierianum Sér. in A.P. de Candolle, *Prodr.* 3: 41 (1828)

subsp. **cinereum** (A.Rich.) Raven & Engelhorn, *New Zealand J. Bot.* 9: 349 (1971)

Epilobium cinereum A.Rich. in J.S.C.Dumont d'Urville, *Voy. Astrolabe,* 330 (1832). T: Bay of Islands, New Zealand, *A.P.Lesson*, holo: ?P *n.v.* The epithet is from the Latin *cinis* (ashes) meaning ashcoloured or ashen, in reference to the pale colour arising from the grey indumentum on the leaves.

Illustrations: P.H. & T.E.Raven, *op. cit.*, 120, fig. 50; H.R.Toelken in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 954, fig. 486B (1986); J.M.Dalby in G.J.Harden, *Fl. New South Wales* 2: 203 (1991).

Perennial herb; shoots decumbent. Leaves shortly petiolate; lamina narrowly elliptic to linear, 0.5–3 cm long, 0.2–0.7 cm broad, attenuate onto petiole, coarsely serrate, with 1–6 teeth on each side, blunt to acute, often with a small apiculum, glabrous to densely strigulose. Flowers erect in axils. Sepals lanceolate, 3–7 mm long, keeled, densely strigulose. Petals pink, 3.5–13.5 mm long, emarginate. Filaments of longer stamens 1.5–5 mm long, those of shorter stamens 1–4.5 mm long. Style 2.5–9 mm long; stigma clavate. Capsule 3–7.5 mm long, densely strigulose; fruiting pedicel 1.2–2 cm long. Fig. 44G–H.

Lord Howe Is. Apparently first recorded in 1963, on rocky ledges; it is therefore possible that this species has only recently arrived on the Island by means of its wind-borne seeds. This subspecies is native in eastern Australia and occasional in south-western Australia and New Zealand.

L.H.Is.: Goat House, *P.S.Green 1679* (A, K); N spur, Mt Gower, *A.N.Rodd 1784* (K, NSW).

2. OENOTHERA

Oenothera L., *Sp. Pl.* 1: 346 (1753); *Gen. Pl.* 5th edn, 163 (1754); an old Greek name of another plant which Linnaeus transferred to and used for this genus.

Type: *O. biennis* L.

Annual, biennial or perennial herbs, sometimes woody at base. Leaves alternate, often in a basal rosette, usually simple, rarely pinnate, usually serrate to dentate, without stipules. Inflorescence terminal, a leafy spike, raceme or corymb, or flowers solitary in axil of upper leaves. Flowers actinomorphic, 4-merous, often opening near sunset or sunrise, often

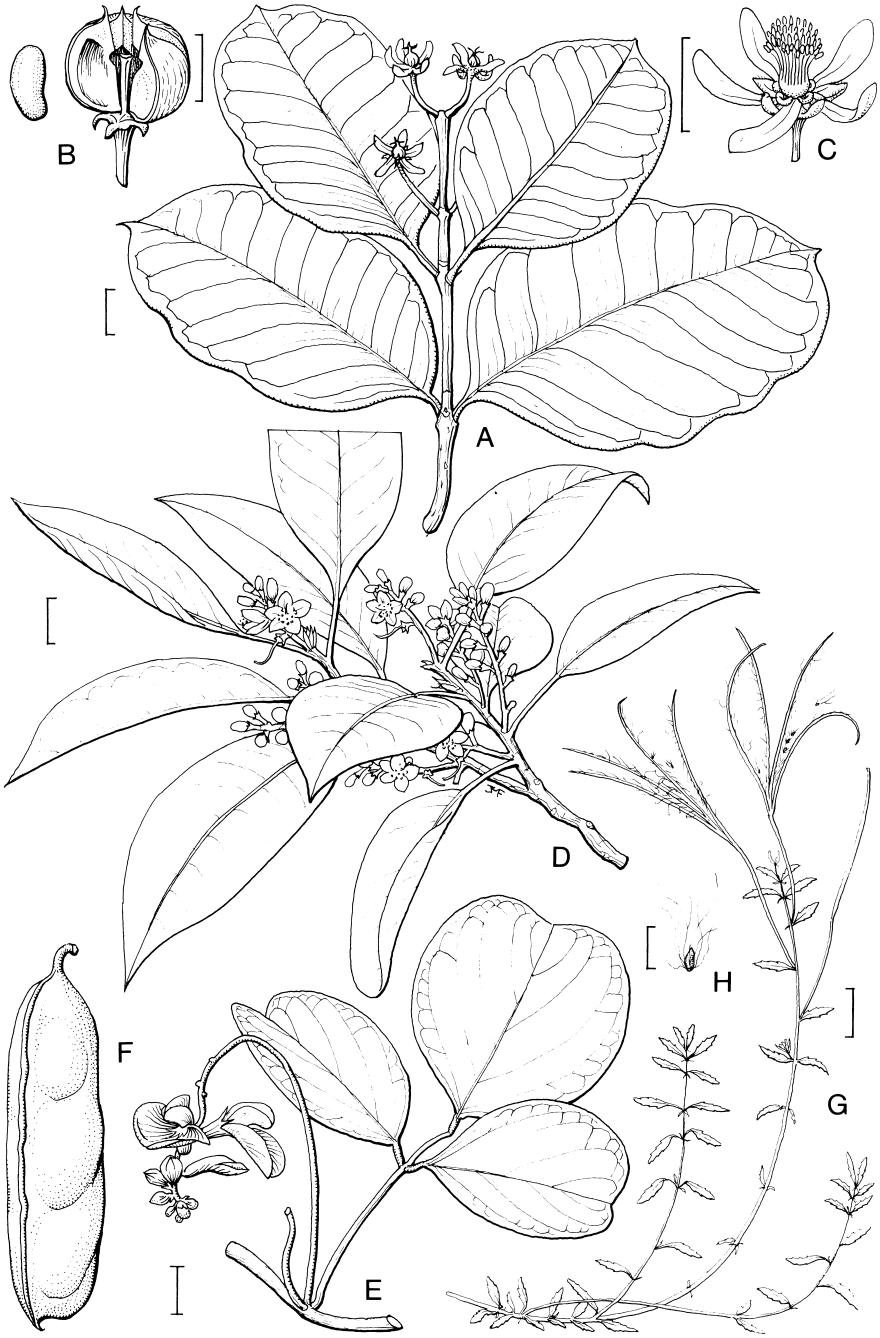

Figure 44. A–C, EUPHORBIACEAE: *Baloghia inophylla*. **A**, habit with female flowers (Phytologic Museum of Melbourne, K); **B**, fruit and seed (A.Rodd 1855, K); **C**, male flower (M.van Balgooy 1088, K). **D**, SYMPLOCACEAE: *Symplocos candelabrum*, habit (A.Rodd 1760). **E–F**, FABACEAE: *Canavalia rosea*. **E**, habit (Phytologic Museum of Melbourne, K); **F**, fruit (photograph). **G–H**, ONAGRACEAE: *Epilobium billardierianum* subsp. *cinereum*. **G**, habit; **H**, seed (**G–H**, A.Rodd 1784, K). Scale bars: **A–G** = 1 cm; **H** = 1 mm. Drawn by M.Fothergill.

scented; a cylindrical floral tube developed beyond ovary, caducous at anthesis. Sepals usually separating incompletely and bent to one side, mucronate. Petals usually broadly obovate, yellow, white or pink. Stamens 8; outer 4 often longer; anthers versatile. Ovary inferior, 4-locular; ovules numerous. Fruit an elongated capsule, usually dehiscing from apex.

A genus of c. 124 species, native in the New World, especially the temperate parts, but a number are widely naturalised, including 4 species on Norfolk Is. and another on Lord Howe Is.

1 Flowers yellow, sometimes becoming reddish with age; capsule ±sessile, cylindrical or ±obconical

2 Stems and leaves villous, shortly glandular or glabrous; capsules slightly broader in upper ½; growing in non-coastal habitats

3 Stems softly villous with numerous long and short hairs; floral tube 8–10 cm long **1. O. affinis**

3: Stems ±glabrous below to scattered-pilose above; floral tube 2–4.5 cm long **2. O. stricta**

2: Stems and leaves canescent-villous; capsule narrowly cylindrical, sometimes slightly curved; growing in coastal sands **3. O. drummondii**

1: Flowers white deepening to pink, or pink deepening to purplish red with age, sometimes with a yellow base; capsule obovoid-pyriform, narrowed at base, slightly 4-winged or 4-angled

4 Petals 2–3.5 cm long; stems, pedicels, ovary and capsules with long spreading hairs **4. O. tetraptera**

4: Petals 0.6–1 cm long; stems, pedicels, ovary and capsules pilose with curled hairs **5. O. rosea**

1. *Oenothera affinis Cambess. in A.F.C.P. de Saint-Hilaire, *Fl. Bras. Merid.* 2: 269 (1830)

T: Rio Grande do Sul, Brazil, *A.F.C.P. de Saint-Hilaire 2791-12*; holo: ?P *n.v.* The epithet means related to or similar to, in allusion to the affinity of this species to *O. mollissima* L.

[*Oenothera biennis auct. non* L.; J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 764 (1904)]

Illustrations: H.R.Toelken in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 954, fig. 486J (1986); J.M.Dalby in G.J.Harden, *Fl. New South Wales* 2: 207 (1991).

Annual herb to c. 1 m tall, villous throughout with long and short simple and glandular hairs. Leaves all cauline; petiole indistinct; lamina narrowly lanceolate, (3–) 4–10 cm long, 0.4–1 cm broad, attenuate, sparsely and shortly serrate, acute, mucronulate. Flowers solitary, sessile in upper leaf axils. Floral tube 8–10 cm long. Sepals 1.5–4 cm long, free or irregularly and slightly basally connate. Petals 2–4 cm long, slightly emarginate, yellow. Style held above anthers at anthesis; stigma lobes 4, slender, c. 5 mm long. Capsule ±sessile, cylindrical or ±obconical, 2–3 cm long, somewhat broader in upper third.

Norfolk Is. Naturalised in disturbed habitats. A native of warm temperate South America.

N.Is.: *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW); *s. loc.*, 1939, *J.D.McComish* (NSW).

2. *Oenothera stricta Ledeb. ex Link, *Enum. Hort. Berol. Alt.* 1: 377 (1821)

subsp. **stricta**

T: cultivated; holo: B, presumed destroyed; neo: MO *n.v.*, *fide* W.Dietrich, *Ann. Missouri Bot. Gard.* 64: 538 (1977). The epithet is from the Latin *strictus* (straight), in allusion to the plant's upright habit; in the original publication it was erroneously spelt *striata*.

Illustrations: H.R.Toelken in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 954, fig. 486I (1986); B.A.Auld & R.W.Medd, *Weeds* 193 (1987); J.M.Dalby in G.J.Harden, *Fl. New South Wales* 2: 207, t. 15 (1991).

Annual or biennial herb. Stems ±glabrous below, scattered pilose and with short glandular hairs above. Leaves in a basal rosette and cauline, sessile, narrowly elliptic to narrowly oblanceolate, 3–10 cm long (rosette leaves sometimes longer), 0.5–1 cm broad, attenuate to subcordate in cauline leaves, sparsely denticulate-undulate, acute. Flowers solitary, axillary, sessile. Floral tube 2–4.5 cm long. Sepals 1.5–3 cm long, free. Petals 2.5–3 cm long, truncate to slightly emarginate, yellow, ageing to orange-red. Stigma lobes 4, c. 5 mm long, level with anthers at anthesis. Capsule ±sessile, narrowly obconical, 2–3 cm long.

Norfolk Is. Naturalised in disturbed habitats. A native of temperate South America, now widely naturalised.

N.Is.: *s. loc.*, 1939, *J.D.McComish* (NSW).

3. *Oenothera drummondii Hook., *Bot. Mag.* 61: t. 3361 (1834)

T: cultivated in Glasgow Botanic Garden, Scotland, from seed collected in Texas by *T.Drummond*; holo: K. Named after Thomas Drummond (c. 1790–1835), a Scotsman who explored and collected plants in North America.

Illustrations: B.A.Auld & R.W.Medd, *Weeds* 193 (1987); C.A.Brown, *Wild Fl. Louisiana* 120 (1972); J.M.Dalby in G.J.Harden, *Fl. New South Wales* 2: 206 (1991).

Perennial herb. Stems ±woody at base, sprawling, to c. 0.5 m tall, from a rosette, densely canescent-villous. Basal leaves very shortly petiolate, upper sessile; lamina obovate to oblanceolate, 1.5–7 cm long, 0.8–1.5 cm broad, attenuate, entire to remotely obscurely toothed, or with large curved teeth in lower half, shortly acuminate to obtuse, canescent. Flowers solitary, axillary. Floral tube 2.5–4.5 cm long. Sepals 2–3 cm long, free, densely villous. Petals 2.5–4 cm long, yellow. Stigma held above anthers at anthesis; lobes 4, 3–5 mm long. Capsule sessile, narrowly cylindrical, 2.5–5 cm long, sometimes slightly curved.

Lord Howe Is. Naturalised and found in coastal sand, this is a native of North America from South Carolina to northern Mexico.

L.H.Is.: Lagoon Beach, S of Signal Point, *J.Pickard 2686* (NSW); Kings Beach, *A.N.Rodd 1440* (NSW); near Windy Point, 1969, *A.D.Mears* (NSW).

4. *Oenothera tetraptera Cav., *Icon.* 3: 40, t. 279 (1795/6)

T: cultivated at Madrid from Mexican seed; holo: ?MA *n.v.* The epithet comes from the Greek *tetra* (four) and *pteros* (winged), referring to the winged capsule.

Illustrations: A.J.Cavanilles, *Icon.* 3: t. 279 (1795/6); W.Curtis, *Bot. Mag.* 13: t. 468 (1800); J.M.Dalby in G.J.Harden, *Fl. New South Wales* 2: 205 (1991).

Perennial herb, rhizomatous, decumbent to ascending, to c. 0.5 m tall, becoming woody. Stems with long spreading hairs. Rosette leaves petiolate, not persistent; upper leaves sessile; lamina narrowly oblanceolate to elliptic, 3–10 cm long, 0.8–3 cm broad, attenuate, entire to sinuate-pinnatifid, especially in lower half, obtuse to acute. Flowers solitary, axillary, sessile. Floral tube c. 1 cm long. Sepals 2.5–3 cm long, ±coherent. Petals 2–3.5 cm long, white, darkening to pink with age. Ovary with long spreading hairs; stigma lobes 4, 4–7 mm long, held above the anthers. Capsules obovoid-pyriform, narrowed into a ribbed peduncle, 1–1.5 cm long, shallowly 4-winged, with long, spreading hairs.

Norfolk Is. A native of North and Central America, from south-western Texas to Mexico, which has presumably escaped from garden cultivation.

N.Is.: *s. loc.*, 1899, *I.Robinson* (NSW); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW); *s. loc.*, 1937, *J.D.McComish* (NSW).

5. *Oenothera rosea L'Hér. ex Aiton, *Hort. Kew.* 2: 3 (1789)

T: cultivated; seed from Peru; holo: *L'Héritier, Stirp. Nov.* 2, t. 6, unpublished, ?BM *n.v.* So named from the colour of the petals.

Illustrations: W.Curtis, *Bot. Mag.* 10: t. 347 (1796); W.Fawcett & A.B.Rendle, *Fl. Jamaica* 5: 411, fig. 148 (1926).

Biennial or short-lived perennial. Stems several, ±erect from a woody taproot, to 50 cm tall, pilose with curled hairs. Leaves cauline or basal, sessile, narrowly elliptic or lanceolate to narrowly oblanceolate, 1.5–6 cm long, 0.7–2 cm broad, narrowed at base, denticulate to subentire, sometimes irregularly pinnatifid, acute. Flowers solitary in leafy pseudoracemes, distant; pedicels slender, 1–2 cm long. Floral tube 3–6 mm long. Sepals 5–8 mm long, variably coherent. Petals 6–10 mm long, rose-pink with a yellow base, ageing to bright reddish purple. Ovary pilose with curled hairs; style exserted; stigma lobes 1.5–2 mm long, level with anthers at anthesis. Capsule obovoid-pyriform, 8–10 mm long, ridged to slightly winged, curled-pilose.

Norfolk Is. Native from southern U.S.A. to Bolivia, but now a widespread weed of roadsides, open ground, *etc.*, also among ruins of buildings on the Island.

N.Is.: Kingston, buildings E of the church, *R.O.Gardner 5767* (AK).

50. MYRTACEAE

Evergreen trees or shrubs. Leaves opposite or alternate, simple, ±coriaceous, often dotted with immersed glands, often with a continuous submarginal vein; stipules absent or vestigial. Inflorescence terminal, axillary or cauliflorous, basically paniculate. Flowers usually actinomorphic, bisexual or rarely unisexual. Hypanthium developed beyond ovary or perigynous. Sepals (3–) 4 or 5 (–6), imbricate or variously connate to calyptrate. Petals (3–) 4 or 5 (–6), imbricate or sometimes calyptrate, rarely absent. Sepals and petals sometimes fused together into an operculum. Stamens usually numerous, rarely 5 or 10; filaments free or connate basally in bundles opposite petals; anthers basifixed or versatile, dehiscing by pores or slits. Ovary superior to inferior, (1–) 2–12 (–16)-locular, each with 1–several ovules; style simple with a capitate stigma. Fruit usually a capsule or berry.

A mainly tropical and Southern Hemisphere family of c. 120 genera and over 3000 species. Seven genera (native and introduced) occur on the Islands. In addition, a number of representatives have been planted either as experimental timber trees (*e.g. Syncarpia glomulifera* (Sm.) Nied.), ornamentals (*e.g. Callistemon citrinus* (Curtis) Skeels or *Myrtus communis* L.) or possible fruit trees (*e.g. Myrrhinum atropurpureum* Schott or *Syzygium jambos* (L.) Alston, Rose Apple). All these plants were recorded as introduced by J.H.Maiden (*Proc. Linn. Soc. New South Wales* 28: 747, 750, 758, 1904), but none of them appear to have become naturalised.

G.Bentham, Myrtaceae, *Fl. Austral.* 3: 1–289 (1866); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Myrtaceae, *Fl. Java* 1: 333–351 (1963); B.Molesworth Allen, *Malayan Fruits* 108–127 (1967); A.C.Smith, Myrtaceae, *Fl. Vit. Nova* 3: 289–377 (1985).

KEY TO GENERA

1 Leaves alternate (sometimes opposite in juvenile shoots)

2 Leaves 2 cm long or less; shrubs or small trees

3 Leaves narrowly elliptic to narrowly oblanceolate, 1.5–3 mm broad; flowers on short side shoots **1. LEPTOSPERMUM**

3: Leaves linear-elliptic, 1–1.5 mm broad; flowers in cylindrical spikes, with axis continuing leafy growth after anthesis **2. MELALEUCA**

2: Leaves 10 cm long or more; tall trees **3. EUCALYPTUS**

1: Leaves opposite

4 Fruit a dry capsule; flowers red, rarely yellow **4. METROSIDEROS**

4: Fruit fleshy; flowers white

5 Shrub or small tree to 6 m; base of trunk without buttresses; inflorescence axillary

6 Fruit with several seeds; petioles 4–15 mm long **5. PSIDIUM**

6: Fruit with 1 seed; petioles 2–4 mm long **7. EUGENIA**

5: Tall tree to 20 m; base of trunk buttressed; inflorescence a terminal panicle **6. CLEISTOCALYX**

1. LEPTOSPERMUM

Leptospermum J.R.Forst. & G.Forst., *Char. Gen. Pl.* 71, t. 36 (1776); from the Greek *leptos* (slender) and *sperma* (seed), alluding to the narrow seeds in the first species described.

Type: *L. scoparium* J.R.Forst. & G.Forst.

Shrubs or small trees. Leaves alternate, simple. Inflorescences on short, axillary side shoots. Flowers 1–3. Hypanthium broad-based, adnate to ovary. Sepals 5, imbricate, persistent or caducous. Petals 5, orbicular, free, spreading, caducous, white, pink or red. Stamens numerous, free, shorter than petals, attached along rim of hypanthium in 5 antipetalous groups; anther connective with a globular gland. Ovary (2–) 3–5 (–many)-locular; ovules few to many, axile. Capsule usually ±woody, opening by apical valves. Seeds numerous, very small, slender.

A genus of c. 40 species in Malesia, New Zealand and especially in Australia; 1 endemic subspecies on Lord Howe Is. The members are often called Tea Tree, and the genus contains the frequently cultivated Manuka, *L. scoparium*.

J.Thompson, A Revision of the Genus *Leptospermum* (Myrtaceae), *Telopea* 3: 301–448 (1989).

Leptospermum polygalifolium subsp. **howense** Joy Thomps., *Telopea* 3: 401 (1989)

T: Mt Gower, a little above Get Up Place, Lord Howe Island, 27 Nov. 1980, *A.N.Rodd 3589*; holo: NSW *n.v., fide* J.Thompson, *loc. cit*. So named after its type locality, Lord Howe Is.

Leptospermum sp., C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 3 (1870).

[*Leptospermum flavescens auct. non* Sm.: F.J.H. von Mueller, *Fragm.* 9: 77 (1875); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst*. 49: 145 (1917); A.N.Rodd & J.Pickard, *Cunninghamia* 1: 273 (1983)]

Illustration: I.Hutton, *Lord Howe Is.* 133 (1986).

Bushy shrub or small spreading tree to 5 (–10) m. Leaves narrowly elliptic to narrowly oblanceolate, (3–) 5–8 (–10) mm long, (1.5–) 2–2.5 (–3) mm broad, attenuate onto a short petiole, apically acute often with slightly recurved blunt point, coriaceous, glabrous, with conspicuous brown glandular dots. Flowers solitary. Hypanthium c. 4 mm deep. Sepals c. 2 mm long. Petals broadly obovate, c. 5 mm long, white. Capsule 5–7 mm diam., domed, opening with 5 triangular valves. *Tea Tree*. Figs 30, 45A–B.

Lord Howe Is. An endemic subspecies characteristic of the Island's mountain tops, in evergreen closed forest or scrub, sometimes at lower altitudes. Flowers mid Nov.–Jan.

L.H.Is.: Boat Harbour track, *J.Pickard 3540* (NSW); Lower Rd, *C.Moore 53* (K, MEL); summit ridge of Mt Lidgbird, *J.Pickard* 1452 (NSW); summit of Mt Gower, *J.P.Fullagar 53* (MEL); *loc. id., P.S.Green 1658* (A, K).

Five other subspecies occur in south-eastern Qld and north-eastern N.S.W., Australia.

2. MELALEUCA

Melaleuca L., *Syst. Nat.* 12th edn, 2: 509 (1767); *Mant. Pl.* 14, 105 (1767); from the Greek *melas* (black) and *leukos* (white), apparently in allusion to the blackened trunks and white branches of the first species described.

Type: *M. leucadendra* (L.) L.

Trees or shrubs, sometimes with papery bark. Leaves opposite or alternate, entire, flat, compressed or terete. Inflorescence a cylindrical spike or head, axis often continuing in vegetative growth. Flowers usually bisexual, 1–3 together, bracteate. Hypanthium cup-like, adnate to ovary at its base, becoming accrescent and ±woody after anthesis. Sepals 5, small, triangular to rounded. Petals 5, ±orbicular. Stamens 15–many, united into 5 antipetalous bundles, longer than petals, united filaments usually flattened. Ovary inferior, 3-locular; ovules numerous. Fruit a capsule, embedded in usually woody hypanthium. Seeds numerous, linear.

A genus of c. 150 species distributed from SE Asia to New Caledonia and especially Australia; 1 species endemic on Lord Howe Is.

B.A.Barlow & K.J.Cowley, Contributions to a revision of *Melaleuca* (Myrtaceae): 4–6, *Austral. Syst. Bot.* 1: 95–126 (1988).

Melaleuca howeana Cheel, *J. & Proc. Roy. Soc. New South Wales* 58: 192 (1924)

T: Lord Howe Island, May 1920, *J.L.Boorman s.n.*; lecto: NSW *n.v.*, *fide* B.A.Barlow & K.J.Cowley, *op. cit.* 123. So named after the island whence it was described.

Melaleuca sp., C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 3 (1870).

[*Melaleuca ericifolia auct. non* Sm.: G.Bentham, *Fl. Austral.* 3: 159 (1866), *p.p.*; F.J.H. von Mueller, *Fragm.* 9: 77 (1875); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 145 (1917)]

Illustrations: J.Pickard in H.F.Recher & S.S.Clark, (eds), *Environm. Survey Lord Howe Is.* 35 (1974); I.Hutton, *Lord Howe Is.* 133 (1986).

Dense low shrub or bush to 3 m, with flaky bark. Leaves alternate, spirally arranged; lamina linear-elliptic, 4–9 mm long, 1–1.5 mm broad, attenuate into a short petiole, blunt at apex, dotted with translucent oil glands when fresh. Inflorescence cylindrical-spicate, c. 1–2 cm long at anthesis, appearing terminal but axis continuing vegetative growth, 15–25-flowered. Hypanthium ±cylindrical, c. 2 mm long. Sepals 0.5 mm long. Petals broadly ovate, 2 mm long, whitish. Stamens 6–10 per bundle, 3–4 mm long. Capsule woody, cup-shaped, c. 4 mm long, 3 mm diam. *Tea Tree*. Fig. 28.

Lord Howe Is. Endemic; common in exposed sites, from the seashore to ridges and cliffs, sometimes forming pure stands. It is said to grow on Balls Pyramid. Flowers mid Sep.–Dec.

L.H.Is.: E end of North Bay, *R.D.Hoogland 2624* (BRI, CANB); North Bay, *P.S.Green 1585* (A, K); lagoon shore between public jetty and Hunter Bay, *L.A.S.Johnson & A.N.Rodd 1231* (K, NSW); near Blinky Beach, *L.A.S.Johnson & A.N.Rodd 1291* (NSW); Roach Is., *J.C.Game 69/274d* (K).

Related to the coastal Australian *M. ericifolia* Sm.

3. EUCALYPTUS

Eucalyptus L'Hér., *Sert. Angl.* 18 (1789); *ibid.*, t. 20 (1792); from the Greek *eu* (well) and *kalypto* (to cover, with a lid), in allusion to the united calyx and petals which form an operculum over the stamens in bud.

Type: *E. obliqua* L'Hér.

Trees or shrubs. Bark variously deciduous (smooth-barked) or scaly, fibrous, or hard and furrowed (rough-barked). Leaves usually of two main types, juvenile and adult, with intermediates; adult leaves usually alternate, ±lanceolate, often falcate, coriaceous, glabrous, with distinct midrib. Inflorescence axillary or terminal, umbellate or paniculate. Calyx and

corolla usually fused together forming an operculum over hypanthium, shed at anthesis. Stamens numerous, usually in several series; anther connective usually bearing a gland. Ovary inferior or semi-inferior, 2–7-locular; ovules many. Fruit a capsule enclosed by woody hypanthium. Seeds usually many, variously shaped.

A genus of over 500 species, the majority Australian but a few extending into Malesia. Many species have been introduced throughout the world and are cultivated as a source of timber or firewood. Several species have been introduced by foresters on Norfolk Is., but only the 2 described below appear to be reproducing themselves without man's aid and thus naturalised.

G.M.Chippendale, *Eucalyptus*, in *Fl. Australia* 19: 1–448, 457–493, 495–507 (1988).

Inflorescence umbellate; flowers usually sessile; operculum 3–5 mm long	**1. E. botryoides**
Inflorescence paniculate; pedicels 1–5 mm long; operculum 6–12 mm long	**2. E. fibrosa**

1. *Eucalyptus botryoides Sm., *Trans. Linn. Soc. London* 3: 286 (1797)

T: New South Wales, 1794, *J.White*; holo: LINN *n.v.*, photo seen (IDC microfiche 5073. 1876/6). The epithet comes from the Greek *botrys* (a bunch of grapes) and the suffix *-oides* (indicating resemblance), alluding to the umbels of flowers.

Illustrations: D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 367, figs 1–9 (1984); G.M.Chippendale, *Fl. Australia* 19: 199, fig. 64I–J (1988); K.D.Hill in G.J.Harden, *Fl. New South Wales* 2: 92, fig. 16 (1991).

Tree to 40 m. Bark fibrous or flaky-fibrous, brown or grey-brown, smooth and whitish on smaller branches. Juvenile leaves ovate. Adult leaves broadly lanceolate; lamina 10–16 cm long, 2.5–4 cm broad, long-acute to acuminate; lateral veins numerous, visible, 40°–60° to midrib; submarginal vein to 2 mm from margin. Inflorescence axillary, umbellate, 7–11-flowered; peduncle broadly flattened, 7–15 mm long; pedicels usually absent, sometimes to 3 mm long. Buds clavate or ovoid; operculum conical to hemispherical, 3–5 mm long. Hypanthium cylindrical or obconical, 4–6 mm long. Fruit cylindrical to truncate-ovoid, 7–12 mm long; valves 3 or 4, level with disc or included.

Norfolk Is. A native of Australia (southern N.S.W., eastern Vic.), planted as a timber tree but now 'escaping' with the appearance of self-sown seedlings.

N.Is.: vicinity of Mt Bates, *G.Uhe 1217* (K).

On the Island this species has sometimes been incorrectly referred to as *E. robusta* Sm., a related and similar species.

2. *Eucalyptus fibrosa F.Muell., *J. Linn. Soc., Bot.* 3: 87 (1859)

T: Brisbane River, Queensland, *F.J.H. von Mueller*; holo: ?MEL *n.v.*; iso: K. The epithet alludes to the fibrous bark.

Illustrations: D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 523, figs 1–9 (1984); G.M.Chippendale, *Fl. Australia* 19: 406, fig. 104I–J (1988); K.D.Hill in G.J.Harden, *Fl. New South Wales* 2: 114, fig. 108 (1991).

Tree to 35 m. Bark rough, dark-coloured. Juvenile leaves orbicular to ovate. Adult leaves narrowly to broadly lanceolate; lamina 14–18 cm long, 3–5 cm broad, acuminate; lateral veins just visible, 35°–45° to midrib; submarginal vein up to 1 mm from margin. Inflorescence terminal, paniculate, with some axillary umbels 7–11-flowered; peduncles terete to flattened, 6–20 mm long; pedicels 1–7 mm long. Buds fusiform; operculum conical, 6–10 mm long. Hypanthium obconical, 4–6 mm long. Fruit obconical to pyriform, 6–10 mm long; valves 4 or 5, ±level with disc or exserted.

Norfolk Is. Introduced from Australia (Qld, N.S.W.), and now reproducing itself very locally.

N.Is.: corner of Anson Bay Rd and Mission Rd, *R.O.Gardner 5883* (AK).

4. METROSIDEROS

Metrosideros Banks ex Gaertn., *Fruct. Sem. Pl.* 1: 170 (1788); from the Greek *meta* (core, heart-wood) and *sideros* (iron), in allusion to the hardness of the wood.

Type: *M. spectabilis* Sol. ex Gaertn.

Trees, shrubs or lianes, sometimes epiphytic, often with bud scales. Leaves opposite. Inflorescence axillary or terminal, pedunculate, cymose, often compound, sometimes reduced to a single flower. Hypanthium extending on top of ovary. Sepals 5, equal, free. Petals 5, oblong to orbicular, red, pink or white, rarely yellow, often caducous. Stamens 3 or more times as many as petals, usually in a single series, free. Ovary semi-inferior to ±superior, usually 3-locular; ovules numerous, axile. Fruit a capsule, sometimes with development of tissue between, and separating, style base and placentas. Seeds linear or filiform, many infertile.

A genus of c. 50 species, from the Bonin Is. and Philippines south through Melanesia to New Zealand, and west to Hawai'i and the Tuamotus. Two species endemic on Lord Howe Is. and 1 naturalised on Norfolk Is. In addition to the species described below, *M. excelsa* Sol. ex Gaertn., the Pohutukawa of New Zealand, is cultivated on both Islands.

1 Leaves with lateral veins very close-set, 0.3–0.5 mm apart, without intermediate reticulation; leaf apex very shortly and abruptly acuminate; margins flat (L.H.Is.) **1. M. nervulosa**

1: Leaves with lateral veins 1–3 mm apart with intermediate reticulation; leaf apex acute to rounded; margins slightly revolute

2 Young stems and leaves sparsely tomentose or glabrous; leaf apex acute, sometimes slightly acuminate; submarginal vein evident (L.H.Is.) **2. M. sclerocarpa**

2: Young stems and leaves persistently pubescent (especially below); leaf apex rounded to blunt; submarginal vein obscure (N.Is.) **3. M kermadecensis**

1. Metrosideros nervulosa C.Moore & F.Muell. in F.J.H. von Mueller, *Fragm.* 8: 15 (1873)

T: Gower and Lidgbird Mts., Lord Howe Island, *J.P.Fullagar* & *Lind*; syn: MEL. Epithet is Latin for full of nerves, in reference to the numerous, close-set veins in the leaves.

Illustrations: A.N.Rodd in H.F.Recher & S.S.Clark (eds), *Environm. Survey Lord Howe Is.* 24 (1974); I.Hutton, *Lord Howe Is.* frontispiece, 133 (1986).

Shrub or small tree to 8 m. Young stems and leaves floccose-villose, becoming glabrous. Leaves coriaceous, flat; lamina broadly ovate to suborbicular, 2–3.5 cm long, 1.4–2.7 cm broad, rounded to cordate at base, very shortly and abruptly acuminate at apex; lateral veins evident, close-set, 0.3–0.5 mm apart, without intermediate reticulate veins. Inflorescence cymose-corymbose, 9–12-flowered; axes and surface of hypanthia densely whitish villose. Hypanthium 4–5 mm long. Sepals triangular, 3–4 mm long, persistent. Petals orbicular to spathulate, 3–5 mm long. Filaments 17–23 mm long, deep red, occasionally yellow. Fruit 6–8 mm long; valves included or level with hypanthium rim. *Mountain Rose*. Figs 3, 45E.

Lord Howe Is. A distinctive endemic, occurring from c. 400 m to the tops of the mountains, more rarely at a lower altitude. Flowers end of Oct.–Jan.

L.H.Is.: The Goat House, *R.D.Hoogland 8768* (CANB, NSW); side of Mt Lidgbird, *C.Moore 58* (K, MEL); Erskine Valley, *A.C.Beauglehole 6020* (CANB); Mt Gower summit, *M.D.Crisp 4543* & *I.R.H.Telford* (CBG); *loc. id.*, P.S.Green 1610 (K).

2. Metrosideros sclerocarpa J.W.Dawson, *Kew Bull.* 45: 244 (1990)

T: Lord Howe Island, *L.A.S.Johnson & A.N.Rodd 1308*; holo: NSW *n.v.*, *fide* J.W.Dawson, *loc. cit.*; iso: K. The epithet comes from the Greek *scleros* (hard) and *karpos* (fruit), in allusion to the woody fruit.

Metrosideros sp. aff. *collina* (J.R.Forst. & G.Forst.) A.Gray; A.N.Rodd & J.Pickard, *Cunninghamia* 1: 273 (1983).

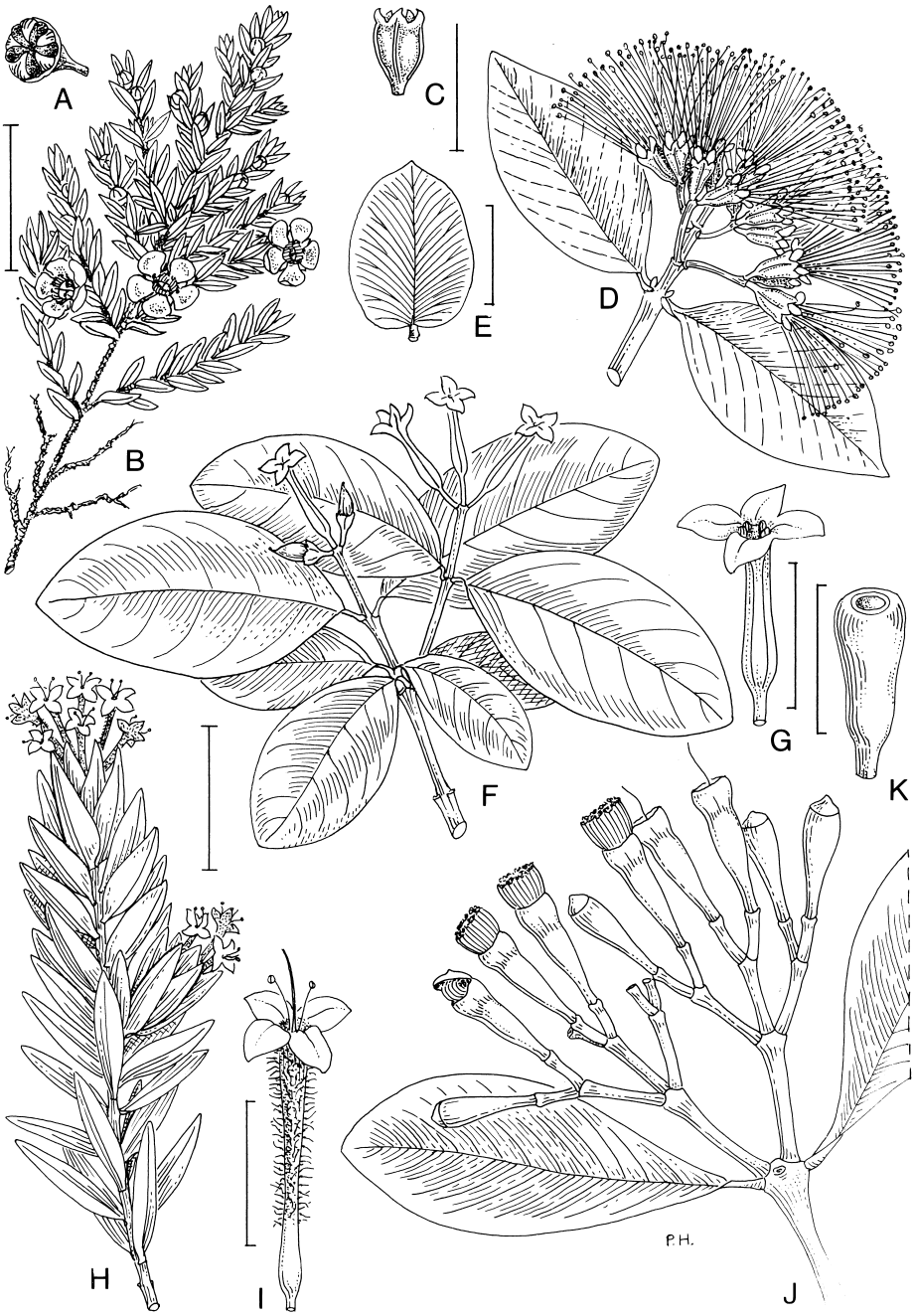

Figure 45. A–E, MYRTACEAE. **A–B**, *Leptospermum polygalifolium* subsp. *howense*. **A**, fruit (C.Moore 40, K); **B**, habit (J.Game 69/344, K). **C–D**, *Metrosideros sclerocarpa*. **C**, fruit; **D**, habit (**C–D**, C.Moore 38, K). **E**, *Metrosideros nervulosa*, leaf (C.Moore 87, K). **F–I**, THYMELAEACEAE. **F–G**, *Wikstroemia australis*. **F**, habit; **G**, flower (**F–G**, G.Uhe 1222, K). **H–I**, *Pimelea congesta*. **H**, habit; **I**, flower (**H–I**, P.Green 1935, K). **J–K**, MYRTACEAE: *Cleistocalyx fullagarii*. **J**, habit; **K**, fruit (**J–K**, C.Moore 37, K). Scale bars: **A–F**, **H**, **J**, **K** = 2 cm; **G**, **I** = 1 cm. Drawn by P.Halliday.

[*Metrosideros polymorpha auct. non* Gaudich.: F.J.H. von Mueller, *Fragm.* 8: 14 (1873); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 236 (1896); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 129 (1898)]

[*Metrosideros villosa auct. non* Sm.: W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 145 (1917); S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 168 (1981)]

Illustration: I.Hutton, *Lord Howe Is.* 134 (1986), as *Metrosideros* sp.

Small trees to 10 m. Young stems and leaves glabrous, or sparsely tomentose and becoming almost glabrous. Leaves coriaceous; lamina ovate to elliptic, 3–6.5 cm long, 1.7–3.2 cm broad, attenuate at base, marginally slightly revolute, acute, sometimes slightly acuminate; lateral veins distinct, c. 1–2 mm apart, with intermediate reticulate veins. Inflorescence cymose-corymbose, 6–12-flowered; axes and surface of hypanthia finely whitish appressed-tomentose. Hypanthium 4.5–6 mm long. Sepals triangular, 2.5 mm long, persistent. Petals obovate, 3.5–4 mm long. Filaments 15–20 mm long, bright red. Fruit 6–7 mm long, appressed pubescent; valves slightly included or level with hypanthium rim. *Mountain Rose*. Fig. 45C–D.

Lord Howe Is. Endemic; mostly near watercourses in the area of the southern mountains, below c. 300 m altitude. Flowers Dec.–Feb.

L.H.Is.: Rocky Run, *L.A.S.Johnson & A.N.Rodd 1308* (K, NSW); Erskine Valley, *A.C.Beauglehole 6019* (CANB); *loc. id., P.S.Green 2366* (K); *loc. id., M.D.Crisp 4536 & I.R.H.Telford* (CBG); *s. loc., C.Moore 38* (K).

The species' nearest affinities are said to be with *M. umbellata* Cav. of New Zealand.

3. *Metrosideros kermadecensis W.R.B.Oliv., *Trans. & Proc. New Zealand Inst.* 59: 422 (1928)

T: Kermadec Is., *J.MacGillivray*; syn: ?K; *T.F.Cheeseman*; syn: AK *n.v.*, ?K; (based on *M. polymorpha sensu* J.D.Hooker, and *M. villosa sensu* T.Kirk). Epithet refers to the type locality.

[*Metrosideros polymorpha auct. non* Gaudich.: J.D.Hooker, *Handb. N. Zeal. Fl.* 73 (1867)]

[*Metrosideros villosa auct. non* Sm.: T.Kirk, *Stud. Fl. New Zealand* 163 (1899)]

Illustration: W.R.Sykes, *Kermadec Is. Fl.* 120, fig. 32 (1977).

Shrub or tree to 20 m or more. Young stems and leaves persistently pubescent. Leaves coriaceous; lamina broadly elliptic to ovate, 2–3.5 cm long, 1.3–2.3 cm broad, rounded to attenuate at base, marginally slightly revolute, rounded to blunt at apex; lateral veins 2–3 mm apart, with intermediate reticulate veins. Inflorescence cymose-corymbose, 9–30-flowered; axes and surface of hypanthia densely white villose. Hypanthium 3–4 mm long. Sepals triangular, 2 mm long, persistent. Petals oblong-ovate, 3–4 mm long. Filaments 12–20 mm long, deep red. Fruit c. 6 mm long; valves exserted.

Norfolk Is. A species endemic to the Kermadec Is. which is prized as an ornamental and has escaped from cultivation. It is also grown on Lord Howe Is., but as yet appears not to have become naturalised.

N.Is.: Ball Bay, *W.R.Sykes NI 579* (CHR).

5. PSIDIUM

Psidium L., *Sp. Pl.* 1: 470 (1753); *Gen. Pl.* 5th edn, 211 (1754); derived from the Greek name for the Pomegranate, *side*, and applied to this genus, which also has edible fruit with many seeds.

Type: *P. guajava* L.

Shrubs or small trees. Leaves opposite. Inflorescence axillary, of 1–3 (–7)-flowered cymes. Hypanthium campanulate or pyriform, prolonged above ovary. Sepals 4 or 5, connate in bud, distinct at anthesis or splitting irregularly down to ovary. Petals 4 or 5, free, spreading, caducous, often showy. Stamens numerous, free, shorter than petals. Ovary inferior, (2–) 3 or 4 (–7)-locular; ovules numerous. Fruit a large berry, usually crowned with persistent sepals.

Seeds usually numerous, bony, embedded in a juicy pulp.

A genus of 100 or more species from tropical and subtropical America. The following 2 species, naturalised on both Islands, have been widely grown for their edible fruit and become equally widely naturalised.

Leaf base rounded; lamina 6–14 cm long with 10–14 lateral veins on each side of midrib; fruit 3–10 cm long; yellow **1. P. guajava**

Leaf base cuneate; lamina 4–8 cm long with 6 or 7 lateral veins on each side of midrib; fruit 2.5–4 cm long; red or yellow **2. P. cattleianum**

1. *Psidium guajava L., *Sp. Pl.* 1: 470 (1753)

T: Herb. Clifford: 184, *Psidium* No 1; lecto: BM *fide* C.E.Jarvis *et al.*, *Regnum Veg.* 127: 79 (1993). The epithet is based on the native West Indian name *guayaba* for the fruit of this plant.

Illustrations: B.E.Nicholson *et al.*, *Oxford Book Food Pl.* 99, t. 4 (1969); D.M.Alexander *et al.*, *Some Tree Fruits for Tropical Australia* 22 (1983); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 966, t. 136 (1990).

Shrub or small tree to 3 m or more. Young shoots 4-angled, ±appressed or spreading pilose. Leaves with petiole 5–10 mm long; lamina elliptic to elliptic-oblong, (6–) 8–10 (–14) cm long, (3.5–) 4.5–5.5 (–6) cm broad, rounded at base, entire, obtuse to rounded at apex, ±coriaceous, appressed-pilose when young (especially below), becoming glabrous (especially above), dotted with numerous glands; lateral veins prominent, 10–14 on each side of midrib, impressed above, raised below, Flowers usually solitary; pedicel 1–1.5 cm long. Calyx 7–10 mm long, pubescent, splitting irregularly. Petals elliptic, 10–20 mm long, white. Fruit globose to pear-shaped, 3–10 cm long, yellow; flesh pink or yellowish, sweet. *Guava, Yellow Guava*.

Norfolk Is., Lord Howe Is. A native of tropical America, including the West Indies; introduced (on Norfolk Is. as early as 1788) as a fruit tree and now naturalised.

N.Is.: Steels Point area, *M.Lazarides 8025* (CANB, K); c. 1.6 km NE of Bloody Bridge, *G.Uhe 1115* (K). **L.H.Is.:** N of Hospital, *A.C.Beauglehole 5854* (NSW).

Spread by birds or cattle; potentially a serious weed, to judge by some other countries where it is naturalised, but not yet as serious on the Islands as *P. cattleianum*.

2. *Psidium cattleianum Sabine, *Trans. Hort. Soc. London* 4: 317, t. 11 (1822)

T: cultivated from seed originally from China; no specimen kept. Named after William Cattley (?–1832) who first fruited this species in cultivation in Britain, and provided the specimen upon which the first description was based.

Shrub or small tree to 10 m. Young shoots rounded, glabrous or puberulous. Leaves dark green, glossy; petiole 4–15 mm long; lamina broadly oblanceolate to obovate, 4–7 (–10) cm long, 2.5–4 (–4.5) cm broad, cuneate at base, marginally glabrous, or ciliolate when young, becoming glabrous, rounded and very shortly acuminate at apex, dotted with numerous glands below; lateral veins 6 or 7 on each side of midrib, raised-reticulate above and below when dried. Flowers usually solitary; pedicels 3–7 mm long. Sepals 3–4 mm long, glabrous, gland-dotted. Petals obovate-elliptic, c. 5 mm long, slightly concave, white. Fruit ±globose, 2.5–3.5 cm long, purplish red, rarely yellow; flesh white, sweet.

Petiole 4–10 mm long; lamina 4–7 (–8) cm long; fruit 2.5–3.5 cm long, red **2a.** var. **cattleianum**

Petiole 12–15 mm long; lamina 5–10 cm long; fruit c. 4 cm long, yellow **2b.** var. **littorale**

2a. Psidium cattleianum var. cattleianum

[*Rhodomyrtus psidioides auct. non* (G.Don) Benth.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 703 (1904); J.S.Turner *et al.*, *Conservation Norfolk Is.* 23 (1968)]

Illustrations: A.B.Graf, *Tropica* 3rd edn, 686 (1986); J.F.Morton, *Fruits for Warm Climates* 364, fig. 99 (1987); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 962, t. 135 (1990).

Shrub or small tree to 6 m tall. Young shoots puberulous. Leaves with petiole 4–10 mm long;

lamina 4–7 (–8) cm long, with margins ciliolate when young, becoming glabrous. Fruit 2.5–3.5 cm long, red. Porpay, Red or Strawberry Guava, Cherry Guava (L.H.Is.).

Norfolk Is., Lord Howe Is. One of the most serious weeds on Norfolk Is., if not the most serious, and a potential threat on Lord Howe Is. A native of Brazil, it was an early introduction as a fruit tree and is now spread by cattle and birds, and growing so thickly that it crowds out any other plant. Rarely, this variety may bear yellow fruit. Sometimes known as f. *lucidum* O.Deg.

N.Is.: Upper Cascade Valley, *P.S.Green 2413* (K); Steels Point Area, *M.Lazarides 8024* (CANB, K); c. 3.2 km NE of the Cemetery at Kingston, *G.Uhe 1105* (K). **L.H.Is.:** just above 'Mountain Inn', *P.S.Green 2035* (K); Transit Hill, *A.C.Beauglehole 5838* (MEL); Lagoon Rd to Boat Harbour Track, *B.Conn 3572* (NSW).

2b. Psidium cattleianum var. **littorale** (Raddi) Fosberg, *Occ. Pap. Bernice Pauahi Bishop Mus*. 23: 37 (1962)

Psidium littorale Raddi, *Alc. Sp. Pero* 4, fig. 2 (1821). T: Brazil, *G.Raddi*; holo: ?FI *n.v.* So called because of its littoral, or shoreline, habitat.

Illustration: G.Raddi, *op. cit.* fig. 2.

Differs from var. *cattleianum* in its height to 10 m tall, glabrous young shoots, leaf petiole 12–15 mm long, lamina 5–10 cm long, not ciliolate when young, and larger, yellow fruit c. 4 cm long.

Norfolk Is. A few trees, along with others of var. *cattleianum*, are found on the Cascade Rd. Also a native of Brazil, often, but more rarely than var. *cattleianum*, grown for its fruit.

N.Is.: Upper Cascade Valley, *P.S.Green 2414* (K); Cascade Rd, *W.R.Sykes NI 383* (CHR); corner Cascade Rd, *W.R.Sykes 878/87* (CHR).

In an unpublished typed list of the Norfolk Is. flora dated 1985, which had limited circulation, it was recorded as *P. longipetiolatum* Legrand. However, it is not that species, which among other characters has slightly longer, slimmer petioles and, especially, slim peduncles 2–3 cm long.

6. CLEISTOCALYX

Cleistocalyx Blume, *Bot. Mus. Lugd.-Bat*. 1: 84, t. 56 (1850); from the Greek *kleistos* (closed) and *kalyx* (a cup, calyx), alluding to the coherent sepals which enclose the rest of the flower in bud.

Type: *C. nitidus* Blume

Trees or shrubs. Young shoots often 4-angled. Leaves opposite. Inflorescence terminal or axillary, paniculate; bracts small, caducous. Hypanthium obconical. Flower buds obconical at maturity. Calyx calyptrate, rounded or with a central apiculum, circumscissile around rim of hypanthium. Petals 4, small, broadly based, imbricate, falling with sepaline calyptra. Stamens numerous, free in 2 or more series. Ovary inferior, 2-locular, each usually with many ovules. Fruit fleshy, cylindrical-ellipsoidal to narrowly obpyriform, with persistent hypanthial rim, 1-seeded. Seed ±obconical, c. 1 cm long.

A genus of c. 25 species from SE Asia and northern Australia to New Caledonia and Fiji; 1 species endemic on Lord Howe Is.

Cleistocalyx fullagarii (F.Muell.) Merr. & L.M.Perry, *J. Arnold Arbor*. 18: 331 (1937)

Acicalyptus fullagarii F.Muell., *Fragm*. 8: 15 (1873), as *fullageri*. T: Lord Howe Island, *C.Moore; J.P.Fullagar & Lind*; syn: MEL. Named after James P. Fullagar who collected plants on Lord Howe Is. with Lind in 1873 and 1874.

Illustrations: E.D.Merrill & L.M.Perry, *J. Arnold Arbor*. 18: 311, t. 215, figs 29–32 (1937); I.Hutton, *Lord Howe Is.* 33, 132 (1986).

Large tree to 20 m with prominent buttresses. Bark reddish brown, flaking. Leaves

coriaceous; lamina oblanceolate to narrowly obovate, (4–) 5–8 (–10) cm long, (2–) 2.5–3 (–4) cm broad, cuneate-attenuate into petiole, slightly revolute, rounded at apex, sometimes very slightly emarginate; lateral veins 12–14 on each side of midrib, raised-reticulate above and below. Calyptra 4 mm long with an apiculum 1.5 mm long. Filaments white, 10–15 mm long. Fruit obconical, 2 cm long, deep red, fleshy. *Scalybark*. Figs 26, 45J–K.

Lord Howe Is. Endemic and common in sheltered forest up to c. 400 m altitude, often, as in Erskine Valley, forming dominant stands. Flowers mid Jan.–mid Apr.

L.H.Is.: base of Malabar ridge, opposite 'Somerset', *A.N.Rodd 1832* (K, NSW); SE edge of Neds Beach Common, *A.N.Rodd 3578* (K, NSW); Transit Hill, *P.S.Green 1640* (A, K); Smoking Tree Ridge, *P.S.Green 2037* (K); N side of Erskine Valley, *A.C.Beauglehole 5819* (MEL).

At one time felled as a timber tree. F.J.H. von Mueller originally spelt the epithet as *fullageri*, despite the collector's name being Fullagar. This should be considered an orthographic error under Article 73 of the International Code of Botanical Nomenclature and corrected.

7. EUGENIA

Eugenia L., *Sp. Pl.* 1: 470 (1753); *Gen. Pl.* 5th edn, 211 (1754); named after Prince Eugene of Savoy (1663–1736); famed as a military campaigner, he also founded a botanic garden near Vienna.

Type: *E. uniflora* L.

Trees or shrubs. Leaves opposite, gland-dotted below. Inflorescence axillary, basically racemose but often with axis shortened, either fasciculate, umbellate or glomerulate, or flowers sometimes few or solitary; bracts and bracteoles persistent. Hypanthium ±globose, abruptly contracted into pedicel, not or scarcely extending beyond ovary. Sepals 4, imbricate, usually persistent in fruit. Petals 4, usually conspicuous. Stamens numerous. Ovary inferior, 2-locular, each with usually several to many ovules. Fruit a berry, with relatively thin pericarp. Seeds 1 or 2, ±globose; testa thin.

A genus of perhaps 1000 species, mostly from tropical and subtropical America; 1 species naturalised on Norfolk Is. A number of species are cultivated for their edible fruit.

*Eugenia uniflora L., *Sp. Pl.* 1: 470 (1753)

T: 'India'; lecto: P.Micheli, *Nov. Pl. Gen.* t. 108 (1729), *fide* R.McVaugh, *Taxon* 5: 140 (1956). So named because frequently the flowers are solitary in the axils.

Illustrations: M.C.Neal, *Gardens Hawai'i* 633, fig. 246c (1965); A.B.Graf, *Tropica* 3rd edn, 460, 677 (1986); J.F.Morton, *Fruits Warm Climates* 387, fig. 104 (1987).

Shrub 2–3 m tall. Young stems glabrous. Leaves thinly coriaceous; petiole 2–4 mm long; lamina ovate to broadly lanceolate, (2.5–) 4–5.5 (–7) cm long, (1.5–) 2–3 (–4) cm broad; rounded to obtuse at base, subacuminate at apex; lateral veins 6–8 on each side of midrib, reticulate, raised above and below. Flowers 1 or 2; pedicels slender, 0.5–4 cm long. Sepals ovate to lanceolate, 3–4 mm long, persistent. Petals obovate, 7–9 mm long, ciliate, white. Filaments 3–7 mm long, white. Fruit globose-spheroidal with 8 longitudinal, rounded ribs, 1–2 cm diam., red, fleshy. Seeds 1 per fruit. *Surinam Cherry, Brazilian Cherry*.

Norfolk Is. Cultivated, escaped and now self-sown in at least one locality. It has been collected on Lord Howe Is., but without information as to its spontaneity (N of the Hospital, *A.C.Beauglehole 5852*, MEL).

N.Is.: Rocky Point area, Hundred Acre Reserve, *W.R.Sykes NI 528* (CHR).

51. GROSSULARIACEAE

Shrubs or small trees, sometimes spiny. Leaves alternate, often fasciculate, simple; stipules adnate to petiole or absent. Inflorescence terminal or axillary, racemose, sometimes fasciculate or umbellate, or flowers solitary. Flowers usually bisexual, actinomorphic, with a hypanthium which is tubular or adnate to ovary. Calyx sometimes tubular with (3–) 5 (–9) lobes, often petaloid. Petals the same number as calyx lobes, rarely absent, usually small and scale-like. Stamens opposite and the same number as calyx lobes, inserted in hypanthium; anthers dehiscing longitudinally. Ovary superior or ±inferior, usually 1-locular, often with intrusive placentas; ovules numerous; styles 2, free or connate; stigma lobed or capitate. Fruit a capsule or berry.

A cosmopolitan family of 25 genera and perhaps 350 species. It contains the widely cultivated members of the genus *Ribes* L. which produce red and black currants and gooseberries. There are still differences of opinion over the delimitation of this family; the following genus, *Corokia*, has been placed in the Grossulariaceae, Escalloniaceae, Corokiaceae or Cornaceae.

COROKIA

Corokia A.Cunn., *Ann. Nat. Hist.* 3: 249 (1839); from the native Maori name *korokio*.

Type: *C. buddleioides* A.Cunn.

Colmeiroa F.Muell., *Fragm.* 7: 149 (1871), *nom. illeg.*, *non* Reut. (1842). T: *C. carpodetoides* F.Muell.

Paracorokia M.Král, *Folia Geobot. Phytotax.* 1: 376 (1966). T: *P. carpodetoides* (F.Muell.) M.Král.

Neocolmeiroa Hutch., *Gen. Fl. Pl.* 2: 25 (1967), *nom. nud.*

Shrubs or small trees. Leaves alternate, entire or dentate. Inflorescence axillary or terminal, paniculate, fasciculate or flowers solitary. Sepals 4 or 5, valvate. Petals 4 or 5, free, valvate, with a small scale at base. Stamens 5. Ovary inferior, 1- or 2-locular. Fruit a drupe.

A genus of 6 species with an interesting disjunct distribution; 2 species in New Zealand, 1 in Australia (northern N.S.W.), 1 from Chatham Is., 1 from Rapa and the following from Lord Howe Is.

Corokia carpodetoides (F.Muell.) L.S.Sm., *Proc. Roy. Soc. Queensland* 69: 54 (1958)

Colmeiroa carpodetoides F.Muell., *Fragm.* 7: 149 (1871); *Paracorokia carpodetoides* (F.Muell.) M.Král, *Folia Geobot. Phytotax.* 1: 376 (1966). T: Lord Howe Island, *C.Moore*; syn: MEL. So named from a resemblance to the genus *Carpodetus*, through the addition of the suffix *-oides* (resembling).

Illustration: I.Hutton, *Lord Howe Is.* 30, 123 (1986).

Shrub to 2 m tall, or rarely tree-like to c. 5 m. Young stems covered in short felted hairs. Leaves somewhat crowded at ends of branches; lamina narrowly oblanceolate to narrowly elliptic, (2–) 3.5–6 cm long, (0.8–) 1–2 cm broad, attenuate onto petiole, dentate in upper half, acute to obtuse, apiculate, shortly felted hairy when young, with indumentum persisting below along midrib and margins, shining light green above, yellowish green below. Inflorescence terminal, corymbose, many-flowered. Sepals 5, triangular, 0.5–0.75 mm long. Petals 5, free, lanceolate, c. 3 mm long, acute, yellow. Ovary turbinate, 1.5–2 mm long, 1- or 2-locular. Fruit 1-seeded, ovoid, c. 3 mm long, becoming dry and brown. Figs 29, 84A.

Lord Howe Is. Endemic and locally common on the upper parts of Mts Gower and Lidgbird. Flowers Dec.–Jan.

L.H.Is.: Mt Lidgbird, *J.D.McComish 147* (K, NSW); *loc. id.*, *C.Moore 59* (K, MEL); near summit, Mt Gower, *A.N.Rodd 1787* (K, NSW); Mt Gower, *J.Pickard 3599* (NSW); *s. loc.*, *C.Moore 35* (K, MEL).

52. SANTALACEAE

Trees, shrubs or perennial herbs; root hemiparasites. Leaves alternate or opposite, simple, entire, sometimes reduced to scales, without stipules. Inflorescence axillary, various, often spicate or racemose. Flowers bisexual or unisexual, actinomorphic, hypogynous to epigynous. Perianth of one whorl, sepaloid or petaloid; perianth segments 3–8, valvate, often connate. Stamens as many as and opposite perianth segments. Ovary inferior to superior, 1-locular; placentation free-central; ovules 1–5, usually only 1 maturing. Fruit a drupe, l-seeded.

A family of c. 30 genera and c. 400 species, mainly pantropical and subtropical, but extending into temperate regions; 1 genus native to Norfolk and Lord Howe Islands.

G.Bentham, Santalaceae, *Fl. Austral.* 6: 211–231 (1873); H.J.Hewson & A.S.George, Santalaceae, *Fl. Australia* 22: 29–67 (1984).

EXOCARPOS

Exocarpos Labill., *Voy. Rech. Pérouse* 1: 155 (1800); from the Greek *exo-* (outside) and *karpos* (a fruit), alluding to the fleshy pedicel resembling a 'fruit' below the drupe.

Type: *E. cupressiformis* Labill.

Trees or shrubs, broom-like. Leaves alternate; on juvenile shoots usually broad with parallel veins from base, caducous; on adult shoots scale-like. Inflorescences terminal and axillary, spicate or clustered, rarely flowers solitary. Flower bisexual. Perianth segments (3) 4–6 (–8), free. Filaments short, flattened. Ovary semi-inferior, conical above; ovule 1, immersed in receptacle-placenta. Fruit a drupe, borne on a swollen, fleshy receptacle.

A genus of 26 species from SE Asia to Australia, New Zealand and some Pacific islands as far as Hawai'i; 1 native species each on Norfolk and Lord Howe Islands.

H.U.Stauffer, Revisio Anthobolearum, *Mitt. Bot. Mus. Univ. Zürich* 213: 1–160 (1959).

Shoots ('leaves') 1–2 mm broad; inflorescence very short, 1- or 2-flowered (L.H.Is.) **1. E. homalocladus**

Shoots ('leaves') 10–40 mm broad; inflorescence spicate, 5–12-flowered (N.Is.) **2. E. phyllanthoides**

1. Exocarpos homalocladus C.Moore & F.Muell. in F.J.H. von Mueller, *Fragm.* 8: 9 (1872)

Xylophyllos homalocladus (C.Moore & F.Muell.) Kuntze, *Revis. Gen. Pl.* 589 (1891). T: Lord Howe Island, *C.Moore 11*; lecto: MEL, *fide* H.U.Stauffer, *op. cit.* 183; isolecto: K. The epithet comes from the Greek *homalos* (flat) and *clados* (cladode, a leaf-like branch), in allusion to the habit.

Exocarpos sp., C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 25 (1870).

Illustrations: H.U.Stauffer, *Mitt. Bot. Mus. Univ. Zürich* 213: t. 11 (1959); I.Hutton, *Lord Howe Is.* 140 (1986).

Shrub or small tree to 4 m tall. Shoots dense, flat, striate, 5–10 cm long, 1–2 mm broad. True leaves only on juvenile shoots, narrowly lanceolate to almost linear, 5–8 cm long, 0.5–1.5 cm broad. Inflorescence of 1 or 2 flowers borne in marginal notches on shoots; peduncle 0.25 mm long. Perianth segments 4 or 5, triangular, 0.5 mm long, yellow-green. Drupe spherical, 5–8 mm long, red; receptacle swollen, obconical, c. 3 mm long, fleshy, red, accrescent. *Grass Tree*. Fig. 31.

Lord Howe Is. Endemic. Widespread and fairly common throughout the Island. Flowers Mar.–Jan.

L.H.Is.: ridge W of Old Settlement, *P.S.Green 1924* (K); Middle Beach Common, *J.Pickard 1212* (K, NSW); top of Transit Hill, *L.A.S.Johnson & A.N.Rodd 1276* (K, NSW), summit ridge of Mt Lidgbird, *J.Pickard 1461*

(NSW); *s. loc.*, *C.Moore 32* (K, MEL).

This species is said to be related to *E. strictus* R.Br. of south-eastern Australia and to *E. psilotiformis* Skottsb. of Rapa.

2. Exocarpos phyllanthoides Endl., *Prodr. Fl. Norfolk*. 46 (1833)

var. **phyllanthoides**

Xylophyllos phyllanthoides (Endl.) Kuntze, *Revis. Gen. Pl.* 2: 589 (1891). T: Norfolk Island, *F.L.Bauer*; holo: W; iso: K. The epithet comes from *Phyllanthus* (a superficially similar genus in the Euphorbiaceae) and the Latin suffix *-oides* (resembling).

Illustrations: N.Hallé, *Fl. Nouv.-Calédon*. 15: 115, t. 21 figs 3, 4, t. 25 (1933).

Tree to 8 m tall. Shoots flat, striate, (4–) 10–15 (–20) cm long, (1–) 1.5–3 (–4) cm broad. Leaves linear to narrowly elliptic, 5–10 mm long, 1–3 mm broad, caducous. Inflorescence spicate, 1 or sometimes 2 spikes borne in marginal notches, (5–) 7–12-flowered. Perianth segments lanceolate, c. 1 mm long, yellow-green. Drupe ovoid-ellipsoidal, 8–12 mm long, red; receptacle somewhat swollen obconical, c. 5 mm long, accrescent. *Isaacwood*. Fig. 46C–D.

Norfolk Is. Not common but widespread; usually growing in forest areas. When growing in the open it bears smaller, more coriaceous shoots. Also occurs in New Caledonia (together with var. *montanus* Stauffer and var. *brachystachys* Stauffer).

N.Is.: W side of Harpers Road, 1963, *P.Ralston 15* (K); lower slopes of Mt Pitt, *J.D.McComish 49* (K); Steels Point area, *M.Lazarides 8026* (CANB, K), *s. loc.*, 1884, *I.Robinson* (MEL); *s. loc.*, 1830, *A.Cunningham 7* (K).

53. LORANTHACEAE

Hemiparasitic shrubs, usually epiphytic on stems and branches, rarely terrestrial and arborescent. Leaves well-developed, usually opposite or whorled, simple, entire, without stipules. Inflorescence various, basically cymose. Flowers bisexual or unisexual, actinomorphic. Calyx reduced to a lobed or truncate rim on apex of ovary. Petals (3–) 4–6 (–9), free or connate into a tube, often split down one side, valvate. Stamens as many as and opposite petals. Ovary inferior; locules 1–4; ovules not distinctly differentiated. Fruit a berry or drupe, usually l-seeded, partly or entirely surrounded by viscid tissue derived from the fruit wall.

A family of c. 75 genera and 950 species; 1 genus native to Norfolk Is. The family which follows, the Viscaceae, has been included in the Loranthaceae in some classifications.

G.Bentham, Loranthaceae, *Fl. Austral.* 3: 386–397 (1866); B.A.Barlow, Loranthaceae, *Fl. Australia* 22: 68–131 (1984).

ILEOSTYLUS

Ileostylus Tiegh., *Bull. Soc. Bot. France* 41: 483 (1894); from the Greek *eileos* (twisted) and *stylos* (style), in allusion to the contorted style in this genus.

Type: *I. micranthus* (Hook.f.) Tiegh.

Woody epiphytic hemiparasites. Leaves opposite, coriaceous. Inflorescence axillary, cymose-paniculate. Flowers bisexual, actinomorphic. Calyx a cylindrical, truncate rim. Petals 4, free. Anthers basifixed. Ovary 1-locular; style contorted. Fruit a berry.

A monotypic genus, originally included in *Loranthus*, confined to New Zealand and Norfolk Is.

Ileostylus micranthus (Hook.f.) Tiegh., *Bull. Soc. Bot. France* 41: 489 (1894)

Loranthus micranthus Hook.f., *Fl. Nov.-Zel.* 1: 100 (1853). T: New Zealand, *W.Colenso 1968*; holo: K. So called from its small flowers, after the Greek *micros* (small) and *anthos* (flower).

Illustrations: L.B.Moore & J.B.Irwin, *Oxford Book New Zealand Pl.* 33, t. 3 (1978); H.D.Wilson, *Stewart Is. Pl.* 103, fig. 114 (1982); A.Eagle, *Eagle's Trees & Shrubs of New Zealand* 2nd edn, 1: t. 121 (1986).

Bushy epiphyte, with a swollen base and with runners attached by haustoria at intervals along host branch. Leaves with petiole slightly winged, 5–10 mm long; lamina broadly elliptic or slightly ovate or obovate, 3–6 cm long, 1.5–4 cm broad, attenuate onto petiole, obtuse to rounded at apex. Inflorescences axillary, solitary or paired, 1–1.5 cm long, with c. 9 or 12 flowers arranged in threes. Calyx an obscure rim c. 0.2 mm high. Petals narrowly lanceolate, c. 3 mm long, greenish. Style coiled in middle, c. 3 mm long when uncoiled. Fruit ellipsoidal-globular, 5–8 mm long, translucent, yellow. *Mistletoe*.

Norfolk Is. This species is best known from New Zealand, where it parasitises a wide range of hosts. It was apparently first collected on Norfolk Is. in the 1930s. R.M.Laing did not include it in his account of the Flora of 1915 (*Trans. & Proc. New Zealand Inst.* 47: 1–39), but there is a specimen in his herbarium which had been contained in a newspaper folder dated 14 July 1939. The collection by J.D.McComish cited below, dated 15 September 1937, says 'only one plant seen', so it was presumably a relatively recent arrival then (carried by birds?), otherwise it would most certainly have been collected by Bauer, Cunningham or Backhouse all of whom sampled the flora comprehensively. It now occurs scattered on a number of host species in the National Park, but seems to favour *Coprosma pilosa* which can be killed by a heavy infestation.

N.Is.: just below summit of Mt Pitt, *B.A.Barlow 3748* (MEL, NSW); near summit of Mt Bates, *R.D.Hoogland 11221* (CANB, K); Mt Bates, track leading to Red Rd, *P.S.Green 1397* (A, K); upper slopes of Mt Pitt, *J.D.McComish 50* (K); *s. loc.*, *R.M.Laing* (CHR).

54. VISCACEAE

Hemiparasitic shrubs, epiphytic on stems and branches, monoecious or dioecious. Leaves opposite, simple, entire, sometimes reduced to scales, without stipules. Inflorescence axillary, spicate or clustered. Flowers small, unisexual, actinomorphic, ±sessile. Calyx absent or a vestigial ring. Corolla lobes 2–4, valvate, often much reduced, usually 4 in male flowers and 3 in female. Stamens as many as and opposite corolla lobes, adnate to corolla or filaments very short, dehiscence various. Ovary inferior, 1-locular, solid without differentiated ovules; style terminal; stigma nipple-like. Fruit a berry. Seed 1 (or 2), surrounded or capped with viscid tissue.

A cosmopolitan family of 7 genera and c. 450 species, but mostly found in tropical regions; 1 genus native on the Islands.

B.A.Barlow, A Revision of the Viscaceae of Australia, *Brunonia* 6: 25–57 (1983); B.A.Barlow, Viscaceae, *Fl. Australia* 22: 131–145 (1984).

KORTHALSELLA

Korthalsella Tiegh., *Bull. Soc. Bot. France* 43: 83 (1896); named in honour of Pieter Willem Korthals (1807–1892), a Dutch botanist who collected in the East Indies and who worked on genera in the Viscaceae, with the Latin diminutive suffix *-ellus*.

Type: *K. remyana* Tiegh.

Bifaria Tiegh., *op. cit.* 163, 164. T: *B. japonica* (Thunb.) Tiegh.

Hemiparasitic subshrubs or perennial herbs. Stems articulated at nodes, terete or usually flattened to form a cladode. Leaves opposite, reduced to minute scales united in pairs at top

of internodes and around flower cluster. Inflorescence axillary, clustered or rarely spike-like; clusters becoming many-flowered with both male and female flowers and sometimes coalescing and encircling stem. Flowers developing in and surrounded by floral cushion of thick-walled hairs. Perianth lobes 3, persistent. Male flower globose to obconical in bud, 0.5 mm diam.; anthers 3, united into a synandrium with a common apical pore. Female flowers globose or pear-shaped, usually less than 0.5 mm diam. Fruit pear-shaped or ellipsoidal. Seed 1, flattened, often ejected explosively.

A genus of c. 30 species distributed from East Africa and the Mascarenes, the Himalayas and Japan, to Australia and New Zealand, and across the Pacific to Hawai'i; 2 native species on Lord Howe Is. and another on Norfolk Is. Because of their simplified habit and highly reduced inflorescence and flowers, the species of this genus have, in the past, been much confused and this is reflected in the complicated synonymy presented below.

1 Flattened internodes usually 3–5 cm long and 1–1.5 cm broad (N.Is.) **1. K. disticha**

1: Flattened internodes usually 1–2 cm long and 0.5–1 cm broad (L.H.Is.)

2 Flange of rudimentary leaves not continuous around stem; flowers immersed in floral cushion, with black tipped hairs; lateral nerves of internode almost as prominent as central nerve **2. K. emersa**

2: Flange of rudimentary leaves sinuous but continuous around stem; flowers not immersed in floral cushion, hairs red; central nerve of internode much more prominent than lateral nerves **3. K. rubra**

1. Korthalsella disticha (Endl.) Engl. in H.G.A.Engler & K.A.E.Prantl, *Nat. Pflanzenfam., Nachtr.* 1: 138 (1897)

Viscum distichum Endl., *Prodr. Fl. Norfolk.* 61 (1833); *Bifaria disticha* (Endl.) Tiegh., *Bull. Soc. Bot. France* 43: 171 (1896); *Viscum opuntia* var. *distichum* (Endl.) Domin, *Biblioth. Bot.* 89: 51 (1921). T: Norfolk Island, *F.L.Bauer*; holo: W; iso: K. So named because the branches are arranged distichously, *i.e.* in 2 vertical ranks.

Bifaria bigibba Tiegh., *loc. cit.*; *Korthalsella bigibba* (Tiegh.) Blakely, *Proc. Linn. Soc. New South Wales* 53: 38, t. 3, figs 12, 13 (1928). T: Norfolk Island, *G.Caley*, holo: ?G *n.v.*

Korthalsella opuntioides Blakely, *Proc. Linn. Soc. New South Wales* 53: 37, t. 3, figs 1–11 (1928). T: Norfolk Island, *J.H.Maiden* (*& J.L.Boorman ?*); holo: NSW; iso: K.

[*Viscum articulatum auct. non* Burm.f.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 715 (1904)]

[*Korthalsella articulata auct. non* (Burm.f.) Laing: R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 24 (1915)]

Illustrations: W.F.Blakely, *op. cit.* t. 3, figs 1–11; B.A.Barlow, *Brunonia* 6: 40, figs 19–22 (1983).

Plant to 14 cm tall. Stems robust, with many nodes, often tinged reddish brown, sometimes darkly so; branching at lower nodes, with up to 12 or more unbranched internodes above. Basal internode terete or flattened in upper part; upper internodes flattened, narrowly elliptic to elliptic, (1.5–) 3–5 (–6) cm long, (0.5–) 1–1.5 (–2) cm broad, attenuate at both ends, with internodes borne alternately at right-angles to one another, 3- or 5-veined, with all veins ±raised and distinct. Flange from rudimentary leaves c. 0.5 mm high, not continuous around nodes. Flowers up to 30 in each cluster, immersed in the two floral cushions; hairs on cushion dark red, later black. Fruit obconical to globose, c. 2 mm long. *Mistletoe*.

Norfolk Is. Endemic and widespread on the Island. Recorded as parasitising a number of species but especially *Baloghia inophylla* and *Citrus jambhiri*.

N.Is.: N slope of Mt Bates, *P.S.Green 1420* (A); Mt Pitt Rd, near entrance to National Park, *I.R.H.Telford 10459* (CBG, K); *s. loc.*, *A.Cunningham 26* (K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW); *s. loc.*, 1964, *P.Ralston* (K, NSW).

This is the largest species in the genus.

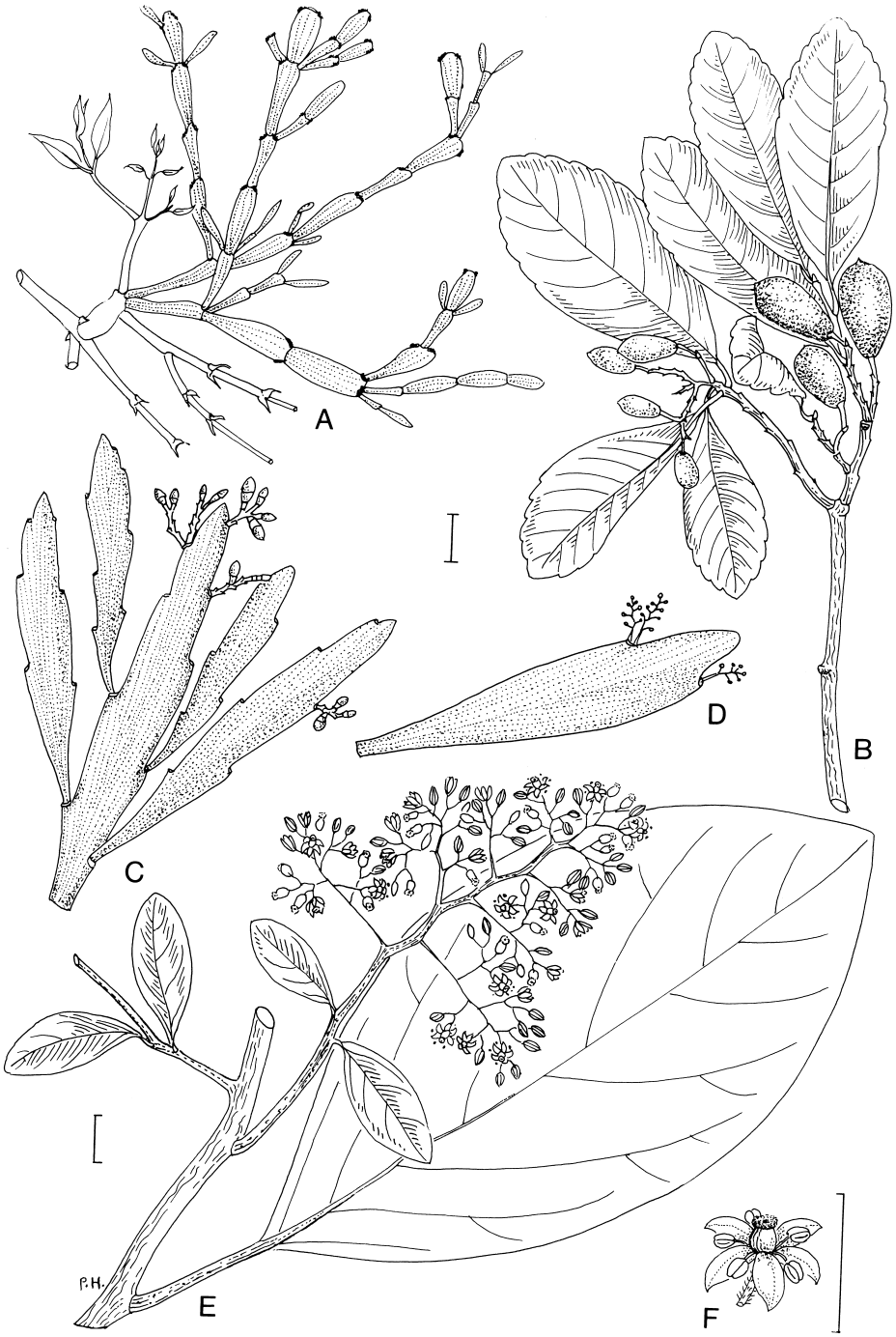

Figure 46. A, VISCACEAE: *Korthalsella emersa*, habit (on *Jasminum*) (P.Green 1934, K). **B**, CELASTRACEAE: *Elaeodendron curtipendulum*, habit (G.Uhe 1342, K). **C–D**, SANTALACEAE: *Exocarpos phyllanthoides* var. *phyllanthoides*. **C**, habit in young fruit (P.Ralston 15, K); **D**, phyllode with flower buds (M.Lazarides 8026, K). **E–F**, ICACINACEAE: *Pennantia endlicheri*. **E**, habit; **F**, flower (**E–F**, J.McComish 35, K). Scale bars = 1 cm. Drawn by P.Halliday.

2. Korthalsella emersa Barlow, *Brunonia* 6: 44 (1983)

T: Lord Howe Island, *M.M.J. van Balgooy 1037*; holo: CANB *n.v., fide* B.A.Barlow, *loc. cit.* So named because its flowers are immersed in the floral cushion.

[*Viscum opuntioides auct. non* L.: C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 2, 3 (1870)]

[*Viscum distichum auct. non* Endl.: C.Moore, *J. Bot.* 7: 303 (1869)]

[*Viscum articulatum auct. non* Burm.f.: F.J.H. von Mueller, *Fragm.* 9: 77 (1875); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 250 (1896); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 134 (1898)]

[*Viscum opuntia auct. non* Thunb.: K.Domin, *Biblioth. Bot.* 89: 50 (1921)]

[*Korthalsella japonica auct. non* (Thunb.) Engl.: S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 210 (1981); A.N.Rodd & J.Pickard, *Cunninghamia* 1: 274 (1983)]

Illustration: B.A.Barlow, *Brunonia* 6: 45, figs 27, 28 (1983).

Plant to 15 cm tall. Stems with many nodes, yellowish green; branching at lower nodes, often with several branches at a node. Basal internode terete; next internode terete at base, flattened at apex; upper internodes flattened, broadly elliptic to elliptic, (5–) 15–25 mm long, (3–) 5–20 mm broad, attenuate at base, contracted at apex, often in same plane as each other; all internodes 3-veined, with central nerve more prominent. Flange from rudimentary leaves c. 0.5 mm high, not continuous around nodes. Flowers up to 30 in a cluster, immersed in floral cushion; hairs on cushion black-tipped. Fruit ellipsoidal, c. 1.5 mm long. Figs 46A, 50.

Lord Howe Is. Endemic. Various host species have been recorded, including *Elaeodendron curtipendulum* Endl. and *Jasminum simplicifolium* G.Forst.

L.H.Is.: Mt Eliza, *A.C.Beauglehole 5512* (CANB, MEL); ridge between Old Settlement and North Bay, *P.S.Green 1934* (K); Malabar, *A.C.Beauglehole 6026* (CANB); SE end of Middle Beach Common, *J.Pickard 1211* (NSW); *s. loc.*, 1873/74, *J.P.Fullagar* (K, MEL).

According to Barlow (*op. cit.* 46) this species is probably related to *K. disticha* of Norfolk Is.

3. Korthalsella rubra (Tiegh.) Engl. in H.G.A.Engler & K.A.E.Prantl, *Nat. Pflanzenfam., Nachtr.* 1: 138 (1897)

subsp. **rubra**

Bifaria rubra Tiegh., *Bull. Soc. Bot. France* 43: 173 (1896). T: New South Wales, *F.Mueller*; holo: ?P *n.v.* So named from the red hairs which occur on the floral cushions.

Bifaria howensis Tiegh., *Bull. Soc. Bot. France* 43: 171 (1896); *Korthalsella howensis* (Tiegh.) Engl. in H.G.A.Engler & K.A.E.Prantl, *Nat. Pflanzenfam., Nachtr.* 1: 138 (1897). T: Lord Howe Island, ?*J.P.Fullagar*; lecto: P *n.v., fide* B.A.Barlow, *Brunonia* 6: 51 (1983).

[*Viscum articulatum auct. non* Burm.f.: F.J.H. von Mueller, *Fragm.* 9: 77 (1875); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 250 (1896); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 134 (1898)]

[*Korthalsella articulata auct. non* (Burm.f.) Laing: W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 135 (1917)]

[*Korthalsella opuntia auct. non* (Thunb.) Merrill: B.H.Danser, *Bull. Jard. Bot. Buitenzorg* ser. 3, 14: 136 (1937); B.H.Danser, *Bull. Jard. Bot. Buitenzorg* ser. 3, 16: 335 (1940)]

[*Korthalsella japonica auct. non* (Thunb.) Engl.: B.A.Barlow, *Fl. New South Wales* 58A: 2 (1971); A.N.Rodd in H.F.Recher & S.S.Clark, *Environm. Survey Lord Howe Is.* 22 (1974)]

Illustrations: W.F.Blakely, *Proc. Linn. Soc. New South Wales* 53: t. 2, figs 8–15 (1928); B.A.Barlow, *op. cit.* 53, figs 42–44; B.A.Barlow, *Fl. Australia* 22: 139, fig. 34D (1984).

Plant to 15 cm tall. Stems with many nodes; branching at lower nodes, sometimes more than one branch at a node, with up to 10 or more unbranched internodes above. Basal internode terete or flattened; subsequent internodes flattened, narrowly elliptic to narrowly oblanceolate, (0.5–) 1–2 cm long, (0.3–) 0.6–0.8 cm broad, attenuate at base, constricted at apex; internodes usually borne in the same plane, 3-nerved with central nerve much more prominent than lateral nerves. Flange from rudimentary leaves 0.5–1 mm high, sinuate, continuous around stem. Flowers c. 10 per cluster, not immersed in floral cushion; hairs on cushion red. Fruit obconical, up to 2 mm long.

Lord Howe Is. Widespread and parasitic on a variety of hosts. Also found in eastern Australia and New Guinea.

L.H.Is.: top of Transit Hill, *L.A.S.Johnson & A.N.Rodd 1278* (NSW); Lagoon Rd, between Flagstaff and Government House, *L.A.S.Johnson & A.N.Rodd 1218* (NSW); Windy Point, *M.D.Crisp 4569 & I.R.H.Telford* (CBG); *s. loc.*, 1873/74, *J.P.Fullagar* (K); *s. loc., J.D.McComish 18A* (K, NSW).

According to Barlow (*op. cit.* 46, 1983) the plants on the Island have as their nearest relatives the Qld populations. He also suggests that, as compared to *K. emersa*, this species is a relatively recent arrival on the Island. The other subspecies, subsp. *geijericola* Barlow, is endemic to Qld.

55. CELASTRACEAE

Shrubs, trees or woody climbers. Leaves alternate or opposite, simple; stipules small, caducous or absent. Inflorescence terminal or axillary, cymose or fasciculate, rarely flowers solitary. Flowers bisexual or unisexual, actinomorphic, 4- or 5-merous, usually with a well-developed, flat, fleshy disc. Calyx lobed, usually persistent, usually imbricate. Petals free, rarely slightly connate at base, rarely absent. Stamens 4 or 5 (rarely 10), alternate with petals. Ovary superior, 2–5-locular; ovules axile, usually 2 (sometimes 1–many) in each cell. Fruit various, a capsule, samara, drupe or berry. Seeds usually arillate, usually reddish, sometimes winged.

A family of c. 90 genera and 1300 species, mostly tropical but with some temperate representatives; 1 genus native on Norfolk and Lord Howe Islands.

G.Bentham, Celastrineae, *Fl. Austral.* 1: 397–404 (1863); Ding Hou, A Revision of the genus *Celastrus*, *Ann. Missouri Bot. Gard.* 2: 215–302 (1955); Ding Hou, Celastraceae, *Fl. Males.* ser. I, 6(1): 227–291 (1963); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Celastraceae, *Fl. Java* 2: 53–56 (1965); L.W.Jessup, Celastraceae, *Fl. Australia* 22: 150–180 (1984).

ELAEODENDRON

Elaeodendron J.Jacq., *Nova Acta Helv. Phys.-Math.* 1: 36 (1787); from the Greek *elaia* (the olive) and *dendron* (a tree), in allusion to the similar appearance of the fruits in this genus of trees and those of the olive.

Type: *E. orientalis* J.Jacq.

Trees or shrubs. Leaves opposite, sometimes alternate on juvenile shoots; stipules caducous. Inflorescence axillary, cymose, sessile or pedunculate. Flowers bisexual or unisexual, 4- or 5-merous, pedicellate; disc convex to flat, thick. Calyx basally connate, entire, imbricate. Petals imbricate, spreading, green to pale yellow. Stamens 4 or 5; filaments thin; anthers versatile. Style short, simple; stigma entire or shortly 2- or 3-lobed. Fruit a drupe, hard, ±fleshy. Seeds 1 or 2 (–3), without arils.

A genus of c. 15 species, from the tropics of the Old World, the West Indies and Central America; 1 species native on the Islands. Sometimes merged with the South African genus *Cassine*, but separable by a number of characters.

Elaeodendron curtipendulum Endl., *Prodr. Fl. Norfolk.* 81 (1833)

T: Norfolk Island, *F.L.Bauer*; holo: W; iso: K. The epithet comes from the Latin *curtus* (shortened) and *pendulus* (hanging down), alluding to the short, pendulous pedicels.

Cassine curtipendula (Endl.) Kuntze, *Revis. Gen. Pl.* 1: 114 (1891), misprinted as *curtipetala*.

[*Elaeodendron australe auct. non* Vent.: A.Cunningham in R.Heward, *Hooker's London J. Bot.* 1: 113 (1842); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 234 (1896)]

[*Elaeodendron australe* var. *melanocarpum auct. non* (F.Muell.) F.Muell.: F.J.H. von Mueller, *Fragm.* 9: 77 (1875), *p.p.*]

[*Elaeodendron melanocarpum auct. non* F.Muell.: W.B.Hemsley, *Ann. Bot.* (*London*) 10: 234 (1896)]

[*Cassine melanocarpa auct. non* (F.Muell.) Kuntze: K.Domin, *Biblioth. Bot.* 89: 341 (1927), *p.p.*]

Illustration: I.Hutton, *Lord Howe Is.* 121 (1986).

Large shrub or tree to 13 m tall. Leaves opposite; lamina elliptic or broadly elliptic, (3–) 4–7 (–8) cm long, (2–) 3–4 (–5) cm broad, acute-cuneate to obtuse at base and attenuate onto petiole, crenate-dentate (serrate in juvenile plants), obtuse to rounded. Inflorescence axillary in upper leaves or terminal, cymose-paniculate, many-flowered. Flowers 5-merous. Sepals 1–1.5 mm long, somewhat persistent. Petals 2–3 mm long, slightly reflexed, green, caducous. Stamens 5; filaments c. 1 mm long; anthers c. 0.25 mm long. Drupe ellipsoidal to obovoid, 1.5–1.8 cm long, somewhat acuminate to sharp, almost black; endocarp pitted. *Maple* (N.Is.), *Tamana* (L.H.Is.). Fig. 46B.

Norfolk Is., Lord Howe Is. An occasional or locally common tree. Flowers May–Aug. Also found in New Caledonia.

N.Is.: Anson Bay, *P.Ralston 3* (A, K, NSW); Steels Point area, *M.Lazarides 8034* (CANB, K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW). **L.H.Is.:** Lagoon Rd, between Flagstaff and Government House, *L.A.S.Johnson & A.N.Rodd 1220* (K, NSW); summit of Transit Hill, *A.N.Rodd 1852* (K, NSW); between Goat House and Smoking Tree, *M.M.J. van Balgooy 1071* (K, L).

The Norfolk Is. (and New Caledonian) population has petioles which are on average longer than those of Lord Howe Is. representatives, being 8–20 mm long, as compared with 5–10 mm on Lord Howe Is., but no other constant difference has been noted. This species is related to *E. australe* Vent. of eastern Australia.

56. ICACINACEAE

Trees or shrubs, rarely climbers. Leaves usually alternate, simple, without stipules. Inflorescence usually axillary, cymose-paniculate, rarely fasciculate or flowers solitary. Flowers bisexual or rarely functionally unisexual, actinomorphic; disk small or absent. Calyx small, 4- or 5-lobed, usually imbricate and persistent. Petals 4 or 5, free or basally connate into a tube, usually valvate. Stamens 4 or 5, alternate with petals. Ovary superior, functionally 1-locular by abortion; ovules (1 or) 2, pendulous; style simple and short or lacking; stigmatic lobes usually 3. Fruit a 1-seeded drupe, rarely a samara.

A family c. 60 genera and 350 or more species, mostly tropical; 1 genus native on Norfolk Is.

G.Bentham, Olacineae Trib. Icacineae, *Fl. Austral.* 1: 395–396 (1863); H.Sleumer, Icacinaceae, *Fl. Males.* ser. I, 7: 1–87 (1972); G.P.Guymer, Icacinaceae, *Fl. Australia* 22: 204–211 (1984).

PENNANTIA

Pennantia J.R.Forst & G.Forst., *Char. Gen. Pl.* 133, t. 67 (1775); named after Thomas Pennant (1726–1798), early British scientist and antiquary.

Type: *P. corymbosa* J.R.Forst & G.Forst.

Shrubs or trees. Leaves alternate. Inflorescence terminal, sometimes on side shoots, corymbose-paniculate; bracts minute. Flowers bisexual or functionally unisexual. Calyx minute or rudimentary. Petals 5, valvate. Stamens 5. Ovule 1; style very short, or lacking with stigma sessile. Fruit a drupe with hard or crustaceous endocarp.

A genus of 3 species confined to eastern Australia, Norfolk Is. and New Zealand; 1 species native (possibly endemic) to Norfolk Is.

Pennantia endlicheri Reissek, *Linnaea* 16: 341, t. 13 (1842)

T: Norfolk Island, *F.L.Bauer*; holo: W. Named after Stephan Friedrich Ladislaus Endlicher (1804–1849), author of the first Flora of Norfolk Island, his *Prodromus Florae Norfolkicae* (1833).

[*Pennantia corymbosa auct. non* J.R.Forst & G.Forst.; S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 80 (1833)]

Illustrations: S.F.L.Endlicher, *Iconogr. Gen. Pl.* t. 121 (1841); S.Reissek, *Linnaea* 16: 346, t. 13 (1842).

Shrub or usually a tree to 10 m tall. Leaves glossy above, glabrous; petiole (1–) 1.5–3 cm long, glabrous; lamina broadly elliptic to obovate, (7–) 9–18 (–25) cm long, (5–) 6–9 (–15) cm broad, acute at base, entire or sometimes obscurely and irregularly sinuate-dentate, obtuse to almost rounded. Inflorescence cymose-paniculate, unisexual, many-flowered. Flowers functionally unisexual. Calyx obscure. Petals lanceolate, 3–4 mm long, white. Stamens 2 mm long. Ovary barrel-shaped, 1.5 mm long; stigma sessile, discoid. Drupe ellipsoidal, 7 mm long. *Pennantia*. Fig. 46E–F.

Norfolk Is. Almost endemic, but 'only one tree found' (G.T.S.Baylis quoted by W.R.B.Oliver in *Rec. Auckland Inst. Mus.* 3: 226, 1948), on Three Kings Islands, off the northern tip of New Zealand. This was described and named *Plectomirtha baylisiana* W.R.B.Oliv. but appears to be this species. On Norfolk Is. this species occurs scattered throughout the National Park and occasionally elsewhere.

N.Is.: saddle between Mt Pitt and Mt Bates, *R.D.Hoogland 11286* (NSW); Mt Bates, track leading to Red Rd, *P.S.Green 1395* (A, K); slopes of Mt Pitt, *J.D.McComish 35* (K); Mt Pitt, 1805, *G.Caley* (K); Cascade Rd, *A.Cunningham 85* (K).

57. EUPHORBIACEAE

Trees, shrubs or herbs, often with milky latex. Leaves alternate, rarely opposite or whorled, usually simple, sometimes digitate, rarely reduced, usually stipulate. Inflorescences various, basically cymose. Flowers actinomorphic, unisexual, sometimes greatly reduced, often with a nectarial disc. Calyx free or united, valvate or imbricate, sometimes much reduced or absent. Corolla usually absent. Stamens 1–many; filaments free or united; anthers 2-locular, usually dehiscing longitudinally. Ovary superior, usually 3-locular, with 1 or 2 axile ovules per locule; styles as many as carpels, free or connate, often 2-lobed, or further divided; stigmas various. Fruit usually a 3-locular schizocarp with a persistent axis, rarely a drupe or berry. Seeds often with a conspicuous caruncle.

A cosmopolitan, but mostly tropical or subtropical family of c. 300 genera and 7500 or more species; 7 native and introduced genera on the Islands.

G.Bentham, Euphorbiaceae, *Fl. Austral.* 6: 41–153 (1873); F.Pax & K.Hoffman, Euphorbiaceae, *Pflanzenr.* IV. 147 (1910–1924); F.Pax & H.Hoffman, *Nat. Pflanzenfam.* 2nd edn, 19c: 11–233 (1931); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Euphorbiaceae, *Fl. Java* 1: 441–505 (1963); G.L.Webster, The genera of Euphorbiaceae in the southeastern United States, *J. Arnold. Arbor.* 48: 303–430 (1967); G.L.Webster, Conspectus of a new classification of the Euphorbiaceae, *Taxon* 24: 593–601 (1975); H.K.Airy Shaw, The Euphorbiaceae of Borneo, *Kew Bull.* Add. Ser. 4 (1975); H.K.Airy Shaw, The Euphorbiaceae of New Guinea, *Kew Bull.* Add. Ser. 8 (1980); H.K.Airy Shaw, The Euphorbiaceae - Platylobeae of Australia, *Kew Bull.* 35: 577–700 (1980); H.K.Airy Shaw, The Euphorbiaceae of Sumatra, *Kew Bull.* 36: 239–374 (1981); A.C.Smith, Euphorbiaceae, *Fl. Vit. Nova* 2: 439–575 (1981).

KEY TO GENERA

1 Male and female flowers much reduced and grouped in a cup-shaped cyathium resembling a single flower, usually with concave glands on margin **8. EUPHORBIA**

1: Male and female flowers separate and distinct (plant dioecious or monoecious); inflorescence not resembling a single flower, without such glands

2 Leaves with palmate, peltate lamina; capsule covered with soft spines **5. RICINUS**

2: Leaves often entire, perhaps crenate-serrate but not peltate; fruit wall smooth or tuberculate

3 Herbs, annual or perennial, to 50 cm tall; stamens 5 **1. PHYLLANTHUS**

3: Shrubs or trees; stamens few to many

4 Leaves opposite; stamens numerous; plant exuding a red sap when cut; flowers with a corolla **3. BALOGHIA**

4: Leaves alternate; stamens 10 or fewer; plant exuding a clear or milky sap when cut; flowers without a corolla

5 Lamina of leaf broadly ovate to rhombic **6. HOMALANTHUS**

5: Lamina of leaf elliptic, broadly elliptic, broadly ovate or broadly oblanceolate

6 Leaves broadly ovate, margins crenate-serrate, primary veins at base of lamina palmate, pinnately-veined above **4. ACALYPHA**

6: Leaves elliptic or broadly elliptic to broadly oblanceolate, margins entire or obscurely bluntly dentate, primary veins of lamina strictly pinnately arranged

7 Fruit a drupe; latex not abundant **2. DRYPETES**

7: Fruit a capsule; abundant white, milky latex **7. EXCOECARIA**

1. PHYLLANTHUS

Phyllanthus L., *Sp. Pl.* 2: 981 (1753); *Gen. Pl.* 5th edn, 422 (1754); from the Greek *phyllon* (a leaf) and *anthos* (a flower), in allusion to the flowers in some species being borne on leaf-like branchlets.

Type: *P. niruri* L.

Trees, shrubs or herbs, monoecious or dioecious, without milky latex. Branchlets often leaf-like, deciduous, subtended by scale-like leaves. Foliage leaves alternate, simple, entire, stipulate. Inflorescences axillary, cymose, with flowers clustered or solitary along rachis, without bracts. Sepals 4–6, free, imbricate or decussate, persistent; disc usually present. Petals absent. Male flowers with 2–5 (–15) stamens; filaments free or connate. Female flower with usually 3-locular ovary; ovules 2 per locule; styles 3, distinct or basally connate, usually bifid; stigma usually recurved. Fruit usually an explosive schizocarp of three, 2-seeded valves. Seeds 3-angled, without caruncle; seed coat usually thin and dry.

A genus of over 750 species from the tropics or subtropics, especially those of the Old World; 1 species naturalised on Norfolk and Lord Howe Islands.

***Phyllanthus tenellus** Roxb., *Fl. Ind. (ed. 1832)* 3: 668 (1832)

T: cultivated in Calcutta, India, origin Mauritius, *N.Wallich 7892A p.p.*; holo: K.

Phyllanthus sp.; R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 30 (1915).

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland*. 1: 430, fig. 67I–M (1983); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 626, t. 85 (1990); T.A.James & G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 398 (1990).

Annual or sometimes perennial herb to 50 cm tall, with a persistent central stem and deciduous lateral branchlets. Leaves thin, glaucescent below, ±sessile; stipules narrowly lanceolate, 0.5 mm long; lamina elliptic to obovate or broadly obovate, (0.6–) 1–2 (–2.5) cm long, 0.4–1 cm broad, broadly acute or rounded at base, acute to obtuse at apex. Lower inflorescences cymose with 2 or 3 pistillate and 1 or 2 staminate flowers; upper flowers solitary, pistillate; pedicels of male flowers to 1.5 mm long; of female flowers to 5 mm long. Sepals 5, narrowly (male) or broadly (female) ovate, 0.6–0.8 mm long. Stamens 5, filaments free. Schizocarp 3-valved, depressed globose, c. 0.8 mm diam., green, explosively dehiscent. Seeds almost 1 mm long, minutely tuberculate, orange-brown. *Hen and Chickens.*

Norfolk Is., Lord Howe Is. An introduced species, native to Madagascar, now widespread as a weed.

N.Is.: Steels Point, *P.S.Green 1884* (K); near Steels Point, *W.R.Sykes NI 184* (CHR); Burnt Pine, New Cascade Rd, *W.R.Sykes NI 589* (CHR); *s. loc., W.Laing* (CHR). **L.H.Is.:** Neds Beach Rd, *A.C.Beauglehole 5860* (MEL); garden of 'Somerset', *A.N.Rodd 1738* (K, NSW).

2. DRYPETES

Drypetes Vahl, *Eclog. Amer.* 3: 49 (1807); Vahl gave no origin for this name. In Greek it means ripened on the tree, from *drys* (a tree, or strictly, an oak) and *pepaino* (I soften or ripen) but the allusion to this genus is obscure. (It has been said that it comes from another Greek word that means to tear or laciniate, but no thorns exist on the only species that was known when the genus was first described).

Type: *D. glauca* Vahl

Trees or shrubs, dioecious, without latex. Leaves alternate, often coriaceous, stipulate. Inflorescences axillary, clustered or flowers solitary, sometimes subsessile, or males in short racemes; bracts small, caducous. Calyx lobes 4 or 5 (–7), imbricate, caducous. Petals absent. Male flowers with 3–12 (–many) stamens; filaments free; sometimes with a rudimentary ovary present. Female flowers with cupulate disc; ovary 1-locular (rarely more), with 2 ovules; styles short or absent; stigma subsessile, unlobed. Fruit a drupe, usually 1-seeded, indehiscent; exocarp fleshy. Seeds without a caruncle.

A mainly Old World tropical genus of c. 200 species; 1 endemic subspecies on Lord Howe Is.

Drypetes deplanchei (Brongn. & Gris) Merr., *J. Arnold Arbor.* 32:199 (1951)

subsp. **affinis** (Pax & K.Hoffm.) P.S.Green, *Kew Bull.* 45: 239 (1990)

Drypetes affinis Pax & K.Hoffm. in H.G.A.Engler, *Pflanzenr.* 81: 271 (1922); *D. lasiogyna* subsp. *affinis* (Pax & K.Hoffm.) P.S.Green, *J. Arnold Arbor.* 67: 111 (1986). T: Lord Howe Island, *'F.Mueller' [C.Moore]*; holo: B, presumably destroyed; iso: K. The epithet means similar to or related to, in this case referring to *D. sepiaria* (Wight & Arn.) Pax & K.Hoffm. of India and Sri Lanka.

Hemecyclia australasica Müll.Arg. var. ?: G.Bentham, *Fl. Austral.* 6: 118 (1873).

[*Hemecyclia australasica auct. non* Müll.Arg.: C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 21, 25 (1870); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 250 (1896); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 149 (1917)]

[*Hemecyclia sepiaria auct. non* (Müll.Arg.) Pax & K.Hoffm.: F.J.H. von Mueller, *Fragm.* 9: 77 (1875)]

[*Drypetes australasica auct. non* (Müll.Arg.) Pax & K.Hoffm.: A.N.Rodd in H.F.Recher & S.S.Clark, *Environm. Survey Lord Howe Is.* 23 (1974); S.W.L.Jacobs & J.Pickard, *Pl. New South. Wales* 116 (1981)]

[*Drypetes lasiogyna* var. *australasica auct. non* (F.Muell.) Airy Shaw: A.N.Rodd & J.Pickard, *Cunninghamia* 1: 272 (1983)]

Illustrations: I.Hutton, *Lord Howe Is.* 32, 124 (1986).

Tall shrub or tree to 16 m tall; bark pale grey, smooth; latex not abundant. Leaves coriaceous; petiole 4–6 mm long; stipules small, caducous; lamina elliptic, (4–) 5–8 (–10) cm long, (2–) 3–4 (–5) cm broad, broadly acute at base, entire or obscurely bluntly dentate, obtuse to rounded at apex; secondary veins pinnate from midrib, finely reticulate above and

below. Inflorescence clustered; pedicels 2–5 mm long. Calyx lobes 4 or 5, broadly elliptic, 3–4 mm long, ciliate, rounded, pale green, scattered pilose externally. Stamens 8–10; filaments 0.5 mm long; anthers ellipsoidal, 1 mm long. Ovary barrel-shaped, 2 mm tall; stigma asymmetrically discoid, 2 mm broad. Fruit globose-ellipsoidal, 2–2.5 cm long, orange-red to yellow. *Greybark*. Figs 47K, 53.

Lord Howe Is. An endemic subspecies which, on the Island, is one of the most widespread and common lowland trees. Flowers end Sept.–late Jan.

L.H.Is.: SE lower slopes of Malabar, *P.S.Green 1572* (A, K); Neds Beach, *A.N.Rodd 1426* (NSW); *loc. id., M.M.J. van Balgooy 1108* (K, NSW); Middle Beach Rd, *I.R.H.Telford 7018* (CBG); *s. loc., J.D.McComish 51* (K, NSW).

Subsp. *deplanchei* occurs in Australia (Qld) and New Caledonia, but details of the classification and relationships of the species remain to be worked out.

3. BALOGHIA

Baloghia Endl., *Prodr. Fl. Norfolk*. 84 (1833). Named after Josef Balogh of Transylvania, who graduated in medicine from Leiden in 1779.

Type: *B. lucida* Endl. = *B. inophylla* (G.Forst.) P.S.Green

Trees or shrubs, dioecious or monoecious, latex present. Leaves opposite or alternate. Inflorescences terminal, racemose, male and female flowers mixed or on separate plants; bracts deciduous. Calyx lobes 4 or 5, imbricate, persistent. Petals 4 or 5. Male flowers with numerous stamens; filaments shortly united at base. Female flowers with 3-locular ovary; ovule 1 per locule; styles 3, deeply bifid; stigma obscure. Fruit a capsule, somewhat fleshy at first, becoming hard and separating from the persistent axis. Seeds with caruncle small or absent.

A genus of c. 12 species from Australia and New Caledonia, with 1 species extending to Norfolk and Lord Howe Islands.

Baloghia inophylla (G.Forst.) P.S.Green, *Kew Bull*. 41: 1026 (1986)

Croton inophyllus G.Forst., *Prodr*. 67 (1786). T: New Caledonia, *J.R. & G.Forster*; lecto: K; isolecto: BM, GOET, *fide* P.S.Green, *loc. cit*. The epithet comes from the Greek *inodes* (fibrous, sinewy) and *phyllon* (a leaf), in allusion to the sinewy, parallel venation of the leaves.

Baloghia lucida Endl., *Prodr. Fl. Norfolk*. 84 (1833); *Codiaeum lucidum* (Endl.) Müll.Arg. in A.L.P.P. de Candolle, *Prodr*. 15(2): 1116 (1866). T: Norfolk Island, *F.L.Bauer*; holo: W.

Croton sanguifluus A.Cunn. ex Heward, *London J. Bot*. 1: 113 (1842), *nom. in synon., non* Kunth.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 425, fig. 66F (1983), as *Baloghia lucida*; I.Hutton, *Lord Howe Is*. 124 (1986), as *Baloghia lucida*; T.A.James & G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 410 (1990).

Shrub or tree to 7 m or more tall, exuding a red sap when cut. Leaves opposite, coriaceous, glabrous, shining; petiole 4–10 mm long; lamina elliptic to broadly elliptic, sometimes slightly oblanceolate, (4–) 5–11 (–15) cm long, (2–) 3.5–6 (–7) cm broad, acute or rounded at base, thickened at margins, rounded at apex and very abruptly acuminate or acute, with a marginal embedded gland on each side 1–5 mm above petiole. Calyx lobes 5, ±ovate, 3–4 mm long, tomentose-ciliate on margin. Petals 5, elliptic-lanceolate, 6–7 mm long, white. Stamens numerous; filaments in bundles, 1.5 mm long; anthers c. 1 mm long. Ovary broadly conical, 2–3 mm long; stylar arms curled, 2–3 mm long. Fruit globose, 15–20 mm diam. Seeds ovoid-obloid, c. 1 cm long, dark brown or black. *Bloodwood*. Figs 44A–C, 52.

Norfolk Is., Lord Howe Is. A frequent tree at altitudes to c. 500 m. Flowers Oct.–early Apr. Also found in Australia (Qld, eastern N.S.W.), and New Caledonia.

N.Is.: Mt Bates, track leading to Red Rd, *P.S.Green 1403* (A, K); top and upper slopes of Mt Pitt, *G.Uhe 1173* (K); Steels Point area, *M.Lazarides 8035* (CANB, K). **L.H.Is.:** Dawsons Ridge, *M.M.J. van Balgooy 1020* (K); S ridge of Transit Hill, *A.N.Rodd 1855* (K, NSW); track to Mt Gower, The Saddle, *I.Hutton 97* (CBG).

4. ACALYPHA

Acalypha L., *Sp. Pl.* 2: 1003 (1753); *Gen. Pl.* 5th edn, 436 (1754); based on the ancient Greek name *akalephe* for the stinging nettle, the leaves of which several species resemble.

Type: *A. virginica* L.

Herbs, shrubs or small trees, monoecious or dioecious, without latex. Leaves alternate, palmately or pinnately veined, petiolate, stipulate. Inflorescences unisexual or male and female flowers mixed; male inflorescence axillary, usually slender and catkin-like; female axillary or terminal, usually spicate, sometimes racemose or paniculate; mixed inflorescences spicate or racemose, often female at base. Male flowers very small, glomerate, subsessile, spaced or crowded, with inconspicuous bracts; calyx lobes 4, valvate; petals absent. Female flowers usually 1 per node, subtended by a small or large, toothed or lobed, foliaceous bract; calyx lobes 3 or 4 (–5), imbricate; petals absent; ovary 3-lobed, 3-locular; ovule 1 per locule/lobe; style simple or numerous, filiform; stigma linear. Fruit a dehiscent capsule. Seeds with or without a caruncle.

A genus of c. 450 species found throughout the tropics, with a few in the warm temperate regions of the New World; 1 species naturalised on Norfolk Is.

***Acalypha wilkesiana** Müll.Arg. in A.L.P.P. de Candolle, *Prodr*. 15(2): 817 (1866)

T: Fiji, *B.Seemann 392* & *1840*; syn: K. Named after Captain Charles Wilkes (1798–1877), who commanded the U.S. Exploring Expedition of 1838–1842.

Illustrations: M.C.Neal, *Gardens Hawaii* 503, fig. 197e (1965); A.B.Graf, *Exotica* 12th edn, 1: 1003–1004 (1985); A.B.Graf, *Tropica* 3rd edn, 408–409 (1986).

Much-branched shrub to 4 m tall; latex clear or milky. Young stems tomentose. Leaves with petiole 5–9 cm long; stipules subulate, 1–1.5 cm long, pubescent; lamina broadly ovate, 8–20 cm long, 5–12 cm broad, rounded at base, crenate-serrate, acuminate, palmately 5–7-veined at base, pinnately veined above, pubescent, especially on veins, membranous, often bronze-coloured beneath or variegated. Inflorescences axillary, spicate, tomentose; male 3–7 cm long, with flowers in numerous, dense groups c. 2 mm across, with bracts lanceolate, 1 mm long; female 2–10 cm long, lax, 1 flower per node, with bracts broadly ovate, accrescent to 5 mm long, with several narrow marginal lobes, acute. Styles laciniate-filiform, 7–9 mm long, red. Fruit 3-lobed, 1.5–2 cm long, tomentose. *Redleaf.*

Norfolk Is. A native of Melanesia, widely cultivated throughout the tropics for its decorative leaves, sometimes becoming naturalised through seeding itself in open ground.

N.Is.: Highlands Lodge, Selwyn Pine Rd, *R.O.Gardner 6231* (AK, K); around Old Prison Settlement, *G.Uhe 1139* (K).

5. RICINUS

Ricinus L., *Sp. Pl.* 2: 1007 (1753); *Gen. Pl.* 5th edn, 437 (1754); so called because the seed resembles a tick, for which the Latin name is *ricinus*.

Type: *R. communis* L.

Shrubs or large herbs, monoecious; latex watery. Leaves alternate, petiolate; stipules sheathing, caducous, leaving an annular scar; lamina peltate, palmately lobed. Inflorescences terminal, but sometimes appearing leaf-opposed, paniculate; upper flowers male; lower female; each subtended by 2 bracts. Calyx lobes 3–5, valvate. Petals absent. Male flowers with numerous stamens; filaments repeatedly branched. Female flowers with 3-locular ovary; ovule 1 per locule; styles 3, bipartite; stigma papillose-plumose. Fruit a capsule, usually softly spiny. Seeds with a terminal caruncle.

A monospecific genus, originally native in Africa, but early introduced to the eastern Mediterranean area, and now both cultivated (as a source of castor oil and as a handsome garden plant, especially the cultivars with red or reddish stems, leaves *etc.*) and a widespread

weed. Naturalised on Norfolk and Lord Howe Islands.

***Ricinus communis** L., *Sp. Pl.* 2: 1007 (1753)

T: cultivated; lecto: Herb. Clifford 450, *Ricinus* 1, BM, *fide* A.Radcliffe-Smith, *Kew Bull.* 39: 794 (1984).

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 465 (1981); J.Z.Weber in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 765, fig. 410 (1986); T.A.James & G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 405, 406 (1990).

Herb or shrub to 4 m tall or more, glabrous. Leaves deeply palmately 5–10-lobed; petiole 10–30 cm long; lamina suborbicular in outline, 15–60 cm broad; lobes irregularly serrate, acute to acuminate. Panicles erect, 8–15 cm tall. Calyx lobes ovate-lanceolate, 5–8 mm long. Male flowers with over 100 stamens. Female flowers with ovary usually spinulose-muricate; styles bifid, connate at base, red. Capsule ovoid-spherical, 10–20 mm diam., ±softly spiny. Seeds mottled, 10–15 mm long. *Castor Oil Plant*.

Norfolk Is., Lord Howe Is. Locally common as a weed of waste ground on Norfolk Is., less common on Lord Howe Is. The seeds are extremely poisonous.

N.Is.: Steels Point, Simons Water, *W.R.Sykes NI 885* (CHR); Rocky Point area, Hundred Acre Reserve, *W.R.Sykes NI 516* (CHR). **L.H.Is.:** Neds Beach Rd, opposite 'Somerset', *J.Pickard 2656* (NSW); *s. loc.*, 1920, *J.L.Boorman* (NSW).

6. HOMALANTHUS

Homalanthus A.Juss., *Euphorb. Gen.* 50 (1824); from the Greek *homalos* (flat) and *anthos* (a flower), in allusion to flattened male flowers of the type species.

Type: *H. leschenaultianus* A.Juss.

Shrubs or small trees, monoecious or dioecious, with milky latex. Leaves alternate, simple, stipulate, with 2 sessile glands at apex of petiole or at base of lamina. Inflorescences terminal, racemose or spicate, with 1–several female flowers at base and numerous male flowers above; bracts broad, with 2 large basal glands. Perianth of 1–3 reduced sepaloid segments. Male flowers solitary or clustered at nodes on rachis, with 6–many stamens. Female flower with subtending bract. Ovary 2 (or 3)-locular; ovule 1 per locule; styles 2 (or 3), basally connate; stigmas entire or bifid. Fruit a capsule, ±fleshy, usually 2-lobed, indehiscent or tardily dehiscent. Seeds carunculate.

A genus of c. 35 species from SE Asia, Australia and the Pacific; 1 species native on Norfolk and Lord Howe Islands. The name was originally spelt *Omalanthus*, without an initial letter h to represent the Greek *spiritus asper* in the word *homalos*, (Jussieu, being French, would have pronounced it as he spelt it), but this is an orthographic error and should be corrected.

Homalanthus populifolius Graham, *Edinburgh New Philos. J.* 3: 175 (1827)

T: cultivated (seed Australian), 1827, *R.C.Graham*; iso: K. So called because the leaves (*folia*) resemble those of the poplar (*Populus*).

[*Carumbium populifolium auct. non* Reinw.: F.J.H. von Mueller, *Fragm.* 9: 77 (1875)]

[*Homalanthus leschenaultianus auct. non* A.Juss.: W.B.Hemsley, *Ann. Bot.* (*London*) 10: 251 (1896); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 134 (1898)]

Illustrations: A.Floyd, *For. Comm. New South Wales Research Notes* 41: 73, t. 22 (1980); I.Hutton, *Lord Howe Is.* 124 (1986); T.A.James & G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 421 (1990).

Shrub or small tree to 5 m tall. Leaves often turning red with age, undersurface grey-green; petiole elongate, 2–12 cm long, with 1 or 2 apical glands; lamina broadly ovate to rhombic, (3–) 5–10 (–15) cm long and broad, acute or truncate at base, abruptly contracted onto petiole, acute at apex; stipules caducous. Inflorescence racemose, 6–14 cm long. Male flowers numerous, solitary or clustered, sessile or pedicels to 1 mm long; perianth lobe single, shield-shaped; stamens 4–10. Female flowers 3–10, each solitary in a bract at inflorescence base; pedicels 3–6 mm long; subtending bract with 2 basal glands; styles 2;

stigmatic arms 1–2 mm long with a terminal gland. Fruit globose, 8–10 mm diam., with 2 grooves and slightly ridged between, smooth, glaucous. *Kava Tree* (N.Is.)., *Dog Wood* (L.H.Is.).

Norfolk Is., Lord Howe Is. On Norfolk Is. confined to the National Park but more widespread on Lord Howe Is. at lower elevations, especially in moist habitats, where it flowers Nov.–Apr. It also occurs in Papua New Guinea and Australia (Qld, N.S.W. and easternmost Vic.).

N.Is.: top and upper slopes of Mt Pitt, *G.Uhe 1174* (K); Mt Pitt, *A.C.Quintall* (CHR); *s. loc, R.M.Laing* (CHR). **L.H.Is.:** near Old Settlement, *R.D.Hoogland 8695* (NSW); S end of golf course, *J.Pickard 3472* (NSW); S end of Little Slope, *J.Pickard 2822* (NSW).

7. EXCOECARIA

Excoecaria L., *Syst. Nat*. 10th edn, 1281, 1288 (1759); from the Latin *excaecare* (to make blind), because the milky sap causes blindness if it enters the eyes.

Type *E. agallocha* L.

Shrubs or trees, usually dioecious, with milky latex. Leaves alternate, simple, petiolate; stipules small. Inflorescences axillary, racemose or spicate, 1 or more per axil, bracteate. Sepals (2–) 3 (–4), imbricate. Petals absent. Male flowers numerous, in clusters of 1–3 in axils of bracts; stamens 2 or 3. Female flowers fewer, in shorter inflorescences; ovary 3-locular; ovule 1 per locule; styles 3, free or basally connate; stigmatic arms entire, reflexed. Fruit a 3-lobed capsule. Seeds without a caruncle.

A genus of c. 40 species from the Old World tropics; 1 species native on Norfolk Is.

Excoecaria agallocha L., *Syst. Nat*. 10th edn, 1288 (1759)

Excoecaria agallocha var. *genuina* Müll.Arg. in A.L.P.P. de Candolle, *Prodr*. 15(2): 1220 (1866). T: 'Arbor excoecans', Rumphius, *Herb. Amboin*. 2: t. 79 (1741); lecto: *fide* G.McPherson in C.E.Jarvis *et al*., *Regnum Veg*. 127: 46 (1993). The epithet is based on an East Indian native name.

Illustrations: A.C.Smith, *Fl. Vit. Nova* 2: 562, fig. 150 (1981); W.R.Elliot & D.L.Jones, *Encycl. Austral. Pl.* 4: 268 (1986); T.A.James & G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 422 (1990).

Shrub or small tree to 9 m tall, dioecious; milky latex copious. Leaves broadly elliptic to somewhat broadly oblanceolate, (4–) 6–8 (–10) cm long, (2.5–) 3.5–4 (–5.5) cm broad, cuneate to obtuse with 2 glands at very base, entire, obtuse or rarely somewhat acute at apex; veins pinnate from midrib, with midrib continuing strongly to apex. Male inflorescence 2–6 cm long; flowers with 2 or 3 stamens; filaments 1–2 mm long. Female inflorescence 1–3 cm long with relatively few flowers; flowers solitary in axils of bracts, subsessile; ovary spherical, slightly 3-lobed, 1 mm diam.; style branches 1 mm long. Capsule depressed spherical, c. 3 mm tall, smooth. *Melky Tree*.

Norfolk Is. In a few places near the south and south-eastern coasts. Also known from the tropical and subtropical coasts of Australia, Malesia and islands of the Pacific.

N.Is.: Ball Bay, *R.D.Hoogland 11302* (CANB, K); *loc. id., J.D.McComish 67* (K); *loc. id., P.S.Green 2399A & B* (K); at the Settlement, *A.Cunningham 142* (K).

The latex can blister the skin and, if it gets into the eyes, can be very painful and cause blindness.

8. EUPHORBIA

Euphorbia L., *Sp. Pl.* 1: 450 (1753); *Gen. Pl.* 5th edn, 208 (1754); said to be named after Euphorbus, physician to King Juba II (c. 50 B.C.–c. 24 A.D.) of Numidia and Mauritania, (who was the son-in-law of Cleopatra and Mark Anthony) and author of a number of works, including *De Euphorbia herba*.

Type: *E. antiquorum* L.

Herbs, shrubs or rarely trees, monoecious, rarely dioecious, with a milky latex, sometimes succulent, sometimes spiny. Leaves alternate, opposite or whorled, usually entire; stipules present or absent. Inflorescences with male and female flowers within a bisexual, involucrate head, a cyathium, its margin with usually 4 or 5, commonly concave horizontal glands, alternating with small marginal lobes; cyathia terminal or axillary, solitary, clustered or umbellate. Male flowers few to many, reduced to a single stamen; filament articulated. Female flowers solitary, reduced to a stalked 3-locular ovary; ovule 1 per locule; style 3-lobed, each lobe entire or bifid; stigmas obscure. Fruit a capsule, dehiscing into 2-valved segments; axis persistent. Seeds smooth or sculptured, often carunculate.

A worldwide genus of perhaps 2000 species, mostly from subtropical and temperate regions; 3 native and 4 naturalised species on the Islands. One subgenus, *Chamaesyce* Gray, is often treated as a separate genus; in most areas there are characters which define it well, but if a world view is taken, especially including those species from the New World tropics, the two groups are not so distinct and it is better to have an inclusive, if large, genus *Euphorbia*.

1 Shrub 1 (–3) m tall; leaves (5–) 6–10 cm long, narrowly oblanceolate (N.Is.) **7. E. norfolkiana**

1: Herbs, prostrate or to 80 cm tall; leaves less than 3 cm long, oblong to broadly elliptic or ovate (except *E. heterophylla*)

2 Cyathia in a terminal dense pseudocyme or 3 in a branched umbel

3 Leaves broadly elliptic (to obovate) to panduriform, 3–10 cm long; inflorescence a clustered head; base of uppermost leaves red **5. E. cyathophora**

3: Leaves obovate to ovate, 0.5–2.5 cm long, glabrous; inflorescence a terminal, branched umbel; all leaves green throughout **6. E. peplus**

2: Cyathia solitary in axils of upper reduced leaves or in terminal pseudocymes with much reduced leaves

4 Maritime plants in sand or rock fissures; leaves 0.5–2 cm long; capsules glabrous

5 Cyathia solitary in axils of upper leaves; seeds pointed, elliptic, almost smooth; in fissures in coralline or basaltic rocks (N.Is.) **1. E. oblique**

5: Cyathia in few-flowered terminal pseudocymes with much reduced leaves; seeds ovoid, obtusely 3-angled, shallowly pitted; in sand (L.H.Is.) **2. E. psammogeton**

4: Weeds of disturbed ground; leaves 0.3–0.8 cm long; capsules hairy

6 Capsules finely and sparsely hairy all over **3. E. supine**

6: Capsules hairy on angles only **4. E. prostrata**

1. Euphorbia obliqua Endl., *Prodr. Fl. Norfolk.* 85 (1833)

T: Norfolk Island, *F.L.Bauer*; holo: W. So named from the oblique base to the leaves.

[*Euphorbia sparmannii auct. non* Boiss.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 716 (1904); R.M.Laing, *Trans & Proc. New Zealand Inst.* 47: 29 (1915)]

Illustration: P.S.Green, *Kew Bull.* 48: 315, fig. 2B (1993).

Perennial herb, glabrous. Stems prostrate, to 20 cm long, articulated. Leaves opposite; stipules narrowly attenuate-triangular, c. 1 mm long, erose; petiole c. 1 mm long; lamina broadly elliptic, (0.5–) 1–1.5 cm long, (0.3–) 0.7–1 cm broad, subcordate and oblique at base, entire, obtuse, very shortly apiculate. Cyathia solitary in axils of upper reduced leaves,

1–1.5 mm long; glands 4, semicircular, 0.5–0.75 mm diam., green, with a narrow white rim; peduncle 1–2 mm long. Ovary not or ½ exserted at anthesis. Capsules spherical, deeply 3-lobed, 3 mm diam., glabrous. Seeds pointed, ellipsoidal, scarcely 3-angled, 1.5 mm long, almost smooth, pale straw coloured, without caruncle. Fig. 47E–G.

Norfolk Is. Characteristic of cracks and fissures in coralline and, sometimes, basaltic rocks by the sea, with a woody rootstock penetrating the fissures. Also known from New Caledonia and Vanuatu.

N.Is.: Kingston, *P.Ralston 44* (A); *loc. id.*, *P.S.Green 1433* (A); Emily Bay, *R.M.Laing* (CHR); rocks near the Old Salt House, *P.Ralston 26* (A); Duncombe Bay, The Chord, *P.S.Green 2428* (K).

2. **Euphorbia psammogeton** P.S.Green, *Kew Bull.* 48: 314 (1993)

T: Lord Howe Island, *P.S.Green 1625*; holo: K; iso: A. The epithet comes from the Greek *psammos* (sand) and *geiton* (neighbour), alluding to the habitat.

Euphorbia sp.; C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales.* 25 (1870).

[*Euphorbia sparmannii auct. non* Boiss.: G.Bentham, *Fl. Austral.* 6: 46 (1873); W.R.B.Oliver, *Trans. & Proc. New Zealand. Inst.* 49: 142 (1917); S.W.L.Jacob & J.Pickard, *Pl. New South Wales* 116 (1981); A.N.Rodd & J.Pickard, *Cunninghamia* 1: 252 (1983)]

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 414, fig. 65B (1983), as *E. sparmannii*; T.A.James & G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 429 (1990), as *Chamaesyce sparrmanii*; P.S.Green, *Kew Bull.* 48: 315, fig. 2A (1993).

Perennial herb, glabrous. Stems prostrate, to 35 cm or more, articulated. Leaves opposite; stipules narrowly attenuate-triangular, 1–1.5 mm long, erose; petiole c. 1 mm long; lamina oblong to broadly elliptic, (0.8–) 1.5–2 (–2.5) cm long, (0.5–) 0.8–1 (–1.3) cm broad, subcordate and oblique at base, entire, rounded obtuse at apex, very shortly apiculate. Cyathia 1.5 mm long, 3 or more in small pseudocymes, each solitary in axil of a much reduced leaf; glands 4, semicircular, 0.5 mm diam., with white marginal band; peduncle 2 mm long. Ovary not or ½ exserted at anthesis. Capsule spheroidal, shallowly 3-lobed, 3 mm diam., glabrous. Seeds somewhat pointed ovoid, 1.5 mm long, obtusely 3-angled, rugulose, Pale grey, without caruncle. Fig. 47A–D.

Lord Howe Is. Frequent in sand above the high tide mark. Also known in a similar habitat from Australia (south-eastern Qld, N.S.W.), under the incorrectly applied name *E. sparrmanii* (several orthographic variations).

L.H.Is.: Lagoon Rd, Main Settlement, *A.C.Beauglehole 5568* (MEL); Blinky Beach, *P.S.Green 1625* (A, K); *loc. id.*, *P.S.Green 2043* (K); *s. loc.*, *C.Moore 22* (K).

3. ***Euphorbia supina** Raf., *Amer. Monthly Mag. & Crit. Rev.* 2: 119 (1817)

T: North America, not designated. The epithet means prostrate.

[*Euphorbia thymifolia auct. non* L.: S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 116 (1981)]

Illustrations: L.C.Wheeler, *Rhodora* 43: t. 662D (1941); T.A.James & G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 428 (1990), as *Chamaesyce supina* (Raf.) Hara.

Annual herb, prostrate, usually much branched from base. Stems scattered pubescent, not articulated, often tinged reddish brown. Leaves opposite; stipules linear or subulate, c. 1.5 mm long, fimbriate; petiole 0.5–1 mm long; lamina oblong to elliptic-oblong, 3–8 mm long, 1–4 mm broad, rounded and somewhat asymmetrical at base, serrulate to almost entire, obtuse to rounded. Cyathia solitary in axils of reduced leaves, often in congested axillary shoots, subsessile, c. 0.5 mm long; glands 4, transversely oblong, 0.5 mm broad, subcrenulate, reddish brown with a small white or pink petaloid appendage. Ovary not exserted at anthesis. Capsule spheroidal, 3-angled, c. 1.25 mm long, sparsely appressed-pilose. Seeds somewhat ovoid, 4-angled, 0.8 mm long, pale brown, without caruncle.

Lord Howe Is. A pantropical weed of disturbed ground, possibly now extinct on the Island, according to A.N.Rodd & J.Pickard, *Cunninghamia* 1: 278 (1983), who list it under the name *E. thymifolia* L.

L.H.Is.: *s. loc.*, 1938, *J.D.McComish* (NSW).

Figure 47. A–I, EUPHORBIACEAE. **A–D**, *Euphorbia psammogeton*. **A**, flowering shoot; **B**, cyathium; **C**, seed; **D**, habit (**A–D**, P.Green 1625, K). **E–G**, *Euphorbia obliqua*. **E**, inflorescence; **F**, cyathium; **G**, seed (**E–G**, P.Ralston 44, K). **H–I**, *Euphorbia norfolkiana*. **H**, fruiting shoot; **I**, habit (**H–I**, photograph & J.McComish 79, K). **J**, SAPINDACEAE: *Guioa coriacea*, flowering shoot (C.Moore 30, K). **K**, EUPHORBIACEAE: *Drypetes deplanchei* subsp. *affinis*, fruiting shoot (M.van Balgooy 1108, K). Scale bars: **A**, **D**, **H**, **J**, **K** = 2 cm; **B**, **C**, **E–G** = 2 mm; **I** = 20 cm. Drawn by P.Halliday.

4. *Euphorbia prostrata Aiton, *Hort. Kew.* 2: 139 (1789)

T: cultivated in England, origin in the West Indies, 1758, *P.Miller*; holo ?: BM. So called from its prostrate habit.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 414, fig. 65F (1983); B.A.Auld & R.W.Medd, *Weeds* 161 (1987); T.A.James & G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 428 (1990), as *Chamaesyce prostrata*.

Annual herb. Stems prostrate, branched, to 20 cm long, tinged purplish, sparsely crisped-hairy, not articulated. Leaves opposite; stipules triangular, 0.5–1 mm long, pilose; petiole 0.5–1 mm long; lamina oblong to obovate, 3–8 mm long, 1–5 mm broad, rounded and oblique at base, obtusely serrulate towards apex, rounded at apex. Cyathia solitary in axils of much reduced leaves, sometimes in congested axillary shoots, c. 0.5 mm long; glands 4, transversely oblong, c. 0.2 mm broad, each with a minute white or pink petaloid appendage; peduncle 0.5–1 mm long. Ovary exserted; pedicel c. 1 mm long. Capsule spheroidal, 3-angled, 1.25 mm long, with a line of crisped hairs along angles. Seeds ovoid, 4-angled, 1 mm long, grey-brown, without a caruncle.

Norfolk Is., Lord Howe Is. A weed found throughout the tropics and subtropics. Common in cultivated and disturbed ground.

N.Is.: ruins of old prison, *P.S.Green 1438* (A); foot of sea-wall, Kingston, *P.Ralston 45* (A). **L.H.Is.:** Lagoon Rd, Windy Point to Blinky Beach, *J.Pickard 2951* (NSW); Lagoon Rd, 1979, *B.Miller* (NSW).

5. *Euphorbia cyathophora Murray, *Commentat. Soc. Regiae Sci. Gött.* 7: 81 (1786)

T: cultivated, Göttingen Botanic Garden, not traced. Named from the Greek *cyathos* (a cup) and *-phorus* (bearing), in reference to the inflorescence.

[*Euphorbia heterophylla auct. non* L.: S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 116 (1981); A.N.Rodd & J.Pickard, *Cunninghamia* 1: 276 (1983)]

Illustrations: E.E.Henty & G.S.Pritchard, *Weeds Papua New Guinea & Control* 102 (1973), as *E. heterophylla*; T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 414, fig. 65L (1983), as *E. heterophylla*; T.A.James & G.J.Harden in G.J.Harden, *Fl. New South Wales* 1: 425 (1990).

Annual herb, erect to c. 1 m tall. Stems glabrous, not articulate. Leaves alternate, opposite on flowering branches; stipules absent; petiole 5–10 mm long, glabrous or pilose; lamina broadly elliptic (to obovate) or panduriform, 3–10 cm long, 1.5–4 cm broad, attenuate onto petiole, entire or lobed, acute, glabrous above, sparsely crisped pilose beneath; uppermost leaves with a red patch at base. Cyathia densely clustered in terminal pseudocymes; gland solitary, ±flat, ±2-lipped, c. 1 mm long, green; peduncle 0.5–2 mm long. Ovary exserted. Capsule broadly ovoid, 5–6 mm diam., glabrous; peduncle reflexed. Seeds ovoid-cylindrical, c. 3 mm long, bluntly tuberculate, without a caruncle.

Lord Howe Is. An occasional weed of disturbed ground. Native from southern U.S.A. to northern South America and the West Indies.

L.H.Is.: jetty area, *A.C.Beauglehole 5673* (MEL); Lagoon Beach, near 'Pine Trees', *A.N.Rodd 1351* (NSW); Lagoon Beach, 0.7 km S of Signal Pt, *J.Pickard 2689* (NSW).

Commonly mistaken for the related *E. heterophylla* L.

6. *Euphorbia peplus L., *Sp. Pl.* 1: 455 (1753)

T: Europe, Herb. LINN 630.24; syn: LINN, and Hort. Clifford 199 *Euphorbia* 16; syn: BM. The epithet is a name used by Dioscorides for a species of this genus.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 26, t. 41 (1969); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 414, fig. 65K, S (1983); B.A.Auld & R.W.Medd, *Weeds* 161 (1987).

Annual herb, 5–30 cm tall, glabrous. Stems not articulate. Leaves alternate, membranous, without stipules; petiole 2–10 mm long; lower leaves caducous; lamina obovate to ovate, 0.5–2.5 cm long, 0.2–1.2 cm broad, acute to cuneate at base, symmetrical, entire, rounded at apex. Cyathia solitary in forks of many branches in the terminal, umbellate inflorescence which is usually (repeatedly) 3-rayed; glands 4, elliptic, with 2 long, slender horns, c. 2.5

mm long, green; peduncle c. 1 mm long. Ovary exserted at anthesis. Capsule broadly ovoid, shallowly grooved, 1.8–2 mm long, spheroidal, shallowly lobed; keels each with 2 slightly winged ridges. Seeds oblong-ovoid, 1.5 mm long, with 2 long pits and several smaller ones, carunculate. *Petty Spurge*.

Norfolk Is., Lord Howe Is. A common weed of gardens and disturbed ground. Originally from Europe but now widespread throughout the world.

N.Is.: c. 1.6 km NE of Bloody Bridge, *G.Uhe 1113* (K); Bloody Bridge, *P.S.Green 1442* (A). **L.H.Is.:** Neds Beach Rd, *J.Pickard 2670* (NSW); Windy Point, *J.Pickard* in *A.N.Rodd 1319* (NSW); Transit Hill, *M.M.J. van Balgooy 1085* (NSW); Potato Hills, S end of Little Slope, *J.Pickard 2767* (NSW).

7. **Euphorbia norfolkiana** Boiss. in A.L.P.P. de Candolle, *Prodr*. 15(2): 110 (1862)

T: Norfolk Island, *F.L.Bauer*; holo: W. Named after the island on which this species is endemic.

[*Euphorbia glauca auct. non* G.Forst.: S.F.L.Endlicher, *Prodr. Fl. Norfolk*. 86 (1833); R.M.Laing, *Trans & Proc. New Zealand Inst*. 47: 29 (1915); J.S.Turner *et al.*, *Conservation Norfolk Is*. 34 (1968)]

[*Euphorbia tannensis auct. non* Spreng.: B.C.Seemann, *Fl. Vit.* 217 (1867); C.Moore & E.Betche, *Handb. Fl. New South Wales* 518 (1893)]

[*Euphorbia obliqua auct. non* Endl.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 715 (1904)]

Shrub to 1 (–3) m tall, glabrous. Stems relatively few, marked with petiolar scars, not articulate. Leaves sessile, very narrowly oblanceolate, (5–) 6–10 cm long, (0.7–) 1–1.3 cm broad, attenuate at base, symmetrical, entire, acute to obtuse, gland-tipped, subcoriaceous. Inflorescence terminal, subumbellate, with 1–5 cyathia; peduncle 1–2 cm long. Cyathia cupulate, 5 mm long, 6 mm broad; glands 4 or 5, 1.5–2 mm broad, olive green. Ovary not exserted at anthesis. Capsule c. 1 cm diam., glabrous, glaucous. Seeds broadly ovoid-cylindrical, smooth, 3.5–4 mm long, with a small caruncle. Figs 47H–I, 51.

Norfolk Is. Endemic and endangered. Apparently now found only at Ball Bay and the Bumbora Reserve areas, in open, light shade.

N.Is.: Bumbora Reserve, *R.D.Hoogland 11189* (CANB, K); near Rocky Point and Cresswell Bay, *P.S.Green 1464* (A, K); Anson Bay, *A.Cunningham 145* (K); *s. loc.*, *J.D.McComish 79* (K).

It is very close to *E. kanalensis* Boiss. of New Caledonia, if not conspecific.

58. LINACEAE

Herbs, shrubs or trees. Leaves alternate or opposite, simple; stipules usually present, often gland-like. Inflorescence terminal or axillary, cymose or racemose, sometimes flowers solitary. Flowers actinomorphic, bisexual, sometimes heterostylous. Sepals 4 or 5, imbricate, free or partially connate. Petals 4 or 5, free or rarely basally connate, usually clawed, contorted in bud, often fugacious. Stamens usually 8–10, the antipetalous ones sometimes reduced to staminodes or wanting; filaments basally connate. Ovary superior, 2–5-locular; locules often almost completely subdivided, with usually 2 ovules per locule; styles 2–5, free or coherent; stigmas simple. Fruit a capsule or rarely a drupe. Seeds ±compressed.

A family of c. 15 genera and c. 250 species. Cosmopolitan, but chiefly from the temperate and warm temperate parts of the Northern Hemisphere; 1 genus is naturalised on Norfolk Is.

G.Bentham, Lineae, *Fl. Austral.* 1: 282–284 (1863).

LINUM

Linum L., *Sp. Pl.* 1: 277 (1753); *Gen. Pl.* 5th edn, 135 (1754); the name is the Latin word for the flax of commerce, *Linum usitatissimum* L.

Type: *L. usitatissimum* L.

Herbs or subshrubs. Leaves usually alternate, sessile, entire, often narrow, usually with a midrib only, but secondary nerves if present parallel; stipules gland-like or absent. Inflorescence terminal, cymose or corymbose, sometimes crowded or spicate. Sepals 5, entire or glandular-toothed. Petals 5, larger than sepals, usually white or blue, rarely yellow. Stamens 5, usually alternating with 5 dentate or filiform staminodes. Ovary 5-locular, styles 5, free or partially fused. Fruit a capsule, usually dehiscing by ten, 1-seeded valves. Seeds flattened, shining.

A genus of c. 200 species from temperate to subtropical regions, especially the Mediterranean; 2 species naturalised on Norfolk Is.

Petals yellow; capsules 2–2.5 mm diam. **1. L. trigynum**

Petals blue; capsules 4–6 mm diam. **2. L. marginale**

1. *Linum trigynum L., *Sp. Pl.* 1: 279 (1753)

T: France, not designated. So called because three styles were said to have been observed in this species.

Linum gallicum L., *Sp. Pl.* 2nd edn, 1: 401 (1762). T: not designated.

Illustrations: J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 734, fig. 394C (1986); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 851, t. 119 (1990).

Annual herb. Stems slender, usually branched at base and erect to c. 40 cm tall. Leaves sessile, narrowly elliptic-ovate to linear, 5–20 mm long, 0.5–2.5 mm broad, acuminate. Inflorescence a lax corymbose panicle, with slender branches. Sepals narrowly ovate to lanceolate, 3–4 mm long, 3-nerved, acuminate, usually glandular-ciliate. Petals narrowly obovate, 4–6 mm long, connate for c. 1.5 mm, basally attenuate, obtuse to rounded, yellow, falling early. Stamens c. 3 mm long, basally connate into a tube, with or without small, filiform staminodes. Styles free; stigmas narrowly capitate. Capsule depressed-globose, beaked, 2–2.5 mm diam., glabrous. Seeds c. 1 mm long.

Norfolk Is. A native of southern Europe and the Mediterranean area, now widely naturalised in open ground in Australia and New Zealand.

N.Is.: Anson Bay, *P.S.Green 2380* (K); Red Rd, *P.S.Green 1358* (A); *s. loc.*, roadsides, *J.D.McComish 57* (K); *s. loc.*, *R.M.Laing* (CHR).

2. *Linum marginale A.Cunn. in B.Field, *Geogr. Mem. New South Wales* 357 (1825)

T: Australia, *A.Cunningham s.n.*; holo: K. So called from the membranous margins to the sepals.

Illustrations: N.C.W.Beadle, *Students Fl. NE New South Wales* 2: 208, fig. 93 (1972); C.Lamp & F.Collet, *Weeds Australia* 198, t. 140 (1979); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 734, fig. 394A, t. 20 (1986).

Perennial herb, branching from base to c. 30 cm tall, glabrous. Stems somewhat slender, erect. Leaves sessile, linear-elliptic, 5–20 mm long, 1–2 mm broad, long-acute. Inflorescence a lax, leafy, terminal panicle. Sepals ovate, 4–6 mm long, with white membranous margins, acute to acuminate; midrib almost keeled at base. Petals 8–10 mm long, rounded, apiculate, blue, falling early. Stamens c. 5 mm long, basally connate; staminal filaments 0.5 mm long or absent. Styles coherent for c. halfway or more; stigmas linear, decurrent. Capsule globose, beaked, 4–6 mm diam., glabrous. Seeds c. 3 mm long.

Norfolk Is. A native of Australia which has been introduced to the Island, probably with fodder.

N.Is.: *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW); *s. loc.*, *R.M.Laing* (CHR); *s. loc.*, roadsides, *J.D.McComish 57B* (K, NSW).

59. POLYGALACEAE

Herbs, shrubs or small trees, rarely climbers. Leaves alternate, rarely opposite or whorled, simple, entire, rarely reduced to scales, without stipules. Inflorescence axillary or terminal, racemose, spicate or paniculate, rarely flowers solitary, bracteate. Flowers zygomorphic, bisexual. Sepals 4 or 5, free; inner 2 larger and often petaloid (the wings). Petals 3–5; lateral 2 often much reduced or absent; lowermost boat-shaped (the keel), often with apical fringe. Stamens (3–) 8, usually connate forming a sheath, split on upper side, sometimes free; anthers 1- or 2-locular. Ovary superior, (1–) 2 (–8)-locular; ovule 1 per locule; placentation axile. Fruit a capsule or drupe.

A family of 18 genera and approaching 1000 species, almost cosmopolitan; 1 genus introduced on Norfolk Is.

G.Bentham, Polygaleae, *Fl. Austral.* 1: 137–149 (1863).

POLYGALA

Polygala L., *Sp. Pl.* 2: 701 (1753); *Gen. Pl.* 5th edn, 315 (1754); from the Greek *polys* (many, much) and *gala* (milk), so named because it was anciently supposed to increase the secretion of milk.

Type: *P. vulgaris* L.

Herbs, shrubs or small trees. Leaves alternate, sometimes opposite or whorled. Inflorescence racemose or spicate, rarely subcapitate or paniculate, each flower with a persistent or caducous bract and 2 bracteoles. Sepals 4 or 5, the inner 2 usually larger and petaloid, caducous or persistent. Petals 3 (–5), the lateral 2 minute or absent; lowest entire or apically (or subapically) beaked or crested. Stamens 8, connate into a split sheath, basally adnate to petals; anthers dehiscing through pores. Fruit a 2-locular capsule, laterally compressed, rarely indehiscent, sometimes winged. Seeds usually hairy, carunculate.

A widespread genus of c. 500 species, especially from the tropics and subtropics; 1 species naturalised on Norfolk Is.

***Polygala myrtifolia** L., *Sp. Pl.* 2: 703 (1753)

T: not designated. So called because the leaves (Latin - *folia*) resemble those of the myrtle (Latin - *Myrtus*).

Illustrations: N.C.W.Beadle, *Students Fl. NE New South Wales* 2: 155, fig. 67A (1972); K.Stove in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 791, fig. 418D (1986); C.J.Webb *et al.*, *Fl. New Zealand* 4: 962, fig. 94 (1988).

Densely branched shrub to 2 m tall. Leaves alternate; petiole 1–2 mm long; lamina elliptic-obovate, sometimes broadly so, 1.5–3.5 cm long, 0.7–1.5 cm broad, basally somewhat cuneate, rounded to obtuse and slightly apiculate. Inflorescence a short, terminal raceme, c. 5-flowered; pedicels 5–10 mm long; bracts suborbicular, c. 1 mm long, persistent. Outer sepals 3, c. 5 mm long, apiculate; wing sepals broadly ovate, slightly oblique, c. 15 mm long, purple. Outer petals slightly shorter than keel, acuminate; keel c. 1 cm long, with a fimbriate, subapical crest. Style curved. Capsule suborbicular, c. 1 cm long, with marginal wing c. 1 mm broad, shorter than persistent calyx wings. Seeds oblong, c. 5 mm long, hairy. *Cascade Curse*.

Norfolk Is. A relatively recent arrival and potentially serious weed; probably an escape from cultivation. Native to southern Africa.

N.Is.: vicinity of Burnt Pine Centre, *G.Uhe 1153* (K).

60. MELIANTHACEAE

Small trees or shrubs. Leaves alternate, pinnate; stipules usually large, intrapetiolar; leaflets entire or toothed. Inflorescence axillary or terminal, racemose. Flowers usually zygomorphic, bisexual, usually resupinate by twisted pedicels. Sepals 4 or 5, free or connate, sometimes 2-lipped; lobes unequal, imbricate. Petals 4 or 5, unequal, clawed, imbricate. Nectarial disc incomplete, borne outside filament bases. Stamens 4 or 5; filaments sometimes basally connate. Ovary superior, 4- or 5-locular, with (1–) 2–5-ovules per locule. Fruit a capsule, papery to woody, apically dehiscent by 4 or 5 valves. Seeds usually 1 or 2 per valve.

A small family from tropical and southern Africa with 2 genera and 8 species; 1 genus introduced on Lord Howe Is.

H.J.Hewson, Melianthaceae, *Fl. Australia* 25: 1–2 (1985).

MELIANTHUS

Melianthus L., S*p. Pl.* 2: 639 (1753); *Gen. Pl.* 5th edn, 287 (1754); from the Greek *meli* (honey) and *anthos* (a flower), referring to the abundant nectar produced by some species.

Type: *M. major* L.

Shrubs or subshrubs, often somewhat unpleasantly scented. Leaves imparipinnate; rachis usually winged; leaflets opposite, deeply toothed, slightly asymmetrical at base. Inflorescence racemose, with 1–4 flowers at each node. Calyx 5-lobed; lobes very unequal, the smallest usually pouched at base. Petals usually 4, spathulate. Nectarial disc large. Stamens 4, in 2 pairs; filaments free. Ovary 4-locular, with 2–4 ovules per locule. Capsules bladder-like, papery to somewhat woody, 4-lobed or 4-winged.

A southern African genus of 6 species, often called *Honey Flowers*. One species is naturalised on Lord Howe Is.

***Melianthus major** L., *Sp. Pl.* 2: 639 (1753)

T: not designated. Epithet is Latin for larger, to distinguish it from the other, smaller species, *M. minor* L., described at the same time.

Illustrations: A.B.Graf, *Exotica 4*, 12th edn, 2: 1549 (1985); A.B.Graf, *Tropica* 3rd edn, 642 (1986); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 801, fig. 424B (1986).

Shrub to c. 3 m tall. Leaves 25–35 cm long; stipules connate, lanceolate, 6–9 cm long; rachis with often dentate wing c. 5 mm broad; leaflets 11–21, sessile, oblong-elliptic, 8–15 cm long, 3–7 cm broad, deeply serrate with teeth 4–8 mm long, acute to obtuse. Inflorescence terminal, to c. 40 cm long, with flowers crowded; pedicels 1–2.5 cm long, bracteate. Flowers reddish brown, somewhat fetid. Calyx manifestly zygomorphic, glandular hairy, persistent; anterior lobes c. 1 cm long, forming a pouch; posterior pair 2–2.5 cm long. Petals oblanceolate, c. equal to anterior sepals. Stamens c. 2 cm long. Capsule 3–5 cm long, angular, papery, net-veined. Seeds c. 5 mm long, black, shiny.

Lord Howe Is. A native of South Africa. Presumably introduced as a garden subject, now seeding and reproducing itself outside cultivation.

L.H.Is.: Andersons Rd, near McGee St, *J.Conran 640* (K, NSW).

61. SAPINDACEAE

Trees, shrubs or climbers with tendrils, monoecious or dioecious, rarely polygamous. Leaves usually alternate, usually pinnately compound or 3-foliolate, rarely simple (*Dodonaea*); stipules absent or rarely present, small. Inflorescence terminal or axillary, cymose or cymose-paniculate, sometimes flowers solitary. Flowers actinomorphic or slightly zygomorphic, usually unisexual, often small. Nectarial disc usually present. Sepals 3–5 (–7), free or connate, usually imbricate. Petals (3–) 4 or 5 (–6), sometimes absent, equal or unequal. Stamens (4–) 8 (–15); filaments usually pubescent. Ovary superior, (2–) 3 (–6)-locular, lobed or deeply divided, with 1 or 2 axile ovules per locule; style terminal, usually lobed. Fruit diverse, dry or fleshy, dehiscent or indehiscent.

A mostly tropical and subtropical family of c. 150 genera and 1500 or more species; 2 genera native on the Islands.

G.Bentham, Sapindaceae, *Fl. Austral.* 1: 451–488 (1863); L.A.T.Radlkofer, Sapindaceae, *Pflanzenr.* 4, 165, Heft 98: 1–1539 (1931–1934); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Sapindaceae, *Fl. Java* 2: 130–143 (1965); S.T.Reynolds & J.G.West, Sapindaceae, *Fl. Australia* 25: 4–164 (1985).

KEY TO GENERA

Leaves pinnate; tall trees; fruit an obcordate, 3-lobed capsule **1. GUIOA**

Leaves simple; shrubs or small trees; fruit a 2- or 3-winged, ellipsoidal capsule **2. DODONAEA**

1. GUIOA

Guioa Cav., *Icon.* 4: 49, t. 373 (1798); named after José de Guio, Spanish botanical artist at the turn of the eighteenth century.

Type: *G. lentiscifolia* Cav.

Trees or shrubs, monoecious. Leaves alternate, with 1–9 pairs of leaflets, often glaucous beneath, without stipules; leaflets often falcate, symmetrical or slightly asymmetrical. Inflorescence axillary or pseudoterminal, cymose-paniculate. Flowers actinomorphic or zygomorphic, functionally unisexual. Calyx lobes 5 (or 6); outer lobes smaller than inner, glandular on margins. Petals 5 (or 6), small, obovate or orbicular, clawed, with scale-like appendages between blade and claw. Stamens 8. Ovary 3-locular, 3-lobed, often on a short gynophore. Fruit a 3-lobed, obcordate capsule (sometimes 1- or 2-lobed by abortion); lobes somewhat flattened; margins obtuse. Seeds globose-ellipsoidal, immersed in an aril, sometimes subtended by a funicle.

A genus from SE Asia to Australia and the western Pacific, with 64 species; 1 endemic species on Lord Howe Is.

P.C. van Welzen, *Guioa* Cav. (Sapindaceae), taxonomy, phylogeny and historical biogeography, *Leiden Bot. Ser.* 12: 1–315 (1989).

Guioa coriacea (Radlk.) Radlk., *Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss.* 16: 60 (1886)

Atalaya coriacea Radlk., *Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München* 3: 326 (1878). T: Lord Howe Island, *J.P.Fullagar*; holo: ?M *n.v.*; iso: K, NSW. The epithet refers to the coriaceous leaves.

Cupania sp.; C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 24 (1870).

Cupania howeana Maiden, *Proc. Linn. Soc. New South Wales* 23: 126 (1898). T: Lord Howe Island, 1898, *J.H.Maiden s.n.*; lecto: MEL, *fide* P.C. van Welzen, *op. cit.* 193.

[*Cupania anacardioides auct. non* A.Rich.: F.J.H. von Mueller, *Fragm.* 9: 77, 91 (1875); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 234 (1896)]

Illustrations: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: t. 1 (1898); I.Hutton, *Lord Howe Is.* 141 (1986); P.C. van Welzen, *op. cit.* 193.

Tree to 15 m tall. Leaves paripinnate, with 1–4 pairs of leaflets; leaflets elliptic-oblanceolate, 3–11 cm long, 1.2–5 cm broad, attenuate onto petiolule, entire, revolute, acute to rounded, blunt. Inflorescence 4–16 cm long; cymules 2- or 3-flowered. Calyx lobes 5, broadly ovate to orbicular, ciliate; outer lobes 1.5–2 mm long; inner lobes 2.5–3.5 mm long. Petals 5, oblanceolate, 2–3.5 mm long, pilose on margins and exterior; scales 1–2.5 mm long, with lobed-clavate apex. Filaments 1–3 mm long. Ovary 1–1.5 mm long; style c. 1 mm long, accrescent. Capsule 1 or 2 (–3)-lobed, 1.5–2.5 cm long. Seeds 1–1.5 mm long, black, covered with an orange aril. *Cedar*. Fig. 47J.

Lord Howe Is. Endemic. Common in lowland forest. Flowers Dec.–early Feb. and often noticeable in the early winter because of the conspicuous orange fleshy arils covering the seeds that have fallen on the ground below the trees.

L.H.Is.: W slopes of Smoking Tree Ridge, *L.A.S.Johnson & A.N.Rodd 1317* (K, NSW); N side of Erskine Valley, *A.C.Beauglehole 5821* (MEL); *s. loc.*, 1920, *J.L.Boorman* (BRI, NSW); *s. loc.*, *J.D.McComish 53A* (K, NSW).

2. DODONAEA

Dodonaea Mill., *Gard. Dict.* Abr. 4th edn (1754); named in honour of Rembert Dodoens (1518–1585), Flemish physician and herbalist, who was Professor of Medicine at Leiden and author of *Crüijdeboeck* (1552–1554) which ran to several editions.

Type: *D. viscosa* (L.) Jacq.

Shrubs or small trees, monoecious or dioecious or polygamous. Leaves simple or pinnate, glandular-punctate, often viscid. Inflorescence axillary or terminal, paniculate or flowers solitary. Flowers actinomorphic, usually unisexual. Sepals 3–6 (–7), valvate or imbricate. Petals absent; disc small or lacking. Stamens 6–12, with glabrous filaments, absent or sometimes reduced to staminodes in female flowers. Ovary 3–5-locular, angular or subglobose, often resinous, with 2 ovules per locule; style filiform, often twisted. Capsule dehiscent, 3–5-angled, each angle usually with a membranous wing. Seeds lenticular, sometimes arillate.

A mainly Australian genus (61 species of a total of 68), with the following highly variable species widespread throughout the tropics and subtropics, including 2 subspecies on Norfolk and Lord Howe Is.

J.G.West, A revision of *Dodonaea* Miller (Sapindaceae) in Australia, *Brunonia* 7: 1–194 (1989).

Dodonaea viscosa (L.) Jacq., *Enum. Syst. Pl.* 19 (1760)

Ptelea viscosa L., *Sp. Pl.* 1: 118 (1753). T: Jamaica, Herb. Sloane v. 97; lecto: BM, *fide* P.W.Leenhouts, *Blumea* 28: 276 (1983). The epithet refers to the viscid leaves and other parts.

Shrub or small tree to c. 5 m tall. Leaves sessile or petiolate, membranous to subcoriaceous, often viscid; lamina variably linear, lanceolate, elliptic, oblanceolate or spathulate, 1–15 cm long, 0.1–4 cm broad, narrowly attenuate to cuneate at base, entire or irregularly denticulate, rounded to acute-acuminate; venation raised. Inflorescence terminal, paniculate. Sepals (3 or) 4, lanceolate-ovate, 1.3–3 mm long, caducous. Stamens (6–) 8 (–10); anthers almost sessile. Ovary (2–) 3- or 4-locular, globose to obovoid, c. 1 mm tall, pubescent or glabrous. Capsule (2–) 3- or 4-winged, broadly ellipsoidal, variously brown, tinged with red; wings 3–10 mm wide, basally cordate, apically somewhat to deeply emarginate. Seeds compressed ellipsoidal, 2–3 mm long, black.

An extremely variable species with a worldwide tropical and subtropical distribution. Many

unsatisfactory attempts have been made to delineate segregate species.

Leaves obtuse to rounded, 1.5–2.5 cm broad (N.Is.) **1a.** subsp. **viscosa**

Leaves acute, 0.8–2 cm broad (L.H.Is.) **1b.** subsp. **burmanniana**

a. **Dodonaea viscosa** subsp. **viscosa**

[*Dodonaea spatulata auct. non* Sm.: R.Heward, *London J. Bot.* 1: 123 (1842)]

Illustrations: Anon., *Dars-Et* (*This Is It*) [14] (1972); P.G.Wilson & J.A.Scott in G.J.Harden, *Fl. New South Wales* 2: 303 (1991).

Shrub or tree to 5 m tall. Leaves usually viscid; petiole c. 5–10 mm long; lamina elliptic to oblanceolate, 5–12 cm long, 1.5–2.5 cm broad, obtuse to rounded, slightly apiculate. Capsules usually 2-winged, (1.8–) 2 cm long, (2–) 2.5 broad including wings. *Tea-Tree, Hopwood, Ake-Ake*.

Norfolk Is. Common on the Island, particularly on the northern sides of Mts Pitt and Bates. This subspecies is also known from New Zealand and eastern Australia, and is widespread throughout the tropics and subtropics. Because it was not collected by Bauer in 1804–1805 it has been suggested that it has arrived on the Island since that time. However, in 1830, Alan Cunningham recorded it as 'frequent in dry spots near hills or the coast' (*Cunningham 9*, K).

N.Is.: Mt Pitt Rd, *P.S.Green 1406* (A, K); sides of Mt Pitt, *A.Cunningham 9*(139) (K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW); *s. loc.*, 1904, *J.Robinson* (K, NSW).

b. **Dodonaea viscosa** subsp. **burmanniana** (DC.) J.G.West, *Brunonia* 7: 37 (1984)

Dodonaea burmanniana DC., *Mém. Soc. Phys. Genève* 1: 447 (1822). T: Ceylon, *J.Burman*; holo: in the Institut de France, Paris *n.v.* Named after Johannes Burman(n) (1707–1779), Dutch physician and botanist who was Professor of Botany at Amsterdam.

[*Dodonaea lanceolata auct. non* F.Muell.: W.B.Hemsley, *Ann. Bot.* (*London*) 10: 234 (1896)]

Illustrations: I.Hutton, *Lord Howe Is.* 141 (1986); P.G.Wilson & J.A.Scott in G.J.Harden, *Fl. New South Wales* 2: 303 (1991).

Shrub or small tree to 4 m tall. Leaves viscid; petiole c. 3–8 mm long; lamina narrowly elliptic to oblanceolate, 5–12 cm long, 0.8–2 cm broad, acute, sometimes subacuminate. Capsules 3-winged, (1–) 1.5 cm long, (1.5–) 2 cm broad including wings. *Hopwood*.

Lord Howe Is. Common and widespread in often exposed lowland areas. Flowers mid May–mid July. This subspecies is also known from Australia (eastern Qld, north-eastern N.S.W.) and from the tropics and subtropics throughout the world.

L.H.Is.: ridge between Old Settlement and North Bay, *P.S.Green 1930* (K); SE slopes of Malabar, *P.S.Green 1538* (A, K); Lagoon Beach, near the Hospital, *R.D.Hoogland 8665* (NSW); top end of Far Flats, W foot of Mt Lidgbird, *J.Pickard 1487* (NSW); near the S end of Little Slope, *J.Pickard 2823* (NSW).

62. ANACARDIACEAE

Trees, shrubs or woody climbers, with resin ducts in bark. Leaves alternate, rarely opposite or whorled, pinnate, 3-foliolate or simple; stipules absent, or rarely present and minute. Inflorescence terminal or axillary, racemose, spicate or paniculate; bracts and bracteoles caducous. Flowers actinomorphic, usually bisexual or functionally unisexual. Nectarial disc present, sometimes forming a gynophore. Sepals and petals (3–) 5 (–7), rarely absent, free or connate. Stamens (1–) 5–10, rarely more, free or filaments basally connate. Ovary usually superior, (1–) 2–5 (–12)-carpellate, usually 1 locule developing; styles free or connate. Fruit usually a drupe; mesocarp usually resinous. Seeds with an oily embryo.

A mainly tropical or subtropical family of c. 75 genera and 850 species; 1 introduced genus on Norfolk Is.

Economically important members of this family include the Cashew Nut (*Anacardium occidentale* L.) and the Mango (*Mangifera indica* L.). The resin from some members can cause dermatitis or severe blistering of the skin, especially for those who are, or become, susceptible.

G.Bentham, Anacardiaceae, *Fl. Austral.* 1: 488–492 (1863); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Anacardiaceae, *Fl. Java* 2: 146–154 (1965); Ding Hou, Anacardiaceae, *Fl. Males.* ser. I, 8: 395–549 (1978); L.W.Jessup, Anacardiaceae, *Fl. Australia* 25: 170–187 (1985).

SCHINUS

Schinus L., *Sp. Pl.* 1: 388 (1753); *Gen. Pl.* 5th edn, 184 (1754); from the Greek name *schinos* for the Mastic Tree (*Pistacia lentiscus* L.), which members of this genus resemble with their resinous juice and pinnate leaves.

Type: *S. molle* L.

Trees or shrubs, dioecious. Leaves alternate, imparipinnate or simple; rachis usually winged. Inflorescence terminal, or in uppermost leaf axils, paniculate. Sepals and petals (4 or) 5, imbricate. Stamens 10, inserted onto base of perigynous disc, reduced to staminodes in female flowers. Ovary superior, 3-carpellate, 1-locular, with 1 ovule; pistillode present in male flowers; styles 3. Fruit a small drupe; mesocarp thin and resinous.

A New World genus of c. 30 species from Mexico to Argentina; 1 species naturalised on Norfolk Is.

***Schinus terebinthifolius** Raddi, *Quar. Piant. Nuov. Bras.* 20 (1820)

T: Brazil, *G.Raddi*; *n.v.* So called because the leaves (Latin - *folia*) resemble those of the Terebinth (*Pistacia terebinthus* L.)

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 492, fig. 77A (1983); A.B.Graf, *Exotica 4*, 12th edn, 1: 133 (1985); W.L.Wagner *et al*., *Man. Fl. Pl. Hawai'i* 1: 195, t. 6 (1990).

Shrubs or trees to 7 m tall. Leaves pinnate with (3–) 5–9 leaflets; rachis slightly winged, especially immediately below insertion of a leaflet pair; leaflets opposite, sessile, elliptic, 3–8 cm long, 1–2.5 cm broad, basally obtuse to acute, or attenuate in terminal leaflet, acute to obtuse and minutely apiculate; terminal leaflet slightly larger than others. Inflorescence terminal or in upper leaf axils, 5–11 cm long. Sepals 5, triangular, almost 1 mm long. Petals ovate, c. 2 mm long, white. Stamens in 2 whorls, with outer whorl equalling petals. Styles 3. Drupe globose, 4–5 mm diam., red, glossy. *Hawai'ian Holly*.

Norfolk Is. Common, and a serious weed. A native of Brazil, introduced in 1935 from Hawai'i (where it is also naturalised and a menace to native vegetation) by means of seeds which were planted out of curiosity. The red fruits are dispersed by introduced birds.

N.Is.: vicinity of the Burnt Pine Centre, *G.Uhe 1150* (K).

63. MELIACEAE

Trees, rarely shrubs, dioecious or monoecious. Leaves alternate, usually pinnate, sometimes 2-pinnate or 1-foliolate, without stipules. Inflorescence axillary, sometimes cauliflorous or epiphyllous, paniculate, thyrsoid-racemose, sometimes spicate or clustered. Flowers actinomorphic, bisexual or functionally unisexual, usually with a nectarial disc. Sepals (2–) 3–5 (–7), usually connate, imbricate or sometimes circumscissile. Petals 3–7 (–14), sometimes basally connate. Stamens 3–19 (–30); filaments usually forming a tube, variously shaped, often with marginal appendages. Ovary superior, (1–) 2–6 (–20)-locular, with 1–many ovules per locule; stigmas capitate, discoid or lobed. Fruit a capsule, berry or drupe.

Seeds sometimes winged or with a fleshy aril.

A mainly tropical family which reaches the warm temperate regions in New Zealand and Australia (south-eastern N.S.W.), containing 51 genera and 550 or more species; 1 genus native on both Islands and another introduced on Norfolk Is. *Toona ciliata* M.Roem. (*Cedrela australis* F.Muell.), Australian Red Cedar, has been planted on Norfolk Is. and may be seeding and establishing itself in the plantation, as near Steels Point (*W.R.Sykes NI 486*, CHR *n.v.*).

G.Bentham, Meliaceae, *Fl. Austral.* 1: 378–390 (1863); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Meliaceae, *Fl. Java* 2: 116–130 (1965); T.D.Pennington and B.T.Styles, A Generic monograph of the Meliaceae, *Blumea* 22: 419–540 (1975).

KEY TO GENERA

Leaves 2- or 3-pinnate; flowers lilac; fruit a drupe	**1. MELIA**
Leaves 1-pinnate; flowers yellow or light green; fruit a capsule	**2. DYSOXYLUM**

1. MELIA

Melia L., *Sp. Pl.* 1: 384 (1753); *Gen. Pl.* 5th edn, 182 (1754); this was the Greek name for a species of Ash (*Fraxinus*), which also has pinnate leaves.

Type: *M. azedarach* L.

Deciduous trees. Young shoots with simple or stellate hairs. Leaves 2- or 3-pinnate; leaflets opposite, dentate, petiolulate. Inflorescence axillary, many-flowered. Flowers bisexual or unisexual. Sepals 5 (or 6), basally connate. Petals 5 (or 6), free, imbricate. Stamens 10 (–12); filaments connate into a narrow, 10–12-ribbed tube, with 20 (–24) slender appendages. Ovary 4–8-locular, with 2 ovules per locule; stigma capitate or crown-shaped or lobed. Fruit a drupe, fleshy; endocarp hard. Seeds laterally flattened, without an aril.

An Old World tropical to warm temperate genus with probably only 3 species, of which the following has been widely cultivated and become naturalised, including on Norfolk Is.

D.J.Mabberley, A monograph of *Melia* in Asia and the Pacific; the history of White Cedar and Persian Lilac, *Gard. Bull. Singapore* 37: 49–64 (1984).

***Melia azedarach** L., *Sp. Pl.* 1: 384 (1753)

T: cultivated, Herb. Clifford 161/1, *Melia* No 1; lecto: BM, *fide* D.J.Mabberley, *op. cit.* 64. The epithet is derived from the Persian name for this plant, *azadiraxt*.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 479, fig. 74B (1983); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 784, fig. 415B (1986); M.J.Taylor & G.J.Harden in G.J.Harden, *Fl. New South Wales* 2: 279, t. 19 (1991).

Trees to 10 m tall, sometimes more; bark furrowed. Leaves 2- or 3-imparipinnate, up to 50 cm long or more; leaflets in 1–6 pairs, ovate to lanceolate, 2–7 cm long, 1.5–3 cm broad, obtuse to rounded at base, entire or usually serrate, deeply so in juvenile leaves, acuminate. Inflorescence 10–20 cm long; pedicels 1–6 mm long. Sepals 2–4 mm long. Petals oblanceolate, 6–10 mm long, lilac. Staminal tube 7–8 mm long, dark purple; marginal appendages irregularly 2-lobed. Ovary 4- or 5-grooved. Fruit broadly ellipsoidal to ovoid, 1–1.5 cm diam., yellow-brown, often persistent on the tree after leaf-fall. Seeds 0.7–1.2 cm diam., ridged. *White Cedar*.

Norfolk Is. Probably introduced as a timber tree and now naturalised. Recently recorded from Philip Is. to which it must have been carried by birds.

N.Is.: vicinity of the Melanesian Mission Stn, *G.Uhe 1192* (K); *loc. id.*, *W.R.Sykes NI 616* (CHR); around the old prison settlement, *G.Uhe 1138* (K).

2. DYSOXYLUM

Dysoxylum Blume, *Bijdr.* 172 (1825); from the Greek prefix *dys-* (bad, ill) and *xylon* (wood), referring to the unpleasant smell produced by some species.

Type: *D. alliaceum* (Blume) Blume

Trees, rarely shrub-like, dioecious; hairs, where present, simple. Leaves alternate, pinnate, rarely 3-foliolate; leaflets opposite, entire, often asymmetrical at base. Inflorescence axillary, sometimes cauliflorous, paniculate or racemose, rarely spicate. Flowers bisexual or functionally unisexual. Sepals and petals (3–) 4 or 5 (–6), imbricate or valvate; sepals often connate; petals free or adnate to staminal tube. Staminal tube cylindrical, entire, crenate, toothed or appendaged; anthers (5–) 8–10 (–15), inserted within staminal tube, sometimes slightly exserted. Ovary 2–5-locular, with 1 or 2 ovules per locule. Fruit a capsule, often coriaceous, sometimes tardily dehiscent, with 2–5 valves. Seeds with a fleshy aril.

A mainly tropical genus of c. 75 species from SE Asia to Australia, New Zealand and the western Pacific islands; 1 native species on each of Norfolk and Lord Howe Islands.

Pairs of leaflets (1–) 2–5, with a fetid smell on bruising; inflorescence usually among or just below leaves; fruit 2–2.5 cm diam. (N.Is.) **1. D. bijugum**

Pairs of leaflets (3–) 5–6, without a fetid smell on bruising; inflorescence invariably cauliflorous; fruit 4 cm diam. (L.H.Is.) **2. D. pachyphyllum**

1. Dysoxylum bijugum (Labill.) Seem., *Fl. Vit.* 37 (1865)

Trichilia bijuga Labill., *Sert. Austro-Caledon.* 54, t. 54 (1825). T: New Caledonia, *J.J.H. de Labillardière*; holo: ?FI *n.v.* The epithet comes from the Latin *bis* (twice) and *jugum* (a pair), in reference to the leaves which frequently have two pairs of leaflets.

Hartighsea patersoniana Endl., *Prodr. Fl. Norfolk.* 79 (1833); *Dysoxylum patersonianum* (Endl.) Benth. & Hook.f. ex F.Muell., *Syst. Census Austral. Pl. Suppl.* 1: 3 (1884), as *patersoni*. T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W; iso: K.

Illustrations: J.J.H. de Labillardière, *Sert. Austro-Caledon.* t. 54 (1825); D.J.Mabberley in P.Morat & H.S.MacKee, *Fl. Nouv.-Calédon.* 15: 67, t. 12 (1988).

Tree to 7 m tall or more, with strong, fetid or garlic-like smell when bruised. Leaves paripinnate, leaflets in (1–) 2–5 pairs, ovate to narrowly ovate-elliptic, 5–10 cm long, 2.5–4.5 cm broad, narrowed onto petiolule, obtuse to acute. Inflorescence axillary, paniculate, c. 10–20-flowered. Sepals connate, without lobes, forming a short tube. Petals (4 or) 5, oblong, c. 8 mm long, yellow, imbricate. Staminal tube suburceolate to cylindrical, with c. 20 small, blunt, tooth-like lobes; anthers (8–) 10. Ovary 4- or 5-locular. Capsules globose, 2–2.5 cm diam., yellow, dehiscing by 4 or 5 valves. Seeds 4 or 5, lenticular, c. 2 mm long, with a red, fleshy aril. *Sharkwood*. Fig. 83F.

Norfolk Is. A relatively common tree. Also known from New Caledonia and southern Vanuatu.

N.Is.: saddle between Mt Pitt and Mt Bates, *R.D.Hoogland 11362* (NSW); halfway up main road to Mt Pitt, *G.Uhe 1201* (K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW); *s. loc.*, *A.Cunningham 21 & 22*(139) (K).

2. Dysoxylum pachyphyllum Hemsl., *Bull. Misc. Inform.* 1907: 58 (1907); *Hooker's Icon. Pl.* 29: t. 2827 (1907)

T: Lord Howe Island, *C.Moore 35*; syn: K. The epithet comes from the Greek *pachys* (thick) and *phyllon* (a leaf), in reference to the coriaceous leaves.

Dysoxylum sp.; C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 24 (1870).

[*Dysoxylum fraserianum auct. non* (A.Juss.) Benth.: F.J.H. von Mueller, *Fragm.* 9: 61, 77 (1875); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 234 (1896); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 124 (1898)]

Illustrations: W.B.Hemsley, *Hooker's Icon. Pl.* 29: t. 2827 (1907); J.H.Maiden, *Forest Fl. New South Wales* 3: 79, t. 93 (1907); I.Hutton, *Lord Howe Is.* 31, 129 (1986).

Tree to 8 m tall (recorded up to 15 m). Leaves paripinnate; leaflets in (3–) 5 or 6 pairs, oblong-elliptic, 5–12 cm long, 2.5–5 cm broad, obtuse and somewhat asymmetrical at base, obtuse, blunt, shortly subacuminate. Inflorescence usually cauliflorous, narrowly paniculate, 10–20-flowered. Calyx 1–2 mm long; lobes 4 (or 5), broadly ovoid. Petals 4 (or 5), oblong, 10 mm long, light green, adnate to staminal tube to c. halfway, becoming reflexed, imbricate in bud; exterior puberulous. Staminal tube cylindrical, 5 mm long, with 10 truncate marginal lobes, 4 mm long; anthers 8. Ovary 4-locular, pilose. Capsules globose, 4 cm diam., tardily dehiscent, Seeds 4, c. 3 cm long, black. *Island Apple*. Figs 54, 83D–E.

Lord Howe Is. Endemic. Not uncommon, and growing at all altitudes, stunted in exposed positions. Flowers late Feb.–mid Aug.

L.H.Is.: crest of Dawsons Ridge, *J.Pickard 3575* (NSW); Transit Hill, *P.S.Green 1639* (A, K); N flank of Mt Lidgbird, *M.M.J. van Balgooy 1073* (NSW); SE side of Erskine Valley, *J.C.Game 69/092* (K); upper slopes of Mt Gower, *R.D.Hoogland 8803* (CANB, NSW).

64. RUTACEAE

Shrubs or trees, rarely herbs. Leaves alternate, opposite or whorled, compound or simple (often by reduction) usually gland-dotted and aromatic, without stipules. Inflorescence axillary or terminal, cymose, racemose or paniculate, or flowers solitary. Flowers actinomorphic, bisexual or unisexual. Sepals (2–) 4 or 5, free or connate, usually imbricate. Petals 4 or 5, sometimes absent, usually free, imbricate or rarely valvate. Nectarial disc sometimes present, between filament bases and ovary. Stamens usually the same number or twice as many as petals, rarely numerous; filaments sometimes connate into a staminal tube. Ovary superior, (2–) 4- or 5 (–20)-locular, ±syncarpous or carpels free and only styles coherent; ovules usually 1 or 2 per locule, axile. Fruit a follicle, capsule, berry or drupe, rarely a samara.

A family of c. 150 genera and 1500 or more species, widely distributed in the tropics and subtropics but reaching the temperate regions. There are 3 native genera and 1 introduced on the Islands.

Economically an important family because of the various fruits in the genus *Citrus*. *Acronychia laevis* J.R.Forst. & G.Forst. has been recorded from Lord Howe Is., based on what are almost certainly mislabelled specimens. It has never been re-collected and the record should be disregarded (see P.S.Green, *Kew Bull.* 48: 322, 1993). Similarly, R.Tate (*Linn. Soc. New South Wales Macleay Mem. Vol.* 215, 1893) wrongly recorded *Acradenia euodiiformis* (F.Muell.) T.G.Hartley (as *Bosistoa euodiiformis*), *Boronia bakeriana* F.Muell., *Phebalium ambiens* (F.Muell.) Maiden & Betche (as *Eriostemon ambiens*) and *Phebalium elatius* subsp. *beckleri* (F.Muell.) Paul G.Wilson (as *Eriostemon beckleri*) all from Norfolk Is. These species are only known from Australia (Qld, N.S.W.), and quite apart from a complete lack of collections to support these records, they are most unlikely to occur on the Island. The listing of them in that publication must have been a clerical error.

G.Bentham, Rutaceae, *Fl. Austral.* 1: 301–372 (1863); W.T.Swingle, The Botany of *Citrus* and its Wild Relatives, of the Orange subfamily (Family Rutaceae, subfamily Aurantioideae), in H.J.Webber & L.D.Batchelor, *The Citrus Industry* 1: 129–474 (1943); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Rutaceae, *Fl. Java* 2: 94–109 (1965).

KEY TO GENERA

1 Leaves compound, of 3 or more leaflets

2 Leaves 3-foliolate; fruit of 4 follicles (sometimes 1 or more abortive), longer than broad, pointed **1. MELICOPE**

2: Leaves pinnate; fruit a single follicle, globose, rounded **2. ZANTHOXYLUM**

1: Leaves simple

3 Petiole apex pulvinate; fruit c. 1 cm long **3. SARCOMELICOPE**

3: Petiole apex articulate; fruit c. 10 cm long **4. CITRUS**

1. MELICOPE

Melicope J.R.Forst. & G.Forst., *Char. Gen. Pl.* 55, t. 28 (1775); from the Greek *meli* (honey) and *kope* (cutting into pieces), referring to the lobed or notched nectarial disc in the type species.

Type: *M. ternata* J.R.Forst. & G.Forst.

Trees or shrubs. Leaves opposite, simple or 3-foliolate with central leaflet slightly the largest, entire, gland-dotted. Inflorescence axillary or terminal, cymose or paniculate. Flowers bisexual or functionally unisexual. Sepals 4, free or basally connate, persistent in fruit. Petals 4, valvate or imbricate. Stamens 4 or 8; disc present. Ovary of 4 carpels, basally connate or free and then coherent at styles; placentation axile; ovules (1 or) 2 per locule; stigma often ±4-lobed. Fruit follicular; follicles basally connate, usually 2-seeded; seeds discharged tardily. Seeds dark, often shiny.

An Old World, tropical and subtropical genus of c. 150 species; 3 species are endemic on the Islands.

This genus is now considered to taxonomically embrace *Pelea* A.Gray and some species originally misplaced in *Euodia*.

1 Leaflets acute, 2–3.5 cm broad (L.H.Is.) **1. M. contermina**

1: Leaflets rounded-obtuse or emarginate, (3.5–) 6–13 cm broad

2 Leaflets rounded-obtuse; lateral leaflets subsessile (N.Is.) **2. M. littoralis**

2: Leaflets emarginate; lateral leaflets petiolulate (L.H.Is.) **3. M. polybotrya**

1. Melicope contermina C.Moore & F.Muell. in F.J.H. von Mueller, *Fragm.* 7: 144 (1871)

T: base of Mt Gower, Lord Howe Island, *C.Moore 14 & 59*; syn: MEL. The epithet comes from the Latin prefix *con-* (with, together with) and *terminus* (limit, end), referring to the styles joined at their ends.

Euodia contermina C.Moore & F.Muell., *loc. cit., nom. in synon.*

Illustration: I.Hutton, *Lord Howe Is.* 29, 140 (1986).

Shrub or small tree to 5 m tall. Leaves 3-foliolate; leaflets petiolulate, elliptic, 4–9 cm long, 2–3.5 cm broad, basally attenuate, acute, densely gland-dotted; lateral leaflets asymmetrical. Inflorescence axillary, 5–10 cm long, 9–15-flowered. Flowers bisexual. Sepals broadly ovate, c. 2 mm long, gland-dotted, shortly connate at base. Petals lanceolate-triangular, 6–7 mm long, acute, erect, with a small retrorse apiculum, gland-dotted, white. Stamens in male flowers c. 4 mm long. Ovary glabrous; style in female flowers slender, 4 mm long; stigma small, slightly lobed. Follicles 4, 12–15 mm long, 5 mm broad, acute. Seeds globose, slightly flattened, 5–6 mm long, black, shiny. Fig. 48F.

Lord Howe Is. Endemic. A somewhat rare species, most frequently seen in Erskine Valley. Flowers late Oct.–late Dec.

L.H.Is.: slopes of Mt Lidgbird, *J.D.McComish 187* (K); Erskine Valley, *A.N.Rodd 1382* (NSW); *loc. id., P.S.Green 1672* (A, K); *loc. id.*, 1985, *P.S.Green* (K); Mt Gower, track to summit, *I.Hutton 205* (CBG).

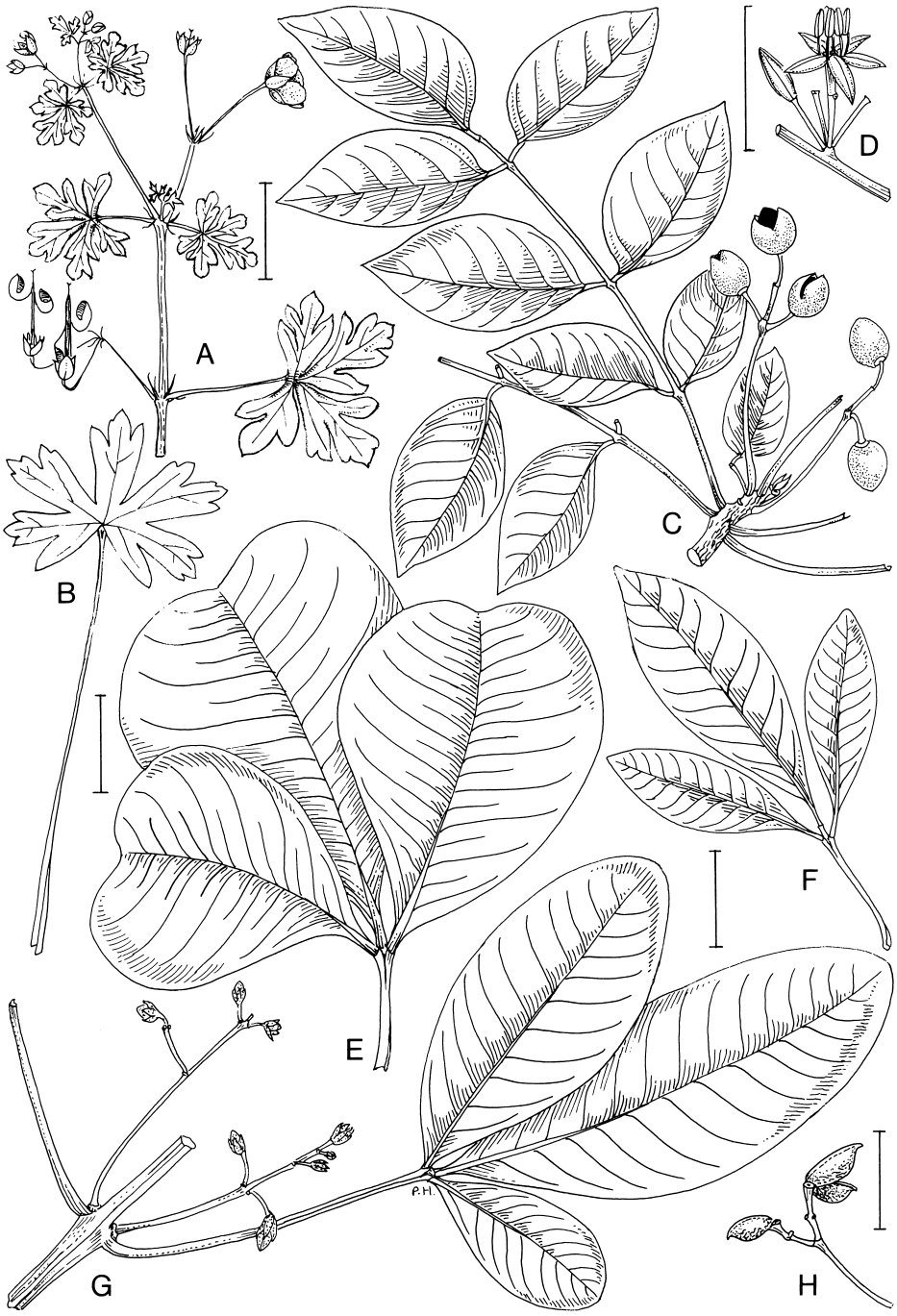

Figure 48. A–B, GERANIACEAE: *Geranium solanderi*. **A**, flowering shoot; **B**, lower leaf (**A–B**, D.Lyall *s.n.*, K). **C–H**, RUTACEAE. **C–D**, *Zanthoxylum pinnatum*. **C**, habit in fruit; **D**, flower (**C–D**, G.Uhe 1323, K). **E**, *Melicope polybotrya*, leaf (P.Green 1988, K). **F**, *Melicope contermina*, leaf (P.Green 1671, K). **G–H**, *Melicope littoralis*. **G**, habit; **H**, young fruit (**G–H**, A.Cunningham 146, K). Scale bars: **A–C**, **E–H** = 2 cm; **D** = 1 cm. Drawn by P.Halliday.

2. Melicope littoralis (Endl.) T.G.Hartley, *Kew Bull.* 45: 256 (1990)

Euodia littoralis Endl., *Prodr. Fl. Norfolk.* 86 (1833). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W. The epithet means of or belonging to the seashore, alluding to the type collection having been made near the sea (Anson Bay).

Illustration: H.W.Schott, *Rutaceae* t. 1 (1834).

Tree to 5 m tall. Leaves 3-foliolate; leaflets subsessile, broadly obovate to elliptic, (7–) 12–30 cm long, (3.5–) 6–13 cm broad, gland-dotted, acute-attenuate at base, rounded-obtuse at apex. Inflorescence axillary, 5–11 cm long, 7–11-flowered. Flowers bisexual. Sepals 2 mm long, densely puberulent, scarcely connate. Petals narrowly lanceolate, 5 mm long, borne erect, somewhat cucullate with a very small retrorse apiculum, pubescent outside, creamy-white. Stamens 4–5 mm long. Ovary pubescent; style 2 mm long; stigma small. Follicles 4, 8–12 mm long, 5 mm broad, acuminate. Seeds globose, slightly flattened, 5–6 mm long, black, shiny. *Shade Tree.* Fig. 48G–H.

Norfolk Is. Endemic. Fairly common in the National Park, but not by the sea despite its Latin name.

N.Is.: Mt Pitt Reserve, *W.R.Sykes NI 401 & NI 671* (CHR), Mt Pitt Rd, junction with Mission Rd, *M.Lazarides 8039* (CANB, K); upper slopes of Mt Pitt, *G.Uhe 1178* (K); track to King Fern Valley, *W.R.Sykes NI 822/87* (CHR); *s. loc., A.Cunningham 23, 146* (K).

The erroneous record of this species (as *Euodia littoralis*) from Qld by F.M.Bailey (*Queensland Fl.* 1: 201, 1899) arose from the presence in the Queensland Herbarium of a mislabelled specimen of *A.Cunningham 23*, said to have been collected on the Brisbane River. The inclusion of *Euodia littoralis* in N.C.W.Beadle, *Students Fl. NE New South Wales* 4: 545 (1980) was probably due to a misidentification.

3. Melicope polybotrya (C.Moore & F.Muell.) T.G.Hartley, *Kew Bull.* 45: 250 (1990)

Euodia polybotrya C.Moore & F.Muell. in F.J.H. von Mueller, *Fragm.* 7: 143 (1871). T: Mt Lidgbird, Lord Howe Island, *C.Moore & W.Carron 41 & 42*; syn: MEL. The epithet comes from the Greek *polys* (many) and *botrys* (a bunch), alluding to the clusters of flowers in the type specimen.

Euodia sp.; C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales*24 (1870).

Illustration: I.Hutton, *Lord Howe Is.* 139 (1986), as *Euodia polybotra*.

Tree to 8 m tall. Leaves 3-foliolate; leaflets petiolulate, broadly obovoid to orbicular, (4–) 7–12 cm long, (4–) 7–9 cm broad, basally acute to abruptly attenuate, emarginate. Inflorescence axillary, 2–5 cm long, few- to many-flowered. Flower functionally unisexual. Sepals 0.5–1 mm long, triangular, finely puberulous, basally shortly connate. Petals narrowly lanceolate, 2–2.5 mm long, erect, ±cucullate, finely puberulent outside, green; upper margins slightly revolute. Functionally male flowers not seen. Functionally female flowers: stamens 1 mm long; ovary puberulous; style 0.5 mm long; stigma capitate, slightly lobed. Follicles 4, oblong, flattened-globose, 5–6 mm long. Seeds globose, slightly flattened, 4 mm long, black. Fig. 48E.

Lord Howe Is. Endemic. A not uncommon tree in sheltered forest, especially at lower altitudes. Flowers mid Dec.–early Feb.

L.H.Is.: ridge between Old Settlement and North Bay, *A.N.Rodd 1237* (NSW); Transit Hill, *P.S.Green 1631* (A, K); Erskine Valley, below The Saddle, *I.Hutton 231* (CBG); ascent of Mt Gower, *P.S.Green 1988* (K); *s. loc., C.Moore 42* (K, MEL).

2. ZANTHOXYLUM

Zanthoxylum L., *Sp. Pl.* 1: 270 (1753); *Gen. Pl.* 5th edn, 130 (1754); from the Greek *xanthos* (yellow) and *xylon* (wood), referring to the colour of the timber from these trees.

Type: *Z. fraxineum* Willd.

Trees or shrubs, sometimes scandent. Leaves alternate, pinnate or 3-foliolate; leaflets up to

15 pairs, opposite or alternate, often gland-dotted, often asymmetrical at base. Inflorescence axillary or terminal, racemose, cymose or paniculate. Flowers usually unisexual, with stamens or ovary rudimentary or absent. Sepals and petals each 4 (or 5), sometimes undifferentiated. Stamens 4–6; nectarial disc flat or cushion-shaped. Ovary of 1–5 free or basally connate carpels; ovules 2 per carpel, pendent; styles coherent or free. Fruit follicular; follicles 1–5, free or partially connate, 1-seeded. Seeds ovoid to globose, often hanging from dehisced follicle, black or reddish.

A mainly pantropical genus, reaching temperate areas in North America and Asia, of c. 200 species; 1 species native to the Islands.

Zanthoxylum pinnatum (J.R.Forst. & G.Forst.) W.R.B.Oliv., *Trans. & Proc. New Zealand Inst.* 49: 140 (1917)

Blackburnia pinnata J.R.Forst. & G.Forst., *Char. Gen. Pl.* 11, t. 6 (1775); *Ptelea pinnata* (J.R.Forst. & G.Forst.) L.f., *Suppl. Pl.* 126 (1782); *Samara blackburnia* Spreng., *Syst. Veg.* 1: 441 (1824), *nom. illeg.*; *Zanthoxylum blackburnia* Benth., *Fl. Austral.* 1: 363 (1863), *nom. illeg.*; *Fagara pinnata* (J.R.Forst. & G.Forst.) Engl. in H.G.A.Engler & K.A.E.Prantl, *Nat. Pflanzenfam.* III: 119 (1896). T: Norfolk Island, *J.R. & G.Forster*; syn: BM, K. The epithet refers to the pinnate leaves.

Xanthoxylon blackburnia C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales.* 24 (1870), *nom. nud.*

Xanthoxylon howeanum F.Muell., *Fragm.* 9: 77 (1875), *nom. nud.*

Illustration: I.Hutton, *Lord Howe Is.* 140 (1986).

Tree to 10 m tall. Branches with prominent leaf scars. Leaves usually paripinnate; leaflets 4–9, oblong-ovate, slightly falcate, (3–) 5–8 (–9) cm long, (1.5–) 3–4.5 (–5.5) cm broad, entire (sometimes sinuate-dentate on Lord Howe Is.), abruptly acuminate. Inflorescence axillary, few- to many-flowered; pedicels articulate. Flowers functionally unisexual. Sepals 4, ovate, 0.5–1 mm long, caducous. Petals 4 or 5, free, lanceolate, 2.5–3 mm long, white, valvate. Stamens 4 or 5, 2–3 mm long. Ovary 1.5 mm long; style short. Fruit a single globose follicle, c. 8 mm diam., dotted with oil glands, purple, splitting to tardily release solitary seed. Seed 6 mm diam., black. *Yellow Wood* (L.H.Is.), *Box Wood, Little Yellow Wood* (N.Is.). Fig. 48C–D.

Norfolk Is., Lord Howe Is. Not common on either Island. Flowers Apr.–Aug. Also known from Vanuatu (see P.S.Green, *J. Arnold Arbor.* 51: 215, 1970), and possibly Fiji (but see A.C.Smith, *Fl. Vit. Nova* 3: 493, 1985).

N.Is.: NE slopes of Mt Bates, above Bird Rock, *R.D.Hoogland 11166* (NSW); top and upper slopes of Mt Pitt, *G.Uhe 1179* (K); *s. loc.*, 1904, *I.Robinson* (K, MEL, NSW). **L.H.Is.:** S ridge of Malabar, *A.N.Rodd 1738a* (K, NSW); 0.4 km NNE of Dawsons Point, *J.Pickard* in *A.N.Rodd 1449* (K, NSW); Erskine Valley, lower part of ascent of Mt Gower, *P.S.Green 1669* (A, K).

Zanthoxylum pancheri P.S.Green, which is closely related, is endemic(?) in New Caledonia. Further work is needed to elucidate the relationships between this and other taxa in this species complex.

3. SARCOMELICOPE

Sarcomelicope Engl. in H.G.A.Engler & K.A.E.Prantl, *Nat. Pflanzenfam.* III: 122 (1896); from the Greek *sarkos* (flesh) and the generic name *Melicope*, because the fruits resemble those of *Melicope* but are somewhat fleshy.

Type: *S. sarcococca* (Baill.) Engl.

Bauerella Borzí, *Boll. Reale Orto Bot. Giardino Colon. Palermo* 1: 155 (1897). T: *B. australiana* Borzí = *Sarcomelicope simplicifolia* (Endl.) T.G.Hartley

Trees or shrubs, functionally dioecious. Leaves opposite or whorled, simple; petiole apex pulvinate; lamina usually gland-dotted. Inflorescence axillary, narrowly racemose or paniculate. Flowers functionally unisexual. Sepals 4, free or basally connate, persistent. Petals 4, free, erect or spreading, with a small, retrorse apiculum, persistent. Stamens 8;

filaments flattened. Ovary of 4 ±free or connate carpels; ovules 2 per carpel; style short; stigma peltate, 4-lobed. Fruit drupaceous, the 4 carpels basally or entirely connate; exocarp fleshy, drying to subcoriaceous. Seeds ±ovoid, black, with a caruncle.

A genus of 6 species, confined to an area from eastern Australia to New Caledonia, Vanuatu and Fiji; 1 species native on the Islands.

T.G.Hartley, A revision of the genus *Sarcomelicope* (Rutaceae), *Austral. J. Bot.* 30: 359–372 (1982).

Sarcomelicope simplicifolia (Endl.) T.G.Hartley, *Austral. J. Bot.* 30: 369 (1982)

subsp. **simplicifolia**

Vepris simplicifolia Endl., *Prodr. Fl. Norfolk.* 89 (1833); *Acronychia endlicheri* Schott, *Rutaceae* 3, t. 2 (1834), *nom. illeg.*; *Acronychia simplicifolia* (Endl.) Steudel in *Nomencl. Bot.* 2nd edn, 2: 747 (1841); *Jambolifera endlicheri* (Schott) Kuntze, *Revis. Gen. Pl.* 2nd edn, 1: 102 (1891), *nom. illeg.*; *Bauerella simplicifolia* (Endl.) T.G.Hartley, *J. Arnold Arbor.* 56: 168 (1975). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W. So called because the leaves are simple, not compound as in related species of *Vepris*.

Acronychia baueri Schott, *op. cit.* 5, t. 3; *Jambolifera baueri* (Schott) Kuntze, *op. cit.* 102; *Bauerella australiana* Borzí, *Bol. Reale Orto Bot. Giardino Colon. Palermo* 1: 155 (1897), *nom. illeg.*; *Bauerella baueri* (Schott) Engl. ex Däniker, *Vierteljahrsschr. Naturf. Ges. Zürich* 77, Beibl. 19 (*Mitt. Bot. Mus. Univ. Zürich* 142): 202 (1932). T: Norfolk Island?, *F.L.Bauer*; holo: ?BP *n.v.*

Illustrations: P.S.Green, *J. Arnold Arbor.* 51: 212, fig. 1a (1970); I.Hutton, *Lord Howe Is.* 139 (1986); P.G.Richardson in G.J.Harden, *Fl. New South Wales* 2: 268 (1991).

Shrub or tree to 10 m tall or more. Leaves opposite, rarely ternate, subcoriaceous, elliptic to obovate, (5–) 6–12 cm long, (3–) 4–5.5 cm broad, cuneate to obtuse at base, acute to rounded at apex, often slightly retuse, reticulate. Inflorescence few- to many-flowered, narrowly paniculate, 1–6 cm long. Flowers clustered. Sepals ovate-triangular, 1.5–2 mm long, densely appressed-pilose dorsally. Petals ovate-triangular, c. 4 mm long, white, densely appressed-pilose dorsally. Stamens 2.5–3 mm long. Ovary subglobose, c. 2 mm long, weakly 4-lobed, pubescent. Fruit ±barrel-shaped with 4 obtuse angles towards top, cream, glabrate, shortly beaked when dry. Seeds 5–7 mm long. *Yellow Wood* (L.H.Is.), *Big Yellow Wood*.

Norfolk Is., Lord Howe Is. Fairly common in the National Park on Norfolk Is. and in woods in lowland areas on Lord Howe Is. Flowers June–Sep.

N.Is.: above Red Stone, 1969, *O.R.Evans* (K); Anson Bay district, *M.Lazarides 8098* (CANB, K); *s. loc., A.Cunningham 29 & 148* (K). **L.H.Is.:** ridge between Old Settlement and North Bay, *P.S.Green 1931* (K); SE lower slopes of Malabar, *P.S.Green 1574* (A, K); track above Mutton Bird Point, *A.C.Beauglehole 5816* (MEL).

The taxon on the Islands is subsp. *simplicifolia*, which is also known from Australia (eastern Qld, N.S.W.). Subsp. *neoscotica* (P.S.Green) T.G.Hartley occurs on New Caledonia and Vanuatu and subsp *petiolaris* (A.Gray) T.G.Hartley on Fiji. The plants on Lord Howe Is. often bear leaves in whorls of three.

4. CITRUS

Citrus L., *Sp. Pl.* 2: 782 (1753); *Gen. Pl.* 5th edn, 341 (1754); the Latin name for the Citron (*Citrus medica*).

Type: *C. medica* L.

Small trees or shrubs. Young branches often bearing simple, axillary spines. Leaves alternate, simple, articulate at petiole apex; petiole usually winged. Inflorescence axillary, clustered or flowers solitary. Flowers usually bisexual. Calyx cup-shaped, 3–5-lobed. Petals (4–) 5 (–8), gland-dotted, imbricate. Stamens numerous, free or in groups. Ovary superior, (8–) 10 (–18)-locular, with 4–12 axile ovules; style cylindrical; stigma usually capitate. Fruit a large berry (hesperidium) with fleshy segments; pericarp with numerous aromatic oil glands.

A genus of c. 12 species from tropical and subtropical, southern and south-east Asia. It is an

economically important genus of fruit trees with numerous man-made hybrids; 1 species naturalised on the Islands. As well as the lemon, it includes orange, lime, grapefruit, tangerine *etc.*

***Citrus jambhiri** Lush., *Indian Forester* 36: 342 (1910)

T: India, cultivated: holo: not designated, ?DD *n.v.* The epithet is based on a native name for this fruit.

Illustrations: Y.Tanaka, *Icon. Japanese Citrus Fruits* 1: 72 (1946); J.F.Morton, *Fruits for Warm Climates* 162, fig. 41 (1987).

Small tree to c. 5 m tall. Branches with stiff, stout spines to 2 cm long. Leaves lemon scented; petiole 3–10 mm long, slightly channelled, not winged; lamina elliptic, (5–) 7–11 cm long, (2.5–) 3.5–6 cm broad, acute at base, usually broadly so, crenate-dentate, blunt and slightly retuse. Flowers clustered or solitary. Sepals 1–1.5 mm long. Petals c. 1.5 cm long, white. Stamens 20–40. Ovary 8–12-locular. Fruit subglobose to ellipsoidal, c. 10 cm long, yellow; pericarp thick, rough and knobbly, gland-dotted, with a short, somewhat depressed, conical protuberance at apex. *Wild Lemon*, *Bush Lemon* (L.H.Is.).

Norfolk Is., Lord Howe Is. Introduced. Presumably a native of tropical Asia, it has either escaped from or is existing as a relic of earlier cultivation (as a rootstock?), and now occurs as scattered naturalised trees on Norfolk Is., less frequently on Lord Howe Is.

N.Is.: King Fern Valley, *W.R.Sykes NI 1092* (CHR); c. 1.6 km NE of Bloody Bridge, *G.Uhe 1117* (K); Stockyard Rd, Friendship House, *W.R.Sykes NI 647* (CHR); *s. loc.*, 1950, *H.Bannister* (CHR). **L.H.Is.:** NW side of Transit Hill, *L.A.S.Johnson & A.N.Rodd 1273* (NSW).

More usually known as the *Rough Lemon*, this species is widely used as a rootstock for cultivated lemons.

65. OXALIDACEAE

Herbs, rarely shrubs or small trees. Leaves alternate, opposite or radical, palmately or pinnately compound, or mostly 3-foliolate, sometimes simple; leaflets often folded at night; stipules small or absent. Inflorescence pedunculate, cymose or umbellate. Flowers actinomorphic, bisexual, sometimes cleistogamous, usually heterostylous. Sepals 5, imbricate. Petals 5, free or sometimes basally slightly connate, usually convolute. Stamens 10 (–15), in 2 (or 3) whorls; filaments basally connate. Ovary superior, (3–) 5 united carpels, each with (1–) 2–several axile ovules; styles usually distinct, persistent. Fruit a capsule or berry. Seeds usually arillate.

A mainly tropical and subtropical family with some temperate representatives, consisting of 8 genera and c. 875 species; 1 genus, with native and naturalised species, on the Islands.

G.Bentham, Geraniaceae, *Fl. Austral.* 1: 300–301 (1863); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Oxalidaceae, *Fl. Java* 1: 244–248 (1963); J.F.Veldkamp, Oxalidaceae, *Fl. Males.* ser. I, 7: 151–178 (1971).

OXALIS

Oxalis L., *Sp. Pl.* 1: 433 (1753); *Gen. Pl.* 5th edn, 198 (1754); from the Greek *oxys* (sour, acid, sharp), in reference to the taste of the leaves.

Type: *O. acetosella* L.

Herbs, rarely subshrubs, often rhizomatous, tuberous or bulbous. Leaves pinnate or digitate, usually 3-foliolate, sometimes stipulate. Inflorescence axillary or radical, pedunculate, cymose or umbellate, 1–many-flowered. Sepals shortly connate. Petals clawed, connate just above claw or free. Stamens 10 in 2 whorls. Ovary 5-locular, with 1–10 ovules per locule in

1 or 2 rows; styles 5, free. Fruit a capsule. Seeds 1–10, with a basal fleshy aril that explosively turns inside out to eject seed.

A cosmopolitan genus of c. 700 or more species. One native and 1 naturalised species on both Islands.

Petals rose pink; roots fleshy, translucent, below a brown bulb and bulbils **1. O. debilis**

Petals yellow; rootstock slender to stout, without bulb or bulbils **2. O. corniculata**

1. *Oxalis debilis Kunth in F.W.H.A.F. von Humboldt, A.J.A.Bonpland & C.S.Kunth, *Nov. Gen. Sp.* 5: 236 (1822)

T: Venezuela, *F.W.H.A.F. von Humboldt & A.J.A.Bonpland*; holo: P *n.v.*, photo seen (IDC microfiche 6209,128/15). The epithet in Latin means weak, and refers to the plant's habit.

Oxalis corymbosa DC., *Prodr.* 1: 696 (1824); *O. debilis* var. *corymbosa* (DC.) Lourteig, *Ann. Missouri Bot. Gard.* 67: 840 (1980). T: Mauritius, *J.B.G.M.Bory de St.Vincent*; lecto: G-DC, *fide* A.Lourteig, *loc. cit.*, *n.v.*, photo seen (IDC microfiche 800,262/4).

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 435 (1981), as *O. corymbosa*; T.W.Jaspers in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 712, fig. 386 (1986); B.A.Auld & R.W.Medd, *Weeds* 195 (1987).

Perennial, stemless herb from a brown bulb, with numerous small, striate bulbils on a swollen, fleshy, white, translucent root. Leaves 3-foliolate; stipules broad, hairy; petiole 5–25 cm long, scattered hairy; leaflets broadly obcordate, 1–4 cm long, 1.5–5 cm broad, basally attenuate, rounded, emarginate, glabrous above, sparsely hairy below and with numerous tiny, orange bodies (calli), especially near margins. Inflorescence densely cymose, 5–15-flowered; peduncle slightly longer than leaves. Sepals acute, c. 5 mm long; with 2 small calli at apices. Petals oblong-obovate, 1.5–2 cm long, rose pink. Fruit unknown on the Islands.

Norfolk Is., Lord Howe Is. A native of South America now widespread as a weed of disturbed ground throughout temperate and warm temperate regions.

N.Is.: Red Rd, *P.S.Green 1364* (A); *s. loc.*, *R.M.Laing* (CHR); *s. loc.*, 1939, *J.D.McComish* (NSW). **L.H.Is.:** portion 77, adjoining the cemetery, *J.Pickard 2676* (NSW); 0.8 km S of Transit Hill, *J.Pickard 1214* (NSW); N of the hospital, *A.C.Beauglehole 5780* (MEL).

Extremely persistent because the bulbils break away very easily and even the smallest produces a new plant. As pointed out in C.J.Webb *et al.*, *Fl. New Zealand* 4: 919 (1988), the recognition of var. *corymbosa* is scarcely justified; even the lectotype chosen has few flowers in its inflorescence.

2. Oxalis corniculata L., *Sp. Pl.* 1: 435 (1753)

T: Europe, Herb. Burser XVIII (2) fol. 60; lecto: UPS, *fide* M.F.Watson, *Bot. J. Linn. Soc.* 101: 357 (1989). The epithet is based on the diminutive of the Latin *cornus* (a horn) plus the suffix *-atus* (indicating similarity), referring to the two erect capsules appearing like little horns.

Oxalis reptans Sol. ex G.Forst., *Fl. Ins. Austr.* 90 (1786), *nom. nud.*

Oxalis perennans Haw., *Misc. Nat.* 181 (1803). T: cultivated in England, origin Australia, destroyed; neo: SE base Black Mtn, Canberra, A.C.T., *H.S.MacKee 11678*, P *n.v.*, *fide* A.Lourteig, *Phytologia* 42: 95 (1979); isoneo: CANB.

Oxalis rubens Haw., *op. cit.* 182. T: cultivated, origin Australia; neo: New South Wales, Australia, 1844, *J.P.Verreaux*, P *n.v.*, *fide* A.Lourteig, *Phytologia* 42: 166 (1979).

Oxalis corniculata var. *villosa* (M.Bieb.) Hohen., *Bull. Soc. Imp. Nat. Moscou* 9 (*Enum. Pl. Talysch*: 159): 395 (1838). T: Caucasus, *C.Stevens*; holo: ?LE *n.v.*

Oxalis exilis A.Cunn., *Ann. Nat. Hist.* 3: 316 (1839). T: Bay of Islands, New Zealand, *R.Cunningham 234*; holo: K.

Oxalis radicosa A.Rich., *Tent. Fl. Abyss.* 1: 123 (1847). T: Ethiopia, *A.Petit*; holo: ?P *n.v.*

Oxalis corniculata var. *microphylla* Hook.f., *Fl. Nov.-Zel.* 1: 42 (1852). T: New Zealand, *A.Cunningham 587*; Tasmania, *A.Cunningham 1837/94*; and 1840, *J.D.Hooker s.n.*; syn: K.

Oxalis corniculata var. *reptans* Laing, *Trans. & Proc. New Zealand Inst.* 47: 28 (1915). T: Norfolk Island,

1912, *R.M.Laing s.n.*; holo: CHR.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 405, fig. 64B (1983); T.W.Jaspers in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 714, fig. 387A (1986); B.A.Auld & R.W.Medd, *Weeds* 195 (1987).

Herb with erect to prostrate aerial stems, variously hairy; rootstock slender to stout. Leaves 3-foliolate; petiole 1–8 cm long, inconspicuously auriculate-stipulate; leaflets broadly obcordate to obovate, 0.5–2 cm long, 0.5–2.5 cm broad, cuneate, emarginate. Inflorescence umbellate, 1–7-flowered; peduncle 1–4 cm long, accrescent in fruit. Sepals lanceolate, 2–6 mm long. Petals oblong-obovate, 4–10 mm long, yellow. Capsule cylindrical to ellipsoidal, 0.8–2.5 mm long, pubescent; fruiting pedicels usually deflexed; capsule erect. Seeds c. 1 mm long, reddish brown. *Oxalis*.

Norfolk Is., Lord Howe Is. This is a cosmopolitan species of uncertain origin, usually found in disturbed ground.

N.Is.: Rocky Point, *W.R.Sykes NI 520* (CHR); near Kingston, alongside creek, *J.D.McComish 122A* (K); Philip Is., *R.D.Hoogland 11330* (NSW). **L.H.Is.:** SE slopes of Malabar, *P.S.Green 1559* (A, K); Neds Beach, *M.M.J. van Balgooy 1054* (K, NSW); E end of Neds Beach, *G.Uhe 1267* (K).

This species is extremely variable and is treated here in a broad sense. Variants occur throughout its more or less worldwide range and some of them have become weedy. The situation has been complicated by the description of a number of local variants as species or infraspecific taxa, and while locally some of them appear distinct, they intergrade when looked at on a world scale. The names *O. chnoodes* Lour. (with hairy leaves and practically no stipules), *O. exilis* A.Cunn. (with very small leaves and capsules short, almost globose, few-seeded), *O. perennans* Haw. (with long hairs and long slender capsules) and *O. radicosa* A.Rich. (with a tap root and inconspicuous stipules) have all been applied as identification for individual plants from Norfolk Is. and Lord Howe Is., but these are not clear-cut entities and cannot really be treated as separate species, even though individual plants may fit their descriptions. Further work is needed to understand the basis of this variation, especially including the plants from SE Asia, where there appears to be a centre of diversity, as well as the Australasian representatives. It is worth bearing Hooker's admonition in mind, that botanists 'should be very careful in supposing a yellow-flowered *Oxalis* to be anything but this [*O. corniculata*]' (*Fl. Nov.-Zel.* 1: 42, 1852).

66. GERANIACEAE

Herbs or subshrubs, often aromatic. Leaves alternate or opposite, usually lobed or dissected, stipulate. Inflorescence terminal or axillary, cymose, umbellate; bracts present or absent. Flowers often paired, bisexual, actinomorphic or zygomorphic. Sepals 5, rarely 4, free or connate. Petals 5 (rarely 2–8 or absent), free, usually imbricate; nectarial glands (absent in *Pelargonium*) alternating with petals. Stamens twice (rarely thrice) as many as petals, sometimes some reduced to staminodes; filaments free or connate. Ovary superior, (2–) 3–5-locular, each with 1 or 2 ovules; style rostrate; stigmas 5. Fruit a schizocarp with 5, usually 1-seeded mericarps which separate elastically along with a portion of stylar beak, forming a curved or spirally coiled awn.

A family of 14 genera and c. 750 species, mainly temperate but also on mountains in the tropics; 3 genera introduced to the Islands.

G.Bentham, Geraniaceae, *Fl. Austral.* 1: 294–301 (1863).

KEY TO GENERA

1 Leaves pinnate or pinnately lobed or divided; awn of mericarp twisting spirally after separation **1. ERODIUM**

1: Leaves entire or ±palmately lobed or divided; awn of mericarp curled after separation, not twisting spirally

2 Flowers actinomorphic; leaves usually deeply palmately lobed or divided **2. GERANIUM**

2: Flowers zygomorphic; leaves palmately nerved and shallowly lobed **3. PELARGONIUM**

1. ERODIUM

Erodium L'Hér. ex Aiton, *Hort. Kew.* 2: 414 (1789); from the Greek *erodios* (a heron), in allusion to the resemblance of the rostrate style in the developed fruit to the beak of a heron.

Type: *E. crassifolium* Sol. ex Aiton

Annual, biennial or perennial herbs with basal rosette and leafy shoots. Leaves alternate or opposite, pinnately lobed or dissected, rarely almost entire. Inflorescence terminal or axillary, cymose-umbellate, bracteate. Flowers usually paired, sometimes solitary, ±zygomorphic. Sepals 5, imbricate. Petals 5, clawed, the 2 upper often slightly different in size from the 3 lower. Stamens 5, opposite sepals, alternating with 5 staminodes. Ovary 5-locular, with 2 ovules per locule. Mericarps indehiscent, usually 1-seeded, sharp-pointed and with retrorse hairs, breaking away with a portion of beak which forms a coiled awn; awn pilose on inner face.

A widespread temperate genus with c. 60 species, mainly from the Mediterranean region; 1 species naturalised on Norfolk Is.

***Erodium moschatum** (L.) L'Hér. ex Aiton, *Hort. Kew.* 2: 414 (1789)

Geranium cicutarium var. *moschatum* L., *Sp. Pl.* 2: 680 (1753). T: Europe, not designated. The epithet comes from the Greek *moschos* (musk) and the Latin suffix *-atus* (indicating likeness), alluding to a musk-like smell from this plant.

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 432 (1981); R.C.Carolin in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 718, fig. 388I (1986); B.A.Auld & R.W.Medd, *Weeds* 174 (1987).

Annual or biennial herb, decumbent or ±erect, to 50 cm tall, with dense sessile glands and a musky smell. Leaves pinnate, 10–30 cm long; stipules broadly ovate, papery; leaflets 5–11, sessile, ovate-oblong, 1–4 cm long, 0.5–3 cm broad, deeply and irregularly serrate. Inflorescence axillary, umbellate, 6–10 (–many)-flowered, with peduncles 6–10 cm long and pedicels to 1 cm long, both elongating in fruit. Sepals lanceolate, cucullate, mucronate, 5–6 mm long. Petals oblong, 6–7 mm long, mauve-pink. Stamens 3–4 mm long; staminodes c. 2 mm long. Ovary densely villous. Fruit with beak 4–5 cm long; mericarps fusiform, 4–6 mm long, with stiff, retrorse hairs, with an apical pit. *Crowfoot*.

Norfolk Is. An occasional weed. Native to southern and western Europe and the Mediterranean region.

N.Is.: outside the graveyard fence, *R.M.Laing* (CHR); *s. loc.*, 1898, *I.Robinson* (NSW); *s. loc.*, *J.D.McComish 198* (NSW).

2. GERANIUM

Geranium L., *Sp. Pl.* 2: 676 (1753); *Gen. Pl.* 5th edn, 306 (1754); from the Greek *geranos* (a crane), alluding to the resemblance of the rostrate style in the developed fruit to the beak of a crane, hence the generic common name 'Cranesbill'.

Type: *G. sylvaticum* L.

Annual, biennial or perennial herbs, rarely subshrubs. Leaves at base larger and forming a rosette; on flowering stems smaller and opposite to alternate, palmately lobed or dissected, rarely only toothed. Inflorescence terminal or axillary, cymose, bracteate. Flowers usually paired, actinomorphic, rarely somewhat zygomorphic. Sepals 5. Petals 5, imbricate, sometimes clawed. Stamens 10, rarely 5 staminodal; filaments broad, free or basally connate. Ovary 5-locular, with 2 ovules per locule. Mericarps dehiscent, usually 1-seeded, breaking away and curling upwards with portion of beak, often temporarily remaining attached at top, glabrous on the inner surface; awn not spirally coiled.

A genus of c. 300 or more species, temperate and warm temperate (montane in the tropics); 2 species naturalised on Norfolk Is. and another on Lord Howe Is.

R.C.Carolin, The genus *Geranium* L. in the south western Pacific area, *Proc. Linn. Soc. New South Wales* 89: 326–361 (1964); R.O.Gardner, *Geranium solanderi* and allies in New Zealand, *New Zealand J. Bot.* 22: 127–134 (1984).

1 Annual (or biennial); stem leaves mostly alternate

2 Leaf laminae divided up to ¾ of their length; segments widening above, usually 3-lobed or coarsely 3-toothed (L.H.Is.) **1. G. molle**

2: Leaf laminae, at least the lower, divided almost to base; segments linear, subdivided into linear lobes (N.Is.) **2. G. dissectum**

1: Perennial; stem leaves mostly opposite (N.Is.) **3. G. solanderi**

1. *Geranium molle L., *Sp. Pl.* 2: 682 (1753)

T: Europe; lecto: S.Vaillant, *Bot. Paris Prodr.* t. 15, fig. 3 (1726), *fide* R.C.Carolin, *Proc. Linn. Soc. New South Wales* 89: 331–333 (1964). The epithet is from the Latin *mollis* (soft), and alludes to the indumentum.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 6: t. 34 (1952); B.E.V.Parham & A.J.Healy, *Common Weeds New Zealand* 62 (1976); R.C.Carolin in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 720, fig. 389B (1986).

Annual or biennial herb, much branched from base, decumbent or ascending, to 40 cm tall. Stems softly hairy. Leaves in a basal rosette, alternate on stems; lamina orbicular-reniform, 1.5–4 cm long, 2–6 cm broad, deeply palmately 5–9-lobed, villous; lobes coarsely 3-toothed, obtuse or rounded. Flowers usually paired; peduncles and pedicels 0.5–1.5 cm long, villous; pedicels curving upwards in fruit. Sepals narrowly ovate, 2–3 mm long, shortly mucronate, accrescent in fruit. Petals obovate, 3–5 mm long, deeply emarginate, rose-pink. Anthers mauve. Fruit with beak 8–10 mm long; mericarps usually wrinkled, glabrous. Seeds smooth.

Lord Howe Is. An occasional weed of disturbed ground. Native from Europe to North Africa and south-western Asia, now widespread as a weed.

L.H.Is.: c. 0.4 km N of 'Pine Trees', *L.A.S.Johnson & A.N.Rodd 1210* (K, NSW); SE end of Andersons Rd, *G.Uhe 1344* (K).

2. *Geranium dissectum L., *Cent. Pl. I* 21 (1755)

T: Europe, not designated; lecto: LINN 858.32, *fide* P.H.Davis, *Fl. Turkey* 2: 461 (1967); IDC microfiche 177/2.459/7. The epithet alludes to the deeply and narrowly dissected leaves.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 6: t. 37 (1952); B.E.V.Parham & A.J.Healy, *Common Weeds New Zealand* 59 (1976); R.C.Carolin in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 730, fig. 389A (1986).

Annual herb, decumbent or ascending, to 50 cm tall. Stems sparsely villous with reflexed hairs. Leaves in a basal rosette, mostly alternate on stems; lamina orbicular to reniform, 3–5

cm long, 3.5–9 cm broad, deeply palmately divided almost to base into 5–7 linear lobes which are also linearly subdivided. Flowers usually paired; peduncle 1–1.5 cm long; pedicels 0.5–1 cm long with scattered simple and glandular hairs; pedicels geniculate on fruit. Sepals narrowly ovate, 5–6 mm long, acute to aristate, accrescent in fruit. Petals obovate, 6–8 mm long, emarginate, deep pink. Anthers blue. Fruit with beak 12–15 mm long; mericarps pilose. Seeds reticulate-pitted, glandular pubescent.

Norfolk Is. A weed first recorded from the Island by J.H.Maiden (*Proc. Linn. Soc. New South Wales* 28: 699, 1904) but not supported by a specimen at NSW. Also recorded, from the top of Mt Pitt, by R.M.Laing (*Trans. & Proc. New Zealand Inst.* 47: 28, 1915), but no specimen has been seen in his herbarium. Apparently not collected since, and probably extinct on the Island.

3. ***Geranium solanderi** Carolin, *Proc. Linn. Soc. New South Wales* 89: 350 (1964)

T: New Zealand, *J.R. & G.Forster*; holo: K. Named after Daniel Solander (1733–1782), Swedish botanist who sailed as naturalist on Captain James Cook's first voyage around the world (1768–1771).

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 433 (1981); B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 211, fig. 124d–e (1983); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 504, fig. 64D (1983).

Perennial herb, decumbent or ascending, to 50 cm tall. Stems somewhat strigose with retrorse hairs. Leaves basal, mostly opposite on stems; lamina orbicular-reniform, 1–3 cm long, 1.5–5 cm broad, deeply palmately (5–) 7-lobed, each lobe with 3–5 (–9) small, obtuse but finely and shortly mucronulate terminal lobes or teeth, with coarse appressed villous hairs on both sides. Flowers paired; peduncle 1–4 cm long; pedicels slightly longer, geniculate near apex, with retrorse villous hairs. Sepals ovate, acute to acuminate, 3 mm long, with coarse antrorse villous hairs, accrescent in fruit. Petals obovate, 5–6 mm long, emarginate, pink. Anthers dark purplish. Fruit with beak 10–18 mm long; mericarps with stiff hairs, smooth. Seeds coarsely pitted, black. *Geranium*. Fig. 48A–B.

Norfolk Is. Although this species is native in both eastern Australia and New Zealand, it is probably an introduction on Norfolk Is., and appears to have been first collected in 1898.

N.Is.: side of track, top of Mt Bates, *P.Ralston 89* (A, K); among old ruins, *R.M.Laing* (CHR); *s. loc.*, 1898, *I.Robinson* (NSW).

The plant on the Island seems to be the adventive variant called *G. solanderi* 'coarse hair' by R.O.Gardner, *New Zealand J. Bot.* 22: 132 (1984).

3. PELARGONIUM

Pelargonium L'Hér. ex Aiton, *Hort. Kew.* 2: 417 (1789); from the Greek *pelargos* (a stork), alluding to the resemblance of the rostrate style in the developed fruit to the beak of a stork.

Type: *P. hirsutum* (Burm.f.) L'Hér. ex Aiton

Herbs or soft-wooded shrubs. Stems sometimes somewhat succulent. Leaves usually opposite, entire to dissected, glabrous or pubescent, often aromatic on bruising. Inflorescence terminal or axillary, 2–many-flowered, bracteate. Flowers zygomorphic. Sepals 5, imbricate, basally connate, the upper one spurred and adnate to pedicel. Petals (2–) 5, convolute, often clawed, the posterior pair usually the largest and often marked with spots and lines. Stamens 6–8, with the staminodes correspondingly 4–2; filaments basally connate. Ovary 5-locular, with 2 ovules per locule. Mericarps dehiscent, 1-seeded, breaking away and curling upwards with a portion of beak, hairy on inner surface; awn not spirally coiled.

An Old World, mainly South African genus of c. 250 species, containing the 'Geraniums' of gardeners; 1 species naturalised on Lord Howe Is.

R.C.Carolin, The genus *Pelargonium* L'Hér. ex Aiton in Australia, *Proc. Linn. Soc. New South Wales* 86: 280–294 (1962).

***Pelargonium australe** Willd., *Sp. Pl.* 3: 675 (1800)

T: Australia, Herb. Willdenow 12478 sheet 1; holo: B, *fide* IDC microfiche 7740, 897/13. So named for its southern distribution.

Illustrations: B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 211, fig. 124a–c (1982); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 1: 405, fig. 64F (1983); R.C.Carolin in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 722, fig. 390B (1986).

Perennial herb, decumbent to ascending, to 50 cm tall, softly hairy. Leaves opposite; lamina broadly ovate to orbicular, 2–9 cm long, 2–8 cm broad, shallowly or obscurely 5–9-lobed, cordate, crenate, pubescent to almost glabrous. Inflorescence 4–12-flowered, villous to pubescent; peduncle 3–10 cm long; pedicels 0.5–2 cm long. Sepals lanceolate, 4–7 mm long, variously hairy; calyx tube short; spur 1–5 mm long. Petals 6–8 mm long, pink, upper pair with darker spots and lines. Fruit with beak 8–15 mm long; mericarps ovoid, c. 2.5 mm long, villous to pubescent; awn 6–12 mm long, its lower part with silky hairs 3–4 mm long becoming shorter upwards. Seeds black or grey.

Norfolk Is., Lord Howe Is. Native in all Australian States except the N.T. Although recorded from Norfolk Is. by J.H.Maiden (*Proc. Linn. Soc. New South Wales* 28: 699, 1904) as 'new for the Island', no specimen to support this record has been found, and R.M.Laing (*Trans. Proc. New Zealand Inst.* 47: 5 & 28, 1915) concluded that it was doubtfully indigenous. Nor has it been seen there lately. On Lord Howe Is. it is thought to have died out (A.N.Rodd & J.Pickard, *Cunninghamia* 1: 278, 1986).

L.H.Is.: *s. loc., coll. unknown, NSW 91494* (NSW).

67. TROPAEOLACEAE

Annual or perennial herbs, often scrambling or climbing, usually ±succulent with a watery, often acrid sap. Leaves usually alternate, palmately lobed or divided, often peltate, with or without stipules; petiole in climbing species sometimes coiling. Flowers usually solitary, axillary, bisexual, strongly zygomorphic. Sepals usually petaloid, connate; dorsal sepal produced into a nectariferous spur. Petals 5 or fewer, free, imbricate, clawed. Stamens 8; filaments filiform. Ovary superior, 3-locular; ovule 1 per locule, axile; style 1 with 3 stigmatic branches. Fruit of 3 indehiscent mericarps, sometimes fleshy, rarely winged.

A family of 3 genera and 88 species from Central and South America; 1 genus introduced on Lord Howe Is.

TROPAEOLUM

Tropaeolum L., *Sp. Pl.* 1: 345 (1753); *Gen. Pl.* 5th edn, 162 (1754); the diminutive of the Latin *tropaeum* (a trophy); the peltate leaves and golden or red flowers are said to resemble the round shields and blood-stained helmets hung on a pillar, which constituted the classical victory sign set up on a battle field.

Type: *T. majus* L.

Prostrate, scrambling or climbing herbs, usually glabrous. Leaves alternate or lowermost leaves opposite; lamina peltate, ±entire. Petals usually red, yellow or orange, lower 3 usually larger and differently shaped, rarely absent. Ovary never winged.

A Central and South American genus of c. 80 species; 1 species naturalised on Lord Howe Is. The 'Nasturtiums' of gardeners.

***Tropaeolum majus** L., *Sp. Pl.* 1: 345 (1753)

T: Lima, Peru; Herb. Clifford 143, *Tropaeolum* 1; lecto: BM, *fide* B.Sparre, *Bot. Notiser* 118: 448 (1965). The epithet is the neuter comparative of the Latin *magnus* (large), given to this species as being the larger of the two first described.

Illustrations: V.H.Heywood, *Fl. Pl. World* 212, fig. 1 (1985); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 724, fig. 391 (1986); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 2: 1294 (1990).

Annual or short-lived perennial, trailing or scrambling to c. 2 m, glabrous, somewhat succulent, aromatic when bruised. Leaves with petiole 10–25 cm or more long; lamina peltate, orbicular, 4–10 cm or more diam., slightly sinuate, glaucescent. Flowers usually solitary; peduncle resembling petioles. Calyx lobes narrowly ovate, unequal, 1.5–2 mm long, pale orange; spur 2.5–3 mm long, ±curved, tapering. Petals somewhat unequal, 2–4 cm long, yellow, red or orange; lower 3 broadly obovate, rounded, narrowly clawed, fringed at base of limb; upper 2 with a broad claw, marked with dark lines. Mericarps somewhat globose, flattened on 2 sides, rounded dorsally, obtusely ribbed, green.

Lord Howe Is. A garden escape, now naturalised in a few places. A native of the Andes in South America.

L.H.Is.: Lagoon Beach, opposite por. 33, *J.Pickard 2692* (NSW); 0.4 km S of Transit Hill, *J.Pickard 1213* (NSW).

68. ARALIACEAE

Trees, shrubs or woody climbers, rarely herbs, sometimes armed. Leaves usually alternate, pinnately or palmately compound, sometimes simple; stipules usually present, often adnate to petiole base. Inflorescence usually terminal, umbellate or sometimes racemose or paniculate, or rarely flowers solitary. Flowers bisexual or unisexual, actinomorphic; pedicels often articulate. Calyx annular or cupuliform, rarely shallowly 5-toothed. Petals (3–) 5 (–many), valvate, free or sometimes connate at base, borne on the edge of a dome-shaped nectariferous disk, caducous. Stamens as many as and alternating with petals, or twice as many. Ovary inferior or semi-inferior, usually 5-locular; ovule usually 1 per locule. Fruit a berry or drupe, rarely a schizocarp.

A family with c. 60 genera and perhaps c. 1000 species, widespread but mainly tropical and subtropical; 2 native and 2 introduced genera on the Islands.

G.Bentham, Araliaceae, *Fl. Austral.* 3: 378–385 (1866); H.Harms, Araliaceae, *Pflanzenfam.* 3(8): 1–62 (1894, 1897); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Araliaceae, *Fl. Java* 2: 161–171 (1965); W.R.Philipson, Araliaceae, *Fl. Males.* ser. I, 9: 1–105 (1979); A.C.Smith, Araliaceae, *Fl. Vit. Nova* 3: 681–652 (1985).

KEY TO GENERA

1 Leaves compound, pinnate

2 Leaflet base symmetrical, rounded to truncate to subcordate **1. DELARBREA**

2: Leaflet base strongly asymmetrical, acute **2. POLYSCIAS**

1: Leaves simple

3 Leaf lamina pinnately veined, narrowly or broadly oblanceolate **3. MERYTA**

3: Leaf lamina palmately veined, ±orbicular **4. TETRAPANAX**

1. DELARBREA

Delarbrea Vieill., *Bull. Soc. Linn. Normandie* 9: 342 (1865); named after M.Delarbre, one-time editor of '*Revue Coloniale*'.

Type: *D. collina* Vieill.

Small trees, unarmed, glabrous. Leaves alternate, clustered towards ends of branches, imparipinnate; petiole base expanded, amplexicaul; leaflets entire to remotely dentate-crenulate, coriaceous, somewhat scarious on margins; without stipules. Inflorescence terminal, paniculate-umbellate, erect or pendulous; pedicels free or basally united in groups of 2–4, articulate below flowers. Flowers bisexual, sometimes functionally male (with ovaries abortive). Sepals 5, valvate, united into a short tube. Petals 5, imbricate, usually clawed. Stamens 5; filaments filiform. Ovary 2-locular; styles 2, free, erect; stigmas clavate. Fruit a fleshy drupe, crowned by persistent calyx and styles.

A genus of 6 species, from the Lesser Sunda Islands and New Guinea to New Caledonia and Queensland; 1 species naturalised on Norfolk Is.

P.P.Lowry, A systematic study of *Delarbrea* Vieill. (Araliaceae), *Allertonia* 4: 170–200 (1986).

***Delarbrea paradoxa** Vieill., *Bull. Soc. Linn. Normandie* 9: 394 ((1865)

T: New Caledonia, *N.C.E.Vieillard 627'A'*; lecto: P, *fide* P.P.Lowry, *Allertonia* 4: 176 (1986). Unfortunately, Vieillard did not suggest why his species is paradoxical.

Illustration: P.P.Lowry, *Allertonia* 4: 177, fig. 1 (1986).

Trees to c. 10 m tall. Leaves (20–) 40–70 (–85) cm long; leaflets (7–) 9–19, narrowly ovate to elliptic-oblong, 6–22 cm long, 2–8 cm broad, rounded to truncate or subcordate at base, entire or in juvenile foliage irregularly serrate, obtuse to acute, usually folded along midrib. Inflorescence pendulous, 35–60 cm long, covered with greyish scurf; secondary axes 9–45, 3–30 cm long, each with a terminal umbellule of (15–) 20–40 bisexual flowers and 1–15 (–20) lateral umbellules of male or bisexual flowers. Calyx lobes 0.5–0.8 mm long; tube c. 2 mm long. Petals 1.6–2.2 mm long, yellow-green. Filaments 1.5–2.2 mm long. Fruit globose to ovoid, 6–10 mm long, purplish black, smooth, ribbed when dry.

Norfolk Is. A native of New Caledonia northwards to New Guinea and south-eastern Malesia which has recently become naturalised in at least one place on the Island.

N.Is.: SE slope of Mt Pitt, *R.O.Gardner 5857* (AK, K).

2. POLYSCIAS

Polyscias J.R.Forst. & G.Forst., *Char. Gen. Pl.* 63, t. 32 (1775); from the Greek *poly* (many) and *skias* (a sun canopy, umbel), because of the many umbellules in the inflorescence.

Type: *P. pinnata* J.R.Forst. & G.Forst.

Shrubs or trees, unarmed, often aromatic on bruising. Leaves alternate, imparipinnate, sometimes 2- or 3-pinnate, rarely unifoliolate; petiole usually amplexicaul; leaflets opposite, entire or divided; rachis usually articulate; stipules inconspicuous, fused with petiole base. Inflorescence terminal or axillary, paniculate, of umbellules, racemules or heads; pedicels articulate below flowers. Flowers bisexual or unisexual. Calyx an undulate or dentate rim. Petals 4 or 5 (–8 or more), valvate. Stamens as many as petals. Ovary inferior, 4 or 5 (–8 or more)-locular; styles free or connate. Fruit a fleshy drupe; calyx rim and styles persistent.

An Old World tropical genus of 100 or more species; 1 species native on Lord Howe Is.

Figure 49. A–B, ARALIACEAE: *Polyscias cissodendron*. **A**, leaf (R.Chinnock WELTU 8157, K); **B**, part of infructescence (J.Pickard in A.Rodd 1405, K). **C**, APIACEAE: *Apium prostratum* subsp. *howense*, portion of shoot (P.Green 1921, K). **D–H**, ARALIACEAE. **D–F**, *Meryta angustifolia*. **D**, part of male inflorescence (P.Green 1865, K); **E**, leaf; **F**, part of female inflorescence (**E–F**, R.Hoogland 11288, K). **G–H**, *Meryta latifolia*. **G**, habit (photograph); **H**, leaf (M.Lazarides 8044, K). Scale bars: **A–D**, **F** = 2 cm; **E**, **H** = 5 cm; **G** = 50 cm.. Drawn by P.Halliday.

Polyscias cissodendron (C.Moore & F.Muell.) Harms in H.G.A.Engler & K.A.E.Prantl, *Nat. Pflanzenfam.* III 8: 45 (1894), as *kissodendron*

Panax cissodendron C.Moore & F.Muell. in F.J.H. von Mueller, *Fragm.* 7: 96 (1870); *Tieghemopanax cissodendron* (C.Moore & F.Muell.) R.Vig., *Bull. Soc. Bot. France* 53: 305 (1905); *Nothopanax cissodendron* (C.Moore & F.Muell.) W.R.B.Oliv., *Trans. & Proc. New Zealand Inst.* 49: 145 (1917). T: Lord Howe Is., ?*C.Moore*; holo: MEL. So named from the Greek *kissos* (ivy) and *dendron* (a tree), the authors having expressed some doubt whether or not this tree might be a member of the genus *Hedera*, Ivy.

Illustration: I.Hutton, *Lord Howe Is.* 118 (1986).

Tree to 12 m or more tall, dioecious. Leaves imparipinnate, 10–35 cm long; leaflets (7–) 11–13, narrowly ovate to lanceolate, strongly oblique, (3–) 4–8 (–10) cm long, (1.5–) 1.8–2.5 (–4.5) cm broad, acute at base, coarsely crenulate-dentate, especially upper margin, acute to acuminate at apex. Inflorescence terminal, paniculate, 10–30 cm long, umbellules 4–7 (–9)-flowered; pedicels 2–3 mm long, articulated at base of flowers. Petals (4 or) 5, ±triangular, yellow, becoming reflexed. Stamens c. 2 mm long. Ovary 2-locular; styles 2, basally united, c. 1 mm long. Fruit laterally compressed-spheroidal, 3.5–4.5 mm long, bluntly ribbed, purple-maroon. *Island Pine*. Fig. 49A–B.

Lord Howe Is. A fairly common tree in sheltered forest in the lowland areas. Also native to New Caledonia and Vanuatu. Flowers mid Sept.–late Nov.

L.H.Is.: below Malabar, *A.C.Beauglehole 5824 & 5845* (CANB, MEL); track to Neds Beach, 1968, *R.J.Chinnock* (K, WELTU); behind Neds Beach, *J.Pickard* in *A.N.Rodd 1405* (K, NSW); Transit Hill, *R.D.Hoogland 8669* (CANB, NSW); ridge between The Saddle and summit of Mt Gower, *I.R.Telford 10376* (CANB, K).

3. MERYTA

Meryta J.R.Forst. & G.Forst., *Char. Gen. Pl.* 60 (1775); from the Greek *merytos* (glomerate), in allusion to the fusion of the fruits in heads in some species.

Type: *M. lanceolata* J.R.Forst. & G.Forst.

Botryodendrum Endl., *Prodr. Fl. Norfolk.* 62 (1833). T: *B. latifolium* Endl.

Trees or shrubs, dioecious. Leaves alternate, clustered at branch ends, simple, usually entire (except in juvenile foliage); stipules fused with petiole base. Inflorescence terminal, paniculate, of crowded umbellules or clustered heads. Calyx reduced to a rim, sometimes shallowly toothed or absent. Petals 3–5 (–6), valvate. Stamens as many as petals, sterile or absent in female flowers. Ovary inferior, 4–15-locular, rudimentary or absent in male flowers; ovule 1 per locule; styles basally united, persistent; stigmatic arms spreading in fruit. Fruit often congested and laterally united, drupaceous, somewhat fleshy when ripe.

A genus of c. 30 species, mainly Pacific from New Guinea and Micronesia to the Marquesas and Tuamotos and S to New Zealand, centred in New Caledonia; 2 species endemic on Norfolk Is.

Leaf lamina oblanceolate, usually 6–7 (–9.5) cm broad; female inflorescence 10–15 cm long; rachis visible between flower clusters **1. M. angustifolia**

Leaf lamina broadly oblanceolate, 25–30 cm broad; female inflorescence 6–10 cm long, densely clustered and rachis not visible **2. M. latifolia**

1. Meryta angustifolia (Endl.) Seem., *Bonplandia* 10: 295 (1862)

Botryodendrum angustifolium Endl., *Prodr. Fl. Norfolk.* 64 (1833). T: Norfolk Island, *F.L.Bauer*; holo: W. The epithet comes from the Latin *angustus* (narrow) and *folium* (a leaf), referring to the narrow leaves.

Tree to 6 m tall, with a single trunk or with few branches towards top, with brittle wood. Leaf lamina oblanceolate, (15–) 20–25 (–35) cm long, (4.5–) 6–7 (–9.5) cm broad, narrowed at base, acute to obtuse. Inflorescence with numerous flower clusters; male clusters 15–25 cm long, 4–7-flowered; female clusters stouter, 10–15 cm long, 3- or 4-flowered. Calyx

abortive, or a rim in female flowers. Petals broadly triangular, 4 in male flowers, 6 or 7 in female, 1–1.5 mm long, persistent. Stamens 4; anthers c. 0.7 mm long. Ovary flask-shaped, 4–5 mm long, 5–7-locular; styles 5–7, 2 mm long, becoming strongly recurved. Fruit globose, 7–8 mm long, bluntly 5–7-ribbed. Fig. 49D–F.

Norfolk Is. Endemic and rare. There are relatively few plants, not all in the National Park, scattered in wooded areas and in need of conservation.

N.Is.: N side of Mt Bates, *P.S.Green 2383* (K); S slopes of Mt Bates, *P.S.Green 1865* (K); saddle between Mt Pitt and Mt Bates, *R.D.Hoogland 11288* (CANB, K, NSW); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW).

2. **Meryta latifolia** (Endl.) Seem., *Bonplandia* 10: 295 (1862)

Botryodendrum latifolium Endl., *Prodr. Fl. Norfolk.* 62 (1833). T: Norfolk Island, *F.L.Bauer*; holo: W. The epithet comes from the Latin *latus* (broad) and *folium* (a leaf), as this is the broad-leaved species.

Aralia macrophylla A.Cunn. ex Loudon, *Hort. Brit.* 2nd edn, 581 (1832), *nom. nud.*

Illustrations: J.D.Hooker, *Bot. Mag.* 97: t. 5932 (1871); E.Wocke, *Neubert's Gart.-Mag.* 49: 537 (1896).

Tree 5–6 m tall, with single trunk or with few branches towards top, with brittle wood. Leaf lamina broadly oblanceolate, 50–75 cm long, 25–30 cm broad, gradually narrowed and finally rounded at base, obtuse to rounded at apex. Male inflorescence not seen. Female inflorescence terminal, paniculate, 10–15 cm long, densely clustered. Calyx rudimentary. Petals 5 or 6, narrowly triangular, 1.5–2 mm long, persistent. Stamens as many as petals, c. 1 mm long. Ovary flask-shaped, 3–4 mm long, 5- or 6-locular; styles 5 or 6, 2–3 mm long, strongly recurved, persistent. Fruit globose, 5–6 mm long, bluntly 5- or 6-ribbed. *Shade Tree*. Fig. 49G–H.

Norfolk Is. Endemic, very rare and endangered.

N.Is.: on Mt Pitt Rd, *M.Lazarides 8044* (CANB, K); *s. loc.*, *J.D.McComish 17A* (K).

4. TETRAPANAX

Tetrapanax (K.Koch) K.Koch, *Wochenschr. Gärtnerei Pflanzenk.* 2: 371 (1859); from the Greek *tetra* (four), alluding to the parts of the flower, and *Panax*, a related genus of plants.

Type: *T. papyrifer* (Hook.) K.Koch

Shrubs to small trees, stoloniferous, little-branched, monoecious. Leaves alternate, crowded at ends of branches, simple, palmately lobed, stipulate. Inflorescence terminal, compound-racemose, of many-flowered, globose, unisexual umbellules, with narrow bracts. Calyx a slight rim. Petals 4, valvate. Stamens 4. Ovary inferior, 2-locular, with 1 ovule per locule; styles 2, free. Fruit a berry.

A monotypic genus, native to Taiwan and southern China; naturalised on Norfolk and Lord Howe Islands.

***Tetrapanax papyrifer** (Hook.) K.Koch, *Wochenschr. Gärtnerei Pflanzenk.* 2: 371 (1859)

Aralia papyrifera Hook., *Hooker's J. Bot. Kew Gard. Misc.* 4: 53, t. 1, t. 2 (1852). T: Taiwan, *coll. unknown*; holo: ?K *n.v.* The epithet comes from the Greek *papyrus* (paper) and the Latin *fero* (to bear), as the pith of this plant is the source of so-called rice-paper.

Illustrations: W.J.Hooker, *Bot. Mag.* 82: t. 4897 (1856); H.-L.Li *et al.*, *Fl. Taiwan* 3: 936, t. 876 (1977); A.B.Graf, *Exotica* 12th edn, 316, 321 (1985).

Shrub or small tree to 4 m or more tall, mostly with a dense, floccose, stellate tomentum. Leaf lamina ±orbicular, 7–12-lobed c. halfway to centre, 15–30 cm or more long, densely tomentose below, becoming glabrous above; lobes acute to acuminate; stipules 5–12 cm long, attenuate, glabrous, adnate to petiole base. Pedicels 3–5 mm long in male heads, 6–8 mm long in female heads. Petals triangular, 2 mm long, tomentose externally. Filaments 3

mm long. Ovary c. 1 mm long, tomentose; styles 2 mm long. Fruit flattened-spheroidal, c. 2 mm long, with 2 shallow grooves, purplish black.

Norfolk Is., Lord Howe Is. An escape from cultivation, preferring damp sites, now establishing itself by stoloniferous growth. Native to southern China and Taiwan, this is the plant from which rice paper is manufactured.

N.Is.: near the Melanesian Mission Chapel, *W.R.Sykes NI 471* (CHR). **L.H.Is.:** Prince William Henry Bay, Lagoon Rd, *M.M.J. van Balgooy 1049* (K); behind 'Pine Trees' guest house, *G.Uhe 1321* (K).

69. APIACEAE

Aromatic herbs or rarely shrubs or climbers. Stems often with hollow internodes. Leaves alternate or basal, rarely opposite, usually compound; petiole base often swollen and sheathing, usually without stipules. Inflorescence an axillary or terminal, simple or compound umbel, sometimes capitate; umbels usually subtended by an involucre of bracts, umbellules by an involucel of bracteoles borne on a secondary pedicel or ray. Flowers small, actinomorphic, or outermost ones zygomorphic, usually bisexual. Sepals small or obsolete. Petals 5, free, usually valvate, often notched or inflexed at apex. Stamens 5, alternating with petals; filaments free, filiform. Ovary inferior, usually 2-locular, with 1 ovule per locule; styles 2, free but fused at base into a nectariferous stylopodium. Fruit of 2 dry, 1-seeded, indehiscent mericarps, often laterally flattened, joined to a central carpophore, each with usually 5 primary and sometimes 4 secondary ribs; usually with oil canals between ribs.

A cosmopolitan family with c. 400 genera and 3000 species, mainly in the temperate Northern Hemisphere; 6 native or introduced genera on the Islands. Often known by its older name of Umbelliferae. It contains many culinary herbs such as Parsley, Fennel, Dill and Coriander, and some vegetables like Carrots, Parsnips and Celery; but many members are poisonous especially, for example, Hemlock (*Conium maculatum* L.).

G.Bentham, Umbelliferae, *Fl. Austral.* 3: 334–378 (1866); V.H.Heywood (ed.), The biology and chemistry of the Umbelliferae, *Bot. J. Linn. Soc.* 64, Suppl. 1: 1–438 (1971).

KEY TO GENERA

1 Leaves simple; stems creeping, rooting at nodes; umbels usually simple

- **2** Leaf margin shallowly 5–20-lobed; petiole stipulate — **1. HYDROCOTYLE**
- **2:** Leaf margin evenly crenate, not lobed; petiole exstipulate — **2. CENTELLA**

1: Leaves compound; stems decumbent or erect, not rooting at nodes; umbels usually compound

- **3** Mericarp ribs smooth; bracteoles absent
  - **4** Perennial; mainly maritime — **3. APIUM**
  - **4:** Annual; weed of pastures, wasteland *etc.* — **4. CICLOSPERMUM**
- **3:** Mericarp ribs spiny or tuberculate; bracteoles present, 1–5 mm long
  - **5** Mericarp pairs similar; both with rows of barbellate spines; umbels not subglobose; rays 3–20 mm long — **5. DAUCUS**
  - **5:** Mericarp pairs dissimilar; one covered with simple spines, the other with tubercles; umbels subglobose; rays 0–2 mm long — **6. TORILIS**

1. HYDROCOTYLE

Hydrocotyle L., *Sp. Pl.* 1: 234 (1753); *Gen. Pl.* 5th edn, 109 (1754); from the Greek *hydor*, *hydro-* (water) and *kotyle* (a small cup or hollow), alluding to the habitat and leaf shape of the type species.

Type: *H. vulgaris* L.

Annual or perennial herbs, erect, or prostrate and rooting at nodes. Leaves simple, alternate, petiolate, stipulate; lamina palmately veined, orbicular, cordate or peltate, lobed or dissected, or digitately compound. Inflorescence axillary, capitate, simple umbellate or compound umbellate, or whorled; involucre of 2 (sometimes 3) small bracts. Flowers bisexual, or unisexual and then plants dioecious. Sepals minute or absent. Petals valvate, usually acute, not inflexed at apex, white or greenish, often tinged with purple. Fruit orbicular to ellipsoidal, laterally flattened, dorsally rounded, usually 5-ribbed or furrowed; oil canals usually absent.

A cosmopolitan genus of c. 100 species; 1 native species and 1 naturalised on Lord Howe Is.

Leaves not peltate; lamina orbicular-cordate to reniform, shallowly 5–9-lobed; flowers in globose heads; peduncles much shorter than petioles **1. H. hirta**

Leaves peltate; lamina elliptic to ±orbicular, shallowly 12–20-lobed; flowers in compound umbels; peduncles ±equalling petioles **2. H. bonariensis**

1. Hydrocotyle hirta R.Br. ex A.Rich., *Ann. Gén. Sci. Phys.* 4: 204 (1820)

T: Australia, *R.Brown*; holo: ?P *n.v.*; ?iso: K. The epithet is from the Latin *hirtus* (hairy), alluding to the hirsute stem, leaves and petioles.

[*Hydrocotyle javanica auct. non* Thunb.: S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 66 (1981)]

Illustrations: J.Galbraith, *Field Guide Wild Fl. SE Australia* t. 82/3 (1977); Hj.Eichler in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 997, fig. 498H (1986); A.Prescott, *It's Blue with Five Petals* 127, fig. 2 (1988).

Perennial herb, prostrate, rooting occasionally at nodes. Petioles 2–8 (–18) cm long, glabrous or sparsely pilose; lamina orbicular-cordate to reniform, 1.5–5 (–9) cm broad, with 5–9 shallow, obtuse, slightly crenulate lobes, glossy and glabrous or glabrescent below, matt and sparsely pilose above. Inflorescence globose, many-flowered; peduncle 3–6 mm long; flowers ±sessile. Petals c. 0.5 mm long, pale yellowish green. Fruit slightly emarginate top and bottom, c. 1 mm long, 1.5 mm broad, smooth except for 1 prominent dorsal and 2 shallow, lateral ribs. Fig. 83B.

Lord Howe Is. A locally frequent herb. Native to Australia, belonging to a complex that still needs to be investigated.

L.H.Is.: Kims Lookout, *P.S.Green 2307* (K); Transit Hill, *G.Uhe 1320* (K); E side of Mt Lidgbird, *A.C.Beauglehole 5586* (CANB, MEL); near the S end of Little Slope, *J.Pickard 2866* (NSW); *s. loc.*, *J.D.McComish 31* (K, NSW).

2. *Hydrocotyle bonariensis Lam., *Encycl.* 3: 153 (1789)

T: Argentina, *P.Commerson*; holo: P *n.v.*, photo seen (IDC microfiche 6207,264/5). The epithet comes from the Latinised form of Buenos Aires, Argentina, plus the suffix *-ensis* indicating place of origin, alluding to the locality whence the original collection came.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 243, fig. 35G (1986); Hj.Eichler in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 995, fig. 497A (1986); B.A.Auld & R.W.Medd, *Weeds* 76 (1987).

Perennial herb, glabrous. Stem creeping underground, rooting at nodes. Leaves peltate; petiole 2–35 cm long; lamina transversely broadly elliptic to ±orbicular, 2–10 cm broad, very shallowly 12–20-lobed; lobes crenulate. Inflorescence compound, of many-flowered umbels; peduncles ±equalling petioles; rays 1–6 cm long, bearing whorls of flowers; pedicels 1–4 mm long; involucral bracts inconspicuous, lanceolate. Petals c. 0.5 mm long, white to yellowish. Fruit somewhat emarginate top and bottom, 1–2 mm long, 2–4 mm broad; dorsal and lateral ribs prominent, acute, almost winged. Fig. 83C.

Lord Howe Is. Native to warm temperate South America, now naturalised widely in Australia in brackish and sandy coastal areas.

L.H.Is.: rear of Lagoon Beach, opposite Middle Beach Rd, *A.N.Rodd 1482* (K, NSW); near the War Memorial, *P.S.Green 1919* (A, K); edge of lagoon, *J.D.McComish* 54 (K, NSW).

2. CENTELLA

Centella L., *Sp. Pl.* 2nd edn, 2: 1393 (1763); from the Greek *kentron* (a spur or sharp point) plus the Latin diminutive suffix *-ella*, probably alluding to the small, pointed styles.

Type: *C. villosa* L.

Perennial herbs or subshrubs. Stems often creeping and rooting at nodes. Leaves simple, exstipulate; lamina orbicular to reniform, palmately veined, entire or shallowly toothed. Inflorescence axillary, umbellate, simple, loose or congested, few-flowered, usually subsessile; involucral bracts 2 (or 3) or absent. Sepals obscure or absent. Petals imbricate, suborbicular to ovate, not inflexed at apex, white to reddish purple. Mericarps laterally compressed, 5–11-ribbed, reticulate; oil canals absent.

A genus of c. 20 species, throughout the tropics and subtropics but mainly South African; 1 species naturalised on the Islands.

***Centella asiatica** (L.) Urb. in C.F.P. von Martius, *Fl. Bras.* 11(1): 287 (1879)

Hydrocotyle asiatica L., *Sp. Pl.* 1: 234 (1753). T: India, not designated. So named from the continent of origin.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 234, fig. 35A (1986); A.Fairley & P.Moore, *Native Pl. Sydney Distr.* 254 (1989); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 195, t. 6 (1990).

Perennial with taproot, and creeping stolons rooting at nodes. Leaves basally clustered or single at stolon nodes; petiole 1–10 cm long, glabrous or sparsely pilose, often cobwebby at apex; lamina glabrous, orbicular-reniform, (0.8–) 1–4 cm long, (1–) 1.5–5 cm broad, cordate, obtuse, evenly crenate along margins; sides of basal sinus entire, ±straight. Inflorescences (1–) 2–4 per node; peduncle 2–10 mm long, often somewhat cobwebby. Petals c. 1 mm long, reddish. Fruit rounded, slightly flattened laterally, deeply grooved between mericarps, 2 mm long, 3 mm broad, (5–) 7–11-ribbed, slightly reticulate, greenish brown to reddish.

Norfolk Is., Lord Howe Is. Growing in grassy and swampy areas. First recorded on Norfolk Is. in 1939 and on Lord Howe Is. in 1974, and probably, therefore, a relatively recent introduction.

N.Is.: Red Rd, *P.S.Green 1362* (A, K); Broken Bridge, near New Cascade Rd, *W.R.Sykes NI 1058* (CHR); *s. loc.*, swamp, *W.R.Sykes NI 475* (CHR); *s. loc.*, *J.D.McComish 49A* (K). **L.H.Is.:** near the golf course, *P.S.Green 2323* (K).

3. APIUM

Apium L., *Sp. Pl.* 1: 264 (1753); *Gen. Pl.* 5th edn, 128 (1754); an old Latin name for some members of this plant family, *e.g.* Celery and Parsley.

Type: *A. graveolens* L.

Annual, biennial or perennial herbs, erect or creeping, usually taprooted, glabrous. Leaves alternate, pinnate or stem leaves sometimes ternate; leaf segments broad to linear. Inflorescence terminal or leaf-opposed, pedunculate to ±sessile, usually compound; bracts and bracteoles small or usually absent. Sepals minute or absent. Petals ovate to suborbicular, inflexed at apex, white or greenish white. Fruit ellipsoidal, ovoid or subglobose, slightly flattened laterally; mericarps 5-ribbed; oil canals sometimes present.

A cosmopolitan genus of c. 20 species; 1 species endemic on Lord Howe Is. and another probably introduced on both Islands.

Apium insulare P.S.Short was recorded from Lord Howe Is. (P.S.Short, *J. Adelaide Bot. Gard.* 1: 230, 1979) in error; the collections cited represent *A. graveolens*, see below (P.S.Green, *Kew Bull.* 45: 253, 1990).

Ultimate leaf segments narrow, 1–3 mm broad; ripe mericarps with 5, rounded, contiguous, spongy-corky ribs **1. A. prostratum**

Ultimate leaf segments deltoid-rhombic, 10–20 mm broad; ripe mericarps with 5 distinct ribs **2. A. graveolens**

1. **Apium prostratum** Labill. ex Vent., *Jard. Malm.* t. 81 (1804–1805)

subsp. **howense** P.S.Short, *J. Adelaide Bot. Gard.* 1: 227 (1979)

T: Lord Howe Island, 27 Nov. 1968, *R.J.Chinnock s.n.*; holo: AD *n.v.*; iso: WELTU *n.v.*, *fide* P.S.Short *loc. cit.* Named after the island.

[*Apium australe auct. non* Thouars: G.Bentham, *Fl. Austral.* 3: 372 (1866)]

Illustration: P.S.Short, *J. Adelaide Bot. Gard.* 1: 226, fig. 10 (1979).

Perennial herb, caespitose to trailing, strongly aromatic when bruised. Stems to 30 cm long. Leaves 1–3-pinnate, 2–17 cm long; petiole 1–10 cm long, with membranous, sheathing base; ultimate leaf segments narrow to linear, 1–3 mm broad, often 3-fid at apex. Inflorescence of 1 (–3) umbels per node, (8–) 12-flowered; peduncle 0.5–3 cm long; pedicels 1–5 mm long; bracts obsolete. Sepals obsolete. Petals c. 0.25 mm long, white to pinkish. Fruit rounded, 1.5 mm long, 2 mm broad; mericarps with spongy-corky, rounded, contiguous ribs; oil canals obscure. Fig. 49C.

Lord Howe Is. Endemic. Fairly common in cracks of coralline rocks and sand pockets, especially near the sea, above the high water mark but within the splash zone.

L.H.Is.: E lower slopes of Malabar, *P.S.Green 1542* (A); Signal Point, *P.S.Green 1921* (K); Middle Beach, *R.D.Hoogland 8635* (CANB, NSW); Blinky Beach, *P.S.Green 2351* (K); *s. loc., J.D.McComish 40* (K).

2. ***Apium graveolens** L., *Sp. Pl.* 1: 246 (1753)

T: Europe, Herb. Clifford 107, *Apium* 1; lecto: BM, *fide* I.C.Hedge & J.M.Lamond in K.H.Rechinger, *Fl. Iran.* 162: 298 (1987). The epithet comes from the Latin *gravis* (heavy) and *oleo* (to smell), alluding to the strong, aromatic smell when the plant is bruised.

Apium australe var. *latisectum* H.Wolff in H.G.A.Engler (ed.), *Pflanzenr.* 90 (IV, 228): 32 (1927). T: Australia and New Zealand; numerous (27?) syntypes: ?B *n.v.* destroyed?.

Apium sp. (aff. *prostratum*) S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 65 (1981).

[*Apium australe auct. non* Thouars: J.S.Turner *et al.*, *Conservation Norfolk Is.* 35 (1968)]

[*Apium insulare auct. non* P.S.Short: P.S.Short, *J. Adelaide Bot. Gard.* 1: 228 (1979), *p.p.*, *quoad* L.H.Is. specimens]

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 12: t. 13 (1958); Hj.Eichler in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 982, fig. 434C (1986); C.J.Webb *et al.*, *Fl. New Zealand* 4: 119, fig. 11A (1988).

Perennial herb, erect, branching, to 1 m tall, strongly aromatic when bruised. Leaves 1- or 2-pinnate, 30 cm or more long; petiole 5–20 cm long, with sheathing base; ultimate segments deltoid–rhombic, 1.5–5 cm long, lobed or serrate. Umbels compound; peduncle (1–) 2–4 cm long; rays 4–15, 1–3 cm long; umbellules c. 10–15-flowered; pedicels 1–5 mm long, without bracts or bracteoles. Sepals obsolete. Petals concave, c. 0.5 mm long, white. Fruit broadly ovoid, laterally compressed, c. 1.5 mm long, 2 mm broad; mericarps each with 5 well-defined ribs; oil canals solitary between ribs. *Celery*.

Norfolk Is., Lord Howe Is. The wild form of the cultivated Celery. Although it appears in typically undisturbed habitats, no record has been seen before 1904 for Norfolk Is. (J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 762), and 1936 for Lord Howe Is. (*McComish 119*). Almost certainly introduced, but now thoroughly naturalised.

N.Is.: Barny Duffys Ck, *P.Ralston 7* (A); Anson Bay, *P.S.Green 2378* (K); *s. loc., J.D.McComish 128* (K). **L.H.Is.:** Dawsons Point, *M.D.Crisp 4493 & I.R.Telford* (CANB); Salmon Beach, *P.S.Green 1962* (K); Goat House, *P.S.Green 2318* (K).

The Island plants appear to differ from typical *A. graveolens* in being perennial, not biennial, and in the compound umbels having a peduncle (1–) 2–4 cm long instead of being sessile or subsessile; in no other character do they seem to differ. The relationship between *A. graveolens* and *A. prostratum* Labill. ex Vent. *sens. lat.* needs investigation.

4. CICLOSPERMUM

Ciclospermum Lag., *Amen. Nat. Españ.* 2: 101 (1821); from the Greek *kiklos* (a circle) and *sperma* (a seed), alluding to the supposed shape of the seed in this genus.

Type: *C. leptophyllum* (Pers.) Sprague

Annual herbs. Leaves pinnately compound; petiole slender, with a sheathing base; ultimate segments very narrow. Inflorescence leaf-opposed, without bracts or bracteoles. Sepals minute. Petals entire, apically inflexed or apiculate, white. Fruit orbicular to ovoid, slightly flattened laterally; mericarps with 5 well-defined ribs; oil canals solitary between ribs.

A genus of 2, possibly 3, species. Natives of South America, but with one species, naturalised on Norfolk and Lord Howe Is., an almost cosmopolitan weed.

*Ciclospermum leptophyllum (Pers.) Sprague, *J. Bot.* 61: 131 (1923)

Pimpinella leptophylla Pers., *Syn. Pl.* 1: 324 (1805); *Apium leptophyllum* (Pers.) F.Muell., *Fragm.* 4: 184 (1864). T: Dominican Republic, *P.A.Poiteau*; holo: P *n.v.*, photo seen (IDC microfiche 6206, 752/6). The epithet comes from the Greek *leptos* (slender, thin) and *phyllon* (a leaf), in allusion to the slender leaf divisions.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 249, fig. 36K (1986); Hj.Eichler in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 985, fig. 495E (1986); B.A.Auld & R.W.Medd, *Weeds* 73 (1987).

Slender, erect herb to c. 60 cm tall, glabrous. Leaves 2–4-pinnate or upper leaves ternately divided, 2–4 (–10) cm long; ultimate segments linear-filiform, 5–15 mm long, 0.5–1 mm broad. Umbels simple or compound, sessile or pedunculate, rays 2–5; pedicels slender, 2–8 mm long. Fruit orbicular to broadly ovoid, 1.5–3 mm long; mericarps with broad, thickened ribs, deeply furrowed.

Norfolk Is., Lord Howe Is. A common weed of disturbed ground, especially in gardens. Native to South America, possibly Brazil, but as a weed now almost pantropical.

N.Is.: New Cascade Rd, *W.R.Sykes NI 164* (CHR); near Stockyard Rd, Cuttings Corner, *W.R.Sykes NI 1072* (CHR); *s. loc.*, *J.D.McComish 32* (K). **L.H.Is.:** midway between Old Settlement Beach and Dawson Point, *A.N.Rodd 1730* (K, NSW); W end of Gray Face palm area, *J.Pickard 2317* (NSW); Potato Hills, S end of Little Slope, *J.Pickard 2776* (NSW).

5. DAUCUS

Daucus L., *Sp. Pl.* 1: 242 (1753); *Gen. Pl.* 5th edn, 113 (1754); the Latin name for the Carrot; the Greek name *daukos* was probably applied to another member of the family.

Type: *D. carota* L.

Annual or biennial herbs, usually taprooted, usually hairy, sometimes hispid. Leaves 2- or 3-pinnate; petiole sheathing basally; ultimate segments usually narrow. Inflorescence terminal or leaf-opposed, usually compound; bracts usually pinnatisect or absent; rays often incurving after anthesis. Sepals small or absent. Petals usually notched apically; outer petals often larger. Fruits ellipsoidal to ovoid, usually slightly flattened; mericarps with 5 narrow, often bristly primary ribs, and 4 secondary ribs each with a single row of usually barbed spines; oil canals solitary under secondary ribs.

An almost cosmopolitan genus of c. 25 species; 1 species naturalised on Norfolk Is. *Daucus carota* L. is the vegetable Carrot.

***Daucus glochidiatus** (Labill.) Fischer *et al.*, *Ind. Sem. Hort. Petrop. 9, Suppl.* 11 (1844)

Scandix glochidiatus Labill., *Nov. Holl. Pl.* 1: 75, t. 102 (1805). T: [Tasmania], *J.J.H. de Labillardière*; holo: ?FI *n.v.* The epithet comes from the Greek *glochis* (a barb) and the Latin suffix *-atus* indicating possession, alluding to the barbed spines on the ripe fruits.

Daucus brachiatus Sieb. ex DC., *Prodr.* 4: 214 (1830). T: New South Wales, Australia, 1823, *F.W.Sieber, Nov. Holl. 115*; holo: G-DC *n.v.*, photo seen (IDC microfiche 800/2,643/9).

Illustrations: N.T.Burbidge & M.Gray, *Fl. Austral. Cap. Terr.* 285, fig. 278 (1970); G.M.Cunningham *et al.*, *Pl. W New South Wales* 541 (1981); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 249, fig. 36G (1986).

Erect herb, often branched from base, to c. 50 cm tall, usually hispid. Leaves bipinnate, some forming a basal rosette; petiole to 10 cm long on basal leaves, shorter on stems; lobes pinnatisect; ultimate segments linear. Umbels simple or compound, subsessile or ±pedunculate; bracts 2–5, usually linear, 1–5 mm long; rays 2–14, 3–20 mm long. Flowers small. Fruit ellipsoidal, 3–4 mm long; secondary ribs each with a row of barbellate tipped spines c. 1 mm long; primary ribs each with a double row of shorter, broadly based, pale hairs which spread alternately on each side of rib.

Norfolk Is. Although a native of New Zealand and throughout Australia, and tentatively accepted as native on Norfolk Is. under the name *D. brachiatus* Sieb. ex DC. by R.M.Laing (*Trans. & Proc. New Zealand Inst.* 47: 33, 1915), it was not found there by the earlier collectors and may therefore be presumed to have been introduced. Recorded for Lord Howe Is. by S.W.L.Jacobs & J.Pickard (*Pl. New South Wales* 65, 1981) and by J.Pickard (*J. Biogeogr.* 11: 505, 1984), but there appears to be no material in NSW to substantiate the record, and the species was not listed by A.N.Rodd & J.Pickard, (*Cunninghamia* 1: 275, 1983).

N.Is.: Selwyn Reserve, near Anson Bay, *R.D.Hoogland 11145* (CANB, NSW).

The plant on Norfolk Is. appears to be var. *leptacantha* Thell., but its status is uncertain as the complex variation in this species needs to be reinvestigated.

6. TORILIS

Torilis Adans., *Fam. Pl.* 2: 99, 612 (1763); derivation unknown; Adanson frequently coined meaningless names.

Type: *T. leptophylla* (L.) Rchb.f.

Annual or sometimes biennial herbs, erect or procumbent. Leaves 1–3-pinnate; petiole sheathing basally; ultimate segments entire or toothed. Inflorescence terminal or leaf-opposed, compound, pedunculate or subsessile, often dense; bracts few or absent; bracteoles several, linear or filiform. Sepals small or absent. Petals narrow, apically inflexed, white or pinkish. Fruit linear-cylindrical to ovoid, slightly flattened laterally, tuberculate or spinous; ribs and furrows obscure; oil canals obscure, solitary between ribs.

A genus of c. 12 species, distributed from the Mediterranean region to eastern Asia, especially from the former; 1 species naturalised on Norfolk and Lord Howe Is.

***Torilis nodosa** (L.) Gaertn., *Fruct. Sem. Pl.* 1: 82, t. 20, fig. 6 (1788)

Tordylium nodosa L., *Sp. Pl.* 1: 240 (1753); *Caucalis nodosa* (L.) Scop., *Fl. Carn.* 2nd edn, 1: 192 (1772). T: Europe; lecto: LINN 337.6, *fide* S.Jurey, *Bot. J. Linn. Soc.* 95: 296 (1987); IDC microfiche 177/2.185/13. The epithet alludes to the supposedly conspicuous joints or nodes (Latin *nodus*, knot or node).

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 13: t. 27 (1959); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 249, fig. 36E (1986); Hj.Eichler in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 1006, fig. 500A (1986).

Annual, usually procumbent to ascending. Stems solid, striate, to 50 cm long, hispid with deflexed hairs. Leaves 1- or 2-pinnate, lanceolate to ovate in outline, to 10 cm or more long, pilose above and below; petiole of basal leaves ±equal to lamina, shorter in upper leaves,

sheathing basally; ultimate segments narrowly lanceolate, pinnatifid or serrate. Umbels subsessile, compound, subglobose; rays 2 or 3, very short and stout; bracteoles linear, 2–3 mm long, longer than flowers. Petals pinkish white. Fruit ovoid, 2.5–3.5 mm long; mericarp pairs dissimilar, the outer with barbed spines 1–2 mm long, inner densely tuberculate.

Norfolk Is., Lord Howe Is. Native of western and southern Europe, now widespread as a common weed of pastures, waste places *etc.*

N.Is.: Harpers Rd, Cascade, *P.Ralston 83* (A, K); Ball Bay, *W.R.Sykes NI 626* (CHR); *s. loc., J.D.McComish 235* (K, NSW). **L.H.Is.:** along the shore of North Bay, *A.C.Beauglehole 5785* (NSW); SE lower slopes of Malabar, *P.S.Green 1555* (A, K); Neds Beach, *J.Pickard 2666* (NSW).

70. LOGANIACEAE

Trees, shrubs or climbers, rarely herbs. Leaves opposite, simple, usually entire; stipules usually present, sometimes reduced to an interpetiolar line. Inflorescences terminal or axillary, usually cymose, rarely flowers solitary, bracteate. Flowers actinomorphic, bisexual, sometimes unisexual. Sepals (2–) 4 or 5, connate, rarely free, imbricate. Corolla tubular, lobes 4 or 5, imbricate, contorted or valvate. Stamens usually equal to and alternate with corolla lobes, inserted on corolla tube; anthers dehiscing longitudinally. Ovary superior, rarely semi-inferior, 2- or 3 (sometimes 4)-locular, usually with numerous ovules per locule; style terminal; stigma capitate or lobed. Fruit a capsule or berry, rarely a drupe. Seeds sometimes winged.

A family of c. 30 genera and 600 species, pantropical in distribution, reaching some temperate areas; 1 genus native on Lord Howe Is.

G.Bentham, Loganiaceae, *Fl. Austral.* 4: 348–369 (1869).

GENIOSTOMA

Geniostoma J.R.Forst. & G.Forst., *Char. Gen. Pl.* 23, t. 12 (1775); from the Greek *geneion* (a beard) and *stoma* (a mouth), alluding to the hairs in the throat of the corolla tube in the type species.

Type: *G. rupestre* J.R.Forst. & G.Forst.

Shrubs or small trees, rarely scrambling. Stems terete to 4-angled. Leaves petiolate to sessile; stipules interpetiolar or intrapetiolar. Inflorescences axillary, sometimes cauliflorous, variously cymose, (1–) few- to many-flowered, bracteate and bracteolate. Calyx united; tube short; lobes (4 or) 5, persistent. Corolla campanulate to rotate; lobes 5 (sometimes 6 in *G. huttonii*) imbricate or contorted in bud; inner surface glabrous to throat densely pilose. Stamens 5, inserted near corolla mouth, exserted. Ovary 2 (or 3)-locular; ovules numerous, axile; style usually short; stigma club-shaped to globose. Fruit a capsule; valves 2, becoming recurved. Seeds embedded in a juicy, usually reddish, pulp.

A genus of c. 25 species (or 40 if *Labordia* Gaudich. of Hawai'i is included), distributed from southern Japan through Malesia to Australia (Qld), New Zealand and across the Pacific to the Tuamotus, with one species reaching the Mascarene Islands. Two species are endemic on Lord Howe Is.

B.J.Conn, A taxonomic revision of *Geniostoma* subg. *Geniostoma* (Loganiaceae), *Blumea* 26: 245–364 (1980).

Leaves 2–3 cm long; corolla tube 0.8–1 mm long; throat papillose, glabrous between filaments; filaments somewhat hairy at base **1. G. huttonii**

Leaves (4–) 5.5–14 cm long; corolla tube 2–3 mm long; throat minutely hairy throughout; filaments glabrous **2. G. petiolosum**

1. Geniostoma huttonii B.J.Conn, *Telopea* 5: 301 (1993)

T: Lord Howe Island, 29 Feb. 1992, *B.Conn 3578 & I.Hutton*; holo: NSW; iso: MEL *n.v.* Named after Ian Hutton who in his extensive explorations on the Island discovered this recently described species.

Illustration: B.J.Conn, *Telopea* 5: 302 (1993).

Scrambling shrub to 1 m tall. Stems furrowed between leaf bases, glabrous. Leaves with petiole 4–6 mm long; lamina ovate, 2–3 cm long, 1–1.6 cm broad, somewhat attenuate at base, entire, subacute to subacuminate, glabrous. Inflorescence less than 1 cm long, 1–3-flowered; pedicels c. 2 mm long; bracts c. 0.5 mm long. Calyx tube c. 0.5 mm long; lobes triangular, 1–1.5 mm long, shortly fimbriate, acute. Corolla tube 0.8–1 mm long; lobes 5 (sometimes 6), lanceolate, c. 2 mm long, acute, papillose in throat. Stamens inserted in throat; filaments c. 1 mm long, somewhat hairy at base; anthers ovoid, c. 0.5 mm long. Ovary ovoid, 0.5 mm long; style 0.2–0.6 mm long; stigma ellipsoidal, c. 0.3–0.7 mm long. Capsules globose-ellipsoidal, 5–6 mm diam., green. Seeds not recorded. Fig. 84B.

Lord Howe Is. Endemic. Recently discovered, rare and very local on the slopes of Mt Lidgbird. Related to the widespread SE Asian and Pacific *G. rupestre* J.R.Forst. & G.Forst.

L.H.Is.: Mt Lidgbird, above The Saddle, *I.Hutton 645 & 651* (K).

2. Geniostoma petiolosum C.Moore & F.Muell. in F.J.H. von Mueller, *Fragm.* 7: 28 (1869)

T: Lord Howe Island, *C.Moore*; holo: MEL. So called from the relatively long, narrow petioles.

Illustrations: B.J.Conn, *Blumea* 26: 328, fig. 19F–J (1980); I.Hutton, *Lord Howe Is.* 128 (1986).

Shrub or small tree to 5 m tall. Stems not furrowed. Leaves with petiole 1–2 cm long; lamina lanceolate-elliptic, (4–) 5.5–14 cm long, (1.5–) 2–4.5 cm broad, attenuate at base, entire, acute to acuminate, glabrous, glossy above. Inflorescences somewhat clustered, 1–2 cm long, 5–c. 20-flowered; pedicels 2–6 mm long; bracts 1–2 mm long. Calyx tube c. 0.5 mm long; lobes lanceolate, 2.5–3.5 mm long, minutely fimbriate, acute. Corolla tube 2–3 mm long; lobes broadly lanceolate, 2.5–3 mm long, acute, minutely hairy in throat. Stamens inserted at base of lobes; filaments 1 mm long, glabrous; anthers ovoid, 1 mm long. Ovary ovoid, c. 3 mm long; style c. 1 mm long; stigma club-shaped. Capsules ovoid-globose, 6–7 mm long, becoming black. Seeds small, black, in a yellow pulp. *Boar Tree.* Fig. 84C.

Lord Howe Is. Endemic. Not common, but occurring in sheltered forest throughout the Island, especially at lower altitudes.

L.H.Is.: Malabar, *A.N.Rodd 1712* (NSW); Transit Hill, N side, *L.A.S.Johnson & A.N.Rodd 1269* (K, NSW); Smoking Tree Ridge, *R.D.Hoogland 8732* (NSW); Erskine Valley, *I.Hutton 209* (CBG); summit plateau of Mt Gower, *P.S.Green 1993* (K).

71. GENTIANACEAE

Annual or perennial herbs, rarely shrubs. Leaves usually opposite, simple, entire, rarely reduced to scales, without stipules. Inflorescence terminal or axillary, usually a dichasial cyme, sometimes flowers solitary. Flowers usually actinomorphic and bisexual. Sepals usually connate, sometimes free, 4 or 5 (–12)-lobed, usually imbricate. Corolla connate, 4 or 5 (–12)-lobed, usually convolute, usually with scales or nectarial pits, or plicate near base of lobes. Stamens as many as and alternating with corolla lobes, inserted in corolla tube, rarely staminodial; anthers usually dehiscing longitudinally. Ovary superior; carpels 2, usually 1-locular; ovules usually numerous, parietal; style terminal; stigma usually 2-lobed. Fruit a capsule, rarely a berry. Seeds often minute.

A widespread family of c. 75 genera and 1200 species, especially found in temperate and warm temperate areas, and on mountains in the tropics. One genus is introduced on Norfolk and Lord Howe Islands.

G.Bentham, Gentianeae, *Fl. Austral*. 4: 369–382 (1867); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Gentianaceae, *Fl. Java* 2: 437–441 (1965); L.H.Cramer, Gentianaceae, *Revised Handb. Fl. Ceylon* 3: 55–78 (1981).

CENTAURIUM

Centaurium Hill, *Brit. Herb*. 62 (1756); named after the Centaur, *Chiron*, who was famous for his knowledge of herbs.

Type: *Gentiana centaurium* L., *nom. illeg. = C. littorale* (D.Turner) Gilmour

Annual, biennial or perennial herbs. Leaves opposite, often in a basal rosette; cauline leaves sessile or stem-clasping. Inflorescences terminal, dichasial-cymose, or corymbose to spicate. Flowers actinomorphic, bisexual. Calyx tube very short; lobes 4 or 5. Corolla usually pink, salverform or funnel-shaped; lobes 5; nectaries absent. Stamens 5, inserted in upper part of corolla tube, usually exserted; anthers twisting after dehiscence. Carpels 1-locular; ovules numerous; style simple or 2-lobed, caducous; stigma capitate. Capsule usually elongate, narrowly cylindrical to narrowly ovoid, enclosed within persistent calyx. Seeds minute, numerous.

A genus of perhaps 30 species, mainly from the Northern Hemisphere; 1 species naturalised on Norfolk and Lord Howe Islands. The species are often difficult to differentiate, partly due to frequent hybridisation.

***Centaurium tenuiflorum** (Hoffmanns. & Link) Fritsch ex Jansen, *Mitt. Naturwiss. Vereins Univ. Wien* ser. 2, 5: 97 (1907)

Erythraea tenuiflora Hoffmanns. & Link, *Fl. Port.* 1: 354, t. 67 (1813–1820). T: Portugal, *J.C.Hoffmannsegg*; holo: ?B *n.v.*, probably destroyed. The epithet means slender flowered, from the Latin *tenuis* (slender) and *flos* (flower).

[*Erythraea australis auct. non* R.Br.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 710 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 34 (1915)]

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 550 (1981), as Branched Centaury; A.Prescott, *It's Blue with Five Petals* 220 (1988); G.R.M.Dashorst & J.P.Jessop, *Pl. Adelaide Plains & Hills* 113, fig. 11 (1990).

Annual herb, erect to 25 cm tall or more. Stem internodes with 4 very narrow wings or angles. Leaves with a basal rosette, often withering early; cauline leaves sessile, oblong-elliptic to ovate, 5–30 mm long, 2–10 mm broad, obtuse to acute. Inflorescence a fairly dense dichasial cyme. Flowers subsessile or pedicels 1–2 mm long; bracts linear to lanceolate, 5–15 mm long. Sepals 5–8 mm long; lobes linear-subulate, usually only slightly shorter than corolla tube. Corolla rose-pink; tube slender, 6–10 mm long; lobes narrowly lanceolate, 3–4 mm long, obtuse to acute. Stamens inserted at top of corolla tube. Ovary narrowly ellipsoidal; style with 2 short stigmas. Capsule fusiform, 7–10 mm long. Seeds reticulate-pitted.

Norfolk Is., Lord Howe Is. An occasional weed. A native of western Europe now widely naturalised in Australia and New Zealand.

N.Is.: Selwyn Pine Rd, *W.R.Sykes NI 153* (CHR); Mullins Bay, *W.R.Sykes NI 905* (CHR); *s. loc.*, *R.M.Laing* (CHR). **L.H.Is.:** halfway to Old Gulch, *A.N.Rodd 1745* (NSW); behind North Beach, *L.A.S.Johnson & A.N.Rodd 1256* (NSW); Rocky Run, *L.A.S.Johnson & A.N.Rodd 1313* (NSW).

72. APOCYNACEAE

Trees, shrubs, climbers or rarely herbs, usually with milky latex. Leaves usually opposite or whorled, simple, entire; usually without stipules. Inflorescences terminal or axillary, cymose or racemose, sometimes flowers solitary. Flowers actinomorphic, bisexual. Sepals 5, free or

connate, imbricate. Corolla salverform or funnel-shaped, usually 5-lobed, usually contorted. Stamens 5, alternate with corolla lobes; without coronal appendages; anthers often sagittate, closely surrounding stigma, free or connate. Ovary usually superior; carpels 2, free, 1-locular with 2 parietal placentae, or 2-locular with axile placentation; ovules 2–many; style 1, entire or united only at apex, with a thickened stylar head; stigma variable, often under stylar head. Fruit various. Seeds naked or with long silky hairs.

A mostly tropical family of c. 200 genera and 2000 species; 4 native genera and 1 introduced on the Islands. Many members are poisonous. The Oleander, *Nerium oleander* L., is often grown as a hedge plant, but does not appear to have become naturalised.

G.Bentham, Apocyneae, *Fl. Austral.* 4: 301–324 (1867); K.Schumann, Apocynaceae, *Pflanzenfam.* 4(2): 109–189 (1895); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Apocynaceae, *Fl. Java* 2: 218–244 (1965).

KEY TO GENERA

1 Trailing herb; leaves ovate **4. VINCA**

1: Shrub or woody climber; leaves elliptic to obovate to oblanceolate or broadly oblanceolate

2 Leaves in opposite pairs

3 Leaves with numerous, parallel secondary nerves; anthers free; fruit a fleshy, obovoid, tough berry; seeds not hairy **1. MELODINUS**

3: Leaves reticulately veined; anthers forming a narrow cone surrounding, and coherent to, the style; fruit a follicle; seeds with a tuft of long, silky hairs **5. PARSONSIA**

2: Leaves in whorls of 3–5

4 Scrambling climber or erect shrub (if erect then the leaves 1–4 cm long); fruit drupaceous, sometimes 2 or more end to end, each c. 1–2 cm long, blue-black or orange **2. ALYXIA**

4: Erect shrub or tree (leaves 5–14 cm long); fruit a pair of drupes, ellipsoidal, pointed at both ends, 3–4 cm long, red **3. OCHROSIA**

1. MELODINUS

Melodinus J.R.Forst. & G.Forst., *Char. Gen. Pl.* 37 (1775); from the Greek *melon* (an apple) and *dinio* (to whirl or turn) alluding to the twisting stems of this climber with an apple-like fruit.

Type: *M. scandens* J.R.Forst. & G.Forst.

Woody climbers with milky latex. Leaves opposite, with an interpetiolar line between bases of petioles; venation usually fine, parallel. Inflorescences terminal or axillary, cymose. Calyx tube shorter than lobes; lobes ovate to lanceolate. Corolla salverform; tube ±cylindrical, widened at insertion of stamens; throat with 5 scales, often fused into a corona; lobes ovate, contorted in bud. Stamens inserted in lower half or around middle of corolla tube; usually not exserted; filaments very short; anthers free; connective without appendage. Ovary superior, 2-locular; ovules numerous; style short; style head cylindrical or ovoid; stigma entire or bifid. Fruit a large, ±globose, fleshy berry, glabrous. Seeds numerous.

A genus of c. 50 species from the Indo-Malesian region to Australia, and across the Pacific to Tonga; 1 species endemic on Norfolk Is.

Melodinus baueri Endl., *Prodr. Fl. Norfolk.* 57 (1833)

T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W; iso: K. Named after Ferdinand Lukas Bauer (1760–1826), who accompanied Lieutenant Matthew Flinders on his voyages of exploration around Australia and collected on Norfolk Island in 1804 and 1805.

Illustration: S.F.L.Endlicher, *Iconogr. Gen. Pl.* t. 59 (1839).

Large climber. Leaves elliptic to slightly oblanceolate, 7–12 cm long, 2.5–5 cm broad, shortly attenuate at base, shortly acuminate at apex, with c. 50, parallel veins on each side of midrib. Inflorescence a dichasial cyme, 5–c. 20-flowered. Calyx tube c. 1 mm long; lobes broadly ovate, 1.5 mm long, acute. Corolla yellow; tube 5 mm long; lobes contorted, ±orbicular-auriculate, 3 mm long, undulate, with 2 small globose scales at base of each lobe. Stamens inserted in lower half of corolla tube; anthers c. 2 mm long. Ovary cylindrical; style head shortly cylindrical; stigma bifid, small, apiculate. Fruit obovoid, 5–6 cm diam., dull grey-green, finely verrucose. Seeds somewhat muricate-bullate. *Big Creeper*. Fig. 82A.

Norfolk Is. Endemic and not uncommon in the forest from the lowest elevations to the summits in the National Park. Maiden's record of *Ochrosia elliptica* Labill. 'in early bud and therefore doubtful' (*Proc. Linn. Soc. New South Wales* 28: 709, 1904) almost certainly belonged to this species.

N.Is.: near the top of Mt Bates, *P.Ralston 27* (A); top and upper slopes of Mt Pitt, *G.Uhe 1167* (K); *s. loc.*, *A.Cunningham 19 & 20* (K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW); *s. loc.*, 1984, *O. & B.Evans* (K).

Closely related to *M. australis* (F.Muell.) Pierre of Australia (N.T., Qld, N.S.W.).

2. ALYXIA

Alyxia Banks ex R.Br., *Prodr.* 469 (1810); from the Greek *halysis* (a chain), alluding to the 'chain' of seeds in the moniliform fruit.

Type: *A. spicata* R.Br.

Shrubs, usually scandent or climbing, with milky latex. Leaves opposite or whorled, often coriaceous, entire, without stipules; venation with numerous parallel secondary nerves. Inflorescences axillary or terminal, cymose. Calyx deeply lobed, usually ciliolate; tube short. Corolla salverform; tube cylindrical, slightly widened at insertion of stamens; throat with reflexed hairs, without scales; lobes contorted in bud. Stamens inserted in middle or in upper half of corolla tube, included; filaments short, slender; anthers free; connective with a small apical appendage. Ovary superior; carpels 2, free or shortly connate at base; ovules 2–6; style simple; style head subglobose to cylindrical; stigma of 2 short apiculae. Fruit a paired moniliform 1–6-seeded drupe (frequently 1-seeded by abortion). Seeds naked, grooved.

A genus of c. 120 species from the Indo-Malesian region to Australia, and across the Pacific to the Tuamotus and Hawai'i; 3 native species on Lord Howe Is. and another on Norfolk Is. In 1871, based on a vegetative specimen from Mt Lidgbird, Lord Howe Is., F.J.H. von Mueller published the name *Alyxia nervulosa* (*Fragm.* 7: 131). However, the name was not positively accepted by Mueller, nor mentioned by him again when two years later he described two species from the Island, so it is here regarded as a *nomen provisorium*, and therefore not validly published.

P.I.Forster, A Taxonomic Revision of *Alyxia* (Apocynaceae) in Australia, *Austral. Syst. Bot.* 5: 547–580 (1992).

1 Inflorescence with numerous flowers; leaf apex obtuse to rounded or emarginate; habit frequently climbing; fruit blue-black (L.H.Is.)

2 Leaf apex obtuse, sometimes to rounded; lamina (3–) 5–9 cm long; pedicels with a whorl of bracteoles **1. A. lindii**

2: Leaf apex rounded to slightly emarginate; lamina 2–5 cm long; pedicels with several to many imbricate bracteoles **2. A. squamulosa**

1: Inflorescence 1- or 2 (–3)-flowered; leaf apex pungent or minutely apiculate; habit ±erect; fruit orange

3 Leaf apex a sharp spine (L.H.Is.) **3. A. ruscifolia**

3: Leaf apex acute to obtuse, sometimes minutely apiculate (N.Is.) **4. A. gynopogon**

1. Alyxia lindii F.Muell., *Fragm.* 8: 46 (1873)

T: Lord Howe Island, *Lind & J.P.Fullagar*; holo: MEL; ?iso: BRI. Named in honour of a Mr Lind who collected on Lord Howe Is. with J.P.Fullagar in 1873.

Illustration: I.Hutton, *Lord Howe Is.* 116 (1986).

Scrambling, woody climber. Internodes of young stems glabrous, deeply grooved. Leaves in whorls of 3, somewhat coriaceous; petiole 3–5 mm long; lamina elliptic to slightly oblanceolate, (3–) 5–9 cm long, (1.3–) 2–3 cm broad, attenuate at base, obtuse (to rounded) at apex; venation raised above, often obscure below. Inflorescence terminal or axillary, cymose, somewhat clustered, 1.5–2 cm long; pedicels with a whorl of pointed bracteoles subtending calyx, resembling calyx lobes. Flowers numerous. Calyx lobes narrowly triangular, 2 mm long, finely ciliolate, acute, keeled. Corolla white; tube 5 mm long, glabrous; lobes ovate, 3 mm long, acute. Fruit drupaceous, solitary or moniliform, ellipsoidal, c. 2 cm long, somewhat curved, pointed, blue-black. Fig. 82C.

Lord Howe Is. Endemic and common on the ridges of the lowland hills. Flowers late Nov.–mid Feb.

L.H.Is.: ridge W of Old Settlement, *P.S.Green 1925* (K); SE slopes of Malabar, *P.S.Green 1570B* (A, K); slopes of Transit Hill, *J.D.McComish 89A* (K); Pooles Lookout, *J.D.McComish 89* (K); W side of Hunter Bay, *J.Pickard* in *A.N.Rodd 1455* (K, NSW).

2. Alyxia squamulosa C.Moore & F.Muell. in F.J.H. von Mueller, *Fragm.* 8: 47 (1873)

T: Lord Howe Island, *C.Moore 56*; lecto: MEL; isolecto: K, *fide* P.S.Green in *Kew Bull.* 48: 309 (1993). So called because of the numerous bracteoles, or 'scales' (Latin *squamae*) subtending the flowers, with the diminutive suffix *-ulus*.

Illustrations: I.Hutton, *Lord Howe Is.* 29, 117 (1986).

Shrub, tending to climb. Internodes of young stems glabrous, deeply grooved. Leaves in whorls of 5; petiole 2–5 mm long; lamina obovate to broadly oblanceolate, 2–5 cm long, 1.5–2.5 cm broad, acute and attenuate at base, rounded, sometimes slightly emarginate at apex, coriaceous; venation usually obscure above and below. Inflorescence terminal, a dense rounded cluster, 2–4 cm diam., with numerous fetid flowers; pedicels usually completely covered by several to many imbricate, pointed bracteoles, resembling calyx lobes. Calyx lobes narrowly triangular, 2 mm long, finely ciliolate, acute, keeled. Corolla white; tube 7 mm long, glabrous; lobes ovate, 4 mm long, obtuse. Fruit drupaceous, c. 2 cm long, slightly curved, pointed, sometimes 2 end to end, blue-black. Fig. 82D.

Lord Howe Is. Endemic and rare. Found in the upper reaches of Mts Gower and Lidgbird.

L.H.Is.: side of Mt Lidgbird, *C.Moore 56* (K, MEL); summit ridge of Mt Lidgbird, *J.Pickard 1481* (NSW); summit plateau of Mt Gower, *J.Pickard 2628* (K, NSW); *loc. id.*, 1913, *W.R.B.Oliver* (NSW).

Closely related to *A. lindii*.

3. Alyxia ruscifolia R.Br., *Prodr.* 470 (1810)

T: Queensland, *R.Brown*; holo: BM. So called because of the resemblance of the leaves (*folia*) to those of *Ruscus aculeatus* L.

[*Alyxia gynopogon auct. non* Roem. & Schult.: C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 25 (1870)]

Illustrations: W.R.Elliot & D.L.Jones, *Encycl. Austral. Pl.* 2: 183 (1983); I.Hutton, *Lord Howe Is.* 116 (1986).

Shrub to 3 m tall, rarely climbing. Young shoots hispid; internodes 4-angled, not grooved.

Leaves in whorls of 3–5 (usually 4), stiff, glossy, glabrous or finely hispid when young; petiole 1–3 mm long; lamina elliptic, 1–2.5 (–4) cm long, 0.5–1.5 (–2) cm broad, attenuate, flat or slightly recurved on margins, obtuse to acute, pungent; venation raised and prominent above, sometimes obscure below. Inflorescence terminal, 1- or 2 (–3)-flowered, almost sessile; pedicels with a whorl of pointed bracteoles 0.5–1 mm long. Calyx lobes triangular, 1–2 mm long, acute, keeled. Corolla white; tube 6–7 mm long, glabrous or shortly pilose outside; lobes ovate, 4 mm long, obtuse. Fruit a drupe, ovoid, c. 1 cm long, slightly pointed, rarely 2 end to end, bright orange. *Christmas Bush.*

Lord Howe Is. Widespread in the forests at lower altitudes. Also found in Australia (N.T., Qld, N.S.W.), Papua New Guinea and on Aru Is. in the East Moluccas (the last three localities var. *tropica* P.I.Forst.).

L.H.Is.: slopes of Malabar, *P.S.Green 1576* (A, K); W point of Neds Beach, *G.Uhe 1273* (K); SE side of Transit Hill, *L.A.S.Johnson & A.N.Rodd 1285* (NSW); Rocky Run, *J.C.Game 69/284* (K); Salmon Beach, *M.M.J. van Balgooy 1001* (NSW).

The leaves of the Australian mainland plants tend to be ±acuminate, while those from Lord Howe Is. are usually slightly broader on average than those from the mainland.

4. Alyxia gynopogon Roem. & Schult., *Syst. Veg.* 4: 440 (1819)

Based on *Gynopogon alyxia* G.Forst., *Prodr.* 19 (1786). T: Norfolk Island, *J.R. & G.Forster*; syn: K. So called from the Greek *gyne* (female) and *pogon* (a beard), alluding to the hairs on the style head.

Alyxia forsteri A.Cunn. ex Loudon, *Hort. Brit.* 2nd edn, 1: 580 (1832), *nom. nud.*

Alyxia daphnoides A.Cunn. in W.J.Hooker, *Bot. Mag.* 61: t. 3313 (1834). T: cultivated, plant from Norfolk Island; holo: K.

Illustrations: W.J.Hooker, *Bot. Mag.* 61: t. 3313 (1834); Anon, *Dars-Et* (*This Is It*) [16] (1976).

Shrub to 3 m tall, rarely climbing. Young shoots hispid, rarely ±glabrous, with internodes 4-angled, not grooved. Leaves in whorls of 3–5 (usually 4), stiff, glossy, glabrous or finely hispid when young; petiole 1–3 mm long; lamina elliptic to slightly oblanceolate, (1–) 1.5–3.5 cm long, (0.5–) 1–2.5 cm broad, attenuate at base, obtuse to acute, rounded or sometimes minutely apiculate; venation raised and usually prominent above. Inflorescence and flowers as for *A. ruscifolia*. *Evergreen*.

Norfolk Is. Endemic and widespread, but not common, in shaded forest areas.

N.Is.: Mt Bates, towards Red Rd, *P.S.Green 1385* (A, K); *s. loc., A.Cunningham 30, 31 & 124* (K); *s. loc., J.Backhouse 684* (K); *s. loc., J.D.McComish 88* (K).

Very closely related to *A. ruscifolia* of which it might almost be considered a subspecies. It differs in its broad, often obtuse and usually completely blunt leaves, at most minutely apiculate. The Lord Howe Is. representatives of *A. ruscifolia* tend to bridge the gap between *A. gynopogon* and the mainland representatives of *A. ruscifolia*.

3. OCHROSIA

Ochrosia Juss., *Gen. Pl.* 144 (1789); from the Greek *ochra* (yellow), alluding to the yellow wood in these plants.

Type: *O. borbonica* J.F.Gmel.

Trees or shrubs, with milky latex. Leaves opposite or whorled, coriaceous, with numerous, straight, parallel secondary nerves; stipules absent. Inflorescences terminal or in upper axils, cymose; bracts small, in opposite pairs. Calyx tube very short; lobes broadly ovate. Corolla salverform; tube cylindrical, slightly broadened below a constricted throat, without scales; lobes contorted in bud. Stamens inserted near top of corolla tube, not exserted; filaments short; anthers narrowly lanceolate; connective apex acute. Ovary superior, of 2 carpels united by the style; each carpel 2–6-ovulate, attenuate into long style; style head shortly cylindrical; stigma conical. Fruit a pair of drupes, or single by abortion, slightly flattened, ±fleshy, partially hollow. Seeds 1–6, flattened, narrowly winged.

A genus of c. 23 species from Indonesia to Australia, and across the Pacific to the Marquesas and Hawai'i, with 1 species native on Lord Howe Is.

Ochrosia elliptica Labill., *Sert. Austro-Caledon.* 25, t. 30 (1824)

T: New Caledonia, *J.J.H. de Labillardière s.n.*; holo: P *n.v.*, *fide* P.Boiteau in A.Aubréville & J.-F.Leroy, *Fl. Nouv.-Calédon.* 10: 56 (1981). So named after its elliptic leaves.

Illustrations: P.Boiteau in A.Aubréville & J.-F.Leroy, *Fl. Nouv.-Calédon.* 10: 55, t. 10/6–12 (1981); I.Hutton, *Lord Howe Is.* 117 (1986).

Shrub or small tree to 4 m tall, glabrous. Leaves in whorls of 3, glossy; petiole 0.5–2 cm long; lamina elliptic to slightly oblanceolate, 5–14 cm long, 2–5 cm broad, attenuate onto petiole, obtuse to rounded, rarely very slightly and shortly acuminate; venation of numerous, parallel, secondary nerves, linking to a strong marginal nerve. Inflorescence axillary, subterminal, a dense, few-flowered cyme; peduncle 2–7 cm long. Calyx tube and lobes each c. 1 mm long. Corolla white; tube 9–10 mm long; lobes narrowly oblong, 6–7 mm long. Fruit a pair of ellipsoidal drupes, 3–4 cm long, pointed at both ends, with a longitudinal ridge along both sides, red. *Red Berrywood*. Fig. 55.

Lord Howe Is. A relatively common plant at lower altitudes, especially on sandy areas near the coast. Flowers Nov.–early Apr. Also known from Australia (coastal Qld), New Caledonia and Vanuatu (Aneityum).

L.H.Is.: Neds Beach, *M.M.J. van Balgooy 1042* (NSW); Lagoon Rd, outside Government House, *J.Pickard 1497* (NSW); Middle Bay, *P.S.Green 1699* (K); Transit Hill, *P.S.Green 1633* (A, K); N end of Blinky Beach, *A.N.Rodd 1856* (K, NSW).

4. VINCA

Vinca L., *Sp. Pl.* 1: 209 (1753); *Gen. Pl.* 5th edn, 98 (1754) contracted from the Latin name *vinca pervinca*, probably from the verb *vincio*, to bind or twist around, alluding to the suitability of the evergreen shoots for making garlands and wreaths.

Type: *V. minor* L.

Perennial herbs or subshrubs, with trailing vegetative shoots and shorter ±upright flowering shoots, latex colourless. Leaves opposite, pinnately veined, without stipules. Flowers solitary in leaf axils, pedicellate. Calyx lobes at least half length of corolla tube. Corolla usually blue (rarely white or pink), salverform; tube gradually widening upwards, with a band of hairs above stamen insertion, and a small ridge connecting the lobes at the mouth; lobes broad, somewhat oblique. Stamens inserted around middle of corolla tube, not exserted; filaments flattened and bent abruptly near base; anthers with flattened connective expanded into a hairy, flap-like appendage. Ovary superior; carpels 2, each 4–8-ovulate; style very slender, obconic; stylar head a band of hairs; stigma a broad band around stylar head. Fruit of 2, divergent, cylindrical follicles. Seeds naked.

A genus of 7 species from Europe and North Africa to Central Asia; rich in alkaloids. One species is naturalised on Norfolk and Lord Howe Islands.

***Vinca major** L., *Sp. Pl.* 1: 209 (1753)

T: Europe; lecto: LINN 299.3, *fide* W.T.Stearn in W.I.Taylor & N.Farnsworth, *The Vinca Alkaloids* 79 (1973); IDC microfiche 177/2.163/19. So called as being the larger of the first two species described.

Illustrations: B.E.V.Parham & A.J.Healey, *Common Weeds New Zealand* 100 (1976); R.D.Pearce in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 1052, fig. 515 (1986); B.A.Auld & R.W.Medd, *Weeds* 78 (1987).

Perennial herb with long trailing stems rooting at some nodes and the tips, and short, almost erect flowering stems. Leaves dark green, glossy; petiole 6–10 mm long, with hirsute margins; lamina ovate, 3–8 cm long, 2–6 cm broad, ±truncate to rounded or subcordate at base, ciliate, obtuse to acute. Pedicels erect, 2.5–6 mm long. Calyx lobes long-subulate, 6–15 mm long, ciliate. Corolla mauve-blue; tube 15–18 mm long; lobes obliquely obovate, 15–25

mm long, truncate to obtuse, slightly pointed. Follicles narrowly cylindrical, 3.5–5 cm long, tapering at apex, pointed, somewhat curved, slightly constricted between each seed. Seeds ellipsoidal, grooved on 1 side.

Norfolk Is., Lord Howe Is. Occurring locally as a garden escape. A native of central and southern Europe to North Africa.

N.Is.: around the ruins of the Old Prison, Kingston, *G.Uhe 1132* (K). **L.H.Is.:** behind Neds Beach, *M.M.J. van Balgooy 1132* (K, NSW); near Neds Beach, *J.Pickard* in *A.N.Rodd 1397* (NSW).

5. PARSONSIA

Parsonsia R.Br., *Prodr.* 465 (1810); *Ascelepiadeae* 53 (1810); named after James Parsons (1705–1770), an English doctor and natural historian.

Type: *P. capsularis* (G.Forst.) R.Br. ex Endl.

Woody climber; latex white, yellow or colourless. Leaves opposite, pinnately veined, without stipules. Inflorescences axillary or terminal, cymose, often paniculate. Calyx tube short, usually with a basal gland inside; lobes shorter than corolla tube. Corolla valvate, salverform to subcampanulate; tube relatively short and broad, shortly hairy within at top, without scales; lobes usually recurved at anthesis. Stamens inserted in lower half of tube; filaments long, appressed and intertwined to coherent with style; anthers usually ±exserted, ±adherent to style; connectives connate around stylar head. Ovary superior, 2-locular, scarcely separated; ovules numerous; style head cylindrical; stigmas on stylar head. Fruit of 2 joined follicles, separating and dehiscing at maturity, cylindrical or ovoid and pointed. Seeds flattened, longer than broad, one end with a dense tuft of long hairs.

A tropical genus of c. 80 species, from SE Asia to Taiwan, south through Malesia to Australia and New Zealand, east to Fiji, with 1 endemic species on Lord Howe Is.

Parsonsia howeana J.B.Williams, *Fl. Australia* 49: 616 (1994)

T: Dawsons Point, Lord Howe Island, 18 Sept. 1963, *A.C.Beauglehole 5792*; holo: CANB; iso: MEL. Named after the island to which this species is endemic.

[*Lyonsia reticulata auct. non* F.Muell.: W.B.Hemsley, *Ann. Bot.* (*London*) 10: 244 (1896); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 47: 149 (1917)]

Illustration: I.Hutton, *Lord Howe Is.* 117 (1986) as *P. straminea* var. *glabrata*.

Tall, twining climber. Young stems finely tomentose. Leaves glossy above; petiole 5–15 mm long; lamina elliptic (4–) 6–9 cm long, (1.5–) 2–3 cm broad, acute to obtuse at base, acute at apex; venation raised-reticulate above and below. Inflorescences axillary or terminal on side shoots, tomentose, usually many-flowered. Flowers honey-scented. Calyx tomentose; tube c. 1 mm long; lobes triangular, 1.5 mm long. Corolla orange to reddish brown, rarely yellowish; tube 2 mm long; lobes lanceolate, 4 mm long, acute, reflexed at anthesis, tomentose outside, with a tuft of white, straight hairs at base of lobes inside. Anthers exserted, forming a narrow cone around style. Follicles cylindrical, 10–12 cm long, blunt. Seeds numerous, flattened ellipsoidal, 1.5 cm long, ribbed. Fig. 56.

Lord Howe Is. Endemic. Fairly common in forested areas at lower altitudes, flowering throughout the year.

L.H.Is.: ridge between Old Settlement Bay and North Bay, *P.S.Green 1933* (K); top of Transit Hill, *M.M.J. van Balgooy 1017* (CANB); N slopes of Intermediate Hill, *J.Pickard* in *A.N.Rodd 1344* (NSW); base of Mt Gower, *J.P.Fullagar s.n.* (MEL); *s. loc., J.D.McComish 64* (K, NSW).

Closely related to *P. straminea* (R.Br.) F.Muell. which occurs in Australia (eastern Qld, N.S.W.).

Figure 50. *Korthalsella emersa*. (L.H.Is.)
Photograph — I.Hutton.

Figure 51. *Euphorbia norfolkiana*. (N.Is.)
Photograph — A.Rodd.

Figure 52. *Baloghia inophylla*. (L.H.Is.)
Photograph — I.Hutton.

Figure 53. *Drypetes deplanchei* subsp. *affinis*. (L.H.Is.)
Photograph — I.Hutton.

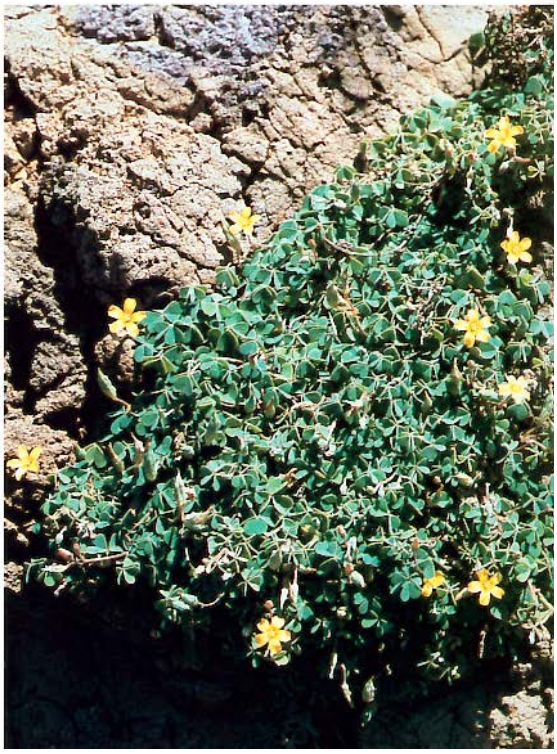

Figure 54. *Dysoxylum pachyphyllum*. (L.H.Is.)
Photograph — I.Hutton.

Figure 55. *Ochrosia elliptica*. (L.H.Is.)
Photograph — I.Hutton.

Figure 56. *Parsonsia howeana*. (L.H.Is.)
Photograph — I.Hutton.

Figure 57. *Oxalis corniculata*. (P.Is.)
Photograph — A.Rodd.

Figure 58. *Calystegia soldanella*. (L.H.Is.)
Photograph — I.Hutton.

Figure 59. *Plantago hedleyi*. (L.H.Is.)
Photograph — I.Hutton.

Figure 60. *Pandorea pandorana* subsp. *austrocaledonica*. (L.H.Is.)
Photograph — I.Hutton.

Figure 61. *Negria rhabdothamnoides*. (L.H.Is.)
Photograph — I.Hutton.

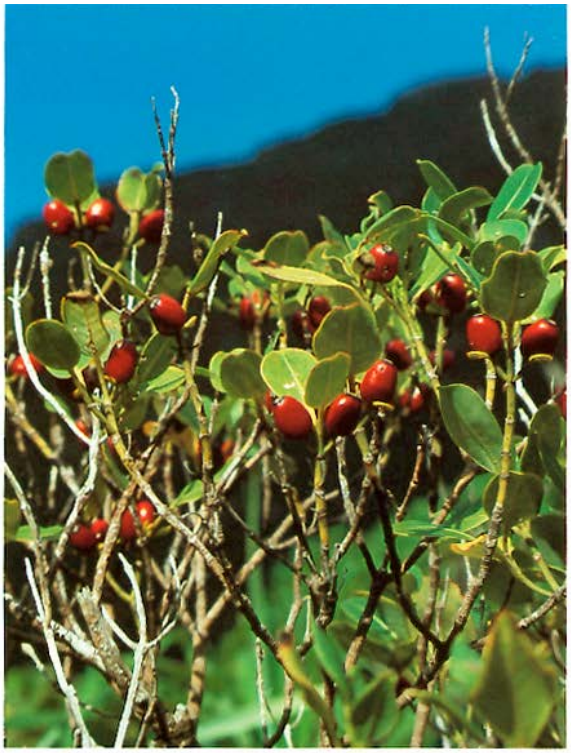

Figure 62. *Coprosma putida*. (L.H.Is.)
Photograph — I.Hutton.

Figure 63. *Lordhowea insularis*. (L.H.Is.)
Photograph — I.Hutton.

Figure 64. *Olearia ballii*. (L.H.Is.)
Photograph — I.Hutton.

Figure 65. *Wollastonia biflora*. (P.Is.)
Photograph — A.Rodd.

Figure 66. *Hedyscepe canterburyana*. (L.H.Is.)
Photograph — I.Hutton.

Figure 67. *Commelina cyanea*. (N.Is.)
Photograph — A.Rodd.

Figure 68. *Cyperus lucidus*. (P.Is.)
Photograph — A.Rodd.

Figure 69. *Lepidorrhachis mooreana*. (L.H.Is.)
Photograph — I.Hutton.

Figure 70. *Pandanus forsteri*. (L.H.Is.)
Photograph — I.Hutton.

Figure 71. *Dietes robinsoniana*. (L.H.Is.)
Photograph — I.Hutton.

Figure 72. *Geitonoplesium cymosum*. (L.H.Is.)
Photograph — I.Hutton.

Figure 73. *Cordyline obtecta*. (N.Is.)
Photograph — A.Rodd.

Figure 74. *Dendrobium macropus* subsp. *howeanum* on Mt Lidgbird. (L.H.Is.)
Photograph — I.Hutton.

Figure 75. *Bulbophyllum argyropus*. (L.H.Is.)
Photograph — I.Hutton.

Figure 76. *Corybas barbarae*. (L.H.Is.)
Photograph — I.Hutton.

Figure 77. *Dendrobium moorei*. (L.H.Is.)
Photograph — I.Hutton.

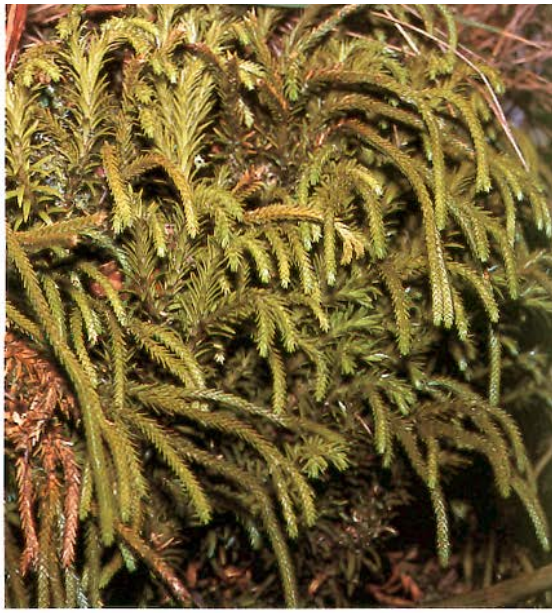

Figure 78. *Ophioglossum pendulum*. (L.H.Is.)
Photograph — I.Hutton.

Figure 79. *Doodia media*. (L.H.Is.)
Photograph — I.Hutton.

Figure 80. *Huperzia varia*. (L.H.Is.)
Photograph — A.Rodd.

Figure 81. *Phymatosorus scandens*. (L.H.Is.)
Photograph — I.Hutton.

73. ASCLEPIADACEAE

Herbs, shrubs or climbers, occasionally trees or succulent herbs, usually with milky latex. Leaves usually opposite, sometimes whorled, simple, without stipules. Inflorescence usually arising between a pair of petioles, cymose, often umbel-like; with or without bracts. Flowers actinomorphic, bisexual. Calyx usually deeply 5-lobed, rarely free, imbricate or valvate. Corolla 5-lobed; tube short or elongate; lobes convolute, imbricate or valvate. Stamens 5, usually joined around style to form a column, often with hood- or horn-shaped appendages, often with a fleshy corona; anthers included; pollen granular in tetrads or pollinia, usually in pairs from adjacent anthers, joined by a connective. Ovary superior, 2-locular, united only by disk-like stigma; ovules 1–many; styles 2. Fruit a pair of follicles, sometimes 1 by abortion. Seeds usually comose with long, silky apical hairs.

A family of c. 250 genera and 3000 species from the tropical to warm-temperate regions, especially Africa; 2 native genera and 1 introduced on the Islands.

G.Bentham, Asclepiadeae, *Fl. Austral.* 4: 324–348 (1867); K.Schumann, Asclepiadaceae, *Nat. Pflanzenfam.* 4(2): 189–306 (1895); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Asclepiadaceae, *Fl. Java* 2: 244–274 (1965).

KEY TO GENERA

1 Erect, perennial herbs or small shrubs; fruit inflated, covered with soft 'spines' **1. GOMPHOCARPUS**

1: Climbers; fruit fusiform or ovoid, smooth

2 Flowers in relatively few-flowered umbel-like clusters maturing acropetalously along inflorescence axis; fruit fusiform **2. TYLOPHORA**

2: Flowers in single, many-flowered, globose-umbel-like inflorescences, all at similar stage of maturity; fruit ovoid, blunt **3. MARSDENIA**

1. GOMPHOCARPUS

Gomphocarpus R.Br., *Asclepiadeae* 26 (1810); from the Greek *gomphos* (a wedge-shaped peg or nail) and *karpos* (a fruit), probably in allusion to the shape of the fruit in some species.

Type: *G. fruticosus* (L.) W.T.Aiton

Perennial herbs or small shrubs with white latex. Leaves opposite or verticillate. Inflorescence axillary, cymose-umbel-like. Calyx deeply lobed, glandular inside at base of tube. Corolla lobes spreading, becoming reflexed. Coronal lobes 5, erect or spreading, hooded, usually toothed. Anthers with an apical membranous appendage; pollinia 2 per anther, pendulous. Stigma flat, 5-sided. Follicles inflated, usually bristly or spiny. Seeds flattened, comose.

A genus of c. 50 species from tropical and subtropical Africa; 1 species naturalised on Norfolk Is. Sometimes included in *Asclepias*.

***Gomphocarpus physocarpus** E.Mey., *Comm. Pl. Afr. Austr.* 202 (1838)

Asclepias physocarpus (E.Mey.) Schltr., *Bot. Jahrb.* 21(5), *Beibl.* 54: 8 (1896). T: South Africa, *J.F.Drège*; syn: B *n.v.*, destroyed? From the Greek *physo* (a little bladder) and *carpos* (a fruit), in allusion to the inflated, bladder-like fruits.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 309, fig. 44G (1986); R.D.Pearce in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 1055, fig. 517C (1986), as *A. physocarpus*; B.A.Auld & R.W.Medd, *Weeds* 80 (1987).

Erect woody perennial herb or shrub to 2 m high. Leaves opposite; lamina linear-lanceolate to narrowly lanceolate, 5–9 cm long, (0.7–) 1–1.5 cm broad, attenuate onto petiole, finely pointed, pilose-tomentose on midrib below. Inflorescence umbel-like, 4–8-flowered; peduncle 2–3.5 cm long, tomentose; pedicels 1–2.5 cm long, reflexed and curved in fruit. Calyx lobes narrowly triangular, 3–4 mm long, acute, dorsally pilose. Corolla white; lobes slightly obovate, 6–8 mm long, ciliolate, reflexed. Coronal lobes white, c. 2 mm long, with rounded margins and the outer edge somewhat lower, with 2 hook-like apical teeth. Follicles inflated, ±spherical, 5–6 cm long, covered with soft spine-like excrescences c. 2 mm long. *Wild Cotton, Cape Cotton.*

Norfolk Is. A native of South Africa now fairly common as a weed of neglected pasture, roadsides *etc.*

N.Is.: W of Mt Pitt, Hurlstone Park, *W.R.Sykes NI 544* (CHR); Philip Is., *P.S.Green 1494* (A); *loc. id., W.R.Sykes NI 629* (CHR); *s. loc., R.M.Laing s.n.* (CHR); *s. loc., J.D.McComish 58/A* (K).

There is some variation on the Island which may possibly be attributed to past hybridisation with *G. fruticosus*, and one collection from Hurlstone Park (*W.R.Sykes NI 544*) in fruit may be the latter species, with its narrow linear leaves and beaked, somewhat falcate fruit.

2. TYLOPHORA

Tylophora R.Br., *Prodr.* 460 (1810); *Asclepiadeae* 17 (1810); from the Greek *tylos* (a knot or callus) and *phoras* (bearing), presumably alluding to the thickening on the filaments in the flowers of this genus.

Type: *T. flexuosa* R.Br.

Perennial, twining vines, herbaceous to somewhat woody, with milky or watery latex. Leaves opposite. Inflorescences cymose, simple or compound, umbel-like, pedunculate. Calyx often with glandular hairs at base; lobes acute. Corolla ±rotate, contorted; tube short, broad; lobes narrow, imbricate to subvalvate. Corona lobes 5, radiating from near base of staminal column, usually shorter than filaments, rounded, usually tuberculate, without appendages. Anthers with an apical membranous appendage; pollinia 2 per anther, erect. Style head short, broad, 5-sided, centrally thickened, with margins membranous; stigma obtuse or 2-lobed. Follicles ovoid to fusiform, smooth. Seeds flat with a marginal wing, comose.

An Old World tropical genus of c. 50 species from South Africa to SE Asia and across the Pacific to Tonga and Samoa; 1 species native on Norfolk and Lord Howe Islands.

Tylophora biglandulosa (Endl.) F.Muell., *Fragm.* 9: 71 (1875)

Hybanthera biglandulosa Endl., *Prodr. Fl. Norfolk.* 59 (1833). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W. Named from the two glands at the base of the petiole.

Tylophora enervia F.Muell., *Fragm.* 9: 70 (1875). T: Lord Howe Island, *J.P.Fullagar*; holo: ?MEL *n.v.*; iso: ?K.

[*Vincetoxicum carnosum auct. non* (R.Br.) Benth.: W.B.Hemsley, *Ann. Bot.* (*London*) 10: 244 (1896); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 110 (1917)]

Illustrations: S.F.L.Endlicher, *Iconogr. Gen. Pl.* t. 63 (1839), as *Hybanthera biglandulosa*; I.Hutton, *Lord Howe Is.* 118 (1986); P.I.Forster, *Kew Bull.* 46: 565 (1991).

Slender, trailing climber, with abundant white latex. Leaves somewhat succulent; lamina narrowly ovate to elliptic or rarely narrowly lanceolate-elliptic, 3–8 cm long, 1–5 cm broad, acute to rounded at base, acute to rounded and somewhat mucronate at apex. Inflorescence of (1 or) 2 or 3, several-flowered umbel-like cymose clusters along a rachis 2–7 cm long, developing successively from base. Calyx lobes triangular, 1–1.5 mm long. Corolla tube c. 1.5 mm long; lobes lanceolate, 6–8 mm long. Corona lobes 1.5–2 mm long, dorsally saccate in lower half; anther appendages small, almost circular, with crenulate margins. Follicles fusiform, pendant, somewhat fleshy, to 10 cm long, 2.5 cm broad at base. *Hoya* (N.Is.). Fig. 83A.

Norfolk Is., Lord Howe Is. Not common, but scattered in the forest on Norfolk Is. and near the shore or on the lower hills on Lord Howe Is. Also known from New Caledonia, Vanuatu and Fiji (see P.I.Forster, The distribution and synonymy of *Tylophora biglandulosa* (Asclepiadaceae), *Kew Bull.* 46: 563–567, 1991).

N.Is.: Mt Pitt, *R.M.Laing* (CHR); top of Mt Bates, *P.Ralston 29* (K); Anson Bay, *J.Backhouse 683* (K). **L.H.Is.:** summit of Malabar, *A.N.Rodd 1709* (K, NSW); near the shore, above the lagoon, *J.D.McComish 73* (K, NSW); Mutton Bird Is., *J.Pickard 2926* (NSW).

It is worth noting that Norfolk Is. collections have flowers recorded as 'mauve-pink' and even 'powdery blue' (*Ralston 29*), and those from Lord Howe Is. as 'dull cream' or ' greenish yellow' (the latter like those from the other areas from which this species is known). Without other, correlated, characters, this is scarcely grounds for taxonomic separation.

3. MARSDENIA

Marsdenia R.Br., *Prodr.* 460 (1810); *Asclepiadeae* 17 (1810); named after William Marsden (1754–1836), traveller, orientalist and numismatist, who collected plants in Sumatra, and wrote 'The History of Sumatra' (1783).

Type: *M. tinctoria* R.Br.

Shrubs or twining climbers; latex usually milky. Leaves opposite, with clusters of small glandular hairs at base of leaf midrib above. Inflorescences pedunculate, cymose, usually simply or compound umbel-like, sometimes paniculate. Calyx with glandular hairs at base inside; tube usually short. Corolla tube short, broad; lobes contorted, spreading at anthesis. Corona segments 5, joined to staminal column at base; lower part sometimes with 2 auricles or a wing; upper part erect and free, usually scarcely exceeding anther column. Anthers with a membranous apical appendage; pollinia 2 per anther, erect. Style head and stigma obtuse or conical. Fruit a pair of follicles, or 1 by abortion. Seeds with long silky apical hairs.

A tropical or subtropical genus of c. 100 species, with 2 native species on Lord Howe Is.

Corolla tube 2 mm long, c. equal to calyx; lobes 3–4 mm long; style head elongate-rostrate, 2–3 mm long **1. M. rostrata**

Corolla tube 4–5 mm long, much longer than the 1 mm calyx; lobes 1–1.5 mm long; style head slightly conical, 0.5 mm long **2. M. tubulosa**

1. Marsdenia rostrata R.Br., *Prodr.* 461 (1810); *Asclepiadeae* 20 (1810)

T: Australia, *R.Brown*; syn: BM; isosyn: K. The epithet comes from the Latin *rostrum* (a beak) with the suffix *-atus* indicating possession or likeness, in allusion to the beak-like appendage to the stigma.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 318, fig. 45I (1986); I.Hutton, *Lord Howe Is.* 118 (1986); A.Fairley & P.Moore, *Native Pl. Sydney District* 777, fig. 974 (1989).

Robust climber. Young stems tomentose-puberulous. Leaves somewhat fleshy; lamina ovate or broadly ovate (to suborbicular), (4–) 5–7 (–14) cm long, (2–) 3–6 (–11) cm broad, rounded to subcordate at base, abruptly acuminate at apex; petiole 2–4 cm long, pilose. Inflorescence globose, umbel-like, many-flowered; peduncles 1–2 cm long; pedicels c. 1 cm long, tomentose-puberulous. Calyx c. 2 mm long; lobes broad, rounded to obtuse. Corolla creamy white; tube c. equal to calyx; lobes lanceolate, 3–4 mm long, obtuse. Corona lobes with apex free, equal to or slightly longer than anther column. Style-head elongate-rostrate, 2–3 mm long. Follicles ovoid, 5–7 cm long, blunt, splitting into 2 boat-shaped valves.

Lord Howe Is. Locally common on the lower hills. Flowers mid Sept.–mid Nov. Also known from Australia (eastern Qld, eastern N.S.W. and eastern Vic.).

L.H.Is.: behind North beach, *J.Pickard & A.N.Rodd 1260* (K, NSW); ridge W of Malabar, *P.S.Green 1946* (K); ridge of Malabar, *A.C.Beauglehole 5793* (CANB, NSW); *s. loc.*, *J.D.McComish 59* (K, NSW).

Bentham (*Fl. Austral.* 4: 339, 1868) commented that the Lord Howe Is. specimen (collected by Milne) had larger flowers, but with the range of material now available from the Island and from the mainland, including the Milne collection, no such difference marks off the Island plant.

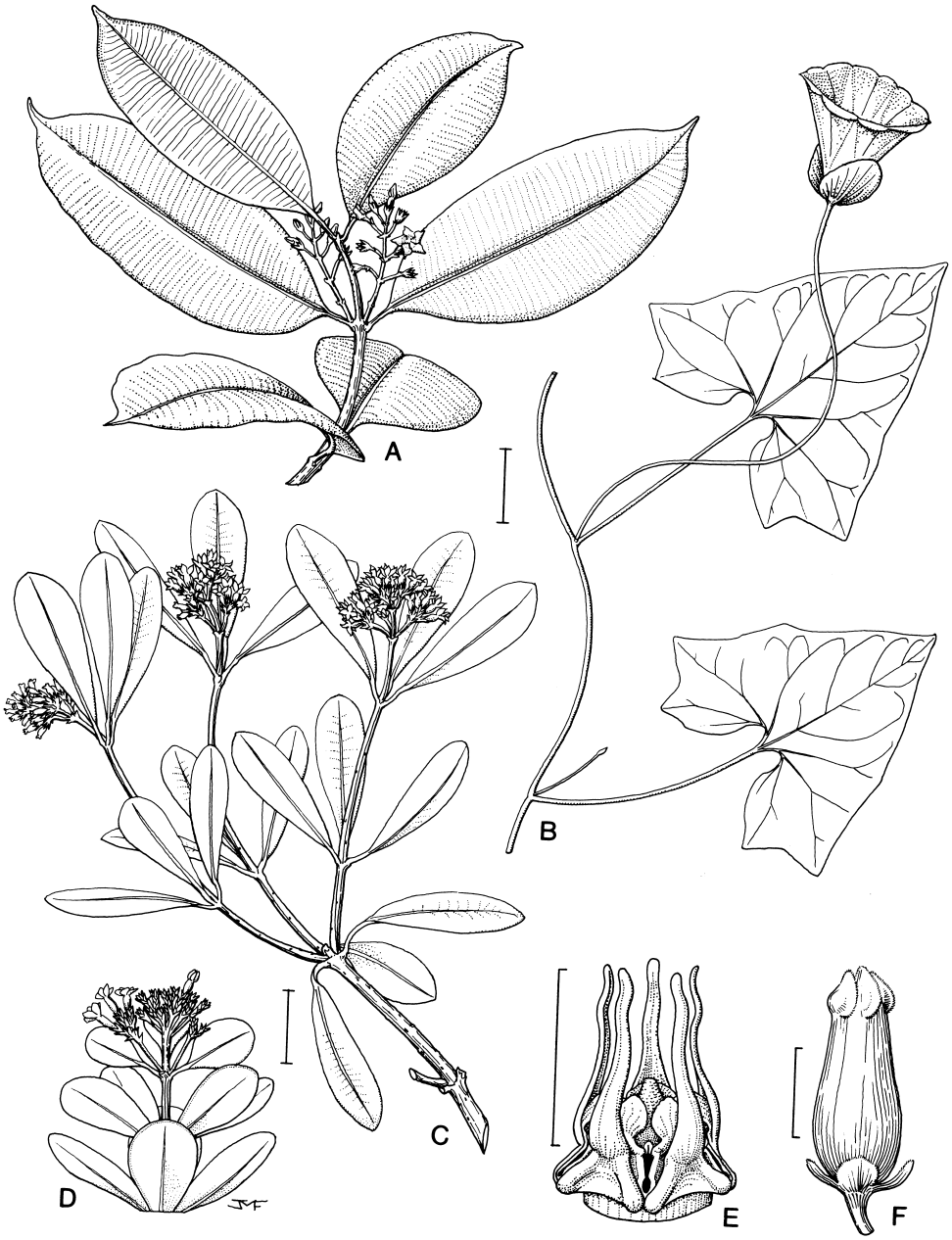

Figure 82. A, APOCYNACEAE: *Melodinus baueri*, habit (A.Cunningham 19, K). **B**, CONVOLVULACEAE: *Calystegia affinis*, habit (P.Green 2352, cult., K). **C–D**, APOCYNACEAE. **C**, *Alyxia lindii*, habit (J.McComish 89A, K). **D**, *Alyxia squamulosa*, habit (J.Pickard 2628, K). **E–F**, ASCLEPIADACEAE: *Marsdenia tubulosa*. **E**, corona; **F**, flower (**E–F**, 1871, J.Fullagar, MEL). Scale bars: **A–D** = 2 cm; **E**, **F** = 2 mm. Drawn by M.Fothergill.

2. Marsdenia tubulosa F.Muell., *Fragm.* 9: 71 (1875)

T: Mt Gower, Lord Howe Island, 1871, *J.P.Fullagar*; holo: MEL. So called because of the tubular corolla.

Illustration: P.S.Green, *Kew Bull.* 48: 310 (1993).

Habit unknown. Leaf suborbicular, 4.5 cm long (only 1 leaf on type specimen, and indistinguishable from *M. rostrata*). Inflorescence umbel-like, 5–10-flowered; peduncle 2.5 cm long; pedicels 4–7 mm long, glabrous. Calyx c. 1 mm long; lobes almost free, broadly ovate, minutely ciliolate. Corolla tube 4–5 mm long; lobes broadly ovate, 1–1.5 mm long, finely fimbriate. Corona lobes 2 mm long, with elongated filiform apex. Style-head slightly conical, 0.5 mm long. Fruit unknown. Fig. 82E–F.

Lord Howe Is. An endemic and scarcely known species, collected once in 1871.

This species is known only from the scrappy type specimen. The single leaf on this specimen is identical with some of those found in *M. rostrata*. Long overlooked; a search should be made to see if *M. tubulosa* might still be extant, if very rare.

74. SOLANACEAE

Herbs, shrubs, climbers or sometimes trees. Leaves usually alternate, simple or compound, without stipules. Inflorescence basically cymose, paniculate, rarely racemose, or flowers solitary. Flowers bisexual, sometimes functionally unisexual, actinomorphic to slightly zygomorphic. Calyx (4–) 5 (–10)-lobed, usually persistent. Corolla usually rotate to tubular, usually 5-lobed, valvate or folded, sometimes convolute or imbricate. Stamens 2, 4 or 5, inserted within corolla tube, alternating with corolla lobes, sometimes paired; anthers dehiscing by longitudinal slits or terminal pores. Ovary superior, rarely inferior, 2 (–5)-locular; placentation axile, the septum obliquely positioned in the flower; ovules few to many; style simple; stigma entire or 2 (3–5)-lobed. Fruit a dry or succulent berry or capsule.

A cosmopolitan family of 90 genera and c. 2700 species. Nine genera naturalised on Norfolk Is., 6 of which also occur on Lord Howe Is. (4 naturalised and 2 with both naturalised and native species). An economically important family, containing food plants such as potato (*Solanum tuberosum* L.), eggplant (*S. melongena* L.), green pepper (*Capsicum annuum* L.) and tomato (*Lycopersicon esculentum* Mill.). It contains a number of well-known garden plants including species of *Petunia*, *Salpiglossis* Ruiz & Pav. and *Cestrum* L. It is also noted as a source of a number of drugs, usually through poisonous alkaloids, *e.g.* atropine from *Atropa belladonna* L. and nicotine from *Nicotiana tabaccum* L.

G.Bentham, Solaneae, *Fl. Australia* 4: 442–470 (1869); R.W.Purdie, D.E.Symon & L.A.Haegi, Solanaceae, *Fl. Australia* 29: 1–208 (1982); D.E.Symon, The Solanaceae of New Guinea, *J. Adelaide Bot. Gard.* 8: 1–171 (1985).

KEY TO GENERA

1 Herbs, annual or perennial

2 Fruit a capsule

3 Capsule with numerous narrowly conical, sharp spines **9. DATURA**

3: Capsule smooth

4 Corolla ±tubular, scarcely to somewhat broader in upper third; pedicels 2–10 mm long **1. NICOTIANA**

4: Corolla funnel-shaped; pedicels 20–40 mm long **2. PETUNIA**

2: Fruit a berry

5 Calyx hardly enlarged in fruit, if at all **4. SOLANUM**

5: Calyx greatly enlarged in fruit, enclosing berry

6 Flowers yellowish with 5 dark spots or blotches at base; accrescent fruiting calyx tube angled or circular in cross-section **5. PHYSALIS**

6: Flowers blue with a white tube; accrescent fruiting calyx tube with 5 'wings', sagittate at base **6. NICANDRA**

1: Shrubs, erect or scrambling

7 Fruit a capsule **8. BRUGMANSIA**

7: Fruit a berry

8 Lateral shoots of an intricately branched shrub ending in a stout spine; leaves linear-oblanceolate to spathulate, to 12 mm broad **3. LYCIUM**

8: Lateral shoots not ending in a spine; leaves various, more than 10 mm broad, usually much broader

9 Corolla rotate or rotate-stellate, up to 4 cm diam., not cylindrical at base, white or mauve to purplish **4. SOLANUM**

9: Corolla with lower part distinctly cylindrical, upper part somewhat cup-shaped, 10–13 mm diam., golden-yellow **7. SOLANDRA**

1. NICOTIANA

Nicotiana L., *Sp. Pl.* 1: 180 (1753); named after Jean Nicot (1530–1600), French Ambassador to Portugal 1559–1561, who obtained seed from Florida, America, and introduced tobacco to France.

Type: *N. tabacum* L.

Annual or short-lived perennial herbs, or more rarely shrubs, often viscid-glandular. Leaves alternate, simple; lamina entire to sinuate. Inflorescence terminal, cymose-paniculate, rarely racemose, or flowers solitary, bracteate. Flowers bisexual, actinomorphic to slightly zygomorphic. Calyx tubular to campanulate, 5-lobed, somewhat accrescent and persistent in fruit. Corolla tubular or salverform, 5-lobed; lobes usually plicate in bud. Stamens 5, variously inserted in corolla tube, usually not exserted, equal or subequal; anthers not cohering, dehiscing by longitudinal slits. Ovary 2-locular; stigma capitate to slightly 2-lobed. Fruit a smooth capsule. Seeds numerous, small.

A genus of c. 65 species, mostly South American; 1 species naturalised on Norfolk and Lord Howe Islands, the other species native on Lord Howe Is. *Nicotiana alata* Link & Otto (and its hybrids) are often cultivated as garden ornamentals. J.H.Maiden (*Proc. Linn. Soc. New South Wales* 45: 566, 1920) recorded it as a garden escape, but no material to support this record has been seen. Presumably it did not become established.

Inflorescence raceme-like; corolla tube 1–2.5 cm long; corolla lobes rounded to slightly emarginate, 2–3 mm long; capsule 5–10 mm long **1. N. forsteri**

Inflorescence densely paniculate; corolla tube 4–5 cm long; corolla lobes acute, c. 5 mm long; capsule 15–25 mm long **2. N. tabacum**

1. Nicotiana forsteri Roem. & Schult., *Syst. Veg.* 4: 323 (1819)

T: New Caledonia, *J.R. & G.Forster*; syn: BM. Named after Johann Georg Adam Forster (1754–1794) who, with his father accompanied Captain James Cook on his second voyage to the Pacific (1772–1775).

Nicotiana debneyi Domin, *Biblioth. Bot.* 89: 593, t. 36, figs 6–8 (1929). T: Rockingham Bay, Qld, *J.Dallachy s.n.*; holo: K.

Illustrations: T.H.Goodspeed, *Chron. Bot.* 16, 482, fig. 116 (1954); P.Horton, *J. Adelaide Bot. Gard.* 3: 13, fig. 5a (1981); R.W.Purdie, *Fl. Australia* 29: 39, fig. 19A & C, 40, fig. 20B, 41, fig. 21N & Q (1982), as *N. debneyi* subsp. *debneyi*.

Figure 83. A, ASCLEPIADACEAE: *Tylophora biglandulosa*, habit (J.McComish 30, K). **B–C**, APIACEAE. **B**, *Hydrocotyle hirta*, habit (J.Fullagar, K). **C**, *Hydrocotyle bonariensis*, inflorescence (J.McComish 54, K). **D–F**, MELIACEAE. **D–E**, *Dysoxylum pachyphyllum*. **D**, inflorescence; **E**, leaf (**D–E**, P.Green 1989, K). **F**, *Dysoxylum bijugum*, leaf (G.Uhe 1201, K). **G**, SOLANACEAE: *Nicotiana forsteri*, habit (P.Green 1545, K). Scale bars = 2 cm. Drawn by P.Halliday.

Herb to 1 (–1.5) m tall. Leaves radical and cauline; lamina of radical leaves elliptic to broadly oblanceolate, 5–20 cm long, 2–10 cm broad, long-attenuate onto the winged petiole, stem clasping and auriculate, obtuse to acute, sparsely pubescent; cauline leaves progressively smaller and narrowly elliptic upwards, becoming sessile. Inflorescence raceme-like, glandular-pubescent; pedicels 2–6 mm long, lengthening somewhat in fruit. Calyx ±campanulate, 4–10 mm long. Corolla tube 10–25 mm long, scarcely broader at top, dull purplish red to white; lobes rounded to slightly emarginate, 2–3 mm long. Stamens with 1 slightly shorter than others; filaments 6–11 mm long. Capsule ellipsoidal to ovoid, 5–10 mm long. Fig. 83G.

Lord Howe Is. Occasional and scattered at lower altitudes. Also known from Australia (coastal and near-coastal N.S.W. and Qld), and from New Caledonia.

L.H.Is.: W end of North Beach, *L.A.S.Johnson & A.N.Rodd 1252* (NSW); south-eastern slopes of Malabar, *P.S.Green 1545* (A, K); near Middle Beach, *J.Pickard* in *A.N.Rodd 1418* (NSW); N end of Little Slope, *J.Pickard 2755* (NSW); *s. loc.*, *J.D.McComish 55* (K, NSW).

P.S.Green (*Kew Bull*. 48: 322, 1993) has shown that the correct name for this species is *N. forsteri*, not *N. debneyi* Domin as was previously thought.

2. *Nicotiana tabacum L., *Sp. Pl.* 1: 180 (1753)

T: 'America', LINN 245.1; lecto: LINN, *fide* T.H.Goodspeed, *Chron. Bot.* 16: 372 (1954). Epithet from the Latin for tobacco, the common name for this species based on a native Carib name.

[*Nicotiana alata auct. non* Link & Otto; J.H.Maiden, *Proc. Linn. Soc. New South Wales* 45: 566 (1920)]

Illustrations: T.H.Goodspeed, *Chron. Bot.* 16: 374, fig. 74 (1954); A.B.Graf, *Exotica* 12th edn, 2: 2067, 2076, 2077 (1985); A.B.Graf, *Tropica* 3rd edn, 895, 897 (1986).

Herb 1–3 m tall. Leaves nearly all cauline; lamina lanceolate or elliptic to ovate or oblanceolate, up to 50 cm long, progressively smaller upwards, decurrent at base, winged-subpetiolate, ±stem-clasping, acute to acuminate, glandular-pubescent; upper leaves sessile. Inflorescence a dense panicle, glandular-pubescent; pedicels 5–10 mm long, lengthening in fruit. Calyx cylindrical-campanulate, 10–20 mm long. Corolla greenish cream to pink; tube 40–50 mm long, cylindrical, widest in upper 1/3; lobes broadly triangular, c. 5 mm long, acute to acuminate. Stamens with 1 much shorter than others; filaments 25–40 mm long. Capsule ellipsoidal to ovoid, 15–25 mm long. *Tobacco*.

Norfolk Is., Lord Howe Is. Occasional as an escape from cultivation. A native of western South America introduced to North America in pre-Columbian times and soon after its discovery to Europe.

N.Is.: Ball Bay, *W.R.Sykes NI 624* (CHR); *s. loc.*, *W.R.Laing* (CHR). **L.H.Is.:** roadside from Flagstaff to Neds Beach, 1920, *J.L.Boorman* (NSW); N end of Middle Beach area, *A.C.Beauglehole 5624* (MEL).

2. PETUNIA

Petunia Juss., *Ann. Mus. Natl Hist. Nat.* 2: 215, t. 47 (1803); from *petun*, a Brazilian name for tobacco.

Type: *P. nyctaginiflora* Juss., *typ. cons.* = *P. axillaris* (Lam.) Britton, Sterns & Poggenb.

Annual or short-lived perennial herbs, glandular-pubescent. Leaves alternate or the upper ones opposite, simple; lamina entire. Flowers axillary, solitary, bisexual, actinomorphic or very slightly zygomorphic. Calyx campanulate, deeply 5-lobed. Corolla funnel-shaped or salverform, shallowly 5-lobed, induplicate in bud. Stamens 5, 1 much shorter than other 4, in 2 pairs; anthers not cohering, dehiscing by longitudinal slits. Ovary 2-locular; stigma capitate. Fruit a smooth capsule. Seeds numerous, spheroidal to angled.

A genus of c. 40 species from warm temperate South and North America, containing popular garden plants, including that described below. One species is naturalised on the Islands.

***Petunia × hybrida** Vilm., *Fl. Pleine Terre* 1: 615 (1863)

T: cultivated, not designated.

Illustrations: A.B.Graf, *Tropica* 3rd edn, 896 (1986); C.J.Webb *et al.*, *Fl. New Zealand* 4: 1234, fig. 115A (1988); C.D.Brickell, *Gard. Encycl. Pl. Fl.* 272 (1989).

Herb, usually decumbent, viscid with glandular hairs. Leafves with lamina broadly ovate to elliptic, 2.5–6 cm long, 1.5–4.5 cm broad, narrowed at base and decurrent onto winged petiole, acute to rounded at apex; lower leaves petiolate; upper leaves sessile, becoming smaller upwards. Flowers solitary; pedicel 2–4 cm long. Calyx 10–20 mm long, deeply lobed; lobes narrowly elliptic to subfoliaceous. Corolla usually white, pink or purple, sometimes multicoloured; tube 3–6 cm long, funnel-shaped; lobes broad, entire, frilled or undulate, acute to rounded. Stamens inserted in lower half of corolla tube; filaments 15–18 mm long. Capsule ovoid-elliptic, glabrous, c. 1 cm long. Seeds to 1 mm long.

Norfolk Is., Lord Howe Is. Occasionally escaping from cultivation, reproducing from seed.

N.Is.: Emily Bay, *W.R.Sykes NI 574* (CHR). **L.H.Is.:** behind dunes 0.1 km SW of airport terminal, *J.Pickard 2858* (NSW).

A popular garden plant of hybrid origin, probably involving *P. axillaris*, *P. inflata* and *P. violacea*.

3. LYCIUM

Lycium L., *Sp. Pl.* 1: 191 (1753); from the Greek name *lykion* for a thorny shrub from Lycia, part of Asia Minor.

Type: *L. afrum* L.

Shrubs with short, lateral branches usually ending in a spine, deciduous or evergreen. Leaves alternate on main shoots, clustered on short axillary branchlets or spurs, simple; lamina entire, usually glabrous. Flowers axillary, solitary to several-clustered, bisexual, actinomorphic. Calyx tubular to campanulate, (2 or) 4- or 5-lobed, accrescent. Corolla funnel-shaped, 4- or 5-lobed. Stamens 5, unequal, not coherent, inserted in corolla throat; anthers exserted, free, dehiscing by longitudinal slits. Ovary 2-locular; stigma capitate with 2 oblong, stigmatic surfaces. Fruit a succulent berry, partly enclosed by enlarged calyx. Seeds few to many, irregularly D-shaped.

A genus of c. 100 species, especially from tropical and warm temperate regions, particularly America and southern Africa.

***Lycium ferocissimum** Miers, *Ann. Mag. Nat. Hist.* ser. 2, 14: 187 (1854)

T: South Africa, *W.H.Harvey 105*; holo: K. Epithet is the superlative of *ferox* (the Latin for fierce, of spiny plants), in reference to the spines.

Illustrations: R.W.Purdie, *Fl. Australia* 29: 65, fig. 23I (1982); L.Haegi in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1244, fig. 566C (1986); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 432, fig. 60G (1986).

Intricately and rigidly branched shrub to 2 m tall or more, branchlets spinescent. Leaves mostly clustered on short spur-shoots; petiole scarcely differentiated; lamina slightly fleshy when fresh, linear-oblanceolate to spathulate, sometimes narrowly so, 1–4 cm long, 0.4–1.2 cm broad, subsessile, attenuate-acuminate at base, obtuse to rounded at apex. Flowers solitary; pedicel c. 0.5 cm long, lengthening in fruit. Calyx ±tubular, 4–7 mm long, 4- or 5-lobed; lobes triangular, acute to obtuse, irregularly split in fruit. Corolla 4- or 5-lobed, pale lilac to white, soon turning brown; tube cylindrical, 10–12 mm long; lobes 3.5–4.5 mm long, reflexed. Stamens exserted; filament hairy at base. Berry spheroidal, 5–12 mm diam., bright red. *African Boxthorn*.

Norfolk Is., Lord Howe Is. Presumably introduced as a hedge plant, but spread by birds eating the berries, occasionally becoming naturalised on the Islands. A native of South Africa.

N.Is.: near Headstone Point, *W.R.Sykes NI 513* (CHR). **L.H.Is.:** above southern end of Middle Beach, *P.S.Green 1913* (K); Middle Beach area, *R.D.Hoogland 8646* (NSW); 0.8 km E of 'Pine Trees', *J.Pickard 1419* (NSW).

4. SOLANUM

Solanum L., *Sp. Pl.* 1: 184 (1753); the Latin name in Pliny for a plant, probably the type species: *S. nigrum* L.

Type: *S. nigrum* L.

Annual or perennial herbs to small trees, sometimes trailing or climbing, armed or unarmed, pubescent with glandular or non-glandular hairs, rarely glabrous. Leaves usually alternate, simple or pinnate. Inflorescence terminal or axillary, extra-axillary or leaf-opposed, cymose, often scorpioid, subumbellate or paniculate. Flowers usually bisexual, actinomorphic or slightly zygomorphic. Calyx (4–) 5 (–10)-lobed, often accrescent in fruit. Corolla usually rotate or stellate, (4–) 5 (–10)-lobed; lobes plicate in bud. Stamens 5, usually equal; anthers usually coherent and cone-like around style, dehiscing by terminal pores or slits confined to upper half. Ovary 2 (–4)-locular; stigma capitate or 2-lobed. Fruit a succulent or leathery berry. Seeds many, orbicular to reniform.

A genus of c. 1500 species, worldwide, but mostly from tropical and subtropical South America. Six species on Norfolk and Lord Howe Islands; 1 species endemic, but probably extinct; 1 species native to Lord Howe Is.; 2 species naturalised on both Islands; 2 species naturalised one on each of the Islands.

D.E.Symon, A revision of the genus *Solanum* in Australia, *J. Adelaide Bot. Gard.* 4: 1–367 (1981).

1 Plant unarmed; berry globose, ovoid or ellipsoidal, up to 20 mm diam., black, red or yellow

2 Annual or short-lived perennial to 1 m tall; berry black

3 Inflorescence cymose-umbellate; corolla 5–8 mm diam.; anthers 1–1.5 mm long; calyx reflexed in fruit; berry black, glossy **1. S. americanum**

3: Inflorescence almost an umbel, usually with 1 flower borne slightly below others; corolla 8–13 mm diam.; anthers 1.7–2.7 mm long; calyx usually appressed in fruit; berry black, dull **2. S. nigrum**

2: Shrub or small tree to 4 m tall; berry red or yellow

4 Plant glabrous or almost glabrous; berry orange to scarlet

5 Corolla bluish lilac; leaves simple or pinnatisect; berry ovoid to ellipsoidal, 10–15 mm diam. **3. S. aviculare**

5: Corolla white; leaves entire or irregularly and coarsely dentate-undulate; berry globose, c. 6 mm diam. **5. S. bauerianum**

4: Plant densely stellate-tomentose (less so on upper surface of leaves); berry dull yellow **4. S. mauritianum**

1: Plant armed with pale yellow prickles; berry globose, 20–35 mm diam., yellow brown when mature **6. S. linnaeanum**

1. *Solanum americanum Mill., *Gard. Dict.* 8th edn, no. 5 (1768)

T: cult., *P.Miller*; lecto: BM, *fide* J.M.Edmonds, *J. Arnold Arbor.* 52: 634 (1971). So named as having been introduced from America.

subsp. **nutans** (R.J.F.Henders.) R.J.F.Henders., *Austrobaileya* 2: 555 (1988)

Solanum nodiflorum subsp. *nutans* R.J.F.Henders., *Contr. Queensland Herb.* 16: 30, pl. 2 (1974). T: Indooroopilly, Qld, April 1969, *R.J.F.Henderson 518*; holo: ?BRI *n.v.*; iso: K (MEL, NSW *n.v.*). Epithet is Latin for nodding, in allusion to the fruiting pedicels.

Solanum oleraceum Dunal ex Poir., *Encycl.* suppl. 3: 750 (1814). T: Brazil, *W.Pison & G.Marcgrave s.n.*; ?MPU *n.v.*

[*Solanum nigrum auct. non* L.; J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 150 (1898)]

[*Solanum astroites auct. non* G.Forst. *nec* Jacq.; E.Cheel, *Proc. Linn. Soc. New South Wales* 42: 595 (1917)]

[*Solanum nodiflorum auct. non* Jacq.; J.S.Turner *et al.*, *Conservation Norfolk Is.* 36 (1968)]

Illustrations: D.E.Symon, *J. Adelaide Bot. Gard.* 4: 38, fig. 1 (1981); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 417, fig. 57D (1986); C.J.Webb *et al.*, *Fl. New Zealand* 4: 1239, fig. 116A (1988).

Annual or short-lived perennial herb to 1 m tall, glabrous or sparsely pubescent when young, unarmed. Leaves alternate; lamina ovate to broadly lanceolate, 4–10 cm long, 2–6 cm broad, sometimes with a pair of smaller leaflets at base, attenuate at base onto petiole, entire or coarsely toothed, ±acute. Inflorescence extra-axillary, cymose-umbellate, 4–8-flowered; peduncle 1–2 cm long; pedicels deflexed, 3–8 mm long. Calyx 1–2 mm long; lobes rounded-obtuse, reflexed and slightly accrescent in fruit. Corolla stellate, 5–8 mm diam., white, sometimes tinged with purple. Anthers 1–1.5 mm long. Berry globose, 5–8 mm diam., black, glossy. Seeds 1–2 mm long. *Black Currant* (L.H.Is.).

Norfolk Is., Lord Howe Is. Although possibly indigenous in Australia and New Zealand, this species is a widespread almost cosmopolitan weed, and has probably been introduced to the Islands (it is significant that it was not collected by Bauer in 1804–1805).

N.Is.: Cascade, *W.R.Sykes NI 151* (CHR); Burnt Pine, 1971, *K.S.Harley* (BRI, K); Philip Is., *P.S.Green 1486* (A). **L.H.Is.:** between North Beach and New Gulch, *A.N.Rodd 1751* (K, NSW); SE lower slopes of Malabar, *P.S.Green 1571* (A, BRI, K); side of Transit Hill, *L.A.S.Johnson & A.N.Rodd 1272* (BRI, K, NSW).

2. *Solanum nigrum L., *Sp. Pl.* 1: 186 (1753)

T: Herb. Linn. 248.18; lecto: LINN, *fide* R.J.F.Henderson, *Contr. Queensland Herb.* 16: 19 (1974), IDC microfiche 177/2, 138. Epithet is Latin for black, in reference to the colour of the berry.

Illustrations: D.E.Symon, *J. Adelaide Bot. Gard.* 4: 47, fig. 5 (1981); G.M.Cunningham *et al.*, *Pl. W New South Wales* 588 (1981); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 417, fig. 57C (1986).

Annual or short-lived perennial herb to c. 75 cm tall, usually ±pubescent, unarmed. Leaves alternate; lamina ovate to broadly lanceolate, 2–12 cm long, 1–7 cm broad, decurrent onto petiole, entire to coarsely toothed, acute at apex, tip blunt. Inflorescence extra-axillary, racemose-umbellate, 4–8-flowered, usually with one flower borne below others; peduncle 1–2 cm long; pedicels deflexed in fruit, 2–8 mm long. Calyx 1–3 mm long; lobes ovate, appressed and accrescent in fruit. Corolla stellate, 8–13 mm diam., white, sometimes tinged with purple; corolla stellate. Anthers 1.7–2.7 mm long. Berry globose, 7–10 mm diam., black, dull. Seeds 1.7–2.2 mm long. *Nightshade*.

Lord Howe Is. An introduced, widespread and cosmopolitan weed.

L.H.Is.: Rabbit Is., *A.N.Rodd 1821* (NSW).

3. Solanum aviculare G.Forst., *Pl. Esc.* 42 (1786)

T: New Zealand, *J.R. & G.Forster*; lecto: BM, *fide* G.T.S.Baylis, *Trans. Roy. Soc. New Zealand* 82: 641 (1954). The epithet means relating to small birds, from the Latin *avicula*, diminutive of *avis* (a bird), plus the suffix *-are* (belonging to or pertaining to), in reference to the birds which were noted by Forster to eat the fruits 'most gratefully'.

[*Solanum laciniatum auct. non* Aiton; R.Heward in W.J.Hooker, *Lond. J. Bot.* 1: 123 (1842); C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales.* 23, 25 (1870)]

Illustrations: D.E.Symon in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1257, fig. 573A (1986); I.Hutton, *Lord Howe Is.* 142 (1988); A.Fairley & P.Moore, *Native Pl. Sydney Distr.* 280, fig. 998 (1989).

Shrub to c. 3 m tall. Shrub glabrous, unarmed. Leaves alternate, simple or pinnatisect; lamina lanceolate-elliptic to narrowly so, 8–30 cm long, 1–4 cm broad, or with 1–4 lobes extending to c. 1 cm from midrib, decurrent at base, entire, acute, often narrowly so. Inflorescence axillary or in fork of stem, of 1 or 2 scorpioid cymes, 2–10-flowered; peduncles 2–5 cm long; pedicels 1.5–2 cm long, deflexed in fruit. Calyx 4–7 mm long; lobes broadly triangular, 1.5–3 mm long, accrescent. Corolla rotate-stellate, 30–40 mm diam., bluish lilac, darkened

towards base; lobes broadly ovate, acute. Anthers 3–4 mm long. Berry ovoid to ellipsoidal, 10–15 mm diam., orange–red, pendant. Seeds c. 2 mm long.

Norfolk Is., Lord Howe Is. Although locally frequent on Lord Howe Is., especially at lower elevations in mountainous areas, it has apparently not been seen recently on Norfolk Is. and is probably extinct there. On Lord Howe Is. it flowers from late Nov.–late Feb. *Solanum aviculare* is also native in eastern Australia (Qld–Vic.), Papua New Guinea, the Solomon Is., Vanuatu, New Caledonia, the Kermadecs and New Zealand.

N.Is.: *s. loc., J.Backhouse 687* (K). **L.H.Is.:** S end of Anderson Rd, *J.Pickard* in *A.N.Rodd 1422* (NSW); terrace on Mt Lidgbird, *J.Pickard 2655* (K, NSW); N side of Mt Lidgbird, *A.C.Beauglehole 5618* (CANB, MEL); lower slopes of W side of Mt Lidgbird, *P.S.Green 1965* (K); *s. loc., J.D.McComish 30* (K, NSW).

4. *Solanum mauritianum Scop., *Delic. Fl. Faun. Insubr.* 3: 16, t. 8 (1788)

T: cult.; lecto: G.A.Scopoli, *op. cit.* t. 8, *fide* K.E.Roe, *Brittonia* 24: 254 (1972). Named after the island of Mauritius, whence seed of it was first obtained.

Solanum auriculatum L'Hér. ex Aiton, *Hort. Kew.* 1: 246 (1789). T: cultivated, origin 'the Islands of Madagascar, Mauritius and Bourbon'; holo: ?G-DC, Herb. L'Héritier, *n.v.*

Illustrations: D.E.Symon, *J. Adelaide Bot. Gard.* 4: 96, fig. 26 (1981); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 417, fig. 57E (1986); B.A.Auld & R.W.Medd, *Weeds* 230 (1987).

Shrub or small tree to 4 m tall, unarmed, densely stellate-tomentose, almost floccose, sparingly on upper leaf surfaces. Leaves alternate; petiole base with 2, broadly ovate, leaf-like auricles, 0.5–2 cm long; lamina elliptic to lanceolate, (7–) 10–30 cm long, (3.5–) 4.5–14 cm broad, acute to somewhat attenuate at base, entire, acute to somewhat acuminate at apex. Inflorescence terminal or axillary, densely corymbose, many-flowered; peduncle 6–18 cm long; pedicels erect, 2–3 mm long. Calyx 4–6 mm long; lobes ovate-lanceolate, acute. Corolla stellate, 15–25 mm diam., stellate-tomentose outside, mauve to violet; lobes triangular-ovate. Anthers 2–3 mm long. Berry globose, 10–15 mm diam., dull yellow, pubescent at first. Seeds 1.5–2 mm long. *Wild Tobacco*.

Norfolk Is., Lord Howe Is. A frequent and serious weed on the Islands. A native of Uruguay and south-eastern Brazil which has become a cosmopolitan, tropical weed (declared noxious in Qld), and has been reported to be poisonous.

N.Is.: 3.2 km NE of the cemetery, Kingston, *G.Uhe 1107* (K); *s. loc., W.G.Milne 5* (K). **L.H.Is.:** SE of the post office, 1970, *J.Pickard s.n.* (NSW); near the cemetery, *J.Pickard* in *A.N.Rodd 1401* (NSW); Thompsons Garden, *J.Pickard 2948* (NSW).

5. Solanum bauerianum Endl., *Prodr. Fl. Norfolk.* 54 (1833)

T: Norfolk Is., 1804–1805, *F.L.Bauer*; holo: W; iso: K. Named after Ferdinand Lukas Bauer (1760–1826), botanical artist who accompanied Matthew Flinders on his Australian voyage of exploration (1801–1805) and collected on Norfolk Is., 1804–1805.

Shrub or small tree to c. 3 m tall, glabrous; wood soft. Leaves alternate or sometimes paired, unequal; lamina lanceolate-elliptic, 6–13 cm long, 2.5–6 cm broad, acute at base, attenuate onto petiole, entire or irregularly and coarsely dentate-undulate, acute to acuminate at apex, blunt tipped. Inflorescence terminal or axillary, densely cymose-paniculate, many-flowered; peduncle 1.5–3.5 cm long; pedicel 5–10 mm long, ±deflexed in fruit. Calyx 1.5–2 mm long; lobes short and broad, apiculate. Corolla rotate-stellate, 1.5–1.7 cm diam., white; lobes broadly ovate-triangular, apiculate. Anthers 2 mm long. Berry globose, c. 6 mm diam., bright red or scarlet. Seeds c. 3 mm long. *Bridal Flower* (L.H.Is.).

Norfolk Is., Lord Howe Is. Endemic to the Islands, but presumed extinct. From Norfolk Is. no specimen exists that was collected later than that by Alan Cunningham in 1830 (K), although J.H.Maiden in 1904 (*Proc. Linn. Soc. New South Wales* 28: 785), speaking of plants from Philip Is., had the fruits described to him as 'like a bright red, elongated tomato'. From Lord Howe Is. it was collected by J.L.Boorman in 1920 from 'near Neds Beach in rocky formation of land overlooking the ocean' (NSW). Also in NSW there is a specimen collected by Mrs Ida McComish in February 1949 'from a tree cultivated on the island'. In 1985 inquiries failed to elicit any knowledge of the plant in cultivation there.

N.Is.: *s. loc., F.L.Bauer* (K, W); *s. loc., G.Caley* (W); *s. loc., A.Cunningham* (K). **L.H.Is.:** North Bay, *C.Moore 47* (K, NSW); near Neds Beach, 1920, *J.L.Boorman* (NSW); *s. loc., J.D.McComish 142* (K, NSW).

This species is a member of sect. *Irenosolanum* Seithe, a relatively small section which, in addition to 3 species in northern Australia, is confined to Papua New Guinea and the islands of the Pacific.

6. *Solanum linnaeanum Hepper & P.Jaeger, *Kew Bull.* 41: 435 (1986)

T: South Africa, *J.W.Burchell 3238*; holo: K. Named after the famous Swedish biologist Carl Linnaeus (1707–1778) who brought together an account of all the plants known at that date in his *Species Plantarum* (1753), and established the binomial system of biological nomenclature.

Solanum hermannii Dunal, *Hist. Nat. Solanum* 212, t. 2, fig. b (1813), *nom. illeg.*

[*Solanum sodomeum auct. non* L.; J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 765 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 2 (1915)]

Illustrations: D.E.Symon, *J. Adelaide Bot. Gard.* 4: 265, fig. 117 (1981); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 422, fig. 58C (1986); B.A.Auld & R.W.Medd, *Weeds* 229 (1987), as *S. hermanni*.

Subshrub or shrub to 1 m tall and wide, strongly armed throughout with pale yellow prickles to c. 1 cm long, stellate hairy. Leaves alternate; lamina deeply sinuate-pinnatisect, ovate-elliptic in outline; lamina 3–10 cm long, 2–6 cm broad; lobes irregular, rounded, unequal at base, rounded at apex. Inflorescence internodal, racemose, 3–6-flowered; peduncle stout, 0–1 cm long; pedicels 1–1.5 cm long, stellate-hairy. Calyx 3–10 mm long; lobes triangular, acute, armed, accrescent. Corolla rotate-stellate to pentagonal, 2–2.5 cm diam., pale purple or violet. Anthers 4–6 mm long. Berry globose, 20–35 mm diam., mottled green and white when immature, yellow-brown when mature. Seeds 2–3 mm long. *Poison Weed, Poison Bush*.

Norfolk Is. An occasional weed of wasteland. A native of South Africa now widely established as a serious weed in warm temperate and subtropical regions.

N.Is.: Bloody Bridge, *P.S.Green 1441* (A); *s. loc.*, 1898, *I.Robinson* (NSW); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW).

Poisonous, and often a serious pest. This species has also been known as *S. hermannii* Dunal.

5. PHYSALIS

Physalis L., *Sp. Pl.* 1: 182 (1753); *Gen. Pl.* 5th edn, 85 (1754); from the Greek *physa* (a bladder), in reference to the inflated fruiting calyx.

Type: *P. alkekengi* L.

Annual or perennial herbs, or sometimes subshrubs, glabrous or variously hairy. Leaves alternate, sometimes 2 per node and unequal, simple; lamina entire, toothed or sinuate. Flowers usually solitary, in leaf axils or stem forks, bisexual, actinomorphic. Calyx tubular to campanulate, 5-lobed, strongly accrescent, angled or circular in cross-section in fruit. Corolla rotate or campanulate, shallowly 5-lobed, plicate in bud. Stamens 5, equal or unequal, inserted near base of corolla tube; anthers dehiscing by longitudinal slits. Ovary 2-locular; stigma capitate. Fruit a globose berry enclosed by accrescent inflated papery calyx. Seeds numerous, usually lens-shaped.

A genus of c. 100 species, a few in the Old World tropics and temperate Asia, but most from warm temperate America; 2 species naturalised, 1 on both Islands, 1 on Lord Howe Is.

Physalis alkekengi (Chinese Lanterns), is often cultivated for use in dried flower arrangements, as is *P. peruviana* (Cape Gooseberry).

Plants clearly pubescent; inflated fruiting calyx 3–4 cm long, pubescent; corolla 15–20 mm long **1. P. peruviana**

Plants sparsely puberulent or glabrescent; inflated fruiting calyx 2–3 cm long, ±glabrous; corolla 6–10 mm long **2. P. ixocarpa**

1. *Physalis peruviana L., *Sp. Pl.* 2nd edn, 2: 1670 (1763)

T: from Lima, Peru, *Alstroemer*; LINN *n.v.* Epithet from Peru, the country of origin.

Illustrations: R.W.Purdie, *Fl. Australia* 29: 182, fig. 46H, L (1982); D.E.Symon in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1253, fig. 572A (1986); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 432, fig. 60E (1986).

Annual or short-lived perennial subshrub to 1 m tall, densely pubescent. Leaves alternate, in unequal pairs; petiole 1–5 cm long; lamina ovate to broadly ovate, 4–15 cm long, 2.5–10 cm broad, truncate to subcordate at base, entire or with a few blunt teeth, acuminate. Flowers solitary; pedicel 6–12 mm long. Calyx 7–8 mm long; lobes triangular, acute; tube greatly enlarged and inflated in fruit. Corolla rotate or shallowly lobed, 15–20 mm long, yellow with 5 purple spots towards base. Anthers 3.5–4 mm long. Fruiting calyx 3–4 cm long, 10-angled; lobes free at tip, pubescent. Berry globose, 1–2 cm diam., orange, flesh sweet. *Cape Gooseberry*.

Norfolk Is., Lord Howe Is. On the Islands an occasional weed of wasteland and open areas. A native of Peru, now cultivated widely for its edible fruit, and often escaped and becoming naturalised throughout warm temperate and subtropical regions.

N.Is.: Mt Bates, towards Red Rd, *P.S.Green 1394* (A); New Cascade Rd, *W.R.Sykes NI 606* (CHR). **L.H.Is.:** Neds Beach, *G.Uhe 1282* (K); between public jetty and Hunter Bay, *L.A.S.Johnson & A.N.Rodd 1228* (NSW); summit ridge of Mt Lidgbird, *J.Pickard 1480* (NSW); S end of Little Slope, *J.Pickard 2828* (NSW).

2. *Physalis ixocarpa Brot. ex Hornem., *Suppl. Hort. Bot. Hafn.* 26 (1819)

T: cultivated; iso: C *n.v.*, photo seen (R.B.Fernandes in *Bol. Soc. Brot.* ser. 2, 44: 346, t. 2, 1970). From the Greek *ixos* (birdlime) and *karpos* (fruit), in reference to the sticky berries.

Illustrations: R.W.Purdie, *Fl. Australia* 29: 182, fig. 46J (1982); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 432, fig. 60D (1986).

Annual herb to 50 cm tall, sparsely puberulent or glabrescent. Leaves alternate, 1 or sometimes an unequal pair per node; lamina lanceolate to ovate, 3–10 cm long, 1–5 cm broad, acute to obtuse at base, unequal, usually irregularly toothed or lobed, sometimes entire, acute, acuminate. Flowers solitary; pedicel 5–10 mm long. Calyx 3.5–5 mm long; lobes triangular, acute; tube greatly accrescent and inflated in fruit. Corolla broadly stellate to pentagonal, 6–10 mm long, pale yellow with 5 brownish blotches towards base. Anthers 1–1.5 mm long. Fruiting calyx 2–3 cm long, circular in section, not angled; lobes free at tip, ±glabrous. Berry globose, 1–1.5 cm diam., sticky, green.

Lord Howe Is. Probably recently introduced. First collected in 1980, now becoming a widespread weed. Its country of origin is not known with any certainty.

L.H.Is.: *s. loc.*, Nov. 1980, *Lord Howe Is. Board's Ranger* (NSW).

6. NICANDRA

Nicandra Adans., *Fam. Pl.* 2: 219 (1763), *nom. cons.*; named after the Greek poet *Nikander* of Colophon in Asia Minor, who, among other things, wrote about plants and their medicinal uses about 100 B.C.

Type: *N. physalodes* (L.) Gaertn.

Annual herbs, glabrous or sparsely pubescent with non-glandular hairs. Leaves alternate, simple; lamina entire. Flowers axillary or internodal, solitary, bisexual, actinomorphic. Calyx 5-lobed; lobes with adjacent margins fused to form wings, sagittate at base, accrescent in fruit. Corolla broadly campanulate, shallowly 5-lobed, plicate in bud. Stamens 5, equal in length, inserted near base of corolla tube, included; anthers dehiscing by longitudinal slits. Ovary 3–5-locular; stigma capitate, 3–5-lobed. Fruit a dryish berry, enclosed by enlarged, papery calyx, splitting irregularly when fruit ripens. Seeds numerous, ±reniform to lens-shaped.

A monotypic genus, native to Peru, naturalised on Norfolk Is.

P.Horton, Taxonomic account of *Nicandra* (Solanaceae), *Austral. J. Bot.* 1: 351–356 (1979).

***Nicandra physalodes** (L.) Gaertn., *Fruct. Sem. Pl.* 2: 237 (1791), as *physaloides*

Atropa physalodes L., *Sp. Pl.* 1: 181 (1753). T: not designated. The epithet, with the Latin suffix *-odes*, indicates resemblance to *Physalis*, which genus also has enlarged papery calyces in fruit.

Illustrations: R.W.Purdie, *Fl. Australia* 29: 187, fig. 47C–D, 191, fig. 49 (1982); P.Horton in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1246, fig. 567B (1986); B.A.Auld & R.W.Medd, *Weeds* 226 (1987).

Herb to c. 2 m tall, ±glabrous. Leaves variable; lamina narrowly to broadly ovate, 4–20 cm long, 2–10 cm broad, long attenuate onto an almost winged petiole, irregularly and shallowly sinuate-dentate or lobed, acute to subacuminate. Pedicels 1–2 cm long, becoming recurved, finely puberulent. Calyx 1–2 cm long, at anthesis deeply divided, greatly accrescent and becoming papery in fruit. Corolla blue, lower part of tube white with purplish markings; lobes shallow, rounded to slightly emarginate. Filaments hairy at base. Berry globose, 1–2 cm diam., almost dry, pale yellow, enclosed in enlarged, reticulate-veined calyx. Seeds 1–2 mm long.

Norfolk Is. First reported from Norfolk Is. in 1904 (J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 766). A native of Peru which is now widespread as a weed of arable land in warm temperate and subtropical areas.

N.Is.: Stockyard Rd, *W.R.Sykes NI 140* (CHR); *s. loc.*, 1898, *I.Robinson* (NSW); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW); *s. loc.*, *J.D.McComish 193* (NSW).

7. SOLANDRA

Solandra Sw., *Kongl. Vetensk. Acad. Nya Handl.* 8: 300 (1787); named in honour of Daniel Carl Solander (1733–1782), Swedish botanist and student of Linnaeus who accompanied Captain James Cook on his first voyage to the Pacific (1768–1771).

Type: *S. grandiflora* Sw.

Scandent shrubs or woody lianes, glabrous or pubescent. Leaves alternate; lamina entire, ±coriaceous. Flowers solitary, terminal, large, bisexual, slightly zygomorphic. Calyx usually tubular, irregularly 2–5-lobed, not enlarged in fruit. Corolla funnel- or cup-shaped or salverform, 5-lobed, imbricate in bud, entire or usually fimbriate. Stamens 5, ±equal, included or exserted; base of filaments hairy; anthers dehiscing by longitudinal slits. Ovary 4-locular, partially inferior; stigma slightly 2-lobed. Fruit a leathery, conical berry. Seeds numerous, reniform, flattened.

A tropical American genus of 10 species; 1 species naturalised on Norfolk Is. One or two species are in cultivation as ornamentals in tropical and subtropical gardens.

L.M.Bernardello & A.T.Hunziker, A synoptical revision of *Solandra* (Solanaceae), *Nordic J. Bot.* 7: 639–652 (1987).

***Solandra maxima** (Sessé & Moç.) P.S.Green, *Bot. Mag.* 176: t. n.s. 506 (1967)

Datura maxima Sessé & Moç., *Pl. Nov. Hisp.*: 25 (1888). T: Mexico, *M.Sessé*; holo: ?MA *n.v.* The epithet is the superlative of the Latin *magnus* (large, great), in reference to the relatively large size of the plant and its flowers compared with other species of the genus *Datura*.

Solandra hartwegii N.E.Br. ex C.F.Ball, *Gard Chron.* ser. 3, 49: 383, fig. 173 (1911). T: cultivated, Glasnevin Bot. Gard.; holo: K.

Illustrations: P.S.Green, *Bot. Mag.* 176: t. n.s. 506 (1967); F.Perry, *Fl. World* 282 (1972); A.B.Graf, *Tropica* 3rd edn, 894 (1986), as *S. nitida*.

Straggling and scrambling, wide ranging, stout evergreen shrub; shoots glabrous. Leaf lamina broadly elliptic, (7–) 9–14 (–18) cm long, (3.5–) 5–8 (–11) cm broad, obtuse to broadly cuneate at base, entire, obtuse to shortly acuminate at apex, thickish. Flowers sweet scented;

pedicel stout, 1–2 cm long. Calyx tubular, 5–7 cm long, unequally divided, (3–) 5-lobed. Corolla 16–24 cm long, somewhat cup-shaped, 10–13 cm diam., with a relatively narrow tube, golden yellow with 5 purplish brown lines inside; lobes 5–8 cm long, becoming rolled back. Filaments 9–10 cm long; anthers versatile. Style 20–25 cm long; stigma capitate. Berry conoid, 4–5 cm long.

Norfolk Is. On Norfolk Is. an escape from cultivation. A native of Mexico now frequently planted in tropical and subtropical gardens.

N.Is.: Mission Rd, *W.R.Sykes NI 644* (CHR).

8. BRUGMANSIA

Brugmansia Pers., *Syn. Pl.* 1: 216 (1805); named after Sebald Justinus Brugmans (1763–1879), Dutch botanist and one-time Professor of Botany at Leiden.

Type: *B. candida* Pers.

Shrubs or small trees with soft wood; young stems usually pubescent. Leaves alternate, simple, usually tomentose to puberulent. Flowers axillary, solitary, nodding or pendulous, bisexual, actinomorphic. Calyx tubular, 5-lobed or spathaceous, falling as a whole or persistent in fruit. Corolla large, broadly cylindrical to trumpet-shaped, 5-lobed; lobes usually ±cuspidate, plicate in bud. Stamens 5, equal, inserted at base of corolla tube; anthers dehiscing by longitudinal slits. Ovary 2-locular; stigma 2-lobed. Fruit a smooth capsule, tardily and irregularly dehiscent. Seeds numerous, flattened, largish.

A genus of c. 6 species native to tropical America, together with a number of hybrids; 1 species naturalised on Norfolk Is. Often used as hallucinogens by American Indians, but their poisonous alkaloids can be fatal.

***Brugmansia suaveolens** (Humb. & Bonpl. ex Willd.) Bercht. & J.Presl, *Prir. Rostlin* 1: 45 (1823)

Datura suaveolens Humb. & Bonpl. ex Willd., *Enum. Pl. Hort. Berol.* 227 (1809). T: cult.; holo: B *n.v.*, IDC microfiche 7446, 4257. The epithet means sweetly smelling, from the Latin *suavis* (sweet) and *olens*, (having a strong smell), in reference to the fragrant flowers.

Illustrations: F.Perry, *Fl. World 283* (1972); W.R.Sykes, *Kermadec Is. Fl.* 142, fig. 37 (1977); A.B.Graf, *Exotica* 12th edn, 2: 2068, 2070, 2071 (1985).

Shrub or small tree to 2.5 m tall; young stems glabrous or usually minutely puberulent. Leaves with lamina ovate-oblong to narrowly elliptic, 10–25 (–30) cm long, 5–10 (–12) cm broad, obtuse and unequal at base, entire, acute, glabrescent. Flowers nodding; pedicel 2–3 cm long. Calyx 5-lobed, not splitting, slightly inflated, 8–12 cm long. Corolla plicate, 25–34 cm long, lower half cylindrical, becoming funnel-shaped above, white; lobes slender, acute, scarcely recurved. Stamens inserted where corolla tube widens; anthers c. 3 mm long. Fruit not seen. *Trumpet Flower*.

Norfolk Is. A native of Brazil, widely cultivated and naturalised in 1 or 2 places on the Island.

N.Is.: around old Prison Settlement, Kingston, *G.Uhe 1142* (K); *s. loc.*, *R.M.Laing* (CHR).

9. DATURA

Datura L., *Sp. Pl.* 1: 179 (1753); from the Sanskrit name for the type species.

Type: *D. stramonium* L.

Annuals or short-lived perennials. Leaves alternate, simple; lamina entire or lobed. Flowers solitary in stem forks, bisexual, actinomorphic. Calyx tubular, usually 5-lobed, circumscissile after anthesis. Corolla funnel- or trumpet-shaped, usually shortly and narrowly 5-lobed, plicate, twisted in bud. Stamens 5, inserted in lower half of corolla tube, equal; anthers

dehiscing by longitudinal slits. Ovary 2-locular, or falsely 4-locular in lower half; stigma 2-lobed. Fruit a capsule, ±spiny or tuberculate, dehiscing irregularly or by 4 valves from the apex. Seeds numerous, irregularly D-shaped.

A tropical or warm temperate genus of c. 10 species, all American except *D. stramonium*. One species naturalised on Norfolk and Lord Howe Islands.

***Datura stramonium** L., *Sp. Pl.* 1: 179 (1753)

T: Europe, Hort. Cliff. 55 Datura No. 1 fol. 1; lecto: BM, *fide* W.D'Arcy, *Ann. Missouri Bot. Gard.* 60: 624 (1974) & F.N.Hepper in M.D.Dassanayake & F.R.Fosberg, *Revis. Handb. Fl. Ceylon* 6: 406 (1987). The epithet is said to be a corruption of the Greek *struchnos manikos*, the name used for this species by Theophrastus.

Illustrations: R.W.Purdie, *Fl. Australia* 29: 191, fig. 51, 192, fig. 52C (1982); L.Haegi in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1239, fig. 562B (1986); C.J.Webb *et al.*, *Fl. New Zealand* 4: 1225, fig. 112 (1988).

Stout, fetid, annual herb, branched and erect to 1 m tall, glabrous or sparsely pubescent. Leaves deeply lobed; lamina rhombic to narrowly or broadly ovate, 5–36 cm long, 2–20 cm broad, obtuse and attenuate at base; lobes coarsely and irregularly toothed. Flowers solitary, erect to suberect; pedicel stout, 0.5–2 cm long. Calyx 3–4.5 cm long, somewhat angled, base forming a persistent collar in fruit. Corolla funnel-shaped, white, sometimes tinged lavender; tube 6–8 (–10) cm long; lobes 5, slender, c. 1 cm long. Anthers 3–4 mm long, included. Ovary 2-locular. Capsule ovoid, 3–5 cm long, erect, with numerous, narrowly conical, sharp spines, dehiscing by 4 valves. Seeds 2.5–3.5 mm long, black, coarsely pitted. *Cranky* or *Cemetery Flower* (Norfolk Is.).

Norfolk Is., Lord Howe Is. Naturalised and occasional on the Islands. Although widely naturalised throughout the world, its origin is uncertain.

N.Is.: cemetery area, near Emily Bay, *W.R.Sykes 784/87* (CHR); Burnt Pine, *W.R.Sykes NI 182* (CHR). **L.H.Is.:** Neds Beach Rd or Middle Beach Rd, 1920, *J.L.Boorman* (NSW); *s. loc.*, *J.D.McComish 145* (NSW).

75. CONVOLVULACEAE

Herbs or shrubs, usually climbing or trailing, rarely trees, sometimes with milky sap. Leaves alternate, entire or divided, sometimes deeply so, without stipules. Inflorescence terminal or axillary, racemose or paniculate, 1–many-flowered. Flowers actinomorphic or rarely slightly zygomorphic, bisexual, often bracteate. Sepals 5, usually free, imbricate, persistent. Corolla usually funnel-shaped or salverform, sometimes campanulate, usually shortly 5-lobed, usually induplicate, often contorted. Stamens 5, inserted on corolla tube. Ovary superior, 1-, 2- or 4-locular, with 2 or 4 basal or basal-axile ovules per locule; style 1, simple or bifid; stigma capitate or bilobed. Fruit a capsule, rarely a berry or nut-like. Seeds usually 1–4.

A family of c. 58 genera and 1650 species, cosmopolitan, but mostly tropical and subtropical; 3 genera occur on the Islands. The family contains the Sweet Potato or Kumara, *Ipomoea batatas* (L.) Lam., and some garden ornamentals such as Morning Glory, *I. purpurea* (L.) Roth.

G.Bentham, Convolvulaceae, *Fl. Austral.* 4: 410–442 (1869); H.Hallier, Convolvulaceae Africanae, *Bot. Jahrb. Syst.* 18: 81–160 (1893); S.J. van Ooststroom, Convolvulaceae, *Fl. Males.* ser. I, 4: 390–512 (1953); B.Verdcourt, *Fl. Trop. E. Africa*, Convolvulaceae: 1–161 (1963); C.A.Backer, R.C.Bakhuizen van den Brink Jr & S.J. van Ooststroom, Convolvulaceae, *Fl. Java* 2: 483–498 (1965).

KEY TO GENERA

1 Corolla to 0.5 cm long, campanulate, deeply lobed, greenish; small creeping herb in turf **3. DICHONDRA**

1: Corolla more than 2 cm long, funnel-shaped or salverform, shallowly lobed, white, pink or purplish; climbing, twining or a vigorous creeping herb

2 Bracts various but not enclosing calyx; stigma capitate, entire **1. IPOMOEA**

2: Bracts enclosing calyx; stigma 2-lobed **2. CALYSTEGIA**

1. IPOMOEA

Ipomoea L., *Sp. Pl.* 1: 159 (1753); *Gen. Pl.* 5th edn, 76 (1754); from the Greek *ips* (a worm) and *homoios* (similar to), alluding to the long trailing stems in this genus.

Type: *I. pes-tigridis* L.

Perennial, rarely annual, herbs, vines or shrubs, usually twining. Leaves simple, entire to variously lobed or divided, usually petiolate. Inflorescence axillary, cymose or sometimes paniculate or flowers solitary; bracts scale-like or foliar, not enclosing sepals. Calyx 5-lobed, variable, often enlarged in fruit. Corolla actinomorphic or rarely slightly zygomorphic, funnel-shaped or salverform, sometimes tubular or campanulate, usually shallowly 5-lobed, contorted in bud. Stamens inserted near base of corolla tube, usually included. Ovary 2- or 4-locular, usually with 2 ovules per locule; style filiform; stigma capitate. Fruit a capsule, usually 4-valved, with 4 seeds. Seeds glabrous or hairy.

A genus of c. 500 species, mostly from the tropics and warm temperate regions; 1 native and 3 naturalised species occur on the Islands.

Ipomoea batatas, the Kumara or Sweet Potato, is commonly cultivated.

1 Leaves divided almost to base **2. I. cairica**

1: Leaves entire or lobed

2 Plant creeping in coastal sand; leaf apices rounded, usually emarginate or shallowly 2-lobed **4. I. pes-caprae**

2: Plant trailing or twining, not in coastal sand; leaf apices acute or acuminate

3 Leaves and sepals glabrous; corolla white, salverform, with a cylindrical tube **1. I. alba**

3: Leaves and sepals pilose; corolla usually reddish purple, funnel-shaped **3. I. indica**

1. *Ipomoea alba L., *Sp. Pl.* 1: 161 (1753)

T: Malabar, India; holo: 'Manda-valli', illustration in H.A. van Rheede, *Hort. Malab.* 11: t. 50 (1692). So called from its white flowers.

Ipomoea bona-nox L., *Sp. Pl.* 2nd edn, 1: 228 (1762). T: as for *Ipomoea alba.*

Ipomoea ambigua Endl., *Prodr. Fl. Norfolk.* 53 (1833). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W.

Ipomoea carinata Endl., *Prodr. Fl. Norfolk.* 53 (1833). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W.

[*Ipomoea grandiflora auct. non* (L.f.) Lam.: W.B.Hemsley, *Ann. Bot.* (*London*) 10: 245 (1896); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 150 (1917)]

Illustrations: J.Sims, *Bot. Mag.* 19: t. 752 (1804), as *I. bona-nox*; F.M.Bailey, *Weeds & Poison. Pl. Queensland* 115 (1907), as *I. bona-nox*; S.J. van Ooststroom, *Fl. Males.* ser. I, 4: 480, fig. 53 (1980).

Annual or perennial twiner, usually glabrous. Leaves with petiole 5–18 cm long; lamina

broadly ovate to orbicular, entire or 3-lobed, 5–20 cm long, 3.5–20 cm broad, cordate, acute to acuminate. Inflorescence 1–several-flowered; peduncle 1–20 cm long; pedicels 0.7–1.5 cm long. Sepals unequal, elliptic; 2 or 3 outer sepals 5–10 mm long, with 4–10 mm long awn; inner sepals 10–20 mm long, shortly mucronate. Corolla salverform, white with greenish nectar guides, scented, opening at night; tube narrowly cylindrical, 7–12 cm long; limb 8–10 cm diam. Stamens and style exserted. Capsule ovoid to broadly ovoid, 2–3 cm long. Seeds 4, ovoid, c. 1 cm long, glabrous.

Norfolk Is., Lord Howe Is. A native of tropical America, possibly Mexico, now widely introduced as a garden plant and escaped from cultivation.

N.Is.: Williams Water, *R.M.Laing* (CHR); W of Mt Pitt, *W.R.Sykes NI 549* (CHR); *s. loc.*, *J.D.McComish 199* (K). **L.H.Is.:** near Neds Beach, *J.D.McComish 193* (K); *s. loc.*, 1898, *J.H.Maiden* (NSW).

This species must have been an early introduction to Norfolk Is., for it was one of the plants drawn in about 1790 by J.Doody (this drawing now in the Mitchell Library, Sydney).

2. *Ipomoea cairica (L.) Sweet, *Hort. Brit.* 287 (1827)

Convolvulus cairicus L., *Syst. Nat.* 10th edn, 922 (1759). T: not designated. The epithet means from Cairo (Cairus), in Egypt.

Ipomoea palmata Forssk., *Fl. Aegypt.-Arab.* 43 (1775). T: Egypt, *P.Forsskål*; holo: ?C *n.v.*

Ipomoea pendula R.Br., *Prodr.* 486 (1810). T: Port Jackson & Tasmania, Australia, *R.Brown*; syn: BM.

Illustrations: F.M.Bailey, *Weeds & Poison. Pl. Queensland* 113 (1907), as *I. palmata*; T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 351, fig. 48D (1986); B.A.Auld & R.W.Medd, *Weeds* 156 (1987).

Perennial twiner, usually glabrous. Leaves with petiole 2–6 cm long, often falsely stipulate; lamina palmately divided almost to base, 5 (–7)-lobed, ovate to orbicular in outline, 3–10 cm long; lobes lanceolate to elliptic or ovate with outermost lobes sometimes unequally 2-lobed, acute to obtuse, mucronulate. Inflorescence 1–several-flowered; peduncle 1–8 cm long; pedicels 1–3 cm long. Sepals ovate, 4.5–6 mm long, with outer sepals slightly shorter, obtuse to acute, mucronulate, glabrous. Corolla funnel-shaped, purple to reddish purple, occasionally white. Stamens and style included. Capsule ±globose, c. 1 cm long. Seeds subglobose to ovoid, c. 0.5 mm long, densely shortly tomentose.

Norfolk Is., Lord Howe Is. A native of tropical Africa and Asia which has become almost cosmopolitan through cultivation as an ornamental, and is now frequently weedy. Flowers mid Nov.–late Apr.

N.Is.: Steels Point, *R.M.Laing* (CHR); c. 1.6 km NE of Bloody Bridge, *G.Uhe 1119* (K); *s. loc.*, *J.D.McComish 94* (K, NSW). **L.H.Is.:** Neds Beach, *M.M.J. van Balgooy 1055* (CANB); Salmon Beach, *P.S.Green 1961* (K); Rabbit Is., *A.N.Rodd 1809* (NSW).

3. *Ipomoea indica (Burm.) Merr., *Interpr. Herb. Amboin.* 445 (1917)

Convolvulus indicus Burm., *Auctuarium* 7: 6 (1755). T: cultivated; lecto: *Convolvulus indicus flore violaceo* Besler, *Hort. Eystett.* 13: fol. 8, fig. 2 (1613), *fide* F.R.Fosberg, *Bot. Not.* 129: 36 (1976). The epithet refers to the 'Indies' in general.

Ipomoea congesta R.Br., *Prodr.* 485 (1810). T: [Queensland], 1770, *J.Banks & D.Solander*; holo: BM.

Ipomoea cataractae Endl., *Prodr. Fl. Norfolk.* 53 (1833). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W; iso: K.

Pharbitis insularis Choisy, *Mém. Soc. Phys. Genève* 6 (= *Convolv. Orient.* 57): 439 (1833). T: Polynesia; numerous syntypes.

Illustrations: B.Everard & B.D.Morley, *Wild Fl. World* 81, fig. D (1970), as *I. learii*; G.M.Cunningham *et al.*, *Pl. W New South Wales* 557 (1981); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 351, fig. 48A (1986).

Perennial with stems twining or sometimes prostrate and rooting at nodes. Leaves with petiole 2–18 cm long; lamina broadly ovate, entire or 3-lobed, 4–17 cm long, 3.5–16 cm broad, cordate, acuminate to acute, densely pilose on lower surface, less so above. Inflorescence a dense umbellate cyme, 2–several-flowered; peduncle 2–20 cm long; pedicels 0.2–2.5 cm long. Sepals 17–25 mm long, acuminate, silky pilose; outer narrowly ovate to ovate; inner narrower at base. Corolla funnel-shaped, 5–8 cm long, purplish blue, becoming

reddish with age. Stamens and style included. Capsule globose, 1 cm long, irregularly dehiscent. Seeds ovoid, 4 mm long, dark brown, sparsely verruculose.

Norfolk Is. A pantropical species, often grown as an ornamental and escaping from cultivation. Presumably an early introduction, already naturalised when collected by F.L.Bauer and mistaken for a native when described as *I. cataractae* by S.F.L.Endlicher.

N.Is.: Steels Point, *P.S.Green 2409* (K); *loc. id., M.Lazarides 8030* (CANB, K); Cascades to Steels Point, 1.6 km inland, *R.M.Laing* (CHR); Cascade, *J.Backhouse 089* (K); *s. loc., J.D.McComish 141* (K).

4. Ipomoea pes-caprae (L.) R.Br. in J.H.Tuckey, *Narr.Exped. Zaire* 477 (1818)

subsp. **brasiliensis** (L.) Ooststr., *Blumea* 3: 533 (1940)

Convolvulus brasiliensis L., *Sp. Pl.* 1: 159 (1753); *Ipomoea brasiliensis* (L.) Sweet, *Hort. Suburb. Lond.* 35 (1818). T: Brazil; lecto: C.Plumier, *Descr. Pl. Amér.* t. 140 (1692), *fide* B.Verdcourt in *Fl. Trop. E. Africa, Convolvulaceae* 121 (1953). The epithet alludes to the country of origin.

Ipomoea biloba Forssk., *Fl. Aegypt.-Arab.* 44 (1775). T: Arabia, *P.Forsskål*; lecto: BM, *fide* B.Verdcourt, *Fl. Trop. E. Africa, Convolvulaceae* 121 (1963).

Illustrations: A.W.Whistler, *Coastal Fl. Trop. Pacific* 71 (1980); J.Brock, *Top End Native Pl.* 228 (1988); W.L.Wagner *et al., Man. Fl. Pl. Hawai'i* 558, t. 72 (1990).

Perennial with long trailing stems, rooting at nodes. Leaves with petiole 4–15 cm long; lamina erect, ovate to suborbicular or elliptic, 4–12 cm long, 3–12 cm broad, cuneate to subcordate, emarginate or rarely rounded-entire, thickish, glabrous. Inflorescence 1–several-flowered; peduncle erect, 3–15 cm long; pedicels 1–4 cm long. Sepals somewhat unequal; outer sepals broadly ovate, 5–9 mm long; inner sepals slightly longer. Corolla funnel-shaped, 3–7 cm long, pink to reddish purple with dark centre. Stamens and style included. Capsule ovoid to globose, c. 1.5 cm long. Seeds ovoid, 5–10 mm long, blackish brown, tomentose. Fig. 86F.

Norfolk Is., Lord Howe Is. A pantropical coastal plant, growing in sand on the foreshore; on Norfolk Is. seemingly only in Anson Bay.

N.Is.: Anson Bay, *R.D.Hoogland 11292* (CANB); *s. loc.*, 1902, *I.Robinson* (NSW). **L.H.Is.:** Neds Beach, *G.Uhe 1238* (K); *loc. id., A.C.Beauglehole 5795* (CANB); Middle Beach, *A.C.Beauglehole 5605* (CANB).

2. CALYSTEGIA

Calystegia R.Br., *Prodr.* 483 (1810); from the Greek *kalyx* (calyx) and *stegé* (a covering), alluding to the two bracts enclosing the calyx.

Type: *C. sepium* (L.) R.Br.

Perennial herbs, prostrate or twining, with milky latex. Leaves entire or lobed, often sagittate. Flowers axillary, usually solitary or rarely in few-flowered cymes. Calyx ±enclosed by 2 large, persistent bracts. Sepals ±equal. Corolla actinomorphic, usually funnel-shaped, sometimes campanulate, ±entire or with shallow lobes, glabrous. Stamens inserted towards base of corolla tube, included. Ovary 1- or imperfectly 2-locular; ovules 4; style simple, included; stigma 2-lobed. Fruit a capsule, 4-valved, with 4 seeds.

A genus of c. 25 species from temperate and warm temperate regions, especially North America; 2 species native to the Islands.

Leaves sagittate; not usually growing in maritime sand **1. C. affinis**

Leaves reniform; creeping in sand by the sea **2. C. soldanella**

1. Calystegia affinis Endl., *Prodr. Fl. Norfolk.* 51 (1833)

Convolvulus affinis (Endl.) Maiden, *Proc. Linn. Soc. New South Wales* 28: 711 (1904), *non* Scheele (1848). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W; iso: K. The epithet means allied to, and refers to a close relationship with *C. marginata* R.Br.

[*Convolvulus marginatus auct. non* (R.Br.) Spreng.: G.Bentham, *Fl. Austral.* 4: 430 (1868), *p.p.*]

[*Calystegia marginata auct. non* R.Br.: W.B.Hemsley, *Ann. Bot.* (*London*) 10: 246 (1896); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 36 (1915); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 150 (1917)]

Vine, climbing or creeping. Leaves with petiole 5–12 cm long; lamina sagittate with a broad sinus and short triangular lobe each side near base, 4–9 cm long, 3.5–7 cm broad, attenuate onto petiole, acute to slightly acuminate, mucronulate. Flowers solitary; pedicel 4–13 cm long; bracts broadly ovate to suborbicular, 1.2–1.5 cm long, cordate. Sepals ovate, 5 mm long, mucronulate. Corolla shortly funnel-shaped, 2.5–3.5 cm long, scarcely lobed, pink with 5 creamy longitudinal bands. Fruit unknown. Fig. 82B.

Norfolk Is., Lord Howe Is. Endemic to the two Islands; on Norfolk Is. a rare plant, recorded from Mt Pitt and its vicinity; on Lord Howe Is. very rare. A.N.Rodd & J.Pickard (*Cunninghamia* 1: 279, 1983) suggested that it is extinct on the latter Island, but a plant found near the Old Settlement Bay in a vegetative state, heavily grazed and not seen in flower, has, when taken into cultivation at Kew, flowered and proved to be this species.

N.Is.: Mt Pitt, *G.Allen* (CHR); S of road to Mt Pitt, *G.Uhe 1197* (K); *s. loc.*, 1805, *G.Caley* (BM). **L.H.Is.:** Old Settlement Bay, *P.S.Green 2352* (K, also a specimen cultivated from this collection); *s. loc.*, a few feet above high water mark, *J.D.McComish 77A* (K, NSW).

To judge from the very limited material available, the plant from Lord Howe Is. differs consistently from that of Norfolk Is. in the size of its corolla: 3.5 cm long as opposed to 2.5 cm on Norfolk Is. Corolla size seems to be significant in *Calystegia* and the Lord Howe Is. entity may represent a separate subspecies. The leaves on the Lord Howe Is. plant also seem to be consistently broader.

2. Calystegia soldanella (L.) R.Br., *Prodr.* 484 (1810)

Convolvulus soldanella L., *Sp. Pl.* 1: 159 (1753); *C. sepium* var. *soldanella* (L.) F.Muell., *Fragm.* 9: 78 (1875). T: Europe; lecto: LINN 218.58, *fide* A.D.J.Meeuse, *Bothalia* 6: 697 (1958); IDC microfiche 177/2.123/1. So called from a resemblance of the leaves to those of the genus *Soldanella*, which itself is thought to be named from the diminutive of the Italian *soldo* (a small coin), in allusion to the rounded leaves.

Calystegia soldanella var. *australis* Endl., *Prodr. Fl. Norfolk.* 52 (1833). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W.

Illustrations: J.T.Salmon, *New Zealand Fl. & Pl. Colour* 22, fig. 20 (1963); L.Cockayne, *New Zealand Pl. Story* 4th edn, 49, fig. 15 (1967); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 355, fig. 49D (1986).

Prostrate herb with a creeping rhizome. Leaves with petiole 1–6 cm long; lamina reniform with a shallow sinus, 1–4 cm long, 1.5–6 cm broad, attenuate onto petiole, entire to slightly and shallowly sinuate-denticulate, rounded to slightly emarginate with a minute apiculum. Flowers solitary; pedicel 2–9 cm long; bracts ovate, 1–1.4 cm long, cordate, obtuse. Sepals slightly longer than bracts, obtuse, mucronate. Corolla funnel-shaped, 3.5–4 cm long, pink with 5 white longitudinal bands. Fruit ovoid-globose, 1.5 cm long, apiculate. Seeds dark brown, smooth. Fig. 58.

Norfolk Is., Lord Howe Is. Local, near Kingston, on Norfolk Is.; more widespread in suitable habitats on Lord Howe Is. This species is widespread in northern and southern temperate regions, growing in sand by the sea.

N.Is.: Emily Bay, *R.D.Hoogland 6611* (CANB); *s. loc.*, *J.Backhouse 693* (K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW). **L.H.Is.:** North Beach, *R.D.Hoogland 8693* (CANB); Blinky Beach, *A.C.Beauglehole 5609* (CANB); Salmon Beach, *P.S.Green 1960* (K).

3. DICHONDRA

Dichondra J.R.Forst. & G.Forst., *Char. Gen. Pl.* 39, t. 20 (1775); from the Greek *di* (two) and *chondros* (a grain), in allusion to the small, grain-like fruits.

Type: *D. repens* J.R.Forst. & G.Forst.

Perennial herbs with creeping stems. Leaves entire. Flowers axillary, solitary, inconspicuous; bracts minute. Sepals 5, free, subequal. Corolla actinomorphic, campanulate, deeply 5-lobed.

Stamens exerted. Ovary deeply 2-lobed, with 2 ovules per lobe; styles 2, inserted between lobes; stigma capitate. Fruit a 2-lobed, irregularly 2-valved capsule, or indehiscent. Seeds globose, slightly 3-angled.

A small genus of 9 species from warm temperate and tropical regions; 1 species native on Norfolk Is.

Dichondra repens J.R.Forst. & G.Forst., *Char. Gen. Pl.* 40, t. 20 (1775)

T: New Zealand, *J.R. & G.Forster*; syn: K. So called from the Latin *repens* (creeping), alluding to its prostrate habit.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 355, fig. 49H (1986); R.W.Johnson in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1141, fig. 528A (1986); G.R.M.Dashorst & J.P.Jessop, *Pl. Adelaide Plains & Hills* 123, t. 54, fig. 4 (1990).

Prostrate herb, rooting at nodes, softly hairy. Leaves with petiole 3–10 cm long; lamina reniform to orbicular, 0.5–2.5 cm broad, cordate, attenuate onto petiole, entire, rounded to shallowly emarginate. Pedicels c. half as long as petiole; bracts basal, c. 0.5 mm long. Sepals oblong to elliptic, 2–3 mm long, obtuse to acute. Corolla usually slightly shorter than calyx, greenish yellow; lobes ovate to elliptic. Capsule lobes almost free, globose, 1.5–2 mm long, pilose.

Norfolk Is. Locally common in short turf in paddocks and grazed pastures. Found throughout the warmer regions of the world.

N.Is.: Ball Bay, *P.S.Green 1883* (K); Mt Pitt, 1937, *J.D.McComish* (NSW); *s. loc., W.Laing* (CHR).

76. BORAGINACEAE

Herbs, annual, biennial or perennial, rarely shrubs or trees. Stems and leaves often hispid. Leaves simple, usually alternate or basal leaves in a rosette, without stipules. Inflorescence axillary, terminal, usually a scorpioid or helicoid cyme, occasionally flowers solitary. Flowers usually actinomorphic, sometimes slightly zygomorphic, bisexual. Sepals usually 5, free or basally joined. Corolla 5-lobed, funnel-shaped, salverform or campanulate, often with 5 scales, dimples or tufts of hairs at base of lobes. Stamens 5, inserted on corolla tube alternate with petals. Ovary superior, 2-locular, or 4-locular by a false septum; ovule 1 per locule, basal; style gynobasic or intermediate; stigma simple or 2-lobed. Fruit of 2 or 4 nutlets, rarely drupaceous.

A family of c. 100 genera and over 2000 species, cosmopolitan in distribution but especially from the Mediterranean and western North America; 2 introduced genera are recorded from Norfolk Is. Various members are cultivated in gardens, for example *Myosotis sylvatica* L. (Forget-me-not), *Borago officinalis* L. (Borage) and *Symphytum officinale* L. (Comfrey).

G.Bentham, Boragineae, *Fl. Austral.* 4: 383–410 (1869); I.M.Johnston, Studies in the Boraginaceae, Representatives of Three Subfamilies in Eastern Asia, *J. Arnold Arbor.* 32: 1–26, 99–122 (1951); I.M.Johnston, Boraginaceae, *Fl. Trinidad & Tobago* 2: 193–194 (1953); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Boraginaceae, *Fl. Java* 2: 457–464 (1965); H.Heine, Boraginaceae, *Fl. Nouv.-Calédon.* 7: 95–118 (1976).

KEY TO GENERA

Stamens unequal, some exserted; nutlets without hooked bristles; leaves somewhat hispid **1. ECHIUM**

Stamens equal, not exserted; nutlets covered with hooked bristles; leaves softly short hairy to coarsely hirsute **2. CYNOGLOSSUM**

1. ECHIUM

Echium L., *Sp. Pl.* 1: 139 (1753); *Gen. Pl.* 5th edn, 68 (1754); from the Greek name for a plant, *echion*, which was said to be good against the bite of a snake (*echis*).

Type: *E. italicum* L.

Annual, biennial or perennial herbs or rarely shrubs, ±hispid or scabrous from stiff, bulbous-based hairs. Basal leaves in a rosette; cauline leaves alternate. Inflorescence a usually paniculate 1-sided cyme, sometime spicate, bracteate. Calyx 5-lobed; lobes often unequal, usually basally connate, usually accrescent in fruit. Corolla oblique and slightly zygomorphic, funnel-shaped with straight or slightly curved tube and open throat; base of tube with minute scales. Stamens inserted c. middle of corolla tube, unequal, ±exserted. Style exserted; stigma ±2-lobed. Nutlets 4, ovoid, 3-angled, often somewhat beaked, usually tuberculate.

A genus of c. 40 species from Europe, Asia, North and South Africa and Macaronesia (from the Azores to the Cape Verde Islands); 1 species naturalised on Norfolk Is.

*Echium plantagineum L., *Mant. Alt.* 202 (1771)

T: Europe; lecto: illustration in J.Barrelier, *Plantae per Galliam, Hispaniam & Italiam*, 145, t. 1025 (1714), *fide* P.E.Gibbs, *Lagascalia* 1: 58 (1971). So called from a resemblance of the leaf-rosette to that of *Plantago* (Plantain).

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 561 (1981); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 362, fig. 50A (1986); H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1157, fig. 535B (1986).

Annual or biennial herb, erect to c. 60 cm or more. Lower leaves with lamina narrowly to broadly lanceolate or ovate, 5–20 cm long, 1.5–10 cm broad, attenuate onto short petiole, acute; upper leaves cordate, sessile; all leaves slightly rough with appressed hairs. Inflorescence spicate or paniculate. Calyx 0.8–1 cm long in flower, 1.5 cm long in fruit. Corolla 2–3 cm long, purplish blue. Stamens with 2 exserted and 3 ±included. Ovary 4-lobed; style 3.5 cm long, hairy; stigma bifid. Nutlets 2–3 mm long, pointed, rugulose.

Norfolk Is. A native of the Mediterranean region, now widespread as a pasture weed.

N.Is.: *s. loc., J.D.McComish 241* (NSW); *s. loc., P.Ralston 88* (A).

This species has been declared a noxious weed in some Australian States (called Paterson's Curse), but has also provided fodder for stock when there is no other food (and called Salvation Jane).

2. CYNOGLOSSUM

Cynoglossum L., *Sp. Pl.* 1: 134 (1753); *Gen. Pl.* 5th edn, 65 (1754); from the Greek *kyon* (a dog) and *glossa* (a tongue), in allusion to the resemblance of the leaves to a hound's tongue.

Type: *C. officinale* L.

Annual, biennial or perennial herbs, usually densely hairy with short and long hairs. Basal leaves in a rosette, often long-petiolate; cauline leaves alternate, shortly petiolate to subsessile. Inflorescence terminal, with 1 or more scorpioid cymes, with or without bracts. Sepals almost free, accrescent and spreading or recurved in fruit. Corolla actinomorphic, funnel-shaped or salverform, with a short tube and scales at throat; lobes obtuse. Stamens included. Ovary 4-lobed; style short, inserted near base; stigma capitate. Nutlets 4, somewhat flattened-ovoid to subglobose, spreading, covered with hooked bristles.

A genus of c. 55 species from temperate and warm temperate regions of the world; 1 species naturalised on Norfolk Is.

***Cynoglossum australe** R.Br., *Prodr.* 495 (1810)

T: Port Jackson and Tasmania, Australia, *R.Brown*; syn: BM. The epithet is from the Latin *australis* (southern), alluding to its distribution.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 362, fig. 50C (1986); H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1154, fig. 534A (1986); B.A.Auld & R.W.Medd, *Weeds* 125 (1987).

Perennial herb with 1 or more erect stems to c. 1 m tall, coarsely hirsute. Basal leaves with petiole 2–10 cm long; lamina oblanceolate, 5–15 cm long, 1–3 cm broad; cauline leaves progressively smaller and sessile. Sepals rounded, c. 1.5 mm long. Corolla funnel-shaped, blue; tube c. 2 mm long, with small scales in throat; lobes rounded, c. 2 mm long. Anthers subsessile. Style c. 1.5 mm long. Nutlets ovoid, c. 2 mm long, flattened, with barbed spines in centre of outer face and around wing-like margin.

Norfolk Is. An introduction recorded over a century ago and probably not to be found on the Island today; native throughout Australia.

N.Is.: in the vicinity of the Settlement, *A.Cunningham 102* (K).

77. VERBENACEAE

Herbs, shrubs or trees. Stems often 4-angled. Leaves opposite or whorled, rarely alternate, simple or compound, without stipules. Inflorescence axillary or terminal, racemose, spicate or cymose, often forming a head. Flowers ±zygomorphic, rarely actinomorphic (*Avicennia*), bisexual. Calyx campanulate or tubular, usually 4-lobed or toothed, accrescent. Corolla funnel-shaped, salverform or campanulate, 4 or 5 (–8)-lobed, sometimes 2-lipped, imbricate. Stamens usually 4 and paired, occasionally 2 or 5, inserted in corolla tube. Ovary superior, usually 2-locular, often 4-locular by a false septum, with 1 or 2 ovules per locule; style terminal; stigma entire or lobed. Fruit a schizocarp, capsule, berry or drupe.

A family of c. 90 genera and 3000 species, mostly tropical or subtropical; 3 genera occur on the Islands.

The genus *Avicennia* is sometimes segregated as a monotypic family, Avicenniaceae (*e.g.*: B.L.Rye in J.R.Wheeler *et al.*, *Fl. Kimberley Region* 800 (1992); B.J.Conn in G.J.Harden, *Fl. New South Wales* 3: 621 (1992)).

G.Bentham, Verbenaceae, *Fl. Austral.* 5: 31–70 (1870); J.C.Schauer, Verbenaceae in A.L.P.P. de Candolle, *Prodr.* 11: 522–700 (1847); H.J.Lam, *The Verbenaceae of the Malayan Archipelago* (1919); H.J.Lam & R.C.Bakhuizen van den Brink, Revision of the Verbenaceae of the Dutch East Indies and surrounding countries, *Bull. Jard. Bot. Buitenzorg* ser. 3, 3: 1–116 (1921); C.A.Backer & R.C.Bakhuizen van den Brink Jr, *Fl. Java* 2: 594–614 (1963); H.N.Moldenke, *A Fifth Summary of the Verbenaceae of the World as to valid taxa, geographic distribution, and synonymy* (1971); H.N. & A.L.Moldenke, Verbenaceae, *Revis. Handb. Fl. Ceylon* 4: 196–487 (1983); B.Verdcourt, *Fl. Trop. E. Africa*, Verbenaceae: 1–155 (1992).

KEY TO GENERA

1 Shrubs or trees; flowers yellow, orange, pink, red or reddish orange

2 Leaves ovate or broadly ovate, hispid-scabrous, crenate-serrate; flowers showy **1. LANTANA**

2: Leaves elliptic or slightly oblanceolate, smoothly hairy below, entire; flowers relatively small **3. AVICENNIA**

1: Herbs, perennial or annual; flowers purplish blue **2. VERBENA**

1. LANTANA

Lantana L., *Sp. Pl.* 2: 626 (1753); *Gen. Pl.* 5th edn, 275 (1754); a late Latin name for *Viburnum* (from *lento*, to bend), transferred to this genus.

Type: *L. camara* L.

Perennial herbs or shrubs, sometimes scrambling, usually scabrid or hispid, often with stout prickles, ±aromatic. Stems 4-angled. Leaves opposite or ternate, usually simple, serrate or dentate, often rugose and glandular. Inflorescence terminal or axillary, usually corymbose or capitate, sometimes spicate. Flowers slightly zygomorphic, sessile, bracteate. Calyx small, 2-lobed. Corolla with a narrow, cylindrical tube and 4 or 5 spreading lobes. Stamens 4, in pairs, inserted near middle of corolla tube, included. Ovary 2-locular; ovule 1 per locule; style short, included; stigma oblique. Fruit drupaceous, 2-locular, usually fleshy at maturity, or divided into 2 pyrenes.

A genus of c. 150 species from tropical and subtropical America; 1 species is naturalised on the Islands. Some are widely cultivated as ornamentals.

***Lantana camara** L., *Sp. Pl.* 2: 627 (1753)

T: tropical America; lecto: LINN 783.4, *fide* H.N. & A.L.Moldenke, *Revis. Handb. Fl. Ceylon* 4: 220 (1983); IDC microfiche 177/2.4122/1. The epithet is a South American name for a species in this genus.

Illustrations: R.A.Buchanan, *Common Weeds Sydney Bushland* 34 (1981); A.A.Munir in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1174, fig. 544A (1986); B.A.Auld & R.W.Medd, *Weeds* 234 (1987).

Shrub to 3 m tall, erect or almost scrambling. Branches usually armed with recurved prickles and asperous with stiff hairs, aromatic when bruised. Leaf lamina ovate to broadly ovate, 3–12 cm long, 1.7–7 cm broad, rounded to truncate or subcordate at base, crenate-serrate, acute to shortly acuminate, hispid or scabrous above, shortly pilose below. Inflorescence axillary, capitate, somewhat hemispherical; peduncle 2–9 cm long, pilose; bracts lanceolate, 4–7 mm long. Calyx 1.5–2 mm long. Corolla opening yellow or orange and turning pink, red or reddish orange, rarely white; tube c. 10 mm long; limb 6–10 mm wide, densely puberulent externally. Drupe globose, c. 5 mm long, dark purple or blue black.

Norfolk Is., Lord Howe Is. A native of tropical America which has escaped from gardens and become a notorious and widespread noxious weed. Unfortunately common on Norfolk Is., less frequent on Lord Howe Is.

N.Is.: c. 3.2 km NE of the Cemetery, *G.Uhe 1106* (K); near Burnt Pine, *K.S.Harley 1* (BRI); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW). **L.H.Is.:** S end of the golf club, *A.N.Rodd 3602* (NSW).

2. VERBENA

Verbena L., *Sp. Pl.*, 1: 18 (1753); *Gen. Pl.* 5th edn, 12 (1754); the Latin word for the foliage and twigs of laurel, myrtle *etc.* used for religious purposes; applied to this genus by Linnaeus.

Type: *V. officinalis* L.

Annual or perennial herbs or subshrubs. Stems ±4-angled. Leaves opposite, rarely whorled, entire to pinnatifid. Inflorescence terminal, spicate or often paniculate to corymbose. Flowers sessile or subsessile; bracts small. Calyx tubular, 5-ribbed and unequally 5-toothed, accrescent. Corolla slightly zygomorphic, funnel-shaped or salverform, ±2-lipped; lobes 5, emarginate or rounded. Stamens 4, in 2 unequal pairs, included. Ovary 4-locular; ovule 1 per locule; style short, included; stigma notched or bifid. Fruit of 4 nutlets, enclosed within persistent calyx.

A genus of c. 250 species, mostly from tropical and subtropical America; 3 species are naturalised on the Islands.

P.F.Yeo, A re-definition of *Verbena brasiliensis* Vell., *Kew Bull.* 45: 101–120 (1990).

1 Lower leaves 2–5 (–11) cm long; spikes usually 3.5–4 mm broad; corolla 2.5–3.5 mm long **3. V. litoralis**

1: Lower leaves (3–) 5–10 (–12) cm long; spikes 5–7 mm broad; corolla 5–7 mm long

2 Spikes usually 0.5–1.5 cm long; corolla 5–7 mm long; anthers just above middle of corolla tube; leaf base stem-clasping **1. V. bonariensis**

2: Spikes usually 1.5–4.5 cm long; corolla 4–4.5 mm long; anthers just below throat of corolla tube; leaf base stem-clasping or cuneate **2. V. brasiliensis**

1. *Verbena bonariensis L., *Sp. Pl.* 1: 20 (1753)

T: Argentina; lecto: LINN 35.11, *fide* P.F.Yeo, *Kew Bull.* 45: 105 (1990); IDC microfiche 177/2.14/19. The epithet means from Buenos Aires.

Illustrations: G.Ell, *Introduced Wild Fl. New Zealand, Weeds* 50, 51 (1983); P.F.Yeo, *Kew Bull.* 45: 106, fig. 2 (1990).

Perennial herb, rigidly erect to c. 2 m tall, scabrid to hispid or hirsute. Lower and middle leaves with lamina ovate to ovate-lanceolate, (3–) 5–10 (–12) cm long, 1–3 cm broad, acute to rounded at base, stem-clasping or somewhat auriculate, irregularly serrate, long-acute; upper leaves with lamina smaller and narrower, less serrate. Inflorescence a cymose cluster of spikes, each 5–15 mm long, elongating with age, 5–7 mm broad. Calyx tube c. 3 mm long, with short teeth. Corolla overtopping spike, 5–7 mm long, purple; limb 4–5 mm diam. Stamens inserted near middle of corolla tube; filaments very short. Nutlets 1.5–2 mm long, 2.5–3.5 times as long as broad.

Norfolk Is. A native of South America, from southern Brazil to Argentina. Presumably introduced as a garden ornamental, now commonly naturalised and spreading on the Island.

N.Is.: Stockyard Rd, *W.R.Sykes NI 161* (CHR).

2 *Verbena brasiliensis Vell., *Fl. Flum.* 16 (1829) & t. 40 (1831)

T: none designated. So named after the country whence it was first described.

[*Verbena bonariensis auct. non* L.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 150 (1898); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 157 (1917); A.N.Rodd & J.Pickard, *Cunninghamia* 1: 278 (1983)]

Illustrations: A.A.Munir in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1177, fig. 545A (1986); B.A.Auld & R.W.Medd, *Weeds* 236 (1987); P.F.Yeo, *Kew Bull.* 45: 110, fig. 3 (1990).

Perennial herb to 2 m tall, sparsely or freely hispid throughout. Lower and middle leaves with lamina rhombic-lanceolate to lanceolate, (1.5–) 5–8 (–12) cm long, 1.2–2 (–3.2) cm broad, acute and stem-clasping or just narrowed at base, regularly or irregularly serrate, acute; upper leaves smaller, narrower. Inflorescence widely branched, arising from an acute angle, with cymose clusters of often sessile spikes, each 1.5–4.5 cm long, 5.5–6.5 mm broad. Calyx tube 2.5–3.5 mm long, with short teeth. Corolla 4–4.5 mm long, not overtopping spike except for last flowers, purple; limb 3–3.5 mm diam. Stamens inserted just below throat of corolla; filaments very short. Nutlets 1–1.7 mm long, 2–3.3 times as long as broad. *Gin Case*.

Lord Howe Is. A native of much of South America, cultivated as a garden plant and now a common and often troublesome weed throughout the tropics.

L.H.Is.: Lagoon Beach, opposite 'Pine Trees'. *J.Pickard 2694* (NSW); Rocky Run valley, *J.Pickard 2838* (NSW); Potato Hills, S end of Little Slope, *J.Pickard 2779* (NSW); Rabbit Is., *A.N.Rodd 1810* (NSW); *s. loc.*, 1898, *J.H.Maiden* (NSW).

The name Gin Case is said to have been given to it on the Island because it appeared on the spot where, about 1860, the packing from a gin-case had been emptied out.

3. *Verbena litoralis Kunth in F.W.H.A. von Humboldt, A.J.A.Bonpland & K.S.Kunth, *Nov. Gen. Sp.* 2: t. 137 (1817) & 276 (1818)

T: Venezuela, *F.W.H.A. von Humboldt & A.J.A.Bonpland*; holo: ?P *n.v.* So called as a littoral plant, growing by the sea.

[*Verbena officinalis auct. non* L.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 712 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 36 (1915)]

Illustrations: K.S.Kunth, *loc. cit.* (1817); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 372, fig. 51E (1986); P.F.Yeo, *Kew Bull.* 45: 116, fig. 4 (1990).

Perennial herb, erect to 1 m or more tall. Stems somewhat hispid. Lower and middle leaves with lamina ovate or rhombic-ovate to oblanceolate, 2–5 (–11) cm long, 0.5–2.5 cm broad, gradually tapered to a short petiole, coarsely serrate, acute; upper leaves with lamina smaller and narrower. Inflorescence loosely paniculate; spikes dense at first, becoming much elongated, usually 3.5–4 mm broad. Calyx tube 2–3 mm long, with short teeth. Corolla 2.5–3.5 mm long, bluish purple; limb 2–3 mm diam. Stamens inserted just below corolla mouth; filaments very short. Nutlets c. 1.5 mm long, 2 or 3 times as long as broad.

Norfolk Is. A widespread native in South America, now widely naturalised as a weed, and locally common on roadsides *etc.* on Norfolk Is.

N.Is.: Mt Pitt Reserve, *W.R.Sykes NI 367* (CHR); S of road to Mt Pitt, *G.Uhe 1196* (K); New Cascade Rd, *W.R.Sykes NI 169* (CHR); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW).

3. AVICENNIA

Avicennia L., *Sp. Pl.* 1: 110 (1753); *Gen. Pl.* 5th edn, 49 (1754); named after the celebrated Arabic or Persian philosopher and author of many works, including some on the natural sciences, abu-Ali al-Husayn ibn-Sina (980–1037), whose Latinised name was *Avicenna*.

Type: *A. officinalis* L.

Shrubs or trees of intertidal zone, with pneumatophores. Leaves opposite, simple, entire. Inflorescence axillary or terminal, umbellate, spicate or paniculate-capitate. Flowers actinomorphic, sessile or subsessile, imbricate-bracteate. Calyx deeply 5-lobed, imbricate, not accrescent. Corolla campanulate to rotate; tube short; lobes 4, spreading. Stamens 4, inserted in corolla throat. Ovary superior, 1-locular but imperfectly divided into 4; ovules 4, pendant with free-central placentation; style 2-lobed. Fruit a capsule, dehiscing by 2 valves, 1-seeded.

A genus of 14 species widely distributed in coastal regions throughout the warmer parts of the world; 1 species native on Lord Howe Is. One of the constituent genera of mangrove communities.

1. Avicennia marina (Forssk.) Vierh., *Denkschr. Kaiserl. Akad. Wiss. Wien. Math.-Naturwiss. Kl.* 71: 435 (1907)

subsp. **australasica** (Walp.) J.Everett, *Telopea* 5: 628 (1994)

Avicennia tomentosa var. *australasica* Walp., *Repert. Bot. Syst.* 4: 133 (1845); *A. marina* var. *australasica* (Walp.) N.C.Duke, *Austral. Syst. Bot.* 4: 373 (1991). T: Australia; holo: not traced. So called as coming from Australia.

Avicennia resinifera G.Forst., *Pl. Esc.* 72 (1786); *A. marina* var. *resinifera* (G.Forst.) Bakh., *Bull. Jard. Bot. Buitenzorg* III 3: 210 (1921). T: New Zealand, *J.R. & G.Forster*; holo: not traced.

[*Avicennia officinalis auct. non* L.: F.J.H. von Mueller, *Fragm.* 9: 78 (1875); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 132 (1898); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 150 (1917)]

Illustrations: E.R.Rotherham *et al.*, *Fl. & Pl. New South Wales & S Queensland* 18, t. 2, 3 (1975); W.R.Elliot & D.L.Jones, *Encycl. Austral. Pl.* 2: 264 (1982); I.Hutton, *Lord Howe Is.* 120 (1986).

Tree to c. 3 m tall (or more elsewhere); roots spreading, with numerous erect pneumatophores. Leaves with petiole 0.5–1 cm long; lamina elliptic to slightly rhombic or oblanceolate, 4–8 cm long, 1.5–3 cm broad, acutely attenuate onto petiole, entire, acute to

obtuse, leathery, pale scurfy-tomentose below, glabrescent above. Inflorescence terminal or in upper leaf axils, of small, dense, 3–7-flowered cymes; peduncle 4-angled, 2–4 cm long. Flowers sessile or subsessile. Sepals ovate, 2.5–3 mm long, dorsally silky-hairy. Corolla tube c. 1 mm long; lobes ovate, 2.5–3 mm long, yellow-orange, glabrous within, silky-hairy dorsally. Capsule compressed-ovoid, c. 2 cm tall, yellowish brown, finely tomentose. *Mangrove*.

Lord Howe Is. One small population of c. 7 or 8 trees occurs at the high tide mark on the north side of Old Settlement Bay. Flowers mid Apr.–late Sep.

L.H.Is.: W shore of Hunters Bay, *J.D.McComish 126* (K, NSW); *loc. id., J.Pickard* in *A.N.Rodd 1446* (NSW); *loc. id., J.C.Game 69/106* (K); *loc. id., P.S.Green 2047* (K).

This subspecies is found in Australia, the North Is. of New Zealand, New Caledonia, Papua New Guinea and the Philippines.

Doubtful records

The genus *Premna* was recorded from Lord Howe Is. by C.Moore (in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 3, 1870), but it has not been re-collected, and W.B.Hemsley (*Ann. Bot.* (*London*) 10: 284, 1896) stated that the specimen was 'flowerless and indeterminable'. *Duranta erecta* L. (syn. *D. repens* L.), with its lavender coloured flowers and orange berries, is commonly grown as a hedge plant on Norfolk Is. Occasionally it may be found in abandoned gardens, but does not seem to be truly naturalised. *Vitex trifolia* L. (as *V. ovata* Thunb.) was supposedly recorded from Norfolk Is. by A.Cunningham (cited by R.Heward, *London J. Bot.* 1: 123, 1842); but *Vitex* has not been found on the Island by anyone else, and there is no supporting specimen among the Cunningham collections at K or BM. Although such a record might not be unexpected in the context of the distribution of this species, it is suspected that in this case a collection from Australia may have been wrongly labelled.

78. LAMIACEAE

Herbs, shrubs or rarely small trees, usually aromatic. Stems usually 4-angled. Leaves opposite or rarely whorled, usually simple, without stipules. Inflorescence terminal, of apparently axillary cymose clusters in verticillasters, sometimes reduced to 1 flower. Flowers usually zygomorphic, usually bisexual. Calyx 5-lobed, often 2-lipped, persistent. Corolla usually 2-lipped, with upper 2-lobed, lower 3-lobed, rarely almost equally 4- or 5-lobed. Stamens 4 in unequal pairs, or 2, sometimes with 2 staminodes, inserted in corolla tube. Ovary superior, 2-carpellate, deeply divided into 4 lobes, each with 1 ovule; style usually gynobasic, usually with 2 stigmatic arms. Fruit a schizocarp of 4 nutlets, dry or rarely fleshy.

A family of 200 or more genera and over 3000 species, cosmopolitan in distribution, but especially common in the Mediterranean region and Central America; 2 native and 6 introduced genera occur on the Islands. The family contains several well-known scented and culinary herbs, such as Lavender (*Lavandula angustifolia* Mill.), Sage (*Salvia officinalis* L.), Basil (*Ocimum basilicum* L.) and Oregano or Marjoram (*Origanum* spp.).

G.Bentham, Labiatae, *Fl. Austral.* 5: 70–137 (1870); J.I.Briquet, Labiatae, *Nat. Pflanzenfam.* 4(3a): 200 (1895); C.A.Backer & R.C.Bakhuizen van den Brink Jr, *Fl. Java* 2: 617 (1965); H.Keng, A revision of Malesian Labiatae, *Gard. Bull. Singapore* 24: 13–180 (1969); H.Keng, Labiatae, *Fl. Males.* ser. I, 8: 301–394 (1978).

KEY TO GENERA

1 Woody shrub with linear leaves in whorls of 3 or 4 — **8. WESTRINGIA**

1: Herbs or subshrubs with ±broad leaves borne in opposite pairs

2 Calyx 2-lipped

3 Subshrubs; pedicels 2–4.4 mm long; corolla tube strongly declinate; leaves densely villous — **1. PLECTRANTHUS**

3: Herbs; pedicels 0–2 mm long; corolla tube horizontal or inclined upwards; leaves hairy but not villous

4 Calyx lips divergent; stamens 2; middle lobe of lower lip of corolla ±entire — **3. SALVIA**

4: Calyx lips pressed together; stamens 4; middle lobe of lower lip of corolla denticulate — **4. PRUNELLA**

2: Calyx not 2-lipped; lobes ±equal

5 Corolla ±actinomorphic — **2. MENTHA**

5: Corolla distinctly 2-lipped

6 Calyx lobes spreading, becoming hooked at tips; anthers included — **5. MARRUBIUM**

6: Calyx lobes not spreading, acute to acuminate but not hooked; anthers exserted, below hooded upper corolla lip

7 Verticillasters subtended by ovate-lanceolate leaves or leaf-like bracts; anthers glabrous; lateral lobes of lower corolla lip obscure, rounded — **6. STACHYS**

7: Verticillasters subtended by broadly ovate, amplexicaul bracts; anthers pilose; lateral lobes of lower corolla lip well developed — **7. LAMIUM**

1. PLECTRANTHUS

Plectranthus L'Hér., *Stirp. Nov.* 4: 84 verso (1788); from the Greek *plectron* (a spur) and *anthos* (a flower), alluding to the corolla spur in some species.

Type: *P. fruticosus* L'Hér.

Annual or perennial herbs or subshrubs. Stems and leaves often somewhat succulent. Leaves opposite, simple or lobed, petiolate. Inflorescence usually terminal and spike-like. Flowers axillary, in cymes or verticillasters. Calyx cylindrical to campanulate, 2-lipped to almost actinomorphic, 10-nerved, 5-toothed. Corolla 2-lipped; upper lip short, 3- or 4-lobed, recurved; lower lip boat-shaped, entire; tube longer than calyx. Stamens 4, inserted in corolla tube, ±enclosed in lower lip; anthers 1-locular. Style shortly 2-lobed, ±enclosed in lower lip. Nutlets ovoid-globose to oblong, smooth or granulate.

A genus of c. 300 species from the warm temperate to tropical regions of the Old World. One native species formerly recorded from Lord Howe Is.

S.T.Blake, A revision of *Plectranthus* (Labiatae) in Australasia, *Contr. Queensland Herb.* 9: 1–120 (1971).

Plectranthus graveolens R.Br., *Prodr.* 506 (1810)

T: Port Clinton, [Queensland], 1802, *R.Brown*; lecto: BM, *fide* S.T.Blake, *Contr. Queensland Herb.* 9: 18 (1971); isolecto: K. The epithet means strong smelling, from the Latin *gravis* (heavy, weighty) and *olens* (smelling).

[*Plectranthus parviflorus auct. non* Willd.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 132 (1898); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 150 (1917)]

Illustrations: S.T.Blake, *Contr. Queensland Herb.* 9: 67, fig. 6 (1971); N.C.W.Beadle, *Students Fl. NE New South Wales* 5: 863, fig. 379B (1984).

Subshrub to 1 m tall, strongly aromatic. Stems densely glandular-pubescent and pilose. Leaves with lamina broadly ovate to ovate, 3–10 cm long, 2–7 cm broad, obtuse, truncate or rounded at base, evenly serrate-dentate, acute to obtuse, densely villous on both surfaces and glandular below. Inflorescence terminal, racemose; verticillasters 5–12-flowered; pedicels 2–4 mm long. Calyx ±2-lipped, zygomorphic, somewhat scoop-shaped, 1.5–2.5 mm long; lower teeth longest, accrescent. Corolla 8–9 mm long, violet-blue; tube deflexed, oblique at mouth; upper lobes deflexed; lower lip largest. Nutlets ovoid-globose, c. 1 mm long.

Lord Howe Is. Collected on the Island by Maiden (*Proc. Linn. Soc. New South Wales* 23: 132, 1898, as *P. parviflorus*) but not collected since, presumably therefore extinct. Known from eastern Qld and N.S.W., Australia.

L.H.Is.: *s. loc.*, 1898, *J.H.Maiden* (NSW).

2. MENTHA

Mentha L., *Sp. Pl.*, 2: 576 (1753); *Gen. Pl.* 5th edn, 250 (1754); the ancient Latin name for plants of this genus.

Type: *M. spicata* L.

Perennial or rarely annual herbs, rhizomatous, aromatic. Leaves simple, usually toothed, with sessile glands; petiole present or absent. Inflorescence of usually dense verticillasters, axillary or in terminal spikes or heads. Calyx campanulate to cylindrical, 10-nerved, with 5 equal or almost equal teeth. Corolla with tube shorter than calyx, subequally 4-lobed or scarcely 2-lipped; upper lobe slightly wider than the others, truncate, emarginate or 2-lobed. Stamens 4, equal, inserted just below mouth of corolla tube, usually exserted. Style gynobasic; stigma bifid. Nutlets ovoid to ellipsoidal or obovoid, smooth, reticulate or tuberculate.

A genus of 25 species, mostly from temperate Eurasia, but also represented in Australia; 2 species naturalised on the Islands.

Leaves sessile or almost so; smelling of spearmint	**1. M. spicata**
Leaves usually distinctly petiolate; smelling of peppermint	**2. M. × piperita**

1. *Mentha spicata L., *Sp. Pl.* 2: 576 (1753)

T: Europe; lecto: Herb. Clifford, BM, *fide* A.O.Tucker *et al.*, *Taxon* 29: 234 (1980). So called from its spicate inflorescence.

[*Mentha viridis auct. non* (L.) L.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 763 (1904)]

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 24: t. 3 (1967); H.R.Toelken in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1203, fig. 554I (1986).

Strongly rhizomatous perennial. Stems 4-angled, erect, to 1 m tall, ±branched, glabrous or sparsely hairy. Leaves sessile or with petiole to 3 mm long; lamina elliptic to ovate or oblong, 3–9 cm long, 1–2.5 cm broad, rounded to cordate at base, sharply serrate, obtuse to shortly acuminate. Inflorescence a terminal cylindrical spike, sometimes interrupted below, 3–10 cm long; verticillasters dense, subtended by linear bracts longer than flowers; lowest pair of bracts sometimes leaf-like. Calyx 1.5–2.5 mm long; lobes linear-lanceolate, sparsely pilose. Corolla 3–5 mm long, scarcely 2-lipped, ±glabrous, lilac. Stamens exserted. Nutlets broadly ovoid, 1.5 mm long, often abortive.

Norfolk Is., Lord Howe Is. Probably a native of south-central Europe. Although recorded from Norfolk Is. by Maiden (*Proc. Linn. Soc. New South Wales* 28: 763, 1904) as 'abundantly acclimatised', no specimens from that Island have been seen; presumably he referred to cultivated plants.

L.H.Is.: Kings Beach area, *A.C.Beauglehole 5613* (NSW).

The culinary Spearmint, which is widely grown and often escapes from cultivation.

2. *Mentha × piperita L., *Sp. Pl.* 2: 576 (1753)

T: England; lecto: J.Ray, *Synops. Meth. Stirp. Brit.* 3rd edn, 234, t. 10, fig. 2 (1724), *fide* A.O.Tucker *et al.*, *Taxon* 29: 235 (1980). The epithet means pepper-like, referring to its taste, from the Greek for pepper, *peperi*.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 24: t. 4 (1967); H.R.Toelken in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1203, fig. 554E (1986).

Rhizomatous perennial. Stems erect, 4-angled, ±branched, glabrous or with a few scattered hairs. Leaves with petiole 4–15 mm long; lamina lanceolate to lanceolate-elliptic, 2.5–8 cm long, 1–3.5 cm broad, acute to rounded at base, serrate, acute. Inflorescence terminal, spike-like, oblong, 2–3 cm long; bracts linear, shorter or scarcely longer than flowers. Calyx 3 mm long; lobes narrowly acuminate, ciliate. Corolla 5–6 mm long, slightly 2-lipped, glabrous, reddish lilac. Stamens included. Nutlets not formed.

Norfolk Is. A garden escape, preferring wet habitats.

N.Is.: Cascade Ck, *P.Ralston 1* (A); Cascade Valley, *P.S.Green 2417* (K); Melanesian Mission Swamp, *P.S.Green 2443* (K); Watermill Dam, *W.R.Sykes NI 506* (CHR).

A hybrid resulting from a cross between *M. aquatica* and *M. spicata*.

P.S.Green 2417 and *P.Ralston 1*, cited above, represent the occasionally occurring f. *hirsuta* (Fraser) R.A.Graham. Collections of this hybrid from the Island have at one time or another been misidentified; as a result the names *M. aquatica* and *M. pulegium* have appeared in informally distributed typed lists of Norfolk Is. plants.

3. SALVIA

Salvia L., *Sp. Pl.* 1: 23 (1753); *Gen. Pl.* 5th edn, 15 (1754); the ancient Latin name for a plant, possibly *S. officinalis* (Sage), noted for its healing properties, from *salveo* (to be in good health).

Type: *S. officinalis* L.

Annual or perennial herbs or shrubs, usually strongly aromatic. Stems 4-angled. Leaves entire, pinnatisect or lobed. Inflorescence a spike or raceme of cymose verticillasters, each 2–12- or more-flowered, remote to crowded; bracts sometimes large and coloured. Calyx 2-lipped, 10-nerved; teeth unequal, upper lip 3-toothed or entire. Corolla tube slightly curved, strongly 2-lipped; upper lip ±hooded, lower lip spreading, with 2 small lateral lobes and a broader middle one. Stamens 2; filaments usually short; connective long, usually curved, articulating with filament; one arm of connective bearing an anther, the other sterile; 2 small staminodes usually present. Style long; stigmatic lobes usually unequal. Nutlets ±3-angled, smooth.

A genus of c. 800 species, almost cosmopolitan in distribution but mainly in warm temperate regions, especially south-western Asia and those parts of the New World with a Mediterranean climate; 2 species naturalised on the Islands.

Corolla scarlet, c. 2 cm long; leaves evenly crenate **1. S. coccinea**

Corolla purplish blue, c. 0.8 cm long; leaves lobed; lobes erose to crenate-serrate **2. S. verbenaca**

1. *Salvia coccinea Etl., *Comment. Salvia* 23 (1777)

T: unknown. The epithet is the Latin for scarlet, referring to the colour of the flowers.

Salvia pseudococcinea Jacq., *Collecteana* 2: 302 (1788). T: not designated.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 389, fig. 54C (1986); B.A.Auld & R.W.Medd, *Weeds* 181 (1987); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 830, t. 115 (1990).

Perennial herb, erect to c. 1 m tall. Stems slightly hispid with short, recurved and long, spreading hairs. Leaves with petiole 0.5–8 cm long, somewhat pilose; lamina deltoid-ovate, 1.5–7 cm long, 1–5 cm broad, truncate or subcordate at base, crenate, acute, glabrous to scattered-pubescent above, densely pubescent below. Inflorescence terminal, of racemose, 3–6-flowered verticillasters; bracts lanceolate, 3–6 mm long. Calyx tubular, 7–10 mm long, slightly accrescent. Corolla slightly curved, c. 2 cm long, scarlet; upper lip c. 5 mm long; lower c. 3 mm long. Nutlets c. 2.5 mm long.

Norfolk Is., Lord Howe Is. Originally an escape from gardens, but now a common and very widespread weed. Native to Brazil.

N.Is.: upper slopes of Mt Pitt, *G.Uhe 1158* (K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW). **L.H.Is.:** Middle Beach Common, *J.Pickard 1204* (K, NSW); *loc. id.*, *P.S.Green 2030* (K).

2. *Salvia verbenaca L., *Sp. Pl.* 1: 25 (1753)

T: not designated. The epithet is the name used for a plant by Pliny.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 24: t. 17 (1967); H.R.Toelken in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1223, fig. 557E (1986); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 389, fig. 54A (1986).

Perennial herb, with basal leaf rosette. Stems to c. 70 cm tall, with short glandular hairs or scattered pilose. Leaves with petiole 1–8 cm long, densely pilose, glandular, or upper leaves ±subsessile; lamina variable, oblong to ovate, 3–10 cm long, 2–5 cm broad, acute to ±truncate at base, with erose, crenate-serrate lobes on margins, acute to obtuse, rugulose, sparsely hairy above and below. Inflorescence of racemose, 4–6-flowered verticillasters; bracts broadly ovate, 3–6 mm long. Calyx somewhat campanulate, 5–10 mm long, accrescent. Corolla c. 8 mm long, purplish blue; tube ±straight; lips c. 4 mm long; upper lip hooded; lower lip with a deflexed middle lobe. Nutlets 2–2.5 mm long.

Norfolk Is. A native of the Mediterranean region, now widely naturalised.

N.Is.: Old Lime Kiln, *J.H.Maiden* in *R.M.Laing* (CHR); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW); *s. loc.*, *J.D.McComish 62A* (NSW).

4. PRUNELLA

Prunella L., *Sp. Pl.* 2: 600 (1753); *Gen. Pl.* 5th edn, 261 (1754); *prunella* or *brunella*, the medieval Latin name for inflammation of the throat or quinsy (probably from the German *Bräune*), was given to *P. vulgaris*, the plant supposed to be a cure for it.

Type: *P. vulgaris* L.

Perennial herbs. Leaves simple, entire to pinnatifid or lobed, petiolate. Inflorescence terminal, of several, closely superimposed, dense, 2–6-flowered verticillasters, bracteate. Calyx tubular to campanulate, 2-lipped, 10-nerved or ±reticulate, closed in fruit, 5-toothed. Corolla with tube straight, exserted; 2-lipped; upper lip hooded; lower with spathulate middle lobe. Stamens 4, in unequal pairs, with outer pair longer; filaments with a subapical appendage. Style scarcely exserted; stigma bifid. Nutlets obovoid-obloid, finely ribbed.

A genus of 7 species from the northern temperate regions; 1 species naturalised on Lord Howe Is.

*Prunella vulgaris L., *Sp. Pl.* 2: 600 (1753)

T: Herb. Clifford 316, *Brunella* 1ß; lecto: BM, *fide* I.C.Hedge, *Regnum Veg.* 127: 79 (1993). The epithet means common.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 24: t. 23 (1967); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 397, fig. 55D (1986); B.A.Auld & R.W.Medd, *Weeds* 180 (1987).

Herb with short rhizomes. Stems decumbent-erect to c. 40 cm tall. Leaves with petiole 1.5–3 cm long; upper leaves becoming sessile; lamina lanceolate, elliptic or ovate, 2–7 cm long, 1–3.5 cm broad, acute to obtuse at base, entire or shallowly toothed, acute with a blunt tip,

sparsely shortly pilose above, pilose on nerves below. Inflorescence subsessile or shortly pedunculate, dense, clustered, 2–5 cm long; verticillasters of usually 6 flowers subtended by broadly ovate to reniform, cuspidate bracts. Calyx 7–9 mm long, persistent; upper lip broad, with 3 very short teeth; lower lip of 2, sharply acuminate teeth. Corolla 10–15 mm long, blue or violet; middle lobe of lower lip with denticulate margins. Nutlets c. 2 mm long.

Lord Howe Is. Widespread as a weed on the Island, but probably native only in northern temperate regions.

L.H.Is.: near Big Ck, *A.C.Beauglehole 5610* (MEL).

5. MARRUBIUM

Marrubium L., *Sp. Pl.* 2: 582 (1753); *Gen. Pl.* 5th edn, 254 (1754); the name of a plant in Pliny, perhaps named after the ancient city of the same name.

Type: *M. vulgare* L.

Perennial herbs. Stems 4-angled, often becoming woody at base, often tomentose or canescent. Leaves simple, often rugose, toothed or lobed, petiolate. Inflorescence usually spike-like, of remote, dense verticillasters; bracts usually leaf-like. Calyx cylindrical, tubular or campanulate, 5- or 10-nerved, with 5 or 10 often spinescent and spreading or reflexed teeth. Corolla with tube included or barely exserted, 2-lipped; upper lip flat, ±emarginate; lower lip with a larger middle lobe. Stamens 4, in 2 pairs; lower pair longer, included. Style included; stigmatic arms short. Nutlets ovoid-ellipsoidal to oblong, almost smooth.

A genus of c. 30 species from temperate Eurasia and especially the Mediterranean region; 1 species naturalised on Norfolk Is.

*Marrubium vulgare L., *Sp. Pl.* 2: 583 (1753)

T: Herb. Clifford 312 *Marrubium* 5A; lecto: BM, *fide* J.R.Press & I.C.Hedge, *Regnum Veg.* 127: 64 (1993). The epithet means common.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 24: t. 25 (1967); H.R.Toelken in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1197, fig. 553I (1986); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 397, fig. 55B (1986).

Much-branched herb to c. 60 cm tall, densely white-tomentose. Leaves with petiole 1–3 cm long, tomentose; lamina broadly ovate to orbicular, 1–4 cm long, 1–3 cm broad, obtuse to cordate at base, irregularly crenate, obtuse to rounded, rugose, thinly tomentose above, densely so below. Inflorescence with 5–9 or more, many-flowered, ±globose verticillasters. Calyx tube 4–6 mm long; teeth 10, spreading, rigid, becoming hooked. Corolla c. 1 cm long, slightly longer than calyx, white, externally white-tomentose; upper lip c. 2 mm long, 1 mm broad, deeply bifid; lower lip with a broad middle lobe. Nutlets oblong, 3-angled, c. 2 mm long.

Norfolk Is. A native of Europe, now a widespread weed of overgrazed pastures and waste ground.

N.Is.: *s. loc.*, 1855, *W.G.Milne 6* (K); *s. loc.*, *I.Robinson 119* (NSW); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW).

6. STACHYS

Stachys L., *Sp. Pl.* 2: 580 (1753); *Gen. Pl.* 5th edn, 253 (1754); a name used by Dioscorides for some members of this family, using the Greek word for a spike (*stachys*).

Type: *S. sylvatica* L.

Annual or perennial herbs or rarely subshrubs, often rhizomatous. Leaves simple, usually crenate or serrate, sessile or petiolate. Inflorescence usually spike-like, of several, few- to many-flowered verticillasters, sometimes somewhat capitate; lower bracts leaf-like. Calyx

tubular or campanulate, obscurely 2-lipped, 5- or 10-nerved, slightly unequally 5-toothed. Corolla tube ±straight, strongly 2-lipped; upper lip hooded; lower lip 3-lobed with central lobe largest. Stamens 4, in pairs, usually exserted or included under hooded corolla lip. Style included or exserted; stigma bifid. Nutlets ovoid to obovoid or almost globose.

A mainly temperate genus of perhaps 300 species, especially from Europe and south-western Asia; 1 species naturalised on the Islands.

***Stachys arvensis** (L.) L., *Sp. Pl.* 2nd edn, 2: 814 (1763)

Glechoma arvensis L., *Sp. Pl.* 2: 578 (1753). T: not designated. The epithet means growing on arable land.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 24: t. 31 (1967); H.R.Toelken in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1223, fig. 557H (1986); B.A.Auld & R.W.Medd, *Weeds* 182 (1987).

Annual herb to c. 30 cm tall, often branched from base. Stems 4-angled, with long, spreading hairs. Leaves with petiole 0.3–3 cm long; lamina ovate to broadly ovate, 1–5 cm long, 1.7–3.5 cm broad, truncate to subcordate at base, crenate, rounded-obtuse, scattered pilose above and below. Inflorescence of 2–6 few-flowered verticillasters, lower subtended by leaves; internodes becoming shorter above. Calyx somewhat campanulate, 5–7 mm long, spreading hirsute, often tinged purple; lobes almost equal, long-acute. Corolla pink; tube 6–8 mm long, equalling the 3-lobed, spotted lower lip; upper lip erect; lateral lobes of lower lip obscure. Nutlets almost globose, c. 2 mm long, finely rugose.

Norfolk Is., Lord Howe Is. A European native now very widespread in temperate regions as a weed of disturbed ground.

N.Is.: Kingston, *P.S.Green 1880* (K); *s. loc.*, 1898, *I.Robinson* (NSW). **L.H.Is.:** between 'Pine Trees' and Eddies Glen, *A.N.Rodd 1432* (K, NSW); Lagoon Rd, Windy Point to Blinky Beach, *J.Pickard 2953* (NSW); *s. loc.*, 1920, *J.L.Boorman* (NSW); *s. loc.*, *J.D.McComish 199* (NSW).

7. LAMIUM

Lamium L., *Sp. Pl.* 2: 579 (1753); *Gen. Pl.* 5th edn, 252 (1754); the name used by Pliny for a species of this genus, said by some to be based on the Greek *laimos* (the throat or gullet).

Type: *L. purpureum* L.

Annual or perennial herbs, sometimes rhizomatous. Leaves simple, crenate, dentate or lobed, petiolate. Inflorescence terminal, of axillary, usually dense, many-flowered verticillasters; bracts leaf-like. Calyx tubular or campanulate, 5-nerved; lobes 5, equal, acute. Corolla with tube usually exserted, 2-lipped; upper lip hooded; lower lip with an emarginate or bifid middle lobe, and lateral lobes small or absent. Stamens 4, in unequal pairs; anthers exserted under corolla hood, often hirsute. Ovary deeply 4-lobed; style exserted below hood; stigmatic lobes 2, subulate. Nutlets obovoid, smooth or verrucose.

A genus of c. 40 species, mainly Eurasian; 1 species naturalised on Lord Howe Is.

***Lamium amplexicaule** L., *Sp. Pl.* 2: 579 (1753)

T: Europe, lecto: LINN 733.12, *fide* I.C.Hedge & J.M.Lamont, *Notes Roy. Bot. Gard. Edinburgh* 28: 89 (1968); IDC microfiche 177/2.383/15. The epithet alludes to the amplexicaul bracts.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 24: t. 36 (1967); H.R.Toelken in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1197, fig. 553D (1986); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 386, fig. 53G (1986).

Annual herb, branching from base to c. 30 cm tall. Basal internodes long. Leaves with petiole 0.5–4 cm long; lamina broadly ovate to orbicular, 0.7–3 cm long, 0.5–3 cm broad, truncate to rounded at base, crenate, often deeply so, rounded at apex, ±appressed pilose. Inflorescence of 2–4 or more dense verticillasters; bracts sessile, amplexicaul. Flowers sometimes cleistogamous. Calyx narrowly campanulate, 5–8 mm long, pilose; lobes c. equalling tube, very acute. Corolla held erect, pinkish purple; tube much exserted, much longer than lobes;

lower lip with dark spots, with middle lobe deeply emarginate, and lateral lobes small, rounded. Anthers pilose. Nutlets narrowly obovoid, 3-angled, densely verruculose.

Lord Howe Is. A Eurasian weed of cultivated land, especially of light soils.

L.H.Is.: main Settlement, *A.C.Beauglehole 5615* (MEL).

8. WESTRINGIA

Westringia Sm., *Kongl. Vetensk. Acad. Nya Handl.* 17: 173 (1797); named after Johan Peter Westring (1753–1833), Swedish physician and lichenologist.

Type: *W. rosmariniformis* Sm.

Shrubs. Stems often 3- or 2-angled. Leaves in whorls of 3 or 4, or rarely opposite, simple, entire, subsessile. Flowers axillary, usually solitary, each with a pair of bracteoles. Calyx campanulate, 5-nerved, often obscurely so, 5-toothed. Corolla tube ±straight, 2-lipped with spreading lobes; upper lobes hardly divided. Stamens 2 with 1-locular anthers; staminodes 2, shorter, inserted below stamens in corolla throat. Style terminal; stigma bifid. Nutlets ellipsoidal to obovoid, usually reticulate-rugose.

A genus of c. 25 species, all endemic in Australia; 1 species endemic on Lord Howe Is.

Westringia viminalis B.J.Conn & Tozer, *Telopea* 5: 347 (1993)

T: Lord Howe Island, 28 Feb 1992, *B.Conn 3573 & I.Hutton*; holo: NSW; iso: K, MEL. The epithet means bearing long, slender shoots.

[*Westringia rosmariniformis auct. non* Sm.: F.J.H. von Mueller, *Fragm.* 9: 78 (1875); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 247 (1896); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 150 (1917)]

[*Westringia fruticosa auct. non* (Willd.) Druce: A.N.Rodd & J.Pickard, *Cunninghamia* 1: 272 (1983)]

Illustration: I.Hutton, *Lord Howe Is.* 127 (1986).

Compact to scrambling shrub to 1 m. Young stems appressed pilose. Leaves somewhat crowded, in whorls of 3 or usually 4; petiole bases persistent; lamina linear to very narrowly elliptic, 10– 20 mm long, 1–3 mm broad, with strongly recurved margins, blunt, densely white silky-pilose below except on midrib. Flowers solitary; pedicels 0.5–1 mm long. Calyx 3.5–5 mm long; lobes triangular, 2–2.5 mm long, somewhat recurved. Corolla white with pink spots in throat, or these somewhat suffused or absent; tube 6.5–7 mm long; upper lip erect, flat, 2-lobed, 6–7 mm long; lower lip 3-lobed, with lobes approximately equal. Stamens and staminodes exserted. Nutlets 1.5–2 mm long. Fig. 84E

Lord Howe Is. An endemic species locally common on mountain ledges and cliffs between 350 and 450 m on Mt Gower and Mt Lidgbird, with a few plants occurring on exposed sites on the North Hills. Flowers Apr.–Dec.

L.H.Is.: North Hills, *J.D.McComish 143* (K, NSW); Goat House, *P.S.Green 1683* (A, K, NSW); *loc. id., A.N.Rodd 1859* (K, NSW); Eddies Cave, *I.Hutton 634* (K); Mt Lidgbird, below the Nobbin, *I.Hutton 655* (K).

The closely related *W. fruticosa* occurs on coastal heath and cliffs in N.S.W., Australia.

79. PLANTAGINACEAE

Annual or perennial herbs, or sometimes subshrubs. Leaves usually radical or less often cauline, opposite or alternate, simple, without stipules, generally with sheathing base. Inflorescence axillary, a scapose, usually dense head or spike. Flowers small, actinomorphic, bisexual or rarely unisexual. Sepals 4, free or partially fused, persistent. Corolla scarious, 3- or usually 4-lobed, imbricate. Stamens 4, rarely fewer, usually long-exserted; filaments slender; anthers usually versatile. Ovary superior, 2–4-locular; ovules 1–many per locule, axile or basal; style simple. Fruit a circumscissile capsule, rarely indehiscent.

A family of 3 genera (2 of them small) and c. 260 species. Widely distributed but mostly in the temperate regions; 1 genus occurs on the Islands.

G.Bentham, Plantagineae, *Fl. Austral.* 5: 137–142 (1870); R.Pilger in A.Engler, *Das Pflanzenreich* 102: 1–466 (1937); B.G.Briggs in G.J.Harden, *Fl. New South Wales* 3: 592–598 (1992).

PLANTAGO

Plantago L., *Sp. Pl.* 1: 112 (1753); *Gen. Pl.* 5th edn, 52 (1754); the Latin name for the type species, from *planta* (the sole of a foot) and the suffix *-ago* (indicating resemblance), in allusion to the flat leaves pressed against the ground.

Type: *P. major* L.

Annual or perennial herbs. Stems usually simple, arising from a rootstock at or below ground level, sometimes branched and plant subshrubby. Leaves usually all basal, crowded, sometimes cauline. Inflorescence spicate, cylindrical to globose, bracteate. Flowers 4-merous, bisexual. Sepals resembling bracts, persistent. Petals united below into a narrow tube, persistent on top of capsule. Stamens 4, adnate to corolla tube, long-exserted. Ovary 2-locular, sometimes becoming 4-locular by placental outgrowths; ovules 1–6 (–8) per locule; style filiform. Capsule with lower portion persistent. Seeds mucilaginous when wet.

A genus of c. 250 species distributed in the temperate regions and on the mountains of the tropics; 1 species endemic on Lord Howe Is., and 3 naturalised on the Islands.

1 Leaves ovate to broadly ovate or broadly elliptic, (2.5–) 5–10 (–17) cm broad; lamina base abruptly narrowed into petiole **1. P. major**

1: Leaves narrowly elliptic-lanceolate to lanceolate or oblanceolate, 0.5–5 cm broad; lamina base gradually narrowed into petiole

2 Inflorescence spike ovoid to cylindrical, 7–10 mm diam.; peduncle strongly ribbed **2. P. lanceolata**

2: Inflorescence spike cylindrical, 3–7 mm diam.; peduncle terete or shallowly grooved

3 Bracts and sepals lanceolate or narrowly elliptic, straight, rigid, 3.5–6 mm long; leaves glabrous (L.H.Is.) **3. P. hedleyi**

3: Bracts and sepals ovate-elliptic or lanceolate-elliptic, dorsally somewhat rounded, 1–2.5 mm long; leaves pilose (N.Is.) **4. P. debilis**

1. *Plantago major L., *Sp. Pl.* 1: 112 (1753)

T: Sweden ?; lecto: LINN 144.1, *fide* B.Verdcourt, *Fl. Trop. E. Africa*, Plantaginaceae 2 (1971); IDC microfiche 177/2.94/20. So named as the major or largest of the species first described.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 25: 5 (1968); H.R.Toelken in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1353, fig. 614H (1986); B.A.Auld & R.W.Medd, *Weeds* 201 (1987).

Perennial herb, glabrous or pubescent. Leaves with petiole 1–20 (–35) cm long, broadened at base; lamina ovate to broadly ovate-elliptic, (4–) 10–20 (–30) cm long, (2.5–) 5–10 (–17) cm broad, abruptly narrowed at base, entire to irregularly bluntly toothed, rounded at apex, 5–7-veined. Scapes to 80 cm tall. Inflorescence cylindrical, (1–) 10–15 (–30) cm long, often sparse towards base. Sepals broadly ovate, 1.5–2.5 mm long. Corolla tube c. equal to calyx; lobes ovate, c. 1.5 mm long, greenish or yellowish white. Anthers almost globose, c. 1 mm long. Ovary 2-locular, with 2–8 ovules per locule; style 4–5 mm long. Capsule broadly ellipsoidal, 4–5.5 mm long, 8–16-seeded. Seeds c. 2 mm long, brown, irregularly angular. *Plantain*.

Norfolk Is., Lord Howe Is. A weedy species usually characteristic of cultivated land and lawns, native in Europe and northern and central Asia but now almost cosmopolitan.

N.Is.: top and upper slopes of Mt Pitt, *G.Uhe 1164* (K); top of Mt Bates, *P.Ralston 34* (A, K); *s. loc.*, 1898, *I.Robinson* (NSW). **L.H.Is.:** Lagoon Rd, between Flagstaff and Government House, *A.N.Rodd 1214 & L.A.S.Johnson* (NSW); Rocky Run, *A.N.Rodd 1310 & L.A.S.Johnson* (NSW); N end of Little Slope, *J.Pickard 2740* (NSW).

Individual plants of this species can vary considerably in size, but despite attempts, this seems to provide no sound basis for the recognition of subspecific taxa.

2. *Plantago lanceolata L., *Sp. Pl.* 1: 113 (1753)

T: Europe, specimen of *Plantago angustifolia major* in *Hort. Cliff.* p. 36, No. 3; lecto: BM, *fide* B.Verdcourt in E.W.B.H.Milne-Redhead & R.M.Polhill, *Fl. Trop. E. Africa*, Plantaginaceae 6 (1971). So named from the lanceolate shape of the leaves.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 25: 3 (1968); H.R.Toelken in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1353, fig. 614G (1986); B.A.Auld & R.W.Medd, *Weeds* 201 (1987).

Perennial herb, glabrous to pilose. Leaves with petiole (1–) 3–8 (–15) cm long, hairy or pilose, with a silky tuft of hairs at base; lamina narrowly lanceolate to elliptic-lanceolate, (3–) 8–15 (–30) cm long, (0.5–) 1–2.5 (–3) cm broad, long-attenuate at base, entire or weakly, distantly toothed, acute, 5-veined. Scape 8–60 cm long, pilose, strongly ribbed. Inflorescence ovoid to cylindrical, 1–6 cm long. Sepals unequal, elliptic, 2.5–4 mm long; anterior pair almost completely connate. Corolla tube c. 3 mm long; lobes ovate, 1.5 mm long, almost apiculate, brownish. Anthers lanceolate, 1.5 mm long. Ovary 2-locular; ovule 1 per locule; style 4–5 mm long. Capsule ellipsoidal, 3–4 mm long, 2-seeded. Seeds 2.5–3 mm long, yellow to pale brown. *Plantain*.

Norfolk Is., Lord Howe Is. A common weed of pastures, lawns, roadsides *etc*. Native to Europe and northern and central Asia, now widely naturalised in all temperate regions.

N.Is.: c. 1.6 km NE of Bloody Bridge, *G.Uhe 1114* (K); *s. loc.*, 1898, *I.Robinson* (NSW); *s. loc.*, *J.D.McComish 56C & 56D* (K). **L.H.Is.:** Neds Beach Common, *M.D.Crisp 4578 & I.R.H.Telford* (CBG, NSW); main settlement, *A.C.Beauglehole 5631* (CANB); W slope of Mt Lidgbird, *B.G.Briggs 4814a* (NSW).

The degree of hairiness of this species depends very much upon the habitat (as well as being under some genetic control); in dry situations plants can develop a dense, shaggy indumentum, especially on the petioles.

3. **Plantago hedleyi** Maiden, *Proc. Linn. Soc. New South Wales* 39: 379 (1914)

T: Mt Gower, Lord Howe Island, 1910, *T.H.Johnston*; holo: NSW. Named after Charles Hedley (1862–1926), noted Australian conchologist and naturalist, who helped make one of the first collections of this species, in 1893.

[*Plantago varia auct. non* R.Br.: F.J.H. von Mueller, *Fragm.* 9: 78 (1875); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 248 (1896)]

Illustration: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 39: t. 28 (1914).

Perennial herb. Leaf 7–20 cm long including petiole; petiole glabrous, winged, broadened at base, with a tuft of axillary hairs; lamina narrowly oblanceolate-elliptic, 1.5–4 cm broad, long-attenuate at base, entire or sometimes with a few irregular, minute teeth, acute, 5–9-veined. Scape 7–25 cm tall, shallowly grooved, pilose. Inflorescence cylindrical, 2–10 cm long. Sepals subequal, narrowly lanceolate, 3.5–4 mm long, keeled, narrowly acute. Corolla 3 mm long; lobes ovate, 1.5 mm long, acuminate, with a distinct midvein. Anthers ovoid, 1 mm long. Ovary 2-locular; ovules 2 per locule and 1 additional ovule separated at apex; style 4 mm long. Capsule ovoid, c. 2.5–3 mm long, 1–5-seeded. Seeds c. 1 mm long, pale brown. *2n* = 24, B.G.Briggs, *Fl. New South Wales* 181: 13 (1977). Figs 59, 84D.

Lord Howe Is. Endemic, on the upper slopes and summits of Mts Gower and Lidgbird, in rocky situations.

L.H.Is.: slopes of Mt Lidgbird, *J.D.McComish 158* (K, NSW); near Goat House, *R.D.Hoogland 8813* (CANB, NSW); summit ridge of Mt Lidgbird, *J.Pickard 1473* (NSW); northern ridge of Mt Gower, *P.S.Green 1651* (A, K); summit of Mt Gower, 1898 & 1908, *J.H.Maiden, C.Hedley & W.S.Dun* (K, NSW).

Figure 84. A, GROSSULARIACEAE: *Corokia carpodetoides*, habit (J.McComish 147, K). **B–C**, LOGANIACEAE. **B**, *Geniostoma huttonii*, leaves and inflorescence (I.Hutton 645, K). **C**, *Geniostoma petiolosum*, leaves and young fruit (P.Green 2365, K). **D**, PLANTAGINACEAE: *Plantago hedleyi*, habit (J.McComish 158). **E**, LAMIACEAE: *Westringia viminalis*, habit (J.Game 69/257). Scale bars = 1 cm. Drawn by P.Halliday.

Said to be related to species from various islands in the eastern Pacific, and also the Auckland Islands and St Helena.

4. *Plantago debilis R.Br., *Prodr.* 425 (1810)

T: Hawkesbury & N [?] Brush, New South Wales, *R.Brown*; lecto: BM, *fide* B.G.Briggs, *Fl. New South Wales* 181: 20 (1977). The Latin epithet means weak or feeble, in allusion to the habit.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 437, fig. 65A (1986); B.A.Auld & R.W.Medd, *Weeds* 200 (1987).

Herb, usually perennial. Leaves with petiole 1–5 cm long, flat, pilose, slightly broadened at base with tuft of hairs; lamina obovate to narrowly oblanceolate, (1.5–) 3–5 (–10) cm long, (0.5–) 1–2 (–3) cm broad, long-attenuate at base, entire or dentate, acute to obtuse, 3–5-veined, pilose. Scape terete, (3–) 7–15 (–30) cm long, pubescent. Inflorescence narrowly cylindrical, sometimes loose towards base, (0.7–) 2–5 (–10) cm long. Sepals subequal, ovate-elliptic, 1.5–2.5 mm long. Corolla tube 1.5–2.5 mm long; lobes broadly ovate to suborbicular, c. 1 mm long, shortly acuminate. Anthers globose, 0.5–0.8 mm long. Ovary 2-locular, one with 2 ovules, the other with 3; style 1.5–2 mm long. Capsule broadly ovoid, 2–3 mm long. Seeds c. 1.5 mm long, brown.

Norfolk Is. Apparently first collected on the Island in 1937 by J.D.McComish, and then described as 'common'. Otherwise only known from eastern Australia where it is native, it is just possible that this species is indigenous on the Island. However, it is more likely to have been introduced with fodder; it is significant that it was not collected in the previous century and is an established alien in New Zealand and Hawai'i.

N.Is.: Duncombe Bay, The Chord, *P.S.Green 2431* (K); Red Rd, *P.S.Green 1366* (A); Anson Bay, *J.D.McComish 140* (K); *s. loc.*, *J.D.McComish 56* (K).

The first collections from Norfolk Is. were erroneously recorded as *P. varia* R.Br., a closely related species and member of the same taxonomically difficult complex.

80. OLEACEAE

Trees, shrubs or woody climbers. Leaves opposite or rarely alternate, simple or 3-foliolate or pinnate, with small peltate hairs, often obscure, petiolate, without stipules. Inflorescence terminal or axillary, various. Flowers actinomorphic, bisexual or unisexual. Calyx small, usually 4-lobed, rarely absent. Corolla usually 4-lobed, sometimes petals free, rarely absent. Stamens 2 or rarely 4, inserted on corolla. Ovary small, superior, 2-locular; ovules (1 or) 2 (–several) per locule; style terminal; stigma 2-lobed or subcapitate. Fruit a drupe, berry, capsule or samara.

A family of c. 28 genera and 900 species, almost cosmopolitan, with greatest representation in eastern and south-eastern Asia; 5 genera occur on the Islands. The family contains several genera of horticultural and silvicultural importance, such as lilacs (*Syringa*), privets (*Ligustrum*), olives (*Olea*), jasmines (*Jasminum*) and ashes (*Fraxinus*).

G.Bentham, Jasmineae, *Fl. Austral.* 4: 293–301 (1869); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Oleaceae, *Fl. Java* 2: 212–218 (1965).

KEY TO GENERA

1 Scrambling or climbing shrubs; flowers salverform **5. JASMINUM**

1: Erect shrubs or trees; flowers not salverform

2 Fruit a 1- or 2-seeded drupelet, 1 cm or less long **4. LIGUSTRUM**

2: Fruit a drupe, 1 cm or more long

3 Corolla lacking (N.Is.) **3. NESTEGIS**

3: Corolla small, white or green, 4-lobed

4 Corolla with a small but distinct tube; stamens 2 **1. OLEA**

4: Corolla split to base; stamens 4 (L.H.Is.) **2. CHIONANTHUS**

1. OLEA

Olea L., *Sp. Pl.* 1: 8 (1753); *Gen. Pl.* 5th edn, 8 (1754); the classical name for the olive.

Type: *O. europaea* L.

Evergreen trees with hard wood. Leaves opposite, simple, usually entire, with small, peltate hairs or scales especially below. Inflorescence terminal or axillary, paniculate or dichasial. Flowers usually bisexual. Calyx campanulate, with 4 ±triangular lobes. Corolla united, 4-lobed, valvate. Stamens 2, inserted at top of corolla tube, exserted at anthesis. Ovary ovoid, 2-locular; ovules 2 per locule; style capitate, slightly 2-lobed; stigma ±2-lobed. Fruit a drupe with hard endocarp.

A genus of c. 20 species from the warmer parts of the Old World, especially the tropics; 1 native species on Lord Howe Is. and 1 naturalised on Norfolk Is.

Leaves narrowly elliptic, densely covered with peltate hairs or scales below; inflorescence axillary **1. O. europaea**

Leaves broadly elliptic, not densely covered with peltate hairs below; inflorescence terminal **2. O. paniculata**

1. *Olea europaea L., *Sp. Pl.* 1:8 (1753)

subsp. **cuspidata** (Wall. ex G.Don) Cif., *L'Olivicoltore* 19: 96 (1942)

Olea cuspidata Wall. ex G.Don, *Gen. Syst.* 4: 49 (1837). T: India, *N.Wallich 2817*; holo: K-W. So called from the cuspidate tips to the leaves.

Olea africana Mill., *Gard. Dict.* 8th edn, *Olea* 4 (1768); *O. europaea* subsp. *africana* (Mill.) P.S.Green, *Kew Bull.* 34: 69 (1979). T: cultivated; holo: BM.

[*Olea europaea auct. non* L.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 757 (1904)]

Illustrations: W.B.Turrill, *Fl. Trop. E. Africa*, Oleaceae 8, fig. 2 (1952), as *O. chrysophylla*; P.S.Green in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 2: 1036, fig. 510D (1986); G.R.M.Dashorst & J.P.Jessop, *Pl. Adelaide Plains & Hills* 119, t. 52/8 (1990), as subsp. *europaea*.

Tree to 10 m tall, rarely more. Leaves elliptic to narrowly elliptic, 3–7 cm long, 0.8–2 cm broad, narrowly attenuate onto petiole, acute-cuspidate, with peltate, silvery white hairs often dense and completely covering lower surface, scattered above. Inflorescence axillary, dichasial. Flowers often functionally unisexual. Calyx c. 1 mm long; lobes 4, barely developed, very shallowly triangular. Corolla whitish or cream; tube 1–2 mm long; lobes triangular-ovate, c. 3 mm long, ±reflexed at anthesis. Filaments c. 1 mm long. Drupe ellipsoidal to spherical, 7–10 mm long, fleshy, purple-black when ripe. *African Olive*, *Wild Olive*.

Norfolk Is. Naturalised and invasive in the National Park and other areas of native vegetation. A native of Africa and Asia.

N.Is.: SE slopes of Mt Bates, *R.D.Hoogland 6635* (CANB); along Selwyn Rd, *R.D.Hoogland 11328* (CANB, NSW); vicinity of Burnt Pine Centre, *G.Uhe 1151* (K); vicinity of the Melanesian Mission Station, *G.Uhe 1190* (K); *s. loc.*, 1964, *P.Ralston* (K).

The cultivated olive, subsp. *europaea*, is of ancient origin, but the wild plant with small, usually bitter fruits, from which it was presumably developed, occurs from South Africa to Arabia and across to the Himalayas. It can become a noxious weed as on Norfolk Is. where, spread by fruit-eating birds, it crowds out other vegetation. There is a specimen (*J.Pickard*

3457, NSW) from Lord Howe Is. which was collected from the site of an old garden and is doubtfully naturalised. It is presumably the basis for the record of *Olea europaea* subsp. *africana* in J.Pickard, *J. Biogeogr.* 11: 207 (1984).

2. Olea paniculata R.Br., *Prodr.* 523 (1810)

T: Australia, *R.Brown*; syn: BM. The epithet alludes to the paniculate inflorescence.

Illustrations: W.D.Francis, *Austral. Rain-forest Trees* 3rd edn, 360, 361 (1970); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 286, fig. 42E (1986); I.Hutton, *Lord Howe Is.* 135 (1986).

Tree to c. 15 m tall. Trunk and branches with prominent white lenticels. Leaves narrowly ovate to elliptic, 4–10 (–15) cm long, 2–5 (–7) cm broad, acute to obtuse at base and attenuate onto petiole, abruptly acuminate, with scattered obscure peltate hairs on both surfaces and often tufted domatia in axils of main lateral nerves below. Inflorescence terminal, paniculate. Flowers bisexual. Calyx c. 1.5 mm long, divided to c. halfway into 4 triangular lobes. Corolla white; tube c. 1 mm long; lobes ovate-triangular, c. 2 mm long, reflexed at anthesis. Filaments c. 1 mm long. Drupe ovoid, c. 10 mm long, blue-black when ripe. *Maulwood*.

Lord Howe Is. A widespread tree at elevations below c. 500 m. Also known from Australia (eastern N.S.W. and Qld), New Caledonia, Vanuatu and SE Asia.

L.H.Is.: between Hunter Bay and North Bay, *R.D.Hoogland 8682* (CANB, NSW); Malabar, *A.C.Beauglehole 5822* (CANB, MEL); summit of Transit Hill, *G.Uhe 1319* (K); below ridge-crest above Goat House, *J.Pickard 1523* (NSW); *s. loc.*, 1920, *J.L.Boorman* (BRI, NSW).

The tough timber has been prized on the Island for its strengh and durability and because it does not split easily.

2. CHIONANTHUS

Chionanthus L., *Sp. Pl.* 1: 8 (1753); *Gen. Pl.* 5th edn, 9 (1754); from the Greek *chion* (snow) and *anthos* (a flower), because of the snowy white flowers in the first species described.

Type: *C. virginica* L.

Evergreen or deciduous trees or shrubs. Leaves opposite, simple, entire or dentate, ±coriaceous. Inflorescence axillary or terminal, dichasial or paniculate. Flowers bisexual. Calyx ±campanulate, 4-lobed. Corolla tube obsolete or extremely short; lobes 4, linear or shortly oblong, usually divided to base and united by bases of filaments, induplicate-valvate. Stamens 2 or rarely 4; filaments short; anthers globose to elliptic. Ovary globose-conical, with 2 ovules per locule; style short; stigma 2-lobed to subcapitate. Fruit a fleshy drupe; endocarp hard or crustaceous.

A genus of c. 100 species from tropical America, Africa and Asia, with a few species in Australia and the Pacific, and a very few in temperate North America and China; 1 species endemic on Lord Howe Is.

Chionanthus quadristamineus F.Muell., *Fragm.* 8: 41 (1873)

Mayepea quadristaminea (F.Muell.) F.Muell., *Fragm.* 10: 89 (1876); *Linociera quadristaminea* (F.Muell.) Knobl., *Bot. Centralbl.* 61: 87 (1895); *Notelaea quadristaminea* (F.Muell.) Hemsl., *Ann. Bot.* (*London*) 10: 243 (1896). T: Lord Howe Island, *C.Moore, Lind & J.P.Fullagar*; syn: MEL; isosyn: ?K. So called because of the four stamens in the flowers.

Illustrations: A.N.Rodd in H.F.Recher & S.S.Clark, *Environm. Survey Lord Howe Is.* 24 (1974); I.Hutton, *Lord Howe Is.* 134 (1986).

Evergreen tree to 15 m tall; bark grey. Leaves somewhat coriaceous; petiole 5–10 mm long, stout; lamina broadly elliptic to almost oblanceolate or narrowly obovate, 5–12 cm long, 3–6 cm broad, attenuate onto petiole, entire, abruptly acuminate. Inflorescence axillary, decussate-cymose, 2–4 cm long, c. 7–12-flowered. Calyx shallow, less than 1 mm long; lobes broadly, bluntly triangular. Corolla green; lobes oblanceolate, 2 mm long. Stamens 4,

subsessile; anthers ellipsoidal, 2 mm long. Ovary conical; style barely differentiated; stigma lobes small, shallow. Drupe ovoid-ellipsoidal, 5.5–6 cm long, with thin flesh, dark blue when ripe. *2n* = 46, B.G.Briggs, *Contr. New South Wales Natl Herb.* 4: 127 (1970). *Blue Plum*. Fig. 85B–C.

Lord Howe Is. Endemic and common in the forests around the southern mountains from sea-level to c. 400 m altitude. Flowers late Nov.–May.

L.H.Is.: track to Goat House, *P.S.Green 1677* (A, K); Erskine Valley, N side of stream, *L.A.S.Johnson & A.N.Rodd 1387* (K, NSW); *loc. id.*, *A.C.Beauglehole 5788* (CANB, MEL); Erskine Valley, *P.S.Green 1647* (A, K, NSW); N slope of Mt Gower, *A.N.Rodd 1384* (K, NSW).

3. NESTEGIS

Nestegis Raf., *Sylv. Tellur.* 10 (1838); from the Greek prefix *ne-* (not) and *stegasma* (a cover), in allusion to the lack of a corolla in the type species.

Type: *N. elliptica* Raf. *nom. illeg.* = *N. apetala* (Vahl) L.A.S.Johnson

Evergreen trees or shrubs. Leaves opposite, simple, entire, coriaceous. Inflorescence axillary, decussate, sometimes terminal and somewhat paniculate. Flowers bisexual or functionally unisexual. Calyx 4-toothed. Corolla absent or 4-lobed with a short tube; lobes imbricate. Stamens 2 or 4. Ovary flask-shaped, with 2 ovules per locule; style short; stigma 2-lobed. Fruit a 1-seeded drupe.

A genus of 5 species, mainly in New Zealand but 1 species reaching Norfolk Is. and another in Hawai'i.

Nestegis apetala (Vahl) L.A.S.Johnson in O.Degener, *Fl. Hawaiiensis*, Fam. 300, *Nestegis* (1958).

Olea apetala Vahl, *Symb. Bot.* 3: 3 (1794); *Gymnelaea apetala* (Vahl) L.A.S.Johnson, *Contr. New South Wales Natl. Herb.* 2: 412 (1975). T: New Zealand, *coll. unknown*; holo: O.

Olea endlicheri F.Muell., *Fragm.* 8: 43 (1873) *nomen*.

Illustrations: S.F.L.Endlicher, *Iconogr. Gen. Pl.* t. 54 (1841); P.S.Green, *J. Arnold Arbor.* 44: 380, fig. 1 (1963).

Shrub or small tree to c. 6 m tall. Leaves glabrous; lamina elliptic to broadly so, sometimes lanceolate, orbicular when juvenile, (4.5–) 5–11 (–12.5) cm long, 1.5–4 (–6) cm broad, larger when juvenile, attenuate at base, acute, sometimes subapiculate. Inflorescence sometimes borne below leaves. Calyx 0.2–1.5 mm long with unequal lobes. Corolla absent. Stamens 2 or occasionally 4; anthers lanceolate, c. 2 mm long in male or bisexual flowers, abortive in female flowers. Ovary 1.5–3 mm long, abortive in male flowers. Drupe oblong-ovoid, 10–15 mm long, red or yellow, less commonly purple when ripe. *Ironwood*. Fig. 85A

Norfolk Is. Common in forested areas, less common elsewhere. Also native on the islands off North Is., New Zealand.

N.Is.: Mt Pitt, *P.S.Green 1513* (A, K); roadside towards Cascade Common, 1963, *P.Ralston* (A, K); vicinity of the Melanesian Mission Station, *G.Uhe 1193* (K); Burnt Pine, *P.S.Green 1514* (A, K); *s. loc.*, 1904, *I.Robinson* (K, NSW).

Noted for its hard timber.

4. LIGUSTRUM

Ligustrum L., *Sp. Pl.* 1: 7 (1753); *Gen. Pl.* 5th edn, 8 (1754); a classical Latin name for a plant with white flowers.

Type: *L. vulgare* L.

Figure 85. A–C, OLEACEAE. **A**, *Nestegis apetala*, habit (P.Green 1513, K). **B–C**, *Chionanthus quadristamineus*. **B**, flower; **C**, habit (**B–C**, C.Moore 49, K). **D–E**, MYOPORACEAE. **D**, *Myoporum obscurum*, habit (G.Uhe 1662, K). **E**, *Myoporum insulare*, leaf (P.Green 1964, K). **F–G** GESNERIACEAE: *Negria rhabdothamnoides*. **F**, habit; **G**, fruit (**F–G**, A.Rodd 1762, K). Scale bars: **A**, **C–G** = 2 cm; **B** = 2 mm. Drawn by P.Halliday.

Evergreen or deciduous shrubs or small trees. Leaves opposite, simple, entire, coriaceous or chartaceous. Inflorescence terminal on main side shoots, cymose-paniculate. Flowers bisexual, white or cream, usually scented. Calyx campanulate, truncate or with 4 shallow teeth. Corolla 4-lobed, valvate or induplicate-valvate. Stamens 2, attached near top of corolla tube, enclosed or exserted; anthers elliptic-oblong. Ovary with 2 ovules per locule; style ±elongate; stigma ±2-lobed. Fruit a 1- or 2-seeded drupelet.

Stems and inflorescences glabrous, even when young **1. L. lucidum**

Stems and inflorescences persistently pubescent **2. L. sinense**

1. *Ligustrum lucidum W.T.Aiton, *Hortus Kew.* 2nd edn, 1: 19 (1810)

T: cultivated; holo: BM. So called because of the shining, lucid foliage.

Illustrations: A.B.Graf, *Exotica* 12th edn, 2: 1634 (1985), as *L. japonica*; B.A.Auld & R.W.Medd, *Weeds* 191 (1987).

Evergreen shrub or tree to 15 m tall, glabrous throughout. Leaves coriaceous; lamina ovoid to elliptic, (4–) 6–10 (–24) cm long, (2.5–) 3.5–4.5 (–6) cm broad, rounded to obtuse at base, shortly attenuate onto petiole, acute to somewhat acuminate, often slightly mucronulate. Inflorescence pyramidal-paniculate, 10–20 cm long, many-flowered. Calyx 1.5 mm long; teeth very shallow. Corolla greenish white; tube 2–3 mm long; lobes somewhat ovate, reflexed at anthesis, 2 mm long, slightly hooded at tips. Stamens exserted; filaments 3 mm long. Ovary subconical, 0.5 mm long; style 1.5–2 mm long; stigma lobes 0.75 mm long. Fruit slightly obliquely ellipsoidal, 5–9 mm long, blue-black and pruinose.

Norfolk Is. A native of western and southern China which has escaped from cultivation and has proved a serious weed in some places.

N.Is.: St Barnabas Chapel Grounds, *W.R.Sykes NI 617* (CHR).

The occurrence of this plant on Norfolk Is. should be closely monitored. J.Pickard in H.F.Recher & S.S.Clark, *Environm. Survey Lord Howe Is.* 80 (1974) has recommended that this species, together with the following, should be declared noxious weeds on Lord Howe Is., but so far there is no evidence that it has become naturalised on that Island.

2. *Ligustrum sinense Lour., *Fl. Cochinch.* 19 (1790)

T: near Canton, China, *J. de Loureiro*; holo: ?P *n.v.*

Illustrations: R.B.Buchanan, *Common Weeds Sydney Bushland* 50, fig. 10 (1981); B.A.Auld & R.W.Medd, *Weeds* 192 (1987).

Evergreen or deciduous shrub or small tree to c. 6 m tall. Young stems densely pubescent. Leaves chartaceous; lamina elliptic, (1–) 2–4 (–5) cm long, (0.5–) 1.2–2 cm broad, slightly rounded to acute at base, somewhat rounded to acute at apex and sometimes minutely mucronulate. Inflorescence cymose-paniculate, 2–6 (–9) cm long, pubescent. Calyx 1 mm long; teeth shallowly triangular. Corolla white; tube 1–2 mm long; lobes oblong-elliptic, 3 mm long, reflexed at anthesis. Stamens long-exserted; filaments 3 mm long. Ovary globose, 0.5 mm long; style 3 mm long; stigmatic lobes c. 1 mm long. Fruit spherical-ellipsoidal, black.

Norfolk Is., Lord Howe Is. A native of China which has also escaped from cultivation and is proving a serious weed in places.

N.Is.: near Cascade Rd. *W.R.Sykes NI 227* (CHR). **L.H.Is.:** Neds Beach Rd, *A.C.Beauglehole, 5848* (CANB, MEL); Anderson Rd, *J.Pickard 1411* (NSW); Morepark Garden, *J.Pickard 3458* (NSW); S end of golf course, *J.Pickard 3462* (NSW).

The species should be rigorously controlled on both Islands.

5. JASMINUM

Jasminum L., *Sp. Pl.* 1: 7 (1753); *Gen. Pl.* 5th edn, 7 (1754); based on the Persian name for these plants, Yasmin.

Type: *J. officinale* L.

Evergreen woody climbers or scramblers, rarely erect shrubs. Leaves opposite or rarely alternate, simple or 3-foliolate or imparipinnate, entire. Inflorescence cymose, paniculate or subumbellate, few- to many-flowered. Flowers heterostylous. Calyx small, with 5–9 inconspicuous to linear-filiform lobes. Corolla salverform, white or rarely yellow or red; lobes 5 or more, imbricate. Stamens 2, included; anthers oblong; connective usually prolonged into a short, obtuse appendage. Ovary 2-locular, with 2 ovules per locule; stigma 2-lobed, sublinear. Fruit a twinned berry, sometimes single by abortion.

An Old World genus of c. 200 species from the tropical and warm temperate regions; 2 species native on the Islands.

Leaves 3-foliolate; corolla lobes 3–4 mm long	**1. J. didymum**
Leaves simple; corolla lobes 8–9 mm long	**2. J. simplicifolium**

1. Jasminum didymum G.Forst., *Fl. Ins. Austr.* 3 (1786)

subsp. **didymum**

T: Society Islands, *J.R. & G.Forster*; syn: K. The epithet comes from the Greek *didymos* (double), and alludes to the double or twinned berries.

Illustrations: P.S.Green, *Allertonia* 3: 407, fig. 2A–C (1984); I.Hutton, *Lord Howe Is.* 135 (1986); J.Brock, *Top End Native Pl.* 233 (1988).

Scandent shrub 3–4 m tall, sometimes climbing to 15 m. Leaves 3-foliolate, glabrous; leaflets ovate or broadly lanceolate to broadly elliptic-oblong, rounded at base, acute or rounded at apex, usually with tufted domatia in axils of main veins below especially towards leaflet base; terminal leaflet (2–) 3–5 cm long, (1.5–) 2.5–4.5 cm broad; lateral leaflets slightly smaller. Inflorescence in upper leaf axils and terminal on side shoots, cymose, paniculate, (3–) 5–15 cm long, usually many-flowered. Calyx cup-shaped, 1.5 mm long, entire or with 5 obscure teeth. Corolla white, sweetly fragrant; tube 5–6 mm long; lobes ovate, 3–4 mm long, acute to obtuse. Fruit globose, 10 mm long, fleshy, black. *Jasmine.*

Lord Howe Is. Widespread at lower altitudes, climbing on bushes and trees. Flowers mid Oct.–early May. Subspecies *didymum* extends from Australia (northern W.A., N.T., Qld) to Timor and Papua New Guinea, New Caledonia and across the Pacific to Tahiti; the other subspecies are endemic in Australia.

L.H.Is.: SE slope of Malabar, *A.N.Rodd 1743* (K, NSW); Transit Hill, *J.C.Game 69/325* (K); E side of North Hummock, *A.C.Beauglehole 5536* (MEL); Tenth of June Is., *J.Pickard 2893* (NSW); *s. loc., C.Moore 3 & 51* (K, MEL).

2. Jasminum simplicifolium G.Forst., *Fl. Ins. Austr.* 3 (1786)

subsp. **australiense** P.S.Green, *Allertonia* 3: 419 (1984)

T: Nathan Gorge, Queensland, 28 Oct. 1963, *N.H.Speck 1924*; holo: K; iso: BRI, CANB, MEL. So called as the Australian representative of this species.

Jasminum volubile Jacq., *Pl. Hort. Schoenbr.* 3: 39, t. 321 (1798). T: cultivated, not traced.

Jasminum gracile Andrews, *Bot. Repos.* 2: t. 127 (1800). T: cultivated from seed ex Norfolk Is.; lecto: H.C.Andrews, *Bot. Repos.* 2: t. 127 (1800), *fide* P.S.Green, *Allertonia* 3: 419 (1984).

[*Jasminum simplicifolium auct. non* G.Forst. *s. str.*: F.J.H. von Mueller, *Fragm.* 8: 43 (1873); F.J.H. von Mueller, *Fragm.* 9: 77 (1875); R.M.Laing, *Trans & Proc. New Zealand Inst.* 47: 34 (1915); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 148 (1917)]

Illustrations: P.S.Green, *Allertonia* 3: 420, fig. 9C, D (1984); I.Hutton, *Lord Howe Is.* 135 (1986).

Scrambling shrub or climber to 10 m. Leaves simple, glabrous; lamina broadly ovate to lanceolate, 3–7 cm long, 1.5–4.5 cm broad, rounded to acute at base, acute to obtuse at apex, sometimes subacuminate, without domatia. Inflorescence terminal on shoots and side shoots, cymose, paniculate, 10-flowered or more. Calyx ±obconical, 2 mm long; lobes 5, narrowly triangular, 0.5 mm long. Corolla white, sweetly fragrant; tube 9–10 mm long; lobes 5 or 6, lanceolate, acute, 8–9 mm long. Fruit globose, 12 mm long, fleshy, shiny black. *Jasmine*. Fig. 86A.

Norfolk Is., Lord Howe Is. Fairly common on both Islands, climbing on trees and shrubs. On Lord Howe Is. at altitudes below c. 300 m. Also known in Australia from eastern Qld and north-eastern N.S.W.

N.Is.: saddle between Mt Pitt and Mt Bates, *R.D.Hoogland 6653* (CANB); Mt Bates, towards Red Rd, *P.S.Green 1390* (A, K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW). **L.H.Is.:** lower slopes of Mt Eliza, *P.S.Green 1580* (A, K); North Beach area, *R.D.Hoogland 8654* (CANB, NSW); Transit Hill, *J.D.McComish 4* (K, NSW).

Earlier authors (F.J.H. von Mueller, *loc. cit.*, 1873; R.M.Laing, *loc. cit.*; W.R.B.Oliver, *loc. cit.*) applied *J. simplicifolium* in its broad sense to this taxon; however, it has now been shown (P.S.Green, *loc. cit.*) to justify subspecific rank within *J. simplicifolium* G.Forst., distinct from the Pacific subsp. *simplicifolium*.

81. SCROPHULARIACEAE

Annual or perennial herbs, rarely shrubs or trees, sometimes wholly or partially parasitic. Leaves alternate or opposite, rarely whorled, entire or lobed, without stipules. Inflorescence usually a raceme or spike, or flowers sometimes solitary and axillary. Flowers weakly to strongly zygomorphic, bisexual. Calyx free or united, 4- or 5-lobed, often persistent. Corolla cylindrical to campanulate, (4–) 5 (–8)-lobed, often 2-lipped, sometimes spurred at base. Stamens usually 4 in unequal pairs or 2, rarely 5, with or without 1 or 3 staminodes, inserted towards base of corolla tube. Ovary superior, usually 2-locular; placentation axile; style terminal; stigma entire or 2-lobed. Fruit a capsule, rarely a berry or indehiscent. Seeds usually numerous.

A family of c. 220 genera and 4000 species. Cosmopolitan in distribution but mostly temperate or warm temperate; 3 genera are introduced on the Islands. *Asarina barclaiana* (Lindl.) Pennell and *Russelia equisetiformis* Schltdl. & Cham. have been recorded as semi-adventive on Norfolk Is., where they occur in an old garden or in a hedge near a garden. The former is a climber with purple, trumpet-shaped flowers and the latter a shrub with rush-like stems and red, pendent tubular flowers.

G.Bentham, Scrophularineae, *Fl. Austral.* 4: 470–523 (1869); R. von Wettstein, Scrophulariaceae, *Nat. Pflanzenfam.* 4(3b): 39–107 (1891–1895); F.W.Pennell, The Scrophulariaceae of eastern temperate North America, *Acad. Nat. Sci. Philadelphia Monogr.* 1 (1935); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Scrophulariaceae, *Fl. Java* 2: 498 (1965).

KEY TO GENERA

1 Decumbent or erect herbs usually less than 50 cm tall; flowers blue or bluish **3. VERONICA**

1: Erect herbs to 1 m tall; flowers yellow or pink

2 Flowers almost actinomorphic, yellow; base with rosette of large persistent leaves **1. VERBASCUM**

2: Flowers very zygomorphic, yellow or pink; basal leaves soon withering

3 Leaves simple, entire; flowers pink with darker veins, lower lip convexly pouched **2. MISOPATES**

3: Leaves deeply lobed, pinnatifid or pinnatisect; flowers yellow, lower lip concavely pouched **4. CALCEOLARIA**

1. VERBASCUM

Verbascum L., *Sp. Pl.* 1: 177 (1753); *Gen. Pl.* 5th edn, 83 (1754); a name used for these plants by Pliny.

Type: *V. thapsus* L.

Biennial or perennial herbs, rarely annual. Basal leaves in a rosette, cauline leaves alternate, all simple. Inflorescence racemose or spicate, sometimes paniculate, bracteate. Flowers slightly zygomorphic. Sepals 5, free or basally united, equal or slightly unequal. Corolla rotate, yellow or rarely white or purple; tube very short. Stamens 5, or 4 with 1 staminode, unequal; filaments often hairy; upper anthers kidney-shaped; lower anthers elongate and decurrent onto filament, all 1-locular. Capsule 2-valved. Seeds numerous, small.

A genus of c. 350 species from temperate and warm temperate Eurasia, especially south-western Asia; 2 species are naturalised on the Islands.

Leaves densely woolly-tomentose, white or grey, entire or finely crenulate **1. V. thapsus**

Leaves pubescent with simple and glandular hairs, green, crenate-serrate **2. V. virgatum**

1. *Verbascum thapsus L., *Sp. Pl.* 1: 177 (1753)

T: Europe; lecto: 242.1 LINN, *fide* A.Huber-Morath, *Denkschr. Schweiz. Naturf. Ges.* 87: 43 (1971); IDC microfiche 177/2.134/10. The epithet alludes to the yellow flowers and was originally the Greek name for *Cotinus coggygria* Scop. which came from the island of Thapsos and was used as the source of a yellow dye.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 2: t. 1 (1966); W.T.Parsons, *Noxious Weeds Victoria* 245, fig. 226 (1973); G.M.Cunningham *et al.*, *Pl. W New South Wales* 600 (1981), as Great Mullein.

Stout biennial herb, erect to 1 m tall or more, densely grey or whitish woolly. Lamina of basal leaves elliptic-ovate to elliptic-obovate, 10–30 cm long, 3–10 cm broad, tapering onto petiole, entire or finely crenulate, acute to obtuse; lamina of upper leaves progressively smaller, sessile. Inflorescence a tall, dense, terminal spike, woolly. Calyx deeply divided; lobes lanceolate, 5–9 mm long. Corolla 8–15 mm long, pale yellow; lobes rounded. Upper 3 filaments villous, lower pair glabrous or nearly so. Capsule broadly ovoid, c. 1 cm long. Seeds cylindrical-oblong, c. 1 mm long, pitted. *Shepherd's Blanket* (*fide* J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 766, 1904).

Norfolk Is. Probably introduced as a garden plant but now occasionally naturalised. A native of much of Eurasia.

N.Is.: Mt Pitt Reserve, S side of summit, *W.R.Sykes NI 368* (CHR); *s. loc.*, 1898, *I.Robinson* (NSW).

2. *Verbascum virgatum Stokes in W.Withering, *Bot. Arr. Brit. Pl.* 2nd edn, 1: 227 (1787)

T: England; not traced. The epithet comes from the Latin *virga* (a slender green wand or shoot), in reference to the long, straight, slender shoots.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 22: t. 2 (1966); G.M.Cunningham *et al.*, *Pl. W New South Wales* 601 (1981), as Twiggy Mullein. B.A.Auld & R.W.Medd, *Weeds* 221, 222 (1987).

Biennial, erect to 1 m tall or more, glandular pubescent. Lamina of basal leaves elliptic to elliptic-obovate, 8–25 cm long, 3–8 cm broad, tapering onto petiole, irregularly crenate-serrate, acute; lamina of upper leaves progressively smaller. Inflorescence a somewhat loose spike, glandular-hairy. Flowers in scattered clusters. Calyx deeply divided; lobes lanceolate, 5–8 mm long. Corolla yellow; lobes 15–20 mm long, rounded. Upper 3 filaments white or

purple, lower pair purple, all densely villous. Capsule globose, 6–8 mm long. Seeds cylindrical, c. 0.8 mm long, pitted.

Norfolk Is., Lord Howe Is. Not common on the Islands. A native of western Europe now widely naturalised in disturbed pastures and other habitats.

N.Is.: Ball Bay, *W.R.Sykes NI 137* (CHR). **L.H.Is.:** adjoining the cemetery, *J.Pickard 2677* (NSW); S end of Kings Beach, *J.Pickard 3448* (NSW); *s. loc., J.D.McComish 207 & 207A* (NSW).

2. MISOPATES

Misopates Raf., *Autik. Bot.* 158 (1840). Although Rafinesque gave no origin for this name it was probably based on *Misopaltos*, an early Greek plant name cited in the Greek herbal of Dioscorides as a synonym of *Okimoeides*, the identity of which is uncertain.

Type: *M. orontium* (L.) Raf.

Annual, erect herbs. Leaves narrow, entire; basal leaves opposite; upper alternate. Inflorescence terminal, racemose, bracteate; pedicels short. Calyx deeply 5-lobed; lobes unequal. Corolla zygomorphic, shorter than or c. equal to calyx; tube pouched at base. Stamens 4. Ovary 2-locular. Fruit a capsule with upper locule indehiscent or sometimes dehiscent by a single pore; lower dehiscing by 2 apical pores. Seeds numerous, compressed.

A Mediterranean genus of 3 species, 1 of which has become a widespread weed, and is naturalised on Norfolk Is.

*Misopates orontium (L.) Raf., *Autik. Bot.* 158 (1840)

Antirrhinum orontium L., *Sp. Pl.* 2: 617 (1753). T: Europe, not designated. From *orontion*, the Greek name said to have been applied to a plant growing in the Syrian river Orontes.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 22: t. 13 (1966); C.J.Webb *et al., Fl. New Zealand* 4: 1189, fig. 108B (1988); W.L.Wagner *et al., Man. Fl. Pl. Hawai'i* 1238, t. 180 (1990); all as *Antirrhinum orontium.*

Herb to 50 cm tall, sparingly branched. Leaves linear to oblong-elliptic, 2–6 cm long, 0.2–0.7 cm broad, subsessile, blunt. Racemes lax, glandular-hairy; pedicels very short, elongating slightly in fruit; bracts resembling reduced leaves. Calyx divided almost to base; lobes linear, 10–18 mm long, unequal. Corolla 10–18 mm long, pink with darker veins; upper lip emarginate; lower lip convexly pouched, with middle lobe triangular, c. 2 mm long. Capsule pouched, 8–10 mm long, glandular-hairy. Seeds c. 1 mm long, black; one face keeled, the other depressed with raised undulate margin.

Norfolk Is. A recently recorded weed. Native to Europe and the Mediterranean region.

N.Is.: valley N of Mission Rd, *R.O.Gardner 5819* (AK).

3. VERONICA

Veronica L., *Sp. Pl.* 1: 9 (1753); *Gen. Pl.* 5th edn, 10 (1754); origin debatable but possibly named after St Veronica, a woman of Jerusalem at the time of Christ.

Type: *V. officinalis* L.

Annual, biennial or perennial herbs, sometimes woody at base. Leaves opposite (or alternate in inflorescence), entire to pinnatisect. Inflorescence of terminal or axillary racemes, or flowers solitary and axillary. Sepals 4, rarely 5, free or basally united, often unequal. Corolla rotate to campanulate, usually blue; tube very short; lobes 4, upper one largest. Stamens 2, exserted. Ovary 2-locular. Fruit a capsule, usually compressed at right angles to narrow septum, emarginate to deeply notched. Seeds few to numerous.

A genus of c. 250 species, mostly from the northern temperate regions of the Old World; 3 species are naturalised on the Islands.

1 Flowers in axillary racemes; leaves irregularly serrate; capsules truncate or scarcely emarginate **1. V. plebeia**

1: Flowers in a terminal raceme or apparently solitary in leaf axils; leaves crenate-serrate; capsules deeply notched

2 Floral bracts resembling stem leaves **2. V. persica**

2: Floral bracts much smaller than leaves **3. V. arvensis**

1. *Veronica plebeia R.Br., *Prodr.* 435 (1810)

T: New South Wales, *R.Brown*; holo: BM. The epithet is the Latin for common or vulgar.

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 602 (1981), as Creeping Speedwell; W.R.Barker in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1305, fig. 596E (1986); A.Fairley & P.Moore, *Native Pl. Sydney District* 283, fig. 1014 (1989).

Perennial herb, creeping and rooting at nodes, puberulous. Leaf lamina broadly ovate to subtriangular, 0.5–3 cm long, 0.3–2.5 cm broad, basally truncate to subcordate, distinctly but irregularly serrate, acute to obtuse. Racemes in upper leaf axils, 2–8- or more-flowered; pedicels slender; bracts shorter than pedicels, usually entire. Sepals 4, equal, oblong to elliptic-oblanceolate, c. 4 mm long, rounded, accrescent in fruit. Corolla bluish; lobes c. 3 mm long. Capsule obovoid, 3–4 mm wide, truncate or very shallowly emarginate. Seeds smooth.

Norfolk Is. Native throughout much of southern and eastern Australia and presumably introduced to the Island with fodder. Growing in grassy road verges *etc.*, and not common.

N.Is.: near the summit of Mt Pitt, *J.D.McComish 161* (K, NSW); Red Rd, *P.S.Green 1359* (A); Ball Bay, *W.R.Sykes NI 413* (CHR).

2. *Veronica persica Poir. in J.B.A.P. de M. de Lamarck, *Encycl.* 8: 542 (1808)

T: cultivated; holo: P; IDC microfiche 6207.487/2. So called because the plant was originally said to come from Persia.

[*Veronica calycina auct. non* R.Br.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 712 (1904); R.M.Laing, *Trans & Proc. New Zealand Inst.* 47: 37 (1915)]

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 22: t. 36 (1966); B.A.Auld & R.W.Medd, *Weeds* 223 (1987); G.R.M.Dashorst & J.P.Jessop, *Pl. Adelaide Plains & Hills* 131, t. 58/11 (1990).

Annual herb, ±prostrate and rooting at nodes, pilose. Leaf lamina ovate to broadly ovate, 0.5–2.5 cm long, 0.5–2 cm broad, basally broadly cuneate to subcordate, crenate-serrate, obtuse to rounded. Flowers axillary, solitary; pedicels slender, longer than subtending bracts. Sepals 4, somewhat unequal, lanceolate to elliptic, 3–4 mm long, ciliate, accrescent in fruit. Corolla lobes unequal, 3–5 mm long, rounded; upper lobe blue; lower bluish white, veined. Capsule ±equalling calyx, c. 8 mm wide; lobes divergent, keeled, pubescent. Seeds concave on one side, tuberculate.

Norfolk Is., Lord Howe Is. A fairly common introduced weed, native to central and southern Europe and south-western Asia.

N.Is.: end of Stockyard Rd, Steels Point, *R.D.Hoogland 11228* (CANB); New Cascade Rd, *W.R.Sykes NI 166* (CHR); *s. loc.*, 1898, *I.Robinson* (NSW); *s. loc.*, *J.D.McComish 205* (K, NSW). **L.H.Is.:** W of Stevens Point, *A.C.Beauglehole 5626* (MEL).

3. *Veronica arvensis L., *Sp. Pl.* 1: 13 (1753)

T: Europe; lecto: LINN 26.58, *fide* L.H.Cramer in M.D.Dassanayake, *Revis. Handb. Fl. Ceylon* 3: 438 (1981); IDC microfiche 177/2.9/11. The epithet means growing on arable land, from the Latin *arvum* (an arable field).

Illustrations: S.Ross-Craig. *Drawings Brit. Pl.* 22: 34 (1966); G.M.Cunningham *et al.*, *Pl. W New South Wales* 601 (1981), as Wall Speedwell; W.R.Barker in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1305, fig. 596I (1986).

Annual herb, 3–20 cm tall, multistemmed from base, ±puberulous. Branches erect but often decumbent. Leaf lamina ovate to suborbicular, 5–15 mm long, 3–13 mm broad, basally truncate to subcordate, irregularly crenate-serrate, obtuse to rounded, glabrous or glandular-puberulent. Racemes terminal; pedicels 0.5–1 mm long; bracts narrowly elliptic. Sepals very unequal, lanceolate, 1.5–2 mm long, pilose, accrescent in fruit. Corolla inconspicuous, blue to almost white; lobes 1.5–2 mm long, rounded. Capsule obcordate, 2-lobed, c. equalling calyx, glandular-ciliate. Seeds flattened, smooth.

Norfolk Is., Lord Howe Is. A frequent weed, native to Europe, the Mediterranean, and central and western Asia.

N.Is.: New Cascade Rd, *W.R.Sykes NI 163* (CHR); *s. loc.*, *J.D.McComish 211* (K, NSW). **L.H.Is.:** W of Stevens Point, *A.C.Beauglehole 5627* (CANB, MEL).

4. CALCEOLARIA

Calceolaria L., *Kongl. Vetansk. Acad. Handl.* 31: 286 (1770); from the Latin *calceolus* (a slipper), alluding to the shape of the flowers.

Type: *C. pinnata* L.

Annual or perennial herbs, rarely vines or small shrubs. Leaves opposite, sometimes ternate, rarely alternate, simple to pinnate, glabrous or pubescent, often glandular. Inflorescence usually terminal, cymose-paniculate, rarely flowers solitary and axillary. Sepals 4, united at base. Corolla zygomorphic, strongly 2-lipped, pouched, usually yellow; lower lip larger, of 3 fused lobes, pouched, inflated, slipper-like. Stamens 2, included; anther cells contiguous and both fertile, or separated by connective and both fertile or 1 sterile or absent. Ovary 2-locular; style short. Fruit a 4-valved capsule. Seeds numerous, minute.

A genus of 300–400 species or more, from tropical and temperate Central and South America, from Mexico southwards. A number of species and hybrids are popular garden plants.

***Calceolaria tripartita** Ruiz & Pav., *Fl. Peruv.* 1: 14, t. 22a (1798)

T: Peru, *H.Ruiz Lopéz & J.A.Pavón s.n.*; holo: ?MA *n.v.* So named from the tripartite leaves.

Illustrations: J.Sims, *Bot. Mag.* 50: t. 2405 (1823), as *C. scabiosaefolia*; A.B.Graf, *Exotica* 12th edn, 2: 2050 (1989), as *C. scabiosaefolia*; W.R.Barker in G.J.Harden, *Fl. New South Wales* 3: 572 (1992).

Annual herb to c. 50 cm tall. Stems dark reddish, glandular-pilose, somewhat fleshy. Leaves opposite; basal leaves soon withering; petiole to 2 cm long; lamina deeply lobed to pinnatifid or pinnatisect, usually 5-lobed or divided, 3–8 cm long, 2–5 cm broad, serrate, acuminate, pilose or glandular-pilose; lobes lanceolate to broadly ovate; terminal lobe largest, to 3.5 cm long. Inflorescence terminal, cymose-paniculate; bracts resembling reduced leaves. Calyx 4–7 mm long; lobes ovate, glandular-ciliate. Corolla bright yellow; upper lip hooded, 3–4 mm long; lower lip suborbicular, concave, 10–15 mm long. Staminal filaments short; connectives 1–1.2 mm long; upper anther cell fertile, with lower sterile. Capsule broadly ovate, 6–9 mm long, glandular-pilose. Seeds longitudinally furrowed, reddish brown.

Norfolk Is. Naturalised and local in damp sheltered pastures. Native from Mexico south to Chile; now naturalised in Australia (eastern N.S.W.) and New Zealand.

N.Is.: Vern Olstens Valley, *N.Gillett B1* (Herb. Gillett).

82. MYOPORACEAE

Shrubs or small trees. Leaves alternate, rarely opposite or whorled, simple, without stipules. Inflorescence axillary, of cymose clusters or flowers solitary. Flowers bisexual. Sepals (4 or) 5, free or united towards base, accrescent in fruit. Corolla zygomorphic to almost actinomorphic, usually 2-lipped; lobes 4 or 5, imbricate. Stamens usually 4 in pairs of unequal length inserted at base of corolla lobes, with or without 1 staminode, rarely stamens 5. Ovary superior, 2-locular, or 4-locular from intrusive placentas, with 1–3 pairs of ovules per locule; placentation apical; style simple, straight or curved to hooked at apex; stigma capitate to slightly lobed. Fruit usually a drupe, sometimes a berry or almost dry. Seeds few.

A family of 3–5 genera and c. 220 species. Mostly Australian but extending to Mauritius, SE Asia, the Pacific and the West Indies; 1 genus native to the Islands.

G.Bentham, Myoporinae, *Fl. Austral.* 5: 1–30 (1870).

MYOPORUM

Myoporum Sol. ex G.Forst., *Fl. Ins. Austr.* 44 (1786); from the Greek *myo* (to close) and *poros* (a pore), in reference to the apparently closed appearance of the pellucid leaf glands.

Type: *M. laetum* G.Forst.

Shrubs to small trees, glabrous or rarely hairy. Leaves alternate or rarely opposite, often gland-dotted, entire or serrate. Flowers in clusters, sometimes solitary. Sepals usually 5, free or basally united, equal or subequal. Corolla somewhat campanulate, almost actinomorphic or very slightly 2-lipped; tube usually shorter than lobes; lobes almost equal, spreading. Stamens 4, exserted. Ovary 2-locular, or becoming 4-locular by intrusive placentas, with 1 or 2 ovules per locule; style straight. Fruit usually a succulent drupe, rarely dry.

A genus of c. 30 species from the Pacific, Australia, SE Asia and Mauritius; 2 species are native on the Islands.

Leaves (6–) 8–14 cm long; calyx lobes 5–8 mm long; corolla tube 6–8 mm long; corolla lobes 6–7 mm long (N.Is.) **1. M. obscurum**

Leaves 3–6 cm long; calyx lobes 2 mm long; corolla tube 3 mm long; corolla lobes 4 mm long (L.H.Is.) **2. M. insulare**

1. Myoporum obscurum Endl., *Prodr. Fl. Norfolk.* 54 (1833)

T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W; iso: K. The epithet means obscure.

Illustration: S.F.L.Endlicher, *Icon. Gen. Pl.* t. 65 (1839).

Small spreading tree to 7 m tall. Leaves alternate, glabrous; petiole 1–2.5 cm long; lamina lanceolate to elliptic-lanceolate, (6–) 8–14 cm long, (1.8–) 2.5–4.5 cm broad, acutely narrowed onto petiole, entire or sometimes obscurely crenate-dentate, acute to subacuminate with fine tip. Flowers (3 or) 4 per leaf axil; pedicels 5–20 mm long. Sepals linear-lanceolate, 5–8 mm long, slenderly tipped. Corolla white with mauve spots and pilose in lower part of lobes; tube 6–8 mm long; lobes broadly ovate, 6–7 mm long, obtusely rounded. Stamens 4, 3–4 mm long. Ovary flask-shaped, 2 mm long; style slender, 3–4 mm long. Drupe ±spherical, 5–6 mm long, white, turning mauve. *Sandalwood, Popwood, Bastard Ironwood.* Fig. 85D.

Norfolk Is. An endemic species, closely related to *M. kermadecensis* Sykes from the Kermadec Islands. Growing in the forest margins, and in cleared and open areas. Not common and in need of conservation.

N.Is.: SE slope of Mt Pitt, *M.Lazarides 8099* (CANB, K, NSW); cliff above Ball Bay, *G.Uhe 1662* (K); *s. loc., A.Cunningham 14 & 110(15)* (K); *s. loc., I.Robinson 95* (NSW); *s. loc.,* 1902, *J.H.Maiden & J.L.Boorman* (NSW).

2. Myoporum insulare R.Br., *Prodr.* 516 (1810)

T: Kent Island, Bass Strait, Australia, *R.Brown*; syn: BM. So named in reference to an island habitat, from the Latin *insula* (an island).

[*Myoporum acuminatum auct. non* R.Br.: C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 3 (1870)]

Illustrations: I.Hutton, *Lord Howe Is.* 131 (1986); R.J.Chinnock in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1346, fig. 613C (1986); A.Fairley & P.Moore, *Native Pl. Sydney District* 286 (1989).

Small bushy tree or shrub to 4 m tall. Leaves alternate, glabrous, glossy, dotted with pellucid glands, somewhat succulent; petiole 5–10 mm long; lamina elliptic to narrowly elliptic or narrowly oblanceolate, 3–6 cm long, 1–2 cm broad, gradually narrowed to petiole, entire or obscurely crenate-serrate towards apex, acute to subacuminate with fine tip. Flowers 1–8 per leaf axil; pedicels 1–10 mm long. Sepals triangular, 2 mm long. Corolla white with purple dots; tube 3 mm long; lobes suborbicular, 4 mm long, pilose towards base. Stamens 4, 2 mm long. Ovary flask-shaped, 2 mm long; style slender, curved, 3 mm long, sparsely pilose. Fruit ovoid, 7–8 mm long, purple. *Juniper*. Fig. 85E.

Lord Howe Is. Relatively common and widespread in lowland areas on the Island, especially near the coast. Mainly flowers Dec.–July, but occasional flowers are produced in other months. Also in Australia in coastal W.A., S.A., Vic., N.S.W., Qld and Tas.

L.H.Is.: ridge between Old Settlement and North Bay, *P.S.Green 1940* (K); track to Malabar, *I.Hutton 129* (CBG); ridge between Windy Point and Transit Hill, *J.Pickard 1489* (NSW); Salmon Beach, *M.M.J. van Balgooy 1002* (K, NSW); Rabbit Is., *A.N.Rodd 1819* (NSW).

83. OROBANCHACEAE

Annual to perennial, parasitic herbs without chlorophyll. Base of stem often swollen. Leaves alternate, reduced to scales, without stipules. Inflorescence terminal, spicate or racemose, rarely paniculate or flowers solitary, bracteate. Flowers bisexual. Calyx 4- or 5-lobed, cup-shaped, irregularly split or 2-lipped. Corolla tubular, zygomorphic and 2-lipped or almost equally 4- or 5-lobed. Stamens 4, in 2 unequal pairs, with or without 1 staminode, inserted within corolla tube; anthers often with basal appendages. Ovary superior, 1-locular, with 2–4 parietal placentas; style simple, terminal; stigma capitate or 2- or 4-lobed. Fruit a capsule. Seeds minute, numerous.

A family of c. 13 genera and 230 species, mostly from the Northern Hemisphere, especially of the Old World; 1 genus introduced to Norfolk Is.

G.Bentham, Orobanchaceae, *Fl. Austral.* 4: 533–534 (1869).

OROBANCHE

Orobanche L., *Sp. Pl.* 2: 632 (1753); *Gen. Pl.* 5th edn, 281 (1754); from the Greek *orobos* (the name of a kind of vetch) and *anche* (to strangle), in allusion to the habit of the type species in parasitising members of the family Fabaceae.

Type: *O. major* L.

Annual, biennial or perennial root-parasitic herbs. Stems usually erect from swollen base, branched or unbranched, variously coloured, often glandular-pilose. Scale leaves numerous. Flowers in a dense spike or raceme. Calyx irregularly 4 (or 5)-lobed or split to base into 2 entire or bifid segments. Corolla curved, strongly 2-lipped, marcescent; upper lip ±2-lobed; lower 3-lobed. Stamens included; anthers usually coherent in pairs below stigma. Ovary with 4 placentas; style usually curved towards apex; stigma 2- or 4-lobed, somewhat fleshy. Capsule enveloped in persistent calyx and corolla, usually dehiscing as 2 valves, often cohering at base of persistent style.

A genus of c. 150 species, mostly from temperate and warm temperate Eurasia and North Africa; 1 species naturalised on Norfolk Is. Some species are very host-specific, others will parasitise a wide range of species.

***Orobanche minor** Sm. in J.E.Sowerby, *Engl. Bot.* 6: t. 422 (1797)

T: England, *C.Sutton*; holo: LINN; IDC microfiche 5073.501/4. The epithet is Latin for smaller or lesser, contrasting the plant with the species *O. major*.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 23: t. 28 (1966); N.C.W.Beadle, *Students Fl. NE New South Wales* 5: 834, fig. 365 (1984); B.A.Auld & R.W.Medd, *Weeds* 194 (1987).

Perennial with erect annual shoots to c. 40 cm tall, with crisped, glandular hairs, dull brownish purple, sometimes tinged yellowish. Scale leaves ovate to lanceolate, 1–2 cm long; upper leaves remote. Spike dense, becoming lax below after flowering; bracts lanceolate, acuminate. Flowers sessile. Calyx 8–15 mm long, deeply split into 2 lateral, unequally bifid segments. Corolla 10–16 mm long with crisped margins, externally glandular-hairy, dull brownish mauve or yellowish, veined; back of tube curved; upper lip notched; lower lip ±equally 3-lobed. Ovary obloid-ellipsoidal, 5 mm long; style c. 1 cm long, curved under upper corolla lip; stigma purplish or yellowish. Capsule 8–9 mm long. Seeds very numerous. *Broomrape*.

Norfolk Is. Not common on the Island. A native of Europe and the Mediterranean region, parasitic on a wide range of hosts but particularly clover, and presumably introduced with fodder plants.

N.Is.: Anson Bay, *W.R.Sykes NI 145* (CHR); *loc. id.*, 1962, *P.Ralston* (CHR); Captain Cook Monument, 1967, *D.M.Henderson* (E); *s. loc.*, *J.D.McComish 107* (K).

84. GESNERIACEAE

Perennial herbs, rarely shrubs or small trees. Leaves radical or opposite, occasionally one leaf of pair much reduced, rarely alternate or whorled, simple, entire or toothed, without stipules. Inflorescence cymose or flowers solitary, rarely racemose. Flowers often large and showy, bisexual. Calyx lobes 5, free or united. Corolla zygomorphic, 5-lobed, usually 2-lipped, imbricate, often basally spurred. Stamens usually 2 or 4, rarely 5, often with 1 staminode; anthers often ±coherent in pairs. Ovary superior to inferior, 1-locular, with 2 ±intrusive, parietal placentas; ovules numerous; style terminal; stigma usually 2-lobed. Fruit a capsule, rarely a berry. Seeds small.

A mainly tropical and subtropical family of c. 140 genera and 2500 species; 1 genus endemic to Lord Howe Is.

G.Bentham, Gesneriaceae, *Fl. Austral.* 4: 534–536 (1869).

NEGRIA

Negria F.Muell., *Fragm.* 7: 151 (1871); named in honour of Professor Cristoforo Negri, 19th century Italian geographer.

Type: *N. rhabdothamnoides* F.Muell.

Small trees with brittle wood. Leaves simple, somewhat succulent, clustered towards ends of shoots, in whorls of 3 (or 4). Inflorescence axillary, cymose, 3-flowered. Calyx cup-shaped, 5-lobed. Corolla ±2-lipped; tube slightly curved. Stamens 4, not coherent, exserted; 1 staminode posterior. Ovary superior, conical, slightly curved, basally surrounded by shallow disc; placentas broad. Fruit a capsule.

A monotypic genus endemic to Lord Howe Is.

The genus is unique in the family in its arborescent habit; its affinities lie with genera in New Caledonia (*Coronanthera* and *Depanthus*) and in New Zealand (*Rhabdothamnus*). Together with *Fieldia* (N.S.W. and south-eastern Qld, Australia) these are the only Old World members of the large and otherwise exclusively New World subfamily Gesnerioideae, characterised by the cotyledons remaining equal after germination, the ovary superior or usually more or less inferior and other more obscure characters.

Negria rhabdothamnoides F.Muell., *Fragm.* 7: 152 (1871)

T: Lord Howe Island. *C.Moore*; holo: MEL; iso: K. So named from its affinity with the New Zealand endemic genus *Rhabdothamnus*.

Illustrations: P.S.Green, *Bot. Mag.* 179: t. 659 (1973); I.Hutton, *Lord Howe Is.* 37, 127 (1986).

Tree to 8 m tall. Leaves with upper surface glossy, pale green below, sparsely pubescent; lamina ovate to broadly elliptic, 7–20 cm long, 4.5–10 cm broad, basally acute to ±rounded, often slightly recurved at margins, very shallowly and bluntly denticulate with teeth small or imperceptible, obtuse to acute, slightly apiculate. Calyx 3–5 mm long, with ±filiform teeth, pubescent. Corolla somewhat waxy-fleshy, yellow with orange-red spots inside lobes and tube, pubescent; tube c. 20 mm long; lobes reflexed at anthesis, with 3 lower lobes 10–13 mm long, and upper pair 5–6 mm long. Filaments 17 mm long, ±reflexed. Capsule ovoid, 15 mm long, beaked. *Pumpkin Tree*. Fig. 85F–G.

Lord Howe Is. Common from c. 500 m altitude and upwards, occasionally at a lower altitude, as in Erskine Creek. Flowers Oct.–Apr.

L.H.Is.: vicinity of Goat House, *A.N.Rodd 1861* (K, NSW); slopes of Mt Lidgbird, *J.D.McComish 108* (K, NSW); Erskine Valley, *A.N.Rodd 1762* (K, NSW); last part of ascent of Mt Gower, *P.S.Green 1612* (A, K); summit of Mt Gower, *J.Pickard & A.N.Rodd 1370* (NSW).

85. ACANTHACEAE

Herbs, shrubs, climbers or sometimes trees. Stems often angled and swollen at nodes. Leaves opposite, simple, often with conspicuous cystoliths, without stipules. Inflorescence terminal or axillary, racemose, spicate, cymose or paniculate, or flowers occasionally solitary, often with large, coloured bracts. Flowers zygomorphic or almost actinomorphic, bisexual. Calyx 4- or 5-lobed, rarely more, sometimes reduced to a ring. Corolla tubular, 5-lobed, usually 2-lipped, convolute or imbricate in bud. Stamens 2, or 4 in 2 pairs, sometimes with 1 or more staminodes, inserted in corolla tube. Ovary superior, 2-locular; placentation axile; style simple; stigma capitate or lobed. Fruit a capsule, usually elastically dehiscent with recurved valves, rarely a berry. Seed usually compressed discoid, sometimes with mucilaginous hairs.

A mainly tropical family of c. 350 genera and 4000 species; 1 genus introduced on Norfolk Is. Many members are often grown as ornamentals, for either their coloured leaves or their showy flowers. *Thunbergia grandiflora* (Roxb. ex Rottler) Roxb., a blue- or white-flowered vine, has been recorded as semi-naturalised near the old prison settlement at Kingstown (*G.Uhe 1137*, K).

Pseuderanthemum grandiflorum (Benth.) Domin (*Eranthemum variabile* var. *grandiflorum* Benth.) was described and based on a specimen collected in the 1850s by W.G.Milne, which purported to come from Lord Howe Is. However, it has never been rediscovered there, and as it turns out to be *P. pelagicum* (Seem.) P.S.Green, a native of Vanuatu, the islands of which were visited by Milne after Lord Howe Is., it has been concluded that the specimen described by Bentham was labelled with the wrong locality.

G.Bentham, Acanthaceae, *Fl. Austral.* 4: 541–555 (1869); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Acanthaceae, *Fl. Java* 2: 544 (1963); R.M.Barker, A taxonomic revision of Australian Acanthaceae, *J. Adelaide Bot. Gard.* 9: 1–286 (1986).

HYPOESTES

Hypoestes Sol. ex R.Br., *Prodr.* 474 (1810); from the Greek *hypo* (under, beneath) and *estes* (a garment), probably referring to the involucre of fused bracts surrounding the base of the flower clusters.

Type: *H. floribunda* R.Br.

Herbs or subshrubs. Leaves with bases of petioles joining and forming a shallow ridge across node. Inflorescence terminal or axillary, spicate or paniculate, with clusters of 1–4 flowers enclosed in 4 fused bracts forming an involucre. Flowers developing sequentially. Calyx 5-lobed; lobes equal, acute. Corolla narrowly cylindrical at base, twisted through 180°, 2-lipped; lower lip reflexed, narrow, entire or slightly notched; upper lip 3-lobed, ±erect. Stamens 2, exserted. Ovary with 2 ovules per locule; stigma shortly 2-lobed. Capsule club-shaped. Seeds 4.

A genus of c. 70 species from the tropical Old World; 1 species introduced on Norfolk Is.

***Hypoestes phyllostachya** Baker, *J. Linn. Soc., Bot.* 22: 511 (1897)

T: Madagascar, *R.Baron 4907*; holo: K. The epithet comes from the Greek *phyllon* (a leaf) and *stachys* (a spike), referring to the leafy spike.

Illustrations: A.B.Graf, *Exotica* 12th edn, 1: 49 (1985); A.B.Graf, *Tropica* 3rd edn, 34 (1986); both as *H. sanguinolenta*; C.Brickell, *Gardeners' Encycl. Pl. & Fl.* 221 (1989).

Herb, becoming woody at base. Stems pilose. Leaves dark green marked with irregular pink dots and blotches; petiole slender, 1–7 cm long; lamina ovate, 3–12 cm long, 2–8 cm broad, basally obtuse to rounded, entire, acute. Inflorescence terminal on axillary branches, spicate; involucres 1-flowered, subtended by a pair of reduced leaves usually unequal in size. Calyx cylindrical, 1 cm long, pilose; lobes lanceolate, 2–3 mm long. Corolla c. 2 cm long, lavender-coloured; upper lip c. 1 cm long, somewhat curled back; lower lip c. 0.5 cm long, strongly recurved. Filaments straight, c. 1 cm long. Capsule not seen. *Polka-Dot Plant*.

Norfolk Is. A native of Madagascar now widely cultivated as a house plant, and in gardens in warm temperate areas, sometimes escaping and becoming naturalised.

N.Is.: New Cascade Rd, *W.R.Sykes NI 610* and *NI 1007* (CHR).

86. BIGNONIACEAE

Trees, shrubs or climbers, rarely herbs. Leaves usually opposite or whorled, usually pinnately compound, sometimes palmately compound or simple; terminal leaflet often becoming a tendril; without stipules. Inflorescence terminal or axillary, cymose, racemose or paniculate, sometimes flowers solitary. Flowers bisexual. Calyx 3–5-lobed, sometimes 2-lipped or truncate. Corolla zygomorphic, rarely almost actinomorphic, 5-lobed, often 2-lipped, imbricate. Stamens 4 and paired, sometimes 2, with or without 1 or 3 staminodes. Ovary superior with base surrounded by a disc, 2 (rarely 4)-locular, sometimes 1-locular with 2 placentas; ovules usually numerous; style 2-lobed. Fruit usually a capsule, rarely fleshy and indehiscent. Seeds usually flat and winged.

A mainly tropical or subtropical family of c. 120 genera and 800 species; 1 genus native to Lord Howe Is. *Tecomaria capensis* (Thunb.) Spach, Cape Honeysuckle, was recorded by Maiden as a hedge plant on Norfolk Is. (*Proc. Linn. Soc. New South Wales* 28: 749 (1904) under the name *Tecoma capensis*), but although still used as a hedge plant the species does not seem to have become naturalised.

G.Bentham, Bignoniaceae, *Fl. Austral.* 4: 536–541 (1869); C.G.G.J. van Steenis, Bignoniaceae, *Fl. Males.* ser. I, 8: 114–186 (1977).

PANDOREA

Pandorea (Endl.) Spach, *Hist. Nat. Vég.* 9: 136 (1840);

Tecoma Juss. sect. *Pandorea* Endl., *Gen Pl.* 711 (1839); named after the mythical Pandora who had a box which, when opened, released evils on the world; in reference to 'a very destructive blight' (a mealy bug?) on Norfolk Is. at the turn of the 18th century, which first appeared on this plant and then spread throughout the island (see H.Andrews, *Bot. Repos.* 2: t. 87, 1800).

T: *P. pandorana* (Andrews) Steenis

Shrubs or woody climbers. Leaves imparipinnate with terminal leaflet sometimes largest; leaflets entire or serrate. Inflorescence terminal or axillary, paniculate. Calyx campanulate or cup-shaped; lobes 5, usually short. Corolla usually ±funnel-shaped, somewhat 2-lipped; upper lip 2-lobed; lower lip 3-lobed, imbricate. Stamens 4, paired, included. Ovary 2-locular. Fruit a capsule. Seeds elliptical, winged.

A genus of 6 species from Australia, Malesia and New Caledonia; 1 species native on Lord Howe Is.

Pandorea pandorana (Andrews) Steenis, *Bull. Jard. Bot. Buitenzorg.* ser. 3, 10: 198 (1928)

subsp. **austrocaledonica** (Bureau) P.S.Green, *Kew Bull.* 45: 236 (1990)

Tecoma austrocaledonica Bureau, *Bull. Soc. Bot. France* 9: 163 (1862). T: New Caledonia, *E.Vieillard 1002*; holo: P; iso: K. So called as from 'South' [New] Caledonia.

[*Tecoma australis auct. non* R.Br.: J.MacGillivray, *Hooker's J. Bot. Kew Gard. Misc.* 6: 353 (1854); G.Bentham, *Fl. Austral.* 4: 537 (1868), *p.p.*; F.J.H. von Mueller, *Fragm.* 9: 77 (1875)]

Illustrations: H.Heine in A.Aubréville & J.-F.Leroy, *Fl. Nouv.-Calédon.* 7: 89, t. 20 (1976), as *Pandorea austrocaledonica*; I.Hutton, *Lord Howe Is.* 121 (1986).

Woody climber. Leaves with (5–) 7–9 leaflets (more in juvenile leaves); leaflets lanceolate to usually ovate, 2–3 (–7) cm long, 1.5–2 (–3.5) cm broad, ±sessile except terminal leaflet, basally acute to rounded, crenate-serrate, acute. Inflorescence many-flowered. Flowers smelling of vanilla. Calyx campanulate, 3 mm long; lobes broadly triangular. Corolla almost actinomorphic, cream with dark red spots in throat; tube 10–12 mm long, usually slightly curved; lobes 2–3 mm long, rounded. Anthers divergent. Ovary flask-shaped, glandular. Capsule obloid-ellipsoidal, 4–5 cm long, acute at apex and base, separating into 2 concave valves. Seeds numerous, flat, surrounded by delicate wing. *Boat Vine*.

Lord Howe Is. Fairly common up to altitudes of c. 500 m and sometimes above this. Flowers late Aug.–late Nov. This subspecies also occurs in New Caledonia and Vanuatu.

L.H.Is.: ridge W of Malabar, *P.S.Green 1951* (K); N of Hospital, *A.C.Beauglehole 5855* (MEL); SE side of Transit Hill, *L.A.S.Johnson & A.N.Rodd 1284* (NSW); summit ridge of Mt Lidgbird, *J.Pickard 1469* (NSW); *s. loc., J.D.McComish 34* (K, NSW).

Known on Norfolk Is. as Bignonia, *P. pandorana* subsp. *pandorana* has long been cultivated on the Island but there is no evidence that it is anything but an early introduction. The seeds from which *P. pandorana* was cultivated in England, when first described in 1800 (as *Bignonia pandorana* Andrews, *Bot. Repos.* 2: t. 86), were said to have come from Norfolk Is.; they either came from a plant cultivated on the Island, or a mistake was made over their provenance and they actually came from the area of Sydney, in New South Wales.

87. CAMPANULACEAE

Herbs, less often shrubs or few-stemmed trees, usually with milky sap. Leaves alternate, rarely opposite or whorled, simple, entire or toothed, rarely pinnately lobed, without stipules. Inflorescence terminal or axillary, racemose, spicate or cymose, or rarely flowers solitary.

Flowers actinomorphic or zygomorphic, bisexual or sometimes unisexual. Calyx with tube adnate to ovary, 5-lobed, persistent. Corolla usually 5-lobed, often 2-lipped; tube sometimes split dorsally. Stamens 5, free or inserted at corolla base; anthers free or coherent around style. Ovary inferior or semi-inferior, 2–5-locular; ovules axile, usually numerous; stigma lobes appressed until lengthening style has pushed them through anther tube, then spreading. Fruit a berry or variously dehiscent capsule. Seeds small, usually numerous.

A cosmopolitan family of c. 80 genera and 2000 species; 3 genera occur on the Islands. The subfamily Lobelioideae, which includes *Lobelia* and *Pratia*, is sometimes treated as a separate family.

G.Bentham, Campanulaceae, *Fl. Austral.* 4: 121–138 (1869); R.McVaugh, A revision of *Laurentia* and allied genera in North America, *Bull. Torrey Bot. Club* 67: 778–798 (1940); R.Melville, Contributions to the Flora of Australia: VI. The pollination mechanism of *Isotoma axillaris* Lindl. and the generic status of *Isotoma* Lindl., *Kew Bull.* 14: 277–279 (1960); R.D.Meikle, Some notes on *Laurentia* Adanson (Campanulaceae), *Kew Bull.* 34: 373–374 (1979).

KEY TO GENERA

1 Flowers actinomorphic; corolla campanulate to rotate; tube not split; stamens free — **1. WAHLENBERGIA**

1: Flowers zygomorphic; corolla not campanulate to rotate; tube split dorsally; stamens partially fused around style

2: Corolla with lobes ±equal, scarcely 2-lipped; fruit indehiscent — **2. PRATIA**

2: Corolla 2-lipped; fruit dehiscent — **3. LOBELIA**

1. WAHLENBERGIA

Wahlenbergia Schrad. ex Roth, *Nov. Pl. Sp.* 399 (1821); named after Georg or Göran Wahlenberg (1780–1851), Swedish botanist who was professor of botany and medicine at the University of Uppsala.

Type: *W. elongata* (Willd.) Schrad. ex Roth, *nom. illeg.* = *W. capensis* (L.) A.DC.

Annual or perennial herbs or subshrubs. Leaves alternate, rarely opposite, usually sessile. Inflorescence terminal or axillary, racemose, spicate or paniculate or flowers solitary. Calyx (3–) 5-lobed, persistent. Corolla actinomorphic, campanulate or rotate, (3–) 5-lobed, often deeply so, usually blue; filaments free; anthers free or sometimes coherent around style. Ovary ±inferior, 2 or 3 (–5)-locular; placentation axile; ovules numerous; style with pollen-collecting hairs on upper part; stigmatic lobes 2–5. Fruit a capsule dehiscing by apical pores. Seeds small, numerous.

A mainly Southern Hemisphere genus of 150 or more species; 2 native species occur on the Islands. More research is needed on the variability of the representatives of this genus on Lord Howe Is.

P.J.Smith. A revision of the genus *Wahlenbergia* (Campanulaceae) in Australia, *Telopea* 5: 91–175 (1992).

Plant much branched, 30–40 cm tall; inflorescence branching, 3–12-flowered — **1. W. gracilis**

Plant ±caespitose, 5–20 cm tall; inflorescence 1- or 2-branched, 1- or 2 (–3)-flowered — **2. W. insulae-howei**

1. Wahlenbergia gracilis (G.Forst.) A.DC., *Monogr. Campan.* 142 (1830)

Campanula gracilis G.Forst., *Fl. Ins. Austr.* 15 (1786). T: New Caledonia or New Zealand, *J.R. & G.Forster*; lecto: GOET *n.v., fide* R.C.Carolin, *Proc. Linn. Soc. New South Wales* 89: 240 (1964); ?isolecto: K. The epithet is the Latin for slender and alludes to the habit.

Illustrations: P.J.Smith in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1382, fig. 627E (1986); A.Fairley & P.Moore, *Native Pl. Sydney District* 297, fig. 1072 (1989); P.J.Smith, *Telopea* 5: 152, fig. 20a–d (1992).

Perennial herb, slender, branching, 30–40 cm tall. Branches leafy; lower leaves soon withering. Leaves narrowly elliptic to elliptic or oblanceolate, 1.5–3.5 cm long, 0.2–1.2 cm broad, decurrent onto an ill-defined petiole, sub-amplexicaul, undulate-denticulate with thickened margins, acute to obtuse, subacuminate, glabrous. Inflorescence frequently branched, 6–10 cm long, 3–12-flowered. Calyx lobes very narrowly triangular, 2–3 mm long. Corolla ±campanulate, 8–13 mm long, blue; lobes acute, 2–4 mm long. Capsule obconical, 3–4.5 mm long.

Norfolk Is., Lord Howe Is. In grassy areas, not common, and possibly introduced on Norfolk Is. (the first record being that of J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 707 (1904) - 'new for the island'). Also known from Papua New Guinea, eastern Australia, New Zealand, the Kermadec Is. and New Caledonia.

N.Is.: Mt Pitt, *R.M.Laing* (CHR); *loc. id., W.R.Sykes NI 365* (CHR); Mt Bates, 1943, *F.C.Allen* (CHR). **L.H.Is.:** SE lower slopes of Malabar, *P.S.Green 1550* (A, K); Mt Eliza, *P.S.Green 1945* (K); *s. loc.*, 1920, *J.L.Boorman* (NSW).

Some authorities have considered this species to be part of a more widespread and variable *W. marginata* (Thunb.) A.DC.

2. Wahlenbergia insulae-howei Lothian, *Proc. Linn. Soc. New South Wales* 71: 234 (1947)

T: Lord Howe Is., 1911, '*W.Woolls*' [*W.W.Watts*]; holo: NSW. Named after the island where it is endemic.

Wahlenbergia limenophylax Lothian, *Proc. Linn. Soc. New South Wales* 71: 233 (1947), as *limnophalyx*; & *Proc. Linn. Soc. New South Wales* 72: 366 (1948). T: Lord Howe Is., 1913, *W.R.B.Oliver*; holo: NSW; ?iso: K.

Illustration: P.J.Smith, *Telopea* 5: 122, fig. 12g–k (1992).

Perennial herb, ±caespitose, sparsely branched, 5–15 cm tall. Leaves glabrous or margins and midrib beneath strigulose with row of hairs; lamina linear or narrowly elliptic to elliptic-oblanceolate, 0.5–2 cm long, 0.1–0.6 cm broad, basally attenuate onto an ill-defined petiole, sub-amplexicaul, undulate-denticulate with thickened margins, acute. Inflorescence of 1–3, 1- or 2-flowered branches, 3–6 cm long. Calyx lobes very narrowly triangular, 2–3 mm long. Corolla ±campanulate, 6.5–10 mm long, blue; lobes 3–4 mm long, narrowly obtuse. Ovary broadly obconical, 3.5–4.5 mm long. Fig. 87A.

Lord Howe Is. Endemic and occasional in rocky places among bushy grassland.

L.H.Is.: Dawsons Point, *C.Moore 78* (K); Northern Hills, W of Kims Lookout, E of Old Gulch, *J.C.Game 69/219* (K); *s. loc., W.R.B.Oliver s.n.* (K).

The habit varies according to severity or otherwise of the substrate, being more stunted and caespitose in exposed clefts in rocks.

2. PRATIA

Pratia Gaudich., *Ann. Sci. Nat. Paris* 5: 103 (1825); named after Charles Louis Prat-Bernon, a midshipman on the *Uranie* on H.L.C. de S. de Freycinet's voyage of scientific discovery, who died at sea a few days after the expedition set sail in 1817.

Type: *P. repens* Gaudich.

Perennial or annual herbs, usually prostrate and rooting at nodes, sometimes erect and somewhat woody at base. Leaves alternate, usually toothed, without stipules. Flowers solitary or in racemes with leaf-like bracts, usually unisexual. Calyx 5-lobed, persistent. Corolla slightly 2-lipped; upper lip 2-lobed; lobes subequal; tube split to base dorsally. Anthers and upper ½ of filaments united into column around style; 3 upper anthers slightly larger and curved over 2 shorter ones, with terminal tuft of hairs or awned. Female flowers with staminodes. Ovary inferior, 2-locular; style slender with ring of hairs below 2-lobed stigma. Fruit indehiscent, usually ±succulent. Seeds small, numerous.

A Southern Hemisphere genus of c. 30 species, sometimes united with *Lobelia*; 1 species introduced to the Islands.

***Pratia purpurascens** (R.Br.) E.Wimm. in H.G.A.Engler, *Pflanzenr.* IV 276b Suppl. (Heft 107): 764 (1956)

Lobelia purpurascens R.Br., *Prodr.* 563 (1810). T: New South Wales, *R.Brown*; holo: BM; iso: K. The epithet means becoming purple, from the Latin *purpura*, the purple dye obtained from the shellfish *Murex*, and the suffix *-ascens*, indicating process of becoming.

Illustration: A.Fairley & P.Moore, *Native Pl. Sydney District* 298, fig. 1077 (1989).

Perennial herb with creeping stem and erect shoots to 30 cm tall, glabrous. Leaves ovate to almost orbicular, 0.7–1.5 cm long, 0.5–1 cm broad, basally obtuse to rounded, serrate-denticulate, acute to obtuse. Flowers solitary, axillary, mauve; pedicels 1.5–3 cm long. Calyx lobes narrowly triangular, 2 mm long. Corolla with tube 4–5 mm long; upper lobes 2–3 mm long; lower lobes 3–4 mm long. Anther tube in male flowers 1.5 mm long; upper anthers glabrous; lower anthers with 1 or 2 apical bristles. Ovary and fruit not seen.

Norfolk Is., Lord Howe Is. Native to eastern Australia. On Norfolk Is. collected once from the 'Officers' Garden' and represented by a male plant. Also recorded from Lord Howe Is., but not seen recently, and listed by A.N.Rodd & J.Pickard (*Cunninghamia* 1: 278, 1983) among those mainly weedy species represented by one or two specimens only and now believed to have died out.

N.Is.: Officers' Garden, *J.D.McComish 11* (K). **L.H.Is.:** *s. loc., J.D.McComish 212* (NSW).

3. LOBELIA

Lobelia L., *Sp. Pl.* 2: 929 (1753); *Gen. Pl.* 5th edn, 401 (1754); named after Matthias de l'Obel (1538–1616), Flemish botanist, author of early botanical works and physician to James I of England.

Type: *L. dortmanna* L.

Annual or perennial herbs, sometimes stout and sparingly branched shrubs. Leaves alternate, simple, entire, toothed or sometimes lobed. Inflorescence terminal, racemose, spicate or paniculate, or rarely flowers solitary, bracteate. Calyx short, persistent. Corolla zygomorphic with tube split to base adaxially, 2-lipped; upper lip 2-lobed, often smaller than lower 3 lobes. Stamens fused into column around style, 2 or sometimes 5, with hairy tips. Ovary inferior, 2-locular; stigma of 2 broad lobes which push up through anther column, separate and become receptive. Fruit a capsule, 2-valved. Seeds small, numerous.

A cosmopolitan genus of 350 or more species; 1 species native on the Islands. *Lobelia erinus* L. is a popular annual bedding plant in gardens.

Figure 86. A, OLEACEAE: *Jasminum simplicifolium* subsp. *australiense*, habit (A.Rodd 1739, K). **B–D**, ASTERACEAE. **B**, *Pseudognaphalium luteoalbum*, habit (J.McComish 41). **C–D**, *Euchiton involucratus*. **C**, habit; **D**, capitulum (**C–D**, 1804, F.L.Bauer, K). **E**, CAMPANULACEAE: *Lobelia anceps*, habit (P.Green 1422, K). **F**, CONVOLVULACEAE: *Ipomoea pes-caprae* subsp. *brasiliensis*, habit (G.Uhe 1238, K). Scale bars = 1 cm. Drawn by P.Halliday.

Lobelia anceps L.f., *Suppl. Pl.* 395 (1782)

T: Cape of Good Hope, *C.P.Thunberg*; lecto: Herb. Thunberg 21004, UPS, *fide* M.Thulin, *Nordic J. Bot.* 3: 380 (1983); IDC microfiche 1036-5184.882/16. The epithet is Latin meaning doubtful or ambiguous (literally 'two-sided'), because it was thought it might perhaps be a variety of *L. erinus*.

Lobelia alata Labill., *Nov. Holl. Pl.* 1: 51, t. 72 (1805). T: Tasmania, *J.J.H. de Labillardière*; holo: ?P *n.v.*

Lobelia alata var. *stolonifera* Endl., *Prodr. Fl. Norfolk.* 50 (1833). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W.

Illustrations: H.R.Toelken in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1371, fig. 623A, t. 39 (1986); G.R.M.Dashorst & J.P.Jessop, *Pl. Adelaide Plains & Hills* 134, t. 60/6 (1990); both as *L. alata*.

Perennial herb, procumbent and rooting from base, with shoots ascending to c. 30 cm or more. Leaves somewhat succulent, glabrous; lamina obovate to oblanceolate or narrowly elliptic, 1.5–5 cm long, 0.7–2.5 cm broad, long decurrent onto hardly differentiated petiole, ±entire or with 2–4 small teeth, obtuse to rounded and blunt or with small apiculum. Flowers solitary in axils of leaf-like bracts; pedicels 2–10 mm long, glabrous. Calyx lobes triangular, 1–2 mm long. Corolla 6–8 mm long, blue to white; lobes 4–6 mm long. Ovary obconical. Capsule ±cylindrical, 6–12 mm long. *Lobelia*. Fig. 86E

Norfolk Is., Lord Howe Is. Frequent by the sea, often on bare soil, sometimes inland. Also occurs in South Africa, Australia, New Zealand and Chile.

N.Is.: Hundred Acres (Rocky Point) Reserve, *R.D.Hoogland 11224* (NSW); Slaughter Bay, 1962, *P.Ralston* (NSW); Philip Is., *P.S.Green 1482* (A, K). **L.H.Is.:** E shore of North Bay, *L.A.S.Johnson & A.N.Rodd 1240* (K, NSW); 0.2 km S of Salmon Beach, *A.N.Rodd 1438* (K, NSW); Goat House, *P.S.Green 2321* (K).

88. GOODENIACEAE

Perennial herbs or shrubs, sometimes small trees, without milky sap. Leaves alternate, rarely opposite or radical, simple, without stipules. Inflorescence axillary, cymose, racemose, spicate or a head, rarely flowers solitary. Flowers zygomorphic, bisexual. Calyx 5-lobed. Corolla 5-lobed, 2-lipped or 1-lipped with tube dorsally split to base; lobes valvate-induplicate. Stamens 5, free or shortly joined to corolla base; anthers free or coherent around style. Ovary inferior or semi-inferior, rarely superior, (1–) 2 (–4)-locular with 1 or more basal or axile ovules per locule; style simple, pushing up through anther tube and collecting pollen with a fringed, cup-shaped indusium below small stigmatic lobes. Fruit a capsule, drupe or nut.

A mainly Southern Hemisphere family, mostly Australian, with 11 genera and c. 400 species; 1 genus native to Lord Howe Is.

G.Bentham, Goodenovieae, *Fl. Austral.* 4: 37–121 (1869); R.C.Carolin, Floral Structure and Anatomy in the Family Goodeniaceae Dumort., *Proc. Linn. Soc. New South Wales* 84: 252–255 (1959); W.J.Peacock, Chromosome numbers and cytoevolution in the Goodeniaceae, *Proc. Linn. Soc. New South Wales* 88: 8–27 (1963); R.C.Carolin, M.T.M.Rajput & D.Morrison, Goodeniaceae, *Fl. Australia* 35: 4–300 (1992).

SCAEVOLA

Scaevola L., *Mant. Pl.* 145 (1771); named, from the similarity in the shape of the corolla to a hand, after Caius Mucius, a hero of ancient Rome who, when captured, showed his courage by thrusting his right hand into a fire, and was thenceforth called *Scaevola*, 'the left-handed one', after the Latin *scaevus* (left).

Type: *S. lobelia* L., *nom. illeg.* = *S. plumieri* (L.) Vahl.

Herbs, shrubs or small trees. Leaves alternate or rarely opposite, simple, entire or dentate, often fleshy. Inflorescence racemose, cymose or flowers solitary, bracteolate. Calyx often short. Corolla with tube split dorsally to base, 1-lipped, fan-like; lobes ±equal, spreading, often winged with thin margins. Stamens free; filaments slender. Ovary inferior, (1 or) 2-locular; ovule usually 1 per locule; style shorter than corolla, exserted through split staminal tube, bent at or near apex. Fruit indehiscent, dry or drupe-like, with 1 or 2 seeds.

A genus of c. 100 species, 2 of them widespread strand plants, the remainder mostly Australian and often localised endemics; 1 species native on Lord Howe Is.

Scaevola taccada (Gaertn.) Roxb., *Hort. Bengal.* 15 (1814)

Lobelia taccada Gaertn., *Fruct. Sem. Pl.* 1: 119, t. 25, fig. 5 (1788). T: Gaertner, *loc. cit.*; lecto: *fide* P.S.Green, *Kew Bull.* 48: 316 (1993). The epithet is the native Sinhalese name for this species.

Scaevola sericea Vahl, *Symb. Bot.* 2: 37 (1791). T: 'Habitat in Savage Island [Niue], DN, *Prof. Fabricius*': *n.v.*

Scaevola koenigii Vahl, *Symb. Bot.* 3: 36 (1794). T: India, *J.G.König*; holo: ?C *n.v.*

[*Scaevola frutescens auct. non* (Mill.) Krause: W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 154 (1917)]

Illustrations: W.A.Whistler, *Coastal Fl. Trop. Pacific* 47 (1980); J.Brock, *Top End Native Pl.* 296 (1988); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i*, 787, t. 108 (1990), as *S. sericea*.

Spreading shrub to 3 m tall. Leaves somewhat thick and leathery, shiny, glabrous to silky, with tufts of hairs in axils; lamina oblanceolate to obovate, to broadly so, 5–20 cm long, 4–7 cm broad, basally long-attenuate, entire or obscurely denticulate towards rounded apex. Inflorescence a few-flowered cyme, 2–5 cm long; pedicels 2–10 mm long. Calyx lobes narrowly lanceolate, 3–4 mm long. Corolla white, often with purple streaks or tinged with brown; tube c. 1 cm long, bearded inside; lobes lanceolate-elliptic, c. 1 cm long, with thin, often fimbriate or erose margins. Fruit globose, c. 1 cm long, white, fleshy.

Lord Howe Is. Although no material from the Island has been seen in the preparation of this Flora and it has not been recorded from there recently, there seems no reason to doubt C.Moore's record of this unmistakable plant (in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 25, 1870). It is presumably extinct on Lord Howe Is. (as suggested by A.N.Rodd & J.Pickard, *Cunninghamia* 1: 278, 1983).

89. RUBIACEAE

Trees, shrubs, climbers or herbs. Leaves opposite or whorled, simple, usually entire, petiolate or sessile; stipules interpetiolar (rarely intrapetiolar), sometimes leaf-like. Inflorescence cymose, usually paniculate, rarely flowers solitary, usually bracteate. Flowers actinomorphic, usually bisexual, often heterostylous. Calyx with tube usually joined to ovary, 4- or 5-lobed; lobes various. Corolla tubular, 4- or 5 (–8)-lobed; lobes contorted, imbricate or valvate in bud. Stamens 4 or 5 (rarely more), inserted on or within corolla tube. Ovary inferior, (1 or) 2-locular, rarely more, with 1–many ovules per locule; style simple; stigmas capitate or lobed. Fruit a capsule, berry or drupe, rarely dry and indehiscent.

A large family of c. 600 genera and perhaps up to 10,000 species; mostly tropical or subtropical, but also represented in temperate regions; 7 genera occur on the Islands.

G.Bentham, Rubiaceae, *Fl. Austral.* 3: 399–447 (1866); H.H.Allan, Rubiaceae, *Fl. New Zealand* 1: 559–593 (1961); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Rubiaceae, *Fl. Java* 2: 274–257 (1965); B.Verdcourt, *Fl. Trop. E. Africa*, Rubiaceae 1: 1–414 (1976); B.Verdcourt, Notes on Mascarene Rubiaceae, *Kew Bull.* 37: 521–574 (1983); C.J.Webb *et al.*, Rubiaceae, *Fl. New Zealand* 4: 1142–1150 (1988).

KEY TO GENERA

1 Shrubs or small trees; leaves in opposite pairs, dissimilar to stipules, usually more than 2 cm long

2 Fruit a capsule; flowers mauve or pink; stipules with filiform segments **1. PENTAS**

2: Fruit ±fleshy; flowers white or green; stipules entire, sometimes ciliolate

3 Stipules prominent, 2.5–4 cm long; corolla tube 8–12 mm long; lobes 14–18 mm long; fruit c. 3 cm long, yellowish green (L.H.Is.) **2. ATRACTOCARPUS**

3: Stipules not more than 1.5 cm long; corolla tube not more than 10 mm long; lobes 1–15 mm long; fruit not more than 2 cm long, red, bluish purple or black

4 Flowers unisexual, green; stamens pendulous; stigmatic arms 3–8 mm long (N.Is., L.H.Is.) **3. COPROSMA**

4: Flowers bisexual, white; stamens not pendulous; stigmatic arms less than 3 mm long

5 Inflorescence axillary; corolla contorted in bud; fruit red, clustered **4. COFFEA**

5: Inflorescence terminal; corolla valvate in bud; fruit black, not clustered (L.H.Is.) **5. PSYCHOTRIA**

1: Herbs, usually procumbent or decumbent

6 Leaves and stipules similar, in whorls of 4–6; leaves to 1.5 cm long **6. SHERARDIA**

6: Leaves and stipules dissimilar, in opposite pairs **7. RICHARDIA**

1. PENTAS

Pentas Benth., *Bot. Mag.* 70: t. 4086 (1844); the name is the Greek for a series of five and refers to the flower parts being in series of five, instead of the usual four in this family.

Type: *P. carnea* Benth.

Perennial herbs or shrubs. Leaves opposite or in whorls of 3–5; stipules interpetiolar, divided into 2–many filiform segments. Inflorescence usually terminal, cymose, much-branched. Flowers bisexual. Calyx 5-lobed; lobes equal, or unequal with 1–3 larger than others, sometimes leaf-like. Corolla with short or long, narrow tube; throat hairy; lobes 5, ovate or oblong, valvate. Stamens included in dilated throat or exserted. Ovary 2-locular, with numerous ovules; style slender, heterostylous of 3 lengths; stigma 2-lobed. Fruit a capsule, dehiscing from apex into 2 or 4 valves. Seeds numerous, minute.

A tropical African genus of c. 40 species; 1 species naturalised on Norfolk Is.

***Pentas lanceolata** (Forssk.) Deflers, *Voy. Yemen* 142 (1889)

Ophiorrhiza lanceolata Forssk., *Fl. Aegypt.-Arab.* 42 (1775). T: Yemen, *P.Forsskål*; holo: ?C *n.v.*; iso: BM. So named from its lanceolate leaves.

Illustrations: F.Perry, *Fl. World* 267 (1972); A.B.Graf, *Exotica* 12th edn, 2: 2011, 2022 (1985); C.Brickell, *Gardeners' Encycl. Pl. & Fl.* 131 (1989).

Subshrub or shrub 0.5–2 m tall, hairy. Leaves lanceolate to broadly lanceolate, 3–12 cm long, 1–5 cm broad, attenuate onto petiole, entire, acute, pubescent above and below, especially on prominent veins; stipules with 3–9 or more setae, 2–10 mm long. Flowers in congested cymose heads. Calyx tube 1–3 mm long, hairy; lobes unequal, 5–10 mm long. Corolla mauve or pink with white eye; tube narrowly cylindrical, 1.5–2 cm long, becoming funnel-shaped at throat. Capsule obconical, 3–4 mm long.

Norfolk Is. An escape from cultivation, becoming naturalised. A native of Africa commonly grown in gardens.

N.Is.: Mrs Moore's Nature Reserve, *W.R.Sykes NI 660* (CHR).

2. ATRACTOCARPUS

Atractocarpus Schltr. & K.Krause, *Bot. Jahrb. Syst. 40 Beibl.* 92: 43 (1908); from the Greek *atraktos* (a spindle) and *carpos* (a fruit); referring to the narrow, fusiform fruit in the type species.

Type: *A. bracteatus* Schltr. & K.Krause

Shrubs or small trees, dioecious or monoecious. Leaves opposite or in whorls of 3 or 4, relatively large; stipules connate or in pairs. Inflorescence axillary or terminal, becoming lateral on bracteate branchlets with growth of shoot apex, clustered to cymose, 1–several-flowered. Calyx tube truncate with 5 small lobes, usually persistent in fruit. Corolla salverform; tube somewhat urceolate; lobes 5, patent, contorted in bud. Stamens 5, included. Ovary 2-locular; ovules few to numerous, embedded in placenta; style included; stigma club-shaped or cleft, borne in corolla throat. Fruit a berry, fusiform to ±globose; endocarp hard. Seeds few to many, embedded in pulp.

A genus of c. 10 species, mainly found in New Caledonia, or if treated in a broad sense, c. 40 species from New Guinea and Micronesia through Melanesia to Tonga; 1 species endemic to Lord Howe Is.

The delimitation of genera in this group of plants is still under debate.

Atractocarpus stipularis (F.Muell.) Puttock in P.S.Green, *Kew Bull.* 45: 246 (1990)

Randia stipulosa C.Moore & F.Muell. in F.J.H. von Mueller, *Fragm.* 7: 47 (1869), *nom. illeg. non.* Miq. (1857); *Randia stipularis* F.Muell., *Descr. Notes Papuan Pl.* 1: 69 (1876), *nom. nov.*; *Trukia stipularis* (F.Muell.) P.S.Green ex Hutton, *Lord Howe Is.* 139 (1986), *nom. inval.* T: Lord Howe Is., *C.Moore 31*; holo: MEL. So called because of the large stipules

Gardenia stipulosa F.Muell., *Fragm.* 7: 47 (1869), *nom. in synon.*

Randia macrophylla C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 2 (1870), *nom. nud.*, *non* Hook.f.

Illustrations: I.Hutton, *Lord Howe Is.* 139 (1986), as *Trukia stipularis*.

Small globose tree, 3–12 m tall, sparsely branched, dioecious. Leaves glabrous; lamina broadly ovate, 12–30 cm long, 8–24 cm broad, basally attenuate, entire, acuminate; domatia in axils of veins beneath; stipules interlocking, thick, 2.5–4 cm long. Inflorescence axillary, cymose; male with 20 or more flowers; female with 2 or 3 flowers. Flowers fragrant. Calyx tube obconical, 4–5 mm long. Corolla tube urceolate, 8–12 mm long, bearded inside; lobes lanceolate, 14–18 mm long. Fertile anthers 6–7 mm long. Ovary with 40–60 ovules in female flowers, 30–40 in male flowers; style 8–12 mm long; stigmatic lobes 5–6 mm long. Fruit subspherical to ovoid, 3.2–3.4 cm long, yellow-green. Seeds disk-shaped. *Green Plum*. Fig. 87F.

Lord Howe Is. Endemic. Widespread in sheltered spots at all altitudes on the Island. Flowers early Nov.–late Feb.

L.H.Is.: Transit Hill, *P.S.Green 1632* (A, K, NSW); W slopes of Transit Hill, *A.N.Rodd 3609* (K, NSW); NE flank of Mt Lidgbird, *M.M.J. van Balgooy 1150* (NSW); summit of Mt Lidgbird, *J.Pickard* in *A.N.Rodd 1467* (NSW); summit of Mt Gower, *L.A.S.Johnson & A.N.Rodd 1358* (NSW).

3. COPROSMA

Coprosma J.R.Forst. & G.Forst., *Char. Gen. Pl.* 137, t. 69 (1775); from the Greek *kopros* (dung) and *osme* (smell), from the unpleasant smell when some members of this genus are bruised.

Type: *C. foetidissima* J.R.Forst. & G.Forst.

Shrubs or small trees, sometimes creeping, usually dioecious, often fetid when bruised. Leaves opposite, rarely ternate, entire; domatia often present; stipules interpetiolar, sometimes united and sheathing stem, entire or dentate. Flowers solitary or in few-flowered

axillary cymes, unisexual, rarely bisexual. Calyx lobes 4 or 5 (–10), often absent in male flowers. Corolla in male flowers deeply divided; in female flowers with distinct, usually narrow tube, 4- or 5 (–10)-lobed, usually greenish, valvate. Stamens 4 or 5 (–10); filaments slender, long exserted; anthers pendulous. Ovary 2 (or 4)-locular; ovule 1 per locule; stigmas long exserted, papillose-hirsute, deeply 2 (–4)-lobed. Fruit a 2 (or 4)-seeded, fleshy drupe.

A genus of c. 90 species distributed from Borneo and Java across the Pacific to Hawai'i and Juan Fernandez, and southwards to eastern Australia, New Zealand and some subantarctic islands; 7 species endemic to Norfolk and Lord Howe Islands.

W.R.B.Oliver, The genus *Coprosma*, *Bernice P. Bishop Mus. Bull.* 132 (1935).

1 Scrambling or prostrate shrub with shoots to 50 cm tall; leaves 0.7–1.3 cm long (L.H.Is.) **7. C. inopinata**

1: Shrub or small tree, ±erect; leaves at least 2 cm long

2 Stipules without distinct linear acumen; fruit obovoid, 4–7 mm long

3 Young stems pilose; leaves ±pilose, especially on veins; petiole 2–5 mm long; in forest areas (N.Is.) **3. C. pilosa**

3: Young stems glabrous or minutely puberulous; leaves glabrous, glossy above when fresh; petiole 0.5–1.5 cm long; usually near the sea

4 Leaves obtuse to rounded; petiole finely puberulous (L.H.Is.) **1. C prisca**

4: Leaves rounded-truncate to shallowly emarginate; petiole glabrous (N.Is.) **2. C. baueri**

2: Stipules with distinct linear acumen 1.5 mm long or more; fruit ellipsoidal, at least 8 mm long (L.H.Is.)

5 Leaves obtuse to rounded with very short apiculum; stipule acumen 6–10 mm long; leaves and stems fetid when cut or bruised; fruit 20 mm long **6. C. putida**

5: Leaves acute or very slightly acuminate; stipule acumen 3–4 mm long; leaves and stems not fetid when cut or bruised; fruit 8–10 mm long

6 Most leaves with 2 prominent domatia beneath, c. 1/3 leaf length from apex; primary veins at an angle of c. 30° to midrib **4. C. lanceolaris**

6: All leaves without domatia beneath; primary veins at an angle of c. 50° to midrib **5. C. huttoniana**

1. Coprosma prisca W.R.B.Oliv., *Trans. & Proc. New Zealand Inst.* 49: 153 (1917)

T: Lord Howe Island, *W.R.B.Oliver*; holo: ?WELT *n.v.* The epithet is Latin for old or ancient; its application to this species is obscure.

[*Coprosma baueri auct. non* Endl.: F.J.H. von Mueller, *Fragm.* 9: 69, 77 (1875); C.Moore & E.Betche, *Handb. Fl. New South Wales* 519 (1893); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 239 (1896)]

Illustrations: W.R.B.Oliver, *Bernice P. Bishop Mus. Bull.* 132: 114, fig. 38, t. 18B (1935); I.Hutton, *Lord Howe Is.* 138 (1986).

Dense shrub to 3 m tall. Branches stout, minutely puberulous when young. Leaves glossy, bright green, not fetid when bruised; petiole 4–12 mm long, finely puberulous; lamina obovate to elliptic or sometimes almost lanceolate, 2–7 cm long, 1–3.5 cm broad, attenuate onto petiole, with slightly recurved margins, obtuse to rounded; venation obscure above, evident below, 4 primary veins on each side of midrib with domatia in their axils; stipules triangular, 1–1.5 mm long. Calyx obscure. Corolla 3–4 mm long, green. Male flowers in clusters of 3–8; filaments c. 4 mm long; anthers 2–2.5 mm long. Female flowers solitary or paired; stigmatic arms 6–8 mm long. Fruit slightly obovoid, 6–7 mm long, green. *Goatwood*.

Lord Howe Is. Endemic. Relatively common at low altitudes, especially near the sea. Flowers late Aug.–early Oct.

L.H.Is.: SE slopes of Malabar, *P.S.Green 1535 & 1536* (A, K); Lagoon Rd, near 'Trader Nick's', *A.N.Rodd 1836* (K, NSW); Middle Beach, *R.D.Hoogland 8639* (CANB, NSW); N end of Blinky Beach, *A.N.Rodd 1853 & 1854* (K, NSW); top of N end of Little Slope, *J.Pickard 2802* (NSW).

2. **Coprosma baueri** Endl., *Iconogr. Gen. Pl.* xi, t. 111 (1841)

T: Norfolk Island, 1804–1805, *F.L.Bauer and K.A.A.Freiherr von Hügel*; syn: W. Named after Ferdinand Lukas Bauer (1760–1826), Austrian botanical artist on Lieutenant M.Flinders' voyage of exploration around Australia. Bauer collected on Norfolk Is. in 1804 and 1805.

Coprosma baueriana Hook.f., *Fl. Nov.-Zel.* 1: 104 (1853), error for *baueri*.

[*Coprosma lucida auct. non* J.R.Forst & G.Forst.: S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 60 (1833); A.Cunningham in R.Heward, *London J. Bot.* 1: 124 (1842); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 706 (1904)]

Illustrations: S.F.L.Endlicher, *Iconogr. Gen. Pl.* t. 111 (1841); W.R.B.Oliver, *Bernice P. Bishop Mus. Bull.* 132: 116, t. 25B (1935).

Shrub or small tree. Young branchlets puberulous. Leaves light green, glossy, not fetid when bruised; petiole 8–15 mm long, glabrous; lamina obovate, 2.5–6 cm long, 1.5–4 cm broad, attenuate onto petiole, with slightly recurved margins, rounded-truncate to shallowly emarginate; primary veins visible above and below, (3–) 4 (–5) on each side of midrib, with small domatia in their axils beneath; stipules triangular, 1–1.5 mm long. Calyx obscure. Corolla green, 3–4 mm long. Male flowers in clusters of 3–8; filaments 3–4 mm long; anthers 2 mm long. Female flowers 1–3 together; stigmatic arms 6–7 mm long. Fruit orange, slightly obovoid, 6–7 mm long. *2n* = 44, *fide* E.J.Beuzenberg, *New Zealand J. Bot.* 21: 9 (1982).

Norfolk Is. Endemic. Here and there near the coast but not common.

N.Is.: Anson Bay, *P.S.Green 1868 & 1869* (K); Moo-Moo Stone, N from Cascades, *R.M.Laing* (CHR); Ball Bay, *R.M.Laing* (CHR); Philip Is., *R.D.Hoogland 11338* (K, NSW); *s. loc., A.Cunningham 117* (6) (K)

This species has been much confused with *C. lucida* J.R.Forst. & G.Forst. and *C. repens* Rich. of New Zealand. It was early taken into cultivation and is useful for growing in areas affected by salt spray.

3. **Coprosma pilosa** Endl., *Prodr. Fl. Norfolk.* 60 (1833)

T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W; iso: K. So called because of its pilose stems and leaves.

Coprosma villosa A.Cunn. in J.Heward, *London J. Bot.* 1: 113 (1842), *nom. nud.*

Illustration: W.R.B.Oliver, *Bernice P. Bishop Mus. Bull.* 132: t. 27B (1935).

Shrub or small tree to 6 m tall. Branches pilose when young. Leaves dark green, pilose above and below, especially on veins, not fetid when bruised; petiole 5–15 mm long, glabrous; lamina elliptic or elliptic-oblong, 2–6 (–10) cm long, 1–3 (–4) cm broad, broadly attenuate onto petiole, flat, acute to obtuse and apiculate; primary veins 3 (or 4) on each side of midrib, with small, pilose domatia in their axils beneath; stipules broadly triangular, 1–3 mm long, acute, pilose. Calyx lobes obscure, or unequal and up to 1 mm long. Corolla 3 mm long, green. Male flowers 1–3; filaments 3 mm long; anthers 2 mm long. Female flowers usually solitary, 2 mm long; stigmatic arms 6 mm long. Fruit obconical, 4–5 mm long, dark bluish purple. *2n* = 132, *fide* E.J.Beuzenberg, *New Zealand J. Bot.* 21: 10 (1982).

Norfolk Is. Endemic. Scattered in the forest around Mt Pitt and Mt Bates.

N.Is.: Mt Pitt, *O.Evans* in *P.S.Green 2441* (K); *loc. id., R.D.Hoogland 11190* (K, NSW); *loc. id., R.M.Laing* (CHR); Mt Bates, *P.S.Green 1511* (A, K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW).

4. **Coprosma lanceolaris** F.Muell., *Fragm.* 9: 70 (1875)

T: Lord Howe Island, *Lind & J.P.Fullagar*; holo: MEL; iso: ?K. The epithet comes from the Latin *lancea* (a lance, or spear) and the suffix *-aris* (pertaining to), referring to the shape of the leaves.

Illustrations: W.R.B.Oliver, *Bernice P. Bishop Mus. Bull.* 132: 129, fig. 44a, t. 30A (1935); I.Hutton, *Lord Howe Is.* 137 (1986).

Shrub to 2 m tall. Young stems glabrous or minutely puberulous. Leaves bright green, not fetid when bruised; lamina broadly lanceolate or lanceolate to elliptic, sometimes slightly oblanceolate, 3–9 cm long, 1.5–4 cm broad, obtusely or narrowly attenuate onto petiole, flat, acute; primary veins 4 or 5 on each side of midrib, usually with pair of prominent domatia in axils of uppermost veins; stipules 5–6 mm long, with rigid, linear acumen 3.5–4 mm long. Calyx obscure. Corolla 3 mm long, green. Male flowers 3, clustered; filaments 4 mm long; anthers 2 mm long. Female flowers 1–3; stigmatic arms 6–7 mm long. Fruit ellipsoidal, 8 mm long, red.

Lord Howe Is. Endemic. Common in the montane forest from c. 500 m. Flowers mid May–mid Oct.

L.H.Is.: NE face of Mt Lidgbird, *M.M.J. van Balgooy 1101* (CANB); S face of Mt Lidgbird, *J.C.Game 69/266* (K); rocky face of Mt Lidgbird, *J.D.McComish 148A* (K); summit of Mt Lidgbird, *J.Pickard* in *A.N.Rodd 1460* (NSW); *s. loc., J.D.McComish 156* (K, NSW).

5. **Coprosma huttoniana** P.S.Green, *Kew Bull.* 45: 249 (1990)

T: Lord Howe Island, *I.Hutton 362*; holo: K. Named in honour of Ian Hutton, author of '*Lord Howe Island*' (1986) and '*Birds of Lord Howe Island, Past and Present*' (1990), who discovered this plant and recognised it as a new species.

Shrub or small tree to 4 m tall. Young stems glabrous. Leaves only slightly fetid when bruised; petiole 4–10 mm long, glabrous; lamina elliptic-ovate to narrowly elliptic, 2–6 cm long, 1.3–2.5 cm broad, basally rounded to acute, abruptly attenuate onto petiole, flat, acute or very slightly acuminate with blunt tip; primary veins 5 (or 6) on each side of midrib, without domatia; stipules 3–4 mm long, with stiff, linear point 1.5–2.5 mm long. Calyx obscure. Corolla 4 mm long, green. Male flowers in clusters of 3; filaments 6 mm long; anthers 3 mm long. Female flowers in clusters of 3; corolla lobes 3 mm long; stigmatic arms 6 mm long. Fruit ellipsoidal, 10 mm long, bright reddish orange. Fig. 87C–E.

Lord Howe Is. Endemic. Frequent in the montane forest.

L.H.Is.: Top of Mt Gower, *C.Moore 70* (K, ?MEL); *loc. id., P.S.Green 1657* (A, K); *loc. id., I.Hutton 362 & 363* (K); NE corner of Mt Gower plateau, *J.C.Game 69/345* (K); Mt Gower track, *I.Hutton 361 & 473* (K).

6. **Coprosma putida** C.Moore & F.Muell. in F.J.H. von Mueller, *Fragm.* 7: 45 (1869)

T: Lord Howe Island, *C.Moore & W.Carron*; holo: MEL; ?iso: K. The epithet, referring to the fetid smell when this species is cut or bruised, comes from the Latin *puteo* (to stink).

Illustrations: W.R.B.Oliver, *Bernice P. Bishop Mus. Bull.* 132: 129, fig. 44b, t. 30B (1935); I.Hutton, *Lord Howe Is.* 138 (1986).

Shrub or small tree to 4 m tall. Young stems glabrous or minutely puberulous. Leaves strongly fetid when bruised; petiole 15–30 mm long, glabrous; lamina broadly elliptic-oblong, sometimes slightly obovate, 4–11 cm long, 2.5–8 cm broad, rounded or narrowly attenuate onto petiole, flat, obtuse to rounded with very short apiculum; primary veins 7–9 on each side of midrib, without domatia; stipules 8–12 mm long, with stiff, linear acumen 6–10 mm long. Calyx obscure. Corolla 6 mm long, greenish white. Male flowers in clusters of 3 or more; filaments 8 mm long; anther 4 mm long. Female flowers solitary or paired; stigmatic arms 10 mm long. Fruit ellipsoidal, 2 cm long, red. *Stinkwood*. Fig. 62

Lord Howe Is. Endemic. Common in sheltered forest and widespread at all altitudes. Flowers Aug.–early Nov.

L.H.Is.: ridge between Old Settlement Bay and North Beach, *L.A.S.Johnson & A.N.Rodd 1235* (K, NSW); W slopes of Smoking Tree Ridge, *R.D.Hoogland 8733* (CANB, NSW); Goat House Cave, *J.Pickard* in *A.N.Rodd 1332* (K, NSW); Erskine Valley, *L.A.S.Johnson & A.N.Rodd 1388* (K, NSW); plateau top, Mt Gower, *I.R.H.Telford 7109* (CBG).

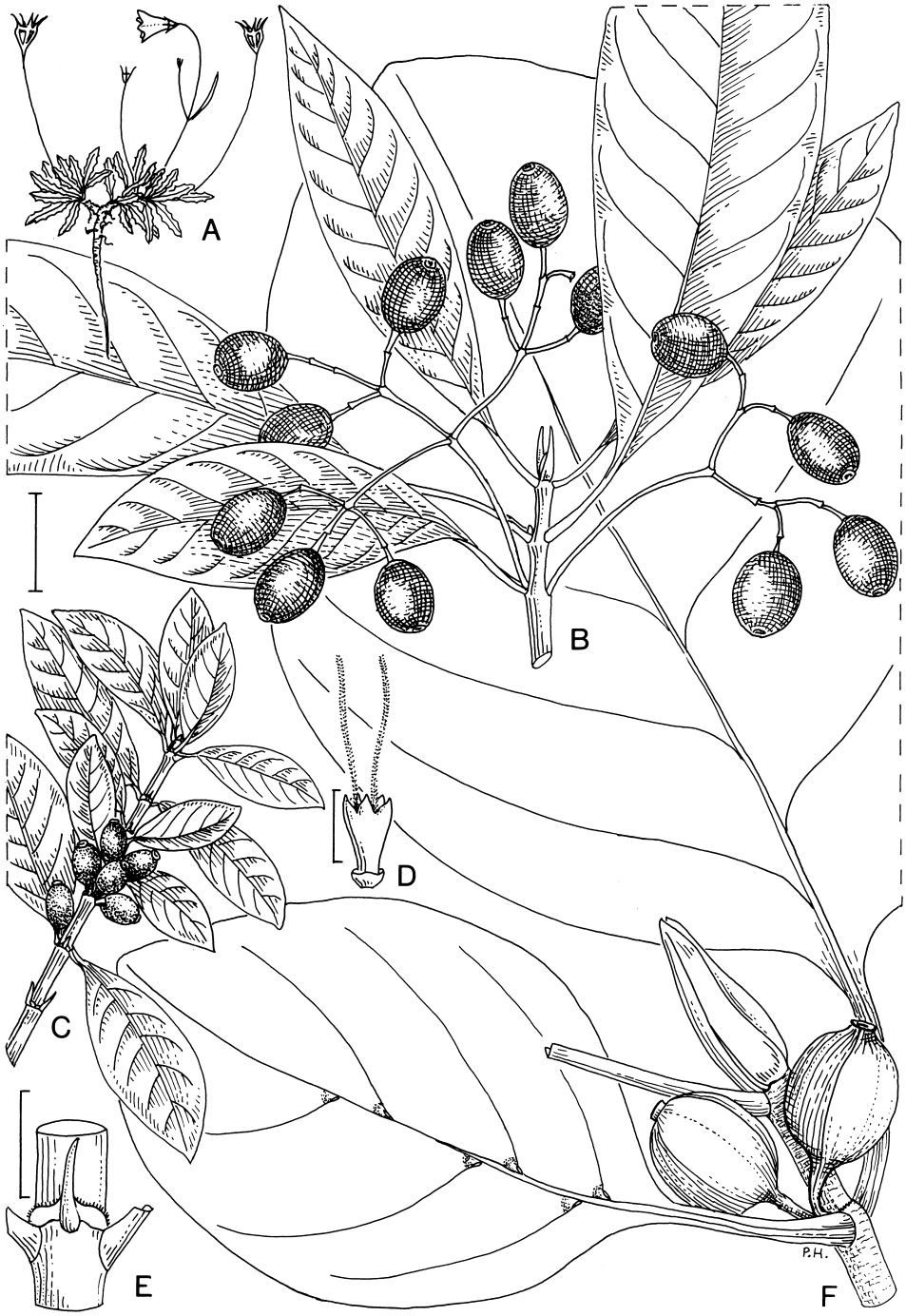

Figure 87. A, CAMPANULACEAE: *Wahlenbergia insulae-howei*, habit (1913, W.Oliver, K, flower from J.Game 69/219, K). **B–F**, RUBIACEAE. **B**, *Psychotria carronis*, habit (P.Green 1638, K). **C–E**, *Coprosma huttoniana*. **C**, habit; **D**, female flower; **E**, node with stipule (**C–E**, I.Hutton 473, K). **F**, *Atractocarpus stipularis*, habit (P.Green 1970, K). Scale bars: **A–C**, **F** = 2 cm; **D**, **E** = 5 mm. Drawn by P.Halliday.

7. **Coprosma inopinata** I.Hutton & P.S.Green, *Kew Bull.* 48: 320 (1993)

T: Lord Howe Island, *I.Hutton 649*; holo: K. The epithet comes from the Latin *inopinus* (unexpected), because it was found unexpectedly and proved to be yet another endemic species on Lord Howe Is.

Illustration: P.S.Green, *Kew Bull.* 48: 321, fig. 4 (1993).

Compact shrub, scrambling or prostrate with shoots to 0.5 m tall. Young stems minutely puberulous. Leaves somewhat crowded, coriaceous, not fetid when bruised; petiole 1–2 mm long, glabrous; lamina broadly lanceolate to elliptic, 0.7–1.3 cm long, 0.3–0.6 cm broad, basally rounded-obtuse, slightly thickened and sometimes slightly recurved on margins, acute or sometimes slightly acuminate; venation reticulate below; primary veins not strongly differentiated, 4 or 5 on each side of midrib, without domatia; stipules 3–5 mm long, with rigid, usually persistent acumen 2–3 mm long. Male and female flowers solitary. Calyx lobes unequal, to 0.5 mm long. Corolla lobes 4 mm long, green with purple margins. Filaments 5 mm long, anthers 2.5 mm long. Stigmatic arms 3 mm long. Fruit ovoid, 5–6 mm long, orange.

Lord Howe Is. Endemic. Found only recently on The Razorback, the steep-sided ridge at the southern tip of the Mt Gower plateau, where a few bushes are growing together. A plant has also been observed by I.Hutton on a ridge to the Nobbin on Mt Lidgbird.

L.H.Is.: The Razorback, Mt Gower, *I.Hutton 520, 527, 528, 628* (in spirit) (K).

4. COFFEA

Coffea L., *Sp. Pl.* 1: 172 (1753); *Gen. Pl.* 5th edn, 80 (1754); derived from Kaffa, the south-western Ethiopian Province, where it is native.

Type: *C. arabica* L.

Shrubs or small trees. Leaves opposite; stipules interpetiolar, rarely intrapetiolar. Inflorescence axillary, rarely terminal on side-shoots, cymose; bracteoles usually forming a cup-like structure. Flowers bisexual. Calyx truncate or shortly toothed. Corolla tube cylindrical and widening at throat, or funnel-shaped; corolla lobes (4–) 5–8 (–12), contorted in bud. Stamens usually same number as corolla lobes, inserted in throat; anthers dorsally attached, linear, usually twisted. Ovary 2-locular; ovule 1 per locule; style slender; stigma 2-lobed. Fruit a 2-seeded drupe. Seeds thin- or thick-walled, with grooved inner face.

A genus of c. 90 species from Africa, Madagascar and the Mascarenes. Two or possibly three widely cultivated species supply the coffee of commerce, 1 of which is introduced on the Islands.

1. ***Coffea arabica** L., *Sp. Pl.* 1: 172 (1753)

T: cultivated; lecto: Hort. Clifford, 59, *Coffea* No. 1 BM, *fide* D.Bridson in M.Polhill, *Fl. Trop. E. Africa*, Rubiaceae (2): 713 (1988). So called as having come from 'Arabia'.

Illustrations: B.E.Nicholson in *Oxford Book Food Pl.* 111, fig. 1 (1969); B.Everard & B.D.Morley, *Wild Fl. World* t. 60D (1970); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 2: 1122, t. 162 (1990).

Shrub or small tree to c. 5 m tall. Stem nodes somewhat swollen. Leaves glossy; lamina elliptic to broadly elliptic or elliptic-oblong, 7–18 cm long, 3–7.5 cm broad, basally acute to obtuse, acuminate; venation with 7–10 primary veins on each side of midrib, usually with obscure domatia in their axils beneath; stipules triangular, 4–8 mm long, acute, mucronate. Flowers in dense, axillary, 2–10-flowered, subsessile clusters, fragrant. Calyx usually a rim. Corolla white; tube c. 1 cm long; lobes 1–1.5 cm long. Fruit oblong-ellipsoidal, sometimes subglobose, 1–2 cm long, red.

Norfolk Is., Lord Howe Is. An escape from cultivation, naturalised to a limited extent; probably originally native to Ethiopia.

N.Is.: near Burnt Pine, Mission Rd, *W.R.Sykes NI 451* (CHR); *s. loc.*, ?cultivated, 1902, *J.H.Maiden & J.L.Boorman* (NSW). **L.H.Is.:** Portion 29, near the E boundary, *A.N.Rodd 1723* (K, NSW); *s. loc.*, ?cultivated, 1898, *J.H.Maiden* (NSW).

An important economic plant, cultivated for many centuries. Together with some other cultivated species, which are also African, this is the source of coffee, now produced mostly in South America.

5. PSYCHOTRIA

Psychotria L., *Syst. Nat.* 10th edn, 929 (1759); based by Linnaeus on *Psychotrophon*, a name given by Patrick Browne to a West Indian plant with medicinal properties, from the Greek *psyche* (soul, life) and *trepho* (to support).

Type: *P. asiatica* L.

Trees or shrubs, sometimes climbers, rarely herbs. Leaves often with domatia on lower surface, or sometimes with bacterial nodules; stipules interpetiolar, valvate, often sheathing towards base, persistent or caducous, usually entire. Inflorescence terminal, cymose-paniculate, rarely capitate. Flowers bisexual, often heterostylous. Calyx minute to prominent, (4–) 5 (–6)-lobed. Corolla (4–) 5 (–6)-lobed; tube short or long, usually pubescent in throat; lobes valvate in bud. Stamens (4–) 5 (–6); anthers included or exserted. Ovary 2-locular; ovule 1 per locule; style with 2 stigmatic lobes. Fruit a drupe with 2 stony seeds.

A pantropical genus of perhaps 1500 or more species; 1 species endemic on Lord Howe Is.

Psychotria carronis C.Moore & F.Muell. in F.J.H. von Mueller, *Fragm.* 7: 49 (1869)

T: Lord Howe Island, *C.Moore 17 & W.Carron*; holo: MEL; iso: K. Named in honour of William Carron (1823–1876) who collected on Lord Howe Is. and from 1866 was official collector for the Botanic Garden, Sydney.

Illustration: I.Hutton, *Lord Howe Is.* 138 (1986).

Small tree to 8 m tall. Stems with prominent ring-like leaf scars. Leaves dark glossy green with whitish midrib and main veins; lamina oblong-oblanceolate, 8–16 cm long, 3–5 cm broad, gradually attenuate onto petiole, acuminate, cuspidate; 10–12 primary veins on each side of midrib, without domatia; stipules lanceolate, 8–10 mm long. Inflorescence of 1–3, many-flowered cymes; peduncle c. 2 cm long; peduncle and pedicels elongating in fruit. Calyx obscurely toothed. Corolla 8 mm long, white; lobes 5, 4 mm long. Fruit ellipsoidal, 1.8–2 cm long, fleshy, black. Seeds ribbed. *Black Grape*. Fig. 87B.

Lord Howe Is. Endemic. In sheltered forest, mainly from c. 100 to 400 m altitude, around the two southern mountains. Flowers late Nov.–late Mar.

L.H.Is.: Transit Hill, *P.S.Green 1638* (A, K); *loc. id.*, *M.M.J. van Balgooy 1012* (NSW); N face of Mt Lidgbird, *J.Pickard* in *A.N.Rodd 1466* (NSW); Gray Face palm area, *J.Pickard 3409* (NSW); N side of Erskine Valley, *A.C.Beauglehole 5818* (MEL).

6. SHERARDIA

Sherardia L., *Sp. Pl.* 1: 102 (1753); *Gen. Pl.* 5th edn, 45 (1754); named after William Sherard (1659–1728), prominent early botanist and founder of the Sherardian Chair of Botany at Oxford University.

Type: *S. arvensis* L.

Annual herbs with 4-angled stems. Leaves and leaf-like stipules similar in size, in whorls of 4–6. Flowers small, in few-flowered, terminal, involucrate heads; involucral bracts 8–10, basally connate. Calyx 4–6-lobed, persistent. Corolla tube narrow; lobes 4. Stamens 4, exserted but shorter than corolla lobes. Ovary 2-locular; ovule 1 per locule; style 2-lobed; stigmas capitate. Fruit dry, of 2, single-seeded mericarps.

A monotypic genus, native to Europe, the Mediterranean region, and western Asia.

***Sherardia arvensis** L., *Sp. Pl.* 1: 102 (1753)

T: not designated; lecto: *Sherard*, Herb. Clifford, 33, *Sherardia* No. 1, BM, *fide* A.Natali in C.E.Jarvis *et al.*, *Regnum Veg.* 127: 88 (1993). The epithet means growing on arable land, from the Latin *arvum* (an arable field).

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 14: t. 26 (1960); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 2: 1172, t. 170 (1990).

Prostrate or decumbent annual herb. Stems sparsely scabridulous along angles. Lowermost leaves ovate, 3–5 mm long, soon withering; upper leaves lanceolate to narrowly elliptic, 2–15 mm long, 1–4 mm broad, sessile, acuminate, mucronulate. Peduncles 3–20 mm long, 6–10- or more-flowered. Calyx lobes broadly lanceolate, c. 1 mm long, hispid on margin. Corolla pale lilac or pink; tube 3–5 mm long; lobes ovate, c. 2 mm long, spreading. Fruit c. 3 mm long, crowned with persistent calyx lobes.

Norfolk Is., Lord Howe Is. A weed of old pastures and waste places. A native of Europe, the Mediterranean region and western Asia, now widely naturalised and most probably introduced to the Islands with fodder.

N.Is.: Bloody Bridge, *P.S.Green 1443* (A); *s. loc.*, *R.M.Laing* (CHR). **L.H.Is.:** road verge, Neds Beach, *J.Pickard 2671* (NSW).

7. RICHARDIA

Richardia L., *Sp. Pl.* 1: 330 (1753); *Gen. Pl.* 5th edn, 153 (1754); named after Richard Richardson (1663–1721), an early botanist who created a garden, at his home in Yorkshire, which was famous at that time for its many different plants.

Type: *R. scabra* L.

Annual or perennial herbs, often prostrate. Leaves opposite; stipules united to petiole bases, fimbriate or setose. Inflorescence terminal, of dense, capitate heads, few- to many-flowered, subtended by 2 or usually 4 leaf-like involucral bracts. Flowers bisexual. Calyx deeply 4–8-lobed, persistent. Corolla shortly salverform. 3–8-lobed, valvate in bud. Stamens 4 or 6; anthers exserted. Ovary (2–) 3- or 4 (–6)-locular; ovule 1 per locule; style filiform; stigma lobed. Fruit splitting into dry, single-seeded mericarps.

An New World genus of c. 15 species from southern U.S.A. and the West Indies to Argentina. One or two species are now widespread as weeds, including 1 naturalised on Lord Howe Is.

***Richardia stellaris** (Cham. & Schltdl.) Steud., *Nomencl. Bot.* 2nd edn, 2: 459 (1841)

Richardsonia stellaris Cham. & Schltdl., *Linnaea* 3: 352 (1828). T: Brazil, *F.Sellow*; holo: ?LE or ?HAL *n.v.* So called from the star-like grouping of leaves and involucral bracts around the inflorescences.

Illustrations: A.Burkart, *Fl. Ill. Entre Rios* (*Argentina*) 6: 33, fig. 14g–s (1974); A.L.Cabrera, *Man. Fl. los Alrededores de Buenos Aires* 2nd edn, 583 (1978); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 328, fig. 46H (1986).

Perennial herb with taproot. Stems obscurely angled, sparsely pilose. Leaves sessile, their bases united by interpetiolar stipules, narrowly triangular-ovate, 0.7–1.5 cm long, 0.2–0.5 cm broad, basally narrowed, revolute on margins, acuminate-acute; stipules with a few marginal setae. Inflorescence usually several-flowered, often with smaller, cleistogamous flowers present; involucral bracts leaf-like, 1–2 cm long. Calyx 4-lobed; lobes narrowly triangular, c. 2 mm long, slightly setose-ciliate. Corolla white, 2–4 mm long; lobes 4, 1–1.5 mm long. Mericarps 4, 1.5–2 mm long; outer surface rounded, smooth; inner surface angled.

Lord Howe Is. A native of warm temperate South America which has now become a weed in eastern Qld and N.S.W., Australia. First recorded from Lord Howe Is. in 1991 as 'locally frequent', yet presumably a recent arrival.

L.H.Is.: W slopes of Mt Eliza, *B.Conn 3568* (NSW).

90. CAPRIFOLIACEAE

Shrubs or woody climbers, sometimes small trees, rarely herbs. Leaves opposite, simple and entire or lobed, sometimes pinnately compound; stipules inconspicuous or absent. Inflorescence usually cymose. Flowers actinomorphic to zygomorphic, usually bisexual. Calyx (4 or) 5-lobed, equal or unequal, usually small. Corolla (4 or) 5-lobed, often 2-lipped; tube variable, often basally pouched or spurred; lobes usually imbricate in bud. Stamens usually same number as corolla lobes, occasionally 4 or 2, equal or unequal, inserted on corolla tube. Ovary inferior, 2–5 (–8)-locular, with 1–many ovules per locule; style 1; stigma usually capitate. Fruit a berry, drupe or rarely a capsule.

A family of c. 15 genera and 400 species, mostly from the northern temperate regions, especially North America and eastern Asia; 1 genus introduced on Norfolk Is. As well as the honeysuckles (*Lonicera*) it also contains a number of other horticulturally important genera, such as *Viburnum*.

G.Bentham, Caprifoliaceae, *Fl. Austral.* 3: 398–399 (1866).

LONICERA

Lonicera L., *Sp. Pl.* 1: 173 (1753); *Gen. Pl.* 5th edn, 80 (1754); named after Adam Lonitzer (1528–1586), German physician and botanist, author of a famous and much reprinted herbal, the '*Kreuterbuch*'.

Type: *L. caprifolium* L.

Erect or twining shrubs. Leaves simple, entire or rarely lobed, usually without stipules but often with connecting line between opposite petiole bases. Flowers either axillary in pedunculate pairs often connate basally by the ovaries, with 2 bracts and 4 bracteoles, or terminal in sessile axillary whorls or heads; frequently fragrant. Calyx small, 5-lobed. Corolla 5-lobed, zygomorphic to almost actinomorphic, usually 2-lipped; tube short or long, usually basally pouched. Stamens 5, usually exserted. Ovary 2- or 3 (–5)-locular, with 2–8 ovules per locule; style slender, 2-lobed. Fruit a few- to many-seeded berry.

A northern temperate genus of c. 180 species, often cultivated, and known as honeysuckles; 1 species naturalised on Norfolk Is.

***Lonicera japonica** Thunb. ex Murray in C.Linnaeus, *Syst. Veg.* 14th edn, 216 (1784)

T: Japan, *C.P.Thunberg*; holo: UPS *n.v.*, photo seen (IDC microfiche 1036-5184.209/8). So named after the country from which it was first described.

Illustrations: R.A.Buchanan, *Common Weeds Sydney Bushland* 76, fig. 31 (1981); B.A.Auld & R.W.Medd, *Weeds* 143 (1987); C.J.Webb *et al.*, *Fl. New Zealand* 4: 467, fig. 48B (1988).

Twining climber. Young stems pubescent. Leaves pubescent, glabrescent above; lamina ovate-oblong to ovate, broadly lanceolate or elliptic, 2.5–10 cm long, 1.5–4.5 cm broad, basally rounded to truncate or subcordate, acute to obtuse. Flowers in axillary pairs; peduncle 1–2.5 cm long, densely pubescent; bracts 1–2 cm long; bracteole c. 1 mm long. Calyx very small; lobes narrowly triangular, fringed. Corolla 2-lipped, white or sometimes flushed pink, turning yellow with age; tube 2–3 cm long; lower lip a single, linear lobe, 2–3 cm long; upper lip flat, slightly recurved, with 4 apical teeth c. 0.5 cm long. Stamens and style exserted. Berry globose, 5–7 mm diameter, glossy, bluish black.

Norfolk Is. A native of China and Japan which has presumably escaped from cultivation. It now occurs in the lower parts of the National Park and should be watched very carefully as it can become a noxious weed, destroying the native vegetation by smothering it.

N.Is.: Red Rd, *P.S.Green 1369* (A); *s. loc.*, *J.D.McComish 142* (NSW).

91. VALERIANACEAE

Annual or perennial herbs, rarely shrubs; rhizomes often strong-smelling. Leaves opposite or whorled, sometimes all basal, simple or pinnate, without stipules. Inflorescence terminal, compound-cymose, usually many-flowered, bracteate. Flowers generally zygomorphic, bisexual or unisexual. Calyx of 1–25 teeth or lobes, sometimes forming a pappus, often accrescent, persistent. Corolla funnel-shaped, frequently pouched or spurred basally; lobes 3–5, unequal, imbricate. Stamens 1–4, inserted in corolla tube, usually exserted. Ovary inferior, 3-locular but only 1 fertile; ovule 1, pendulous; style 1, slender; stigma simple or finely divided. Fruit dry, indehiscent, 1-seeded.

A widely distributed family of c. 15 genera and 400 species, best represented in the northern temperate regions and the Andean mountains; 1 genus introduced on Lord Howe Is.

CENTRANTHUS

Centranthus Necker ex DC. in J.B.A.P. de M. de Lamark & A.P. de Candolle, *Fl. Franç.* 3rd edn, 4: 238 (1805); from the Greek *kentros* (a spur) and *anthos* (a flower) because of the spurred corolla.

Type: not designated.

Annual or perennial herbs, glabrous. Leaves simple and entire to toothed or compound. Flowers bisexual or unisexual. Calyx of 5–25 small teeth, curled inwards at anthesis, enlarging and spreading in fruit, forming a plumose pappus. Corolla zygomorphic, 5-lobed; tube slender, pouched near middle or spurred near base, ±2-lipped; upper lip 1-lobed; lower lip 4-lobed. Stamen 1. Stigma entire to shortly 3-lobed. Fruit compressed, seemingly 1-locular, crowned with a conspicuous, plumose pappus.

A genus of 9 species from southern Europe and the Mediterranean region; 1 species naturalised on Lord Howe Is.

***Centranthus ruber** (L.) DC. in J.B.A.P. de M. de Lamark & A.P. de Candolle, *Fl. Franç.* 3rd edn, 4: 239 (1805)

Valeriana rubra L., *Sp. Pl.* 1: 31 (1753). T: Europe, not designated. So named from the Latin for red, referring to the colour of the flowers.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 14: t. 29 (1960); B.Everard & B.D.Morley, *Wild Fl. World* t. 17A (1970); H.R.Toelken in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1362, fig. 619B (1986).

Perennial, rhizomatous herb, ±glaucous. Stems ascending to c. 75 cm tall, usually branched from base. Lower leaves lanceolate to narrowly elliptic, 3–12 cm long, 1–5 cm broad, petiolate; upper leaves ovate, acuminate, often toothed, sessile, becoming amplexicaul below inflorescence. Inflorescence to 25 cm long, with many sessile, crowded flowers. Flowers bisexual. Calyx to 5 mm long in fruit, feather-like. Corolla red, rarely white; tube 7–10 mm long, with linear spur 4–6 mm long; lobes 3–4 mm long, almost equal. Fruit narrowly ovoid, flattened, 3–4 mm long, ribbed on one side.

Lord Howe Is. Presumably a garden escape; native to south-western Europe and the Mediterranean region, often cultivated.

L.H.Is.: Neds Beach, *A.N.Rodd 1485* (NSW).

92. ASTERACEAE

Herbs, shrubs, climbers or rarely small trees. Leaves alternate or opposite, sometimes all basal, simple or compound, without stipules. Inflorescence of small flowers (florets) crowded into a capitulum surrounded by an involucre of few to many overlapping bracts, and sessile upon a receptacle, rarely capitula reduced to 1 floret. Florets bisexual, unisexual or neuter; sometimes all with a tubular, usually 5-toothed corolla, or all with corolla zygomorphically extended into a 1–5-lobed, often brightly coloured ligule, or sometimes the central (disc) florets tubular and bisexual and the marginal (ray) florets ligulate and female or sterile. Calyx absent or reduced to hairs, bristles or scales, often forming a pappus that persists and may enlarge in fruit. Stamens 5, anthers usually connate into a tube around style. Ovary inferior, 1-locular; ovule 1; style bifid; stigma ±linear. Fruit a cypsela, rarely a drupe.

Perhaps the largest family of flowering plants with c. 1100 genera and 20,000 species. Cosmopolitan, but poorly represented in tropical forest. Most tribes of the family are represented on the Islands: the Cardueae (genera 1–4 below), Lactuceae (genera 5–10), Arctotideae (genus 11), Inuleae (genera 12–16), Astereae (genera 17–21), Anthemideae (genera 22–25), Senecioneae (genera 26–31), Calenduleae (genus 32), Heliantheae (genera 33–38) and Eupatorieae (genera 39 and 40).

The Bathurst Burr, *Xanthium spinosum* L., a noxious weed, was recorded as having appeared on Lord Howe Is. but was exterminated by concerted action (J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 148, 1898). A.D.Mears of the New South Wales Department of Agriculture, in a 1969 report on the weeds of agricultural land, recorded *Onopordum illyricum* from Lord Howe Is., but, as J.Pickard in H.F.Recher & S.S.Clark, *Environm. Survey Lord Howe Is.* 79 (1974) pointed out, there is no evidence that this plant occurs or has occurred on the Island. *Montanoa hibiscifolia* Benth., a large herb with opposite, fig-like leaves hangs on as an abandoned garden relic in one or two places on Norfolk Is., but does not seem to be reproducing itself (*P.S.Green 2439*, K and *W.R.Sykes NI 208*, CHR).

G.Bentham, Compositae, *Fl. Austral.* 3: 447–680 (1866); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Asteraceae, *Fl. Java* 2: 362–437 (1965); A.J.C.Grierson in M.D.Dassanayake & F.R.Fosberg (eds), Compositae, *Fl. Ceylon* 1: 111–278 (1980); E.A.Brown *et al.* in G.J.Harden, *Fl. New South Wales* 3: 131–341 (1992).

KEY TO GENERA

1 Involucral bracts of capitula spine-tipped ('thistles')

2 Leaf margins without spines; florets yellow — **4. CENTAUREA**

2: Leaf margins with spines; florets purple or reddish purple

3 Leaves variegated with white midrib and usually white veins; receptacle densely hairy — **3. SILYBUM**

3: Leaves not variegated; receptacle densely bristly

4 Stems with an interrupted spiny wing; pappus bristles feathery — **1. CIRSIUM**

4: Stems with a continuous spiny wing; pappus bristles scabridulous — **2. CARDUUS**

1: Involucral bracts of capitula not spine-tipped

5 Florets all ligulate; milky latex often present

6 Leaves entire; ligules purple — **7. TRAGOPOGON**

6: Leaves variously toothed or lobed, not linear to narrowly lanceolate, not parallel veined; ligules yellow

7 Leaves all basal, stems with, at most, leafy bracts

8 Flowering stems at least sparingly branched; leaf margins sinuate-dentate to deeply pinnatifid **5. HYPOCHAERIS**

8: Flowering stems unbranched; leaves runcinate-pinnatifid; lobes ±triangular, with terminal lobe largest **8. TARAXACUM**

7: Leaves cauline as well as basal, the latter often withering before anthesis

9 Margins of leaves and clasping leaf bases sharply toothed to prickly; cypselas not beaked **10. SONCHUS**

9: Margins of leaves and leaf bases not sharply toothed or prickly; cypselas with or without a beak

10 Inflorescence a loose corymb with terminal capitula; capitula ovoid; cypselas scarcely beaked **6. PICRIS**

10: Inflorescence of spike-like branches; capitula sessile or subsessile, cylindrical or narrowly conical; cypselas beaked **9. LACTUCA**

5: Florets not all ligulate (only outer florets ligulate, or all florets tubular); milky latex lacking

11 Capitula with outer florets ligulate

12 Shrubs or subshrubs

13 Ligules white (sometimes tips tinged with purple)

14 Leaves simple, entire (L.H.Is.) **20. OLEARIA**

14: Leaves pinnatisect to bipinnatisect **22. ARGYRANTHEMUM**

13: Ligules yellow or pale yellow (sometimes fading to whitish)

15 Leaves opposite, appressed strigose; straggling coastal perennial herb or subshrub **33. WOLLASTONIA**

15: Leaves alternate

16 Leaves palmately veined or shallowly lobed, almost circular in outline, scattered strigulose above, crisped pubescent below **26. ROLDANA**

16: Leaves pinnately veined, glabrous or lanate when young and becoming glabrous

17 Fruit cylindrical, dry, with a pappus; involucral bracts in 1 series; leaves glabrous (L.H.Is.) **27. LORDHOWEA**

17: Fruit globose-ovoid, hard with a thin fleshy covering, without a pappus; involucral bracts in 2 or 3 series; leaves lanate when young **32. CHRYSANTHEMOIDES**

12: Herbs, annual or perennial, sometimes becoming woody at base

18 Capitula solitary, pedunculate, 1–12 cm diam.

19 Leaves pinnatifid to bipinnatisect

20 Ligules yellow above, grey-green on undersurface; leaves with terminal segment 2–6 cm broad; capitula 2–5 cm diam. (N.Is.) **11. ARCTOTHECA**

20: Ligules white sometimes tinged pink below; each pinna cuneate at base and usually apically 3-toothed, 2–5 mm broad; capitula c. 1 cm diam. (L.H.Is.) **21. BRACHYSCOME**

19: Leaves entire, serrate or dentate, sometimes shallowly pinnatisect

21 Leaves opposite; ligules all yellow **33. WOLLASTONIA**

21: Leaves alternate or basal; ligules not all yellow

22 Ligules deep reddish brown to orange, tipped with yellow **36. GAILLARDIA**

22: Ligules white, sometimes turning pinkish with age

23 Capitula 1.5–2 cm diam.; peduncles 2–10 cm long; leaves 1–3.5 cm long **18. ERIGERON**

23: Capitula 7–12 cm diam.; peduncles to 1 m long; leaves 6–30 cm long **23. LEUCANTHEMUM**

18: Capitula in cymes, panicles or corymbs

24 Ligules white to mauve or tinged pink

25 Involucral bracts ovate, 1–2 mm long; ligules 1.5 mm long, 1 mm broad **37. GALINSOGA**

25: Involucral bracts linear to lanceolate, 3–8 mm long

26 Pappus of hairs or fine bristles

27 Involucral bracts in 1 series, all equal **29. SENECIO**

27: Involucral bracts unequal, in 2–4 series

28 Plants completely glabrous; ligules c. 5 mm long, 1 mm broad **17. ASTER**

28: Plants ±pilose; ligules inconspicuous **19. CONYZA**

26: Pappus not of hairs or bristles

29 Involucral bracts unequal in 2 series; plant not aromatic when bruised; pappus of 2 or 3 retrorsely barbed awns **35. BIDENS**

29: Involucral bracts fused into a tube; plant aromatic when bruised; pappus of scales **38. TAGETES**

24: Ligules yellow, yellowish green or reddish purple

30 Involucral bracts all equal, in 1 series

31 Involucral bracts fused laterally into a narrow cylinder surrounding the florets; plants strongly aromatic; ligules cream or yellowish green **38. TAGETES**

31: Involucral bracts not fused into a cylinder surrounding the florets; plants not strongly aromatic; ligules clear yellow or reddish purple **29. SENECIO**

30: Involucral bracts unequal, in 2 series

32 Perennials; capitula 1–5, 10–15 mm diam. **33. WOLLASTONIA**

32: Annuals; capitula usually more than 5, 6–10 mm diam.

33 Outer involucral bracts spreading, 5–10 mm long, stalked-glandular; cypselas without a pappus **34. SIGESBECKIA**

33: Outer involucral bracts erect, 2.5–5 mm long, not stalked-glandular; pappus of (2 or) 3 retrorsely barbed awns 1–2 mm long **35. BIDENS**

11: Capitula with all florets tubular

34 Leaves opposite

35 Leaves mostly trifoliolate; pappus of 2 (or 3) awns, retrorsely barbed **35. BIDENS**

35: Leaves all simple; pappus of 5–many scales or bristles

36 Annuals or short-lived perennials; pappus of 5 scales **39. AGERATUM**

36: Perennials, subshrubby; pappus of 5–10 scabrid bristles **40. AGERATINA**

34: Leaves alternate

37 Shrubs, or climbers becoming woody at base

38 Dense shrub; leaves linear (L.H.Is.) **16. CASSINIA**

38: Twining climber, base becoming woody; leaves triangular-hastate to ±circular **28. DELAIREA**

37: Herbs, annual to perennial, sometimes woody at base

39 Involucral bracts in 2 or more series, usually with at least the margins scarious or papery

40 Leaves simple, entire or toothed

41 Capitula individually pedicellate in a paniculate inflorescence **19. CONYZA**

41: Capitula crowded together into compound heads

42 Leaves all narrowly cuneate, 1–4 mm broad, with a truncate or retuse apex; capitula in a terminal racemose inflorescence **15. FACELIS**

42: Basal leaves elliptic or oblanceolate or spathulate, 3–20 mm broad; cauline leaves gradually reduced in size upwards

43 Compound capitula in dense, globose heads, with a subtending 'involucre' of linear leaves, 0.5–3 cm long, sometimes with small axillary heads immediately below **14. EUCHITON**

43: Compound capitula in corymbose or spike-like inflorescences, without an evident 'involucre' of linear subtending leaves

44 Compound capitula in terminal corymbs; florets yellow **12. PSEUDOGNAPHALIUM**

44: Compound capitula in spike-like inflorescences; florets yellow to purplish **13. GAMOCHAETA**

40: Leaves compound, pinnatisect or bipinnatisect

45 Capitula ±sessile; plants prostrate; cypselas winged with an apical spine **24. SOLIVA**

45: Capitula pedunculate; plants prostrate to ascending; cypselas flattened or winged but without an apical spine **25. COTULA**

39: Involucral bracts herbaceous, in 1 series, with small bracteoles at base of capitulum

46 Florets yellow; bracteoles ovate to narrowly linear-lanceolate, 1.5–2 mm long **29. SENECIO**

46: Florets pink to pale purple or orange to red; bracteoles linear, 1–2 mm long

47 Pappus and florets pink to pale purple; outer florets female **30. ERECHTITES**

47: Pappus white; florets orange-red to brick red; outer florets bisexual **31. CRASSOCEPHALUM**

1. CIRSIUM

Cirsium Mill., *Gard. Dict*. abr. 4th edn (1754); a name applied by Dioscorides and others to a thistle used medicinally for the enlargement of veins (Greek *kirsós*).

Type: *C. heterophyllum* (L.) Hill

Herbs, biennial or perennial, spiny, without latex. Stems often winged. Leaves alternate, toothed or irregularly pinnatifid or pinnatisect, with lobes and teeth spine-tipped, sessile. Capitula terminal, solitary or grouped, cylindrical to globose; involucral bracts in several imbricate series; outer bracts spine-tipped, usually spreading; receptacle with numerous bristly scales. Florets all tubular, usually bisexual. Corolla 5-lobed, slender, glabrous, usually purple. Cypselas slightly flattened, smooth; pappus of several series of feathery hairs, united at base into a ring.

A genus with c. 150 species from northern temperate regions; 1 species naturalised on Lord Howe Is. Commonly called thistles.

***Cirsium vulgare** (Savi) Ten., *Fl. Napol.* 5: 209 (1835–1836)

Carduus vulgaris Savi, *Fl. Pis.* 2: 241 (1798). T: Italy, *G.Savi*; holo: ?PI *n.v.* The epithet is Latin for common or ordinary, suggesting that this is the common thistle.

Carduus lanceolatus L., *Sp. Pl.* 2: 821 (1753), non *Cirsium lanceolatum* Hill. T: Europe, Hort. Cliff.; lecto: BM, *fide* C.Jeffrey, *Kew Bull.* 22: 129 (1968).

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 17: t. 10 (1962); D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1634, fig. 746B (1986); B.A.Auld & R.W.Medd, *Weeds* 94, 95 (1987).

Biennial herb with a long taproot. Stems erect, 30–150 cm tall, branched, interruptedly spiny-winged, with cobwebby hairs. Basal leaves oblanceolate, ±pinnatifid, and undulate; stem leaves sessile, decurrent, deeply pinnatifid, 10–30 (–40) cm long, 4–10 (–20) cm broad, coarsely toothed, spine-tipped on lobes and teeth, prickly-hairy above, cobwebby below. Capitula terminal, solitary or in clusters of 2 or 3, ovoid-obloid, erect, sessile or shortly stalked; involucral bracts linear-lanceolate, acuminate; inner bracts erect, acute. Corolla purple; tube 2.5–3.8 mm long; lobes 5–6 mm long. Cypselas narrowly obovoid, 3.5–4 mm long, pale, streaked with black; pappus 2–3 cm long, white.

Lord Howe Is. An often noxious weed of wasteland, neglected pastures *etc*.; native to Europe, western Asia and North Africa and naturalised throughout temperate regions of the world.

L.H.Is.: 0.8 km E of 'Pine Trees' hotel, 1970, *J.Pickard* (NSW); Mosely Park, *A.C.Beauglehole 5658* (CANB, MEL); S end of golf course, *J.Pickard 3475* (NSW); Goat House cave, *J.Pickard* in *A.N.Rodd 1337* (NSW); S end of Little Slope, *J.Pickard 2782* (NSW).

2. CARDUUS

Carduus L., *Sp. Pl.* 2: 82 (1753); *Gen. Pl.* 5th edn, 358 (1754); the classical Latin name for various thistles.

Type: *C. nutans* L.

Herbs, annual to perennial, spinose, without latex. Stems often winged. Leaves alternate, dentate to pinnatisect, with spiny margins, sessile. Capitula terminal, solitary or clustered, cylindrical to ovoid; involucral bracts numerous, in several series, narrow, imbricate, usually spine-tipped; receptacle densely bristly. Florets all tubular, bisexual. Corolla 5-lobed, glabrous. Cypselas slightly flattened, smooth; pappus of several series of simple, scabrid hairs, united basally.

A genus of c. 100 species from Eurasia, the Mediterranean region and some East African mountains; 1 species naturalised on Norfolk Is.

***Carduus tenuiflorus** Curtis, *Fl. Londin.* 2(6): t. 55 (1789)

T: not designated. The epithet, alluding to the narrow capitula, comes from the Latin *tenuis* (slender) and *flos* (flower).

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 17: t. 6 (1962); G.M.Cunningham *et al.*, *Pl. W New South Wales* 724 (1981); B.A.Auld & R.W.Medd, *Weeds* 88 (1987).

Annual or biennial herb with stout taproot. Stems erect, 20–120 cm tall, branched above, continuously spiny-winged, ±covered with cobwebby hairs. Leaves oblanceolate in outline, 5–30 cm long, 2–15 cm broad, sinuate-pinnatifid, obtuse in apical outline, cobwebby beneath; basal leaves narrowed at base; stem leaves decurrent. Capitula terminal, cylindrical, densely clustered, erect or suberect, sessile or shortly stalked; involucral bracts ovate-lanceolate, acuminate, scariously margined, with a ±outwardly curved spine at apex. Corolla pale purplish red; tube 5–8 mm long; lobes 5–6 mm long. Cypselas ellipsoidal, 3.5–4 mm long, pale brown, with fine transverse wrinkles; pappus 10–13 mm long, white, scabridulous.

Norfolk Is. A weed from western and southern Europe.

N.Is.: Philip Is., *P.S.Green 1493* (A); *s. loc., J.D.McComish 238* (NSW).

Like the previous and following species, officially declared noxious in a number of countries. Although recorded from Lord Howe Is. by J.Pickard (*J. Biogeogr.* 11: 205, 1984), no material from there has been seen; he noted it as first recorded in 1962, but suggested that by 1984 it was extinct on the Island.

3. SILYBUM

Silybum Adans., *Fam. Pl.* 2: 116, 605 (1763); a name used by Dioscorides for a thistle-like plant, thought to be the following species.

Type: *S. marianum* (L.) Gaertn.

Annual or biennial herbs, without latex. Stems erect, simple or branched. Leaves alternate, cauline or basal, sinuate-lobed to pinnatisect, with spiny margins, variegated with white veins, sessile. Capitula terminal, solitary, somewhat globose; involucral bracts imbricate, in several series, rigid, spine-tipped; receptacle densely hairy. Florets all tubular, bisexual. Corolla deeply 5-lobed, slender, usually purple. Cypselas slightly flattened, glabrous, with a membranous, apical rim; pappus of numerous series of somewhat scabrid hairs, basally united into a ring, deciduous.

A genus of 2 species from the Mediterranean region with 1 extending to south-western Asia; 1 species naturalised on the Islands.

***Silybum marianum** (L.) Gaertn., *Fruct. Sem. Pl.* 2: 378, t. 162, fig. 2 (1791)

Carduus marianus L., *Sp. Pl.* 2: 823 (1753). T: Europe, Herb. Clifford 393, *Carduus* 9; lecto: BM; *fide* C.Jeffrey, *Kew Bull.* 22: 131 (1968). Named after Mary, the mother of Jesus, following the legend that the white marks on the leaves represent milk spilt when feeding the infant Jesus during the flight to Egypt.

Illustrations: G.M.Cunningham *et al., Pl. W New South Wales* 725 (1981); D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1638, fig. 748B (1986); B.A.Auld & R.W.Medd, *Weeds* 115 (1987).

Annual or biennial herb, 0.5–2 m tall. Stems erect, simple or branched, striate, glabrous or slightly cobwebby. Leaves oblanceolate in outline, 10–50 cm long, 5–25 cm broad, sinuate-lobed with spiny margins, variegated, sometimes blotched with white; basal leaves in a rosette. Capitula solitary, ovoid to subglobose, 4–5 cm diam., erect; involucral bracts broadly ovate at base with a stout, rigid spine, 2.5–7 cm long, with small marginal spines, recurved in the middle series of bracts. Corolla reddish purple; tube slender, c. 2 cm long; lobes c. 6 mm long. Cypselas flattened, 6–7 mm long, blackish, flecked with grey, with a pale narrow rim near apex; pappus rather rigid, c. 15 mm long, white, slightly scabrid or barbate.

Norfolk Is., Lord Howe Is. A noxious weed of roadsides, wasteland *etc*. Native to the Mediterranean region and south-western Asia.

N.Is.: near Steels Point, *W.R.Sykes NI 488* (CHR). **L.H.Is.:** track to Billys Dam, Middle Beach Common, *J.Pickard 3536* (NSW).

4. CENTAUREA

Centaurea L., *Sp. Pl.* 2: 909 (1973); *Gen. Pl.* 5th edn, 389 (1754); named after Chiron the Centaur, famous for his knowledge of the use of herbs.

Type: *C. centaurium* L.

Annual to perennial herbs or rarely subshrubs, without latex. Leaves basal or alternate, entire to pinnatisect, without spines, petiolate, or with cauline leaves sessile. Capitula terminal, solitary or in small groups, ovoid to globose; involucral bracts imbricate in several unequal series, each bract with a scarious or membranous terminal appendage which is laciniate, toothed, pectinate or spiny; receptacle bristly. Florets all tubular; outer florets neuter,

enlarged, often spreading; inner florets bisexual, fertile. Corolla 4–8-lobed, funnel-shaped. Cypselas somewhat compressed, smooth; pappus of several series of rough hairs, free to base; innermost series often scale-like, sometimes absent.

A genus of 600 or more species, mostly from the Mediterranean region and SE Asia, with one native Australian species. One species is naturalised on Norfolk and Lord Howe Islands.

***Centaurea melitensis** L., *Sp. Pl.* 2: 917 (1753)

T: Malta, not designated. Named after the island of Malta, of which the Roman name was Melita.

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 720 (1981); B.A.Auld & R.W.Medd, *Weeds* 91 (1987); C.J.Webb *et al.*, *Fl. New Zealand* 4: 305, fig. 33F (1988).

Annual or biennial herb. Stems erect, branched, rigid, ribbed, pubescent; upper parts slightly winged. Leaves basal and cauline, oblanceolate to spathulate, toothed to pinnatifid, 5–10 cm long, 0.5–1.5 cm broad, becoming smaller and narrower above, decurrent, pubescent. Capitula ovoid to globose, solitary or clustered, sessile or shortly stalked; involucral bracts ovate, cobwebby; appendages spiny, recurved; terminal spine 6–10 mm long with lateral spines basal, usually 3 on each margin, 1–3 mm long, straw-coloured. Corolla 8–10 mm long, yellow, densely glandular. Cypselas c. 2.5 mm long, greyish with whitish stripes, finely puberulous; pappus of unequal bristles, 1.5–2 mm long.

Norfolk Is., Lord Howe Is. A weed of waste places, native to the Mediterranean region. A.N.Rodd & J.Pickard, *Cunninghamia* 1: 278 (1983) suggested that it was only established briefly on Lord Howe Is. and has since died out.

N.Is.: Philip Is., *W.R.Sykes NI 975* (CHR); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW). **L.H.Is.:** *s. loc.*, *J.D.McComish 206* (NSW).

5. HYPOCHAERIS

Hypochaeris L., *Sp. Pl.* 2: 810 (1753); *Gen. Pl.* 5th edn, 352 (1754); a name used by Theophrastus for this or another plant.

Type: *H. glabra* L.

Annual or perennial herbs with taproot, without latex. Leaves in a basal rosette, often with a few reduced, alternate stem leaves, simple, toothed or pinnatifid; petiole obscure or absent. Capitula terminal on long peduncles, solitary or few, cylindrical to campanulate; involucral bracts lanceolate, imbricate in indistinct series; outer bracts smaller than inner; receptacle flat, with numerous narrow scales subtending florets. Florets ligulate, bisexual. Corolla 5-toothed at apex, yellow or white. Cypselas narrowly obloid, ellipsoidal or subcylindrical, ribbed, with at least inner cypselas beaked; pappus of 1 series of feathery hairs, and sometimes with an outer, shorter, non-feathery series.

A genus of c. 50 species from Europe, the Mediterranean region and South America; 2 species naturalised on the Islands.

Annual; leaves glabrous or with a few scattered hairs; outer florets hardly exceeding the involucre	**1. H. glabra**
Perennial; leaves ±hispid; outer florets much longer than the involucre	**2. H. radicata**

1. *Hypochaeris glabra L., *Sp. Pl.* 2: 811 (1753)

T: Europe, Herb. Linn. No 959.4; lecto: LINN, *fide* S.A.Alavi in S.M.H.Jafri & A.El-Gadi, *Fl. Libya* 107: 347 (1983); IDC microfiche 177/2.545/9. So named because of its glabrous, or near glabrous, leaves.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 18: 22 (1863); G.M.Cunningham *et al.*, *Pl. W New South Wales* 716 (1981); B.A.Auld & R.W.Medd, *Weeds* 105 (1987).

Annual herb, 10–45 cm tall. Leaves in a rosette, oblanceolate or broadly so, 1.5–10 cm long, 0.5–2 cm broad, sinuate-dentate to shallowly or deeply pinnatifid, ±glabrous. Scape sparingly branched, glabrous or nearly so. Capitula solitary on branches, narrowly

cylindrical; involucral bracts very unequal, lanceolate, accrescent in fruit; outer bracts 3–6 mm long; inner bracts to 15 mm long. Corolla yellow; outer florets scarcely longer than involucre. Cypselas narrowly ellipsoidal, dark brown, scabrid; inner cypselas tapered to a slender beak; pappus tinged brown, with outer hairs 2–4 mm long, somewhat scabrid, and inner hairs to 10 mm long, finely plumose.

Norfolk Is. An occasional weed of grassland *etc.*; native to Europe and the Mediterranean region.

N.Is.: above Steels Point, *W.R.Sykes NI 201* (CHR); Philip Is., *P.S.Green 1497* (A); *s. loc.*, 1898, *I.Robinson* (NSW); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW); *s. loc.*, *J.D.McComish 240* (NSW).

2. *Hypochaeris radicata L., *Sp. Pl.* 2: 811 (1753)

T: Europe, not designated. The epithet means rooted.

Illustrations: G.Ell, *Introduced Wildfl. New Zealand Weeds* 34 (1983); B.A.Auld & R.W.Medd, *Weeds* 106 (1987); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 329, t. 29 (1990).

Perennial herb, taprooted. Leaves in a rosette, oblanceolate, 3–35 cm long, 0.6–8 cm broad, usually deeply or shallowly pinnatifid, somewhat hispid. Scape sparsely branched, 10–60 cm tall, ±glabrous or hispid, especially below. Capitula solitary on branches, ±cylindrical; involucral bracts unequal, lanceolate, 6–15 mm long, bristly on midribs, accrescent in fruit. Corolla yellow; outer florets clearly exceeding the involucre. Cypselas narrowly ellipsoidal, slenderly beaked, orange-brown, scabrid; outer cypselas with a shorter beak; pappus dirty white, with outer hairs 3–4 mm long, scabrid or slightly plumose, and inner hairs to 12 mm long, finely plumose.

Norfolk Is., Lord Howe Is. A weed of grassland, native to Europe and the Mediterranean region.

N.Is.: Anson Bay, *W.R.Sykes NI 207* (CHR); Mt Pitt Reserve, *W.R.Sykes NI 372* (CHR); Ball Bay, *W.R.Sykes NI 625* (CHR). **L.H.Is.:** Rocky Run Valley, *J.Pickard 2833* (NSW); Rabbit Is., *A.N.Rodd 1811* (NSW); *s. loc.*, *J.D.McComish 202* (NSW).

6. PICRIS

Picris L., *Sp. Pl.* 2: 792 (1753); *Gen. Pl.* 5th edn, 347 (1754); a name given to a bitter herb by Theophrastus, from the Greek *picros* (bitter).

Type: *P. hieracioides* L.

Annual to perennial herbs, usually branched, generally hispid or bristly, without latex. Leaves alternate, sometimes rosetted at base, entire to sinuate-dentate or shallowly pinnatifid; cauline leaves sessile. Scape sparsely to corymbosely branched. Capitula terminal; involucral bracts in several series; outer series short, often broad, with spreading or reflexed apices; inner series linear-lanceolate, erect; receptacle flat, pitted, naked. Florets ligulate, bisexual. Corolla 5-toothed at apex, yellow; outer ligules often striped purplish externally. Cypselas flattened, ellipsoidal, ribbed, sometimes beaked; pappus of 2 series, deciduous or persistent; outer series shorter, plumose or simple; inner series plumose.

A genus of c. 45 species from Europe, the Mediterranean region, Asia and mountains of tropical Africa; 1 species naturalised on Norfolk Is.

*Picris hieracioides L., *Sp. Pl.* 2: 792 (1753)

T: Europe, Herb. Clifford 387, *Picris* 2; lecto: BM, *fide* H.W.Lack, *Taxon* 24: 113 (1975). So named from a similarity to the genus *Hieracium*.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 17: 30 (1962); G.M.Cunningham *et al.*, *Pl. W New South Wales* 717 (1981), as Hawkweed; D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1650, fig. 755B (1986).

Biennial to perennial herb, 30–90 cm tall. Leaves ±sinuate-dentate, bristly, at least on veins below; basal and lower stem leaves oblanceolate, 7–20 cm long, narrowed at base to a short

petiole, soon withering; middle and upper leaves ±amplexicaul at base. Peduncle stout, erect, branched, with sparse to dense spreading, stiff hairs. Capitula terminal, in a loose corymb, ovoid; outer involucral bracts short, narrow, usually spreading; inner bracts lanceolate, 1–1.5 cm long, blackish green externally. Corolla bright yellow; outer ligules longer than involucre. Cypselas somewhat flattened, ellipsoidal, 3–6 mm long, longitudinally grooved, transversely wrinkled, narrowed at apex, scarcely beaked; pappus cream, feathery, deciduous.

Norfolk Is. An introduced weed, native to western and southern Europe, sometimes thought to be native in Australia (H.W.Lack, *loc. cit.*) and New Zealand, and included as such in C.J.Webb *et al.*, *Fl. New Zealand* 4: 341 (1988).

N.Is.: *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW); *s. loc.*, *W.Laing s.n.* (CHR).

7. TRAGOPOGON

Tragopogon L., *Sp. Pl.* 2: 789 (1753); *Gen. Pl.* 5th edn, 346 (1754); a plant name used by Theophrastus from the Greek *tragos* (a goat) and *pogon* (a beard), presumably alluding to the appearance of the pappus.

Type: *T. porrifolius* L.

Annual, biennial or perennial herbs, taprooted, with milky sap. Leaves alternate, simple, entire, linear to lanceolate, with parallel veins, sessile, often sheathing. Capitula solitary on branches, conical in bud; involucral bracts uniseriate, lanceolate, acuminate, basally connate; receptacle naked, pitted. Florets all ligulate, bisexual. Corolla 5-toothed, yellow or purplish. Cypselas cylindrical, tapering at apex with 5 or 10 scabrid ribs, beaked; beak long, with an apical ring below pappus; pappus persistent, with 2 series of hairs; hairs simple at base, feathery in upper part; outer cypselas sometimes with a pappus of bristles.

A genus of c. 50 species from Europe, the Mediterranean region and south-western Asia; 1 species naturalised on Norfolk Is.

*Tragopogon porrifolius L., *Sp. Pl.* 2: 789 (1753)

T: Europe, Herb. Burser XV(2): 69, central plant; lecto: UPS *n.v.*, *fide* C.D. de la Guardia & G.Blanca, *Taxon* 41: 549 (1992). The epithet means leaves (*folia*) like those of the leek, Latin *porrum*.

Illustrations: C.Lamp & F.Collet, *Weeds in Australia* 320, t. 254 (1979); G.M.Cunningham *et al.*, *Pl. W New South Wales* 714 (1981), as Salsify; B.A.Auld & R.W.Medd, *Weeds* 119 (1987).

Biennial herb, glabrous; taproot cylindrical. Leaves linear to narrowly lanceolate, 10–30 cm long, 1–2 cm broad, long-tapered base sheathing, margins entire. Peduncle erect, branched, to c. 1 m tall, swollen below the capitula, ±glaucous. Involucre 2.5–4 cm long, accrescent in fruit, bracts (sometimes 6–) 8, lanceolate, acuminate. Corolla purple, the outer almost as long as the involucre. Cypselas tapered-cylindrical, 8–12 mm long, tapered to a slender beak 10–20 mm long, ribbed, muricate; pappus dirty white, 1.5–2 cm long.

Norfolk Is. A rare weed, native to the Mediterranean region. Originally perhaps an escape from gardens and recorded as wild by J.H.Maiden (*Proc. Linn. Soc. New South Wales* 28: 762, 1904), but no material has been seen from the Island in the preparation of this Flora.

8. TARAXACUM

Taraxacum Weber in F.H.Wiggers, *Prim. Fl. Holsat.* 56 (1780); a medieval Latin name derived ultimately from the Persian *talkh chokok*, meaning a bitter pot herb.

Type: *T. officinale* Weber

Perennial, rarely biennial herbs, taprooted, with milky sap. Leaves in a basal rosette, entire to pinnatifid or lobed, commonly serrate; petioles obscure. Scapes 1 or more, simple, leafless. Capitula terminal, solitary; involucre cylindrical; bracts in several imbricate series; outer bracts short, often reflexed; inner bracts erect, equal; receptacle naked, pitted. Florets all

ligulate, bisexual (or apomictic). Corolla yellow, rarely white or pink. Cypselas cylindrical, tapering at apex with a long beak, ribbed, scabrid towards top below beak; pappus in several series, white or brownish, slightly scabrid.

A genus of perhaps 50 to 60 species from northern temperate regions and temperate South America, but due to polyploidy and apomixis in some groups, over 1200 microspecies have been described. One 'species' is naturalised on the Islands.

***Taraxacum officinale** Weber in F.H.Wiggers *Prim. Fl. Holsat.* 56 (1780) aggregate

Taraxacum dens-leonis Desf., *Fl. Atlant.* 2: 228 (1798). T: Algiers; holo: ?FI *n.v.*

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 18: t. 27 (1963); G.M.Cunningham *et al.*, *Pl. W New South Wales* 715 (1981), as Dandelion; B.A.Auld & R.W.Medd, *Weeds* 118 (1987).

Perennial herb. Leaves all basal, oblanceolate, 5–40 cm long, 1–15 cm broad, runcinate-pinnatifid; lobes ±triangular, often recurved, toothed, almost glabrous, with terminal lobe largest. Scapes stout, hollow, glabrous or cobwebby, 5–40 cm tall. Involucral bracts in 2 series; outer bracts narrowly lanceolate, strongly reflexed to recurved; inner lobes narrowly lanceolate to linear, erect, forming a cylindrical sheath around florets. Corolla golden yellow. Cypselas 2.5–3.5 mm long excluding beak, cream to greenish grey or brownish, ribbed; apex spinulose below beak; beak slender, 7–15 mm long, pale; pappus 5–6 mm long, white. *Dandelion*.

Norfolk Is., Lord Howe Is. A common weed of lawns, grassland, roadsides *etc*., native to Europe.

N.Is.: Kingston, around the ruins, *G.Uhe 1127* (K). **L.H.Is.:** 0.2 km S of Salmon Beach, *A.N.Rodd 1439* (K, NSW); Goat House Cave, *J.Pickard* in *A.N.Rodd 1335* (NSW); *s. loc.*, 1898, *J.H.Maiden* (NSW); *s. loc.*, 1920, *J.L.Boorman* (NSW).

Taraxacum officinale is the name usually applied to the widespread, apomictic aggregate species. Strictly, it was based on *Leontodon taraxacum* L. (in F.H.Wiggers, *Prim. Fl. Holsat.* 56, 1780) which is a distinct species from northern Scandinavia, but the nomenclatural problem of providing a scientific name to cover the aggregate has not yet been solved (see J.A.Richards, *Taxon* 34: 633–644, 1985).

9. LACTUCA

Lactuca L., *Sp. Pl.* 2: 795 (1753); *Gen. Pl.* 5th edn, 348 (1754); the Latin name for lettuce, from *lac* (milk), because of the milky latex contained in these plants.

Type: *L. sativa* L.

Annual, biennial or perennial herbs, sometimes subshrubby, with copious milky latex. Stems erect, often with fine bristles towards base. Leaves alternate, simple, entire to pinnatifid, often glaucous, often prickly; basal leaves ± petiolate; upper leaves often stem-clasping. Capitula numerous, in terminal panicles, cylindrical or narrowly conical; involucral bracts imbricate, in 2 or 3 series; receptacle naked, pitted. Florets all ligulate, bisexual. Corolla 5-toothed at apex, yellow or bluish. Cypselas flattened, sometimes slightly winged, beaked; beak slender, with a small disc at apex; pappus of 2 equal series, smooth or slightly scabrid, white or yellowish.

An Old World genus of c. 20 species, especially from south-western Asia; 1 species naturalised on Lord Howe Is.

***Lactuca saligna** L., *Sp. Pl.* 2: 796 (1753)

T: Europe, Herb. Burser VI: 11; lecto: UPS; *fide* I.M. de Vries & C.E.Jarvis, *Taxon* 36: 153, fig. 7 (1987). The epithet means willow-like, from *Salix* (the willows).

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 18: t. 33 (1963); G.M.Cunningham *et al.*, *Pl. W New South Wales* 718 (1981), as Wild Lettuce; D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1646, fig. 753A (1986).

Annual, rarely biennial herb. Stems erect, to 1 m tall, with ascending branches. Rosette and lower stem leaves oblanceolate in outline, 3–10 cm long, 1–4.5 cm broad, pinnatifid with lobes acute, entire, recurved, glaucous, often withering before anthesis; upper leaves linear, amplexicaul, usually held vertically and all in one plane. Capitula single or in remote clusters on a strict, spike-like branch; involucral bracts glaucous; outermost bracts ovoid, 2–3 mm long; inner bracts linear-lanceolate, 12 mm long, accrescent in fruit. Ligules suberect, pale yellow. Cypselas flattened, elliptic, 3–4 mm long, longitudinally ribbed, slightly scabrid, brown; beak 6–8 mm long, pale; pappus c. 5 mm long, white.

Lord Howe Is. An introduced weed of waste places, native to western Europe and the Mediterranean region.

L.H.Is.: North Beach, *L.A.S.Johnson & A.N.Rodd 1247* (NSW); behind North Beach, *L.A.S.Johnson & A.N.Rodd 1258* (NSW); W facing slope around from Dawsons Point, *A.N.Rodd 1728* (K, NSW).

10. SONCHUS

Sonchus L., *Sp. Pl.* 2: 793 (1753); *Gen. Pl.* 5th edn, 347 (1754); the Greek name for this or perhaps other thistle-like plants.

Type: *S. oleraceus* L.

Annual, biennial or perennial herbs, sometimes subshrubs, with copious white latex. Leaves alternate or basal, simple, entire, pinnatifid or pinnatisect, denticulate or spinulose, usually auriculate at base; basal leaves petiolate. Capitula terminal, 1–many in a panicle or sometimes subumbellate; involucre ovoid or cylindrical, often becoming conical; bracts in several series; inner series usually membranous; receptacle naked, pitted. Florets all ligulate, bisexual. Corolla 5-toothed at apex, yellow. Cypselas flattened, ellipsoidal, ribbed, without a beak; pappus of 2 equal series; outer series setaceous and deciduous; inner series soft, white, persistent.

A genus of c. 60 species from temperate Europe, the Mediterranean region, Asia and Africa; 3 naturalised species on the Islands. In Macaronesia (Azores to Cape Verde Is.) some species are shrubs.

1 Cypselas 4.5–7.5 mm long, with prominent smooth wings; rhizomatous perennial, in sandy, coastal habitats **3. S. megalocarpus**

1: Cypselas 2.5–3 mm long, ribbed, without prominent wings; non-rhizomatous annuals or biennials, in weedy habitats

2 Auricles of stem leaves pointed; cypselas ribbed, rugulose **1. S. oleraceus**

2: Auricles of stem leaves rounded; cypselas smooth between ribs **2. S. asper**

1. *Sonchus oleraceus L., *Sp. Pl.* 2: 794 (1753)

T: Europe Herb. Linn. 949.6; lecto: LINN, *fide* L.Boulos, *Bot. Notis.* 126: 155 (1973); IDC microfiche 177/2.534/8. The epithet means having the character of a vegetable, from the Latin (*h*)*olus* (a vegetable or green) with the suffix *-aceus*, indicating resemblance.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 18: t. 38 (1963); G.M.Cunningham *et al.*, *Pl. W New South Wales* 718 (1981), as Common Sowthistle; B.A.Auld & R.W.Medd, *Weeds* 117 (1987).

Annual herb. Stems hollow, erect, 20–150 cm tall, branched in upper part, glabrous, finely grooved or ribbed. Leaves variable, dull, ±glaucous; leaves on lower stem pinnatifid or pinnatisect, 6–20 cm long, 1–10 cm broad, with dentate auricle at base, sharply pointed, projecting downwards, sharply toothed, not spiny; terminal lobe ±triangular, broader and larger than other divisions; upper leaves smaller. Capitula few to many, conical after anthesis; involucral bracts 1–1.5 cm long, imbricate, erect, reflexed in fruit. Corolla 1.5–2

cm long, obscurely 3- or 5-toothed. Cypselas flattened, ellipsoidal, 2.5–3 mm long, ribbed, rugulose, pale brown; pappus white, cottony.

Norfolk Is., Lord Howe Is. A common weed of disturbed soil; native to Europe, the Mediterranean region and south-western Asia.

N.Is.: around the ruins, Kingston, *G.Uhe 1131* (K). **L.H.Is.:** Blinky Beach, *P.S.Green 1628* (A, K); Soldiers Cap, *J.Pickard 2880* (NSW); Tenth of June Is., *J.Pickard 2903* (NSW); *s. loc., J.D.McComish 201* (NSW).

2. *Sonchus asper (L.) Hill, *Herb. Brit.* 1:47 (1769)

subsp. **glaucescens** (Jord.) Ball, *J. Linn. Soc., Bot.* 16: 548 (1878)

Sonchus glaucescens Jord., *Observ. Pl. Nouv.* 5: 75 (1847). T: France; syn: ?LY *n.v.* The epithet alludes to the glaucescent leaves.

Illustrations: (subsp. unspecified) S.Ross-Craig, *Drawings Brit. Pl.* 18: 39 (1963); G.M.Cunningham *et al., Pl. W New South Wales* 717 (1981), as Prickly Sowthistle; C.J.Webb *et al., Fl. New Zealand* 4: 342, fig. 37B (1988).

Biennial herb. Stems hollow, erect, 10–120 cm tall, sometimes angled or somewhat grooved, branched in upper part. Leaves lanceolate to oblanceolate, rounded-auriculate, ±entire to pinnatifid half way to midrib, crisped and prickly-spinose on margins, glaucous, especially beneath; lower stem leaves 6–20 cm long, 1–6 cm broad, terminal lobe, where present, narrower than those below. Capitula few to many, conical after anthesis; involucral bracts 1–1.5 cm long, imbricate, reflexed in fruit. Corolla 1–1.5 cm long, minutely 3–5-toothed, golden yellow. Cypselas ellipsoidal, 2.5–3 mm long, flattened, ribbed, with small recurved spinules on margins and ribs, smooth between ribs, brown; pappus white, cottony.

Lord Howe Is. A weed of disturbed ground with the same native distribution as the previous species.

L.H.Is.: E end of Neds Beach, *G.Uhe 1263* (K); Transit Hill, *P.S.Green 1629* (A, K); Stevens Point, *A.C.Beauglehole 5665* (MEL).

3. *Sonchus megalocarpus (Hook.f.) J.M.Black, *Fl. S. Australia* 661 (1929)

Sonchus asper var. *megalocarpus* Hook.f., *Fl. Tasman.* 1: 227 (1856). T: north coast, Tasmania, *R.C.Gunn 845*; holo: K. The epithet comes from the Greek *mega* (big) and *karpos* (fruit), alluding to the size of the cypselas.

Embergeria sp.; A.N.Rodd in H.S.Recher & S.S.Clark, *Environm. Survey Lord Howe Is.* 25 (1974).

Illustrations: D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1653, fig. 757C (1986); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 595, fig. 841D (1986).

Perennial herb with creeping rhizomes. Stems erect, to 30 cm tall, somewhat woody at base. Leaves oblanceolate, 1.5–17 (–37) cm long, 0.5–4.5 cm broad, narrowed at base, entire to lobed or pinnatisect, sinuate, prickly-dentate, obtuse at apex, glabrous; lower leaves imperceptibly petiolate; upper leaves sessile with a small, rounded auricle. Capitula solitary or few and corymbose, c. 3 cm diam.; involucral bracts triangular to narrowly triangular, 4–20 mm long, imbricate. Corolla 1–2 cm long, yellow. Cypselas flattened, ±elliptical, 4.5–7.5 mm long, glabrous with prominent smooth wings, pale brown; pappus 7–14 mm long, persistent.

Lord Howe Is. In coastal sands.

L.H.Is.: N end of Blinky Beach, *L.A.S.Johnson & A.N.Rodd 1287* (NSW).

Although this species is native along the coast of N.S.W. and occurs on the Island in a typical habitat, the fact that it was not recorded or collected before 1970 (specimen cited above), indicates that it is a recent arrival and has probably been accidentally introduced; it will be interesting to see if the plant survives or spreads. This species has been placed in its own genus *Actites* Lander (*Telopea* 1: 130, 1976), but taken in the context of the whole genus *Sonchus*, its separation on the characters of the cypsela does not seem justified.

11. ARCTOTHECA

Arctotheca J.C.Wendl., *Bot. Beob.* 41 (1798); from the Greek *arktos* (a bear) and *theke* (a box), in allusion to the shaggy cypselas in these plants.

Type: *A. repens* J.C.Wendl.

Annual or perennial herbs, trailing, erect or forming a rosette, sometimes white woolly, without latex. Leaves radical or alternate, pinnatifid to bipinnatisect, rarely entire, petiolate. Capitula axillary, solitary, on long peduncles, hemispherical; involucral bracts in several unequal series, free; receptacle ±flat, naked, pitted. Ray florets ligulate, sterile; disc florets bisexual, tubular, 5-lobed. Cypselas terete, obovoid, ribbed, densely tomentose or silky, rarely glabrous; pappus of one series of short, scarious scales, occasionally absent.

A southern African genus of 4 species; 1 species naturalised on Norfolk Is.

*Arctotheca calendula (L.) Levyns, *J. S. African Bot.* 8: 284 (1942)

Arctotis calendula L., *Sp. Pl.* 2: 922 (1753). T: 'Aethiopia', Herb. Linn. 1036.7; lecto: LINN, *fide* D.O.Wijnands, *Botany Commelins 66* (1988); IDC microfiche 177/2.622/20. From the Latin *calendae*, the first day of the month.

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 680 (1981), as Capeweed; D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1625, fig. 740A (1986); B.A.Auld & R.W.Medd, *Weeds* 84 (1987).

Annual herb, rosetted, sprawling. Stems white woolly. Leaves oblanceolate in outline, lyrate-pinnatifid to bipinnatisect, with 3–5 pairs of lobes, 5–20 cm long, 2–6 cm broad, irregularly dentate, glabrous to mealy-pubescent above, white felted below; terminal lobe ovate to deltoid, 2–6 mm broad. Capitula solitary, 2–5 cm diam.; peduncles erect, 5–10 (–15) cm long; involucral bracts in 4 or 5 unequal series; outer bracts spreading, ciliate, acuminate; inner bracts longer with rounded scarious apex. Ray florets uniseriate, 1–2.5 cm long, yellow above, grey-green below; disc florets dark purplish. Cypselas oblong, c. 2.5 mm long, densely enveloped in a light brownish wool; pappus of minute scales.

Norfolk Is. Locally common on the Island. A native of South Africa which was originally cultivated as a garden plant but has now become a weed in many places.

N.Is.: vicinity of Bloody Bridge, *G.Uhe 1124* (K); point S of Emily Bay, *P.S.Green 1877* (K).

12. PSEUDOGNAPHALIUM

Pseudognaphalium Kirp., *Trudy Bot. Inst. Akad. Nauk SSSR* ser. 1, *Fl. Sist. Vyssh. Rast.* 9: 33 (1950); from the Greek *pseudo-* (false) and the generic name *Gnaphalium*, indicating that it superficially resembles that genus.

Type: *P. oxyphyllum* (DC.) Kirp.

Herbs, annual, biennial or perennial, without latex. Leaves alternate, cauline and basal, entire, flat or undulate on margins, woolly to velutinous, sessile, sometimes decurrent. Capitula crowded in compound heads arranged in terminal corymbs; involucral bracts in 3 or 4 series, uniform, papery, usually yellowish or white; inner series equal to or a little longer than florets; receptacle flat, naked. Outer florets ±filiform, female, more numerous than few to many tubular, bisexual disc florets. Corolla slender, yellow; lobes 5, erect. Cypselas glabrous or sparsely hairy with mucilage producing hairs when wet; pappus 1 series of free, slender barbellate bristles.

A genus of c. 50 species throughout warm temperate regions; 1 native species on Norfolk and Lord Howe Islands. The genus is in need of revision, which may reveal further species.

Pseudognaphalium luteoalbum (L.) Hilliard & B.L.Burtt, *Bot. J. Linn. Soc.* 82: 206 (1981)

Gnaphalium luteoalbum L., *Sp. Pl.* 2: 851 (1753). T: Europe, *Herb. van Royen* sheet 900.286-294; lecto: L, *fide* O.M.Hilliard & B.L.Burtt, *Bot. J. Linn. Soc.* 82: 206 (1981). The epithet combines the Latin *luteo* (golden yellow) and *albus* (white), in allusion to the colour of the inflorescence.

Gnaphalium lanatum G.Forst., *Fl. Ins. Austr.* 55 (1786). T: New Zealand, *J.R.& G.Forster*; syn: BM, K.

Gnaphalium luteoalbum var. *incanum* A.Rich. in J.S.C.Dumont d'Urville, *Voy. Astrolabe* 1: 236 (1832). T: New Zealand, *P.A.Lesson*; holo: ?P *n.v.*

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 687 (1981), as Jersey Cudweed; D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1575, fig. 713A (1986); B.A.Auld & R.W.Medd, *Weeds* 103 (1987).

Annual or biennial herb, to 50 cm tall. Stems erect or ascending, cobwebby or white-woolly. Basal leaves oblanceolate to spathulate, 1–8 cm long, 0.3–1.5 cm broad, withering early; stem leaves oblong to linear, 2.5–5.5 cm long, 0.2–0.6 cm broad, gradually reduced in size upwards, obtuse or acute, white-woolly or densely cobwebby above and below. Capitula ovoid, 3.5–5 mm diam., 5–40 arranged in simple or compound corymbs, often clustered; involucral bracts in c. 4 series, yellowish, shiny; inner bracts 3–4 mm long, spreading in fruit. Corollas 2–3 mm long. Cypselas cylindrical, c. 0.5 mm long, brownish; pappus bristles 2–3 mm long, white, deciduous. Fig. 86B.

Norfolk Is., Lord Howe Is. Locally common. Almost cosmopolitan, especially in light and sandy soils, often weedy.

N.Is.: Bloody Bridge, *P.S.Green 1440* (A); *s. loc.*, *F.L.Bauer* (W); *s. loc.*, 1902, *J.H.Maiden & J.L Boorman* (BM, K, NSW). **L.H.Is.:** between public jetty and Hunter Bay, *L.A.S.Johnson & A.N.Rodd 1225* (NSW); W end of Grey Face palm area, *J.Pickard 3412* (NSW); *s. loc.*, *J.D.McComish 41* (K, NSW).

13. GAMOCHAETA

Gamochaeta Wedd., *Chlor. Andina* 1: 151 (1856); from the Greek *gamos* (marriage, wedlock) and *chaite* (hair), alluding to the base of the pappus hairs being united.

Type: *G. americana* (Mill.) Wedd.

Herbs, annual or perennial, without stolons, without latex. Leaves alternate, entire, with flat margins, sessile. Capitula small, crowded into terminal and axillary, bracteate clusters, coalescing onto a ±elongated, spiciform inflorescence, somewhat cylindrical; involucral bracts in 3 or 4 series, imbricate; outer bracts woolly on back; inner bracts transparent, brownish or with apex tinged reddish; receptacle flat, naked. Outer florets female, more numerous than central bisexual florets. Corolla of female florets very slender, 5-toothed; corolla of central florets 5-lobed, tubular, dilated above. Cypselas small, obovoid, glabrous or sparsely pubescent with mucilage producing hairs; pappus uniseriate, of slender bristles, without basal cilia, united at base into a ring, deciduous.

A genus of perhaps 40 species from the New World, especially South America; 1 species naturalised on Norfolk and Lord Howe Islands. Classified by some authors as a section of *Gnaphalium*, but in most recent treatments given generic rank.

***Gamochaeta purpurea** (L.) Cabrera, *Bol. Soc. Argent. Bot.* 9: 377 (1961)

Gnaphalium purpureum L., *Sp. Pl.* 2: 854 (1753). T: North America, *Herb. van Royen*, sheet 900.286-424; lecto: L, *fide* O.M.Hilliard & B.L.Burtt, *J. Linn. Soc., Bot.* 82: 246 (1981). So called from the frequent purple colour of the tips of the inner involucral bracts and florets.

Gnaphalium spicatum Lam., *Encycl.* 2: 757 (1788), *nom. illeg., non* Mill. (1768). T: Paraguay, *P.Commerson*; holo: ?P *n.v.*

Gnaphalium americanum Mill., *Gard. Dict.* 8th edn, *Gnaphalium No. 17* (1768). T: cultivated; ?holo: ?BM *n.v.*

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 532, fig. 74H, I (1986); B.A.Auld & R.W.Medd, *Weeds* 102, 103 (1987), as *Gnaphalium coarctatum* & *Gnaphalium pensylvanicum*; J.Everett in G.J.Harden, *Fl. New South Wales* 3: 210 (1992), as *Gnaphalium americanum.*

Annual or biennial herbs. Stems decumbent to erect, to 50 cm tall, sparsely to densely white tomentose. Rosette leaves ±sessile, oblanceolate to spathulate, 2–10 cm long, 0.5–2 cm broad, obtuse to rounded and shortly apiculate, densely white tomentose below, ±glabrous to sparsely cobwebby above, with midrib ±sunken; stem leaves reduced upwards, some linear. Capitula 3–4.5 mm diam.; inflorescence interrupted below; involucral bracts in 3 or 4 unequal series, to c. 3 mm long, scarious in upper part. Corolla yellow to purplish. Cypselas obovoid-cylindrical, c. 5 mm long; pappus 2.5–3 mm long.

Norfolk Is., Lord Howe Is. A relatively common introduced weed from America, now widespread in warm temperate regions.

N.Is.: New Cascade Rd, *W.R.Sykes NI 204* (CHR); *s. loc., J.D.McComish 61A & 247* (NSW). **L.H.Is.:** Dawsons Ridge, *M.M.J. van Balgooy 1024* (CANB); SE slopes of Malabar, *P.S.Green 1552* (A, K); Neds Beach Rd, *J.Pickard 2658* (NSW); near Goat House, *R.D.Hoogland 8819* (CANB, NSW).

This species is part of a complex of forms to which several names have been given, and within which attempts have been made to recognise discrete entities, but they all intergrade. See for example the comments by P.Short, *Newslett. Austral. Syst. Bot. Soc.* 52: 7–11 (1987). One collection, (*P.S.Green 1552*) cited above, consists of large and small individuals which were selected as extremes from the same population, yet one investigator has determined them as two different species.

14. EUCHITON

Euchiton Cass., *Dict. Sci. Nat.* 56: 214 (1828); from the Greek *eu-* (a prefix meaning good, well-developed) and *chiton* (tunic or covering), alluding both to the involucre of the capitula and to the involucre of leaves which surround the cluster of flower-heads.

Type: *E. pulchellus* Cass. = *E. involucratus* (G.Forst.) Holub

Herbs, annual or perennial, stoloniferous, without latex. Leaves alternate, cauline and basal, simple, flat or sometimes revolute, not keeled, sessile. Capitula solitary or aggregated into a terminal cluster surrounded by an involucre of leaves, with or without axillary clusters below, ±cylindrical; involucral bracts in 2–4 series, imbricate, membranous, straw coloured to brown; inner bracts translucent; receptacle flat, naked. Outer florets female, more numerous than inner bisexual florets. Corollas tubular; female 3- or 4-lobed; bisexual 5-lobed. Cypselas small, oblong, with numerous paired papillae; pappus uniseriate, of barbellate bristles, ciliate at base, free.

A genus of c. 15 species, mostly from SE Asia, Australia, New Zealand and the Pacific islands; 1 species native on the Islands. Until recently, usually treated as a section of *Gnaphalium*.

Euchiton involucratus (G.Forst.) Holub, *Folia Geobot. & Phytotax.* 9: 271 (1974)

Gnaphalium involucratum G.Forst., *Fl. Ins. Austr.* 55 (1786). T: New Zealand, *J.R. & G.Forster*; lecto: P; isolecto: BM, K, *fide* H.H.Allan, *Fl. New Zealand* 1: 700 (1961). So named from the 'involucre' of leaves subtending the terminal cluster of capitula.

Gnaphalium sp. J (aff. *sphaericum*); S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 78 (1981).

Gnaphalium sp. aff. *sphaericum* Willd.; A.N.Rodd & J.Pickard, *Cunninghamia* 1: 271 (1983).

[*Gnaphalium japonicum auct. non* Thunb.: F.J.H. von Mueller, *Fragm.* 9: 77 (1875); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 240 (1896); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 707 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 38 (1915); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 4: 155 (1917); J.S.Turner *et al.*, *Conservation Norfolk Is.* 36 (1968)]

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 686 (1981), as Japanese Cudweed; D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1517, fig. 690C, E (1986), as *Gnaphalium*

gymnocephalum and *Gnaphalium involucratum*; G.R.M.Dashorst & J.P.Jessop, *Pl. Adelaide Plains & Hills* 143, t. 64/8 (1990).

Perennial or annual, often stoloniferous, to 50 cm tall. Rosette leaves withering or persistent, elliptic to oblanceolate, 3–15 cm long, 0.3–1 cm broad, acute to obtuse, white tomentose below, ±glabrous above; stem leaves becoming linear. Capitula numerous, 1.5–3 mm diam., in dense, terminal, somewhat globular clusters, sometimes with 1 (or 2) smaller, axillary clusters below, surrounded by an 'involucre' of linear, subtending leaves 0.5–3 cm long; involucral bracts in 2 series, 3.5–4.5 mm long, pale brown, sometimes tinged purplish red. Outer florets numerous; inner florets 1–4. Corollas filiform throughout, 2–3 mm long. Cypselas ellipsoidal, 0.6–0.8 mm long, minutely papillate; pappus 2–3 mm long. Fig. 86C–D.

Norfolk Is., Lord Howe Is. Almost certainly a native, but growing in open and disturbed habitats. Also known from Australia, New Zealand, the Kermadec Is. and New Caledonia.

N.Is.: The Chord, Duncombe Bay, *P.S.Green 2435* (K, NSW); Ball Bay, *R.O.Gardner 5917* (AK); *s. loc.*, 1804, *F.L.Bauer* (W). **L.H.Is.:** E slope of Dawsons Point, *A.N.Rodd 1737* (NSW); S end of Salmon Beach, *J.Pickard 3370* (NSW); near S end of Little Slope, *J.Pickard 2817* (NSW).

A broad view has been taken of this species (see P.Short, *Newslett. Austral. Syst. Bot. Soc.* 52: 7–11, 1987), but more work is needed on this group relating the reproductive biology to the variation.

15. FACELIS

Facelis Cass., *Bull. Sci. Soc. Philom. Paris* 1819: 94 (1819); derivation unknown.

Type: *F. apiculata* Cass. = *F. retusa* (Lam.) Sch.Bip.

Herbs, annual or perennial, multistemmed, decumbent, without latex. Leaves alternate, simple, narrow, emarginate or 3-toothed at apex, sessile. Capitula axillary, solitary or in small ±terminal clusters; involucre ovoid-conical; bracts imbricate in 3 or 4 series; outer bracts somewhat foliaceous; inner bracts scarious; receptacle flat, naked. Female florets numerous, filiform, truncate or obscurely dentate; bisexual florets few, surrounded by female florets, narrowly tubular, minutely 5-toothed. Cypselas ellipsoidal, densely short silky villous; pappus plumose, fused at base.

A genus of 4 species from South America; 1 species naturalised on Norfolk Is.

*Facelis retusa (Lam.) Sch.Bip., *Linnaea* 34: 532 (1866)

Gnaphalium retusum Lam., *Encycl.* 2: 758 (1786). T: Argentina and Uruguay, *P.Commerson*; holo: P *n.v.*, IDC microfiche 6207/2.324/17. The epithet comes from the retuse leaf apex.

Illustrations: M.Henderson & J.G.Anderson, *Common Weeds in S. Africa* 369, fig. 183 (1966); B.A.Auld & R.W.Medd, *Weeds* 102 (1987); M.F.Porteners in G.J.Harden, *Fl. New South Wales* 3: 206 (1992).

Annual, semi-prostrate herb, branching near base; shoots erect, to 20 cm tall. Stems villous to somewhat cobwebby. Leaves simple, sessile, narrowly obcuneiform, 5–20 mm long, 1–4 mm broad, ±revolute, truncate or retuse with a small apical mucro, villous below, glabrous above. Capitula silvery white, terminal on short shoots, forming a racemose clustered inflorescence at the ends of branches; involucral bracts linear-lanceolate, membranous, reflexed in fruit. Corolla purple-tipped. Cypselas 1.5 mm long, densely appressed pubescent; pappus to 1 cm long; bristles markedly plumose, much longer than corolla.

Norfolk Is. This native of Argentina, Uruguay, Paraguay and southern Brazil is now a weed of disturbed and open grassland in Australia (coastal N.S.W.), as well as South Africa. It has been collected once from the Island and will, it is hoped, not spread.

N.Is.: wayside bank, Middlegate Rd, *W.R.Sykes NI 191* (CHR).

16. CASSINIA

Cassinia R.Br., *Trans. Linn. Soc. London* 12: 126 (1818); named after Alexandre-Henri Gabriel de Cassini (1781–1832), a French botanist who worked and published extensively on the Asteraceae.

Type: *C. aculeata* (Labill.) R.Br.

Shrubs or small trees, aromatic, without latex. Leaves alternate, simple, entire with revolute margins, sessile. Capitula small, numerous, in dense terminal corymbs or panicles, cylindrical to campanulate; involucral bracts in 3–5 series, imbricate, membranous; inner bracts white to pale brown; receptacle convex, with chaffy scales between florets. Florets usually all bisexual. Corollas 5-toothed, tubular. Cypselas small, terete, angled or slightly flattened; pappus of a single series of bristles shortly united in a ring at base.

A genus confined to Lord Howe Is. and to Australia and New Zealand, containing c. 20 species, including 1 species endemic on Lord Howe Is.

Cassinia tenuifolia Benth., *Fl. Austral.* 3: 585 (1867)

T: Lord Howe Island, *W.G.Milne* [2]; holo: K. The epithet comes from the Latin *tenuis* (slender) and *folium* (leaf), alluding to the leaf shape.

Illustrations: A.N.Rodd in H.F.Recher & S.S.Clark, *Environm. Survey Lord Howe Is.* 54 (1974); I.Hutton, *Lord Howe Is.* 119 (1986).

Dense, bushy shrub, to 2 m tall. Young stems densely felted tomentose. Leaves somewhat crowded; petiole 1–2 mm long; lamina linear, 20–40 mm long, 1.5–3 mm broad, marginally recurved, apiculate, densely white tomentose below, glabrous above. Capitula 1.5–2 mm diam., crowded in a terminal corymb, level with or shorter than surrounding leaves, sweetly scented; involucral bracts in 4 series, ovate to oblong, 1–3 mm long, erect, rounded and scarious on tips. Florets all bisexual. Corollas cream. Cypselas ellipsoidal, 0.75 mm long, brown; pappus c. 2 mm long, white. *Bully Bush, Killmoke.* Fig. 88D–E.

Lord Howe Is. Endemic, common and widespread at low altitudes, including in exposed positions. Flowers mid Jan.–early April. Sometimes called a weed because it invades pastures, and if not kept down when young by grazing, develops quite naturally into its climax habit of a full sized shrub.

L.H.Is.: North Beach, *L.A.S.Johnson & A.N.Rodd 1241* (K, NSW); Dawsons Ridge, *M.M.J. van Balgooy* 1033 (K, NSW); track to Malabar, *I.Hutton 10* (CBG); c. 100 m from the sea at the mouth of Rocky Run, *J.C.Game 69/282* (K); Rabbit Is., *A.N.Rodd 1808* (NSW).

17. ASTER

Aster L., *Sp. Pl.* 2: 872 (1753); *Gen. Pl.* 5th edn, 373 (1754); the Greek for a star, presumably in allusion to the appearance of the flowers.

Type: *A. amellus* L.

Herbs, perennial or sometimes annual or biennial, rarely shrubby, without latex. Leaves radical or alternate, simple, entire or dentate, usually narrowed onto petiole. Capitula terminal, 1–several in corymbs or panicles, cylindrical to campanulate; involucral bracts in 2–6 series, imbricate, usually with apex herbaceous; receptacle flat to convex, naked, pitted. Outer florets ligulate, usually female, rarely sterile; disc florets bisexual. Ligulate corollas white to red or blue; disc corollas yellow, tubular, 5-lobed. Cypselas obovoid to ellipsoidal, flattened, often glandular, glabrous or ±pilose; pappus in 1 or 2 series, with an inner series of scabrid bristles and an outer series reduced to short hairs or scales.

A genus of c. 250 species, especially well represented in North America, but also found in South America, Europe and Africa; 1 species naturalised on the Islands.

***Aster subulatus** Michx., *Fl. Bor. Amer.* 2: 111 (1803)

T: coastal Pennsylvania and Carolina, North America, *A.Michaux*; lecto: P, *fide* P.Bosserdot, *Taxon* 19: 248 (1970).

Illustrations: D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1445, fig. 653B (1986); B.A.Auld & R.W.Medd, *Weeds* 85 (1987); M.F.Porteners in G.J.Harden, *Fl. New South Wales* 3: 175 (1992).

Annual or short-lived perennial herb, erect to 2 m tall, sparingly branched below inflorescence, glabrous. Basal leaves narrowly ovate, petiolate; stem leaves lanceolate to linear, 1–12 cm long, 0.2–2 cm broad, sessile, slightly amplexicaul, entire, acute, diminishing in size upwards. Capitula in a compound panicle, numerous, 2–5 mm diam.; involucral bracts in 3 or 4 series, imbricate, linear-lanceolate, c. 5 mm long, finely acute, green and purplish towards apex. Ligulate corollas numerous, white to mauve, very slightly longer than involucre; disc florets few, slightly shorter. Cypselas flattened, ellipsoidal, c. 2 mm long, slightly ribbed, sparsely and minutely pubescent; pappus of delicate bristles, white, c. 5 mm long.

Norfolk Is., Lord Howe Is. A common weed of disturbed ground, roadsides *etc*. A native of north-eastern North America.

N.Is.: Harpers Rd, near Cascade Point, *W.R.Sykes NI 385* (CHR); Anson Bay, *J.D.McComish 130* (K). **L.H.Is.:** 0.3 km NE of 'Pine Trees', *L.A.S.Johnson & A.N.Rodd 1206* (NSW); S end of golf course, *J.Pickard 3462* (NSW); summit ridge of Mt Lidgbird, *J.Pickard 1476* (NSW); *s. loc.*, 1920, *J.L.Boorman* (NSW).

18. ERIGERON

Erigeron L., *Sp. Pl.* 2: 863 (1753); *Gen. Pl.* 5th edn, 371 (1754); a name, from the Greek *eri* (early) and *geron* (an old man) used by Theophrastus, probably for *Senecio vulgaris*, alluding to the early appearance of the white pappus.

Type: *E. uniflorus* L.

Herbs, annual or perennial, without latex. Leaves alternate, simple, entire, serrate or lobed, petiolate or sessile. Capitula 1–many, terminal on branches of a loose corymb or panicle, broadly campanulate; involucral bracts in 2 or 3 series, graduated or subequal; outer bracts herbaceous; inner bracts scarious on margins; receptacle flat to convex, naked, pitted. Outer florets ligulate, female; inner florets tubular, bisexual. Cypselas ellipsoidal to obovoid, flattened, pubescent; pappus of numerous, fine bristles and a few shorter outer scales.

A genus of c. 200 species, cosmopolitan, but best represented in North America; 1 species naturalised on Norfolk Is.

***Erigeron karvinskianus** DC., *Prodr.* 5: 285 (1836)

T: Mexico, *W.F.Karwinski*; holo: ?M *n.v.* Named after Freiherr (Baron) Wilhelm Friedrich von Karwinski von Kerwin (1780–1855), who collected in Brazil and Mexico.

Illustrations: D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1467, fig. 662A (1986); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 316, t. 26 (1990).

Perennial herb, much branched, procumbent, rooting at nodes. Stems ascending to c. 30 cm. Leaves often in tufts on short side shoots; lower leaves petiolate; upper leaves sessile; lamina elliptic to ovate or cuneate, 1–3.5 cm long, 0.2–2 cm broad, 3-toothed. Capitula solitary, 1.5–2 cm diam.; peduncles slender, erect, 2–10 cm long; involucral bracts linear-lanceolate, 3–4 mm long, green with a pale margin, glabrous or with a few scattered hairs, reflexed in fruit. Ligulate florets 5–10 mm long, white, becoming flushed purplish pink with age. Tubular florets c. 3 mm long, yellowish. Cypselas ellipsoidal, c. 1 mm long, flattened, sparsely and minutely hispid, with a slight marginal rib, pale brown; pappus with 1 series of hairs 2–3 mm long, and sometimes a few shorter ones.

Norfolk Is. A native of Mexico, frequently naturalised as a garden escape with a tendency to weediness.

N.Is.: Burnt Pine, *W.R.Sykes NI 467* (CHR).

19. CONYZA

Conyza Less., *Syn. Gen. Compos.* 203 (1832); a name used by Theophrastus for plants in another genus of this family.

Type: *C. chilensis* Spreng.

Herbs, annual to perennial, rarely subshrubby, without latex. Leaves radical and cauline, alternate, simple, entire, toothed or pinnatifid, sessile. Capitula rather small, few to numerous in panicles, hemispherical to campanulate; involucral bracts in 2–4 series, somewhat imbricate; outer bracts ±herbaceous, with scarious margins; inner bracts membranous; receptacle flat or convex, naked. Outer florets female, filiform or shortly ligulate, in 2–several rows; inner florets fewer, tubular, bisexual. Ligulate corollas white to purple; disc florets pale yellow. Cypselas oblong-elliptic, somewhat flattened, usually with lateral ribs; pappus of fine barbellate bristles, sometimes with a shorter outer series.

A genus of c. 50 species throughout temperate and warm temperate regions of the world; 3 species naturalised on the Islands.

1 Involucral bracts glabrous; capitula 1–3 mm diam.; receptacles 0.75–1 mm diam. **3. C. parva**

1: Involucral bracts ±hairy; capitula 5 mm or more diam.; receptacles 1.5–3 mm diam.

2 Capitula 6–10 mm wide; receptacles 2–3 mm diam.; involucral bracts usually with apex tinged reddish **1. C. bonariensis**

2: Capitula 5–7 mm wide; receptacles 1.5–2 mm diam.; involucral bracts not red tipped **2. C. sumatrensis**

1. *Conyza bonariensis (L.) Cronquist, *Bull. Torrey Bot. Club* 70: 632 (1943)

Erigeron bonariensis L., *Sp. Pl.* 2: 863 (1753). T: not designated. Named after Buenos Aires whence early collections were obtained.

Erigeron linifolius Willd., *Sp. Pl.* 4th edn, 3: 1955 (1803). T: cultivated, origin unknown; holo: B *n.v.*; photo seen (IDC microfiche 7740/1.1126/1).

Illustrations: D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1465, fig. 660B (1986); B.A.Auld & R.W.Medd, *Weeds* 96 (1987); G.R.M.Dashorst & J.P.Jessop, *Pl. Adelaide Plains & Hills* 147, t. 66/8 (1990).

Annual or biennial herb to 1.5 m tall. Stem usually unbranched below inflorescence, with long soft, and shorter stiff hairs. Basal leaves elliptic to oblanceolate, 5–8 cm long, 1–2 cm broad, rounded dentate to shallowly pinnatifid, hispid-pilose; upper stem leaves narrowly elliptic to linear, 2–3 (–6) mm broad, entire, hispid-pilose. Inflorescence pyramidal to broadly corymbose, with lateral branches often exceeding central axis. Capitula 6–10 mm diam.; involucral bracts narrowly lanceolate, 5–6 mm long, dorsally strigose, usually tinged reddish purple at apex, with inner face pallid; receptacle 2–3 mm diam. Outer florets ligulate though inconspicuous, white to mauve. Cypselas 1.5–1.75 mm long; pappus 3 mm long, white or tinged pink. *Cobblers Pegs*.

Norfolk Is., Lord Howe Is. Originally from warm temperate South America, this species is now a cosmopolitan weed.

N.Is.: Anson Bay, *J.D.McComish 138* (K); Kingston, *R.O.Gardner 5768* (AK). **L.H.Is.:** Lagoon Rd on SE side of airstrip, *J.Pickard 2718* (NSW); N end of Little Slope, *J.Pickard 2751* & *2795* (NSW); *s. loc.*, 1898, *J.H.Maiden* (NSW); *s. loc.*, 1920, *J.L.Boorman* (NSW).

2. *Conyza sumatrensis (Retz.) E.Walker, *J. Jap. Bot.* 46: 72 (1971)

Erigeron sumatrensis Retz., *Observ. Bot.* 5: 28 (1788). T: Sumatra, *H.P.Wennerberg*; holo: ?LD *n.v.* Named after the island whence the type specimen was collected.

Conyza albida Willd. ex Spreng., *Syst. Veg.* 3: 514 (1826). T: Brazil, ex Herb. Hoffmannsegg; holo: B *n.v.*; photo seen (IDC microfiche 7740/1.1124/4).

Conyza floribunda Kunth in F.W.H.A. von Humboldt, A.J.A.Bonpland & K.S.Kunth, *Nov. Gen. Sp.* 4: 73 (1820). T: Ecuador, *F.W.H.A. von Humboldt & A.J.A.Bonpland*; holo: P *n.v.*; photo seen (IDC microfiche 6209/2.95/21).

[*Vernonia cinerea auct. non* (L.) Less.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 707 (1904)]

Illustrations: D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1465, fig. 660A (1986); B.A.Auld & R.W.Medd, *Weeds* 95 (1987); G.R.M.Dashorst & J.P.Jessop, *Pl. Adelaide Plains & Hills* 147, t. 66/7 (1990); all as *C. albida*.

Annual or biennial herb to 2 m tall. Stem usually unbranched below inflorescence, with long soft and shorter stiff hairs. Basal leaves elliptic to oblanceolate, 5–15 cm long, 1–1.5 cm broad, entire to obtusely dentate, hispid-pilose; upper stem leaves narrowly oblanceolate, rarely linear, 3–7 mm wide, entire, hispid-pilose. Inflorescence pyramidal, with lateral branches not overtopping central axis. Capitula 5–7 mm diam.; involucral bracts narrowly lanceolate, 4–5 mm long, dorsally pilose, not tinged reddish at apex, with inner face brown when reflexed; receptacle 1.5–2 mm diam. Outer florets ligulate though inconspicuous, white to mauve. Cypselas 1–1.2 mm long; pappus c. 3 mm long, straw coloured or dirty white.

Norfolk Is., Lord Howe Is. Although first described from Sumatra this species probably came originally from the New World, as did the previous species, and, like it too, is now a widespread weed in warm temperate and subtropical regions.

N.Is.: top of Mt Bates, *P.Ralston 35* (K); Bumbora Rd turn-off, *W.R.Sykes NI 927* (CHR); *s. loc.*, 1889 & 1902, *I.Robinson* (NSW). **L.H.Is.:** ridge W of Malabar, *P.S.Green 1948* (K); main Settlement, *A.C.Beauglehole 5645* (MEL); Government House, *L.A.S.Johnson & A.N.Rodd 1222* (NSW).

3. *Conyza parva Cronquist, *Bull. Torrey Bot. Club* 70: 632 (1943)

T: North America, based on *Erigeron pusillus* Nutt.; holo: ?PH *n.v.* The epithet means small, alluding to the comparative size of the capitula.

Illustrations: B.A.Auld & R.W.Medd, *Weeds* 97 (1987); C.J.Webb *et al.*, *Fl. New Zealand* 4: 190, fig. 19B (1988); J.Everett in G.J.Harden, *Fl. New South Wales* 3: 199 (1992).

Annual herb, slender, erect to 50 cm tall. Stems sparsely strigose or almost glabrous, unbranched below inflorescence. Basal and stem leaves narrowly oblanceolate, 0.5–4 cm long, 0.1–0.5 cm broad, entire, finely scabrid on margins, glabrous below, scattered scabrous above or almost glabrous; basal leaves withering early. Inflorescence cylindrical; branches short. Capitula 1–3 mm diam.; involucral bracts linear, 3–3.5 mm long, glabrous, generally with a red spot at apex; receptacle 0.75–1 mm diam. Outer florets ligulate though inconspicuous, white to mauve. Cypselas 0.75–1 mm long; pappus 2–3 mm long, cream to pale straw coloured.

Lord Howe Is. A less common weed from the New World, presumably introduced with grass seed or fodder.

L.H.Is.: bank behind Lagoon Beach, opposite Middle Beach Rd, *J.Pickard 3328* (NSW).

20. OLEARIA

Olearia Moench, *Suppl. Meth.* 254 (1802); named after Johann Gottfried Olearius (1635–1711), a German botanist who in 1668 published an early work on the Flora of Halle.

Type: *O. tomentosa* (J.C.Wendl.) DC.

Shrubs, rarely small trees, without latex. Leaves alternate or opposite, simple, entire or toothed, sessile or petiolate. Capitula axillary or terminal, solitary or variously clustered in corymbs or panicles, cylindrical to broadly hemispherical; bracts imbricate in several series, herbaceous with scarious margins; receptacle flat or convex, naked, pitted. Ray florets uniseriate, female, ligulate or filiform, rarely absent; disc florets few to many, bisexual, tubular. Cypselas terete or slightly flattened, striate, glabrous or hairy; pappus of numerous, usually unequal barbellate bristles.

A genus of c. 180 species from New Guinea, Australia and New Zealand; 2 endemic species and 1 endemic subspecies on Lord Howe Is.

1 Leaves linear, 0.5–1.5 mm broad; capitula large, 1.5–2 cm diam., solitary **1. O. ballii**

1: Leaves narrowly to broadly elliptic to obovate or oblanceolate, (6–) 10–35 mm broad; capitula smaller, 0.5–1 cm broad, (4–) 8–many in terminal corymbs

2 Leaves 4–10 cm long; terminal corymbs dense, with many capitula; young shoots and inflorescences not sticky **2. O. mooneyi**

2: Leaves (1.5–) 2.5–3.5 (–5) cm long; terminal corymbs with (4–) 8–15 capitula; young shoots and inflorescences resinous-sticky **3. O. elliptica**

1. Olearia ballii (F.Muell.) Hemsl., *Ann. Bot.* (*London*) 10: 239 (1896)

Aster ballii F.Muell., *Fragm.* 8: 143 (1874). T: Lord Howe Is., *J.P.Fullagar & Lind*; holo: MEL. Named after Lieutenant Henry Lidgbird Ball who, while in command of H.M.S. *Supply* in 1788, sailing between Port Jackson and Norfolk Is., discovered and named Lord Howe Is.

Illustration: I.Hutton, *Lord Howe Is.* 119 (1986).

Dense shrub to 1.5 m tall. Leaves alternate, crowded, sessile or subsessile, linear, 5–12 mm long, 0.5–1.5 mm broad, entire, revolute, acute with a blunt tip, white-woolly beneath except on midrib, glabrous above. Capitula terminal, solitary, sessile, 1.5–2 cm diam.; involucral bracts without a distinct pilose midrib. Ray florets 20–30, c. 8 mm long, white with purple tips; disc florets c. 40, c. 4 mm long, purplish. Cypselas ellipsoidal, c. 3 mm long, length, brown, glandular; pappus uniseriate, of c. 30 bristles, c. 2 mm long. *Mountain Daisy.* Figs 64, 88A.

Lord Howe Is. Endemic. Found from c. 400 m altitude to the tops of the mountains, where it is frequent. Flowers throughout the year, but mainly Nov.–March.

L.H.Is.: Goat House Cave, *J.Pickard NSW137318* (K, NSW); slopes of Mt Lidgbird, *J.D.McComish 141* (K, NSW); NW flank of Mt Gower, *M.M.J. van Balgooy 1112* (NSW); summit of Mt Gower, *R.D.Hoogland 8799* (NSW); *loc. id.*, *P.S.Green 1590* (K).

2. Olearia mooneyi (F.Muell.) Hemsl., *Ann. Bot.* (*London*) 10: 239 (1896)

Aster mooneyi F.Muell., *Fragm.* 8: 144 (1874). T: Lord Howe Island, *Lind & J.P.Fullagar* [68]; holo: MEL. Named after Thomas Mooney (1842–?), an early resident on Lord Howe Is. who was interested in its plants but died while relatively young.

Illustration: I.Hutton, *Lord Howe Is.* 36, 120 (1986).

Shrub to 2 m or small tree to 4 m tall. Leaves alternate, somewhat crowded; petiole 3–12 mm long; lamina narrowly to broadly elliptic to obovate, 4–10 cm long, 1.5–3.5 cm broad, rounded at base, entire, flat, broadly acute to obtuse, mucronulate, pale biscuit coloured, finely woolly below, becoming glabrous and shiny above. Capitula terminal, many in a dense corymb, c. 8 mm diam.; involucral bracts appressed pilose dorsally, c. 3 mm long. Ray florets c. 12, c. 6 mm long, white; disc florets c. 8, 6 mm long, pale yellow. Cypselas c. 5 mm long, brown, strigulose; pappus uniseriate, with c. 20 bristles, 3–3.5 mm long. *Pumpkin Bush*. Fig. 88F–G.

Lord Howe Is. Endemic. Found on the mountains, from c. 750 m upwards, and one of the main trees on the summits. Flowers late Nov.–mid Jan.

L.H.Is.: corner of SW spur, Mt Lidgbird, *A.N.Rodd 1778* (NSW); N spur of Mt Gower, *A.N.Rodd 1375* (K, NSW); summit of Mt Gower, *P.S.Green 1589* (A, K); *loc. id.*, *M.D.Crisp 4566 & I.R.H.Telford* (CBG); *s. loc.*, 1901, *E.King* (MEL, NSW).

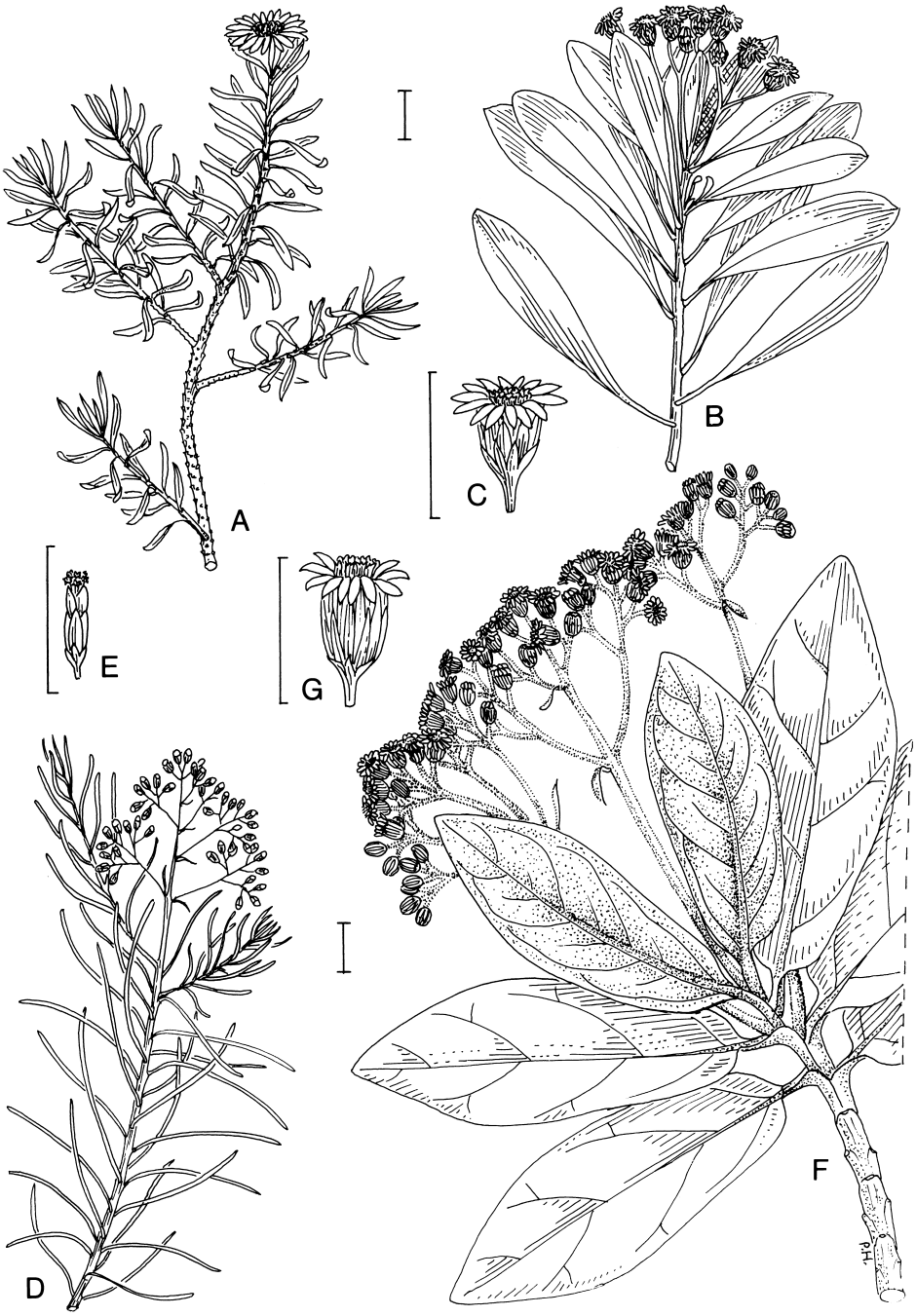

Figure 88. ASTERACEAE. **A**, *Olearia ballii*, habit (P.Green 1590, K). **B–C**, *Olearia elliptica* subsp. *praetermissa*. **B**, habit, **C**, capitulum (**B–C**, I.Hutton 656, K). **D–E**, *Cassinia tenuifolia*. **D**, habit; **E**, capitulum (**D–E**, M.van Balgooy 1033, K). **F–G**, *Olearia mooneyi*. **F**, habit; **G**, capitulum (**F–G**, C.Moore 68, K). Scale bars = 1 cm. Drawn by P.Halliday.

3. Olearia elliptica DC., *Prodr.* 5: 271 (1836)

subsp. **praetermissa** P.S.Green, *Kew Bull.* 48: 311 (1993)

T: Lord Howe Is., 25 Mar. 1971, *A.N.Rodd 1771*; holo: K; iso: NSW. The epithet means overlooked, and alludes to the fact that the distinctness of this endemic species had been overlooked until recently.

[*Olearia elliptica auct. non* DC.: A.N.Rodd & J.Pickard, *Cunninghamia* 1: 271 (1983)]

Illustration: I.Hutton, *Lord Howe Is.* 120 (1986), as *O. elliptica.*

Shrub, stunted or to 1 m tall. Young shoots resinous-sticky. Leaves alternate, crowded towards ends of shoots; petiole scarcely differentiated, 2–7 mm long; lamina oblanceolate, (1.5–) 2.5–3.5 (–5) cm long, (0.6–) 1–1.5 (–2) cm broad, attenuate, entire, flat, broadly acute to obtuse, somewhat resinous-sticky, especially below. Capitula (4–) 8–15, in terminal corymbs, c. 5–8 mm diam., level or almost level with leaves; involucral bracts sticky; outer bracts 1 mm long; inner bracts slightly concave, c. 3.5 mm long. Ray florets 14–25, c. 6 mm long, white; disc florets 15–20, 3 mm long. Cypselas slightly compressed, ridged, 1.5–1.8 mm long, scattered strigulose; pappus in two series; outer series of narrow scales c. 1 mm long; inner series of c. 15–20 slender bristles c. 3 mm long, finely strigulose. Fig. 88B–C.

Lord Howe Is. An endemic subspecies found in pockets of soil on rocky, mountain ledges. Flowers mid May–early Oct.

L.H.Is.: Goat House, *P.S.Green 2039* (K); *loc. id., M.D.Crisp 4520 & I.R.H.Telford* (CBG); Mt Lidgbird, S spur above first cliffs, *A.N.Rodd 1771* (K, NSW); *loc. id., I.Hutton 656* (K); tableland, E side of Mt Lidgbird, *J.Pickard 3629* (NSW).

Olearia elliptica subsp. *elliptica* occurs on the mainland of Australia in south-eastern Qld and eastern N.S.W.

21. BRACHYSCOME

Brachyscome Cass., *Bull. Sci. Soc. Philom. Paris* 1816: 199 (1816); *Dict. Sci. Nat.* 37: 491 (1825); from the Greek *brachys* (short) and *kome* (hair), alluding to the short pappus.

Type: *B. aculeata* (Labill.) Less.

Annual or perennial herbs, rarely subshrubs, without latex. Leaves alternate, radical or cauline, entire to pinnatisect, sessile or petiolate. Capitula terminal, solitary or few in corymbs, usually pedunculate, usually broadly campanulate; involucral bracts imbricate in 1–3 series, herbaceous with membranous margins; receptacle convex to somewhat conical-hemispherical, glabrous or hairy, without scales, sometimes pitted. Outer florets ligulate, female, in 1 series; inner florets tubular, bisexual, few to many. Cypselas terete or flattened, often with ribs or wings, glabrous, tuberculate or hairy; pappus uniseriate, bristles free or united, or sometimes absent.

A genus of c. 65 species, confined to New Guinea, Australia and New Zealand; 1 endemic species on Lord Howe Is.

G.L.Davis, A revision of the genus *Brachycome* Cass., Australian Species, *Proc. Linn. Soc. New South Wales* 73: 142–248 (1948).

Brachyscome segmentosa C.Moore & F.Muell. in F.J.H. von Mueller, *Fragm.* 8: 144 (1874)

T: Lord Howe Island, *C.Moore, J.P.Fullagar & Lind*; syn: MEL. From the Latin *segmentum* (a segment) and the suffix *-osa* (indicating a marked abundance), alluding to the many and deep divisions of the leaf.

[*Brachyscome diversifolia auct. non* (Graham) Fisch. & C.A.Mey.: F.J.H. von Mueller, *Fragm.* 9: 77 (1875)]

Illustration; G.L.Davis, *Proc. Linn. Soc. New South Wales* 73: 206, fig. 71, 207, fig. 78 (1948).

Perennial herb. Stems spreading, decumbent. Leaves crowded towards ends of shoots, pinnatisect, oblanceolate in outline, 2–5 cm long, 0.5–2.5 cm broad, long-attenuate into a

scarcely differentiated petiole, glabrous, with 3 or 4 pairs of segments, each segment 2–5 mm broad, cuneate, usually with 3 apical teeth. Capitula solitary, c. 1 cm diam.; peduncles 10–20 cm long, naked except for 1 or 2 small bract-like leaves; involucral bracts uniseriate, oblong-elliptic, 5–6 mm long, 2–2.5 mm broad, rounded. Ray florets c. 30, 7 mm long, 0.75 mm broad, white, sometimes tinged pink outside; disc florets numerous, yellow. Cypselas c. 2 mm long, cuneate, with longitudinal folds; pappus of c. 15 bristles, free, 0.25 mm long. *Mountain Daisy*. Fig. 89C.

Lord Howe Is. Endemic. Frequent in damp rocky ledges at medium to higher altitudes on the southern mountains, rare at lower elevations.

L.H.Is.: edge of beach, S end of lagoon, *J.D.McComish 124* (K, NSW); Goat House, *R.D.Hoogland 8772* (NSW); Mt Lidgbird, around corner from Goat House, *A.N.Rodd 1828* (NSW); base of SW face of Mt Lidgbird, *J.C.Game 69/262* (K); Erskine Valley, not far from The Saddle, *A.N.Rodd 1767* (NSW).

Closely related to *B. diversifolia* var. *maritima* Benth. of the islands of Bass Strait.

22. ARGYRANTHEMUM

Argyranthemum Webb ex Sch.Bip. in P.B.Webb & P.Berthelot, *Hist. Nat. Iles Canaries* 2: 245, 258 (1844); from the Greek *argyros* (silver) and *anthemon* (flower), alluding to the white ligules, in contrast to golden ones in the related genus *Chrysanthemum*.

Type: *A. frutescens* (L.) Webb ex Sch.Bip.

Perennials herbs, woody at base to somewhat shrubby, without latex. Leaves alternate, entire to pinnatisect, sessile to petiolate. Capitula terminal, few to many in leafy corymbs, or solitary, on long erect peduncles; involucral bracts in 3 or 4 imbricate series, prominently veined, herbaceous; receptacle convex to conical, naked. Outer florets ligulate, female, yellow, white or pink; disc florets tubular, bisexual. Cypselas of two kinds: those from the ray florets sometimes coalesced into groups of 2–9, 3-angled, with wings absent or up to 3; cypselas from disc florets obconical, terete, 4-angled or flattened, with wings absent or 1 or 2; pappus a complete or partial small corona, or absent.

A genus endemic to Madeira and the Canary Islands, containing 22 species and a number of subspecies; 1 species is naturalised on Norfolk Is. The genus used to be classified as part of the genus *Chrysanthemum*.

C.J.Humphries, A revision of the Macaronesian genus *Argyranthemum* Webb ex Schultz Bip. (Compositae - Anthemideae), *Bull. Brit. Mus. (Nat. Hist.) Bot.* 5: 147–240 (1976).

***Argyranthemum frutescens** (L.) Webb ex Sch.Bip. in P.B.Webb & P.Berthelot, *Hist. Nat. Iles Canaries* 2: 264 (1844)

Chrysanthemum frutescens L., *Sp. Pl.* 2: 887 (1753). T: cultivated, ex Canary Islands, Hort. Cliff.; lecto: BM, *fide* C.J.Humphries, *Bull. Brit. Mus.* (*Nat. Hist.*), *Bot.* 5: 181 (1976). The epithet means shrubby, from the Latin *frutex* (a shrub).

Illustrations: A.B.Graf, *Exotica* 12th edn, 801 (1985); C.Brickell, *Gard. Encycl. Pl. & Fl.* 201 (1989).

Perennial subshrub, woody at base, much branched, to 1 m tall. Leaves glabrous, pinnatisect to bipinnatisect, obovate in outline, 2–5 cm long, 0.5–3 cm broad, long-attenuate onto the scarcely differentiated petiole; primary lobes subopposite, 0.5–2 mm broad; secondary lobes opposite, entire or with up to 3 acute teeth. Capitula few to many, in a corymbose inflorescence; peduncles erect, to 15 cm long; involucral bracts triangular-ovate, somewhat convex, 2–4 mm long, membranous on margins. Ray florets c. 12–25, 10–15 mm long, white; disc florets numerous, yellow. Ray floret cypselas 3–5 mm long, 3-angled with 2 or 3 angles broadly winged; disc floret cypselas 2–3 mm long, ±flattened, 1-winged, with innermost cypselas scarcely flattened, not winged. Pappus a small corona or absent.

Norfolk Is. A popular ornamental plant which has become a locally naturalised garden escape. Native to the Canary Islands.

N.Is.: vicinity of Emily Bay, *G.Uhe 1213* (K); Kingston Cemetery, *W.R.Sykes NI 654* (CHR).

23. LEUCANTHEMUM

Leucanthemum Mill., *Gard. Dict.* abr. 4th edn (1754); from the Greek *leukos* (white) and *anthemon* (a flower), alluding to the white florets; in contrast to those of the related *Chrysanthemum*.

Type: not designated.

Perennial, rarely annual herbs, without latex. Leaves alternate, simple or pinnate, petiolate to sessile. Capitula terminal, solitary or rarely 2 or 3, broadly campanulate, pedunculate; involucral bracts in 2 or 3 series, imbricate; receptacle usually convex, or sometimes flat, naked. Outer florets ligulate, usually female, white or pinkish, rarely tubular and bisexual or female and yellow; disc florets tubular, bisexual, yellow. Cypselas usually all similar, oblong-cylindrical, usually 10-ribbed, ribs with interposed mucilaginous and secretory cells; pappus a minute corona, or absent.

A genus of c. 25 species from Europe, south-western Asia and the Mediterranean region; 1 species naturalised on Lord Howe Is.

***Leucanthemum × superbum** (Bergmans ex J.W.Ingram) D.H.Kent, *Watsonia* 18: 89 (1990)

Chrysanthemum × superbum Bergmans ex J.W.Ingram, *Baileya* 19: 167 (1975). T: cultivated, 1921, L.H.Bailey *s.n.*; holo: BH *n.v.*

[*Leucanthemum vulgare auct. non* Lam.: J.Pickard, *J. Biogeogr.* 11: (1984)]

Illustrations: S.Macoboy, *What Fl. is That?* 211 (1969); C.D.Brickell, *Gard. Encycl. Pl. & Fl.* 201 (1989); E.A.Brown in G.J.Harden, *Fl. New South Wales* 3: 288 (1992).

Perennial rhizomatous herb. Stems erect from base to c. 1 m tall, slightly ribbed. Leaves narrowly elliptic to narrowly oblanceolate, 6–30 cm long, 1–4 cm broad, evenly and coarsely serrate, acute at apex; basal and lower leaves petiolate; upper leaves becoming progressively sessile or subamplexicaul and smaller. Capitula solitary, 7–12 cm diam.; peduncle to 1 m long; involucral bracts ovate; inner series 8–10 mm long, with a wide membranous margin. Ray florets 20–30, 2.5–4 cm long, white; disc florets very numerous, yellow. Cypselas 2.5–3 mm long, ±10-ribbed; those from the ray florets somewhat flattened, with the pappus an irregular corona c. 1 mm long; those from the disc florets similar, ±terete, without a corona.

Lord Howe Is. Probably of garden origin. Naturalised from a garden throw-out.

L.H.Is.: Big Ck, *J.Pickard 3366* (K, NSW).

Commonly grown in gardens and known as the Shashta Daisy, this apparently fertile hybrid occasionally becomes naturalised. Until recently it has usually been known by the names *Chrysanthemum maximum* Raymond or *Leucanthemum maximum* (Raymond) DC., which is a species native to the Pyreneean Mountains, but the popular plant of gardens is not the same.

24. SOLIVA

Soliva Ruiz & Pav., *Fl. Peruv. Prodr.* 113 t. 24 (1794); named after Salvador Soliva, a late 18th century Spanish botanist, Director of the Madrid Botanic Garden and physician to the Royal family of Spain.

Type: *S. sessilis* Ruiz & Pav.

Annual herbs, without latex. Leaves alternate basal or cauline, usually finely 2- or 3-pinnatisect, petiolate. Capitula axillary, solitary or clustered, ±sessile; involucral bracts in 2 subequal series, with margins narrowly membranous; receptacle flat, naked, pitted. Outer florets in 2 or 3 series, female, without a corolla; inner florets tubular, bisexual or functionally male, white. Styles of outer florets rigid, persistent, forming spines; styles of inner florets short, truncate. Cypselas distinctly flattened, winged, with a central spine from the persistent style; pappus absent.

A small genus of c. 9 species, native to South America. Two or three species are troublesome weeds, including 1 naturalised on Norfolk Is.

***Soliva pterosperma** (Juss.) Less., *Syn. Gen. Compos.* 268 (1832)

Gymnostyles pterosperma Juss., *Ann. Mus. Natl. Hist. Nat.* 4: 262 (1804). T: Buenos Aires, Argentina, *P.Commerson*; holo: ?P *n.v.* The epithet comes from the Greek *pteron* (a wing) and *sperma* (a seed), in allusion to the winged cypselas.

Illustrations: D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1622, fig. 738 (1986); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 573, fig. 80F (1986); B.A.Auld & R.W.Medd, *Weeds* 116 (1987).

Annual herb. Stems prostrate, branched, pilose. Leaves basal and cauline, 1- or 2-pinnatisect; petiole base sheathing; lamina broadly ovate in outline, 1–2 cm long, entire, acute to obtuse; lobes linear, pilose. Capitula axillary, solitary, ±sessile, 3–5 mm diam. in fruit; involucral bracts in 1 or 2 series, acute to apiculate, pilose. Cypselas ellipsoidal, 2 mm long, pubescent, with a sharp apical spine, and with 2 apiculate scarious wings 1–1.5 mm wide, and auriculate lobes at base of cypsela.

Norfolk Is. Naturalised on waste land and roadsides, uncommon. A native of warm temperate South America.

N.Is.: roadside, Harpers Rd, *P.Ralston 67* (A); *s. loc.*, *R.M.Laing* (CHR).

Because it can be troublesome, this is fortunately an uncommon weed. It can persist in lawns and turf and the sharp, hardened spine can penetrate one's skin. This species belongs to a complex sometimes treated as an aggregate under the name *Soliva sessilis*.

25. COTULA

Cotula L., *Sp. Pl.* 2: 891 (1753); *Gen. Pl.* 5th edn, 380 (1754); a medieval Latin name, possibly derived from the Greek *kotyle* (a small cup), in allusion to the shape of the involucre.

Type: *C. coronopifolia* L.

Herbs, annual or perennial, sometimes rhizomatous or stoloniferous, without latex. Leaves alternate, usually pinnatisect, rarely simple and dentate, usually petiolate. Capitula usually small, terminal and axillary, solitary, pedunculate; involucral bracts in ±2 series, with membranous margins; receptacle flat, convex or conical, naked. Outer florets female, with corolla much reduced, rarely with a much reduced ligule; inner florets bisexual, tubular, 4-lobed. Cypselas usually on a minute stalk; outer cypselas broadly winged; inner cypselas ribbed; pappus absent.

A genus of c. 80 species, almost cosmopolitan but chiefly from the Southern Hemisphere; 1 species, probably native, on Norfolk and Lord Howe Islands.

Cotula australis (Sieber ex Spreng.) Hook.f., *Fl. Nov.-Zel.* 1: 128 (1852)

Anacyclus australis Sieber ex Spreng., *Syst. Veg.* 3: 497 (1826). T: Australia, *F.W.Sieber*; holo: ?P *n.v.*; iso: K. So called for its austral or southern distribution.

Illustrations: D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1615, fig. 734A (1986); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 573, fig. 80C (1986); B.A.Auld & R.W.Medd, *Weeds* 98 (1987).

Annual or perennial herb, prostrate to ascending, branched, sparsely to densely villous. Leaves deeply 1- or 2-pinnatisect, obovate to oblanceolate in outline, 1–3 cm long, 0.5–1 cm broad, ±villous; lobes 0.5–1.5 mm wide. Capitula 3–5 mm diam.; peduncles slender, erect, 3–6 cm long; involucral bracts in 2 series, oblong, 1.5–2 mm long, rounded; receptacle flat. Female florets in 2 or 3 series, stalked, without corolla; central florets numerous, sessile, yellow. Outer cypselas flattened, c. 1 mm long, glandular-hairy with 2 thin, glabrous, marginal wings; inner cypselas flattened, smooth, laterally ribbed.

Norfolk Is., Lord Howe Is. Found in lowland areas, particularly where there is open soil.

N.Is.: roadside, Harpers Rd, Cascade, *P.Ralston 57* (A); prison ruins, Kingston, *P.S.Green 1436* (A); *s. loc.*, *W.Laing* (CHR). **L.H.Is.:** Dawsons Ridge, *M.M.J. van Balgooy* 1025 (K, NSW); last part of ascent of Mt Gower, *P.S.Green 1613* (A); Potato Hills, S end of Little Slope, *J.Pickard 2772* (NSW).

Although of a weedy habit this species is indigenous to Australia and probably to New Zealand. There has been doubt about its status on Norfolk Is. It is perhaps significant that it was not collected there until 1902 and R.M.Laing (*Trans. & Proc. New Zealand Inst.* 47: 38, 1915) considered it as 'probably an introduced weed', but J.S.Turner *et al.* (*Conservation Norfolk Is.* 36, 1968) felt that 'it may be native'. W.R.Sykes (in his *Kermadec Islands Fl.* 87, 1977) regarded it as indigenous on Norfolk Is.

26. ROLDANA

Roldana La Llave in P. de La Llave & J.J.M. de Lexarza, *Nov. Veg. Descr.* 2: 10 (1825); named after Eugene Montana y Roldan of Otumba, a hero of the Mexican Wars of Independence.

Type: *R. lobata* La Llave

Large herbs or subshrubs, without latex. Stems with prominent pith. Leaves alternate, petiolate, usually palmate, often peltate, sometimes pinnately veined. Capitula numerous in terminal, compound cymes, often paniculate, cylindrical to narrowly campanulate; involucral bracts uniseriate, on a densely puberulous, disc-shaped base, with 2–4 small, narrow bracteoles; receptacle flat, naked, pitted. Ray florets present or absent, female; disc florets bisexual, broadly tubular to narrowly funnel-shaped in upper part, very narrowly tubular below, with lobes much longer than broad. Cypselas cylindrical, glabrous or setulose; pappus of many slender, finely setulose hairs.

A mainly Mexican and Central American genus of c. 48 species; 1 species naturalised on Lord Howe Is. Formerly treated as part of *Senecio*.

***Roldana petasitis** (Sims) H.Rob. & Brettell, *Phytologia* 27: 423 (1977)

Cineraria petasitis Sims, *Bot. Mag.* 37: t. 1536 (1813); *Senecio petasitis* (Sims) DC., *Prodr.* 6: 431 (1838). T: cultivated, not designated. So called from a similarity in the leaves to those of species in the genus *Petasites*.

Illustrations: T.H.Everett, *New York Bot. Gard. Ill. Encycl. Hort.* 9: 3126 (1982); A.B.Graf, *Exotica* 12th edn, 1: 812 (1985), as *Senecio petasitis*; G.J.Harden in G.J.Harden, *Fl. New South Wales* 3: 299 (1992).

Bushy shrub to 3 m tall, pilose throughout. Leaves with petiole 7–14 cm long; lamina almost circular in outline, 6–14 cm long, 7–15 cm broad, ±cordate to truncate at base, with 9–11 shallow, somewhat triangular lobes and small, hard denticulations, palmately veined, scattered strigulose above, pale crisped-pubescent below. Capitula cylindrical, in large, compound, cymose panicles, with reduced, sessile leaf-like bracts; involucral bracts 8, narrowly lanceolate, 8–10 mm long, shortly pubescent. Outer florets 5 or 6, ligulate, 6–8 mm long, yellow; disc florets c. 15, 7–8 mm long, narrowly funnel-shaped in upper half. Cypselas narrowly cylindrical, 3–4 mm long, striate, with a narrow apical rim, glabrous; pappus hairs 6–7 mm long.

Lord Howe Is. A naturalised garden escape, native to Central America (Mexico to Nicaragua) and widely cultivated in warm temperate and subtropical gardens, but not usually escaping.

L.H.Is.: alongside lane at 'Ocean View', NE of the jetty, *R.O.Belcher 2673* (EMC); Anderson Rd, *J.Pickard* in *A.N.Rodd 1402* (NSW); SE side of Mt Lidgbird, *A.C.Beauglehole 5666* (CANB, MEL).

Figure 89. ASTERACEAE. **A**, *Lordhowea insularis*, habit (P.Green 1938). **B**, *Wollastonia biflora*, habit (C.Moore 52). **C**, *Brachyscome segmentosa*, habit (P.Green 2040). Scale bar = 2 cm. Drawn by P.Halliday.

27. LORDHOWEA

Lordhowea B.Nord., *Opera Bot.* 44: 38 (1978); named after the island to which this genus is endemic.

Type: *L. insularis* (Benth.) B.Nord.

Low erect shrub, without latex. Stems slightly ribbed. Leaves alternate, coarsely and deeply dentate-lobed, pinnately veined, petiolate. Capitula many, in a terminal corymb, ±cylindrical; involucral bracts few, uniseriate; receptacle somewhat convex, pitted, with small scale-like projections. Outer florets female, few, narrowly ligulate; disc florets bisexual, 10–20, tubular to narrowly funnel-shaped. Cypselas terete, glabrous, ribbed; pappus bristles numerous, minutely scabridulous, basally united into a ring.

A monotypic genus endemic on Lord Howe Is., at one time included in *Senecio*, and closely related to that genus.

Lordhowea insularis (Benth.) B.Nord., *Opera Bot.* 44: 40 (1978)

Senecio insularis Benth., *Fl. Austral.* 3: 666 (1867). T: Lord Howe Island, *W.G.Milne* [3]; *J.MacGillivray* [709]; syn: K. The epithet means pertaining to an island.

Illustrations: B.Nordenstam, *Opera Bot.* 44: 39, fig. 19 (1978); I.Hutton, *Lord Howe Is.* 34, 119 (1986).

Shrub, loosely branched, to 2 m tall. Leaves glabrous, slightly succulent; petiole 2–5 cm long; lamina lanceolate to elliptic, (6–) 7–11 cm long, (2–) 2.5–5 cm broad, attenuate onto petiole, slightly thickened on margins with c. 7 or 8 large, dentate lobes each 3–10 mm long, acute at apex. Capitula cylindrical, c. 15–25 in an almost flat-topped corymb; involucral bracts usually 8, oblong-lanceolate, 6–7 mm long, glabrous except at the shortly pubescent apex; bracteoles 3 or 4, 0.5–1 mm long, near base of capitula. Ligulate florets 5–7, pale yellow, fading to whitish; disc florets c. 10–20. Cypselas narrowly cylindrical, 3–5 mm long; pappus of many fine, soft bristles, 6–7 mm long. n = 19 and $2n$ = 38; E.J.Beuzenberg, *New Zealand J. Bot.* 13: 349 (1975). Figs 63, 89A.

Lord Howe Is. Endemic. Widespread and fairly common in open, moist forest areas from low ridges to mountain summits. Flowers May–Aug.

L.H.Is.: ridge between Old Settlement and North Bay, *P.S.Green 1938* (CHR, K); N side of Intermediate Hill, *J.Pickard & A.N.Rodd 1345* (NSW); base of N face of Mt Lidgbird, *P.S.Green 1700* (A, K); summit of Mt Lidgbird, *J.Pickard 1459* (NSW); Erskine Valley, *A.N.Rodd 3703 & R.F.Thorn* (K, NSW).

28. DELAIREA

Delairea Lem., *Ann. Sci. Nat. Bot.* ser. 3, 1: 379 (1844); named after Eugène Delaire (1810–1856), horticulturist of Orléans, France, who sent Lemaire the plant described.

Type: *D. odorata* Lem.

Climbing herb, older parts woody, without latex. Leaves alternate, deltoid-hastate, lobed, palmately nerved, petiolate. Capitula terminal on side shoots, somewhat dense, corymbose-paniculate; involucral bracts mostly in one series with a few bracteoles at capitulum base; receptacle pitted. Florets all tubular, bisexual. Cypselas cylindrical, striate; pappus of many slender bristles, white, deciduous.

A monotypic genus, a native of South Africa, until recently usually included in the genus *Senecio*. Naturalised on Lord Howe Is.

***Delairea odorata** Lem, *Ann. Sci. Nat. Bot.* ser. 3, 1: 380 (1844)

T: cultivated, not designated. So called from the plant's fragrant flowers.

Illustrations: T.H.Everett, *New York Bot. Gard. Ill. Encycl. Hort.* 9: 3162 (1982); M.E.Lawrence & R.O.Belcher in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1599, fig. 726F (1986); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 354, t. 34 (1990); all as *Senecio mikanioides*.

Perennial herb, becoming woody at base, twining and climbing, glabrous. Leaves somewhat fleshy; petiole 2–7 cm long, usually with a pair of auricles 2–10 mm diam. at base; lamina deltoid-hastate to ±circular, 2.5–9 cm long, 2.5–10 cm broad, with 5 (–7) broadly triangular lobes, shallowly to deeply cordate at base. Capitula cylindrical, numerous in corymbose panicles; involucral bracts 8–10, oblong, 3–4 mm long. Florets tubular, 10–12, longer than involucre. Cypselas 2–2.5 mm long, glabrous; pappus 4–5 mm long.

Lord Howe Is. Native to southern Africa.

L.H.Is.: top of Middle Beach Rd, *P.S.Green 2339* (K).

Perhaps a recent escape from cultivation which will need to be watched as it has proved to be a serious pest in, for example, parts of Hawai'i. Until recently known as *Senecio mikanioides* Otto ex Walp.

29. SENECIO

R.O.Belcher

Senecio L., *Sp. Pl.* 2: 866 (1753); *Gen. Pl.* 5th edn, 373 (1754); named from the Latin *senex* (old man), in allusion to the white-haired pappus of some species.

Type: *S. vulgaris* L.

Herbs, annual or perennial, or subshrubs, sometimes succulent or climbing, without latex. Leaves alternate, (elsewhere sometimes opposite) simple, pinnately or palmately veined, petiolate or sessile. Capitula solitary to numerous, in terminal and axillary cymose corymbs or panicles, variously shaped; involucral bracts uniseriate with few to many small, unequal, calycular bracteoles at base; receptacle flat, pitted. Outer florets female and ligulate or filiform, or bisexual and tubular; disc florets bisexual. Ligulate florets yellow, rarely white or reddish purple; disc florets yellow. Cypselas various; pappus of numerous white slender hairs.

One of the largest genera of flowering plants with perhaps 1500 species, occurring on all continents except Antarctica. One naturalised and 5 endemic species occur on the Islands. It is currently under intensive study in an effort to divide it into more nearly monophyletic groups. Plants of *Senecio* spread easily by wind-borne cypselas and often germinate and grow in habitats deficient in nutrients and water. The resultant depauperate specimens, usually lacking the distinctive mid-cauline leaves, although often collected, may pose difficulties in identification, especially if the marginal florets have been lost.

R.O.Belcher, The genus *Senecio* (*Compositae*) on Lord Howe and Norfolk Islands, *Kew Bull.* 47: 765–773 (1992).

1 Marginal florets ligulate, sometimes briefly so

- **2** Ligules some shade of purplish red, rarely paler or white — **1. S. elegans**
- **2:** Ligules yellow
  - **3** Ligules (7–) 8 (–9); plant sparsely hairy or glabrescent (N.Is.) — **2. S. australis**
  - **3:** Ligules (4–) 5 (–7); plant hairy (L.H.Is.) — **3. S. pauciradiatus**

1: Marginal florets not ligulate

- **4** Marginal florets narrowly funnel-shaped or oblique, with 1 or 2 deep sinuses; low, spreading plants, hairy (N.Is.) — **4. S. evansianus**
- **4:** Marginal florets slenderly tubular, with lobes about even-sized; plants erect, glabrescent
  - **5** Mid-cauline leaves auriculate (L.H.Is.) — **5. S. howeanus**
  - **5:** Mid-cauline leaves without auriculate bases (N.Is.) — **6. S. hooglandii**

1. *Senecio elegans L., *Sp. Pl.* 2: 869 (1753)

T: cultivated, seed from South Africa, Herb. Clifford 406, *Senecio* 4; lecto: *fide* R.O.Belcher, *Fl. Australia* 49: 617 (1994). The epithet alludes to the elegant or beautiful flower heads.

Illustrations: M.Armstrong, *Field Book Western Wild Flowers* 569 (1915); R.Marloth, *Fl. S. Africa* 3(2): t. 63B, opp. p. 265 (1932); M.E.Lawrence & R.O.Belcher in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1595, fig. 725C (1986).

Annual herb with woody base, erect or much-branched, 15–40 cm tall, with sparse short hairs. Leaves 4–9 cm long, 1–3 cm broad, reduced upwards, auriculate, pinnately sinuate-lobate; lobes toothed or lobulate. Capitula 1–6 per head in a lax cyme; calycular bracteoles 10–15, imbricate near and on receptacle base, ovate, to 3 mm long, ciliolate, dark-tipped; involucre bracts c. 13, 7–8 mm long. Outer florets ligulate, 12–18; ligule 8–10 mm long, 3–4.5 mm broad, purplish red, rarely paler or white; disc florets c. 50, yellow, funnel-shaped, 5-lobed. Cypselas to 2.5 mm long, hairy between ribs; pappus hairs easily detached. *Purple Groundsel.*

Lord Howe Is. A native of the Cape region of South Africa, widely grown as a garden ornamental, and naturalised along many subtropical and warm temperate shores as a sand-binder; also colonising sandy pockets in rock outcrops, and there usually depauperate, often with only a single capitulum.

L.H.Is.: Neds Beach, *R.O.Belcher 2652 & 2653* (EMC); Blinky Beach, *P.S.Green 1623* (A, K).

No material has been seen to support the record for Lord Howe Is. of *Senecio vulgaris*, from Neds Beach, made by W.R.B.Oliver (*Trans. & Proc. New Zealand Inst.* 49: 157, 1917), despite attempts to trace Oliver's specimen. As this often common weedy species has not otherwise been recorded from the Island, it is suspected that Oliver's specimen may have been an insect damaged *S. elegans*.

2. Senecio australis Willd., *Sp. Pl.* 3: 1981 (1803)

T: 'New Zealand' [Norfolk Island], *J.R. & G.Forster*; holo: B-W, IDC microfiche 7740/1.1130/19; iso: K, P. The epithet means southern.

Senecio angustifolius G.Forst., *Fl. Ins. Austr.* 91 (1786), *nom. nud., non* Willd. (1803).

[*Senecio lautus auct. non* G.Forst. ex Willd.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 707 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 39 (1915); J.S.Turner *et al.*, *Conservation Norfolk Is.* 36 (1968)]

Illustration: R.O.Belcher, *Taxon* 41: figs 2, 4B–C (1992).

Erect annual or short-lived perennial, becoming woody at base, 10–40 (–90) cm tall, sparsely hairy or glabrescent. Lower leaves entire, sub-petiolate, obovate to oblanceolate, to 5.5 cm long, 1.3 cm broad; mid-cauline leaves (if developed) lobate or coarsely dentate; uppermost leaves reduced, narrowly lanceolate to linear, lobulate to remotely denticulate. Capitula few to many in a lax cyme; calycular bracteoles 4 or 5, linear-lanceolate, not imbricate; involucral bracts (9–) 13 (–15), 4.5–5.5 mm long. Outer florets (7–) 8 (–9), female; ligule (1–) 2–3 (–4) mm long, 0.7–1.5 mm broad, yellow, sometimes nearly suppressed; disc florets 15–30, funnel-shaped. Cypselas to 2.5 mm long, hairy between ribs; pappus hairs persistent. *2n* = 80; E.J.Buezenberg, *New Zealand J. Bot.* 13: 346 (1975), as *S. lautus*.

Norfolk Is., including Philip Is. Endemic.

N.Is.: Barney Duffy, *O.Evans & R.O.Belcher 2639* (EMC, K, MEL, NSW); Ball Bay, *J.D.McComish 39* (K, WELT); Anson Bay, *W.R.B.Oliver* (WELT); Duncombe Bay, at The Chord, *P.S.Green 2433* (K); Philip Is., The Stool, *R.O.Belcher 2640* (EMC).

The identity and provenance of this species has long been enigmatic. Forster stated that it came from New Zealand, but it has never been collected from there again. Willdenow's name was misapplied by Sprengel (*Syst. Veg.* 3: 562, 1826) to material of the *S. linearifolius* complex of Australia. Hooker, Bentham and others supposed it to pertain to some form of *S. lautus*. As shown by Belcher (*Taxon* 41: 235–252, 1992), Willdenow's holotype at Berlin agrees fully and only with numerous specimens collected on Norfolk Is. over many years, and was most probably collected there by the Forsters on Discovery Day in 1774; they landed at

Duncombe Bay. It is distinguished from *S. lautus* (of which no authentic specimens on or from Norfolk or Lord Howe Islands have been seen), by its eight rays (rather than 13), and by its calyculus of fewer and non-imbricated bracteoles.

3. Senecio pauciradiatus Belcher, *Kew Bull.* 47: 767 (1992)

T: Lord Howe Island, 25 Nov. 1986, *R.O.Belcher 2663*; holo: K; iso: MEL, NSW. The epithet comes from the Latin *pauci-* (few) and *radiatus*, bearing few ray florets.

Annual herb, erect, 5–25 cm tall, rarely branched below inflorescence; beaded hairs on lower stem and leaves. Leaves petiolate or subpetiolate, without auricles, oblanceolate, to 5–6 cm long, 1 cm broad, entire or remotely denticulate; upper leaves sessile, reduced. Capitula few, tending to be paired, in a compact cyme; calycular bracteoles 3–6 towards peduncle apex, 1 or 2 on receptacle, linear; involucral bracts (7–) 8 (–10), 6–7 mm long. Outer florets (4–) 5 (–7), female; ligule 1–2 (–3) mm long, 1 mm broad, yellow; disc florets 6–8, funnel-shaped; lobes (3–) 4 or 5. Cypselas 2.5–3 mm long, with short hairs between brown ribs; pappus hairs persistent. Fig. 90A–D.

Lord Howe Is. Endemic. Apparently restricted to Middle Beach and Stevens Point. If so, this is a highly localised species, very rarely collected and probably in need of protection.

L.H.Is.: Middle Beach, *C.Moore 73* (K, MEL); cliffs of the E side, *viz.* at Middle Beach, *J.P.Fullagar & Lind 76* (MEL, in part, mixed with *S. howeanus*); just E of Middle Beach, *R.O.Belcher 2664 & 2665* (EMC); Stevens Point, *A.C.Beauglehole 5650* (MEL).

4. Senecio evansianus Belcher, *Kew Bull.* 47: 765 (1992)

T: Norfolk Island, 17 Nov. 1986, *O.Evans* in *R.O.Belcher 2638*; holo: K; iso: MEL, MICH, NSW. The epithet honours Owen Evans, naturalist *par excellence* on Norfolk Is.

[?*Senecio argutus auct. non* A.Rich.: S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 51 (1833)]

[*Erechtites arguta auct. non* (A.Rich.) DC.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 707 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 38 (1915)]

Low herb, often woody at base. Stem simple or branching, (3–) 10–20 (–30) cm tall, hairy near base; hairs multicellular, with tapering wisps. Leaves crowded, without auricles, hairy on margins and undersides; lower leaves subpetiolate, obovate, obtuse, entire, rarely lobate; mid-cauline leaves oblanceolate, sometimes pinnately few-lobed; upper leaves reduced, linear-lanceolate. Capitula few in a lax cyme; calycular bracteoles 3 or 4 (–5), ovate to linear-lanceolate, 1.5–2 mm long, 0.5 mm broad; involucral bracts 7–9, 4–5 mm long. Outer florets 8, female, often with 1 or more staminodes, narrowly funnel-shaped or oblique and minutely 3- or 4-toothed with 1 or 2 deeper sinuses, yellow; disc florets 10–20, 4- or 5-lobed. Cypselas 2–2.5 mm long, ribbed, brown; pappus hairs easily detached. Fig. 90K–N.

Norfolk Is. Endemic. Apparently restricted to well watered clay soils beneath rather open stands of Norfolk Island Pine (*Araucaria heterophylla*); not seen on rocks or in full sun.

N.Is.: Rocky Point, *P.S.Green 1447* (A, K); Bumbora Reserve, above Cresswell Bay, *R.O.Belcher 2617, 2617a & 2621* (EMC); Bloody Bridge, *R.O.Belcher 2623* (EMC); E of Bloody Bridge, *R.O.Belcher 2624* (EMC); *s. loc.*, *R.Metcalfe 83* (WELT).

Endlicher recorded (*loc. cit.*) a *Senecio argutus* from Norfolk Is. based on a specimen collected by F.L.Bauer, but true *S. argutus* A.Rich. (= *S. glomeratus* Desf. ex. Poir.) has never subsequently been collected on Norfolk Is., and the Bauer specimen has not been located in the Herbarium of the Vienna Natural History Museum (W), but from Endlicher's description it was almost certainly what is now known as *S. evansianus*. Specimens cited by Maiden (*loc. cit.*) and Laing (*loc. cit.*) have not been seen.

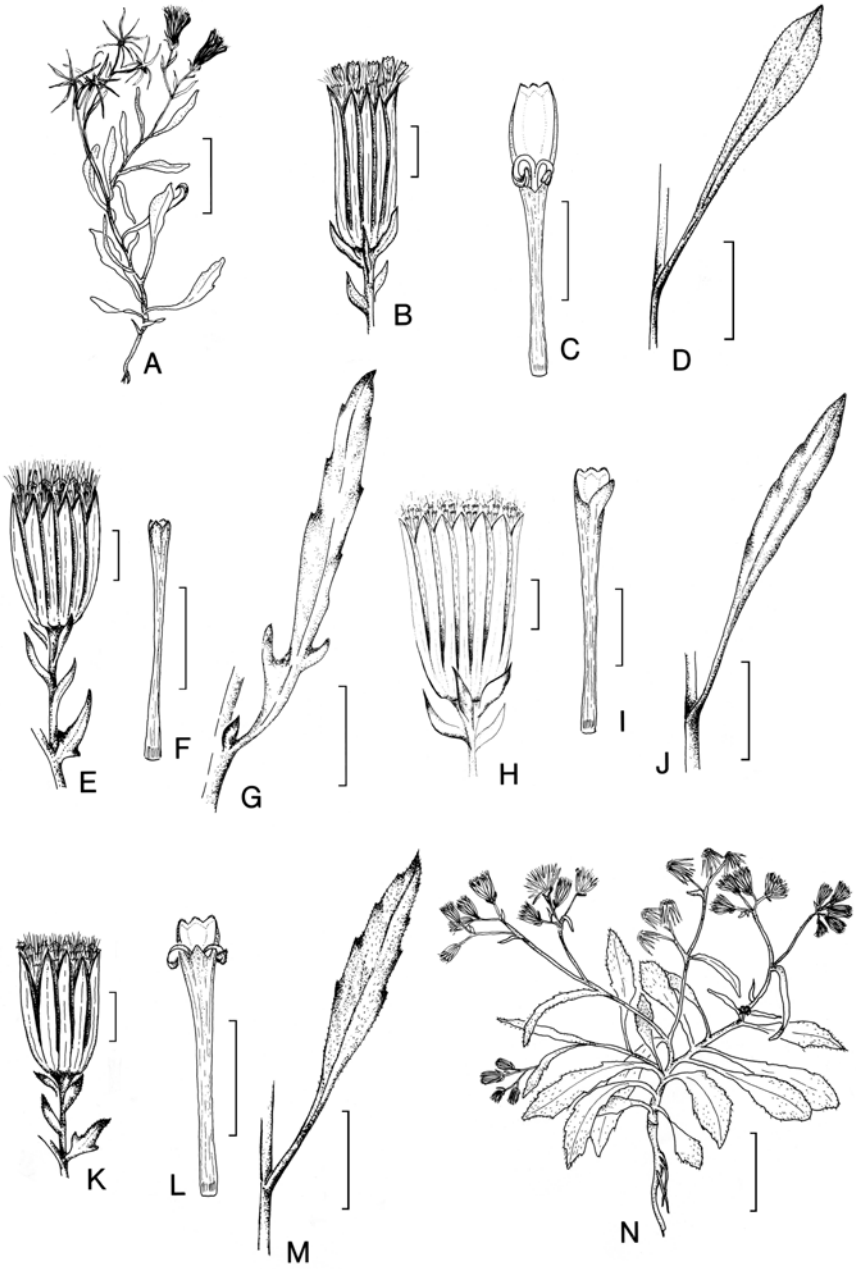

Figure 90. ASTERACEAE. **A–D**, *Senecio pauciradiatus*. **A**, habit (R.Belcher 2663, K); **B**, capitulum (J.Fullagar & Lind 76, K); **C**, marginal floret; **D**, mid-cauline leaf (**C–D**, R.Belcher 2663, K). **E–G**, *Senecio howeanus*. **E**, capitulum; **F**, marginal floret; **G**, mid-cauline leaf (**E–G**, R.Belcher 2651, K). **H–J**, *Senecio hooglandii*. **H**, capitulum; **I**, marginal floret; **J**, mid-cauline leaf (**H–J**, R.Hoogland 11351, K). **K–N**, *Senecio evansianus*. **K**, capitulum; **L**, marginal floret; **M**, mid-cauline leaf; **N**, habit (**K–N**, O.Evans in R.Belcher 2638, K). Scale bars: **A**, **D**, **G**, **J**, **M**, **N** = 2 cm; **B**, **C**, **E**, **F**, **H**, **I**, **K**, **L** = 2 mm. Drawn by L.Lesko.

5. **Senecio howeanus** Belcher, *Kew Bull.* 47: 768 (1992)

T: Lord Howe Island, 24 Nov. 1986 *R.O.Belcher 2651*; holo: K; iso: MEL, MICH, NSW. The epithet comes from (Lord) Howe (Island) and the suffix *-anus* (belonging or connected with).

Erechtites quadridentatus var. *glabrescens* (DC.) Benth., *Fl. Austral.* 3: 660 (1867), *p.p., quoad* W.G.Milne [9]. T: New South Wales, *A.Cunningham 134*; holo: G, IDC microfiche 500/2.1091/4.

Senecio glomeratus var. *tridentatus* Belcher ex J.S.Turner *et al.*, *Conservation Norfolk Is.* 36 (1968), *nom. nud.* cf. *Kew Bull*. 47: 772 (1992).

Senecio sp. 'B'; S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 86 (1981).

Senecio sp. aff. *quadridentatus* Labill.; A.N.Rodd & J.Pickard, *Cunninghamia* 1: 273 (1983).

[*Erechtites quadridentatus auct. non* (Labill.) DC.: F.J.H. von Mueller, *Fragm.* 9: 77 (1875); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 240 (1896); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 39: 379 (1914)]

Annual herb or short-lived perennial, spreading or erect to 40 cm, with scattered wispy hairs. Lower leaves crowded, subpetiolate, obovate to oblanceolate, without auricles, to 4 cm long, 1.2 cm broad, entire or remotely callose-denticulate; mid-cauline leaves subpetiolate, oblanceolate, auriculate, lobulate or 2–4-pinnately lobed; upper leaves sessile, clasping, auriculate. Capitula few–100 in a cymose inflorescence; calycular bracteoles 4–6, linear-lanceolate, 1.5–2 mm long, crowded below receptacle; involucral bracts (9–) 11–13, 4.5–6 mm long. Outer florets 8–10, usually female, often with staminodes, sometimes with pollen, slender, tubular, yellow; lobes (2–) 3 or 4 (–5); disc florets 15–25, funnel-shaped; lobes 4 or 5. Cypselas 2.2–2.5 mm long, brown; pappus hairs persistent. Fig. 90E–G.

Lord Howe Is. Endemic. It is common near the shore around the Island, including adjacent islets, and scattered at higher elevations; almost weedy.

L.H.Is.: North Beach, *L.A.S.Johnson & A.N.Rodd 1245* (NSW); E end of Neds Beach, *J.H.Willis* (MEL); sea cliffs by Transit Hill, *P.S.Green 1627* (K); E side of Mt Lidgbird, *J.Pickard 3631* (NSW); Roach Is., *A.C.Beauglehole 5649* (CANB, MEL).

Frequently collected and variously misnamed in the past. Some early collections were erroneously named *S. lautus*.

6. **Senecio hooglandii** Belcher, *Kew Bull.* 47: 769 (1992)

T: Norfolk Island, 3 Jan. 1968, *R.D.Hoogland 11351*; holo: K; iso: CANB, NSW. Named in honour of Ruurd Dirk Hoogland, an ardent collector on Norfolk Is. (and Lord Howe Is.), and active in the conservation of its flora.

Erect herb to c. 60 cm tall; base not seen. Mid-cauline leaves subpetiolate, without auricles, narrowly oblanceolate, to 6 cm long, 6 mm broad, entire, remotely denticulate or pinnately few-lobed; upper leaves reduced. Capitula numerous, 1–3 per branch in a lax to congested cyme; capitula when pressed measure to 8 mm long, 10–12 mm broad; calycular bracteoles 4 or 5, linear, 1.5–2 mm long, at apex of peduncle; involucral bracts 13, 6–6.5 mm long. Marginal florets c. 7 or 8, filiform, 4- or 5-lobed, yellow, rarely with 1 or more staminodes; submarginal florets few, female 4- or 5-lobed, narrowly funnel-shaped, not or partially polleniferous; disc florets c. 20–25, 5-lobed; total florets c. 45. Cypselas 2.4–3 mm long, with short hairs between ribs; pappus hairs persistent. Fig. 90H–J.

Norfolk Is. Endemic.

N.Is.: near the Cemetery, *R.D.Hoogland 11351* (CANB, K, NSW); Philip Is., N side, *W.R.Sykes NI 628* (CHR).

This species has been described with some hesitation because of the few collections available. However, because the composition of the heads is different from that of *S. australis* and of *S. howeanus*, it is given recognition in the hope that further specimens may be found. Its occurrence on Philip Is. is probably due to the widespread broadcasting of innumerable cypselas of *Senecio* collected from Norfolk Is. in the effort to revegetate the Island after the removal of rabbits. No earlier collections from there have been seen.

30. ERECHTITES

Erechtites Raf., *Fl. Ludov.* 65 (1817); an ancient name used by Dioscorides for a species of *Senecio*.

Type: *E. prealta* Raf. = *E. hieraciifolia* (L.) Raf. ex DC.

Annual or short lived perennial herbs, erect, rarely branching below inflorescence, without latex. Leaves alternate, simple, subentire to pinnately lobed, petiolate or with mid-cauline leaves semi-amplexicaul. Capitula terminal, numerous, in corymbose panicles, often crowded, cylindrical; involucral bracts uniseriate, with linear supplementary bracteoles at base; receptacle ±flat, naked. Outer florets female, filiform, greenish white or pinkish; inner florets bisexual, tubular. Cypselas ±cylindrical, prominently c. 10-ribbed; pappus hairs numerous, shiny, white or pinkish.

A genus of 6 species, all native to the New World. Two species are widely naturalised in the Old World, excluding Africa, and 1 of these is found on Norfolk Is.

*Erechtites valerianifolia (Wolf) DC., *Prodr.* 6: 295 (1838)

Senecio valerianifolius Wolf, *Ind. Sem. Hort. Berol.* (1825). T: cultivated; neo: '*Senecio valerianaefolius* ex Herb. Raffeliano, 1825', *Herb. Reichenbach f. 16256*, W, *fide* R.O.Belcher, *Ann. Missouri Bot. Gard.* 43: 26 (1956). So named from a resemblance of the leaves (*folia*) to those of the genus *Valeriana*.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 573, fig. 80G (1986); B.A.Auld & R.W.Medd, *Weeds* 101 (1987); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 311, t. 25 (1990).

Annual herb, erect to 1.5 m tall, glabrous or sparsely hispidulous. Lowest leaves petiolate, ovate-lanceolate to oblanceolate, entire, serrate to irregularly dentate; mid cauline leaves pinnatisect to subpinnatisect with a narrow winged rachis, broadly lanceolate in outline, 5–25 cm long, 2–8 cm broad, irregularly serrate to incised-dentate, with 3–7 segments per side; upper leaves gradually reduced upwards. Capitula slender, c. 10 mm long, 3 mm wide; calycular bracteoles linear; involucral bracts 12–14, 7–8 mm long. Outer florets 5-fid, rarely 4-fid; disc florets numerous; all corollas pale pink to pale purple. Cypselas cylindrical, 2.5–3.5 mm long; pappus pale pink to pale purple.

Norfolk Is. An uncommon adventive in moist disturbed sites, such as forest clearings. Apparently not so aggressive an invader on the Island as in Australia (N.S.W.) and New Zealand. A native of Central and South America, represented on the Island (and in Australia) by f. *valerianifolia*.

N.Is.: near Burnt Pine, *W.R.Sykes NI 189* (CHR); Douglas Rd, *G.Uhe 1187* (K); near the Melanesian Mission, *W.R.Sykes NI 476* (CHR).

31. CRASSOCEPHALUM

Crassocephalum Moench, *Methodus* 516 (1794); from the Latin *crassus* (thick) and the Greek *kephale* (a head), in allusion to the broad capitulum in the type species.

Type: *C. cernuum* (L.f.) Moench, *nom. illeg.* = *C. rubens* (Juss. ex Jacq.) S.Moore

Annual herbs, stout, erect, without latex. Leaves alternate, simple, serrate to lyrate-pinnatifid, petiolate. Capitula terminal and axillary, solitary to numerous and clustered in loose corymbs, nodding at anthesis, cylindrical; involucral bracts uniseriate, coherent, becoming ±reflexed in fruit, with small, linear, supplementary bracteoles at base; receptacle flat, naked. Florets all similar, bisexual, slender, tubular, 5-lobed. Cypselas cylindrical, weakly 8–10-ribbed; pappus long and finely silky.

A genus of c. 25 species from Arabia, tropical Africa and Madagascar; 1 species naturalised on Norfolk Is.

***Crassocephalum crepidioides** (Benth.) S.Moore, *J. Bot.* 50: 211 (1912)

Gynura crepidioides Benth. in W.J.Hooker, *Niger Fl.* 438 (1849). T: West Africa, Sierra Leone, *G.Don f.*; lecto: BM, *fide* A.J.C.Grierson in *Revis. Handb. Fl. Ceylon* 1: 248 (1980). Through the use of the suffix (*oides*) the epithet means resembling the genus *Crepis*.

Illustrations: R.J.F.Henderson, *Proc. Roy. Soc. Queensland* 84: t. 5 (facing p. 60) (1973); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 573, fig. 80I (1986); B.A.Auld & R.W.Medd, *Weeds* 99 (1987).

Annual herb, erect to c. 1 m tall, with tawny, appressed, crisped hairs throughout. Leaves petiolate, ovate to elliptic or oblanceolate, 5–15 cm long, 1–7 cm broad, diminishing in size upwards, coarsely serrate; lower leaves lyrate-pinnatifid; upper leaves entire or with a single lobe on each side at base. Capitula few to many in ±congested corymbs, nodding at anthesis; involucral bracts c. 16, 8–10 mm long. Florets orange-red to brick red. Cypselas linear-cylindrical, c. 2 mm long, with weakly developed narrow ribs, reddish brown; pappus white, c. 1 cm long.

Norfolk Is. A native of tropical Africa, now a widespread invasive weed in the tropics and subtropics, which has arrived on the Island recently.

N.Is.: Duncombe Bay, *P.S.Green 2436* (K); *loc. id.*, *R.O.Belcher 2630* (EMC).

32. CHRYSANTHEMOIDES

Chrysanthemoides Fabr., *Enum.* 79 (1759); the suffix *-oides* indicates a resemblance, in this case to the genus *Chrysanthemum*.

Type: *C. monilifera* (L.) Norl.

Shrubs, without latex. Leaves alternate, simple, entire or toothed, petiolate or sessile. Capitula in terminal loose corymbs or panicles; involucral bracts in 2 or 3 unequal series; bracts with narrow membranous margins; receptacle slightly convex, naked, pitted. Outer florets ligulate, female, yellow; disc florets tubular, bisexual but functionally male, 5-lobed. Cypselas only from outer florets, drupe-like, with a hard, smooth stone and thin fleshy outer covering; pappus absent.

A South African genus of 2 species, and a number of subspecies; 1 species naturalised on Lord Howe Is.

***Chrysanthemoides monilifera** (L.) Norl., *Studies in the Calenduleae* 374 (1943)

subsp. **rotundata** (DC.) Norl., *op. cit.* 391

Osteospermum rotundatum DC., *Prodr.* 6: 461 (1838). T: South Africa, *J.F.Drège 5051 & 5052*; syn: G *n.v.*; photo seen (IDC microfiche 800/2.1151/14 & 15).

Illustrations: R.A.Buchanan, *Common Weeds Sydney Bushland* 42, fig. 15 (1981); G.M.Cunningham *et al.*, *Pl. W New South Wales* 682 (1981), as Boneseed.

Shrub, to 1.5 m tall. Young stems white-cobwebby. Leaves somewhat fleshy-coriaceous, lanate below when young, becoming glabrous; petiole ill-defined, 1–2 cm long; lamina elliptic to obovate, or broadly so, 2.5–5 cm long, 1.5–3.5 cm broad, long-attenuate onto petiole, entire to obscurely dentate in upper half, obtuse to usually rounded, slightly apiculate, pinnately veined. Capitula 5–10 in loose bracteate corymbs, 7–10 mm diam.; involucral bracts lanceolate, acute; outer bracts narrow, 2–3 mm long; inner bracts 6 mm long. Ray florets 5–12, bright yellow; ligule 8–12 mm long; disc florets yellow. Cypselas subglobose-ovoid, 6–8 mm long, black when ripe. *Bitou Bush.*

Lord Howe Is. A native of South Africa which has arrived on the Island relatively recently and was first recorded in 1963 (J.Pickard in *J. Biogeogr.* 11: 205, 1984). It is a noxious weed, distributed by birds which eat the fruits. It has the potential to crowd out indigenous vegetation and should be exterminated on the Island before it spreads further.

L.H.Is.: Middle Beach, *P.S.Green 2055* (K); foreshore of lagoon, opposite corner of Blinky and Lagoon Rd, 1965, *H.Ward* (NSW); Lagoon Beach, near S end, *A.C.Beauglehole 7804* (CANB); Prince William Henry Bay, *M.M.J. van Balgooy 1138* (CANB, NSW); halfway up Mt Gower, 1963, *H.Ward* (NSW).

33. WOLLASTONIA

Wollastonia DC. ex Decne., *Nouv. Ann. Mus. Hist. Nat.* 3: 414 (1834); named after William Hyde Wollaston (1766–1828), eminent British physiologist, chemist and physicist.

Type: *W. scabriuscula* DC. ex Decne.

Perennial herbs or subshrubs, without latex. Leaves opposite, dentate to serrate, sometimes lobed, often 3-veined, petiolate. Capitula terminal on main or lateral shoots, solitary or few, paniculate, long-pedunculate, broadly campanulate; involucral bracts in 2 or 3 series; outer bracts small; receptacle with rigid, keeled, obtuse or apiculate bracts often enfolding disc florets. Outer florets 6–10, ligulate, female, 2- or 3-toothed; disc florets tubular, bisexual, sometimes male, 5-lobed. Cypselas from ray florets 3-angled; from disc florets 4-angled; pappus of one short awn, or absent.

A small genus of a few species from Asia and the Pacific; 1 species native on the Islands. Sometimes united with *Lipochaeta* DC. of Hawai'i with 20 species.

Wollastonia biflora (L.) DC., *Prodr.* 5: 546 (1836)

Verbesina biflora L., *Sp. Pl.* 2nd edn, 2: 1272 (1763); *Wedelia biflora* (L.) DC. ex Wight, *Contr. Bot. India* 18 (1834); *Melanthera biflora* (L.) Wild, *Kirkia* 5: 4 (1965). T: 'India'; holo: LINN 1021/4; IDC microfiche 177/2.610/18. So called from the two capitula on the original specimen.

Buphthalmum uniflorum G.Forst., *Fl. Ins. Austr.* 91 (1786), *nom. nud.*; G.Forst. ex Willd., *Sp. Pl.* 3(3): 2235 (1803); *Wedelia forsteriana* Endl., *Prodr. Fl. Norfolk.* 51 (1833), *nom. illeg.*; *Wollastonia forsteriana* (Endl.) DC., *Prodr.* 5: 548 (1836), *nom. illeg.*; *Wedelia uniflora* (G.Forst. ex Willd.) W.R.B.Oliv., *Trans. & Proc. New Zealand Inst.* 49: 155 (1917). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W.

Illustrations: W.A.Whistler, *Coastal Fl. Trop. Pacific* 51 (1980); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 562, t. 8B (1986); A.C.Smith, *Fl. Vit. Nova* 5: 272, fig. 31 (1991).

Coarse, straggling, perennial herb or subshrub to 1 (–1.5) m tall, usually whitish with closely appressed hairs. Leaves with both surfaces sparsely to densely appressed strigose; lamina ovate to lanceolate or elliptic, 2–7 cm long, 1.5–4 cm broad, acute to rounded at base and attenuate onto petiole, serrate, acute, with 3 main veins from base of leaf. Capitula 1–5; peduncles 1–6 cm long; involucral bracts in 2 or 3 imbricate series, 3–4 mm long with appressed strigose hairs. Ligulate florets bright yellow; disc florets yellow. Cypselas obovoid, angled, slightly flattened, 2.5–3 mm long, glabrous or apex pilose; pappus an awn c. 1 mm long, or absent. *Mile-a-Minute* (N.Is.). Fig. 89B.

Norfolk Is., Lord Howe Is. A common coastal plant. Also known from East Africa to SE Asia, and the southern Pacific islands, as well as coastal N.S.W. and Qld, Australia.

N.Is.: Duncombe Bay, *M.Lazarides 8067* (K); Ball Bay, *R.D.Hoogland 11230* (NSW); Philip Is., *P.S.Green 1483* (A). **L.H.Is.:** North Bay, *P.S.Green 1582* (A, K); Middle Beach, *R.D.Hoogland 8653* (NSW); Salmon Beach, *J.Pickard 3552* (NSW).

34. SIGESBECKIA

Sigesbeckia L., *Sp. Pl.* 2: 900 (1753); *Gen. Pl.* 5th edn, 383 (1754); named after Johann Georg Sigesbeck (1686–1755), German botanist and physician, at one time Director of the Botanic Garden at St Petersburg.

Type: *S. orientalis* L.

Annual herbs, without latex. Leaves opposite, simple, entire to deeply serrate, petiolate or sessile. Capitula terminal, usually small, solitary or in loose corymbose panicles, ±hemispherical; involucral bracts in 2 series; outer bracts usually 5, leaf-like, spreading,

glandular; inner bracts smaller, erect; receptacle flat, with scales enclosing disc cypselas. Outer florets ligulate, female; ligule short, 3-toothed; disc florets tubular, bisexual. Cypselas obpyramidal, often curved, 3- or 4-angled; pappus absent.

A small genus of c. 10 species distributed throughout the tropics and subtropics; 1 species naturalised on Norfolk Is.

*Sigesbeckia orientalis L., *Sp. Pl.* 2: 900 (1753)

T: cultivated, lecto: Herb. Linn 1018.1; *fide* R.McVaugh & C.Anderson in *Contr. Univ. Michigan Herb.* 9: 488 (1972); IDC microfiche 177/2.610/4. So called as having come from the East or orient.

Illustrations: D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1440, fig. 649B (1986); B.A.Auld & R.W.Medd, *Weeds* 115 (1987); G.R.M.Dashorst & J.P.Jessop, *Pl. Adelaide Plains & Hills* 157, t. 71/10 (1990).

Herb, often much branched, to c. 1 m tall. Leaves with winged petiole 0.5–6 cm long; lamina deltoid to elliptic-lanceolate, 3–12 cm long, 1.5–9 cm broad, acute to truncate at base and attenuate onto petiole, dentate with larger teeth at base, diminishing towards apex, acute, scaberulous above, ±glandular pubescent below. Capitula in loose corymbose panicles, 0.6–1 cm diam.; outer involucral bracts 5, narrowly spathulate, 5–10 mm long, stalked-glandular; inner bracts obovate, 3 mm long, enfolding the outer cypselas. Ligulate florets 3–5, yellow; disc florets yellow. Cypselas slightly 3- or 4-angled, usually curved, 2–3 mm long, very dark brown.

Norfolk Is. A weed of disturbed ground, native to warm temperate Asia and Africa.

N.Is.: Steels Point, *P.S.Green 1889* (K).

35. BIDENS

Bidens L., *Sp. Pl.* 2: 831 (1753); *Gen. Pl.* 5th edn, 362 (1754); from the Latin *bi-* (two) and *dens* (tooth), referring to the rigid awns of the fruit.

Type: *B. tripartita* L.

Annual or perennial herbs, or shrubs, without latex. Leaves opposite, simple or ternately to pinnately compound, sessile or petiolate. Capitula terminal, solitary or in loose cymes, pedunculate, ±campanulate; involucral bracts in 2 series; outer bracts ±foliaceous, green; inner bracts membranous; receptacle with narrow, flat membranous scales. Outer florets ligulate, female or sterile, white, yellow or pink, or absent and then all florets tubular and bisexual. Cypselas often flattened, usually ±4-angled; pappus of 2–4 rigid awns (sometimes absent), usually retrorsely barbed.

A genus of c. 230 species, distributed throughout warm temperate and tropical regions, but especially in America; 1 species naturalised on Norfolk and Lord Howe Islands.

*Bidens pilosa L., *Sp. Pl.* 2: 832 (1753)

T: America, Herb. Linn, 975/8; lecto: LINN, *fide* A.J.C.Grierson in *Revis. Handb. Fl. Ceylon* 1: 227 (1980), IDC microfiche 177/2.554/12.

Illustrations: D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1434, fig. 543 (1986); B.A.Auld & R.W.Medd, *Weeds* 86 (1987); C.J.Webb *et al.*, *Fl. New Zealand* 4: 211, fig. 21B (1988).

Annual herb to 1 m tall. Stems angular, with opposite branches. Leaves simple or trifoliolate; petiole 1–5 cm long; lamina of simple leaf or terminal leaflet ovate to lanceolate, 2–8 cm long, 1.5–3 cm broad, attenuate at base, serrate, acute; lateral leaflets subsessile, c. ½ as long as terminal leaflet. Capitula in loose cymes; outer involucral bracts linear-spathulate, 2.5–5 mm long, erect, ciliate; inner bracts lanceolate, 4–6 mm long; receptacular scales similar to outer bracts but narrower. Florets usually all tubular, bisexual, yellowish orange; 4–7 ray florets sometimes present, white. Cypselas linear, ribbed, somewhat flattened, 4-angled, 6–9 mm long; pappus awns (2 or) 3, 1–2 mm long, retrorsely barbed. *Broom-Stick, Grab-a-Leg* (N.Is.), *Teasers* (L.H.Is.).

Norfolk Is., Lord Howe Is. A weed of disturbed ground, gardens *etc*., pantropical but probably from America originally. Said to have been introduced to Lord Howe Is. by whalers with potatoes from the Kermadec Is. (see J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 150, 1898).

N.Is.: *s. loc.*, 1898, *I.Robinson* (NSW). **L.H.Is.:** Middle Beach, *R.D.Hoogland 8643* (NSW); near the War Memorial, *P.S.Green 1915* (K); NW side of Transit Hill, *L.A.S.Johnson & A.N.Rodd 1271* (K, NSW); summit ridge of Mt Lidgbird, *J.Pickard 1477* (NSW); top of Little Slope, *J.Pickard 2801* (NSW).

36. GAILLARDIA

Gaillardia Foug., *Observ. Phys.* 29: 55 (1786); named after Gaillard de Charentonneau, a French magistrate and patron of botany and horticulture.

Type: *G. pulchella* Foug.

Herbs, annual or perennial, without latex. Leaves alternate or basal, simple, usually narrow, entire to pinnatisect, ±petiolate. Capitula terminal, usually large, solitary, pedunculate, broadly campanulate; involucral bracts in 2 or 3 series, herbaceous, reflexed in fruit; receptacle convex to subglobose, with numerous setae. Outer florets ligulate, usually sterile; ligules yellow or purple, 3-toothed at apex; inner florets bisexual. Cypselas usually terete, obpyramidal, villous; pappus of 5–10 scales, tapering into awns.

A genus of 25 species of temperate North and South America; 1 hybrid species naturalised on Lord Howe Is.

***Gaillardia × grandiflora** Van Houtte, *Fl. Serres* 12: t. 1183 (1857)

T: cultivated, not designated.

[*Gaillardia picta auct. non* Sweet: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 155 (1898)]

Illustrations: A.B.Graf, *Tropica* 3rd edn, 319, 321 (1986); C.D.Brickell, *Gard. Encycl. Pl. & Fl.* 240 (1989); W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 319, t. 27 (1990).

Perennial herb to c. 80 cm tall. Stems ±hairy. Leaves alternate or basal, densely glandular and pilose, ±sessile; lamina narrowly elliptic, 3–12 cm long, 0.7–2 cm broad, attenuate, entire to coarsely toothed, sometimes shallowly pinnatisect, acute. Capitula c. 2 cm diam. (not including ray florets); involucral bracts ovate-triangular to lanceolate, 5–10 mm long, densely hairy; receptacle with fine setae usually longer than cypselas. Ligulate florets c. 2 cm long, deeply 3-toothed, deep reddish brown to orange, tipped bright yellow; disc florets dark purple. Cypselas c. 3 mm long; pappus scales 6–8, broadly lanceolate, 3 mm or more long, aristate, connate at base.

Lord Howe Is. A garden ornamental of hybrid origin (*G. aristata* Pursh × *G. pulchella* Foug.) which has been naturalised near the Old Settlement for about a century.

L.H.Is.: S end of Old Settlement Beach, *A.Rodd 1435* (K, NSW); E side of Old Settlement Bay, *G.Uhe 1307* (K).

37. GALINSOGA

Galinsoga Ruiz & Pav., *Fl. Peruv. Prodr.* 110, t. 24 (1794); named after Don Mariano Martinez de Galinsoga (1766–1797), one-time Director of the Madrid Botanic Garden and physician to the Queen of Spain.

Type: *G. parviflora* Cav.

Annual herbs, without latex. Leaves opposite, simple, entire or serrate, 3-veined, sessile or shortly petiolate. Capitula in loose to congested terminal cymes, ±hemispherical; involucral bracts in 1–3 series; receptacle conical, with scarious, veined scales. Outer florets with a small ligule, female, white or purplish; disc florets tubular, bisexual, usually yellowish. Cypselas obconic or obpyramidal; those from ray florets compressed, curved, embraced by

the involucral bracts, with a pappus of laciniate scales; those from disc florets slightly angular, with pappus similar or reduced to bristles or absent.

A Central American genus of 14 species, 2 of which, *G. quadriradiata* Ruiz & Pav. and *G. parviflora* Cav., have become widespread weeds. One species is naturalised on Norfolk and Lord Howe Islands.

***Galinsoga parviflora** Cav., *Icon.* 3: 41, t. 281 (1795)

T: cultivated, seed from Peru; holo: ?MA *n.v.* So named because of its small (Latin - *parvus*) flowers.

Illustrations: B.E.V.Parham & A.J.Healy, *Common Weeds New Zealand* 111 (1976); D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1437, fig. 646 (1986); B.A.Auld & R.W.Medd, *Weeds* 102 (1987).

Annual herb, sparsely pubescent to glabrous. Stems branched, to c. 50 cm tall. Leaves with petiole 0.5–2.5 cm long; lamina lanceolate to ovate, 2–6 cm long, 1–3 cm broad, acute to subtruncate at base, entire to serrulate, acute to subacuminate. Capitula in loose cymes, 3–7 mm diam.; involucral bracts ovate, 1–2 mm long; outermost receptacular scales broadly elliptic to obovate, basally adnate to inner involucral scales; inner scales often ±persistent. Ray florets usually 5, white or tinged pink; ligule c. 1.5 mm long, 1 mm broad, 3-toothed. Cypselas c. 2 mm long, black, those of disc florets slightly shorter; pappus of disc florets of numerous lanceolate, fimbriate, somewhat obtuse scales.

Norfolk Is., Lord Howe Is. A native of Central America, now a worldwide weed of disturbed ground.

N.Is.: near Steels Point, *W.R.Sykes NI 496* (CHR); *loc. id., P.S.Green 2411* (K); Burnt Pine, *W.R.Sykes NI 188* (CHR); *s. loc.*, 1898, *I.Robinson* (NSW). **L.H.Is.:** Middle Beach, *J.D.McComish 128* (NSW); lower slopes of Mt Lidgbird, *M.D.Crisp 4508 & I.R.H.Telford* (CBG); *s. loc.*, 1920, *J.L.Boorman* (NSW).

38. TAGETES

Tagetes L., *Sp. Pl.* 2: 887 (1753); *Gen. Pl.* 5th edn, 378 (1754); named, in an allusion to it being a weed of arable land; after the Etruscan deity, Tages, who was said to have sprung from the earth while it was being ploughed.

Type: *T. patula* L.

Herbs, annual or perennial, aromatic, without latex. Leaves opposite, or upper leaves sometimes alternate, pinnatifid to pinnate, gland-dotted, petiolate or ±sessile. Capitula terminal, usually in a loose or dense corymb, sometimes solitary, cylindrical or campanulate; involucral bracts uniseriate, connate, herbaceous, gland-dotted; receptacle flat, naked, pitted. Outer florets ligulate, female; ligules yellow to orange-brown; disc florets tubular, bisexual. Cypselas all similar, ±linear; pappus of several unequal, often connate, acute or awn-tipped scales.

A southern United States and Central American genus of c. 50 species, which includes the garden plants, French Marigold, *T. patula* L., and African Marigold, *T. erecta* L. One species is naturalised on Norfolk Is.

***Tagetes minuta** L., *Sp. Pl.* 2: 887 (1753)

T: Chile, not designated. The epithet alludes to the small size of the capitula.

Illustrations: T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 565, fig. 79F (1986); D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1443, fig. 652 (1986); B.A.Auld & R.W.Medd, *Weeds* 118 (1987).

Annual herb, erect to c. 2 m tall, strongly fetid-aromatic. Leaves opposite, pinnate, with (3–) 5–9 subopposite, sessile pairs of leaflets; leaflets linear to narrowly lanceolate-elliptic, 1–6 cm long, 0.1–1 cm broad, finely serrate, with immersed glands. Capitula cylindrical, 2–4 mm diam., in dense corymbs; involucral bracts connate into a cylinder with 3–5 apical teeth, 8–10 mm long, streaked with immersed glands. Ray florets (1–) 3; ligule 1–2 mm long, pale

yellowish green or cream; disc florets 3–5, green. Cypselas flattened, angular towards base, 6–8 mm long, black; pappus scales 1–3 mm long, free.

Norfolk Is. An uncommon but locally frequent weed of broken ground. A native of South America.

N.Is.: Stockyard Rd, Friendship House, *W.R.Sykes NI 594* (CHR).

39. AGERATUM

Ageratum L., *Sp. Pl.* 2: 839 (1753); *Gen. Pl.* 5th edn, 363 (1754); an ancient Greek name for some plant, presumably derived from *a-* (not) and *geras* (old age), possibly because the flowers retain their colour for a long time.

Type: *A. conyzoides* L.

Annual or perennial herbs, sometimes subshrubs, without latex. Leaves opposite, simple, entire to lobed, petiolate. Capitula in terminal, usually dense, cymose clusters, ±campanulate; involucral bracts in 2 or 3 series, subequal, usually lanceolate; innermost bracts sometimes persistent; receptacle convex to conical, naked. Florets all tubular, bisexual, 5-lobed. Cypselas oblong to obpyramidal, 4- or 5-ribbed; pappus of 5 or 6 free or connate scales, often awn-tipped, or reduced and absent.

A Central and South American genus of c. 40 species; 1 species naturalised on the Islands. *Ageratum houstonianum* Mill. is a commonly grown, blue-flowered garden plant.

*Ageratum conyzoides L., *Sp. Pl.* 2: 839 (1753)

T: cultivated, seed probably from the West Indies, Herb. Clifford; lecto: BM, *fide* A.J.C.Grierson in *Revis. Handb. Fl. Ceylon* 1: 141 (1980). The epithet with the suffix *-oides* (resembling) means like *Conyza*, a similar genus.

[*Eupatorium cannabinum auct. non* L.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 45: 566 (1920)]

Illustration: W.L.Wagner *et al.*, *Man. Fl. Pl. Hawai'i* 1: 253, t. 14 (1990).

Annual or short lived perennial herb, to c. 1 m tall, sparingly to densely hairy, strong smelling when bruised. Leaves ovate or broadly ovate, 3–10 cm long, 2–7 cm broad, acute to truncate at base and attenuate onto petiole, crenate-dentate, obtuse to somewhat acute, pilose, gland-dotted below. Capitula 3–7 mm diam., c. 5–15 grouped in a flat-topped corymb; involucral bracts oblong-lanceolate, 3–4 mm long, erose or dentate, acute or shortly acuminate, glabrous or with a few short hairs. Florets bluish lavender, sometimes white. Cypselas narrowly oblong, c. 1.5 mm long, scaberulous on ribs, black; pappus scales 5, sharply acute to awned, free. *Nightshade* (N.Is.).

Norfolk Is., Lord Howe Is. An occasional weed, originally escaped from cultivation. A native of Mexico, the West Indies and South America.

N.Is.: Cascade, 1957, *G.R.Quintal* (BRI); c. 3.2 km NE of the cemetery at Kingston, *G.Uhe 1108* (K); *s. loc.*, 1898, *I.Robinson* (NSW). **L.H.Is.:** 0.3 km E of 'Sea Breeze', *J.Pickard 3352* (NSW); cleared area in Rocky Run Valley, *J.Pickard 2843* (NSW); Mt Gower track just before entering Erskine Valley, *G.Uhe 1327* (K).

40. AGERATINA

Ageratina Spach, *Hist. Nat. Vég.* 10: 286 (1841); from the generic name *Ageratum* with the suffix *-inus*, indicating resemblance to that genus.

Type: *A. aromatica* (L.) Spach

Herbs, annual or perennial, or shrubs, without latex. Leaves opposite (elsewhere rarely alternate), simple, entire to lobed, petiolate. Capitula in loose to dense terminal corymbs, ±campanulate; involucral bracts in 1 or 2 (–3) series, usually subequal, slightly imbricate; receptacle convex, naked or sometimes with minute hairs. Florets all tubular, funnel-shaped

with a slender lower portion, bisexual. Cypselas slender, usually 5-ribbed, glabrous, hairy or glandular; pappus of scabrid bristles, usually many, easily deciduous.

A genus of c. 240 species from the New World which has been relatively recently separated from the Old World genus *Eupatorium* L. Two species are naturalised, 1 each on Norfolk and Lord Howe Islands.

Leaves deltoid to rhombic, 1.5–7 cm broad; stems and inflorescence densely glandular-pubescent **1. A. adenophora**

Leaves lanceolate to narrowly lanceolate or narrowly elliptic, 0.8–3 cm broad; stems and inflorescence pubescent but not glandular **2. A. riparia**

1. *Ageratina adenophora (Spreng.) R.M.King & H.Rob., *Phytologia* 19: 211 (1970)

Eupatorium adenophorum Spreng., *Syst. Veg.* 3: 420 (1826). T: Mexico; holo: ?P *n.v.* The epithet comes from the Greek *aden* (a gland) and *phoreo* (to bear), alluding to the glandular indumentum.

Illustrations: R.A.Buchanan, *Common Weeds Sydney Bushland* 58, fig. 23 (1981); D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 3: 1639, fig. 749 (1986); B.A.Auld & R.W.Medd, *Weeds* 81 (1987).

Perennial herb or sometimes a subshrub to 2 m tall, densely glandular pubescent. Leaf with lamina deltoid to rhombic, 3–12 cm long, 1.5–7 cm broad, cuneate to obtuse at base, coarsely crenate-serrate, acute to subacuminate, glabrous above, shortly glandular pubescent on veins below. Capitula 4–6 mm diam., numerous, in erect, dense, terminal, densely glandular corymbs; involucral bracts in 2 subequal series, narrowly elliptic to lanceolate, 3–4 mm long, glandular, 2- or 3-veined. Florets white, 3–4 mm long. Cypselas 5-ribbed, c. 1.5 mm long, dark reddish brown to black; pappus bristles 5–10, c. 4 mm long.

Lord Howe Is. A Central American adventive which is invading open areas in the forest and should be urgently controlled.

L.H.Is.: in front of 'Pine Trees' guest house, *G.Uhe 1284* (K); S base of Intermediate Hill, *L.A.S.Johnson & A.N.Rodd 1307* (NSW); lower slopes, W side of Mt Lidgbird, *P.S.Green 1969* (K); W slopes of Smoking Tree Ridge, *R.D.Hoogland 8730* (NSW); Potato Hills, S end of Little Slope, *J.Pickard 2766* (NSW).

2. *Ageratina riparia (Regel) R.M.King & H.Rob., *Phytologia* 19: 216 (1970)

Eupatorium riparium Regel, *Gartenflora* 15: 324, t. 525 (1866). T: cultivated; holo: ?LE *n.v.* The epithet means of the banks of rivers, but its application to this species is not clear.

Illustrations: R.A.Buchanan, *Common Weeds Sydney Bushland* 60, fig. 24 (1981); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 2: 506, fig. 70G (1986); B.A.Auld & R.W.Medd, *Weeds* 82 (1987).

Perennial herb to subshrub, erect or sprawling, to c. 1 m tall, sparsely to densely pubescent, not glandular. Leaf with lamina lanceolate to narrowly lanceolate or narrowly elliptic, 3–11 cm long, 0.8–3 cm broad, cuneate-acute at base, coarsely serrate, acute to acuminate, glabrescent to sparsely short-pilose, especially on veins below. Capitula numerous, 3–5 mm diam., grouped in terminal loose corymbs, sparsely short-pilose, not glandular; involucral bracts narrowly lanceolate, 3–4 mm long, 1- or 2-veined, puberulent. Florets white, 4–5 mm long. Cypselas 5-ribbed, 1.5–2 mm long, ciliate on ribs, black; pappus bristles c. 10, 3–4 mm long. *William Taylor* (N.Is.).

Norfolk Is. A serious weed in areas of degraded forest, and an invader of the margins of undisturbed forest, smothering ferns and seedlings. It is said to have been introduced as a garden plant by one William Taylor; hence the common name.

N.Is.: c. 3.2 km NE of cemetery at Kingston, *G.Uhe 1100* (K); *s. loc.*, *R.M.Laing* (CHR); *s. loc.*, 1932, *the Administrator of Norfolk Is.* (NSW); *s. loc.*, 1937, *J.D.McComish 96* (NSW); *s. loc.*, *P.Ralston 312* (A, K).

MONOCOTYLEDONAE

93. LIMNOCHARITACEAE

Aquatic herbs. Leaves arising at end of rhizome or stolon; first leaves linear, submersed; later leaves petiolate, with parallel venation. Flowers bisexual, actinomorphic. Sepals 3, green, persistent. Petals 3, larger than sepals, caducous. Stamens 3–many. Carpels superior, 3–20; placentation scattered; ovules numerous; embryo curved or folded; style terminal or sessile with decurrent stigma. Fruit a follicle.

A tropical family of 3 genera and c. 12 species; 1 introduced genus on Norfolk Is.

A.J.Healy & E.Edgar, *Fl. New Zealand* 3: 25–31 (1980).

1. HYDROCLEYS

Hydrocleys Rich., *Mém. Mus. Hist. Nat.* 1: 368 (1815); from the Greek *hydro* (water) and *kleis* (a key), but with no clear reason for the allusion.

Type: *H. commersonii* Rich.

Aquatic freshwater annuals or stoloniferous perennials; roots permanently immersed. Leaves with transversely septate petiole; lamina ovate or suborbicular, cordate. Inflorescence terminal, in umbel-like clusters or flowers solitary; pedicels transversely septate. Petals yellow, delicate. Stamens 6–many, with an outer whorl of staminodes. Carpels 3–6, linear-lanceolate, connate at base. Seeds small, horseshoe-shaped.

A genus of perhaps 9 species native to tropical South America; 1 species naturalised on Norfolk Is. and also in Australia (Qld, Vic.). This genus is often classified in the Butomaceae.

***Hydrocleys nymphoides** (Humb. & Bonpl. ex Willd.) Buchenau in *Abh. Naturwiss. Vereine Bremen* 2: 2 (1869)

Stratiotes nymphoides Humb. & Bonpl. ex Willd., *Sp. Pl.* 4th edn 4(2): 821 (1806). T: Caracas, Venezuela, *F.W.H.A. von Humboldt & A.J.A.Bonpland*; holo: B-W *n.v.*, photo seen (IDC microfiche 7740/1.1343/13). The epithet means like *Nymphaea*, in allusion to that genus of waterlilies.

Illustrations: H.I.Aston & S.W.L.Jacobs, *Muelleria* 4: 287 (1980); A.J.Healy & E.Edgar, *Fl. New Zealand* 3: 24 (1980); G.R.Sainty & S.W.L.Jacobs, *Water Pl. New South Wales* 76 (1981).

Stoloniferous herb, rooting at nodes; each node producing a cluster of leaves. Leaves floating; lamina broadly elliptic to suborbicular, 3.5–13.5 cm long, 3–12 cm broad, obtuse to rounded; longitudinal veins 3 or 4, curved. Flowers (4–) 5–6 cm diam. Petals broadly obovate. Stamens numerous. Carpels 6. *Water-Poppy.*

Norfolk Is. A native of northern South America, naturalised in Cascade Creek. Also naturalised as an escape from aquaria in a few localities in New Zealand and mainland Australia (H.I.Aston & S.W.L.Jacobs, *Muelleria* 4: 285–293, 1980).

N.Is.: cult. in O.Evans' garden, from Cascade, *P.S.Green 2415* (photo K).

94. HYDROCHARITACEAE

Marine or freshwater perennial herbs, wholly or partially submerged, rooted or free floating. Leaves basal or cauline, variable in shape and size, with axillary scales. Inflorescence axillary; spathe sessile or with a long stalk. Flowers usually unisexual (and plants dioecious), actinomorphic. Perianth usually 3 + 3, free; outer often sepaloid; inner petaloid, white. Male flowers in umbellate inflorescence; stamens 3–many; pistillodes usually 1 (or more). Female flowers solitary; staminodes often present; ovary inferior, 1-locular; styles usually 3–6; ovules numerous on 3–6 parietal placentae. Fruit irregularly dehiscent, berry-like. Seeds numerous, without endosperm.

A cosmopolitan family of c. 16 genera and 80 species in both temperate and tropical regions; 1 native genus on Lord Howe Is.

G.Bentham, Naiadeae, *Fl. Austral*. 7: 182–183 (1878); C. den Hartog, Hydrocharitaceae, *Fl. Males*. ser. I, 5: 381–413 (1957); H.I.Aston, *Aquat. Pl. Australia* 210–240 (1973); D.Simpson, *Fl. Trop. E. Africa*, Hydrocharitaceae 1–29 (1989).

HALOPHILA

Halophila Thouars, *Gen. Nova Madag*. 2 (1806); from the Greek *halos* (salt) and *philos* (loving), in allusion to the salt-water habitat of these plants.

Type: *H. madagascariensis* Doty & B.C.Stone

Marine herbs with creeping rhizome; nodes with 2 scales, 1 around the rhizome, the other around the base of (usually) a pair of leaves. Spathe sessile, of 2 overlapping bracts, usually enclosing one unisexual flower. Male flowers pedicellate; tepals 3; stamens 3. Female flowers sessile; ovary surrounded by a long hypanthium; styles 3–5, linear. Fruit ovoid to globose.

A genus of 8–10 species in shallow tropical and subtropical coastal waters throughout the world; 1 species native to Lord Howe Is.

Halophila ovalis (R.Br.) Hook.f., *Fl. Tasman*. 2: 45 (1858)

Caulinia ovalis R.Br., *Prodr*. 339 (1810). T: tropical Australia, *R.Brown*; holo: BM. The epithet refers to the oval leaf lamina.

Illustrations: C. den Hartog, *Sea-Grasses World* 242 (1970); S.W.L.Jacobs in G.J.Harden, *Fl. New South Wales* 4: 13 (1993).

Rhizome 2 mm thick. Leaves in pairs at nodes; petiole 1–5 cm long; lamina thin, oblong-elliptic, 7.5–40 mm long, 5–15 mm broad, rounded, truncate or obtuse at base, entire, apically rounded; primary veins 9–15 (–25) pairs, usually at 40°–60° to midrib. Male flowers with tepals 4 mm long, translucent, white. Female flowers with hypanthium 3–5 mm long; ovary ovoid, 1–1.5 mm long. Fruit globose, 3–4 mm long.

Lord Howe Is. Common in a zone at the lower edge of the Lagoon beach, just emergent at spring low tides. Widely distributed around the Indian Ocean and western Pacific.

L.H.Is.: beach near War Memorial, *P.S.Green 1918* (K); Rabbit Is., *A.N.Rodd 1799* (K, NSW); North Bay, *J.C.Game 69/225* (K).

95. JUNCAGINACEAE

Perennial (rarely annual) herbs of fresh or salt-water marshes. Leaves radical, linear, sheathing, ligulate. Inflorescence a spike or raceme, bractless. Flowers small, bisexual or unisexual, actinomorphic. Perianth segments usually 6, herbaceous, in 2 whorls. Stamens

usually 6 (rarely 3, 4 or 8), subsessile. Ovary superior, of usually 6 1-ovulate carpels, alternate ones often sterile; style short or absent; stigmata brush-like. Capsule loculicidal. Fruit follicular.

A widespread family in temperate or cold regions of both Hemispheres, containing 3 genera and c. 20 species; 1 genus native on Lord Howe Is.

G.Bentham, Naiadeae, *Fl. Austral.* 7: 165–169 (1878); H.I.Aston, *Aquat. Pl. Australia* 241–248 (1973).

TRIGLOCHIN

Triglochin L., *Sp. Pl.* 1: 338 (1753); *Gen. Pl.* 5th edn, 157 (1754); from the Greek *treis* (three) and *glochis* (barb of an arrow), in allusion to the fruit shape in the type and other species.

Type: *T. palustris* L.

Tufted herbs with leafless flowering spikes or racemes. Perianth segments 3 + 3, small, greenish or greenish white. Stamens 3 + 3. Ovary 6-carpellate, sometimes alternate carpels abortive. At dehiscence the base of the ripe carpels separating from central axis first, often sharp and prolonged outwards; separated carpels indehiscent.

A genus of c. 15 species found in fresh or salt-water marshes, rarely fully aquatic, in temperate and cold regions of the world, especially Australia and South America; 1 species native on Lord Howe Is.

Triglochin striata Ruiz & Pav., *Fl. Peruv.* 3: 72 (1802)

T: Peru, *H.Ruiz López & J.A.Pavón*; holo: ?MA *n.v.* The epithet alludes to the striate scape of the type material.

Illustrations: L.B.Moore & J.B.Irwin, *Oxford Book New Zealand Pl.* 203, fig. 2 (1978); S.W.L.Jacobs in G.J.Harden, *Fl. New South Wales* 4: 20 & pl. 1 (1993).

Freshwater grass-like herb, rooted in soil, not permanently immersed. Leaves slightly fleshy, 4–30 cm long, c. 2 mm broad; sheath 2–8 cm long, usually tinged purplish. Inflorescence racemose, 6–25 cm long, 15–70- or more-flowered. Pedicels 1–2 mm long. Perianth lobes 0.75–1 mm long, greenish white. Stamens c. 0.5 mm long. Carpels 0.5–1 mm long; style short or absent; stigma much branched, whitish green. Ripe fruit hemi-ovoid, 2 mm long, keeled. Fig. 93E.

Lord Howe Is. Forming a dense zone in sandy mud beside the creek in Old Settlement Bay. Widely distributed in southern North America, South America, South Africa, Australia and New Zealand; naturalised in Portugal.

L.H.Is.: Old Settlement Beach, *J.D.McComish 190* (K); *loc. id.*, *L.A.S.Johnson & A.N.Rodd 1229* (K, NSW); Johnsons Beach, *M.D.Crisp 4583 & I.R.H.Telford* (CBG).

96. ZOSTERACEAE

Marine rhizomatous herbs. Rhizome creeping, bearing bracts (prophylls) or single leaves with, in their axils, lateral branches of distichous leaves. Leaf sheath compressed, membranous, ligulate; lamina linear. Fertile shoots with 1–5 spathes. Spadix with much reduced alternating unisexual flowers and marginal outgrowths. Male flower a single anther. Female flower an elliptic or crescentic ovary; style short; stigmata 2. Fruit 1-seeded.

A family of 3 genera and c. 18 species, mainly restricted to the temperate areas of both Hemispheres; 1 native genus on Lord Howe Is.

G.Bentham, Naiadeae, *Fl. Austral*. 7: 175–177 (1878); H.I.Aston, *Aquat. Pl. Australia* 325–332 (1973).

ZOSTERA

Zostera L., *Sp. Pl.* 2: 968 (1753); *Gen. Pl.* 5th edn, 415 (1754); from the Greek *zoster*, a belt or girdle, in allusion to the leaf shape.

Type: *Z. marina* L.

Aquatic herbs with creeping monopodial rhizomes. Leaves tufted on lateral branches; sheath persistent; lamina linear, 3–9 (–11)-nerved. Fertile shoots bearing 2–5 spathes, partially adnate to their subtending axes. Spadix sessile, lanceolate, bearing alternating male and female flowers.

A genus of 12 species in northern and southern temperate areas, extending slightly into the tropics; 1 species native to Lord Howe Is.

Zostera capricorni Asch., *Sitzungsber. Ges. Naturf. Freunde Berlin* 1876: 11 (1876)

T: Queensland, 1875, *F.C.Naumann*; New Zealand, *T.Kirk*; syn: B *n.v.*, presumed destroyed. Named from the Tropic of Capricorn near which the type material was collected.

Illustrations: C. den Hartog, *Sea-Grasses World* pl. 4 (1970); L.B.Moore in L.B.Moore & E.Edgar, *Fl. New Zealand* 2: 9, fig. 1 (1970); S.W.L.Jacobs in G.J.Harden, *Fl. New South Wales* 4: 27 & pl. 2 (1993).

Rhizome 1–2 mm thick, with 2 bundles of roots and a bract (prophyll) from each node. Leaf sheath 1–3 (–10) cm long; ligule very short; lamina 2–6 (–30) cm long, 1.5–3 (–5) mm broad, truncate, not notched; veins 5.

Lord Howe Is. Common in a zone just below low water mark on the Lagoon beach. Known in Australia from Kangaroo Is., S.A., and widely distributed along the coasts of Qld and N.S.W.; also known from the North Is. of New Zealand.

L.H.Is.: North Bay, *J.C.Game 69/226* (K); Old Settlement Beach, *J.Pickard 3334* (K, NSW); *loc. id.*, *P.S.Green 2048* (K); Signal Point, *J.Pickard 3371* (K, NSW); Rabbit Is., *A.N.Rodd 1800* (K, NSW).

97. ARECACEAE

Palms. Stems woody, usually stout, unbranched or very short or scandent. Leaves large, alternate, forming a terminal crown, evergreen, pinnate, bipinnate or palmate. Inflorescence axillary or terminal, usually branched, usually bracteate; primary bracts persistent or caducous, usually large. Flowers bisexual or unisexual, actinomorphic, ±sessile or pedicellate or immersed in rachilla, usually small, numerous. Perianth usually of 3 sepals and 3 petals, valvate or imbricate. Stamens (3–) 6–many, reduced to staminodes or absent in pistillate flowers. Ovary superior, apocarpous or syncarpous; locules 1–3 (–10), 1-ovulate, reduced or absent in staminate flowers. Fruit usually a berry, often dry, or a drupe.

A family with 200 genera and c. 2750 species, distributed throughout the tropics or, less commonly, subtropics of the world. One native genus on Norfolk Is., and 3 endemic genera on Lord Howe Is.

G.Bentham, Palmae, *Fl. Austral*. 7: 132–147 (1878); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Arecaceae, *Fl. Java* 3: 165–199 (1968); H.E.Moore in A.C.Smith, Arecaceae, *Fl. Vit. Nova* 1: 392–438 (1979); N.W.Uhl & J.Dransfield, Arecaceae, *Genera Palmarum* 331–479 (1987).

KEY TO GENERA

1 Inflorescence of 1–5 (–8) long pendulous spikes, first appearing in leaf axils; leaves not forming a distinct crownshaft (L.H.Is.) **1. HOWEA**

1: Inflorescence much-branched, borne below a distinct crownshaft

2 Crownshaft 15–20 cm long, somewhat loose; sheaths gradually passing into leaf bases (L.H.Is.) **2. LEPIDORRHACHIS**

2: Crownshaft 50–100 cm long, compact; leaf bases and sheaths ±distinct

3 Leaves strongly arching, 1.5–3 m long; fruit ovoid-ellipsoidal, c. 5 cm long (L.H.Is.) **3. HEDYSCEPE**

3: Leaves straight, ±erect, arching only slightly, 3–4 m long; fruit ovoid-globular, 1.2–1.5 cm long (N.Is.) **4. RHOPALOSTYLIS**

1. HOWEA

Howea Becc., *Malesia* 1: 41, 66 (1877) 'Howeia', & 2: 339 (1886) 'Howea'; from the name of the island to which this genus is endemic.

Type: *H. belmoreana* (C.Moore & F.Muell.) Becc.

Grisebachia Drude & H.Wendl., *Nachr. Königl. Ges. Wiss. Georg-Augusts-Univ.* 1875: 54 (1875), *nom. illeg., non* Klotzsch (1838). T: not designated.

Denea O.F.Cook, *J. Wash. Acad. Sci.* 16: 395 (1926). T: *D. forsteriana* (C.Moore & F.Muell.) O.F.Cook

Graceful palms with pinnate leaves. Crownshaft not developed. Leaf sheaths fibrous. Inflorescences spicate, borne in axils of lowest leaves and maturing after the leaves have eventually fallen; prophyll fibrous, short; penduncular bract pendulous, cylindrical, much larger than prophyll. Flowers immersed in spike, in groups of 3, 2 staminate with 1 pistillate between, which develops later. Male flowers: sepals 3; petals 3, coriaceous, projecting c. 1 cm; stamens 30–100, with basifixed anthers; pistillode absent or very small. Female flowers: sepals 3; petals 3, half projecting; staminodes tooth-shaped; ovary ovoid-ellipsoidal; stigma 3-lobed, ±sessile. Fruit a drupe, ovoid-ellipsoidal to ellipsoidal.

A genus of 2 species, endemic to Lord Howe Is. Together, they form the mainstay of the Island's palm seed industry, although, today, most of the trade from the Island is in newly germinated seedlings. They are also cultivated on Norfolk Is. for an export trade in their seed. Hybrids between the two species have been recorded from time to time (W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 129, 1917; J.H.Maiden, *Proc. Linn. Soc. New South Wales* 45: 565, 1921).

Inflorescence a single spike; rachis of leaves arcuate **1. H. belmoreana**

Inflorescence of 3–5 (–8) spikes from a single broad base; rachis of central and lower leaves horizontal and drooping **2. H. forsteriana**

1. Howea belmoreana (C.Moore & F.Muell.) Becc., *Malesia* 1: 66 (1877)

Kentia belmoreana C.Moore & F.Muell., *Fragm.* 7: 99 (1870); *Grisebachia belmoreana* (C.Moore & F.Muell.) Drude & H.Wendl., *Nachr. Königl. Ges. Wiss. Georg-Augusts-Univ.* 1875: 58 (1875). T: Lord Howe Island, *C.Moore & W.Carron*; holo: MEL. Named in honour of S.R.Lowry-Corry, 4th Earl Belmore, Governor of New South Wales from 1867 to 1872.

Illustrations: A.Blombery & A.N.Rodd, *Palms* 104 (1982); D.L.Jones, *Palms Australia* 117 (1984); I.Hutton, *Lord Howe Is.* 107 (1986).

Slender tree to 12 m high. Leaves strongly arcuate; c. 2–3 (–5) m long; petiole short, 20–40 cm long; pinnae 30–60 cm long, borne upwards at an acute angle to rachis. Inflorescence spicate, 1–1.8 m long, pendulous, with a prophyll at base. Male flowers creamy brown; stamens short, numerous. Female flowers developing a year after male flowers. Fruit ovoid-ellipsoidal, 3–4 cm long, shortly and slightly beaked, brownish red. *Curly Palm.* Fig. 91A–B.

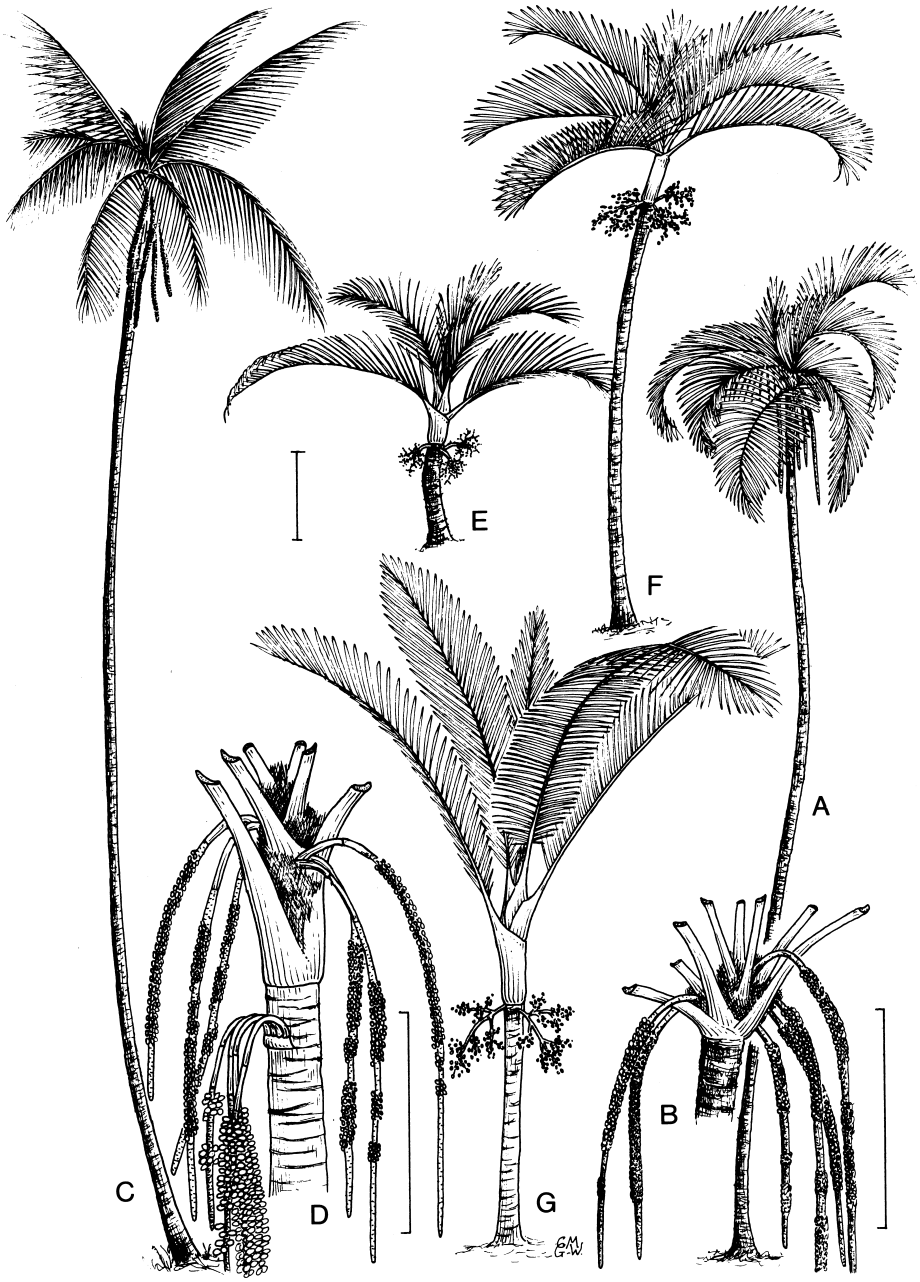

Figure 91. ARECACEAE. **A–B**, *Howea belmoreana*. **A**, habit; **B**, top of trunk with inflorescences. **C–D**, *Howea forsteriana*. **C**, habit; **D**, top of trunk with inflorescences. **E**, *Lepidorrhachis mooreana*, habit. **F**, *Hedyscepe canterburyana*, habit. **G**, *Rhopalostylis baueri* var. *baueri*, habit. Scale bars: **A**, **C**, **E–G** = 1 m; **B**, **D** = 50 cm. **A–G** all drawn from photographs. Drawn by C.Grey-Wilson.

Lord Howe Is. Endemic. On basalt on lower slopes throughout the Island from c. 50–400 m altitude. Flowers Nov.–early Jan.

L.H.Is.: Boat Harbour Track, *J.Pickard 3445* (NSW).

2. Howea forsteriana (C.Moore & F.Muell.) Becc., *Malesia* 1: 66 (1877)

Kentia forsteriana C.Moore & F.Muell., *Fragm.* 7: 100 (1870); *Grisebachia forsteriana* (C.Moore & F.Muell.) Drude & H.Wendl., *Nachr. Konigl. Ges. Wiss. Georg-Augusts-Univ.* 1875: 58 (1875); *Denea forsteriana* (C.Moore & F.Muell.) O.F.Cook, *J. Wash. Acad. Sci.* 16: 397 (1926). T: Lord Howe Island, *C.Moore*; holo: MEL. Named in honour of William Forster, at one time Senator in New South Wales.

Illustrations: A.Blombery & A.N.Rodd, *Palms* 105 (1982); D.L.Jones, *Palms Australia* 118 (1984); I.Hutton, *Lord Howe Is*. 108 (1986).

Slender tree to 20 m high. Leaves 3–4 (–5) m long; petiole 100–167 cm long; pinnae 30–60 cm long, borne horizontally, drooping; central and lower leaves horizontal or drooping from crown and upper leaves ±erect. Inflorescence of 3–5 (–8) similar spikes, c. 1 m long, all enclosed at base by a common prophyll, pendulous; peduncle flattened, 3–5 cm long; spikes 0.7–1.25 m long, each with its own peduncular bract. Male flower creamy brown; stamens 65–100. Fruit ellipsoidal, gradually tapered towards apex, 3–5 cm long, bright or dull red. *Thatch Palm, Kentia Palm* (internationally). Figs 2, 91C–D.

Lord Howe Is. Endemic. On coralline and basalt soils, especially on flat calcarenite sites, from sea-level to about 300 m, often in pure stands. Flowers mid Aug.–late Oct.

L.H.Is.: Erskine Valley, 1920, *J.L.Boorman* (NSW).

2. LEPIDORRHACHIS

Lepidorrhachis (H.Wendl. & Drude) O.F.Cook, *J. Heredity* 18: 408 (1927); from the Greek *lepis* (a scale) and *rhachis*, in allusion to the scales on the rachis of the leaf.

Type: *L. mooreana* (F.Muell.) O.F.Cook

Clinostigma sect. *Lepidorrhachis* H.Wendl. & Drude, *Linnaea* 39: 218 (1875). T: *Clinostigma mooreanum* (F.Muell.) H.Wendl. & Drude

Stout palms with pinnate leaves. Crownshaft short, 15–20 cm long, somewhat loose, deep green with brown scurf; sheathing leaf bases gradually passing into stout petioles. Inflorescences paniculate, much branched, borne below crownshaft; prophyll tubular, 2-keeled; bract perpendicular, tubular, beaked, exserted from the prophyll. Flowers sessile on notched rachillae, in groups of 3, with 2 staminate and 1 pistillate between, the latter developing later. Male flowers: sepals 3, imbricate; petals 3, valvate; stamens 6; pistillode small. Female flowers: sepals and petals 3, both whorls imbricate; staminodes 3; ovary subglobose; stigmas recurved. Fruit a globular drupe; stigma scar lateral.

A monotypic genus endemic to Lord Howe Is.

Lepidorrhachis mooreana (F.Muell.) O.F.Cook, *J. Heredity* 18: 408 (1927)

Kentia mooreana F.Muell., *Fragm.* 7: 101 (1870); *Clinostigma mooreanum* (F.Muell.) H.Wendl. & Drude, *Linnaea* 39: 218 (1875). T: Mt Gower, Lord Howe Island, *C.Moore*; holo: MEL. Named in honour of Charles Moore (1820–1905), Director of the Royal Botanic Gardens, Sydney, 1848–1896, who collected on Lord Howe Is.

Clinostigma moorei F.Muell., *Fragm.* 9: 78 (1875), *nom. nud.* (Apparently based on *Kentia mooreana* F.Muell. although this was not actually stated).

Illustrations: H.E.Moore, *Principes* 10: 19, figs 11–13 (1966); D.L.Jones, *Palms Australia* 122 (1984); I.Hutton, *Lord Howe Is*. 109 (1986).

Palm with sturdy trunk to 2 m tall; leaf scars 1–2 cm apart. Leaves stiff, arcuate, 1–1.5 m long; petiole stout, 20–30 cm long; pinnae 25–40 cm long. Inflorescence 30–50 cm long, spreading stiffly, with 100 or more ultimately slender branches. Male flowers developing first; petals c. twice as long as sepals; anthers dorsifixed; pistillode cylindrical. Female

flowers cream-coloured, 8 mm long. Fruit c. 1 cm diam., red. *Little Mountain Palm, Moorei Palm*. Fig. 91E.

Lord Howe Is. Endemic. Confined to the dwarf forest above 750 m on Mts Gower and Lidgbird. Flowers June–Dec.

L.H.Is.: Mt Gower, *C.Moore 42* (MEL); *loc. id., H.E.Moore 9250 & M.Schick* (NSW).

3. HEDYSCEPE

Hedyscepe H.Wendl. & Drude, *Linnaea* 39: 178, 189, 203, t. 1, fig. 4 (1875); from the Greek *hedys* (pleasant) and *scepe* (a covering) in allusion to the common name Umbrella Palm.

Type: *H. canterburyana* (C.Moore & F.Muell.) H.Wendl. & Drude

Stout palm with pinnate leaves. Crownshaft of tightly closed leaf bases; leaf base and sheath distinct. Inflorescence paniculate; branches stoutish; prophyll tubular, with 2 flat lateral keels; bract simlar to prophyll but not keeled. Flowers sessile, in triads of usually only staminate flowers and paired basally and distally on rachillae; female flowers, when present, between a pair of male flowers. Male flowers; sepals 3, imbricate; petals 3, valvate; stamens 9–12, with anthers versatile; pistillode small. Female flowers developing a year later than male flowers: sepals and petals each 3, imbricate; staminodes 3; ovary spheroidal-conical; stigma entire. Fruit a drupe, ovoid-ellipsoidal, large.

A monotypic genus endemic to Lord Howe Is.

Hedyscepe canterburyana (C.Moore & F.Muell.) H.Wendl. & Drude, *Linnaea* 39: 204 (1875)

Kentia canterburyana C.Moore & F.Muell., *Fragm.* 7: 101 (1870); *Veitchia canterburyana* (C.Moore & F.Muell.) H.Wendl. ex Anon., *Gard. Chron.* 32: 327 (1872). T: Lord Howe Is., *C.Moore & R.D.Fitzgerald*; holo: MEL. Named in honour of J.H.T.Manners-Sutton, 3rd Viscount Canterbury, Governor of Victoria from 1866 to 1873.

Illustrations: A.Blombery & A.N.Rodd, *Palms* 102 (1982); D.L.Jones, *Palms Australia* 116 (1984); I.Hutton, *Lord Howe Is.* 106 (1986).

Palm 3–10 (–15) m high; leaf scars 2–5 cm apart. Crownshaft c. 50 cm long, glaucous. Leaves arcuate, 1.5–2 (–3) m long; petiole short; rachis stout; pinnae 40–60, borne upwards on rachis, 20–30 cm long. Inflorescence arising below crownshaft, 30–40 cm long; prophyll and pedunculate bract caducous; rachis stout, 20–60 cm long, with 30–50 branches. Male flowers ivory-coloured; sepals 4 mm long, acuminate; petals ovate, 8 mm long, acute; filaments 10 mm long. Female flowers purplish black; sepals and petals imbricate; stigma ±sessile. Fruit c. 5 cm long, 4 cm broad, dull red. *Umbrella Palm, Big Mountain Palm*. Fig. 91F.

Lord Howe Is. Endemic. On the upper slopes and summits of Mts Gower and Lidgbird, from about 400 m. Flowers end Mar.–mid July.

L.H.Is.: Goat House, *A.N.Rodd 1865* (NSW); slopes and ridges of Mt Gower, *H.E.Moore 9252 & M.Schick* (NSW); below the Get-Up Place, *A.N.Rodd 1797* (NSW); almost at the top, Mt Gower, *P.S.Green 2331* (K).

4. RHOPALOSTYLIS

Rhopalostylis H.Wendl. & Drude, *Linnaea* 39: 180, t. 2, fig. 2 (1875), from the Greek *rhopalon* (a club) and *stylis* (a small pillar) in allusion to the shape of the rudimentary style in the male flowers.

Type: *R. baueri* H.Wendl. & Drude

Eora O.F.Cook, *J. Heredity* 18: 409 (1927). T: *E. sapida* (H.Wendl. & Drude) O.F.Cook

Pinnate leaved palms. Crownshaft distinct, compact; leaf base and sheath distinct. Inflorescence arising below crownshaft, paniculate, notched; prophyll tubular, with lateral

keels; bract similar to prophyll but not keeled. Flowers sessile, in triads of 2 staminate flowers with 1 pistillate between, or staminate flowers paired basally on rachis and solitary distally, subtended by a small bract. Sepals 3, basally imbricate but valvate at apex. Petals 3. Male flowers: stamens 6, with anthers versatile; ovary rudimentary. Female flowers: staminodes very small; ovary ovoid; stigma short, trifid, persistent. Fruit a globular-ovoid drupe.

A genus of 2 species, 1 on Norfolk Is. and the Kermadec Islands, the other in New Zealand.

Rhopalostylis baueri H.Wendl. & Drude, *Linnaea* 39: 234 (1875)

var. **baueri**

Areca baueri Hook.f., *Bot. Mag.* 94: t. 5735 (1868), *nom. illeg.*; *Kentia baueri* (Hook.f.) Seem., *Fl. Vit.* 269 (1868); *Eora baueri* (H.Wendl. & Drude) O.F.Cook, *J. Heredity* 18: 409 (1927). T: cult. in Hort. Herrnhausen; holo: ?GOET *n.v.* Named in honour of the artist Ferdinand Lucas Bauer (1760–1826) who accompanied Lieutenant M.Flinders on his Australian voyage of exploration and who collected on Norfolk Is. in 1804–1805.

Areca sapida Endl., *Prodr. Fl. Norfolk.* 26 (1833) *non* Sol. ex Hook.f.; *Kentia sapida* (Sol. ex Endl.) Mart., *Hist. Nat. Palm.* 3: 172, t. 151, 152 (1837). T: Norfolk Is., *F.L.Bauer*; holo: ?W *n.v.*, presumably destroyed.

Illustrations: J.D.Hooker, *Bot. Mag.* 94: t. 5735 (1868); A.Blombery & A.N.Rodd, *Palms* 161 (1982); D.L.Jones, *Palms Australia* 239 (1984).

Stout palm to 10 m or more. Crownshaft 50–60 cm long. Leaves 3–4 m long; petiole ±erect, stout, c. 20 cm long; lamina spreading. Inflorescence 30–50 cm long with 50–60 fairly stout branches, creamy white at first, turning green in fruit. Male flowers very pale mauve; sepals very narrow, 2–4 mm long; petals ovate, 5–6 mm long, acuminate, valvate. Female flowers cream; sepals 3–4 mm long, imbricate; petals 5–6 mm long, imbricate. Fruit 12–15 mm long, red. *Norfolk Island Palm, Broom*. Fig. 91G.

Norfolk Is. An endemic variety. Common throughout the National Park.

N.Is.: N side of Mt Bates, *P.S.Green 2385* (K); Mt Pitt, *P.S.Green 2448* (K).

Rhopalostylis baueri var. *cheesemanii* (Becc.) Sykes is endemic to the Kermadec Is.

98. PANDANACEAE

Trees or shrubs with stout prop roots, or woody climbers attached by roots, dioecious. Leaves usually in 3 or 4 spiral ranks, terminal, congested, linear, keeled, tough, parallel-nerved, usually with spinulose keel and margins, sessile; base sheathing. Inflorescence with leafy spathaceous bracts. Perianth absent. Male flowers in a panicle or simple cylindrical spadix, usually individually indistinguishable. Female flowers in a crowded spherical or cylindrical spadix, with or without staminodes; ovary superior, 1-locular, sometimes laterally confluent; ovules 1–many; stigma sessile or very shortly stalked. Fruit a syncarpous berry (*Freycinetia*) shortly cylindrical to spheroid head of woody drupes connate into phalanges (*Pandanus*).

A family of 3 genera and c. 600–700 species, distributed over the Old World tropics and subtropics; 1 genus native on Norfolk Is., and another native on Lord Howe Is.

G.Bentham, Pandaneae, *Fl. Austral.* 7: 147–151 (1878); H.N.Ridley, Pandanaceae, *J. Straits Branch Roy. Asiat. Soc.* 23: 123–140 (1891); O.Warburg, Pandanaceae, *Pflanzenr.* 3, 4(9): 1–99 (1900); U.Martelli, Pandanaceae, *Webbia* 1: 361–371 (1905); H.N.Ridley, Pandanaceae, *J. Straits Branch Roy. Asiat. Soc.* 45: 137–271 (1906); H.St.John, Pandanaceae, *Pacific Sci.* 19: 113–119 (1965); B.C.Stone, Pandanaceae, *Fed. Mus. J.* n. ser. 28: 1–100 (1983); B.C.Stone, Pandanaceae, *Gardens Bull. Singapore* 39(2): 193–202 (1986).

PANDANACEAE

KEY TO GENERA

Climbers; male and female flowers in cylindrical spadices, aggregated in groups of 2–5; fruit a berry **1. FREYCINETIA**

Erect trees with prominent prop roots; male flowers paniculate; female flowers in globose spadices with ovaries connate into clusters (phalanges); fruit a head of phalanges **2. PANDANUS**

1. FREYCINETIA

Freycinetia Gaudich., *Ann. Sci. Nat.* 3: 509 (1824); named after Admiral Henri Louis Claude de Saulces de Freycinet (1779–1842), navigator on the French *Naturaliste* expedition and commander of the *Uranie* expedition, both of which explored the coast of Australia and the Pacific.

Type: *F. arborea* Gaudich.

Woody climbers with adherent and sometimes pendulous aerial roots. Leaves with fragile, membranous, basal auricles. Inflorescences terminal (or lateral), of 2–5, simple, cylindrical spadices, closely grouped and subtended by several green to reddish spathes. Male spadices with sessile, densely congested stamens. Female spadices with densely congested sessile ovaries with minute staminodes; ovules numerous; stigmas 2 or more, sessile, separate or confluent. Fruit fleshy.

A genus of c. 175 or more species from Ceylon to SE Asia, Australasia and the Pacific to Hawaii. One species with an endemic subspecies on Norfolk Is.

B.C.Stone, Materials for a monograph of *Freycinetia* Gaud. XIV. *New Zealand J. Bot.* 11: 241–246 (1973).

Freycinetia baueriana Endl., *Prodr. Fl. Norfolk.* 25 (1883)

subsp. **baueriana**

T: Norfolk Is., *F.L.Bauer*; holo: ?W *n.v.* Named after Ferdinand Lucas Bauer (1760–1826), Austrian botanical artist on Flinders' expedition to Australia, who made the first comprehensive collections of Norfolk Is. plants in 1804–1805.

Illustration: Anon., *Dars-Et* back cover (1976).

Woody climber, attached by roots. Stems 4–5 cm diam. Leaves spirally arranged, c. 1 m long, 2.5–4 cm broad, very long-attenuate. Inflorescence terminal, of 3–5 spadices; spadices solitary in axils of dark to pale salmon pink bracts, cylindrical, 7–9 cm long, covered with tightly packed flowers; peduncles 2–5 cm long. Male flowers of several short stamens around a vestigial ovary. Female flowers with several minute staminodes around base of elongated ovary, c. 3 mm tall; ovaries free but crowded; stigmas 8–14. Individual fruits flattened laterally, 5–6 mm long, 3–4 mm broad. *Mountain Rush, Palm-lily, Screw Palm.* Fig. 92E.

Norfolk Is. An endemic subspecies, frequent in the forested areas. Male plants are much commoner than the relatively rare female.

N.Is.: Mt Bates, 1965, 1968 & 1969, *O.Evans & P.Ralston* (K); 1 km SE of Mt Bates, *I.R.H.Telford 7153* (CBG); Mt Pitt, *I.R.H.Telford 7183* (CBG).

The Norfolk Is. plant is conspecific with the *Freycinetia* from New Zealand which is now considered to be a different subspecies, *F. baueriana* subsp. *banksii* (A.Cunn.) B.C.Stone.

Figure 92. A–D, JUNCACEAE. **A–B**, *Luzula longiflora*. **A**, habit; **B**, inflorescence (**A–B**, P.Green 1611, K). **C–D**, *Juncus continuus*. **C**, portion of infructescence; **D**, habit (**C–D**, P.Green 2419, K). **E–H**, PANDANACEAE. **E**, *Freycinetia baueriana* subsp. *baueriana*, female inflorescence (photographs). **F–H**, *Pandanus forsteri*. **F**, habit (photographs); **G**, phalange, apical view; **H**, phalange, lateral view (**G–H**, I.Hutton 489, K). Scale bars: **A**, **D, E** = 10 cm; **B**, **C**, **G**, **H** = 1 cm; **F** = 1 m. Drawn by C.Grey-Wilson.

2. PANDANUS

Pandanus Parkinson, *J. Voy. South Seas* 46 (1773). The name is the Latinised version of the Malay name, *pandan*, for one of the species.

Type: *P. tectorius* Parkinson

Erect trees or shrubs, simple or branched, supported by prop roots. Leaves terminal, crowded in 3 or 4 spiral series. Inflorescences enclosed in spathaceous bracts, the male paniculate, the female of globose, elliptical or cylindrical spadices. Male flowers congested, sessile, often individually indistinguishable, sessile or shortly stalked. Female flowers densely crowded, carpels solitary or several grouped together in phalanges, each 1-ovulate; stigmas sessile or very shortly stalked. Fruit often large, breaking up into numerous, usually woody phalanges.

A large genus of 600 or more species, native in the Old World tropics. Commonly known as Screw Pines. One species is native to Lord Howe Is.

In addition to *P. forsteri*, *Pandanus pedunculata* R.Br. of Australia once grew on Lord Howe Is. It occurred as a single tree in the North Bay and presumably grew there from water-borne seed. However, it never propagated itself and died in 1975. It is represented by specimens in MEL (*J.D.McComish 120* and *R.D.Hoogland 8692*) and is presumably the basis of *P. hemsleyanus* Martelli (*Webbia* 4: 16, 1913).

Pandanus forsteri C.Moore & F.Muell. in F.J.H. von Mueller, *Fragm.* 8: 220 (1874)

T: Lord Howe Is., *C.Moore* and *J.P.Fullagar*; syn: MEL; isosyn: K. Named in honour of either J.R.Forster (1729–1798) or J.G.A.Forster (1754–1794), German botanists, father and son, who accompanied Captain James Cook as naturalists on his second voyage (1772–1775).

Pandanus moorei F.Muell., *Syst. Census Austral. Pl.* 140 (1882), *nom. nud.*

Illustrations: F.Muell., *Fragm.* 7: t. 61 (1870); H.F.Recher & S.S.Clark, *Environm. Survey Lord Howe Is.* 33 (1974); I.Hutton, *Lord Howe Is.* 115 (1986).

Trees to 13 m tall with numerous sharp wart-like outgrowths. Prop roots up to 5 m long. Leaves strap-shaped, 1–1.5 m long, 3–5 cm broad, very long pointed, deeply grooved above, sharply spinulose on margins and midrib beneath. Male inflorescences terminal, 30–50 cm long, with white spathaceous bracts. Female inflorescences terminal, in compound spheroidal heads. Fruit spheroidal, c. 20 cm diam., reddish green; phalanges slightly obconoid, 5 cm long, 4 cm broad, each surmounted by 4 or 5 conical remains of carpel apices; walls hard and fibrous. *Forky-Tree, Pandanus*. Fig. 92F–H.

Lord Howe Is. An unmistakable endemic species which is common and locally frequent from low elevations to about 400 m altitude. Flowers Jan.–mid Apr.

L.H.Is.: W side of Old Settlement Beach, *A.N.Rodd 3582* (NSW); behind North Beach, *J.Pickard 3348* (NSW).

99. ARACEAE

Perennial herbs or somewhat woody climbers. Leaves alternate, simple or variously compound, parallel or net-veined. Inflorescence of spadix and large spathe; flowers small, sessile, crowded, bisexual or unisexual, often with pistillate flowers in lower part of spadix and staminate above, perhaps with sterile flowers in between. Perianth reduced, absent or 4–6, free or united. Stamens 4–6, free or coherent. Ovary superior, 1–many locular with 1–many ovules per locule. Fruit a berry.

A mainly tropical family but also found in temperate regions; c. 110 genera and over 2000 species. Three genera introduced on Norfolk Is., 1 of which is also introduced on Lord Howe Is.

G.Bentham, Aroideae, *Fl. Austral.* 7: 151–158 (1878); C.A.Backer & R.C.Bakhuizen van den

Brink Jr, Araceae, *Fl. Java* 3: 100–126 (1968); D.H.Nicolson in A.C.Smith, Araceae, *Fl. Vit. Nova* 1: 438–460 (1979); S.J.Mayo, *Fl. Mascareignes* 192: 1–29 (1984); S.J.Mayo, *Fl. Trop. E. Africa*, Araceae 1–71 (1985).

KEY TO GENERA

1 Leaves without clear marginal veins, not peltate; spathe usually pure white **1. ZANTEDESCHIA**

1: Leaves with 1–4 clear marginal veins

2 Spathe usually yellowish green, with sterile terminal portion; leaves peltate, sometimes only slightly so **2. COLOCASIA**

2: Spathe usually greenish white, covered with flowers to the apex; leaves not peltate **3. XANTHOSOMA**

1. ZANTEDESCHIA

Zantedeschia Spreng., *Syst. Veg.* 3: 756 (1826), *nom. cons.*, named in honour of the Italian botanist, Giovanni Zantedeschi (1773–1846).

Type: *Z. aethiopica* (L.) Spreng.

Perennial, rhizomatous herbs. Leaves with long erect petiole; lamina cordate-hastate or ovate-cordate to lanceolate. Spathe showy, white, yellow or pink, persistent, with margins overlapping at base; spadix with a basal pistillate zone contiguous with an upper male zone of free stamens, without a sterile terminal appendix. Pistillate flowers without perianth (surrounded by staminodes in *Z. aethiopica*); ovary 2–5-locular; ovules 2–4 per locule, axile.

A genus of 6 species in southern Africa; several are cultivated as ornamentals. One species naturalised on Norfolk Is.

***Zantedeschia aethiopica** (L.) Spreng., *Syst. Veg.* 3: 765 (1826)

Calla aethiopica L., *Sp. Pl.* 2: 968 (1753). T: cultivated, Herb. Hort. Cliff. 435, *Calla* 1; lecto: BM, *fide* C.Letty, *Bothalia* 11: 9, fig. 3 (1973). The epithet means that it comes from Ethiopia, a name which in early days was often used for most of Africa.

Illustrations: B.Everard & B.D.Morley, *Wild Fl. World* t. 88/D (1970); A.B.Graf, *Exotica* 4: 301–302 (1982); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1997, fig. 916 (1986).

Evergreen, erect, clump-forming herb, 1–1.5 m high. Leaves slightly leathery; lamina hastate or ovate–cordate, 15–40 cm long, without clear marginal veins. Spathe pure white, widely spreading, narrowed towards the arched apex; spadix bright yellow. *Arum Lily*.

Norfolk Is. Naturalised beside one or two streams; an escape from cultivation. A native of southern Africa.

N.Is.: streamside between Cascade and Bird Rock, 1971, *P.S.Green* (photo K).

2. COLOCASIA

Colocasia Schott in H.W.Schott & S.F.L.Endlicher, *Melet. Bot.* 18 (1832), *nom. cons.*; from the Greek *kolokasion*, the name used by Dioscorides for the edible root of the Lotus, *Nelumbo nucifera* Gaertn.

Type: *C. antiquorum* Schott

Erect tuberous herbs. Leaves petiolate, peltate, ovate-cordate or sagittate. Lower part of spathe persistent, upper part soon withering; spadix with four zones, lowermost of pistillate flowers, above them sterile, then staminate flowers and above these a naked appendix.

Stamens 3–6, coherent. Pistillate flowers 3- or 4-locular; ovules numerous, parietal. Fruit a many-seeded berry.

About 8 species from Indo-Malesia and Polynesia. One naturalised species occurring on both Islands.

***Colocasia esculenta** (L.) Schott in H.W.Schott & S.F.L.Endlicher, *Melet. Bot.* 18 (1832)

Arum esculentum L., *Sp. Pl.* 2: 965 (1753). T: America, H.Sloane, *Voy. Jamaica* 1: 167, t. 106, fig. 1 (1723); lecto, *fide* D.H.Nicolson in A.C.Smith, *Fl. Vit. Nova* 1: 456 (1979). So named because of its edible tubers.

Colocasia antiquorum Schott in H.W.Schott & S.F.L.Endlicher, *Melet. Bot.* 18 (1832); *Arum colocasia* L., *Sp. Pl.* 2: 965 (1753). T: Asia, *coll. unknown*; lecto: LINN 1079.4, *fide*, D.H.Nicolson in A.C.Smith, *Fl. Vit. Nova* 1: 457 (1979); IDC microfiche 177/2.649/2.

Illustrations: L.H.Bailey, *Stand. Cycl. Hort.* 2: 830 (1914); B.E.Nicholson, *Oxford Book Food Pl.* 181, fig. 3 (1969); A.Hay in G.J.Harden, *Fl. New South Wales* 4: 34 (1993).

Perennial, robust herb to 1 m high or more. Leaves with long erect petiole; lamina ovate-cordate, peltate, sometimes only just so, 20–50 cm long, entire, acute with small apiculus, with 1–4 clear marginal veins. Spathe 15–30 cm long, rolled inwards, constricted above pistillate flowers, yellowish green; spadix $^1/_3$–$^1/_2$ length of spathe, terminal appendix naked, often short.

Norfolk Is., Lord Howe Is. Cultivated on Norfolk Is. and suggested by J.H.Maiden (*Proc. Linn. Soc. New South Wales* 28: 723, 1904) as possibly growing there and naturalised before the 1788 settlement, but this is disputed by R.M.Laing (*Trans. & Proc. New Zealand Inst.* 47: 19–20, 1915). On Lord Howe Is. it is naturalised from cultivation here and there.

N.Is.: Ball Bay area, *W.R.Sykes NI 442* (CHR); Melanesian Mission Chapel, *W.R.Sykes NI 662* (CHR); Bumbora, *W.R.Sykes NI 848* (CHR). **L.H.Is.:** swamp behind 'Pine Trees', *J.Pickard 3335* (NSW); 100 m SE of 'Pine Trees', *A.N.Rodd 1436 & J.Pickard* (NSW).

Grown as a food plant throughout the Old World Tropics and commonly known as Taro.

3. XANTHOSOMA

Xanthosoma Schott in H.W.Schott & S.F.L.Endlicher, *Melet. Bot.* 19 (1832); the name is derived from the Greek *xanthos* (yellow) and *soma* (a body), in allusion to the yellow inner tissue of the tubers of some species.

Type: *X. sagittifolium* (L.) Schott

Perennial herbs with tuberous rhizomes and usually milky sap. Leaves petiolate, sagittate or hastate. Lower part of spathe persistent, upper part withering; spadix with 3 zones, pistillate basally, then with sterile flowers, then staminate to apex. Stamens 4–6, coherent. Pistillate flowers 2–4-locular; ovules numerous, axillary. Fruit a many-seeded berry.

A genus of perhaps 40 species, distributed in the New World tropics, some species of which are widely cultivated for ornament or for food. One naturalised species on Norfolk Is.

***Xanthosoma sagittifolium** (L.) Schott in H.W.Schott & S.F.L.Endlicher, *Melet. Bot.* 19 (1832)

Arum sagittifolium L., *Sp. Pl.* 2: 966 (1753). T: America, Jamaica, H.Sloane, *Voy. Jamaica* 1: 167, t. 106, fig. 2 (1707); lecto, *fide* R.A.Howard, *J. Arnold Arbor.* 60: 289 (1979). The epithet refers to the sagittate, or arrow-shaped, leaves.

Illustrations: W.J.Hooker, *Bot. Mag.* 83: t. 4989 (1857); R.A.Howard, *Fl. Lesser Antilles* 3: 399 (1979).

Robust herb, at first stalkless, later with erect, thick stalk to 1 m or more tall. Leaves with petiole to 1 m long; lamina broadly sagittate, 40–80 cm long, 30–70 cm broad, with 1–4 clear marginal veins; upper lobe twice as long as lateral lobes. Inflorescence peduncles to c. 20 cm long; spathe 13–15 cm long, usually greenish white; lower portion ovoid and 6–7 cm long,

constricted above pistillate flowers. Spadix staminate to apex, c. $^{2}/_{3}$–$^{3}/_{4}$ as long as spathe.

Norfolk Is. This species has established itself on the Island as an escape from cultivation near the Melanesian Mission. The exact origin of *Xanthosoma sagittifolium* is uncertain but it is now commonly cultivated throughout the tropics.

N.Is.: below Mission Rd, *W.R.Sykes NI 1031* (CHR).

100. COMMELINACEAE

Annual or perennial herbs, usually succulent; stems jointed. Leaves alternate, with sheaths. Inflorescence usually a cincinnus, sometimes compound umbellate, spicate or paniculate, or rarely flowers solitary. Flowers actinomorphic or zygomorphic, bisexual. Sepals 3, scarious or herbaceous. Petals 3, coloured or white, equal or unequal, free or ±connate, ephemeral or deciduous. Stamens 6, or 3 by abortion and with the others represented by staminodes, rarely only 1 fertile. Ovary superior, usually 3-locular; ovules1–few per locule. Fruit usually a thin-walled, loculicidal capsule, rarely fleshy and indehiscent.

A family containing c. 40 or more genera and perhaps 1000 species which are mainly tropical or subtropical, distributed throughout the world. One native genus on both Norfolk Is. and Lord Howe Is., and 2 introduced genera on Lord Howe Is.

G.Bentham, Commelynaceae, *Fl. Austral.* 7: 81–92 (1878); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Commelinaceae, *Fl. Java* 3: 12–22 (1968); A.C.Smith, Commelinaceae, *Fl. Vit. Nova* 1: 277–283 (1979).

KEY TO GENERA

1	Flowers zygomorphic; stamens 3; staminodes 3, cruciform	**1. COMMELINA**
1:	Flowers actinomorphic; stamens 6, all similar	
2	Inflorescence branched, sheathing bracts inconspicuous	**2. CALLISIA**
2:	Inflorescence short, in paired, boat-shaped, leafy, sheathing bracts	**3. TRADESCANTIA**

1. COMMELINA

Commelina L., *Sp. Pl.* 1: 40 (1753); *Gen. Pl.* 5th edn, 25 (1754); named after the two early Dutch botanists Johan & Caspar Commelin and Caspar's son, representing the two showy petals and a third which is not conspicuous.

Type: *C. communis* L.

Annual or perennial herbs. Leaves sessile or slightly stalked. Inflorescence leaf-opposed, of 1 or 2 cincinni enclosed in a spathaceous bract. Flowers zygomorphic. Perianth segments unequal; sepals usually green. Upper petals generally blue, delicate; lower petal reduced. Fertile stamens 3; staminodes 3, with cruciform anthers. Ovary 3-locular; ovules 1 or 2 per locule. Fruit a dehiscent capsule.

A mainly pantropical genus of 200–250 species. One species native (or possibly introduced) to both Islands.

Commelina cyanea R.Br., *Prodr.* 269 (1810)

T: Port Jackson, New South Wales, *R.Brown*; holo: BM. So named from the Greek *kyanos*, a dark blue substance, in allusion to the flower colour.

[*Commelina communis auct. non* L.: F.J.H. von Mueller, *Fragm.* 8: 59 (1873)]

Illustrations: T.Y.Harris, *Wild Fl. Australia* 8th edn, t. 8 (1979); W.R.Elliot & D.L.Jones, *Encycl. Austral. Pl.* 3: 62 (1984); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 4: pl. 19 (1993).

Weak, procumbent herb, rooting at nodes, almost glabrous. Leaves lanceolate or broadly lanceolate, 3–7 cm long. Spathe enclosing flowers folded, 15–22 mm long, cordate-rounded at base, acuminate, green. Flowers intense blue, 12–15 mm diam. Staminodes yellow. *Forget-Me-Not* (N.Is.), *Wandering Jew*.

Norfolk Is., Lord Howe Is. In open habitats often near the sea, frequently weedy, possibly introduced. Also found in Australia (Qld, N.S.W.).

N.Is.: Banana Valley, *R.M.Laing* (CHR); Cascade, *W.R.Sykes NI 156* (CHR); New Cascade Rd, *W.R.Sykes NI 611* (CHR). **L.H.Is.:** Blinky Beach, *A.C.Beauglehole 5488* (CANB, MEL); just N of Salmon Beach, *A.N.Rodd 1437* (K, NSW); Rabbit Is., *A.N.Rodd 1816* (K, NSW).

2. CALLISIA

Callisia Loefl., *Iter. Hispan.* 305 (1758); from the Greek *kallos* (beautiful) in allusion to the charm of the plant described.

Type: *C. repens* L.

Perennial herbs. Leaves usually succulent. Inflorescence spicate or paniculate; bracts resembling the bracteoles, not leaf-like. Flowers actinomorphic. Sepals scarious or green. Petals with or without expanded upper portion, usually white or pink. Stamens all similar, 6 or 1–3; filaments usually glabrous. Ovary (2 or) 3-locular; ovules 1 or 2 per locule. Fruit a dehiscent capsule.

A genus of c. 20 species native to tropical America. Two or three are widespread in cultivation as ornamentals. One species is introduced to Lord Howe Is.

*Callisia fragrans (Lindl.) Woodson, *Ann. Missouri Bot. Gard.* 29: 154 (1942)

Spironema fragrans Lindl., *Edward's Bot. Reg.* 26: t. 47 (1840). T: cultivated, origin Mexico; holo: ?CGE *n.v.* The epithet refers to the sweetly fragrant flowers.

Illustrations: J.Lindley, *Edward's Bot. Reg.* 26: t. 47 (1840), as *Spironema fragrans*; O.Degener, *Fl. Hawaiiensis* 1: 62 (1932), as *Rectanthes fragrans*; A.B.Graf, *Exotica* 12th edn, 1: 787 (1985).

Stout fleshy herb to 1.5 m tall, spreading by strong stolons. Leaves sessile, elliptic-lanceolate, 25–30 cm long, acute. Inflorescence terminal, paniculate, to 50 cm or more long. Flowers clustered, sweetly fragrant or inodorous. Sepals scarious. Petals 5 mm long, white. Stamens 6, projecting from the petals; connective broad; filaments glabrous. Ovary 3-locular.

Lord Howe Is. A large colony has established itself on the Island as a garden escape beside Anderson Rd. A native of Mexico.

L.H.Is.: Anderson Rd, *J.G.Conran 642* (K, NSW).

3. TRADESCANTIA

Tradescantia L., *Sp. Pl.* 1: 288 (1753); *Gen. Pl.* 5th edn, 139 (1754); named in honour of John Tradescant (1608–1662), gardener to King Charles I of England.

Type: *T. virginiana* L.

Perennial herbs, erect or prostrate. Leaves cauline or basal. Inflorescence an axillary or terminal cincinnus or compoundly umbellate, short, in paired, equal or unequal boat-shaped leafy bracts. Flowers few to many, actinomorphic. Sepals green or coloured. Petals free or connate, blue, red, magenta or white. Stamens 6, all fertile, often with hairy filaments. Ovary 3-locular, with 2 ovules per locule. Fruit a dehiscent capsule.

A New World genus of c. 60 species; 3 species naturalised on Lord Howe Is.

1 Plant with ±trailing stem; leaves 2–7 cm long, spaced along stem

2 Leaves green: flowers white; petals free **1. T. fluminensis**

2: Leaves green tinged with purple-red, especially beneath; flowers purple-magenta; base of petals forming a white tube **2. T. zebrina**

1: Plant with short, erect stem; leaves 20–35 cm long, crowded basally **3. T. spathacea**

1. *Tradescantia fluminensis Vell., *Fl. Flumin.* 140 (1825); 3: t. 152 (1835)

T: Brazil, *J.M. da C. Vellozo* (?); holo: ?R *n.v.* So named from the Latin *flumen* (river), referring to the Rio de Janeiro, Brazil.

Tradescantia albiflora Kunth, *Enum. Pl.* 4: 84 (1843). T: cult. Berlin; holo: ?B *n.v.* probably destroyed.

Illustrations: A.B.Graf, *Exotica* 12th edn, 1: 781, 785, 786 (1985); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 4: 257 & pl. 19 (1993), as *T. albiflora*.

Trailing perennial. Stem succulent, prostrate or ascending, rooting readily. Leaves spaced along stem; petiole c. 2 mm long, passing into basal ciliate sheath; lamina narrowly ovate to lanceolate, 3–7 cm long, acute, green. Inflorescence axillary, subumbellate, from 2 unequal leaf-like boat-shaped bracts; pedicels 3–15 mm long, slender. Petals ovate, 7–10 mm long, delicate, acute, free, white.

Lord Howe Is. Escaped from cultivation in a few places. Native to South America.

L.H.Is.: 400 m SE of Signal Point, *J.Pickard 3476* (NSW).

2. *Tradescantia zebrina Hort. ex Bosse, *Vollst. Handb. Blumengartnerei* 2nd edn, 4: 655 (1849)

T: a cultivated plant, not traced. The epithet means zebra-striped, in allusion to the usually striped leaves.

Zebrina pendula Schnitzl., *Bot. Zeitung*. (*Berlin*) 7: 870 (1849). T: as for *T. zebrina*.

Illustrations: B.Everard & B.D.Morley, *Wild Fl. World* t. 187D (1970); V.H.Heywood, *Fl. Pl. World* 280, fig. 3 (1978); A.B.Graf, *Exotica* 12th edn, 1: 781, 783 (1985); all as *Zebrina pendula*.

Creeping and pendulous, succulent herb, rooting readily at nodes; stems, leaves and floral bracts tinged with purple-red. Leaves spaced along stem; petiole c. 2 mm long, passing into basal ciliate sheath; lamina ovate, 2–5 cm long, green tinged with purple-red, especially beneath, usually with c. 3 darker, broad, longitudinal stripes. Inflorescence terminal, of 2 short cincinni subtended closely by 2 leaf-like bracts. Petals ovate, 10–12 mm long, delicate, connate in lower half into a narrow white tube, purple-magenta.

Lord Howe Is. Escaped from cultivation in one or two shady places on the Island. Probably a native of Mexico.

L.H.Is.: Anderson Rd, *A.N.Rodd 3605* (NSW); Stevens Reserve, *J.Pickard 3326* (NSW).

3. *Tradescantia spathacea Sw., *Prodr.* 57 (1788)

T: West Indies, cult. Jamaica, *O.Swartz*; holo: ?S *n.v.* So named because of the spathe-like bracts enclosing the flowers.

Illustrations: A.B.Graf, *Exotica* 12th edn, 1: 779 (1985); A.B.Graf, *Tropica* 3rd edn, 307 (1986); V.H.Heywood, *Fl. Pl. World* 280, fig. 5 (1978); all as *Rhoeo spathacea*.

Erect herb. Stem short, stoutish, to c. 20 cm high. Leaves crowded basally, ±erect, sessile; lamina linear-lanceolate, 20–35 cm long, long-acuminate, dark green above, purple beneath. Inflorescence axillary, circinnate; flowers many, scarcely projecting from bracts. Petals ovate, 8–9 mm long, free, white.

Lord Howe Is. This species has established itself on the Island in disturbed forest near houses. A native of Central America, it is now widely cultivated, often under the old, incorrect name of *Rhoeo discolor*.

L.H.Is.: Lagoon Rd, *J.Conran 632* (K, NSW).

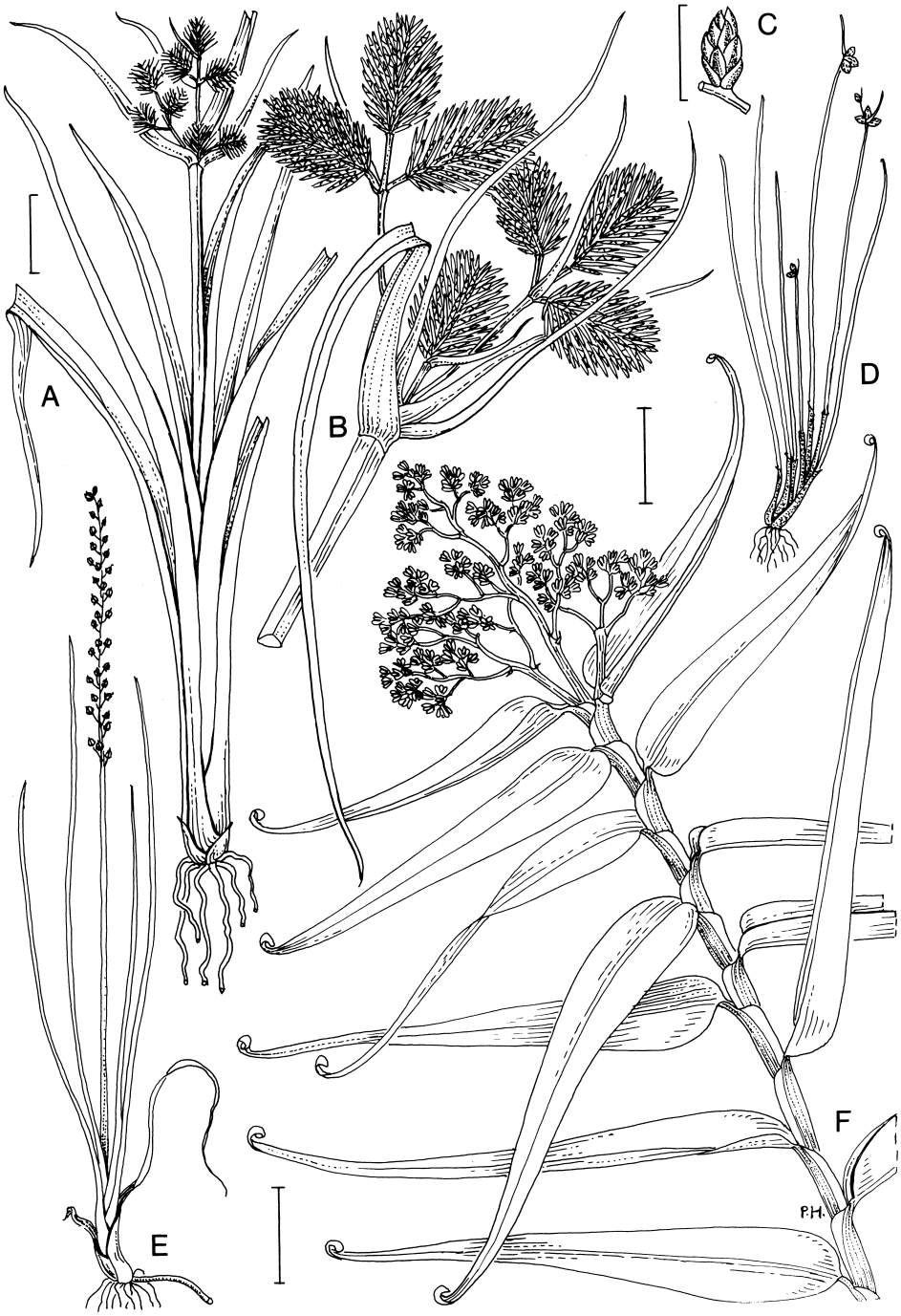

Figure 93. A–D, CYPERACEAE. **A–B**, *Cyperus lucidus*. **A**, habit (J.Game 69/227, K); **B**, inflorescence (G.Uhe 1301, K). **C–D**, *Isolepis inundata*. **C**, spikelet; **D**, habit (**C–D**, F.Bauer, K). **E**, JUNCAGINACEAE: *Triglochin striata*, habit (J.McComish 190, K). **F**, FLAGELLARIACEAE: *Flagellaria indica*, habit (J.McComish 116, K). Scale bars: **A** = 10 cm; **B**, **D**, **E**, **F** = 2 cm; **C** = 5 mm. Drawn by P.Halliday.

This species is sometimes separated from *Tradescantia* to form the monotypic genus *Rhoeo*. In treating *Rhoeo* as part of *Tradescantia* I follow D.R.Hunt (*Kew Bull*. 41: 401–405, 1986) who reviewed the New World Commelinaceae.

101. FLAGELLARIACEAE

Strong, cane-like climbers. Stems sometimes dichotomously branched, solid, covered with tubular leaf-sheaths. Leaves alternate, grass-like, with a coiled apical tendril, rolled in bud. Inflorescence terminal, branched. Flowers small, actinomorphic, bisexual, sessile. Perianth 3 + 3, ±petaloid when young, persistent. Stamens 3 + 3, anthers basifixed. Ovary superior, 3-locular; ovule 1 per locule, axile; styles 3, persistent. Fruit drupaceous, ±fleshy, 1–3-seeded, indehiscent, dull white to reddish brown.

A monogeneric family of the tropical Old World with 4 species from Indo-Malaysia to Australia and the Pacific; native on Lord Howe Is.

G.Bentham, Liliaceae, *Fl. Austral*. 7: 10–11 (1878).

FLAGELLARIA

Flagellaria L., *Sp. Pl.* 1: 333 (1753); *Gen. Pl.* 5th edn, 156 (1754); from the Latin *flagellaris* (whip-like), in allusion to the coiled apex of the leaves.

Type: *F. indica* L.

Flagellaria indica L., *Sp. Pl.* 1: 333 (1753)

T: tropical Asia; lecto: LINN 463.1; *fide* D.M.Napper in E.Milne-Redhead & R.M.Polhill (eds), *Fl. Trop. E. Africa*, Flagellariaceae 3 (1971), IDC microfiche 177/2.242/18. Named after the Indies, whence it was first known.

Illustrations: B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 375, fig. 221a–c (1983); I.Hutton, *Lord Howe Is*. 110 (1986); J.Brock, *Top End Native Pl*. 191 (1988).

Climber reaching to tops of trees. Stems dichotomously branched. Leaves gradually tapered from base, 7–50 cm long, 1–3 cm broad, with numerous parallel veins. Inflorescence paniculate, much branched, conical, (6–) 8–12 cm long. Perianth segments c. 2 mm long, cream or whitish, membranous. Anthers 1.5 mm long, exserted. Ovary c. 2 mm long; stylar arms exserted, 2 mm long. Fruit globular, c. 6 mm diam., dull white to reddish brown. *Cane, Bush Cane*. Fig. 93F.

Lord Howe Is. Common in lowland and low montane forest. Distributed from Fiji westward to eastern and northern Australia, Malesia and SE Asia. Flowers late spring and summer.

L.H.Is.: ridge running S from Malabar, *J.Pickard NSW 123733* (K, NSW); E end of Neds Beach, *G.Uhe 1243* (K); W and E side of Mt Lidgbird, *A.C.Beauglehole 5700 & 5701* (MEL); Big Slope, *M.J. de S.Disney NSW 123732* (K, MEL, NSW).

CENTROLEPIDACEAE

There are two small dried specimens of *Centrolepis strigosa* (R.Br.) Roem. & Schult. in the Smith Herbarium at LINN, No. 146.27, labelled 'Norfolk Island, Herb. Banks', and a further specimen in the Smith Herbarium at LIV (with an unpublished *Eriocaulon* name appended). This species is known from most States and Territories of Australia and from New Zealand, but because neither Bauer nor Cunningham recorded it when they spent some time on Norfolk Is., and it has never been found there subsequently, it must be concluded that these three specimens have been mislabelled.

102. JUNCACEAE

Herbs, usually perennial. Leaves narrow, often all basal, sometimes reduced to a basal sheath. Inflorescences cymose, usually a contracted panicle, or flowers in clusters. Flowers actinomorphic, bisexual. Perianth 3 + 3, glumaceous, persistent. Stamens 3 or 6; anthers 2-locular; pollen in tetrads. Ovary superior, 1- or 3-locular with 1–many anatropous, axile or parietal ovules; styles 3, or 1 with trifid stigma. Fruit a loculicidal capsule. Seeds small.

A family with c. 9 genera and 400 species, mostly native in the temperate or cold regions of the world. 1 genus with both native and introduced species on Norfolk Is. and 1 native and 1 introduced genus on Lord Howe Is.

G.Bentham, Juncaceae, *Fl. Austral.* 7: 92–132 (1878); E.Edgar in L.B.Moore & E.Edgar, Juncaceae, *Fl. New Zealand* 2: 55–79 (1970).

KEY TO GENERA

Leaves glabrous, cylindrical, flat and narrow, or reduced to basal sheaths; capsule many-seeded **1. JUNCUS**

Leaves with sparsely hairy margins, flat, grass-like; capsule 3-seeded **2. LUZULA**

1. JUNCUS

Juncus L., *Sp. Pl.* 1: 325 (1753); *Gen. Pl.* 5th edn, 152 (1754); the Latin name for a rush.

Type: *J. acutus* L.

Perennial or more rarely annual herbs, tufted and/or rhizomatous. Leaves flat or cylindrical with basal sheaths and often internal transverse septa, or sometimes reduced to basal sheaths, if cylindrical then channelled or laterally compressed. Inflorescence much branched, or condensed into a ±compact head; lowermost bract sometimes longer than panicle and appearing as a continuation of stem. Outer perianth segments acute to lanceolate-acuminate; inner segments acute, occasionally ±obtuse. Stamens 3 or 6. Ovary 3-locular (elsewhere sometimes 1-locular); placentation parietal. Seeds numerous, small.

A widespread genus of c. 300 species, chiefly of damp or wet habitats in temperate or cold regions; 1 native and 3 introduced species on Norfolk Is., 3 introduced species on Lord Howe Is.

1 Leaves reduced to basal sheaths, stems functioning as leaves, cylindrical, stiff; inflorescence appearing as though lateral

2 Habit stout, with stem just below inflorescence 3–6 mm diam.; perianth 2.6–3.5 mm long; capsule 2.8–3.5 mm long **1. J. pallidus**

2: Habit slender, with stem just below inflorescence 1.5–3 mm diam.; perianth 1.5–2.5 mm long; capsule 2–2.5 mm long

3 Pith of stem, in longitudinal section, continuous **2. J. continuus**

3: Pith of stem, in longitudinal section, interrupted **3. J. aridicola**

1: Leaves cylindrical but ±laterally compressed, or flat; with or without transverse septae; inflorescence terminal

4 Leaves 0.5–1 mm broad, laterally compressed with evident transverse septa; plant (15–) 25–50 cm **4. J. articulatus**

4: Leaves 0.5 mm or less broad, filiform, without septa; plant 2–25 (–30) cm high **5. J. bufonius**

1. *Juncus pallidus R.Br., *Prodr*. 258 (1810)

T: south coast, Australia, *R.Brown*; holo: BM. So called from the pale or pallid aspect of the flowers.

[*Juncus maritimus auct. non* Lam.: W.B.Hemsley, *Ann. Bot.* (*London*) 10: 254 (1896)]

Illustrations: J.T.Salmon, *New Zealand Fl. & Pl. Colour* 104, t. 317 (1936); E.Edgar, *New Zealand J. Bot.* 2: 181, fig. 1, 192, fig. 15 (1964); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1807, fig. 821G (1986).

Stems robust, functioning as leaves, cylindrical, 1–2 m high, 3–6 mm diam. just below inflorescence, stiff, tufted, rhizomatous; pith continuous. Leaves reduced to basal sheaths. Inflorescence apparently lateral, many-flowered, contracted or effuse, 6–20 cm long; pedicels relatively stout. Perianth segments 2.6–3.5 mm long, acute, pale; inner segments very slightly shorter. Stamens 6. Capsule 2.8–3.5 mm long, slightly but clearly larger than perianth.

Lord Howe Is. East of Lovers Bay. A native of New Zealand and throughout Australia except N.T. and Qld; probably introduced to Lord Howe Is.

L.H.Is.: E of Lovers Bay, *A.C.Beauglehole 5762* (CANB).

2. Juncus continuus L.A.S.Johnson in J.M.Black, *Fl. S. Australia* 3rd edn, 1: 325 (1978)

T: Sailors Bay, Northbridge, N.S.W., *L.A.S.Johnson NSW48976*; holo: NSW; iso: K. So named because of the stem's continuous pith in longitudinal section.

Illustrations: J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1807, fig. 821F (1986); K.L.Wilson, L.A.S.Johnson & P.Bankoff in G.J.Harden, *Fl. New South Wales* 4: 276 (1993).

Stems slender, functioning as leaves, cylindrical, 0.6–1.4 m high, 2–3 mm diam. below inflorescence, stiff, tufted, rhizomatous, with occasional stems not flowering; pith continuous in longitudinal section. Leaves reduced to basal sheaths. Inflorescence apparently lateral, many-flowered, dense or effuse, 2–10 (–14) cm long; pedicels very slender. Perianth segments 1.5–2 mm long, acute, pale; inner perianth segments only slightly shorter than outer. Stamens 3. Capsule 2–2.5 mm long, slightly longer than perianth. Fig. 92C–D.

Norfolk Is. In marshy creeks and Cascade Valley swamps. A native of Australia (S.A.?, Qld, N.S.W., N.T.). Possibly introduced to Norfolk Is.

N.Is.: Broken Bridge Ck, *P.Ralston 57 & 58* (CHR); Harpers Rd, *W.R.Sykes NI 612* (CHR); near Old Melanesian Chapel, *W.R.Sykes NI 470* (CHR); *s. loc.*, *J.D.McComish 153* (NSW).

3. *Juncus aridicola L.A.S.Johnson in J.M.Black, *Fl. S. Australia* 3rd edn, 1: 322 (1978)

T: c. 20 miles [32 km] E of Matakana (c. 1.5 km E of crossroad to Lake Cargellico), 16 Apr. 1970, N.S.W., *L.A.S.Johnson NSW 105140*; holo: NSW *n.v.*, *fide* L.A.S.Johnson, *loc. cit*. The epithet comes from the Latin *aridus* (dry) plus the suffix *-icola* (inhabitant of), alluding to the dry habitats in which this species is found.

[*Juncus polyanthemus auct. non* Buchenau: S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 22 (1981); J.Pickard, *J. Biogeogr*. 11: 204 (1984)]

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 179 (1981), as Tussock Rush; J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1809, fig. 822E (1986); K.L.Wilson, L.A.S.Johnson & P.Bankoff in G.J.Harden, *Fl. New South Wales* 4: 280 (1993).

Stems slender, functioning as leaves, cylindrical, 0.6–1.2 m high, 1.5–3 mm diam. just below inflorescence, stiff, tufted, rhizomatous, with occasional stems not flowering; pith interrupted in longitudinal section. Leaves reduced to basal sheaths. Inflorescence apparently lateral, many-flowered, ±effuse, 5–8 (–10) cm long; pedicels very slender. Perianth segments 2–2.5 mm long, acute, pale; inner perianth segments the same length as or only slightly shorter than outer. Stamens 3. Capsule 2–2.5 mm long, equal to or slightly longer than perianth.

Lord Howe Is. In marshy 'grassland' near Lagoon Road. Native to Australia (all mainland States). Probably introduced to Lord Howe Is.

L.H.Is.: Lagoon Rd, S of airstrip, *J.Pickard 2715* (NSW).

4. *Juncus articulatus L., *Sp. Pl.* 1: 327 (1753)

T: not designated. So named from the septa or 'articulations' in the leaves.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 30: 19 (1973); A.J.Healy & E.Edgar, *Fl. New Zealand* 3: 88 (1980); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1811, fig. 823C (1986).

Perennial, ascending or prostrate, often creeping, (15–) 25–50 cm high. Stems with 2–7 leaves. Leaves laterally compressed, 0.5–1 mm broad, distinctly transversely septate. Inflorescence terminal, paniculate, branching, much longer than basal leafy bracts. Flowers ±sessile, (2–) 4–10 in compact heads. Perianth segments all 3 mm long, acute. Stamens 6. Capsule elongate-ovoid, acuminate, longer than perianth, dark brown.

Norfolk Is. In the Melanesian Mission swamp. A native of Eurasia and eastern North America, and widely introduced in southern Australia.

N.Is.: Melanesian Mission Swamp, *W.R.Sykes NI 474* (CHR).

5. *Juncus bufonius L., *Sp. Pl.* 1: 328 (1753)

T: Europe; lecto: LINN 449.24; *fide* S.Carter in E.Milne-Redhead & R.M.Polhill (eds), *Fl. Trop. E. Africa*, Juncaceae 2 (1966); IDC microfiche 177/2.238/3. So named from the Latin *bufo* (a toad), in allusion to their shared habitat.

Illustrations: S.Ross-Craig, *Drawings Brit. Pl.* 30: 1 (1973); A.J.Healy & E.Edgar, *Fl. New Zealand* 3: 88 (1980); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1813, fig. 824A (1986).

Slender annual 2–25 (–30) cm high, much branched from base. Leaves filiform, 0.5 mm or less broad, without septa. Inflorescence a terminal much branched panicle, often the greater part of the plant. Flowers solitary, or 2–6 together along branches of inflorescence. Perianth segments lanceolate-acuminate, 4–7 mm long; inner slightly shorter, less acute. Capsule distinctly shorter than perianth, blunt.

Norfolk Is., Lord Howe Is. In open swampy and muddy land. Cosmopolitan in the northern and southern temperate zones.

N.Is.: behind the Administration Building, Kingstown, *P.S.Green 1507* (A). **L.H.Is.:** E of Johnsons Beach, *A.C.Beauglehole 5490* (CANB); *s. loc., J.D.McComish 26* (K).

2. LUZULA

Luzula DC. in J.B.A.P. de M. de Lamarck & A.P. de Candolle, *Fl. Franç.* 3rd edn, 3: 158 (1805) *nom. cons.*; from the Italian *lucciola* (a firefly), one species having been called *gramen luzula* by J.Bauhin (1541–1612) after the folk name 'fire-fly grass'.

Type: *L. campestris* (L.) DC., *typ. cons.*

Grass-like perennials, tufted or stoloniferous. Leaves flat, fringed with few or many long hairs. Inflorescence terminal, cymose, congested into a head or unequally branched, with leaf-like subtending bracts. Flowers with subtending papery or scarious bracts. Stamens 3 or 6. Ovary 1-locular with 3 basal ovules. Fruit a capsule. Seeds shining, usually with a conspicuous light-coloured caruncle.

A genus of c. 80 species, cosmopolitan, but especially in Eurasia; 1 endemic species on Lord Howe Is.

Luzula longiflora Benth., *Fl. Austral.* 7: 123 (1878)

Luzula campestris var. *longiflora* (Benth.) Kuntze, *Revis. Gen. Pl.* 2: 724 (1891). T: Mt Lidgbird, Lord Howe Island, *C.Moore*, and Mt Gower, *J.P.Fullagar*; syn: K. So named from the long perianth of the flowers.

[*Luzula campestris auct. non* (L.) DC.: F.J.H. von Mueller, *Fragm.* 9: 78 (1875)]

Herb 10–30 cm high. Leaves tufted, 5–35 cm long, 4–5 mm broad, ribbed on underside, ±smooth above, sparsely fringed with long white hairs. Inflorescence 5–25 cm high, branched, with 3–9 dense heads of numerous flowers subtended by several leaf-like bracts. Perianth 4 mm long, long-acuminate, dark brown or pale margined. Stamens 6; filaments 1.5

mm long; anthers 0.5 mm long. Ovary 2 mm long; styles 3, filiform, 2 mm long. Fig. 92A–B.

Lord Howe Is. Endemic. Occurs on ledges, crevices, *etc.* on the upper slopes of Mts Gower and Lidgbird.

L.H.Is.: top of Mt Lidgbird, *C.Moore 39* (K); lower N slopes of Mt Lidgbird, *M.D.Crisp 5409 & I.R.H.Telford* (CBG); near Goat House, *R.D.Hoogland 8816* (CANB); last part of ascent of Mt Gower, *P.S.Green 1611* (K); top of Mt Gower, *A.C.Beauglehole 5761* (CANB, MEL).

103. CYPERACEAE

Annual or perennial herbs, bisexual or monoecious, (elsewhere rarely dioecious) usually rhizomatous. Leaves usually linear, sometimes reduced to a closed basal sheath. Culms often trigonous, not hollow; inflorescence various, but often main axis shorter than lateral axes and often subtended by leaf-like bracts. Flowers unisexual or bisexual, each solitary within a glume, arranged in rounded, quadrangular or flattened spikelets, or solitary and aggregated into spikes (*Carex*), wind pollinated; subtended by distichous or spiral glumes, often overlapping. Perianth absent or reduced to hypogynous scales or bristles. Stamens 3 or fewer, rarely more. Ovary 1-locular; ovule 1, erect; style terminal with 2 or 3 (–4) filiform branches. Fruit usually a small nut, ±3-angled or ±biconvex, naked or enclosed in a utricle (*Uncinia* and *Carex*).

A cosmopolitan family of c. 90 genera and 4000 species, characteristic of wet and marshy habitats, and generally called sedges. Thirteen native and introduced genera on the Islands.

G.Bentham, Cyperaceae, *Fl. Austral.* 7: 246–449 (1878); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Cyperaceae, *Fl. Java* 3: 451–495 (1968); E.Edgar in L.B.Moore & E.Edgar, Cyperaceae, *Fl. New Zealand* 2: 167–285 (1970); J.H.Kern, Cyperaceae, *Fl. Males.* ser. I, 7: 435–753 (1974); T.Koyama in A.C.Smith, Cyperaceae, *Fl. Vit. Nova* 1: 220–274 (1979).

KEY TO GENERA

1 Flowers all unisexual; nut enclosed in a flask-shaped utricle

2 Inflorescence a single spike; fruit with a terminal hooked 'bristle' (L.H.Is.) **12. UNCINIA**

2: Inflorescence of more than one spike; fruit not hooked (N.Is., L.H.Is.) **13. CAREX**

1: Flowers mostly bisexual (sometimes with a few additional male); fruit not enclosed in a utricle

3 Leaves generally reduced to basal sheaths, occasionally with setaceous lamina to 5 cm long, less than culm in length

4 Bracts subtending the inflorescence numerous, leaf-like **1. CYPERUS**

4: Bracts subtending the inflorescence not numerous and leaf-like; sometimes one appearing to be a continuation of the culm

5 Inflorescence corymbose-umbellate, with few to many spikelets; nut not crowned by a persistent style base (N.Is.) **8. SCHOENOPLECTUS**

5: Inflorescence a single spikelet, or if more then these sessile in a head or spike-like inflorescence; nut crowned or not by a persistent style base

6 Spikelets in an apparently lateral head; lowest bract appearing to be a continuation of the culm **7. ISOLEPIS**

6: Spikelets obviously terminal, subtending bracts not a continuation of the culm

7 Spikelets 3–6 in a spike-like inflorescence 1–7 cm long (L.H.Is.) **10. BAUMEA**

7: Spikelet solitary, rarely 2 (N.Is.)

8 Spikelet cylindrical, 5–20 mm long; hypogynous bristles 6 or 7 **4. ELEOCHARIS**

8: Spikelet ovoid, 2–4 mm long; hypogynous bristles absent **7. ISOLEPIS**

3: Leaves with a distinct lamina, usually much longer than 5 mm (sometimes setaceous)

9 Inflorescence a dense head, of 1 or more spikelets; rarely slightly branched (*Pycreus* with up to 5 unequal rays); style branches 2

10 Head of spikelets subglobose or irregularly lobed, 20 mm or more diam. **2. PYCREUS**

10: Head of spikelets entire, rounded, 2–30 mm diam. **3. KYLLINGA**

9: Inflorescence branched, compound; style branches 3 or 4

11 Habit very slender; leaves 0.4–0.6 mm broad, capillary; leaves with long silky hairs at base of lamina; style base persistent as a small knob on the nut (L.H.Is.) **5. BULBOSTYLIS**

11: Habit more robust; leaves (0.5–) 1–1.5 mm broad; leaf sheaths without such hairs; style base not thickened (except in *Machaerina* where corky and persistent)

12 Spikelets ovoid, 5–7 mm broad; inflorescence subtended by numerous leafy bracts (N.Is.) **6. BOLBOSCHOENUS**

12: Spikelets less than 4 mm broad; leafy inflorescence bracts present or absent

13 Inflorescence subtended by a whorl of unequal leafy bracts; culms with basal leaves only (N.Is., L.H.Is.) **1. CYPERUS**

13: Inflorescence not subtended by a whorl of leafy bracts; culms leafy.

14 Leaves smooth, laterally flattened, 2-ranked equitant at base; hypogynous bristles 3; ripe nut not suspended below spike by lengthened filaments; style base persistent, corky (L.H.Is). **9. MACHAERINA**

14: Leaves harshly scabrid, grass-like from a round sheathing base; hypogynous bristles absent; ripe nut suspended below spike by lengthened filaments; style base often persistent but not thickened (L.H.Is.) **11. GAHNIA**

1. CYPERUS

Cyperus L., *Sp. Pl.* 1: 44 (1753); *Gen. Pl.* 5th edn, 26 (1754); the classical Greek name for a sedge.

Type: *C. esculentus* L.

Annual or perennial, often rhizomatous. Leaves basal or reduced to a sheath; sheaths without long silky hairs at base of lamina. Inflorescence terminal, umbel-like, with simple or compound rays bearing spikelets, often crowded, or reduced to a single head, subtended by leaf-like or filiform bracts. Spikelets compressed or sometimes ±quadrangular, few- to many-flowered. Glumes distichous, often overlapping, persistent or caducous. Flowers usually bisexual, sometimes terminal 1–3 flowers male. Hypogynous bristles absent. Stamens (1–) 2 or 3. Style trifid, not thickened at base. Nut triquetrous or trigonous, naked.

About 550 species in the warm temperate and tropical regions throughout the world. There are 1 native and 4 naturalised species on the Islands.

1 Leaves reduced to sheaths at base of culm; inflorescence bracts usually c. 20 **3. C. involucratus**

1: Leaf lamina present; inflorescence bracts 11 or less

2 Margins of leaves smooth except towards tip

3 Leaves filiform, 0.4–0.6 mm broad; spikelets 3 or 4 per head, ±sessile; umbels simple, without rays (N.Is.) **5. C. gracilis**

3: Leaves grass-like, 2–4 mm broad, rarely less; spikelets 5–many per head; umbels compound with 3–numerous rays(N.Is., L.H.Is.) **1. C. rotundus**

2: Margins of leaves scabrid or finely serrulate throughout

4 Leaves usually longer than culms, 10–30 mm broad; habit robust; culms 4–10 mm broad; spikelets ±linear, 1–1.5 mm broad (N.Is., L.H.Is.) **6. C. lucidus**

4: Leaves shorter than culms, 3–10 mm broad; habit more slender; culms 2–3 mm broad

5 Spikelets oblong-elliptic, 2.5–3 mm broad; inflorescence bracts 10–30 cm long; leaves 15–40 cm long (L.H.Is) **2. C. eragrostis**

5: Spikelets linear-elliptic, 1–2 mm broad; inflorescence bracts 5–15 cm long; leaves 5–30 cm long (N.Is.) **4. C. albostriatus**

1. *Cyperus rotundus L., *Sp. Pl.* 1: 45 (1753)

T: not designated. The Latin *rotundus* refers to the rounded subterranean tubers.

Illustrations: C.Lamp & F.Collet, *Field Guide Weeds Australia* 137 (1979); K.L.Wilson in B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 366, fig. 216o–p (1983); J.P.Jessop & J.Z.Weber in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 2021, fig. 928G (1986).

Perennial. Rhizome extensive, wiry, bearing globose-ellipsoidal tubers 5–10 mm diam. Leaves mainly basal, much shorter than culms, 2–4 mm broad, rarely less, smooth on margins except towards tip. Culm triquetrous, 10–40 cm tall; inflorescence bracts 2–4, unequal, leaf-like, the lowest equal to or slightly longer than inflorescence. Umbel compound, with 3–10 rigid, unequal rays 1–10 cm long. Spikelets 8–24-flowered, ±clustered 5–many per head, linear, compressed, 5–30 mm long, 1.5–2.5 mm broad, brown. Glumes overlapping, 3–3.5 mm long, obtuse, keeled, 5–7-veined. Stamens 3. Nut triquetrous, smaller than glumes, often not maturing. *Nut Grass*.

Norfolk Is., Lord Howe Is. A cosmopolitan weed of warm countries; known from New Caledonia, New Zealand and all Australian States except Tas.

N.Is.: near Steels Point, *W.R.Sykes NI 502* & *NI 505* (CHR). **L.H.Is.:** flat behind Bowling Club, *J.Pickard 2698* (NSW).

2. *Cyperus eragrostis Lam., *Tabl. Encycl.* 1: 146 (1791)

T: Central America; holo: P–LA *n.v.*; photo seen (IDC microfiche 6207.671/20). Named from a resemblance of the spikelets to those of the grass genus *Eragrostis*.

Illustrations: W.T.Parsons, *Noxious Weeds Victoria* 142 (1973); C.Lamp & F.Collet, *Field Guide Weeds Australia* 136 (1979); A.J.Healy & E.Edgar, *Fl. New Zealand* 3: 183, fig. 30D (1980).

Tufted perennial. Rhizome short, thick. Leaves basal, shorter than culms, 15–40 mm long, 3–8 mm broad, scabrid to serrulate along margins. Culms bluntly trigonous, 20–100 cm tall, 2–3 mm broad; inflorescence bracts 4–7, leaf-like, unequal, 10–30 cm long, the longest several times longer than inflorescence. Umbel compound, on unequal peduncles, ±congested in 8–12 subglobose clusters of spikelets; spikelet clusters 1–2 (–3) cm diam. Spikelets 10–40-flowered, oblong-elliptic, compressed, 5–20 mm long, 2.5–3 mm broad, pale to yellowish green. Glumes overlapping, caducous from base of spikelet, ovate-lanceolate, 2–2.5 mm long, acute, keeled, with 1 visible lateral vein. Stamen 1. Nut triquetrous, shorter than glume.

Lord Howe Is. An uncommon weed of moist soils. Native to tropical America.

L.H.Is.: flat at end of Big Ck, *J.Pickard 3403* (NSW).

This species is also adventive in mainland Australia, where the culms can be much more robust (to 8 mm broad).

3. *Cyperus involucratus Rottb., *Descr. Pl. Rar.* 22 (1772)

T: Yemen, *P.Forsskål*; holo: C, missing, *fide* F.N.Hepper & I.Friis, *The plants of Peter Forsskål's Flora Aegyptiaco-Arabica* 258 (1993). Named from the 'involucre' of inflorescence bracts.

Illustrations: A.J.Healy & E.Edgar, *Fl. New Zealand* 3: 183, fig. 30B (1980); A.B.Graf, *Exotica* 12th edn, 1: 946 (1985), as *C. alternifolius*.

Tufted perennial. Rhizome short, thick. Leaves reduced to basal sheaths. Culms stout, subterete, 30–100 cm tall; inflorescence bracts c. 20, subequal, leaf-like, 10–20 cm long, 5–12 mm broad, much larger than inflorescence. Umbel compound, c. 10 subequal; primary rays 2–10 cm long. Spikelets clustered-umbellate, 8–20-flowered, narrowly ovoid, 3–7 mm long, 1.5–2 mm broad, pale brown or straw-coloured. Glumes closely overlapping, ovate, c. 2 mm long, acute, ±hyaline, slightly keeled, without lateral veins. Stamens 3. Nut triquetrous, shorter than glume.

Norfolk Is., Lord Howe Is. In damp soil as an escape from cultivation. A native of Africa, naturalised in the North Is. of New Zealand, the warmer parts of Australia and many parts of the tropics.

N.Is.: Mission Rd, *W.R.Sykes NI 661* (CHR). **L.H.Is.:** S end of Anderson Rd, *J.Pickard 1207* (NSW).

Much grown as a house plant and formerly known as *Cyperus alternifolius* subsp. *flabelliformis* (Rottb.) Kük.

4. *Cyperus albostriatus Schrad., *Analecta ad Floram Capensem* 7 (1832)

T: S.Africa, *C.F.Eklon 890*; holo: ?LE *n.v.* Named in allusion to the longitudinal white lines exhibited by the midrib and two veins on the leaves and involucral bracts.

Illustrations: T.H.Everett, *New York Bot. Gard. Encycl. Hort.* 3: 984 (1981); A.B.Graf, *Exotica* 12th edn, 1: 946, 947 (1985), as *C. elegans* & *C. diffusus*; K.L.Wilson in G.J.Harden, *Fl. New South Wales* 4: 340 (1993).

Perennial. Rhizome thickish, c. 5 mm diam., creeping, purplish brown, scaly. Leaves basal, 5–30 cm long, 5–15 mm broad, shorter than culm, finely scabrid on margins, white on midrib and 2 lateral veins. Culm trigonous, smooth, to 35 cm tall, 2–3 mm broad; inflorescence bracts 7–11, unequal, leaf-like, 5–15 cm long, 5–15 mm broad. Umbel compound; rays numerous, unequal, to 8 cm long. Spikelets clustered, many-flowered, linear-elliptic, 3–10 mm long, 1–2 mm broad. Glumes overlapping, elliptic-ovate, 1–1.5 mm long, clearly thickened at base, acute, slightly keeled, brown, with several lateral veins. Stamens 3. Nut triquetrous, slightly shorter than glumes.

Norfolk Is. A relict or escape from cultivation; native to South Africa.

N.Is.: 'Mrs Moores Nature Reserve', Mission Rd, *W.R.Sykes NI 661* (CHR).

This species is commonly cultivated and was formerly known erroneously under the names *Cyperus elegans* or *C. diffusus*.

5. *Cyperus gracilis R.Br., *Prodr.* 213 (1810)

T: New South Wales, *R.Brown*; holo: BM. The Latin *gracilis* alludes to the slender habit of this plant.

Illustration: F.M.Bailey, *Weeds & Poison. Pl. Queensland* 212, fig. 361 (1907); K.L.Wilson in G.J.Harden, *Fl. New South Wales* 4: 343 (1993).

Slender tufted perennial. Rhizome very short, without tubers. Leaves basal, filiform, shorter than culms, 0.5–1 mm broad, marginally smooth except towards apices. Culms slender, 5–30 cm tall; inflorescence bracts 3 (or 4), filiform, unequal, longest up to 10 times longer than spikelets. Umbels simple. Spikelets 3 or 4, 5–15-flowered, sessile, elliptic, compressed, 5–15 mm long, 2 mm broad, greenish brown. Glumes ovate, 1.5–2 mm long, slightly reflexed at

short pointed apex, prominently veined. Stamens 3. Nut obconoid, prominently 3-angled, c. 1 mm long, dark brown.

Norfolk Is. Rare. Although native in Australia (Qld, N.S.W.), and New Caledonia, this species has only recently been recorded from Norfolk Is. It may have been overlooked previously but it is probably a recent introduction.

N.Is.: Anson Bay, *W.R.Sykes NI 468* (CHR); Anson Bay Rd, *K.L.Wilson 6261* (K, NSW).

Mainland Australian specimens of this species have up to 7 spikelets in the inflorescence.

6. Cyperus lucidus R.Br., *Prodr.* 218 (1810)

T: New South Wales, *R.Brown*; holo: BM. The epithet comes from the Latin *luceo* (to shine), in reference to the shining spikelets.

Cyperus haematodes Endl., *Prodr. Fl. Norfolk.* 22 (1833); *Mariscus haematodes* (Endl.) C.B.Clarke, *Bull. Misc. Inform. Kew* 8: 18 (1908). T: Mt Pitt, Norfolk Island; Philips Is. 1804–1805, *F.L.Bauer*; syn: ?W *n.v.* The Latin *haematodes* (blood red) refers to the colour of the spikes.

Cyperus congestus f. *gigantea* F.Muell., *Fragm.* 8: 269 (1874), *nom. nud.*

Illustrations: J.D.Hooker, *Fl. Tasman.* 2: t. 139 (1858), as *C. sanguineo-fuscus*; K.L.Wilson in G.J.Harden, *Fl. New South Wales* 4: 351 (1993).

Robust tufted perennial. Rhizome short, stout. Leaves basal, c. as long as culms, 10–30 mm broad, sharply scabrid-serrulate on margin. Culms stout, distinctly 3-angled, 75–150 cm tall, 4–10 mm broad, smooth; inflorescence bracts 7–10, unequal, leaf-like, 15–20 mm broad; lower bracts much longer than inflorescence. Umbels compound; rays 10–12, rigid, unequal, 2–10 cm long. Spikelets very numerous, in spikes at end of each ray, ±linear, ±terete, 7–12 mm long, 1–1.5 mm broad (2–) 3- or 4-flowered, reddish brown. Basal glumes ovate, 1 mm long; upper glumes lanceolate, 5–6 mm long, obtuse to acute, scarcely keeled, distinctly ribbed, reddish brown towards apex. Stamens 3. Nut triquetrous, shorter than glumes. *Moo-oo Grass* (N.Is.), *Cutty* or *Cutting Grass* (L.H.Is.). Figs 68, 93A–B.

Norfolk Is., Lord Howe Is. Widespread in coastal grassland and scrub. Also in Qld, N.S.W., Vic. and Tas.

N.Is.: Point Ross, *R.D.Hoogland 6605* (CANB); Anson Point, *I.R.H.Telford 7194* (CBG). **L.H.Is.:** between Mt Eliza and North Head, *J.C.Game 69/227* (K); between North Beach and Old Gulch, *R.D.Hoogland 8691* (CANB); North Bay, *G.Uhe 1301* (K); The Clear Place, *M.D.Crisp 4472 & I.R.H.Telford* (CBG).

The mainland Australian plant often appears more robust, with a more open inflorescence, with longer rays (to 20 cm long) and spikelets (20 mm long), with up to 10 flowers per spikelet, and leaves to 40 mm broad.

2. PYCREUS

Pycreus P.Beauv., *Fl. Oware* 2: 48, t. 86, fig. 2 (1816); an anagram of *Cyperus*.

Type: *P. polystachyos* (Rottb.) P.Beauv.

Annuals or perennials, often rhizomatous. Leaves at base of culm. Inflorescence a terminal umbel-like corymb with simple or compound rays bearing spikelets, often crowded, subtended by leaf-like bracts. Spikelets laterally flattened, few- to many-flowered. Glumes all similar, distichous, often overlapping, acropetally caducous. Flowers usually bisexual. Hypogynous bristles absent. Stamens 1–3. Style bifid, not thickened at base. Nut biconvex with one edge towards the rachilla.

A genus of perhaps 100 species, in warm temperate and tropical regions throughout the world, included by some authors in *Cyperus*. One naturalised species on the Islands.

***Pycreus polystachyos** (Rottb.) P.Beauv., *Fl. Oware* 2: 48, t. 86, fig. 2 (1816)

Cyperus polystachyos Rottb., *Descr. Pl. Rar.* 21 (1772). T: L.Plukenet, *Phytographia*, t. 416, fig. 6 (1705). The epithet comes from the Greek *polys* (many) and *stachys* (an ear of corn or spikelet), in reference to the many spikelets in the inflorescence.

[*Cyperus congestus auct. non* Vahl: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 724 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 18 (1915); G.Kükenthal in H.G.A.Engler, *Pflanzenr.* IV 20 (Heft 101): 445 (1936)]

Illustrations: F.M.Bailey, *Weeds & Poison. Pl. Queensland* 212, fig. 360 (1907); K.L.Wilson in G.J.Harden, *Fl. New South Wales* 4: 355 (1993) as *Cyperus polystachyos*.

Tufted perennial or annual. Leaves basal, much shorter than culm, 1.5–4 (–5) mm broad. Culm stiffly erect, triquetrous, 20–60 cm tall; inflorescence bracts 3–5, unequal, leaf-like, much longer than inflorescence. Inflorescence a subglobose or irregularly lobed head 20 mm or more diam., with up to 5 unequal rays, up to 40 mm long. Spikelets ±erect, clustered, 10–30-flowered, ±linear, (5–) 10–15 (–20) mm long, 1.5 mm broad, acute. Glumes closely overlapping, oblong-ovate, c. 2 mm long, flattened, keeled, straw-coloured, usually with an elongated chestnut brown patch between the green keel and the margin. Stamens (1 or) 2. Style deeply bifid. Nut shorter than glume.

Norfolk Is., Lord Howe Is. Occasional in damp grassland and beside watercourses. Widespread in the tropics and subtropics including the North Is. of New Zealand and suitable habitats in much of Australia.

N.Is.: Barney Duffys Ck, *P.Ralston 5* (A); *s. loc., W.Laing* (CANTY). **L.H.Is.:** cricket ground, *A.C.Beauglehole 5465* (CANB, MEL).

3. KYLLINGA

Kyllinga Rottb., *Descr. Icon. Rar. Pl.* 12 (1773), *nom. cons.*; named after P.L.Kylling, a 17th century Danish botanist and apothecary.

Type: *K. monocephala* Rottb., *nom. illeg.* = *K. nemoralis* (J.R.Forst. & G.Forst.) Dandy ex Hutch. & Dalziel

Rhizomatous perennial. Leaves at base of culms. Inflorescence a terminal clustered head of 1–3 sessile dense spikes, subtended by leaf-like bracts. Spikelets compressed, of 2–several keeled glumes; lower glume with bisexual flowers; upper glumes with staminate flowers or empty. Hypogynous bristles absent. Stamens 1–3. Style bifid, not thickened at base. Nut ±lens-shaped, with one edge towards rachilla.

A genus of c. 50 species in tropical and warm temperate regions of the world, especially in Africa. One species naturalised on Norfolk and Lord Howe Islands.

Kyllinga is sometimes included within the genus *Cyperus*.

***Kyllinga brevifolia** Rottb., *Descr. Icon. Rar. Pl.* 13, t. 4, fig. 3 (1773)

Cyperus brevifolius (Rottb.) Hassk., *Cat. Hort. Bot. Bogor.* 24 (1844). T: India or Ceylon, *J.G.König*; holo: ?C *n.v.* The epithet comes from the Latin *brevis* (short) and *folium* (leaf), in reference to the short leaves.

[*Kyllinga monocephala auct. non.* Rottb.: R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 18 (1915); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 128 (1917)]

[*Cyperus kyllingia auct. non* Endl.: G.Kükenthal in H.G.A.Engler, *Pflanzenr.* 20 (Heft 101): 607 (1936)]

Illustrations: C.F.Rottbøll, *Descr. Icon. Rar. Pl.* t. 4, fig. 3 (1773); C.B.Clarke, *Ill. Cyperaceae* t. 1, figs 1–4 (1909); K.L.Wilson in G.J.Harden, *Fl. New South Wales* 4: 356 (1993), as *Cyperus brevifolius*.

Perennial. Rhizomes long, creeping. Leaves few, usually shorter than culms, 1–3 mm broad. Culms at nodes along rhizome, slender, triquetrous, 3–30 cm tall; inflorescence bracts 3 (sometimes 2 or 4), leaf-like, spreading, unequal, more than 40 mm long; inflorescence a single, sessile, ovoid-globose head (occasionally with 2 or 3 much smaller spikes at base), 4–10 mm long, 3–7 mm broad. Spikelets numerous, clustered, compressed, c. 3 mm long, of

2 glumes; upper glume with a fertile flower, strongly keeled, membranous, with 2 lateral veins per side; subtending bract sterile with 3 or 4 lateral veins per side and keel green, spinulose towards the slightly cuspidate and recurved apex. Stamen 1 or 2 (rarely 3). Nut obovoid, biconvex, c. 1.5 mm long, naked.

Norfolk Is., Lord Howe Is. In wet grassy areas, often forming a turf. Also known from the North Is. of New Zealand, and widespread in Australia and most tropical and subtropical countries, including New Caledonia.

N.Is.: Pt Blackbourne Res., *N.Gillett D7* (Herb. Gillett); Red Rd, *P.S.Green 1365* (A); *s. loc.*, *R.M.Laing* (CHR). **L.H.Is.:** N side of North Hummock, *A.C.Beauglehole 5479* (CANB, MEL); main settlement, *A.C.Beauglehole 5480* (CANB, MEL); Mosely Park, *R.D.Hoogland 8744* (CANB).

4. ELEOCHARIS

Eleocharis R.Br., *Prodr*. 224 (1810); from the Greek *helos* (a marsh) and *charis* (charm, delight), in allusion to the favourite habitat of these plants.

Type: *E. capitata* (L.) R.Br. = *E. geniculata* (L.) Roem. & Schult.

Annual or perennial herbs, rhizomatous, sometimes stoloniferous. Leaves reduced to sheaths at base of culm. Culms often tufted, terete or angular. Inflorescence a single terminal spike-like spikelet subtended by a scale-like bract. Spikelet ovoid to cylindrical, few- to many-flowered. Glumes spirally arranged, overlapping. Flowers bisexual. Hypogynous bristles 4–10, filamentous. Stamens 1–3. Style branches 2 or 3. Nut trigonous or biconvex, naked, crowned by persistent enlarged base of style.

A genus of c. 200 species in marshy habitats throughout the world; 1 native species on Norfolk Is.

S.T.Blake, *Proc. Roy. Soc. Queensland* 50: 88–132 (1939).

Eleocharis acuta R.Br., *Prodr*. 224 (1810)

T: Tasmania and New South Wales, *R.Brown*; syn: BM. So named because of the acute glumes.

[*Eleocharis gracilis auct. non.* R.Br.: S.T.Blake, *Proc. Roy. Soc. Queensland* 50: 113 (1939); J.S.Turner *et al.*, *Conservation Norfolk Is.* 32 (1968)]

Illustrations: S.T.Blake, *Proc. Roy. Soc. Queensland* 50: t. 10, figs 1–7 (1939); K.L.Wilson in B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 366, fig. 216m–n (1983); J.P.Jessop & J.Z.Weber in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 2028, fig. 930A (1986).

Tufted rhizomatous perennial. Basal leaf sheaths tinged red; sheath mouths oblique, with those of upper sheaths less oblique, mucronate. Culm erect, terete, slender, 10–50 cm or more tall, 0.5–2 mm diam. Spikelet cylindrical, 5–20 mm long, 2–4 mm diam., acute. Glumes ovate-lanceolate, 3–5 mm long, marginally hyaline, blunt to acute, 1-veined. Hypogynous bristles 6 or 7. Stamens 3. Nut broadly biconvex, 1.5–2 mm long, brown; persistent style base ±conical, pale.

Norfolk Is. Swampy ground. Also native in New Zealand and Australia (excluding N.T.).

N.Is.: Rocky Point Stream, *P.S.Green 1467* (A); *s. loc.*, *R.M.Laing* (CHR); *s. loc.*, *J.D.McComish 181* (BRI).

5. BULBOSTYLIS

Bulbostylis Kunth, *Enum. Pl.* 2: 205 (1837), *nom. cons.*; from the Greek *bolbos* (bulb) and *stylos* (style), in allusion to the bulbous base to the style in these plants.

Type: *B. capillaris* (L.) C.B.Clarke

Tufted annuals or perennials. Leaves basal only, very narrow-capillary; sheath usually with fine hairs at mouth. Culms erect, slender; inflorescence terminal, capitate, umbellate or reduced to a single spikelet, subtended by leaf-like bracts. Spikelets usually numerous.

Glumes spirally arranged, overlapping, acropetally caducous, with lower 1 or 2 empty. Flowers mostly bisexual, with uppermost usually staminate or barren. Hypogonous bristles absent. Stamens 1–3. Style branches (2 or) 3; style base thickened, persistent. Nut 3-angled (rarely biconvex), obovoid, naked.

A genus of c. 100 species in the tropical and subtropical regions of the world; 1 species native on Lord Howe Is.

Bulbostylis densa (Wall.) Hand.-Mazz. in G.H.H.Karsten & H.Schenck, *Vegetationsb.* 20(7): [16] (1930)

Scirpus densus Wall. in W.Roxburgh, *Fl. Ind.* 1: 231 (1820). T: Nepal, *N.Wallich 3514C*; holo: K–W. So named from a habit of growing in dense tufts.

Illustrations: S.H.Koorders, *Exkurs.-Fl. Java* 4(2): 9 (1922), as *Scirpus capillaris*; B.K.Schischkin in V.L.Komarov, *Fl. URSS* 3: 99, t. 8/1 (1935), as *Bulbostylis capillaris*; K.L.Wilson in G.J.Harden, *Fl. New South Wales* 4: 381 (1993).

Very slender perennial, rarely annual. Leaves 1–20 cm long, less than 1 mm broad; lamina with long, silky hairs at base. Culms slender, 5–30 cm tall; subtending bracts small, leaf-like, 2–5 mm long; inflorescence terminal, (1–) 3–7 (–11) spikelets, with the lowest subsessile, and others on 1–7 unequal rays up to 20 mm long; longer rays sometimes secondarily compound. Glumes lanceolate, 1.5–2 mm long, acute, keeled, brown. Style branches 3. Nut triquetrous, obovoid, 0.5–0.75 mm long, pale; persistent style base brown.

Lord Howe Is. Rare, and known from the one collection in 1971, according to J.Pickard (*Biol. Conservation* 27: 134, 135, 137, 1983). Native in the tropics and subtropics of the Old World.

L.H.Is.: Mt Gower, 1971, *J.Pickard s.n.* (NSW).

6. BOLBOSCHOENUS

Bolboschoenus (Asch.) Palla in E.H.Hallier, *Syn. Deutsch. Schweiz. Fl.* 3rd edn, 3: 2531 (1905); from the Greek *bolbos* (bulb) and *schoinos* (a rush), in allusion to the bulbous base of these rush-like plants.

Type: *B. maritimus* (L.) Palla

Rhizomatous perennials; rootstock tuberous. Leaves cauline. Culms erect, simple, triquetrous, with leafy nodes; inflorescence terminal, umbel-like, with rays bearing ±crowded heads of spikelets. Spikelets many-flowered, ovoid. Glumes spirally arranged, overlapping. Flowers bisexual. Hypogonous bristles present. Stamens 3. Style base not thickened; branches 2 or 3. Nut biconvex or trigonous, naked.

A genus of c. 16 species, widely distributed in all continents; 1 native species on Norfolk Is.

K.L.Wilson, A synopsis of the genus *Scirpus sens. lat.* (Cyperaceae) in Australia, *Telopea* 2: 153–172 (1981).

Bolboschoenus fluviatilis (Torr.) Soják, *Cas. Nár. Mus., Odd. Prír.* 141: 62 (1972)

Scirpus maritimus var. *fluviatilis* Torr., *Ann. Lyceum Nat. Hist. New York* 3: 324 (1836); *Scirpus fluviatilis* (Torr.) A.Gray, *Manual* 527 (1848). T: western parts of New York State, U.S.A., *A.Gray*, and Missouri above St Louis, *Dr Baldwin*; syn: ?NY *n.v.* The epithet means 'of the river'.

Illustrations: A.J.Ewart, *Fl. Victoria* 217, fig. 126, 221, fig. 127 (1931), as *Scirpus maritimus*; D.S.Correll & H.B.Correll, *Aquat. & Wetl. Pl. SW. United States* 347, fig. 175 (1972); K.L.Wilson in G.J.Harden, *Fl. New South Wales* 4: 366 (1993).

Perennial. Rhizome thick, creeping, forming tubers. Leaves long-tapering, 30–50 cm long, 4–15 mm broad at base. Culm triquetrous, 1–1.5 (–2) m tall, leafy throughout; inflorescence bracts as many as rays, leaf-like, with outer bracts much longer than the rays; uppermost bracts much reduced and glume-like; inflorescence with 6–9 rays; outer rays up to 8 cm long, diminishing inwards, each bearing a cluster of spikelets; central cluster of spikelets ±sessile.

Spikelets ovoid, 1–1.5 cm long, 5–7 mm broad, dull brown. Glumes membranous, broadly ovate, somewhat jagged on margin; keel ending in a recurved awn. Hypogynous bristles 6, unequal, persistent. Style branches 3. Nut obovoid-trigonous, 3–4 mm long.

Norfolk Is. Occasional beside fresh water. Also known from North America, Europe, Asia, New Caledonia, New Zealand and eastern Australia.

N.Is.: open culvert, Government House, *R.M.Laing* (CHR).

7. ISOLEPIS

Isolepis R.Br., *Prodr*. 221 (1810); from the Greek *isos* (equal) and *lepis* (a scale) as the lower glumes are the same as the upper.

Type: *I. setacea* (L.) R.Br.

Rhizomatous, usually tufted annuals or perennials. Leaves usually setaceous, small or reduced to basal sheaths. Culms usually erect, terete; inflorescence terminal, apparently lateral; inflorescence bract green and sometimes appearing as a prolongation of the culm. Spikelets small, 1–many, ±sessile. Glumes spirally arranged, overlapping. Flowers bisexual. Hypogynous bristles absent. Stamens 1–3. Style branches 2 or 3. Nut ±trigonous or biconvex, smooth, striate or tuberculate, not rugose, crowned by persistent base of style, naked.

A genus of c. 70 species, widely distributed throughout the world, especially in Africa and Australia. Three species native to Norfolk Is., with 1 extending to Lord Howe Is.

K.L.Wilson, A synopsis of the genus *Scirpus sens. lat*. (Cyperaceae) in Australia, *Telopea* 2: 153–172 (1981).

1 Plants stout; culms 30 or more cm tall; spikelets numerous in a dense hemispherical head (N.Is., L.H.Is.) **1. I. nodosa**

1: Plants ±slender, culms up to 30 cm tall; 1–6 (–10) spikelets in the head

2 Inflorescence of 3–6 (–10) spikelets; inflorescence bract 5–15 mm long (N.Is.) **2. I. inundata**

2: Inflorescence of usually a solitary spikelet; inflorescence bract 2–4 mm long (N.Is.) **3. I. sp.**

1. Isolepis nodosa (Rottb.) R.Br., *Prodr*. 221 (1810)

Scirpus nodosus Rottb., *Descr. Pl. Rar*. 24 (1772). T: S. Africa, *J.F.König*; holo: ?C *n.v.* The epithet comes from the Latin *nodosus* (knotty), in allusion, it is said, to the capitate inflorescence.

Ficinia guttata Endl., *Prodr. Fl. Norfolk*. 23 (1833). T: Norfolk Island, *F.L.Bauer*; holo: ?W *n.v.*

Illustrations: J.T.Salmon, *New Zealand Fl. Pl. Colour* 33, fig. 59 (1963); L.B.Moore & J.B.Irwin, *Oxford Book New Zealand Pl.* 205, fig. 3 (1978); J.P.Jessop & J.Z.Weber in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 2037, fig. 935B (1986).

Perennial. Rhizome stout, horizontal. Leaves reduced to a basal sheath. Culms crowded, rigid, erect, terete, (30–) 50–100 (–150) cm tall, 1.5–3 mm diam.; subtending bract continuous with culm, rigid, 1.5–3 mm long, pungent; inflorescence apparently lateral, a hemispherical head of numerous densely crowded spikelets, 0.5–1.5 cm diam. Spikelets ovoid, 3–4 mm long. Glumes overlapping, broadly ovate, 2–3 mm long, obtuse to apiculate, not keeled, with conspicuous lateral nerves. Stamens 3. Style branches 3. Nut plano-convex to trigonous, c. 1 mm long, dark brown to black.

Norfolk Is., Lord Howe Is. Common in flushes on coastal cliffs and by the sea. Native throughout most of the temperate and warm temperate Southern Hemisphere.

N.Is.: Philip Is., *W.Laing* (CHR); Old Prison settlement, *G.Uhe 1147* (K). **L.H.Is.:** Old Settlement Beach, *M.D.Crisp 4527 & I.R.H.Telford* (CBG); E end of Neds Beach, *G.Uhe 1269* (K).

2. Isolepis inundata R.Br., *Prodr.* 222 (1810)

Scirpus inundatus (R.Br.) Poir., *Encycl. Suppl.* 5: 103 (1817). T: Tasmania, *R.Brown*; holo: BM. The epithet comes from the Latin *inundatus* (flooded) in reference to the plant's habitat.

Isolepis conspersa Nees in S.L.Endlicher, *Prodr. Fl. Norfolk.* 23 (1833); *Scirpus conspersus* (Nees) Boeck., *Linnaea* 36: 505 (1870). T: Norfolk Island, *F.L.Bauer*; holo: W.

Illustrations: W.H.Fitch in J.D.Hooker, *Fl. Tasman.* 2, t. 144 (1859), as *I. prolifera*; K.L.Wilson in G.J.Harden, *Fl. New South Wales* 4: 361 (1993).

Densely tufted slender perennial. Rhizome not creeping. Leaves towards culm base, usually reduced to a sheath, purplish at base, with a setaceous lamina shorter than culm. Culms erect or slightly curved, 5–30 cm high, c. 1 mm diam.; subtending bract 5–15 mm long, usually longer than the inflorescence; inflorescence terminal, but apparently lateral, of 3–6 (–10) clustered spikelets, sometimes proliferating. Spikelets ovoid, 1.5–4 mm long. Glumes overlapping, ovate, c. 1.5 mm long, marginally membranous, obtuse or acute, pale green on keel, often stained or blotched purplish brown along the lateral nerves. Stamens 1 (or 2). Style branches 3. Nut trigonous, c. 1 mm long, pale coloured. Fig. 93C–D.

Norfolk Is. Occasional, beside watercourses. Also native in South America, SE Asia, New Zealand and all Australian States except N.T.

N.Is.: Emily Bay, *R.M.Laing* (CHR); *s. loc.*, *F.L.Bauer* (W).

3. Isolepis sp.

[*Scirpus riparius auct. non* (R.Br.) Spreng.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 771 (1904)]

Small tufted perennial. Rhizome not creeping. Leaves towards culm base; lamina setaceous, less than c. 5 cm long. Culms erect or slightly curved, (5–) 6–10 (–12) cm tall, 0.2 mm diam., purplish at base; subtending bract often appearing as a continuation of culm, 2–4 mm long; inflorescence terminal, sometimes appearing subterminal-lateral. Spikelet 1 (or 2), ovoid, 2–4 mm long. Glumes spirally arranged, overlapping, broadly ovate, 1.5–2 mm long, marginally membranous with several longitudinal veins; keel green at tip forming a slight apiculus to the obtuse apex. Stamen 1 (or 2). Style branches 2. Nut broadly obovate, subtrigonous, with dorsal angle weak, 0.8–1 mm long, slightly glistening, puncticulate, dark brown. Fig. 94A–B.

Norfolk Is. Endemic?

N.Is.: Bloody Bridge, *P.S.Green 1427* (A, K); Ball Bay, *K.L.Wilson 6264* (K, NSW); Emily Bay, *W.Laing 1737 & 1758* (CHR); *s. loc.*, *J.Backhouse 715* (K).

This plant, part of the *Isolepis cernua* complex, is close to both *I. setiformis* (S.T.Blake) K.L.Wilson, native to south-western W.A. and *I. platycarpa* (S.T.Blake) Soják, known from south-western W.A., N.S.W., Vic., Tas. and New Zealand, especially the former species. In her synopsis of *Scirpus s. lat.* in Australia, K.L.Wilson (*Telopea* 2: 153–173, 1981) comments (p. 166) under *Isolepis cernua* that 'a 2–3-gynous form with blackish, broad-obovate nuts is widespread in Australia (also collected on Norfolk Is.) and this may prove to be a distinct species.' She is still working on the group.

8. SCHOENOPLECTUS

Schoenoplectus (Rchb.) Palla, *Verh. K.K. Zool.-Bot. Ges. Wien* 38, *Sitzungsber.*: 49 (1888), *nom. cons.*; from the Greek *schoinos* (a rush) and *plecto* (to plait), in reference to some members of the genus having been used for plaiting.

Type: *S. lacustris* (L.) Palla

Stout rhizomatous perennials (sometimes annuals). Leaves basal, usually reduced to a sheath only or with a short lamina. Culms triquetrous or terete; inflorescence terminal, sometimes appearing lateral because inflorescence bract appears as a continuation of culm, simple or compound, capitate to irregularly corymbose-umbellate, with up to several rays bearing few to numerous spikelets. Spikelets many-flowered. Glumes spirally arranged, overlapping.

Flowers bisexual. Hypogynous bristles present or absent. Stamens 3. Style branches 2 or 3, not enlarged or persistent at base. Nut transversely rugose or smooth, naked.

A genus of possibly 60 species widely distributed in temperate or tropical parts of the world; 1 species native to Norfolk Is.

K.L.Wilson, A synopsis of the genus *Scirpus sens. lat.* (Cyperaceae) in Australia, *Telopea* 2: 153–172 (1981).

Schoenoplectus validus (J.Vahl) Á.Löve & D.Löve, *Bull. Torrey Bot. Club* 81: 3 (1954)

Scirpus validus J.Vahl, *Enum. Pl.* 2: 268 (1805). T: Caribbean, *coll. unknown*; holo: C *n.v.*, photo seen (IDC microfiche 2201.69/16). The Latin *validus* means strong, sturdy, alluding to the habit.

[S*cirpus lacustris auct. non* L.: R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 18 (1915)]

Illustrations: J.T.Salmon, *New Zealand Fl. Pl. Colour* 103, fig. 315 (1963), as *Scirpus lacustris*; J.P.Jessop & J.Z.Weber in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 2044, fig. 938D (1986); K.L.Wilson in G.J.Harden, *Fl. New South Wales* 4: 367 (1993).

Leaves reduced to papery basal sheaths; uppermost sheath sometimes with a short pointed lamina less than 5 cm long. Culms cylindrical, with spongy pith, 0.5–1.5 (–2) m tall; bract shorter than inflorescence; inflorescence irregularly corymbose-umbellate with 6–10 unequal, scabrid rays up to 6 cm long. Spikelets ovoid, 5–10 mm long. Glumes numerous, broadly ovate, membranous, fimbriate, emarginate-mucronate, keeled. Hypogynous bristles 5 or 6. Style branches 2. Nut broadly obovoid, biconvex, c. 2 mm long, smooth.

Norfolk Is. In shallow water and marshy margins of streams, frequent. Also in all Australian States except N.T., New Zealand, New Caledonia and Vanuatu.

N.Is.: Bumbora, *P.Ralston 40* (CHR); Barney Duffy Ck, *P.Ralston 4* (A); *loc. id.*, *P.Ralston 63* (CHR); Kingston, *P.S.Green 1506* (A).

9. MACHAERINA

Machaerina M.Vahl, *Enum. Pl.* 2: 238 (1805); from the Greek *machaira* (a large knife), from the shape of the leaves in the type species.

Type: *M. restioides* (Sw.) M.Vahl

Rhizomatous perennials. Leaves mainly basal, a few cauline, laterally compressed, distichous, equitant at base. Culms tufted, pithy; inflorescence paniculate, of several partial panicles. Spikelets numerous, clustered, persistent, ovate to lanceolate, compressed. Glumes distichous; lowest 1–4 glumes empty, smaller than those bearing nuts; upper ones small, with staminate flowers or empty. Flowers bisexual and male. Hypogynous bristles absent or 3–6. Stamens 3. Style 3-fid. Nut ovoid–ellipsoidal, 3-sided or terete, usually long stipitate, usually 3-winged, crowned by style base, naked.

A genus of c. 25 species in tropical America, the West Indies, Malesia, Australia and the Pacific; 1 endemic species on Lord Howe Is.

Machaerina insularis (Benth.) T.Koyama, *Bot. Mag.* (*Tokyo*) 69: 64 (1956)

Cladium insulare Benth., *Fl. Austral.* 7: 403 (1878); *Gahnia insularis* (Benth.) F.Muell., *Second Syst. Census Austral. Pl.* 216 (1889). T: Mt Lidgbird, Lord Howe Island, *C.Moore*; holo: K. The Latin *insularis* means growing on an island and alludes to the home of this endemic species.

Tufted perennial. Leaves mostly basal, laterally compressed, equitant at base, 1–1.8 m tall, 2–3 cm broad, smooth. Culms erect, biconvex, 1–2 m high, smooth; inflorescence bracts and bracteoles sheathing, long-pointed, diminishing in size at each branch; bracteoles fimbriate; inflorescence much branched, 10–20 cm long. Spikelets very numerous, brown, 5–6 mm long, 3–4 mm broad. Basal 2 or 3 glumes empty, acute to long-acuminate; next 2 or 3 glumes with fertile flowers, lanceolate, 4–5 mm long; terminal glume small, empty. Hypogynous bristles 3, 6 mm long. Nut narrowly ellipsoidal-trigonous, 2 mm long, brown, crowned by 'corky' base of style. Fig. 94C–D.

Figure 94. CYPERACEAE. **A–B**, *Isolepis sp.*; **A**, habit; **B**, inflorescence (**A–B**, P.Green 1427, K). **C–D**, *Machaerina insularis*. **C**, habit; **D**, part of inflorescence (**C–D**, P.Green 2333, K). **E–F**, *Gahnia xanthocarpa*. **E**, habit; **F**, part of infructescence (**E–F**, P.Green 2340, K). **G–I**, *Uncinia debilior*. **G**, habit; **H**, spike; **I**, spikelet (**G–I**, P.Green 1605, K). **J–K**, *Carex neesiana*. **J**, habit; **K**, two spikelets (**J–K**, P.Green 1386, K). Scale bars: **A**, **C**, **E**, **G**, **J**, = 20 cm; **B**, **D**, **F**, **I** = 5 mm; **H**, **K** = 1 cm. Drawn by C.Grey-Wilson.

Lord Howe Is. Endemic. On the rocky slopes and summits of Mts Gower and Lidgbird.

L.H.Is.: N side of Rocky Point, *A.C.Beauglehole 5476* (MEL); SE side of Mt Lidgbird, *A.C.Beauglehole 5474* (MEL); side of Mt Lidgbird, *C.Moore 41* (MEL); Erskine Valley, *R.D.Hoogland 8807* (CANB); *loc. id., M.D.Crisp 4537 & I.R.H.Telford* (CBG).

10. BAUMEA

Baumea Gaudich. in H.L.C. de S. de Freycinet, *Voy. Uranie* t. 29 (1827), 416 (1829); named after Antoine Baumé (1728–1804), French chemist and apothecary.

Type: *B. glomerata* Gaudich.

Rhizomatous perennials. Leaves usually basal, flattened, angled, terete or ±reduced to a sheath. Culms compressed, angled or terete; inflorescence compound or spicate. Spikelets 1–5-flowered, with the lowest 1 (rarely 2) setting fruit, ±persistent. Glumes distichous or spirally arranged. Flowers bisexual. Hypogynous bristles absent. Stamens 3. Style 3-fid; base often pubescent, somewhat thickened and ±conical, not separated from nut by a constriction. Nut ovoid-ellipsoidal, often 3-angled but not winged, naked; endocarp hard.

A genus of c. 30 species from the Mascarene Is. and Madagascar to Indomalaysia, Australia, New Zealand and the Pacific; 1 species native to Lord Howe Is. (possibly introduced). Previously often treated as part of *Cladium* or *Machaerina*.

Baumea juncea (R.Br.) Palla, *Allg. Bot. Z. Syst.* 15: 113 (1909)

Cladium junceum R.Br., *Prodr.* 237 (1810). T: Port Jackson, southern Australia, Tasmania, *R.Brown*; syn: BM. So named from a resemblance in habit to a rush, the genus *Juncus*.

Illustrations: F.W.Carpenter, *Proc. Linn. Soc. New South Wales* 44: t. 30, fig. 28 (1919), as *Cladium junceum*; E.R.Rotherham *et al*., *Fl. Pl. New South Wales & S Queensland* 168, fig. 553 (1975); J.P.Jessop & J.Z.Weber in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 2004, fig. 920C (1986).

Rush-like perennial. Rhizome stout, covered with loose membranous scales. Leaves reduced to sheaths with a mucro-like lamina 1–5 mm long, usually dark brown on rim of sheath. Culms tufted, several arising from each node, 2- or 3-noded, rigid, erect, terete, (20–) 30–100 cm tall, 1–2.5 mm diam., smooth; inflorescence terminal, spike-like, 1–7 cm long, of 3–6 sessile spikelets each subtended by a small pointed sheathing bract c. 5 mm long. Spikelets crowded, 4–5 mm long, reddish brown, 1- or 2-flowered; lower flower fertile. Glumes 4 or 5, ovate, acute to acuminate, finely scabrid on keel toward tip. Nut obloid-ovoid, 2.5–3.5 mm long, pitted, with a small, ±pyramidal, finely pubescent style base.

Lord Howe Is. Rare, found in wet pockets on rocks near Rocky Run. Possibly a recent arrival for, although it is said to be very uncommon, it is spreading rapidly according to J.Pickard (*Biol. Conservation* 27: 135, 137, 1983). It is also native on the North Is. of New Zealand, in New Caledonia and all Australian States except N.T.

L.H.Is.: Rocky Run, *L.A.S.Johnson & A.N.Rodd 1309* (NSW).

11. GAHNIA

Gahnia J.R.Forst. & G.Forst., *Char. Gen. Pl.* 26 (1775); named after Henric Gahn (1747–1816), Swedish doctor and pupil of Linnaeus.

Type: *G. procera* J.R.Forst. & G.Forst.

Perennial; rhizomatous, frequently in large tussocks. Leaves basal and cauline, 3-ranked, ligulate, terete or involute, gradually narrowing to a long tapering point, marginally usually strongly scabrous. Culm erect, stout, terete; inflorescence paniculate, of usually many panicles subtended by long filiform leaf-like bracts. Spikelets numerous, persistent, usually dark brown. Glumes several, spirally arranged, overlapping; lower 2–6 glumes empty and upper 1–3 with bisexual flowers, or usually lower flowers functionally male and upper

flowers functionally bisexual. Hypogynous bristles usually absent. Stamens 2–6; filaments usually lengthening greatly after anthesis and suspending the nut. Style not thickened at base; branches 3 (rarely 4 or 5). Nut usually obscurely 3-angled or terete, usually shining; endocarp hard.

A genus of 30–40 species from China through Malesia to Australia and the Pacific; 1 native species on Lord Howe Is.

Gahnia xanthocarpa (Hook.f.) Hook.f., *Handb. N. Zeal. Fl.* 1: 306 (1864)

Lampocarya xanthocarpa Hook.f., *Fl. Nov.-Zel.* 1: 278 (1853); *Cladium xanthocarpum* (Hook.f.) F.Muell., *Fragm.* 9: 13, 78 (1875). T: North Island, New Zealand, *Colenso 383*; lecto: K, *fide* E.Edgar in L.B.Moore & E.Edgar, *Fl. New Zealand* 2: 214 (1970). So named from the Greek *xanthos* (yellow) and *carpos* (fruit), in allusion to the colour of the ripe nuts.

Strong tussocky perennial. Leaves ±equal in length to culm, 1–2 m long, c. 1 cm broad at base tapering to a long fine point, harshly scabrid on midrib beneath and margins, which tend to inroll. Culms stout, 1–2 m tall, smooth; panicle ±drooping, 30–40 cm long. Spikelets very numerous, 6–8 mm long, 2–3 mm broad, chestnut brown; lower 3 or 4 glumes lanceolate-acuminate, 6–7 mm long, empty, scabrid keeled; upper 2 or 3 glumes ovate-oblanceolate, 4–5 mm long, thinner, smaller, with fertile flowers. Stamens 4, filaments elongating to c. 1 cm. Style branches 3 or 4. Nut fusiform, 4–5 mm long, yellow or light brown, shining; base of style often persistent but not thickened. Fig. 94E–F.

Lord Howe Is. In damp patches in low rocky forest on the sides and summits of Mts Gower and Lidgbird. Also native to the North Is. of New Zealand.

L.H.Is.: N side of Mt Lidgbird, *A.C.Beauglehole 5470* (CANB, MEL); NE flank of Mt Lidgbird, *M.M.J. van Balgooy 1104* (CANB); E of Salmon Beach, *A.C.Beauglehole 5984* (CANB).

12. UNCINIA

Uncinia Pers., *Syn. Pl.* 2: 534 (1807); from the Latin *uncinus* (a little hook), in reference to the hooked apex of the axis of the female spikelet.

Type: *U. australis* Pers. = *U. uncinata* (L.f.) Kük.

Tufted or shortly rhizomatous perennial. Leaves basal and cauline, grass-like, very slender. Culms ±trigonous (occasionally terete); inflorescence a simple, terminal, ±loose, usually narrowly cylindrical spike of unisexual flowers, with the lower female, and the upper male. Spikelets 1-flowered. Glumes spirally arranged. Male flower with 3 stamens. Female flower enclosed in a persistent utricle from which 3 style branches protrude as well as the spikelet axis terminated by a rigid hook. Nutlet enclosed in a utricle.

A genus of c. 35 species, mostly confined to the temperate regions of South America (including the Andes), Malesia, Australia, New Zealand and the subantarctic islands, but also from Hawai'i, Central America and the Caribbean; 1 endemic species on Lord Howe Is.

Uncinia debilior F.Muell., *Fragm.* 8: 151 (1874)

Uncinia filiformis var. *debilior* (F.Muell.) W.R.B.Oliv., *Trans. Proc. New Zealand Inst.* 49: 128 (1917). T: Mt Gower, Lord Howe Is., *J.P.Fullagar & Lind*; holo: MEL. The epithet means weaker, more feeble, from the Latin *debilis*, in allusion to this species having weaker culms than *U. compacta* R.Br.

[*Uncinia filiformis auct. non* Boott: W.B.Hemsley, *Ann. Bot.* (*London*) 10: 257 (1896)]

[*Uncinia riparia auct. non* R.Br.: G.Kükenthal in H.G.A.Engler, *Pflanzenr.* IV 20 (Heft 38): 63 (1909), *p.p.*]

Tufted perennial. Leaves grass-like, 5–10 cm longer than culms, 0.5–1 mm broad. Culms filiform, 15–50 cm tall; inflorescence slender, 4–7 cm long. Glumes narrowly lanceolate, acute, keeled, 4–5 mm long; lowermost glume with a leaf-like tip up to 10 cm long; lower glumes separated on axis; mid glumes gradually closer; upper glumes overlapping. Lowermost 20–30 flowers female; uppermost 5–10 flowers male. Utricle slender, ±equalling glume; hooked bristle 4 (–5) mm long. Fig. 94G–I.

Lord Howe Is. Endemic. In low forest on or near the summits of Mts Gower and Lidgbird.

L.H.Is.: summit plateau of Mt Gower, *P.S.Green 1605 & 1660* (A, K); top of Mt Gower, *A.C.Beauglehole 8915* (CANB).

Although endemic, this species is closely allied to others from New Zealand.

13. CAREX

Carex L., *Sp. Pl.* 2: 972 (1753); *Gen. Pl.* 5th edn, 420 (1754), *nom. cons. prop.*; the classical Latin name for a sedge.

Type: *C. hirta* L., *typ. cons. prop.*

Perennial grass-like rhizomatous herbs, creeping or tufted. Leaves basal and cauline. Culms usually trigonous; inflorescence of compound or simple, cylindrical spikes, subtended by leaf-like bracts. Spikelets 1-flowered. Glumes spirally arranged. Flowers numerous, unisexual; hypogynous bristles absent. Male flower of 3 stamens. Female flower a single ovary enclosed in a sac-like, persistent utricle, from which the 2 or 3 style branches protrude through an orifice. Nutlet enclosed in utricle.

A large genus of 1500–2000 species, distributed throughout the world, especially in temperate regions and in moist or wet habitats. Five species native on the Islands.

1 Spikes 2–5, crowded in 1 head, rarely with 1 (sometimes 2) spike borne 1–2 cm below the cluster

2 Style branches 2; male flowers 1–3 at base of spikes; leaves 0.5–1.5 mm broad; culms not distinctly shorter than leaves (N.Is., L.H.Is.) **1. C. inversa**

2: Style branches 3; male flowers in a terminal spike or a few at apex of other spikes; leaves 1.5–3 mm broad; culms distinctly shorter than leaves (L.H.Is) **2. C. breviculmis**

1: Spikes 5–25, not all crowded in 1 head, sometimes in separate clusters

3 Habit long-creeping; culms 10–25 cm tall, much shorter than leaves; utricle corky and smooth; sand dunes (L.H.Is) **5. C. pumila**

3: Habit tufted; culms 30–100 cm tall, equal to or nearly as long as leaves; utricle not corky and smooth; in damp places by streams and in forests

4 Spikes 1–2 cm long, equal; leaves 2–3.5 mm broad; style branches 2 (L.H.Is.) **3. C. brunnea**

4: Spikes 4–7 cm long, if 1–2 cm long then clustered at the base of a longer spike; leaves 4–9 mm broad; style branches 3 (N.Is.) **4. C. neesiana**

1. Carex inversa R.Br., *Prodr.* 242 (1810)

T: New South Wales, *R.Brown*; holo: BM. The Latin epithet means turned over, perhaps in allusion to the culms being frequently bent over.

Illustrations: F.Boott, *Ill. Gen. Carex* 4: t. 488, figs 2–3 (1867); G.Kükenthal in H.G.A.Engler, *Pflanzenr.* IV, 20 (Heft 38): 188, fig. 31A–C (1909); J.P.Jessop & J.Z.Weber in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 2012, fig. 925C (1986).

Rhizomatous perennial. Leaves grass-like, 5–25 cm long, 0.5–1.5 mm broad. Culms slender, erect or bent over, height very variable, usually up to 20 (–40) cm tall, smooth; subtending inflorescence bracts leaf-like, up to 10 cm long; inflorescence dense, c. 1 cm long, green, of 2–5 closely packed sessile spikes, or occasionally 1 or 2 spikes a little distant; spikes 0.5–1 cm long with 1–3 male flowers at base. Glumes shorter than utricles, whitish with a green keel. Stigmatic branches 2. Utricles plano-convex, c. 3 mm long, 1.5 mm broad, with 2 lateral ribs and 7–9 longitudinal veins between; beak c. 1 mm long.

Norfolk Is., Lord Howe Is. On Norfolk Is. widespread in the National Park in clearings, and in turf elsewhere; on Lord Howe Is. widespread in clearings in lowland forest and

occasionally in turf. Also native in New Zealand and all Australian States except N.T.

N.Is.: Ball Bay, *P.S.Green 1886* (K); NE slopes of Mt Bates, *R.D.Hoogland 6624* (CANB); near Pop Rock, *R.M.Laing* (CHR); *s. loc.*, *R.D.McComish 228* (NSW). **L.H.Is.:** above Old Settlement Beach, *A.C.Beauglehole 5477* (CANB, MEL); N slope of Mt Gower, *M.D.Crisp 4538 & I.R.H.Telford* (CBG).

2. Carex breviculmis R.Br., *Prodr.* 242 (1810)

T: New South Wales, *R.Brown*; holo: BM. The epithet alludes to the short culm in this species.

Carex breviculmis var. *stipitata* Kük. in H.G.A.Engler, *Pflanzenr.* IV 20 (Heft 38): 469 (1909). T: Tasmania; Lord Howe Island, *J.P.Fullagar*; syn: MEL. So named from the stipitate or stalked utricle.

Illustrations: J.D.Hooker, *Fl. Nov.-Zel.* 1: t. 63, fig. A (1853); A.B.Costin *et al.*, *Kosciusko Alpine Fl.* 254, pl. 112 (1979); J.P.Jessop & J.Z.Weber in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 2010, fig. 924C (1986).

Tufted perennial. Leaves grass-like, 8–25 cm long, 1.5–3 mm broad. Culms erect, 3–16 cm tall, much shorter than leaves, smooth; subtending inflorescence bracts leaf-like, 5–10 (–25) cm long; inflorescence of 2–5 spikes, ±clustered, or occasionally the basal spike up to 2 cm distant; spikes subsessile, 8–10 mm long; terminal spikes male or a few flowers at the apex of other spikes male. Glumes longer than utricles, pale with narrow green midrib produced into a distinct awn. Stigmatic branches 3. Utricles subtrigonous, c. 3 mm long, 1.5 mm broad, distinctly keeled, faintly many-veined, finely pubescent.

Norfolk Is., Lord Howe Is. In grassy patches in forest throughout the Islands, although apparently rare on Norfolk Is. Also native in New Zealand, Australia (S.A., Qld, N.S.W., Vic., Tas.), and in New Guinea.

N.Is.: J.E. Rd, *K.L.Wilson 6260* (K, NSW); track to Bird Rock from Red Rd, *K.L.Wilson 6265* (K, NSW); track to Captain Cook Monument from Duncombe Bay Rd, *K.L.Wilson 6267* (K, NSW). **L.H.Is.:** SE slopes of Malabar, *P.S.Green 1544B & 1558* (A, K); near Old Settlement, *P.S.Green 1923* (K); N side of North Hummock, *A.C.Beauglehole 5472* (CANB, MEL).

Mainland Australian plants have longer spikes, to 18 mm long.

3. Carex brunnea Thunb. ex Murray, *Syst. Veg.* 14th edn, 844 (1784)

T: Japan, *C.P.Thunberg*; holo: UPS *n.v.*, photo seen (IDC microfiche 1036-5184.913/17). The epithet means brown, in reference to the colour of the spikes.

Carex gracilis R.Br., *Prodr.* 242 (1810), *nom. illeg.*, *non* Curtis (1780). T: New South Wales, *R.Brown*; holo: BM.

[*Carex hattoriana auct. non* Nakai ex Tuyama: S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 11 (1981); A.N.Rodd & J.Pickard, *Cunninghamia* 1: 270 (1983)]

Illustrations: G.Kükenthal in H.G.A.Engler, *Pflanzenr.* IV 20 (Heft 38): 600, fig. 102A–E (1919); K.L.Wilson in G.J.Harden, *Fl. New South Wales* 4: 389 (1993).

Tussock-forming perennial. Leaves grass-like, 10–50 cm long, 2–3.5 mm broad, rough on margins. Culms erect, smooth, 30–80 cm tall; subtending inflorescence bracts ±leaf-like, 7–15 cm long, equal to inflorescence or shorter, rarely slightly longer; inflorescence of 12–25 spikes with upper spikes ±clustered; apical flowers of each spike male; spikes 1–2 cm long; upper spikes ±sessile; lower spikes with pedicels 1–5 cm long. Glumes equal to or sometimes shorter than utricles, keeled; lower glumes aristate; upper glumes acute. Stigmatic branches 2. Utricles plano-convex, 3–4 mm long, 1 mm broad, ±prominently ribbed, scabrid-pubescent in upper half with a gradually narrowed beak c. 1 mm long.

Lord Howe Is. In clearings and lighter parts of lower and mid-elevation forest throughout the Island. Also in Australia (Qld, N.S.W.), and possibly New Caledonia - as another segregate within this broad species.

L.H.Is.: SE lower slopes of Malabar, *P.S.Green 1533* (A, K); N end of Lagoon Rd, *P.S.Green 1922* (K); Transit Hill, *M.M.J. van Balgooy 1004* (K); Boat Harbour, *R.D.Hoogland 8782* (CANB); Hunter Bay, *M.D.Crisp 4452 & I.R.H.Telford* (CBG).

This species is part of a complex, distributed from Japan to Australia, and India to Arabia, Ethiopia, Mauritius and Hawai'i, which needs investigation. The Lord Howe Is. and

Australian representative has been called *C. hattoriana* Nakai ex Tuyama, as it resembles that plant, endemic to the Bonin Islands, but it does not exactly match that species.

4. Carex neesiana Endl., *Prodr. Fl. Norfolk.* 24 (1833)

Carex dissita var. *neesiana* (Endl.) Kük. in H.G.A.Engler, *Pflanzenr.* IV 20 (Heft 38): 691 (1909). T: Norfolk Island, *F.L.Bauer*; holo: ?W *n.v.* Named after the German botanist C.G.D.Nees von Essenbeck (1776–1858).

Illustration: F.Boott, *Ill. Gen. Carex* 4: 136, t. 436 (1867).

Tufted perennial. Leaves grass-like, 30–100 cm long, 4–9 mm broad, marginally asperous. Culms erect, equal to or nearly as long as leaves, 40–100 cm tall, asperous below and near the leaf-like bracts, smooth in the lower part; subtending bracts very leaf-like, 10–50 cm long; inflorescence of (5–) 10–25 spikes, in 2–4 pedunculate clusters, each cluster of c. 4 or 5 crowded, ±sessile, short spikes, 1–4 cm long, and a single longer terminal spike, 5–7 cm long, with its uppermost flowers male. Glumes broadly lanceolate, equal to or longer than utricles, acute to aristate, with prominent midrib. Stigmatic branches 3. Utricles ellipsoidal-ovoid, 3.5–4 mm long, obscurely veined, shining dark brown, shortly and slightly scabrid-beaked. Fig. 94J–K.

Norfolk Is. Endemic. In damp areas in the National Park and by streams, locally common.

N.Is.: Rocky Point Ck, *P.S.Green 1458* (A, K); Mt Bates, *P.S.Green 1386* (A); One Hundred Acre Reserve, *W.R.Sykes NI 1043* (CHR); *loc. id., R.D.Hoogland 11141* (CANB, K).

This species is related to a group of New Zealand species (see B.G.Hamlin, *Rec. Dominion Mus.* 6: 97–111, 1968).

5. Carex pumila Thunb. ex Murray, *Syst. Veg.* 14th edn, 844 (1784)

T: Japan, *C.P.Thunberg*; holo: UPS *n.v.*; photo seen (IDC microfiche 1036-5184.919/20). The epithet means dwarf, in reference to its low-growing habit.

Illustrations: J.T.Salmon, *New Zealand Fl. Pl. Colour* 24, fig. 24 (1963); H.D.Wilson, *Stewart Is. Pl.* 357, fig. 589 (1982); J.P.Jessop & J.Z.Weber in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 2012, fig. 925E (1986).

Strongly rhizomatous, long-creeping perennial. Leaves 1.5–3 mm broad, often somewhat inrolled, long-tapering to a fine apex, smooth. Culms erect, much shorter than leaves, 8–25 cm tall, smooth; subtending inflorescence bracts leaf-like, 10–20 cm long; inflorescence of 5–7 spikes, not all crowded into one head; spikes 1–3 cm long, with the lower 2 or 3 spikes female and the upper 1–4 spikes male. Glumes ovate, shorter than utricles, acute, slightly keeled in upper half. Stigmatic branches 3. Utricles ovoid-conoid, 5.5–7 mm long, smooth, corky, slightly beaked.

Lord Howe Is. In sand dunes at Old Settlement Bay. Listed as rare by J.Pickard (*Biol. Conservation* 27: 137, 1983). Also native in eastern Australia, New Zealand, Chile, Japan, Korea and China.

L.H.Is.: E end of Old Settlement Bay, *A.C.Beauglehole 5473* (CANB); mouth of Soldiers Ck, *P.S.Green 2034* (K).

104. POACEAE

Annual or perennial herbs, rarely woody. Stems terete, usually hollow, except at the slightly swollen nodes. Leaves distichous, solitary at nodes, consisting of a sheath, ligule and blade, the latter usually flat and linear. Inflorescence usually terminal, usually composed of spikelets of 1–many florets in rows; each spikelet with 2 (3 in *Arundinaria*) empty glumes (*i.e.* basal scales) at base; lower glume rarely absent. Florets bisexual or unisexual, sessile on rachilla, when perfect consisting of a lower lemma (median scale), often awned, and an upper

palea (upper scale), 2 or 3 lodicules, usually 3 stamens and a superior 1-locular ovary with 1 ovule; style usually with 2 plumose stigmas. Fruit a caryopsis.

The true grasses and bamboos (the 'woody' grasses of subfamily Bambusoideae). A cosmopolitan family of c. 650 genera and 10,000 species, with 51 native and introduced genera on the Islands.

The genera of the widely grown, temperate grain producers: *Triticum aestivum* L. (wheat), *Hordeum vulgare* L. (barley) and *Secale cereale* L. (rye) are included in the following key (marked †) as they are sometimes grown on the Islands and might be met with as occasional casual escapes. However, they cannot be considered as naturalised there and are therefore not included in the main account of this family.

The family is also important in pasturage, and many of the introduced species were imported to improve the grazing and provide fodder for stock.

J.H.Maiden, (*Proc. Linn. Soc. New South Wales* 45: 566, 1920) recorded *Dactyloctenium aegyptium* (L.) Willd. as an introduced plant on Lord Howe Is., collected by J.L.Boorman. However, the specimen upon which this record was based cannot be traced, nor has a *Dactyloctenium* been found on the Island since. One may have been introduced as fodder and subsequently died out. Furthermore, there is some doubt that it was this species, for according to Dr Surrey Jacobs (in litt.) the species was not recorded from New South Wales until 1935. He suggests that the plant concerned might more likely have been *D. radulans* (R.Br.) P.Beauv. Until a more certain record can be established it seems best not to include *Dactyloctenium* in this Flora.

G.Bentham, Graminae, *Fl. Austral.* 7: 449–670 (1878); W.D.Clayton & S.A.Renvoize, *Genera Graminum* (1986); L.Watson & M.J.Dallwitz, *Grass Gen. World* (1992); B.K.Simon, *Key Austral. Grasses* 2nd edn (1993).

KEY TO GENERA

1 Bamboo with woody culms; leaf blades petiolate — **1. ARUNDINARIA**

1: Herbs (at most reed-like); leaf blades not clearly petiolate

2 Spikelets hidden within upper leaf sheaths — **44. PENNISETUM**

2: Spikelets not hidden within upper leaf sheaths, or if enclosed by them, only partially so, with more than 4 spikelets

3 Inflorescence spherical; spikelets in centre with radiating bristles — **46. SPINIFEX**

3: Inflorescence not as above

4 Inflorescence a spike, raceme or panicle, not radiating from a central axis

5 Inflorescence a spike or raceme; if a raceme pedicels short and unbranched, bearing a single spikelet, or 2 or 3 spikelets forming a unit

6 Inflorescence spike-like; spikelets sessile or subsessile on axis, or if spikelets paired then the lowermost sessile

7 Spikelets sunk into hollows in axis of inflorescence

8 Inflorescence ±flattened; spikelets all on one side — **40. STENOTAPHRUM**

8: Inflorescence cylindrical

9 Spikelets solitary at each node of inflorescence axis

10 Spikelets 1- or 2-flowered; inflorescence axis breaking up in fruit — **31. LEPTURUS**

10: Spikelets 3–11-flowered; axis not breaking up in fruit — **4. LOLIUM**

9: Spikelets paired; upper sterile, its pedicel fused with axis **51. ROTTBOELLIA**

7: Spikelets not so sunk

11 Inflorescence elongate; spikelets separated by c. their own length

12 Spikelets with 2 glumes both borne laterally to the inflorescence axis; both glumes well developed, awned or awnless **22. ELYMUS**

12: Spikelets apparently with 1 glume only (except in terminal spikelet) borne away from the axis, and awnless **4. LOLIUM**

11: Inflorescence dense; spikelets clearly overlapping

13 Spikelets grouped within a burr-like, bristly involucre, in which the bristles are basally fused **45. CENCHRUS**

13: Spikelets not as above

14 Glumes or lemmas prominently awned; pedicels not bristly-hairy

15 Spikelets in groups of 3 **23. HORDEUM**

15: Spikelets solitary at each node **† SECALE**

14: Glumes and lemmas not awned; pedicels glabrous or persistently bristly-hairy

16 Pedicels glabrous **† TRITICUM**

16: Pedicels persistently bristly-hairy

17 Bristles or hairs on pedicels persistent after spikelets have fallen **39. SETARIA**

17: Bristles or hairs falling with mature spikelets **44. PENNISETUM**

6: Inflorescence a raceme; spikelets pedicellate

18 Lemmas with transverse rows of stiff hairs on back; lemma apex deeply bilobed; lobes finely setose with an awn from between lobes **25. RYTIDOSPERMA**

18: Lemmas glabrous or with scattered short hairs on back; lemma apex not bilobed

19 Lemma apices obtuse, with a dorsal awn; spikelets enclosed within upper glume, 3-flowered; central floret bisexual; 2 outer sterile florets reduced to awned lemmas **13. ANTHOXANTHUM**

19: Lemma apices passing into a terminal awn

20 Glumes minute, with a gap between them and lower lemma; spikelets 3-flowered; central floret bisexual; 2 outer sterile florets reduced to awned lemmas **2. MICROLAENA**

20: Glumes 2–6 mm long, overlapping lemmas of lower florets; spikelets with 4–10 florets **5. VULPIA**

5: Inflorescence an open or dense panicle; pedicels branched, and sometimes quite short

21 Panicle dense, ±cylindrical

22 Lemmas awned

23 Spikelets with 2 or more bisexual, fertile florets

24 Perennials, erect or tussocky, 0.5–6 m tall

25 Panicles 15–25 cm long; leaves not strongly distichous; base of culm clothed in old leaf sheaths **24. CHIONOCHLOA**

25: Panicles 30–60 cm long; leaves strongly distichous; base of culm not clothed in old leaf sheaths **26. ARUNDO**

24: Annuals, usually tufted, ±slender

26 Panicle 1-sided, often slightly nodding; lemma apices long-acute, passing into a terminal awn 6–14 mm long; spikelets 6–14 mm long **5. VULPIA**

26: Panicle dense, ±cylindrical or pyramidal; lemma apices slightly notched, with a short, delicate awn 1–3 mm long borne just below the notch; spikelets 3–6 mm long

27 Awns 1–3 mm long; panicle of very many spikelets; spikelets 3–6 mm long **11. ROSTRARIA**

27: Awns 7–15 mm long; panicle of 5–20 spikelets; spikelets 10–20 mm long **21. BROMUS**

23: Spikelets with 1 bisexual floret, sometimes with 1 or 2 sterile florets below

28 Lemmas and glumes both awned; annuals **20. POLYPOGON**

28: Lemmas awned; glumes awnless; annuals or perennials

29 Glumes equal or subequal; upper glume 1-veined; spikelets 1-flowered; lemma awned

30 Panicle densely ovoid or ovoid-cylindrical, 1–6 cm long; awns straight or geniculate

31 Annuals; glumes very narrow with long, fine tip, longer than floret, with fine spreading hairs **19. LAGURUS**

31: Perennials; glumes slender, acute, shorter than floret, with a scabrid keel **17. ECHINOPOGON**

30: Panicle ±cylindrical, often somewhat loosely so, 10–25 cm long; awns flexuous; glumes slender, acute, with a scabrid keel **18. DICHELACHNE**

29: Glumes unequal; upper glume 3–7-veined; spikelets 2- or 3-flowered; lower, sterile lemmas awned; lemma of upper fertile floret awnless

32 Awns not protruding prominently from inflorescence, 3–10 mm long; spikelets 7–9 mm long, 3-flowered (lower 2 florets sterile); lower glumes 1-veined, ½ length of upper glume; upper glume 3-veined **13. ANTHOXANTHUM**

32: Awns protruding prominently from inflorescence, 2–6 mm long; spikelets 1.5–3 mm long, 2-flowered (lower floret sterile); lower glume very small, veinless; upper glume 7-veined **42. MELINIS**

22: Lemmas awnless

33 Reed-like, (1–) 2–6 m tall; panicle plumose; spikelets 2–6-flowered **27. PHRAGMITES**

33: Perennial or annual grasses up to 1.5 m tall; panicle cylindrical or ovoid; spikelets 1–3-flowered

34 Spikelets enveloped in silky hairs 10–15 mm long, arising from back and base of glumes **47. IMPERATA**

34: Spikelets glabrous, slightly hairy, or with hairs up to 5 mm long, arising from base of lemmas

35 Annuals; glumes distinctly longer than enclosed lemmas

36 Glumes oblanceolate, winged in upper part, awnless **14. PHALARIS**

36: Glumes narrowly lanceolate, not winged; with awn 4–7 mm long **20. POLYPOGON**

35: Perennials; glumes equal to or shorter than enclosed lemmas

37 Spikelets 12–16 mm long, grey-green; panicles densely cylindrical, 1–2.5 cm diam.; leaves to 60 cm long **16. AMMOPHILA**

37: Spikelets 2–2.5 mm long, leaden coloured; panicles narrowly cylindrical, sometimes interrupted, up to 1 cm diam.; leaves to 18 cm long **30. SPOROBOLUS**

21: Panicles variously branched and open

38 Spikelets awned

39 Awns arising from glumes, viscid; leaves flat, 3–10 mm broad **34. OPLISMENUS**

39: Awns arising from lemmas, or, if from glumes, not viscid

40 Awns borne dorsally on lemmas, geniculate or flexuous

41 Spikelets 10–40 mm long, nodding, 2–4-flowered; awns 15–35 mm long **10. AVENA**

41: Spikelets 2–5 mm long, not nodding, 1- or 2-flowered, delicate; awns 2–7 mm long

42 Panicles 2–10 cm long; spikelets 2-flowered; awns 2–2.5 mm long **12. AIRA**

42: Panicles 8–25 cm long; spikelets 1-flowered; awns 5–7 mm long **15. AGROSTIS**

40: Awns terminal on lemmas, straight, often between 2 apical lobes or points, or borne subapically

43 Spikelets crowded, ±globose in 1-sided masses at ends of panicle branches **8. DACTYLIS**

43: Spikelets not so arranged

44 Habit resembling a small bamboo, to c. 1 m tall; culms much branched at nodes and with slim, hard internodes; spikelets 1-flowered **3. STIPA**

44: Habit not 'bamboo-like'; spikelets 2–13-flowered

45 Awns geniculate

46 Spikelets 3–10-flowered; lemmas deeply bilobed, with 2 or 3 transverse rows of stiff hairs; tufted, slender perennials **25. RYTIDOSPERMA**

46: Spikelets 2-flowered; lemmas shortly bilobed, ciliate; robust annuals or perennials **48. SORGHUM**

45: Awns straight

47 Upper glume to 1 mm long, separated from lower lemma by 1–1.5 mm of rachilla base; rachilla bearded at base **2. MICROLAENA**

47: Upper glume at least 1.5 mm long, usually more, adjacent to lower lemma

48 Spikelets 0.6–10 cm long; 4–12-flowered

49 Panicles narrow, up to c. 1 cm broad; spikelets somewhat 1-sided, erect, 6–14 mm long; pedicels 1–4 mm long **5. VULPIA**

49: Panicles open or contracted, 3 cm or more broad; spikelets not 1-sided, nodding or erect, 10–90 mm long; pedicels 1–25 mm long **21. BROMUS**

48: Spikelets 0.15–0.5 cm long; 2-flowered

50 Panicles fluffy, often tinged pink or purplish; spikelets immersed in straight hairs to 5 mm long, overtopping the awns **41. RHYNCHELYTRUM**

50: Panicles with protruding glumes, but not fluffy; spikelets glabrous or with short, spiny, somewhat hispid hairs

51 Lower glumes broad, c. 2 mm long, 3–5-veined; upper glumes c. twice as long; leaves glabrous **36. ECHINOCHLOA**

51: Lower glumes minute, absent or reduced to veinless scales to 0.5 mm long; upper glumes 1.5–2 mm long; leaves tomentose, often smelling vaguely of molasses **42. MELINIS**

38: Spikelets without awns

52 Spikelets single-flowered **15. AGROSTIS**

52: Spikelets 2–several-flowered

53 Spikelets in crowded, ±globose, 1-sided masses at ends of panicle branches **8. DACTYLIS**

53: Spikelets not so

54 Panicle with occasional bristles 4–7 mm long **39. SETARIA**

54: Panicle without occasional bristles

55 Lower glume not more than half as long as upper glume

56 Spikelets immersed in tufts of straight hairs to 5 mm long; panicle fluffy, often tinged pink or purplish **41. RHYNCHELYTRUM**

56: Spikelets glabrous; panicle when fully emerged diffuse but not fluffy **35. PANICUM**

55: Lower glume more than half as long as upper glume

57 Perennial, stoloniferous sand-binder; panicles unisexual; male racemes in clusters subtended by large silky-haired bracts **46. SPINIFEX**

57: Perennials or annuals; habitat usually not sand dunes; panicles not unisexual; racemes not clustered

58 Spikelets broadly ovate or ovate-oblong; glumes ovate, rounded **6. BRIZA**

58: Spikelets narrowly ovate, lanceolate or elliptic; glumes boat-shaped and keeled

59 Panicle 1-sided, rigid; annuals **9. CATAPODIUM**

59: Panicle not 1-sided, not rigid; annuals or perennials

60 Spikelets narrowly elliptic, 6–30-flowered; glumes dissimilar to and usually shorter than lemmas **28. ERAGROSTIS**

60: Spikelets ovoid-lanceolate, 2–12-flowered; glumes similar to lemmas, even if slightly shorter

61 Lemmas sharply subaristate; spikelets 20–35 mm long, strongly compressed **21. BROMUS**

61: Lemmas acute but apex not sharp; spikelets 3–10 mm long, slightly laterally compressed **7. POA**

4: Inflorescence of linear racemes or spikes radiating from or spaced along a central axis, digitate, subdigitate or umbellate

62 Inflorescence of several groups of paired racemes along length of axis, their bases ±enclosed in a spathe-like bract; bases of raceme axes often reflexed **50. CYMBOPOGON**

62: Racemes of inflorescence, ±terminal, digitate, subdigitate or umbellate, not in several separate pairs

63 Spikelets in pairs along raceme axis

64 Upper spikelet of pair sterile; upper lemma of fertile spikelet reduced to a stalk with a prominent awn **49. BOTHRIOCHLOA**

64: Upper spikelet of pair fertile; upper lemma with or without awns

65 Spikelets lanceolate to narrowly lanceolate **43. DIGITARIA**

65: Spikelets broadly ovate to broadly lanceolate **37. PASPALUM**

63: Spikelets borne singly along racemes

66 Fertile spikelets with 3 or more florets **29. ELEUSINE**

66: Spikelets with 1 or 2 florets only

67 Lemmas awned; spikelets imbricate in 2 rows along 1 side of rachis **32. CHLORIS**

67: Lemmas without awns; spikelets imbricate or alternating in 2 rows

68 Spikelets in 2 imbricate rows along 1 side of flattened rachis

69 Lower glume 1–1.5 mm long **33. CYNODON**

69: Lower glume minute or absent **37. PASPALUM**

68: Spikelets alternating in 2 rows along 2 sides of a 3-sided rachis **38. AXONOPUS**

† *Secale* and *Triticum* are not established in the wild and are not treated further in the text.

1. ARUNDINARIA

Arundinaria Michx., *Fl. Bor.-Amer.* 1: 73 (1803); from *arundo*, Latin for a reed.

Type: *A. macrosperma* Michx.

Perennial, shrubby bamboos, rarely small trees. Rhizomes monopodial, 3–7 branches developing at each node. Culms woody. Leaves petiolate. Inflorescence racemose or paniculate. Spikelets usually several–many-flowered. Glumes 3. Florets bisexual. Stigmas 3. Lemmas longer than glumes. Palea 2-keeled.

A genus of c. 50 species from Madagascar and northern India to Japan, also N America; 1 species naturalised on Lord Howe Is. Some species are often grown as garden ornamentals.

***Arundinaria simonii** (Carrière) Rivière & C.Rivière, *Bull. Soc. Natl. Acclim. France* 5: 774 (1878)

f. **variegata** (Hook.f.) Rehder, *Bibl. Cult. Trees* 638 (1949)

Arundinaria simonii var. *variegata* Hook.f., *Bot. Mag.* 116: t. 7146 (1890). T: cultivated, *Messrs. Paul & Sons*, Cheshunt, 21 Apr. 1888; holo: K. So named from the variegated leaves.

Illustrations: J.D.Hooker, *Bot. Mag.* 116: t. 7146 (1890); A.H.Lawson, *Bamboo* 109 (1968), as var. *simonii*; S.Suzuki, *Index Jap. Bambusaceae* 295 (1978), as var. *simonii*.

Slightly rhizomatous. Culms erect, 3–6 m tall, 2–3 cm diam., tough. Leaves with sheaths

somewhat persistent; shortly petiolate; blades narrowly lanceolate to linear-lanceolate, 10–25 cm long, 1.5–2.5 cm broad, longitudinally streaked with white bands of variable width. Spikelets narrowly lanceolate, 3–11 mm long. Glumes lanceolate, 15–16 mm long, ±chartaceous. Lemmas broadly lanceolate, minutely bimucronate at apex, somewhat coriaceous, dorsally puberulous. Palea keels ciliate.

Lord Howe Is. An escape from cultivation. This widely cultivated species is a native of China and Japan. Like most bamboos, populations flower together at intervals when all the plants may die after setting seed, but in this species flowering can also be intermittent.

L.H.Is.: Valley Gardens, *J.Pickard 2705* (K, NSW).

2. MICROLAENA

Microlaena R.Br., *Prodr.* 210 (1810); from Greek *micros* (small) and *laina* (cloak) in allusion to the small outer glumes in this group of plants.

Type: *M. stipoides* (Labill.) R.Br.

Perennials (elsewhere rarely annuals). Leaf blades variable. Inflorescence a panicle or raceme. Spikelets solitary or paired, 3-flowered; rachilla articulated above glumes. Glumes persistent, tiny to large. Lower 2 florets reduced to sterile lemmas; upper floret bisexual. Lemmas unequal; sterile lemmas with long terminal awn; fertile lemma usually shorter, with apex rounded or acute. Palea hyaline, faintly 1-nerved.

A genus of c. 10 species from Asia, Australia and New Zealand; 1 species native on Norfolk and Lord Howe Islands. It is sometimes considered part of a larger genus *Ehrharta* Thunb. (see L.M.P.Willemse, *Blumea* 28: 181–194, 1982).

Microlaena stipoides (Labill.) R.Br., *Prodr.* 210 (1810)

Ehrharta stipoides Labill., *Nov. Holl. Pl.* 1: 91, t. 118 (1805). T: Tasmania, 1797, *J.J.H. de Labillardière*; holo: ?FI *n.v.* So named because of its supposed resemblance to members of the genus *Stipa*.

Illustrations: N.T.Burbidge, *Austral. Grasses* 2nd edn, 183 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1838, fig. 839A (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 202 (1990).

Rhizomatous perennial. Culms slender, ascending, 30–75 cm tall. Leaf sheaths tightly clasping; ligule a membranous rim; blade flat, 2–15 cm long. Panicles slender, branched towards base or simple, usually slightly drooping. Spikelets narrow, 2–4 cm long including awns; pedicels slender, 1–15 mm long; rachilla bearded at base. Glumes 0.5–1 mm long, remote from lemmas by 1–1.5 mm. Sterile lemmas rigid, 8–10 mm long, tapered to a straight slender awn 20 mm long; fertile lemma acute, mucronate. Palea slightly shorter than fertile lemma. Stamens 4.

Norfolk Is., Lord Howe Is. Fairly common in open forest *etc.*, 'often forming dense mats' (*fide* W.R.Sykes *in litt.*). Widespread in Malesia, in all Australian States except N.T., and New Zealand.

N.Is.: edge of bush and shady pastures, *F.C.Allen 55* (CHR, K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW). **L.H.Is.:** Malabar Hill, 1982, *H.T.Clifford s.n.* (NSW).

3. STIPA

Stipa L., *Sp. Pl.* 1: 78 (1753); *Gen. Pl.* 5th edn, 34 (1754); from the Greek *stuppe* (oakum or tow), in allusion to the feathery inflorescences in these grasses.

Type: *S. pennata* L.

Perennials, usually tufted. Leaf sheaths open; blades narrow, usually rough to the touch, often inrolled. Inflorescence a dense or sparsely branched panicle. Spikelets 1-flowered. Glumes equal or subequal, longer than floret, awnless. Floret bisexual, disarticulating above glumes. Lemma hardened, awned, enclosing palea and floret; awn flexuous, spirally twisted,

geniculate, usually plumose. Palea usually thin.

A genus of c. 300 species, mostly occurring in temperate and warm temperate regions throughout the world; 1 species naturalised on Lord Howe Is.

*Stipa ramosissima (Trin.) Nees, *Flora* 11: 301 (1828)

Urachne ramosissima Trin., *Gram. Unifl. Sesquifl.* 173 (1824). T: 'Nova Hollandia', *F.W.Sieber, Agrost. 82*; holo: ?LE *n.v.*; iso: K. The epithet means most or very much branched, from the Latin *ramus* (a branch).

Tufted, erect, bamboo-like perennial, c. 1 m tall. Culms branching freely at nodes. Leaf blades 10–30 cm long, 1–5 mm broad, inrolled. Panicles 20–40 cm long; branches whorled. Spikelets 2–2.5 mm long. Glumes narrowly lanceolate, 2–3 mm long, acute. Lemma 1.5–2 mm long, glabrous; awn 1–2 cm long, not plumose. Fig. 96A–C.

Lord Howe Is. Naturalised; a native of Australia (Qld, N.S.W.).

L.H.Is.: Anderson Rd, *J.Pickard 1409* (NSW).

4. LOLIUM

Lolium L., *Sp. Pl.* 1: 83 (1753); *Gen. Pl.* 5th edn, 36 (1754); the name, in Virgil, of a troublesome weed.

Type: *L. perenne* L.

Annuals or perennials. Leaf blade flat, folded or rolled. Inflorescence a raceme of ±sessile spikelets in two opposite rows, with glumes borne away from the axis. Spikelets of several florets. Glumes longer or shorter than spikelets, awnless; lower (inner) glume absent except in terminal spikelet. Florets bisexual. Rachis articulated and breaking up in fruit. Lemma terminally awned or awnless. Palea tough, c. equalling lemma.

A genus from temperate Eurasia containing c. 8 species; 2 species introduced on the Islands. One or two species are important pasture grasses. *Lolium temulentum* L. was listed in an unpublished typed list of Norfolk Is. plants, but the specimens upon which the record was based had been misidentified and are actually *L. rigidum*.

E.E.Terrell, A taxonomic revision of the genus *Lolium*, *Techn. Bull. U.S.D.A.* 1392: 1–65 (1968); P.M.Kloot, The genus *Lolium* in Australia, *Austral. J. Bot.* 31: 421–435 (1983).

Perennial; spikelets flattened, abutting but not ±sunken into rachis; glume c. ½–¾ length of spikelet; leaf blades folded or flat when young (N.Is.) **1. L. perenne**

Annual; spikelets narrow, ±sunken into rachis; glume slightly shorter or longer than spikelet; leaf blades rolled when young (N.Is., L.H.Is.) **2. L. rigidum**

1. *Lolium perenne L., *Sp. Pl.* 1: 83 (1753)

T: Europe, Herb. Linn. 99.1; lecto: LINN, *fide* E.E.Terrell, *op. cit.* 7; IDC microfiche 177/2.74/5. Named from its perennial habit.

Illustrations: N.T.Burbidge, *Austral. Grasses* 2: 135 (1968); P.M.Kloot in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1895, fig. 863E (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 195 (1990).

Perennial, ±tufted, 10–50 cm tall. Culms erect or spreading. Leaf blades folded or flat when young. Spikelets flattened, abutting but not ±sunken into rachis, ±their own length apart, 7–20 mm long, 4–10-flowered. Outer glume usually c. ½–¾ length of spikelet. Lemma awnless. *Rye Grass*.

Norfolk Is. Introduced and widely grown as a pasture grass. It is native to Europe, temperate Asia and N Africa.

N.Is.: Emily Bay, *W.R.Sykes NI 792* (CHR); Bumbora, *W.R.Sykes NI 841* (CHR).

2. *Lolium rigidum Gaudin, *Agrost. Helv.* 1: 334 (1811)

T: Switzerland, 1809, *J.Gaudin*; holo: ?LAU *n.v.* Named from its rigid habit.

Stiff annual, to c. 70 cm tall. Culms erect to subprostrate. Leaf blades rolled when young. Racemes somewhat rigid, straight or curved, 3–30 cm long. Spikelets narrow, set in slight hollows of rachis, ±their own length apart, 5–18 mm long, 3–11-flowered. Outer glume c. same length as spikelet. Lemma usually awnless.

This is a very variable species, native to southern Europe and south-western Asia. The more leafy variants make good fodder plants in the drier climates but at the other extreme some forms are only 'weedy'. Although these latter have been treated together as a distinct species, subspecies or variety (each, through quirks of nomenclature, with different epithets), in view of the apparently continuous variation and the ease with which the different forms ('species') cross, the treatment in Terrell's monograph of the genus (*loc. cit.*) is followed here.

Rachis 0.5–2 mm diam., somewhat angular in section; culms erect to decumbent, to 70 cm tall; lemma and florets usually 4.5–8.5 mm long; spikelets usually longer than glumes **2a.** var. **rigidum**

Rachis 1.5–3.5 mm diam., cylindrical; culms decumbent to subprostrate, usually less than 40 cm tall; lemma and florets 3.2–5.5 (–7) mm long; spikelets usually shorter than glumes, never longer **2b.** var. **rottboellioides**

2a. *Lolium rigidum Gaudin var. rigidum

[*Lolium perenne auct. non* L.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 752 (1904)]

Illustrations: N.T.Burbidge, *Austral. Grasses* 1: 119 (1966); E.E.Terrell, *Techn. Bull. U.S.D.A.* 1392: 17, 21 (1968); C.A.Lamp *et al.*, *Grasses Temp. Australia* 199 (1990).

Usually a somewhat erect annual. Culms erect to decumbent, to 70 cm tall. Rachis somewhat angular in section, shorter than rest of culm, 0.5–2 mm diam. Spikelets usually longer than glumes. Lemma and florets usually 4.5–8.5 mm long.

Norfolk Is., Lord Howe Is. Introduced as a fodder grass and recorded as a naturalised alien on Lord Howe Is. by A.N.Rodd & J.Pickard, *Cunninghamia* 1: 275 (1983). Native from southern Europe to Kashmir.

N.Is.: *s. loc.*, *P.Ralston 7* (CHR); *s. loc.*, Nov. 1902, *J.H.Maiden & J.L.Boorman* (NSW). **L.H.Is.:** Lagoon Beach, *A.N.Rodd 1349* (NSW).

2b. *Lolium rigidum var. rottboellioides Heldr. ex Boiss., *Fl. Orient.* 5: 680 (1884)

Based on *Rottboellia loliacea* Bory & Chaub. ex Fauché in J.B.G.G.M.Bory de Saint-Vincent, *Exp. Sci. Morée, Bot.* 3(2): 46 (1832) t. 3, fig. 2 (1835); *Lolium loliaceum* (Bory & Chaub. ex Fauché) Hand.-Mazz., *Ann. K.K. Naturhist. Hofmus.* 28: 32 (1914); *Lolium rigidum* subsp. *lepturoides* Sennen & Mauricio, *Cat. Fl. Rif Orient.* 135 (1933). T: Greece, 'les environs de Modon', *J.B.G.G.M.Bory de Saint-Vincent*; holo: ?P *n.v.* Named in allusion to a resemblance to grasses in the genus *Rottboellia*.

Illustrations: E.Breakwell, *Grasses & Fodder Pl. New South Wales* 173 (1923), as *L. rigidum*; P.M.Kloot in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1895, fig. 863B (1986).

Usually a somewhat decumbent or subprostrate 'weedy' annual. Culms decumbent to subprostrate, usually less than 40 cm tall. Rachis cylindrical, longer than rest of culm, 1.5–3.5 mm diam. Spikelets usually shorter than glumes, never longer. Lemma and florets 3.2–5.5 (–7) mm long.

Norfolk Is., Lord Howe Is. Naturalised in such habitats as roadsides and disturbed ground. Native to the Mediterranean region from Sicily to south-western Turkey and the Crimea.

N.Is.: Red Rd, *P.S.Green 1367* (A); behind Kingston, *F.C.Allen 227* (CHR); above Ball Bay, *W.R.Sykes NI 64* (CHR). **L.H.Is.:** SE lower slopes of Malabar, *P.S.Green 1565* (A, K); *s. loc.*, *L.M.Bingley 19* (K).

5. VULPIA

Vulpia C.C.Gmel., *Fl. Bad.* 1: 8 (1805); named after Johann Samuel Vulpius (1760–1846), a German pharmacist who investigated the flora of Baden.

Type: *V. myuros* (L.) C.C.Gmel.

Annuals. Leaves convolute when dry. Inflorescence a panicle or raceme, usually 1-sided. Spikelets shortly stalked or subsessile, 3–12-flowered, usually 2 or more florets fertile. Glumes very unequal; lower glume very small, 1-veined; upper glume 1–3-veined, awnless. Lemma tough, dorsally rounded, tapering to a straight, rough awn; awn longer than lemma. Palea ±equalling lemma, with apex bifid.

A genus of c. 22 species native to temperate and subtropical regions of the Northern Hemisphere; 2 species naturalised on the Islands.

Lower glume at least 1/2 length of upper glume; margin of upper 1/3 of lemma (below awn) glabrous (N.Is., L.H.Is.) **1. V. bromoides**

Lower glume less than 1/2 length of upper glume; margin of upper 1/3 of lemma ciliate (N.Is.) **2. V. myuros**

1. *Vulpia bromoides (L.) Gray, *Nat. Arr. Brit. Pl.* 2: 1124 (1821)

Festuca bromoides L., *Sp. Pl.* 1: 75 (1753). T: Europe, Herb. A. van Royen No. 912, 356–219; lecto: L, *fide* C.A.Stace in P.H.Davis, *Fl. Turkey* 9: 455 (1985). Named from the resemblance of the spikelets to those of *Bromus*.

Illustrations: J.C.Tothill & J.B.Hacker, *Grasses SE Queensland* 280 (1973); G.M.Cunningham *et al.*, *Pl. W New South Wales* 153 (1981); C.A.Lamp *et al.*, *Grasses Temp. Australia* 291, fig. A (1990).

Culms erect, slender, 5–50 cm tall. Inflorescences narrow, 2–10 cm long. Spikelets somewhat 1-sided, 6–14 mm long, 4–10-flowered. Glumes persistent; lower glume 2.5–6 mm long, 1/2–3/4 length of upper. Lemma 5–8 mm long, marginally glabrous in upper 1/3; apical awn fine, rough, to 13 mm long. *Silver Grass.*

Norfolk Is., Lord Howe Is. Naturalised in waste places and open soil. A native of western Europe, the Mediterranean region and the high mountains of tropical Africa.

N.Is.: Philip Is., *P.S.Green 1501* (A). **L.H.Is.:** SE lower slopes of Malabar, *P.S.Green 1554* (A).

2. *Vulpia myuros (L.) C.C.Gmel., *Fl. Bad.* 1: 9 (1806)

f. **megalura** (Nutt.) Stace & R.Cotton, *Watsonia* 11: 72 (1976)

Festuca megalura Nutt., *J. Acad. Nat. Sci. Philadelphia* ser. 2, 1: 188 (1847). T: California, ?1844, *W.Gambel*; holo: ?GH *n.v.* Epithet from the Greek *mega-* (large) and *oura* (a tail), referring to the resemblance of the panicle to a large tail.

[*Festuca bromoides auct. non* L.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 767 (1904)]

Illustrations: A.S.Hitchcock, *Man. Grasses U.S.* 2nd edn, 61, fig. 45 (1951); P.M.Kloot in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1905, fig. 867D (1986); both as *V. megalura*; C.A.Lamp *et al.*, *Grasses Temp. Australia* 291, fig. C (1990).

Culms erect, slender, to 60 cm tall. Inflorescences narrow, 7–20 cm long. Spikelets ±1-sided, 7–10 cm long, 4–7-flowered. Glumes persistent; lower glume 0.5–2 mm long, 1/6–1/3 length of upper. Lemma 5–7 mm long, upper third ciliate; apical awn fine, rough, 6–14 mm long.

Norfolk Is. An introduced weed. Although a native of the Mediterranean region it was first described from California where it had been introduced in the early years of European settlement.

N.Is.: *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K).

This species was first recorded from Norfolk Is. erroneously as *Festuca bromoides* L.

6. BRIZA

Briza L., *Sp. Pl.* 1: 70 (1753); *Gen. Pl.* 5th edn, 32 (1754); the name in ancient and modern Greek for rye, but applied to these grasses by Linnaeus.

Type: *B. minor* L.

Annuals or perennials. Leaf blades flat. Inflorescence a panicle, usually branched; pedicels slender. Spikelets ovoid or broadly triangular, often pendulous, 4–many-flowered. Glumes almost equal, ovate, dorsally rounded, chartaceous, persistent. Florets bisexual. Lemma concave, suborbicular, closely overlapping, papery, diminishing in size up spikelet. Palea shorter than lemma, concave.

A genus of c. 20 species native in temperate Eurasia and S America; 2 species naturalised on Norfolk and Lord Howe Is.

Spikelets 10–25 mm long, not more than c. 10 in panicle	**1. B. maxima**
Spikelets 2–5 mm long, numerous	**2. B. minor**

1. *Briza maxima L., *Sp. Pl.* 1: 70 (1753)

T: Europe, not designated. This species is so named because, of the three species first named, it has the largest spikelets.

Illustrations: C.E.Hubbard, *Grasses* 2nd edn, 212 (1968); N.T.Burbidge, *Austral. Grasses* 2nd edn, 79 (1984); C.A.Lamp, *et al.*, *Grasses Temp. Australia* 97 (1990).

Annual, 10–60 cm tall. Panicles loose, nodding. Spikelets usually 3–8, broadly ovoid, 10–25 mm long, 5–15 mm broad, 7–20-flowered. Glumes shorter than first lemma, dark brown or purplish. Lemmas broadly ovate, 6–8 mm long, pale, rounded at apex. Palea up to $^{2}/_{3}$ length of lemma. *Giant Shivery Grass, Quaking Grass*.

Norfolk Is., Lord Howe Is. A naturalised weed sometimes escaped from cultivation as an ornamental grass. This species is a native of the Mediterranean region.

N.Is.: Airport Intersection, Nov. 1989, *P.Summerscales* (K). **L.H.Is.:** by roadsides, *L.M.Bingley 23* (K); Signal Point, *R.D.Hoogland 8659* (CANB); Transit Hill, *P.S.Green 1621* (A, K).

2. *Briza minor L., *Sp. Pl.* 1: 70 (1753)

T: Europe, Herb. Linn. No 93.1; lecto: LINN, *fide* C.E.Hubbard in E.W.B.H.Milne-Redhead & R.M.Polhill, *Fl. Trop. E. Africa*, Gramineae 53 (1973). This species so named as the smallest of the three species first described.

Illustrations: N.T.Burbidge, *Austral. Grasses*, 2nd edn, 79 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1887, fig. 859C (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 99 (1990).

Annual, up to 60 cm tall. Panicles loose, much branched. Spikelets numerous, usually nodding, spikelets broadly ovoid, 2–5 mm long and broad, 4–8-flowered. Glumes c. equalling lemma, green or sometimes purplish. Lemmas broadly ovate, 2–3.5 mm long, apex hooded. Palea c. $^{1}/_{2}$ length of lemma. *Small Shivery Grass, Quaking Grass*.

Norfolk Is., Lord Howe Is. An introduced weed of pasture, roadsides *etc*., native in the Mediterranean region.

N.Is.: Airport Intersection, Nov. 1989, *P.Summerscales* (K); *s. loc.*, Nov. 1898, *I.Robinson* (NSW). **L.H.Is.:** SE lower slopes of Malabar, *P.S.Green 1551* (A, K); Transit Hill, *R.D.Hoogland 8676* (CANB); in a garden, *L.M.Bingley 13* (K); *s. loc.*, *C.Moore 34* (K).

7. POA

Poa L., *Sp. Pl.* 1: 67 (1753); *Gen. Pl.* 5th edn, 31 (1754); a Greek name for a grass, especially applied to fodder.

Type: *P. pratensis* L.

Perennials or a few annuals. Leaf blade flat or inrolled, shaped like a boat's bow at tip. Panicles loose or slightly contracted. Spikelets slightly laterally compressed, 2–several-flowered. Glumes somewhat unequal, keeled, membranous; lower glume usually 1-veined; upper usually 3-veined, awnless. Florets bisexual. Lemma somewhat keeled, membranous, usually 5-veined, awnless, often with a tuft of woolly hairs at base. Palea 2-veined, usually bifid.

A large genus of c. 500 species, throughout the temperate regions of the world and on mountain tops in the tropics; 1 species native to Lord Howe Is. and 2 naturalised on Norfolk and Lord Howe Is.

J.W.Vickery, A taxonomic study of the genus *Poa* L. in Australia, *Contr. New South Wales Natl. Herb.* 4: 145–243 (1970); E.Edgar, *Poa* L. in New Zealand, *New Zealand J. Bot.* 24: 425–503 (1986).

1 Leaves inrolled, tough, ±rigid; habit tussocky; panicle contracted; found near coast, usually in sand **3. P. poiformis**

1: Leaves flat, pliable; habit not tussocky-tufted; panicle ovoid or oblong to pyramidal; found in pastures, roadsides or as a weed

2 Annual or, less usually, short-lived perennial, tufted, 3–30 cm tall; lemma without basal tuft of hairs **1. P. annua**

2: Perennial, rhizomatous, 10–90 cm tall; lemma with tuft of long, crimped hairs at base **2. P. pratensis**

1. *Poa annua L., *Sp. Pl.* 1: 68 (1973)

T: Europe, not designated. Named after its annual habit.

Illustrations: J.C.Tothill & J.B.Hacker, *Grasses SE Queensland* 228 (1973); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1901, fig. 865A (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 245 (1990).

Usually annual, tufted. Culms erect to prostrate, 3–30 cm tall. Leaves flat, pliable. Panicles ±pyramidal, 1–8 cm long; lower branches 1 or 2 together. Spikelets ovoid-oblong, 3–10 mm long, 3–10-flowered. Glumes unequal, boat-shaped, 1.5–4 mm long. Lemma ovate-oblong, 2.5–4 mm long, blunt at apex, without basal tuft of hairs, hyaline at tips and margins. Palea slightly shorter than lemma. *Winter Grass*.

Norfolk Is., Lord Howe Is. An introduced and now common weed, especially of cultivated ground, including lawns. Possibly originating in Europe, it is now widespread in temperate regions and on tropical mountains.

N.Is.: Ball Bay, *R.D.Hoogland 11233* (CANB). **L.H.Is.:** W of Stevens Point, *A.C.Beauglehole 5423* (CANB, MEL); between Lagoon Beach and road opposite War Memorial, *A.N.Rodd 1480* (K, NSW); on lawn, *L.M.Bingley 11* (K); Roach Is., *J.C.Game 69/273e* (K).

2. *Poa pratensis L., *Sp. Pl.* 1: 67 (1753)

T: Europe, not designated. The Latin epithet means growing in meadows.

Illustrations: C.E.Hubbard, *Grasses* 2nd edn, 190 (1968); G.M.Cunningham *et al.*, *Pl. W New South Wales* 135 (1981), as Kentucky Bluegrass; C.A.Lamp *et al.*, *Grasses Temp. Australia* 247 (1990).

Variable perennial with creeping rhizomes. Culms erect, 10–90 cm tall. Leaves flat, pliable. Panicles ovoid or oblong, 2–20 cm long; lower branches 3–5 together. Spikelets ovoid to oblong, 4–6 mm long, 2–5-flowered. Glumes slightly unequal, ovate to elliptic, 2–4 mm long. Lemma ovate-oblong, 3–4 mm long, with tuft of long, fine, crimped hairs at base, with hyaline tips and margins, blunt or slightly pointed. Palea c. same length as lemma.

Norfolk Is., Lord Howe Is. Introduced to the Islands as a pasture grass. Native throughout Europe and temperate Asia.

N.Is.: *s. loc., F.C.Allen 179* (CHR). **L.H.Is.:** Lagoon Rd, *A.C.Beauglehole 5421* (CANB, MEL); Main Settlement, *A.C.Beauglehole 5422* (CANB, MEL).

3. **Poa poiformis** (Labill.) Druce, *Bot. Soc. Exch. Club Brit. Isles* 4: 640 (1917)

Arundo poaeformis Labill., *Nov. Holl. Pl.* 27, t. 35 (1805). T: Australia, *J.J.H. de Labillardière*; holo: ?FI *n.v.*; iso: K. The epithet was given, when described in *Arundo*, from its resemblance to *Poa*.

[*Poa caespitosa auct. non* G.Forst. ex Spreng.: F.J.H. von Mueller, *Fragm.* 9: 78 (1875); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 259 (1896); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 127 (1917)]

[*Poa labillardierei auct. non* Steud.: G.Bentham, *Fl. Austral.* 7: 651 (1878), as *P. billardieri*]

Illustrations: J.J.H. de Labillardière, *loc. cit.*; J.W.Vickery, *Contr. New South Wales Natl. Herb.* 4: t. XV (1970); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1901, fig. 865C (1986).

Tussocky perennial. Culms erect, 20–90 cm tall. Leaves somewhat rigid, tough, usually inrolled. Panicles usually contracted, 8–10 cm long; lower branches 3–5 together. Spikelets ovate-oblong, 6–10 mm long, usually 3–5-flowered. Glumes equal or upper slightly longer, lanceolate, 3–3.5 mm long. Lemma lanceolate, usually 4–5 mm long, obtuse or truncate, hairy on lower part of keel and veins, usually with tuft of long crimped hairs at base.

Lord Howe Is. Fairly common in coastal areas, especially if sandy. Native also in similar habitats in Australia from W.A. to N.S.W.

L.H.Is.: SE slopes of Malabar, *P.S.Green 1567* (A, K); Signal Point, *R.D.Hoogland 8656* (CANB, NSW); on S end of Island, *W.Milne 22* (K); Roach Is., *A.C.Beauglehole 5981* (CANB, MEL).

8. DACTYLIS

Dactylis L., *Sp. Pl.* 1: 71 (1753); *Gen. Pl.* 5th edn, 32 (1754); the derivation is a little obscure, the Greek *daktylos* means a finger and the name may refer to a supposed, but scarcely, finger-like appearance of the inflorescence, but *daktylos* is also said to be the classical name for a kind of grape, again obscure, but perhaps referring to the form of the panicle.

Type: *D. glomerata* L.

Perennial; vegetative shoots laterally compressed. Leaf blades flat. Inflorescence a compound panicle. Spikelets densely crowded in thick, 1-sided clusters at ends of branches, laterally compressed, 2–5-flowered. Glumes subequal, keeled, shorter than lemmas. Florets bisexual. Lemma keeled, mucronate or shortly awned, 5-veined. Palea 2-keeled.

A Mediterranean genus best regarded as containing one complex, variable species with local infraspecific groups sometimes treated as subspecies but whose taxonomy has yet to be resolved; naturalised on Norfolk and Lord Howe Islands. The plant on the Islands represents the typical variant.

*Dactylis glomerata** L., *Sp. Pl.* 1: 71 (1753)

T: Europe, Herb. Linn. No. 90.3; lecto: LINN, *fide* W.D.Clayton in E.W.B.H.Milne-Redhead & R.M.Polhill, *Fl. Trop. E. Africa*, Gramineae: 43 (1970). The epithet means gathered together into a round mass, from the Latin *glomus* (a ball of yarn *etc*.).

Illustrations: N.T.Burbidge, *Austral. Grasses* 2nd edn, 100 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1889, fig. 860B (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 119 (1990).

Tufted perennial to 1 m tall. Leaves flat, somewhat keeled, usually glaucous. Panicles 1-sided; lower branches 1–10 cm long, progressively shorter upwards. Spikelets flattened ovoid, 5–9 mm long. Glumes 4–6.5 mm long, hairy or scabrid on keel, finely pointed, 1–3-veined. Lemma lanceolate, 4–7 mm long, hairy or scabrid on keel, with an apical awn to 1.5 mm long. Palea almost equal to glumes. *Cocksfoot*.

Norfolk Is., Lord Howe Is. A coarse pasture grass introduced for fodder. Native to Europe, temperate Asia and N Africa.

N.Is.: *s. loc.*, *P.H.Metcalfe* (NSW). **L.H.Is.:** Old Settlement Beach, *A.C.Beauglehole 5418* (CANB, MEL); Rabbit Is., *L.M.Bingley 20* (K).

9. CATAPODIUM

Catapodium Link, *Hort. Berol.* 1: 44 (1827); from the Greek *kata* (downwards, here used in a disparaging sense) and *podion* (diminutive of foot), in allusion to the spikelets with little or no stalk.

Type: *C. loliaceum* (Huds.) Link

Annuals. Leaf blade flat. Inflorescence a rigid, 1-sided, panicle or raceme. Spikelets somewhat compressed, several-flowered. Glumes subequal, 1–3-veined. Florets bisexual. Lemma coriaceous, dorsally rounded, glabrous, 5-veined. Palea shorter than or equalling lemmas.

A genus of 2 species distributed from western Europe and North Africa to Afghanistan, generally growing in dry areas; 1 species naturalised on Norfolk and Lord Howe Islands. It is sometimes united with the genus *Desmazeria* Dumort.

*Catapodium rigidum (L.) C.E.Hubbard in J.D.Dony, *Fl. Bedford.* 437 (1953)

Poa rigida L., *Fl. Angl.* 10 (1754). T: Europe, Herb. Linn. 87.37; lecto: LINN, *fide* C.A.Stace in P.H.Davis, *Fl. Turkey* 9: 462 (1985); IDC microfiche 177/2.58/4). The epithet refers to its rigid habit.

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 71, fig. 12 (1981); N.T.Burbidge, *Austral. Grasses* 2nd edn, 85 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1889, fig. 860C (1986), as *Desmazeria rigida*.

Rigid annual, 5–30 cm tall. Culms erect or spreading, slender, smooth, often geniculate at base. Panicles 1-sided, ovoid or narrowly ovoid, 2–8 cm long; pedicels shorter than spikelets. Spikelets narrow, 4–7 mm long, 3–10-flowered. Glumes to 2 mm long, acute, strongly veined. Lemma 2–2.5 mm long, blunt, tough, faintly veined. *Rigid Fescue*.

Norfolk Is., Lord Howe Is. Introduced, presumably with fodder and widespread in open habitats. A native of western and southern Europe, North Africa and western Asia.

N.Is.: Red Rd, *P.S.Green 1368* (A). **L.H.Is.:** Stevens Point, *A.C.Beauglehole 5419* (CANB, MEL); Lagoon Beach, opposite War Memorial, *A.N.Rodd 1481* (K, NSW); Transit Hill, *R.D.Hoogland 8677* (CANB, NSW).

10. AVENA

Avena L., *Sp. Pl.* 1: 79 (1753); *Gen. Pl.* 5th edn, 34 (1754); the Latin for oats.

Type: *A. fatua* L.

Stout annuals. Leaf blades flat. Inflorescence a loose, nodding panicle. Spikelets large, 10–40 mm long, 2–several-flowered. Glumes large, usually equal, usually as long as spikelets, membranous, dorsally rounded, 7–9-veined. Florets bisexual. Lemma rounded, coriaceous, usually with a stout, dorsal, geniculate and twisted awn. Palea shorter than lemma.

A genus of c. 25 species, mainly from the Mediterranean region and south-western Asia; 2 species introduced on Lord Howe Is. and another on Norfolk Is.

1 Lemmas with silky hairs on dorsal lower half (L.H.Is.) **1. A. barbata**

1: Lemmas not silky-hairy (N.Is.)

2 Lemmas hairless at base, fracturing horizontally at base from spikelet axis; awn when present with a distinct, twisted column **2. A. sativa**

2: Lemmas with a few silky hairs at base, fracturing obliquely at base from spikelet axis; awn when present without a distinct column **3. A. byzantina**

1. *Avena barbata Pott ex Link, *J. Bot.* (*Schrader*) 1799(2): 315 (1800)

T: Germany, *J.F.Pott*?; holo: ?H *n.v.* Named from the barbate or bearded lemmas.

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 63, fig. 9 (1981); N.T.Burbidge, *Austral.*

Grasses 2nd edn, 71 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1911, fig. 871A (1986).

Annual, 30–100 cm tall. Panicles c. 30 cm long, somewhat 1-sided. Spikelets 18–30 mm long, drooping, 2- or 3-flowered. Rachilla fracturing between florets. Glumes subequal, 15–25 mm long. Lemma narrowly lanceolate, 12–20 mm long including 2 long apical bristles, with silky hairs on lower half, awned; awn 25–35 mm long, geniculate. Palea almost as long as lemma.

Lord Howe Is. Recorded as a non-native species on the Island by A.N.Rodd & J.Pickard, *Cunninghamia* 1: 275 (1983). Native to the Mediterranean region, and a weed of disturbed soil.

L.H.Is.: Signal Point, *R.D.Hoogland 8657* (CANB).

2. *Avena sativa L., *Sp. Pl.* 1: 79 (1753)

T: cultivated, Europe, Herb. Clifford. 25 *Avena* 1; lecto: BM, *fide* B.R.Baum, *Taxon* 23: 579, fig. 1 (1974). The epithet is from the Latin *sativus* (sown, cultivated), in reference to its use as an agricultural crop.

Illustrations: C.A.Gardner, *Fl. W. Australia* 1: 38, t. 9C (1952); C.E.Hubbard, *Grasses* 2nd edn, 16 (1968); C.A.Lamp *et al.*, *Grasses Temp. Australia* 93 (1990).

Annual, 30–60 cm tall. Panicles 20–40 cm long. Spikelets 17–30 mm long, often drooping, 2- or 3-flowered. Rachilla fracturing at the base of florets. Glumes c. equal, 15–25 mm long. Lemma lanceolate, 12–25 mm long, emarginate or shortly toothed at apex, glabrous. Lemmas of lower florets sometimes awned; awn when present 15–30 mm long, slightly geniculate with lower part stiff, twisted. Palea a little shorter than lemma. *Oats*.

Norfolk Is. Introduced to the Island as fodder, or possibly grain, and recorded by N.Hermes (*in litt.*), but no specimen from there has been examined in the compilation of this Flora. Recorded from Lord Howe Is. and, following J.H.Maiden (*Proc. Linn. Soc. New South Wales* 23: 151, 1898), listed by A.N.Rodd & J.Pickard (*Cunninghamia* 1: 278, 1983) but believed by them to have died out there. An important cereal crop.

3. *Avena byzantina K.Koch, *Linnaea* 21: 392 (1848)

T: Turkey, *Thirke 4*; holo: ?B *n.v.* The epithet is based on Byzantium, an old name for Istanbul, Turkey.

Illustrations: E.E.Stanford, *Economic Pl.* 299, fig. 217 (1934); L.R.Parodi, *Revista Fac. Agron. Veterin.* 5: 105, fig. 5/1 (1926).

Similar to previous species except that spikelets usually have 3 florets (rarely 4); rachilla fractures obliquely at base of florets; lemmas have a few hairs at their base, more of them are awned and the awns are flexuous, never geniculate, and without a distinct, straight basal 'column'.

Lord Howe Is. A chance introduction, possibly not persistent. *Avena byzantina*, derived from *A. sativa*, is grown in southern Europe and sometimes cultivated as a crop plant in Australia; it is also used in plant breeding, and may well have been introduced to the Island with fodder.

L.H.Is.: *s. loc.*, by roadside, *L.M.Bingley 28* (K).

11. ROSTRARIA

Rostraria Trin., *Fund. Agrost.* 149 (1820); from the Latin *rostrum* (a beak), in allusion to the 'beaked' appearance of the lemma.

Type: not designated.

Annuals. Leaf blades flat. Inflorescence a panicle, usually dense, spike-like. Spikelets 2–6-flowered. Glumes unequal, keeled, acute to somewhat obtuse; lower glume 1-veined; upper glume 3-veined, broader and longer than lower. Fertile florets 3 or more. Lemma usually a little longer than glumes, membranous, 5-veined, acute or obtuse, with a straight awn to 3

mm long arising just below bifid apex. Palea usually as long as or longer than lemma, 2-veined.

A genus of c. 10 species from the Mediterranean or south-western Asia, especially characteristic of dry, 'weedy' habitats; 1 species naturalised on Norfolk and Lord Howe Islands.

***Rostraria cristata** (L.) Tzvelev, *Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR* 7: 47 (1971)

Festuca cristata L., *Sp. Pl.* 1: 76 (1753); *Lophochloa cristata* (L.) Hyl., *Bot. Not.* 106: 355 (1953). T: Spain, not designated. The epithet is from the Latin *crista* (a tuft, plume or crest), alluding to the shape of the panicle.

Koeleria phleoides (Vill.) Pers., *Syn. Pl.* 1: 97 (1805). T: France, *D.Villars*; holo: ?GRM *n.v.*

Illustrations: N.T.Burbidge, *Austral. Grasses*, 2nd edn, 179 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1912, fig. 872A (1986), both as *Lophochloa cristata*; C.A.Lamp *et al.*, *Grasses Temp. Australia* 255 (1990).

Tufted annual to 50 cm tall. Leaves somewhat hairy. Panicles dense, ±cylindrical, sometimes somewhat pyramidal and somewhat lobed at base, 1–12 cm long. Spikelets 3–6 mm long, 3–6-flowered. Glumes hairy or glabrous; lower glume 2–3 mm long; upper slightly longer. Lemma 2.5–3.5 mm long, glabrous or slightly hairy; awn 1–3 mm long.

Norfolk Is., Lord Howe Is. An introduced weed, native in the Mediterranean region and south-western Asia.

N.Is.: Douglas Drive, *P.S.Green 1413* (A). **L.H.Is.:** Northern Hills, *R.D.Hoogland 8701* (CANB); Anderson Rd, *A.C.Beauglehole 5435* (CANB, MEL); Main Settlement, *A.C.Beauglehole 5434* (CANB, MEL).

12. AIRA

Aira L., *Sp. Pl.* 1: 63 (1753); *Gen. Pl.* 5th edn, 31 (1990); the ancient Greek name for a grass weed found among wheat.

Type: *A. praecox* L.

Annuals. Leaf blades usually inrolled. Inflorescence an open or dense panicle. Spikelets small, laterally compressed, 2-flowered. Glumes equal, usually longer than florets, membranous; lower glume 1-veined; upper 3-veined. Florets bisexual. Lemma 5-veined, bifid at apex with a fine, dorsal, geniculate awn from below middle, or sometimes awnless. Palea shorter than lemma, 2-veined.

A genus of c. 8 species from Europe, the Mediterranean and E to Iran. Some species now widespread as weeds. One species naturalised on Norfolk Is.

***Aira cupaniana** Guss., *Fl. Sicul. Syn.* 1: 148 (1843)

T: Sicily, *G.Gussone*; holo: ?NAP *n.v.* Named after Francesco Cupani (1657–1711), an early Sicilian botanist.

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 52 (1981); N.T.Burbidge, *Austral. Grasses* 2nd edn, 43 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1906, fig. 868B (1986).

Slender annual, 5–30 cm tall. Panicles open, 2–10 cm long; pedicels to c. twice as long as spikelets, slender, somewhat abruptly thickened at apex. Spikelets ±erect, 2–2.5 mm long. Glumes 2–2.5 mm long, subobtuse, finely denticulate towards apex, often mucronate, shiny. Lemmas 1–2 mm long, acuminate, brownish; upper lemma with a slightly geniculate awn 2–2.5 mm long; lower lemma often awnless.

Norfolk Is. Introduced; a native of southern Europe.

N.Is.: Selwyn Pine Rd, *W.R.Sykes NI 62* (CHR); in pastures & waste places, *F.C.Allen 42* (CHR); Cascade,

E.Ralston 16 (CHR).

This species is very similar to *Aira caryophyllea* L. and *A. elegantissima* Schur (*A. elegans* Willd. ex Gaudin) with both of which it has often been confused.

13. ANTHOXANTHUM

Anthoxanthum L., *Sp. Pl.* 1: 28 (1753); *Gen. Pl.* 5th edn, 17 (1754); from the Greek *anthos* (a flower) and *xanthos* (yellow), from the colour of the ripe spikelets.

Type: *A. odoratum* L.

Annuals or perennials, sweetly scented. Leaf blades flat. Panicles contracted or spike-like. Spikelets laterally compressed, 3-flowered. Glumes very unequal; lower glume 1-veined; upper glume keeled, 3-veined, enclosing spikelet. Lower 2 florets sterile with empty lemmas; upper floret bisexual. Lemmas unequal. Sterile lemmas membranous, longer than fertile lemma, notched at apex, dorsally awned, hairy; lower sterile lemma with a short straight awn; upper with a geniculate awn. Fertile lemma smaller, glabrous, awnless, notched. Palea shorter than fertile lemmas, 1-veined.

A genus of c. 18 species from temperate Eurasia, Africa and Central America, widely introduced as fodder grasses; 1 species introduced on Norfolk Is.

*Anthoxanthum odoratum L., *Sp. Pl.* 1: 28 (1753)

T: Europe, Herb. Linn. 46.1; lecto: LINN, *fide* T.A.Cope in C.E.Jarvis *et al.*, *Regnum Veg.* 127: 19 (1993); IDC microfiche 177/2.20/21. This species was so named because of its sweet odour, especially when dried.

Illustrations: N.T.Burbidge, *Austral. Grasses* 2nd edn, 57 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1909, fig. 870A (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 81 (1990).

Tufted perennial, 10–100 cm tall. Panicles compact, narrow, sometimes slightly lobed near base, 2–7 cm long. Spikelets lanceolate, 7–9 mm long. Glumes keeled, finely pointed, pubescent; upper glume ovate to elliptic, 6–8.5 mm long; lower ovate, ½ length of upper. Sterile lemmas 3–3.5 mm long, brown silky hairy below a white, slightly 2-lobed tip; lower awn 2–3 mm long; upper awn 4–6 mm long. Fertile lemma 1.5–2 mm long, smooth, shiny. Palea 1.5–2 mm long.

Norfolk Is. A widespread native of Europe and temperate Asia. Its inclusion for Norfolk Is. rests on *Allen 315*, cited below, which bears the comment, 'probably introduced in packing or bedding'.

N.Is.: Old 'Kiwi' camp site, *F.C.Allen 315* (CHR).

14. PHALARIS

Phalaris L., *Sp. Pl.* 1: 54 (1753); *Gen. Pl.* 5th edn, 29 (1754); a name used by Dioscorides for a kind of grass.

Type: *P. canariensis* L.

Annuals or perennials. Leaf blades flat. Inflorescence a panicle, ±cylindrical, ovoid or contracted. Spikelets laterally compressed, 3-flowered, with 1 fertile. Glumes usually equal, oblanceolate, papery, keeled; upper part of keel often winged, enclosing florets. Lower 2 florets reduced to rudimentary lemmas. Sterile lemmas to ½ length of fertile lemma, usually subulate or chaffy; fertile lemma laterally compressed indurate at maturity, shiny, awnless. Paleas with 1 or 2 ciliate veins.

A genus of 15 species from northern temperate regions, also in South America; 2 naturalised species on Lord Howe Is. and another on Norfolk Is. Often introduced elsewhere as pasture grasses.

D.E.Anderson, Taxonomy and distribution of the genus *Phalaris*, *Iowa State Coll. J. Sci.* 16:

1–96 (1961); J.W.Vickery, *Phalaris* in *Fl. New South Wales* 19: 283–293 (1975).

1 Perennial, rhizomatous, often bulbous at base; panicle ±cylindrical, to 10 cm long **2. P. aquatica**

1: Annual, without rhizome; panicle ovoid to subcylindrical, 2–6 cm long

2 Spikelets 4.5–6.5 mm long, 5–6 mm broad; wing of glume toothed **1. P. minor**

2: Spikelets 6–10 mm long, 2.5–3 mm broad; wing of glume entire **3. P. canariensis**

1. *Phalaris minor Retz., *Observ. Bot.* 3: 8 (1783)

T: Europe; holo: ?LD *n.v.* So named through being the smaller species when originally described.

Illustrations: C.E.Hubbard, *Grasses* 2nd edn, 272, fig. 2 (1968); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1914, fig. 973A (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 237 (1990).

Annual to 100 cm tall. Culms erect or base geniculate, somewhat slender. Panicles dense, ovoid-oblong to somewhat cylindrical, 2–6 cm long, 1–2 cm broad. Spikelets 4.5–6.5 mm long, 5–6 mm broad. Glumes ±equal, 4–6.5 mm long; upper ½ of keel winged; wing margin usually slightly toothed. Sterile lemmas glabrous; upper c. 1 mm long; lower minute; fertile lemma ovate-lanceolate, 3–4 mm long, pubescent.

Norfolk Is. Probably introduced as a fodder plant; native to the Mediterranean region and parts of western Europe.

N.Is.: Philip Is., near the 'landing rock', *P.S.Green 1488* (A).

2. *Phalaris aquatica L., *Cent. Pl. I* 4 (1755)

T: Egypt, *F.Hasselquist*, Herb. Linn. 78.4; lecto: LINN, *fide* C.E.Hubbard in *Fl. Trop. E. Africa*, Gramineae 97 (1970); IDC microfiche 177/2.44/17. Named after its aquatic habit.

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 130 (1981); N.T.Burbidge, *Austral. Grasses* 2nd edn, 209 (1984); C.A.Lamp *et al.*, *Grasses Temp. Australia* 233 (1990).

Tufted perennial to 1.5 m tall. Culms erect, often bulbous at base. Panicles dense, ±cylindrical, sometimes slightly lobed towards base, 2–10 cm long. Spikelet 6–7.5 mm long, 4–5 mm broad. Glumes 4.5–7.5 cm long; upper keel broadly winged; wing entire, tapering at apex. Sterile lemmas hairy; upper lemma subulate, 1.5–2 mm long; lower less than 0.5 mm long. Fertile lemma lanceolate, 3–4.5 mm long, hairy.

Lord Howe Is. A native of the Mediterranean region, probably introduced for fodder.

L.H.Is.: E side of Dawsons Point, *A.C.Beauglehole 5436* (CANB, NSW).

'Harding Grass', the hybrid of this species with *P. arundinacea* L., was recorded as a naturalised alien by A.N.Rodd in H.F.Recher & S.S.Clark, *Environm. Survey Lord Howe Is.* 21 (1974).

3. *Phalaris canariensis L., *Sp. Pl.* 1: 54 (1753)

T: Europe, cultivated, Herb. Clifford 23, *Phalaris* 1; lecto: BM, *fide* R.M.Baldini & C.E.Jarvis, *Taxon* 40: 483 (1991). Named as a native of the Canary Islands.

Illustrations: H.H.Allan, *Intr. Grasses New Zealand*, 121, fig. 86e (1936); C.A.Gardner, *Fl. W. Australia* 1: 24, t. 4A, 25, t. 5A (1952); C.E.Hubbard, *Grasses* 2nd edn, 272, fig. 1 (1968).

Annual, 20–100 cm tall. Culms erect or base geniculate. Panicles dense, ovoid or sometimes ovoid-oblong, 1.5–4 cm long. Spikelets 6–10 mm long, 2.5–3 mm broad. Glumes equal, 6–10 mm long, abruptly pointed, 3–5-veined, slightly hairy; keel broadly winged above; wing entire. Sterile lemmas lanceolate, 2.5–4.5 mm long, chaffy; fertile lemma broad, 5–6.5 mm long, acute, keeled, tough, hairy, becoming glossy, 5-veined.

Lord Howe Is. Introduced, often with birdseed. Native in the western Mediterranean region.

L.H.Is.: bowling green, *L.M.Bingley 29* (K, NSW).

15. AGROSTIS

Agrostis L., *Sp. Pl.* 1: 61 (1753); *Gen. Pl.* 5th edn, 30 (1754); named after the Latin *ager* (a field).

Type: *A. canina* L.

Annuals or perennials. Leaves flat or almost setaceous. Inflorescence a loose or contracted panicle. Spikelets small, 1-flowered. Glumes equal or unequal, usually longer than floret, membranous, 1-veined, usually persistent. Lemmas usually shorter and more membranous than glumes, truncate or denticulate, with a dorsal geniculate awn, or awnless. Palea shorter than lemma, sometimes minute.

A large and difficult genus of over 200 species in the temperate regions of the world, including the high mountains of the tropics; 2 native species and 1 naturalised on Norfolk and Lord Howe Islands.

1 Perennial, rhizomatous; lemma usually awnless; spikelets 2–4 mm long; anthers 1–1.5 mm long **3. A. gigantea**

1: Annual, not rhizomatous; lemma awned

2 Spikelets 4.5–5 mm long on pedicels 3–10 mm long; anthers 0.6–1.2 mm long; panicle branches not drooping when young **1. A. aemula**

2: Spikelets 2–4 mm long on pedicels 1–5 mm long; anthers 0.2–0.4 mm long; panicle branches often drooping slightly when young **2. A. avenacea**

1. Agrostis aemula R.Br., *Prodr.* 172 (1810)

T: New South Wales and Tasmania, 1802 or 1804, *R.Brown*; lecto: BM, lefthand specimen of No. 6219, *fide* J.W.Vickery, *Contr. New South Wales Natl. Herb.* 1: 115 (1941). The epithet comes from the Latin *aemulus* (striving, rivalling) in allusion to its distinctness from other species.

Illustrations: F.Turner, *Agric. Gaz. New South Wales* 2: t. opp. 309 (1892), as *Deyeuxia billardieri*; N.T.Burbidge, *Austral. Grasses* 3: 51 (1970).

Tufted annual, 25–60 cm tall. Panicles spreading divaricately, 10–25 cm long; branches spreading to slightly erect. Spikelets 4.5–5 mm long; pedicels 3–10 mm long. Glumes slightly unequal, 4–6 mm long, acuminate. Lemma 2–3 mm long, membranous, truncate and 4-toothed at apex; outer teeth somewhat longer, to 0.8 mm, dorsally villous, awned from c. middle; awn geniculate, 5–7 mm long. Anthers 0.6–1.2 mm long.

Lord Howe Is. Rare, perhaps no longer on the Island. Native in all Australian States except N.T.

L.H.Is.: Mt Gower, *C.Moore 38* (K, MEL); *s. loc., J.P.Fullagar* (K).

2. Agrostis avenacea J.F.Gmel., *Syst. Nat.* 1: 171 (1791)

Avena filiformis G.Forst., *Prodr.* 9 (1786), *nom. illeg., non Agrostis filiformis* Vill. (1787), *nec* Willd. (1809); *Agrostis forsteri* Rich. ex Roem. & Schult., *Syst. Veg.* 2: 359 (1817), *nom. illeg.*; *Lachnagrostis filiformis* (G.Forst.) Trin., *Fund. Agrost.* 128 t. 10 (1820), *nom. illeg.*; *Deyeuxia forsteri* (Rich. ex Roem. & Schult.) Kunth, *Révis. Gramin.* 1: 77 (1829), *nom. illeg.*; *Agrostis solandri* F.Muell., *Veg. Chatham-Isl.* 60 (1864), *nom. illeg.*; *Deyeuxia filiformis* (G.Forst.) Petrie in C.Chilton, *Subantarctic Is. New Zealand* 2: 474 (1909), *nom. illeg.*, non (Griseb.) Hook.f. (1887); *Calamagrostis avenacea* (J.F.Gmel.) W.R.B.Oliv., *Trans. & Proc. New Zealand. Inst.* 49: 127 (1917), *non Calamagrostis filiformis* Griseb. (1868). T: New Zealand & Easter Island, 1773 & 1774, *G.Forster*; syn: K. So named because of an affinity to *Avena*.

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 52 (1981); J.P.Jessop, *Fl. Central Australia* 435, fig. 560 (1981); N.T.Burbidge, *Austral. Grasses* 2nd edn, 41 (1984).

Tufted annual or perennial, 20–70 cm tall. Panicles spreading divaricately, 10–25 cm long; branches often drooping slightly when young. Spikelets 2–4 mm long; pedicels 1–5 mm long. Glumes equal, ±2 mm long, acute or acuminate. Lemma 1.5–2 mm long, membranous, apically truncate with 4 short, ±equal teeth, dorsally villous, awned from c. middle; awn geniculate, 5–7 mm long. Anthers 0.2–0.4 mm long.

Norfolk Is. Found on earthy banks and poor pasture, not common. This species is also native in all Australian States, New Zealand and Hawai'i.

N.Is.: Jonnanigga'bunnit, *W.Laing* (CHR); near Rocky Point, *P.S.Green 1459* (A, K); Anson Bay, *W.R.Sykes NI 74, NI 77 & NI 890* (CHR); Ball Bay, *F.C.Allen 236* (CHR).

3. *Agrostis gigantea Roth, *Tent. Fl. Germ.* 1: 31 (1788)

T: R. Weser, Bremen, Germany, *A.W.Roth*; holo: B *n.v.*, presumably destroyed. So named because of its large size.

Illustrations: A.S.Hitchcock, *Man. Grasses U.S.* 2nd edn, 340, fig. 467 (1951), as *Agrostis alba*; C.E.Hubbard, *Grasses* 2nd edn, 302 (1968).

Tufted rhizomatous perennial, 40–100 cm tall. Panicles spreading, narrowly pyramidal, 8–25 cm long; branches spreading at an acute angle to the culm. Spikelets 2–4 mm long; pedicels 1–5 mm long. Glumes equal or almost equal, 2–3 mm long, finely pointed. Lemma 1.5–2.5 mm long, blunt, without teeth, 3–5-veined, minutely hairy at base, awnless or rarely shortly awned from near tip. Anthers 1–1.5 mm long.

Lord Howe Is. Introduced, presumably as a pasture grass. A.N.Rodd & J.Pickard, *Cunninghamia* 1: 278 (1983), while recording it as an introduction, suggest that it has died out on the Island. It is a native of most parts of Europe and temperate Asia.

L.H.Is.: in Mr Fentons cultivation, *L.M.Bingley 32* (K).

16. AMMOPHILA

Ammophila Host, *Icon. Descr. Gram. Austriac.* 4: 24 (1809); meaning sand-lover, from the Greek *ammos* (sand) and *philos* (friend).

Type: *A. arundinacea* Host

Rhizomatous perennials. Leaf blades tough, in-rolled; ligule long, tapering. Inflorescence a dense, cylindrical panicle. Spikelets laterally compressed, 1-flowered. Glumes stiff, sub-equal, slightly longer than floret, keeled, persistent; lower glume 1-veined; upper glume 3-veined. Lemma thinly coriaceous, keeled, bidentate at apex with a subterminal mucro. Palea almost equalling lemma.

A genus of 2 species native to Europe, North Africa and eastern North America, characteristic of sandy, maritime habitats; 1 species introduced on Norfolk Is.

*Ammophila arenaria (L.) Link, *Hort. Berol.* 1: 105 (1827)

Arundo arenaria L., *Sp. Pl.* 1: 82 (1753); *Ammophila arundinacea* Host, *Icon. Descr. Gram. Austriac.* 4: 24 (1809), *nom. illeg.* T: Europe, not designated. Named from its preference for sandy habitats, from the Latin *arena* (sand).

Illustrations: C.E.Hubbard, *Grasses* 2nd edn, 288 (1968); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1918, fig. 875B (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 73 (1990).

Vigorously rhizomatous perennial. Culms 50–120 cm tall. Leaves rigid, tightly in-rolled, to 60 cm long, densely hairy on closely spaced ribs above, smooth below. Panicles narrowly lanceolate-cylindric, 7–25 cm long, 1–2.5 mm diam. Spikelets 12–16 mm long, grey-green. Glumes narrowly lanceolate. Lemma firm, lanceolate, 10–14 mm long, 5- or 7-veined, with a tuft of fine white hairs at base; apex with a subterminal mucro 0.2–0.8 mm long. Palea 2–4-veined. *Marram Grass*.

Norfolk Is. Introduced as a sand-binder at Emily Bay. Native along the coast of western Europe.

N.Is.: *s. loc.*, Nov. 1902, *J.H.Maiden & J.L.Boorman* (NSW).

17. ECHINOPOGON

Echinopogon P.Beauv., *Ess. Agrost.* 42 (1812); from the Greek *echinus* (a hedgehog) and *pogon* (a beard), in allusion to the spiny-bearded appearance of the panicle.

Type: *E. ovatus* (G.Forst.) P.Beauv.

Perennials. Leaf blades flat. Inflorescence a panicle, dense, ovoid to oblong-cylindrical, bristly. Spikelets subsessile, 1-flowered. Glumes subequal, acute, keeled, 1-veined. Lemma slightly coriaceous, 5–7-veined, acutely 2-lobed with a straight, stiff, terminal or subterminal awn. Palea narrow, c. equal to lemma, 2-veined.

A genus of 7 species native to New Guinea, Australia and New Zealand, especially characteristic of open woodland. One species native on Norfolk and Lord Howe Islands.

Echinopogon ovatus (G.Forst.) P.Beauv., *Ess. Agrostogr.* 161 (1812)

Agrostis ovata G.Forst., *Fl. Ins. Austr.* 8 (1786). T: New Zealand, *J.R. & G.Forster*; syn: K. So named because of its ovate panicles.

Illustrations: G.M.Cunningham *et al., Pl. W New South Wales* 91 (1981); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1919, fig. 876C (1986); C.A.Lamp *et al., Grasses Temp. Australia* 149 (1990).

Erect perennial with slender rhizome. Culms slender, 15–70 cm tall, scabrid. Leaf margins scabrid. Panicles ovoid or oblong-ovoid, compact, 1–4 cm long. Spikelets 3–5 mm long. Glumes c. 4 mm long, scabrid on keel. Lemma c. 4 mm long, 5-veined, sharply bifid, central vein ending with a straight awn 3–15 mm long. Palea a little shorter than lemma, slightly toothed at apex.

Norfolk Is., Lord Howe Is. Possibly native in rough pasture and forest margins. It is native in all Australian States except N.T. and in New Zealand.

N.Is.: *s. loc., A.F.Oldfield 96* (K). **L.H.Is.:** W side of Mt. Lidgbird, *A.C.Beauglehole 5443 & 5444* (CANB, MEL); track to Goat House, *P.S.Green 1681* (A).

18. DICHELACHNE

Dichelachne Endl., *Prodr. Fl. Norfolk.* 20 (1833); from the Greek *di* (two), *cheilos* (a lip) and *achne* (chaff), in allusion to the frequently split apex to the lemmas in these grasses.

Type: *D. montana* Endl.

Perennials, often short lived. Leaf blades flat or setose-convolute. Inflorescence a densely branched or open panicle. Spikelets small, 1-flowered. Glumes unequal or subequal, narrow, acute or acuminate to shortly aristate, persistent, 1-veined. Lemma narrow, shorter than glumes, 5-veined, easily split into 2 teeth at apex, with a long, subapical, dorsal awn; awn 2–6 times length of lemma, straight or flexuous. Palea slightly shorter than lemma, 2-keeled.

A genus of 5 species from New Guinea, Australia, New Zealand and Easter Is., characteristic of forest clearings. Two species native on Norfolk and Lord Howe Islands.

J.F.Veldkamp, A taxonomic revision of *Dichelachne* Endl. (Gramineae), *Blumea* 22: 5–12 (1974); E.Edgar & H.E.Connor, *Dichelachne* (Gramineae) in New Zealand, *New Zealand J. Bot.* 20: 303–309 (1982).

Awns 10–18 mm long, inserted 0.5–1 mm below lemma apex; glumes 3–5 mm long, acute to acuminate; lemma 2–4 mm long (N.Is.) **1. D. micrantha**

Awns 20–40 mm long, inserted 1–3 mm below lemma apex; glumes 4–10 mm long, long-acuminate, often shortly aristate; lemma 4–8 mm long (N.Is., L.H.Is.) **2. D. crinita**

1. Dichelachne micrantha (Cav.) Domin, *Biblioth. Bot.* 85: 353 (1915)

Stipa micrantha Cav., *Icon*. 5: 42, t. 4676, fig. 2 (1799). T: Australia, *L.Neé*; holo: ?MA *n.v.* Epithet from the Greek *micros* (small) and *anthos* (a flower), in allusion to the small florets.

Dichelachne montana Endl., *Prodr. Fl. Norfolk.* 20 (1833). T: Norfolk Island, *F.L.Bauer*; holo: W.

Dichelachne sciurea (R.Br.) Hook.f., *Fl. Nov.-Zel.* 1: 294 (1853). T: Port Jackson, Australia, *R.Brown '6211'*; lecto: BM; isolecto: K, *fide* E.Edgar & H.E.Connor *op. cit*. 307.

Illustrations: J.C.Tothill & J.B.Hacker, *Grasses SE Queensland* 126 (1973); G.M.Cunningham *et al.*, *Pl. W New South Wales* 84 (1981), as Short-haired Plume Grass; N.T.Burbidge, *Austral. Grasses* 2nd edn, 111 (1984).

Tufted perennial. Culms 30–100 cm tall. Panicles dense, spike-like, sometimes somewhat lobed at base, 10–20 cm long; axis and branches scabrous, hidden by spikelets. Glumes subequal, 3–5 mm long, acute to acuminate, with a scabrid keel. Lemma 2–4 mm long; awn flexuous, 10–18 mm long, inserted 0.5–1 mm below apex, with base of awn straight, curving somewhat above. Palea 2–3 mm long.

Norfolk Is. Common by the side of tracks, forest margins *etc.*, it is also native in all Australian States except N.T., New Zealand and Easter Is.

N.Is.: Douglas Drive, *P.S.Green 1411* (A); Ball Bay, *W.R.Sykes NI 83* (CHR); *s. loc.*, *A.F.Oldfield 81* (K); *s. loc.*, Nov. 1898, *I.Robinson* (NSW).

The specimen upon which the record for this species from Lord Howe Is. was based (see A.N.Rodd & J.Pickard, *Cunninghamia* 1: 270, 1981) is in fact *D. crinita*

2. Dichelachne crinita (L.f.) Hook.f., *Fl. Nov.-Zel.* 1: 293 (1853)

Anthoxanthum crinitum L.f., *Suppl. Pl.* 90 (1781); *Stipa micrantha* var. *crinita* (L.f.) F.Muell., *Fragm*. 9: 78 (1875). T: New Zealand, *[Forster] ex Herb. Back*, Herb. Smith 71.6; holo: LINN; IDC microfiche 5073.36/5. The name comes from the Latin *crinio* (I cover with hairs) in allusion to the 'hairy' panicles.

Illustrations: C.A.Gardner, *Fl. W. Australia* 1: 153, t. 46A (1952); N.T.Burbidge, *Austral. Grasses* 3: 129 (1970); J.C.Tothill & J.B.Hacker, *Grasses SE Queensland* 126 (1973).

Tufted perennial. Culms 50–100 cm tall. Panicle dense, spike-like, 10–25 cm long; branches shortly scabrous, hidden by spikelets held together by entwining awns. Glumes subequal, 4–10 mm long, acuminate, often shortly aristate, with a scabrid keel. Lemma 4–8 mm long; awn flexuous, 20–40 mm long, inserted 1–3 mm below lemma apex, somewhat curved. Palea 3–4 mm long.

Norfolk Is., Lord Howe Is. Tracksides and clearings in the forest. Also native in New Guinea, Australia (all States), the Kermadec Is. and New Zealand. Listed as an introduced species on Lord Howe Is. by J.Pickard, *J. Biogeogr.* 11: 205 (1984).

N.Is.: on coast and roadsides towards Kingston, *F.C.Allen 239* (CHR); *s. loc.*, Nov. 1902, *J.H.Maiden & J.L.Boorman* (NSW). **L.H.Is.:** Mount Eliza, *A.C.Beauglehole 5437* (CANB, MEL); 0.1 km S of Kims Lookout, *J.Pickard 2724* (NSW); *s. loc.*, *C.Moore 36* (K, MEL).

19. LAGURUS

Lagurus L., *Sp. Pl.* 1: 81 (1753); *Gen. Pl.* 5th edn, 34 (1754); from the Greek *lagus* (a hare) and *oura* (a tail), in allusion to the soft, hairy, tail-like panicles.

Type: *L. ovatus* L.

Annuals. Leaf blades flat. Inflorescence a dense panicle, globose-ovoid to oblong-cylindrical. Spikelets 1-flowered. Glumes equal, persistent, 1-veined. Lemma 5-veined; apex divided and narrowed into 2 fine, straight bristles and a dorsal geniculate awn inserted from upper 1/3. Palea 2-veined.

A monotypic genus native to the Mediterranean region but often grown as a garden ornamental; naturalised on Lord Howe Is.

***Lagurus ovatus** L., *Sp. Pl.* 1: 81 (1753)

T: Europe; lecto: Herb. Linn. No. 96.1, LINN, *fide* T.A.Cope in C.E.Jarvis *et al.*, *Regnum Veg.* 127: 59 (1993). The epithet is derived from the ovate-shaped panicle.

Illustrations: N.T.Burbidge, *Austral. Grasses* 2nd edn, 169 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1922, fig. 877B (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 191 (1990).

Hairy annual. Culms 5–50 cm tall. Panicles 1–6 cm long, softly hairy and somewhat bristly. Spikelets narrow, 8–10 mm long. Glumes narrow, 9–10 mm long, tapering to a plumose bristle. Lemma elliptic, 4–5 mm long, hairy at base; apical bristles 3–5 mm long; awn 8–20 mm long. Palea narrow, shorter than lemma.

Lord Howe Is. Presumably a garden escape now naturalised on the Island.

L.H.Is.: Lagoon Beach, opposite 'Pine Trees', *J.Pickard 2693* (NSW).

20. POLYPOGON

Polypogon Desf., *Fl. Atlant.* 1: 66 (1798); from the Greek *poly* (many) and *pogon* (a beard), in allusion to the several beard-like panicles borne on some plants.

Type: *P. monspeliensis* (L.) Desf.

Annuals or perennials. Leaf blades flat. Inflorescence a dense, spike-like panicle. Spikelets laterally compressed, 1-flowered, falling entire. Glumes equal, somewhat scabrid, 1-veined, notched or truncate at apex, often with a slender awn arising from notch. Lemma hyaline, 5-veined, with veins sometimes slightly excurrent, truncate at apex, with or without a subapical awnlet or a dorsal geniculate awn. Palea hyaline, 1/2 as long as lemma.

A genus of 18 species characteristic of damp places in warm temperate regions throughout the world, and on tropical mountains; 1 species naturalised on Lord Howe Is.

***Polypogon monspeliensis** (L.) Desf., *Fl. Atlant.* 1: 66 (1798)

Alopecurus monspeliensis L., *Sp. Pl.* 1: 61 (1753). T: France, not designated. Named after Monspelium, an ancient Roman name for Montpellier in southern France.

Illustrations: N.T.Burbidge, *Austral. Grasses* 2nd edn, 223 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1923, fig. 878B (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 251 (1990).

Annual. Culms 5–80 cm tall. Panicles narrowly oblong to cylindrical, sometimes somewhat lobed, 2–15 cm long. Spikelets 2–3 mm long. Glumes 2–2.5 mm long, keeled, with short, stout hairs, truncate or slightly notched, with a fine, straight awn 4–7 mm long. Lemma 1–1.5 mm long, shining, faintly veined, with a broad, blunt, minutely toothed apex, awnless or with a subapical awnlet 1–2 mm long. Palea 2-veined.

Lord Howe Is. A naturalised alien, this species is native in southern and western Europe, North Africa and south-western Asia.

L.H.Is.: Stevens Point, *A.C.Beauglehole 5441* (CANB, MEL); E of Johnsons Beach, *A.C.Beauglehole 5442* (CANB, MEL); near Salmon Beach, *P.S.Green 2327* (K, NSW).

21. BROMUS

Bromus L., *Sp. Pl.* 1: 76 (1753); *Gen. Pl.* 5th edn, 33 (1754); a name used by ancient Greek authors for a kind of oat.

Type: *B. secalinus* L.

Annuals or perennials. Leaf blades flat. Inflorescence an open or contracted panicle. Spikelets laterally compressed, 1–many-flowered; rachilla disarticulating below each floret in fruit. Glumes usually unequal, herbaceous, persistent, 1–9-veined. Florets bisexual. Lemma few- to many-veined; apex entire to bilobed, mucronate to awned. Palea 2-veined or keeled, ciliate on veins.

A genus of c. 150 species from temperate regions throughout the world, but particularly the Northern Hemisphere; 4 species naturalised on Norfolk and Lord Howe Islands.

1 Spikelets (including awns) 7–9 cm long; lower glumes 1 (–3)-veined **1. B. diandrus**

1: Spikelets (including awns) 1–4 cm long; lower glumes 3–7-veined

2 Awn of lemma absent or to 1 mm long; lemma strongly keeled; lower glumes 10–12 mm long, 7-veined **2. B. catharticus**

2: Awn of lemma 4–15 mm long; lemma dorsally rounded; lower glumes 3–8 mm long, 3–7-veined

3 Panicle base somewhat rounded or truncate; lemma 3–5 mm broad; awn not flattened at base, arising c. 1 mm below lemma apex **3. B. hordeaceus**

3: Panicle base narrow, cuneate; lemma 2–3 mm broad; awn flattened at base, arising 2–3 mm below lemma apex **4. B. scoparius**

1. *Bromus diandrus Roth, *Bot. Abh. Beobacht.* 44 (1787)

T: Germany, *A.W.Roth*; holo: B *n.v.*, presumably destroyed. Named from the Greek *di* (two) and *andros* (a man), because of the two stamens in the florets.

Illustrations: N.T.Burbidge, *Austral. Grasses* 2: 53 (1968); L.D.Williams in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1881, fig. 856C (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 103 (1990).

Annual. Culms 30–90 cm tall, hairy. Panicles loose, nodding, to 25 cm long, 3 cm or more broad; branches 2–4 together, rough, some as long as spikelets, each bearing 1 (rarely 2) spikelets. Spikelets narrow, 7–9 cm long (including awns), 4–8-flowered; pedicels 0.5–5 cm long. Glumes unequal, narrow, finely pointed; lower glume 15–20 mm long, 1 (–3)-veined; upper glume 10–30 mm long, 3–5-veined. Lemma finely pointed, 25–35 mm long, 7-veined, with middle vein rough; apex with 2 fine teeth 4–7 mm long and a straight, rough, subapical awn 35–60 mm long. Palea shorter than lemma, 2-keeled, slightly fringed.

Norfolk Is., Lord Howe Is. A fairly common weed of poor pastures, roadsides *etc*., native to the Mediterranean region.

N.Is.: Cresswell Bay, *P.S.Green 1478* (A); near Emily Bay, in the cemetery area, *W.R.Sykes 772/87* (CHR); *s. loc.*, *W.Laing* (CHR). **L.H.Is.:** Signal Point, *R.D.Hoogland 8658* (CANB); Transit Hill, *P.S.Green 1643* (A, K); Blinky Beach, *A.C.Beauglehole 5430* (CANB, MEL).

The specimen upon which J.H.Maiden (*Proc. Linn. Soc. New South Wales* 28: 767, 1904) based his record of *B. sterilis* L. from Norfolk Is. has not been found, but it was almost certainly a misidentified plant of *B. diandrus*. This species is sometimes classified in a segregate genus *Anisantha* K.Koch.

2. *Bromus catharticus Vahl, *Sym. Bot.* 2: 22 (1791)

T: Peru, *J.Dombey*; lecto: P-JU, *fide* P.Pinto-Escobar, *Caldasia* 112: 11 (1976). The epithet is derived from the Greek *kathartikos* (purging), presumably in allusion to some supposed medicinal property.

Festuca unioloides Willd., *Hort. Berol.* 1: 3 (1803); *Ceratochloa unioloides* (Willd.) Kunth in F.W.H.A. von Humboldt, A.J.A.Bonpland & K.S.Kunth, *Nov. Gen. Sp.* 1: 115 (1816). T: cultivated, seed from Carolina; holo: B-W *n.v.*; IDC microfiche 7440, 2103.

[*Bromus arenarius auct. non* Labill.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 752 (1904)]

Illustrations: N.T.Burbidge, *Austral. Grasses* 2nd edn, 81 (1984), as *B. unioloides*; L.D.Williams in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1881, fig. 865 (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 101 (1990).

Annual or short lived perennial. Culms to 1 m tall; sheaths hairy. Panicle loose, 10–30 cm long; branches 2 or 3 together, spreading or nodding, slightly rough, usually longer than spikelets, each bearing 1–4 (–5) spikelets. Spikelets lanceolate to elliptical, strongly compressed, 2–4 cm long including awn, 6–12-flowered; pedicels 0.5–4 cm long. Glumes unequal, acuminate, sharply and roughly keeled; lower glume 10–12 mm long, 7-veined; upper glume 12–18 mm long, 9-veined. Lemma broadly lanceolate, 14–20 mm long, strongly keeled, c. 11-veined, awnless or with a short awn to c. 1 mm long. Palea somewhat shorter

than lemma.

Norfolk Is., Lord Howe Is. A fairly common alien grass which has been grown for fodder, but is sometimes weedy. It is native to South America.

N.Is.: Second Sands, *P.Ralston 6* (A); Rocky Point, *P.S.Green 1448* (A, K); near the old lime kiln, Emily Bay, *W.R.Sykes NI 923* (CHR). **L.H.Is.:** Signal Point, *R.D.Hoogland 8660* (CANB); W of Stevens Point, *A.C.Beauglehole 5428* (CANB, MEL).

This species is sometimes classified in the segregate genus *Ceratochloa* L.

3. *Bromus hordeaceus L., *Sp. Pl.* 1: 77 (1753)

T: Europe; neo: LINN 93.7 *n.v.*, *fide* P.Smith, *Notes Roy. Bot. Gard. Edinb.* 42: 499 (1985); IDC microfiche 177/2.66/4. The epithet alludes to this grass being a weedy accompaniment to *Hordeum* (barley).

Illustrations: N.T.Burbidge, *Austral. Grasses* 2: 119 (1968), as *Serrafalcus mollis*; L.D.Williams in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1881, fig. 856D (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 105 (1990).

Annual or biennial. Culms 10–100 cm tall, generally softly hairy. Panicles erect, fairly compact, somewhat rounded or truncate at base, 1.5–3 cm or more broad; branches 1–3 together, shorter than spikelets, each bearing 1–5 spikelets. Spikelets narrowly ovate to lanceolate, 12–22 mm long including awn, softly hairy, 6–12-flowered; pedicels 1–5 mm long. Glumes unequal, broadly acute; lower glume ovate, 5–8 mm long, 3–7-veined; upper glume broadly elliptic, 6–9 mm long, 5–7-veined. Lemma obovate, 7–11 mm long, 3–5 mm broad, dorsally rounded, blunt, 7–9-veined, with 2 short, broad apical teeth and a fine, rough, straight awn; awn 4–11 mm long, subterminal, arising c. 1 mm from lemma apex. Palea slightly shorter than lemma.

Norfolk Is., Lord Howe Is. A weedy grass native to Europe and western Asia.

N.Is.: Kingston, *P.S.Green 1508* (A, K); near Emily Bay, in the cemetery area, *W.R.Sykes 766/87* (CHR); Cascade roadside, *E.Ralston 49* (CHR). **L.H.Is.:** Lagoon Rd, *A.C.Beauglehole 5429* (CANB, MEL).

Several segregate microspecies or subspecies have been recognised in this species. The specimens cited above appear to be subsp. *hordeaceus*.

4. *Bromus scoparius L., *Cent. Pl. I* 6 (1755)

T: Spain, *P.Loefling* 81; holo: LINN *n.v.*; IDC microfiche 177/2.67/13. The epithet means a sweeper, from the Latin *scopula* (a little broom), in allusion to the appearance of the panicles.

Illustrations: A.Fiori, *Iconogr. Fl. Ital.* 3rd edn, 45, fig. 340 (1933); N.L.Bor in C.C.Townsend & E.Guest, *Fl. Iraq* 9: 155 (1968).

Annuals. Culms 10–30 cm tall, glabrous or hairy. Panicle dense, narrow, erect, 2–8 cm long, 1.5–2.5 cm broad, cuneate at base; branches 1–3 together, 1–4 mm long, each bearing 1 or 2 spikelets. Spikelets lanceolate, 10–20 mm long (not including awn), glabrous or hairy, 5–10-flowered; pedicels 1–3 cm long. Glumes unequal, narrow, finely pointed, 5-veined; lower glume 3–4 mm long; upper glume 5–7 mm long. Lemma oblong-lanceolate, 6–10 mm long, 2–3 mm broad, 5-veined, shortly bifid at apex; awn arising 2–3 mm below tip, 7–15 mm long, becoming somewhat recurved, flattened and twisted at base. Palea slightly shorter than lemma.

Norfolk Is. This grass is a native of the Mediterranean region which has become a weed in several parts of the world. It has been recorded from Norfolk Is. once, in 1943 (see below), and may now have died out.

N.Is.: Mount Pitt Rd, between junction of old and new roads, *F.C.Allen 71* (CHR).

Both hairy and glabrous variants of this species are known.

Figure 95. POACEAE. **A**, *Elymus multiflorus* var. *kingianus*, habit (2 Dec. 1987, W.Sykes, K). **B–C**, *Spinifex sericeus*. **B**, male inflorescence (1947, L.Bingley, K); **C**, female inflorescence (W.Milne 20, K). **D**, *Sporobolus virginicus*, habit (M.Lazarides 8062, K). **E**, *Oplismenus hirtellus*, habit (A.Rodd 1756, K). Scale bar = 2 cm. Drawn by A.Farrer.

22. ELYMUS

Elymus L., *Sp. Pl.* 1: 83 (1753); *Gen. Pl.* 5th edn, 36 (1754); an ancient Greek name for a kind of grass.

Type: *E. sibiricus* L.

Tufted or rhizomatous perennials. Leaf blades flat or convolute. Inflorescence a spike. Spikelets sessile or almost so, imbricate, usually single at nodes (elsewhere sometimes in pairs), separated along rachis by c. their own length, usually with the broader side against inflorescence axis, 2–13-flowered. Glumes laterally compressed, 1–11-veined, often keeled in upper ½, awned or awnless. Florets bisexual. Lemma dorsally rounded, 3–5-veined, keeled at apex, acute, with or without an awn. Palea 2-keeled.

A genus of c. 150 species throughout temperate regions of the Northern and Southern Hemispheres, particularly in Asia; 2 species native on Norfolk and Lord Howe Islands. Many species were classified in the genus *Agropyron* Gaertn., but usually that genus is now treated in a more restricted sense.

Á.Löve & H.E.Conner, Relationships and taxonomy of New Zealand Wheatgrasses, *New Zealand J. Bot.* 20: 169–186 (1982); H.E.Connor, *Elymus* (Gramineae) on Norfolk Is., *Kew Bull.* 45: 680 (1990).

Awn recurving, 2 or 3 times as long as lemma **2. E. rectisetus**

Awn straight or only slightly divergent, about as long as lemma **1. E. multiflorus**

1. Elymus multiflorus (Banks & Sol. ex Hook.f.) Á.Löve & Connor, *New Zealand J. Bot.* 20: 183 (1982)

var. **kingianus** (Endl.) Connor, *Kew Bull.* 45: 680 (1990)

Triticum kingianum Endl., *Prodr. Fl. Norfolk.* 21 (1833); *Agropyron kingianum* (Endl.) Petrie, *Trans. & Proc. New Zealand Inst.* 47: 18 (1915); *Elymus kingianus* (Endl.) Á.Löve, *Feddes Repert.* 95: 469 (1984). T: Philip Island, 1804, *F.L.Bauer*; holo: W. Named after Philip Gidley King (1758–1808), in charge of the first settlement on Norfolk Is. and Commandant from 1788–1796; later Governor of New South Wales (1800–1806).

[*Festuca billardieri auct. non* Steud.: F.J.H. von Mueller, *Fragm.* 9: 78 (1875)]

[*Agyropogon scabrum auct. non* (R.Br.) P.Beauv.: G.Bentham, *Fl. Austral.* 7: 665 (1878); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 259 (1896); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 127 (1917); A.N.Rodd & J.Pickard, *Cunninghamia* 1: 270 (1983)]

Illustration: W.R.Sykes & I.A.E.Atkinson, *Rare & Endangered Pl. Norfolk Is.* cover (1988).

Somewhat tufted perennial. Culms slender, 30–100 cm tall. Leaves narrow, 3–5 mm broad, flat or inrolled, finely scabrid on margin. Spikes 7–17 cm long, with 6–10 spikelets arranged alternately along axis. Spikelets 3–4 cm long (including awn), 3–9-flowered. Glumes unequal, acute; lower glume 9–11 mm long, 5-veined; upper glume 10–12 mm long, 7–9-veined. Lemma narrow, 8–10 mm long, setose-ciliate on margin, dorsally finely scabrid, especially on upper part and awn, with central vein broadening towards base into a coriaceous, round back; apex tapering to a slender scabrid awn, 8–14 mm long, straight or only slightly curved. Palea 8–9 mm long, setose-ciliate on margin. *Philip Island Wheatgrass*. Fig. 95A.

Norfolk Is., Lord Howe Is. Endemic.

N.Is.: Philip Is., 1804, *F.L.Bauer* (W); *loc. id., W.R.Sykes NI 995* (CHR, K); Second Sands, Norfolk Is., *W.E.Ralston 60* (CHR). **L.H.Is.:** *s. loc., J.P.Fullagar* (K).

The taxa of *Elymus* in Australia and New Zealand are badly in need of revision, but for the present it seems best to treat the plant on the Islands as an endemic variety. The plants from the two Islands appear to be identical, although until recently the Philip Is. plant was believed to be confined to that small islet and thought to be extinct, having, like most of the vegetation on Philip Is., been exterminated by goats, pigs and, latterly, rabbits. However, with the removal of the rabbits it has reappeared and was collected in 1987 by W.R.Sykes.

Furthermore, it had evidently been overlooked on Norfolk Is. itself, for a specimen, cited above, was collected there by Mrs Ralston in 1963.

2. Elymus rectisetus (Nees) Á.Löve & Connor, *New Zealand J. Bot.* 20: 183 (1982)

Vulpia rectisetus Nees in J.G.C.Lehmann, *Pl. Preiss.* 2: 107 (1846). T: W. Australia, *L.Preiss 1819*; holo: B *n.v.*, presumably destroyed. The epithet alludes to the straight '*setae*', or awns.

[*Triticum scabrum auct. non* R.Br.: S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 21 (1833)]

[*Agropyron scabrum auct. non* (R.Br.) P.Beauv.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 726 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 18 (1915); J.S.Turner *et al.*, *Conservation Norfolk Is.* 32 (1968)]

Somewhat tufted perennial. Culms slender, 30–70 cm tall. Leaves narrow, 3–5 mm broad, flat or inrolled, finely scabrid on margin. Spike 10–15 cm long, with 4–8 spikelets alternately along axis. Spikelets 3–4 cm long (including awns), 4–8-flowered. Glumes unequal, acute; lower glume 4.5–6 mm long, 7-veined; upper glume 6.5–7 mm long, 7-veined. Lemma narrow, 10–12 mm long, almost smooth, setose-ciliate towards upper part and on awn, obscurely 3-veined, with central vein broadening towards base into a coriaceous, rounded back; apex tapering to a slender, scabrous awn, 25–30 mm long, slightly curved at maturity. Palea 10–11 mm long, scabrid on margin. *Wheatgrass*.

Norfolk Is. Occasional. Also known from New Zealand.

N.Is.: Cuttings Corner, near Stockyard Rd, *W.R.Sykes NI 1103* (CHR); *s. loc., A.F.Oldfield 92* (K); *s. loc., F.C.Allen 34 & 35* (CHR).

23. HORDEUM

Hordeum L., *Sp. Pl.* 1: 84 (1753); *Gen. Pl.* 5th edn, 37 (1754); the Latin name for barley.

Type: *H. vulgare* L.

Annuals or perennials. Leaf blades flat. Inflorescence a dense spike with 3 linked spikelets at each node, in 2 longitudinal rows, and on opposite sides of rachis. Central spikelet bisexual; 2 laterals usually male or sterile. Spikelets 1-flowered, dorsally compressed. Glumes subulate to linear-lanceolate and awned. Lemma ovate to lanceolate, 5-veined, acuminate to strongly awned. Palea 2-veined.

A genus of c. 40 species from temperate regions of the world; 1 species naturalised on Norfolk and Lord Howe Islands. The genus includes *H. vulgare* L. (barley), as well as a number of weeds characteristic of wasteland.

*Hordeum murinum L., *Sp. Pl.* 1: 85 (1753)

T: Europe; lecto: specimen 3 in Hort. Cliff. Sicc. BM, *fide* B.R.Baum & C.E.Jarvis, *Taxon* 34: 529 (1985). The epithet means of mice, or mouse-like, from the Latin *mus, muris* (a mouse).

Annual. Culms 6–60 cm tall. Spike erect, strongly compressed, 2–12 cm long, bristly. Central spikelets sessile or shortly stalked; lateral spikelets male or sterile, shortly stalked. Glumes of central spikelet lanceolate, to 26 mm long (including awn), fringed with hairs, long-awned; glumes of lateral spikelets bristle-like with a rough, fine, stiff awn, 15–30 mm long. Lemma of central spikelet lanceolate, 7–12 mm long; apical awn stiff, 18–50 mm long, rough towards base. Lemma of lateral spikelets lanceolate, 7–11 mm long, with an apical awn 10–40 mm long.

Leaves glaucous; anthers of central spikelet 0.2–0.5 mm long — **1a.** subsp. **glaucum**

Leaves not glaucous; anthers of central spikelet 0.7–1.4 mm long — **1b.** subsp. **leporinum**

a. *Hordeum murinum subsp. **glaucum** (Steud.) Tzvelev, *Novosti. Sist. Vyssh. Rast.* 8: 67 (1971)

Hordeum glaucum Steud., *Syn. Pl. Glumac.* 1: 352 (1854). T: Sinai, *W.Schimper 383*; holo: ?P *n.v.*; iso: K. So named from the plant's glaucous appearance.

Illustration: J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1885, fig. 858B (1986).

Leaves glaucous. Central spikelets with a pedicel c. 1 mm long; lateral spikelets shorter than central spikelet. Rachilla of lateral spikelets stout, orange-brown. Anthers of central spikelet 0.2–0.5 mm long. *Hedgehog Grass.*

Norfolk Is., Lord Howe Is. An introduced weed, native to the Mediterranean region and south-western Europe.

N.Is.: Burnt Pine, Nov. 1962, *P.Ralston* (CHR); above Anson Bay, *W.R.Sykes NI 76* (CHR). **L.H.Is.:** on Mr N.Fenton's property, *L.M.Bingley 27* (K).

b. *Hordeum murinum subsp. **leporinum** (Link) Arcang., *Comp. Fl. Ital.* 805 (1882)

Hordeum leporinum Link, *Linnaea* 9: 133 (1835). T: Greece, *J.D.G.Bory de St.Vincent* ?; holo: B, presumably destroyed; iso: ?P *n.v.* From the Latin, pertaining to *lepus* (a hare), from a supposed resemblance between the inflorescence of this grass and the tail of a hare.

Illustrations: J.C.Tothill & J.B.Hacker, *Grasses SE Queensland* 176 (1973); N.T.Burbidge, *Austral. Grasses* 2nd edn, 157 (1984); C.A.Lamp *et al.*, *Grasses Temp. Australia* 181 (1990), as *H. leporinum.*

Leaves not glaucous. Central spikelets with a pedicel 0.7–1.8 mm long; lateral spikelets longer than central spikelets. Rachilla of lateral spikelets slender, green. Anthers of central spikelets 0.7–1.4 mm long.

Norfolk Is., Lord Howe Is. A weed, native to southern Europe.

N.Is.: *s. loc., F.C.Allen 135 & 221* (CHR). **L.H.Is.:** Kings Beach area, *A.C.Beauglehole 5433* (CANB, MEL).

24. CHIONOCHLOA

Chionochloa Zotov, *New Zealand J. Bot.* 1: 87 (1963); from the Greek *chion* (snow) and *chloë* (grass). A translation of Snowgrass, the common New Zealand name for members of this genus.

Type: *C. rigida* (Raoul) Zotov

Coarse, tussocky perennials. Leaves ribbed, generally harsh. Inflorescence a panicle, dense or lax, sometimes sparse. Spikelets several-flowered. Florets bisexual. Glumes generally shorter than spikelet, also sometimes shorter than lemma, 1-veined or 3–5-veined in lower half. Lemma membranous, pilose on margins or all over, mostly 7–9-veined, bilobed; lobes usually long-aristate, with a central, usually conspicuous, straight or geniculate awn arising between them. Palea pilose.

A genus of c. 20 species, with 1 in southern Australia and, apart from the following on Lord Howe Is., the remainder in New Zealand.

Chionochloa howensis Jacobs, *Telopea* 3: 281 (1988)

T: Lord Howe Island, *J.Pickard 2634*; holo: NSW; iso: K. Named after the island on which it occurs.

Chionochloa conspicua (G.Forst.) Zotov subsp. nov.; A.N.Rodd in H.F.Recher & S.S.Clark, *Environm. Survey Lord Howe Is.* 21 (1974).

Chionochloa sp. A (aff. *conspicua*); S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 39 (1981).

Chionochloa sp. aff. *conspicua*; A.N.Rodd & J.Pickard, *Cunninghamia* 1: 270 (1983).

Erect perennial to c. 1 m tall. Leaf blade 60 cm or more long, to 12 mm broad, flat when fresh, scabrous on upper surface, strongly ribbed. Panicle dense, 15–25 cm long, 6–8 cm broad; branches pubescent, 2–5 per node. Spikelets 6–8 mm long, mostly 3–5-flowered.

Lower 2 or 3 florets fertile; upper florets male or sterile. Glumes membranous, acute, 1-veined; lower glumes 4–5.5 mm long; upper glume 5–6 mm long. Lemmas becoming progressively smaller up spikelet; lowest lemma 4.5–5.5 mm long, entire or bilobed at apex, 5–7-veined, dorsally glabrous, ciliate on lower margins; awn straight, 8–10 mm long, flat or sometimes slightly twisted. Paleas almost equalling lemmas, 2-veined, bilobed, stiffly ciliate on margins. Fig. 96G–I.

Lord Howe Is. Endemic. Only known on or near the cliffs of Mts Lidgbird and Gower, and first discovered there by John Pickard as recently as 1970.

L.H.Is.: shoulder of Mt Lidgbird, *J.Pickard NSW178643* (CHR, K, NSW); 'Razorback', S end of summit, Mt Gower, *J.Pickard 2634* (BRI, CHR, K, NSW, US).

The affinities of this grass lie with *C. flavicans* Zotov of New Zealand and not with the Australian species.

25. RYTIDOSPERMA

Rytidosperma Steud., *Syn. Pl. Glumac.* 1: 425 (1854); from the Greek *rhytidos* (wrinkled) and *sperma* (seed), in allusion to a character of the seed of the type species.

Type: *R. lechleri* Steud.

Tufted perennials, rarely annuals. Leaf blades flat or convolute. Inflorescence a ±contracted panicle, or sometimes a raceme, rarely reduced to 1–3 spikelets. Spikelets 4–10-flowered. Florets bisexual, upper ones often reduced. Glumes subequal, narrowly lanceolate to boat-shaped, 3–13-veined. Lemma 5–9-veined with 2 or 3 transverse series of tufts of hairs, sometimes reduced to 2 lateral tufts, bilobed, awned; lobe apices shortly awned; central awn well developed, arising between lobes, straight or geniculate. Palea glabrous or pilose.

A genus of perhaps 90 species, mainly from New Zealand, Australia and southern Africa, but native also in parts of Asia, Madagascar and Argentina, including 2 species native to Lord Howe Is. Its members are characteristic of montane grassland.

Many species were formerly classified in the genus *Danthonia* DC., and there has been much controversy over the correct names and delimitations within the group of closely related genera involved. In fact, *Rytidosperma* is not recognised by most Australian agrostologists pending a worldwide treatment of *Danthonia sens. lat.* The New Zealand species, which include those treated below, have been revised lately by H.E.Connor & E.Edgar, *Rytidosperma* Steudel (*Notodanthonia* Zotov) in New Zealand, *New Zealand J. Bot.* 17: 311–337 (1979).

Upper row of hairs on lemma in isolated tufts or lateral only, shorter than or equalling those of lower ring; all hairs 1–2 mm long; panicle subracemose **1. R. racemosum**

Upper row of hairs on lemma a dense, continuous ring, longer than those of lower ring; upper hairs 3–4 mm long; panicle dense, slightly branched **2. R. unarede**

1. Rytidosperma racemosum (R.Br.) Connor & Edgar, *New Zealand J. Bot.* 17: 327 (1979)

Danthonia racemosa R.Br., *Prodr.* 177 (1810). T: Port Jackson, N.S.W., *R.Brown, Iter Austral. 6235*; holo: BM; iso: K. Named in allusion to the racemose panicle.

Illustrations: V.D.Zotov, *New Zealand J. Bot.* 1: 120, fig. 10/18 (1963), as *Notodanthonia racemosa*; D.J.B.Wheeler *et al.*, *Grasses New South Wales* 154, fig. 14d (1982), as *Danthonia racemosa*; N.T.Burbidge, *Austral. Grasses* 2nd edn, 103 (1984), as *Danthonia racemosa*.

Slender perennial to 60 cm tall. Leaf blades narrow, 5–20 cm long, to 2 mm broad or tightly inrolled. Inflorescence a raceme or slightly and shortly branched panicle, erect, 5–15 cm long. Spikelets 4–10-flowered. Glumes 7–16 mm long, ±acute, 5–7-veined, pale greenish. Lemma c. 5 mm long, tinged purplish, deeply bilobed, with 3 transverse rows of stiff hairs, 1–2 mm long; upper row sometimes reduced to lateral tufts; lobe awns fine, straight, 2–7 mm long; central awn geniculate, 8–15 mm long, twisted in lower part. Palea narrow, 4–5 mm

long, dorsally glabrous.

Lord Howe Is. Recently recorded from the Island for the first time (as locally frequent in the northern parts) by A.N.Rodd & J.Pickard, *Cunninghamia* 1: 270 (1983). Native also in eastern Australia and the Kermadec Is. and widely naturalised in New Zealand.

L.H.Is.: 0.1 km S of Kims Lookout, *J.Pickard 2723* (NSW).

2. Rytidosperma unarede (Raoul) Connor & Edgar, *New Zealand J. Bot.* 17: 328 (1979)

Danthonia unarede Raoul, *Ann. Sci. Nat. Bot.* ser. 3, 2: 116 (1844); *Notodanthonia unarede* (Raoul) Zotov, *New Zealand J. Bot.* 1: 122 (1963). T: Akaroa, New Zealand, 1843, *E.F.L.Raoul*; holo: ?P *n.v.*; iso: K. The epithet is the native name recorded by Raoul, 'Unarede'.

Illustrations: J.Buchanan, *Man. Indig. Grasses New Zealand* t. 34 (1880), as *Danthonia semiannularis*; H.H.Allan, *Intr. Grasses New Zealand* 71, figs 41/1a–b, 4, 5 (1936), as *Danthonia semiannularis*; V.D.Zotov, *New Zealand J. Bot.* 1: 120, fig. 10/21 (1953), as *Notodanthonia unarede*.

Slender perennial, to c. 45 cm tall. Leaf blade narrow, to 40 cm long, 3.5 mm broad or tightly inrolled. Panicle erect, 5–10 cm long, 1–2.3 cm broad, slightly branched. Spikelets 3–8-flowered. Glumes 8–15 mm long, acuminate, 5 (–7)-veined, dorsally purplish. Lemma 2–5 mm long, tinged purplish, deeply bilobed, with 2 transverse rows of stiff hairs; lower hairs 1–1.5 mm long; uppermost row of hairs 3–4 mm long, dense, continuous; lobe awns fine, straight, 2–4 mm long; central awn geniculate, 8–12 mm long, twisted in lower part. Palea narrow, 4–5 mm long, glabrous or with a few marginal hairs.

Lord Howe Is. Rare. Also recorded from the Island for the first time recently by A.N.Rodd & J.Pickard, *Cunninghamia* 1: 270 (1983), and from the southern mountainous areas by J.Pickard, *Biol. Conservation.* 27: 138 (1983). Also native in New Zealand.

L.H.Is.: Old Kings Cave, Erskine Valley, 1971, *J.Pickard s.n.* (NSW).

26. ARUNDO

Arundo L., *Sp. Pl.* 1: 81 (1753); *Gen. Pl.* 5th edn, 35 (1754); from the Latin *arundo* (a reed).

Type: *A. donax* L.

Tall, rhizomatous perennials. Leaf blades broad and flat. Inflorescence a large, dense, much branched, plumose panicle. Spikelets few-flowered; rachilla glabrous. Glumes as long as spikelet, thin, 3–5-veined. Florets bisexual or the uppermost sterile. Lemma thin, 3–5-veined, entire or bifid, with lower half of back covered with long, silky hairs; awn short, straight, terminal or arising between apices. Palea shorter than lemma, with 2 ciliate keels.

A small genus of 3 species from the Mediterranean to China, but widely introduced elsewhere, including 1 species on Norfolk Is. Characteristic of river banks and damp places. The reeds of woodwind instruments are cut from the culms.

***Arundo donax** L., *Sp. Pl.* 1: 81 (1753)

T: Europe, Herb. A. van Royen 912.356-93; lecto: L, *fide* S.A.Renvoize in C.E.Jarvis *et al.*, *Regnum Veg.* 127: 21 (1993). The epithet, *donax*, was the Greek name for a kind of reed.

Illustrations: H.H.Allan, *Intr. Grasses New Zealand* 33, fig. 6 (1936); N.T.Burbidge, *Austral. Grasses* 2nd edn, 67 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1854, fig. 845A (1986).

Perennial reed, 2–6 m tall; rhizomes short. Leaves alternate, distichous. Panicle 30–60 cm long, silky-hairy. Spikelets 8–12 mm long, 2–7-flowered. Glumes subequal, lanceolate, 8–12 mm long, acuminate. Lemma 6–11 mm long, lanceolate, with dense hairs 4–6 mm long; apex bifid, shortly aristate, with a straight, central awn 2–3 mm long. Palea narrow, glabrous. *Elephant Grass*.

Norfolk Is. Naturalised, a native of southern Europe and Asia.

N.Is.: near the Melanesian Mission, *W.R.Sykes NI 621* (CHR); Lower Gardens, 1962, *P.Ralston s.n.* (CHR).

27. PHRAGMITES

Phragmites Adans., *Fam. Pl.* 2: 34 (1763); a name used by Dioscorides for a kind of reed, derived from the Greek *phragma* (a hedge or screen).

Type: *P. communis* Trin. = *P. australis* (Cav.) Trin. ex Steud.

Tall, rhizomatous, aquatic perennials. Leaf blades flat, deciduous. Inflorescence a large, dense, much branched, plumose panicle. Spikelets 3–6-flowered; rachilla with long spreading, silky hairs at base of floret. Glumes membranous, shorter than spikelet, 3–5-veined, glabrous. Lowest floret male; the others bisexual; uppermost florets usually reduced or sterile. Lemmas narrow, membranous, glabrous, awnless (elsewhere sometimes awned); lower lemma longer than glumes, 3–7-veined, persistent; fertile lemmas long acute, 1–3-veined. Palea shorter than lemma.

A genus of 3 or 4 species which is cosmopolitan in distribution and characteristic of marshes and river banks. One species native on Lord Howe Is.

Phragmites australis (Cav.) Trin. ex Steud., *Nomencl. Bot.* 2nd edn, 2: 324 (1841)

Arundo australis Cav., *Anales Hist. Nat.* 1: 100 (1799). T: near Port Jackson, Australia, *L.Née*; holo: ?MA *n.v.* Named for its occurrence in the Southern Hemisphere.

Illustrations: N.T.Burbidge, *Austral. Grasses* 2nd edn, 213 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1855, fig. 846 (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 243 (1990).

Robust perennial, 1–3 m tall. Panicle 15–40 cm long, erect or nodding; lowest nodes branched. Spikelets 10–18 mm long, opening at maturity to display rachilla hairs. Glumes persistent; lower glume 3-veined, ½ length of upper; upper glume 3–5 mm long. Lowest lemma narrowly lanceolate, 9–15 mm long, 3-veined; upper, fertile lemmas very narrow. Palea 3–4 mm long, blunt. *Common Reed.*

Lord Howe Is. Perhaps the most cosmopolitan of all the world's grasses, it is characteristic of marshy ground and water margins. Although listed by J.S.Turner *et al.* (*Conservation Norfolk Is.* 32, 1968) for Norfolk Is., the only specimen I have seen identified as *Phragmites*, a vegetative one, turned out to be a small specimen of *Arundo donax*.

L.H.Is.: Old Settlement Beach, *A.C.Beauglehole 5448* (CANB, MEL); *s. loc.*, 1898, *J.H.Maiden* (NSW).

28. ERAGROSTIS

Eragrostis Wolf, *Gen. Pl.* 23 (1776); from the Greek *eros* (love) and *agrostis* (grass), a translation of Love-Grass, the common name of some species.

Type: *E. minor* Host

Annuals, or perennials. Leaf blades flat. Inflorescence an open, contracted or spike-like panicle. Spikelets usually laterally compressed, awnless, disarticulating, few- to many-flowered. Glumes usually subequal, shorter than lowest lemma, usually 1-veined, usually deciduous. Florets usually bisexual. Lemma obtuse to acuminate, 3-veined, generally glabrous. Palea a little shorter than lemma, with 2 keels; keels sometimes winged or ciliate.

A widespread tropical and subtropical genus containing c. 350 species, particularly characteristic of dry and open, often weedy, habitats. Two species are naturalised, 1 on each of Norfolk and Lord Howe Islands.

Spikelets 10–30-flowered, 6–18 mm long; lemmas 2–2.8 mm long, obtuse; leaf blades to 8 mm broad, with small, dark glands on margins; odour unpleasant (L.H.Is.) **1. E. cilianensis**

Spikelets 6–16-flowered, 4–8 mm long; lemmas 1–1.5 mm long, acute; leaf blades 1–1.5 mm broad, without marginal glands; lacking unpleasant odour (N.Is.) **2. E. brownii**

1. *Eragrostis cilianensis (All.) Link ex Vignolo, *Malpighia* 18: 386 (1904)

Poa cilianensis All., *Fl. Pedem.* 2: 246 (1785). T: Italy, *C.A.L.Bellardi*; holo: ?TO *n.v.* The epithet commemorates Ciliani in Northern Italy, whence it was first collected.

Illustrations: D.J.B.Wheeler *et al.*, *Grasses New South Wales* 183, fig. 23a–c (1982); M.Lazarides in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1939, fig. 884E (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 163 (1990).

Tufted annual to c. 60 cm tall, with an unpleasant odour. Leaf blades to 8 mm broad, with small, dark glands along margins. Panicle ±narrow, somewhat dense to fairly open, 5–20 cm long, with a dark ring of glands around axis below lower branches. Spikelets narrowly elliptic, 6–18 mm long, 2–5 mm broad, 10–30-flowered; pedicels 1–3 mm long. Glumes subequal, boat-shaped, 1.5–2.5 mm long, 1–3-veined, with glands on keel. Lemma broadly ovate, 2–2.8 mm long, glabrous on margins, obtuse.

Lord Howe Is. An occasional weed. A native of disturbed ground in the Old World tropics and subtropics, now widespread as a weedy grass.

L.H.Is.: a garden, *L.M.Bingley 6* (K).

2. *Eragrostis brownii (Kunth) Nees ex Wight, *Catalogue of Indian Plants* 105 (1834)

Poa polymorpha R.Br., *Prodr.* 180 (1810), *non* Wibel (1799), *nec* Willd. (1803), *nom. illeg.*; *Poa brownii* Kunth, *Révis. Gramin.* 1: 112 (1829), as *P. brownei*. T: Port Jackson and Hunter's River, Australia, *R.Brown*; syn: BM; isosyn: K. Named after Robert Brown (1772–1858), naturalist on Lieutenant M.Flinders' voyage of exploration around Australia in H.M.S. *Investigator* (1801–1805).

Illustrations: C.A.Gardner, *Fl. W. Australia* 1: 45 (1966); D.J.B.Wheeler *et al.*, *Grasses New South Wales* 182, fig. 22j-l (1982); C.A.Lamp *et al.*, *Grasses Temp. Australia* 161 (1990).

Tufted perennial to c. 50 cm tall. Leaf blades narrow, 1–1.5 mm broad, without marginal glands, without unpleasant odour. Panicle narrowly ovate, 5–20 cm long, without glandular rings. Spikelets narrowly elliptic, 4–8 mm long, 2–2.5 mm broad, 6–16-flowered; pedicels 1–3 mm long. Glumes unequal, lanceolate; lower glume 0.8–1.5 mm long; upper 1.2–2 mm long, 1-veined. Lemma broadly ovate, 1–2 mm long, finely ciliate on margin, acute to slightly acuminate; lateral veins prominent.

Norfolk Is. Although native in western and eastern Australia and SE Asia, it has possibly been introduced to the Island as a fodder plant.

N.Is.: Burnt Pine area, *F.C.Allen 113* (CHR).

In an unpublished list of Norfolk Is. plants that was distributed a few years ago this species appeared as a misidentification under the name *Eragrostis tenuifolia* (A.Rich.) Steud.

29. ELEUSINE

Eleusine Gaertn., *Fruct. Sem. Pl.* 1: 7 (1788); named after the ancient Greek city of *Eleusis* where the temple of *Demeter* (the Roman *Ceres*), goddess of agriculture, stood.

Type: *E. coracana* (L.) Gaertn.

Annuals or perennials. Leaf sheath keeled; blade usually folded. Inflorescences of several spikes ±clustered towards culm apex. Spikelets in 1-sided rows, laterally compressed, several-flowered. Glumes shorter than lemmas, persistent, keeled, 1–several-veined. Florets bisexual. Lemma keeled, 3 (5)-veined; apex entire. Palea 2-keeled.

A genus of 9 species, all African except the following cosmopolitan weed.

***Eleusine indica** (L.) Gaertn., *Fruct.* 1: 8 (1788)

Cynosurus indicus L., *Sp. Pl.* 1: 72 (1753). T: illustration in J.Burman, *Thes. Zeylan.* 106, t. 47, fig. 1 (1737); lecto, *fide* S.M.Phillips, *Kew Bull.* 27: 257 (1972). So named as coming from 'India', in the ancient and general sense.

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 92 (1981), as Crow's-foot Grass;

N.T.Burbidge, *Austral. Grasses* 2nd edn, 127 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1934, fig. 883A (1986).

Coarse, tufted annual, 30–80 cm tall. Inflorescence of 2–10 ascending, clustered, terminal spikes, 4–15 cm long, 1 usually borne slightly below others. Spikelets 4–7 mm long, 3–6-flowered. Glumes acute; lower glume 1–2 mm long, 1-veined, with keel winged, scabrid on margins; upper glume 2–3 mm long, 3-veined. Lemma lanceolate, 2.5–4 mm long, broadly keeled in upper half, acute or subacute. *Crow's-Foot Grass, Crab Grass.*

Norfolk Is., Lord Howe Is. An introduced weed of roadsides, waste ground and gardens, in the tropics and subtropics throughout the world.

N.Is.: Burnt Pine Rd, *F.C.Allen 180* (CHR); Emily Bay, *W.R.Sykes NI 588* (CHR). **L.H.Is.:** paddocks, *L.M.Bingley 3* (K).

30. SPOROBOLUS

Sporobolus R.Br., *Prodr.* 169 (1810); from the Greek *sporos* (a seed) and *bolos* (throwing), because the seeds in some species are easily shed.

Type: *S. indicus* (L.) R.Br.

Annuals or perennials. Leaf blades flat or convolute. Inflorescence an open or contracted panicle, rarely spike-like. Spikelets small, fusiform, awnless, 1-flowered. Glumes unequal, with lower usually smaller than upper, 1-veined. Lemma membranous, 1-veined. Palea 2-veined.

A widely distributed, tropical and subtropical genus of 150 or more species; 1 native and 1 naturalised species on Norfolk and Lord Howe Islands.

Habit creeping, rhizomatous; leaves stiffly inrolled; glumes subequal, 1.2–2 mm long, ±equalling lemma **1. S. virginicus**

Habit tufted; leaves flat or weakly inrolled; glumes unequal; lower glume c. 0.5 mm long; upper glume 1–1.5 mm long, shorter than lemma **2. S. indicus**

1. Sporobolus virginicus (L.) Kunth, *Révis. Gramin.* 1: 67 (1829)

Agrostis virginica L., *Sp. Pl.* 1: 63 (1753). T: Virginia, U.S.A., *J.Clayton 507*, LINN 84.30; lecto: LINN, *fide* A.S.Hitchcock, *Contr. U.S. Natl. Herb.* 12: 119 (1908); iso: BM; IDC microfiche 177/2.53/6. Named after the State of Virginia, whence the type material was collected.

Illustrations: C.A.Gardner, *Fl. W. Australia* 1: 161, t. 48A (1952); J.C.Tothill & J.B.Hacker, *Grasses SE Queensland* 254, fig. 3 (1973); C.A.Lamp *et al.*, *Grasses Temp. Australia* 269 (1990).

Creeping rhizomatous perennial to c. 30 cm tall. Leaf blades 2–10 cm long, inrolled, stiff, with a fine point. Panicle narrow, cylindrical, dense, 2–10 cm long, 4–10 mm broad. Spikelets leaden-coloured, 2–2.5 mm long, glabrous. Glumes subequal, lanceolate, 1.2–2 mm long; upper glume slightly longer, acute. Lemma equalling upper glume. Fig. 95D.

Norfolk Is., Lord Howe Is. This species grows by the sea, often forming dense stands, and is found in maritime habitats throughout the tropics and subtropics.

N.Is.: Duncombe Bay, *M.Lazarides 8062* (CANB, K); *loc. id.*, *P.S.Green 2429* (K); base of cliffs, Crystal Pool, *P.Ralston 22* (A). **L.H.Is.:** E end of Old Settlement Beach, *A.C.Beauglehole 5439* (CANB, MEL); Roach Is., Admiralty Group, *A.C.Beauglehole 5440* (CANB, MEL); Neds Beach, *J.Pickard 1420* (NSW).

The plant on the Islands appears to be what has been called var. *virginicus*.

2. *Sporobolus africanus (Poir.) Robyns & Tournay, *Bull. Jard. Bot. État* 25: 242 (1955)

Agrostis africana Poir. in J.B.A.P. de M. de Lamarck, *Encycl. Suppl.* 1: 254 (1810). T: South Africa, *C.P.Thunberg*; holo: ?UPS *n.v.* Named after Africa whence the original material had come.

[*Sporobolus elongatus auct. non* R.Br.: C.Moore, *J. Bot.* 7: 302 (1869); F.J.H. von Mueller, *Fragm.* 9: 78 (1875)]

[*Sporobolus indicus auct. non* (L.) R.Br.: G.Bentham, *Fl. Austral.* 7: 622 (1878); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 16 (1915); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 111, 157 (1917)]

Illustrations: N.T.Burbidge, *Austral. Grasses* 2nd edn, 247 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1956, fig. 892B (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 267 (1990), the last two as *S. indicus* var. *africanus*.

Tufted perennial to c. 60 cm tall. Leaf blades flat or weakly inrolled, 6–18 cm long. Panicles narrow, spike-like, often interrupted in lower part, 10–25 cm long, 4–7 mm broad. Spikelets 2–2.5 mm long, leaden-coloured, glabrous. Glumes unequal; lower glume broad, c. 0.5 mm long, obtuse; upper glume narrower, 1–1.5 mm long, acute. Lemma lanceolate, as long as spikelet. Lemma 2 mm long. *Rat's Tail, Tufty Grass*.

Norfolk Is., Lord Howe Is. Although an introduction, this species is common in open areas and on grassy slopes, often indicating that the pasture is overgrazed. As its name suggests it is a native of Africa.

N.Is.: Duncombe Bay, *M.Lazarides 8064* (CANB, K); Point Howe, *P.S.Green 1409* (A, K); the Cascades, *W.Laing* (CHR). **L.H.Is.:** SE lower slopes of Malabar Ridge, *P.S.Green 1548* (A, K); top of Transit Hill, *L.A.S.Johnson & A.N.Rodd 1286* (K, NSW); Signal Point, *R.D.Hoogland 8655* (CANB).

If, following some authorities, this grass is treated as a variety of *S. indicus*, then the correct name is *S. indicus* var. *capensis* (P.Beauv.) Engl.

31. LEPTURUS

Lepturus R.Br., *Prodr.* 207 (1810); from the Greek *leptos* (slender) and *oura* (a tail), in allusion to the slender, tail-like spikes in these grasses.

Type: *L. repens* (G.Forst.) R.Br.

Perennials. Leaf blades flat or convolute. Inflorescence a cylindrical spike of alternate spikelets ±sunk into axis; axis articulated in fruit. Spikelets 1 (or 2)-flowered. Glumes unequal except in terminal spikelet; lower glume absent or minute; upper glume very acute, 5–12-veined, covering cavity in axis. Upper floret usually vestigial. Lemma of fertile floret dorsally rounded, ±membranous, 3-veined. Palea almost equalling lemmas, membranous, 2-veined.

A genus of from 8 to c. 15 species, depending upon how variable *L. repens* is considered to be. Distributed on the shores of the Indian and Pacific Oceans from E Africa to Polynesia. One species native on Lord Howe Is.

Lepturus repens (G.Forst.) R.Br., *Prodr.* 207 (1810)

Rottboellia repens G.Forst., *Fl. Ins. Austr.* 9 (1786). T: 'insulae intra tropicos' [Tahiti], *J.G.Forster*; syn: K. The epithet means creeping, from the latin *repo* (I creep), referring to the habit.

Illustrations: H.B.Gilliland, *Revis. Fl. Malaya* 3: 84 (1971); J.C.Tothill & J.B.Hacker, *Grasses SE Queensland* 194 (1973); C.E.Hubbard in *Fl. Trop. E. Africa*, Gramineae 390 (1974).

Creeping perennial. Culms 10–50 cm tall. Spikes 4–15 cm long, 1–2.5 mm diam. Upper glumes narrowly lanceolate, 5–10 mm long. Lemma 3.5–5 mm long, somewhat acute.

Lord Howe Is. Although only relatively recently collected, it has probably been overlooked previously. It is a native of tropical shores from E Africa to Polynesia.

L.H.Is.: N end of Little Slope, *J.Pickard 2735* (NSW).

The specimen upon which the record of *Monerma cylindrica* (Willd.) Coss. & Dur. was based, *J.Pickard 2735* (see S.W.Jacobs & J.Pickard, *Pl. New South Wales* 48, 1981 and A.N.Rodd & J.Pickard, *Cunninghamia* 1: 275, 1983) turns out, on close examination, to be a dwarf example of *Lepturus repens*.

32. CHLORIS

Chloris Sw., *Prodr.* 1: 25 (1788); named after *Chloris*, the ancient Greek goddess of flowers.

Type: *C. cruciata* (L.) Sw.

Annuals or perennials. Leaf blades flat or folded. Inflorescence of digitate or subdigitate spikes, each with overlapping spikelets arranged on one side of axis. Spikelets laterally compressed, with 1 (rarely 2 or more) fertile floret; rachilla ending with 1 or more sterile florets, of lemmas only. Glumes unequal, acute or shortly awned, 1-veined, usually persistent. Fertile lemmas keeled, usually ciliate on margins and keel, 3-veined; apex 2-lobed, subapically awned; sterile lemmas ±reduced, variable. Palea 2-keeled.

A genus of c. 50 species from tropical and warm temperate regions throughout the world; 2 species naturalised on Norfolk and Lord Howe Islands.

D.E.Anderson, Taxonomy of the genus *Chloris* (Gramineae), *Brigham Young Univ. Sci. Bull. Biol. Ser.* 29(2): 1–133 (1974).

Chloris pumilio R.Br. was recorded from Lord Howe Is. by C.Moore (in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 8, 1870), but there are no specimens to substantiate the record, and J.H.Maiden 'made diligent search for it but failed to find it' (*Proc. Linn. Soc. New South Wales* 23: 143, 1898). Presumably it was a misidentification for one of the following species.

Spikes, in flower, held erect or at an oblique angle; lowest lemma long-ciliate on upper ½ of margin; awn c. 3 mm long; apex of upper lemma oblique, with awn 1.5 mm long **1. C. gayana**

Spikes, in flower, held horizontally; lower lemma shortly ciliate on marginal veins with awn 8–14 mm long; apex of upper lemma truncate, with awn 4–9 mm long **2. C. truncata**

1. *Chloris gayana Kunth, *Révis. Gramin.* 1: 293 (1830)

T: Senegal, *F.Doellinger 21 & 40*; isosyn: K. Named after Claude Gay (1800–1873), French botanist and traveller.

Illustrations: J.C.Tothill & J.B.Hacker, *Grasses SE Queensland* 106, 108, fig. 9 (1973); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1951, fig. 888B (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 109 (1990).

Tufted perennial, often stoloniferous, 40–150 cm tall. Inflorescence subdigitate, of 6–15 spikes, each 7–10 cm long, held erect or oblique. Spikelets 3–4 mm long, closely imbricate, 2- or 3-flowered. Lower glume 1–1.5 mm long, acute; upper glume ovate-lanceolate, 2–3 mm long, very acute to aristate. Lower floret bisexual, the second male and the third, when present, reduced and sterile. Lowest lemma c. 3 mm long, straw coloured, with cilia c. 1 mm long on upper margin and an awn c. 3 mm long; upper lemma 2.5 mm long, oblique, with subapical awn 1.5 mm long, glabrous; third lemma similar but smaller. Palea narrow, c. equalling lemma. *Rhodes Grass.*

Norfolk Is., Lord Howe Is. Introduced, occurring in rough grassland and pasture. This species is a native of Africa and is now widely naturalised in tropical and subtropical regions of the world. According to the notes with *L.M.Bingley 25* (cited below) it was introduced to Lord Howe Is. sometime before 1933.

N.Is.: Duncombe Bay, *M.Lazarides 8066* (CANB). **L.H.Is.:** by the road at the creek, *L.M.Bingley 25* (K); near Lovers Bay, *R.D.Hoogland 8719* (CANB, MEL); Rabbit Is., *A.N.Rodd 1822* (K, NSW).

2. *Chloris truncata R.Br., *Prodr.* 186 (1810)

T: Port Jackson, Australia, *R.Brown*; holo: BM; iso: K. Named for the truncate apex of the lemmas.

Illustrations: J.C.Tothill & J.B.Hacker, *Grasses SE Queensland* 108, fig. 8 (1973); N.T.Burbidge, *Austral. Grasses* 2nd edn, 89 (1984); C.A.Lamp *et al.*, *Grasses Temp. Australia* 111 (1990).

Tufted, short-lived perennial, sometimes stoloniferous, 15–40 cm tall. Inflorescence digitate,

of 6–9 (rarely more) spikes spreading horizontally when in flower, each usually 9–15 cm long. Spikelets 3–4 mm long, somewhat imbricate, 2-flowered. Glumes narrow, acute; lower glume 1.5–2 mm long; upper glume 2.5–4 mm long, scabrous on keel. Lower floret bisexual; upper floret sterile. Lower lemma 2–4 mm long, often black when mature, shortly ciliate on marginal veins, with a scabrid, slender awn 8–14 mm long; upper lemma 1.2–2 mm long, truncate with an awn 4–9 mm long. Palea absent.

Lord Howe Is. Introduced to the Island as a pasture grass. Native in all Australian States except N.T.

L.H.Is.: Mt Eliza, *A.C.Beauglehole 5445* (CANB, MEL).

33. CYNODON

Cynodon Rich. in C.H.Persoon, *Syn. Pl.* 1: 85 (1805); from the Greek *cynos* (a dog) and *odous* (a tooth), a translation of the French name for this grass, *chiendent*, in allusion to the tooth-like buds on the rhizome.

Type: *C. dactylon* (L.) Pers.

Perennials, rhizomatous or stoloniferous. Leaf blades flat or convolute. Inflorescence digitate, of 1-sided spikes; rachis flattened. Spikelets laterally compressed, imbricate in 2 rows on one side of spike, awnless, 1-flowered. Glumes subequal, narrow, shorter than floret, 1-veined. Lemmas keeled, 3-veined, awnless. Paleas 2-keeled.

A genus of c. 8 species from the Old World tropics; 1 species naturalised on Norfolk and Lord Howe Islands.

***Cynodon dactylon** (L.) Pers., *Syn. Pl.* 1: 85 (1805)

Panicum dactylon L., *Sp. Pl.* 1: 58 (1753). T: Portugal, *coll. unknown*; syn: LINN 80.35 *n.v.*, *fide* W.D.Clayton, *Kew Bull.* 24: 186 (1970); IDC microfiche 177/2.47/19. The epithet from the Greek *dactylos* (a finger), in allusion to the finger-like spikes.

Illustrations: N.T.Burbidge, *Austral. Grasses* 2nd edn, 97 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1952, fig. 889C (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 113 (1990).

Sward-forming, stoloniferous perennial. Inflorescence usually of 2–6 straight spikes, each 1–6 cm long. Spikelets 2–2.5 mm long, appressed, often purplish. Lower glume 1–1.5 mm long. Lemma boat-shaped, 2–2.5 mm long, obtuse to apiculate, silky pubescent on keel. Palea slightly shorter than lemma, glabrous. *Couch*.

Norfolk Is., Lord Howe Is. This may be a native or an early introduction on the Islands as it occurs in pastures, lawns and on the roadsides. It is found in tropical and warm temperate regions throughout the world, and is often grown as a lawn grass.

N.Is.: Point Ross, *R.D.Hoogland 6602* (CANB); Anson Bay Rd, above Jacobs Rock, *M.Lazarides 8050* (CANB, K). **L.H.Is.:** Northern Hills, *R.D.Hoogland 8702* (CANB); Rabbit Is., *A.N.Rodd 1813* (K, NSW); on edge of garden, *L.M.Bingley 14* (K).

34. OPLISMENUS

Oplismenus P.Beauv., *Fl. Oware* 2: 14 (1810); from the Greek *hoplismos* (a weapon), in allusion to the prominent awns, as 'spears'.

Type: *O. africanus* P.Beauv.

Annuals or perennials, usually trailing, often rooting from nodes. Leaf blades usually flat, thin, rather broad. Inflorescence a panicle of 1-sided racemes along a rachis bearing paired spikelets. Spikelets usually laterally compressed, 2-flowered. Lower floret usually sterile. Glumes subequal, ½–¾ length of spikelet, 3–5-veined; lower glume or both with an apical, often viscid awn. Lemma of lower floret acute or shortly awned, 5–9-veined; upper lemma acute or obtuse. Palea of lower floret absent; upper palea subequal to lemma, acute, 2-veined.

A genus of c. 5 closely related species characteristic of forest shade throughout the tropics and subtropics; 1 species native on Norfolk and Lord Howe Islands.

Oplismenus hirtellus (L.) P.Beauv., *Ess. Agrostogr.* 54, 170 (1812)

Panicum hirtellum L., *Syst. Nat.* 10th edn, 2: 870 (1759). T: Jamaica, *P.Browne*; lecto: LINN 80.28, *fide* J.C.Davey & W.D.Clayton, *Kew Bull.* 33: 156 (1978); IDC microfiche 177/2.47/11. The epithet is the diminutive of the Latin *hirtus* (hairy), meaning rather, or somewhat hairy.

Orthopogon imbecillis R.Br., *Prodr.* 194 (1810); *Oplismenus imbecillis* (R.Br.) Roem. & Schult., *Syst. Veg.* 15th edn, 2: 487 (1817). T: Port Jackson, Australia, *R.Brown*; holo: BM; iso: K.

[*Oplismenus aemulus auct. non* (R.Br.) Roem. & Schult.: S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 18 (1833); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 126 (1917)]

[*Oplismenus compositus auct. non* (L.) P.Beauv.: S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 18 (1833); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 258 (1896); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 17 (1915)]

[*Panicum aemulum auct. non* (R.Br.) Steud.: D.F.L. von Schlechtendal, *Linnaea* 31: 286 (1861)]

[*Panicum compositum auct. non* L.: F.J.H. von Mueller, *Fragm.* 8: 199 (1874)]

[*Oplismenus setarius auct. non* (Lam.) Roem. & Schult.: G.Bentham, *Fl. Austral.* 7: 492 (1878)]

[*Oplismenus compositus* var. *setarius auct. non* (Lam.) Bailey: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 143 (1898)]

[*Oplismenus undulatifolius auct. non* (Ard.) Roem. & Schult.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 725 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 17: 17 (1915); J.S.Turner *et al.*, *Conservation Norfolk Is.* 32 (1968)]

Illustrations: H.H.Allan, *Intr. New Zealand Grasses* 127, fig. 90/1 (1936); N.T.Burbidge, *Austral. Grasses* 2nd edn, 189 (1984).

Weak, trailing and creeping perennial. Leaf blades flat, 3–10 mm broad. Inflorescence spike-like, 3–10 cm long, with 4–10 lateral racemes; racemes 3–25 mm long, diminishing upwards, bearing 1–8 spikelets. Spikelets 2–3 mm long, glabrous or sparsely hairy. Glumes subequal, with stiff, straight, or sometimes kinked, smooth, viscid awns; lower glume 3-veined, with awn 4–13 mm long; upper glume broader than lower, 5–7-veined, with awn 0.5–1 mm long. Lemma 2–3 mm long, acute to aristate. Fig. 95E.

Norfolk Is., Lord Howe Is. A grass of the forest floor, where it is common and mat-forming. This is a very variable species characteristic of this habitat throughout the tropics.

N.Is.: Mt Pitt Reserve, *W.R.Sykes NI 51, 52 & 53* (CHR); between Palm Glen and Red Rd, *M.Lazarides 8094* (CANB, K); *s. loc.*, 1804–1805, *F.L.Bauer* (K, W). **L.H.Is.:** from North Beach to Kims Lookout Ridge, *A.N.Rodd 1756* (K, NSW); NW spur of Intermediate Hill, *J.Pickard* in *A.N.Rodd 1443* (K, NSW); *s. loc.*, *C.Moore 37* (K, MEL).

In Australia the broad-leaved expression of this variable species, usually with more spikelets per raceme, is generally recognised as a separate species, *O. aemulus* (R.Br.) Roem. & Schult., but as J.C.Davey & W.D.Clayton (*Kew Bull.* 33: 149–151, 1978) have shown, statistical analysis, even including Australian material, fails to provide reliable characters for consistent and positive discrimination when the full geographical range on a world scale is considered. However, the two do appear distinct in Australian populations and, despite the foregoing, are there generally recognised as separate species. When *O. aemulus* is so recognised as distinct, the plant on the Islands should be referred to as *O. hirtellus* subsp. *imbicillis* (R.Br.) U.Scholz.

35. PANICUM

Panicum L., *Sp. Pl.* 1: 55 (1753); *Gen. Pl.* 5th edn, 29 (1754); the ancient Latin name for millet (*Setaria italica*), itself derived from the Latin *panis* (bread).

Type: *P. miliaceum* L.

Annuals or perennials. Leaf blades usually flat. Inflorescence a panicle, usually open, much branched. Spikelets usually rounded, pedicellate, 2-flowered. Glumes unequal, truncate to

awn-pointed; lower glume shorter than spikelet; upper glume as long as spikelet. Lower floret male or sterile; upper floret bisexual. Lower lemma resembling upper glume; upper lemma ±equalling spikelet, becoming hard and smooth. Palea hyaline, or absent in lower floret; upper palea resembling the upper lemma.

A large pantropical and warm temperate genus of nearly 500 species, reaching into warm temperate areas in North America. As well as native species, a few have been introduced into Australasia. One native and 1 naturalised species on Norfolk Is.

Lower glume c. ½ length of spikelet, acute to acuminate; lower floret sterile; upper lemma smooth; tufted, non-rhizomatous perennials to 60 cm tall **1. P. effusum**

Lower glume less than ½ length of spikelet, blunt; lower floret male; upper lemma rugulose; vigorous, shortly rhizomatous perennials, often over 1 m tall **2. P. maximum**

1. Panicum effusum R.Br., *Prodr.* 191 (1810)

T: Queensland or Northern Territory, Australia, *R.Brown*; holo: BM. The epithet refers to the effuse or outspread panicle.

Illustrations: N.T.Burbidge, *Austral. Grasses* 2nd edn, 197 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1969, fig. 898B (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 215 (1990).

Tufted perennial, 20–60 cm tall, with long, stiff, spreading, basally tuberculate hairs on stems and leaves. Leaf blades 2–5.5 mm broad. Panicle open, 10–30 cm long, enclosed in uppermost leaf sheath at first, stiffly spreading, much branched, the whole eventually deciduous; pedicels 1–15 mm long. Spikelets often paired, 2–3 mm long, glabrous, 1–4 mm apart, at ends of branchlets. Lower glume ½ length of spikelet, acute, 3–5-veined; upper glume equalling spikelet, 5-veined. Lower floret sterile. Lower lemma subequal to upper glume, 7-veined, embracing palea; upper lemma 1.5–1.7 mm long, acute-acuminate, smooth, shining, embracing palea.

Norfolk Is. Native; also in all mainland Australian States.

N.Is.: pastures, *s. loc.*, *F.C.Allen 366* (CHR); *s. loc.*, without date, *P.H.Metcalf* (NSW).

A pasture grass which has a reputation for causing photo-sensitisation under certain circumstances.

2. *Panicum maximum Jacq., *Icon. Pl. Rar.* 1: 2, t. 13 (1781)

T: Guadeloupe, *N.J.Jacquin*; holo: ?W *n.v.*; iso: BM. Named in allusion to its size.

Illustrations: E.Breakwell, *Grasses & Fodder Pl. New South Wales* 54 (1923); P.P.Rotar, *Grasses Hawaii* 278 (1968); D.J.B.Wheeler *et al.*, *Grasses New South Wales* 220, fig. 35d (1982).

Tufted and shortly rhizomatous perennial, to 3 m tall, glabrous or hairy. Leaf blades 5–30 mm broad. Panicle oblong or pyramidal, 15–50 cm long; branches ascending to spreading; pedicels 1–5 mm long. Spikelets oblong, 2.5–4 mm long, glabrous. Lower glume less than ½ length of spikelet, blunt, 3-veined; upper glume equalling spikelet, acute, 5-veined. Lower floret male. Lower lemma ovate-oblong, equalling upper glume, 5-veined; upper lemma 2–2.5 mm long, transversely rugulose, embracing palea. *Guinea Grass.*

Norfolk Is. Introduced to the Island as a fodder plant, it is native in Africa.

N.Is.: Anson Bay Rd, *M.Lazarides 8047* (CANB, K); Rocky Point Reserve area, *W.R.Sykes NI 524* (CHR).

Under the name Guinea Grass it has been widely introduced throughout the tropics as an important source of fodder. Plants with the upper glume and lower lemma pubescent have been called var. *trichoglume* Robyns and var. *pubiglume*, but the varieties are not clear-cut as there is considerable variation in this character.

36. ECHINOCHLOA

Echinochloa P.Beauv., *Ess. Agrostogr.* 53 (1812); from the Greek *echinos* (a hedgehog) and *chloe* (grass), alluding to the 'spiny' spikelets in these grasses.

Type: *E. crusgalli* (L.) P.Beauv.

Annuals or perennials. Leaf blades flat. Inflorescence a panicle of lateral spikelike racemes along a main axis, each consisting of usually paired spikelets in 2 to usually 4 rows. Spikelets 2-flowered. Glumes unequal; lower glume ovate, less than ½ spikelet length; upper glume equalling spikelet. Lower floret male or sterile; upper bisexual. Lower lemma resembling upper glume, usually spiny-hispid, with a short, incurved, apical beak, often awned. Palea often absent in lower floret; upper palea equalling to slightly longer than lemma, acute.

A genus of c. 30 species from warm temperate and tropical parts of the world; 1 species naturalised on Norfolk Is.

*Echinochloa crusgalli (L.) P.Beauv., *Ess. Agrostogr.* 161 (1812)

Panicum crusgalli L., *Sp. Pl.* 1: 56 (1753). T: Europe; lecto: LINN 80.18, *fide* A.S.Hitchcock, *Contr. U.S. Natl. Herb.* 12: 117 (1908); IDC microfiche 177/2.46/20. The epithet comes from the Latin *crus* (a leg) and *gallus* (a cockerel), in allusion to a supposed similarity between the awn on the lemma and the spur of a cockerel.

Illustrations: N.T.Burbidge, *Austral. Grasses* 2nd edn, 119 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1967, fig. 897A (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 145 (1990).

Coarse, tufted annual, 35–100 cm tall. Sheaths often flattened. Panicle 6–20 cm long, of 6–12 spike-like racemes; racemes 2–10 cm long, with bristles 1–3 mm long on rachises. Spikelets in 2–4 untidy rows, ovoid to ellipsoidal, ventrally flattened, 2–4 mm long. Lower glumes c. ⅓ length of spikelet, 3–5-veined; upper glume covering rounded back of spikelet, 5-veined, with veins hispid. Lower lemma equalling upper glume, shortly cuspidate or with an awn to 5 cm long; upper lemma equalling spikelet, smooth, ivory-coloured. Lower palea shorter than lemma; upper palea equalling lemma.

Norfolk Is., Lord Howe Is. As elsewhere in the warm temperate and tropical regions of the world, this is a weed of cultivated land and open ground.

N.Is.: a creek, Stockyard Rd, *W.R.Sykes NI 69* (CHR); Ladies Garden, *W.Laing* (CHR); Bumbora, *E.Ralston 38 & 39* (CHR); *s. loc.*, a long awned variant, *W.Laing* (CHR); *s. loc.*, Nov. 1898, *I.Robinson* (NSW). **L.H.Is.:** Big Ck, *A.C.Beauglehole 5449* (CANB).

As treated here This species includes the variants that have sometimes been recognised as distinct and named *E. walteri* (Pursh) F.Heller and *E. telmatophila* P.W.Michael & Vickery.

37. PASPALUM

Paspalum L., *Syst. Nat.* 10th edn, 846, 855, 1359 (1759); from the old Greek name for millet, *paspalos*, which is really *Pennisetum glaucum*, but was intentionally applied to this genus by Linnaeus.

Type: *P. dimidiatum* L., *nom. illeg.* = *P. dissectum* (L.) L.

Annuals or perennials. Leaf blades flat, 1–10 mm broad. Inflorescence of 1-sided 'spikes', digitate or separate towards tops of culms; rachis flat or slightly winged. Spikelets paired or single, orbicular-oblong, plano-convex, 2-flowered. Glumes very unequal or lower glume absent; upper glume as long as spikelet. Lower floret sterile, without a palea. Lemmas c. equal to spikelet; upper lemma usually obtuse, coriaceous to crustaceous. Palea equal to upper lemma.

A tropical or subtropical genus of c. 330 species, mostly from the New World; 3 native and 1 naturalised species on Norfolk and Lord Howe Islands.

1 Tufted perennial; leaf blades 2–10 mm broad; panicle of (2–) 3–5 (–11) spike-like racemes

2 Upper glume fringed with a few to copious, long, fine hairs; spikelets paired, usually in 2 (apparently 4) rows **1. P. dilatatum**

2: Upper glume glabrous; spikelets usually single, in 2 rows **2. P. scrobiculatum**

1: Rhizomatous perennial; leaf blades 1–3 (–5) mm broad; panicle of 2, rarely 3–5, spike-like racemes

3 Upper glume finely appressed-pubescent; spikelets 2.5–3 mm long, broadly ellipsoidal to ovoid **3. P. distichum**

3: Upper glume glabrous; spikelets 3–4 mm long, narrowly ellipsoidal **4. P. vaginatum**

1. *Paspalum dilatatum Poir., *Encycl.* 5: 35 (1804)

T: Argentina, *P.Commerson*; holo: ?P *n.v.* The epithet means spread-out, from the Latin *dilato* (I make wider), in allusion to the broad 'spikes' in this grass.

Illustrations: J.C.Tothill & J.B.Hacker, *Grasses SE Queensland* 216 (1973); N.T.Burbidge, *Austral. Grasses* 2nd edn, 203 (1984); C.A.Lamp *et al.*, *Grasses Temp. Australia* 219 (1990).

Robust perennial, somewhat tufted, 40–150 cm tall. Leaf blades 5–10 mm broad. Inflorescence of (2–) 3–5 (–11) spike-like racemes, arranged along a central axis 10–25 cm long; racemes 4–12 cm long, with a tuft of hairs to 7 mm long at base. Spikelets paired, apparently 4, in 2 rows on rachis, broadly ovate, plano-convex, 2.8–3.5 mm long, 1 mm broad, yellowish green or tinged purplish; rachis flattened, c. 1 mm broad, entire. Lower glume absent; upper glume 5-veined, fringed with a few to usually copious long, fine hairs. Lower lemma almost equalling glume, 5-veined; upper lemma thin, shining, usually pale. *Paspalum*.

Norfolk Is., Lord Howe Is. Introduced as a pasture grass and now common, with a tendency to weediness. Native to Uruguay and Argentina, it is now widely grown for fodder.

N.Is.: Cresswell Bay, *P.S.Green 1479* (A); Anson Bay Rd, near Selwyn Bridge, *M.Lazarides 8052* (CANB); Ball Bay area, *W.R.Sykes NI 444* (CHR). **L.H.Is.:** beside path just W of Smoking Tree Ridge, *P.S.Green 2036* (K); in paddocks, *L.M.Bingley 5* (K); the Clear Place (N slope of Transit Hill), *R.D.Hoogland 8752* (CANB).

2. Paspalum scrobiculatum L., *Syst. Nat.* 12th edn, 2: 86 (1767); *Mant. Pl.* 1: 29 (1767)

T: cultivated at Uppsala; holo: LINN 79.4; IDC microfiche 177/2.45/14. The epithet comes from the diminutive of the Latin *scrobus* (a ditch), hence a minute depression, in allusion to the pitted surface of the upper lemma.

Paspalum orbiculare G.Forst., *Fl. Ins. Austr.* 7 (1786). T: Society Islands; *J.R. & G.Forster*; syn: K.

Illustrations: C.A.Gardner, *Fl. W. Australia* 1: 244, t. 72A (1952), as *P. commersonii*; P.R.Rotar, *Grasses Hawaii* 288 (1968), as *P. commersonii*; W.D.Clayton, *Fl. Trop. E. Africa*, Gramineae 611 (1982).

Tufted perennial with knotted rootstock, 30–100 cm tall. Leaf blade 2–7 mm broad. Inflorescence of 2–5 spike-like racemes 2–8 cm long, arranged along a central axis, glabrous or very shortly scabridulous at base. Spikelets borne singly in 2 rows on rachis, broadly elliptic, depressed plano-convex, 2–3 mm long, green or brownish; rachis flattened, 1.5–2.5 mm broad. Lower glume absent; upper glume 5-veined, glabrous. Lower lemma equalling spikelet, 5-veined; upper lemma thin, finely puncticulate. *Ditch Millet*.

Norfolk Is. This species appears not to have been recorded recently. It occurs throughout the Old World tropics and subtropics, especially in damp or wet soils.

N.Is.: Cascades and elsewhere, *W.Laing* (CHR); *s. loc.*, Nov. 1898, *I.Robinson* (NSW); *s. loc.*, Nov. 1902, *J.H.Maiden & J.L.Boorman* (NSW).

The Australian-Polynesian expression of this widespread species has often been treated as distinct, under the name *P. orbiculare* G.Forst., but as W.D.Clayton has shown (*Kew Bull.* 30: 101–108, 1975), it falls within the total, continuous variation, when the whole complex is considered.

3. **Paspalum distichum** L., *Syst. Nat.* 10th edn, 2: 855 (1759)

T: Jamaica, *P.Browne*; lecto: LINN 79.7, second specimen from the left; *fide* M.Guédès, *Taxon* 25: 513 (1976); IDC microfiche 177/2.45/19. The epithet is derived from the Greek *dis* (twice) and *stichos* (a row), in allusion to the two rows of spikelets on the racemes.

Digitaria paspalodes Michx., *Fl. Bor.-Amer.* 1: 46 (1830); *Paspalum paspalodes* (Michx.) Scribn., *Mem. Torrey Bot. Club* 5: 29 (1894). T: S. Carolina, N America, *A.Michaux*; holo: ?P *n.v.*

Illustrations: A.S.Hitchcock, *Man. Grasses U.S.* 2nd edn, 603, fig. 866 (1951); G.M.Cunningham *et al.*, *Pl. W New South Wales* 127 (1981), as Water Couch; J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1973, fig. 900B (1986).

Perennial; rhizome creeping. Culms to 45 cm tall. Leaf blades 1–3 (–5) mm broad. Inflorescence of 2, rarely 3, terminal, spike-like racemes, each 2–6 cm long, glabrous, or sometimes a few hairs at the base. Spikelets singly in 2 rows on rachis, broadly elliptic to ovate, plano-convex, 2.5–3 mm long, green; rachis flattened, 1.5–1.75 mm broad, minutely scabrid on margins. Lower glume minute or absent; upper glume 3–5-veined, finely appressed-pubescent. Lower lemma equalling spikelet, 5-veined, glabrous; upper lemma smooth, pallid.

Lord Howe Is. A widespread, subtropical and warm temperate species.

L.H.Is.: Lagoon Rd, on S side of airstrip, *J.Pickard 2716* (NSW).

Recently recorded from the Island as *P. paspalodes* (Rodd & Pickard, *Cunninghamia* 1: 270, 1983), this species and the following have, in the last few years, been the subject of nomenclatural confusion, depending upon one's interpretation of Linnaeus' *P. distichum*. This last name has now been settled in the above sense (see *Taxon* 32: 281, 1983).

4. **Paspalum vaginatum** Sw., *Prodr.* 21 (1788)

T: Jamaica, *O.Swartz*; holo: ?S *n.v.* The epithet comes from the Latin *vaginatus* (sheathed), in allusion to the sheathed nodes.

[*Paspalum distichum auct. non* L.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 142 (1898); J.H.Maiden, *Proc. Linn. Soc. New South Wales*: 39: 383 (1914); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 126 (1917); A.N.Rodd & J.Pickard, *Cunninghamia* 1: 270 (1983)]

Illustrations: J.Buchanan, *Man. Indig. Grasses New Zealand* 19, t. 10B (1880), as *P. distichum*; D.O.Cross, *Sci. Bull. Dept. Agric. New South Wales* 59: 11, fig. A–B (1938); A.S.Hitchcock, *Man. Grasses U.S.* 2nd edn, 603, fig. 865 (1952).

Perennial; rhizomes creeping. Culms to 50 cm tall. Leaf blades 3–6 mm broad. Inflorescence of 2 (–5) terminal, spike-like racemes, each 1.5–5 cm long, glabrous. Spikelets single in 2 rows on rachis, narrowly elliptic, plano-convex, 3–4 mm long, pale brownish green; rachis flattened, 0.75–1.25 mm broad, glabrous on margins. Lower glume minute or absent; upper glume equalling spikelet, 3–5-veined, glabrous. Lower lemma 5-veined (mid-vein sometimes suppressed), glabrous; upper lemma smooth, pallid.

Lord Howe Is. Although possibly native, this species has not, as far as is known, been recorded from the Island for about a century. It is native in coastal regions throughout the tropics, extending to the subtropics.

L.H.Is.: *s. loc.*, 1898, *J.H.Maiden* (K, NSW).

38. AXONOPUS

Axonopus P.Beauv., *Ess. Agrostogr.* 12 (1812); from the Greek *axon* (axis) and *pous* (foot or stalk), in allusion to the spike-like racemes radiating like spokes from a wheel's axis.

Type: *A. compressus* (Sw.) P.Beauv.

Tufted or creeping perennials, rarely annuals. Leaf blades flat, folded or convolute. Inflorescence of 2–many slender, spike-like racemes, digitate, or with a short common axis. Spikelets small, borne singly and alternately along 2 sides of a triquetrous rachis, 2-flowered. Lower glume absent; upper glume equal to spikelet, membranous, 4- or 5-veined. Lower

floret sterile; upper bisexual. Lower lemma resembling upper glume; upper lemma usually obtuse, crustaceous, with margins inrolled and clasping edges of palea.

A genus of c. 110 species, natives of tropical and subtropical America, except for one, possibly African, and another on Easter Is. One species is naturalised on each of the Islands.

Leaf blades 2–4 (–6) mm broad, with glabrous margins, those of stolons and culm c. equal in length; culm nodes glabrous; upper glume 1.8–2 mm long, obtuse or abruptly subacute, not longer than fertile floret (N.Is.) **1. A. fissifolius**

Leaf blades 4–10 mm broad, with ciliate margins, those of stolons shorter than those of culm; culm nodes hairy; upper glume 2–2.5 mm long, somewhat acuminate, longer than fertile floret (L.H.Is.) **2. A. compressus**

1. *Axonopus fissifolius (Raddi) Kuhlm., *Relat. Commiss. Linhas. Telegr. Estratég. Matto Grosso Amazonas* 11: 87 (1922)

Paspalum fissifolium Raddi, *Agrostogr. Bras.* 26 (1823). T: Brazil, *G.Raddi*; holo: ?QI *n.v.* So named from the supposedly split (*fissus*) apex to the leaf (*folia*).

Tufted and rhizomatous perennial, forming dense mats. Culms 20–40 cm tall, sometimes taller; nodes glabrous. Leaf blades 2–4 (–6) mm broad, with glabrous margins; sheaths flattened. Racemes 2 or 3, rarely 4, 3–10 cm long, borne (5–) 10–35 cm above the uppermost leaf; culm very slender; upper 2 racemes usually paired. Spikelets oblong-elliptic in outline, 1.8–2 mm long, obtuse or subacute. Upper glume 1.8–2 mm long, not longer than fertile florets, obtuse or abruptly subacute, 4-veined, glabrous or usually very sparingly silky pilose at base and apex. Lower lemma similar to upper glume, very slightly shorter. Palea blunt, shorter than lemma.

Norfolk Is. This species was introduced as a pasture and lawn grass, but as a pasture grass it is not very palatable and forms a dense mat that crowds out other species. It is native to the warmer parts of America.

N.Is.: near Selwyn Bridge, above Jacobs Rock, *M.Lazarides 8051* (CANB, K).

Until recently, this species was known under the name *A. affinis* Chase. The specimen upon which the record for Lord Howe Is. was based (A.N.Rodd & J.Pickard, *Cunninghamia* 1: 275, 1983, & J.Pickard, *J. Biogeogr.* 11: 204, 1984) is in fact *Digitaria violescens* Link.

2. *Axonopus compressus (Sw.) P.Beauv., *Ess. Agrostogr.* 154 (1812)

Milium compressum Sw., *Prodr.* 24 (1788). T: Jamaica, not traced. The epithet alludes to the flattened or compressed sheaths.

Illustrations: H.H.Allan, *Intr. Grasses New Zealand* 136, fig. 98 (1936); A.S.Hitchcock, *Man. Grasses U.S.* 2nd edn, 597, fig. 859 (1951); J.C.Tothill & J.D.Hacker, *Grasses SE Queensland* 80 (1973).

Tufted and rhizomatous perennial. Culms 15–40 cm tall; nodes often densely villous. Leaf blades usually 4–10 mm broad, with ciliate margins. Racemes 2 or 3, sometimes 5, 3–9 cm long, borne (0–) 2–7 cm above the uppermost leaf; culm slender; upper 2 racemes usually paired. Spikelets lanceolate, 2–2.5 mm long, somewhat acuminate. Upper glume 2–2.5 mm long, longer than fertile florets, somewhat acuminate, 4-veined, scarcely pilose. Lower lemma similar to upper glume but very slightly shorter. Palea blunt, shorter than lemma.

Lord Howe Is. Introduced to the Island as a pasture grass and first recorded by A.N.Rodd & J.Pickard (*Cunninghamia* 1: 275, 1983). It is native from southern U.S.A. to Brazil.

L.H.Is.: cleared area in Rocky Run Valley, *J.Pickard 2841* (NSW).

39. SETARIA

Setaria P.Beauv., *Ess. Agrostogr.* 51 (1812); from the Latin *seta* (a bristle), in allusion to the bristles on the peduncle of the spikelets in these grasses.

Type: *S. viridis* (L.) P.Beauv.

Annuals or perennials. Leaf blades flat or folded. Inflorescence a panicle, cylindrical and spike-like or open. Spikelets oblong-ovoid, ±plano-convex, awnless, subtended by 1 or more scabrid bristles which are persistent after spikelets fall, 2-flowered. Glumes unequal; lower glume to ½ as long as upper glume, 1–3-veined; upper glume ⅔ as long to equalling spikelet, 5–7-veined. Lower floret male or sterile. Lower lemma equalling spikelet, 5–7-veined; upper lemma convex, usually finely rugose. Palea of lower floret sometimes absent; upper palea equalling upper lemmas.

A large genus of c. 100 species, characteristic of the tropics and subtropics throughout the world; 3 species naturalised on Norfolk and Lord Howe Islands.

1 Tall, somewhat coarse perennial to 150 cm or more; leaf blades plicate, 3–6 cm broad; panicle open, to 30 cm wide **3. S. palmifolia**

1: Somewhat tufted annual to 100 cm tall; leaf blades flat, to 1.5 cm broad; panicle cylindrical, spike-like, to 2 cm diam.

2 Bristles on panicle finely antrorsely barbed, not sticking tightly to clothing *etc*, 5–8 below each spikelet **1. S. pumila**

2: Bristles on panicle retrorsely barbed, sticking tightly to clothing *etc*., usually only 1 below each spikelet **2. S. verticillata**

1.*Setaria pumila (Poir.) Roem. & Schult., *Syst. Veg.* 2: 891 (1817)

subsp. **pallidefusca** (Schumach.) B.K.Simon, *Austrobaileya* 2: 22 (1984)

Panicum pallidefuscum Schumach., *Beskr. Guin. Pl.* 58 (1827). T: 'Guinea', *P.Thonning 344*; holo: ?C *n.v.* The epithet comes from the Latin *pallidus* (pale) and *fuscus* (dark, swarthy), in allusion to the spikelet bristles on the original specimen being pale at the base and dark at the apex.

Illustrations: N.T.Burbidge, *Austral. Grasses* 2: 125 (1968), as *S. glauca*; J.C.Tothill & J.B.Hacker, *Grasses SE Queensland* 242 (1973), as *S. glauca*; G.M.Cunningham *et al.*, *Pl. W New South Wales* 138 (1981), as Pale Pigeon Grass.

Somewhat tufted annual to 60 cm tall. Leaf blades flat, to 1.5 cm broad. Panicle erect, dense, cylindrical and spike-like, 1–10 cm long or more, to 2 cm diam. Spikelets broadly ellipsoidal, 1.5–2.6 mm long, each subtended by 5–8 finely antrorsely barbed bristles. Glumes broadly ovate; lower glume ½ length of spikelet; upper glume ⅔ as long as spikelet. Lemmas equalling spikelet; lower lemma broadly ovate, 5-veined; upper lemma broadly boat-shaped, prominently transversely wrinkled. Lower palea slightly shorter than lemmas, 2-keeled; upper palea 2-keeled.

Norfolk Is. A locally common weed, this species is widespread in the Old World

N.Is.: Stockyard Rd, *W.R.Sykes NI 359* (CHR); garden weed, New Cascade Rd, *W.R.Sykes NI 999* (CHR).

There has been much confusion over the name of this species. It has generally been called *S. glauca* P.Beauv., but it has been shown (E.E.Terrell, *Taxon* 25: 297–304, 1976) that this should apply to another species. Two variants seem to have been introduced in the Australasian region, subsp. *pumila*, of Mediterranean origin, and subsp. *pallidefusca*, originating in tropical Africa. The latter is the plant on Norfolk Is.

2. *Setaria verticillata (L.) P.Beauv., *Ess. Agrostogr.* 178 (1812)

Panicum verticillatum L., *Sp. Pl.* 2nd edn, 82 (1762). T: not designated. The epithet derives from the Latin *verticillus* (a whorl), in allusion to the whorled arrangement of the branchlets on the axis of the panicle.

Illustrations: G.M.Cunningham *et al.*, *Pl. W New South Wales* 139 (1981), as Whorled Pigeon Grass; J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1978, fig. 903C (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 259 (1990).

Somewhat tufted annual, 10–100 cm tall. Leaf blades flat, to 1.5 cm broad. Panicle ±cylindrical, spike-like, often interrupted in lower part, 2–15 cm long, to 2 cm diam. Spikelets densely clustered, ellipsoidal, 1.5–2.5 mm long, each subtended by a retrorsely barbed bristle, 4–8 mm long. Lower glume broadly ovate, 6–8 mm long, obtuse, 3-veined; upper glume equalling spikelet, 5-veined. Lower lemma resembling upper glume; upper

lemma finely rugulose or almost smooth. Palea of lower floret minute or absent; upper palea 2-keeled.

Norfolk Is., Lord Howe Is. An introduced weed, especially of cultivated and open land, as it is in most tropical and warm temperate regions of the world, although most probably originally a native of southern Europe. The Suckling collection from Norfolk Is. cited below was made during the 1939–1945 war and was probably introduced with military equipment; no other specimen has been seen from that Island.

N.Is.: *s. loc.*, *F.E.T.Suckling* (CHR). **L.H.Is.:** W of Stevens Point, *A.C.Beauglehole 5455* (CANB, MEL); in a vegetable garden, *L.M.Bingley 9* (K).

From Lord Howe Is., the Bingley collection, cited above, had previously been determined as *S. adhaerans* (Forssk.) Chiov., but following W.D.Clayton in *Fl. Trop. E. Africa*, Gramineae 524 (1982), that entity, with glabrous sheath, margins and spikelets 1.5– 2 mm long, is here treated as part of the variable *S. verticillata*.

3. *Setaria palmifolia (J.König) Stapf, *J. Linn. Soc., Bot.* 42: 186 (1914)

Panicum palmifolium J.König, *Naturforscher* (*Halle*) 23: 208 (1788). T: India, *J.P.Röttler*; ?holo: K. Named in allusion to its palm-like leaves.

Illustrations: A.S.Hitchcock, *Man. Grasses U.S.* 2nd edn, 726, fig. 1108 (1951); H.B.Gilliland, *Revis. Fl. Malaya* 3: 158 (1971).

Tall somewhat coarse perennial to 150 cm or more tall. Leaf blades plicate, 3–6 cm broad. Panicle loose, open, to 50 cm long, 30 cm broad; branches slender, to 20 cm long, bearing short branchlets along their length. Spikelets sometimes infertile, subsessile, ellipsoidal, 2–3 mm long, glabrous, sometimes subtended by a scabrid bristle, 4–7 mm long. Lower glume broadly ovate, 1 mm long, 5-veined; upper glume ovate, 2–3 mm long, acuminate, 5–7-veined. Lower lemma lanceolate, 2.5–3 mm long, acute, shortly mucronate, 5-veined; upper lemma faintly rugulose. Palea of lower floret absent. Upper palea hyaline, c. 2 mm long. *Pampas* (L.H.Is.).

Norfolk Is., Lord Howe Is. Native in India and SE Asia, it was presumably first introduced to the Islands as an ornamental. Only one specimen has been seen from Norfolk Is., collected in 1943, but on Lord Howe Is. it may well be established and spreading.

N.Is.: *s. loc.*, *F.C.Allen 170* (CHR). **L.H.Is.:** by the side of Back Rd, *L.M.Bingley 33* (K); Anderson Rd, *A.C.Beauglehole 5462 & 5758* (CANB, MEL); road between portions 80 and 86, *J.Pickard 2681* (NSW); Far Flats, *I.R.Telford 10382* (CBG, K).

40. STENOTAPHRUM

Stenotaphrum Trin., *Fund. Agrost.* 175 (1820); from the Greek *stenos* (narrow) and *taphros* (a trench), alluding to the pockets in the axis of the panicle in these grasses into which the spikelets are sunk.

Type: *S. glabrum* Trin., *nom. illeg.* = *S. dimidiatum* (L.) Brongn.

Creeping annuals or perennials. Leaf blades flat or folded. Inflorescence a spike-like panicle, with very short racemes sunk into pockets on both sides of the often corky axis. Spikelets 2-flowered. Glumes equal or unequal; lower glume short; upper glume sometimes equalling spikelet. Lower floret male or sterile; upper floret bisexual. Lemmas unequal; lower lemma similar to upper glume; upper lemma slightly smaller, clasping margins of palea. Paleas dissimilar; lower palea hyaline; upper palea stiff with its tip free of the clasping lemma.

A genus of 7 species, characteristic of coastal habitats in the tropics and subtropics. The following species, naturalised on Norfolk and Lord Howe Islands, is also used extensively as a lawn grass in frost-free areas.

J.D.Sauer, Revision of *Stenotaphrum* (Gramineae: Paniceae) with attention to its historical geography, *Brittonia* 24: 202–222 (1972).

***Stenotaphrum secundatum** (Walter) Kuntze, *Revis. Gen. Pl.* 2: 794 (1891)

Ischaemum secundatum Walter, *Fl. Carol.* 249 (1788). T: Carolina, U.S.A., *T.Walter*; holo: ?BM *n.v.* The botanical Latin *secundus* means 'arranged to one side', although the classical meaning was 'following' or 'second'.

Stenotaphrum americanum Schrank, *Pl. Rar. Hort. Monac.* t. 98 (1822). T: cultivated, Germany, not traced.

Illustrations: J.C.Tothill & J.B.Hacker, *Grasses SE Queensland* 256 (1973); N.T.Burbidge, *Austral. Grasses* 2nd edn, 249 (1984); C.A.Lamp *et al.*, *Grasses Temp. Australia* 270–271 (1990).

Coarse perennial, rooting at nodes, forming dense mats. Culms 10–30 cm tall. Lower leaf sheaths flattened; blades commonly to 10 cm long. Inflorescence stiff, 3–8 cm long, 2–5 mm broad, ±dorsally flattened, with short racemes bearing 1–3 crowded spikelets, all on 1 side. Spikelets flattened-ellipsoidal, 3–4 mm long, acute. Lower glume broadly ovate, 0.5 mm long, rounded; upper glume lanceolate, 2.5–3 mm long, subacuminate. Lower lemma 7–9-veined; upper lemma slightly shorter than lower lemma, membranous. Paleas membranous. *Buffalo Grass*.

Norfolk Is., Lord Howe Is. Introduced as a pasture and lawn grass, and now common, especially on coastal cliffs and swards. It is a native of coastal south-eastern North and Central America, and because of its invasive and blanketing habit is a threat to native species.

N.Is.: *s. loc.*, 1902, *I.Robinson* (NSW). **L.H.Is.:** foreshore and lower levels, *L.M.Bingley 4* (K, NSW); Middle Beach, *R.D.Hoogland 8649* (CANB, NSW); Stevens Point, *A.C.Beauglehole 5458* (CANB, MEL).

J.D.Sauer (*op. cit.* 218) identifies a triploid clone, which he calls the Cape deme, on the two Islands, and on Norfolk Is., the normal deme.

41. RHYNCHELYTRUM

Rhynchelytrum Nees in J.Lindley, *Intr. Nat. Syst. Bot.* 2nd edn, 378, 446 (1836); from the Greek *rhynchos* (a beak) and *elytron* (a cover or husk), in allusion to the beaked glumes and lemmas in the type and other species.

Type: *R. dregeanum* Nees

Annuals or perennials. Inflorescence an open or contracted panicle; branches slender. Spikelets 2-flowered. Glumes unequal; lower small, often distant from upper glume; upper glume as long as spikelet, 5-veined, silky hairy below middle, tapering to a beak, emarginate or 2-lobed, often awned from sinus. Lower floret male or sterile, often silky hairy. Lemmas unequal; lower lemma resembling upper glume; upper lemma smaller, thin. Lower palea with 2, usually ciliate, keels; upper palea equalling upper lemma, 2-veined.

A genus of c. 15 species, natives of Africa, but with the following species introduced and now widespread throughout the tropics as a weed.

G.Zizka (*Biblioth. Bot.* 138: 55, 1988) has sunk this genus under *Melinis*. The name used here is well-known and it seems preferable at present to maintain the two as separate.

***Rhynchelytrum repens** (Willd.) C.E.Hubbard, *Bull. Misc. Inform.* 1934: 110 (1934)

Saccharum repens Willd., *Sp. Pl.* 4th edn, 1: 322 (1797). T: Ghana, *P.T.Isert*; holo: B *n.v.*; IDC microfiche 7440/1.87/25. The epithet comes from the Latin *repo* (I creep).

Illustrations: N.T.Burbidge, *Austral. Grasses* 2nd edn, 231 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1976, fig. 902 (1986); C.A.Lamp *et al.*, *Grasses Temp. Australia* 253 (1990).

Tufted annual or short lived perennial, lower nodes often rooting. Culms 30–100 cm tall. Inflorescence open, ovate-oblong, 5–20 cm long, fluffy, silvery pink or purple. Spikelets 2.5–5 mm long, villous, with hairs to 5 mm long. Glumes unequal; lower glume 0.3–1.5 mm long, separated from upper by 0.1–0.5 mm; upper glume ±equalling spikelets, gibbous, tapering to a glabrous, emarginate beak, awned, densely villous with longest hairs to 6 mm long, just above middle; awn to 4 mm long, inconspicuous amidst purplish hairs. Upper

lemma thin, 2–2.5 mm long, glabrous. Palea narrow, a little shorter than lemma, membranous. *Natal Grass*.

Norfolk Is. An occasional weed which is native throughout Africa.

N.Is.: Burnt Pine, *P.Ralston 50* (CHR); New Cascade Rd, *W.R.Sykes NI 605* (CHR).

The plant on the Island appears to be subsp. *repens*.

42. MELINIS

Melinis P.Beauv., *Ess. Agrostogr.* 54 (1812); from the Greek *meline* (millet).

Type: *M. minutiflora* P.Beauv.

Annuals or perennials. Leaf blades flat. Inflorescence an open panicle; branches capillary. Spikelets small, 2-flowered. Glumes very unequal; lower glume minute; upper glume uniformly membranous, not gibbous, 7-veined, awned or awnless. Lower floret sterile. Lower lemma resembling upper glume; upper lemma somewhat laterally compressed, hyaline. Palea absent in sterile floret.

A genus of 11 species native to tropical and southern Africa. The following species has, however, been introduced as a fodder grass throughout the tropics and warm temperate regions.

*Melinis minutiflora P.Beauv., *Ess. Agrostogr.* 54 (1812)

T: Rio de Janeiro, Brazil, *J. de Jussieu*; holo: ?G *n.v.* Named after its minute flowers.

Illustrations: J.C.Tothill & J.B.Hacker, *Grasses SE Queensland* 198 (1973); N.T.Burbidge, *Austral. Grasses* 2nd edn, 181 (1984); C.A.Lamp *et al.*, *Grasses Temp. Australia* 200–201 (1990).

Trailing perennial, rooting at nodes, often becoming matted. Culms to 100 cm tall. Leaf sheaths and blades viscid-pubescent, smelling of molasses. Panicles narrow at first, opening to narrowly ovate, 10–20 cm long, often purplish. Spikelets narrow, 1.5–2 mm long. Upper glume equalling spikelets, slightly bilobed, with or without a central, minute mucro. Lower lemma equalling spikelets, 5-veined, shortly bilobed, with a terminal awn 3–10 mm long; upper lemma slightly shorter, thin, 3-veined, slightly notched at apex. Palea resembling upper lemma, 2-veined.

Norfolk Is., Lord Howe Is. Introduced, probably relatively recently, as a fodder grass.

N.Is.: Hurlstone Point, *W.R.Sykes NI 547* (CHR). **L.H.Is.:** Boat Harbour Clearing, *J.Pickard 3531* (NSW).

43. DIGITARIA

Digitaria Haller, *Hist. Stirp. Helv.* 2: 244 (1768); from the Latin *digitus* (a finger), in allusion to the radiating, or digitate, spike-like racemes.

Type: *D. sanguinalis* (L.) Scop.

Annuals or perennials. Leaf blades flat, rolled in bud. Inflorescence of 1-sided, spike-like racemes, digitate or on a short central axis. Spikelets paired or in groups of 3 along axis, lanceolate to elliptic, plano-convex, 2-flowered. Glumes very unequal; lower glume absent or to 1/4 length of spikelet; upper glume as long as or shorter than spikelet. Lower floret sterile. Lemma margins clasping palea; lower lemma usually equalling spikelet, usually prominently veined; upper lemma thin, glabrous. Paleas hardening when ripe.

A genus of c. 230 species distributed in warm temperate and tropical regions of the world, especially in Africa, with 1 native and 3 naturalised species on Norfolk and Lord Howe Islands. Some are minor fodder or grain crops, others are weedy.

J.T.Henrard, *Monograph of the genus Digitaria* (1950); R.D.Webster, A revision of the genus *Digitaria* Haller (Paniceae, Poaceae) in Australia, *Brunonia* 6: 131–216 (1984).

1 Lower glume absent or obscure (less than 0.2 mm long)

2 Spikelets narrowly lanceolate-elliptic, 2.5–3.5 mm long, slightly acuminate; fertile floret yellowish to olive brown **1. D. setigera**

2: Spikelets narrowly ovoid-ellipsoidal, 1.3–2 mm long, acute; fertile floret chestnut coloured **2. D. violescens**

1: Lower glume present and ±obvious (at least 0.2 mm long)

3 Veins of lower lemma smooth; upper glumes (1/2–) 2/3–3/4 length of spikelet **3. D. ciliaris**

3: Veins of lower lemma with a few to numerous, small, scabrid spines; upper glumes 1/3–1/2 length of spikelet **4. D. sanguinalis**

1. Digitaria setigera Roth ex Roem. & Schult., *Syst. Veg.* 2: 474 (1817)

T: India, *B.Heyne*; holo: B *n.v.*, presumably destroyed. From the Latin *seta* (bristle) and *gero* (I bear), alluding to the fine bristles on the rachis of the panicle racemes.

Panicum norfolkianum Nees ex Endl., *Prodr. Fl. Norfolk.* 18 (1833); *Digitaria timorensis* var. *norfolkiana* (Nees ex Endl.) Henrard, *Monogr. Digitaria* 748 (1950). T: Norfolk Island, *F.L.Bauer*; holo: W.

Illustrations: J.T.Henrard, *loc. cit.*, as *Panicum norfolkianum*; F.Veldkamp, *Blumea* 21: 36, fig. 5C (1973); C.-C.Hsu, *Taiwan Grasses* 518 (1975).

Annual. Culms to c. 100 cm tall. Inflorescence of 5–15 spike-like racemes, each 4–15 cm long, digitate or spaced along a common axis 1–10 cm long. Spikelets elliptic-lanceolate, 2.5–3.5 mm long, slightly acuminate; pedicel apex truncate. Lower glume absent or a minute scale; upper glume 1/10–1/3 as long as spikelet, veinless or faintly 3-veined, glabrous or silky pubescent. Fertile floret yellowish to olive-brown. Lower lemma equalling spikelet, with 7 equally spaced veins or wider spaces next to midrib, smooth, appressed silky pubescent, sometimes ciliate; upper lemma equalling spikelet, very acute, with 2 faint lateral veins, smooth, pale.

Norfolk Is. Uncommon, found on slopes above the sea. This is a very variable species with a wide range from southern India through SE Asia to the Pacific.

N.Is.: *s. loc.*, *R.M.Laing* (CHR); *s. loc.*, Nov. 1898, *I.Robinson* (NSW).

This species has been recorded from the Kermadec Is. as *D. pruriens* Büse.

2. *Digitaria violescens Link, *Hort. Berol.* 1: 229 (1827)

T: cultivated in Berlin, seed from Brazil, Herb. Link 93; holo: B *n.v.*, presumably destroyed. The epithet alludes to the colour of the fertile floret.

Illustrations: J.C.Tothill & J.B.Hacker, *Grasses SE Queensland* 130, fig. l7 (1973); D.J.B.Wheeler *et al.*, *Grasses New South Wales* 170, fig. 20f (1982); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1963, fig. 896I (1986).

Annual. Culms 10–50 cm tall. Inflorescence of 2–6 (–10) slender spike-like racemes, each 3–10 cm long, digitate or with a short common axis up to 2 cm long. Spikelets in groups of 3, narrowly ovoid-ellipsoidal, 1.3–2 mm long, acute; pedicel apex discoid. Lower glume absent; upper glume almost as long as spikelet, 3–5-veined, usually somewhat shortly and finely pubescent between veins, or glabrous. Fertile floret chestnut coloured. Lower lemma equalling spikelet, with 7 unequally spaced veins, finely pubescent between veins or glabrous; upper lemma equalling spikelet, acute, dark coloured. Fertile floret chestnut coloured to almost black in fruit.

Lord Howe Is. Occasionally growing in sown grassland; possibly native in tropical Asia, but now widely naturalised as a weed species throughout the tropics, including Australia and the Pacific islands.

L.H.Is.: S end of golf course, portion 119, *J.Pickard 3466* (NSW).

Due to a misidentification this species was recorded from Lord Howe Is. as *Axonopus affinis* Chase (see A.N.Rodd & J.Pickard, *Cunninghamia* 1: 275, 1983).

3. *Digitaria ciliaris (Retz.) Koeler, *Descr. Gram.* 27 (1802)

Panicum ciliare Retz., *Obs. Bot.* 4: 16 (1786); *Digitaria sanguinalis* var. *ciliaris* (Retz.) Parl., *Fl. Ital.* 1: 126 (1848). T: China, *H.P.Wennerberg*; lecto: LD *n.v., fide* S.T.Blake, *Proc. Roy. Soc. Queensland* 81: 11 (1969).

Illustrations: J.C.Tothill & J.B.Hacker, *Grasses SE Queensland* 128 (1973); C.-C.Hsu, *Taiwan Grasses* 499 (1975); D.J.B.Wheeler *et al.*, *Grasses New South Wales* 165, fig. 17e (1982).

Annual. Culms to 100 cm tall. Inflorescence of 3–10 spike-like racemes, each 3–20 cm long, subdigitate or along a common axis 1–4 cm long. Spikelets elliptic-lanceolate, 2.5–3.5 mm long, sharply acute. Lower glume distinct, 0.25–0.5 mm long; upper glume 1.5–2.5 mm long, 3-veined, silky hairy. Fertile floret pale green to pale purplish. Lower lemma equalling spikelet, with 7 equally spaced veins or slightly wider spaces next to midrib, smooth, silky hairy on lateral veins, often densely ciliate; upper lemma almost equalling spikelet, slightly acuminate, pale, smooth. *Summer Grass*.

Norfolk Is., Lord Howe Is. Probably introduced for fodder but common as a weed throughout the tropics.

N.Is.: Duncombe Bay, *W.R.Sykes NI 637* (CHR); Philip Is., sea cliffs, *R.M.Laing* (CHR); Anson Bay Rd, *M.Lazarides* 8048 (CANB, K); *s. loc.*, Jan. 1900, *Dr Axford* (NSW). **L.H.Is.:** *s. loc.*, *L.M.Bingley 2* (K).

4. *Digitaria sanguinalis (L.) Scop., *Fl. Carniol.* 2nd edn, 1: 52 (1771)

Panicum sanguinale L., *Sp. Pl.* 1: 57 (1753). T: cultivated at Leiden, *A. van Royen*; lecto: L (sheet 912,356-240), *n.v., fide* W.D.Clayton & S.A.Renvoize, *Fl. Trop. E. Africa*, Gramineae 3: 650 (1982). The epithet comes from the Latin *sanguis* (blood) and *-alis* (pertaining to), in allusion to a supposed ability of this grass to staunch bleeding.

Illustrations: D.J.B.Wheeler *et al.*, *Grasses New South Wales* 170, fig. 20c (1982); N.T.Burbidge, *Austral. Grasses* 2nd edn, 113 (1984); C.A.Lamp *et al.*, *Grasses Temp. Australia* 139 (1990).

Annual. Culms to 60 cm tall. Inflorescence of 4–10 spike-like racemes, each 3–18 cm long, digitate or along a common axis 1–5 cm long. Spikelets lanceolate-elliptic, 2.5–3.5 mm long, acute. Lower glume distinct, 0.2–0.5 mm long; upper glume 1–1.75 mm long, 3-veined, usually minutely hairy. Fertile floret pale green to purplish. Lower lemma equalling spikelets, with 7 equally spaced veins or with slightly wider spaces next to midrib, scabridulous, sometimes obscurely pubescent, rarely ciliate; upper lemma equalling spikelet, smooth.

Lord Howe Is. A weed of cultivated and wasteland, as it is throughout the warm temperate regions of the world.

L.H.Is.: cultivated paddocks, *L.M.Bingley 34* (K).

44. PENNISETUM

Pennisetum Rich. in C.H.Persoon, *Syn. Pl.* 1: 72 (1805); from the Latin *penna* (a feather) and *seta* (a bristle), in allusion to the plumose bristles surrounding the spikelets of some species of this genus.

Type: *P. typhoideum* Rich., *nom. illeg. =P. glaucum* (L.) R.Br.

Annuals or perennials. Leaf blades flat or convolute. Inflorescence usually dense and spike-like, cylindrical or subglobose, rarely of 2–4 spikelets hidden by upper leaf sheaths. Spikelets singly or in clusters of 2–4 along axis, subtended by an involucre of usually many, free slender bristles, 2-flowered. Glumes unequal, awnless, variable; lower glume absent or to $^{2}/_{3}$ length of spikelet; upper glume small or subequal to spikelet. Lower floret male or sterile. Lemmas usually dissimilar, awnless; lower lemma membranous, small or equalling spikelet; upper lemma membranous to coriaceous, subequal to spikelets. Paleas similar to and ±equal to lemmas, or lower palea absent.

A pantropical genus of c. 80 species. *Pennisetum glaucum* is a tropical grain crop, Pearl Millet, while the 2 species naturalised on Norfolk and Lord Howe Islands are widely grown for fodder.

Habit stoloniferous and rhizomatous, low growing; inflorescence obscure, hidden in uppermost leaf sheath; filaments and stigmas long-protruding **1. P. clandestinum**

Habit robust, erect, 2 m or more tall; inflorescence cylindrical, 7–25 cm long; filaments and stigmas not long-protruding **2. P. purpureum**

1. *Pennisetum clandestinum Hochst. ex Chiov., *Annuario Reale Ist. Bot. Roma* 8: 41, fig. S/2 (1903)

T: Ethiopia, *G.H.W.Schimper 2084*: holo: not located. So named because of its hidden or clandestine inflorescence.

Illustrations: P.P.Rotar, *Grasses Hawaii* 296 (1968); J.C.Tothill & J.B.Hacker, *Grasses Queensland* 220 (1973); C.A.Lamp *et al.*, *Grasses Temp. Australia* 223, 225 (1990).

Perennial, forming a sward, with slender rhizomes, and stout stolons with subinflated leaf sheaths and short internodes. Leaf blades 1–5 mm broad. Inflorescence reduced to groups of usually 2–4 subsessile spikelets completely hidden in uppermost leaf sheaths. Spikelets narrowly lanceolate, 10–20 mm long; involucre with up to 15 delicate bristles; bristles shorter than spikelets. Lower glume absent; upper glume narrowly deltoid, 1–3 mm long, acute. Upper and lower lemmas similar, equalling spikelets, acute. Filaments long-exserted, slender, to 5 cm long, silvery. Anther tips glabrous. Stigmas exserted, to 3 cm long. *Kikuyu Grass.*

Norfolk Is., Lord Howe Is. A native of central Africa, it has been introduced and is commonly used as a pasture grass, and also in lawns.

N.Is.: Burnt Pine, *W.R.Sykes NI 55* (CHR); Cascade, *P.Ralston 5* (CHR). **L.H.Is.:** in the school ground, *L.M.Bingley 30* (K, NSW); W of Stevens Point, *A.C.Beauglehole 5457* (CANB, MEL); Neds Beach Rd, *A.C.Beauglehole 5979* (CANB).

2. *Pennisetum purpureum Schumach., *Beskr. Guin. Pl.* 44 (1827)

T: Ghana, *P.Thonning*; holo: ?C *n.v.* Named after the commonly purplish panicles.

Illustrations: C.A.Gardner, *Fl. W. Australia* 1: 282, t. 81 (1952); P.P.Rotar, *Grasses Hawaii* 298 (1968); C.-C.Hsu, *Taiwan Grasses* 602 (1975).

Robust tufted perennial to 2 m or more tall. Leaf blades to 4 cm broad; margins becoming razor sharp. Inflorescence dense, spike-like, cylindrical, 7–25 cm long, pubescent on axis. Spikelets 4.5–7 mm long, 1–5 together; involucre of numerous unequal bristles, one bristle much longer than others, to 15 mm long; lowest spikelet bisexual, others male. Lower glume minute or absent; upper glume narrowly lanceolate, 2–3 mm long, very acute. Lower lemma 3–4.5 mm long, acuminate; upper lemma slightly longer, 5-veined. Filaments and stigmas just exserted. Anther tips with a tiny tuft of short hairs. *Elephant Grass.*

Norfolk Is. A native of tropical Africa, it has presumably been introduced to the Island as a pasture grass, but to be palatable for stock it needs to be cut before the leaves mature fully and develop their very sharp cutting edges.

N.Is.: Broken Bridge Ck, *P.Ralston 11* (A, K); *s. loc.*, *F.C.Allen CHR 224496* (CHR).

45. CENCHRUS

Cenchrus L., *Sp. Pl.* 2: 1049 (1753); *Gen. Pl.* 5th edn, 470 (1754); the ancient Greek name for a small-grained millet.

Type: *C. echinatus* L.

Annuals or perennials. Leaf blades flat or convolute. Inflorescence spike-like, cylindrical, bearing burr-like, deciduous clusters of spikelets within an involucre of 1 or more whorls of basally fused, ±flattened, often spiny bristles. Spikelets 2-flowered. Glumes unequal; lower glume absent or to ½ as long as spikelets; upper glume subequal to spikelet. Lower floret male or sterile. Lemmas as long as spikelet; lower lemma membranous; upper lemma

somewhat coriaceous.

A genus of c. 20 species distributed throughout the tropics, with 1 species native to Norfolk Is. It is close to *Pennisetum* but is most easily distinguished by its prickly burrs.

A.S.Weston, The Genus *Cenchrus* (Poaceae) in Australia, *Nuytsia* 1: 375–380 (1974).

Cenchrus caliculatus Cav., *Icones* 5: 39, t. 463 (1799)

T: Society Islands, *L.Née*; holo: ?MA *n.v.* The epithet is derived from the Greek/Latin *calyx* (a cup or chalice), *-ulus* (a suffix indicating a diminutive) and *-atus* (indicating likeness), in allusion to the resemblance of the involucre to a small cup.

Illustrations: D.D.DeLisle, *Iowa State Coll. J. Sci.* 37: 318, fig. l6A–E (1963); N.T.Burbidge, *Austral. Grasses* 2: 127 (1968); N.T.Burbidge, *Austral. Grasses* 2nd edn, 2: 87 insert (1984).

Coarse perennial to 1 m or more tall. Inflorescence spike-like, 8–20 cm long; burrs shortly pedicellate, 7–10 mm long including bristles; bristles terete, retrorsely barbed throughout, intergrading but mainly of two types, a fine, outer whorl 1.5–3 mm long and a stouter inner whorl 4–7 mm long, with one often longer than others. Spikelets 1 or rarely 2 per burr, 5–6 mm long. Lower glume 1.5–3 mm long; upper glume 2.5–4 mm long, acute. Lemmas lanceolate, equalling spikelets, acuminate; upper part of upper lemma dorsally very finely scabridulous.

Norfolk Is. It may now be rare on the Island, not having been recorded recently. This species is native in New Caledonia, on the Kermadec Is. and throughout much of Polynesia. The burrs are easily carried on feathers, clothing *etc*. and the species may have been introduced by seabirds. However, its overall distribution would not conflict with a native status on Norfolk Is.

N.Is.: on the edge of the cliff, Anson Bay, *R.M.Laing* (CHR).

It has also been considered as indigenous in eastern N.S.W. and Qld but the Australian plant, with slightly but consistently smaller parts to the flowers and burrs, has recently been treated as a separate species, *C. australis* R.Br., by R.D.Webster (*The Australian Paniceae* (*Poaceae*), 1987).

46. SPINIFEX

Spinifex L., *Mant. Pl.* 163, 300 (1771); from the Latin *spina* (a thorn) and *facere* (to make), in allusion to the spiny leaves of the first species described.

Type: *S. squarrosus* L.

Perennials, usually rhizomatous, male or gynomonoecious. Leaf blades flat or convolute. Male inflorescence a terminal cluster of stalked racemes, usually with 1–several supplementary racemes borne lower on culm subtended by silky-hairy bracts; raceme axis prolonged into a short stout bristle. Female or bisexual inflorescence a large, globose head of racemes, falling as a unit when mature; spikelets solitary at base of racemes and hidden among subtending bracts; raceme axis prolonged into a long, stout bristle. Spikelets 2-flowered; in male spikelets both florets fertile; in female or bisexual spikelets lower floret barren, with upper floret female or bisexual. Glumes similar and subequal, shorter in male florets. Lemmas similar; lower lemma 7-veined; upper lemma slightly shorter, 3-veined. Paleas 2-veined, equal to lemmas.

A genus of 4 species distributed from India and China to Australia, New Caledonia and New Zealand, with 1 species native on Norfolk Is. and introduced to Lord Howe Is.; characteristic of coastal sand dunes.

Spinifex sericeus R.Br., *Prodr.* 198 (1810)

T: Broad Sound, Queensland, *R.Brown*; lecto: BM *n.v.*, *fide* G.F.Craig, *Nuytsia* 5: 70 (1984). The epithet comes from the Latin *sericus* (silky), in allusion to the silky hairs characteristic of this species.

[*Spinifex hirsutus auct. non* Labill.: F.J.H. von Mueller, *Fragm.* 9: 78 (1875); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 126 (1917); J.S.Turner *et al.*, *Conservation Norfolk Is.* 37 (1968); A.N.Rodd & J.Pickard, *Cunninghamia* 1: 270 (1983)]

Illustrations: H.H.Allan, *Intr. Grasses New Zealand* 139, fig. 101 (1936); J.C.Tothill & J.B.Hacker, *Grasses SE Queensland* 250 (1973); N.T.Burbidge, *Austral. Grasses* 2nd edn, 245 (1084); all as *S. hirsutus*.

Robust, rhizomatous, stoloniferous perennial. Culms to 40 cm tall. Leaves silky-hairy. Male inflorescence: racemes 2–4 cm long, with 7–20 spikelets in each raceme, subtended by broadly based, leaf-like bracts; axis extended beyond spikelet into a stout bristle to 20 mm long. Bisexual inflorescence a globose head, 15–25 cm diam., subtended and enclosed in a large, silky-hairy bract, of sessile racemes reduced to 1 spikelet; axis extended beyond spikelet into a long bristle to 10 cm long or more. Glumes subequal, 12–18 mm long in bisexual flowers, 5–7 mm in male flowers, silky-hairy, especially on upper margins. Lower lemma 10–15 mm long. *Beach Grass*. Fig. 95B–C.

Norfolk Is., Lord Howe Is. On Lord Howe Is. this species is native, but on Norfolk Is. it was introduced with the object of binding the sand at Emily Bay, where it is now dominant. Also native in eastern Australia, New Zealand and New Caledonia.

N.Is.: Emily Bay. *R.D.Hoogland 6613* (CANB); *loc. id.*, *W.R.Sykes NI 576* (CHR); *loc. id.*, *F.C.Allen 402* (CHR). **L.H.Is.:** beach near the War Memorial, *P.S.Green 1917* (K); Middle Beach, *R.D.Hoogland 8634* (MEL, NSW); Lagoon Beach, *R.D.Hoogland 8662* (CANB, NSW).

Spinifex sericeus has recently been restored as a species distinct from the south-western Australian species, *S. hirsutus*, (see G.F.Craig, *op. cit.* 67–74).

47. IMPERATA

Imperata Cirillo, *Pl. Rar. Neapol.* 2: 26 (1792); named after Ferrante Imperato (1550–1625), an apothecary of Naples.

Type: *I. arundinacea* Cirillo, *nom. illeg.* = *I. cylindrica* (L.) Raeusch.

Rhizomatous perennials. Culms erect, few-noded. Leaves mostly basal; lamina narrow. Inflorescence a narrow, often spike-like panicle, with numerous branches bearing short secondary racemes with paired, similar spikelets. Spikelets terete, enveloped in long silky hairs from their base and glumes, awnless, 2-flowered. Glumes subequal, membranous, long silky-hairy from base. Lower floret reduced to a lemma. Lemma lanceolate, shorter than spikelet. Palea membranous, without nerves.

A genus of 8 species from the tropics and warm temperate regions, characteristic of disturbed open habitats; 1 species naturalised on Lord Howe Is.

***Imperata cylindrica** (L.) Raeusch. *Nomenci. Bot.* 3rd edn, 3: 10 (1797)

var. **major** (Nees) C.E.Hubb. & R.E.Vaughan, *Grasses Mauritius & Rodriguez* 96 (1940)

Imperata koenigii var. *major* Nees, *Fl. Afr. Austral. Ill.* 90 (1841). T: S. Africa, *J.F.Drège*; holo: B *n.v.*, presumably destroyed. So named from its larger size.

[*Imperata arundinacea auct. non* Cirillo: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 143 (1898); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 156 (1917)]

Illustrations: C.A.Gardner, *Fl. W. Australia* 1: 313, t. 92B (1952), as *I. cylindrica* var. *koenigii*; J.C.Tothill & J.B.Hacker, *Grasses SE Queensland* 180 (1973); N.T.Burbidge, *Austral. Grasses* 2nd edn, 161 (1984).

Rhizomatous perennial. Culms to 1 m tall. Leaves mostly basal, tufted. Panicles erect, cylindrical, 5–22 cm long, silky-white. Spikelets in unequally stalked pairs, 3–4 mm long, enveloped in hairs 10–15 mm long. Glumes equalling spikelets, long silky-hairy from bases and backs; lower glume 5-veined; upper glume 3-veined. Lemma 2–2.5 mm long, thin,

veinless; upper lemma slightly shorter, rounded. Palea of fertile floret thin, truncate, veinless.

Lord Howe Is. Although J.H.Maiden (*op. cit.* 156) listed this grass as indigenous on the Island, W.R.B.Oliver (*loc. cit.*) considered it to have been introduced.It is native in East Africa, SE Asia, New Caledonia and in all Australian States.

L.H.Is.: North Head, *A.C.Beauglehole 5757* (CANB, MEL); *s. loc.*, 1898, *J.H.Maiden* (K, NSW).

In Australia this grass has been consistently treated as var. *major* (as above), but W.D.Clayton & S.A.Renvoize (*Fl. Trop. E. Africa*, Gramineae 3: 702, 1982) point out that the varieties intergrade, with 'a number of imperfectly separable geographical variants'.

48. SORGHUM

Sorghum Moench, *Methodus* 207 (1794); based on the Italian *sorgere* (to rise, emerge or stand up), but the connection is not clear.

Type: *S. bicolor* (L.) Moench

Annuals or perennials, generally robust, sometimes rhizomatous. Leaf blades flat, often broad. Inflorescence a large panicle; ultimate branches with hairy internodes, bearing dissimilar spikelet pairs (3 on terminal branchlets). Lower spikelet of pair sessile, 2-flowered; lower floret bisexual; upper floret male or sterile, pedicellate. Upper spikelet stalked, male or sterile. Glumes of lower spikelet ±equal, convex, somewhat coriaceous, 2-keeled; glume of upper spikelet narrower. Lemma of lower floret reduced; upper lemma of fertile spikelet bidentate, geniculately awned; lemma of upper spikelet smaller, awnless. Palea absent.

A genus of c. 20 species from the tropics and subtropics of the Old World, with 1 species endemic in Mexico; 1 species naturalised on Norfolk Is. *Sorghum bicolor*, Grain Sorghum or Broom Millet, derived under ancient domestication from *S. arundinaceum*, is an important tropical grain crop.

***Sorghum arundinaceum** (Desv.) Stapf in D.Oliver, *Fl. Trop. Afr.* 9: 114 (1917)

Raphis arundinacea Desv., *Opusc. Sci. Phys. Nat.* 69 (1831). T: Ghana, *P.T.Isert*; holo: B *n.v.*, presumably destroyed. The epithet is derived from the Latin *arundo* (a reed) with the suffix *-aceus* (indicating resemblance), in allusion to the habit.

[*Trachypogon avenaceus auct. non* (Kunth) Nees: S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 19 (1833)]

[*Sorghum halepense auct. non* (L.) Pers.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 752 (1904)]

Illustrations: N.L.Bor, *Grasses Burma, Ceylon, India & Pakistan* 225 (1960), as *S. verticilliflorum*; W.D.Clayton & S.A.Renvoize, *Fl. Trop. E. Africa*, Gramineae 3: 728, fig. 168 (1982).

Annual or short-lived perennial, robust. Culms to 2 m tall or more. Panicles narrowly ovoid to broadly spreading, 20–40 cm long; ultimate branchlets bearing 3–7 spikelet pairs; pedicels hairy. Lower spikelet of pair lanceolate to ovate, 5–7 mm long, deciduous at maturity together with pedicel and upper spikelet; upper spikelet smaller, narrowly lanceolate, stalked. Glumes equalling spikelets, dorsally ±pubescent. Lemma of fertile floret c. 6 mm long, ciliate; lemma of upper floret c. 4 mm long, shortly 2-lobed with a fine, terminal awn 5–20 mm long; lemma of upper floret smaller, awnless.

Norfolk Is. An early introduction, probably originally from West Africa.

N.Is.: Steels Point area, *M.Lazarides 8031* (CANB, K); *loc. id.*, *P.S.Green 2416* (K); N side of Mt Bates, *M.Lazarides 11318* (NSW); *s. loc.*, Nov. 1902, *J.H.Maiden & J.L.Boorman* (NSW).

The classification and recognition of species and other entities in this group within *Sorghum* are extremely complex, and are reflected by corresponding difficulties in their nomenclature. Many of those grown for grain are of ancient origin, and have been back-crossed and hybridised with the 'wild-type' represented by *S. arundinaceum*. For a recent treatment of this group see J.M.J. de Wet, Systematics and evolution of *Sorghum* Sect. *Sorghum* (Gramineae),

Amer. J. Bot. 65: 477–484 (1978), where the species above is treated as *S. bicolor* subsp. *arundinaceum* (Desv.) de Wet & Harlan.

49. BOTHRIOCHLOA

Bothriochloa Kuntze, *Revis. Gen.* 2: 762 (1891); from the Greek *bothrion* (a small pit) and *chloë* (grass), in allusion to the prominent pits on the glumes of the type, and other species.

Type: *B. anamitica* Kuntze

Perennials. Leaves often aromatic; blades usually flat. Inflorescence of spike-like racemes, arranged digitately, subdigitately or along a longer central axis; racemes with more than 8 spikelets; internodes and pedicels with a hyaline median line. Spikelets paired; lower spikelet sessile, awned, with a lower sterile and an upper fertile floret; upper spikelet pedicellate, sterile, awnless, reduced to 1 or 2 glumes, sometimes with a reduced lemma. Glumes of lower spikelet subequal; lower glume obtuse, with 2 marginal ciliate keels and often a prominent dorsal pit; upper glume slightly shorter, acute. Lemmas hyaline; lemma of upper spikelet reduced to a stipe passing into a slender awn. Palea usually absent.

A genus of c. 35 species found throughout the tropics and warm temperate regions, with 1 species naturalised on Norfolk Is.

***Bothriochloa macra** (Steud.) S.T.Blake, *Proc. Roy. Soc. Queensland* 80: 64 (1969)

Andropogon macer Steud., *Syn. Pl. Glumac.* 1: 371 (1854). T: New South Wales, *J.S.C.Dumont d'Urville*; holo: ?S *n.v.* The epithet comes from the Latin *macer* (meagre, poor), referring to the depauperate type specimen.

[*Andropogon affinis auct. non* R.Br.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 725 (1904)]

Illustrations: D.J.B.Wheeler *et al.*, *Grasses New South Wales* 127, fig. 5b (1982); N.T.Burbidge, *Austral. Grasses* 2nd edn, 75 (1984); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1985, fig. 908B (1986).

Tufted perennial. Culms to c. 80 cm tall. Inflorescence of 1–4, rarely more, shortly stalked, subdigitate, spike-like racemes, each 2–8 cm long, often borne erect and closely together; rachises and pedicels with white-silky hairs, longest on upper half of pedicel, 1–3 mm long. Sessile spikelets 5–7 mm long; pedicellate spikelets very narrowly elliptic, 3–6 mm long, usually reduced to 1 empty glume. Glumes of lower spikelet lanceolate, acute, dorsally hairy towards base, sometimes with a shallow dorsal pit. Lemmas of lower spikelet 3–4 mm long, hyaline, veinless, ciliate; lemmas of upper spikelet with a brown, apical, geniculate awn, 1.5–2 cm long.

Norfolk Is. Introduced to the Island as a pasture grass, it is native in eastern Australia, from south-eastern Qld to Vic. and S.A.This species was erroneously recorded in a unpublished typescript list of Norfolk Is. plants as *Dichanthium annulatum* (Forssk.) Stapf.

N.Is.: Ball Bay, *W.R.Sykes NI 418* (CHR); Kingston, *W.R.Sykes NI 650* (CHR); common in dry pastures, 1943, *F.C.Allen 52* (CHR); *s. loc.*, *P.H.Metcalfe* (K, NSW).

50. CYMBOPOGON

Cymbopogon Spreng., *Pl. Min. Cogn. Pug.* 2: 14 (1815); from the Greek *kymbe* (a boat) and *pogon* (a beard), in allusion to the bearded, boat-shaped bracts which subtend the groups of racemes in these grasses.

Type: *C. schoenanthus* (L.) Spreng.

Perennials, rarely annuals, usually tall and robust. Leaves often aromatic. Inflorescence of paired racemes on a common axis, ±enclosed in spathe-like bracts and crowded into a compound inflorescence; racemes often reflexed. Spikelets paired. Lower spikelet sessile, 2-flowered; lower floret sterile, reduced to an empty lemma; upper floret bisexual. Upper spikelet pedicellate, sterile, reduced to glumes. Glumes of fertile floret equal or subequal,

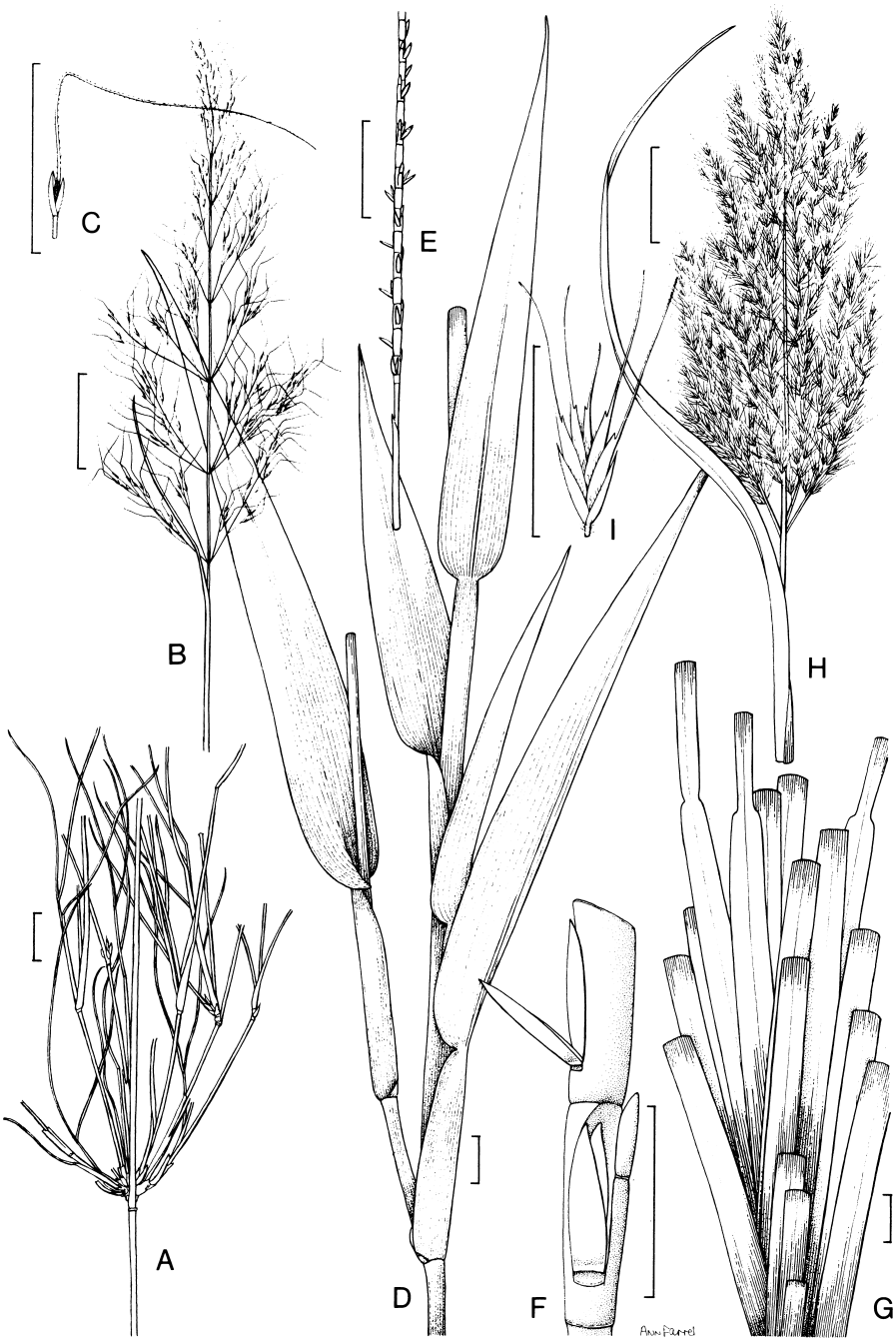

Figure 96. POACEAE. **A–C**, *Stipa ramosissima*. **A**. portion of culm; **B**, panicle; **C**, spikelet (**A–C**, F.Sieber Agrost. 82). **D–F**, *Rottboellia coelorachis*. **D**, portion of culm; **E**, inflorescence; **F**, two spikelets (**D–F**, A.Rodd 1720, K). **G–I**, *Chionochloa howensis*. **G**, base of tuft with leaf sheaths; **H**, panicle; **I**, spikelet (**G–I**, J.Pickard 2634, K). Scale bars: = 1 cm. Drawn by A.Farrer.

chartaceous, often streaked with oil-glands; upper glume of spikelet much smaller than lower glume. Lemmas hyaline; upper lemma of lower spikelet usually 2-lobed, with or without an awn arising from sinus. Palea absent.

A genus of c. 20 species from the tropics and subtropics of the Old World, including 1 species native to Norfolk Is.

S.Soenarko, The Genus *Cymbopogon* Sprengel (Gramineae), *Reinwardtia* 9: 225–375 (1977).

Cymbopogon refractus (R.Br.) A.Camus, *Rev. Int. Bot. Appl. Agric. Trop.* 1: 290 (1921)

Andropogon refractus R.Br., *Prodr.* 202 (1810). T: Port Jackson, Australia, *R.Brown*; holo: BM; iso: K. The epithet is derived from the Latin *refractus* (broken), in allusion to the racemes which are sharply bent downwards.

Illustrations: J.C.Tothill & J.B.Hacker, *Grasses SE Queensland* 114 (1973); G.M.Cunningham *et al.*, *Pl. W New South Wales* 78 (1981), as Barbed-wire Grass; N.T.Burbidge, *Austral. Grasses* 2nd edn, 95 (1984).

Tufted, erect perennial. Culms to 1 m tall or more. Leaves aromatic when crushed, becoming curled at maturity. Inflorescence narrow, with 1 to several, short, erect branches terminating in paired spike-like racemes 15–25 mm long; racemes ±reflexed at maturity and often covered with a scurfy wax. Glumes of lower spikelet subequal, equalling spikelet, 5–5.5 mm long; lower glume 7–9-veined, 2-keeled; upper 3-veined, l-keeled in upper part. Glumes of upper spikelet very unequal. Lemma of lower sterile floret narrowly acute; lemma of fertile floret almost linear; lemma of upper spikelet absent.

Norfolk Is. One of the few indigenous grasses on the Island, and still common in a few grassy cliff-top areas. It is also native in eastern Australia, just reaching Vic. and some parts of N.T., but also stretching across the Pacific from Vanuatu to the Tuamotus and Hawai'i.

N.Is.: Duncombe Bay, *M.Lazarides 8065* (CANB, K); *s. loc.*, *R.M.Laing* (CHR).

51. ROTTBOELLIA

Rottboellia L.f., *Nov. Gram. Gen.* 23 (1779); named after C.F.Rottbøll (1727–1797), a Danish botanist, Professor at Copenhagen and student of Linnaeus (1756–1757).

Type: *R. exaltata* (L.) L.f.

Annuals. Inflorescence axillary, of cylindrical spike-like racemes, dwindling to sterile spikelets towards apex; racemes subtended by spathe-like leaf sheaths; raceme internodes cylindrical, hollowed around sunken spikelets, articulate between spikelet bases. Spikelets paired,each 1-flowered; lower spikelet sessile, fertile; upper spikelet stalked, sterile, with stalk fused to raceme rachis. Glumes of lower spikelet coriaceous, 2-keeled; glumes of upper spikelet subequal, smaller. Lemmas hyaline, awnless. Palea of fertile floret well-developed.

A genus of 4 species from the Old World tropics, 3 of them of limited distribution, but the type species, *R. cochinchinensis*, now becoming a troublesome tropical weed in the New World and elsewhere.

***Rottboellia coelorachis** G.Forst., *Fl. Ins. Austr.* 9 (1786)

T: Tanna, Vanuatu, *J.R. & G.Forster*; *n.v.* The epithet comes from the Greek *koilos* (hollow) and *rachis* (a backbone), in allusion to the hollow pockets in the rachis of the racemes into which the spikelets are tucked.

[*Rottboellia exaltata auct. non* (L.) L.f.: A.N.Rodd in H.F.Recher & S.S.Clark, *Environm. Survey Lord Howe Is.* 21 (1974); A.N.Rodd & J.Pickard, *Cunninghamia* 1: 275 (1983)]

Illustration: J.J.H. de Labillardière, *Sert. Austro-Caledon.* t. 20 (1824).

Coarse annual to 2 m tall, glabrous. Leaf blades 1.5–4 cm broad, auriculate, undulate towards base. Racemes 3 or 4, cylindrical, stiff, 8–15 cm long, 3–5 mm diam., arising from very slightly inflated leaf sheaths. Spikelets sunk in pockets on rachis except at anthesis. Glumes of lower spikelet equal, 6.5–7.5 mm long, rounded-obtuse to acute; keel margin minutely

serrulate. Glumes of upper spikelet both similar, 4.5–5.5 mm long. Lemma of lower spikelet subequal to glumes, acute, marginally hyaline. Fig. 96D–F.

Lord Howe Is. Probably introduced, native to Vanuatu and New Caledonia. It was collected on the Island by A.N.Rodd in 1971 and 1980 (see the citations below), and recorded by him (*loc. cit.*) and by Rodd & Pickard (*loc. cit.*) under the name of *R. exaltata*, but re-examination of Rodd's collection shows that it is actually *R. coelorachis* G.Forst. Being native to Vanuatu and New Caledonia, it is quite conceivably indigenous to Lord Howe Is., but as it is growing in only one patch near the jetty, where ships from New Caledonia unload, it is more likely to have been a recent introduction. (See P.S.Green, *Kew Bull.* 45: 240, 1990).

L.H.Is.: c. 100 m N of the Public Jetty, *A.N.Rodd 1720* (K, NSW); Lagoon shore, c. halfway between the jetty and the E end of Old Settlement Beach, *A.N.Rodd 3581* (NSW).

105. TYPHACEAE

Perennial herbs, usually robust, rhizomatous, monoecious. Leaves distichous, sheathing at base; lamina linear, ±flattened. Inflorescence a dense, terminal, cylindrical spike of many much-reduced flowers mixed with hair-like bracts; lower part female, ±stout, cylindrical or ovoid, persistent until fruit shed; upper part male, often ±contiguous with female, slender, short-lived. Male flower with 2–4 (–7) stamens; filaments connate below; anthers basifixed; connective produced. Female flower a fusiform ovary on a slender gynophore-bearing hair-like bracts ±expanded terminally; style slender; stigma linear or narrowly spathulate; abortive female flowers often reduced and clavate. Fruit a 1-seeded follicle, dry, wind-dispersed.

A family of 1 cosmopolitan genus, of wet habitats in temperate and tropical regions of the world, with c. 10 species. One native species occurs on each of the Islands.

G.Bentham, Typhaceae, *Fl. Austral.* 7: 158–161 (1878); B.G.Briggs & L.A.S.Johnson, The status and relationships of the Australian species of *Typha*, *Contr. New South Wales Natl. Herb.* 4: 57–69 (1968); M.Finlayson *et al.*, Identification of native *Typha* species in Australia, *Austral. J. Bot.* 33: 101–107 (1985); B.G.Briggs, Typhaceae, *Fl. Australia* 45: 8–10 (1987).

TYPHA

Typha L., *Sp. Pl.* 2: 971 (1753); *Gen. Pl.* 5th edn, 418 (1754); the classical Greek name for these plants.

Type: *T. latifolia* L.

Sheaths of 4 uppermost leaves distinctly auriculate; male and female spikes contiguous or separated by up to 2 cm (rarely more); stigma narrowly obovate **1. T. orientalis**

Sheaths of 4 uppermost leaves not auriculate; male and female spikes separated by (0.5–) 2–5 cm; stigma linear **2. T. domingensis**

1. Typha orientalis C.Presl, *Abh. Königl. Böhm. Ges. Wiss.* ser. 5, 6 (*Epimel. Bot.* 239): 599 (1851)

T: Philippines, *H.Cuming 1767*; ?iso: K. The epithet is Latin for oriental or eastern, referring to the known distribution of the species when first described.

[*Typha angustifolia auct. non* L.: R.Heward, *London J. Bot.* 1: 123 (1842); J.D.Hooker, *Handb. N. Zeal. Fl.* 276 (1864); B.C.Seemann, *Fl. Vit.* 281 (1868)]

[*Typha angustifolia* var. *brownii auct. non* (Kunth) Kronfeldt: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 723 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 16 (1915)]

Illustrations: H.I.Aston, *Aquat. Pl. Australia* 299, 300, fig. 119a–b (1973); L.B.Moore & I.B.Irwin, *Oxford*

Book New Zealand Pl. 192, fig. 2 (1978); B.G.Briggs, *Fl. Australia* 45: 11, fig. 22N–O (1987).

Stout colonial herb, 1–3 m tall. Leaves linear, 30 cm or more long, 0.5–3 cm broad, flattened, ±spongy; sheaths of uppermost 4 leaves auriculate. Inflorescence shorter than leaves; spadix 3–5 mm diam. Female spike 10–30 cm long, 1–3.5 cm diam., depending on maturity; bracts narrowly spathulate; stigma narrowly obovate. Male spike slightly shorter and narrower, contiguous with female or separated by up to 2 cm of naked spadix. *Flags*.

Norfolk Is. Forming colonies in shallow water or swampy ground; possibly an early introduction. Native in eastern Asia, parts of Malesia, Australia and New Zealand (where, however, it was possibly introduced).

N.Is.: Cascade Valley, *P.S.Green 2421* (K); *s. loc.*, *J.Backhouse 712* (K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K).

2. **Typha domingensis** Pers., *Syn. Pl.* 2: 532 (1807)

T: Dominican Republic, *coll. unknown*; holo: ?L *n.v.* Named after Santa Domingo, whence it was first described.

Illustrations: H.I.Aston, *Aquat. Pl. Australia* 300, fig. 119d–e (1973); G.R.Sainty & S.W.L.Jacobs, *Waterpl. New South Wales* 416 (1981); B.G.Briggs, *Fl. Australia* 45: 11, fig. 22J–M (1987).

Stout colonial herb, 1–3 m tall. Leaves linear, 30 cm or more long, 0.5–1.5 cm broad, flattened, ±spongy; upper sheaths not (or rarely one) auriculate. Inflorescence slightly shorter than leaves; spadix 3–5 mm diam. Female spike 10–30 cm long, 0.5–2 cm broad, depending on maturity; bracts spathulate; stigma linear. Male spike slightly shorter and narrower, separated from female by (0.5–) 2–5 cm of naked spadix.

Lord Howe Is. First recorded in 1974 and spreading slightly since, but threatened by cattle (J.Pickard, *Biol. Conservation* 27: 132, 1983). Only found in the margin of fresh water near the mouth of Soldiers Creek. A pantropical species also found in Australia.

L.H.Is.: creek behind dunes at Johnsons Beach, *I.Hutton 687* (K).

MUSACEAE

Musa paradisiaca L. was recorded from Norfolk Is. by Endlicher (*Prodr. Fl. Norfolk.* 35, 1833) on the basis of the report by King and others that bananas were found on the Island by the first settlers. No doubt they had been earlier introduced by visiting Polynesians, but there seems no grounds for accepting them as naturalised, certainly not during the past two centuries.

106. CANNACEAE

Perennial herbs, usually rhizomatous. Leaves cauline, broad, pinnately veined, petiolate. Inflorescence terminal, spicate, of 1–3-flowered, bracteate cymules. Flowers asymmetrical, bisexual, showy. Sepals 3, free, usually green. Petals 3, sepaloid or ±petaloid, connate at base and adnate to androecium. Staminodes 3–5, petaloid, connate at base. Stamen 1, petaloid; anther 1-locular. Ovary inferior, 3-locular; ovules numerous, axile; style petaloid. Fruit a capsule.

A monogeneric family with c. 50 species, native in tropical and subtropical America, now widely cultivated and naturalised; 2 species introduced to the Islands.

T.D.Stanley, Cannaceae, *Fl. Australia* 45: 38–39 (1987).

CANNA

Canna L., *Sp. Pl.* 1: 1 (1753); *Gen. Pl.* 5th edn, 1 (1754); from the Greek *kanna*, a reed.

Type: *C. indica* L.

Flowers to c. 6 cm long; staminodes to 5 cm long, c. 1–1.5 cm broad **1. C. indica**

Flowers larger and showier; staminodes to c. 10 cm long, 5.5 cm broad **2. C. × generalis**

1. *Canna indica L., *Sp. Pl.* 1: 1 (1753)

T: not designated; lecto: Herb van Royen, Leiden No. 912.356-390; L, *fide* P.J.M.Maas in C.E.Jarvis *et al.*, *Regnum Veg.* 127: 29 (1993). So named from an early belief that the species came from India.

Illustrations: G.Nicholson, *Ill. Dict. Gard.* 361, fig. 359 (1884); A.B.Graf, *Tropica* 3rd edn, 288 (1986); B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 554, fig. 212 (1983).

Erect rhizomatous herb to 1 m or more high. Leaves sheathing, ovate, 20–40 cm long, 8–18 cm broad, long-acute. Inflorescence lax, spicate, c. 6–11-flowered, flowers paired, c. 3 cm across. Sepals ovate, 6–10 mm long, rounded. Petals narrow, 26–30 mm long, acute, yellow or red. Staminodes 3, erect, spathulate, 35–60 mm long, 5–10 mm broad, red, tips orange with red spots. Capsule verrucose. Seeds spheroidal, 4–5 mm diam., hard, black.

Norfolk Is. Naturalised beside tracks *etc*. A native of tropical America now naturalised throughout the tropics. *R.O.Gardner 6000*, cited below, has yellow flowers and few seeds, and may be of hybrid origin.

N.Is.: Hundred Acre Reserve, *W.R.Sykes NI 54* (CHR); S of Mt Pitt, *G.Uhe 1194* (K); Cascade Bay, *R.O.Gardner 6000* (AK); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW).

2. *Canna × generalis L.H.Bailey, *Gentes Herb.* 1: 120 (1923)

T: cultivated; holo: ?BH *n.v.* So named as being in general cultivation.

Illustrations: F.Perry, *Fl. World* 65 (1972); T.D.Stanley & E.M.Ross, *Fl. SE Queensland* 3: 357, figs 53B (1987); A.J.Healy & E.Edgar, *Fl. New Zealand* 3: 43, fig. 8 (1980), as *C. indica*.

Similar to *C. indica* but up to 2 m tall and the flowers larger, 7–10 cm across, showier, with 4 broad staminodes to 10 cm long, 5.5 cm broad, various shades of yellow, orange or red.

Lord Howe Is. Planted c. 1974 and now naturalised and spreading (*fide* J.Pickard, specimen cited below). A variable cultigen cultivated throughout the tropics.

L.H.Is.: S end of Far Flats, *J.Pickard 3381* (NSW).

107. PONTEDERIACEAE

Aquatic herbs, rooted or free floating. Leaves aerial or emersed, parallel veined, sheathing at base. Inflorescence terminal, a spike-like panicle, 1–several-flowered. Flowers actinomorphic or zygomorphic, bisexual. Perianth 6-lobed, petaloid, basally connate. Stamens 6 (rarely 3 or 1), inserted on perianth; anthers 2-locular. Ovary superior, (1 or) 3-locular; ovules usually numerous, axile; style slender; stigma entire or shortly lobed. Fruit usually a capsule. Seeds longitudinally ribbed.

A family of c. 9 genera and 36 species, inhabiting fresh water mostly in the tropics and subtropics; 1 genus introduced on Norfolk Is.

G.Bentham, Pontederaceae, *Fl. Austral.* 7: 72–73 (1878); H.I.Aston, *Aquat. Pl. Australia* 263–270 (1973); H.I.Aston, Pontederiaceae, *Fl. Australia* 45: 46–55 (1987).

EICHHORNIA

Eichhornia Kunth, *Eichhornia* (1842); *Enum. Pl.* 4: 129 (1843); named after J.A.F.Eichhorn (1779–1856), at one time Prussian Minister for Religious Affairs and Education.

Type: *E. azurea* (Sw.) Kunth

Floating or creeping, aquatic, stoloniferous perennials. Leaves clustered; petiole bases sheathing. Inflorescence spicate, 2–many-flowered. Perianth zygomorphic with a short tube. Stamens 6, anterior 3 included, posterior 3 exserted. Ovary 3-locular; ovules numerous. Fruit a capsule.

A tropical genus containing c. 7 species, mostly American but with 1 species from Africa which can be a serious aquatic weed, and is naturalised on Norfolk Is.

***Eichhornia crassipes** (Mart.) Solms in A.L.P.P. de Candolle & A.C.P. de Candolle, *Monogr. Phan.* 4: 527 (1883)

Pontederia crassipes Mart., *Nov. Gen. Sp. Pl.* 1: 9, t. 4 (1823). T: Brazil, *C.F.P. von Martius*; holo: ?M *n.v.* The epithet comes from the Latin *crassus* (thick, fat) and *pes* (a foot), in allusion to the swollen petioles.

Illustrations: H.I.Aston, *Aquat. Pl. Australia* 265, fig. 105 (1973; B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 344, fig. 286b–e (1983); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1781, fig. 808 (1986).

Free-floating aquatic herb with feathery pendulous roots, forming leafy tufts at nodes. Leaves usually with an inflated bladder-like petiole; lamina ovate-orbicular, (3–) 8–10 cm broad, upper leaves absent or much smaller. Flowers c. 7 cm diam., blue-purple; posterior perianth lobe with a yellow spot in a deeper coloured patch. Capsule on recurved stem, enclosed in withered perianth, becoming submerged. Seeds small, ribbed. *Water Hyacinth*.

Norfolk Is. Introduced c. 90 years ago (J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 763, 1904) and now common in open fresh-water habitats. A native of Brazil and one of the most troublesome aquatic weeds throughout the tropics.

N.Is.: sight record, 1983, *P.S.Green*.

108. LILIACEAE

Perennial terrestrial herbs or rarely shrubby, erect or climbing, aerial shoots annual or evergreen with rhizomes, corms or bulbs, sometimes with tuberous roots. Leaves alternate (elsewhere sometimes opposite), basal or cauline, simple, usually sheathing at base. Inflorescence terminal or axillary, racemose, cymose, paniculate, umbellate or flowers solitary. Flowers usually actinomorphic, bisexual, rarely unisexual. Perianth segments 6 in 2 whorls, very similar, usually petaloid, with or without a tube, often showy. Stamens 6 (rarely 3–12), frequently adnate to perianth; anthers bilocular. Ovary superior or inferior, (1–) 3-locular; ovules usually numerous, axile; style entire or 3-lobed; stigma capitate or 2- or 3 (–7)-lobed. Fruit a capsule or berry.

A worldwide family of c. 280 genera and perhaps 4000 species; 3 native and 9 introduced genera on the Islands.

There has been, and continues to be, much discussion on the delimitation of this family and the classification of its constituent genera. Varying emphasis has been placed, for example, on whether the ovary is inferior or superior, the number of stamens and the structure of the inflorescence. The broad view taken by A.Cronquist, *An Integrated System of Classification of Flowering Plants* (1981) has been followed here (as in other volumes of the *Flora of Australia*), but every genus except *Lilium* in the following account has, by some, been treated in other families, even other orders *e.g.* R.M.T.Dahlgren *et al.*, *The families of Monocotyledons* (1985). The families in which the following genera would be classified

under in this other system will be found noted under each genus.

The family, as treated here, contains some members familiar and important in horticulture. In addition to those mentioned below, there is *Allium* (onions, garlic and leeks), *Amaryllis*, *Convallaria* (Lily-of-the-Valley), *Hosta* (plantain lilies), *Hyacinthus*, *Nerine* and *Tulipa* (tulips).

G.Bentham, Liliaceae, *Fl. Austral.* 7: 2–71 (1878); A.C.Smith, Liliaceae, *Fl. Vit. Nova* 1: 141–148 (1979); Fifteen authors, Liliaceae, *Fl. Australia* 45: 148–419 (1987); R.M.T.Dahlgren, H.T.Clifford & P.F.Yeo, *The families of the Monocotyledons*, Springer-Verlag (1985).

KEY TO GENERA

1 Scrambling or climbing perennials; leaves either up to 3 cm long, or longer but with an apical curled tendril

2 Leaves 3 cm long or less — **1. ASPARAGUS**

2: Leaves 6–15 cm long with apical curled tendril — **10. GLORIOSA**

1: Erect perennials; leaves longer than 3 cm, without apical tendrils

3 Leaves cauline, or basal as well

4 Ovary superior; flowers white or blue; leaves linear

5 Inflorescence 1–3-flowered; flowers large, trumpet-shaped, c. 15 cm long — **11. LILIUM**

5: Inflorescence a many-flowered panicle; flowers open, less than 1 cm long — **2. DIANELLA**

4: Ovary inferior, flowers dull red, green tipped; leaves elliptic-lanceolate to linear-oblanceolate — **9. ALSTROEMERIA**

3: Leaves basal only

6 Leaves distinctly petiolate; flowers dull, purplish red, borne level with soil surface — **† ASPIDISTRA**

6: Leaves without distinct petiole; inflorescence borne above ground surface

7 Inflorescence paniculate; often bearing viviparous plantlets; flowers white or greenish white, c. 1.5 cm diam. — **3. CHLOROPHYTUM**

7: Inflorescence umbellate

8 Ovary superior

9 Slender herbs; leaves 0.3–1 cm broad; flowers 0.8–1 cm long — **4. NOTHOSCORDUM**

9: Stout herbs; leaves 3–5 cm broad; flowers 4–4.5 cm long — **5. AGAPANTHUS**

8: Ovary inferior

10 Flowers without distinct corona, white or variously red; leaves 3–15 cm broad

11 Perianth with a narrow basal, cylindrical tube 4.5–8 cm long, free portion 0.5–0.8 cm broad; total height up to 2 m — **6. CRINUM**

11: Perianth connate for 3–4 cm at base, not narrowly cylindrical, free portion 2–4 cm broad; total height to c. 50 cm — **7. HIPPEASTRUM**

10: Flowers with conspicuous, yellow or orange corona; leaves 0.6–1.5 cm broad — **8. NARCISSUS**

† *Aspidistra elatior* Blume is growing on Lord Howe Is. along Lagoon Rd as isolated clumps outside cultivation (*J.G.Conran 636*, K, NSW). It does not appear to be reproducing itself

and so is not given full treatment here, but because it could cause confusion if mistaken for a 'wild' plant it is included in the key above.

1. ASPARAGUS

Asparagus L., *Sp. Pl.* 1: 313 (1753); *Gen. Pl.* 5th edn, 147 (1754); the classic Greek name for this delectable vegetable.

Type: *A. officinalis* L.

Evergreen perennials with fleshy roots. Stems erect or scrambling, branched, often slightly woody. Leaves reduced to scales, often with a basal spine; cladodes solitary or fasciculate, needle- or leaf-like. Inflorescence axillary or terminal, clustered, racemose or flowers solitary. Flowers actinomorphic, bisexual or unisexual; pedicels articulated. Perianth lobes petaloid, smallish, free. Stamens 6. Ovary superior, 3-locular; style 1; stigma capitate or minutely 3-fid. Fruit a berry with 1–several seeds.

An Old World genus, especially characteristic of dry areas, consisting of c. 300 species; 3 species naturalised on the Islands. Segregate genera have recently been recognised by A.A.Obermeyer, *S. African J. Bot.* 2: 243–244 (1983) and A.A.Obermeyer, *Bothalia* 15: 77–88 (1984) and in the treatment in *Fl. Australia* 45: 159–165 (1987) (the species below becoming *Myrsiphyllum asparagoides* (L.) Willd., *Protasparagus aethiopicus* (L.) Oberm. and *P. plumosus* (Baker) Oberm.) but in my opinion these segregates are better treated at infrageneric rank. This opinion is strongly supported by the results of a detailed analysis by S.T.Malcomber & D.Sebsebe in *Kew Bull.* 48: 63–78 (1993).

The genus *Asparagus s. lat.* is, by some, classified in a family of its own, the Asparagaceae.

J.P.Jessop, The Genus *Asparagus* in Southern Africa, *Bothalia* 9: 31–96 (1966).

1 'Leaves' ovate, 4–12 mm broad; flowers axillary, 1 or 2 per axil **1. A. asparagoides**

1: 'Leaves' linear or setaceous

2 'Leaves' linear, 1.5–2 mm broad; flowers in axillary racemes **2. A. aethiopicus**

2: 'Leaves' setaceous, less than 1 mm broad; flowers terminal, 1 (–3) **3. A. plumosus**

1.*Asparagus asparagoides (L.) Druce, *Bot. Exch. Club Soc. Brit. Isles* 3: 414 (1914)

Medeola asparagoides L., *Sp. Pl.* 339 (1753). T: 'Aethiopia'; lecto: M.Tilli, *Cat. Pl. Hort. Pisani* t. 12, fig. 1, 2 (1723); *fide* J.P.Jessop, *Bothalia* 9: 82 (1966). The epithet means resembling asparagus.

Illustrations: L.H.Bailey, *Stand. Cycl. Hort.* 2nd edn, 409, fig. 410 (1922); A.B.Graf, *Tropica* 3rd edn, 574 (1986); H.T.Clifford & J.G.Conran, *Fl. Australia* 45: 160, fig. 56E–F (1987), as *Myrsiphyllum asparagoides*.

Scrambling and twining, evergreen or semi-deciduous perennial, tuberous. Stems tortuous, to 3 m or more long, becoming slightly woody; young stems slightly scabrid. Leaf scales without spine; cladodes solitary, ovate, 10–30 mm long, 4–12 mm broad, acute. Flowers 1 or 2 in axils, bisexual; pedicels articulate. Perianth segments narrowly oblong, 5–6 mm long, reflexed, greenish white. Berry spheroidal, 6–10 mm diam., red.

Lord Howe Is. Naturalised and spreading near Lagoon Rd. A native of South Africa escaped from cultivation.

L.H.Is.: Lagoon Rd, *G.Uhe 1340* (K); near the War Memorial, *P.S.Green 1914* (K).

2.*Asparagus aethiopicus L., *Mant. Pl.* 62 (1767)

T: South Africa; lecto: LINN 434.6; *fide* J.P.Jessop, *Bothalia* 9: 67 (1966); IDC microfiche 177/2.232A/3. The epithet derives from an early use of the name Ethiopia applied to the whole of Africa.

[*Asparagus 'sprengeri' auct. mult.*: J.Pickard in H.F.Recher & S.S.Clark, *Environm. Survey Lord Howe Is.* 78, 79 (1974)]

[*Asparagus densiflorus auct. non* (Kunth) Jessop: S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 24 (1981); A.N.Rodd & J.Pickard, *Cunninghamia* 1: 275 (1983); J.Pickard; *J. Biogeogr.* 11: 204 (1984)]

Illustrations: W.H.Fitch, *Bot. Mag.* 132: t. 8052 (1906); A.B.Graf, *Tropica* 3rd edn, 574 (1986), as *A. sprengeri* Regel; H.T.Clifford & J.G.Conran, *Fl. Australia* 45: 160, fig. 56C–D (1987), as *Protasparagus densiflorus*.

Scrambling, arching perennial, tuberous. Stems to 1.5 m or more long, becoming somewhat woody below; young stems lightly grooved. Leaf scales with spines usually developed except on branchlets, reflexed; cladodes solitary, flattened, linear, slightly arcuate, 10–25 mm long, 1.5–2 mm broad, mucronate. Inflorescence an axillary raceme, 10–20-flowered. Flowers often paired, bisexual; pedicels articulate. Perianth segments ovate, 3 mm long, white. Berry spheroidal, c. 8 mm diam., red. *Asparagus Fern*.

Norfolk Is., Lord Howe Is. Naturalised. An escape from cultivation and a serious pest.

N.Is.: Selwyn Pine Rd, *W.R.Sykes NI 213* (CHR). **L.H.Is.:** Pine Trees Guest House, *G.Uhe 1285* (K); Anderson Rd, *P.S.Green 2027* (K).

This species has been widely grown for its foliage under the name *A. sprengeri*, but is now more correctly called *A. aethiopicus* L. cv. 'Sprengeri' (see P.S.Green, *Plantsman* 7: 249–250, 1986).

3.*Asparagus plumosus Baker, *J. Linn. Soc., Bot.* 14: 613 (1875)

T: S. Africa, *J.F.Drège 4482 & T.Cooper 202*; syn: K. The epithet refers to the plume-like foliage of this plant.

Asparagus plumosus var. *nanus* Hort.; J.H.Maiden, *Proc. Linn. Soc. New South Wales* 45: 566 (1920).

[*Asparagus setaceus auct. non* (Kunth) Jessop: S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 24 (1981)]

Illustrations: L.H.Bailey, *Stand. Cycl. Hort.* 2nd edn, 407, fig. 405 (1922); A.B.Graf, *Tropica* 3rd edn, 574 (1986), as *A. setaceus*; J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1766, fig. 798 (1986), as *Protasparagus setaceus* (Kunth) Oberm.

Sprawling, climbing perennial, without tubers. Stems 2 m or more long, becoming slightly woody below; branches smooth, widely spreading, with branchlets and cladodes in one plane. Leaf scales with spines usually developed except on branchlets, reflexed; cladodes in fascicles of 5–20, setaceous, sometimes slightly arcuate, 3–7 mm long, less than 1 mm broad. Flowers terminal, 1 (–3), bisexual; pedicels articulate. Perianth segments narrow, oblong-lanceolate, 3 mm long, creamy white. Berry spheroidal, c. 6 mm diam., red. *Asparagus Fern*.

Norfolk Is., Lord Howe Is. Naturalised and becoming a serious pest. A native of South Africa widely grown as a foliage plant, and escaped from cultivation.

N.Is.: near Steels Point, *W.R.Sykes NI 504* (CHR); *loc. id., W.R.Sykes NI 539* (CHR). **L.H.Is.:** Anderson Rd, *J.Pickard NSW 13929* (K, NSW); *loc. id., P.S.Green 2026* (K); *s. loc., G.Uhe 1337* (K).

2. DIANELLA

Dianella Lam. ex Juss., *Gen. Pl.* 41 (1789); diminutive of the Latin *Diana*, Goddess of the Chase; P.Sonnerat (1748–1814) called the type species from the Mascarenes, which he had seen wild, 'Reine des Bois'. Following this, P.Commerson (1727–1773) applied to it the synonymous name Diana. This was then taken up by Lamarck as *Dianella*.

Type: *D. ensifolia* (L.) DC.

Evergreen rhizomatous herbs, (elsewhere sometimes subshrubby); roots fleshy to tuberous. Leaves distichous, often crowded at base of stem, linear to narrowly oblong, sessile. Inflorescence compound-cymose, often interrupted-paniculate. Flowers actinomorphic, bisexual; pedicels articulated below flower. Perianth segments petaloid, ±equal, free, 3–7 (–11)-nerved, reflexed at anthesis; base persistent. Stamens 6; filaments enlarged in middle; anthers basifixed, dehiscing by terminal pores or slits. Ovary superior, 3-locular; ovules numerous; style filiform; stigma capitate, minute. Fruit a berry, often a shade of blue. Seeds black, shiny.

A genus of c. 30 species, from the Mascarene islands, tropical Asia, Australia, New Zealand and the Pacific islands; 1 species endemic to Norfolk and Lord Howe Islands.

The genus *Dianella* is taxonomically difficult and needs monographic study using living material. The populations on the two islands may represent close but different taxonomic entities but the collections and information at present available are inadequate for a firm conclusion to be reached. For example, the flowers on Norfolk Is. are recorded as dull creamy white while those on Lord Howe Is. are shades of blue. The name *D. intermedia* Endl. has been used by some authors in a broad sense for plants from New Caledonia, Fiji and other Pacific islands but they all differ consistently from the Norfolk and Lord Howe Islands populations, except perhaps for one or two collections from New Caledonia. The characters for distinguishing the New Caledonian *D. adenanthera* (G.Forst.) R.J.F.Hend. are set out in R.J.F.Henderson, Nomenclatural Studies in *Dianella* Lam. ex Juss. (Phormiaceae) I. *Austrobaileya* 2: 419–426 (1988).

Dianella has recently been included in the Phormiaceae, along with a number of other genera.

F.B.H.Brown (*Occas. Pap. Bernice Pauahi Bishop Mus.* 84: 149, 1931) described a *D. intermedia* var. *norfolkensis* but, despite the name, based it solely on New Zealand specimens which are now considered to belong to *D. nigra* Colenso, the endemic New Zealand species.

Dianella intermedia Endl., *Prodr. Fl. Norfolk.* 28 (1833)

T: Norfolk Is., *F.L.Bauer*; holo: W, destroyed; neo: Anson Bay, *J.D.McComish 47*, K, *fide* R.J.F.Henderson, *Austrobaileya* 2: 425 (1988). So named because it was considered to be intermediate between two other species.

Dianella sp., F.J.H. von Mueller, *Fragm.* 9: 78 (1875).

[*Dianella caerulea auct. non* Sims: G.Bentham, *Fl. Austral.* 7: 11 (1878) *p.p.*; W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 131 (1917)]

Illustration: O.Evans in Anon., *Dars-Et* [15] (1976).

Herb to 30 (–40) cm high. Leaves basal and cauline; upper cauline leaves distichous, equitant, linear, 30–70 cm or more long, 1–2 cm broad, readily revolute, especially on drying, slightly asperous towards apex, with prominent midrib. Inflorescence 20–40 cm tall, elongate, narrowly paniculate. Flowers dull creamy white to blue or pale violet-blue; pedicels retrorse, 2–7 mm long. Perianth lobes 5–7 mm long, 1.5–2 mm broad. Filaments yellow. Berry spheroidal-ovoid, c. 1 cm diam., royal blue or purplish blue when ripe. Seeds ovoid, 4 mm long. Fig. 97A–B.

Norfolk Is., Lord Howe Is. Endemic to the Islands. Fairly rare; in grassy and rocky places in light forest and in coastal areas.

N.Is.: Anson Bay, *J.D.McComish 47* (K); Ball Bay, *J.D.McComish 47* (K); from Mt Bates to Red Rd, *P.S.Green 1387* (A). **L.H.Is.:** Mt Eliza, *A.C.Beauglehole 5492* (MEL); track up Mt Gower above The Saddle, 1984, *I.Hutton* (CBG, K); lower slopes of Mt Lidgbird, *M.D.Crisp 4505 & I.R.H.Telford* (CBG).

3. CHLOROPHYTUM

Chlorophytum Ker Gawl., *Bot. Mag.* 27: t. 1071 (1807); from the Greek *chloros* (green) and *phyton* (a plant), in allusion to the overall green colour of the plant so named, including its flowers.

Type: *C. inornatum* Ker Gawl.

Evergreen herbaceous perennials, rhizomatous, often with fleshy or tuberous roots. Aerial stems condensed, leafy. Leaves linear and sessile or lanceolate-ovate and petiolate. Inflorescence axillary, paniculate. Flowers actinomorphic, bisexual, in bracteate clusters; pedicels articulate near middle. Perianth star-shaped; segments petaloid, free, 3–7-veined, greenish or white. Stamens 6; anthers basifixed, introrse. Ovary superior, spherical to ovoid, angular, 3-locular; ovules 2–several per locule; style filiform. Fruit a 3-angled capsule.

A genus of perhaps 300 species from the Old World tropics, especially Africa and India; 1 species naturalised on Lord Howe Is.

Figure 97. A–B, LILIACEAE: *Dianella intermedia*. **A**, Lord Howe Is., habit (P.Green 2046, K); **B**, Norfolk Is., habit (photograph). **C–D**, IRIDACEAE: *Dietes robinsoniana*. **C**, habit; **D**, inflorescence (**C–D**, photograph & 1877, J.Fullagar, K). **E**, SMILACACEAE: *Geitonoplesium cymosum*, habit in fruit (P.Green 2053, K). **F–I**, AGAVACEAE: *Phormium tenax*. **F**, habit; **G**, inflorescence; **H**, part of leaf; **I**, tip of leaf (**G–I**, photograph & specimen cult. Kew EN 339-53). Scale bars: **A**, **D**, **E**, **G**, **H**, **I** = 2 cm; **B**, **C**, **F** = 20 cm. Drawn by P.Halliday.

By some classified in the family Anthericaceae.

***Chlorophytum comosum** (Thunb.) Jacques, *J. Soc. Imp. Centr. Hort.* 8: 345 (1862)

Anthericum comosum Thunb., *Prodr. Pl. Cap.* 1: 63 (1794). T: S. Africa, *C.P.Thunberg*; holo: UPS *n.v.*, photo seen (IDC microfiche 1036.8361). The epithet comes from the Latin *coma* (hair of the head or, figuratively, foliage), used in botanical Latin for a tuft, in this case alluding to the tuft of viviparous plantlets in the inflorescence.

Illustrations: A.B.Graf, *Exotica* 12th edn, 2: 1426 (1985); R.J.F.Henderson, *Fl. Australia* 45: 351, fig. 107D–E (1987).

Tufted herb; roots tuberous. Leaves sessile, linear to linear-lanceolate, 20–45 cm long. Inflorescence branched or simple, 30–80 cm long, becoming pendulous. Flowers 1–6 per node, often abortive, or substituted by viviparous, tufted plantlets, often with roots. Perianth segments ovate-elliptic, c. 8 mm long, acute, white or greenish white. Capsule c. 9 mm long. Seeds flat or angular, black.

Lord Howe Is. A naturalised garden escape by the roads in forested areas near houses. A native of South Africa, widely cultivated, often with variegated leaves.

L.H.Is.: Lagoon Rd, *J.G.Conran 635* (K, NSW).

4. NOTHOSCORDUM

Nothoscordum Kunth, *Enum. Pl.* 4: 457 (1843); from the Greek *nothos* (false) and *skordon* (garlic), in allusion to its relationship with *Allium sativum* L., the true garlic.

Type: *N. bivalve* (L.) Britton = *N. striatum* (Jacq.) Kunth

Evergreen perennial herbs with tunicate bulbs. Leaves basal, linear, flat, sessile. Inflorescence scapose, umbellate, 2–many-flowered; spathaceous bracts 2 (or 3). Flowers actinomorphic, bisexual. Perianth segments petaloid, connate at base or in lower half, white or yellow. Stamens 6; filaments dilated; anthers dorsifixed, introrse. Ovary superior, 3-locular; style terminal. Fruit a loculicidal capsule. Seeds numerous, black.

An American genus of c. 35 species, with 1 of them adventive, and now almost a cosmopolitan weed, including on the Islands.

Nothoscordum is sometimes classified in the family Alliaceae.

***Nothoscordum borbonicum** Kunth, *Enum. Pl.* 4: 463 (1843)

T: Réunion; not designated: B, destroyed? Named after the Isle de Bourbon, an earlier name for the island of Réunion.

[*Allium fragrans auct. non* Vent.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 148 (1898); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 767 (1904)]

[*Nothoscordum inodorum auct. non* (Aiton) G.Nicholson: A.N.Rodd & J.Pickard, *Cunninghamia* 1: 278 (1983)]

Illustrations: B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 332, fig. 196b (1983); J.P.Jessop in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1765, fig. 797A (1986), as *N. inodorum*; W.T.Stearn, *Fl. Australia* 45: 359, fig. 109A–B (1987), as *N. gracile*.

Bulb ovoid-globose, usually with numerous offset bulbils at base. Leaves without onion smell, 20–40 cm long, 3–10 mm broad. Scape slender, 30–50 cm long, ±terete; umbel 6–15-flowered; bracts 2, 6–15 mm long, connate at base, ±membranous; pedicels 2–4 cm long. Perianth segments 8–10 mm long, white with reddish midrib. Capsule c. 5 mm long; valves rounded. Seeds angled.

Norfolk Is., Lord Howe Is. Introduced and weedy but not recently collected. Fortunately it now appears to be exterminated on Norfolk Is. according to J.H.Maiden (*loc. cit.*, 1898) and on Lord Howe Is. according to A.N.Rodd & J.Pickard (*loc. cit.*), but was collected on the latter island by A.C.Beauglehole in 1962.

N.Is.: *fide* J.H.Maiden (1904). **L.H.Is.:** Old Settlement Beach, *A.C.Beauglehole 5496* (MEL); near Big Ck, *A.C.Beauglehole 5497* (MEL).

P.Ravenna, *Taxon* 40: 485–488 (1991), has shown that *N. gracile* is not the weedy species, for which the correct name is *N. borbonicum*.

5. AGAPANTHUS

Agapanthus L'Hér., *Sert. Angl.* 17 (1789); from the Greek *agape* (love) and *anthos* (a flower), possibly in reference to the showy flowers.

T: *A. umbellatus* L'Hér., *nom. illeg.* = *A. africanus* (L.) Hoffmanns.

Evergreen perennial herb, rhizomatous or rootstock tuberous; roots fleshy. Leaves distichous, usually basal, strap-shaped, slightly fleshy or leathery, sessile. Inflorescence an umbel on a tall, stout hollow scape with 2 deciduous, spathaceous bracts; pedicels erect or spreading with basal thread-like bracteoles, apically articulated. Flowers actinomorphic, bisexual. Perianth segments petaloid, equal, connate towards base, tubular, slightly spreading, dark blue to white. Stamens 6, inserted on perianth tube; anthers dorsifixed, introrse. Ovary superior, 3-locular; ovules numerous; style filiform. Fruit a capsule. Seeds numerous, flat, black, winged.

A genus of 10 species and a number of subspecies native to South Africa; 1 species naturalised on Lord Howe Is. Several are popular garden plants.

This genus is by some classified in the family Alliaceae.

F.M.Leighton, The Genus *Agapanthus* L'Héritier, *J. S. African Bot.* Suppl. 4 (1965).

***Agapanthus praecox** subsp. **orientalis** (F.M.Leight.) F.M.Leight., *J. S. African Bot.* Suppl. 4: 21 (1965)

T: Port St Johns, South Africa, *N.S.Pillans 7198*; holo: ?BOL *n.v.* So named as this plant occurs in the eastern (Latin - *orient*) part of Cape Province, South Africa.

Illustration: F.M.Leighton, *op. cit.* t. 4.

Stout herb to 1 m tall, forming clumps. Leaves up to 20 per shoot, basal, linear, arcuate, canaliculate, 20–70 cm long, 3–5 cm broad. Scape 60–100 cm tall; umbel dense, many-flowered; pedicels 9–12 cm long, spreading. Perianth 4–4.5 cm long, pale to medium blue; tube 1.5–2 cm long; segments spreading, with outer segments 6–8 mm broad, inner segments 9–11 mm broad.

Lord Howe Is. An escape from cultivation on the Island and now seeding itself. A native of Cape Province and Natal in South Africa.

L.H.Is.: Lagoon Rd, *J.G.Conran 633* (K, NSW).

6. CRINUM

Crinum L., *Sp. Pl.* 1: 291 (1753); *Gen. Pl.* 5th edn, 141 (1754); from the Greek *krinon* (a lily).

Type: *C. americanum* L.

Evergreen, large, bulbous, perennial herbs. Leaves sessile, basal, long, broadly linear (elsewhere sometimes almost terete). Inflorescence umbellate on a stout leafless scape with 2 broad membranous apical bracts and smaller ones between flowers. Flowers ±actinomorphic, bisexual, (1–) many, showy, sessile or pedicellate. Perianth segments petaloid, connate into a slender tube, with lobes ±equal. Stamens 6, inserted in throat of perianth tube; anthers versatile, dehiscing longitudinally, everting. Ovary inferior, 3-locular; ovules immersed in axile placentas; style long; stigma capitate. Fruit a capsule, dehiscing irregularly. Seeds large.

A genus of 100 or more species, distributed especially on sea coasts in the tropics and subtropics; 1 native species on Norfolk and Lord Howe Islands.

Often, because of its inferior ovary, classified in the Amaryllidaceae.

Crinum asiaticum L., *Sp. Pl.* 1: 292 (1753)

var. **pedunculatum** (R.Br.) Fosberg & Sachet, *Micronesica* 20: 131 (1987)

Crinum pedunculatum R.Br., *Prodr.* 297 (1810). T: Port Jackson, New South Wales, *R.Brown*; holo: BM. The epithet means provided with a peduncle, from the Latin *pedunculus* and the suffix *-atum*, indicating possession.

Crinum norfolkianum A.Cunn. ex Heward, *London J. Bot.* 1: 123 (1842). T: Norfolk Is., *A.Cunningham*; holo: not traced.

Illustrations: W.R.Elliot & D.L.Jones, *Encycl. Austral. Pl.* 3: 110 (1984); H.J.Hewson, *Fl. Australia* 45: 371, fig. 111E (1987).

Coarse herb to 2 m with false stem of compact leaf bases, 10–15 cm diam. Leaves up to 1.5 m long, up to 15 cm broad. Scape to 1.5 m tall, 25–50-flowered; pedicels 2.5–5 cm long. Perianth white; tube slender, 4.5–8 cm long, scarcely dilated at apex; lobes narrowly lanceolate-linear, 4–6 cm long, 0.5–0.8 mm broad. Filaments 3–5 cm long, distally purple; anthers 12–16 mm long. Style 2.5–4.5 cm long, filiform, purple.

Norfolk Is., Lord Howe Is. Also native to coastal areas of Australia, from N.S.W. to the N.T., New Guinea, Micronesia and Cocos (Keeling) Is. Although probably native on Lord Howe Is., near North Bay and Old Gulch and on Roach Is., there has been some doubt about its status on Norfolk Is. R.M.Laing (*Trans. & Proc. New Zealand Inst.* 47: 21, 1915) believed it was 'evidently introduced in convict times; it still survives along Watermill Creek'.

N.Is.: near Kingston, *J.D.McComish 121* (K, NSW); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW); *s. loc., W.Laing* (CHR). **L.H.Is.:** North Beach, *I.R.H.Telford 7051 & M.D.Crisp* (CBG); between North Beach and Old Gulch, *R.D.Hoogland 8690* (NSW); swamp at North Bay, *I.Hutton 615* (K).

As has been pointed out by H.J.Hewson in *Fl. Australia* 45: 369 (1987), the genus *Crinum* needs revision. For some time I have doubted the specific distinctiveness of *C. pedunculatum* R.Br. when compared with *C. asiaticum* L., and have come to the conclusion, followed here, that F.R.Fosberg & M.-H.Sachet are correct in treating the former as a variety of the latter. Although *Crinum norfolkianum* is listed in J.Leigh, J.Briggs & W.Hartley, *Rare or Threatened Austral. Pl.* 125 (1981), it is not certain that the plants presently on Norfolk Is. are the same as those that were described by Cunningham, and its distinctness as a species is very doubtful indeed.

7. HIPPEASTRUM

Hippeastrum Herb., *Appendix 31* (1821); from the Greek *hippeus* (a horse rider) and Latin *aster* (a star) derived from the common name for this genus used by Herbert, 'Knight's-star-lily'.

Type: *H. reginae* (L.) Herb.

Tunicated, bulbous, perennial herbs. Leaves annual, few, basal, linear or strap-shaped, sessile. Inflorescence umbellate, 2–10-flowered; scape stout, hollow; spathaceous bracts 2, equal, lanceolate, membranous, enclosing the bud, persistent. Flowers slightly zygomorphic, bisexual, erect, horizontal or drooping. Perianth petaloid; tube long or short; lobes spreading, subequal; corona represented by fimbriate scales beside filament bases. Stamens 6, adnate to perianth tube; anthers linear, versatile, introrse. Ovary inferior, 3-locular; ovules few to many; style long, declinate then curved upwards. Fruit a spherical or 3-lobed capsule. Seeds black, flattened.

A genus of c. 80 species from tropical and subtropical Central and South America; 1 species naturalised on Lord Howe Is.

In some classifications, this genus is treated as a member of the Amaryllidaceae.

***Hippeastrum puniceum** (Lam.) Voss, *Vilm. Blumengärtn.* 3rd edn, 1033 (1895)

Amaryllis punicea Lam., *Encycl.* 1: 122 (1783). T: Surinam; lecto: M.S.Merian, *Metamorph. Insect. Surinam* t. 22 (1705), *fide* R.A.Howard, *Fl. Lesser Antilles* 3: 476 (1979). The Latin epithet means crimson or Phoenician purple, in allusion to the colour of the flowers.

Illustrations: R.A.Howard, *op. cit.* 480, fig. 106, as *Hymenocallis fragrans* Salisb.; A.B.Graf, *Exotica* 12th edn, 1: 103, 107 (1985); A.B.Graf, *Tropica* 3rd edn, 66 (1986).

Bulb globose, c. 5 cm long, with a short neck. Leaves strap-shaped, 25–50 cm long, apically blunt. Scape stout, c. 50 cm tall; umbel 2–4-flowered; spathaceous bracts 6–7 cm long; pedicels 4–8 cm long. Flowers trumpet-shaped, horizontal, usually variously coloured red, green at base. Perianth tube c. 3 cm long; lobes c. 10 cm long, spreading. Capsule rare, globose. Seeds numerous, flattened.

Lord Howe Is. An escape from cultivation now spreading by self-sown seed. Several species have been hybridised in horticulture (of which *H. puniceum* is probably the principal) to produce the widely grown, so-called Amaryllis.

L.H.Is.: Lagoon Rd, between Lagoon Store and Wilson's bike shop, *J.G.Conran 634* (K, NSW).

8. NARCISSUS

Narcissus L., *Sp. Pl.* 1: 289 (1753); *Gen. Pl.* 5th edn, 141 (1754); the classical Greek name for a handsome youth who so liked his own reflection that the gods turned him into this flower. It has also been suggested that the ancient Greek name *narkissus* was derived from *narke* (stupor) because of the stupifying effect of the flowers' strong scent.

Type: *N. poeticus* L.

Tunicated, bulbous perennial herbs; roots fibrous. Leaves annual, basal, linear, flat to almost circular in cross-section. Inflorescence umbellate, scapose, 1–many-flowered; spathes scarious. Flowers actinomorphic, bisexual. Perianth segments petaloid, connate and tubular below; lobes equal; corona present, free from stamens. Stamens 6, inserted in perianth tube in 2 whorls; anthers dorsifixed, introrse. Ovary inferior, 3-locular; ovules numerous; style often long and slender. Fruit a capsule. Seeds numerous, black, angular.

A taxonomically complex genus from western and southern Europe and the Mediterranean. Estimates of the number of species range from 27 to about 60. One species is naturalised on Norfolk and Lord Howe Islands. Very popular in temperate gardens, and many hybrids and cultivars have been developed.

Also placed in the Amaryllidaceae in some classifications.

***Narcissus tazetta** L., *Sp. Pl.* 1: 290 (1753)

T: cultivated, origin Europe, not designated. The epithet comes from the Italian *tazza* (a small cup), in allusion to the form of the corona.

Illustrations: O.Polunin & A.J.Huxley, *Flowers Mediterranean* t. 257 (1965); B.Mathew *et al.*, *P.J.Redouté Lilies and Related Flowers* 139 (1981); H.Hewson, *Fl. Australia* 45: 381, fig. 113A (1987).

Herb, forming tufted clumps. Leaves ±flat, linear, somewhat channelled, 20–50 cm long, 5–15 mm broad, obtuse. Scape slightly longer than leaves, compressed; umbel 3–15-flowered; pedicels unequal, 1–7.5 cm long. Flowers 3.5–4 cm diam., sweetly fragrant. Perianth tube 1.5–2 cm long; lobes 8–22 mm long, spreading, ovate; corona cup-shaped, crenate-undulate, 3–6 mm high, yellow or orange, darker than lobes. Stamens ±exserted.

Lord Howe Is. An escape from gardens, established in one or two places near Lagoon Rd. Native to the Mediterranean region, but long since naturalised elsewhere, even as far to the east as Japan.

L.H.Is.: cemetery near Windy Point, *J.G.Conran 641* (K, NSW).

9. ALSTROEMERIA

Alstroemeria L., *Pl. Alströemeria* 8 (1762); named after Baron Claus Alstroemer (1736–1794), a friend of Linnaeus.

Type: *A. pelegrina* L.

Perennial rhizomatous herbs with fleshy tubers. Stems annual, erect, leafy. Leaves alternate; petiole twisted through 180°. Inflorescence terminal, corymbose, cymose, or a simple or cymose umbel, surrounded by a whorl of leaf-like bracts. Flowers bisexual, slightly zygomorphic. Perianth segments petaloid, free, clawed. Stamens 6, free; anthers basifixed, introrse. Ovary inferior, 3-locular; ovules numerous; style simple with 3 stigmatic branches. Fruit a loculicidal capsule. Seeds numerous, globose to ellipsoidal.

A South American genus of perhaps 50 species; 1 species naturalised on Norfolk and Lord Howe Islands. A number are cultivated for their flowers and have been hybridised.

In some treatments this genus is placed in its own family, the Alstroemeriaceae, along with a few other genera.

*Alstroemeria pulchella L.f., *Suppl. Pl.* 206 (1781)

T: Brazil, not designated. The epithet means beautiful, from the Latin *pulcher*.

Alstroemeria psittacina Lehm., *Sem. Hort. Bot. Hamburg* 17 (1826). T: cult. Hort. Bot. Hamburg (origin not traced); holo: ?S *n.v.*

Illustrations: F.Perry & L.Greenwood, *Fl. World* 21 (1972); A.J.Healy & E.Edgar, *Fl. New Zealand* 3: t. 3, fig. 24c (1980); A.B.Graf, *Tropica* 3rd edn, 64 (1986).

Soft herb. Sterile shoots to 20 (–30) cm tall with a loose terminal cluster of thin elliptic-lanceolate leaves; fertile shoots to 1 m tall with equidistant cauline linear-oblanceolate leaves. Inflorescence a simple umbel, usually 6–8-flowered; pedicels 1–3 cm long. Flowers trumpet-shaped, 4–5 cm long, borne ±horizontally; perianth segments narrowly spathulate, free, dull red tipped with green and purplish brown markings towards apex inside. Capsule spheroidal, 1–2 cm long, 6-ribbed, encircled with the remains of the perianth rim. *Curse of the Island* (N.Is.), *Christmas Lily* (L.H.Is.).

Norfolk Is., Lord Howe Is. Naturalised in scattered locations. A native of Brazil escaped from cultivation.

N.Is.: New Cascade Rd, *W.R.Sykes NI 609* (CHR); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW). **L.H.Is.:** behind Pine Trees Guest House, *G.Uhe 1322* (K); between portion 80 and 86, *J.Pickard 2680* (NSW).

10. GLORIOSA

Gloriosa L., *Sp. Pl.* 305 (1753); *Gen. Pl.* 5th edn, 144 (1754); from the Latin *gloriosus* because of the 'glorious' flowers in this genus.

Type: *G. superba* L.

Evergreen scrambling or climbing herb; rootstock tuberous. Leaves alternate or opposite, cauline, subsessile, attenuate, usually into a curled tendril. Flowers solitary in upper leaf axils, actinomorphic, bisexual, pendulous; pedicels erect, bent over at apex. Perianth segments petaloid, free, reflexed. Stamens 6, spreading, free; anthers dorsifixed, extrorse. Ovary superior, 3-locular; ovules numerous; style bent at right angles at base, 3-fid at apex. Fruit a capsule. Seeds numerous, ±fleshy, strophiolate, bright red.

A genus of a single variable species, although up to 30 have been described (5 in *Fl. Australia*, 45: 412, 1987), mainly based on differences in colour or shape *etc.* of the perianth. These, where necessary, are better treated as cultivars, following Field (1972) quoted below. The species is naturalised on Lord Howe Is.

Classified by some as a member of the Colchicaceae.

D.V.Field, The genus *Gloriosa*, *Lilies 1973*, 93–95 (1972).

***Gloriosa superba** L., *Sp. Pl.* 305 (1753)

T: cultivated, Herb. Hermann No. 122 vol. 3, fol. 31; lecto: BM, *fide* D.O.Wijnands, *Botany Commelins* 133 (1983). So named as a description of its spectacular flowers.

Illustrations: G.A.C.Herklots, *Fl. Trop. Climbers* 127 (1976); A.B.Graf, *Exotica* 12th edn, 2, 1450–1452 (1985) under various names; J.G.Conran, *Fl. Australia* 45: 411, fig. 122 (1987).

Leaves lanceolate to broadly lanceolate, 6–15 cm long, 1.2–4 cm broad, with a curled apical tendril. Perianth segments narrowly lanceolate or linear, 5–8 cm long, flat or with margin undulate, variously coloured red or yellow. Filaments 2–4 cm long; anthers versatile, c. 1 cm long. Ovary cylindrical, 5–10 mm long; style 2–5 cm long. Capsule cylindrical, ±lobed, 4 cm long.

Lord Howe Is. A naturalised escape from cultivation. All parts of the plant are poisonous.

L.H.Is.: roadside, Salmon Beach, *I.Hutton 640* (K).

11. LILIUM

Lilium L., *Sp. Pl.* 1: 302 (1753); *Gen. Pl.* 5th edn, 143 (1754); a name used by Virgil, probably for a species of this or a related genus.

Type: *L. candidum* L.

Perennials with bulb of fleshy scales. Leaves annual or perennial, cauline, alternate or whorled, sessile. Inflorescence a terminal raceme or flowers solitary. Flowers large, actinomorphic, bisexual, erect, horizontal or nodding. Perianth segments petaloid, free, spreading, reflexed or ±trumpet-shaped with ends somewhat revolute, usually with a basal nectary. Stamens 6, free; anthers dorsifixed, versatile, dehiscence longitudinal, introrse. Ovary superior, 3-locular; ovules numerous; style long; stigma ±3-lobed. Fruit a capsule. Seeds numerous, flattened.

A genus of c. 90 species, characteristic of the northern temperate regions; much cultivated, with a few species becoming adventive, including 1 species naturalised on Lord Howe Is.

***Lilium formosanum** A.Wallace, *Garden* (*London*) 40: 442 (1891)

T: cultivated (not preserved). The epithet alludes to the Island of Formosa (Taiwan), where it is native.

Illustrations: W.E.Trevithick in O.Stapf, *Bot. Mag.* 154: t. 925 (1930); R.M.Withers, *Liliums in Australia* fig. 39 (1967).

Bulb scales ovate to oblong-lanceolate, acute. Stems to 1 m tall, glabrous. Leaves numerous, sessile, linear, 5–15 cm long, 3–10 mm broad. Flowers 1–3, horizontal, trumpet-shaped, c. 15 cm long, white, tinged purple on outside, especially along midrib of perianth lobes. Basal nectariferous groove very narrow, green. Capsule angled, elongate, 6–9 cm long. Seeds thin, papery. *Tiger Lily.*

Lord Howe Is. A native of Taiwan which has escaped from cultivation. First recorded on Lord Howe Is. in 1970, since then it has rapidly invaded the native vegetation in many areas (see J.Pickard, *J. Biogeogr.* 11: 198, 1984).

L.H.Is.: Malabar, *M.D.Crisp 4579 & I.R.H.Telford* (CBG).

109. IRIDACEAE

Terrestrial perennial or annual herbs; cormous, bulbous or rhizomatous. Leaves radical or cauline, usually linear or ensiform, vertically flattened, equitant. Inflorescence racemose, spicate or paniculate, rarely flowers solitary. Flowers bisexual, actinomorphic or zygomorphic, borne between paired spathaceous bracts. Perianth petaloid, often marcescent, 6 or 3 + 3, connate at base (occasionally free). Stamens 3, inserted on perianth. Ovary inferior (elsewhere rarely superior), 3-locular; ovules usually numerous, axile; style 3-fid, with branches entire or lobed, sometimes broad and petaloid. Fruit a capsule, loculicidally dehiscent. Seeds few to many, usually ±globular.

A family of 60–70 genera and 800 or more species, distributed in most parts of the world, but especially South Africa; 8 genera naturalised on Norfolk and Lord Howe Islands and 1 native to Lord Howe Is.

As well as the garden escapes included below *Moraea iridoides* L. has been recorded as a relict of cultivation on Norfolk Is. but appears not to be naturalised.

G.Bentham, Irideae, *Fl. Austral.* 6: 398–415 (1873); D.J.Geerinck, Revision of Australian Iridaceae, *Bull. Jard. Bot. État* 44: 29–60 (1974); D.A.Cooke, Iridaceae, *Fl. Australia* 46: 1–66 (1986).

KEY TO GENERA

1 Spathaceous bracts subtending 2 or more flowers

2 Inflorescence stem 1–1.5 m high, stout; leaves 4–7 cm broad; flowers large, white, c. 8–10 cm diam.; style petaloid (L.H.Is.) **2. DIETES**

2: Inflorescence stem 5–60 cm tall, ±slender; leaves less than 1.5 cm broad; flowers variously coloured, not white, less than 6 cm diam.; style not petaloid

3 Inflorescence enclosed in numerous, overlapping, distichous bracts; flowers mottled purplish black **4. FERRARIA**

3: Inflorescence not enclosed in numerous, overlapping, distichous bracts

4 Flowers 4–6 cm diam., salmon-orange or yellowish with basal yellow nectar guide; leaves longer than inflorescence; capsule narrowly cylindrical **3. HOMERIA**

4: Flowers less than 1 cm diam., yellow with reddish brown nectar guides; leaves shorter than inflorescence; capsule depressed globose **1. SISYRINCHIUM**

1: Spathaceous bracts each subtending a single flower

5 Inflorescence with a solitary, terminal flower; leaves linear-filiform; flowers actinomorphic **5. ROMULEA**

5: Inflorescence spicate or pseudoracemose; leaves ensiform to linear-lanceolate; flowers slightly to strongly zygomorphic

6 Spathaceous bracts ±herbaceous, narrowly acute; perianth 7–12 cm long **6. GLADIOLUS**

6: Spathaceous bracts ±membranous, broad, apically toothed; perianth 2.5–5 cm long

7 Perianth tube very slender, much longer than lobes; style branches deeply bifid; stigmas 6 **7. ANOMATHECA**

7: Perianth tube funnel-shaped, shorter or not much longer than lobes; style branches entire; stigmas 3

8 Flowers cream or pale yellow; perianth tube straight; corms not stoloniferous **8. TRITONIA**

8: Flowers orange-red; perianth tube curved; stoloniferous **9. CROCOSMIA**

1. SISYRINCHIUM

Sisyrinchium L., *Sp. Pl.* 2: 954 (1753); *Gen. Pl.* 5th edn, 409 (1754); a Greek name used by Theophrastus for another plant in this family.

Type: *S. bermudiana* L.

Annual or perennial herbs, tufted or shortly rhizomatous. Scapes simple or branched. Leaves basal and cauline, linear, flattened or terete. Inflorescence a panicle of subumbellate clusters of 2–many pedicellate flowers, opening sequentially from paired spathaceous bracts. Flowers actinomorphic. Perianth connate at base; tube often suburceolate; lobes ±equal, ±apiculate. Filaments inserted at base of tube, connate at base. Style branches simple. Capsule ±globose, borne on filiform pedicel. Seeds numerous.

A genus of c. 100 species from the New World and a single species from Ireland; 1 species naturalised on Norfolk and Lord Howe Islands.

***Sisyrinchium micranthum** Cav., *Monad. Classis Diss.* 6: 345, pl. 191, fig. 2 (1788)

T: Peru, *Cavanilles*?; holo: ?P *n.v.* The epithet comes from the Greek *micros* (small) and *anthos* (a flower).

Illustrations: J.Sims, *Bot. Mag.* 47: t. 2116 (1819); A.M.Payne in F.M.Bailey, *Weeds & Suspect Poison. Pl. Queensland* 191, fig. 337 (1906); A.J.Healy & E.Edgar, *Fl. New Zealand* 3, fig. 22e–f (1980).

Annual herb, (5–) 10–20 cm tall, tufted. Scape slightly winged. Leaves distichous, equitant; lamina flat, shorter than stems, less than 1.5 cm broad, narrowly acute. Spathaceous bracts 12–30 mm long, acute; pedicels filiform, 5–15 mm long, exserted beyond bracts. Perianth yellow with reddish brown markings, 7 mm long; lobes acute, ±apiculate. Capsule nodding, depressed-globose, 2–3 mm long. Seeds spheroidal, c. 0.5 mm diam., black, pitted.

Norfolk Is., Lord Howe Is. A weed, scattered and frequent in cultivated ground and on wasteland. A native of South America, it is now a widespread weed in eastern Australia, New Zealand, New Caledonia and Fiji.

N.Is.: Red Rd, *P.S.Green 1363* (A); *s. loc., W.Laing* (CHR). **L.H.Is.:** Mt Eliza, *A.C.Beauglehole 5501* (CANB, MEL); Northern Hills, *R.B.Hoogland 8705* (CANB); jetty area, *A.C.Beauglehole 5502* (CANB, MEL).

2. DIETES

Dietes Salisb. ex Klatt, *Linnaea* 34: 583 (1866), *nom. cons.*; from the Greek *di* (two) and *etes* (clansman) in allusion to the relationships of this genus with *Iris* and *Moraea*.

Type: *D. compressa* (L.f.) Klatt, *nom. illeg.* = *D. iridioides* (L.) Klatt

Perennial herbs with thick, creeping rhizome. Stems erect; lower nodes leafy; upper with spathe-like bracts. Leaves basal and cauline, distichous, tough, equitant. Inflorescence a terminal panicle; bracts sheathing, subtending several flowers which open sequentially. Flowers ±actinomorphic, large. Perianth segments free, with an erect claw and an outspread limb. Filaments free or connate at base. Style branches large, flattened, petaloid, each with an transverse stigmatic flap and 2 petaloid crests. Capsule ±globose to ellipsoidal, usually ±erect. Seeds numerous, large, irregularly flattened.

A genus of 6 species, all confined to southern Africa, except 1 endemic to Lord Howe Is.

P.Goldblatt, Systematics, phylogeny and evolution of *Dietes* (Iridaceae), *Ann. Missouri Bot. Gard.* 68: 132–153 (1981).

Dietes robinsoniana (C.Moore & F.Muell.) Klatt, *Abh. Naturf. Ges. Halle* 15: 374 (1882); *Ergänz. Baker's Syst. Irid.* 60 (1882).

Iris robinsoniana C.Moore & F.Muell. in F.J.H. von Mueller, *Fragm.* 7: 153, t. 63, 64 (1871); *Moraea robinsoniana* (C.Moore & F.Muell.) Benth., *Fl. Austral.* 6: 409 (1873). T: Lord Howe Island, *C.Moore*; holo: MEL. Named after Sir Hercules G.R.Robinson (1824–1897), Governor of New South Wales (1872–1879).

Illustrations: A.N.Rodd in H.F.Recher & S.S.Clark, *Environm. Survey Lord Howe Is.* 22 (1974); I.Hutton, *Lord Howe Is.* 110 (1986); W.H.Payne, *Australian Pl.* 16: 337 (1992).

Tough herb 1–1.5 m high. Leaves linear-ensiform, ±equal to inflorescence, 4–7 cm wide. Inflorescence several times branched in upper half; outer spathaceous bracts 2–3 cm long, inner 4–6 cm long. Flowers opening for 1 day, white with bright yellow nectar guide at base of limb of outer perianth lobes. Outer perianth lobes 4.5–5 cm long, 3.5–4 cm broad, obtuse; inner lobes slightly smaller, narrower, ±acute. Style 1–1.5 cm long; crests 4–5 mm long, blunt. Capsule ellipsoidal-globose, 3–4 cm long, gradually dehiscing and rotting from the top down. Seeds ±flat, triangular, 10 mm long, black. Chromosome number, *2n* = 20 *fide* P.Goldblatt, *Ann. Missouri Bot. Gard.* 66: 852 (1979). *Wedding Lily*. Figs 71, 97C–E.

Lord Howe Is. Endemic. Uncommon, but locally abundant, in the margins of forests, from near the sea to the mountain tops (rare north of Intermediate Hill). Flowers Sept.–early Dec.

L.H.Is.: S of Salmon Beach, *G.Uhe 1329* (K); *s. loc., J.P.Fullagar* (K).

This species is listed in J.Leigh, J.Briggs & W.Hartley, *Rare or Threatened Austral. Pl.* 121 (1981). The most nearly related species is *D. bicolor* (Steud.) Sweet ex Klatt of the Eastern Cape area of South Africa. (P.Goldblatt, *op. cit.* 143).

3. HOMERIA

Homeria Vent., *Dec. Gen. Nov.* 5 (1808); from the Greek *homereo* (to meet), in allusion to the joining of the staminal filaments into a tube around the style.

Type: *H. collina* (Thunb.) Salisb.

Perennial, cormous herbs. Stems slender. Leaves 1 or several at base or above, sheathing, flattened, linear; cauline leaves smaller, uppermost reduced to sheathing bracts. Inflorescence paniculate, several-flowered, 2–4 flowers borne serially between pairs of spathaceous bracts. Flowers actinomorphic. Perianth connate or free; lobes subequal with a ±erect claw, ±forming a cup at base; limb spreading. Filaments inserted at base of perianth, connate around style; anthers pressed against style branches. Style a slender column, with separate, short, flattened branches with transverse stigmas and paired crests or apical stigmatic lobes. Capsule linear to narrowly cylindrical. Seeds numerous, angular.

A genus of 31 species, all natives of South Africa, but with 2 or 3 now adventive in Australia. One species naturalised on Norfolk Is.

P.Goldblatt, Systematics and biology of *Homeria* (Iridaceae), *Ann. Missouri Bot. Gard.* 68: 413–503 (1981).

*Homeria flaccida Sweet, *Hort. Brit.* 395 (1826)

T: S. Africa, cultivated in Britain; lecto: *Bot. Mag.* t. 1612 (1814), *fide* P.Goldblatt, *op. cit.* 464. The Latin epithet means drooping, presumably referring to the drooping leaf.

Illustrations: P.Goldblatt, *op. cit.* 465, fig. 16; D.A.Cooke, *Fl. Australia* 46: 35, fig. 9A–F (1986).

Plants 25–60 cm tall. Corms c. 1.5 cm diam., fibrous, dark brown. Leaf solitary, drooping, strap-shaped, 40–100 cm long, less than 1.5 cm broad, inserted above ground level. Stem erect, simple or with branches flexed at bracts, 2–6 cm long; spathes 3–8 cm long, with inner c. twice as long as outer. Flowers salmon-orange, or yellowish with basal deep yellow nectar guide. Perianth segments free, forming a basal cup 1–2 cm diam. Outer perianth 3.5–4 cm long, 0.8–1 cm wide, obovate, obtuse or ±apiculate, spreading ±horizontally; inner very slightly smaller. Filaments connate, 6–8 mm long; anthers 6–11 mm long. Style branches 5–7

mm long; crests triangular, 1 mm long. Capsule 3–5 cm long, 5 mm wide. Seeds numerous, triangular, light brown. *Cascade Onion.*

Norfolk Is. Introduced with soil and now spread with soil to many parts of the Island. Native of the Cape Region, South Africa.

N.Is.: Rooty Hill, Nov. 1989, *M.Christian* (K); Middlegate, *W.R.Sykes NI 996* (CHR); Ball Bay, *W.R.Sykes NI 180* (CHR).

A dangerous weed, poisonous to livestock and very difficult to exterminate. As pointed out for Australia by D.A.Cooke (in *Fl. Australia* 46: 34, 1986) this weed may have originated as a hybrid between *H. flaccida* and *H. collina*.

4. FERRARIA

Ferraria Burm. ex Mill., *Fig. Pl. Gard. Dict.* 187 (1760); named after Giovanni Battista Ferrari (1584–1655), an Italian botanist who published an illustration of this genus in 1633.

Type: *F. crispa* Burm.

Perennial herbs; corm tuber-like, naked or with a membranous tunic. Stem erect, shortly branched above. Leaves cauline, few to many, distichous, linear to ensiform, passing gradually into ovate-lanceolate, amplexicaul bracts. Scape erect, terete, leafy, with 2 (–6)-flowered lateral, bracteate branches; flowers 2 or more per bract pair; pedicels short. Flowers actinomorphic. Perianth segments free, the bases forming a cup; limbs spreading, reflexed, acute to acuminate, crisped on margin, spotted or blotched in dull colours. Filaments forming a column around style; anthers versatile, appressed to style. Ovary long, slender, ±3-angled, tapering to an erect style; stigmas 6, small, each exceeded by 2 broad, fringed lobes. Capsule ellipsoidal to rarely globose. Seeds numerous, angular.

A South African genus of 10 species, 1 of which is sometimes cultivated and has become naturalised on Norfolk Is.

M.P. de Vos, The African genus *Ferraria*, *J. S. African Bot.* 45: 295–375 (1979).

***Ferraria crispa** Burm., *Nova Acta Phys.-Med. Acad. Caes. Leop.-Carol. Nat. Cur.* 2: 199 (1761)

T: Cape of Good Hope, South Africa, J.Burman, *op. cit.* t. 3, fig. 1. So called because of the crisped margins of the perianth lobes.

Illustrations: M.P. de Vos, *J. S. African Bot.* 45: 339, fig. 19 (1979); D.A.Cooke, *Fl. Australia* 46: 25, fig. 6 (1986); C.Brickell, *Gardeners' Encycl. Pl. Fl.* 347 (1989).

Herb to c. 50 cm tall; corm depressed-globose, 1.5–3.5 cm diam. Leaves numerous, ensheathing stem; lower leaves distichous, very narrowly oblong, suberect, 15–40 cm long, acute to obtuse and mucronate, glabrous. Bracts elliptic, 3–6 cm long, keeled, cucullate. Inflorescence enclosed in numerous, overlapping distichous bracts. Flowers malodorous. Perianth segments crisped and undulate along margins, ±fleshy, mottled purplish black; outer segments 2.5–3 cm long, 1–1.7 cm broad; inner segments slightly narrower. Filament tube 6–8 mm long; free upper portions 2–3 mm long; anthers horizontal; pollen orange. Ovary 15–25 mm long; style 7–9 mm long, with branches 3–4 mm long, dividing into 2, slender, spreading, fimbriate arms, 3–4 mm long. Capsule ellipsoidal, 2–2.5 cm long, beaked. Seeds 2.5–3 mm diam., brown, shining.

Norfolk Is. A garden escape now naturalised in one or two places on the Island. A native of South Africa.

N.Is.: Kingston cemetery, *R.O.Gardner 5785* (A, K).

The Norfolk Is. plant appears to be subsp. *crispa*.

5. ROMULEA

Romulea Maratti, *Pl. Romul. Saturn.* 13 (1772), *nom. cons.*; named after Romulus, legendary King of the Romans and founder of Rome, from where the genus was first described.

Type: *R. bulbocodium* (L.) Sebast. & Mauri

Cormous perennials; corm small; tunic hard, smooth. Stem short or erect, slender. Leaves usually all basal or some cauline, linear-filiform, grooved, erect or curved, longer than stiffly erect scapes. Scapes 1–5, terminated by the bracts subtending a solitary, actinomorphic, funnel- or bell-shaped, highly coloured flower. Perianth connate; tube very short; lobes usually equal, ±spreading. Filaments usually inserted near base of tube, free. Style filiform with short deeply bifid branches; stigmas 6, rarely more, grooved above. Capsule shortly cylindrical or subglobose, 3-valved, loculicidal. Seeds numerous, globose or angled.

A genus of c. 90 species, mostly South African but with some in the Mediterranean region and 1 reaching Britain. One species naturalised on Lord Howe Is.

M.P. de Vos, The genus *Romulea* in South Africa, *J. S. African Bot.* Suppl. 9: 1–307 (1972).

***Romulea rosea** (L.) Eckl., *Topogr. Verz. Pflanzensamml. Ecklon* 19 (1827)

var. **australis** (Ewart) M.P. de Vos, *J. S. African Bot.* Suppl. 9: 254 (1972)

Romulea cruciata var. *australis* Ewart, *Proc. Roy. Soc. Victoria* 19: 43, t. 12 (1907). T: near Melbourne, Victoria, 1906, *J.R.Tovey*; lecto: MEL, *fide* M.P. de Vos, *loc. cit.* So named as coming from Australia.

Illustrations: H.W.Davey, *J. Dept. Agric. Victoria* 20: 668 (1922); D.A.Cooke, *Fl. Australia* 46: 46, fig. 10 (1986); D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1799, fig. 818A (1986).

Corm c. 1 cm diam.; tunic splitting to acute teeth. Leaves tough, linear, compressed, with 2 grooves on each side, 5–30 (–50) cm long, 1–2 mm broad. Scapes 1–5, stiff, 3–10 (–15) cm long; spathaceous bracts acute, 5–15 mm long, persistent, the inner flecked with brown on margins. Flowers 15–20 mm long, lilac-pink to deep purple or magenta with yellow centre and three purple veins. Perianth tube c. 2 mm long; lobes 5–18 mm long, 1.5–4 mm broad; outer lobes greenish outside. Capsule shortly cylindrical, leathery, 6–12 mm long. Seeds globose, somewhat angled, 1.5–2 mm diam., dark brown.

Lord Howe Is. Northern Hills; first recorded in 1963 from Mt Eliza. A native of South Africa which has become a noxious weed in parts of Vic. and N.S.W. where it is called Onion Grass or Guildford Grass.

L.H.Is.: Mt Eliza, *F.Davies & A.C.Beauglehole 5263* (MEL).

6. GLADIOLUS

Gladiolus L., *Sp. Pl.* 36 (1753); *Gen. Pl.* 5th edn, 23 (1754); the diminutive of the Latin *gladius* (a sword), in allusion to the form of the leaves.

Type: *G. communis* L.

Cormous perennial; corm with fibrous tunic. Stem leafy. Leaves basal and cauline, flat, equitant. Inflorescence a 1-sided or distichous spike; bracts herbaceous, subtending a single flower. Flowers somewhat zygomorphic, showy. Perianth connate; tube funnel-shaped, usually ±curved; lobes usually unequal, sometimes ±equal, with the upper the largest. Stamens arched, filaments inserted on perianth tube. Style arched, with branches undivided, linear-cuneate. Capsule cylindrical to globose. Seeds numerous, globose or flattened.

A genus of c. 300 species from Europe, Asia and Africa, especially South Africa; 1 species naturalised on Norfolk and Lord Howe Islands. Many species are cultivated for their showy flowers.

G.J.Lewis & A.A.Obermeyer with T.T.Barnard, *Gladiolus*: a revision of the South African species, *J. S. African Bot.* Suppl. 10 (1972).

Gladiolus × hortulanus L.H.Bailey, *Hortus* 277 (1930)

T: cultivated; holo: ?BH *n.v.* The epithet means pertaining to the gardener.

Illustration: L.Greenwood in F.Perry, *Fl. World* 147 (1972).

Robust herb, 70–120 cm high. Leaves 30–50 cm long, 1–2 cm broad. Inflorescence with up to 10 flowers; spathaceous bracts 5–7 cm long, narrowly acute, inner one slightly shorter than outer, upper ones empty. Perianth tube narrow at base, curved, 3–5 cm long; lobes unequal, 5–7 cm broad, orange-apricot. Perianth 7–12 cm long; lobes c. 4–6 cm long. Anthers 2 cm long. Capsule not seen.

Norfolk Is., Lord Howe Is. Escaped from cultivation: on Lord Howe Is. on Stevens Reserve Walk and on Norfolk Is. in a nursery area near Duncombe Bay, invading the grassy areas on the margin of a paddock and between young trees.

N.Is.: above Duncombe Bay, *P.S.Green 2438* (K). **L.H.Is.:** sight record, 1988, *J.G.Conran*.

This is a cultivated plant of complex parentage with many different cultivars.

7. ANOMATHECA

Anomatheca Ker Gawl., *Ann. Bot.* (*König & Sims*) 1: 277 (1804); from the Greek *anomalos* (abnormal) and *theca* (a case, a capsule), in allusion to the papillose wall of the capsule in the type species.

Type: *A. juncea* (L.f.) Ker Gawl. = *A. verrucosa* (Vogel) Goldblatt

Perennial herbs; corms conical to ovoid, covered with a fibrous net-like tunic. Stem erect, terete or winged. Basal leaves 2–several, soft, erect and ensiform to decumbent and ovate-lanceolate; cauline leaves few, lanceolate. Inflorescence 1-sided, flexuous, spicate or pseudo-racemose; floral bracts herbaceous to membranous, broad, apically toothed. Flowers ±erect, zygomorphic, slightly bilabiate. Perianth connate; tube short or long, erect, slender, straight or curved at apex, or widening at throat; lobes subequal. Stamens asymmetrically inserted in throat; anthers unilateral, often contiguous. Ovary small; style erect, with stigmatic branches deeply 3-fid and recurved. Capsules oblong, smooth or roughly papillose. Seeds rounded or angular.

A genus of 5 species, native of South Africa, and sometimes cultivated; 1 species naturalised on Norfolk Is.

P.Goldblatt, A revision of the genera *Lapeirousia* Pourret and *Anomatheca* Ker in the winter rainfall region of South Africa, *Contr. Bolus Herb.* 4: 1–111 (1972).

***Anomatheca laxa** (Thunb.) Goldblatt, *J. S. African Bot.* 37: 442 (1971)

Gladiolus laxa Thunb., *Fl. Cap.* 2nd edn, 50 (1823); *Lapeirousia laxa* (Thunb.) N.E.Br., *J. Linn. Soc., Bot.* 48: 24 (1928). T: South Africa, *C.P.Thunberg s.n.*; holo: UPS *n.v.*, photo seen (IDC microfiche 1036-3184.44/13). So named from the open or lax inflorescence.

Illustrations: P.Goldblatt, *Contr. Bolus Herb.* 4: 78, fig. 6E (1972); A.B.Graf, *Exotica* 12th edn, 2: 1336 (1985); A.B.Graf, *Tropica* 3rd edn, 525 (1986), both as *Lapeirousia laxa*.

Herb to 35 cm tall; corm conical, c. 1 cm diam. Basal leaves several, ensiform, 10–35 cm long, 0.5–1.5 cm broad, glabrous, soft-textured with a prominent midrib. Scape somewhat shorter than leaves. Spike 3–6-flowered; bracts ovate, 4–7 mm long, acute. Perianth pink or pale blue; tube slender, 2–3 cm long, widening at throat; lobes spreading, oblong, 8–12 mm long, the lower 3 with a dark blotch near base. Style branching above anthers, deeply forked and recurved. Capsule c. 1.2 cm long, smooth to irregularly papillose. Seeds c. 1 mm diam., dark red, glossy.

Norfolk Is. A recently recorded garden escape. Native to South Africa, but also naturalised in N.S.W.

N.Is.: forest remnant, S of Mission Rd, *R.O.Gardner 5826* (AK).

8. TRITONIA

Tritonia Ker Gawl., *Bot. Mag.* 16, sub t. 581 (1802); the name was derived from *Triton*, a Greek sea god, in his aspect as a weathercock, alluding to the variable direction of the stamens in different species.

Type: *T. squalida* Ker Gawl., *nom. illeg.* = *T. lancea* (Thunb.) N.E.Br.

Perennial cormous herbs. Stem erect, rarely branched. Leaves basal or near basal, distichous, linear-ensiform, equitant. Inflorescence a simple or branched, distichous spike; bracts subtending a single flower, ±membranous, apically toothed. Flowers ±actinomorphic or zygomorphic. Perianth connate below to form a cylindrical tube, dilated above to funnel-shaped; lobes spreading, equal or unequal, longer than tube. Stamens arcuate, inserted in tube. Style filiform, branches simple. Capsule small, ellipsoidal. Seeds globose or angled.

A genus of c. 55 species native in tropical and southern Africa; 1 species naturalised on Norfolk Is.

M.P. de Vos, The African genus *Tritonia* Ker Gawler (Iridaceae): Part 1, *J. S. African Bot.* 48: 105–163 (1982); Part 2, *J. S. African Bot.* 49: 347–422 (1983).

***Tritonia lineata** (Salisb.) Ker Gawl., *Ann. Bot.* (*König & Sims*) 1: 228 (1804)

Gladiolus lineatus Salisb., *Prodr. Stirp. Chap. Allert.* 40 (1796). T: cultivated, Hort. Kew.; holo: ?BM *n.v.* From the Latin *lineatus* (with lines or stripes), in allusion to the three parallel lines on the outside of the perianth lobes.

Illustrations: A.J.Healy & E.Edgar, *Fl. New Zealand* 3: fig. 25e (1980); D.A.Cooke, *Fl. Australia* 46: 61, fig. 11F–H (1986); D.A.Cooke in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 4: 1801, fig. 819B (1986).

Tufted perennial. Stem stiff, 30–60 cm tall. Leaves flat, linear-lanceolate to ensiform, 10–30 cm long, 7–15 mm broad, with prominent midrib and submarginal veins. Inflorescence longer than leaves, simple, 6–10-flowered, slightly laterally flexuous; bracts erect, broad, 7–12 mm long, apically toothed, brown. Flowers ±zygomorphic. Perianth pale yellow or cream with 3 parallel, brown or greenish lines down the centre outside, and divergent veins; tube straight, funnel-shaped, 10–15 mm long; lobes oblong, 15–20 mm long, rounded, uppermost slightly broader. Capsule c. 8 mm long. Seeds numerous.

Norfolk Is. An escape from cultivation and naturalised in one or two places. A native of South Africa, also naturalised in eastern Australia and New Zealand.

N.Is.: New Cascade Rd, *W.R.Sykes NI 179* (CHR).

9. CROCOSMIA

Crocosmia Planch., *Fl. Serres Jard. Eur.* 7: 161 (1851); from the Greek *krokos* (saffron) and *osme* (a smell) as the dried flowers smell of saffron when moistened with warm water.

Type: *C. aurea* (Pappe ex Hook.) Planch.

Perennial, cormous herbs with creeping stolons. Stem erect, rigid. Leaves mostly basal, linear to narrowly lanceolate, ensiform, ribbed, sometimes plicate. Scape erect. Inflorescence several-flowered, spicate, compound or simple; bracts small, ±membranous, broad, apically toothed, subtending 1 flower. Flowers zygomorphic, yellow or orange. Perianth connate; tube curved, narrow at base, abruptly expanded above; lobes similar or upper slightly larger. Stamens inserted on tube, free; anthers linear, versatile, bifid at base. Style slender; stigmatic branches shortly 3-fid, slightly expanded, longer than stamens. Capsule globose, 3-lobed. Seeds globose or angled.

A genus of c. 10 species, natives of southern Africa; 1 species naturalised on Lord Howe Is. Several species are cultivated as ornamentals and a number of garden hybrids have been raised.

M.P. de Vos, The African genus *Crocosmia* Planch., *J. S. African Bot.* 50: 463–502 (1984).

***Crocosmia × crocosmiiflora** (Lemoine ex Morren) N.E.Br., *Trans. Roy. Soc. S. Africa* 20: 264 (1932)

Montbretia × crocosmiaefolia Lemoine ex Morren, *Belgique Hort.* 31: 299, t. 14 (1881). T: cultivated, not designated. So named because the flowers resemble those of *Crocosmia*.

Illustrations: I.B.Pole Evans, *Fl. Pl. S. Africa* 4: t. 152 (1924); M.Rex & R.Philips, *The Bulb Book* 168 (1981).

Herb 50–100 cm tall. Leaves 30–75 cm long, slightly tapered towards base, long-tapered at apex, glabrous. Inflorescence a panicle of 1–few spikes, 4–20-flowered; bracts 5–10 mm long, scarious. Flowers bright orange-red. Perianth tube slightly curved, funnel-shaped, 12–18 mm long; lobes 18–20 mm long, spreading. Anthers exserted. Style branches c. 4 mm long, slightly obcuneate. Capsule rarely developed.

Lord Howe Is. This garden plant has escaped from cultivation on the Island, presumably as a garden throw-out, and is now reproducing itself by the production of corms and stolons. It originally arose as a hybrid between *Crocosmia aurea* (Pappe ex Hook.) Planch. and *C. potsii* (Baker) N.E.Br., both of which are natives of South Africa.

L.H.Is.: Anderson Rd, near McGee St, *J.G.Conran 637* (K, NSW).

110. ALOACEAE

Perennial, simple or sparsely branched shrubs, often arborescent. Leaves long-lasting, in dense terminal rosettes, spiral or distichous, simple, often toothed, sometimes spinescent at apex, succulent, sessile. Inflorescence terminal or axillary, a spike, raceme or panicle. Flowers actinomorphic or zygomorphic, bisexual. Perianth lobes 6, petaloid; outer 3 basally connate; inner 3 free. Stamens 6. Ovary superior, 3-locular; ovules numerous, axile; style simple; stigma capitate or trilobed. Fruit a capsule, rarely fleshy. Seeds commonly flattened or winged.

A family of c. 5 to 7 genera and 500 or more species, native only in the Old World and mainly African, especially South African; 1 genus introduced on Lord Howe Is. Some genera are widely cultivated by horticulturalists interested in succulent plants. It includes the genus *Kniphofia* Moench, well-known to gardeners as Red-Hot Pokers. The family is often treated as a subfamily of the Liliaceae, separated largely by its woody habit.

P.I.Forster & H.T.Clifford, Aloeaceae, *Fl. Australia* 46: 66–70 (1986).

ALOE

Aloe L., *Sp. Pl.* 1: 319 (1753); *Gen. Pl.* 5th edn, 150 (1754); the name is derived from an old Arabic name for representatives of the genus used in medicine.

Type: *A. perfoliata* L.

Shrubby perennials with short stems, or arborescent. Leaves in terminal rosettes, sometimes dispersed along stem, succulent, often tough and leathery, usually sinuate-dentate and spiny on margins. Inflorescence axillary, racemose or paniculate, often with sterile bracts on lower part. Flowers slightly zygomorphic, pedicellate, protandrous. Perianth yellow, orange or red. Stamens exserted. Style exserted on second day of anthesis. Fruit a papery or woody capsule. Seeds numerous, triquetrous or flattened.

A genus of c. 350 species, native of Africa, Madagascar and Arabia, especially southern Africa; 2 species naturalised on Lord Howe Is. *Aloe vera* (L.) Burm.f. and close relatives are grown extensively for the cosmetics industry, in several countries including Australia.

Erect, not more than 50 cm tall; leaves rosulate, 5–10 cm broad, not sheathing-auriculate at base **1. A. maculata**

Scrambling; leaves dispersed along stem, 1.5–2 cm broad, sheathing-auriculate at base **2. A. ciliaris**

1. *Aloe maculata* All., *Auct. Syn.* 13 (1773)

T: cultivated, origin S. Africa. Illustration in J.Commelijn, *Horti Med. Amstelod.* 2: 9 t. 5 (1701). The Latin epithet means spotted, referring to the usually spotted upper surface of the leaf.

Illustrations: B.Jeppe, *S. African Aloes* 67 (1969); H.Bornman & D.Hardy, *Aloes S. African Veld* 88 (1971); A.B.Graf, *Exotica* 12th edn, 2: 1401–1402, 1405 (1985); all as *A. saponaria* Haw.

Succulent erect perennial; suckering. Stems up to 50 cm, usually less. Leaves 12–20, densely rosulate, broadly to narrowly lanceolate, 10–30 cm long, 5–10 cm broad, not sheathing-auriculate at base, sinuate-dentate, with numerous, sharp teeth 3–5 mm long; upper surface usually with numerous dull white oblong spots arranged in wavy interrupted bands; lower surface convex, usually without spots. Inflorescence axillary, branched, 40–60 cm tall or sometimes more, racemes capitate, flat-topped, c. 30-flowered; pedicels 30–45 mm long. Flowers ±pendent. Perianth slightly flattened-cylindrical, 35–45 mm long, constricted above ovary, yellow to orange-red; perianth subacute to obtuse, spreading or recurved, cohering for most of length. Fruit not seen.

Lord Howe Is. Naturalised as a garden escape on Lagoon Rd. This species is a native of South Africa.

L.H.Is.: Lagoon Rd, c. 50 m E of Neds Beach Rd, *J.G.Conran 629* (K, NSW).

Until recently, this species was known as *A. saponaria* (Aiton) Haw.

2. *Aloe ciliaris* Haw., *Philos. Mag. J.* 66: 281 (1825)

T: cultivated, origin S. Africa; not located. So called from the ciliolate leaf margin.

Illustrations: B.Jeppe, *S. African Aloes* 110 (1969); H.Bornman & D.Hardy, *Aloes S. African Veld* 190 (1971); A.B.Graf, *Exotica* 12th edn, 2: 1398, 1400, 1404 (1985).

Scrambling succulent perennial, up to 5 m long. Leaves dispersed along stem, linear-lanceolate, convex beneath, 8–15 cm long, 1.5–2 cm broad, auriculate and stem-sheathing at base, dentate-ciliolate, with sharp teeth 1–3 mm long, becoming sparse and then absent towards attenuate apex, not spotted. Inflorescence axillary, simple, 15–30 cm long, cylindrical-racemose, 25–30-flowered; pedicels c. 5 mm long. Flowers horizontal, pendulous at anthesis, bright red. Perianth cylindrical, c. 3 cm long; segments c. 6 mm long. Fruit not seen.

Lord Howe Is. Escaped from cultivation and established in roadside forest in the central, inhabited part of the Island. A native of the Cape Province of South Africa.

L.H.Is.: Lagoon Rd, near Lagoon Store, *J.G.Conran 630* (K, NSW).

111. AGAVACEAE

Coarse herbs or woody perennials. Leaves simple, usually crowded. Inflorescence somewhat massive, terminal, racemose or paniculate. Flowers unisexual or bisexual. Perianth 3 + 3, petaloid, often fleshy, free or connate at base. Stamens 6, inserted in the perianth tube or at base of lobes; filaments free; anthers dorsifixed. Ovary superior (or inferior), 3-locular; placentation axile; ovules usually numerous; style entire, terminal; stigma capitate or 3-lobed. Fruit a loculicidal capsule or berry. Seeds compressed.

A family of c. 20 genera and perhaps 600 species, from the warmer parts of the world, especially some of the arid regions; 2 native genera on Norfolk Is. and 3 introduced on Lord Howe Is.

Phormium and *Cordyline* are sometimes placed into the families Phormiaceae and Asteliaceae respectively. The genus *Dracaena*, members of which are often cultivated, also belongs to this family.

G.Bentham, Liliaceae, *Fl. Austral.* 7: 20–22 (1878); P.I.Forster & L.Pedley, Agavaceae, *Fl. Australia* 46: 71–88 (1986).

KEY TO GENERA

1 Leaves rosulate or crowded at ends of branches, not tufted; plant usually with a woody short stem to tall trunk

2 Leaves spine-tipped, rosulate, succulent

3 Ovary superior — **† YUCCA**

3: Ovary inferior

4 Flowers erect; stamens exserted, longer than perianth — **1. AGAVE**

4: Flowers pendulous; stamens included, shorter than perianth — **2. FURCRAEA**

2: Leaves acute, not spine-tipped, spirally crowded, thinly coriaceous — **5. CORDYLINE**

1: Leaves tufted, erect; plant without a distinct woody stalk or trunk

5 Leaves 1–2 (–3) m long, glaucous, midrib prominent; perianth lobes 2.5–4 cm long, yellow-orange — **3. PHORMIUM**

5: Leaves 0.3–1.2 m tall, dark green, transversely banded with lighter irregular areas; perianth lobes 1.5–2 cm long, greenish white — **4. SANSEVIERA**

† *Yucca aloifolia* L. (*J.G.Conran 628*, K, NSW) has been reported to be growing on Lord Howe Is. away from cultivation, but it is not described below as it is apparently not reproducing itself and thus not truly naturalised. It is presumably a garden throw-out.

1. AGAVE

Agave L., *Sp. Pl.* 1: 323 (1753); *Gen. Pl.* 5th edn, 150 (1754); from the Greek *agavos* (admirable), in allusion to the noble appearance of these plants.

Type: *A. americana* L.

Robust, succulent perennials, with or without a short stout stem, often suckering. Leaves radical or in a terminal, crowded rosette, long-lived, usually stiff, succulent, fibrous, often marginally spiny, with an apical spine. Inflorescence a terminal raceme or panicle, often large, with numerous flowers in umbellate clusters. Flowers actinomorphic, bisexual, tubular or funnel-shaped, protandrous. Perianth shortly connate; lobes subequal, imbricate in bud. Stamens exserted, inserted on perianth tube near throat; filaments 6–9 cm long; anthers versatile. Ovary inferior; ovules in 2 rows per locule; style slender; stigma 3-lobed. Fruit a capsule. Seeds numerous, flattened, black.

A genus of c. 300 species from the southern U.S.A. to tropical America; 1 species naturalised on Lord Howe Is. *Agave sisalana* Perrine is cultivated for its fibres, called sisal, and others are often cultivated for their arresting appearance.

***Agave americana** L., *Sp. Pl.* 1: 323 (1753)

T: tropical America; lecto: LINN 443.1, *fide* H.S.Gentry, *Agaves Continental N. Amer.* 278 (1982); IDC microfiche 177/2.236/7. Named after the continent from which it was first described.

Illustrations: H.S.Gentry, *op. cit.* 281, figs 12.6, 12.7, 12.9; A.B.Graf, *Exotica* 12th edn, 1: 85, 89 (1986).

Large trunkless perennial, suckering. Leaves numerous in a basal rosette, stout, rigid or reflexed towards apex, lanceolate, 1–2 m long, marginal spiny teeth 5–8 mm long, 2–6 cm

apart, with a stout apical spine 3–5 cm long, light grey-green, glaucous. Inflorescence a panicle 5–8 m tall, with 15–35 branches in upper half bearing umbellate clusters of flowers. Flowers erect, 7–10 cm long, yellow. Perianth tube 8–20 mm long. Filaments 10–90 mm long; anthers 30–36 mm long. Ovary 30–45 mm long. Capsule oblong, c. 5 cm long. Seeds 7–8 mm long, shiny, black. *Century Plant.*

Lord Howe Is. A garden escape now propagating itself by suckers. A native of Mexico, often cultivated.

L.H.Is.: c. 50 m E of Neds Beach Rd, on Lagoon Rd, *J.G.Conran 628* (K, NSW).

2. FURCRAEA

Furcraea Vent., *Bull. Sci. Soc. Philom. Paris* 1: 65 (1793); named after Antoine-François de Fourcroy (1755–1809), Parisian chemist and naturalist.

Type: *F. cubensis* (Jacq.) Vent.

Large rosette-forming succulent with or without a stout woody trunk. Leaves rosulate, long-lived, rigid, succulent, narrowed towards base, entire or prickly on margins, with an apical spine. Inflorescence terminal, stout, erect, paniculate, with flowers in clusters of 1–3 in axils of bracts. Flowers actinomorphic, bisexual, pendent, bell-shaped, white or greenish white, often replaced by bulbils. Perianth basally connate; lobes ovate, spreading. Stamens attached at base of perianth lobes; filaments swollen in lower half; anthers dorsifixed. Ovary inferior; ovules in 2 rows per locule; style angled, thickened below; stigma small, 3-lobed. Fruit a capsule, oblong, 3-angled. Seeds numerous, flattened.

A genus of c. 20 species from tropical America; 1 species naturalised on Lord Howe Is.

*Furcraea foetida (L.) Haw., *Syn. Pl. Succ.* 1: 73 (1812)

Agave foetida L., *Sp. Pl.* 1: 323 (1753). T: illustration in J.Commelijn, *Horti Med. Amstelod.* 2: 35, t. 18 (1701); lecto: *fide* W.Marais & M.J.E.Coode, *Fl. Mascareignes* 180: 6 (1978). The Latin epithet means stinking and alludes to the unpleasant smell of the cut leaf.

Illustrations: J.Sims, *Bot. Mag.* 48: t. 2250 (1821), as *F. gigantea*; P.I.Forster, *Fl. Australia* 46: 73, fig. 14D–G (1986).

Rosulate succulent with trunk 50 cm or more tall. Leaves oblanceolate-lanceolate, 1.2–2.5 m long, 7–20 cm broad, entire or with antrorsely hooked teeth to 3 mm long in lower half, narrowed to a sharp point at apex, glossy green; sap fetid. Inflorescence 6–12 m tall, with panicle 3–6 m long. Flowers 3.5–4 cm long, 4–4.5 cm diam., white above, greenish below, heavily fragrant, often replaced by bulbils. Perianth lobes 2.5–3.3 cm long. Stamens included; filaments c. 10 mm long. Ovary c. 5 mm long; style c. 10 mm long. Fruit not seen.

Lord Howe Is. Naturalised near Neds Beach and the eastern edge of the airstrip. Native in central America, the West Indies and tropical South America.

L.H.Is.: c. 50 metres E of Neds Beach on Lagoon Rd, *J.G.Conran 639* (K, NSW).

3. PHORMIUM

Phormium J.R.Forst. & G.Forst., *Char. Gen. Pl.* 47, t. 24 (1776); from the Greek *phormion* (a mat), in allusion to the weaving of the fibres of this plant by the Maoris.

Type: *P. tenax* J.R.Forst. & G.Forst.

Tall, tufted, perennial herbs, rhizomatous. Leaves long-lived, linear-ensiform, equitant, fibrous, entire. Inflorescence tall, stout, paniculate with deciduous sheathing bracts; upper bracts smaller, subtending short flowering branchlets; pedicels articulated. Flowers slightly zygomorphic, bisexual, erect. Perianth segments forming a tube, free or connate at base; inner segments slightly longer. Stamens inserted near base of perianth tube, unequally exserted; filaments somewhat stout; anthers dorsifixed. Ovary superior, elongate; ovules in 3

rows, axile; style filiform, terete; stigma small, terminal. Fruit an elongate, loculicidal capsule. Seeds numerous, ±flattened, black.

A genus of 2 species, both native to New Zealand and 1 extending to Norfolk Is. Sometimes, and recently, placed in the family Phormiaceae with *Dianella* (R.D.Henderson & H.T.Clifford, *Taxon* 33: 423–427, 1984).

Phormium tenax J.R.Forst. & G.Forst., *Char. Gen. Pl.* 48, t. 24 (1776)

T: New Zealand, *J.R. & G.Forster*; syn: *n.v.* The epithet means tough, tenacious, in allusion to the strong fibres in the leaves, used for cordage by the Maoris.

Illustrations: R.M.Laing & E.W.Blackwell, *Pl. New Zealand* 4th edn, 107, fig. 34 (1940); J.T.Salmon, *New Zealand Fl. Pl. Colour* 102, fig. 310 (1963); L.B.Moore & J.B.Irwin, *Oxford Book New Zealand Pl.* 181 (1978).

Leaves stiff, ±erect, 1–2 (–3) m tall, 4–10 cm broad, glaucous; midrib prominent with numerous fine longitudinal veins. Inflorescence to c. 3 or 4 m tall; axis stout. Flower 3–5 cm long. Perianth connate at base; lobes 2.5–4 cm long, yellow-orange, tips of outer lobes slightly recurved. Filaments red; anthers olive green before dehiscence. Ovary erect. Capsule erect, ellipsoidal-cylindrical, slightly curved, 4.5–9 cm long, blackish, persistent. Seeds flattish, ellipsoidal, c. 10 mm long, slightly twisted, shining and black. *Flax*. Fig. 97G–I.

Norfolk Is. On grassy slopes and cliffs by the sea. Also native in New Zealand.

N.Is.: Ball Bay Reserve, *R.D.Hoogland 11236* (CANB); *s. loc.*, *R.M.Laing* (CHR).

The presence of this flax plant and the Norfolk Island Pine, *Araucaria heterophylla*, on Norfolk Is. were the reasons for the Island's settlement early in 1788.

4. SANSEVIERA

Sanseviera Thunb., *Prodr. Pl. Cap.* 65 (1794); named after Pietro Sanseverino, Prince of Bisignano, who grew the type species in his garden near Naples at the end of the 18th century.

Type: *S. hyacinthoides* (L.) Druce

Stemless perennials; rhizome creeping. Leaves tufted, long-lived, erect, fibrous, coriaceous or succulent, terete or flattened, entire. Inflorescence terminal, racemose, simple or paniculate, with flowers solitary or clustered in axils of scarious bracts. Flowers actinomorphic, bisexual. Perianth segments connate at base; base tubular; lobes equal, usually narrow, spreading or commonly recurved. Stamens exserted, apparently through the reflexion of perianth lobes, inserted at top of perianth tube; filaments slender; anthers medifixed. Ovary superior; ovule 1 per locule; style slender; stigma entire. Fruit a 1–3-seeded berry.

A genus of c. 60 species from dry areas of tropical and southern Africa, Madagascar and Arabia, with a few in southern Asia; 1 species naturalised on Lord Howe Is. Several species are cultivated as succulents. The genus is sometimes classified in the family Dracaenaceae.

***Sanseviera trifasciata** Hort. ex Prain, *Bengal Pl.* 2: 1054 (1903)

T: cultivated, origin tropical Africa; holo: not designated, probably no specimen preserved. The epithet comes from the Latin *tri-* (three-) and *fascis* (a bundle), in allusion to the often tufted appearance of the leaves.

Illustrations: A.B.Graf, *Exotica* 12th edn, 2: 1482, 1484–1485 (1985); A.B.Graf, *Tropica* 3rd edn, 607, 609 (1986); P.I.Forster, *Fl. Australia* 46: 79, fig. 16 (1986).

Perennial; rhizomes stout. Leaves in tufts of 2–6, narrowly lanceolate, 30–120 cm long, 2.5–7 cm broad, tapering to a stout, sharp point, stiff, leathery, dark green, transversely banded with light green irregular areas. Racemes erect, 30–75 cm tall. Flowers in clusters of 1–3, greenish white, scented. Perianth segments free; tube 6–12 mm long; lobes linear, 15–20 mm long, obtuse. Fruit globose, 8 mm diam., orange.

Lord Howe Is. A garden escape near several of the roads. A native of tropical Africa, now widely cultivated.

L.H.Is.: Lagoon Rd, between Lagoon Store and Wilson's Bike Shop, *J.G.Conran 631* (K, NSW).

5. CORDYLINE

Cordyline Comm. ex R.Br., *Prodr.* 280 (1810), *nom. cons.*; from the Greek *kordyle* (a club), in allusion to the club-like flower buds of some species.

Type: *C. cannifolia* R.Br.

Tufted or arborescent perennials, with woody stems. Leaves long-lived, numerous, spirally crowded at ends of branches, linear or lanceolate; petiole base broadened to clasp stem. Inflorescence paniculate; bracteoles 1-flowered. Flowers actinomorphic, bisexual. Perianth connate at base; lobes equal, becoming recurved. Stamens inserted at mouth of perianth tube; filaments flattened, stoutish; anthers dorsifixed. Ovary superior; ovules few to many per locule; style filiform; stigma capitate or 3-lobed. Fruit ±globose, fleshy, becoming dry with age, indehiscent or tardily dehiscent. Seeds usually curved, black.

A genus of c. 15 species from Mauritius and India to Australia (Qld), New Zealand, the Pacific Islands and South America, with 1 species endemic to Norfolk Is. Sometimes classified in the family Asteliaceae.

The widely grown *Cordyline fruticosa* (L.) A.Chev. had been recorded from Norfolk Is. (R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 20 (1915), as *C. terminalis* (L.) Kunth) but it has been generally agreed that this species is an introduction which has not become naturalised. J.H.Maiden (*Proc. Linn. Soc. New South Wales* 28: 719, 1904), under the name *C. terminalis* var. *cannaefolia* (R.Br.) Baker, says it was introduced by the Pitcairn Islanders and known as Pitcairn or Home Rau-ti.

Cordyline obtecta (Graham) Baker, *J. Linn. Soc., Bot.* 14: 543 (1875)

Dracaena obtecta Graham, *Edinburgh New Philos. J.* 3: 175 (1827); *Cordyline baueri* Hook.f., *Gard. Chron.* 1860: 792 (1860), *nom. illeg.* T: cultivated at the Royal Botanic Gardens Edinburgh; not traced. The epithet comes from the Latin *obtegere* (to conceal, to cover up), in allusion to the inflorescence scarcely protruding beyond the leaves in the plant as first described.

[*Dracaena australis auct. non* G.Forst.: W.J.Hooker, *Bot. Mag.* 55: t. 2835 (1828)]

[*Cordyline australis auct. non* (G.Forst.) Endl.: S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 29 (1833)]

[*Cordyline cannaefolia auct. non* R.Br.: R.Heward in W.J.Hooker, *Lond. J. Bot.* 1: 123 (1842)]

Illustrations: W.J.Hooker, *Bot. Mag.* 55: t. 2835 (1828), as *Dracaena australis*; O.Evans in Anon., *Dars-Et* [12] (1976).

Tree to 10 m tall; trunk 20–30 cm diam.; old bark flaky, grey. Leaves sessile, numerous, thinly coriaceous, erect to spreading, narrowly lanceolate-ensiform, 35–100 cm long, 2.5–7 cm broad, contracted above base to a flat, leafy petiole ¼–⅓ as wide as lamina, acute. Inflorescence much branched, erect, pyramidal, c. 30 cm long; bracteoles subtending flowers ±equal, c. 1 mm long. Perianth white; lobes equal, 5–6 mm long. Filaments connate at base. Fruit spheroidal, 4–5 mm diam., whitish or bluish purple. *Ti.*

Norfolk Is. Endemic. Frequent in the forest in the National Park.

N.Is.: Mt Bates, *P.S.Green 1388* (A); between Mt Pitt and Mt Bates, *R.D.Hoogland 6648* (CANB); Mt Pitt Rd, *M.Lazarides 8038* (CANB, K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (NSW).

Very close to *Cordyline kaspar* W.R.B.Oliv. of the Three Kings Is., New Zealand, with which, after investigation, it may prove to be conspecific.

112. SMILACACEAE

Woody climbers or scramblers, often with stems bearing hooked prickles. Leaves opposite, whorled or usually alternate, often with petiolar or rarely leaf opposed tendrils; venation usually reticulate between 3–7 curved longitudinal veins. Inflorescence usually axillary, simple or compound, umbellate, racemose or spicate. Flowers unisexual or bisexual. Perianth segments 3 + 3, usually ±similar and petaloid, usually free. Stamens usually 6; filaments free or connate; staminodes present in pistillate flowers. Ovary superior, 3-locular, usually lacking in staminate flowers; ovules 1–many per locule, axile; style various; stigma capitate or 3-lobed. Fruit a 1–3-seeded berry. Seeds 1–many.

A family of c. 12 genera, mainly from the tropical and subtropical regions; 1 genus native on both Islands and another on Lord Howe Is.

Rhipogonum dubium Endl. was described from Norfolk Is. by S.F.L.Endlicher (*Prodr. Fl. Norfolk.* 30, 1833) but the type and only specimen was destroyed in 1945. Although A.L.P.P. de Candolle (*Mongr. Phan.* 1: 217, 1878) suggested that it might possibly be a *Dioscorea* this is very unlikely. A careful comparison of the description with the known plants of Norfolk Is., while accounting for those included by Endlicher, shows, by process of elimination, that it must be a *Clematis.*

G.Bentham, Liliaceae, *Fl. Austral.* 7: 6–10, 17–19 (1863); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Smilacaceae, *Fl. Java* 3: 98–99 (1968); J.G.Conran & H.T.Clifford, Smilacaceae, *Fl. Australia* 46: 180–196 (1986).

KEY TO GENERA

Leaves coriaceous, broadly ovate to suborbicular; stems prickly; inflorescence with 20–50 or more flowers **1. SMILAX**

Leaves herbaceous, narrowly lanceolate to narrowly elliptic; stems smooth; inflorescence 5–12-flowered **2. GEITONOPLESIUM**

1. SMILAX

Smilax L., *Sp. Pl.* 2: 1028 (1753); *Gen. Pl.* 5th edn, 455 (1754); possibly the ancient Greek name for these climbers.

Type: *S. aspera* L.

Shrubby dioecious climbers. Stems often with recurved hooked prickles. Leaves alternate, usually broad, coriaceous, with reticulate venation and longitudinal veins; petioles usually with 2 caducous tendrils. Inflorescence axillary, umbellate, unisexual. Perianth lobes free, ±equal. Anthers 3–18, free, often staminodial in female flowers. Ovary small, flask-shaped, lacking in male flowers. Fruit a berry with 1–3 seeds.

A large genus of c. 350 species; mainly from tropical and subtropical regions throughout the world but also from some temperate areas; 1 species native to Lord Howe Is. *Smilax glyciphylla* Sm. was recorded from Norfolk Is. by R.Tate in *Macleay Mem. Vol.* 220 (1893), but rightly doubted by J.H.Maiden (*Proc. Linn. Soc. New South Wales* 28: 718, 1904). *Smilax purpurata* G.Forst. has also been recorded from Norfolk Is.; J.H.Maiden (*loc. cit.*) says 'on good authority, but I cannot quote it'; yet the occurrence of this species on the Island has never been confirmed.

Smilax australis R.Br., *Prodr.* 293 (1810)

T: Port Jackson, New South Wales, *R.Brown*; holo: BM. The epithet is the Latin for southern.

Smilax latifolia R.Br., *Prodr.* 293 (1810). T: tropical Australia, *R.Brown*; holo: BM.

[*Smilax purpurata auct. non* G.Forst.: A.L.P.P. de Candolle, *Monogr. Phan.* 1: 64 (1878), *p.p.*]

Illustrations: B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 341, fig. 203c–g (1983); J.G.Conran & H.T.Clifford, *Fl. Australia* 46: 185, fig. 47 (1986); I.Hutton, *Lord Howe Is.* 116 (1986).

Tough, extensive climber. Stem slightly angular, with a variable development of small hooked prickles. Leaves stiff, very coriaceous, with 2 tendrils from base of many petioles; lamina broadly ovate to suborbicular, 5–10 cm long, 3.5–8 cm broad, rounded-cordate at base, rounded and mucronate at apex, with 5 prominent longitudinal veins and reticulate between. Inflorescence of 20–50 or more flowers; peduncle 1–2 cm long; pedicels filiform, 1–2 cm long. Perianth lobes c. 3 mm long, greenish cream. Fruit globose, c. 1 cm diam., black, shining. Seeds 1–3, rounded or angular, c. 5 mm diam., black.

Lord Howe Is. A common liane in lowland forest. Flowers mid July–mid Oct. Also occurs in northern and eastern Australia.

L.H.Is.: Malabar, *M.M.J. van Balgooy 1090* (CANB); *loc. id., P.S.Green 1947* (K); between Old Settlement and North Bay, *P.S.Green 1927* (K); Prince William Henry Bay, *M.M.J. van Balgooy 1134* (CANB); E end of Neds Beach, *G.Uhe 1242* (K).

2. GEITONOPLESIUM

Geitonoplesium A.Cunn. ex R.Br., *Bot. Mag.* 59: t. 3131 (1832); from the Greek *geiton* (a neighbour) and *plesion* (near), in allusion no less to the close affinity of this plant with *Eustrephus* than to the close proximity of the two in one of Cunningham's localities.

Type: *G. cymosum* (R.Br.) A.Cunn. ex R.Br.

Slender climbing or scrambling shrubs. Leaves alternate, resupinate, shortly petiolate, narrowly lanceolate to narrowly elliptic, with a prominent midrib and parallel venation. Inflorescence a few-flowered, terminal, cymose panicle, sometimes subfasciculate. Flowers bisexual. Perianth lobes free, equal. Stamens 6, free. Ovary globular; ovules several per locule. Fruit a berry. Seeds few to many.

A monotypic genus, distributed from the Philippines, eastern Indonesian islands and New Guinea, to Fiji and New Caledonia, to eastern Australia, and to Norfolk and Lord Howe Islands. Sometimes classified in the Luzuriagaceae or the Geitonoplesiaceae

J.G.Conran, Variation in *Eustrephus* R.Br. ex Ker Gawl. and *Geitonoplesium* A.Cunn. ex R.Br. (Asperagales: Luzuliagaceae), *Muelleria* 6: 363–370 (1987).

Geitonoplesium cymosum (R.Br.) A.Cunn. ex R.Br., *Bot. Mag.* 59: t. 3131 (1832)

Luzuriaga cymosa R.Br., *Prodr.* 282 (1810). T: Port Jackson, Australia, *R.Brown*; holo: BM. So named in allusion to the cymose inflorescence.

Illustrations: B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 338, fig. 200d–e (1983); I.Hutton, *Lord Howe Is.* 115 (1986); J.G.Conran & H.T.Clifford, *Fl. Australia* 46: 195, fig. 50 (1986).

Shrub climbing or scrambling to several metres. Stem wiry, much branched, glabrous. Leaves herbaceous; petiole 1–3 mm long; lamina 4–9 cm long, 0.6–1.5 cm broad, acute with a small apiculum. Inflorescence often drooping, 5–12-flowered; pedicels 4–10 mm long. Flowers white, sweetly scented. Perianth lobes oblong, 6–8 mm long, white. Anthers linear, 3–4 mm long. Ovary 1–2 mm diam. Fruit globose, 6–8 mm diam., purple-black. Seeds irregularly rounded, c. 3 mm diam., black. *Climbing Lily* (N.Is.). Figs 72, 97F.

Norfolk Is., Lord Howe Is. Generally uncommon on Norfolk Is. but more widespread in the northern forest of Lord Howe Is.; flowers mid Nov.–late Mar.

N.Is.: *s. loc., A.Cunningham 68* (K); *s. loc., R.M.Laing* (CHR). **L.H.Is.:** slopes of Malabar, *P.S.Green 1570A* (K); S end of Anderson Rd, *J.Pickard & A.N.Rodd 1406* (K, NSW); Transit Hill, *P.S.Green 2053* (K).

The plants on the Islands appear consistently to be the broad leaved form of this species.

113. ORCHIDACEAE

Perennial herbs, epiphytic or terrestrial, rarely saprophytic. Roots often velamen-covered, sometimes tuberous. Stems sometimes pseudobulbous. Leaves usually alternate and entire. Flowers solitary or in a raceme, panicle or spike, zygomorphic or rarely appearing regular, usually bisexual, usually resupinate. Perianth lobes 6, petaloid, free or variously connate; sepals similar or dissimilar, with lateral sepals sometimes adnate to a column foot and forming a spur; petals usually dissimilar, with lower petal often a lobed, ridged and sometimes saccate lip (labellum). Androecium and gynoecium fused into a column with a ventral stigmatic cavity and an apical anther with 2–8 granulose or waxy pollinia, with or without stipes and a viscidium, enclosed in an anther cap. Ovary inferior, 3-carpellate; 1-locular with parietal placentation or 3-locular with axile placentation. Fruit a dry capsule. Seeds dust-like.

One of the largest families of flowering plants, probably with more than 25,000 species in some 800 genera, distributed worldwide except for the polar regions, but with most diversity in the tropics; 11 genera native to the Islands. Many species bear flowers of horticultural value, and several genera have produced hybrids of commercial importance. Vanilla is obtained from the fermented pods of *Vanilla* species.

Ian Hutton has collected a plant in a non-flowering state on the top of Mt Gower which appears to be a species of *Chiloglottis* R.Br. (*I.Hutton 622*). To be certain of this record, and the species involved, flowers will need to be seen, but despite continued observations, none has yet been found.

G.Bentham, Orchideae, *Fl. Austral.* 6: 266–396 (1873); R.E.Holttum, *Fl. Malaya* 1, *Orchids Malaya* (1953); C.A.Backer & R.C.Bakhuizen van den Brink Jr, Orchidaceae, *Fl. Java* 3: 215–450 (1968); A.W.Dockrill, *Austral. Indig. Orchids 1* (1969); R.L.Dressler, *The Orchids, Natural History and Classification* (1981); P.S.Green, *Orchid Rev.* 94: 199–203 (1986); D.L.Jones, *Native Orchids of Australia* (1988).

KEY TO GENERA

1 Plants terrestrial

2 Leaves plicate, more than 5 cm long, with 3 or more, ±equal longitudinal veins

3 Flowers green and brown; labellum enclosed by lateral sepals, not lobed; leaves narrowly lanceolate, 5–15 cm long; inflorescence few-flowered (N.Is.) **1. TROPIDIA**

3: Flowers white; labellum exserted, lobed; leaves broadly elliptic, 20–70 cm long; inflorescence many-flowered (L.H.Is.) **5. CALANTHE**

2: Leaves up to 6 cm long, usually less, without prominent veins

4 Leaves several, flat, in rosettes or as leafy cauline bracts; inflorescence of a single, largish flower; dorsal sepal large, hooded; lateral sepals ±united, prominent, with erect, acute or filiform tip (L.H.Is.) **2. PTEROSTYLIS**

4: Leaf solitary, flat or terete

5 Leaf flat, broad; flower solitary, large; dorsal sepal large, hooded; lateral sepals small, filiform (L.H.Is.) **3. CORYBAS**

5: Leaf terete; flowers numerous, small; dorsal sepal small, hooded; lateral sepals small, reflexed or recurved (N.Is., L.H.Is.) **4. MICROTIS**

1: Plants epiphytic or lithophytic

6 Pseudobulbs present, globose or cane-like

7 Leaves 2 or more per pseudobulb; inflorescence usually several–many-flowered

8 Flowers c. 50 or more, less than 1 cm long; pseudobulbs globose (N.Is.) **7. PHREATIA**

8: Flowers (2–) 4–20 per inflorescence, c. 1 cm long or more; pseudobulbs cane-like (N.Is., L.H.Is.) **8. DENDROBIUM**

7: Leaves single at each pseudobulb; inflorescence 1–4-flowered (N.Is., L.H.Is.) **9. BULBOPHYLLUM**

6: Pseudobulbs absent

9 Plant lacking leaves, 3–6 cm long; roots green (N.Is.) **11. TAENIOPHYLLUM**

9: Plant with leaves

10 Leaves separated along an erect, wiry stem, coriaceous; inflorescence 6–9-flowered (L.H.Is.) **10. PLECTORRHIZA**

10: Leaves tufted, distichous, fleshy; inflorescence many-flowered (N.Is.)

11 Flowers with coral red petals & labellum; leaves biconvex but not grooved **6. OBERONIA**

11: Flowers greenish white; leaves biconvex but grooved above **7. PHREATIA**

1. TROPIDIA

Tropidia Lindl., *Edward's Bot. Reg.* 19: sub t. 1618 (1833); from the Greek *tropideion* (a keel), in allusion to the boat-shaped lip found in this genus of orchids.

Type: *T. curculigoides* Lindl.

Terrestrial herbs with rigid rhizomes and stems, simple or branched. Leaves evergreen, plicate, clearly veined. Inflorescence terminal, a short dense bracteate raceme. Flowers resupinate or non-resupinate. Dorsal sepal free, smaller than lateral sepals which enclose base of labellum. Labellum without lateral lobes, with a broad saccate or spurred base and narrowed to a slender, often downturned, lip. Column short. Pollinia 2.

A genus of about 25 species from northern India and Ceylon to Japan and Taiwan, south through Malesia to Fiji, New Caledonia and Norfolk Is. One native species on Norfolk Is.

1. Tropidia viridifusca Kraenzl., *Vierteljahrsschr. Naturf. Ges. Zürich* 74: 71 (1929)

T: New Caledonia, *A.U.Däniker 2720*; holo: ?Z *n.v.* The epithet comes from the Latin *viridis* (green) and *fuscus* (brown), in allusion to the colour of the flowers.

Illustration: N.Hallé, *Fl. Nouv.-Calédon.* 8: 399 (1977).

Herb 15–30 cm tall. Lower stem naked, stiff, 2 mm diam., with prominent nodes. Leaves 4–7, narrowly lanceolate, 5–15 cm long, 0.8–2 cm broad, attenuate into a short, sheathing petiole, long-acute, with 3 prominent longitudinal veins below and numerous intermediate ones. Inflorescence c. 1 cm long, few-flowered; bracts 5–8, persistent, 4–5 mm long, acute. Flowers resupinate, green and brown. Dorsal sepal oblong; lateral sepals broadly oblong, 8–9 mm long. Lateral petals lanceolate, acute. Labellum base saccate, thick, channelled; lip pointed with wavy margin. Capsule c. 1 cm long; ribs persistent after dehiscence. *Ground Orchid*.

Norfolk Is. In the shady forest on the northern slopes of Mt Bates, First collected by R.M.Laing (see below) but without date, although presumably after 1915 as it is not mentioned in his account of the Flora of that date. Also known for New Caledonia and Vanuatu.

N.Is.: Junction of Red Rd with bridle track, *P.Ralston 24A & B* (A); *s. loc.*, without date, *R.M.Laing s.n.* (CHR).

Often mistaken for seedlings of the palm *Rhopalostylis*, which the orchid resembles.

2. PTEROSTYLIS

Pterostylis R.Br., *Prodr.* 326 (1810), *nom. cons.*; from the Greek *pteron* (a wing) and *stylos* (a style or column), in allusion to the winged column of these orchids.

Type: *P. curta* R.Br.

Terrestrial herbs arising annually from small underground tubers. Leaves broad, often in a rosette, or narrower and cauline, not prominently veined. Inflorescence terminal, racemose, usually few-flowered, sometimes flowers solitary. Flowers resupinate, usually green. Dorsal sepal hooded; lateral sepals ±connate, free portions usually divergent and tapered, often erect and embracing hood. Lateral petals appressed or adnate to dorsal sepal, together forming the hood (galea). Labellum usually ±enclosed, entire or obscurely 3-lobed, attached by a movable claw, with an appendage at junction. Column elongate and curved within hood, laterally winged. Pollinia 2.

A mainly Australian genus of c. 70 species, also occurring in New Guinea, New Caledonia and New Zealand; 3 species native to Lord Howe Is.

The descriptions below are largely based on Australian material. On Lord Howe Is. the conservation status of members of this genus has been classified as 'rare, but locally common' by J.Pickard (*Biol. Conservation* 27: 137, 138, 1983).

1 Tips of lateral sepals erect but ±level with hood of dorsal sepal; leaves of rosette 1.5–6 cm long; bracts of scape non-leafy **1. P. curta**

1: Tips of lateral sepals erect beyond hood of dorsal sepal; leaves of rosette 1–3 cm long

2 Bracts of scape leafy; base of scape without a rosette of leaves; labellum obtuse **2. P. obtusa**

2: Bracts of scape not leafy; base of scape with rosette of leaves; labellum acute **3. P. pedunculata**

1. Pterostylis curta R.Br., *Prodr.* 326 (1810)

T: Port Jackson, Australia, *R.Brown*; holo: BM; iso: K. So named in allusion to the short (Latin - *curtus*) lateral spurs.

Pterostylis sp.; A.N.Rodd & J.Pickard, *Cunninghamia* 1: 270 (1983).

Pterostylis curtipendula J.Pickard, *Biol. Conservation* 27: 137 (1984), *nom. nud.*

Illustrations: W.H.Nicholls, *Orchids Australia* t. 301 (1969); R.Fiveash, *Austral. Orchids* tt. 35, 78/3, 95/1 (1974); D.L.Jones, *Native Orchids Australia* 188 (1988).

Slender herb 10–30 cm tall. Leaves basal, rosetted, petiolate; lamina broadly elliptic, 1.5–6 cm long, 1–2.5 cm broad. Bracts on scape usually 2, not leafy. Flowers solitary, terminal, green, with lighter and darker longitudinal markings; hood 2–3 cm long. Lateral sepals erect, 1.5–2 cm long, shortly acuminate, ±level with hood. Labellum ±oblanceolate, entire, rusty coloured; tip twisted, just showing between lateral sepals; appendage narrow, curved, fimbriate. Column c. 2 cm long; upper angle of wing with 2 fine points, 1.5–2 mm long.

Lord Howe Is. On moist grassy ledges in the upper parts of Mt Gower. Also native in New Caledonia and all Australian States except W.A. and N.T.

L.H.Is.: atop Mt Gower, *A.C.Beauglehole 5767* (MEL).

2. Pterostylis obtusa R.Br., *Prodr.* 327 (1810)

T: Port Jackson, Australia, *R.Brown*; holo: BM; iso: K. So named because of the obtuse tip of the labellum.

Illustrations: W.H.Nicholls, *Orchids Australia* t. 323 (1969); I.Hutton, *Lord Howe Is.* 113 (1986); D.L.Jones, *Native Orchids Australia* 201 (1988).

Slender herb 10–25 cm tall. Leaves basal, rosetted, shortly petiolate, not developed at flowering time; lamina ovate, 1–2 cm long, 8–10 mm broad. Bracts on scape 3–5, leafy, linear-lanceolate, 1–2 cm long, acute. Flowers solitary, terminal, green with broad whitish

longitudinal stripes; hood 2–2.5 cm long, finely pointed. Lateral sepals erect, bulging forward below sinus, produced into filiform points, 1.5–2.5 cm long, exceeding the hood. Labellum oblong-linear, obtuse, reddish brown; appendage linear, curved, papillate. Column c. 10 mm long; upper angle of wing with an acute tooth, c. 1 mm long.

Lord Howe Is. Rare on moist grassy ledges on the upper parts of Mts Gower and Lidgbird. Flowers Apr.–May. Also found in eastern Australia from S.A. to south-eastern Qld.

L.H.Is.: Mt Lidgbird, *A.N.Rodd 1780* (NSW); N spur of Mt Gower, *A.N.Rodd 1376* (NSW).

3. Pterostylis pedunculata R.Br., *Prodr.* 327 (1810)

T: Tasmania, Australia, *W.Paterson*; holo: BM. So named because of the clear peduncle above the upper cauline bract.

Illustrations: R.Fiveash, *Austral Orchids* tt. 40, 77, 78/1 (1974); I.Hutton, *Lord Howe Is.* 114 (1986); D.L.Jones, *Native Orchids Australia* 203 (1988).

Slender herb 10–25 cm tall. Leaves basal, rosetted, petiolate; lamina broadly elliptic-ovate, 1.1–3 cm long, 0.7–1.5 cm broad, obtuse to subcordate at base, obtuse at apex. Bracts of scape usually 2, not leafy. Flowers solitary, terminal; hood c. 1.5 cm long, green with reddish brown tip. Lateral sepals erect, divergent, 10–15 mm long, with long subulate points, exceeding the hood. Labellum ovate-lanceolate, with a central ridge, acute, reddish brown; appendage linear with a 3-fid apical tip. Column c. 10 mm long; upper angle of wing with 2 filiform points, 1.5–2 mm long.

Lord Howe Is. Growing on ledges on the upper parts of Mt Gower. Flowers July–Oct. Also distributed in eastern Australia from S.A. to south-eastern Qld.

L.H.Is.: atop Mt Gower, *A.C.Beauglehole 5766* (MEL); summit of Mt Gower, *J.Pickard* in *A.N.Rodd 1377* (NSW).

3. CORYBAS

Corybas Salisb., *Parad. Lond.* t. 83 (1807); named for the shape of the flowers, being said to resemble the head covering of the *Korybantes*, the dancing priests of the Greek earth goddess *Cybele*.

Type: *C. aconitiflorus* Salisb.

Dwarf, delicate, terrestrial herbs, arising annually from small underground globular tubers. Leaf solitary, flat, ovate to orbicular, cordate, without prominent venation. Flower solitary, terminal, erect, resupinate, proportionately large. Dorsal sepal large, erect, hood-shaped; lateral sepals and petals inconspicuous, linear or filiform. Labellum large, erect, often 2-spurred at base, cylindrical and clasping column; upper part expanded, concave, usually variously fringed. Column short, broadened or winged in upper part. Pollinia 4, in 2 pairs, without caudicle; pollen granular or mealy. Pedicel elongating in fruit.

A genus of 50 or more species from eastern, and particularly south-eastern Asia, to Australia, New Zealand and some Pacific Islands; 1 species native to Lord Howe Is. Often characteristic of mossy habitats.

Corybas barbarae D.L.Jones, *Austrobaileya* 2: 548 (1988)

T: Queensland, Australia, *D.L.Jones 2484 & B.E.Jones*; holo: ?BRI *n.v.* Named after Barbara Elizabeth Jones who helped collect the type specimen.

Illustration. D.L.Jones, *Austrobaileya* 2: 549, fig. 1D–F (1988).

Herb 3–5 cm tall when in flower, from a twinned, ovoid corm c. 4 mm long. Leaf orbicular, 14–20 mm long, deeply cordate, very shortly apiculate, glabrous, subtending the flower. Pedicel 1–2 mm long; floral bract 1–2 mm long, basally sheathing, acuminate and curled back. Dorsal sepal deeply hooded, 10–12 mm long, c. 8 mm broad, very shortly apiculate; lateral sepals erect, linear, 1 mm long; petals 1 mm long, concealed. Labellum c. 8 mm long,

7 mm broad, mostly concealed within the dorsal sepal, spurred; outer portion flared and recurved, hispid hairy; upper part with auricles 2 mm long, reflexed against ovary. Column c. 4 mm long, within labellum base.

Lord Howe Is. Discovered by Ian Hutton in June 1988 and probably overlooked or missed before that. He reported that it occurred very locally in quite large numbers of individuals in an area of a mossy rock c. 2 m square.

L.H.Is.: between Kims Lookout and Malabar, *I.Hutton 518* (CBG, K).

4. MICROTIS

Microtis R.Br., *Prodr.* 320 (1810); from the Greek *mickros* (small) and *otos* (an ear), in allusion to the small auricles on the column in the flowers of these plants.

Type: *M. rara* R.Br.

Terrestrial perennial herbs, arising annually from globose underground tubers. Leaf solitary, terete, ±hollow; sheath long. Inflorescence a raceme, with few to many flowers; floral bracts small, ±equaling the short pedicels. Flowers resupinate, small, spirally arranged. Dorsal sepal hooded; lateral sepals narrower, free. Lateral petals narrower and smaller than lateral sepals. Labellum sessile, ±equal in length to sepals, usually ±pendulous, entire, obtuse to emarginate, with or without callosities. Column short, with 2 membranous, obtuse auricles. Pollinia 4 in 2 unequal pairs. Ovary comparatively large.

A genus of 9 species, mainly from Australia but 1 species extending from the Ryu-Kyu Islands, south through the Malesian islands to New Caledonia, New Zealand and Norfolk and Lord Howe Islands.

R.Bates, The Genus *Microtis* R.Br. (Orchidaceae): a taxonomic revision with notes on biology, *J. Adelaide Bot. Gard.* 7: 45–89 (1984).

Microtis unifolia (G.Forst.) Rchb.f., *Beitr. Syst. Pflanzenk.* 62 (1871)

Ophrys unifolia G.Forst., *Fl. Ins. Austr.* 59 (1786); *Microtis porrifolia* (Sw.) R.Br. ex Spreng., *Syst. Veg.* 16th edn, 3: 713 (1826); *nom. illeg.* T: New Zealand, *G.Forster*; lecto: GOET *n.v.*; isolecto: P *n.v.*, *fide* A.S.George, *Nuytsia* 1: 185 (1971). The epithet refers to the single leaf produced.

Illustrations: W.H.Nicholls, *Orchids Australia* 96 (1969); I.Hutton, *Lord Howe Is.* 112 (1986); D.L.Jones, *Native Orchids Australia* 329 (1988).

Herb 15–40 (–50) cm tall; tuber 0.5–1.5 cm diam. Leaf to 60 cm or more long, exceeding inflorescence when undamaged, sheathing base of flowering stem. Flowers numerous, fairly dense on raceme, green. Dorsal sepal c. 2–3 mm long, forming a hood with an acute tip. Lateral sepals slightly shorter, half the width of dorsal sepal, reflexed or recurved, ±obtuse. Petals half the size of and mostly within dorsal sepal. Labellum oblong, c. 1–2 mm long, ±truncate-emarginate at apex, marginally papillose, with 2 basal and 1 median anterior calosities. Capsule ellipsoidal, ribbed, c. 5 mm long. *Onion Orchid*. Fig. 99E–G.

Norfolk Is., Lord Howe Is. Not common on Norfolk Is. Widespread, but not common on Lord Howe Is., mostly in the Northern Hills. Flowers Oct.–Jan. This species also occurs in Australia (excluding N.T.), and from southern Japan through Malesia to New Caledonia and New Zealand.

N.Is.: *s. loc.*, *J.D.McComish 40* (K). **L.H.Is.:** lower slopes of Malabar, *P.S.Green 1556* (AMES); Transit Hill and Pooles Lookout, *J.D.McComish 20* (K).

5. CALANTHE

Calanthe R.Br., *Bot. Reg.* 7: sub t. 573 (1821); from the Greek *kalos* (beautiful) and *anthos* (a flower), in allusion to the beautiful flowers of many of the species.

Type: *C. veratrifolia* Ker Gawl., *nom. illeg.* = *C. triplicata* (Willemet) Ames

Terrestrial, rarely epiphytic herbs. Pseudobulbs various, often obscure, usually leafy, 1–several-noded. Leaves plicate, usually evergreen, sometimes deciduous, often large. Inflorescence axillary, basal, racemose, erect, with few to many flowers, ±pubescent. Flowers resupinate, often showy. Sepals ±similar. Petals usually smaller than sepals. Labellum usually lobed, fused at side of base to column forming a tube, usually spurred; callus often verrucose at base. Column short; rostellum bifid. Pollinia 8 in two groups.

A large genus of over 200 species, mostly in the Old World tropics and Madagascar, but one species each in Australia, Central America and the West Indies; 1 species native to Lord Howe Is.

Calanthe triplicata (Willemet) Ames, *Philipp. J. Sci.* 2: 326 (1907)

Orchis triplicata Willemet, *Ann. Bot.* (*Usteri*) 18: 52 (1796); *Calanthe veratrifolia* (Willd.) R.Br. ex Lindl., *Gen. Sp. Orchid. Pl.* 249 (1833), *nom. illeg.* T: Mauritius; holo: NCY? *n.v.* So called because an early account described the flowers as being in triplicate.

Calanthe sp.; A.N.Rodd in H.F.Recher & S.S.Clark, *Environm. Survey Lord Howe Is.* 22 (1974).

Illustrations: W.H.Nicholls, *Orchids Australia* t. 369 (1969); A.W.Dockrill, *Austral. Indig. Orchids* 243 (1969); D.L.Jones, *Native Orchids Australia* 359 (1988).

Terrestrial herb to 150 cm high. Pseudobulbs 3–8 cm long with 4–10 nodes. Leaves persistent, petiolate; lamina broadly elliptic, 20–70 cm long, 4–10 cm broad, attenuate at base, acute, with 3 or more ±equal longitudinal veins. Inflorescences 1 or 2, lengthening as individual flowers develop. Flowers numerous, white; pedicels 2–3 cm long, subtended by persistent bracts. Sepals obovate, c. 12 mm long, 7 mm broad, apiculate. Petals oblong, 10 mm long, 4 mm broad, acuminate. Labellum deeply 3-lobed; free portion above mouth of tube c. 2 cm long; lateral lobes narrow, widely spreading; mid lobe deeply bifid; spur 2–3 cm long, filiform. Capsule 3–4 cm long.

Lord Howe Is. Rare; some doubt has been cast on the occurrence of this orchid as a native on the Island but from the ecology and distribution of the species, its claim as indigenous does not seem unreasonable. It was first recorded from there by C.H.Jaede (*Austral. Orchid Rev.* 27: 122, 1962) from 'North Eastern slope of the Island on the road to Rocky Run'. It was later collected from the top of Mt Gower by Ron Payton (see Beauglehole specimen cited below). The above description has been taken mainly from Australian material. The species is distributed from India and Japan to Australia, New Caledonia and Vanuatu.

L.H.Is.: Dinner Run, *I.Hutton 648* (K, in spirit); grown in garden at 'Yaldon', from the top of Mt Gower, *A.C.Beauglehole 5505* (MEL).

6. OBERONIA

Oberonia Lindl., *Gen. Sp. Orchid. Pl.* 15 (1830), *nom. cons.*; named after Oberon (prince of fairies) 'As Oberon, that little King of the Dryads, prince of the northern hobgoblins, rides about on the branches of the trees, hiding his many-formed countenance amongst the leaves, so our little herbs, not less changeable in form, lurk in the forests of India and ride triumphantly in their leafy chariot'. (Translated from Lindley's original description).

Type: *O. iridifolia* Lindl. = *O. ensiformis* (Sm.) Lindl.

Epiphytes, generally small, without pseudobulbs, usually tufted. Leaves ±fleshy, distichous, bilaterally flattened or ternate. Inflorescence terminal, a narrow raceme or flowers verticillate, tapering, often dense with many flowers. Flowers small, not resupinate. Sepals and petals free, ±similar, spreading; petals slightly smaller. Labellum sessile, entire or lobed. Column very short, often enclosed by basal auricles or side lobes of labellum. Pollinia of 2 pairs.

A large genus of 150 or more species, from East Africa to Samoa, and from northern India to Australia, but especially in tropical Asia. One endemic species occurs on Norfolk Is.

Oberonia titania Lindl., *Fol. Orchid. Oberonia* 8 (1859)

Based on *Titania miniata* Endl., *Prodr. Fl. Norfolk.* 31 (1833), *non Oberonia miniata* Lindl. T: Anson Bay, Norfolk Island, *F.L.Bauer*; holo: W. Named after Titania, wife of Oberon.

[*Oberonia palmicola auct. non* F.Muell.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 717 (1904)]

Illustrations: H.G.Reichenbach, *Xenia Orchid.* 2: t. 130 (1863), as *Eria limenophylax*; P.S.Green, *Orchid Rev.* 94: 202, fig. 183 (1986); D.L.Jones, *Native Orchids Australia* 606 (1988).

Small tufted epiphyte, 5–8 cm tall. Leaves fleshy, biconvex, somewhat bilaterally flattened, 10–40 cm long, 3–6 mm broad. Inflorescence slender, 5–7 cm long, many-flowered, subverticillate; bracts linear-lanceolate, acute, shorter than flowers. Pedicels c. 1 mm long. Sepals ovate-triangular, 0.75 mm long, slightly reflexed, translucent white. Petals similar, 0.5 mm long, coral-red. Labellum 0.75 mm long, coral-red, 3-lobed; middle lobe largest, ovate, acute. Column enclosed. Capsule sub-globose, c. 1 mm long. *Norfolk Island Oberonia*. Fig. 99C–D.

Norfolk Is. A somewhat endangered occasional epiphyte on trees in the National Park, especially on *Dysoxylum*. Although at one time thought to be endemic, its occurrence in Qld and north-eastern N.S.W. has recently been recognised.

N.Is.: Anson Bay, *F.L.Bauer* (W); Mt Bates, 1967, *P.Ralston, R.D.Hoogland & J.Turner s.n.* (K); S slopes of Mt Bates, *P.S.Green 1901* - living plant, cult. Hort. Kew., No. 310-71.02700, 8 Aug. 1972 (K).

This species is very close to *Oberonia palmicola* F.Muell. of Qld & N.S.W., and their differentiation needs further study using fresh material.

7. PHREATIA

Phreatia Lindl., *Gen. Sp. Orchid. Pl.* 63 (1830); from the Greek *phreatia* (a well), probably referring to the well-like mentum formed by the lateral sepals and the lip.

Type: *P. elegans* Lindl.

Epiphytic herbs. Stems with pseudobulbs or these sometimes almost vestigial. Leaves few to many, or 1 or 2 in pseudobulbous species, alternate, ±distichous, thin or thick and fleshy. Inflorescences arising from leaf axils or base of pseudobulb sheaths, racemose, with few to many flowers, ±erect. Flowers small to minute, resupinate, usually white, not opening widely. Lateral sepals forming a mentum with column foot. Petals free, somewhat smaller than sepals. Labellum usually narrow and concave, sometimes saccate at base, upcurved near base, lamina usually entire. Column very short; column foot short. Pollinia 8, in two groups, on a slender stipe and viscidium.

A genus of c. 150 species distributed from northern India, through south-eastern Asia, including Malesia (especially New Guinea) to Polynesia, with three species in Australia. Two native (1 endemic) species on Norfolk Is.

Diminutive epiphytes to 6 cm tall, without pseudobulbs; leaves fleshy, distichous, 2–6 cm long **1. P. limenophylax**

Prominent epiphytes to 30 cm tall, with pseudobulbs; leaves (1) 2 together, leathery, 7–25 cm long **2. P. paleata**

1. Phreatia limenophylax (Endl.) Benth., *Fl. Austral.* 6: 290 (1873)

Plexaure limenophylax Endl., *Prodr. Fl. Norfolk.* 30 (1833); *Eria limenophylax* (Endl.) Rchb.f., *Bonplandia* 5: 54 (1857). T: Anson Bay, Norfolk Island, *F.L.Bauer*; holo: W *n.v.*; iso: K. The epithet comes from the Greek and means a harbour watcher or coast-guard, in allusion to the locality where it was first collected, Anson Bay.

Illustration: F.Kränzlin in H.G.A.Engler, *Pflanzenr.* IV. 50 (Heft 50): 20, fig. 2 (1911).

Small tufted epiphyte without pseudobulbs, 3–6 cm tall. Stems very short. Leaves 4–6, fleshy, distichous, biconvex, with upper edge grooved, 20–60 mm long, 2–4 mm broad, with an abscission zone at base. Inflorescence terminal, slender, 2–3 cm long, many-flowered;

bracts linear-lanceolate, acute, equal to or longer than flowers. Flowers subsessile, greenish white (*fide* Kränzlin *op. cit.* 21). Dorsal sepal hooded, c. 0.5 mm long; lateral sepals ovate-triangular. Petals linear-oblong, c. 0.4 mm long, curled out and above dorsal sepal. Labellum slightly longer than sepals, narrowed into a petiole-like deflexed base. Capsule subcylindrical, c. 1.5 mm long. *Norfolk Island Phreatia.* Fig. 99H.

Norfolk Is. Endemic. Very rare and endangered; the reference in Turner *et al.* (*Conservation Norfolk Is.* 32, 1968) to it being a 'fairly common epiphyte' was based on confusion with *Phreatia paleata*.

N.Is.: Anson Bay, *F.L.Bauer* (K, W); *s. loc., J.Backhouse 710* (K).

The description of the flowers above is based on a tracing of Bauer's original drawing which is in the Lindley collection at Kew. This species has also been confused with *P. crassiuscula* F.Muell. ex Nicholls of northern Qld, which was the plant described by Bentham (*Fl. Austral.* 6: 290, 1879) under the name *P. limenophylax*, and the name incorrectly used on the Norfolk Is. 3 cent postage stamp issued in 1985.

2. **Phreatia paleata** Rchb.f., *Linnaea* 41: 653 (1877)

T: New Caledonia, *E.Vieillard*; holo: ?W *n.v.* The epithet is derived from the Latin *palea* (chaff), in allusion to the bracts on the inflorescence.

[*Phreatia tahitensis auct. non* Lindl.: P.S.Green, *Orchadian* 8: 101 (1986)]

Illustrations: N.Hallé, *Fl. Nouv.-Calédon.* 8: 325, fig. 133 (1977); P.S.Green, *Orchid Rev.* 94: 201, figs 181, 182 (1986).

Tufted epiphyte, 10–30 cm tall. Pseudobulbs globose, 1–2 cm long. Leaves (1 or) 2 per pseudobulb, leathery, flattened, 7–25 cm long, 1–2 cm broad, with prominent midrib. Inflorescence basal, drooping, 15–35 cm long; bracts below flowers distant, membranous, 6–10 mm long; pedicels c. 1 mm long. Flowers 50 or more, non-resupinate, white, subtended by bracts 3–4 mm long, shorter than flowers. Dorsal sepal ovate, 2 mm long, obtuse, not reflexed; lateral sepals erect, ovate, slightly asymmetrical, broadly based. Petals oblong, 1.5 mm long. Labellum with papillate margin, broadly triangular at apex, forming a short 'bulbous' mentum at base. Capsule cylindrical, 6 mm long. Fig. 99I–K.

Norfolk Is. A locally frequent epiphyte on trees in the National Park. This species was not collected or recorded by the early visitors to the Island. The Laing specimen cited below is not dated but may be the first record, and could perhaps have been collected after 1914, for this species is not included in his Flora compiled at that date (*Trans. & Proc. New Zealand Inst.* 45: 1–39, 1915), but under *P. limenophylax* he states that it is 'not uncommon' and so may have confused the species. Nor do the extensive field notes with the McComish specimen give indication of its frequency in 1939. Although first described from New Caledonia, this species also appears to occur in New Guinea, the Solomon Is. and Vanuatu.

N.Is.: near the summit of Mt Pitt, *J.D.McComish 144* (K); Mt Pitt, *P.S.Green 2391* (K); top of Mt Bates, *P.Ralston 25* (A); *s. loc., R.M.Laing 82* (CHR).

8. DENDROBIUM

Dendrobium Sw., *Nova Acta Regiae Soc. Sci. Upsal.* ser 2, 6: 82 (1799), *nom. cons.*; from the Greek *dendron* (a tree) and *-bios* (living) in reference to the epiphytic habit of many of the species.

Type: *D. moniliforme* (L.) Sw.

Clump-forming, epiphytic or sometimes lithophytic herbs. Stems usually swollen into cane-like pseudobulbs, produced annually. Leaves alternate, distichous; lamina articulated to a closely sheathing base. Inflorescence borne laterally or apparently terminally, racemose. Flowers resupinate, zygomorphic or sometimes appearing regular (peloric), often showy. Lateral sepals adnate at base to a column foot, forming an often spur-like mentum. Petals equal to or longer than dorsal sepal. Labellum 3-lobed with erect side lobes separated by 1–7

raised ridges. Column usually short, with 2 erect teeth at apex or sometimes winged. Pollinia 4, in 2 appressed pairs, without caudicles or stipes.

The second largest orchid genus with c. 900 species, mainly tropical, from the Himalayas, throughout Malesia to Australia (which has c. 50 species), also in New Zealand and Polynesia. Two species and 2 subspecies occur on the Islands, with all but 1 subspecies endemic.

J.B.Irwin, Peloric *Dendrobiums* of Norfolk Island, *Orchadian* 10: 100–103 (1991).

1 Pseudobulbs 15–35 cm tall; flowers open at anthesis

2 Flowers creamy yellow; middle lobe of labellum lacking or broadly triangular, streaked with purplish red; leaves narrowly lanceolate, somewhat thick; occurring in lowland forest (N.Is., L.H.Is.) **1. D. macropus**

2: Flowers pure white; middle lobe of labellum narrowly triangular, acute, pure white (sometimes with faint pink lines or spots at base); leaves lanceolate or elliptic-lanceolate, not thickened; occurring in montane forest (L.H.Is.) **2. D. moorei**

1: Pseudobulbs to 5 cm tall; flowers small, remaining almost closed (N.Is.) **3. D. brachypus**

1. Dendrobium macropus (Endl.) Rchb.f. ex Lindl., *J. Linn. Soc., Bot.* 3: 9 (1859)

Thelychiton macropus Endl., *Prodr. Fl. Norfolk.* 33 (1833). T: Norfolk Island, *F.L.Bauer*; holo: W. The epithet comes from the Greek *makros* (long or large) and *podos* (a foot), in allusion to the relatively long pseudobulb, and in contrast to those of the other species, *D. brachypus*, described by Endlicher at the same time.

Epiphytic or lithophytic herb. Stems in groups, erect, up to c. 40 cm tall. Pseudobulbs cane-like, 15–35 cm long. Leaves 3–6, terminal, narrowly lanceolate, 5–15 cm long, 1–2.5 cm broad, somewhat thickened, shortly sheathing at base, acute. Inflorescence terminal, 6–10 cm long, 4–20-flowered; pedicels 1–1.5 cm long. Flowers creamy yellow, fragrant. Capsule c. 2.5 cm long.

This species is represented on the eastern mainland of Australia by subsp. *gracilicaule* (F.Muell.) P.S.Green (syn. *D. gracilicaule* F.Muell.) which has slightly more slender pseudobulbs, less stiff erect inflorescences, and flowers which are more golden yellow and heavily blotched with reddish brown on the outside but not on the labellum. The species is also known from New Caledonia and Fiji.

Flowers peloric; perianth lobes ±similar, without labellum (N.Is.) **1a.** subsp. **macropus**

Flowers zygomorphic, with distinct outer and inner perianth lobes and labellum (L.H.Is.) **1b.** subsp. **howeanum**

1a. Dendrobium macropus (Endl.) Rchb.f. ex Lindl. subsp. **macropus**

Illustrations: P.S.Green, *Orchid Rev.* 94: 199, fig. 179 (1986); J.B.Irwin, *Orchadian* 10: 101, fig. 1 (1991).

Flowers peloric. Sepals and petals linear-elliptic, blunt, 1 cm long. Labellum not differentiated; mentum absent. *Norfolk Island Orchid.* Fig. 98A–B.

Norfolk Is. An endemic subspecies, fairly common in forested areas.

N.Is.: SE of Mt Bates, *I.R.H.Telford 7154* (CBG); *s. loc., R.M.Laing s.n.* (CHR); *s. loc., J.Backhouse 527* (K); *s. loc., J.D.McComish 75* (K); *s. loc., P.Ralston s.n.* (K, spirit).

The whole population on the Island appears to be peloric and presumably cleistogamous.

1b. Dendrobium macropus subsp. **howeanum** (Maiden) P.S.Green, *J. Arnold Arbor.* 67: 115 (1986)

Dendrobium gracilicaule var. *howeanum* Maiden, *Proc. Linn. Soc. New South Wales* 24: 382 (1899). T: Lord Howe Island, *J.H.Maiden*; holo: ?NSW *n.v.* Named after Lord Howe Island.

Illustrations: W.H.Nicholls, *Orchids Australia* t. 404 (1969); R.Fiveash, *Austral. Orchids* t. 50 (1974); I.Hutton, *Lord Howe Is.* 111 (1986).

Flowers zygomorphic. Sepals slightly curved, ovate-lanceolate, c. 1 cm long. Petals narrower, very slightly shorter. Labellum 7 mm long; middle lobe broadly rounded triangular, pointed, with transverse purplish streaks; mentum blunt, c. 3 mm long. *Bush Orchid*.

Lord Howe Is. An endemic subspecies, fairly common in forested lowland areas throughout the Island. Flowers Sept.–Nov.

L.H.Is.: Hunter Bay, *M.D.Crisp 4465 & I.R.H.Telford* (CBG); between Old Settlement and North Bay, *P.S.Green 1943* (K); *s. loc., J.MacGillivray 725* (K); *s. loc., W.G.Milne 7* (K); *s. loc., R.D.Fitzgerald* (K).

These two subspecies are part of a complex for which the earliest valid name is *D. macropus* (see P.S.Green, *J. Arnold Arbor*. 67: 115, 1986). B.Lewis & P.Cribb (*Orchids Vanuatu* 97, 1989) followed by P.J.Kores (in A.C.Smith, *Fl. Vit. Nova* 5: 412, 1991) have also treated *D. gracilicaule* as conspecific with *D. macropus*. However, ignoring infraspecific ranks and taking a narrower definition of species, D.L.Jones (*Native Orchids Australia* 622, 1988) and M.S.Clements (*Australian Orchid Research* 1: 50, 1989) have treated subsp. *howeanum* as a synonym of *D. comptonii* Rendle (otherwise known from New Caledonia, Vanuatu and Fiji).

2. **Dendrobium moorei** F.Muell., *Fragm*. 7: 29 (1869)

T: Lord Howe Island, *C.Moore*; holo: ?MEL; iso: K. Named after Charles Moore (1820–1905), Director of the Botanic Gardens, Sydney, (1849–1896), who made extensive collections from Lord Howe Is. in 1869.

Illustrations: H.F.Recher & S.S.Clark, *Environm. Survey Lord Howe Is.* 22 (1974); I.Hutton, *Lord Howe Is.* 11 (1986); D.L.Jones, *Native Orchids Australia* 469 (1988).

Epiphytic, occasionally lithophytic herb. Stems in groups, erect, to c. 25 cm tall. Pseudobulbs cane-like, slender, furrowed, 15–20 cm tall. Leaves 4 or 5, terminal, lanceolate or lanceolate-elliptic, 5–15 cm long, 1.5–2 cm broad, not thickened, shortly sheathing at base, blunt or acute. Inflorescences 1–5 in leaf axils, 5–10 cm long, 5–15-flowered; pedicels c. 1 cm long. Flowers zygomorphic, pure white, except labellum sometimes with faint pink lines or spots at base. Sepals narrowly lanceolate, c. 10 mm long, slightly curved outwards. Petals similar, slightly shorter. Labellum shorter than sepals, with 2 small lateral spurs; middle lobe narrowly triangular, acute; spur 6–8 mm long, slightly curved. Capsule slender, c. 2 cm long. *Moorei Orchid*.

Lord Howe Is. Endemic. Frequent in the northern montane forest areas from about 400 m to the summits, flowering almost all year, with a peak from Dec.–May.

L.H.Is.: summit plateau, Mt Gower, *P.S.Green 1991* (K); Mt Gower, 1872, *J.P.Fullagar* (MEL); near summit of Mt Lidgbird, *J.P.Fullagar* (MEL); Mt Lidgbird, *C.Moore 1* (K).

3. **Dendrobium brachypus** (Endl.) Rchb.f., *Linnaea* 41: 42 (1877)

Thelychiton brachypus Endl., *Prodr. Fl. Norfolk.* 33 (1833). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: ?W *n.v.* The epithet is derived from the Greek *brachys* (short) and *podos* (a foot), in contrast to the long pseudobulbs of *D. macropus* which Endlicher also described from Norfolk Is.

Illustration: J.B.Irwin, *Orchadian* 10: 102, fig. 2 (1991).

Epiphytic herb. Pseudobulbs grouped, erect, 2–5 cm tall, somewhat conical. Leaves 4 or 5, terminal, ovate-elliptic, 1–2 cm long, 0.5–1 cm broad, ±clasping scape at base, rounded-obtuse, apex on one side of midrib often slightly longer than the other. Inflorescence terminal, 2- or 3-flowered; c. 2 cm long. Flowers peloric, scarcely opening, pale cream. Sepals elliptic, c. 0.5 cm long, blunt. Petals similar, but narrowly elliptic. Labellum undifferentiated. Capsule unknown. *Norfolk Island Orchid*. Fig. 98C.

Norfolk Is. Endemic, a rare epiphyte in forest on the slopes of Mt Pitt.

N.Is.: *s. loc., F.L.Bauer* (W).

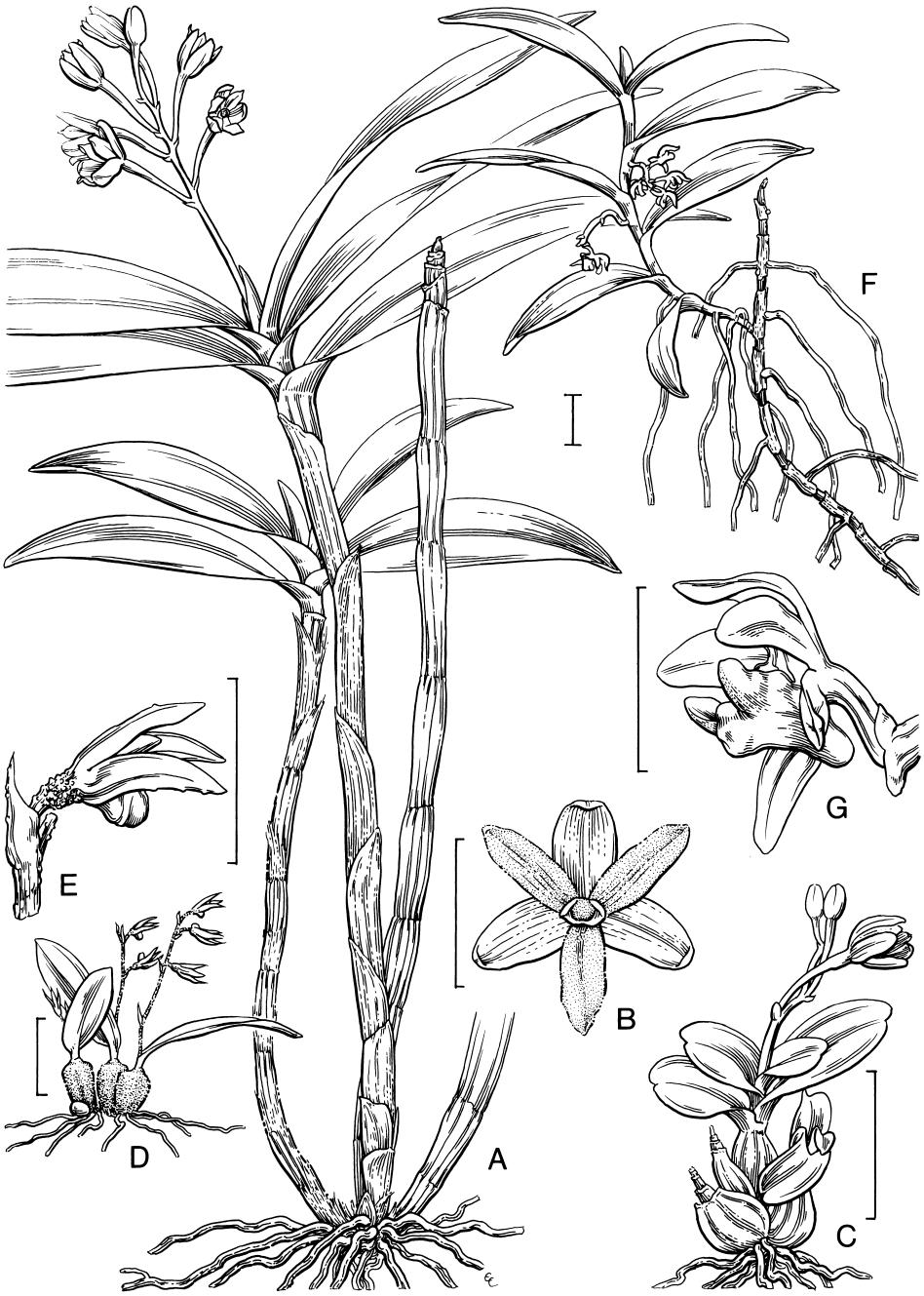

Figure 98. ORCHIDACEAE. **A–B**, *Dendrobium macropus* subsp. *macropus*. **A**, habit (J.McComish 75, K); **B**, flower (P.Ralston *s.n.*, K). **C**, *Dendrobium brachypus*, habit (based on drawingby F.Bauer). **D–E**, *Bulbophyllum argyropus*. **D**, habit; **E**, flower (**D–E**, P.Green 2375, K). **F–G**, *Plectorrhiza erecta*. **F**, habit (J.McComish 101A, K); **G**, flower (P.Green 2376, K). Scale bars: **A–D**, **F** = 1 cm; **E**, **G** = 5 mm. Drawn by E.Catherine.

9. BULBOPHYLLUM

Bulbophyllum Thouars, *Hist. Orchid., Tab. Especies* 3, t. 93–110 (1822), *nom. cons.*; from the Greek *bolbos* (bulb) and *phyllon* (leaf), in allusion to the pseudobulb bearing a leaf in these orchids.

Type: *B. nutans* Thouars

Epiphytic, rhizomatous herbs. Pseudobulbs simple, distant or clustered, with 1 or 2 leaves at apex. Leaves usually ±fleshy or coriaceous. Inflorescence usually arising from base of pseudobulb, racemose or rarely umbellate, with 1–many flowers. Flowers resupinate, ±fleshy, often not opening widely. Sepals usually ±equal; lateral sepals joined at base to column foot to form a mentum. Petals usually shorter than sepals. Labellum often much smaller, hinged to column foot, usually entire, often fleshy and curved. Column short, often with apical arms. Pollinia 4.

The largest orchid genus with over 1000 species, widespread in the tropics and subtropics throughout the world, especially numerous in New Guinea; 1 species native on both Islands.

Bulbophyllum argyropus (Endl.) Rchb.f., *Linnaea* 41: 42 (1876)

Thelychiton argyropus Endl., *Prodr. Fl. Norfolk.* 32 (1833). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W *n.v.*; iso: K. The epithet comes from the Greek *argyreios* (silvery) and *podos* (a foot), in allusion to the silvery scales on the upper surface of the pseudobulbs.

[*Bulbophyllum exiguum auct. non* F.Muell.: F.J.H. von Mueller, *Fragm.* 9: 78 (1875)]

[*Bulbophyllum tuberculatum auct. non* Colenso: H.M.R.Rupp, *Victorian Naturalist* 52: 73 (1935); S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 27 (1981)]

[*Bulbophyllum pygmaeum auct. non* (Sm.) Lindl.: C.H.Jaede, *Austral. Orchid Rev.* 27: 122 (1962)]

Illustrations: S.F.L.Endlicher, *Icon. Gen. Pl.* x, t. 29 (1837); P.S.Green, *Orchid Rev.* 94: 202, fig. 185 (1986); I.Hutton, *Lord Howe Is.* 110 (1986).

Epiphyte. Rhizome stringy, creeping, sometimes forming a mat. Pseudobulbs angular-globose with shallow longitudinal grooves, 5–10 mm high, ±conoid at apex, with scattered silvery scales. Leaves solitary on each pseudobulb; petiole 2 mm long; lamina elliptic, 15–30 mm long, 4–6 mm wide. Inflorescence with 2 (sometimes 1–4) flowers, 2–3 cm long, minutely glandular-tuberculate. Flowers greenish white or cream, with orange labellum. Sepals 4 mm long, acute. Petals c. 1 mm long, blunt. Labellum 3 mm long; mentum relatively broad, rounded, whitish, 1–2 mm long. Capsule 6 mm long, ribbed. *One-leaf Orchid* (N.Is.). Figs 75, 98D–E.

Norfolk Is., Lord Howe Is. Widespread but rare and endangered on both islands (listed by J.Pickard, *Biol. Conservation* 27: 127, 1983). Flowers Aug.–Sept. Recently this species has been recorded from the Qld–N.S.W. border area (S.C.Clemesha, *Orchadian* 6: 136, 1979).

N.Is.: *s. loc.*, *F.L.Bauer* (K). **L.H.Is.:** Dawsons Ridge, *P.S.Green 2375* (K, spirit) from a plant cult. hort. Kew. (No. 017-85.00804).

The recently described *B. corythium* N.Hallé from New Caledonia may also be this species. The pseudobulbs on the Norfolk Is. plant may be slightly more globose than those from Lord Howe Is.

10. PLECTORRHIZA

Plectorrhiza Dockrill, *Australas. Sarcanthinae* 27 (1967); from the Greek *plectos* (plaited or twisted) and *rhizos* (a root), in allusion to the tangled roots in this genus.

Type: *P. tridentata* (Lindl.) Dockrill

Epiphytic or lithophytic herbs. Roots usually numerous, long, tangled. Stems long, wiry. Leaves alternate, ±persistent. Inflorescence axillary. Flowers small, resupinate. Sepals and petals free, ±equal. Labellum immovable, fixed to base of column, saccate, spurred with a hairy callus near mouth; lateral lobes small, divergent; mid lobe slightly larger compared to laterals, hollow or fleshy. Column short, erect, not winged; rostellum prominent, pointed. laterals, hollow or fleshy. Column short, erect, not winged; rostellum prominent, pointed.

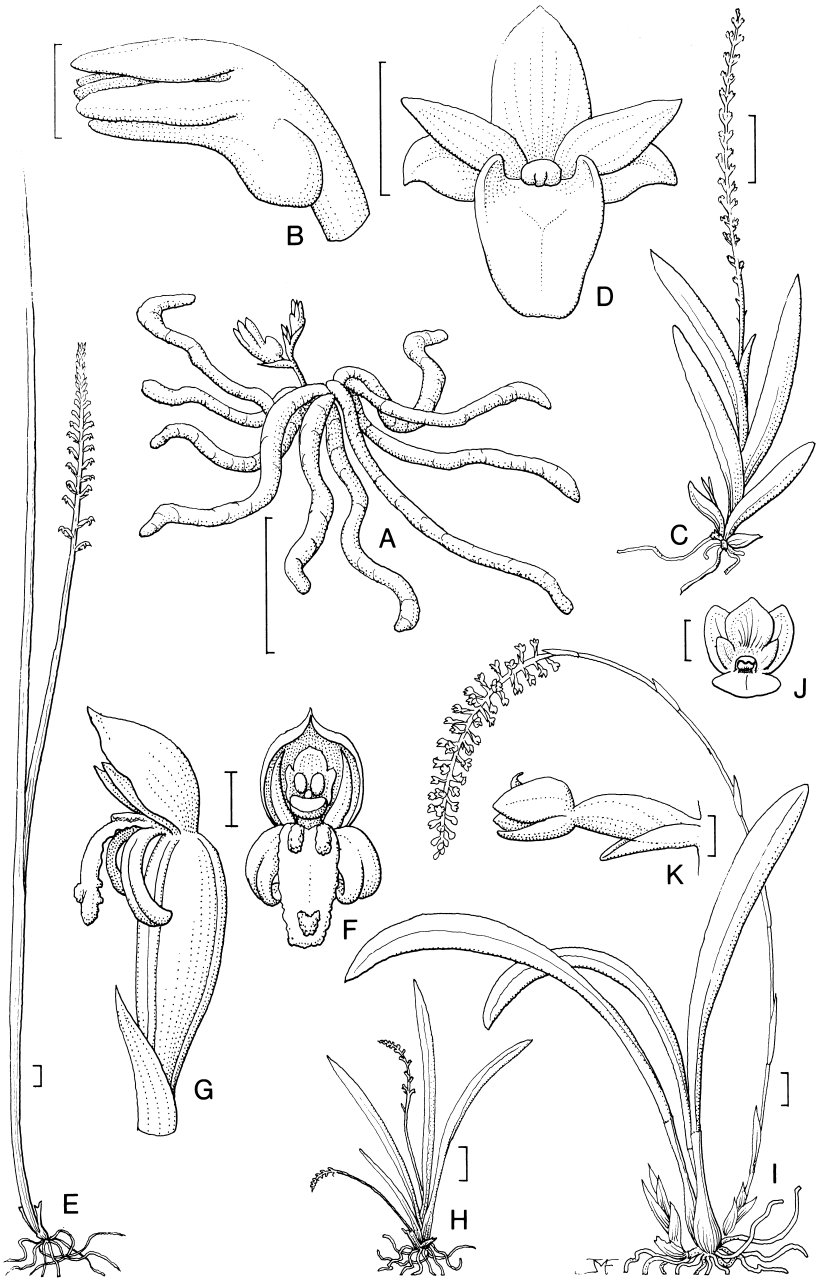

Figure 99. ORCHIDACEAE. **A–B**, *Taeniophyllum muelleri*. **A**, habit; **B**, flower (**A–B**, P.Green 1910, K). **C–D**, *Oberonia titania*. **C**, habit; **D**, flower (**C–D**, P.Green 1901, K). **E–G**, *Microtis unifolia*. **E**, habit; **F**, flower; **G**, flower, lateral view (**E–G**, J.McComish 20, K). **H**, *Phreatia limenophylax*, habit (F.Bauer, K). **I–K**, *Phreatia paleata*. **I**, habit; **J**, flower; **K**, flower, lateral view (**I–K**, P.Green 2391, K). Scale bars: **A**, **C**, **E**, **H**, **I** = 1 cm; **B**, **D**, **F**, **G**, **J**, **K** = 1 mm. Drawn by M.Fothergill.

Pollinia of 2 pairs.

A small Australasian genus of 3 species: this Lord Howe Is. endemic and 2 other species from eastern Australia.

Plectorrhiza erecta (Fitzg.) Dockrill, *Australas. Sarcanthinae* 28 (1967)

Cleisostoma erecta Fitzg., *Austral. Orchids* 1(4): t. 5 (1878); *Sarcochilus erectus* (Fitzg.) F.Muell., *Syst. Cens. Austral. Pl.* 111 (1882); *Sarcanthus erectus* (Fitzg.) Rupp, *Victorian Naturalist* 57: 218 (1941). T: Lord Howe Island, *R.D.Fitzgerald*; holo: ?MEL *n.v.* So named because of its erect habit.

Sarcochilus sp., C.Moore, *Gard. Chron.* 28: 968 (1869); *J. Bot.* 7: 302 (1869).

Illustrations: A.W.Dockrill, *Australas. Sarcanthinae* 28, t. 13 (1967); W.H.Nicholls, *Orchids Australia* t. 470 (1969); I.Hutton, *Lord Howe Is.* 114 (1986).

Epiphyte or lithophyte. Stems erect, wiry, up to c. 30 cm tall, supported by prominent, much bent, thick, often tangled, white roots c. 30 cm long, arising from below leaves. Leaves not tufted, coriaceous, lanceolate, 3–4.5 cm long, 0.6–1.2 cm broad, obtuse to acute. Inflorescences internodal; racemes c. 3 cm long, 6–9-flowered. Sepals and lateral petals similar, erect, slightly concave, c. 4 mm long, yellowish orange, much blotched with purplish brown within. Labellum cream-coloured, papillate; lateral lobes like 2 acute wings; central lobe ±entire; spur c. 1.5 mm long. Column c. 1 mm tall, purple. Fig. 98F–G.

Lord Howe Is. Endemic. Of wide occurrence at intermediate elevations but only locally abundant; although classed as rare by J.Pickard (*Biol. Conservation* 27: 139, 1983). Flowers late Nov.–early Jan.

L.H.Is.: Northern Hills, *J.D.McComish 101A* (K); Goat House, *P.S.Green 2376* (K, spirit material from plant in Hort. Kew. No. 017- 85.00805).

11. TAENIOPHYLLUM

Taeniophyllum Blume, *Bijdr.* 355, t. 3, fig. 70 (1825); from *Taenia*, the scientific name for a tape worm, and *phyllon* (a leaf), in allusion to the worm-like photosynthetic roots of these leafless orchids.

Type: *T. obtusum* Blume

Leafless epiphytes with extremely short stems. Roots green, photosynthetic. Inflorescences racemose, flowers few to many. Flowers small, resupinate, short lived. Sepals and petals similar, free or with bases connate to form a tube. Labellum adnate to base of column, entire or trilobed, saccate or spurred. Column very short. Pollinia 4, distinct.

A genus of c. 100 species distributed in tropical Asia, from Japan south to Australia and Polynesia; 1 species native on Norfolk Is.

Taeniophyllum muelleri Lindl. ex Benth., *Fl. Austral.* 6: 291 (1873)

T: Queensland, *F.M.Bailey, W.Hill and C.Prentice*; syn: K. Named after Baron Ferdinand von Mueller (1825–1896), director of the Royal Botanic Gardens, Melbourne (1857–1873).

Illustration: P.S.Green, *Orchid Rev.* 94: 202, fig. 184 (1986).

Small epiphyte; plant 3–6 cm across. Roots tumid, c. 1.5 mm diam., pale green. Inflorescence 3–5 mm long, 1- or 2-flowered. Sepals and petals 1.5 mm long, greenish yellow. Labellum slightly shorter than perianth. Capsule ellipsoidal, 6 mm long. *Minute Orchid*. Fig. 99A–B.

Norfolk Is. A rare and local epiphyte on the undersides of branches of *Araucaria* on the slopes of Mt Bates. There is need for further study and comparison of this Norfolk Is. plant with that from Australia. The material at present available from Norfolk Is. exhibits a very short inflorescence with only one or two flowers and may represent a different species.

N.Is.: along track to Bird Rock, 1967, *P.Ralston, R.D.Hoogland & J.S.Turner s.n.* (K); *loc. id., I.R.H.Telford 7125* (CBG); slopes of Mt Bates, *P.S.Green 1910* (K).

PINOPHYTA

114. ARAUCARIACEAE

Evergreen trees, resinous, monoecious or dioecious. Leaves simple, entire, tough, opposite or spirally arranged, subulate to flattened, flexible or rigid, often sharply pointed. Male cones terminal or axillary, solitary or clustered, cylindrical, deciduous; scales (microsporophylls) numerous, spirally arranged, overlapping, ovate, with 4–20 pollen sacs. Female cones terminal on thick, short lateral shoots, heavy, massive, ovoid or subglobose; scales (megasporophylls) numerous, spirally arranged, imbricate, linear to spathulate, woody or leathery. Ovule 1, free or adnate to scale. Seeds ±flattened; cotyledons 2, deeply cleft in some species.

A family of 2 genera and c. 30 species. Distributed from Malaysia to Australia and New Zealand, and from Melanesia to South America; 1 genus occurs on the Islands.

G.Bentham, Coniferae, *Fl. Austral.* 6: 242–243 (1873).

ARAUCARIA

Araucaria Juss., *Gen. Pl.* 413 (1789); named after the Araucani Indians of central Chile in whose area the first named species grows.

Type: *A. araucana* (Molina) K.Koch

Tall trees, usually dioecious. Branches on young plants symmetrical. Leaves crowded, spirally arranged, overlapping, triangular-lanceolate to subulate or scale-like, often changing shape with age of tree, sharply pointed, without petioles or midrib. Male cones terminal, solitary or clustered. Female cones solitary, ovoid to globose, shattering at maturity; scales narrowly winged, each with single large seed partly adnate to base, shed as single unit.

A genus of c. 18 species from New Guinea, eastern Australia, South America and New Caledonia (with 13 endemic species); 1 species endemic to Norfolk Is. and becoming naturalised on Lord Howe Is.

Araucaria heterophylla (Salisb.) Franco, *Anais Inst. Super. Agron.* 19: 11 (1952)

Eutassa heterophylla Salisb., *Trans. Linn. Soc. London* 8: 316 (1807). T: Norfolk Island, *P.G.King*, not traced.

Dombeya excelsa Lamb., *Descr. Pinus* 87, t. 39, 40 (1803), *quoad spec.* Norfolk Is., *nom. illeg*; *Araucaria excelsa* (Lamb) W.T.Aiton, *Hort. Kew*. 2nd edn, 5: 412 (1813), *quoad spec.* Norfolk Is., *nom. illeg.*; *Columbea excelsa* (Lamb) Spreng., *Syst. Veg.* 4(2): 315 (1827), *nom. illeg.*; *Eutacta excelsa* (Lamb) Link, *Linnaea* 15: 544 (1841), *nom. illeg.* T: not designated.

Pinus columbaria Dum.Cours., *Bot. Cult.* 2nd edn, 6: 460 (1811); *Abies columbaria* (Dum.Cours.) Dum.Cours., *Bot. Cult.* 2nd edn, 7: 347 (1814). T: cultivated, not traced.

Pinus australasia Bosc. in H.A.Tessier *et al.*, *Encycl. Méth. Agric.* 7: 649 (1821), *nom. nud.*

[*Cupressus columnaris auct. non* G.Forst. *s. str.*: J.G.A.Forster, *Fl. Ins. Austr.* 67 (1786), *quoad loc.* Norfolk Is.]

Illustrations: A.B.Lambert, *Desc. Pinus 1 App.*: t. 39, fig. b–d, f–k, t. 40 (1807); S.W.Burstall & E.V.Sale, *Great Trees New Zealand* 38, 43, 103, t. 4 (1984); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 46–47 (1984).

Tree to 70 m tall with trunk to 2 m diam. Bark peeling in thin flakes. Branches horizontal; ultimate shoots horizontal or somewhat pendulous; shoots, including leaves, 7–10 mm diam. Juvenile leaves subulate, 1–1.25 cm long, incurved, transitional to mature leaves. Mature leaves in imbricate series encircling stems, broadly ovate, 4–7 mm long, 3–6 mm broad, minutely ciliolate, with slightly incurved, blunt, horny apex. Male cones solitary, 4–5 cm

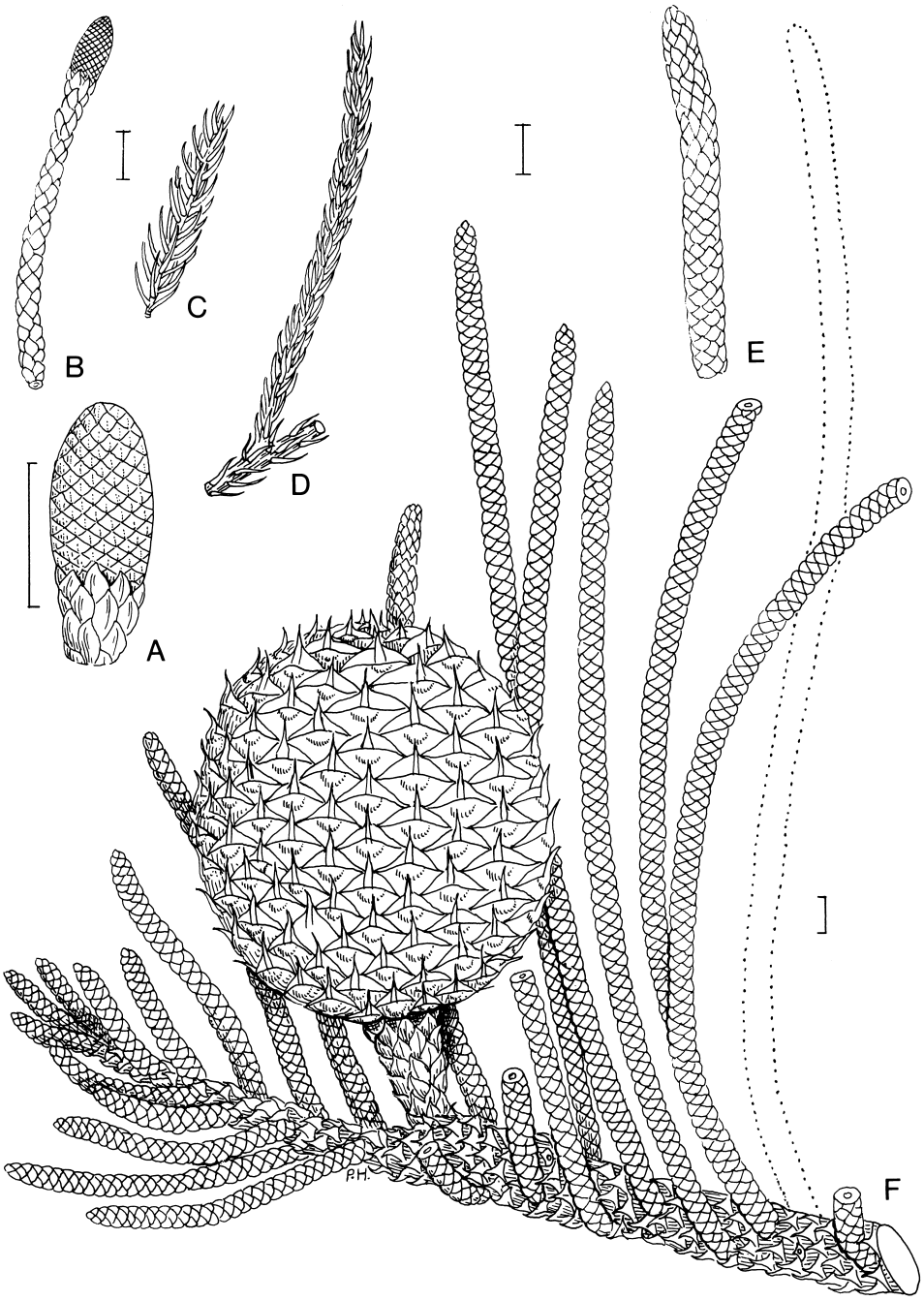

Figure 100. ARAUCARIACEAE. *Araucaria heterophylla*. **A**, shoot with male cone; **B**, male cone (**A–B**, J.Backhouse, K 493); **C**, juvenile shoots (W.Paterson ex Herb. Lambert, K 492); **D**, juvenile shoot (cult. Hort. Kew, K 659); **E**, mature shoot; **F**, branch with almost mature female cone (**E–F**, J.Buckholz 1599, K). Scale bars = 1 cm. Drawn by P.Halliday.

long, 1–1.3 cm diam. Female cones subglobose, 7.5–10 cm long, 8–10 cm diam.; scales 3.5–4 cm long, upper half with wings 7–10 mm broad, and an upturned, soft, apical spine 5–8 mm long. Seeds 2.5–3 cm long, 1.3–1.5 cm broad. *Norfolk Island Pine.* Fig. 100A–F.

Norfolk Is., Lord Howe Is. This species is endemic to Norfolk Is. and is frequent in the National Park and elsewhere; on Lord Howe Is. it has become self-sown beside the lagoon, between the beach and the road.

N.Is.: *s. loc., Col. Paterson* (K); *s. loc.,* 1835, *J.Backhouse* (K); *s. loc., J.T.Buchholz 1599* (K). **L.H.Is.:** between the beach and the lagoon, *I.Hutton 684* (K).

This species is perhaps the most famous of all the Norfolk Is. plants, through cultivation throughout the world either in the open, or indoors in regions affected by frost. Heavy coning is intermittent, occurring every three to five years. For a long time this species was generally known as *A. excelsa*, a name which has had to be rejected on nomenclatural grounds. Taxonomically it is close to *A. columnaris* (G.Forst.) Hook. of New Caledonia, with which it was at one time much confused.

115. CUPRESSACEAE

Evergreen trees or shrubs, monoecious or dioecious. Leaves in opposite pairs or whorls of 3 or 4, simple, entire, basally decurrent or jointed; juvenile leaves linear, spreading; adult leaves scale-like, adnate at least at base and completely enclosing stem, often glandular. Male cones terminal or axillary, usually solitary; scales (microsporophylls) few to many. Female cones terminal, solitary or clustered, globose; scales (megasporophylls) few, without distinct bracts; ovules 1–many; scales becoming leathery, woody, or fleshy and coalescent. Seeds with or without a narrow wing; cotyledons usually 2.

A family of c. 20 genera and 125 species, with a wide distribution throughout the world; 1 genus is introduced on Norfolk Is. The family includes the genus *Juniperus*, 1 species of which, *J. communis* L., is the source of juniper berries used in culinary flavouring.

CUPRESSUS

Cupressus L., *Sp. Pl.* 2: 1002 (1753); *Gen. Pl.* 5th edn, 435 (1754); the Latin name for the Mediterranean cypress tree, *C. sempervirens.*

Type: *C. sempervirens* L.

Trees. Bark usually fissured, stringy or rarely smooth to scaly. Branches spreading or borne in one plane. Adult leaves whorled, scale-like, usually aromatic, often with prominent dorsal resin gland. Male cones terminal, solitary, 4–10 mm long, ovoid. Female cones shortly pedunculate, globose, 1.5–4 cm diam., woody at maturity; scales c. 8, peltate, often with a raised central point.

A genus of c. 15 species, from North Africa and the Mediterranean to China, and central America from the extreme south-western U.S.A. to Honduras; 1 species becoming naturalised on Norfolk Is.

***Cupressus lusitanica** Mill., *Gard. Dict.* 8th edn, *Cupressus* No. 3 (1768)

T: cultivated; holo: BM? *n.v.* The epithet implies that it comes from Lusitania, *i.e.* Portugal and the western part of the Iberian Peninsula, where in fact it was only cultivated.

Illustrations: W.Dalimore & A.B.Jackson, *Handb. Conifers* 206, fig. 41 (1923); H.J.Welch, *Conifer Manual* 293, fig. 172, 300, fig. 177 (1991).

Trees to 30 m tall. Bark reddish brown, fissured, peeling in long, thin strips. Branches spreading; branchlets usually ±pendulous. Leaves closely appressed, in 4 ranks, 1.5–2 mm

long, glaucous grey-green, somewhat acuminate with tips free, very occasionally with dorsal resin-gland. Female cones c. 1.5 cm diam., dark brown when mature; scales 6–8, usually with prominent, hooked, central mucro. Seeds 8–10 per scale, winged.

Norfolk Is. Saplings develop spontaneously from seed around planted trees. A widely cultivated native of Mexico.

N.Is.: W slope of Mt Pitt, *R.O.Gardner 5881* (AK).

PTERIDOPHYTA

Vascular herbs, rarely arborescent, often rhizomatous, often with scales; true roots usually present (rhizoids in *Psilotum*). Leaves either bract-like or a frond which is circinate in bud (except in Psilotaceae, Lycopodiaceae, Selaginellaceae and Ophioglossaceae). Stipe usually lacking stipules (fleshy stipules in Marattiaceae, non-fleshy ones in Osmundaceae). Lamina broad, simple or variously pinnate, bearing sporangia. Sporangia usually in sori (often protected by an indusium) or grouped in synangia, or (in *Psilotum*) borne on the stems. Spores germinating to produce a prothallus which bears the male and female organs, producing, after fertilisation, the new sporophyte.

The ferns and fern allies are a large and ancient, worldwide division of land plants (very rarely, floating aquatics). They produce spores, usually in sori, which on germination develop into the sexual generation called the prothallus, which bears the male and female reproductive organs. Well known in the fossil state, especially from the Carboniferous Age, the group consists of four Classes, Psilopsida, Lycopsida, Sphenopsida and Filicopsida, all except the third occurring on Norfolk and Lord Howe Islands.

116. PSILOTACEAE

Epiphytic, lithophytic or terrestrial; rhizomes dichotomously branched, bearing rhizoids. Aerial stems simple, forked once or dichotomously branched in upper part, bearing flattened 'leaves' or scale-like appendages. Synangia 2- or 3-lobed, homosporous.

A tropical or subtropical family containing only the following 2 living genera, and c. 12 species; both genera native on the Islands.

R.E.G.Pichi Sermolli, Tentatem Pteridophytorum genera in taxonomicum ordinem redigendi, *Webbia* 31: 313–512 (1977); R.A.White, D.W.Bierhorst, P.G.Gensel, D.R.Kaplan & W.H.Wagner Jr, Taxonomic and morphological relationships of the Psilotaceae, *Brittonia* 29: 1–68 (1977); D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 27–28 (1981); R.M.Tryon & A.F.Tryon, *Ferns & Allied Pl.* 782–787 (1982); D.L.Jones, *Encycl. Ferns* 44–47 (1987).

KEY TO GENERA

Synangia 3-chambered, subtended by a bifid scale-like sporophyll or leaf	**1. PSILOTUM**
Synangia 2-chambered, fused to a bifid leaf-like sporophyll	**2. TMESIPTERIS**

1. PSILOTUM

Psilotum Sw., *J. Bot.* (*Schrader*) 1800(2): 109 (1801); from the Greek *psilos* (naked or bare), in allusion to the naked synangia.

Type: *P. triquetrum* Sw., *nom. illeg.* = *P. nudum* (L.) P.Beauv.

Terrestrial, lithophytic or epiphytic plants, rhizomatous, creeping; rhizome bearing rhizoids, not true roots. Stems erect or pendulous, often tufted, dichotomously branched, bearing scale-like sporophylls ('leaves'). Fertile sporophylls bract-like, bifid, subtending a ±sessile 3-lobed synangium.

A genus of 2 species distributed throughout the tropics and subtropics. Together with *Tmesipteris* (below), structurally the most primitive living genera of vascular plants. One species is native to both Islands.

G.Bentham, Lycopodiaceae, *Psilotum*, *Fl. Austral.* 7: 681–682 (1878).

Psilotum nudum (L.) P.Beauv., *Prodr. Aetheogam.* 112 (1805)

Lycopodium nudum L., *Sp. Pl.* 2: 1100 (1753); *Psilotum triquetrum* Sw., *J. Bot.* (*Schrader*) 1800(2): 109 (1801), *nom. illeg.* T: 'in Indiis'; lecto: LINN 1257.1, *fide* G.R.Proctor in R.A.Howard, *Fl. Lesser Antilles* 2: 16 (1977); IDC microfiche 177/2.734/21. The epithet comes from the Latin *nudus* (naked), in reference to the synangia.

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 28 (1981); D.L.Jones, *Encycl. Ferns* 45, 49 (1987); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 3, t. 1 (1990).

Tough herb. Stems erect, 15–50 cm tall, 2–4 mm thick, simple basally, repeatedly dichotomously branched in the upper part; branches 3-angled. Scales scattered, ovate-subulate, 2–3 mm long; fertile leaves 2-lobed, subulate, c. 2 mm long, subtending ±sessile synangia on uppermost branches; synangia ±globular, 3-celled, c. 2 mm diam., yellow when mature. *Skeleton Forkfern*.

Norfolk Is., Lord Howe Is. On Norfolk Is. occasional to common in the National Park, occasional elsewhere; common throughout Lord Howe Is. Also in Australia and the North Is. of New Zealand, and widespread throughout the tropics and subtropics.

N.Is.: Mt Pitt Reserve, *M.Lazarides 8076* (CANB); *s. loc.*, *A.Cunningham 61* (K). **L.H.Is.:** Transit Hill, *P.S.Green 1637* (A, K); near Lovers Bay, *R.D.Hoogland 8725* (CANB, NSW).

2. TMESIPTERIS

Tmesipteris Bernh., *J. Bot.* (*Schrader*) 1800(2): 131 (1801); from the Greek *tmesis* (cutting or incision) and *pteris* (fern), in allusion to the sporophyll being cut in two in these fern allies.

Type: *T. tannensis* (Spreng.) Bernh.

Rhizomatous herbs. Aerial branches simple or forked once (elsewhere, repeatedly forked), bearing flattened appendages ('leaves') with a midrib. Synangia of paired sporangia fused to these leaf-like structures.

A genus of c. 10 species, mostly from eastern Australia and New Zealand, but also from Mindanao, Celebes, Papua New Guinea, Solomon Is., Vanuatu, New Caledonia, Fiji, Samoa, Tahiti and the Marquesas. Two native species, 1 on each of the Islands. Sometimes classified in its own family, the Tmesipteridaceae.

G.Bentham, Lycopodiaceae, *Tmesipteris*, *Fl. Austral.* 7: 680–681 (1878); M.M.J. van Balgooy, *Blumea Suppl.* 5: 274–275 (1966); R.J.Chinnock, The New Zealand species of *Tmesipteris* (Psilotaceae), *New Zealand J. Bot.* 13: 743–768 (1975).

Synangia ±globose, blunt, 3.5–4 mm long, 1.75–2 mm broad; leaf-like appendages acute, apiculate (N.Is.) **1. T. norfolkensis**

Synangia somewhat elongated, ±pointed, 5.5–6 mm long, 1.25–1.5 mm broad; leaf-like appendages subtruncate, prominently apiculate (L.H.Is.) **2. T. truncata**

1. Tmesipteris norfolkensis P.S.Green, *J. Arnold Arbor.* 67: 109 (1986)

T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W.

Tmesipteris forsteri Endl., *Prodr. Fl. Norfolk.* 6 (1833), *nom. illeg.*; *Psilotum forsteri* (Endl.) Endl., *Iconogr. Gen. Pl.* ix, t. 85 (1838), *nom. illeg.* T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W.

[*Tmesipteris tannensis auct. non* (Spreng.) Bernh.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 740 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 15 (1915); C.F.Reed, *Bol. Soc. Brot.* ser. 2, 40: 84 (1966)]

[*Tmesipteris truncata auct. non* (R.Br.) Desv.: C.F.Reed, *op. cit.* 85, *p.p.*]

[*Tmesipteris billardieri auct. non* Endl.: M.D.Tindale in N.C.W.Beadle *et al.*, *Fl. Sydney Region* 3rd edn, 40 (1982), *p.p.*]

Illustration: S.F.L.Endlicher, *Iconogr. Gen. Pl.* t. 85 (1835).

Pendulous epiphyte on trunks of tree ferns. Branches 10–25 cm long, of limited growth. Leaf-like appendages slightly sigmoid, 10–20 mm long, 3–5 mm broad, acute, apiculate. Synangia ±globose, 3.5–4 mm long, 1.75–2 mm broad, blunt. *Hanging Forkfern*. Fig. 101A.

Norfolk Is. Endemic and scattered throughout the populations of tree ferns.

N.Is.: Mt Pitt Reserve, *M.Lazarides 8086* (CANB, K); SE slopes of Mt Pitt, *R.D.Hoogland 6591* (CANB); between Palm Glen and Red Rd, *R.J.Chinnock 5964* (AD, K); *s. loc.*, Nov. 1902, *J.H.Maiden & J.L.Boorman* (BM, K, NSW).

2. Tmesipteris truncata (R.Br.) Desv., *Mém. Soc. Linn. Paris* 6: 192 (1827)

Psilotum truncatum R.Br., *Prodr.* 164 (1810). T: Tasmania and Port Jackson, Australia, 1802, *R.Brown*; syn: BM; isosyn: K. The epithet alludes to the truncate apex of the leaves.

[*Tmesipteris tannensis auct. non* (Spreng.) Bernh.: G.Bentham, *Fl. Austral.* 7: 681 (1878), *p.p.*; W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 117 (1917)]

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 32, fig. 15b (1981); S.B.Andrews, *Ferns Queensland* fig. 31.1A (1990); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 4 (1990).

Pendulous epiphyte on trunks of tree ferns. Branches 10–30 cm long, of limited growth. Leaf-like appendages oblong, only very slightly sigmoid, 10–20 mm long, 3–5 mm broad, subtruncate with prominent apiculum 1–2 mm long. Synangia somewhat elongate, ovoid-conoid, 5.5–6 mm long, 1.25–1.5 mm broad, ±pointed.

Lord Howe Is. Common as an epiphyte on tree fern trunks in the mountains. Also known from similar habitats in southern Qld and in N.S.W.

L.H.Is.: top of Mt Gower, *M.M.J. van Balgooy 1119* (CANB); *loc. id.*, *P.S.Green 1593* (A, K); side of Mt Lidgbird, *C.Moore 33* (K, MEL).

117. LYCOPODIACEAE

Herbaceous, terrestrial or epiphytic herbs. Stems erect, scrambling or pendulous, simple or dichotomously branched. Leaves numerous, small, simple, 1-veined. Sporophylls similar to other leaves or modified and forming compact, terminal spikes ('cones'). Sporangia axillary, 1-locular, homosporous.

A family of 4 living genera and c. 250 species, pantropical with many southern temperate species. One native genus on each of the Islands. In addition to *Lycopodium*, the type genus,

2 other genera, *Huperzia* and *Lycopodiella*, previously treated as part of *Lycopodium*, are now generally recognised as distinct. The fourth is *Phylloglossum*, a monotypic genus from Australia and New Zealand.

G.Bentham, Lycopodiaceae, *Fl. Austral.* 7: 670–682 (1878); D.L.Jones & S.C.Clemesha, Lycopodiaceae, *Austral. Ferns & Fern Allies* 2nd edn, 20–27 (1981); F.M.Tryon & A.F.Tryon, Lycopodiaceae, *Ferns & Allied Pl.* 796–812 (1982); B.Øllgaard, A revised classification of the Lycopodiaceae *s. lat.*, *Opera Bot.* 92: 153–178 (1987); D.L.Jones, Lycopodiaceae, *Encycl. Ferns* 364–368 (1987); B.Øllgaard, Index of the Lycopodiaceae, *Biol. Skr.* 34: 1–135 (1989); P.J.Brownsey & J.C.Smith-Dodsworth, Lycopodiaceae, *New Zealand Ferns Allied Pl.* 19–24 (1989).

KEY TO GENERA

Roots in a basal tuft; branches clustered together; branch dichotomies equal	**1. HUPERZIA**
Roots occurring at nodes along stem; branch dichotomies unequal	**2. LYCOPODIELLA**

1. HUPERZIA

Huperzia Bernh., *J. Bot.* (*Schrader*) 1800(2): 126 (1801); named after Johann Peter Huperz (?–1816), a German botanist who wrote on ferns.

Type: *H. selago* (L.) Schrank & Mart.

Epiphytic or terrestrial. Stems all similar, ascending or pendulous; branches bifurcating equally and of ±equal length; roots in a single basal tuft. Sporophylls resembling sterile leaves or reduced, persistent. Strobili ('cones') made up of sporangia in the axils of unmodified or reduced leaves, erect, merging into vegetative shoots or distinct. Sporangia reniform, shortly pedunculate. Prothallus subterranean, saprophytic.

A cosmopolitan genus of 200 or more species; 1 species native to Lord Howe Is.

G.Bentham, Lycopodiaceae, *Lycopodium*, *Fl. Austral.* 7: 674 (1878).

Huperzia varia (R.Br.) Trev., *Atti Soc. Ital. Sci. Nat.* 17: 247 (1874)

Lycopodium varium R.Br., *Prodr.* 165 (1810); *Lycopodium selago* var. *varium* (R.Br.) F.Muell., *Fragm.* 10: 118 (1877); *Urostigma varius* (R.Br.) Herter ex Nessel, *Bärlappgewächse* 192 (1939). T: Tasmania, 1804, *R.Brown*; holo: BM. The epithet is the Latin for diverse, presumably alluding to the leaves either spreading or overlapping.

[*Lycopodium myrtifolium auct. non* G.Forst.: G.Bentham, *Fl. Austral.* 7: 674 (1876) *et auct. mult.*]

[*Lycopodium nutans auct. non* Brack.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 24: 383 (1899)]

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 23, fig. 6b (1981), as *L. myrtifolium*; B.Duncan & G.Isaac, *Ferns & Allied Pl. Victoria, Tasmania & S. Australia* 41 (1986), as *L. varium*; S.B.Andrews, *Ferns Queensland* 233, fig. 20.4A (1990), as *L. myrtifolium*.

Terrestrial, perennial, ±erect, up to 50 cm high, usually less; ±tufted branches relatively few. Leaves crowded, narrowly lanceolate-linear, 10–15 mm long, 2–3 mm broad, ±blunt. Cone slender, (3–) 6–15 cm long, 3–5 mm broad; sporophylls imbricate in 4 rows, variable, some ±intermediate with vegetative leaves, ovate, 2–5 mm long, entire, cuspidate.

Lord Howe Is. Known from the upper slopes of Mt Gower. Classified as 'rare, very uncommon' by J.Pickard (*Biol. Conservation* 27: 139, 1983). Also known from Australia (southern Qld, N.S.W., Vic. and Tas.) and New Zealand.

L.H.Is.: N ridge of Mt Gower, *P.S.Green 1649* (K); summit of Mt Gower, *J.P.Fullagar* (K, MEL).

2. LYCOPODIELLA

Lycopodiella Holub, *Preslia* 36: 22 (1964); the name is derived from that of the related *Lycopodium* plus the diminutive suffix *-ella*.

Type: *L. inundatum* (L.) Holub.

Terrestrial ferns, of diverse habit. Rhizome indeterminate, rooting. Stems erect, simple or branched. Sporophylls and vegetative leaves dissimilar; sporophylls ephemeral, usually subpeltate. Cones terminal on simple branches or apparently lateral, pendulous or erect. Prothallus green, hemisaprophytic.

A genus of c. 40 species, mostly from the Americas; 1 species native to Norfolk Is.

G.Bentham, Lycopodiaceae, *Lycopodium*, *Fl. Austral.* 7: 676 (1878).

Lycopodiella cernua (L.) Pic.Serm., *Webbia* 23: 166 (1968)

Lycopodium cernuum L., *Sp. Pl.* 2: 1103 (1753). T: locality unknown, LINN 1257.15; holo: LINN; IDC microfiche 177/2.735/15. Named from the Latin *cernuus* (nodding), alluding to the inclination of the cones.

Illustrations: D.L.Jones, *Encycl. Ferns* 365, 366 (1987); P.J.Brownsey & J.C.Smith-Dodsworth, *New Zealand Ferns & Allied Pl.* 20, fig. 20, t. 2B (1989); S.B.Andrews, *Ferns Queensland* 227, fig. 20.1B (1990); all as *Lycopodium cernuum*.

Rhizome long-creeping; stems to 1 m high, much branched in upper part. Leaves crowded, linear-subulate, 3–5 mm long. Cones solitary on nodding tips of branchlets, oblong, 0.5–1 (–1.5) cm long, obtuse; sporophylls closely overlapping, ovate, denticulate, cuspidate. *Club Moss*.

Norfolk Is. In open areas in the forest. Possibly a relatively recent arrival; this species has a pantropical distribution.

N.Is.: valley S of Mt Bates, *P.S.Green 1896* (K); *s. loc.*, *B.Chapman* in *J.D.McComish 253* (K).

Doubtful record

Lycopodium deuterodensum Herter, *Index Lycopod.* 15 (1949) (*L. densum* Labill. *nom. illeg. non* Lam.) has been recorded from Norfolk Is., first by Bentham (*Fl. Austral.* 7: 676, 1878) and subsequently copied by other authors, but a search has failed to find any specimen upon which this record could be based, and the species has not been found since on the Island.

118. SELAGINELLACEAE

Terrestrial herbs, erect or creeping, often with rhizophores, usually much branched. Leaves numerous, small, 1-veined, with a small ligule, often of two kinds borne in two planes. Sporophylls in compact, terminal strobili (cones); sporangia axillary, producing 1–4 relatively large megaspores or very numerous, minute microspores; megasporangia and microsporangia usually in same spike.

A monogeneric family of perhaps 700 or more species, found mostly in the humid tropical or subtropical regions of the world, but with a few temperate species; 1 species naturalised on Norfolk Is.

G.Bentham, Lycopodiaceae, *Fl. Austral.* 7: 677–679 (1878); A.H.G.Alston, The genus *Selaginella* in the Malay Peninsula, *Gard. Bull. Straits Settlem.* 8: 41–62 (1934); A.H.G.Alston, The *Selaginellae* of the Malay Islands, 1, Java and the Lesser Sunda Islands, *Bull. Jard. Bot. Buitenzorg* 13: 432–442 (1935); A.H.G.Alston, The *Selaginellae* of the Malay Islands, 2, Sumatra, *Bull. Jard. Bot. Buitenzorg* 14: 175–186 (1937); K.M.Wong,

Critical Observations on Peninsular Malaysian *Selaginella*, *Gard. Bull. Singapore* 35: 107–135 (1982).

SELAGINELLA

Selaginella P.Beauv., *Mag. Encycl. Paris IX* 5: 478 (1804); a diminutive of *selago*, a name used by Pliny for a plant resembling a Mediterranean species of juniper.

Type: *S. spinosa* P.Beauv., *nom. illeg.* = *S. selaginoides* (L.) Link

A large genus of perhaps 700 or more species found mostly in humid tropical and subtropical regions of the world.

***Selaginella kraussiana** (Kunze) A.Braun, *Index Sem. Hort. Bot. Berol. App.* 22 (1859)

Lycopodium kraussianum Kunze, *Linnaea* 18: 114 (1844). T: Natal, South Africa, *C.F.F. von Krauss*; iso: K. Named after the collector of the type specimen.

Illustrations: B.D.Duncan & G.Isaac, *Ferns & Allied Pl. Victoria, Tasmania & S. Australia* 52, fig. 4.15C, 54, fig. 4.18 (1986); D.L.Jones, *Encycl. Ferns* 52, 371 (1987); S.B.Andrews, *Ferns Queensland* 319, fig. 33.1D (1990).

Trailing herb, 20–30 cm long, much branched, with a rhizophore at each branching. Leaves of two forms: lateral leaves crowded on terminal branches, lanceolate-oblong, 2–3 mm long, acute; median leaves appressed, lanceolate, 1.5–2 mm long, acuminate, slightly keeled. Cones, when produced, narrow, 5 mm long; sporophylls ovate, acuminate, keeled.

Norfolk Is. A garden escape, persisting as a weed in a few places.

N.Is.: New Cascade Rd, *W.R.Sykes NI 658* (CHR).

Doubtful record

Selaginella uliginosa (Labill.) Spring was recorded by G.Bentham (*Fl. Austral.* 7: 678, 1878) from Lord Howe Is., based on a collection by C.Moore. This has not been traced and it is believed that the specimen at Kew annotated in Baker's hand: 'Lord Howe's Island Hb. Macleay recd. 5/73' is mislabelled.

119. OPHIOGLOSSACEAE

Terrestrial or epiphytic herbs; rhizome short, erect. Fronds solitary or few, simple or divided. Sporangia borne in a simple or branched spike which arises on or at the top of the common stipe of the lamina. Sporangia numerous, large, without an annulus, many-spored, in *Ophioglossum* ±sunk into the surrounding tissue.

A worldwide family of 4 genera and c. 55 species; 2 genera native to Lord Howe Is., 1 also native to Norfolk Is.

G.Bentham, Filices, Tribe *Ophioglosseae*, *Fl. Austral.* 7: 688–690 (1878); R.T.Clausen, A Monograph of the Ophioglossaceae, *Mem. Torrey Bot. Club* 19: 1–77 (1938); J.H.Wieffering, A preliminary revision of the Indo-Pacific species of *Ophioglossum* (Ophioglossaceae), *Blumea* 12: 321–337 (1964); R.E.Holttum, *Fl. Malaya* (*Ferns*) 2nd edn, 2: 38–42 (1968); D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 57, 62–63 (1981); R.M.Tryon & F.M.Tryon, *Ferns & Allied Pl.* 25–39 (1982).

KEY TO GENERA

Sterile lamina simple, or the upper end sometimes once branched; venation reticulate **1. OPHIOGLOSSUM**

Sterile lamina compound; venation open and dichotomous **2. BOTRYCHIUM**

1. OPHIOGLOSSUM

Ophioglossum L., *Sp. Pl.* 2: 1062 (1753); *Gen. Pl.* 5th edn, 484 (1754); from the Greek *ophis* (snake) and *glossa* (tongue), from Adder's Tongue, the folk-name in several languages.

Type: *O. vulgatum* L.

Terrestrial, perennial or annual herbs. Fronds erect or pendulous, somewhat fleshy, with a stipe which is common to the fertile spike(s); lamina simple or palmately lobed, with reticulate venation; primary areoles with free veinlets. Sporangia borne in 1–several, simple, stalked spikes; sporangia ±immersed in 2 marginal rows, dehiscing by transverse slits.

A cosmopolitan but mainly tropical genus of 25–30 species. Four native species on Lord Howe Is., with 1 also on Norfolk Is.

G.Bentham, Filices, *Ophioglossum*, *Fl. Austral.* 7: 688–689 (1878).

1 Terrestrial herb; fronds erect, lamina 1–6 cm long

2 Sterile lamina broadly ovate, broadly obtuse to subtruncate at base, venation clearly reticulate; plants 3–7 cm tall; spike with peduncle 1.2–4 cm long **1. O. reticulatum**

2: Sterile lamina lanceolate, ovate-lanceolate or elliptic, obtuse to narrowly acute at base, venation clearly or obscurely reticulate; plants 5–20 cm tall; spike with peduncle (1.5–) 4–14 cm long

3 Sterile lamina thick, with obvious venation, lanceolate to ovate-lanceolate, ±obtuse at base; spike 2–5 cm long, with peduncle (1.5–) 5–14 cm long **2. O. petiolatum**

3: Sterile lamina somewhat thick with venation ±obscure, elliptic to broadly elliptic, rarely somewhat narrowly lanceolate, acute to narrowly acute at base; spike 0.5–4 cm long, with peduncle 4–8 cm long **3. O. coriaceum**

1: Epiphytic herb; fronds pendulous; lamina 30–100 cm long **4. O. pendulum**

1. Ophioglossum reticulatum L., *Sp. Pl.* 2: 1063 (1753)

T: Haiti, not designated; lecto: C.Plumier, *Traité Foug. Amér.* t. 164 (1705), *fide* G.R.Proctor in R.A.Howard, *Fl. Lesser Antilles* 2: 43 (1977). So named from the reticulate venation.

Illustrations: J.H.Wieffering, *Blumea* 12: 325 (1964); G.Brownlie, *Pteridо. Fl. Fiji* 47, t. 4, fig. 1 (1977); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 18 (1990).

Terrestrial herb 3–7 cm tall. Fronds erect. Sterile lamina broadly ovate, 1.5–2.5 cm long, (0.8–) 1.2–1.5 cm broad, broadly obtuse to subtruncate at base, acute at apex, venation evident. Fertile spike 0.8–1.2 cm long on a stipe 1.2–4 cm long.

Lord Howe Is. Rare? Of pantropical distribution. Very recently collected for the first time on the Island from a small, very local population growing in a mossy substrate. Not known from Australia or New Zealand.

L.H.Is.: The Saddle, *I.Hutton 578* (K).

The description above is based on *Hutton 578*, cited above; with further collections the dimensions may be increased slightly. It appears to coincide with J.H.Wieffering's figure of *O. reticulatum* f. *dilatatum* (Miq.) Wieff. in *Blumea* 12: 325 (1964).

2. **Ophioglossum petiolatum** Hook., *Exot. Fl.* 1: 56 (1823)

T: cult., grown from a sporeling on the root of a plant introduced from the West Indies; holo: K. So named from the conspicuously petiolate leaves.

[*Ophioglossum vulgatum auct. non* L.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 740 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 15 (1915)]

Illustrations: D.L.Jones, *Encycl. Ferns* 58 (1987); P.J.Brownsey & J.C.Smith-Dodsworth, *New Zealand Ferns & Allied Pl.* 35, fig. 36, t. 4F (1989); S.B.Andrews, *Ferns Queensland* 262, fig. 25.3B (1990).

Terrestrial herb 10–20 cm tall. Fronds erect. Sterile lamina thick, lanceolate to ovate-lanceolate, 2–6 cm long, 1–2 cm broad, widest in the lower half, basally ±obtuse, apically acute; venation evident. Spike 2–5 cm long, with peduncle (1.5–) 5–14 cm long.

Norfolk Is., Lord Howe Is. Rare, dying down in summer. Also known from New Zealand, the Kermadec Islands, all Australian States and New Caledonia.

N.Is.: Mt Pitt, *F.C.Allen CHR229320* (CHR); *s. loc.*, *R.M.Laing* (CHR); *s. loc.*, 1902, *I.Robinson* (NSW). **L.H.Is.:** North Beach, *I.R.H.Telford 7049 & M.D.Crisp* (CBG).

Ophioglossum petiolatum is sometimes included in *O. reticulatum* by Australian authors (*e.g.* P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 18, 1990).

3. **Ophioglossum coriaceum** A.Cunn., *Companion Bot. Mag.* 2: 361 (1837)

T: New Zealand, *A.Cunningham 161*; holo: K. The epithet refers to the thick or coriaceous texture of the leaf lamina.

Ophioglossum vulgatum var. *lanceolatum* Luerss., *J. Mus. Godeffroy* 8: 115 (1875); *Ophioglossum prantlii* C.Chr., *Index Filic.* 471 (1906); *Ophioglossum vulgatum* var. *prantlii* (C.Chr.) W.R.B.Oliv., *Trans. & Proc. New Zealand Inst.* 49: 126 (1917). T: Rockhampton, Queensland, *A.Dietrich 513*; holo: ?HBG *n.v.*; iso: BM.

[*Ophioglossum vulgatum auct. non* L.: W.W.Watts, *Proc. Linn. Soc. New South Wales* 37: 396 (1912)]

Illustrations: C.Luerrsen, *J. Mus. Godeffroy* 8: t. 13, figs 66–76 (1875); P.J.Brownsey & J.C.Smith-Dodsworth, *New Zealand Ferns & Allied Pl.* 35, fig. 35, t. 4E (1989); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 18 (1990).

Terrestrial, erect herb 5–15 cm tall. Sterile lamina somewhat thick, narrowly to broadly elliptic, rarely somewhat lanceolate, (1–) 2–4 (–5) cm long, 0.6–2 (usually c. 1.2) cm broad, usually widest towards middle, basally acute to narrowly acute, venation ±obscure. Spike 0.5–4 cm long, with peduncle 4–8 cm long. Fig. 101B.

Lord Howe Is. Of scattered occurrence throughout the Island, but never common. Also known from all Australian States and New Zealand.

L.H.Is.: Johnsons Farm, 1911, *W.W.Watts* (NSW); Mt Eliza, *A.C.Beauglehole 4745* (CANB, MEL); Erskine Valley, *A.C.Beauglehole 5744* (CANB, MEL).

Variable in size, and to some extent in the shape of the sterile laminas, this species has been the cause of much taxonomic confusion and is sometimes included in *O. lusitanicum* by Australian authors (*e.g.* R.Chinnock in J.P.Jessop & H.R.Toelken, *Fl. S. Australia* 4th edn, 1: 84, 1986).

4. **Ophioglossum pendulum** L. in Stickman, *Herb. Amboin.* 27 (1754)

T: illustration in G.E.Rumphius, *Herb. Amboin.* 6: t. 37, fig. 3 (1750); an illustration of *Scolopendria major*. Named in allusion to its pendulous fronds.

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 62, fig. 37d (1981); D.L.Jones, *Encycl. Ferns* 346 (1987); S.B.Andrews, *Ferns Queensland* 260, fig. 25.2A (1990).

Epiphyte, rhizome short. Sterile lamina 1–several, pendulous, strap-shaped, 30–100 cm long, 1–3 cm broad, gradually narrowed into an indefinite stipe, rounded, with apical part sometimes dichotomously forked; veins narrowly reticulate. Spike 6–15 cm long, 5–8 mm broad, arising from middle, or towards base of lamina; peduncle 2–5 cm long.

Lord Howe Is. Rare, growing in pockets of humus, for example, in and above plants of *Platycerium*, and probably overlooked there. Also known from Madagascar, Ceylon and

Malesia, to Australia (Qld and northern N.S.W.), and to the south-western Pacific islands, but not on Norfolk Is. or New Zealand.

L.H.Is.: Boat Harbour track. *I.Hutton 585* (K); *s. loc.*, 1948, *M.Nicholls* (NSW).

2. BOTRYCHIUM

Botrychium Sw., *J. Bot.* (*Schrader*) 1800(2): 8, 110 (1801); from the Greek *botrychios*, a diminutive derived from *botrys* (a bunch of grapes), in allusion to the appearance of the fertile portion of these plants.

Type: *B. lunaria* (L.) Sw.

Perennial, terrestrial herbs. Fronds 1 or 2, erect, with a common stipe bearing sterile and fertile parts; venation open, dichotomous. Sporangia numerous, globose, naked, not immersed in surrounding tissue.

A worldwide genus of c. 40 species; 1 species native to Lord Howe Is.

G.Bentham, Filices, *Botrychium*, *Fl. Austral.* 7: 689–690 (1878).

Botrychium australe R.Br., *Prodr.* 164 (1810)

T: Port Jackson and Tasmania, Australia, 1802 & 1803, *R.Brown*; syn: BM. Named from the Latin *australis* (southern), referring to the Southern Hemisphere distribution of this species.

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 57, fig. 51 (1981); P.J.Brownsey & J.C.Smith-Dodsworth, *New Zealand Ferns & Allied Pl.* 33, fig. 32, t. 4B (1989); S.B.Andrews, *Ferns Queensland* 257, fig. 25.1A (1990).

Herb, 15–30 (–40) cm tall. Sterile lamina with numerous, deep divisions, ±triangular in outline, (6–) 8–10 (–15) cm long, (6–) 8–10 (–15) cm broad at base. Fertile sporangiophore also much branched; sporangia very numerous, globose, c. 1 mm diam., opening by a transverse slit.

Lord Howe Is. Rare, in shade. Also known from eastern Australia and New Zealand.

L.H.Is.: in the vicinity of the post office, 1920, *J.L.Boorman* (NSW); The Saddle, *J.Pickard 3626* (NSW).

120. MARATTIACEAE

Large terrestrial ferns with massive, erect or creeping, fleshy rhizome. Fronds small to very large, simple or pinnately compound, attached by an enlarged joint and stipule-like outgrowth. Sporangia in rounded or elongate dorsal sori, free or connate into thick-walled synangia opening by a ventral, longitudinal slit; homosporous.

A family of 5 genera and c. 200 species, from the moist tropics and subtropics; 1 genus native to the Islands.

MARATTIA

Marattia Sw., *Prodr.* 128 (1788); named after the Italian botanist, Giovanni Francesco Marratti (?–1777).

Type: *M. alata* Sw.

Medium-sized to massive ferns; rhizomes stout. Fronds with a pair of fleshy stipules at base of stipe, pinnately compound, with base of pinnae pulvinate; veins free, simple or forked. Sporangia coalescent in double row to form oval to oblong or rounded synangia along each side of midvein.

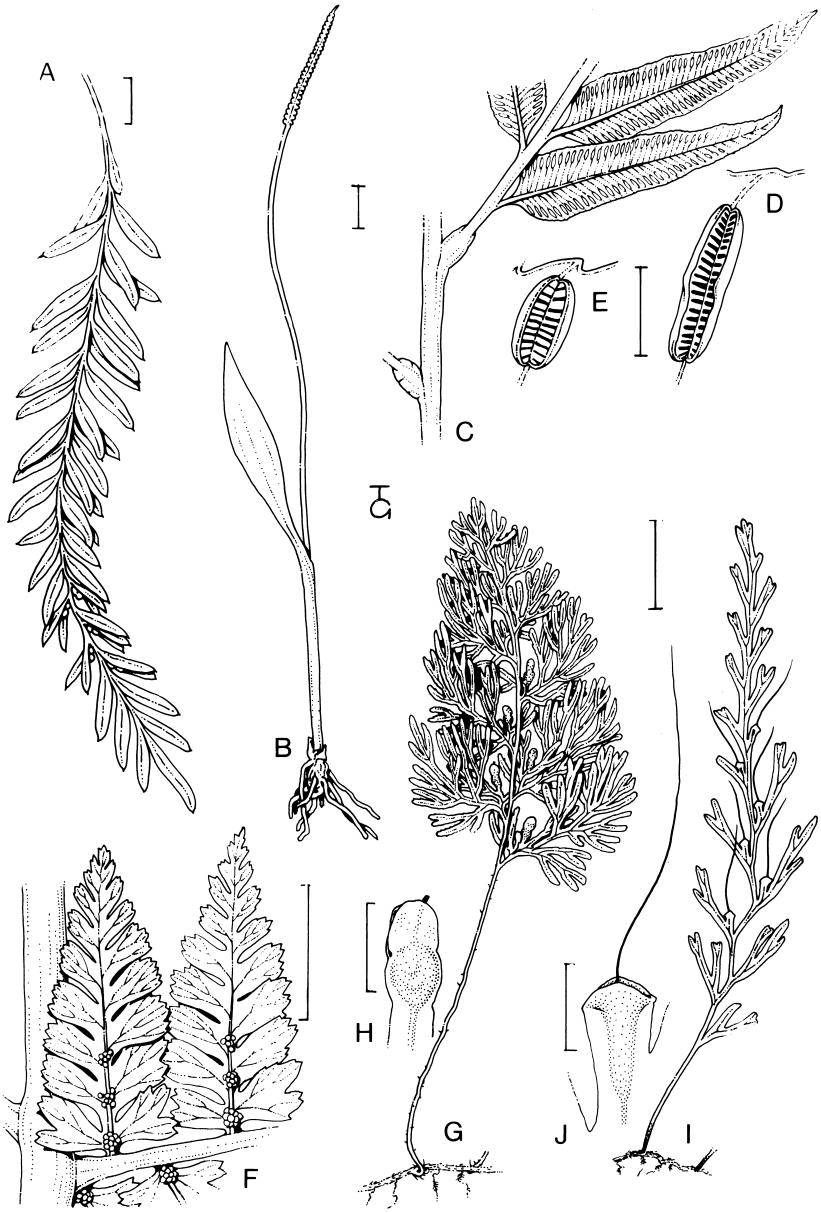

Figure 101. A, PSILOTACEAE: *Tmesipteris norfolkensis*, habit (1849, C.Simmons, K). **B**, OPHIOGLOSSACEAE: *Ophioglossum coriaceum*, habit (W.Watts 5014, NSW). **C–E**, MARATTIACEAE. **C–D**, *Marattia howeana*. **C**, base of pinna; **D**, synangium (**C–D**, C.Moore 64, K). **E**, *Marattia salicina*, synangium (A.Cunningham 17, K). **F**, OSMUNDACEAE: *Leptopteris moorei*, two pinnules (Phytologic Museum of Melbourne, K). **G–J**, HYMENOPHYLLACEAE. **G–H**, *Hymenophyllum howense*. **G**, frond (C.Moore 4, K); **H**, sorus (J.Game 69/022, K). **I–J**, *Crepidomanes endlicherianum*. **I**, frond; **J**, sorus (**I–J**, P.Green 1890, K). Scale bars: **A–C**, **F**, **G**, **I** = 1 cm; **D**, **E**, **H**, **J** = 2 mm. Drawn by T.Galloway.

A genus of c. 60 species, distributed in most tropical countries, and reaching New Zealand and Japan; 1 native species on each of the Islands.

G.Bentham, Filices, *Marattia*, *Fl. Austral.* 7: 694–695 (1878).

Synangia (1–) 1.5–2.5 mm long, with (6–) 7–14 (–16) pairs of sori; base of midveins of pinnae on undersides with scattered, cobwebby scales (N.Is.) **1. M. salicina**

Synangia 2–3.5 mm long, with (15–) 20–22 pairs of sori; base of midveins on undersides glabrous (L.H.Is.) **2. M. howeana**

1. Marattia salicina Sm. in A.Rees, *Cycl. 22*: *Marattia* No. 6 (1812)

T: 'New South Wales' [Norfolk Island], *Molesworth* in *Herb. Smith 1644.3*; holo: LINN *n.v.*; photo seen (IDC microfiche 5073-837/15). The epithet comes from the Latin *salix* (willow), in allusion to the willow-shaped leaflets.

Marattia elegans Endl., *Prodr. Fl. Norfolk.* 6 (1833). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W.

[*Marattia fraxinea auct. non* Sm.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 740 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 15 (1915)]

Illustrations: S.Firth *et al.*, *Ferns New Zealand* 58 (1986); D.L.Jones, *Encycl. Ferns* 15 (1987); P.J.Brownsey & J.C.Smith-Dodsworth, *New Zealand Ferns & Allied Pl.* 36, fig. 37, t. 5A (1989).

Large, robust fern. Stipes 2 m long; lamina 1–4 m long, 2- or 3-pinnate; pinnae alternate; pinnules shortly petiolulate, narrowly lanceolate, 8–15 cm long, 1–2 cm broad, finely serrate, acute, with scattered, long cobwebby scaly hairs beneath, especially towards base and midrib. Synangia marginal, 8–10 per cm, (1–) 1.5–2.5 mm long, with (6–) 7–14 (–16) pairs of sori. *King Fern*. Fig. 101E.

Norfolk Is. In valleys on the south-eastern slopes of Mts Pitt and Bates, vulnerable. Also known from New Zealand.

N.Is.: King Fern Gully, E slope of Mt Pitt, *R.D.Hoogland 11192* (CANB, K, NSW); *s. loc.*, 1884, *I.Robinson* (MEL, NSW).

Although in his original description Smith ascribed the plant to N.S.W., no *Marattia* occurs there and it is most probable that he had received what was the Norfolk Is. plant, via Port Jackson [Sydney] (see A.H.G.Alston, *J. Bot.* 74: 74, 1936).

2. Marattia howeana (W.R.B.Oliv.) P.S.Green, *Kew Bull.* 43: 655 (1988)

Marattia fraxinea var. *howeana* W.R.B.Oliv., *Trans. & Proc. New Zealand Inst.* 49: 125 (1917). T: Deep Creek, Lord Howe Island, *W.R.B.Oliver*; holo: WELT. The epithet is derived from the name of the island on which this fern is endemic.

[*Marattia salicina auct. non* Sm.: F.J.H. von Mueller, *Fragm.* 10: 118 (1877)]

[*Marattia fraxinea auct. non* Sm.: G.Bentham, *Fl. Austral.* 7: 695 (1879); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 267 (1896)]

Marattia salicina Sm. subsp.: G.L.Lucas & A.H.M.Synge, IUCN Red Data Book 41 (1978); A.N.Rodd & J.Pickard, *Cunninghamia* 1: 269 (1983).

Illustration: C.J.Goudey, *Austral. Fern J.* 1: fig. 12 [but not fig. 13] (1984).

Large, robust fern. Fronds up to 4 m long, 2- or 3-pinnate; pinnae alternate; pinnules very shortly petiolulate, lanceolate, 6–9 cm long, 1–2 cm broad, distinctly crenulate, ±abruptly acuminate, glabrous. Synangia submarginal, 8 or 9 per cm, 2–3.5 mm long, with 15–22 pairs of sori. *Horse Shoe Fern*, *King Fern*. Fig. 101C–D.

Lord Howe Is. Endemic, and threatened. Found beside streams in dense forest in the mountainous southern half of the Island.

L.H.Is.: Eddies Cave, *J.Pickard 3591* (NSW); N side of Erskine Valley, *A.C.Beauglehole 5746* (CANB, MEL); *loc. id.*, *P.S.Green 2367* (K); Big Ck, *C.Moore 21 & 64* (K, MEL).

Related to *M. attenuata* Labill. of New Caledonia.

121. OSMUNDACEAE

Terrestrial ferns. Rhizomes short or trunk-like, without hairs or scales. Fronds uniform or dimorphic, 1–3-pinnate; veins free. Sporangia not aggregated in sori, large, maturing simultaneously, opening by vertical slits; rudimentary annulus represented by a group of thick-walled cells.

A family of 3 genera and 18 species, of worldwide representation; 1 genus native to Lord Howe Is.

LEPTOPTERIS

Leptopteris C.Presl, *Suppl. Tent. Pterid.* 70 (1845); from the Greek *leptos* (thin or slender) and *pteris* (fern), in allusion to the thin texture of these delicate ferns.

Type: *L. hymenophylloides* (A.Rich.) C.Presl

Ferns with stout, erect trunk up to 1 m tall. Fronds 2- or 3-pinnate or 3-pinnate-pinnatisect, very thin, lacking mesophyll and stomata. Sporangia naked, clustered around basal region of veins on dorsal surface of pinnules.

A genus of c. 7 species from Papua New Guinea, eastern Australia, New Zealand, Vanuatu, Fiji and Samoa; characteristic of very humid situations. One species endemic to Lord Howe Is.

G.Bentham, Filicales, Tribe Osmundeae, *Todea*, *Fl. Austral.* 7: 699–700 (1878).

Leptopteris moorei (Baker) H.Christ, *Farnkr. Erde* 335 (1897)

Todea moorei Baker, *J. Bot.* 11: 16 (1873); *Osmunda moorei* (Baker) F.Muell., *Fragm.* 9: 78 (1875). T: summit of Mt Gower, Lord Howe Island, *R.D.Fitzgerald*; holo: K. Named after Charles Moore, (1820–1905), Director of the Botanic Gardens, Sydney, (1849–1896), who collected on Lord Howe Is. in 1869.

Illustration: J.G.Baker, *Hooker's Icon. Pl.* 17: t. 1697 (1887).

Fern with trunk 20–30 cm tall. Fronds delicate, 0.5–1 m long, 30–45 cm broad, 2- or 3-pinnate or pinnatisect; pinnules numerous, overlapping, lanceolate, bluntly denticulate. Fig. 101F.

Lord Howe Is. Endemic and confined to the summit of Mt Gower, vulnerable.

L.H.Is.: Mt Gower, *C.Moore 17* (K, MEL); summit of Mt Gower, *J.Pickard 2623 & 2629* (NSW).

SCHIZAEACEAE

There is a specimen of the climbing fern *Lygodium japonicum* (Thunb.) Sw., in the herbarium of the Royal Botanic Gardens, Sydney labelled 'Norfolk Island' in J.H.Maiden's hand, but although this fern is known from tropical Australia this record for Norfolk Is. has not been confirmed and the specimen may be presumed to have been mislabelled.

122. HYMENOPHYLLACEAE

Epiphytic, lithophytic or terrestrial ferns of humid places. Rhizomes slender, long-creeping or short and suberect. Fronds diverse; lamina membranous, only one cell thick, without stomata. Sori marginal at vein endings; sporangia on short or elongate receptacles enclosed

in tubular or cup-like indusia, often 2-lobed; sporangia developing basipetally, sessile, with an oblique or horizontal annulus.

A family with a variable number of genera between 2 and 34, depending on the authority followed, but containing c. 600 species, most abundant in the wet tropics; 2 genera native on each Island. They are usually called Filmy Ferns, because of their thin, membranous (usually 1 cell thick), often semi-transparent fronds. For generic classification see Morton (1968) (below), where two of the genera recognised below are treated as sections of the genus *Trichomanes*.

C.V.Morton, The genera, subgenera and sections of *Hymenophyllum*, *Contr. U.S. Natl. Herb.* 38: 153–214 (1968); K.Iwatsuki in K.Kubitzki, *Families & Genera of Vascular Plants* 1: 157–163 (1990).

KEY TO GENERA

1 Involucre cup-shaped and 2-lipped or ±deeply 2-lobed; receptacle usually not exserted; rhizome always slender, often long-creeping **1. HYMENOPHYLLUM**

1: Involucre narrowly or broadly tubular, ±truncate and entire, sometimes ±dilated; receptacle often long-exserted; rhizome long-creeping or erect

2 Rhizome wiry, long-creeping **2. CREPIDOMANES**

2: Rhizome robust, erect **3. CEPHALOMANES**

1. HYMENOPHYLLUM

Hymenophyllum Sm., *Mém. Acad. Roy. Sci.* (*Turin*) 5: 418 (1793); from the Greek *hymen* (a thin membrane) and *phyllum* (a leaf), in allusion to the texture of the leaves in this genus.

Type: *H. tunbridgense* (L.) Sm.

Delicate epiphytes; rhizomes slender, often long-creeping. Fronds scattered, ascending or pendent; stipe slender; lamina pinnate or 2–4-pinnatifid, glabrous or hairy; ultimate segments entire or toothed, 1-veined. Sori usually immersed, or partially free; involucre cup-shaped and 2-lipped or ±deeply 2-lobed; receptacle included to long-exserted.

A genus with c. 300 species of widespread distribution in humid habitats; 2 species endemic to Lord Howe Is. For a discussion of subdivisions of this genus see C.V.Morton, *loc. cit*.

G.Bentham, Filicales, *Hymenophyllum*, *Fl. Austral.* 7: 704–707 (1878).

Fronds 5–12 cm long; ultimate pinnules 0.5–1 mm wide; margins of involucre entire **1. H. howense**

Fronds 2–6 cm long; ultimate pinnules 1.5–2 mm wide; margins of involucre dentate **2. H. moorei**

1. Hymenophyllum howense Brownlie, *Pacific Sci.* 14: 244 (1960)

T: Mt Gower, Lord Howe Island, *C.Moore* 4; holo: K. Named after the island on which this species occurs.

[*Hymenophyllum tunbridgense auct. non* (L.) Sm.: F.J.H. von Mueller, *Fragm.* 9: 78 (1875); G.Bentham, *Fl. Austral.* 7: 706 (1878), *p.p.*; W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 118 (1917)]

[*Hymenophyllum flabellatum auct. non* Labill.: G.Bentham, *Fl. Austral.* 7: 705 (1878), *p.p.*; W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 118 (1917)]

[*Hymenophyllum multifidum auct. non* (G.Forst.) Sw.: G.Bentham, *Fl. Austral.* 7: 708 (1878); A.N.Rodd & J.Pickard, *Cunninghamia* 1: 269 (1983)]

[*Hymenophyllum nitens auct. non* R.Br.: R.Tate in J.J.Fletcher, *Macleay Mem. Vol.* 218 (1893)]

Rhizome creeping, wiry, with reddish brown adpressed hairs. Fronds: stipe 2–5 (–7) cm long, with scattered hairs; lamina triangular-ovate, 4–6 cm long, 2–5 cm broad, 3- or 4-pinnatifid;

ultimate divisions narrowly linear, 0.5–1 mm broad, obscurely serrate. Sori not immersed, terminal on short segments of lamina; involucre oblong, rounded, lobes c. half the length of involucre, entire; receptacle eventually exserted. Fig. 101G–H.

Lord Howe Is. Endemic in the upper regions of Mts Gower and Lidgbird, especially in the moss-forest.

L.H.Is.: top of Mt Gower, *P.S.Green 1592 & 1596* (A, K, NSW); summit of Mt Lidgbird, *C.Moore 84* (K, NSW); SW cliffs of Mt Lidgbird, *A.N.Rodd 1777* (BRI, K, NSW).

This species belongs to subg. *Hymenophyllum*, and is closely related to the New Zealand *H. multifidum* (G.Forst.) Sw., from which it differs in the generally smaller fronds, obscure teeth and more elongate indusia.

2. Hymenophyllum moorei Baker in W.J.Hooker & J.G.Baker, *Syn. Fil.* 2nd edn, 2: 464 (1874)

T: Lord Howe Island, *C.Moore*; holo: K. Named after Charles Moore (1820–1905), Director of the Botanic Gardens, Sydney (1849–1896), who collected on Lord Howe Is. in 1869.

[*Hymenophyllum pumilum auct. non* C.Moore ex Baker: G.Bentham, *Fl. Austral.* 7: 706 (1878), *p.p.*; W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 118 (1917)]

[*Hymenophyllum minimum auct. non* A.Rich.: G.Bentham, *Fl. Austral.* 7: 706 (1878), *p.p.*; W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 118 (1917)]

Illustration: E.B.Copeland, *Philipp. J. Sci.* 64: 91, t. 45 (1937), as *H. pumilum.*

Rhizome shortly creeping, wiry, with reddish brown adpressed hairs. Fronds: stipe 1–3 cm long; lamina ovate-lanceolate in outline, 1–3 cm long, 0.5–2 cm wide, bipinnatifid; ultimate divisions linear, 1.5–2 mm wide, serrate. Sori immersed, lateral; involucre rounded, subtruncate, strongly serrate towards apex; receptacle included.

Lord Howe Is. Endemic, in the upper regions of Mts Gower and Lidgbird, especially in the moss-forest.

L.H.Is.: summit of Mt Gower, *P.S.Green 1666* (A, K, NSW); *loc. id.*, 1911, *W.W.Watts* (BRI, NSW); summit ridge of Mt Lidgbird, *J.Pickard 1483* (NSW).

This species also belongs to subg. *Hymenophyllum*.

2. CREPIDOMANES

Crepidomanes (C.Presl) C.Presl, *Epimel. Bot.* 258 (1851); *Trichomanes* subg. *Crepidomanes* C.Presl, *op. cit.* 17; from the Greek *krepis* (a slipper) and *manos* (slender or loose), presumably in allusion to the sori resembling a slender or loose slipper or shoe.

Type: *C. intramarginale* (Hook. & Grev.) C.Presl

Epiphytic, lithophytic or terrestrial ferns. Rhizome long-creeping, somewhat slender. Fronds usually separated along rhizome; stipe distinct; lamina flabellate, digitate or 1–4-pinnate; false veins present. Sori solitary on tips of lateral or ultimate segments; involucre cup-shaped, ±truncate or 2-lipped; receptacle long-exserted.

A genus of c. 120 species, mostly from the Old World tropics; 2 species native to Norfolk Is.

Fronds 3–10 cm long, delicate, slender, irregularly bipinnate	**1. C. endlicherianum**
Fronds 0.5–2.5 cm long, flabellate, almost circular in outline	**2. C. saxifragoides**

1. Crepidomanes endlicherianum (C.Presl) P.S.Green, *Kew Bull.* 48: 618 (1993)

Trichomanes endlicherianum C.Presl, *Gefässbündel Farrn* 25 (1847); *Trichomanes humile* var. *ß* in W.J.Hooker & J.G.Baker, *Syn. Fil.* 80 (1868); *Crepidopteris endlicherianum* (C.Presl) Copel., *Philipp. J. Sci.* 67: 58 (1938); *Crepidophyllum endlicherianum* (C.Presl) H.S.Reed, *Amer. Fern J.* 38: 89 (1948); *Reediella endlicherianum* (C.Presl) Pic.Serm., *Webbia* 24: 719 (1970). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W. Named after the Austrian botanist Stephan Endlicher (1804–1849), the author of the first Flora of Norfolk Is., his *Prodromus Florae Norfolkicae*, 1833.

[*Trichomanes humile auct. non* G.Forst.: S.F.L.Endlicher, *Prodr. Fl. Norfolk*. 17 (1833)]

Illustrations: E.B.Copeland, *Philipp. J. Sci*. 51: 168, tt. 14, 15 (1933), as *Trichomanes endlicheriana*; M.Crookes & H.B.Dobbie, *New Zealand Ferns* 6th edn, 111 (1963), as *Crepidopteris endlicheriana*; E.Heath & R.J.Chinnock, *Ferns & Fern Allies New Zealand* 31, t. 65 (1974), as *Trichomanes endlicheriana.*

Epiphytic, lithophytic or terrestrial ferns. Rhizome slender with simple reddish brown hairs. Fronds in scattered groups along rhizome; stipe 1–2 cm long; lamina irregularly bipinnate, 3–10 cm long, 1–2.5 cm broad, delicate, slender, dark green; ultimate segments linear-oblong, 1–5 mm long, obtuse, sometimes slightly emarginate. Sori immersed in tips of lateral segments; indusia tubular, trumpet-shaped; receptacle prominently exserted, 5–12 mm long. *Middle Filmy Fern*. Fig. 101I–J.

Norfolk Is. In the moist, shaded forest, often beside waterfalls. Also known from New Zealand, Fiji and Vanuatu, east to Samoa and Tahiti (but not New Caledonia).

N.Is.: Now-Now Valley, *R.D.Hoogland 11254* (K, NSW); between Palm Glen and Red Rd, *M.Lazarides 8090* (CANB, K, NSW); valley S of Mt Bates, *P.S.Green 1390* (A, K).

2. Crepidomanes saxifragoides (C.Presl) P.S.Green, *Kew Bull*. 48: 618 (1993)

Trichomanes saxifragoides C.Presl, *Hymenophyllaceae* 16, 39 (1843); *Gonocormus saxifragoides* (C.Presl) Bosch, *Verh. Kon. Ned. Akad. Wetensch. Afd. Natuurk. 9* (*Hymenophyll. Javan.*): 9 (1861). T: Philippine Islands, *H.Cuming 256*; holo: ?PR or ?PRC *n.v.*; iso: K. So named from a supposed resemblance to some species of *Saxifraga*.

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 44, fig. 20j (1981), as *Gonocormus saxifragoides*; D.L.Jones, *Encycl. Ferns* 66 (1987), as *Trichomanes saxifragoides*; P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 34 (1990), as *Gonocormus saxifragoides*.

Epiphytic or lithophytic fern, often forming large patches. Rhizome very slender, creeping, with simple brown hairs. Fronds: stipe wiry, 0.3–2 cm long, hairy; lamina fan-shaped, subreniform, or almost circular, 0.5–2.5 cm long, delicate, dark-green; segments ±oblong, 1–6 mm long, obtuse, emarginate or bifid. Sori immersed in apices of segments; indusia tubular with broadly dilated mouth; receptacle exserted to 0.5 mm when old. *Small Filmy Fern*.

Norfolk Is. In moist, humid valleys in the National Park, localised, but not rare, even though first discovered only in the 1960s. Also known from Africa to Japan, and Malesia to north-eastern Australia, New Caledonia, Fiji and Samoa.

N.Is.: S side of Mt Bates, *P.S.Green 1873* (K).

3. CEPHALOMANES

Cephalomanes C.Presl, *Hymenophyllaceae* 17 (1843); from the Greek *kephale* (a head) and *manos* (slender or loose), presumably in allusion to the slender receptacles in the type species.

Type: *C. atrovirens* C.Presl

Terrestrial or lithophytic fern. Rhizomes erect or only shortly creeping, relatively thick. Fronds somewhat clustered on rhizome; stipe distinct; lamina usually only 1-pinnate, with false veins absent; cell walls usually thick. Sori usually at tips of ultimate segments; indusium cup-shaped, bell-shaped or tubular, truncate, entire or dilated; receptacle long-exserted.

A genus of c. 60 species, mostly from the Old World; 2 native species on Lord Howe Is. with 1 also present on Norfolk Is.

G.Bentham, Filicales, *Trichomanes*, *Fl. Austral*. 7: 700–704 (1878).

Fronds 7–20 cm long, pinnate; segments broad	**1. C. atrovirens**
Fronds 15–50 cm long, deeply and narrowly tripinnatifid	**2. C. bauerianum**

1. Cephalomanes atrovirens C.Presl, *Hymenophyllaceae* 18, t. 5 (1843)

Trichomanes atrovirens (C.Presl) Kuntze, *Bot. Zeitung* (*Berlin*) 5: 371 (1847). T: Philippine Islands, *H.Cuming 169*; holo: ?PR or ?PRC *n.v.* The epithet comes from the Latin *ater* (black) and *virens* (green), in allusion to the dark colour of the fronds.

[*Trichomanes javanicum auct. non* Blume: W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 117 (1917)]

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies*, 2nd edn, 45, fig. 221 (1981); P.J.Brownsey & J.C.Smith-Dodsworth, *New Zealand Ferns & Allied Pl.* 69, fig. 71, t. 16A (1989), as *Hymenophyllum atrovirens*; S.B.Andrews, *Ferns Queensland* 197, fig. 16.14A (1990).

Terrestrial or lithophytic fern. Rhizome erect, often elevated on stilt-like roots. Fronds: stipe 1–4 cm long, hairy; lamina somewhat harsh-textured, ±erect, 7–20 cm long, pinnate; pinnae 4–6 mm broad, asymmetrical; veins prominent, protruding beyond the margin as tiny mucros. Sori marginal, free; indusia tubular, 1–2 mm long, slightly dilated; receptacle exserted by 1–6 mm.

Lord Howe Is. Rare, no recent records seen. Also known from Australia (northern Qld), Vanuatu, the Solomon Islands, New Guinea and the Philippines.

L.H.Is.: Soldiers or Deep Ck, 1887, *T.Whitelegge* (NSW).

This species is very closely related to *C. javanicum* (Blume) C.Presl and *C. boryanum* (Kunze) Bosch.

2. Cephalomanes bauerianum (Endl.) P.S.Green, *Kew Bull.* 48: 618 (1993)

Trichomanes bauerianum Endl., *Prodr. Fl. Norfolk.* 17 (1833); *Trichomanes meifolium* var. *bauerianum* (Endl.) Hook., *Syn. Fil.* 1: 137 (1845); *Callistopteris bauerianum* (Endl.) Copel., *Philipp. J. Sci.* 67: 65 (1938). T: Norfolk Island, *F.L.Bauer*; holo: W; iso: K. Named after the Austrian botanical artist, Frederick Lucas Bauer (1760–1826), who collected on Norfolk Is. in 1804–1805.

[*Trichomanes polyanthos auct. non* Hook.: F.J.H. von Mueller, *Fragm.* 7: 121 (1870)]

[*Trichomanes apiifolium auct. non* C.Presl: G.Bentham, *Fl. Austral.* 7: 703 (1878); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 729 (1904)]

Illustration: E.B.Copeland, *Philipp. J. Sci.* 51: t. 42, fig. 2 (1933), as *Trichomanes bauerianum.*

Terrestrial or lithophytic fern. Rhizome short, erect, supported by coarse roots, with abundant dark brown, filiform scales and hairs 4–7 mm long. Fronds: stipe 5–25 cm tall, filiform, hairy; lamina ±erect, lanceolate in outline, 10–30 cm long, deeply and abundantly tripinnatifid; pinnae often overlapping; segments linear, 0.5–0.75 mm broad, obtuse; veins not protruding. Sori somewhat immersed in tips of lateral pinnae; indusia conoid, 1 mm long, ±flared at apex; receptacle becoming exserted when fully developed, 2 mm long. *Large Filmy Fern*.

Norfolk Is., Lord Howe Is. Growing beside streams in deep forest shade, endemic to the Islands.

N.Is.: Mt Pitt Reserve, *M.Lazarides 8088* (CANB, K, NSW); valley S of Mt Bates, *P.S.Green 1895* (K); Now-Now Valley, *R.D.Hoogland 11253* (NSW). **L.H.Is.:** top of Mt Gower, *P.S.Green 1599* (K, NSW); Erskine Valley, *J.C.Game 69/148* (K); Rocky Run, *J.Pickard 3428* (NSW).

This species is related to *Trichomanes apiifolium* C.Presl (combination not currently available in *Cephalomanes*) of Malesia and Melanesia.

123. ADIANTACEAE

Terrestrial or epiphytic ferns. Rhizome erect or creeping, with scales and/or hairs. Fertile and sterile fronds similar; stipe dark-coloured, often shining; lamina simple, 1–5-pinnate, pinnatifid or basally pedate; veins free or anastomosing, without free veinlets. Sori marginal, or apparently so, with or without indusia, often covered by reflexed margin of lamina, terminal on veins or spreading along them, and then without indusia; paraphyses present.

A cosmopolitan family containing a variable number of genera depending on the classification followed. Sometimes treated as monogeneric, but here including 2 other genera recorded from the Islands.

KEY TO GENERA

1 Sori discrete, kidney-shaped or subcircular **1. ADIANTUM**

1: Sori merged, usually linear

2 Fronds 2- or 3-pinnate; pinnules less than 1 cm long **2. CHEILANTHES**

2: Fronds simply pinnate; pinnae 2–7 cm long **3. PELLAEA**

1. ADIANTUM

Adiantum L., *Sp. Pl.* 2: 1094 (1753); *Gen. Pl.* 5th edn, 485 (1754); from the Greek *adiantos* (dry, unwetted), a name given by Greek authors to a plant with unwettable leaves, possibly *A. capillus-veneris*.

Type: *A. capillus-veneris* L.

Terrestrial ferns. Rhizome short, creeping or erect, scaly at apex. Fronds: stipe erect, wiry, often lustrous; lamina 1–3 (–5)-pinnate or pedate, hairy or glabrous; rachis not grooved; pinnules sessile or stalked, often fan-shaped, usually marginally toothed; veins free and dichotomously branched. Sori apparently marginal, protected by reflexed flap from margin, discrete, circular or kidney-shaped.

A mainly pantropical genus of c. 200 species, especially from South America, but with a few temperate species; 2 species native to Norfolk Is. and 3 to Lord Howe Is.

G.Bentham, Filices, *Adiantum*, *Fl. Austral.* 7: 722–725 (1878).

1 Fronds 3-pinnate; petiolules attached to centre of base of pinnules; pinnules rounded obovate-cuneate, not arranged in a close series on either side of pinna rachis (L.H.Is.) **1. A. aethiopicum**

1: Frond 2-pinnate or pedate, petiolules attached at basal corner of pinnules; pinnules dimidiate, oblong to rhomboid, arranged in a close series on either side of pinna rachis

2 Pinnae 1–3 (–4), rarely a small additional one; frond 2-pinnate; lamina glabrous except for 1–few stiff black setae on lower edge (N.Is.) **2. A. diaphanum**

2: Pinnae 6–10 (–12); frond pedate or sub-pedate; lamina covered, especially below, with short or long pale hairs

3 Lamina covered, especially below, with numerous, longish, thin, pale, flexuous hairs; frond strictly pedate (N.Is., L.H.Is.) **3. A. pubescens**

3: Lamina covered, especially below, with numerous, short, ±rigid hairs, less than 0.5 mm long; frond subpedate, not strictly pedate (L.H.Is.) **4. A. hispidulum**

1. Adiantum aethiopicum L., *Syst. Nat.* 10th edn, 2: 1329 (1759)

T: South Africa; syn: LINN 1252/15 & 16; IDC microfiche 177/2.733/8 & 9. Being described from African material it was given the epithet which at that time was widely applied to Africa.

Adiantum aethiopicum var. *nodosum* Bonap., *Notes Pteridologiques* 1: 196 (1915). T: Queensland, *J.MacGillivray F5*; holo: ?P *n.v.*

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 13, fig. 43 (1981); S.Firth *et al.*, *Ferns New Zealand* 12, 13 (1986); P.J.Brownsey & J.C.Smith-Dodsworth, *New Zealand Ferns & Allied Pl.* 45, fig. 44, 45, t. 7B–C (1989).

Rhizome stoloniferous, 2 mm diam., covered with brown scales. Fronds: stipe 5–15 cm tall, c. 1 mm diam., shining, flexuous, smooth, blackish; lamina alternately 3-pinnate; pinnae

10–20 cm long, delicate, light green; petiolule 1–5 mm long, central to pinnule base; pinnules 3–11 per pinna, not arranged in a close series on either side of the pinna rachis, rounded obovate-cuneate, with upper margin serrate. Sori 2–6 per pinnule, in marginal notches; 'indusium' reniform. *Maidenhair*.

Lord Howe Is. Growing in the Northern Hills, on rocky ledges *etc*. in the forest edges. Also known from New Zealand (North Is.), Australia and South Africa.

L.H.Is.: lower slopes of Mt Eliza, *P.S.Green 1579* (A, K); North Head, 1911, *W.W.Watts* (K); ridge of North Head, *A.C.Beauglehole 5750* (CANB); *loc. id, J.C.Game 1/13* (BM, K).

2. **Adiantum diaphanum** Blume, *Enum. Pl. Javae* 215 (1828)

T: Java, *C.L.Blume* ?; holo: ?L *n.v.* The epithet comes from the Greek *diaphanes* (transparent), in allusion to the thin membranous leaves.

Adiantum setulosum J.Sm., *Bot. Mag*. 72: 22 (1846). T: cult. ex Norfolk Island; holo: ?BM *n.v.*

[*Adiantum affine auct. non* Willd.: S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 14 (1833)]

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 71, fig. 46 (1981); D.L.Jones, *Encycl. Ferns* 214, 215 (1987); S.B.Andrews, *Ferns Queensland* 11, fig. 1.1H, 15, fig. 1.2F (1990).

Rhizome, with brown scales at apex. Fronds ±clustered: stipes 5–10 cm tall, c. 1 mm diam., smooth, blackish; lamina bipinnate, 10–20 cm long, ±pendulous, delicate, dark green; pinnae 1–3 (–4), often subequal, 10–15 mm long; petiolules 0.5–2 mm long, attached at lower corner of pinnules; pinnules 20–40 per pinna, arranged in a close series on either side of the pinna rachis, dimidiate; upper margin crenulate; lower margin with 1–few, stiff, blackish setae, otherwise pinnae glabrous. Sori 5–10 per pinnule, in notches of upper and outer margins; 'indusium' reniform to almost circular. *Threefrond Maidenhair Fern*.

Norfolk Is. Common on earthy banks in forest, as, for example, in the National Park. Also known from southern China to Australia, Vanuatu, Fiji, New Zealand and the Kermadec Is.

N.Is.: high grounds, *s.loc., W.G.Milne 15* (K); Mt Bates, *R.D.Hoogland 11246* (CANB, K); between Palm Glen and Red Rd, *R.J.Chinnock 5965* (AD, K).

3. **Adiantum pubescens** Schkuhr, *Kl. Linn. Pfl-Syst.* 1: 108 (1809)

T: New Zealand, *J.R.Forster & G.Forster* '259.458'; lecto: BM, *fide* B.S.Parris, *New Zealand J. Bot.* 18: 503 (1980). So named because of its pubescent pinnules.

[*Adiantum hispidulum auct. non* Sw.: W.J.Hooker, *Sp. Fil.* 2: 31 (1851), *p.p.*; G.Bentham, *Fl. Austral.* 7: 725 (1878), *p.p.*; J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 731 (1904); J.S.Turner *et al., Conservation Norfolk Is.* 29 (1968)]

Illustrations: B.S.Parris, *New Zealand J. Bot.* 18: 504, fig. 1 & 505, fig. 2 bottom left (1980); S.Frith *et al., Ferns New Zealand* 15, upper fig. (1986).

Rhizome erect; scales narrowly acute, dark brown. Fronds ±clustered; stipe (10–) 20–30 cm tall, 1–2 mm diam., rough (sometimes smooth on Lord Howe Is.), blackish; lamina strictly pedate at base, slightly coriaceous, dark green, with young fronds pinkish; pinnae 6–10 (–12), 5–20 cm long, graduated, with central pinnae longest; petiolules attached at lower corner of pinnules; lowest petiolule 1–2 mm long, upper pinnules sessile; pinnules 12–60 (–70) per pinna, arranged in a close series on either side of the pinna rachis, dimidiate, flabellate to somewhat rhomboid, upper margins ±serrate, surface (especially below) with numerous long, thin, pale, flexuous hairs. Sori 6–14 per pinnule, in small marginal notches below the upper and outer margins of the pinnules; 'indusium' dark brown, reniform-circular. *Rough Maidenhair Fern*. Fig. 104D–E.

Norfolk Is., Lord Howe Is. Common on tracksides, open areas and forest banks. Also known from New Zealand and the Kermadec Is. Its distribution elsewhere needs investigation.

N.Is.: Mt Bates, *R.D.Hoogland 11248* (CANB); Anson Bay, *P.S.Green 1871* (K); *s. loc., A.Cunningham 43* (K). **L.H.Is.:** W face of Mt Lidgbird, *P.S.Green 1646* (A, K); *loc. id., J.C.Game 69/190* (K).

There has been much confusion of this species with *Adiantum hispidulum.* It was recently re-

established as distinct by B.S.Parris, *New Zealand J. Bot.* 18: 503–506 (1980). While this book was in the final stages of preparation, M.F.Large & J.E.Braggins, *New Zealand J. Bot.* 31: 416 (1993), reduced the species to a variety of *A. hispidulum*, a view which has much to recommend it.

4. Adiantum hispidulum Sw., *J. Bot.* (*Schrader*) 1800(2): 82 (1802)

T: New South Wales, *coll. not known*; holo: ?S *n.v.* Named in reference to the slightly hispid stipes.

Illustrations: B.S.Parris, *New Zealand J. Bot.* 18: 504, fig. 1, 505, fig. 2 top (1980); S.Firth *et al.*, *Ferns New Zealand* 15, lower fig. (1986); B.D.Duncan & G.Isaac, *Ferns & Allied Pl. Victoria, Tasmania & S. Australia* 140, fig. 13.9 (1986).

Description as for *A. pubescens* except that the stipes are consistently rough, the fronds not strictly pedate and the lamina below has short, ±rigid hairs, less than 0.5 mm long. *Maidenhair Fern*.

Lord Howe Is. Also known from New Zealand (North Is.) and Australia. Its exact distribution needs investigation, see under *Adiantum pubescens*.

L.H.Is.: ridge between Old Settlement and North Bay, *P.S.Green 1939* (K).

Doubtful records

Adiantum formosum R.Br. was recorded from the 'Little Slope', Lord Howe Is., by J.H.Maiden (*Proc. Linn. Soc. New South Wales* 45: 564, 1920) and there is a specimen merely labelled 'Lord Howe Island' (NSW P2501) in the National Herbarium of N.S.W. It has never been collected since and the record needs confirmation.

Adiantum fulvum Raoul was recorded from Norfolk Is. by W.J.Hooker (*Syn. Fil.* 120, 1868), presumably on the strength of a specimen at Kew simply labelled 'Norfolk Island' in Hooker's hand (and without any other annotation). This record has not been supported by any further collections and it must be assumed that the specimen was mislabelled.

2. CHEILANTHES

Cheilanthes Sw., *Syn. Fil.* 5: 126 (1806); from the Greek *cheilos* (a lip) and *anthos* (a flower), in allusion to the 'flower', or in this case sorus, being marginal in these ferns.

Type: *C. micropteris* Sw.

Terrestrial or epiphytic ferns. Rhizome short, scaly. Fronds clustered; stipe erect, ±slender; lamina pinnatifid or 1–4-pinnate, usually glandular, scaly or hairy; pinnules less than 1 cm long; veins free or rarely anastomosing. Sori marginal, elongate or linear, spreading and ±joined laterally, protected by the reflexed, modified laminal margin.

A genus of nearly 200 species throughout the tropics and warm temperate regions of the world. Two species native to both islands.

G.Bentham, Filices, *Cheilanthes*, *Fl. Austral.* 7: 726–727 (1878); T.C.Chambers & P.A.Farrant, A re-examination of the genus *Cheilanthes* (Adiantaceae) in Australia, *Telopea* 4: 509–557 (1991).

Stipe and rachis glabrous or stipe with a few fine hairs and scales towards base	**1. C. sieberi**
Stipe and rachis ±densely scaly throughout	**2. C. distans**

1. Cheilanthes sieberi Kunze in J.G.C.Lehmann, *Pl. Preiss.* 2: 112 (1847)

Cheilanthes tenuifolia var. *sieberi* (Kunze) Hook.f., *Handb. New Zealand Fl.* 362 (1867). T: Western Australia, *J.A.L.Preiss 1304*; lecto: BM, *fide* H.M.Quirk *et al.*, *Austral. J. Bot.* 312: 517 (1983). Named after Franz Wilhelm Sieber (1789–1844), Bohemian botanist who collected in New South Wales in 1823.

[*Cheilanthes tenuifolia auct. non* (Burm.f.) Sw.: G.Bentham, *Fl. Austral.* 7: 726 (1876), *p.p.*; F.J.H. von

Mueller, *J. Bot.* 22: 290 (1884)]

[*Cheilanthes humilis auct. non* (G.Forst.) P.S.Green: P.S.Green, *Kew Bull.* 43: 653 (1988)]

Illustrations: H.M.Quirk *et al.*, *Austral. J. Bot.* 31: 518 (1983); S.B.Andrews, *Ferns Queensland* 338, fig. 34.5A (1990); T.C.Chambers & P.A.Farrant, *Telopea* 4: 534, fig. 13g–h (1991).

Rhizome horizontal, shortly creeping. Fronds ±clustered; stipe stiff, wiry, grooved, glabrous or with a few fine hairs, especially towards the scaly base, chestnut-brown; lamina narrow, 10–20 (–30) cm tall, 1–2 cm broad, suboppositely 2- (to 3)-pinnate; pinnules deeply pinnatisect. Sori marginal, ±discrete to continuous, protected by inrolled margin of lamina.

Norfolk Is., Lord Howe Is. Growing in dry rocky habitats, rare on both islands and not collected recently on Norfolk Is. Also known from New Zealand, Australia (widespread) and New Caledonia.

N.Is.: *s. loc.*, 1905, *P.H.Metcalfe* (NSW). **L.H.Is.:** Malabar Hill, *M.M.J. van Balgooy 1057* (NSW); near Malabar, *P.S.Green 2312* (K).

2. Cheilanthes distans (R.Br.) Mett., *Abh. Senckenberg. Naturf. Ges.* 3: 69 (1859)

Notholaena distans R.Br., *Prodr.* 146 (1810). T: New South Wales, *R.Brown*; holo: BM. Named in allusion to the 'distant' arrangement of the pinnae along the rachis.

Illustrations: H.M.Quirk *et al.*, *Austral. J. Bot.* 31: 524, figs 16, 17 (1983); D.L.Jones, *Encycl. Ferns* 337 (1987); S.B.Andrews, *Ferns Queensland* 331, fig. 34.2B (1990).

Rhizome short. Fronds clustered; stipe stiff, grooved, scaly and somewhat hairy, brown; lamina narrow, 10–20 (–30) cm tall, 1–2 cm broad, suboppositely 2-pinnate; deeply pinnatifid, rachis and veins below densely covered with pale brown scales. Sori marginal, continuous, partially protected by inrolled margin of lamina. *Bristly Cloakfern*. Fig. 104F–G.

Norfolk Is., Lord Howe Is. Frequent in dryish, rocky habitats. Also known from New Zealand, southern and eastern Australia and New Caledonia.

N.Is.: Ball Bay, *R.D.Hoogland 11309* (CANB, K); N side of Mt Bates, *R.D.Hoogland 11317* (CANB, NSW); Duncombe Bay, *P.S.Green 2432* (K). **L.H.Is.:** Malabar Hill, *M.M.J. van Balgooy 1089* (CANB, NSW); 'Lower Rd', SW base of Mt Lidgbird, *A.N.Rodd 1393* (K, NSW).

3. PELLAEA

Pellaea Link, *Fil. Sp.* 59 (1841); named from the Greek *pellaios* (dark), in allusion to the generally dark stipes in these ferns.

Type: *P. atropurpurea* (L.) Link

Terrestrial ferns. Rhizome short and thick or long-creeping, covered with narrow scales. Fronds: stipe erect, wiry, dark-coloured, shining; lamina pinnate, palmate (or pedate elsewhere), usually glabrous; pinnae uniform, sessile or shortly stalked, entire, often coriaceous, with veins free. Sori marginal, linear or oblong, merging laterally, protected by reflexed margin of lamina.

A genus of c. 80 species, especially from tropical and subtropical South America and South Africa. 2 species native to Lord Howe Is.

G.Bentham, Filices, *Pteris*, *Fl. Austral.* 7: 727–730 (1878).

Pinnae 10–35 pairs, 5–10 mm broad; rachis manifestly scaly	**1. P. falcate**
Pinnae 2–8 pairs, 12–30 mm broad; rachis slightly rough, almost naked	**2. P. paradoxa**

1. Pellaea falcata (R.Br.) Fée, *Gen. Filic.* 129 (1852)

Pteris falcata R.Br., *Prodr.* 154 (1810). T: New South Wales and Tasmania, *R.Brown*; syn: BM. The epithet comes from the Latin *falcatus* (sickle-shaped), in allusion to the shape of the pinnae.

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 179, fig. 241 (1981);

D.L.Jones, *Encycl. Ferns* 5, 19, 342 (1987); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 25 (1990).

Rhizomes shortly creeping, closely covered with appressed, dark brown scales with a pale margin. Fronds: stipe 5–10 cm tall, dark brown; lamina erect, 12–40 cm tall, simply imparipinnate; rachis clothed with numerous light brown scales and hairs; pinnae ±sessile, 10–35 pairs, opposite or alternate, narrowly lanceolate to falcate, 2–5 cm long, asymmetrical at base, acute, ±coriaceous, almost glabrous. Sori in a dense band, especially on upper pinnae; laminal margins slightly reflexed.

Lord Howe Is. Growing in rocky places in the northern hills. Also known from eastern Australia, New Zealand, the Kermadec Is. and New Caledonia.

L.H.Is.: Kims Lookout, *P.S.Green 1944* (K); W of Kims Lookout, *J.C.Game 69/220a* (K).

2. Pellaea paradoxa (R.Br.) Hook., *Sp. Fil.* 2: 135 (1858)

Adiantum paradoxum R.Br., *Prodr.* 155 (1810). T: Australia, *R.Brown*; holo: BM. So named because it was paradoxical in *Adiantum*, the genus in which it was first classified.

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 179, fig. 242 (1981); S.B.Andrews, *Ferns Queensland* 343, fig. 34.7A (1990); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 25 (1990).

Rhizome with appressed, dark brown scales. Fronds: stipe 20–30 cm tall, blackish, with scattered, small, pale scales and hairs; lamina erect, 30–50 cm tall, simply imparipinnate; petiolules 2–7 mm long; pinnae 2–8 pairs, alternate, ovate to broadly lanceolate, 3–7 cm long, asymmetrical at base, entire, acute, ±coriaceous, glabrous. Sori dense, especially on upper pinnae; laminal margins slightly reflexed.

Lord Howe Is. Rare, recorded only once. Also known from Qld and N.S.W.

L.H.Is.: S side of Malabar, *A.C.Beauglehole 5752* (MEL).

Doubtful record

Pellaea rotundifolia (G.Forst.) Hook. has been recorded from Norfolk Is. (W.J.Hooker, *Sp. Fil.* 2: 136, 1858 and G.Bentham, *Fl. Austral.* 7: 730, 1878), but no collections from the Island have been seen. These records trace back to G.Kunze (*Linnaea* 23: 219, 1850), under the name *Allosorus rotundifolius* (G.Forst.) Kunze, but no specimens are cited by him. It is suspected that specimens distributed by the Botanical Society of London, communicated by H.C.Watson in 1844, labelled 'From a collection of ferns made by one of the Cunninghams in New Zealand and Norfolk Island' (specimen at Kew) may have led, erroneously, to this record.

124. VITTARIACEAE

Epiphytic ferns. Rhizomes usually short, creeping, with narrow clathrate scales. Fronds simple, linear to ovate or obovate, entire; fertile fronds not differentiated; veins reticulate, forming elongate areoles, without free veinlets. Sori elongate, distributed along veins, usually submarginal, sometimes reticulate, without indusia, often in a groove, when young protected by paraphyses.

A small tropical family of 9 genera and c. 100 species. One genus native to Norfolk Is.

VITTARIA

Vittaria Sm., *Mém. Acad. Roy. Sci.* (*Turin*) 5: 413, t. 9 (1793); named from the Latin *vitta* (a ribbon), in allusion to the ribbon-like shape of the fronds in the type, and other, species.

Type: *V. lineata* (L.) Sm.

Rhizome shortly creeping, covered with brown scales at apex. Fronds crowded, narrowly to broadly linear, erect or drooping. Sori linear, along a submarginal vein, ±immersed in a groove; paraphyses numerous.

A pantropical genus of 50 or more species. One species native to Norfolk Is.

G.Bentham, Filices, *Vittaria*, *Fl. Austral.* 7: 717–718 (1878).

Vittaria elongata Sw., *Syn. Fil.* 109, 302 (1806)

T: India, *J.P.Röttler*; holo: ?UPS *n.v.* Named in allusion to the elongate habit of the fronds.

[*Vittaria rigida auct. non* Kaulf.: S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 12 (1833)]

Illustrations: D.L.Jones, *Encycl. Ferns* 180, 384 (1987); S.B.Andrews, *Ferns Queensland* 380, fig. 38.2A (1990); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 28 (1990).

Rhizome shortly creeping; scales dark brown, with hair-like apices. Fronds ±sessile, linear, gradually tapered at base and apex, 10–30 (–40) cm long, 3–5 mm broad; midrib ±obscure. Sori linear, in a deep marginal groove. *Tape Fern*.

Norfolk Is. Not common, on tree fern trunks and fallen logs in King Fern Valley and similar habitats. Also known from India and Malesia to Australia (Qld and N.S.W.) and the tropical Pacific islands, including New Caledonia and Fiji.

N.Is.: slopes of Mt Pitt, *P.S.Green, P.Ralston & O.Evans 1415* (A, NSW); King Fern Gully, *R.D.Hoogland 11193* (NSW); between Palm Glen and Red Rd, *R.J.Chinnock 5954* (AD, K).

125. PTERIDACEAE

Terrestrial ferns. Rhizome erect or creeping, scaly. Fronds usually uniform, 1–4-pinnate, borne close together, usually clustered at apex of rhizome; veins usually free. Sori without indusia or with a false indusium from a scarious margin; paraphyses often present.

A worldwide family variously interpreted as containing from 3 to 7 genera and over 250 species. One genus native to both Islands.

PTERIS

Pteris L., *Sp. Pl.* 2: 1073 (1753); *Gen. Pl.* 5th edn, 484 (1754); the Greek name for a fern.

Type: *P. longifolia* L.

Rhizome often stout, scaly at apex. Fronds: stipe grooved on upper surface; lamina 1–4-pinnate, with rachis deeply grooved above; pinnae often deeply pinnatisect, with short spines often present at base of ultimate costules. Sori linear, marginal to submarginal, connecting the vein endings; false indusia linear, continuous, formed from modified margin.

A large worldwide genus of 250 or more species. Parts of it are in need of revision, especially the *P. comans* G.Forst. group. In the meantime recognition is given, at specific rank, to *P. microptera* and *P. zahlbruckneriana*, members of this group.

G.Bentham, Filices, *Pteris*, *Fl. Austral.* 7: 727–733 (1878).

1 Veins of lamina simple or once forked, free

2 Frond bipinnate for 1 (sometimes 2) basal divisions, pinnatifid apical portion c. 1/3 of length of lamina; median pinnules 15–30 mm long, 3–5 mm broad; sterile apex broadly acute, 2–4 (–5) mm long (N.Is.) **1. P. kingiana**

2: Frond bipinnate for 4–5 (–7) basal divisions, with only a short pinnatifid apical portion; median pinnules 10–15 (–20) mm long, 1.5–3 (–5) mm broad; sterile apex somewhat blunt, 1–2 (–3) mm long (N.Is., L.H.Is.) **2. P. tremula**

1: Veins of lamina netted

3 Segments of lamina 4–6 mm broad, acute; continuous portion along midrib 0.5–1.5 mm broad (L.H.Is.) **3. P. microptera**

3: Segments of lamina (6–) 8–10 mm broad, ±obtuse; continuous portion along midrib 3–5 mm broad (N.Is.) **4. P. zahlbruckneriana**

1. Pteris kingiana Endl., *Prodr. Fl. Norfolk.* 13 (1833)

Pteris tremula var. *kingiana* (Endl.) Hook. & Baker, *Syn. Fil.* 161 (1867). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W. Named after Philip Gidley King (1758–1808), who superintended the first settlement on Norfolk Is. in 1788 and who was later Governor of New South Wales from 1800–1806.

Pteris trattinickiana Endl., *op. cit.* 14. T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W.

[*Pteris quadriaurita auct. non* Retz.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 732 (1904)]

[*Pteris marginata auct. non* Bory; J.H.Maiden, *loc. cit.*]

[*Pteris biaurita* var. *quadriaurita auct. non* (Retz.) Luerss.: R.M.Laing, *Trans. & Proc. New Zealand Inst.* 48: 231 (1916)]

[*Pteris tripartita auct. non* Sw.: J.S.Turner *et al.*, *Conservation Norfolk Is.* 31 (1968)]

Illustrations: W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 48: 230, figs. 1, 2 (1916); D.L.Jones, *Encycl. Ferns* 37 (1987).

Rhizome short, erect; apex covered with long, narrow, brown scales. Fronds tufted, 30–90 cm tall; stipe base scurfy, with numerous narrow, brown scales 4–7 mm long; lamina outline broadly deltoid, 15–50 cm long, 12–35 cm broad, usually coriaceous, bipinnate at base for 1 (sometimes 2) divisions, pinnate for 3–5 pairs of subopposite divisions, then apical portion deeply pinnatifid, c. 1/3 length of lamina; midrib of pinnae above flanged, usually with acute 'teeth' 0.5–1.5 mm long at junction of each pinnule midrib; pinnules narrow (those of median pinnae 15–30 mm long, 3–5 mm broad), shortly acute; veins simple or once forked, free. Sori marginal, continuous; apex of pinnules sterile, dentate, 2–4(–5) mm long, broadly acute. *King's Brakefern*.

Norfolk Is. Endemic, and locally common near the coast and in valleys leading to the sea.

N.Is.: Ball Bay, *R.D.Hoogland 11232* (NSW); *loc. id.*, *P.S.Green 2425 & 2426* (K); *s. loc.*, *A.Cunningham 42* (K).

Very close to *P. tremula* and, with it, part of the widespread *P. tripartita* Sw. complex.

2. Pteris tremula R.Br., *Prodr.* 154 (1810)

T: New South Wales, *R.Brown*; holo: BM; iso: K. The epithet comes from the Latin *tremo* (I quiver or tremble), in allusion to the easily quivering fronds in this fern.

Pteris baueriana Diesing ex Endl., *Prodr. Fl. Norfolk.* 12 (1833). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W.

[*Pteris arguta auct. non* Aiton: F.J.H. von Mueller, *Fragm.* 9: 78 (1875)]

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 195, fig. 266 (1981); D.L.Jones, *Encycl. Ferns* 272, 273 (1987); P.J.Brownsey & J.C.Smith-Dodsworth, *New Zealand Ferns & Allied Pl.* 54, fig. 54, t. 10F (1989).

Rhizome short, erect; apex covered with long, narrow, pale brown scales. Fronds tufted, 30–120 cm tall; stipe base with a few pale, narrow scales, 2–3 mm long, or scales absent; lamina outline ovate-deltoid, 25–60 cm long, 15–40 cm broad, usually ±membranous,

bipinnate or bipinnatifid; bipinnate from base for 4–5 (–7) subopposite divisions, then pinnate for 5–8 divisions, with only a short apical portion deeply pinnatifid; upper midrib of pinnae slightly flanged with 'teeth' vestigial or lacking; pinnules very narrow (those of median pinnae 10–15 (–20) mm long, 1.5–3 (–5) mm broad), acute to ±blunt; veins simple or once forked, free. Sori marginal, continuous; apex of pinnules sterile, 1–2 (–3) mm long, somewhat blunt. *Tender Brakefern*.

Norfolk Is., Lord Howe Is. On Norfolk Is. this species is not as common as *P. kingiana*, but is believed to occur in similar habitats, or more commonly in forested areas; it is widespread on Lord Howe Is. Also known from Australia, New Zealand, the Kermadec Is. and Fiji.

N.Is.: New Farm Rd, 1985, *D.Nobbs* (K); spontaneous in a garden, New Cascades Rd, *P.S.Green 2424* (K). **L.H.Is.:** W ridge of Malabar, *P.S.Green 1950* (K); base of Mt Lidgbird, *J.McGillivray 699* (K); W of Intermediate Hill, *J.Pickard 3359* (NSW).

This species is part of the difficult *P. tripartita* Sw. complex. The Australian plants tend to have the narrowest pinnules.

3. Pteris microptera Mett. ex Kuhn, *Linnaea* 36: 92 (1869)

T: Lord Howe Island, *W.G.Milne*; syn: ?B *n.v.*; isosyn: K; & *Stange*: syn: ?B *n.v.* The epithet comes from the Greek *micros* (small) and *pteros* (a wing), in allusion to the (comparatively) narrow wing on the pinna rachis.

Pteris comans G.Forst. var. ß Hook., *Sp. Fil.* 2: 219 (1858).

[*Pteris milneana auct. non* (Hook.) Baker: C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 4 (1870)]

[*Pteris comans auct. non* G.Forst.: F.J.H. von Mueller, *Fragm.* 9: 78 (1875); G.Bentham, *Fl. Austral.* 7: 733 (1878), *p.p.*; W.B.Hemsley, *Ann. Bot.* (*London*) 10: 263 (1896); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 123 (1917)]

Illustration: D.L.Jones, *Encycl. Ferns* 270 (1987).

Rhizome stout, erect; apex covered with short triangular brown scales. Fronds tufted, erect, 50–200 cm tall, shining; stipe base with no scales or a few short dark brown scales; lamina outline broadly deltoid, 30–150 cm long, slightly coriaceous, bipinnate at base for 1 or 2 divisions, pinnate for 3 or 4 divisions, then apical portion deeply pinnatifid with a continuous portion of lamina along midrib of pinnules between segments 0.5–1.5 mm broad; midrib of pinnae above slightly flanged, with a blunt tooth 0.5–1 mm long at the junction of each pinnule midrib; pinnules narrow (those of median pinnae (2–) 3–4 (–6) cm long, 4–6 mm broad); veins netted. Sori submarginal, continuous; pinnule apex sterile, 2–7 mm long, dentate, long-acute. Fig. 104H.

Lord Howe Is. Endemic, widespread and common throughout the Island at lower altitudes.

L.H.Is.: c. 180 m NE of Old Settlement Beach, *J.C.Game 65/6/11* (K); Transit Hill, *M.M.J. van Balgooy 1005* (NSW); Erskine Valley, *P.S.Green 1670* (A, K).

This species is part of the widespread and complex *P. comans* group. A rare form with forked proliferation of the pinna apices was described from Lord Howe Is. material as *P. comans* var. *furcata* Bonap., *Notes Ptéridologiques* 5: 128 (1917).

4. Pteris zahlbruckneriana Endl., *Prodr. Fl. Norfolk.* 13 (1833)

T: Norfolk Island, *F.L.Bauer*; holo: ?W *n.v.* Named after Johann Baptist Zahlbruckner (1782–1851), prominent Austrian amateur botanist.

Pteris endlicheriana J.Agardh, *Recens. Spec. Pterid.* 66 (1839); *Litobrochia endlicheriana* (J.Agardh) Hook., *Gen. Fil.* t. 65B (1842); *Pteris comans* var. *endlicheriana* (J.Agardh) Hook. & Baker, *Syn. Fil.* 171 (1867). T: Norfolk Island, [*A.Cunningham 60*]; holo: K.

[*Pteris comans auct. non* G.Forst.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 732 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 14 (1915); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 48: 233 (1916); J.S.Turner *et al.*, *Conservation Norfolk Is.* 31 (1968)]

Illustrations: W.J.Hooker, *Gen. Fil.* t. 65B, figs 6, 7 (1842); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 48: 233, fig. 3 (1916).

Rhizome short, erect; apex of rhizome and base of stipe covered with lanceolate-triangular

brown scales, 5–7 mm long. Fronds tufted, erect, c 1 m high; lamina outline broadly deltoid, 60 cm long and broad, membranous; bipinnate at base for 1 or 2 divisions, pinnate for 4 divisions, then apical portion deeply pinnatifid with a continuous portion of lamina along midrib of pinnules between segments 3–5 mm broad; midrib of pinnae above raised, with a blunt 'tooth' 0.25–0.5 mm long associated with junction of each pinnule midrib; pinnules slightly curved (those of median pinnae 15–40 mm long, (6–) 8–10 mm broad), acute; veins netted. Sori almost marginal, continuous; pinnule apex sterile, serrate, 2–10 mm long. *Netted Brakefern*. Fig. 104I.

Norfolk Is. Endemic; usually in the forest on banks by the creeks. Part of the *P. comans* complex.

N.Is.: Mt Cross, 1992, *M.Christian* (K); 'shady woods, deep ravines', *A.Cunningham 59* (K); *s. loc*., 1849, *C.J.Simmons* (K).

The plant illustrated as *P. endlicheriana* in W.J.Hooker's *Icon. Pl.* 10: t. 73 (1854) represents the generally slightly shorter-pinnuled New Zealand representative of this complex.

126. GLEICHENIACEAE

Rhizomatous, long-creeping, often scrambling and forming dense thickets. Fronds pinnate or more compound, usually pseudo-dichotomous by branching below a dormant or aborted apical bud; ultimate branches 1- or 2-pinnatifid; veins free, simple or forked. Sori of a few, rather large sporangia, without indusia; sporangia opening by a vertical or oblique annulus.

A relatively primitive family of 5 or 6 genera, and c. 150 species. Found throughout the tropics and subtropics, entering the temperate zone in the Southern Hemisphere. One genus native on Lord Howe Is.

STICHERUS

Sticherus C.Presl, *Tent. Pterid.* 51 (1836); from the Greek *stichos* (a row), in allusion to the double row of sori in these ferns.

Type: *S. laevigatus* (Willd.) C.Presl

Rhizome long-creeping. Fronds consistently dichotomously branched, with a pair of leafy secondary branches below each terminal bud which, in turn, ends with a dormant bud and a further pair of leafy branches; pinnules entire; veins forked once. Sori in a single row on each side of the costae.

A genus of c. 100 species, found in the tropics, subtropics or warm temperate regions of the Southern Hemisphere, sometimes included in the genus *Gleichenia*. One native species on Lord Howe Is.

Sticherus lobatus N.A.Wakef., *Victorian Naturalist* 40: 110 (1943)

T: Victoria, 1941, *N.A.Wakefield*; holo: ?MEL *n.v.* So named from the occasionally lobed basal pinnules.

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 204, fig. 285 (1981); S.B.Andrews, *Ferns Queensland* 141, fig. 13.3B (1990); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 37 (1990).

Rhizome slender, scaly. Stipes spaced along rhizome, tough, erect, to 1 m tall, with a few scales near base; branches forming up to 3 tiers; primary branches of rachis short, 1–3 cm long, the angle between them wide; ultimate branches almost at right angles to rachis, 1–3.5 cm long. Sori of 3–6 large, naked sporangia, midway between margins and costae.

Lord Howe Is. Found on the southern end of the summit of Mt Gower where it is perhaps a recent arrival by natural means, and spreading, having first been recorded in the last decade

by A.N.Rodd & J.Pickard (*Cunninghamia* 1: 269, 1983). It was said (by J.Pickard) to occupy an area of about 2 square metres in 1976. I.Hutton, in collecting the specimens cited below, reported in February, 1988, that it was then occupying an area of about 10 square metres.

L.H.Is.: S end of Mt Gower summit, *I.Hutton 470 & 471* (K).

127. POLYPODIACEAE

Epiphytic, rarely terrestrial ferns. Rhizome creeping, rarely erect, with peltate, clathrate or non-clathrate scales. Fronds simple, lobed, dichotomously branched or pinnate, uniform or dimorphic, often with peltate or stellate hairs; stipe usually articulate with rhizome; veins usually reticulate, with free, included veinlets. Sori superficial or somewhat immersed, or elongated and coalescent, spread over lamina surface, without indusia; paraphyses often present.

A family of c. 29 genera and c. 1000 species, found throughout the world, but mostly tropical or subtropical; 3 native genera on Lord Howe Is., 2 of which are also found on Norfolk Is.

KEY TO GENERA

1 Bracket epiphytes; fronds strongly dimorphic, with basal sterile nest-fronds and dichotomously forked fertile fronds — **1. PLATYCERIUM**

1: Creeping epiphytes, or lithophytes or on earth banks; fronds not strongly dimorphic

2 Fronds consistently simple; lamina densely covered with stellate hairs, at least below; sori coalescing — **2. PYRROSIA**

2: Fronds simple or pinnatifid on the same plant; lamina not densely covered with stellate hairs; sori discrete — **3. PHYMATOSORUS**

1. PLATYCERIUM

Platycerium Desv., *Mém. Soc. Linn. Paris* 6: 213 (1827); from the Greek *platys* (broad) and *keras* (a horn), in allusion to the shape of the frond, hence also the common names, *Stag's Horn Fern* and *Elkhorn Fern*.

Type: *P. alcicorne* Desv.

Epiphytes. Rhizome short, covered with nest-fronds. Fronds strongly dimorphic; stipe very short or wanting; nest-fronds sterile, erect, broadly based, deeply cordate, papery with age, humus-collecting; fertile fronds erect or pendulous, dichotomously forked, densely stellate-hairy when young; primary veins dichotomously branched, almost parallel; secondary veins reticulate. Sori diffuse; sporangia not grouped in sori, covering areas on the lower surface or on differentiated fertile lobes.

An unmistakable genus of c. 15 species; pantropical, with 1 species in Peru and the remainder in the Old World, from Africa to SE Asia and eastern Australia. One species native to Lord Howe Is.

G.Bentham, Filices, *Platycerium*, *Fl. Austral.* 7: 780–781 (1878); E.Hennipman & M.C.Roos, A monograph of the fern genus *Platycerium* (Polypodiaceae), *Verh. Kon. Ned. Akad. Wetensch., Afd. Natuurk., Tweede Sect.* 80: 1–126 (1982).

Platycerium bifurcatum (Cav.) C.Chr., *Index Filic.* 498 (1906)

Acrostichum bifurcatum Cav., *Anales Hist. Nat.* 1: 105 (1799). T: Port Jackson, Australia, *L.Née*; holo: M *n.v.* The epithet is from the Latin *bi-* (two) and *furcatus* (forked), in reference to the forked, fertile fronds.

[*Platycerium alcicorne auct. non* Desv.: J.L.MacGillivray, *Hooker's J. Bot. Kew Gard. Misc.* 6: 353 (1854); G.Bentham, *Fl. Austral.* 7: 781 (1878); W.W.Watts, *Proc. Linn. Soc. New South Wales* 37: 395 (1913)]

Illustrations: D.L.Jones, *Encycl. Ferns* 188, 260 (1987); S.B.Andrews, *Ferns Queensland* 286, fig. 28.6C (1990); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 39 (1990).

Bracket epiphyte, rarely a lithophyte. Rhizome short, stout. Rachis short, scaly. Nest-fronds sessile, 2 or more, 10–30 cm diam., broader than long, convex, entire, sinuate or lobed, stellate-hairy when young. Fertile fronds clustered, erect or hanging, 25–100 cm long, dichotomously forked up to 3 times, narrowly cuneate at base, coriaceous, covered with light brown, appressed, stellate hairs when young, especially on the backs. Soral patches covering most of the ultimate lobes of the fertile fronds. *Elkhorn Fern*.

Lord Howe Is. On trees in the forest, especially from Intermediate Hill southwards. Also known from Papua New Guinea and Australia (Qld, N.S.W.), with a subspecies in Java.

L.H.Is.: Intermediate Hill, *J.Pickard 3361* (NSW); Smoking Tree Ridge, *P.S.Green 2041* (A, K); Rocky Run Ck, *J.Pickard 3425* (NSW); S end of golf course, *J.Pickard 3467* (NSW).

The Lord Howe Is. plant is subsp. *bifurcatum* var. *bifurcatum*.

2. PYRROSIA

Pyrrosia Mirb. in J.B.A.P. de Lamarck & C.F.B. de Mirbel, *Hist. Nat. Vég.* 3: 471 & 5: 91 (1802); from the Greek *pyrros* (flame-coloured), in allusion to the reddish yellow colour given to the fronds of some species by their stellate indumentum.

Type: *P. chinensis* Mirb. = *P. stigmosa* (Sw.) Ching

Epiphytes or lithophytes. Rhizome creeping; scales non-clathrate, usually peltate at base. Fronds usually thickish, fleshy, usually simple, monomorphic or dimorphic; stipe articulate with rhizome, usually covered with caducous, stellate hairs; lamina usually decurrent onto stipe, ±covered with caducous, stellate hairs; veins complex-reticulate, usually obscure. Sori round or elongate, often confluent, usually occupying apical portion of frond, with stellate paraphyses.

An Old World, mostly pantropical, genus of just over 50 species, especially from SE Asia; 1 species native to Norfolk and Lord Howe Islands.

G.Bentham, Filices, *Polypodium*, *Fl. Austral.* 7: 767 (1878); P.H.Hovenkamp, A Monograph of the Fern Genus *Pyrrosia*, Leiden, 1986.

Pyrrosia confluens (R.Br.) Ching, *Bull. Chin. Bot. Soc.* 1: 49 (1935)

Polypodium confluens R.Br., *Prodr.* 146 (1810); *Cyclophorus confluens* (R.Br.) C.Chr., *Index Filic.* 198 (1905). T: Hunter and Paterson Rivers, Australia, 1804, *R.Brown*; syn: BM. The epithet is Latin for running together, in reference to the sori.

Drymoglossum carnosum J.Sm., *J. Bot.* (*Hooker*) 4: 66 (1841), *non* Hook. (1842); *Drymoglossum cunninghamii* T.Moore, *Index Fil.* xxxi (1857), *nom. nud.* T: Norfolk Is., *A.Cunningham*; holo: K.

Niphobolus ovalis C.Presl, *Epim. Bot.* 129 (1849); *Crespedaria ovalis* (C.Presl) C.Presl, *op. cit.* 263. T: Norfolk Island, *C.Hügel*; ?iso: W.

[*Niphobolus serpens auct. non* (G.Forst.) Endl.: S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 8 (1833), *p.p.*]

[*Polypodium serpens auct. non* G.Forst.: F.J.H. von Mueller, *Fragm.* 9: 78 (1875); J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 729 (1904)]

[*Polypodium acrostichoides auct. non* G.Forst.: J.H.Maiden, *op. cit.* 730 (1904)]

Illustrations: D.L.Jones, *Encycl. Ferns* 251, 252 (1987); S.B.Andrews, *Ferns Queensland* 291, fig. 28.7D (1990); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 40, t. 4 (1990).

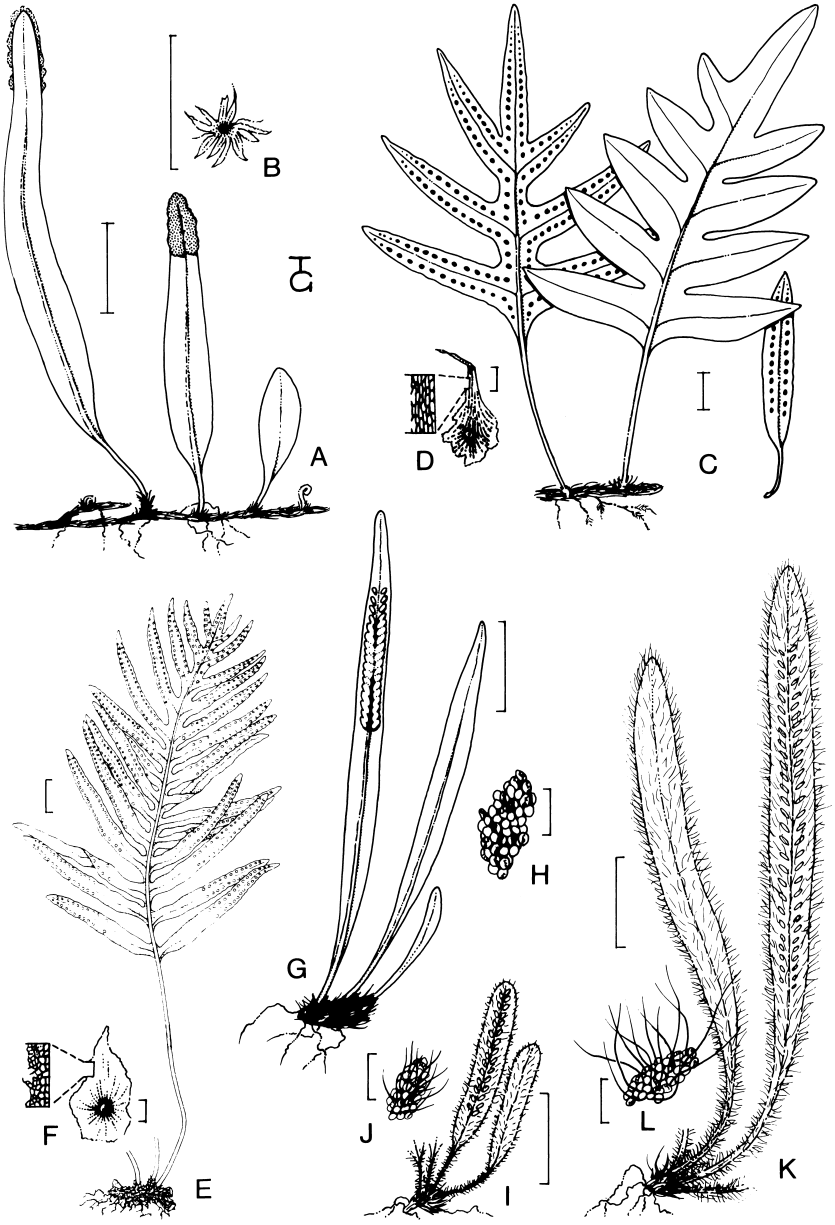

Figure 102. A–F, POLYPODIACEAE. **A–B**, *Pyrrosia confluens*. **A**, habit; **B**, stellate hair (**A–B**, P.Green 1578, K). **C–D**, *Phymatosorus pustulatus* subsp. *pustulatus*. **C**, habit, including simple frond (V.Thomson, K); **D**, rhizome scale (R.Hoogland 11272, K). **E–F**, *Phymatosorus pustulatus* subsp. *howensis*. **E**, habit (P.Green 1561); **F**, rhizome scale (P.Green 1947, K). **G–L**, GRAMMITIDACEAE. **G–H**, *Grammitis diminuta*; **G**, habit; **H**, sorus (**G–H**, P.Green 1995, K). **I–J**, *Grammitis nudicarpa*. **I**, habit; **J**, sorus (**I–J**, J.Game 69/182, K). **K–L**, *Grammitis wattsii*. **K**, habit; **L**, sorus (**K–L**, P.Green 1595, K). Scale bars: **A**, **C**, **E**, **G**, **I**, **K** = 2 cm; **B**, **D**, **F**, **H**, **J**, **L** = 1 mm. **A–D**, **F–L** drawn by T.Galloway. **E** drawn by D.Mackay.

Epiphytic or lithophytic fern. Rhizome much-branched, 1–2 mm diam., covered with long, acute, appressed, peltate scales, 2–5 mm long, 0.5–1 mm broad, fringed with long, white hairs. Fronds simple, ±dimorphic, fleshy-coriaceous, densely covered with stellate hairs below, sparsely so above, entire or obscurely sinuate; stipe 0.2–4 cm long, stellate-hairy, becoming glabrous; sterile fronds ovate-elliptic to lanceolate-linear with lamina 1–10 cm long, 0.7–1.5 cm broad, decurrent at base, blunt at apex; fertile fronds lanceolate-linear with lamina 4–20 cm long, 0.8–1.5 cm broad; veins reticulate, usually with obscure hydathodes near or on margins above. Sori superficial, usually as 2 oblong patches formed by lateral fusion, rarely a short row of sori. *Felt Fern*. Fig. 102A–B.

Norfolk Is., Lord Howe Is. A common epiphyte on Norfolk Is.; on Lord Howe Is. less common and in drier forest. Also known from Australia (Qld, N.S.W.), and New Caledonia.

N.Is.: N slope of Mt Bates, *R.D.Hoogland 11277* (K, NSW); between Palm Glen and Red Rd, *R.J.Chinnock 5966* (AD, K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (A, K, NSW). **L.H.Is.:** lower slopes of Mt Eliza, *P.S.Green 1578* (K, NSW); spur running S from Malabar, *J.Pickard* in *A.N.Rodd 1403* (NSW); Mt Malabar, *M.Percival 10* (BRI).

M.Tindale (*Contr. New South Wales Natl. Herb.* 3: 35, 36, 1961) commented that the plants from New Caledonia, Norfolk Is. and Lord Howe Is. differ slightly from those of the Australian mainland, and recognised the New Caledonian plant as a separate subspecies. However, P.H.Hovenkamp (*op. cit.* 169), commented that the Norfolk Is. representatives are very often intermediate, and does not treat the New Caledonian plant as a distinct taxon.

P.H.Hovenkamp (*op. cit.* 179) attributes one specimen from Norfolk Is. (*A.Cunningham 33*, U) to *P. eleagnifolia* (Bory) Hovenkamp, and (p. 235) another single sheet from Norfolk Is. (*Hügel s.n.*, M) to *P. serpens* (G.Forst.) Ching. In addition, there are in the Kew herbarium, two sheets labelled as from Norfolk Is. (both of which appear to be part of the same collection; 1849, coll. *C.J.Simmons*, *s. loc.*) one of which has been determined by Hovenkamp as *P. confluens* and the other as *P. serpens*. However, observations of plants on the Island lead to the conclusion that there is only one species present there, and arouses the suspicion that the distinctness of these three taxa needs reconsideration.

Frequently, on Norfolk Is., this fern produces bands of fasciated branched rhizomes. Their cause is not known, although it has been suggested that it might be due to attack by gall-forming mites (Hovenkamp, *op. cit.* 178).

3. PHYMATOSORUS

Phymatosorus Pic.Serm., *Webbia* 28: 457 (1973); from the Greek *phymatos* (a swelling) and sorus, because of the pustulate swelling of upper surface of the lamina above the sorus in most of the species in this genus.

Type: *P. scolopendria* (Burm.f.) Pic.Serm.

Scrambling, creeping or climbing epiphytes or lithophytes. Rhizomes often thick; scales peltate, clathrate. Stipes remote, articulate with rhizome; lamina usually simple or pinnatisect, thickened at margin, glabrous; veins distinctly anastomosing, with free, included veinlets. Sori round or elliptic, in 1 (or 2) rows on each side of midrib, ±sunk in the lamina, resulting in protuberances on upper surface.

A genus of c. 12 species from Africa, Madagascar and the Mascarene Islands, to warm temperate Asia, Australia, New Zealand and the Pacific islands; 1 species native to Norfolk Is., 2 species native to Lord Howe Is. (1 subspecies endemic).

G.Bentham, Filices, *Polypodium*, *Fl. Austral.* 7: 769–770 (1878).

Scales on rhizomes ±appressed; rhizome fleshy, 3–10 mm diam.; base of lamina shortly decurrent onto stipe; lobes of lamina 0.7–2 cm broad; sori near middle of lamina (N.Is., L.H.Is.) **1. P. pustulatus**

Scales on rhizome squarrose; rhizome slender, 2–7 mm diam.; base of lamina long-decurrent onto stipe; lobes of lamina 0.4–1 cm broad; sori submarginal (L.H.Is.) **2. P. scandens**

1. Phymatosorus pustulatus (G.Forst.) M.F.Large, J.E.Braggins & P.S.Green, *New Zealand J. Bot.* 30: 207 (1992), as *P. pustulatum*

Polypodium pustulatum G.Forst., *Fl. Ins. Austr.* 81 (1786). T: New Zealand, *J.R. & G.Forster*; lecto: BM, *fide* M.F.Large *et al.*, *Kew Bull.* 47: 126 (1992). The epithet is Latin for having pustules, in reference to the lamina appearing blistered due to the slightly sunken sori.

Epiphytic, lithophytic or terrestrial ferns, climbing or creeping. Rhizome fleshy, 3–10 mm diam., with appressed brown scales. Fronds variously dissected; stipe 1.5–30 cm long, glabrous except at articulated base; lamina shortly decurrent onto stipe, simple, trisect or pinnatisect, glabrous or occasionally with scattered small, clathrate scales; veins reticulate, linked to a wavy submarginal vein; lobes of lamina 2–14, 0.7–2 cm broad, on each side of broadly winged rachis; sori remote from margin of lamina, ±sunken.

Two subspecies are recognised.

Sori median on the lamina, rarely deeply sunken in lamina; scales of rhizome 1–2 mm broad; frond 3-lobed or pinnatisect, rarely 2-pinnate, often simple **1a.** subsp. **pustulatus**

Sori submarginal or about ⅓ of the way from the margin to the midrib, rarely median, deeply sunken in lamina; scales of rhizome 1.5–3.3 mm broad; fronds mostly pinnatisect, sometimes 3-lobed (rarely simple) **1b.** subsp. **howensis**

1a. Phymatosorus pustulatus (G.Forst.) M.F.Large, J.E.Braggins & P.S.Green subsp. pustulatus

Polypodium diversifolium Willd., *Sp. Pl.* 5th edn, 5(1): 166 (1810). T: Australia, ?*J.J.H. de Labillardière*; holo: B *n.v.*, IDC microfiche 7740/1.1419/1.

Polypodium billardieri R.Br.: S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 7 (1833). T: Tasmania, *R.Brown*; holo: ?BM *n.v.*

[*Polypodium phymatodes auct. non* L.: A.Cunningham in R.Heward, *J. Bot.* (*Hooker*) 1: 121 (1842)]

[*Polypodium scandens auct. non* G.Forst.: K.Domin, *Biblioth. Bot.* 85: 178 (1915)]

Illustrations: B.D.Duncan & G.Isaac, *Ferns & Allied Pl. Victoria, Tasmania & S. Australia* 155, fig. 15.1A, 156, figs 15.2A, 15.3 (1986), as *Microsorum diversifolium*; S.B.Andrews, *Ferns Queensland* 282, fig. 28.4D (1990); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 41 (1990), as *Microsorum diversifolium.*

Epiphytic or lithophytic, sometimes terrestrial fern, climbing. Rhizome 3–7 mm diam.; scales 3–6 mm long, 1–2 mm broad, attenuate, slenderly acuminate, eventually deciduous. Fronds: stipe 1.5–30 cm long; lamina 10–40 cm long, simple (narrowly elliptic), trisect or pinnatisect; lobes 2–10, 3–15 cm long, 0.7–2 cm broad, occasionally with scattered, small, clathrate, peltate scales, acute. Sori slightly sunken, ovoid, 1.5–4 mm diam., about midway between margin and midrib. *Kangaroo Fern*. Fig. 102C–D.

Norfolk Is. Locally abundant in shady forest. Also known from eastern Australia (southern Qld to Tas.) and New Zealand.

N.Is.: E slopes of Mt Bates, *R.D.Hoogland 11250* (CANB, NSW); beside Red Rd, *P.S.Green 1381* (A, NSW); *s. loc., A.Cunningham 19* (K); *s. loc., W.Laing* (CHR).

1b. Phymatosorus pustulatus subsp. howensis Tindale & P.S.Green, *Fl. Australia* 49: 617 (1994)

T: Transit Hill, Lord Howe Island, Oct. 1963, *R.D.Hoogland 8673*; holo: NSW; iso: CANB. The epithet alludes to Lord Howe Island, where this subspecies is endemic.

[*Polypodium scandens auct. non* G.Forst.: C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 26 (1870)]

[*Polypodium billardieri auct. non* R.Br.: F.J.H. von Mueller, *Fragm.* 9: 78 (1875)]

[*Polypodium pustulatum auct. non* G.Forst.: G.Bentham, *Fl. Austral.* 7: 770 (1878)]

[*Polypodium diversifolium auct. non* Willd.: W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 124 (1917)]

Epiphytic, lithophytic or terrestrial ferns. Rhizome creeping, 4–10 mm diam.; scales broadly lanceolate, 3–5 mm long, 1.5–3 mm broad, acute to abruptly acuminate. Fronds (simple?), trisect (rarely), or pinnatisect; stipe 10–25 cm long; lamina 15–35 cm long, shortly decurrent onto stipe at base; lobes 2–14, 3–20 cm long, 0.8–2 cm broad, blunt to acute, glabrous. Sori manifestly sunken, globose, 1.5–3 mm diam., about 1/3 of the way in from margin to midrib. Fig. 102E–F.

Lord Howe Is. Endemic. Frequent on mossy rocks, decaying stumps *etc*. in forested areas.

L.H.Is.: SE lower slopes of Malabar, *P.S.Green 1561* (K, NSW); Neds Beach, *A.N.Rodd 1486* (NSW); track to Smoking Tree Ridge at Big (Deep) Ck, *J.C.Game 69/119* (K); Big Slope, 1972, *H.J. de S.Disney* (NSW).

2. Phymatosorus scandens (G.Forst.) Pic.Serm., *Webbia* 28: 459 (1973)

Polypodium scandens G.Forst., *Fl. Ins. Austr.* 81 (1786); *Microsorum scandens* (G.Forst.) Tindale, *Amer. Fern J.* 50: 241 (1960). T: 'Society Islands', *J.R. & G.Forster*; lecto: BM, *fide* M.D.Tindale, *Amer. Fern J.* 50: 241 (1960). The epithet comes from the Latin *scando* (I climb), in allusion to the habit.

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 171, fig. 228 (1981), as *Microsorum scandens*; S.B.Andrews, *Ferns Queensland* 282, fig. 28.4C (1990), as *Microsorum scandens*; P.J.Brownsey & J.C.Smith-Dodsworth, *New Zealand Ferns & Allied Pl.* 63, fig. 62, 65, fig. 66, t. 14C (1989).

Epiphytic, lithophytic or terrestrial fern, climbing. Rhizome elongate, slender, 2–7 mm diam.; scales dense, narrow, 4–5 mm long, 1–1.2 mm broad at base, squarrose, clathrate, dark brown, persistent. Fronds simple or usually pinnatisect: stipe 5–15 cm long, glabrous except at articulated base; lamina 10–40 cm long, long-decurrent onto stipe; lobes 1–3 on each side of winged midrib, 1–10 cm long, 0.4–1 cm broad, long-acute, glabrous; veins reticulate, not forming a wavy submarginal vein. Sori ±immersed, globose to oval, 1–2.5 mm diam., submarginal.

Lord Howe Is. Occasional to frequent in forest on the mountainous southern end of the Island. Also known from eastern Australia (Qld to Tas.) and New Zealand.

L.H.Is.: Upper Erskine Valley, *A.N.Rodd 3707* (NSW); summit plateau of Mt Gower, *J.Pickard 2627 & 2631* (NSW).

This species has been cited from Norfolk Is. by M.D.Tindale (*Contr. New South Wales Natl. Herb. Fl. Ser.* 201: 42, 1961) with the comment that she has 'not seen any specimen of *M. scandens* from Norfolk Island'. A convincing collection from Norfolk Is. has not been seen in the preparation of this treatment either, but there is a specimen, formerly part of Christensen's herbarium, now at the British Natural History Museum (BM), labelled 'Norfolk Island', No.4' and attributed to Cunningham (but not in Cunningham's hand). In the absence of any other collection of this species from the Island, this specimen must be considered to have been mislabelled.

128. GRAMMITIDACEAE

Small epiphytes or lithophytes. Rhizomes erect or shortly creeping, rarely long-creeping; scales shining brown, often with unicellular hairs. Stipes usually crowded, usually with spreading unicellular or branched hairs. Fronds uniform, simple or more rarely pinnatifid or pinnate; pinnae sessile, entire or toothed, with unicellular or branched hairs; veins usually free. Sori round to elliptic, superficial or immersed; without indusia.

A family of c. 10 genera and c. 400 species, mainly tropical, and characteristic of montane cloud-forest; 1 genus native on Lord Howe Is. Previously included in the Polypodiaceae.

GRAMMITIS

Grammitis Sw., *J. Bot.* (*Schrader*) 1800(2): 17 (1801); from the Greek *gramma*, *grammikos* (a written character, linear), in allusion to the sori forming narrow lines in these ferns.

Type: *G. marginella* (Sw.) Sw.

Small epiphytes. Rhizomes short, ascending or creeping, with scales at apex. Fronds crowded, not articulated with rhizome, simple, entire or rarely irregularly lobed, usually attenuate at base and apex, usually with setose hairs, sometimes glabrous, without scales; veins simple or forked, rarely slightly reticulate, without free included vein endings. Sori usually superficial, usually in a single row on each side of midrib, round or elongate.

A pantropical genus of c. 160 species, especially characteristic of cool, montane cloud-forests; 3 species endemic to Lord Howe Is.

G.Bentham, Filices, *Polypodium*, *Grammitis*, *Fl. Austral.* 7: 763, 774–777 (1878).

1 Fronds glabrous; sori ±confined to upper part of frond **1. G. diminuta**

1: Fronds setose; sori usually throughout entire length of frond

2 Setose hairs 0.5–2 mm long; fronds (including stipe) 3–8 cm long **2. G. nudicarpa**

2: Setose hairs 2–4 mm long; fronds (including stipe) 6–25 cm long **3. G. wattsii**

1. Grammitis diminuta (Baker) Copel., *Philipp. J. Sci.* 80: 141, fig. 13 (1952)

Polypodium diminutum Baker in W.J.Hooker & J.G.Baker, *Syn. Fil.* 2nd edn, 507 (1874). T: Lord Howe Island, *C.Moore [31]*; holo: K. The epithet comes from the Latin *diminutio* (to decrease, diminish), in allusion to the tapered frond base.

Polypodium howeanum Watts, *J. Proc. Roy. Soc. New South Wales* 49: 388 (1915). T: Lord Howe Island, *W.W.Watts*; holo: NSW.

[*Polypodium australe auct. non* (R.Br.) Mett.: F.J.H. von Mueller, *Fragm.* 9: 78 (1875), *p.p.*]

Illustrations: E.B.Copeland, *loc. cit.*; D.L.Jones, *Encycl. Ferns* 54 (1987).

Epiphyte. Rhizome stoutish, erect; scales lanceolate, long-pointed, somewhat flexuous, light brown. Fronds simple; stipe merging shortly and imperceptably into attenuate base of lamina, glabrous; lamina very narrowly elliptic, 3–15 cm long, 0.4–0.8 cm broad, entire, ±recurved when desiccated, long-attenuate at apex with tip blunt, ±coriaceous, glabrous; veins obscure. Sori elongate, 1 row on each side of prominent midrib in upper part of frond, with a tendency to coalesce. Fig. 102G–H.

Lord Howe Is. Endemic. Confined to the cloud-forest on the upper slopes and tops of Mts Gower and Lidgbird.

L.H.Is.: base of E cliffs of Mt Lidgbird, near Goat House, *I.R.Telford 7080 & M.D.Crisp* (CBG, NSW); summit plateau, Mt Gower, *P.S.Green 1995* (K); summit of Mt Lidgbird, *C.Moore 83* (K).

2. Grammitis nudicarpa Copel., *Univ. Calif. Publ. Bot.* 18: 222 (1942)

T: Lord Howe Island, coll. unknown, 'No. 908,302.93'; holo: L *n.v.* The epithet comes from the Latin *nudus* (naked) and the Greek *carpos* (fruit), in allusion to the sporangia not bearing hairs.

Illustration: E.B.Copeland, *Philipp. J. Sci.* 80: 143, fig. 15 (1952).

Very small epiphyte. Rhizome short; scales on apex relatively short, long-pointed, dark brown. Fronds simple; stipe merging shortly and imperceptably into attenuate base of lamina, setose; lamina very narrowly oblanceolate, 2–8 cm long, 0.3–0.8 cm broad, entire, relatively abrupt, rounded and blunt at apex, setose with fine, dark brown hairs 0.5–2 mm long throughout; veins obscure. Sori elliptic, in 1 row on each side of midrib, usually throughout entire length of frond, with dark setose hairs. Fig. 102I–J.

Lord Howe Is. Endemic. Rare and confined to the densely shaded, summit areas on Mts Gower and Lidgbird.

L.H.Is.: E side of Mt Lidgbird, *J.C.Game 69/182* (K); E side of Mt Lidgbird, *M.M.J. van Balgooy 1097* (L,

NSW); summit of Mt Gower, *J.P.Fullagar & Lind 21 p.p.* (K).

3. Grammitis wattsii Copel., *Univ. Cal. Publ. Bot.* 18: 222 (1942)

T: as for *Polypodium pulchellum* Watts.

Polypodium pulchellum Watts, *J. Proc. Roy. Soc. New South Wales* 49: 386 (1916), *non* Salisb. (1796). T: upper slopes of Mt Gower, Lord Howe Island, *W.W.Watts*?; holo: NSW; iso: K. Named after the Rev. W.W.Watts (1856–1920), prominent Australian cryptogamist about the turn of the century.

[*Polypodium hirtum auct. non* (Blume) C.Presl: W.J.Hooker in W.J.Hooker & J.G.Baker, *Syn. Fil.* 320 (1864), *p.p.*]

[*Polypodium hookeri auct. non* Brack.: F.J.H. von Mueller, *Fragm.* 7: 104 (1870); G.Bentham, *Fl. Austral.* 7: 104 (1878), *p.p.*]

Illustration: E.B.Copeland, *Philipp. J. Sci.* 80: 143, fig. 14 (1952).

Epiphyte. Rhizome erect or shortly creeping; scales dense, narrow, long-pointed, chestnut-brown. Fronds simple; stipe 0.5–5 cm long, merging imperceptably into attenuate base of lamina, densely setose with chestnut-brown hairs 2–4 mm long; lamina very narrowly elliptic-linear, 5–20 cm long, 0.4–1.2 cm broad, entire, gradually narrowed at apex, tip blunt, setose throughout with fine, dark or chestnut-brown hairs, especially on margins; veins obscure. Sori round to elongate-elliptic, 1 row on each side of midrib throughout length of frond, with denser groups of setose hairs. Fig. 102K–L.

Lord Howe Is. Endemic. Confined to the cloud-forest on the tops of Mts Gower and Lidgbird.

L.H.Is.: top of Mt Gower, *P.S.Green 1595* (A, K, NSW); SW corner of Mt Gower plateau, *J.C.Game 69/020* (K, NSW); top of Mt Lidgbird, *C.Moore 22* (K).

129. CYATHEACEAE

Tree ferns with a definite trunk-like caudex. Stipe base usually ±persistent, eventually leaving a scar on the trunk; fronds small to large, 1–4-pinnate. Sori dorsal or marginal, round or ellipsoidal; indusia subtending and partially or entirely enclosing the sorus, or absent. Sporangia shortly stalked, often with paraphyses; annulus oblique.

A pantropical family of c. 8 genera and c. 700 species. The genera *Cystodium* and *Dicksonia* are sometimes recognised as constituting a separate family, the Dicksoniaceae. R.Tryon (*Contr. Gray Herb.* 200: 1–53, 1970) proposed a reclassification of the Cyatheaceae not followed here. The following species were all treated in either *Alsophila* or *Sphaeropteris*.

G.Bentham, Filicales, Tribe Cyatheae, *Fl. Austral.* 7: 707–712 (1878); R.E.Holttum, The tree-ferns of the genus *Cyathea* in Australasia and the Pacific, *Blumea* 12: 241–274 (1964).

CYATHEA

Cyathea Sm., *Mém. Acad. Roy. Sci.* (*Turin*) 5: 416 (1793); from the Greek *kyatheion* (a little cup), in allusion to the indusia in some of these ferns.

Type: *C. arborea* (L.) Sm.

Tree ferns; apical bud clothed in scales. Fronds usually large, usually more than 1.5 m long, 1–3-pinnate or pinnatifid, with an indumentum of scales and hairs; stipe thick, densely covered with ±caducous scales towards the base; veins simple or branched, free. Sori dorsal on veins or vein dichotomies; indusia present or absent; receptacle erect, somewhat club-shaped to spherical; filamentous paraphyses often present.

A mainly tropical genus of c. 600 or more species, extending south to New Zealand, Chile

and South Africa. Two species native to Norfolk Is.; 4 species native to Lord Howe Is.

G.Bentham, Filicales, *Cyathea*, *Fl. Austral*. 7: 707–709 (1878).

1 Pinnules in the central portion of the pinnae 7–14 cm long, with 16–20 opposite pairs (before they diminish markedly in size towards the long, pointed apex)

2 Fertile pinnules deeply pinnatisect, the divisions in the centre of the pinnule joined basally along the costa by 0.5–1 mm of continuous lamina

3 Pinna rachis, costae and costules on the upper side at the base of the lamina with hairs and some scattered scales; stipe and primary rachis with a mixture of scales and crumpled hairs, but scarcely a felted indumentum (N.Is.) **1. C. australis**

3: Pinna rachis, costae and costules on the upper side at the base of lamina glabrous; stipe and primary rachis with felted indumentum of crumpled hairs (L.H.Is.) **2. C. macarthurii**

2: Fertile pinnules completely pinnatifid, the divisions in the centre of the pinnules not joined by even a narrowly continuous lamina at their base

4 Lower surface of costae and costules scurfy with narrow setiferous scales, soon detached (L.H.Is.) **5. C. robusta**

4: Lower surface of costae and costules ±felted with small, thin, entangled, fringed scales, soon detached (N.Is.) **6. C. brownii**

1: Pinnules in central portion of pinnae 3–7 cm long, with 10–15 lamina segments (before diminishing in size towards the apex) (L.H.Is.)

5 Lower surface of costae and costules with small (0.15–1 mm long), scattered, 'bubble-like', bullate scales; pinnules deeply toothed, with acute teeth deflexed round sori **3. C. howeana**

5: Lower surface of costae and costules without scales, somewhat prickly with the bases of early shed scales; pinnules ±entire except where fertile; fertile pinnules deeply toothed, with rounded teeth deflexed around sori **4. C. brevipinna**

1. Cyathea australis (R.BR.) Domin, *Pteridophyta* 262 (1929)

subsp. **norfolkensis** Holttum, *Blumea* 12: 244 (1964)

T: Norfolk Island, 1905, *P.H.Metcalfe*; holo: NSW. So named as coming from Norfolk Is.

[*Cyathea medullaris auct. non* (G.Forst.) Sw.: S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 15 (1833)]

[*Alsophila australis auct. non* R.Br.: G.Bentham, *Fl. Austral.* 7: 710 (1878), *p.p.*]

Trunk to 8 m tall; frond bases persistent; scars largish, shaggy. Fronds: stipe c. 50 cm long, prickly, scurfy-hairy; base covered with dark brown, twisted-pointed scales 2–4 cm long; costae and to a lesser extent costules covered below with a mixed tomentum of large pale scales, small 'bubble-like' scales and fine crumpled hairs (easily rubbed off); lamina bipinnatisect to tripinnate; primary pinnae to 50 cm long, ±flat, acuminate; secondary pinnae 8–10 cm long, c. 1.5 cm broad; largest pinnules 16–20 pairs, 8–10 mm long, 2.5–3 mm broad, with lowest 1 or 2 pairs of pinnules free, remainder adnate by a continuous lamina up to 1 mm wide on each side of costa. Sori without indusia. *Rough Tree Fern, Farn.* Fig. 103A–D.

Norfolk Is. Endemic; in the valleys and upper slopes of Mts Pitt and Bates, not common.

N.Is.: S slopes of Mt Pitt, *R.D.Hoogland 11354* (K, MEL, NSW); *loc. id., P.S.Green, P.Ralston & O.Evans 1416, 1417 & 1418* (K).

Although described as a subspecies of the east Australian *C. australis*, this plant has been thought by some to be more correctly treated as an endemic Norfolk Is. species.

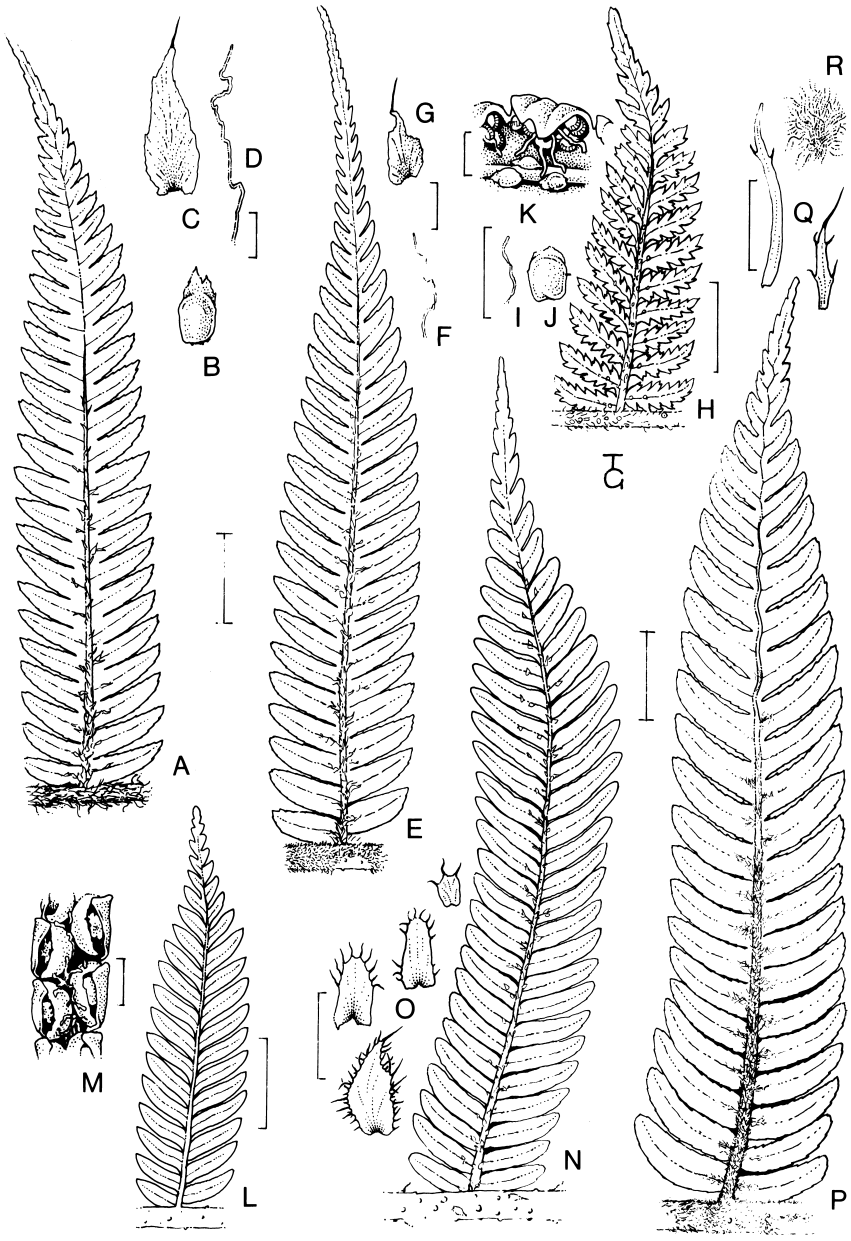

Figure 103. CYATHEACEAE. **A–D**, *Cyathea australis* subsp. *norfolkensis*. **A**, sterile pinnule; **B**, bullate scale; **C**, scale; **D**, hair (**A–D**, P.Green *et al.* 1418, K). **E–G**, *Cyathea macarthurii*. **E**, sterile pinnule; **F**, scale; **G**, hair (**E–G**, J.MacGillivray, Herald 703, K). **H–K**, *Cyathea howeana*. **H**, sterile pinnule; **I**, hair; **J**, scale; **K**, portion of fertile pinnule (**H–K**, C.Moore 68, K). **L–M**, *Cyathea brevipinna*. **L**, sterile pinnule; **M**, portion of fertile pinnule (**L–M**, P.Green 1591, K). **N–O**, *Cyathea robusta*. **N**, sterile pinnule; **O,** scales (**N–O**, J.Fullagar., K). **P–R**, *Cyathea brownii*. **P**, sterile pinnule; **Q**, scales; **R**, felted hairs (**P–R**, R.Hoogland 11358, K). Scale bars: **A**, **E**, **H**, **L**, **N**, **P** = 1 cm; **B**, **C**, **D**, **F**, **G**, **I**, **J**, **K**, **M**, **O**, **Q**, **R**, = 1 mm. Drawn by T.Galloway.

2. **Cyathea macarthurii** (F.Muell.) Baker, *J. Bot.* 12: 280 (1874)

Hemitelia macarthurii F.Muell., *Fragm.* 8: 176 (Apr. 1874), *non Alsophila macarthurii* Hook. (1866); *Alsophila ferdinandii* R.M.Tryon, *Contr. Gray Herb.* 200: 37 (1970). T: Lord Howe Island, *W.Carron & C.Moore*; syn: MEL; *Lind & J.P.Fullagar*; syn: MEL. Named after Sir William Macarthur (1800–1882), an early botanist, horticulturalist and agriculturalist in N.S.W., who did much to establish a wine industry in Australia.

Cyathea moorei Baker in W.J.Hooker & J.G.Baker, *Syn. Fil.* 2nd edn, 453 (Oct. 1874), *non Alsophila moorei* J.Sm. (1866). T: Lord Howe Island, *C.Moore*; holo: K.

[*Cyathea dealbata auct. non* (G.Forst.) Sw.: W.J.Hooker & J.G.Baker, *Syn. Fil.* 26 (1865), *p.p.*; H.H.Allan, *Fl. New Zealand* 1: 40 (1961), *p.p.*]

Trunk to 4 m or more tall, usually ±shaggy with dark, persistent frond bases, sometimes clear with round scars. Fronds: stipe prickly, with light brown woolly indumentum covered with long, twisted, acuminate brown scales 2–3 cm long; costae glabrous above, with a pale brown, woolly, felt-like indumentum of pale crumpled hairs (easily rubbed off), over a finely warty surface below; lamina bipinnatisect; primary pinnae to 50 cm long, slender-pointed; secondary pinnae 7–11 cm long, 1.5 cm broad; largest pinnules 16–18 pairs, 5–9 mm long, 2–3 mm broad, ±glaucous, shallowly adnate by 0.5 mm on each side of the costae. Sori with saucer-shaped indusia. Fig. 103E–G.

Lord Howe Is. Endemic; perhaps the commonest tree fern on the Island, widespread from relatively low elevations (*e.g.* Intermediate Hill) onto the mountains.

L.H.Is.: Mt Lidgbird, *C.Moore 29* (K, MEL); E slopes of Mt Lidgbird, *P.S.Green 1691* (K); summit of Mt Gower, *J.Pickard 3594* (NSW); The Saddle, *J.Pickard 3625* (NSW).

3. **Cyathea howeana** Domin, *Pteridophyta* 264 (1929)

T: as for *Hemitelia moorei* Baker. Named after Lord Howe Island.

Hemitelia moorei Baker, *Gard. Chron.* 31: 252 (1872); *Cyathea moorei* (Baker) F.Muell., *Syst. Census Austral. Pl.* 137 (1882), *nom. illeg. non* Baker (1874). T: Lord Howe Island, *C.Moore*; holo: K.

Illustration: C.J.Goudey, *Austral. Fern J.* 1: [3] t. 4 (1984).

Trunk to 3 m tall, with round leaf scars below the crown; stipe bases not persistent. Fronds: stipe with relatively few, caducous brown scales with pale margin and without terminal seta; costae and costules with numerous matted, pale bubble-like bullate scales 0.15–1 mm long, and some short, crumpled hairs below, with dense, long, pale, antrorse hairs above, few or absent on costules; lamina tripinnate; primary pinnae to 35 cm long, relatively shortly acuminate; secondary pinnae 4–7 cm long, 1–2 cm broad; largest pinnules 12–15 pairs, 5–9 mm long, 2–3 mm broad, free, deeply toothed, with teeth acute, usually reflexed. Sori attached on one side, usually enclosed in deflexed pinnule lobes. Fig. 103H–K.

Lord Howe Is. Endemic; frequent on the slopes and tops of Mts Gower and Lidgbird.

L.H.Is.: top of Mt Gower, *P.S.Green 1597* (K, NSW); Mt Lidgbird, about Round Face, *J.Pickard 1449* (NSW); NE flank of Mt Lidgbird, *M.M.J. van Balgooy 1146* (NSW); Erskine Valley, *A.N.Rodd 1773* (NSW).

The affinity of this species lies, along with others in the Melanesian *C. decurrens* Copel. group, with Central and South America (see R.E.Holttum, *Kew Bull.* 37: 383–388, 1982).

4. **Cyathea brevipinna** Baker ex Benth., *Fl. Austral.* 7: 709 (1878)

Alsophila brevipinna (Baker ex Benth.) R.M.Tryon, *Contr. Gray Herb.* 200: 36 (1970). T: Lord Howe Island, *Lind & J.P.Fullagar*; holo: K; iso: MEL, NSW. The name refers to the short (brief) pinnae.

[*Cyathea medullaris auct. non* (G.Forst.) Sw.: F.J.H. von Mueller, *Fragm.* 9: 78 (1875)]

Trunk 1.5–3 m tall, with dense, reddish brown scales near top; leaf scars with persistent ±fibrous stipe bases. Fronds: stipe 25–50 cm long, with scales ±persistent, narrow, 2–3 cm long, with a fine tip, dark brown with a lighter edge, warty below; costae and costules glabrescent below except for scattered warty bases of early shed scales, somewhat prickly, with antrorse hairs above, few or absent on costules; lamina tripinnate; primary pinnae to 20

cm long; secondary pinnae 3–5 cm long, 1–1.2 cm broad; largest pinnules 10–15 pairs, 5–6 mm long, 2–5 mm broad, free; fertile pinnules deeply divided, with divisions rounded-crenate and curled over sori. Sori attached on one side, with large, persistent indusia. Fig. 103L–M.

Lord Howe Is. Endemic; on the higher parts of Mt Gower (and presumably Mt Lidgbird, but no collections or records have been seen from there). It often grows in exposed positions and is then somewhat stunted and gnarled. This species is said to spread and reproduce by means of stolons.

L.H.Is.: top of Mt Gower, *P.S.Green 1591* (K); summit plateau of Mt Gower, *J.Pickard 2644, 3573 & 3595* (NSW); *loc. id.*, *A.N.Rodd 1367* (NSW).

5. **Cyathea robusta** Holttum, *Blumea* 12: 265 (1964)

Alsophila robusta C.Moore ex Maiden, *Proc. Linn. Soc. New South Wales* 23: 144 (1898), *non* de Vriese (1852); *Sphaeropteris robusta* (Holttum) R.M.Tryon, *Contr. Gray Herb.* 200: 24 (1970). T: Lord Howe Island, *C.Moore 1*; holo: K. Named in allusion to its robust habit.

Alsophila australis var. *nigrescens* Benth., *Fl. Austral.* 7: 711 (1878). T: Lord Howe Island, *C.Moore*; holo: ?MEL *n.v.*

Trunk to 5 m tall, with roundish scars; stipe bases variably persistent with lower parts of trunk often clear. Fronds: stipe c. 1 m long, rough, ±glaucous, with basal scales 2–4 cm long, whitish, with dark brown, setiferous margins; costae (and to a lesser extent costules) with pale scales of mixed sizes with setiferous margins below, and with fine pale antrorse setiferous hairs on veins above; lamina tripinnate; primary pinnae to 50 cm long; pinna rachis with numerous short warty excrescences and small scurfy scales, occasionally with white caducous scales; secondary pinnae 7–11 cm long, 1.2–2 cm broad; largest pinnules 18–20 pairs, 5–6 mm long, 2.5–3 mm broad, free. Sori without indusia, with paraphyses around the base. Fig. 103N–O.

Lord Howe Is. Endemic; widespread, but rarer than the other species, scattered in the southern mountainous areas at low to medium elevations.

L.H.Is.: Boat Harbour track, *J.Pickard 2649* (K, NSW); Rocky Run, *J.Pickard 3424* (NSW); Dinner Run, *P.S.Green 2341* (K); N side of Mt Lidgbird, *A.C.Beauglehole 5365* (MEL).

On juvenile plants the large, white scales are very prominent and abundant.

6. **Cyathea brownii** Domin, *Pteridophyta* 262 (1929)

T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W. Named after Robert Brown (1773–1858), naturalist on Lieutenant M.Flinders' voyage of exploration around Australia in the *Investigator*.

Alsophila excelsa R.Br. ex Endl., *Prodr. Fl. Norfolk.* 16 (1833), *non Cyathea excelsa* Sw.; *Sphaeropteris excelsa* (R.Br. ex Endl.) R.M.Tryon, *Contr. Gray Herb.* 200: 24 (1970). T: as for *Cyathea brownii*.

Alsophila robusta var. *norfolkiana* R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 9 (1915). T: Norfolk Is., *R.M.Laing*; holo: CHR.

Illustrations: W.J.Hooker, *Gen. Fil.* t. 9 (1842); W.J.Hooker, *Sp. Fil.* 1: t. 18A (1844); D.L.Jones, *Encycl. Ferns*: 25 (1987).

Trunk usually to 5 m, rarely to 18 m tall, smooth, with stipe base scars. Fronds: stipe 30–50 cm long, finely warty; basal scales narrow, 2–4 cm long, lightish brown, caducous; costae and costules below with dense felted hairs and small narrow scales with marginal hairs; costae above with shortish crisped antrorse hairs, glabrous on upper surface of veins; lamina tripinnate; primary pinnae to 60 cm long with apex long-pointed; pinna rachis finely warty with caducous, fine, ±felted hairs; secondary pinnae 7–13 cm long, 1.5–2.2 cm broad; largest pinnules 16–18 pairs, 8–15 mm long, 2–4 mm broad, free, shallowly crenate, acuminate; fertile pinnules with margin recurved over sori. Sori without indusium, with paraphyses. *Norfolk Tree Fern, Farn*. Figs 4, 103P–R.

Norfolk Is. Endemic; common, occurring at all elevations.

N.Is.: Palm Glen, *R.D.Hoogland 11358* (K, NSW); top of Mount Bates, *P.S.Green, P.Ralston & O.Evans 1419* (K); Now-Now Valley, *W.Laing* (CHR).

Records of individuals with trunks to 24 m tall have been reported in the past.

Doubtful record

Culcita dubia (R.Br.) Maxon was, under the name *Davallia dubia* R.Br., recorded from Lord Howe Is. by G.Bentham (*Fl. Austral.* 7: 178, 1878), citing a Moore & Fullagar specimen, but no such collection is represented in the herbarium at Kew, where Bentham worked. There is, however, a specimen of this species labelled: 'Lord Howe's Island, Herb. Macleay, received 5/73' in Baker's hand, but there has been no other record and, without such confirmation, it is best to treat this specimen as having been mislabelled.

130. THELYPTERIDACEAE

Terrestrial ferns. Rhizome erect or creeping; scales with marginal, also often superficial, unicellular hairs. Fronds pinnate to usually bipinnatifid or sometimes tripinnatifid, with a transparent membrane in the sinus between pinna lobes; hairs acicular, unicellular on upper surface, sometimes with glandular hairs beneath; veins free or those from adjacent costules joining to produce an excurrent vein ending in a sinus. Sori round, indusiate, rarely naked; indusia kidney-shaped.

A worldwide family of 15 or more genera and c. 900 species; 2 native genera on Norfolk Is., 1 of which also occurs on Lord Howe Is.

The family was misinterpreted in the past and is currently under revision. An earlier belief in an affinity with *Dryopteris* is now discounted.

G.Bentham, Filices, *Aspidium*, *Fl. Austral.* 7: 756 (1878); R.E.Holttum, The family Thelypteridaceae in the Old World, *J. Linn. Soc., Bot.* 67: *Suppl.* 173–189 (1973); R.E.Holttum, The family Thelypteridaceae in the Pacific and Australia, *Allertonia* 1: 169–223 (1977).

KEY TO GENERA

Fronds pinnate to bipinnatifid; pinnules not as below	**1. CHRISTELLA**
Fronds bipinnate to tripinnatifid; pinnules decurrent as a narrow wing on the costa	**2. MACROTHELYPTERIS**

1. CHRISTELLA

Christella H.Lév., *Fl. Kouy-Tchéou* 472 (1915); named after K.H.H.Christ (1833–1933), Swiss pteridologist.

Type: *C. parasitica* (L.) H.Lév.

Terrestrial ferns. Rhizomes erect or creeping; scales narrow, setiferous. Fronds pinnate, with basal veins of pinna segments usually anastomosing; hairs on both surfaces acicular, with short, capitate hairs often present, and the lower surface sometimes with thick, glandular hairs. Sori ±circular, indusiate.

A genus of c. 50 species, found throughout the tropics and subtropics, especially in the Old World; 1 species native to Norfolk Is.; 1 species native to both Islands.

R.E.Holttum, The genus *Christella* H.Lév., Sect. *Christella*, *Kew Bull.* 31: 293–339 (1976).

Lower pinnae in several pairs gradually reduced in length; rhizome ±tufted or very shortly creeping; veins beneath without orange glandular hairs (N.Is., L.H.Is.) **1. C. dentata**

Lower 1 or 2 pairs of pinnae ±abruptly reduced in length; rhizome distinctly creeping; veins beneath with orange glandular hairs (N.Is.) **2. C. parasitica**

1. Christella dentata (Forssk.) Brownsey & Jermy, *Brit. Fern Gaz.* 10: 338 (1973)

Polypodium dentatum Forssk., *Fl. Aegypt.-Arab.* 185 (1775). T: Arabia, *P.Forsskål*; holo: C *n.v.*; photo seen (IDC microfiche 2200/2.83/22). Epithet is Latin for toothed, in reference to the supposedly dentate margins to the pinnae.

Aspidium molle Sw., *J. Bot. (Schrader)* 1800(2): 34 (1801); *Nephrodium molle* (Sw.) R.Br., *Prodr.* 149 (1810). T: Caracas, Colombia, *N.T. von Jacquin?*; holo: not traced.

Nephrodium remotum Heward, *London J. Bot.* 1: 121 (1842). T: Norfolk Island, *A.Cunningham 21***; holo: K.

Cyclosorus nymphalis (G.Forst.) Ching, *Bull. Fan Mem. Inst. Biol.* 10: 247 (1941). T: New Zealand, *G.Forster*; syn: K.

[*Aspidium parasiticum auct. non* (L.) Sw.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 735 (1904)]

[*Dryopteris parasitica auct. non* (L.) Kuntze: W.W.Watts, *Proc. Linn. Soc. New South Wales* 37: 396 (1913)]

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 115 (1981); B.D.Duncan & G.Isaac, *Ferns & Allied Pl. Victoria, Tasmania & S. Australia* 186, fig. 18 (1986); S.B.Andrews, *Ferns Queensland* 357, fig. 36.3B, 358, fig. 36.4B (1990).

Rhizome at most very shortly creeping. Fronds 40–50 cm tall; stipes borne close together; pinnae 15–25 pairs, 6–10 (–14) cm long, the lower 3–6 pairs gradually reduced in length to c. 2–3 cm long, lobed for the lower ⅔; lobes rounded, slightly oblique; hairs on rachis, costae and veins pale, 0.2–0.5 mm long, slightly longer hairs on upper surface, below with minute, erect hairs between veins. Sori circular; indusia hairy. *Binung*.

Norfolk Is., Lord Howe Is. Fairly common on banks in the forest and wooded roadsides. This species is probably cosmopolitan, having a wide distribution throughout the tropics and subtropics of the Old World, including Australia, North Is. of New Zealand, and the Pacific islands.

N.Is.: Anson Bay Rd, near Selwyn Bridge, *M.Lazarides 8055* (CANB, K); Ghost Corner, Anson Bay Road, *P.S.Green 2381* (K); bottom of Douglas Drive, along Mission Rd, *R.J.Chinnock 5912* (AD, K). **L.H.Is.:** Deep Ck, *J.C.Game 69/317* (K); Middle Beach Common, *J.Pickard 2700* (NSW); SW base of Mt Lidgbird, *A.N.Rodd 1718* (NSW).

The Norfolk Is. population is somewhat aberrant in having up to 6 pairs of reduced lower pinnae and in the presence of numerous capitate hairs on and between the veins.

2. Christella parasitica (L.) H.Lév., *Fl. Kouy-Tchéou* 475 (1915)

Polypodium parasiticum L., *Sp. Pl.* 2: 1090 (1753). T: China, *P.Osbeck*; holo: S *n.v.*, *fide* R.E.Holttum, *Kew Bull.* 31: 309 (1976). Named after its supposed 'parasitic', *i.e.* epiphytic, habit.

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 116, fig. 126 (1981); S.B.Andrews, *Ferns Queensland* 357, fig. 36.3C, 358, fig. 36.4C (1990); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 52 (1990).

Rhizome distinctly creeping. Fronds 30–100 cm tall: stipes somewhat separate at base; pinnae 15–20 pairs, 4–14 cm long, the lowest scarcely shorter than those above, lobed for the lower ⅔; lobes rounded, oblique; hairs on rachis, costae, veins and lamina pale, 0.2–0.75 mm long, the longest on the costae above, also numerous short capitate hairs and orange, glandular hairs below, usually on costae and veins. Sori circular; indusia hairy.

Norfolk Is. Uncommon on woodside banks. Distributed from mainland SE Asia and Japan, through Malesia to Australia (Qld), New Caledonia and the Pacific islands.

N.Is.: Anson Bay Rd, near Bullock Hut Rd, *P.S.Green 2377* (K); Ghost Corner, S of site of old Anson Bay School, *R.J.Chinnock 5925* (AD, K); Rocky Point area (Hundred Acre Reserve), *W.R.Sykes NI 517* (CHR).

Although the collections cited are here treated as *Christella parasitica* they are somewhat

aberrant for the species. However, despite their slight differences from each other, without field and experimental studies it would be premature to name the Island population as a distinct new taxon. The Chinnock collection in its pubescence resembles *Christella hispidula* (Decne.) Holttum and it bears relatively few orange glands.

2. MACROTHELYPTERIS

Macrothelypteris (H.Itô) Ching, *Acta Phytotax. Sin.* 8: 308 (1963); from the Greek *makros* (large) and *Thelypteris*, a related genus of ferns.

Type: *M. oligophlebia* (Baker) Ching

Terrestrial ferns. Rhizome short, creeping or suberect; scales narrow with marginal and superficial fine hairs. Fronds large, bipinnate-tripinnatifid; rachis with hair-tipped scales or long slender septate hairs; veins usually branched, not reaching margin. Sori circular, small; indusia lacking or very small.

A genus of c. 9 species, extending from the Mascarenes to tropical Asia, Australia and the Pacific islands; 1 species native to Norfolk Is.

Macrothelypteris torresiana (Gaudich.) Ching, *Acta Phytotax. Sin.* 8: 310 (1963)

Polystichum torresianum Gaudich. in H.L.C. de S. de Freycinet, *Voy. Uranie* 333 (1828). T: Mariana Islands, *C.Gaudichaud-Beaupré*; holo: ?G *n.v.* Named after Don José Torres, resident on Guam in 1819, when the type specimen was collected during the expedition under de Freycinet in *L'Uranie*.

Aspidium uliginosum Kuntze, *Linnaea* 20: 6 (1847). T: cultivated, spores from Java; holo: ?LZ *n.v.*, probably destroyed.

[*Aspidium setigerum auct. non* (Blume) Kuhn: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 727 (1904)]

[*Dryopteris setigera auct. non* (Blume) Kuntze: R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 10 (1915)]

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 167, fig. 272 (1976); S.B.Andrews, *Ferns Queensland* 349, fig. 36.1A (1990); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 51 (1990).

Rhizome stout, shortly creeping, densely covered with narrow, brown, hairy scales. Fronds to 2 m tall, triangular in outline, deeply tripinnatifid, pale green; stipe bases swollen; largest pinnae c. 20 cm long, 9 cm broad, deltoid; pinnules decurrent as a narrow wing along pinna rachis, oblique, deeply cut, with scattered, pale, slender hairs c. 1 mm long on costae and veins and short, capitate hairs on lamina surface. Sori small, circular; indusia very small.

Norfolk Is. Rare. Known from the Old World tropics, from Madagascar to SE Asia, Australia (Qld), Polynesia and Hawai'i. It is also adventive in several parts of the New World.

N.Is.: *s. loc., P.H.Metcalfe* (K).

131. DENNSTAEDTIACEAE

Terrestrial ferns. Rhizomes long-creeping, subterranean, usually bearing hairs. Fronds often distant, large, much divided, usually bearing multicellular hairs on rachis and usually also on lamina; veins free or anastomosing. Sori marginal or submarginal, terminal on veins, indusiate; indusium continuous, formed from modified margin of lamina or pouch-shaped, or sorus protected by a 'cup' formed from fusion of indusium with a lobe of the margin.

A mainly tropical family of c. 7 genera and c. 200 species; 3 genera native to Norfolk Is., of which 2 are also on Lord Howe Is.

KEY TO GENERA

1	Sori rounded, discrete, protected by a reflexed lobe of the margin	**2. HYPOLEPIS**
1:	Sori linear, continuous, protected by a reflexed margin	
2	Veins anastomosing; lamina ±soft, herbaceous; ultimate segments broad	**1. HISTIOPTERIS**
2:	Veins all free; lamina hard, coriaceous; ultimate segments narrow, linear	**3. PTERIDIUM**

1. HISTIOPTERIS

Histiopteris (J.Agardh) J.Sm., *Hist. Fil.* 294 (1875); from the Greek *histion* (a sail) and *pteris* (a fern), in allusion to the shape of the pinnae in these ferns.

Type: *H. vespertilionis* (Labill.) J.Sm.

Rhizomes long, hairy. Fronds distant, large, usually tripinnatifid; stipe long, dark coloured; lamina soft; pinnae and pinnules opposite, with basal ones often 'stipule-like', ultimate segments broad, lobed or entire; veins anastomosing, without free included veinlets. Sori submarginal, continuous, linear or elongate, protected by an indusium formed from the reflexed and modified margin; paraphyses present.

A genus of c. 7 species from tropical regions, extending to warm temperate areas in the Southern Hemisphere; 1 species native to the Islands.

G.Bentham, Filices, *Pteris*, *Fl. Austral.* 7: 727–733 (1878).

Histiopteris incisa (Thunb.) J.Sm., *Hist. Fil.* 295 (1875)

Pteris incisa Thunb., *Prodr. Pl. Cap.* 171 (1800). T: The Cape [of Good Hope], S. Africa, *C.P.Thunberg*; holo: ?UPS *n.v.* The epithet comes from the Latin *incisio* (a cut or incision), in allusion to the shape of the margin of the pinnules.

Pteris brunoniana Endl., *Prodr. Fl. Norfolk.* 12 (1833). T: Norfolk Island, *F.L.Bauer*; holo: W.

[*Pteris comans auct. non* G.Forst.: S.F.L.Endlicher, *op. cit.* 13]

[*Pteris vespertilionis auct. non* Labill.: J.D.Hooker, *Fl. Nov.-Zel.* 2: 26 (1854), *p.p.*]

[*Pteris aurita auct. non* Blume: W.J.Hooker, *Sp. Fil.* 2: 231 (1858), *p.p.*]

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 147, fig. 183 (1981); D.L.Jones, *Encycl. Ferns* 330 (1987); P.J.Brownsey & J.C.Smith-Dodsworth, *New Zealand Ferns & Allied Pl.* 95, fig. 116, t. 19F (1989).

Rhizome robust, 5–10 mm diam., with scales and hairs. Fronds: stipe to 1 m tall, polished, very dark brown towards base; lamina 1–2 m long, c. half as broad, usually tripinnatifid, ±soft, herbaceous, pea-green when young; ultimate pinnules becoming adnate towards ends of costules; sterile segments broadly triangular, rounded; fertile segments narrowly deltoid, acute; basal segments smaller and stipule-like. *Oak Fern*, *Bat-Wing Fern*.

Norfolk Is., Lord Howe Is. Widespread in forested and shaded areas, including disturbed ground. Pantropical (especially on mountains), extending to southern temperate Africa, Australia, New Zealand, Fiji and New Caledonia.

N.Is.: Now-Now Valley, *R.M.Laing* (CHR); Cascade, *P.Ralston 63* (NSW); *s. loc.*, *A.Cunningham 38 (57)* (K). **L.H.Is.:** Mt Gower, 1908, *C.Hedley & W.S.Dunn* (NSW); Mt Lidgbird, *A.C.Beauglehole 6275* (MEL); Soldiers Cap, *J.Pickard 2886* (NSW).

Although R.M.Laing (*Trans. & Proc. New Zealand Inst.* 48: 236, 1916) claimed to differentiate between *Pteris brunoniana* and *P. incisa*, his specimens (examined on loan from CHR), which correspond to his descriptions and figures, can be matched by specimens in a range of material from New Zealand and Australia, showing them to be different growth forms of the same species.

2. HYPOLEPIS

Hypolepis Bernh., *Neues J. Bot.* 1(2): 34 (1805); from the Greek *hypo-* (under) and *lepis* (a scale), in allusion to the sori protected beneath a reflexed portion of the margin in these ferns.

Type: *H. tenuifolia* (G.Forst.) Bernh. ex C.Presl

Rhizome hairy, scurfy or glabrous, lacking scales. Fronds distant; stipe stout, continuous with rhizome; lamina 2–5-pinnate, glabrous or hairy, often glandular; veins free; pinnules sessile, rachis grooved above. Sori marginal or submarginal, rounded, discrete, usually indusiate from a ±reflexed marginal flap of the lamina; paraphyses rarely present.

A mainly tropical genus of c. 45 species, with extensions into the warm temperate regions of the Northern and Southern Hemispheres, including South Africa, Australia and New Zealand.

G.Bentham, Filices, *Hypolepis*, *Fl. Austral.* 7: 726 (1878); P.J.Brownsey & R.J.Chinnock, *New Zealand J. Bot.* 22: 43–80 (1984); P.J.Brownsey, *Blumea* 32: 227–276 (1987); P.J.Brownsey & R.J.Chinnock, *J. Adelaide Bot. Gard.* 10: 1–30 (1987).

1 Primary rachis and its branches with both glandular and non-glandular hairs, predominantly glandular, viscid when fresh (N.Is.)

2 Hairs on lamina undersurface stoutish, 0.2–1.5 mm long; indusial flap green at base, membranous at apex, tapering, often bearing glandular hairs on margin **1. H. dicksonioides**

2: Hairs on lamina undersurface fine, 0.1–1 mm long; indusial flap mostly membranous, broad, sometimes bearing glandular hairs on outer surface **2. H. tenuifolia**

1: Primary rachis and its branches with non-glandular hairs only (L.H.Is.) **3. H. elegans**

1. Hypolepis dicksonioides (Endl.) Hook., *Sp. Fil.* 2: 61 (1852)

Cheilanthes dicksonioides Endl., *Prodr. Fl. Norfolk.* 15 (1833); *Hypolepis endlicherianum* C.Presl, *Tent. Pterid.* 162 (1836), *nom. illeg.* T: Norfolk Island, *F.L.Bauer*; holo: W. Named from a presumed similarity of the fronds to those of *Dicksonia*.

[*Polypodium rugulosum auct. non* Labill.: S.F.L.Endlicher, *op. cit.* 7]

[*Cheilanthes arborescens auct. non* Sw.: S.F.L.Endlicher, *op. cit.* 15]

[*Hypolepis tenuifolia auct. non* (G.Forst.) Bernh. ex C.Presl: W.J.Hooker & J.G.Baker, *Syn. Fil.* 2nd edn, 129 (1874) *p.p.*; R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 14 (1915); J.S.Turner *et al.*, *Conservation Norfolk Is.* 30 (1968)]

[*Phegopteris punctata auct. non* (Thunb.) Mett.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 730 (1904)]

[*Dryopteris punctata auct. non* (Thunb.) C.Chr.: R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 10 (1915)]

[*Hypolepis punctata auct. non* (Thunb.) Mett.: J.S.Turner *et al.*, *Conservation Norfolk Is.* 30 (1968)]

Illustrations: P.J.Brownsey & R.J.Chinnock, *New Zealand J. Bot.* 22: 66 (1984); P.J.Brownsey & R.J.Chinnock, *J. Adelaide Bot. Gard.* 10: 5, fig. 2C, 23, fig. 11 (1987); P.J.Brownsey & J.C.Smith-Dodsworth, *New Zealand Ferns & Allied Pl.* 96, fig. 117, 98, fig. 120, t. 22B (1989).

Rhizome apex densely covered with pale brown hairs. Fronds: stipe 30–60 (–100) cm tall, with pale glandular and non-glandular hairs when young; lamina 30–100 cm long or more, almost as wide, bipinnate at apex, becoming 3- or 4-pinnate towards base; rachis and its branches viscid with soft, pale glandular and non-glandular hairs 0.2–1.5 mm long, especially above; hairs on undersurface of lamina stoutish, 0.2–1.5 mm long; primary pinnae ±opposite, 15–50 cm long. Sori marginal, associated with ultimate segments, protected when young by reflexed, ear-like marginal lobes of lamina; lobes 0.3–0.8 mm wide, mostly green at base, membranous at apex, tapering, often with a few marginal, glandular hairs. *Ground Fern, Brake Fern.* Fig. 104A–B.

Norfolk Is. Rare, in disturbed sites and open rocky places. Also known from the Kermadec Is., New Zealand (North Is. and the northernmost parts of South Is.), Samoa, the Society Is.

and the Marquesas Is.

N.Is.: Mt Bates, *P.S.Green 1396* (A, K, NSW); *s. loc.*, Oct.–Dec. 1849, *C.J.Simmons* (K).

2. Hypolepis tenuifolia (G.Forst.) Bernh. ex C.Presl, *Tent. Pterid.* 162 (1836)

Lonchitis tenuifolia G.Forst., *Fl. Ins. Austr.* 80 (1786). T: islands of the Pacific Ocean, *G.Forster*; lecto: BM, *fide* P.J.Brownsey & R.J.Chinnock, *J. Adelaide Bot. Gard.* 10: 5 (1987). The epithet comes from the Latin *tenuis* (fine, slender) and *folium* (a leaf), in allusion to the habit of the leaves.

Illustrations: P.J.Brownsey & R.J.Chinnock, *J. Adelaide Bot. Gard.* 10: 5, fig. 2D (1987); D.L.Jones, *Encycl. Ferns* 5 (1987); S.B.Andrews, *Ferns Queensland* 128, fig. 10.3B (1990).

Rhizome apex covered with pale brown hairs. Fronds: stipe 30–150 cm tall, with pale glandular and non-glandular hairs above when young; lamina 25–150 cm long, 25–120 cm broad, bipinnate at apex, becoming 4-pinnate towards base with hairs on undersurface fine and 0.1–1 mm long; rachis and its branches with soft, pale glandular and non-glandular hairs 0.1–1 mm long, above and below; primary pinnae subopposite, 15–80 cm long. Sori marginal, associated with ultimate segments, protected by broad, reflexed, ear-like, membranous marginal lobes of lamina; lobes 0.5–1.2 mm wide, sometimes bearing glandular hairs on outer surface. Fig. 104C.

Norfolk Is. Apparently rare, although much confused with *H. dicksonioides*. Also known from Qld and the Pacific islands, from Taiwan and Hainan, through the Philippines, Flores and New Guinea to New Caledonia, and as far as Mangareva and Pitcairn Is.

N.Is.: Ball Bay, *W.R.Sykes NI 106* (CHR); *s. loc.*, *J.Backhouse 736* (BM).

3. Hypolepis elegans Carruth. in B.C.Seemann, *Fl. Vit.* 347 (1873)

T: Fiji, *W.G.Milne & J.MacGillivray*; holo: BM. Named in allusion to the elegant appearance of the fronds in this fern.

Hypolepis sp.; A.N.Rodd & J.Pickard, *Cunninghamia* 1: 269 (1983).

[*Davallia flaccida auct. non* R.Br.: G.Bentham, *Fl. Austral.* 7: 714, 717 (1878), *p.p.*]

[*Hypolepis tenuifolia auct. non* (G.Forst.) Bernh. ex C.Presl: G.Bentham, *op. cit.* 726, *p.p.*; W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 123 (1917)]

Illustrations: G.Brownlie, *Pteridophyte Fl. Fiji* 119, fig. 2 (1977); P.J.Brownsey & R.J.Chinnock, *J. Adelaide Bot. Gard.* 10: 5, fig. 2B, 20, fig. 9 (1987); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 46 (1990).

Rhizome apex minutely scurfy with pale brown hairs, or glabrous, not scaly. Fronds: stipe 30–50 cm tall, with pale, non-glandular hairs when young; lamina 50–100 cm or more long and wide, bipinnate at apex, becoming 4- or 5-pinnate towards base; rachis and its branches with stiff, slightly curved, pale, non-glandular hairs above and below; primary pinnae ±opposite, 15–40 cm long. Sori marginal, associated with ultimate segments, protected by ear-like, reflexed marginal lobes of lamina when young; lobes ±semicircular, c. 0.5 mm wide, membranous, glabrous.

Lord Howe Is. Common, especially in open areas. Also known from eastern New Guinea to New Caledonia, and from Fiji, Samoa and Rapa, as well as eastern Australia.

L.H.Is.: Old Settlement Beach, *J.C.Game 65/1/10* (BM, K, NSW); behind 'Mountain Inn', 1968, *R.J.Chinnock* (NSW); E slopes of Mt Lidgbird, *P.S.Green 1693* (A, K, NSW).

3. PTERIDIUM

Pteridium Gled. ex Scop., *Fl. Carniol.* 169 (1760); a diminutive of the Greek *pteris* (a fern).

Type: *P. aquilinum* (L.) Kuhn

Rhizome apex hairy. Fronds: stipe ±distant, erect, smooth; lamina medium to large, 3- or 4-pinnate, stiff, revolute along margins, with veins free. Sori marginal, linear; outer indusia formed from the reflexed margin; the inner indusia thin; paraphyses absent.

A cosmopolitan genus of c. 6 species, treated by some as a single variable species. One

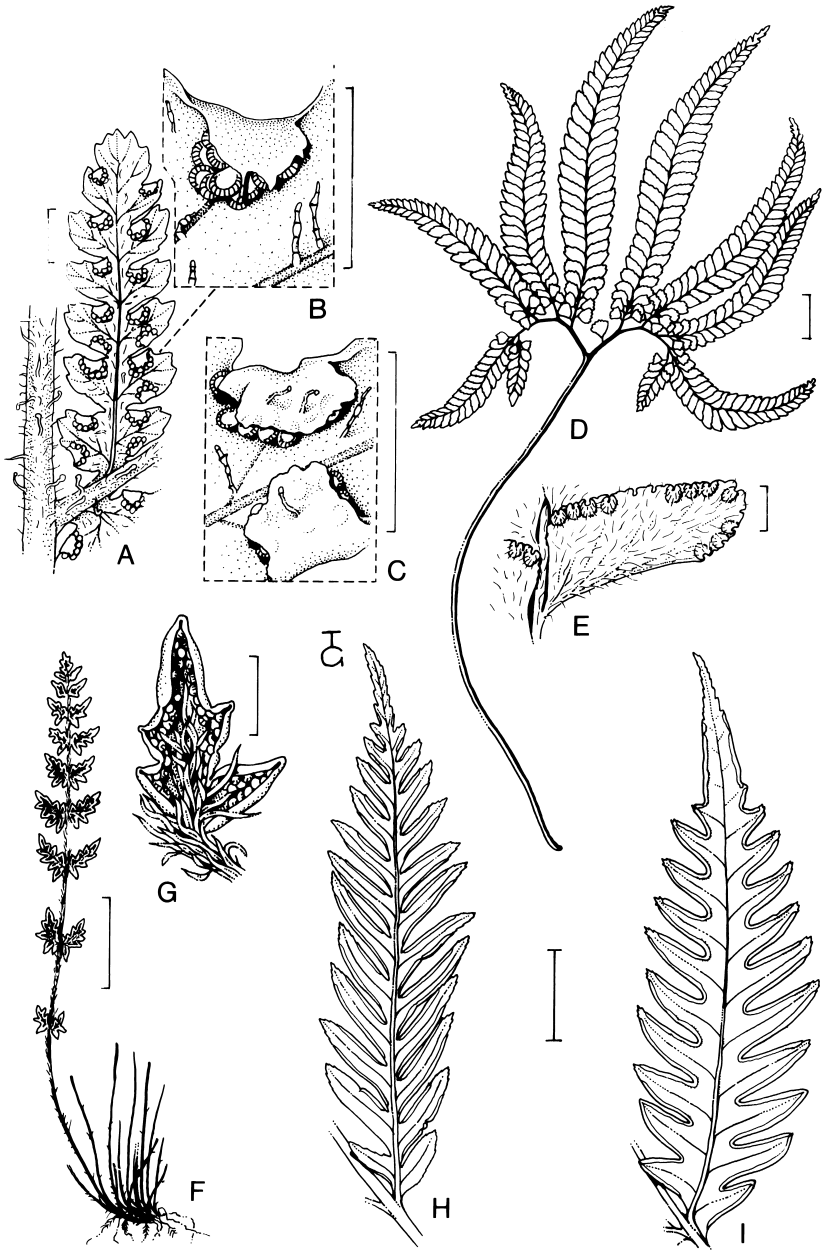

Figure 104. A–C, DENNSTAEDTIACEAE. **A–B**, *Hypolepis dicksonioides*. **A**, pinna; **B**, marginal indusium (**A–B**, V.Thomson, K). **C**, *Hypolepis tenuifolia*, marginal indusium (W.R.Sykes NI 106, CHR). **D–G**, ADIANTACEAE. **D–E**, *Adiantum pubescens*. **D**, frond; **E**, lamina segment (**D–E**, Phytologic Museum of Melbourne, K). **F–G**, *Cheilanthes distans*. **F**, habit; **G**, underside of lamina segment (**F–G**, l849, C.J.Simmons, K). **H–I**, PTERIDACEAE. **H**, *Pteris microptera*, pinnule (P.Green 1670, K). **I**, *Pteris zahlbruckneriana*, pinnule (A.Cunningham 39, K). Scale bars: **A**, **E**, **G** = 2 mm; **B**, **C** = 1 mm; **D**, **F**, **H**, **I** = 2 cm. Drawn by T.Galloway.

species native to Norfolk Is.

G.Bentham, Filices, *Pteris*, *Fl. Austral.* 7: 731–732 (1878); R.M.Tryon, A revision of the genus *Pteridium*, *Rhodora* 43: 1–31, 37–67 (1941), reprinted as *Contr. Gray Herb.* 134: 1–70 (1941); P.J.Brownsey, The taxonomy of Bracken (*Pteridium*: Dennstaedtiaceae) in Australia, *Aust. Syst. Bot.* 2: 113–128 (1989).

For information on a wide range of topics relating to the taxonomy and biology of Bracken in a worldwide sense, see *Bot. J. Linn Soc.* 73: 1–302 (1976).

1. Pteridium esculentum (G.Forst.) Cockayne, *Rep. Bot. Survey Tongariro Park* 34 (1908)

Pteris esculenta G.Forst., *Pl. Esc.* 74 (1786); *Pteris aquilina* var. *esculenta* (G.Forst.) Hook.f., *Fl. Nov.-Zel.* 2: 25 (1854); *Pteridium aquilinum* var. *esculentum* (G.Forst.) Kuhn, *Chaetopt.* 27 (1882). T: 'Society Islands' [probably New Zealand], *J.R.Forster & G.Forster*; lecto: BM *n.v.*, *fide* P.J.Brownsey, *op. cit.* 119. The epithet comes from the Latin *esculentus* (edible), in allusion to the use of the rhizome as a source of starch when a 'starvation' food.

[*Pteris aquilina auct. non* L.: W.B.Hemsley, *Ann. Bot.* (*London*) 10: 276 (1896)]

[*Pteridium aquilinum auct. non* (L.) Kuhn: W.W.Watts, *Proc. Linn. Soc. New South Wales* 37: 396 (1913)]

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 190, fig. 259a (1981); D.L.Jones, *Encycl. Ferns* 334 (1987); P.J.Brownsey & J.C.Smith-Dodsworth, *New Zealand Ferns & Allied Pl.* 105, fig. 127, t. 23F (1989).

Rhizome black, ±fleshy. Fronds 1–2 m or more tall, broadly triangular in outline, hard, coriaceous, often distant on rhizome; stipe erect; lamina 3 or 4-pinnate; rachis grooved above; ultimate segments of pinnae linear, decurrent; margins reflexed. Sori continuous around segments, even the decurrent base, protected by continuous indusium formed from margin. *Bracken*.

Norfolk Is. Common in open areas and neglected pastures. Known also from Malesia to Australia, New Zealand, the Kermadec Is., New Caledonia, Vanuatu, Fiji and Polynesia. Recorded from Lord Howe Is. (F.J.H. von Mueller, *Fragm.* 9: 75, 1875), and accepted for the Island by W.R.B.Oliver (*Trans. & Proc. New Zealand Inst.* 49: 124, 1917), but no authentic specimen has been seen; the record is doubted by A.N.Rodd & J.Pickard in their census (*Cunninghamia* 1: 278, 1983).

N.Is.: Mt Bates, *P.Ralston 57* (NSW); *s. loc.*, *M.Burgess NI 12* (CBG); *s. loc.*, *A.Cunningham 36 & 61* (K).

Doubtful record

Microlepia speluncae (L.) T.Moore was recorded from Norfolk Is. under the name *Davallia flaccida* R.Br. by F.J.H. von Mueller (*Fragm.* 5: 118, 1866) and under the name *Dicksonia davallioides* R.Br. by G.Bentham (*Fl. Austral.* 7: 713, 1878). J.H.Maiden included the record under the name *Dennstaedtia davallioides* (R.Br.) T.Moore in his 'Flora of Norfolk Island' (*Proc. Linn. Soc. New South Wales* 28: 737, 1904), attributing the record to G.Bentham, but R.M.Laing intentionally omitted it from his 'Revised List of Norfolk Island Plants' (*Trans. & Proc. New Zealand Inst.* 47: 9, 1915). There are, however, two specimens in the Kew Herbarium (both Oct./Dec, 1849, *C.J.Simmons s.n.*) which bear the annotation 'Norfolk Island' and were at one time named *Dicksonia polypodioides* Sw., a synonym of *Microlepia speluncae*. This species has not been recorded from Norfolk Is. by any other collector and it is most likely that these two specimens, bearing so little data, were mislabelled as having come from the Island.

LINDSAEACEAE

Although *Lindsaea linearis* Sw. was recorded from Norfolk Is. by G.Bentham (*Fl. Austral.* 7: 717, 1878) and, from its general distribution in Australia, New Zealand and New Caledonia, might be expected on the Island, there is no specimen to support the record in the Kew Herbarium where Bentham worked. It has never been recorded since and its occurrence on the Island must be doubted.

132. ASPLENIACEAE

Terrestrial or epiphytic ferns. Rhizome short or long creeping, with clathrate scales. Stipes not articulated. Fronds simple or 1–2-pinnate, rarely to 4-pinnate, glabrous or with minute hairs. Sori elongate, with narrow, linear indusia attached to veins.

A cosmopolitan family of 1 large genus (*Asplenium*) and c. 7 smaller ones, totalling c. 750 species; 1 genus native on both islands.

ASPLENIUM

Asplenium L., *Sp. Pl.* 2: 1078 (1753); *Gen. Pl.* 5th edn, 485 (1754); the name of a plant in Dioscorides, from the Greek *a*, in this case said to be euphonic, and *splen* (the spleen), in reference to the plant's traditional herbal virtues in afflictions of the spleen.

Type: *A. marinum* L.

Rhizome creeping or short and erect, covered with dark brown clathrate scales. Veins usually free. Sori along 1 side of veins.

A worldwide genus of perhaps 700 species; 2 species on both islands, 3 species endemic on Lord Howe Is., and 2 species (1 native, 1 endemic) on Norfolk Is.

Notable throughout its range for frequent inter-specific hybridisation.

G.Bentham, Filices, *Asplenium*, *Fl. Austral.* 7: 742–752 (1878); P.J.Brownsey, *New Zealand J. Bot.* 15: 39–86 (1977); P.S.Green, *Kew Bull.* 43: 649–651 (1988).

1 Fronds simple (irregularly divided and margin cristate in f. *robinsonii*) (N.Is., L.H.Is.) **1. A. australasicum**

1: Fronds compound

2 Sterile and fertile fronds very different, with segments of fertile fronds linear, 1–2 mm broad, those of sterile fronds 10–20 mm broad, bipinnatisect or bipinnate **7. A. dimorphum**

2: Sterile and fertile fronds similar

3 Divisions of fronds usually simply pinnate

4 Pinna margins shallowly toothed

5 Serrations of pinna margins acute; pinnae (2–) 5–15 cm long; rachis and costae below with scattered, small, dark brown scales; fronds pinnate (L.H.Is.) **2. A. milnei**

5: Serrations of pinna margins blunt; pinnae 1–5 (–10) cm long; rachis and costae glabrous; some fronds usually bipinnate (N.Is.) **3. A. difforme**

4: Pinna margins deeply cut or prominently doubly serrate

6 Margins of pinnae regularly and deeply divided, with apices of lobes c. 3–4 mm apart; pinnae elongate, oblong-lanceolate, ±equally broad up to middle before narrowing to an acute apex (L.H.Is.) **4. A. surrogatum**

6: Margins of pinnae variously cut to an acute angle to costae, with apices of lobes c. 10 mm apart; pinnae lanceolate to very narrowly lanceolate, widest at base, gradually narrowing towards the very long-acute apex (N.Is., L.H.Is.) **5. A. polyodon**

3: Divisions of fronds 2- or 3-pinnate

7 Rachis, costae, costules and lamina glabrous; pinnae and upper half of rachis narrowly winged; sori all marginal (L.H.Is.) **6. A. pteridoides**

7: Rachis, costae, costules and lamina with occasional, usually very narrow, clathrate scales; pinnae and upper half of rachis not winged; sori on lamina or marginal (N.Is.) **3. A. difforme**

1. Asplenium australasicum (J.Sm.) Hook., *Fil. Exot.* t. 88 (1859)

Neottopteris australasica J.Sm., *Cult. Ferns* 49 (1857). T: cultivated at Kew, origin Australia, *J.Smith*; holo: ?BM *n.v.* Named after Australia, to which it is native.

[*Asplenium nidus auct. non* L.: S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 9 (1833); W.J.Hooker & J.G.Baker, *Syn. Fil.* 2nd edn, 190 (1874); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 11 (1915); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 121 (1917)]

[*Thamnopteris nidus auct. non* (L.) C.Presl: C.B.Presl, *Abh. Bohm. Ges. Wiss. V 6* (*Epimel. Bot. 68*): 428 (1851), *p.p.*]

Illustrations: D.L.Jones, *Encycl. Ferns* 225 (1987); S.B.Andrews, *Ferns Queensland* 54, fig. 4.3B (1990); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 54, t. 5 (1990).

Epiphytic or lithophytic fern. Rhizome stout, erect, with a rosette of fronds at apex; scales dark brown. Fronds ascending; stipe 1–5 cm long, almost black; lamina simple, or crisped and/or irregularly cut, to c. 1.5 m long, 20 cm broad, broadest just above middle; midrib strongly and acutely keeled on lower surface; veins forked, connected to a submarginal vein. Sori linear, 3–6 cm long. *Dock* (N.Is.), *Bird's Nest Fern*.

Two forms are recognised.

Fronds simple; not proliferating **1a.** f. **australasicum**

Fronds crisped and/or irregularly and deeply cut; rarely proliferating **1b.** f. **robinsonii**

1a. Asplenium australasicum (J.Sm.) Hook. f. australasicum

Fronds simple, ascending; stipe 1–5 cm long; lamina to 1.5 m long, 20 cm broad, broadest just above middle; not proliferating.

Norfolk Is., Lord Howe Is. Growing in forested areas, becoming uncommon on Norfolk Is. because of removal into gardens. This form is also known from Australia (Qld and northern N.S.W.), Vanuatu, New Caledonia, Fiji, Tonga and Tahiti.

N.Is.: high ground, *W.G.Milne 10* (K); Now-Now Valley, *R.M.Laing* (CHR). **L.H.Is.:** Old Settlement area, *A.C.Beauglehole 5388* (MEL); E side of North Hummock, *A.C.Beauglehole 5589* (MEL); high ground, *W.G.Milne 35* (K).

The Lord Howe Is. plant has been said to have a narrower, more erect habit, with thicker, more obtuse, glaucous fronds than those elsewhere, but more comparative observations are required.

Fronds from a small (?juvenile) plant with the lamina deeply cut into a few irregular lobes has been collected on Lord Howe Is. (*A.C.Beauglehole 5411*, MEL, NSW).

1b. Asplenium australasicum f. **robinsonii** (F.Muell.) P.S.Green in *Kew Bull.* 43: 649 (1988)

Asplenium robinsonii F.Muell., *J. Bot.* 22: 289 (1884). T: Norfolk Island, *I.Robinson*; holo: ?MEL *n.v.*; iso: BM, K. Named after Isaac Robinson, resident on Norfolk Is., who collected extensively there in the latter half of the 19th century for the Botanic Gardens, Sydney.

Asplenium squamulatum ß *smithii* Hook., *Sp. Fil.* 3: 83 (1860). T: cult. Hort. Kew.; holo: BM; iso: K.

Generally somewhat smaller than the typical form but with the fronds crisped and/or occasionally, and irregularly, deeply cut or, rarely, proliferating. *Crispy Bird's Nest Fern*.

Norfolk Is. Now only known in cultivation. When grown from spores, most sporelings develop into typical *Asplenium australasicum*. It has been recorded from the eastern slopes of Mt Gower, Lord Howe Is. (J.H.Maiden, *Proc. Linn. Soc. New South Wales* 23: 146, 1898), but the specimen appears to have been lost.

N.Is.: Mrs Chas Nobbs' bush house, *R.M.Laing* (CHR); in a pot in a private garden, *R.D.Hoogland 11204* (CANB).

2. Asplenium milnei Carruth. in B.C.Seemann, *Fl. Vit.* 353 (1873)

T: Lord Howe Island, '*Macrae*' [*Milne*?]; holo: ?BM *n.v.* Named after William Grant Milne (?–1866), botanist on the *Herald* expedition in the south-western Pacific (1852–1856), who collected on Lord Howe Is. in 1853.

[*Asplenium obtusatum* var. *lucidum auct. non* (G.Forst.) Hook. & Baker: W.J.Hooker & J.G.Baker, *Syn. Fil.* 207 (1867), *p.p.*]

[*Asplenium lucidum auct. non* G.Forst.: C.Moore in E.S.Hill, *Votes & Proc. Legislative Assembly New South Wales* 26 (1870)]

[*Asplenium marinum auct. non* L.: F.J.H. von Mueller, *Fragm.* 9: 78 (1875)]

[*Asplenium obtusatum auct. non* G.Forst.: W.B.Hemsley, *Ann. Bot.* (*London*) 10: 264 (1896)]

Illustrations: C.J.Goudey, *Austral. Fern J.* 1: [3] t. 7 (1984); D.L.Jones, *Encycl. Ferns* 229 (1987).

Terrestrial fern. Rhizome stout; scales dense, lanceolate, clathrate. Fronds pinnate; stipe 15–24 cm long, dark brown, densely covered with small, clathrate, dark brown scales, especially towards base, often rubbed off; lamina 10–60 cm long, 5–25 cm broad, shining; pinnae 11–18 per side, narrowly lanceolate (to ovate), asymmetrically cuneate at base, (2–) 5–15 cm long, 1–2 cm broad, rarely once divided to the costae at base, ±evenly serrate, usually contracting to an acute apex from c. the middle; rachis and costae below with scattered, small, dark brown scales. Sori linear, 5–10 mm long, following a lateral nerve with a branch nerve between. Fig. 105B–C.

Lord Howe Is. Endemic. Common in the lowland forest.

L.H.Is.: lower slopes of Malabar, *P.S.Green 1544A* (K); above E end of North Beach, *A.N.Rodd 1755* (K, NSW); near the Goathouse, *R.D.Hoogland 8815* (CANB); *s. loc.*, *W.G.Milne 25* (K).

This is a species closely related to *Asplenium oblongifolium* Colenso (*A. lucidum* G.Forst. *non* Burm.f.) of New Zealand, and *A. obtusatum* G.Forst. of eastern Australia and New Zealand. A hybrid with *A. polyodon* G.Forst., recorded on the field notes as 'rare', has been collected once (*J.Pickard 2711*, Boat Harbour track, Dec. 1975, K, NSW). In addition, a hybrid with *A. surrogatum* P.S.Green has once been collected. This was by Chris Goudey from beside the track to Boat Harbour; I have seen a specimen cultivated from this plant.

3. Asplenium difforme R.Br., *Prodr.* 151 (1810)

Asplenium obtusatum var. *difforme* (R.Br.) Hook., *Sp. Fil.* 3: 97 (1860). T: Botany Bay, Australia, *J.Banks & D.Solander*; holo: ?BM *n.v.* The epithet comes from the Latin *dis-* (apart) and *forma* (shape), in allusion to the distinct fronds in this fern.

Asplenium obtusatum var.: W.J.Hooker, *Fil. Exot.* t. 46 (1859).

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 88, fig. 75a (1981); S.B.Andrews, *Ferns Queensland* 59, fig. 4.5A (1990), as *A. obtusatum* var. *difforme*; P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 55 (1990).

Terrestrial fern. Rhizome short, tufted; scales narrow, to c. 1.5 cm long, long-pointed,

clathrate. Fronds pinnate to bipinnate, ±coriaceous, discolorous, glabrous; stipe 2–15 cm long, glabrous except for occasional, almost linear, clathrate scales; upper half of rachis not winged; lamina 3–30 (–40) cm long, (2–) 3–10 (–15) cm broad, with scattered, almost linear, clathrate scales; pinnae (3–) 5–10 (–15) per side, lanceolate to deltoid-lanceolate in outline, bluntly serrate to pinnatifid or bipinnate, 1–5 (–10) cm long, (0.7–) 1.5–2.5 cm broad; fertile pinnules 4–12 mm broad. Sori oblong-linear, 3–6 mm long, along lateral veins, almost marginal in bipinnate fronds. *Coastal Fern*, *Coastal Asplenium*.

Norfolk Is. Fairly common or occasional in coastal rock crevices and in forest at low altitudes. Also known from N.S.W. and southern Qld.

N.Is.: Duncombe Bay, *M.Lazarides 8063* (CANB, K, NSW); along Rooty Hill Rd, *R.D.Hoogland 11298* (CANB, K); point S of Emily Bay, *P.S.Green 1878* (K); Cascade, *A.Cunningham 28* (K); Philip Is., *R.M.Laing* (CHR).

Hybrids with *A. dimorphum* Kunze occur on Norfolk Is.

4. **Asplenium surrogatum** P.S.Green, *Kew Bull.* 43: 650 (1988)

T: Lord Howe Island, *P.S.Green 2334*; holo: K. So named in reference to the substitute or surrogate role for *A. pteridoides* which this species has played.

?*Asplenium obtusatum* var. *incisum* Benth., *Fl. Austral.* 7: 747 (1878); ?*A. lucidum* var. *incisum* (Benth.) Hook. ex Bonap., *Notes Pteridologiques* 5: 123 (1917). T: Lord Howe Island, *J.P.Fullagar*; holo: ?MEL *n.v.*

[*Asplenium pteridoides auct. non* Baker: J.G.Baker in W.J.Hooker, *Icon. Pl.* 17: t. 1649/1, 2, 4 (1886), *et auct. mult.*]

Illustrations: J.G.Baker in W.J.Hooker, *Icon. Pl.* 17: t. 1649, figs. 1, 2, 4 (1886); C.J.Goudey, *Austral. Fern J.* 1: [6] (1984).

Terrestrial or epiphytic fern. Caudex short, distinct; scales narrow, to 3 cm long, clathrate, hair-tipped. Fronds pinnate–bipinnatifid; stipe 15–30 cm long, with occasional long, narrow scales and dense brown, appressed 'scurfy' scales 0.5–2 mm long, easily rubbed off; lamina 30–55 cm long, 15–30 cm broad, with very small, scattered, irregularly-shaped scales beneath; pinnae long-acute, the longest 6–16 cm long, 1–2 cm broad, deeply and regularly divided, apices of lobes 3–4 mm apart; segments narrow, 2–3 mm wide with 2 or 3 apical teeth. Sori oblong-linear to elongate oblong-lanceolate, 3–7 mm long, on upper edges of segments only. Fig. 105F.

Lord Howe Is. Endemic. Occurs in forest at high altitudes, rare at lower elevations.

L.H.Is.: Mt Gower, *J.P.Fullagar 16* (MEL); *loc. id.*, *P.S.Green 1606* (A, K); *loc. id.*, *P.S.Green 2334* (K); Erskine Valley, *M.Percival 11* (BRI); side of Mt Lidgbird, *W.G.Milne 24* (MEL); track to North Bay, *A.C.Beauglehole 5384* (MEL).

Shortly after *A. pteridoides* was described by J.G.Baker he published a drawing (W.J.Hooker, *Icon. Pl.* 17: t. 1649, 1886) in which, without realising, he included this species as well – and as the most prominent part of the plate. Many subsequent authors have consequently misidentified this, the commoner of the two species, as Baker's *A. pteridoides*. A hybrid with *A. milnei* has been recorded.

5. **Asplenium polyodon** G.Forst., *Fl. Ins. Austr.* 80 (1786)

T: not traced. The epithet is derived from the Greek *poly* (many) and *odontos* (tooth), in allusion to the serrate margins to the pinnae.

Asplenium falcatum Lam., *Encycl.* 2: 306 (1786). T: Mauritius, *P.Commerson*; holo: ?P *n.v.*

Asplenium adiantoides (L.) C.Chr., *Ind. Fil.* 99 (1906), *nom. illeg.*

[*Asplenium caudatum auct. non* G.Forst.: W.J.Hooker, *Sp. Fil.* 3: 152 (1860), *p.p.*]

[*Asplenium contiguum auct. non* Kaulf.: W.Carruthers in B.C.Seemann, *Fl. Vit.* 353 (1873)]

[*Asplenium falcatum* var. *caudatum auct. non* (G.Forst.) Maiden: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 734 (1904), *p.p.*]

[*Asplenium adiantoides* var. *caudatum auct. non* (G.Forst.) Domin: K.Domin, *Biblioth. Bot.* 85: 97 (1914), *p.p.*]

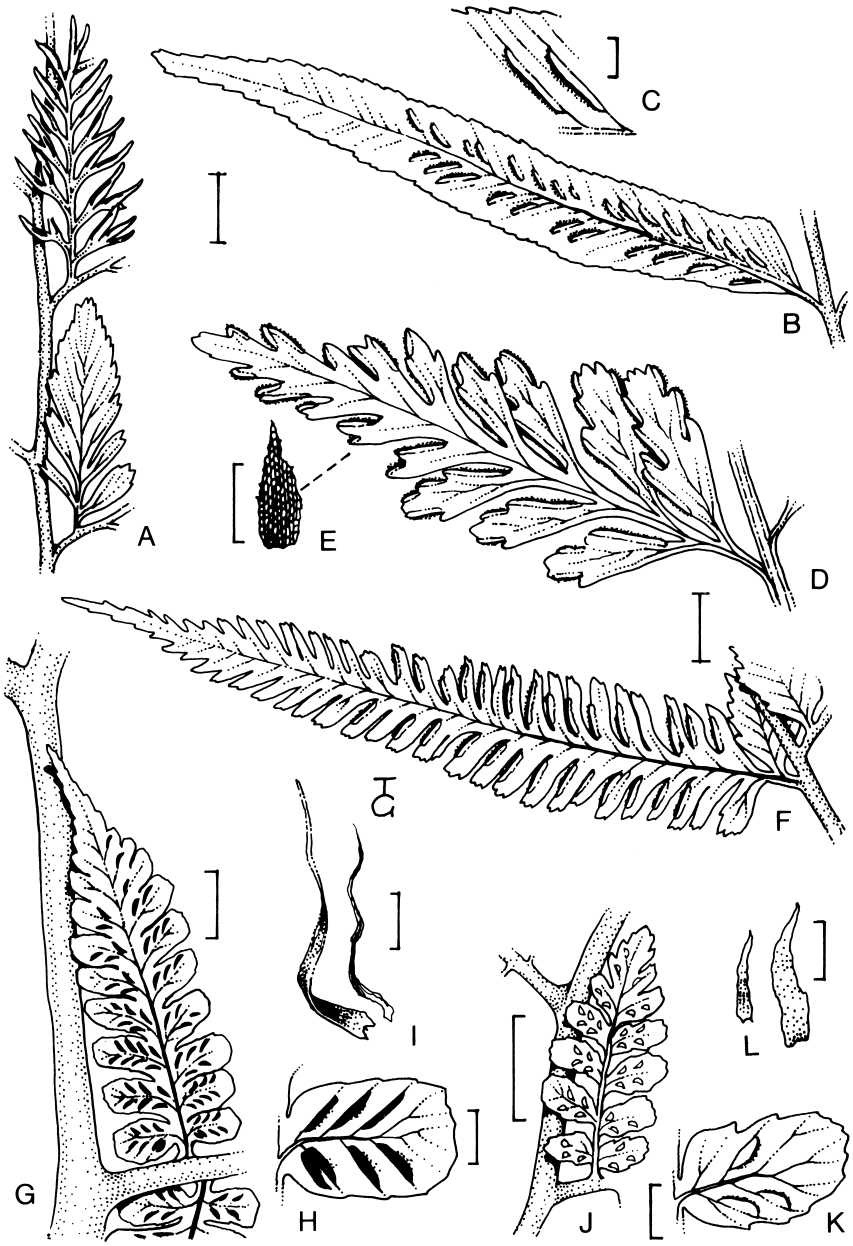

Figure 105. A–D, ASPLENIACEAE. **A**, *Asplenium dimorphum*, fertile and sterile pinnules (V.Thomson, K). **B–C**, *Asplenium milnei*. **B**, underside of fertile pinnule; **C**, two sori (**B–C**, J.Game 65/1/0l, K). **D–E**, *Asplenium pteridoides*. **D**, underside of fertile pinnule; **E**, rachis scale (**D–E**, C.Moore 19, K). **F**, *Asplenium surrogatum*, underside of fertile pinnule (P.Green 2334, K). **G–L**, ATHYRIACEAE. **G–I**, *Diplazium melanochlamys*. **G**, underside of fertile pinnule; **H**, underside of lamina segment (**G–H**, J.Game 69/252, K); **I**, scales (P.Green 1686, K). **J–L**, *Diplazium assimile*. **J**, underside of fertile pinnule; **K**, underside of lamina segment (**J–K**, McWilliams *s.n.*, K); **L**, scales (P.Green 1895, K). Scale bars: **A**, **B**, **D**, **F**, **G**, **J** = 1 cm; **C**, **E**, **H**, **I**, **K**, **L** = 2 mm. Drawn by T.Galloway.

Illustrations: D.L.Jones, *Encycl. Ferns* 232 (1987); P.J.Brownsey & J.C.Smith-Dodsworth, *New Zealand Ferns & Allied Pl.* 114, fig. 141, t. 26B (1989); S.B.Andrews, *Ferns Queensland* 61, fig. 4.6F, 63, fig. 4.7B (1990).

Terrestrial or epiphytic fern. Rhizome stout, shortly creeping; scales dense, narrow, clathrate. Fronds pinnate; stipe 10–20 (–30) cm long; rachis with narrow, brown scales when young, usually shed early; lamina 25–90 cm long, 10–20 cm broad, discolourous; pinnae 15–25 per side, lanceolate to very narrowly lanceolate, widest towards base, 5–12 cm long, 0.5–2 cm broad, doubly serrate with margins variously cut, at an acute angle to costae, apices of lobes c. 10 mm apart, long-acute. Sori linear, often almost parallel to or at a very acute angle to midrib, to 1.5 cm long; indusia attached on alternate sides of adjacent sori. *Sicklefern*, *Sickle Asplenium*.

Norfolk Is., Lord Howe Is. Quite common in the National Park on Norfolk Is., only occasional on Lord Howe Is. Also known from Madagascar, through tropical Asia to Malesia, Australia, New Zealand and Polynesia.

N.Is.: King Fern Gully, *R.D.Hoogland 11194* (CANB, K); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW); *s. loc., A.Cunningham 52* (K). **L.H.Is.:** E side of North Hummock, *A.C.Beauglehole 5386* (CANB, MEL); E edge of Intermediate Hill, *J.C.Game 69/292* (K); atop Mt Gower, *A.C.Beauglehole 5962* (CANB).

P.J.Brownsey, in his revision of the New Zealand species (*New Zealand J. Bot.* 15: 47, 1977), commented that the narrow-leaved variant from the Kermadec Is. closely resembles the plants from Lord Howe Is. and Norfolk Is. A hybrid with the Lord Howe Is. endemic, *A. milnei*, has been recorded.

6. **Asplenium pteridoides** Baker, *J. Bot.* 11: 17 (1873) & *Hooker's Icon. Pl.* 17: t.1649/3 (1886) *p.p.*

T: Lord Howe Island, 1871, Eclipse Expedition, [*C.Moore 19*]; holo: K. Named from a resemblance to ferns of the genus *Pteris*.

Asplenium bulbiferum var. *howeanum* Watts, *Proc. Linn. Soc. New South Wales* 37: 399 (1913); *A. howeanum* (Watts) W.R.B.Oliv., *Trans. & Proc. New Zealand Inst.* 49: 122 (1917). T: Dinner Run, Lord Howe Island, *W.W.Watts*; lecto: NSW, *fide* P.S.Green, *Kew Bull.* 43: 650 (1988).

Illustration: J.G.Baker in W.J.Hooker, *Icon. Pl.* 17: t. 1649, fig. 3 (1886).

Terrestrial fern. Rhizome decumbent(?); scales very narrowly triangular, 4–6 mm long. Fronds tripinnatifid; stipe 9–10 cm long, naked except for the base with scales like those on rhizome; rachis narrowly winged in upper half; lamina 12–23 cm long, 7–15 cm broad, glabrous; pinnae 6–9 per side, lanceolate-deltoid in outline, the largest 5–9 cm long, 1.5–4 cm broad, divided to the narrowly winged costae; pinnules cuneate-rhomboid, 1–2.5 cm long, lower half entire. Sori linear, 2–3 mm long, confined to outermost edges of pinnules. Fig. 105D–E.

Lord Howe Is. Endemic. This has been little collected and, confined to the southern mountainous areas, is perhaps rare or local in its occurrence.

L.H.Is.: Mt Gower, *C.Moore 19* (K); *loc. id.*, 1920, *J.L.Boorman* (K, NSW); *loc. id., J.P.Fullagar* (K); SE side of Mt Lidgbird, *A.C.Beauglehole 5387* (MEL); *s. loc., J.P.Fullagar* (MEL).

Generally confused with the more common fern now called *A. surrogatum*.

7. **Asplenium dimorphum** Kunze, *Linnaea* 23: 233 (1850)

Based on *Asplenium diversifolium* A.Cunn. ex Endl., *Prodr. Fl. Norfolk.* 10 (1833), *nom. illeg. non* Blume (1828). T: Norfolk Island, *F.L.Bauer* & *loc. id., A.Cunningham*; syn: W; isosyn: K. So named from the Greek *dis* (twice) and *morphe* (shape), in reference to the different types of frond in this fern.

Darea heterophylla Sm. in A.Rees, *Cycl.* 11: No. 2 (1808), *non Asplenium heterophyllum* C.Presl (1825). T: 'New South Wales' [Norfolk Island], *comm. R.Molesworth*; holo: LINN; IDC microfiche 5074.1629/6.

Illustrations: E.J.Lowe, *Ferns* 5: 53, 54, t. 17 (1858); D.L.Jones, *Encycl. Ferns* 10, 227 (1987); S.B.Andrews, *Ferns Queensland* 48, fig. 4.1A (1990).

Terrestrial fern. Rhizome short; scales c. 1 cm long, clathrate. Fronds bipinnate and tripinnate; stipe 30–40 cm long, covered with short, appressed, and long, narrow, scattered,

clathrate scales, easily rubbed off; upper half of rachis not winged; lamina 30–60 cm long, 25–40 cm broad, with small, scattered, clathrate scales below or glabrescent; pinnae 8–10 per side, lanceolate-deltoid in outline, the longest 12–20 cm long, 3–8 cm broad, markedly dimorphic; sterile pinnules deltoid, 10–20 mm broad, bipinnatisect or sometimes bipinnate, serrate, acute, with base somewhat asymmetrical; fertile pinnules linear, 3–15 mm long, 1–2 mm broad, tripinnate; sterile and fertile fronds separate or sometimes both types of pinnae on same frond, the sterile in the lower part. Sori linear, 4–12 mm long, marginal. *Two-Leaf* or *Two-Frond Fern, Lace Fern*. Fig. 105A.

Norfolk Is. Endemic. This species is quite common in the forest of the National Park.

N.Is.: between Palm Glen and Red Rd, *M.Lazarides 8091* (CANB, K); Ball Bay, *P.S.Green 2402* (K); *s. loc., A.Cunningham 29*(*51*) (K); *s. loc., I.Robinson 12* (MEL).

Hybrids between this species and *A. difforme* can occur (Norfolk Is., *s. loc., R.M.Laing,* CHR). In these the 'fertile', linear pinnules are generally shorter and broader than in *A. dimorphum* (3–7 × 2–3 mm long versus 5–15 × 1–2 mm), and the sterile pinnules are somewhat intermediate between the two species in shape and texture.

Doubtful record

Asplenium oblongifolium Colenso was recorded from Norfolk Is. as *A. lucidum* G.Forst. (*non* Burm.f.) by W.J.Hooker (*Sp. Fil.* 3: 98, 1860), attributing a collection to Dr. Vaughan Thomson, without any further locality, date *etc*. However, the only specimen at Kew marked 'Norfolk Island' and bearing Thomson's name in Hooker's hand (and stamped 'Herb. Hook. 1867') is a single frond mounted on the same sheet as *Colenso 60*, labelled '60 *Asplenium oblongifolium* n.sp. W.C.' in Colenso's hand; this latter is from New Zealand, and possibly an isotype of Colenso's species. With no further collections of this species having been made from Norfolk Is., the frond attributed to Thomson must be assumed to have been mislabelled.

133. ATHYRIACEAE

Terrestrial ferns. Rhizomes with pale or dark, non-clathrate, entire or toothed scales. Fronds simple to 4-pinnate; rachis and costae grooved above; veins free or reticulate, the areoles without free included veinlets. Sori elliptic to elongate-linear, along one or both sides of a vein; indusia narrow (elsewhere absent), following the sori, sometimes double, back to back (especially on basal pinnae).

A worldwide family of c. 8 genera and c. 650 species; 2 genera native on Norfolk Is., 1 of which is also on Lord Howe Is. Generic delimitation and classification in this family is a matter of debate.

G.Bentham, Filices, *Asplenium*, Section *Diplasium*, *Fl. Austral.* 7: 750–752 (1878).

KEY TO GENERA

Grooves on rachis above, confluent with and open at junction with grooves of costae; fronds ±tufted, 2- or 3-pinnate	**1. DIPLAZIUM**
Grooves on rachis above, not confluent at junction with costae; fronds borne along a creeping rhizome, pinnate, deeply pinnatisect	**2. LUNATHYRIUM**

1. DIPLAZIUM

Diplazium Sw., *J. Bot.* (*Schrader*) 1800(2): 61 (1801); from the Greek *diplasios* (double), in reference to the frequently double sori in these ferns.

Type: *D. plantagineum* (L.) Sw.

Terrestrial ferns. Rhizome erect, usually short. Stipes sometimes rough at base. Fronds (simple to) 2–4-pinnate, glabrous; rachis and costae with grooves confluent and open at their junctions, glabrous; veins free or reticulate. Sori elliptic or linear, sometimes double along both sides of vein.

A large genus of c. 400 species, mainly tropical, and distributed widely; 2 species native to Norfolk Is., 1 species endemic on Lord Howe Is.

1 Pinnules narrowed at base; larger secondary pinnules 2–5 cm long (N.Is.) **1. D. assimile**

1: Pinnules not narrowed at base; larger secondary pinnules 3–10 cm long

2 Sori lightish brown, 1–2 mm long (N.Is.) **2. D. australe**

2: Sori very dark brown, 2–4 mm long (L.H.Is.) **3. D. melanochlamys**

1. Diplazium assimile (Endl.) Bedd., *Ferns Brit. India* t. 294 (1868)

Asplenium assimile Endl., *Prodr. Fl. Norfolk.* 10 (1833); *Athyrium assimile* (Endl.) C.Presl, *Tent. Pterid.* 98 (1836); *Asplenium umbrosum* var. *assimile* (Endl.) Hook. & Baker, *Syn. Fil.* 2nd edn, 489 (1874); *Diplazium umbrosum* var. *assimile* (Endl.) Bedd., *Handb. Ferns Brit. India* 190 (1883). T: Norfolk Island, 1804–1805, *F.L.Bauer*; holo: W. The epithet is from the Latin *assimilis* (dissimilar), but the meaning is obscure.

[*Athyrium umbrosum auct. non* (Aiton) C.Presl: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 735 (1904); R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 11 (1915)]

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 127, fig. 144 (1981); S.B.Andrews, *Ferns Queensland* 77, fig. 5.2A (1990); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 58 (1990).

Rhizome ±erect. Fronds tripinnate; stipe 15–50 cm tall, light brown shading to black at base, with brown scales 3–5 mm long at base; lamina broadly triangular in outline, 30–60 cm long, 25–40 cm broad; larger secondary pinnae 2–5 cm long, with 4–8 separate pinnules; pinnules 5–10 mm long, narrowed at base, decurrent onto the very narrowly winged costule, bluntly toothed at margin, blunt at apex. Sori elongate, 1–3 mm long, (2–) 3 or 4 per pinnule side, rarely the basal sori doubled; indusia light brown. *Upside-Down Fern*. Fig. 105J–L.

Norfolk Is. Frequent in shaded valleys in the National Park, often near streams. Also known from N.S.W. and Qld.

N.Is.: between Palm Glen and Red Rd, *M.Lazarides 8093* (K, NSW); valley below Now-Now Ridge, *P.Ralston 20* (NSW); valley S of Mt Bates, *P.S.Green 1895* (K).

2. Diplazium australe (R.Br.) N.A.Wakef., *Victorian Naturalist* 58: 142 (1942)

Allantodia australis R.Br., *Prodr.* 149 (1810); *Asplenium australe* (R.Br.) Brack., *U.S. Expl. Exped., Filic.* 16: 173 (1854), *non* (L.) Sw. T: Tasmania, *R.Brown*; holo: BM. The epithet refers to this plant's southern or austral origin.

[?*Athyrium brevisorum auct. non* (Wall.) T.Moore: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 735 (1904)]

Illustrations: B.D.Duncan & G.Isaac, *Ferns & Allied Pl. Victoria, Tasmania & S. Australia* 180, 181, figs. 18.3, 18.4 (1986); S.B.Andrews, *Ferns Queensland* 77, fig. 5.2 (1990); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 58 (1990).

Rhizome ±erect. Fronds tripinnate; stipe 40–70 cm tall, light brown shading to black at base, with a few narrow, dark brown scales c. 5 cm long at base and occasionally a little above; lamina broadly triangular in outline, 40–75 cm long, 30–70 cm broad; larger secondary pinnae 3–10 cm long, with 7–12 pinnules; tripinnate pinnules 5–20 mm long, not narrowed

at base, decurrent onto a winged costule, bluntly toothed at margin, blunt at apex. Sori elongate, 1–2 mm long, 3–5 per pinnule side, rarely the basal sori double; indusia lightish brown. *Austral Lady Fern, Large Upside-Down Fern.*

Norfolk Is. Uncommon in the National Park; in similar habitats to *D. assimile*. Also known from the North Is. of New Zealand, and eastern Australia (Qld to Tas.).

N.Is.: below Palm Glen and Red Rd, *M.Lazarides 8095* (K, NSW); valley S of Mt Bates, *P.S.Green 1894* (K); *s. loc., R.M.Laing* (CHR).

3. Diplazium melanochlamys (Hook.) T.Moore, *Index Fil.* 332 (1861)

Asplenium melanochlamys Hook., *Sp. Fil.* 3: 259 (1860). T: Lord Howe Island, *J.MacGillivray 702* & *loc. id.*, *W.G.Milne 336*; syn: K. The epithet comes from the Greek *melanos* (black, dark) and *chlamys* (a cloak, mantle), in allusion to the almost black indusia in this fern.

Rhizome short, fern ±tufted. Fronds 2- or 3-pinnate; stipe c. 40 cm tall, with narrow, very dark brown scales; scales 1–2 cm long at base; lamina broadly triangular in outline, 60–100 cm long, 40–60 cm broad; larger secondary pinnae 5–8 cm long, with 8–10 serrate pinnules; tripinnate pinnules 5–10 mm long, not narrowed at base, decurrent onto a winged costule, bluntly toothed at margin, blunt to truncate at apex. Sori elongate, 2–4 mm long, 2–5 per pinnule side, the basal sori often double; indusia very dark brown, almost black, shining. Fig. 105G–I.

Lord Howe Is. Endemic. An occasional or locally abundant fern in the forest in the southern half of the Island.

L.H.Is.: Smoking Tree Ridge, *R.D.Hoogland 8735* (CANB, NSW); E slopes of Mt Lidgbird, *P.S.Green 1686* (A, K); summit of Mt Gower, *J.Pickard 2615* (NSW).

2. LUNATHYRIUM

Lunathyrium Koidz., *Acta Phytotax. Geobot.* 1: 30 (1932); from the supposedly somewhat lunate, or moonshaped, indusia in these ferns, and *Athyrium*, a closely related genus.

Type: *L. pycnosorum* (H.Christ) Koidz.

Terrestrial fern. Rhizome erect or creeping. Fronds pinnate to tripinnate; stipe approximately equal to lamina; rachis and costae grooves not confluent at their junctions; hairs on rachis, costae and lamina multiseptate; veins free. Sori circular or elongate, with or without indusia.

A genus of 40 or more species, especially found in tropical and subtropical Asia; 1 native species on Norfolk Is.

This genus is frequently treated as a section of *Deparia*, and in that genus the following plant would be called *D. petersenii* subsp. *congrua* (Brack.) M.Kato (see M.Kato, *J. Fac. Sci. Univ. Tokyo Sect. III* 13: 426, 1984).

Lunathyrium japonicum (Thunb.) Sa.Kurata, *J. Geobot.* 9: 99 (1961)

Asplenium japonicum Thunb., *Syst. Veg.* 14th edn, 934 (1784); *Diplazium japonicum* (Thunb.) Bedd., *Ferns Brit. India Suppl.* 12 (1876); *Athyrium japonicum* (Thunb.) Copel., *Philipp. J. Sci.* 3: 290 (1908). T: Japan, *C.P.Thunberg*; holo: ?S *n.v.* The epithet is the Latin for Japan, whence it was first described.

Illustrations: B.D.Duncan & G.Isaac, *Ferns & Allied Pl. Victoria, Tasmania & S. Australia* 182, fig. 18.5 (1986); D.L.Jones, *Encycl. Ferns* 19 (1987); S.B.Andrews, *Ferns Queensland* 73, fig. 5.1A (1990).

Rhizome creeping; scales thin, brown. Fronds pinnate, deeply pinnatisect; stipe 15–25 cm tall, scaly at base, scales becoming scattered and pale above with scattered multiseptate hairs; lamina 20–35 cm long; the lowermost pinnae 10–25 cm long, broadest in middle; pinnule lobes 10–25 mm long, bluntly toothed, obtuse-rounded at apex; hairs below on rachis, costae and veins multiseptate. Sori linear-oblong, 1–2 mm long, 3–5 per side of pinnule lobes, occasionally doubled; indusia pale brown, thin.

Norfolk Is. Rare. Occurs in heavily shaded valleys in the National Park. Also found from

Japan through SE Asia to eastern Australia, North Is. of New Zealand, and Polynesia.

N.Is.: Now-Now Valley, *R.D.Hoogland 11256* (NSW); Cascade, *P.Ralston 65* (NSW); *s. loc.*, *P.H.Metcalfe* (CHR, K).

134. DRYOPTERIDACEAE

Terrestrial or lithophytic ferns. Rhizome erect or creeping; scales usually non-clathrate. Fronds usually 2–4-pinnate, rarely simple; stipe with scales or multicellular hairs; rachis and costae scaly or with multicellular hairs; pinnules asymmetrical; veins free or netted. Sori round, on veins or ends of veins; indusia peltate or reniform, rarely absent.

A family of perhaps 45 genera and c. 150 species, whose classification is still unsettled. It is distributed throughout the world; 2 native genera on Norfolk Is., 3 genera (1 introduced) on Lord Howe Is.

KEY TO GENERA

1 Fronds once pinnate **1. PHANEROPHLEBIA**

1: Fronds 2- or 3-pinnate

2 Margins of pinnules sharply aristate-apiculate; scales at base of stipe narrowly lanceolate, 4–10 mm long, 0.2–0.8 mm broad; groove of rachis and costae above glabrous, or with very occasional narrow scales; indusia attached laterally **2. ARACHNIODES**

2: Margins of pinnules not sharply aristate-apiculate

3 Scales at base of stipe lanceolate, 10–20 mm long, 1.5–3.5 mm broad; groove of rachis and costae above glabrous, or with long hairs and occasional narrow scales; indusia attached centrally **3. POLYSTICHUM**

3: Scales at base of stipe linear to narrowly elongate-triangular, 2–20 mm long, 0.5–2 mm broad; groove of rachis and costae above with dense, short hairs; indusia attached laterally **4. LASTREOPSIS**

1. PHANEROPHLEBIA

Phanerophlebia C.Presl, *Tent. Pterid.* 84 (1836); from the Greek *phaneros* (evident) and *phlebia* (a vein), in allusion to the obvious vein in the pinnae of the first species included in this genus.

Type: *P. nobilis* (Schltdl. & Cham.) C.Presl

Terrestrial fern. Rhizome short, ±erect, with dense, broad scales. Fronds pinnate, often pinnatifid at apex; pinnae often falcate, usually with sharp teeth at margin, usually acuminate; veins usually anastomosing, sometimes free. Sori circular, scattered on underside of pinnae on veins, sometimes terminal on them; indusia peltate, persistent or caducous.

A genus of c. 20 species, distributed from Hawai'i, Japan and tropical Asia to southern Africa and Central and South America; 1 species naturalised on Lord Howe Is.

*Phanerophlebia falcata (L.f.) Copel., *Gen. Fil.* 111 (1947)

Polypodium falcatum L.f., *Suppl. Pl.* 446 (1781); *Cyrtomium falcatum* (L.f.) C.Presl, *Tent. Pterid.* 86 (1836). T: Japan, *C.P.Thunberg*; holo: ?UPS *n.v.* The epithet is Latin for sickle-shaped, in allusion to the shape of the pinnae.

Illustrations: D.L.Jones, *Encycl. Ferns*: 18, 37, 287 (1987); S.B.Andrews, *Ferns Queensland* 23, fig. 3.3A

(1990); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 59 (1990); all as *Cyrtomium falcatum*.

Tufted fern. Fronds pinnate; stipe 10–30 cm long, with broad, brown scales, especially at base; lamina 15–30 cm long, 8–20 cm broad; pinnae ovate-falcate, asymmetrical, often with a short, acute lobe at base, especially on side nearest rachis, rounded at base, finely sharp-toothed at margin, long-acuminate. Sori scattered, circular; indusia peltate.

Lord Howe Is. A native of Japan, this species is often cultivated as a house plant in temperate regions or in gardens in warmer climates. It has become naturalised after having been discarded from cultivation.

L.H.Is.: Anderson Rd, *A.N.Rodd 3605* (NSW).

2. ARACHNIODES

Arachniodes Blume, *Enum. Pl. Jav.* 241 (1828); from the Greek *arachniodes* (like a spider's web), in allusion to the indumentum of the fern.

Type: *A. aspidioides* Blume

Terrestrial ferns. Rhizome erect or creeping, clothed with scales at base. Fronds 2–4-pinnate, generally 3-pinnate; glabrous or with very occasional narrow scales; pinnules usually unequally sided at base, with or without stiff marginal hairs; veins free, not reaching margin. Sori round, dorsal or submarginal on veins; indusia orbicular-reniform, with a deep sinus, attached laterally, rarely lacking.

A genus of c. 50 species, widespread in the tropics and subtropics, but especially found in the Sino-Himalayan region; 1 species native to the Islands.

M.D.Tindale, *Contr. New South Wales Natl. Herb.* 3: 89–90 (1961); M.D.Tindale, *Contr. New South Wales Natl. Herb. Fl. Ser.* 211: 55–59 (1961).

Arachniodes aristata (G.Forst.) Tindale, *Contr. New South Wales Natl. Herb.* 3: 89 (1961)

Polypodium aristatum G.Forst., *Fl. Ins. Austr.* 82 (1786); *Aspidium aristatum* (G.Forst.) Sw., *J. Bot.* (*Schrader*) 1800(2): 37 (1801); *Polystichum aristatum* (G.Forst.) C.Presl, *Tent. Pterid.* 83 (1836). T: Tahiti, *J.R. & G.Forster*; syn: BM. The epithet is Latin for awn, in reference to the aristate-apiculate tips to the pinnules.

Illustrations: H.T.Clifford & J.Constantine, *Ferns, Fern Allies & Conifers Australia* 79, figs. 3A, B (1980); D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 79, fig. 60 (1981); S.B.Andrews, *Ferns Queensland* 19, fig. 3.1A (1990).

Rhizome long-creeping, densely clothed with narrowly lanceolate, finely pointed scales 4–10 mm long, 0.2–0.8 mm broad. Fronds drooping, 3- or 4-pinnatifid; lamina deltoid; stipes remote, 20–60 cm long, scaly at base with linear scales above; lamina 20–40 cm long, 15–25 cm broad; basal pinnules of lowermost pinnae larger than others; pinnule apex and segments sharply aristate-apiculate. Sori in a single row on each side of costules; indusia orbicular-reniform. *Prickly Shieldfern* (N.Is.). Fig. 106D–E.

Norfolk Is., Lord Howe Is. Very common in drier parts of forests on Norfolk Is.; known from only one collection on Lord Howe Is. Distributed from SE Asia to Australia (Qld & N.S.W.), the Kermadec Islands and Polynesia.

N.Is.: beside Red Rd, *P.S.Green 1373* (A, K); between Palm Glen and Red Rd, *R.J.Chinnock 5961* (AD, K); E slopes of Mt Bates, *R.D.Hoogland 11252* (CANB, K, NSW); Rooty Hill Rd, *R.D.Hoogland 11297* (CANB, NSW). **L.H.Is.:** E side of Intermediate Hill, *J.C.Game 69/297* (K).

On Norfolk Is. it is sometimes infected with the gall-forming fungus, *Taphrina cornu-cervi* Gissenhagen.

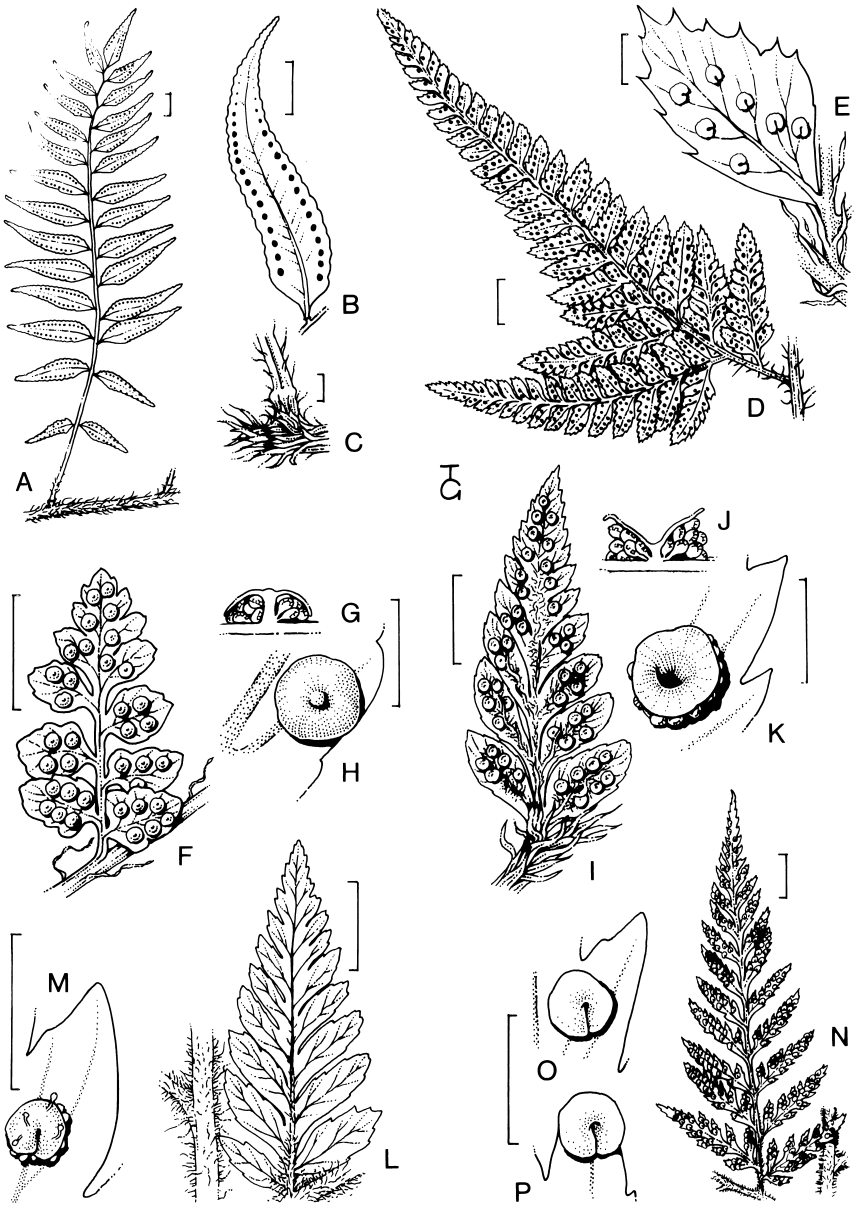

Figure 106. A–C, DAVALLIACEAE: *Arthropteris tenella*. **A**, fertile frond; **B**, underside of fertile pinna; **C**, base of stipe (**A–C**, J.MacGillivray, Herald 692, K). **D–N**, DRYOPTERIDACEAE. **D–E**, *Arachniodes aristata*. **D**, basal pinna; **E**, fertile lamina segment (**D–E**, A.Cunningham 50, K). **F–H**, *Polystichum moorei*. **F**, underside of fertile pinna; **G**, section of sorus; **H**, sorus and lamina margin (**F–H**, E.King Pl00l, NSW). **I–K**, *Polystichum whiteleggei*. **I**, underside of fertile pinna; **J**, section of sorus; **K**, sorus and lamina margin (**I–K**, P.Green 2317, K). **L–M**, *Lastreopsis calantha*. **L**, sterile pinna; **M**, sorus and lamina margin (**L–M**, P.Ralston, P8445, NSW). **N–P**, *Lastreopsis nephrodioides*. **N**, underside of fertile pinna; **O**, sorus and lamina margin (**N–O**, R.Hoogland 8809, K); **P**, sorus and lamina margin (C.Moore 7, K). Scale bars: **A**, **B**, **D**, **F**, **I**, **L**, **N** = 1 cm; **C**, **E**, **G**, **H**, **J**, **K**, **M**, **O**, **P** = 2 mm. Drawn by T.Galloway.

3. POLYSTICHUM

Polystichum Roth, *Tent. Fl. Germ.* 1: 31, 69 (1799); from the Greek *poly* (many) and *stichos* (a row), alluding to the many rows of sori in these ferns.

Type: *P. lonchitis* (L.) Roth

Terrestrial or lithophytic ferns. Rhizome short, densely scaly. Stipes erect or arching, usually densely scaly, especially at base, not articulated to rhizome. Fronds 1–3-pinnate, rarely simple; pinnules unequal at base, ±auriculate, serrate to spinulose; veins free; groove of rachis and costae above glabrous or with long hairs and occasional narrow scales. Sori round, dorsal or subterminal on veins; indusia centrally peltate, sometimes caducous, rarely lacking.

A large, cosmopolitan genus of 135 or more species; in the tropics it is usually confined to the high mountains. Two species endemic to Lord Howe Is.

G.Bentham, Filices, *Aspidium*, *Fl. Austral.* 7: 757–758 (1878).

Fronds with dense, light brown scales, especially towards base of stipe, without arachnoid hairs, but rachis and costae minutely glandular; lamina outline lanceolate, 10–25 cm long, 7–14 cm broad; pinnules ovate, obtuse; indusia dome-shaped **1. P. moorei**

Fronds with dense, brown scales on rachis and costae mixed with easily rubbed-off arachnoid hairs; lamina outline deltoid, (15–) 25–40 cm broad; pinnules lanceolate, acute or deltoid; indusia ±funnel-shaped **2. P. whiteleggei**

1. Polystichum moorei H.Christ, *Arkiv Bot.* 4(12): 3 (1903)

T: Lord Howe Island, 1892, *J.H.Maiden* and '*E.Kirk*' [*E.King*] 42; syn: P. Named after Charles Moore (1820–1905), Director of the Royal Botanic Gardens, Sydney (1848–1896), who collected on Lord Howe Is. in 1869.

Aspidium aculeatum var. *moorei* H.Christ ex Maiden, *Proc. Linn. Soc. New South Wales* 23: 146 (1898); *Polystichum moorei* (H.Christ ex Maiden) W.R.B.Oliv., *Trans. & Proc. New Zealand Inst.* 47: 120 (1917), *nom. illeg.* T: eastern side of Mt Lidgbird, Lord Howe Is., *E.King*; holo: NSW.

Polystichum kingii Watts, *Proc. Linn. Soc. New South Wales* 37: 401 (1913). T: eastern side of Mt Lidgbird, Lord Howe Island, 1895, *E.King*; syn: NSW; in a cave, Mt Lidgbird, 1911, *E.King*; syn: NSW; mouth of Soldiers Creek, 1898, *J.H.Maiden*; syn: NSW.

Polystichum kingii f. *umbrosa* Watts, *op. cit.* 403, *nom. prov.* T: Lord Howe Island, collector not specified; holo: ?NSW *n.v.*

Polystichum moorei var. *tenerum* Watts, *Proc. Linn. Soc. New South Wales* 39: 258 (1914). T: mouth of Soldiers Creek, Lord Howe Island, [1898], *J.H.Maiden*; syn: ?NSW *n.v.*; isosyn: P; base of Mt Gower, Lord Howe Island, 1911, *E.King*; syn: ?NSW *n.v.*; isosyn: P.

Terrestrial or lithophytic ferns. Rhizome short; scales dense, lanceolate, to 2 cm long, 2–5 mm broad, long-acute, brown. Fronds 3-pinnate or 2-pinnatisect; stipe 2–12 cm long; scales on stipe numerous, similar to those on rhizome, to 1.5 cm long, especially dense towards base; rachis with scattered, linear-lanceolate, brown scales to 1 cm long, especially towards base, and minute glandular hairs; lamina lanceolate in outline, 10–25 cm long, 7–14 cm broad; pinnules obliquely ovate, 0.5–2 cm long, with apices obtuse, bluntly serrate; veins not visible above. Sori ±dome-shaped, 1.5–2 mm diam., glandular; indusia orbicular. Fig. 106F–H.

Lord Howe Is. Endemic. Rare in rocky habitats near and around the bases of Mts Gower and Lidgbird.

L.H.Is.: E side of Mt Lidgbird, *E.King s.n.* (NSW); *loc. id.*, 1920, *J.L.Boorman* (NSW); Tableland, *J.Pickard 3633* (NSW); W base of Mt Gower, 1913, *W.R.B.Oliver* (NSW, P).

2. Polystichum whiteleggei Watts, *Proc. Linn. Soc. New South Wales* 39: 258 (1914)

T: [slopes of Mt Lidgbird], Lord Howe Is., [1911], *W.W.Watts*; holo: NSW; iso: BRI. Named after Thomas Whitelegge (1850–1927) of the Australian Museum, who collected zoological specimens on the Island in 1887, and who first pointed out the distinctiveness of this fern.

[*Aspidium aculeatum auct. non* (L) Sw.: F.J.H. von Mueller, *Fragm.* 9: 78 (1875)]

[*Aspidium capense auct. non* (L.f.) Willd.: G.Bentham. *Fl. Austral.* 7: 758 (1878); W.B.Hemsley, *Ann. Bot.* (*London*) 10: 265 (1896)]

[*Polystichum moorei auct. non* H.Christ: W.W.Watts, *Proc. Linn. Soc. New South Wales* 37: 399–401 (1913)]

Illustration: D.L.Jones, *Encycl. Ferns* 299 (1987).

Terrestrial or lithophytic ferns, ±tufted. Rhizome shortly creeping; scales on apex dense, lanceolate, to 2 cm long, 3–4 mm broad, long-acute, dark brown. Fronds 3-pinnate; stipe (5–) 10–50 cm long; scales on stipe similar to those on rhizome, to 1.5 cm long, especially towards base; lamina deltoid in outline, (10–) 15–50 cm long, (7–) 12–40 cm broad, somewhat coriaceous; rachis and costae with usually dense, lanceolate scales to 7 mm long, with non-glandular arachnoid hairs between which are easily rubbed off; pinnules lanceolate, 1–2 cm long, irregularly bluntly serrate with apex bluntly acute and veins just visible above. Sori often almost covering lower surface; indusia ±funnel-shaped, 1–2 mm diam., without glands, caducous. Fig. 106I–K.

Lord Howe Is. Endemic. Locally common to rare on the flanks and edges of the summits of Mts Gower and Lidgbird.

L.H.Is.: N flank of Mt Lidgbird, *M.M.J. van Balgooy 1148* (CANB, NSW); *loc. id.*, *R.D.Hoogland 8758* (CANB, NSW); E slopes of Mt Lidgbird, *P.S.Green 1687* (A, K, NSW); Erskine Valley, *A.N.Rodd 1701* (NSW); N ridge of Mt Gower, *J.Pickard 2641* (NSW).

In the past a common name, Heavy Fern, has been used for this species, alluding to the weight of a fully developed, thick textured, frond with its dense indumentum of scales.

4. LASTREOPSIS

Lastreopsis Ching, *Bull. Fan Mem. Inst. Biol.* 8: 157 (1938); from *Lastrea*, a related genus, and the Greek suffix *-opsis* (similar to).

Type: *L. tenera* (R.Br.) Tindale = *L. recedens* (J.Sm. ex T.Moore) Ching

Terrestrial or epiphytic ferns. Rhizome creeping or rarely erect, clothed with narrow scales. Fronds 3- or 4-pinnate, outline generally deltoid; costae grooved above and confluent with the rachis groove, both with dense and short hairs. Upper basal pinnule lobe nearest the costa usually larger than the lower; veins free, sometimes reaching the margin. Sori round, dorsal or terminal on veinlets; indusia usually present, usually reniform.

A genus of c. 33 species, widespread in the tropics, reaching temperate areas in Tasmania and New Zealand; 1 endemic species on each Island.

G.Bentham, Filices, *Deparia*, *Fl. Austral.* 7: 714 (1878); M.D.Tindale, A monograph of the genus *Lastreopsis* Ching, *Contr. New South Wales Natl. Herb.* 3: 249–339 (1965).

Rhizome long-creeping; stipe base with relatively few scattered dark brown scales to 0.6 cm long; margins of pinnules dentate; sori medial (N.Is.) **1. L. calantha**

Rhizome scarcely creeping; stipe base with dense, very dark brown scales to 2 cm long; margins of pinnules crenate; sori medial to marginal, often on tip of a short marginal projection (L.H.Is.) **2. L. nephrodioides**

1. Lastreopsis calantha (Endl.) Tindale, *Victorian Naturalist* 73: 184 (1957)

Nephrodium calanthum Endl., *Prodr. Fl. Norfolk.* 9 (1833). T: Norfolk Is., 1804–1805, *F.L.Bauer*; holo: W. The epithet comes from the Greek *calos* (beautiful) and *anthos* (flower), presumably in reference to the attractive appearance of this fern.

Nephrodium microsorum Endl., *loc. cit., p.p., quoad spec. ins. Norfolk.*

[*Aspidium coriaceum auct. non* (Sw.) Sw.: S.F.L.Endlicher, *op. cit.* 8]

[*Aspidium capense auct. non* Willd.: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 736 (1904)]

[*Aspidium decompositum auct. non* (R.Br.) Spreng.: J.H.Maiden, *op. cit.* 736]

[*Aspidium tenerum auct. non* Spreng.: J.H.Maiden, *op. cit.* 737]

[*Polystichum adiantiforme auct. non* (G.Forst.) J.Sm.: R.M.Laing, *Trans. & Proc. New Zealand Inst.* 47: 11 (1915)]

[*Lastreopsis decomposita auct. non* (R.Br.) Tindale: M.D.Tindale, *Contr. New South Wales Natl. Herb.* 3: 321 (1965), *p.p.*]

[*Rumohra adiantiformis auct. non* (G.Forst.) Ching: J.S.Turner *et al.*, *Conservation Norfolk Is.* 30 (1968)]

Terrestrial fern. Rhizome long-creeping, decumbent at apex; rhizome and base of stipe covered with narrowly elongate, triangular, dark brown scales 2–6 mm long, 0.5–1 mm broad at base. Fronds 3-pinnate to 4-pinnatisect, erect; stipes borne 1–2 cm apart, 15–30 (–50) cm tall, with scattered scales at base like those on rhizome; lamina 20–50 (–70) cm long, 15–50 cm broad; pinnules 1–5 cm long, 0.5–1.5 cm broad, dentate, not aristate. Sori medial; indusia reniform, 0.5–0.75 mm diam., with a few glandular hairs 0.1 mm long. *Shieldfern*. Fig. 106L–M.

Norfolk Is. Endemic. Fairly common in shaded forest.

N.Is.: SE slope just below summit of Mt Bates, 1962, *P.Ralston* (NSW); between Palm Glen and Red Rd, *R.J.Chinnock 5960* (AD, K); *s. loc.*, 1964, *P.Ralston* (NSW); *s. loc., W.G.Milne 13* (K); *s. loc.*, 1849, *C.J.Simmons* (BM, K).

Closely related to *L. microsora* (Endl.) Tindale from Australia and New Zealand.

2. Lastreopsis nephrodioides (Baker) Tindale, *Victorian Naturalist* 73: 184 (1957)

Deparia nephrodioides Baker, *Gard. Chron.* 32: 253 (1872); *Davallia nephrodioides* (Baker) F.Muell., *Fragm.* 10: 104 (1877); *Dicksonia nephrodioides* (Baker) F.Muell., *Fragm.* 9: 78 (1875); *Dryopteris decomposita* var. *nephrodioides* (Baker) Watts, *Proc. Linn. Soc. New South Wales* 37: 397 (1913); *Dryopteris nephrodioides* (Baker) Watts, *Proc. Linn. Soc. New South Wales* 39: 259 (1914), *non* (Hook.) Kuntze, *nec* (Klotsch) Hiron.; *Ctenitis nephrodioides* (Baker) F.Ballard, *Kew Bull.* 4: 559 (1955). T: Lord Howe Island, *C.Moore 7*; holo: K. Named from its resemblance to *Nephrodium decompositum* R.Br. (= *Lastreopsis decomposita* (R.Br.) Tindale).

Nephrodium apicale Baker in W.J.Hooker & J.G.Baker, *Syn. Fil.* 2nd edn, 499 (1874); *Aspidium apicale* (Baker) Benth., *Fl. Austral.* 7: 758 (1878); *Ctenitis apicalis* (Baker) F.Ballard, *loc. cit.* T: Lord Howe Island, *C.Moore 28*; holo: K.

Illustrations: J.G.Baker in W.J.Hooker, *Icon. Pl.* 17: t. 1608 (1886), as *Deparia nephrodioides*; M.D.Tindale, *Contr. New South Wales Natl. Herb.* 3: t. 11/3, 11/4 (1965).

Terrestrial or epiphytic fern. Rhizome scarcely creeping, suberect at apex; rhizome and base of stipe densely covered with linear, ±hair-pointed, very dark brown scales 1–2 cm long, 1–2 mm broad at base. Fronds 4-pinnate to 5-pinnatisect, erect, ±tufted; stipe 10–40 cm tall, with lower part bearing scales like those on rhizome; lamina 15–40 cm long, 20–50 cm broad; pinnules 1–4 cm long, 0.4–1.5 cm broad, crenate. Sori medial to marginal, often on the tip of a short marginal projection; indusia reniform, 0.5–1 mm diam., glabrous. Fig. 106N–P.

Lord Howe Is. Endemic. Occurs in the forest on the southern parts of the Island, especially at higher altitudes.

L.H.Is.: near the Goat House, *R.D.Hoogland 8809* (NSW); E slopes of Mt Lidgbird, *P.S.Green 1689* (A, NSW); Erskine Valley, *A.C.Beauglehole 5741* (A, BRI, MEL); slopes of Mt Gower, 1911, *W.W.Watts* (BRI, NSW); summit of Mt Gower, *P.S.Green 1652* (A, NSW).

Doubtful record

Lastreopsis microsora (Endl.) Tindale was included by S.F.L.Endlicher in his *Prodromus Florae Norfolkicae* (1833) on p. 9, as *Nephrodium microsorum*, citing a collection from Norfolk Is. made by F.L.Bauer, but this specimen fits his description of *N. calanthum*, while his description of *N. microsorum* fits the Australian collection by F.W.Sieber which he also cites. M.D.Tindale (*Victorian Naturalist* 73: 182, 1957) has typified *N. microsorum* on this Sieber material.

135. DAVALLIACEAE

Terrestrial or epiphytic ferns. Rhizome erect, creeping or climbing, densely covered with scales. Fronds simple or pinnate, usually articulate with rhizome. Pinnae entire or deeply lobed, articulate with rachis. Veins usually free, rarely confluent, usually ending near margin in a hydrathode. Sori dorsal or submarginal; indusia reniform or sometimes peltate, rarely lacking.

A pantropical family of c. 9 genera and c. 200 species; 2 genera native on the Islands.

KEY TO GENERA

Rhizome erect; stipe not articulate to rhizome	**1. NEPHROLEPIS**
Rhizome creeping or climbing; stipe articulate to rhizome	**2. ARTHROPTERIS**

1. NEPHROLEPIS

Nephrolepis Schott, *Gen. Fil.* 1: t. 3 (1834); from the Greek *nephros* (a kidney) and *lepis* (a scale), in allusion to the kidney-shaped indusia in the type species.

Type: *N. exaltata* (L.) Schott

Terrestrial or sometimes epiphytic ferns. Rhizome short, erect; scales peltate at base. Fronds pinnate; stipe tufted, not articulate to rhizome; lamina long and narrow; pinnae usually crowded, articulate to rachis, asymmetrical at base, usually crenate; veins free, simple or forked. Sori usually circular in a single row on each side of costae, terminal on a vein, dorsal or near margin; indusia reniform.

A pantropical genus of c. 30 species; 1 species native to both Islands. It has also been treated as a monotypic family of its own, the Nephrolepidaceae.

G.Bentham, Filices, *Aspidium*, *Fl. Austral.* 7: 754 (1878).

Nephrolepis cordifolia (L.) C.Presl, *Tent. Pterid.* 79 (1836)

Polypodium cordifolium L., *Sp. Pl.* 2: 1089 (1753); *Aspidium cordifolium* (L.) Sw., *J. Bot.* (*Schrader*) 1800(2): 32 (1801). T: Petiver, *Pter.-Americana* t. 1, fig. 11 (1712). The epithet comes from the botanical Latin *cordatum* (heart-shaped) and *folium* (a leaf), in allusion to the heart-shaped pinnae depicted in an early drawing of this species.

Aspidium tuberosum Bory ex Willd., *Sp. Pl.* 5: 234 (1810); *Nephrolepis tuberosa* (Bory ex Willd.) C.Presl, *Tent. Pterid.* 79 (1836). T: Réunion, *J.B.G.M.Bory de St. Vincent s.n.*; holo: B *n.v.*, IDC microfiche 7740/1.1427/13.

Illustrations: D.L.Jones, *Encycl. Ferns* 36, 182, 304 (1987); P.J.Brownsey & J.C.Smith-Dodsworth, *New Zealand Ferns & Allied Pl.* 136, fig. 172A, D, t. 31D (1989); S.B.Andrews, *Ferns Queensland* 249, fig. 23.2B (1990).

Terrestrial fern. Rhizome with numerous, narrow, attenuate, light brown scales. Fronds pinnate, erect; stipe 5–10 cm long, with narrow scales becoming linear above; lamina 30–50 cm long, 2–4.5 cm broad; rachis with narrow, linear scales; pinnae closely adjacent, subsessile, deltoid-oblong, 10–25 mm long, 5–9 mm broad, unequally cordate at base, shortly auriculate, the lobes overlapping the rachis, shallowly crenate; veins terminating in submarginal hydrathodes on upper surface. Sori in a single row on each side of costae. *Pop-Rock Fern* (N.Is.).

Norfolk Is., Lord Howe Is. Local on Norfolk Is.; common in rocky habitats on Lord Howe Is. Also known from Australia, New Zealand and New Caledonia, probably pantropical, but much cultivated and possibly naturalised in some places.

N.Is.: *s. loc., C.J.Simmons* (K); *s. loc., V.Thomson* (K). **L.H.Is.:** ascent of Mt Gower, *P.S.Green 1608* (K); W side of Mt Lidgbird, *J.C.Game 69/191* (K); *s. loc., C.Moore 27 & 73* (K).

W.R.Sykes in *Kermadec Is. Fl.* 68 (1977) suggests that on Norfolk Is. the native plants differ from the naturalised plants (found near dwellings and known as the Fishbone Fern). As on North Is., New Zealand, the matter needs investigation; the native plant is treated and described as *Nephrolepis* aff. *cordifolia* in *Fl. New Zealand* 4: 14 (1988) and by P.J.Brownsey & J.C.Smith-Dodsworth, *New Zealand Ferns & Allied Pl.* 137, fig. 172, t. 31F (1989).

2. ARTHROPTERIS

Arthropteris J.Sm. ex Hook.f., *Fl. Nov.-Zel.* 2: 43, t. 82 (1854); from the Greek *arthron* (a joint) and *pteris* (a fern), in reference to the joint, or articulation, at the base of the pinnae.

Type: *A. tenella* (G.Forst.) J.Sm. ex Hook.f.

Epiphytic or lithophytic fern. Rhizome slender, long creeping or climbing, scaly; scales with toothed margins. Fronds pinnate, small to medium sized; stipes remote, articulate to rhizome at base; rachis with multiseptate hairs and often scales; pinnae articulate to rachis, entire or lobed; veins free, bifurcating. Sori circular, in 1 row on each side of pinnae below, often submarginal; indusia reniform or lacking.

A genus of c. 20 species from tropical Africa through southern Asia to Australia, New Zealand and the Pacific islands (including Juan Fernandez); 1 species native to both Islands.

G.Bentham, Filices, *Polypodium*, *Fl. Austral.* 7: 764 (1878).

Arthropteris tenella (G.Forst.) J.Sm. ex Hook.f., *Fl. Nov.-Zel.* 2: 43, t. 82 (1854)

Polypodium tenellum G.Forst., *Fl. Ins. Austr.* 81 (1786). T: *s. loc.* [New Zealand?], *J.R. & G.Forster*; lecto: BM, *fide* M.D.Tindale, *Contr. New South Wales Natl. Herb. Fl. Ser.* 208: 9 (1961). The epithet is from the Latin *tenellus* (somewhat delicate), in allusion to the habit.

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 81, fig. 64 (1981); P.J.Brownsey & J.C.Smith-Dodsworth, *New Zealand Ferns & Allied Pl.* 135, fig. 170, t. 31A, B (1989); S.B.Andrews, *Ferns Queensland* 245, fig. 23.1A (1990).

Epiphytic or lithophytic fern. Rhizome climbing, elongated, covered with narrow, overlapping, brown scales, attached just above their rounded bases, and mixed with smaller scales and hairs. Fronds: stipe articulated at base, 3–8 cm long, with scales becoming sparser upwards; rachis with occasional, smaller scales and shorter hairs; lamina 8–30 cm long; pinnae 4–14 per side, lanceolate, 3–6 cm long, 0.8–1.3 cm broad, very shortly stalked, articulate and ±asymmetrical at base, crenate to almost entire (sterile pinnae), acuminate. Sori circular, submarginal, 10–20 per side, without indusia. *Climbing Fern*. Fig. 106A–C.

Norfolk Is., Lord Howe Is. Common in the dense forest of the National Park on Norfolk Is., and likewise in the forest on the northern half of Lord Howe Is. Also known from Australia (Qld, N.S.W.), and New Zealand.

N.Is.: E slopes of Mt Bates, *R.D.Hoogland 11251* (CANB, NSW); *s. loc.*, 1902, *J.H.Maiden & J.L.Boorman* (K, NSW); *s. loc., A.Cunningham 47* (K). **L.H.Is.:** between Hunter Bay and North Bay, *J.D.Hoogland*

8681 (NSW); approach to Transit Hill, 1920, *J.L.Boorman* (BRI, NSW); S slope of Intermediate Hill, *R.D.Hoogland 8739* (NSW).

Doubtful records

Davallia pyxidata Cav. was recorded from Mt Pitt, Norfolk Is., by R.M.Laing (*Trans. & Proc. New Zealand Inst.* 47: 11, 1915), citing J.H.Maiden (*Proc. Linn. Soc. New South Wales* 28: 737, 1904), but traceable back to W.J.Hooker (*Sp. Fil.* 1: 169, 1875), who cited a specimen collected by Dr. V.Thomson. In the Kew Herbarium there is a frond of this species labelled 'Norfolk Island' in Hooker's hand, but as this species, native to eastern Australia, has never been collected on the Island by anyone else, the record should be rejected and attributed to an error in labelling.

Rumohra adiantiformis (G.Forst.) Ching, as *Aspidium capense* (L.f.) Willd., was recorded from Lord Howe Is. by G.Bentham (*Fl. Austral.* 7: 758, 1878) and, following him, by W.B.Hemsley (*Ann. Bot.* (*London*) 10: 265, 1896). G.Bentham cited a specimen collected by C.Moore (sides of cliffs, Red Point, Mt Lidgbird, *C.Moore 18*, K), but this specimen is actually *Polystichum whiteleggei* Watts. It appears therefore, that *Rumohra adiantiformis* has never occurred on Lord Howe Is.

J.S.Turner *et al.*, *Conservation of Norfolk Is.* 30 (1968), with some doubt, list *Rumohra adiantiformis* for Norfolk Is., but the record may be traced back through synonymy via *Aspidium capense* (J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 736, 1904), to *Aspidium coriaceum* Sw. (S.F.L.Endlicher, *Prodr. Fl. Norfolk*. 8, 1833), yet the F.L.Bauer specimen cited, and present in W, is actually *Lastreopsis calantha*. It appears therefore, that *Rumohra adiantiformis* has never occurred on Norfolk Is. either.

136. BLECHNACEAE

Terrestrial, rarely epiphytic or lithophytic ferns. Rhizome short, erect or suberect, sometimes forming a trunk, or scandent, scaly especially at apex. Fronds often in rosettes, simple to bipinnate, often coarsely textured, all similar, or dimorphic, with fertile fronds contracted. Sori oblong to linear, in 1 or 2 rows either side of midrib, or continuous, parallel to and near costa of a pinna or its lobes; indusia attached to side of sorus away from costa and opening towards it.

A family of one large genus, *Blechnum*, and about 7 other smaller ones, with c. 220 species. Worldwide, but most abundant in the southern tropical regions. Two genera native to Norfolk and Lord Howe Islands.

KEY TO GENERA

Sori forming a continuous band on either side of midrib	**1. BLECHNUM**
Sori short, oblong in one or two rows on either side of midrib	**2. DOODIA**

1. BLECHNUM

Blechnum L., *Sp. Pl.* 2: 1077 (1753); *Gen. Pl.* 5th edn, 485(1754); from *blechnon*, a name used by Greek authors for a fern, possibly not even this genus.

Type: *B. occidentale* L.

Terrestrial, rarely epiphytic or lithophytic ferns. Rhizome stout, usually erect, rarely

creeping, with dark brown, shining, entire scales at apex. Fronds uniform or dimorphic, usually pinnate or deeply pinnatifid, rarely simple or bipinnatifid, usually coriaceous, entire or serrate; veins free, frequently once forked, parallel. Sori linear, continuous, parallel to and close to midrib or costae, dense, covering lower surface of linear lobes of fertile fronds; indusia membranous, attached to margin, covering sori when young.

A genus of c. 200 species with a worldwide distribution, but most species in the Southern Hemisphere. One species native to Norfolk Is., and 5 native to Lord Howe Is. (3 endemic).

G.Bentham, Filices, *Blechnum*, *Fl. Austral.* 7: 738–740 (1878).

1 Sterile fronds simple (L.H.Is.) **1. B. patersonii**

1: All fronds pinnate, pinnatifid or pinnatisect

2 Sterile fronds deeply pinnatisect, pinnatifid or pinnate; lobes joined by a narrow wing on rachis

3 Basal pinnae abruptly reduced in length to a basal pair of pinnae 10 mm long and 1 or 2 distant pairs 0.5–2 mm long; rachis geniculate at base of lamina (L.H.Is.) **2. B. geniculatum**

3: Basal pinnae very gradually reduced in length; rachis straight, not geniculate

4 Lower pinnae ±at right angles to rachis; apices obtuse; major pinnae narrowing in their upper half (N.Is.) **3. B. norfolkianum**

4: Lower pinnae at an angle of 45°–60° to rachis; apices acute; major pinnae generally narrowing from near their base (L.H.Is.) **4. B. contiguum**

2: Sterile fronds pinnate; pinnae often contiguous or sometimes overlapping slightly, ±auriculate at base or in lower half of frond (L.H.Is.)

5 Rachis of fronds sparsely scaly, without setae; pinnae up to 20 cm long **5. B. howeanum**

5: Rachis of fronds sparsely scaly but with dense dark brown setae; pinnae up to 7 cm long **6. B. fullagarii**

On Norfolk Is., growing against the base of the wall of the Melanesian Mission Chapel, is a *Blechnum* which by tradition is said to have been brought there from Melanesia during the time that the Melanesian Mission was based on Norfolk Is. It appears to be a member of the difficult, unresolved *B. procerum* (G.Forst.) Sw. group (*P.S.Green 2442*, K). As it seems to be entirely a cultivated species, it is not treated further here.

1. Blechnum patersonii (R.Br.) Mett., *Fil. Hort. Bot. Lips.* 64, t. 4, figs 4–10 (1856)

Stegania patersonii R.Br., *Prodr.* 152 (1810). T: Tasmania, *W.Paterson*; holo: BM. Named after William Paterson (1755–1810), botanical explorer and twice temporary Governor of New South Wales.

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 101, fig. 97 (1981); D.L.Jones, *Encycl. Ferns* 323 (1987); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 66 (1990).

Terrestrial. Rhizome short, ±erect; apical scales narrow, 3–4 mm long, brown. Fronds dimorphic, glabrous, clustered; stipe 2.5–20 cm long. Lamina of sterile fronds simple, very narrowly oblanceolate, 20–50 cm long, 1.5–2.5 cm broad, long-decurrent at base, acuminate; margins finely undulate; veins close together, simple or once forked near midrib. Lamina of fertile fronds simple; lobes linear, 2–4 mm broad.

Lord Howe Is. Rare, confined to the upper parts of Mt Gower. Also known from eastern Australia (Qld to Tas.).

L.H.Is.: N ridge of Mt Gower, *J.Pickard 2640* (NSW); ridge of Mt Gower, *J.Pickard 3610* (NSW); almost at the top of Mt Gower, *P.S.Green 2332* (K).

In mainland Australia and Tasmania the sterile and fertile fronds may be irregularly pinnatisect. The island plant appears to consistently bear simple fronds.

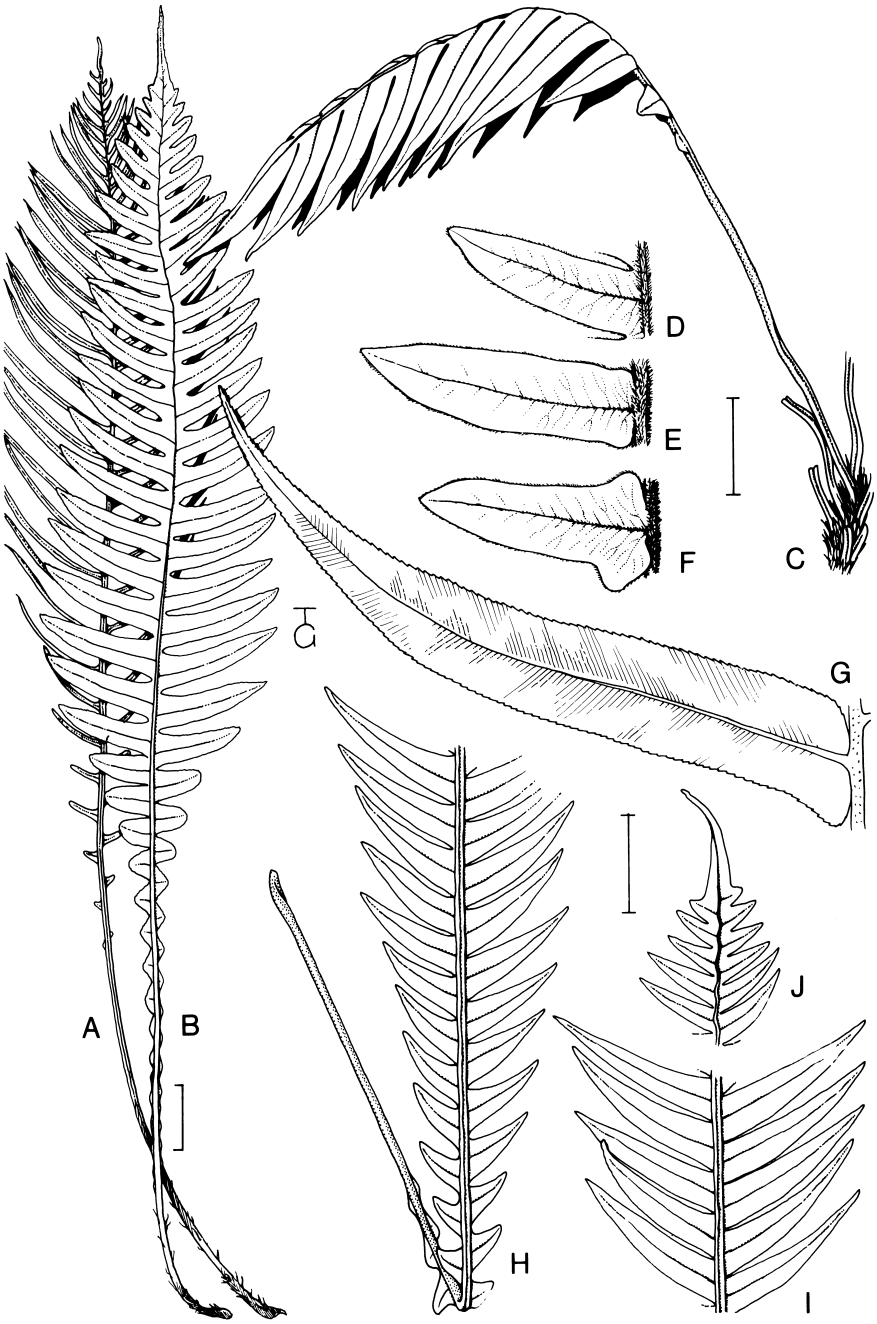

Figure 107. BLECHNACEAE. **A–B**, *Blechnum norfolkianum*. **A**, fertile frond (collector unknown, K); **B**, sterile frond (Carne, Herb. Hook. 1867, K). **C**, *Blechnum geniculatum*, habit (J.Pickard 3632, K). **D–F**, *Blechnum fullagarii*. **D**, upper; **E**, mid; **F**, lower pinnae (**D–F**, J.Game 69/235, K). **G**, *Blechnum howeanum*, pinna from upper part of frond (J.Game 69/237, K). **H–J**, *Blechnum contiguum*, **H**, base of sterile frond; **I**, middle; **J**, upper portions of sterile frond (**H–J**, J.Game 65/1/*s.n.*, K). Scale bars = 2 cm. Drawn by T.Galloway.

2. Blechnum geniculatum T.C.Chambers & P.A.Farrant, *Telopea* 5: 329 (1993)

T: Lord Howe Island, *J.Pickard 3632*; holo: NSW; iso: K. The epithet alludes to the strongly geniculate base to the sterile fronds.

Illustration: T.C.Chambers & P.A.Farrant, *Telopea* 5: 330, fig. 1 (1993).

Terrestrial or lithophytic fern. Rhizome shortly creeping; apical scales dense, 5–20 mm long, acute, dark brown. Fronds dimorphic, somewhat clustered; rachis strongly geniculate at base of the fronds forming an inverted 'cup', glabrous; stipe 8–32 cm long. Lamina of sterile fronds deeply pinnatisect, overall outline broadly lanceolate, 10–25 cm long, 7–15 cm broad; pinnae 8–23 pairs, closely adjacent, overlapping slightly towards frond base, broadly oblong-linear, up to 3.5–8 cm long, 1–2 cm broad, at frond base abruptly reduced to 1 pair of very short roundish lobes to 1 cm long, and 1 or 2 others, distant, 0.5–2 mm long; apex of pinnae acuminate, stoutly aristate; veins close together, rarely once forking. Lamina of fertile fronds with 10–17 pairs of linear pinnae. Fig. 107C.

Lord Howe Is. Endemic and rare on the summits of Mts Gower and Lidgbird. Growing on damp to wet, shaded banks in moss-forest.

L.H.Is.: summit plateau of Mt Gower, *P.S.Green 1655* (A); *loc. id., P.S.Green 1996* (K); 600 m N of tableland on W side of Mt Lidgbird, *J.Pickard 3632* (K, NSW).

3. Blechnum norfolkianum (Heward) Maiden, *Proc. Linn. Soc. New South Wales* 28: 732 (1904)

Lomaria norfolkiana Heward, *London J. Bot.* 1: 122 (1842); *Blechnum lanceolatum* var. *norfolkianum* (Heward) Laing, *Trans. & Proc. New Zealand Inst.* 47: 13 (1915). T: Norfolk Island, *A.Cunningham 34*; holo: K. Named after Norfolk Is.

Lomaria acuminata Baker in W.J.Hooker & J.G.Baker, *Syn. Fil.* 2nd edn, 481 (1874), *nom. illeg. non* Desv. (1811), *nec* C.Presl (1825); *Spicanta acuminata* (Baker) Kuntze, *Revis. Gen.* 2: 821 (1891), *nom. illeg.*; *Blechnum acuminatum* (Baker) Maiden, *op. cit.* 733 (1904) *nom. illeg. non* Fée (1852), *nec* Sturm (1853). T: Norfolk Island, [*Milne 14*]; holo: K.

[*Stegania lanceolata auct. non* R.Br.: S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 11 (1833)]

[*Lomaria lanceolata auct. non* (R.Br.) Spreng.: W.J.Hooker, *Icon. Pl.* 5: sub t. 429 (1842), *p.p.*]

[*Blechnum lanceolatum auct. non* (R.Br.) Sturm: J.H.Maiden, *op. cit.* 732]

[*Blechnum nudum auct. non* (Labill.) Mett. ex Luerss.: J.H.Willis, *Handb. Pl. Victoria* 1: 43 (1962), *p.p.*]

Terrestrial fern. Rhizome short, erect; apical scales 3–4 mm long, long-pointed, dark brown. Fronds dimorphic, erect, not geniculate, glabrous, clustered; stipe 10–35 cm long. Lamina of sterile fronds deeply pinnatifid, overall outline elliptic, 30–80 cm long, 4.5–20 cm broad; pinnae 15–30 pairs (excluding the greatly diminished basal pairs), slightly dentate, especially towards apex, long-acute, the longest 2.5–10 cm long, 0.7–1.7 cm broad; median pinnae narrowing in their upper half; basal pinnae very gradually reduced for c. 1/3 length of lamina, ±at right angles to the rachis, apices obtuse; major sterile pinnae narrowing in their upper half; veins often forking once near midrib. Lamina of fertile fronds pinnate, with 25–35 pairs of linear pinnae. *Norfolk Island Water Fern*. Fig. 107A–B.

Norfolk Is. Not common; in valleys in the middle and upper slopes of Mt Bates. Also known from the Kermadec Is., Vanuatu, Samoa and the Society Is.

N.Is.: E slopes of Mt Bates, *R.D.Hoogland 11195* (CANB, K, NSW); between Palm Glen and Red Rd, *M.Lazarides 8085* (CANB, K, NSW); *loc. id., R.J.Chinnock 5953* (AD, K); S slopes of Mt Bates, *P.S.Green 1866* (K); *s. loc., A.Cunningham 34 & 56* (K).

The Kermadec Island plants are perhaps a little less robust and the margins of the pinna lobes slightly more dentate than those on Norfolk Island. This species is very close to *B. chambersii* Tindale (*B. lanceolatum* (R.Br.) Sturm) of eastern Australia and *B. aggregatum* (Colenso) Tindale of New Zealand.

One collection in MEL from Lord Howe Is. (the south-eastern side of Mt Lidgbird) made on 26 Nov. 1962 by A.C.Beauglehole (*A.C.Beauglehole 5398*) may be this species. It differs from the Norfolk Is. plant only by being almost completely pinnate (the base of the pinnae

are scarcely joined even by a 1 mm wide continuation of the lamina) and the tips of the pinnae lack even very slight serrations.

4. **Blechnum contiguum** Mett., *Ann. Sci. Nat. Bot.* ser. 4, 15: 70 (1861)

T: New Caledonia, *E.Veillard 1524*; holo: ?P *n.v.* The epithet alludes to the contiguous lobes of the fronds.

Blechnum sp. aff. *oceanicum* (Rosenst.) Brownlie; A.N.Rodd & J.Pickard, *Cunninghamia* 1: 268 (1983).

[*Lomaria attenuata auct. non* (Sw.) Willd.: G.Bentham, *Fl. Austral.* 7: 736 (1878), *et sensu aliorum*]

[*Blechnum attenuatum auct. non* (Sw.) Mett.: W.W.Watts, *Proc. Linn. Soc. New South Wales* 37: 397 (1913); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 116 (1917)]

Illustration: C.J.Goudey, *Austral. Fern J.* 1: [6] t. 9 (1984).

Climbing epiphyte fern. Rhizome long, covered with dense, narrowly lanceolate scales; scales c. 1.5 cm long, with a long fine apex. Fronds dimorphic, 0.5–2 cm apart on rhizome; stipe 5–10 cm long, with a few scattered, narrow scales. Sterile fronds erect, not geniculate; lamina pinnate, overall outline narrowly lanceolate, 30–50 cm or more long, 5–12 cm broad, glabrous or a few narrow scales beside midrib beneath; base with gradually reduced pinnae; pinnae 30–40 pairs, borne at an angle of 45°–60° to midrib, not overlapping, narrowly elongate-triangular, sometimes somewhat falcate, (2.5–) 3–7 cm long, 0.5–1 cm broad at base, diminishing gradually to a long-acute apex, with bases entire; veins distinct below, usually forked once. Lamina of fertile fronds pinnate; pinnae 40–50 pairs, narrowly linear, 4–10 cm long. Fig. 107H–J.

Lord Howe Is. Frequent in the cloud-forest on the summits of Mts Gower and Lidgbird. Also known from New Caledonia.

L.H.Is.: top of Mt Gower, *P.S.Green 1601* (A, K, NSW); *loc. id.*, *C.Moore 14* (K); summit plateau of Mt Gower, *J.C.Game 65/1/s.n.* (K); summit of Mt Lidgbird, *C.Moore 82* (K); cliff above middle of Erskine Valley, Mt Lidgbird, *A.N.Rodd 1776* (NSW).

The New Caledonian plants tend to be larger and bear pinnae which are more parallel sided.

5. **Blechnum howeanum** T.C.Chambers & P.A.Farrant, *Telopea* 5: 331 (1993)

T: Lord Howe Island, *A.N.Rodd 3700*; holo: NSW *n.v.*, *fide* T.C.Chambers & P.A.Farrant, *loc. cit.* Named after the island to which it is endemic.

Blechnum sp. aff. *wattsii* Tindale: A.N.Rodd & J.Pickard, *Cunninghamia* 1: 268 (1983).

Blechnum sp. aff. *capense* (L.) Schltdl.: C.J.Goudey, *Austral. Fern J.* 1: [8 & 10] (1984).

[*Lomaria capensis auct. non* (L.) Willd.: G.Bentham, *Fl. Austral.* 7: 737 (1878), *p.p.*, *et sensu aliorum*]

[*Blechnum capense auct. non* (L.) Schltdl.: W.W.Watts, *Proc. Linn. Soc. New South Wales* 37: 397 (1913); W.R.B.Oliver, *Trans. & Proc. New Zealand Inst.* 49: 122 (1917)]

Illustration: T.C.Chambers & P.A.Farrant, *Telopea* 5: 332, fig. 2 (1993).

Terrestrial fern. Rhizome creeping or shortly erect; apical scales dense, to 2.5 cm long, reddish-brown, acuminate. Fronds dimorphic; stipe to 45 cm long, scaly; scales with a basal black spot, dense and similar to those on rhizome for c. 8 cm from base, diminishing in size and density up stipe. Lamina of sterile fronds pinnate, linear to lanceolate or deltoid in outline, to 70 cm long, to 40 cm broad, with a few, scattered narrow scales; pinnae 24 pairs, often overlapping, narrowly lanceolate, 15–20 cm long, 2–2.5 cm broad, auriculate-hastate, serrulate-crenulate, long-acuminate; veins numerous and unbranched; basal pinnae reduced to auricles. Lamina of fertile fronds pinnate; pinnae narrowly linear, to 20 cm long, auriculate with auricles diminishing in size up the rachis, finely laciniate. Fig. 107G.

Lord Howe Is. Endemic. Grows in shaded montane forest, especially on the summits of Mts Gower and Lidgbird.

L.H.Is.: near Dinner Run, *J.Pickard 3621* (NSW); SE side of Mt Lidgbird, *A.C.Beauglehole 5397* (MEL); S of Goat House, *J.Pickard 3436* (NSW); summit of Mt Gower, *P.S.Green 1659* (A); *loc. id.*, *J.C.Game 1/16B* (BM, NSW).

This species is a member of the widespread and complex *B. capense* (Willd.) Schltdl. aggregate, and related to a number of species in this group from New Zealand and Australia.

6. Blechnum fullagarii (F.Muell.) C.Chr., *Index Filic.* 154 (1905)

Lomaria fullagarii F.Muell., *Fragm.* 8: 157 (1874), as *fullageri*. T: Lord Howe Island, *Lind & J.P.Fullagar*; holo: MEL; iso: K. Named after James Fullagar (fl. 1866), who collected on Lord Howe Is. for the Royal Botanic Gardens, Melbourne.

Lomaria auriculata Baker in W.J.Hooker & J.G.Baker, *Syn. Fil.* 2nd edn, 481 (1874), *non* Desv. (1811), *nom. illeg.* T: [Mt Gower], Lord Howe Island, *C.Moore* [15]; holo: K.

Illustration: C.J.Goudy, *Austral. Fern. J.* 1: [5] t. 8 (1984).

Terrestrial or lithophytic fern. Rhizome prominent; apical scales narrow, twisted, c. 1.5 cm long, long-pointed. Fronds dimorphic, clustered; stipe 5–10 cm long, with dense setose hairs and narrow scales, especially towards base. Lamina of sterile fronds pinnate or deeply pinnatifid, elliptic in outline, 30–50 cm long, 8–14 cm broad, with dense, dark brown, setose hairs on rachis and costae, scattered below; pinnae 15–25 pairs, entire, blunt at apex, often contiguous or sometimes overlapping slightly; longest pinnae 5–7 cm long, 1.2–2 cm broad in the middle; basal pinnae gradually reduced in length; veins mostly forked twice; pinnae in lower half of frond auriculate; upper pinnae ±adnate. Lamina of fertile fronds pinnate; pinnae 15–20 pairs, linear, 3–6 cm long. Sori continuous, indusiate when young. Fig. 107D–F.

Lord Howe Is. Endemic and confined to the cloud-forest on the top of Mt. Gower.

L.H.Is.: near the top of Mt Gower, *C.Moore 3* (K); Mt Gower plateau, *J.C.Game 69/235* (K); summit of Mt Gower, *J.Pickard 3602* (NSW); top of Mt Gower, 1911, *W.W.Watts* (BRI, NSW); *loc. id.*, *J.C.Game 65/1/ s.n.* (K); *loc. id.*, *C.Moore 15* (K).

Doubtful record

Blechnum discolor (G.Forst.) Keys was recorded from Norfolk Is. by J.H.Maiden (*Proc. Linn. Soc. New South Wales* 28: 732, 1904), and earlier by G.Bentham (*Fl. Austral.* 7: 735, 1878) (as *Lomaria discolor* (G.Forst.) Willd.), but R.M.Laing records (*Trans. & Proc. New Zealand Inst.* 47: 13, 1915) that J.H.Maiden had subsequently come to the opinion that this identification was erroneous.

2. DOODIA

Doodia R.Br., *Prodr.* 151 (1810); named after Samuel Doody (1656–1706), an apothecary of London, who was an early worker on cryptogamic plants.

Type: *D. aspera* R.Br.

Terrestrial. Rhizomes short, erect or suberect with persistent stipe bases and brown, or almost black, scales. Fronds all similar or dimorphic, pinnatifid to pinnate, usually hard textured, with sharply toothed margins; veins forked, connected by short, cross veinlets. Sori borne on outer veinlets, not marginal, oblong to somewhat linear, discrete or sometimes coalescing; indusia opening towards midrib.

A genus of c. 12 species found from Sri Lanka, Java and Papua New Guinea to Australia, New Zealand and the Pacific islands. Three species native to Lord Howe Is, with 2 of these also present on Norfolk Is.

G.Bentham, Filices, *Doodia*, *Fl. Austral.* 7: 740–742 (1878); B.S.Parris, *The Genus Doodia* R.Br. (Blechnaceae: Filicales) in New Zealand, *New Zealand J. Bot.* 10: 585–604 (1972).

1 Lower pinnae adnate to rachis by a broadened base; stipe and rachis with tubercles and scales glabrescent **1. D. aspera**

1: Lower pinnae attached to rachis by an unexpanded base or shortly stalked; stipe and rachis pubescent

2 Pinnae in middle ⅓ of frond partly or completely adnate to rachis **2. D. media**

2: Pinnae in middle ⅓ of frond stalked **3. D. caudata**

1. **Doodia aspera** R.Br., *Prodr.* 151 (1810)

T: Port Jackson, Australia, *R.Brown*; holo: BM. The epithet is derived from the Latin *asper* (rough), in allusion to the rough stipe and rachis.

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 132, fig. 154 (1981); D.L.Jones, *Encycl. Ferns* 325 (1987); P.J.Brownsey & J.C.Smith-Dodsworth, *New Zealand Ferns & Allied Pl.* 151, fig. 193, t. 35A–B (1989).

Rhizome covered with blackish scales. Fronds: stipe and rachis with narrow, blackish, caducous scales leaving harsh tubercles when shed, usually glabrescent; fertile and sterile fronds similar, pinnate, 15–40 cm long, erect, harsh; pinnae, except sometimes the lowest pair, adnate to rachis by a broadened base; longest pinnae 1–7 cm long; terminal lobe 2–4 cm long. Sori in 1 or 2 rows on each side of midrib; indusia usually pushed to one side.

Norfolk Is., Lord Howe Is. According to B.S.Parris, *New Zealand J. Bot.* 10: 590 (1972), it has been recorded from the Islands, but no material was cited. It was also recorded for Norfolk Island by J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 733 (1904) and by R.M.Laing, *Trans. & Proc. New Zealand Inst.* 49: 13 (1915). However, the presence of this species on the Islands needs confirmation. It is known from Australia and the North Is. of New Zealand.

2. **Doodia media** R.Br., *Prodr.* 151 (1810)

Doodia caudata var. *media* (R.Br.) Benth., *Fl. Austral.* 7: 742 (1878). T: Endeavour River, Queensland, *J.Banks & D.Solander*; holo: BM. The epithet comes from the apparent mid position of this species in the three described by Robert Brown.

[*Doodia kunthiana auct. non* Gaudich.: S.F.L.Endlicher, *Prodr. Fl. Norfolk.* 11 (1833)]

[*Doodia lunulata auct. non* R.Br. ex E.J.Lowe: E.J.Lowe, *Ferns* 4: 75 (1859)]

[*Doodia media* var. *kunthiana auct. non* (Gaudich.) Maiden: J.H.Maiden, *Proc. Linn. Soc. New South Wales* 28: 733 (1904), *p.p.*]

[*Doodia caudata auct. non* (Cav.) R.Br.: R.M.Laing, *Trans. & Proc. New Zealand Inst.* 49: 13 (1915)]

[*Doodia media* subsp. *australis auct. non* Parris: A.N.Rodd & J.Pickard, *Cunninghamia* 1: 268 (1983)]

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 135, figs 159, 160a (1981); D.L.Jones, *Encycl. Ferns* 327 (1987); S.B.Andrews, *Ferns Queensland* 103, fig. 7.8A (1990).

Rhizome densely covered with black scales. Fronds pubescent: stipe and rachis with narrow, dark brown scales, especially towards base, pubescent; fertile and sterile fronds similar (or fertile pinnae narrower), pinnate, 10–50 cm long, harsh, erect or inclined; pinnae in lower 1/3 of frond shortly stalked; pinnae in middle 1/3 of frond partly or completely adnate by an unwidened base to rachis, longest pinnae 1–5 cm long; terminal lobe 1–5 cm long. Sori oblong to elongate, in 1 (sometimes 2) rows on each side of midrib, discrete or coalesced laterally; indusia linear, often obscured.

Norfolk Is., Lord Howe Is. Common in low forest. Also known from eastern Australia and New Caledonia.

N.Is.: SW lower slopes of Mt Pitt, *P.S.Green 2404* (K); Anson Bay Rd, *W.R.Sykes NI 18* (CHR); SE side of Mt Bates, *R.J.Chinnock NK40* (CHR). **L.H.Is.:** E side of Mt Gower, *C.Moore 13* (K); N slope of Mt Lidgbird, *R.D.Hoogland 8764* (CANB, NSW); Goat House, *A.C.Beauglehole 5976* (NSW).

The Norfolk Is. (and Lord Howe Is.?) plants differ slightly from those from both Australia (subsp. *media* and subsp. *australis* Parris) and New Zealand (subsp. *australis*) in that the transition from stalked to adnate pinnae takes place relatively abruptly, but near the base of the frond (and in this they resemble much of the material from New Caledonia). However, this does not seem a sufficient basis for nomenclatural distinction.

3. **Doodia caudata** (Cav.) R.Br., *Prodr.* 151 (1810)

Woodwardia caudata Cav., *Descr. Pl.* 264 (1801). T: Australia, *M.Née*; holo: ?M *n.v.* The epithet comes from the Latin *cauda* (a tail), in allusion to the long, terminal lobe to the fronds.

Illustrations: D.L.Jones & S.C.Clemesha, *Austral. Ferns & Fern Allies* 2nd edn, 133, fig. 155 (1981); D.L.Jones, *Encycl. Ferns* 326 (1987); P.G.Wilson in G.J.Harden, *Fl. New South Wales* 1: 61 (1990).

Rhizome densely covered with brown scales. Fronds harsh textured, pinnate, dimorphic; stipe with a few brown scales, especially towards base; rachis without scales, pubescent. Sterile fronds inclined or somewhat prostrate, 5–15 cm long; lower and middle pinnae shortly stalked; longest pinnae 3–15 cm long; terminal lobe 1.5–6.5 cm long. Fertile fronds erect, 10–30 cm long; longest pinnae 5–20 cm long. Sori in a single row, elongate, often coalesced laterally, parallel to costae; indusium elongate. *Small Raspfern*.

Lord Howe Is. Inhabiting rock crevices in montane forest. Also known in Australia from Qld to Tas.

L.H.Is.: E slopes of Mt Lidgbird, *P.S.Green 1692* (A, K); S face of Mt Lidgbird, *J.C.Game 69/270* (K); Erskine Valley, *A.C.Beauglehole 5399* (MEL); *loc. id.*, *P.S.Green 2337* (K); Potato Hills, S end of Little Slope, *J.Pickard 2761* (NSW).

The closely related *D. mollis* Parris comes from the North Is., New Zealand, and *D. gracilis* Copel. from New Caledonia.

Doubtful record

Doodia caudata was recorded from Norfolk Is. by S.F.L.Endlicher in 1833 (*Prodr. Fl. Norfolk.* 11), but the record has never been repeated or confirmed.

APPENDIX

New taxa and lectotypifications

New taxa and lectotypifications occurring in this volume of the *Flora of Australia* are formally published here. Taxa are arranged in the order they appear in the text. For economy the entries are brief; the treatment in the main text is more comprehensive. Accepted names are in **bold**, basionyms and synonyms in *italic*. The date of publication of this Volume will be given in Volume 55.

APOCYNACEAE

PARSONSIA

J.B. Williams

Parsonsia howeanna J. Williams, *sp. nov.*

P. straminea (R.Br.) F.Muell. affinis, a qua seminibus praeditis numerosis prominentibus linearibus porcis, caulibus adventitiis haerentibus radicibus desunt, capsulibus brevioribus latioribusque, 6–12 cm longis, 1–2 cm latis, foliis juvenilibus folii adulti similibus sed aliquantum magnioris, viridis non cordatis, foliis adultis parvioris subtus viridis epapillosis, basi obtusis vel fere acutis, corollae plerumque aurantiacae, lobis non nisi basi barbatis differt.

T: Dawsons Point, Lord Howe Island, 18 Sept. 1963, *A.C.Beauglehole 5792*; holo: CANB; iso: MEL.

Endemic on Lorde Howe Island, where it is a common vine in forests. The specific epithet refers to its occurrence on Lord Howe Island and its restriction to that location.

M.Pichon, *Nat. Syst.* 14: 13 (1950) included this species in his var. *glabrata* of *P. straminea* (R.Br.) F.Muell. The two taxa both have corolla lobes that are glabrous inside except at the base, but *P. howeana* differs from *P. straminea* by the characters described above. It has stems lacking adventitious clinging roots, juvenile leaves larger than but resembling the adult leaves, adult leaves that are smaller than those of *P. straminea*, green and epapillate below, with a rounded or almost acute base, a usually orange corolla, a shorter, broader capsule, and seeds covered by raised linear ridges.

Parsonsia straminea var. *glabrata* Pichon occurs in coastal Queensland and New South Wales but is absent from Lord Howe Island.

P.S.Green (*Kew Bull.* 45: 235, 1990), proposed a Fullagar specimen, collected on Lord Howe Island, as lectotype of *P. straminea* var. *glabrata*, but he overlooked the citing by Pichon of Dallachy's specimen from Rockingham Bay, North Queensland, as the type of the variety. Hence a lectotype was not needed for *P. straminea* var. *glabrata*. As I consider the Lord Howe population of *Parsonsia* to comprise a distinct species it requires a new name and the designation of a type, which I have provided above.

APPENDIX

ASTERACEAE

SENECIO

R.Belcher

Senecio elegans L., *Sp. Pl.* 2: 869 (1753)

T: cultivated, seed from South Africa; lecto: Herb. Clifford 406, *Senecio* 4, here lectotypified.

POLYPODIACEAE

PHYMATOSORUS

Mary D.Tindale & P.S.Green

Phymatosorus pustulatus (G.Forst.) Large, Braggins & P.S.Green (as *Phymatosorus pustulatum*), *New Zealand J. Bot.* 30: 207 (1992)

subsp. **howensis** Tindale & P.S.Green *subsp. nov.*

A subsp. *pustulato* soris in lamina profunde inclusis et submarginalibus vel ad ⅓ distantiae a margine foliorum locatis, frondibus plerumque robustioribus et vulgo pinnatisectis saepe 10–14-jugis, rhizomatis squamis latioribus (1.5–3.3 mm non 1–2 mm latis) et abrupte acuminatis differt.

T: Lord Howe Island, Transit Hill, in undergrowth of low forest on summit, alt. c. 400 ft, Oct. 1963, *R.D.Hooglund 8673*; holo: NSW; iso: CANB.

Endemic to Lord Howe Island, to which the subspecific epithet '*howensis*' refers.

Phymatosorus pustulatus subsp. *pustulatus s. lat.* occurs in eastern Australia, Norfolk Island, New Zealand, the Kermadec Islands and Chatham Island.

GLOSSARY

This glossary is an expansion of that provided in Vol. 1 of the Flora of Australia (Alison McCusker, 1981) to include those additional terms appearing in the supplementary glossary of volumes published before 1994 (excluding vol 54). It is included here because this and Vol. 50 comprise a subset of the Flora of Australia which will often be used in isolation from the rest of the series.

Specialist glossaries for non-vascular plants will be provided in the introductory volumes for each subseries (Bryophytes, Lichens, Algae, Fungi)

abaxial: *of the side or surface of an organ*, facing away from the axis. *cf.* **adaxial**.

abscission: the normal shedding from a plant of an organ that is mature or aged, *e.g.* a ripe fruit, an old leaf. adj. **abscissile**.

acarodomatia: domatia adapted to provide shelter to beneficial mites.

accessory fruit: a fruit, or group of fruits derived from one flower, in which the conspicuous, fleshy portion develops from the receptacle and is shed with the true fruit(s) attached.

accrescent: increasing in size with age, as the calyx of some plants after flowering.

accumbent: *of the orientation of an embryo*, with the radicle lying against the edges of the two cotyledons.

achene: a dry, indehiscent fruit formed from a superior ovary of one carpel and containing one seed which is free from the pericarp (often applied, less correctly, to the one-seeded fruits of Asteraceae). *cf.* **cypsela**.

acicle: a slender, stiff, needle-like prickle. adj. **acicular**.

aciculate: finely scored on the surface, as if scratched by a pin.

acropetal: arising or developing in a longitudinal sequence beginning at the base and proceeding towards the apex. *cf.* **basipetal**.

acrostichoid: *of sporangia*, densely covering the abaxial surface of the fertile frond, *i.e.* not in distinct groups; *of ferns*, having the sporangia arranged as above.

actinomorphic: *of flowers*, symmetrical about more than one vertical plane. *cf.* **zygomorphic**.

aculeate: prickly.

acumen: a long, tapering point.

acuminate: tapering gradually to a protracted point.

acute: terminating in a distinct but not protracted point, the converging edges separated by an angle less than 90°.

adaxial: facing towards the axis. *cf.* **abaxial**.

adnate: fused to an organ of a different kind, *e.g.* applied to a stamen fused to a petal.

adventitious: arising in abnormal positions, *e.g.* roots arising from the shoot system, buds arising elsewhere than in axils of leaves.

adventive: introduced recently, in particular since colonisation by man. *cf.* **introduced.**

aerenchyma: tissue incorporating large, gas-filled spaces interspersed with the cells in a characteristic pattern.

aerophore: a small patch of aerating tissue on the stipe below a pinna-base, becoming much-enlarged in some species; a pale ±raised line, overlying aerating tissue, running along each side of a stipe.

aestivation: the arrangement of sepals and petals or their lobes in an unexpanded flower bud. *cf.* **vernation**.

aggregate fruit: a cluster of fruits formed from the free carpels of one flower. *cf.* **syncarp.**

albumen: = **endosperm**.

allopatric: *of two or more species*, having different ranges of distribution. *cf.* **sympatric**.

alternate: *of leaves or other lateral organs*, borne singly at different heights on the axis; *of floral parts*, on a different radius, *e.g.* describing the position of stamens with respect to petals. *cf.* **opposite.**

alveolate: pitted or honeycombed on the surface.

amplexicaul: *of a leaf base*, stem-clasping.

anastomosis: fusion to form a network *e.g.* of veins in a leaf blade.

anatropous: *of an ovule*, inverted so that the micropyle faces the placenta.

androdioecious: having bisexual flowers and male flowers, on separate plants.

androecium: the stamens of one flower collectively.

androgynophore: a stalk bearing both the androecium and gynoecium of a flower above the level of insertion of the perianth.

androgynous: having male and female flowers in the same inflorescence.

andromonoecious: having bisexual and male flowers on the same plant.

androphore: a stalk bearing the androecium.

anemophilous: pollinated by wind.

angiosperm: a seed-bearing plant whose ovules, and hence seeds, develop within an enclosed ovary. *cf.* **gymnosperm**.

angustiseptate: with narrow partitions, *cf.* **latiseptate.**

annual: a plant whose life span ends within one year after germination.

annular: arranged in or forming a ring.

annulus: a ring; *in ferns*, the elastic ring of cells, forming part of the sporangium wall, that initiates dehiscence.

anterior: *of floral organs*, on the side of the flower farthest from the axis. *cf.* **posterior**.

anther: the pollen-bearing part of a stamen. *cf.* **filament**.

antheridium: the fertile organ of a male gametophyte or the male organ of a bisexual gametophyte, in which male gametes are formed.

anthesis: the time of opening of a flower.

anthocarp: a false fruit consisting of the true fruit and the base of the perianth, as in Nyctaginaceae.

antipetalous: inserted in front of the petals; opposite the petals.

antisepalous: inserted in front of the sepals; opposite the sepals.

antrorse: directed forwards or upwards. *cf.* **retrorse**.

apetalous: without petals.

apical: *of a placenta*, at the top of the ovary.

apiculate: terminating in a short, sharp, flexible point.

apiculum: a short, abrupt, flexible point, adj. **apiculate.**

apocarpous: *of a gynoecium*, consisting of two or more carpels which are free from one another or almost so.

apomict: a plant that produces viable seed without fertilisation.

appendage: a structure arising from the surface or extending beyond the tip of another structure.

appressed: pressed closely against but not united with.

aquatic: living in or on water for all or a substantial part of the life span (generally restricted to fresh/inland waters).

arborescent: resembling a tree (applied to non-woody plants attaining tree height and to shrubs tending to become tree-like in size). *cf.* **dendroid**.

arcuate: curved like a bow.

areole: a space between the threads of a net; *in Cactaceae*, a cluster of hairs/spines/bristles borne at the node of a leafless stem; *in Mimosaceae (for example)*, a distinct, oblong or elliptical area on the face of a seed, bounded by a fine line; *in ferns*. adj. **areolate**.

aril: a structure partly or wholly covering the testa of a seed and formed by expansion of the funicle. adj. **arillate**.

aristate: having a stiff, bristle-like awn or tip.

aristulate: having a small awn.

article: a segment of a jointed stem or of a fruit with constrictions between the seeds.

articulate: jointed; having joints where separation may occur naturally; *of a stem*, having nodes.

ascending: growing erect after an oblique or semi-horizontal beginning.

asexual: not forming part of a cycle which involves fertilisation and meiosis.

asperulate: slightly rough to the touch.

attenuate: tapering gradually.

auricle: an ear-shaped appendage at the base of a leaf, leaflet or corolla lobe. adj. **auriculate**.

autochthonous: *of the inhabitants of a region*, original; earliest known; (applied to an element of the Australian flora rich in endemics and believed to have been evolving in Australia for a long period of time).

autotrophic: independent of other organisms in respect of organic nutrition; able to fix carbon dioxide, by photosynthesis, to form carbohydrates.

awn: a bristle-like appendage, *e.g.* on the tip or back of the lemma of a grass floret.

axil: the angle between a leaf or bract and the axis bearing it. adj. **axillary**.

axile: on an axis; *of a placenta*, on the central axis of the ovary.

axis: a stem, (commonly used for the main stem of a whole plant or of an inflorescence).

baccate: berry-like; *of seeds*, having a succulent or pulpy testa; *of fruits*, having the seeds embedded in pulp.

barbellae: short, straight, stiff hairs or barbs.

barbulae: in *Scaevola*, outgrowths on the margin of the wings or in the throat of the corolla; they may be simple or have apical hairs or papillae.

basal: at the base; *of a placenta*, at the base of the ovary.

basifixed: attached at or by the base, *e.g. of anthers*, by the base of the connective.

basipetal: developing, in sequence, from the apex towards the base. *cf.* **acropetal**.

basiscopic: pointing towards the base (applied to the first lateral vein of a leaflet on the side nearer the leaf base).

bathyphyll: a leaf at the base of a stem with the function of attachment to a substrate.

beak: a prominent terminal projection, especially of a carpel or fruit.

berry: a fleshy or pulpy indehiscent fruit with the seed(s) embedded in the fleshy tissue of the pericarp. *cf.* **drupe**, **pyrene**.

biennial: a plant whose life span extends for more than one but less than two years after germination.

bifacial: *of leaves*, flat or channelled with distinct adaxial and abaxial surfaces.

bifid: divided, for about half the length, into two parts. *cf.* **bipartite**.

bifoliate: *of plants*, having two leaves.

bifoliolate: *of leaves*, having two leaflets.

bigeminate: in two pairs; in pinnate leaves referring to only two pairs of pinnae.

bilabiate: two-lipped, *e.g.* of a corolla in which fusion of an anterior group and a posterior group of petals extends beyond the top of the corolla tube.

bilamellate: consisting of two plates or lamellae.

bilocular: having two cavities.

bipartite: divided, nearly to the base, into two parts. *cf.* **bifid**.

bipinnate: *of leaves*, twice pinnately divided. *cf.* **pinnate**, **tripinnate**.

biseriate: arranged in two rows or whorls.

bisexual: bearing both male and female organs together, *e.g.* on the same gametophyte or in the same flower.

biternate: twice ternate, the three pinnae each divided into three pinnules.

blade: the expanded part of a leaf or petal. *cf.* **lamina**, **limb**.

bole: the trunk of a tree, below the lowest branch. *cf.* **canopy**.

brachyblast: a short branch; a spur shoot.

bract: a leaf-like structure, different in form from the foliage leaves and without an axillary bud, associated with an inflorescence or flower.

bracteole: a small bract-like structure borne singly or in pairs on the pedicel or calyx of a flower.

broom-like: with many branches parallel or almost so and usually erect, as in *Spartium* (Spanish broom).

bulb: a storage organ, usually underground, made up of a stem and leaf bases, the food reserves being stored in the inner, fleshy leaf bases.

bulbel (=**bulblet**)**:** a bulb arising from another bulb.

bulbil: a small, deciduous bulb (or tuber) formed in the axil of a leaf or replacing flowers in an inflorescence, and functioning to propagate the plant vegetatively.

bullate: surface blistered or puckered; *of a leaf surface* prominently raised between veins.

burr: a rough or prickly propagule consisting of a seed or fruit and associated floral parts or bracts.

buttress: a flange of tissue protruding from the base of the main trunk of a tree.

caducous: falling off early.

caespitose: growing in tufts.

calli: small outgrowths in the throat of the corolla (acting as tactile guides for pollinators).

callus: a protruding mass of hardened tissue, often formed after an injury but sometimes a regular feature of the plant, *e.g.* on the labellum of some orchids and the axis of the spikelet of some grasses. adj. **callose**.

calycine: belonging to the calyx; with a well-developed calyx.

calyptra: *in mosses*, a cap-like structure covering or partly covering the capsule and derived from the neck of the archegonium; *in a flower*, (= **operculum**), a cap covering the stamens and carpels in the bud and formed by fusion or cohesion of perianth parts.

calyx tube: a tube formed by fusion or cohesion of sepals. *cf.* **hypanthium**.

calyx: the sepals of one flower collectively.

campanulate: bell-shaped.

campylotropous: *of an ovule*, orientated transversely, *i.e.* with its axis at right angles to its stalk, and with a curved embryo sac.

canaliculate: with a longitudinal groove or channel.

canescent: more or less grey-pubescent, hoary.

canopy: the branches and foliage of a tree. *cf.* **bole**.

capillary: *of hairs etc*., very slender, hair-like.

capitate: *of an inflorescence*, with the flowers unstalked and aggregated into a dense cluster; *of a stigma*, globose, like the head of a pin.

capitellate: shaped like, or aggregated into, a very small head.

capitulum: a dense cluster of sessile flowers. adj. **capitate**.

capsule: a dry fruit formed from two or more united carpels and dehiscing at maturity to release the seeds.

carinate: keeled.

carpel: an organ (generally believed to be a modified foliar unit) at the centre of a flower, bearing one or more ovules and having its margins fused together or with other carpels to enclose the ovule(s) in an ovary, and consisting also of a stigma and usually a style.

carpophore: *in ferns*, the stalk of a sporocarp; *in a fruit*, the stalk of a mericarp.

caruncle (= strophiole): an outgrowth of a seed coat, near the hilum.

caryopsis: a dry, indehiscent, one-seeded fruit in which the seed coat is closely fused to the fruit wall (characteristic of grasses).

cataphyll: a scale leaf associated with a vegetative part of a plant, *e.g.* rhizome, perennating bud.

catkin: a spike in which the flowers are unisexual and without conspicuous perianth.

caudate: having a narrow tail-like appendage.

caudex: a thick, erect trunk, especially of cycads.

caudicle: a thread to which a pollen mass is attached in Orchidaceae and Asclepiadaceae.

cauliflorous: see **cauline**.

cauline: *of leaves*, borne on an aerial stem; *of flowers or fruits*, (= **cauliflorous**) borne on old wood.

cell: the basic unit of plant structure consisting, at least when young, of a protoplast surrounded by a wall.

centrifugal: directed, or developing, from the centre or axis outwards.

centripetal: directed, or developing, from the outside towards the centre or axis.

chaff: thin, membranous scales or bracts; thin, dry unfertilised ovules among the fully developed seeds of a fruit.

chalaza: the part of an ovule to which the end of the stalk (funicle) is attached.

chartaceous: papery.

chasmogamous: *of flowers*, pollination effected in open flower. *cf.* **cleistogamous**.

chlorophyll: pigment(s) constituting the green colouring matter of plants and absorbing radiant energy in photosynthesis.

chromosome: a thread-like structure in the nucleus of a cell, containing a linear sequence of genes.

cilia: *in unicellular plants, gametes, spores etc.*, minute hair-like protoplasmic protrusions whose movement confers motility on the cell; *in higher plants*, hairs more or less confined to the margins of an organ. sing. **cilium**; adj. **ciliate**.

ciliolate: minutely ciliate.

cincinnus: a monochasial, cymose inflorescence with flowers arising alternately from one side of an axis then the other.

cinereous: ash-grey, as of wood ash.

circinnate (= circinate): spirally coiled, with the tip innermost.

circumsciss: (to) break open along a transverse line around the circumference. adj. **circumscissile**.

cladode: the photosynthetic stem of a plant whose foliage leaves are absent or much reduced. *cf.* **phyllode**.

cladophyll: a flattened, leaf-like photosynthetic stem not bearing leaves or scales. *cf.* **phylloclade**.

class: a major taxonomic rank, between **order** and **division**.

clathrate: latticed or pierced with apertures like a trellis.

clavate: club-shaped.

claw: a narrow, stalk-like basal portion of a petal, sepal or bract.

cleistogamous: *of flowers*, self-pollinating and setting fertile seed but never opening.

clone: a set of organisms produced from one parent by vegetative reproduction.

coccus: a one-carpel unit of a schizocarp or lobed fruit, becoming separate at maturity. pl. **cocci**.

cochlear: *of the arrangement of corolla lobes in a bud*, a variant of imbricate aestivation.

cochleate: coiled like a snail-shell.

cohesion: the sticking together of floral parts of the same whorl without organic fusion. adj. **coherent**.

collateral: situated side by side; adjacent and on the same radius of an axis.

colliculate: covered with small, rounded or hillock-like elevations (**colliculae**).

colporate: *of a pollen grain*, having both an elongated and a rounded aperture. *cf.* **porate**.

columella: the central axis of a moss capsule; *sometimes applied to* the central axis of fruits and cones.

column: the lower part of an awn in grasses, when distinctly different in form from the upper part; (=**gynostemium**), a structure in Orchidaceae, Asclepiadaceae and Stylidiaceae, extending above the ovary of a flower and incorporating stigma, style and stamens.

coma: a tuft, especially of hairs on a seed. adj. **comose**.

commissure: a join or seam; the interfacing of two fused carpels in an ovary.

complicate: *of leaves*, the lamina (or part of the lamina) folded upon itself.

compound: *of a leaf*, having the blade divided into two or more distinct leaflets; *of an inflorescence*, made up of an aggregate of smaller inflorescences.

compressed: flattened in one plane, either dorsally (bringing the front and back closer together) or laterally (bringing the sides closer together).

concolorous: coloured uniformly; the same colour on both sides. *cf.* **discolorous**.

conduplicate: folded together, with the fold-line along the long axis (*e.g. of cotyledons in a seed*).

cone: *in gymnosperms and club-mosses*, a group of sporophylls arranged compactly on a central axis; (loosely) *in Casuarina*, a woody multiple fruit incorporating the bracts and bracteoles associated with the flowers.

conflorescence: a compound inflorescence consisting of two or more unit inflorescences, in which the main axis does not end in a flower but the axes of the branches do so.

connate: fused to another organ (or other organs) of the same kind.

connective: the part of an anther that connects the lobes.

connivent: coming into contact; converging.

contorted: see **convolute**.

convolute: *of the arrangement of corolla lobes in a bud*, a form of imbricate aestivation in which each segment has one edge overlapping the adjacent segment, like a furled umbrella.

cordate: *of a leaf blade*, broad and notched at the base; heart-shaped.

cordiform: shaped like a heart (in three dimensions).

coriaceous: leathery.

corm: a fleshy, swollen stem base, usually underground, in which food reserves are stored between growing seasons.

corniculate: bearing, or terminating in, one or more small horns.

corolla: the petals of a flower collectively.

corona: a ring of tissue arising from the corolla, perianth or filaments of a flower and standing between the perianth lobes and the stamens.

cortex: the region of a stem or root surrounding the vascular cylinder but inside the epidermis.

corymb: a racemose inflorescence in which the pedicels of the lower flowers are longer than those of the flowers above, bringing all flowers to about the same level.

costa: a rib; when single, a midrib or middle-nerve.

costule: the midvein of a pinnule.

cotyledon: the primary leaf (or one of two or more primary leaves) of an embryo.

crenate: with small, rounded teeth; scalloped.

crenulate: minutely scalloped.

crisped: curled.

crown: the part of a tree or shrub above the level of the lowest branch.

crownshaft: *in palms*, a conspicuous cylinder formed by the tubular base of leaf sheaths at the top of a stem.

crustaceous: brittle; *of marine algae*, encrusted with calcium carbonate.

cryptogam: (literally) a plant whose sexual reproductive parts are not conspicuous; a plant that produces spores, not seeds, in its sexual reproductive cycle, *e.g.* ferns, mosses, algae. *cf.* **phanerogam**.

cucullate: hooded; hood-shaped.

culm: an aerial stem; *in grasses, sedges, rushes, etc*., bearing the inflorescence.

cuneate: wedge-shaped.

cupule: a small cup.

cupuliform: nearly hemispherical, cupola-shaped.

curvinerved: with curved parallel veins.

cushion, floral: a swollen floral axis on which several small flowers are borne.

cuspidate: tapering into a sharp, rigid point.

cyathium: an inflorescence of unisexual flowers surrounded by a cup of involucral bracts, as in *Euphorbia*.

cyclic: *of floral organs*, several borne at the same level on the axis; whorled. *cf.* **spiral**.

cyme: an inflorescence in which each flower, in turn, is formed at the tip of a growing axis and further flowers are formed on branches arising below it.

cymule: a diminutive cyme, usually few-flowered.

cypsela: a dry, indehiscent, one-seeded fruit formed from an inferior ovary. *cf.* **achene**.

cystolith: a stalked structure growing from a cell wall into the cell cavity, encrusted with calcium carbonate.

deciduous: falling seasonally, *e.g.* of the leaves or bark of some trees.

declinate: bent downwards or forwards.

decompound: more than once compound.

decumbent: spreading horizontally but then growing upwards.

decurrent: extending downwards beyond the point of insertion, *e.g.* of a lamina extending downwards to form a flange along the petiole.

decurved: bent downwards from axis, attachment, or point of reference and curved or curled.

decussate: in pairs, with successive pairs borne at right angles to each other.

definite: of a constant number; *of stamens*, twice as many as the petals or sepals, or less; *of an inflorescence*, ending in a flower or an aborted floral bud.

deflexed: bent downwards. *cf.* **inflexed**.

dehiscent: breaking open at maturity to release the contents.

deltoid (=deltate): triangular with the sides of about equal length.

dendroid: tree-like in form but not in size. *cf.* **arborescent.**

dentate: toothed.

denticle: a small tooth; thick papillate tubercles on the margin of the interpetiolar stipules in *Coprosma* (Rubiaceae).

denticulate: finely toothed.

depressed: flattened as if pressed down from the top or end.

determinate: *of growth or branching*, with a bud or flower terminating the growth of the main axis; *of an inflorescence*, see **definite**.

diadelphous: having the stamens united into two groups, or all but one united in a group and one free.

diaphanous: extremely thin and transparent.

dichasium: a cymose inflorescence with opposite branching below the flower which terminates each axis. *cf.* **monochasium**.

dichlamydeous: *of a flower*, having two whorls of perianth parts.

dichotomous: forking into two equal branches resulting from division of the growing point.

diclinous: having the stamens and the carpels in separate flowers.

dicotyledon: a flowering plant whose embryo has two (rarely more) cotyledons (seed leaves). *cf.* **monocotyledon**.

didymous: borne in pairs; *of anthers*, having two lobes, with scarcely any tissue connecting them.

didynamous: *of stamens*, four in number, two being distinctly longer than the other two.

digitate: branching from the axis or stalk like the fingers of a hand.

dimidiate: halved, as when half an organ is so much smaller than the other that it seems absent.

dimorphic: of two different forms.

dioecious: having the male and female reproductive structures on separate plants. *cf.* **monoecious**.

diplecolobous: *of cotyledons in a seed*, twice folded transversely.

diploid: having two of the basic sets of chromosomes in the nucleus. *cf.* **haploid**, **polyploid**.

disc: a plate or rim of tissue, derived from the receptacle of a flower, occurring between whorls of floral parts.

discolorous: of different colours; *of leaves*, having the two surfaces different in colour; variegated. *cf.* **concolorous**.

dissepiment: a partition (septum) within an ovary or fruit, derived by fusion of adjacent carpels.

distal: remote from the point of origin or attachment. *cf.* **proximal**.

distichous: arranged in two rows on opposite sides of a stem and thus in the same plane.

diurnal: *of flowers*, opening only during daylight hours.

divaricate: widely spreading.

division: the major taxonomic rank within the Plant Kingdom. Alternate name for **phylum**.

domatia: small structures on the lower surface of a leaf in some woody dicotyledons, usually consisting of depressions, partly enclosed by leaf tissue or hairs, located in the axils of the primary veins. sing. **domatium**.

dorsal: *of a lateral organ*, (relating to the side) facing away from the axis, *i.e.* the 'back'; *of a thallus*, facing away from the substratum. *cf.* **ventral**.

dorsifixed: attached at or by the back.

dorsiventral: having structurally different upper and lower surfaces.

drupe: a succulent fruit formed from one carpel, having the seed(s) enclosed in an inner stony layer of the fruit wall. adj. **drupaceous** (which is often used to mean drupe-like but not strictly a drupe). *cf.* **berry, pyrene**.

duplicate: folded twice.

echinate: bearing stiff, stout, prickly hairs.

edaphic: pertaining to the soil.

eglandular: without glands.

elaiosome: an appendage of a seed, usually rich in oil, not essential for the viability of the seed but attractive to fauna (especially ants) as a food for larvae *etc*. and hence an aid to dispersal by such fauna.

elater: an elongated, spirally thickened, hygroscopic cell in the capsule of a liverwort, derived from sporogenous tissue and assisting in spore dispersal; an appendage to the spore of *Equisetum*.

elliptic: oval in outline, widest at the centre.

emarginate: having a broad, shallow notch at the apex.

embryo: a young plant contained within an archegonium or seed.

emersed: rooted in but rising above the surface of water *e.g.* leaves.

enation: an epidermal outgrowth.

endemic: having a natural distribution confined to a particular geographical region.

endocarp: the innermost layer of the wall of a fruit; *in a drupe*, the stony layer surrounding the seed.

endosperm: nutritive tissue in a seed, in angiosperms triploid and formed in the embryo sac after fertilisation, in gymnosperms haploid and derived from the sterile portion of the female gametophyte. *cf.* **perisperm**.

ensiform: sword-shaped.

entire: having a smooth margin, not dissected or toothed.

entomophilous: pollinated by insects.

ephemeral: short-lived.

epicalyx: a whorl of bracts, just below a flower, looking like a second calyx.

epicarp: the outer layer of the wall of a fruit, *i.e.* the 'skin'. Also known as the **exocarp**.

epicormic: *of buds, shoots or flowers*, borne on the old wood of trees (applied especially to shoots arising from dormant buds after injury or fire).

epicortical: on top of the bark, *i.e.* outside the bark.

epidermis: the outermost layer of cells of an organ, usually only one cell thick.

epigeal: *of germination*, having the cotyledon(s) emerging from the seed coat and becoming photosynthetic. *cf.* **hypogeal**.

epigynous: *of floral parts (especially stamens)*, attached above the level of insertion of the ovary, and arising from tissue that is fused to the ovary wall. *cf.* **hypogynous**, **perigynous**.

epipetalous: borne on the petals.

epiphyllous: growing on leaves, *e.g.* applied to vegetatively propagated plantlets in some Crassulaceae.

epiphyte: a plant growing on, but not parasitic on, another plant (often loosely applied to plants, such as orchids, that grow on vertical rock faces). *cf.* **parasite, saprophyte**.

episepalous: *of stamens*, borne on the sepals.

equilateral: *of stamens*, with anthers regularly spaced around the style.

equitant: *of leaves*, folded in half along the midline so that the adaxial surface disappears, and overlapping the edges of a similarly folded leaf on the opposite side of the stem (at least at the base).

eremean: pertaining to regions of low, irregular rainfall.

erose: *of a margin*, finely and irregularly eroded or incised.

eusporangiate: *of ferns*, having sporangia with walls more than one cell thick. *cf.* **leptosporangiate**.

evergreen: bearing green leaves throughout the year.

excentric: to one side; off centre.

exine: the outer layer of the wall of a pollen grain or spore.

exocarp: the outer layer or "skin" of a pericarp. Also known as the **epicarp**.

exserted: protruding, *e.g.* of stamens with respect to a corolla tube.

exstipulate: without stipules.

extra-floral: *of nectaries*, not within the flower.

extrastaminal: outside the stamens.

extravaginal: *of a shoot*, arising from an axillary bud which breaks through the sheath of the subtending leaf.

extrorse: *of anthers*, opening away from the centre of the flower. *cf.* **introrse**.

facultative: *of parasites*, optional. *cf.* **obligate**.

falcate: sickle-shaped.

family: a group of one to many genera believed to be related phylogenetically, usually clearly separable from other such groups.

farinaceous: containing starch grains; mealy; resembling flour.

fascicle: a cluster, adj. **fasciculate**.

favulariate: *of a surface*, finely ribbed, the ribs separated by zig-zag furrows.

fenestrate: having openings or translucent areas ('windows').

fertilisation: the union of male and female gametes.

filament: the stalk of a stamen; a thread one or more cells thick; *in blue-green Algae*, a trichome enclosed in a mucilaginous sheath. *cf.* **anther**.

filiform: thread-like.

fimbriate: *of a margin*, fringed with long slender hair-like processes (called **fimbriae**).

fimbrillate: minutely fimbriate.

fistular: hollow throughout its length.

flabellate: fan-shaped.

flaccid: limp; tending to wilt. *cf.* **turgid**.

flagelliform: long and very slender, like a whip-lash.

flexuous (= flexuose): bent from side to side in a zig-zag form.

floccose: bearing tufts of soft hairs or wool which tend to rub off and adhere in small masses.

floral: belonging to or associated with a flower.

floret: a grass flower, together with the lemma and palea that enclose it (often also applied to the small flowers in Cyperaceae and Asteraceae).

flower: the sexual reproductive structure of the angiosperms, typically consisting of gynoecium, androecium and perianth and the axis bearing these parts.

foliaceous: leaf-like.

follicle: a dry, dehiscent fruit formed from one carpel and dehiscing along the line of fusion of its edges.

forb: a non-woody plant other than a grass, sedge, rush, *etc*. *cf.* **herb**.

foveate: pitted.

free-central: placentation in which the ovules are borne on a free-standing central placenta within the ovary.

free: not fused or united (with other organs).

frond: a leaf especially of a fern, cycad or palm; a leaf-like portion of a non-vascular plant (*e.g.* a foliose alga).

fruit: the seed-bearing structure in angiosperms formed from the ovary after flowering.

frutescent: becoming shrub-like (woody).

fruticose: shrub-like.

fugacious: falling or withering away very early.

funicle (= funiculus): the stalk of an ovule.

fusiform: spindle-shaped, *i.e.* narrower at both ends than at the centre.

gamete: a cell or nucleus that fuses with another, of opposite sex, in sexual reproduction.

gametophyte: a plant, or phase of a plant's life cycle, that bears gametes.

gamopetalous (= sympetalous): with the petals united by their margins, at least at the base. *cf.* **polypetalous**.

gamophyllous: having the leaves or perianth segments united by their margins, at least at the base.

gamosepalous: having the sepals united by their margins, at least at the base.

gemmae: bud or bud-like organ capable of reproducing the plant.

geniculate: bent abruptly like a knee joint.

genotype: the total complement of hereditary factors (genes) acquired by an organism from its parents and available for transmission to its offspring. *cf.* **phenotype**.

genus: a group of species believed to be related phylogenetically and usually clearly separable from other such groups, or a single species without close relatives. pl. **genera**.

geophyte: a plant whose perennating buds are buried in the soil.

gibbous: with a large inflation or gibbosity on one side; usually refers to a corolla humped or swollen on one side.

glabrescent: becoming glabrous.

glabrous: without hairs.

gland: a structure, within or on the surface of a plant, with a secretory function.

glandular: bearing glands; functioning as a gland.

glaucous: blue-green in colour, with a whitish bloom (as in the juvenile leaves of many eucalypts).

globose: nearly spherical.

glochid: a barbed hair or bristle.

glomerule: a small compact cluster. adj. **glomerulate**.

glumaceous: glume-like, tending to be chaffy or membranous in texture.

glume: a bract in the inflorescence of a grass, sedge or similar plant.

grain: a fruit characteristic of grasses (= **caryopsis**); **pollen grain**, a microspore of a seed plant, or the partially developed gametophyte formed from it.

granulate: *of a surface*, granular.

gymnosperm: a seed plant with the ovules borne on the surface of a sporophyll. *cf.* **angiosperm**.

gynobasic: *of a style*, arising near the base of the gynoecium, *e.g.* between the lobes of the ovary.

gynodioecious: having bisexual flowers and female flowers, on separate plants. *cf.* **gynomonoecious**.

gynoecium: the carpels of a flower collectively.

gynomonoecious: having bisexual and female flowers on the same plant *cf.* **gynodioecious**.

gynophore: a stalk bearing the gynoecium above the level of insertion of the other floral parts.

gynostegium: the staminal crown in *Asclepias*, the stamens being fused to the gynoecium.

gynostemium: see **column**.

habit: the growth form of a plant, comprising its size, shape, texture and orientation.

habitat: the environment in which a plant lives.

half-inferior: *of an ovary*, partly below and partly above the level of attachment of the perianth and stamens.

halophyte: a plant adapted to living in highly saline habitats; a plant that accumulates high concentrations of salt in its tissues.

haploid: having a single set of chromosomes in the nucleus (*i.e.* having each gene locus represented only once).

hastate: spear-shaped; *of a leaf blade*, narrow and pointed but with two basal lobes spreading approximately at right angle.

haustorium: an absorbing organ through which a parasite obtains chemical substances from its host.

helicoid: coiled; *of a cymose inflorescence*, branching repeatedly on the same side.

hemiparasite: an organism which lives on and derives part of its nourishment from a different organism, and is partially self-supporting.

herb: any vascular plant that never produces a woody stem. *cf.* **forb**.

herbaceous: not woody; soft in texture.

hermaphrodite: = bisexual.

hesperidium: fleshy indehiscent fruit derived from a single pistil, with an outer leathery rind and septate interior (*e.g. Citrus*).

heteroblastic: having the adult parts of the plant (especially the leaves) distinctly different in form from the juvenile parts.

heterogamous: producing flowers of two or more kinds with respect to their fertile organs, *e.g.* male and female or bisexual and female. *cf.* **homogamous**.

heteromorphous (= heteromorphic): of two or more distinct forms.

heterosporous: producing separate male and female spores. *cf.* **homosporous**.

heterostylous: species in which flowers are similar except that the stigmas and anthers are held at different levels relative to each other, because style length differs between plants. *cf.* **homostylous**.

hilum: the scar on a seed coat at the place where it was attached to its stalk during development.

hirsute: bearing coarse, rough, longish hairs. *cf.* **villous**.

hispid: bearing stiff, bristly hairs.

hispidulous: minutely hispid.

hoary: covered with a greyish layer of very short, closely interwoven hairs.

holotype: a single specimen or illustration designated by the author of a plant (or animal) name, at the time of original publication, which fixes the application of the name; the 'voucher specimen' of a name.

homogamous: having flowers of only one kind. *cf.* **heterogamous**.

homosporous: producing only one kind of spore in the sexual reproductive cycle, and hence one gametophyte which produces both male and female gametes. *cf.* **heterosporous**.

homostylous: species in which the flowers have stigmas and anthers held at the same level relative to each other on all plants. *cf.* **heterostylous**.

host: an organism on which a parasite lives and by which it is nourished (also applied, loosely, to a plant supporting an epiphyte).

hyalescent: becoming translucent.

hyaline: translucent, almost like clear glass.

hybrid: an offspring of genetically different parents (in a Flora, usually applied where the parents are of different species).

hygroscopic: absorbing water and undergoing movements or changes brought about by changes in water content.

hypanthium: a cup or tube bearing floral parts above the base, and often above the top, of the ovary of a flower, *e.g.* in many Myrtales. *cf.* **calyx tube**.

hypocotyl: the part of the stem of an embryo or young seedling below the cotyledonary node.

hypodermis: a layer of cells below the epidermis.

hypogeal: *of germination*, having the cotyledon(s) remaining within the seed coat. *cf.* **epigeal**.

hypogynous: arising below the level of insertion of the ovary (often applied, loosely, to a *flower* in which the sepals, petals and stamens are inserted below the ovary). *cf.* **perigynous**, **epigynous**.

imbricate: *of perianth parts*, having the edges overlapping in the bud. *cf.* **valvate**.

imparipinnate: having an uneven number of pinnae, by virtue of having one terminal pinna. *cf.* **paripinnate**.

incised: cut deeply, sharply and often irregularly (an intermediate condition between toothed and lobed).

included: enclosed, not protruding.

incrassate: thickened; *of a pollen grain*, with thickened margins around the apertures.

incumbent: *of the orientation of an embryo*, with the cotyledons lying face to face and folded downwards beside the radicle; *of anthers*, lying against the inner face of the filament.

incurved: bent or curved inwards or upwards; of *leaf margins*, curved towards the adaxial surface.

indefinite: variable in number; numerous; *of stamens*, more than twice as many as the petals or sepals; *of an inflorescence*, not terminating in a flower (*i.e.* having a continuing, terminal growing point).

indehiscent: not opening at maturity.

indeterminate (= monopodial): *of growth*, the condition in which the terminal bud persists and produces successive lateral branches.

indumentum: the epidermal appendages, *e.g.* hairs or scales, collectively.

induplicate: folded inwards so that the outer faces of the margins are in contact.

indurated: hardened.

indusium: tissue covering the sorus of a fern; the pollen-cup of Goodeniaceae.

inferior: *of an ovary*, at least partly below the level of attachment of the other floral parts. *cf.* **superior**.

inflexed: bent sharply upwards or forwards. *cf.* **deflexed**.

inflorescence: the group or arrangement in which flowers are borne on a plant.

infraspecific: of lower taxonomic rank than species.

infructescence: the grouping or arrangement in which fruits are borne on a plant.

insectivorous: catching, and ostensibly feeding on, insects.

inserted (*on*): attached to; arising from.

integument: a covering; one of the outer layers of tissue of an ovule.

internode: the portion of a stem between the level of insertion of two successive leaves or leaf pairs (or branches of an inflorescence).

interpetiolar: *of stipules*, between the petioles of two opposite leaves. *cf.* **intrapetiolar**.

interrupted: *of an inflorescence*, having the flowers unevenly distributed along the axis, with conspicuous gaps.

intramarginal: situated inside but close to the margin, *e.g.* of a vein in a leaf.

intrapetiolar: between a petiole and the subtending stem. *cf.* **interpetiolar**.

introduced: not indigenous; not native to the area in which it now occurs. *cf.* **adventive**.

introrse: *of anthers*, dehiscing towards the centre of the flower. *cf.* **extrorse**.

involucre: a group of bracts enveloping a condensed inflorescence; a layer of tissue enveloping particular structures, *e.g.* an archegonium in Bryophyta, sporangia in Hymenophyllaceae.

involucel: involucre of bractlets surrounding a secondary inflorescence such as the base of an umbellule.

involute: rolled inwards; *of a leaf*, with the margins rolled towards the adaxial surface.

irregular: see **zygomorphic**.

isolateral (=isobilateral): having structurally similar upper and lower surfaces.

isotype: a specimen which is a duplicate of the holotype, *i.e.* part of the same collection.

juvenile: *of leaves*, formed on a young plant and different in form from the adult leaves.

karyoevolution: evolutionary change in the chromosome set, expressed as changes in number and gross structure of the chromosomes; (more broadly), evolutionary relationships between taxa as indicated by karyotype differences.

karyotype: the gross morphology of the chromosome set, described in terms of number, length, centromere position, *etc*.

keel: a ridge like the keel of a boat; *in particular*, a boat-shaped structure formed by fusion of the two anterior petals of a flower in Fabaceae.

keeled: *of leaves or bracts*, folded and ridged along the midrib.

labellum: a lip; *in Orchidaceae*, the distinctive median petal that serves as an alighting platform for pollinating insects, *in Zingiberaceae and Costaceae*, a usually showy petaloid structure, staminodal in origin.

laciniate: slashed into narrow, pointed lobes.

lacrymiform: tear-shaped, *i.e.* more or less ovoid or obovoid.

lacuna: a gap or cavity.

lamella: a thin, plate-like layer; **middle lamella**, the layer between the walls of two adjacent cells.

lamina: the blade of a leaf.

lanceolate: *of a leaf*, about four times as long as it is broad, broadest in the lower half and tapering towards the tip.

latex: a viscous fluid exuded from the cut surfaces of the leaves and stems of certain plants.

latiseptate: with broad partitions. *cf.* **angustiseptate.**

latrorse: turned sideways, *i.e.* not towards or away from axis; *of anthers*, opening laterally towards adjacent anthers.

leaflet: one of the ultimate segments of a compound leaf.

lectotype: a specimen or illustration selected from among those cited with the original description to serve in place of a holotype where the holotype is missing or destroyed, or where no holotype was designated.

legume: a fruit characteristic of the families Mimosaceae, Caesalpiniaceae and Fabaceae, formed from one carpel and either dehiscent along both sides, or indehiscent; *in particular*, such a fruit that is grown as an edible crop; a crop species in the family Fabaceae.

lemma: the lower of two bracts enclosing a grass flower.

lenticel: a loosely-packed mass of cells in the bark of a woody plant, visible on the surface of a stem as a raised powdery spot, through which gaseous exchange occurs.

lenticular: shaped like a biconvex lens.

lepidote: covered with small, membranous scales.

leptosporangiate: *of ferns*, having sporangia with walls only one cell thick. *cf.* **eusporangiate**.

liane: a climbing or twining plant (usually applied to woody climbers).

lignified: converted into wood.

lignotuber: a woody swelling below or just above the ground, containing adventitious buds from which new shoots develop if the top of the plant is cut or burnt (common in the shrubby eucalypts and in many other fire-tolerant Australian shrubs).

ligulate: bearing a ligule; strap-shaped.

ligule: a strap-shaped structure; a membranous or hairy appendage on the adaxial surface of a leaf, especially in grasses, at the junction between sheath and blade; a small adaxial appendage near the leaf base in some pteridophytes; the corolla limb in ray flowers of Asteraceae.

limb: the upper, free, spreading portion of a corolla or perianth that is connate at the base.

linear: very narrow in relation to the length, and with the sides parallel.

lithophyte: a plant that grows on the surface of unweathered rock.

lobulate: having small or indistinct lobes.

loculicidal: *of the dehiscence of a fruit*, along lines coinciding with the centres of loculi. *cf.* **septicidal**.

loculus: an enclosed compartment within an organ *e.g.* an ovary, an anther. pl. **loculi**.

lodicule: one of a pair of tiny scales in a grass floret, between the lemma and the fertile parts of the flower, which may be reduced perianth segments.

lomentum: a legume having distinct constrictions or lines of abscission between the seeds and breaking into one-seeded segments when mature.

lorate: *of leaves*, strap-shaped (moderately long with the two margins parallel).

lyrate: deeply lobed, with a large terminal lobe and smaller lateral ones.

macrospore: = megaspore.

mallee: a growth habit in which several woody stems arise separately from a lignotuber (usually applied to shrubby eucalypts); a plant having the above growth habit.

mammillate: having small nipple-shaped projections.

marcescent: withering without falling off.

marginal: occurring at or very close to the margin.

medifixed: attached by or at the middle, *e.g. of anthers*, attached to the filament at the middle of the connective.

megagametophyte: a plant body or cell lineage, formed by vegetative growth of the megaspore, that produces the female gametes of a heterosporous plant.

megasporangium: the larger of the two kinds of sporangia produced in the sexual life cycle of a heterosporous plant.

megaspore: the larger of the two kinds of spores produced in the sexual life cycle of a heterosporous plant, giving rise to the female gametophyte.

megasporophyll: a specialised leaf upon which (or in the axil of which) one or more megasporangia are borne.

meiosis: the two-stage division of a diploid nucleus, occurring once in every sexual life cycle, in which gene recombination occurs and the number of chromosomes characteristic of the sporophyte plant is halved prior to the production of gametes.

mentum: *of Orchidaceae*, an extension of the foot of the column which forms a spur.

mericarp: one segment of a fruit that breaks at maturity into units derived from the individual carpels. *cf.* **schizocarp**.

meristem: growing regions of a plant in which cells that have retained their embryonic characteristics, or have reverted to them secondarily, divide to produce new cells.

mery: the number of parts per whorl that characterises a particular flower (generally constant for the perianth whorls and less often for the whorl(s) of stamens also). adj. **merous**.

mesocarp: the fleshy portion of the wall of a succulent fruit inside the skin and outside the stony layer, if any, surrounding the seed(s).

mesophyll: photosynthetic tissue of a green plant; *of vegetation*, characteristic of moist habitats and with soft, fairly large leaves predominating; a leaf whose area is within the approximate range 20—180 square cm.

microgametophyte: a plant body or cell lineage, formed by vegetative growth of the microspore, that produces the male gametes of a heterosporous plant.

microphyll: small leaf.

micropyle: a small canal through the integument(s) of an ovule, persisting as a pore in the seed coat.

microsporangium: the smaller of the two kinds of sporangia produced in the sexual life cycle of a heterosporous plant.

microspore: the smaller of the two kinds of spores produced in the sexual life cycle of a heterosporous plant, giving rise to the male gametophyte.

microsporophyll: a specialised leaf upon (or in the axil of) which one or more microsporangia are borne.

midrib: the central, and usually the most prominent, vein of a leaf or leaf-like organ.

monadelphous: *of stamens*, united by their filaments into one bundle.

moniliform: cylindrical but constricted at regular intervals like a string of beads.

monocarpic: flowering and fruiting only once during its life span.

monochasium: a cymose inflorescence with the branches arising singly. *cf.* **dichasium**.

monochlamydeous: *of a flower*, having only one whorl of perianth parts.

monoclinus: having male and female reproductive organs in the same flower.

monocotyledon: a flowering plant whose embryo has only one cotyledon (seed leaf). *cf.* **dicotyledon**.

monoecious: having the male and female reproductive structures in separate flowers but on the same plant. *cf.* **dioecious**.

monophyletic: derived from a single ancestral line. *cf.* **polyphyletic**.

monopodial: *of growth*, with a persistent terminal growing point producing many lateral organs successively; *of a stem*, growing in the above manner. *cf.* **sympodial**.

monotypic: containing only one taxon of the next lower rank (*e.g.* applied to a family containing only one genus). *cf.* **polytypic**.

morphology: the form and structure of an organism or part of an organism; the study of form and structure.

motile: actively moving; self-propelled.

mucilage: slimy material exuded by certain plants or plant organs. adj. **mucilaginous**.

mucous: slimy.

mucro: a sharp, abrupt terminal point. adj. **mucronate**.

mucronulate: with a very small mucro; diminutive of **mucronate**.

muricate: rough on the surface; covered with short, hard tubercles or hard outgrowths of the epidermis.

muriculate: rough with minute, short, hard points.

muticous: pointless, blunt, awnless.

mycorrhiza: a symbiotic union between a fungus and a plant root.

naked: *of sporangia*, not covered by an indusium; *of seeds*, exposed on the surface of a sporophyll (not enclosed within an ovary); *of flowers*, without perianth; *of protoplasts or gametes*, not bounded by a cell wall.

navicular: boat-shaped.

nectary: a gland that secretes nectar. adj. **nectariferous**.

neotype: a specimen or illustration selected to serve in place of a holotype where all of the material on which the name was originally based is missing.

nerve: a vein.

nest-fronds: specialised, shield-like, basal fronds in some ferns which accumulate leaf-litter. *e.g Platycerium*.

neuter: sterile (*e.g.* of flowers in which neither the androecium nor the gynoecium is functional in reproduction).

nocturnal: *of flowers*, opening only at night.

node: the level (transverse plane) of a stem at which one or more leaves arise.

nomen conservandum: a name of a family or genus (or taxon intermediate between these two) that has been formally accepted as the correct name contrary to the usual principles of botanical nomenclature.

nomen illegitimum: a name which, at the time of its publication, was superfluous (because it included the type of an earlier name which should have been adopted) or had already been applied to another plant.

nomen nudum: a name published without a diagnosis or description of the entity to which it applies, and without reference to either.

nomen rejiciendum: a name rejected in favour of a 'nomen conservandum'.

nucellus: the central tissue of an ovule, within which the megaspore mother cell is formed.

nut: a hard, dry, indehiscent fruit formed from two or more carpels but containing only one seed.

obconical: cone-shaped but attached at the narrower end.

obcordate: *of a leaf blade*, broad and notched at the tip; heart-shaped but attached at the pointed end.

oblanceolate: similar in shape to **lanceolate** but attached at the narrower end.

obligate: *of parasites*, unable to survive without the host. *cf.* **facultative**.

oblique: *of a leaf or leaflet*, larger on one side of the midrib than on the other, *i.e.* asymmetrical.

obloid: (a three-dimensional shape) with short, parallel sides and rounded ends, as if composed of two hemispheres linked together by a very short cylinder.

oblong: having the length greater than the width but not many times greater, and the sides parallel.

obovate: similar in shape to **ovate** but attached at the narrower end.

obsolescent: non-functional but not reduced to a rudiment.

obsolete: reduced to a rudiment, or completely lacking. *cf.* **rudimentary, vestigial**.

obtuse: blunt or rounded at the apex, the converging edges separated by an angle greater than 90 degrees.

ochrea: a sheath, formed from two stipules, encircling the node in Polygonaceae.

ontogeny: the development of a single organism, *i.e.* the sequence of stages through which it passes during its lifetime.

operculum: a lid or cover becoming detached at maturity by abscission; *in Eucalyptus*, a cap covering the bud and formed by fusion or cohesion of perianth parts.

opposite: *of leaves*, borne at the same level but on opposite sides of the stem; *of floral parts*, on the same radius. *cf.* **alternate**.

orbicular: circular or nearly so.

order: a taxonomic grouping of families believed to be closely related (sometimes a single family with no apparent close relatives).

orthotropous: *of an ovule*, erect so that the micropyle points away from the placenta.

ostiole: an opening or pore, *e.g.* (in Moraceae) at the apex of a fig, or (in fungi and lichens) at the apex of a perithecium. adj. **ostiolar, ostiolate**.

ovary: the basal portion of a carpel or group of fused carpels, enclosing the ovule(s).

ovate: shaped like a section through the long axis of an egg, and attached by the wider end. *cf.* **ovoid**.

ovoid: egg-shaped (in three dimensions). *cf.* **ovate**.

ovulate: with ovules.

ovule: a structure in a seed plant within which one or more megaspores are formed and which develops into a seed after fertilisation.

ovuliferous: bearing ovules (*e.g.* applied to scales in a megasporangiate cone in gymnosperms).

ovulode: sterile structures on the placenta.

palea: *in a grass floret*, the upper one of the two bracts enclosing a flower.

palmate: *of a leaf*, divided into several leaflets which arise at the same point.

palmatifid: *of a leaf*, deeply divided into several lobes which arise (almost) at the same level. *cf.* **pinnatifid**.

palmatinerved: *of leaves*, palmately nerved, *i.e.* with the (main) nerves radiating from one basal point.

palmatisect: a condition intermediate between **palmate** and **palmatifid**, with the green tissue of the lamina completely divided into several segments, but the segments not fully separated at the base.

palynology: the scientific study of pollen.

pandurate: fiddle-shaped.

panicle: a compound raceme; an indeterminate inflorescence in which the flowers are borne on branches of the main axis or on further branches of these.

paniculate: indeterminate and much branched.

pantoporate: *of a pollen grain*, with rounded apertures all over the surface.

papilla: a small, elongated protuberance on the surface of an organ, usually an extension of one epidermal cell. adj. **papillose**.

pappus: a tuft (or ring) of hairs or scales borne above the ovary and outside the corolla in Asteraceae and possibly representing the calyx; a tuft of hairs on a fruit.

paraphyses: sterile filaments in the fruiting bodies of non-vascular plants.

parasite: an organism living on or in a different organism and deriving nourishment from it. *cf.* **saprophyte**, **epiphyte**.

paratype: a specimen or illustration, other than the holotype, isotype or one of the syntypes, that was cited with the original publication of a name.

parenchyma: plant tissue consisting of mature, living cells that are relatively unspecialised in function.

parietal: attached to the margins of a structure; *of placentation*, having the ovules attached to placentas on the wall of the ovary.

paripinnate: having an even number of pinnae by virtue of having a pair in the terminal position. *cf.* **imparipinnate**.

-partite: divided, almost to the base, into segments (commonly applied to a style).

pectinate: comb-like.

pedate: *of a palmate or palmately-lobed leaf*, having the lateral segments divided again.

pedicel: the stalk of a flower. adj. **pedicellate**.

peduncle: the stalk of an inflorescence; *in ferns*, the stalk of a sporocarp. adj. **pedunculate**.

pellucid: transparent.

peloric: an actinomorphic flower which would, from its taxonomic context, be expected to be zygomorphic.

peltate: *of a leaf*, having the stalk attached to the lower surface of the blade, not to the margin (also applied, in the same sense, to other stalked structures).

pendulous: drooping; *of ovules*, attached at the top of the ovary and hanging downwards from an apical placenta.

penicillate: pencil-shaped; tufted like an artist's brush.

penninerved (= **penniveined):** having conspicuous lateral veins divergent from the midrib and lying approximately parallel to each other.

pentamerous: *of a flower*, having five parts in each floral whorl (not necessarily including the gynoecium).

pepo: *literally*, a pumpkin (Latin); a fruit with firm skin, pulpy interior, many seeds and a single locule.

perennate: maintain a dormant, vegetative state throughout non-growing seasons.

perennial: a plant whose life span extends over more than two growing seasons.

perfoliate: *of a sessile leaf or bract*, having its base completely wrapped around the stem.

perianth: the calyx and corolla of a flower, especially where the two are similar.

pericarp: the wall of a fruit, developed from the ovary wall.

perigynous: *of perianth segments and stamens*, arising from a cup or tube (hypanthium) that is free from the ovary but extending above its base. *cf.* **hypogynous**, **epigynous**.

perisperm: nutritive tissue in an angiospermous seed, formed from the nucellus. *cf.* **endosperm**.

persistent: remaining attached to the plant beyond the expected time of falling (*e.g.* of sepals not falling after flowering).

petal: a member of the inner whorl of non-fertile parts surrounding the fertile organs of a flower, usually soft and coloured conspicuously.

petaloid: like a petal; soft in texture and coloured conspicuously.

petiole: the stalk portion of a leaf.

petiolule: the stalk portion of a leaflet.

phalange: a connate bundle, applied to a group of connate carpels, *e.g.* in Pandanaceae.

phanerogam: (literally) a plant with conspicuous reproductive parts; a plant reproducing by seeds. *cf.* **cryptogam**.

phenotype: the physical characteristics of an organism; the outward expression of characteristics conferred on an organism by its genotype. *cf.* **genotype**.

phloem: the tissue in the conducting system of a plant through which metabolites (products of chemical reactions in the plant) are transported.

phyllichnium: in Casuarinaceae, the ridge of a branchlet article; pl. **phyllichnia**.

phylloclade: a very leaf-like, photosynthetic stem of a plant whose true leaves are much reduced. *cf.* **cladophyll**.

phyllode: a leaf whose blade is much reduced or absent, and whose petiole and rachis have assumed the functions of the whole leaf. *cf.* **cladode**.

phyllotaxy: the arrangement of leaves on a stem (when spiral, often expressed quantitatively as the fraction of the circumference of the stem that separates two successive leaves).

phylogeny: the evolutionary development of a plant group, *i.e.* its derivation from its ancestors and the relationship among its members. adj. **phylogenetic**.

phylum: an alternate name for **division**, the major taxonomic rank in the Plant Kingdom.

pilose: hairy, the hairs soft and clearly separated but not sparse.

pinna: a primary segment of the blade of a compound leaf.

pinnate: divided into pinnae; once-compound. *cf.* **bipinnate, tripinnate**.

pinnatifid: cut deeply into lobes that are spaced out along the axis (of the leaf). *cf.* **palmatifid**.

pinnatisect: dissected down to the midrib but having the segments confluent with it.

pinnule: a leaflet of a bipinnate leaf.

pistil: a free carpel or a group of fused carpels.

pistillode: a sterile pistil, often rudimentary.

pith: the central region of a stem, inside the vascular cylinder.

placenta: a region, within an ovary, to which ovules are attached.

placentation: the arrangement of placentas, and hence of ovules, within an ovary.

pleurogram: lateral marking.

plicate: folded back and forth longitudinally like a fan.

plumose: like a feather; with fine hairs branching from a central axis.

plumule: the portion of an embryo that gives rise to the shoot system (as distinct from the root system) of a plant. *cf.* **radicle**.

pneumatophore: an air-vessel; an organ containing aerenchyma; *in particular*, a root of a mangrove plant, growing above the substratum.

pod: a leguminous fruit.

pollen-grain: see **grain**.

pollen-sac: see **sac**.

pollen: the microspores of seed plants; the powdery mass of microspores shed from anthers.

pollination: the transfer of pollen from the male organ, where it is formed, to the receptive region of a female organ, *e.g.* from anther to stigma.

pollinium: a cohering mass of pollen grains, transferred as a unit in pollination. pl. **pollinia**.

polygamodioecious: having bisexual and male flowers on some plants, and bisexual and female flowers on others.

polygamomonoecious: with bisexual and unisexual flowers on the same plant.

polygamous: having bisexual and unisexual flowers on the same or different plants.

polymorphic: having more than two distinct morphological variants.

polypetalous: with free petals. *cf.* **gamopetalous**.

polyphyletic: composed of members that originated, independently, from more than one evolutionary line. *cf.* **monophyletic**.

polyploid: having more than two of the basic sets of chromosomes in the nucleus.

polytypic: containing more than one taxon of the next lower rank. *cf.* **monotypic**.

pome: a fleshy (false) fruit, formed from an inferior ovary, in which the receptacle or hypanthium has enlarged to enclose the true fruit.

porate: *of a pollen grain*, with rounded apertures only. *cf.* **colporate.**

poricidal: *of anthers or capsules*, opening by pores.

porrect: directed outwards and forwards.

posterior: *of floral parts*, on the side of the flower nearest to the axis. *cf.* **anterior**.

praemorse: appearing bitten off at the end.

prickle: a hard, pointed outgrowth from the surface of a plant, involving several layers of cells but not containing a vein.

probract: small, leaf-like structure at the base of an inflorescence in Cucurbitaceae, usually arising opposite a tendril.

process: a projecting outgrowth or appendage.

procumbent: trailing or spreading along the ground but not rooting at the nodes.

proliferous: having erect or spreading, elongating stems which are capable of rooting at the nodes but rarely do so *e.g. in Conostylis*; producing plantlets asexually on the leaves or fronds, *e.g. Pteris*, or in the inflorescence, e.g. *Isolepis*.

propagule: a structure with the capacity to give rise to a new plant, *e.g.* a seed, a spore, part of the vegetative body capable of independent growth if detached from the parent.

prophyll: a leaf formed at the base of a shoot, usually smaller than those formed subsequently.

prostrate: lying flat on the ground.

protandrous: having the male sex organs maturing before the female; *of a flower*, shedding the pollen before the stigma is receptive. *cf.* **protogynous**.

prothallus: a gametophyte body, especially in ferns and related plants.

protogynous: having the female sex organs maturing before the male; *of a flower*, shedding the pollen after the stigma has ceased to be receptive. *cf.* **protandrous**.

proximal: near to the point of origin or attachment. *cf.* **distal**.

pruinose: having a whitish, waxy, powdery bloom on the surface.

pseudo-: false; apparent but not genuine.

puberulous: covered with minute, soft, erect hairs.

pubescent: covered with short, soft, erect hairs.

pulverulent: as though dusted over with powder.

pulvinate: cushion- or pad-shaped, resembling a pulvinus.

pulvinus: a swelling at the base of the stalk of a leaf or leaflet, often glandular or responsive to touch.

punctate: marked with dots.

puncticulate: minutely dotted.

pungent: ending in a stiff, sharp point; having an acrid taste or smell.

pustulate: covered with small pustule- or blister-like elevations.

pyrene: the 'stone' (endocarp plus seed) of a succulent fruit. *cf.* **berry, drupe**.

quincuncial: *of the arrangement of corolla lobes in a bud*, a variant of imbricate aestivation.

raceme: an indeterminate inflorescence in which a main axis produces a series of flowers on lateral stalks, the oldest at the base and the youngest at the top. adj. **racemose**.

racemule: secondary raceme in a compound raceme or umbellate inflorescence.

rachilla: *of palms and woody monocots*, the lateral or secondary branches of the inflorescence; *of a grass spikelet*, the axis above the glumes.

rachis: the axis of an inflorescence or a pinnate leaf; pl. **rachises. secondary rachis:** the axis of a pinna in a bipinnate leaf.

radical: *of leaves*, clustered at the base of the stem.

radicle: the portion of an embryo that gives rise to the root system of a plant. *cf.* **plumule**.

raphe: the part of the stalk of an anatropous ovule that is fused along the side of the ovule.

raphides: needle-like crystals that occur in bundles in the vacuoles of some plant cells.

ray: a radial band of cells traversing the conducting elements in woody stems; *of a compound umbel*, one of the first (lower) series of branches of the inflorescence axis; **ray floret:** a zygomorphic flower in Asteraceae.

receptacle: the axis of a flower (= **torus**); *in ferns*, an axis on which sporangia arise.

recurved: curved or curled downwards or backwards.

reflexed: bent sharply downwards or backwards.

regular: see **actinomorphic**.

reniform: kidney-shaped.

replum: a longitudinal partition in an ovary, formed between parietal placentas.

resupinate: twisted through 180°, *e.g.* as with the ovary of most Orchidaceae.

reticulate: forming a network.

retinaculum: a hook-like structure to which another structure is tethered; *in Orchidaceae and Asclepiadaceae*, the structure to which pollen masses are attached; *in Acanthaceae*, the persistent stalk of an ovule.

retrorse: directed backwards or downwards. *cf.* **antrorse**.

retuse: with a very blunt and slightly notched apex.

revolute: rolled downwards or backwards.

rhachilla: = rachilla.

rhachis: = rachis.

rhipidium: an inflorescence of cymose units, the lateral branches developed alternately in opposite directions.

rhizoid: a thread-like, unicellular absorbing structure, occurring in fern gametophytes, some fern allies and in some non-vascular plants.

rhizome: an underground stem, usually growing horizontally.

rhizophore: *in Selaginella*, a leafless stem that produces roots.

rhomboid: quadangular, with the lateral angles obtuse.

root: unit of the axial system of a plant which is usually underground, does not bear leaves, tends to grow downwards and is typically derived from the radicle of the embryo. See **adventitious**.

rootstock: a short, erect, swollen structure at the junction of the root and shoot systems of a plant (loosely: the root system).

rostellum: a beak-like upward extension of the stigma in Orchidaceae.

rostrate: beaked.

rosulate: clustered into a rosette.

rotate: circular and flattened, *e.g.* of a corolla with a very short tube and spreading lobes.

rudimentary: poorly developed and not functional. *cf.* **vestigial**, **obsolete**.

rugose: deeply wrinkled.

rugulose: covered with minute wrinkles.

ruminate: mottled in appearance, *e.g.* of bark, or of the food reserves in a seed.

runcinate: deeply lobed and with the lobes slanted away from the apex.

runner: a slender, prostrate or trailing stem which produces roots and sometimes erect shoots at its nodes. *cf.* **stolon**.

sac: a pouch or cavity; **pollen-sac:** a cavity, in an anther, in which pollen is formed; **embryo-sac:** a large, multi-nucleate cell in which an egg nucleus is formed and fertilised, and in which an embryo begins to develop.

saccate: pouched.

sagittate: shaped like an arrow-head.

salverform: salver-shaped, a sympetalous corolla with a slender tube and abruptly expanded flat limbs.

samara: a dry, indehiscent fruit with its wall expanded into a wing.

saprophyte: an organism deriving its nourishment from dead organic matter and usually lacking chlorophyll. *cf.* **epiphyte**, **parasite**.

scaberulous: slightly or minutely rough to the touch, minutely scabrous.

scabrid (= scabrous): rough to the touch.

scabridulous: slightly rough; diminutive of scabrous.

scalariform: having a ladder-like pattern.

scale: a reduced or rudimentary leaf, *e.g.* surrounding a dormant bud; a thin flap of tissue, *e.g.* on the ventral surface of a liverwort thallus and at the base of a stamen in Simaroubaceae.

scandent: climbing.

scape: the stem-like, flowering stalk of a plant with radical or rosulate leaves.

scarious: dry and membranous.

schizocarp: a dry fruit formed from more than one carpel but breaking apart into 1-carpel units when ripe. *cf.* **mericarp**.

sclerenchyma: mechanical tissue with heavily thickened cell walls.

scleromorph: a plant whose leaves (or stems, if leafless) are hard in texture, usually having thick cuticle and containing many fibres. *cf.* **xeromorph**.

sclerophyllous: with leaves stiffened by sclerenchyma.

scorpioid: *of a cymose inflorescence*, branching alternately on one side and then the other. *cf.* **helicoid**.

scribble: irregular lines on the bark of some eucalypts, being the old tunnels burrowed by moth larvae between bark layers and exposed when the outer layer falls.

secund: with all the parts grouped on one side or turned to one side (applied especially to inflorescences).

seed: a propagating organ formed in the sexual reproductive cycle of gymnosperms and angiosperms, consisting of a protective coat enclosing an embryo and food reserves.

segment: a part or sub-division of a divided organ; one of a group of similar organs named collectively, *e.g.* one petal = a segment of a corolla.

sepal: a member of the (usually green) outer whorl of non-fertile parts surrounding the fertile organs of a flower.

sepaloid: looking like sepals, *e.g. of bracts*, usually green and arranged in a ring beneath a flower.

septate: divided internally by partitions.

septicidal: *of the dehiscence of a fruit*, along lines coinciding with the partitions between loculi. *cf.* **loculicidal**.

septifragal: of the dehiscence of a fruit, when the valves or backs of the carpels break away leaving the septa intact.

septum: a partition. pl. **septa**.

seriate: in rows or whorls.

sericeous: silky; covered with silky hairs.

serrate: toothed, with asymmetrical teeth pointing forward.

serrulate: finely serrate.

sessile: without a stalk (when applied to a stigma, indicates that the style is absent, the stigma being 'sessile' on the ovary).

seta: a bristle or stiff hair; *in Bryophyta*, the stalk portion of a sporophyte plant body; **terminal seta:** an appendage to the tip of an organ, *e.g.* the primary rachis of a bipinnate leaf in *Acacia*. adj. **setaceous**.

setiferous: *of a scale etc.*, bearing setae.

setose: bristly.

setulose: resembling a fine bristle or scale.

shrub: a woody plant less than 5 metres high, either without a distinct main axis, or with branches persisting on the main axis almost to its base.

sigmoid: doubly curved in opposite directions like the letter S.

siliceous: containing silica.

silicula: a short siliqua, not more than twice as long as its width.

siliqua: a dry, dehiscent fruit formed from a superior ovary of two carpels, with two parietal placentas and divided into two loculi by a false septum between the placentas.

simple: undivided; *of a leaf*, not divided into leaflets; *of a hair or an inflorescence*, not branched.

sinuate: with deep, wave-like depressions along the margin. *cf.* **undulate**.

sinus: a notch or depression in the margin of an organ.

solitary: *of flowers*, borne singly, not grouped in an inflorescence.

sorus: *in ferns*, a discrete group of sporangia. pl. **sori**.

spadix: a spicate inflorescence with a stout, often succulent axis.

spathaceous: like a spathe; with a spathe.

spathe: a large bract ensheathing an inflorescence.

spathella: a closed membranous sac which envelopes the immature flower in some Podostemaceae, rupturing irregularly as the pedicel elongates at anthesis.

spathulate (= spatulate): spoon-shaped; broad at the tip and narrowed towards the base.

species: a taxon comprising individuals, or populations of individuals, capable of interbreeding to produce fertile offspring; the largest group of individuals between which there are no distinguishable, consistent differences in form or reproductive mechanisms.

spike: an unbranched, indeterminate inflorescence in which the flowers are without stalks. adj. **spicate**.

spikelet: a unit of the inflorescence in grasses, sedges and some other monocotyledons, consisting of one to many flowers and associated glumes.

spine: a stiff, sharp-pointed structure, formed by modification of a plant organ, *e.g.* a lateral branch or a stipule.

spinescent: ending in a spine; modified to form a spine.

spinose: bearing spines.

spiral: *of leaves or floral organs*, borne at different levels on the axis, in an ascending spiral. *cf.* **cyclic**.

sporangiate: bearing spores (or pollen).

sporangiophore: the stalk of a sporangium; *in Botrychium*, the branched axis bearing sporangia.

sporangium: a structure within which spores are formed. pl. **sporangia**.

spore: a simple propagule, produced either sexually or asexually, and consisting of one or a few cells.

sporocarp: a fruiting body containing sporangia.

sporogenous: *of cells or tissues*, in which spores are formed.

sporophyll: a specialised leaf-like organ on which one or more sporangia are borne.

sporophyte: a plant, or phase of a life cycle, that bears the spores formed during the sexual reproductive cycle.

spur: a tubular pouch at the base of a perianth part, often containing nectar.

stamen: one of the male organs of a flower, consisting typically of a stalk (filament) and a pollen-bearing portion (anther). adj. **staminate**.

staminode: a sterile stamen, often rudimentary.

staminophore: a band of tissue around the apex of the hypanthium in a eucalypt flower on which the stamens are inserted.

standard: the posterior petal in the flower in Fabaceae.

stellate: star-shaped; consisting of star-shaped cells.

stem: the main axis or a branch of the main axial system of a plant, developed from the plumule of the embryo and typically bearing leaves.

stigma: the pollen-receptive surface of a carpel or group of fused carpels, usually sticky.

stipe: a small stalk; *in ferns*, the petiole of a frond; *in algae*, the cylindrical basal portion of a thallus.

stipel: stipule-like appendage at the base of a leaflet (in unifoliolate leaves, inserted on the petiole, not on the stem). pl. **stipellae**. adj. **stipellate**.

stipitate: stalked; borne on a stipe; *of an ovary*, borne on a gynophore.

stipule: one of a pair of appendages at the bases of leaves in many dicotyledons.

stolon: a prostrate or trailing stem that produces roots at the nodes. *cf.* **runner**.

stoloniferous: having stolons; trailing over the soil surface and rooting at the nodes.

stoma: a pore; a pore in the epidermis of a leaf or other aerial organ, providing access for gaseous exchange between the tissues and the atmosphere. pl. **stomata**.

stomium: a region of dehiscence, *e.g.* of an anther in flowering plants or of a capsule in mosses. pl. **stomia**.

stramineous: straw coloured.

striate: striped with parallel longitudinal lines or ridges.

strigose: with sharp, stiff hairs which are appressed to the surface.

strigulose: minutely strigose.

strobilus: a 'cone' consisting of sporophylls borne close together on an axis.

strophiole: = caruncle.

struma: a cushion-like swelling, *e.g.* at the apex of staminal filaments in *Dianella*.

style: an elongated part of a carpel, or group of fused carpels, between the ovary and the stigma.

stylopodium: a disc-like enlargement of the base of the style.

subulate: narrow and tapering gradually to a fine point.

sulcate: grooved; furrowed.

superior: *of an ovary*, borne above the level of attachment of the other floral parts, or above the base of a cup (hypanthium) that is free from the ovary and bears the perianth segments and stamens. *cf.* **inferior**.

suture: a line of junction between two fused organs; a line of dehiscence.

syconium: a multiple fruit with a hollow centre, *e.g.* in *Ficus* (fig).

sympatric: *of two or more species*, having coincident or overlapping ranges of distribution. *cf.* **allopatric**.

sympetalous: = gamopetalous.

sympodial: *of growth*, without a single, persistent growing point; changing direction by frequent replacement of the growing apex by a lateral growing point below it; *of a stem*, growing in the above manner. *cf.* **monopodial**.

synandrium: an androecium with the anthers of the stamens cohering. *cf.* **syngenesious**.

synangium: *of a fruit*, several fruits united in a single structure; *in cryptogams*, a group of fused sporangia.

syncarp: a structure consisting of several united fruits, usually fleshy. *cf.* **aggregate fruit.**

syncarpous: *of a flower*, having two or more carpels, all fused together.

syngenesious: *of the stamens of one flower*, fused together by the anthers *e.g.* in Asteraceae. *cf.* **synandrium**.

syntepalum: *in Musaceae*, a unilaterally split tube formed by the coherence of 3 sepals and 2 anterior petals in flowers of some species.

syntype: one of two or more specimens cited by the author at the time of publication of a name, when no holotype was designated, or any one of two or more specimens simultaneously designated as types.

taproot: the main, descending root of a plant that has a single, dominant root axis.

taxon: a group or category, at any level, in a system for classifying plants or animals.

tendril: a slender climbing organ formed by modification of a part of a plant, *e.g.* a stem, a leaf or leaflet, a stipule.

tenuiexinous: *of a pollen grain*, with a thin exine.

tepal: a perianth segment in a flower in which all the perianth segments are similar in appearance.

terete: cylindrical or nearly so; circular in cross-section.

terminal: at the apex or distal end.

ternate: in groups of three; *of leaves*, arranged in whorls of three; *of a single leaf*, having the leaflets arranged in groups of three.

ternatifid: *of leaves*, deeply cut into three lobes.

terrestrial: of or on the ground; *of the habitat of a plant*, on land as opposed to in water, or on the ground as opposed to on another plant.

testa: a seed coat.

tetrad: a group of four; four pollen grains remaining fused together at maturity, *e.g.* in Ericaceae, Epacridaceae.

tetradynamous: *of an androecium*, consisting of four stamens of the same length and two of a different length.

tetramerous: *of a flower*, having four segments in each perianth whorl, and usually four in each whorl of stamens also.

thallus: the vegetative body of a plant that is not differentiated into organs such as stems and leaves, *e.g.* algae, the gametophytes of many liverworts, and Lemnaceae.

thorn: a modified plant organ, especially a stem, that is stiffened and terminates in a pungent point.

throat: *of a corolla tube*, the top, where the tube joins the lobes.

thyrse: a branched inflorescence in which the main axis is indeterminate and the lateral branches determinate in their growth.

tomentellous: minutely tomentose.

tomentum: a covering of dense, matted, woolly hairs. adj. **tomentose**.

torus: see **receptacle**.

trabecula: a transverse partition dividing or partly dividing a cavity.

tree: a woody plant at least 5 metres high, with a main axis the lower part of which is usually unbranched.

trichome: an unbranched epidermal outgrowth, *e.g.* a hair, a papilla; *in blue-green algae*, a single row of cells in a filamentous colony.

trichotomous: branching almost equally into three parts.

trifid: deeply divided into three parts.

trifoliate: having three leaves.

trifoliolate: *of a leaf*, having three leaflets.

trigonous: triangular in cross-section and obtusely-angled. *cf.* **triquetrous**.

trimerous: *of a flower*, having three segments in each perianth whorl and usually three in each whorl of stamens also.

tripinnate: *of leaves*, thrice pinnately divided.

triplicate: folded three times.

triquetrous: triangular in cross-section and acutely-angled; with three distinct longitudinal ridges. *cf.* **trigonous**.

tristichous: arranged in three rows on a stem, each row in the same plane.

tristylous: heterostylous species having three style lengths (short, mid, long), the flowers of any one plant having styles of the same length.

trulliform: shaped like a bricklayer's trowel, angular-ovate, broadest below the middle, rhomboid with the two lower equal sides shorter than the upper.

truncate: with an abruptly transverse end, as if cut off.

tuber: a storage organ formed by swelling of an underground stem or the distal end of a root.

tubercle: a small wart-like outgrowth.

tuberculate: covered with tubercles.

tuberous: swollen; *of roots*, tuber-like.

tumid: swollen; inflated.

tunic: thin membranous or fibrous outer layers of a bulb or corm.

turbinate: top-shaped, obconical.

turgid: swollen due to high water content. *cf.* **flaccid**.

type: a designated representative (standard) for a plant name.

umbel: a racemose inflorescence in which all the individual flower stalks arise in a cluster at the top of the peduncle and are of about equal length.

umbellule: secondary umbel in a compound umbellate inflorescence.

uncinate: terminating in a hooked point.

undulate: wavy, *i.e.* not flat. *cf.* **sinuate**.

unifoliate: having one leaf.

unifoliolate: *of a leaf*, basically compound, but reduced to only one leaflet.

unilateral: *of stamens*, with anthers grouped to one side of the style.

unilocular: *of an ovary, anther or fruit*, having only one internal cavity.

unisexual: bearing only male or only female reproductive organs.

united: fused together.

urceolate: urn-shaped.

utricle: a small bladder; a membranous bladder-like sac enclosing an ovary or fruit.

valvate: *of sepals or petals in a bud*, meeting edge to edge, not overlapping. *cf.* **imbricate**.

valve: a portion of an organ that has fragmented; *of a capsule*, the teeth-like portions into which the dehiscing part of the pericarp splits at maturity.

vascular: specialised for conduction of fluids; **vascular plants:** plants containing specialised conducting tissues.

vein: a strand of vascular tissue.

velamen: a water-retaining outer layer of the aerial roots of some epiphytes, especially orchids.

velum: a membranous covering; a veil.

venation: the arrangement of veins in a leaf.

ventral: *of a lateral organ*, facing towards the subtending axis; *of a thallus*, facing towards the substratum. *cf.* **dorsal**.

vernation: the arrangement of unexpanded leaves in a bud. *cf.* **aestivation**.

verrucose: covered with wart-like outgrowths, warted.

verruculose: covered with closely spaced, minute wart-like outgrowths.

versatile: *of anthers*, swinging freely about the point of attachment to the filament, which is approximately central.

verticil: a whorl or circular arrangement of similar parts around an axis.

verticillaster: a false whorl of opposed cymes.

verticillate: arranged in one or more whorls; a false whorl of flowers in a pair of opposite dense cymes, especially in Lamiaceae.

vesicle: a bladder-like sac or cavity filled with gas or liquid.

vessel: a capillary tube formed from a series of open-ended cells in the water-conducting tissue of a plant.

vestigial: reduced from the ancestral condition and no longer functional. *cf.* **obsolete**, **rudimentary**.

villous: shaggy with long, weak hairs. *cf.* **hirsute**.

viscid: *of a surface*, sticky; coated with a thick, syrupy secretion.

viscidium: *of orchids*, a viscid part of the rostellum which is clearly defined and removed with the pollinia as a unit, serving to attach the pollinia to an insect or other pollination vector.

viscous: *of a liquid*, not pouring freely; having the consistency of syrup or honey.

viviparous: *of seeds or fruits*, germinating before being shed from the parent plant.

whorl: a ring of leaves, bracts or floral parts borne at the same level on an axis.

wing: a membranous expansion of a fruit or seed, which aids dispersal; a thin flange of tissue extended beyond the normal outline of a stem or petiole; a lateral petal of a flower in Fabaceae.

xeromorph: a plant having structural features usually associated with plants of arid habitats (such as hard or succulent leaves) but not necessarily drought-tolerant. *cf.* **scleromorph**, **xerophyte**.

xerophyte: a drought-tolerant plant. *cf.* **xeromorph**.

xylem: the tissue, in a vascular plant, that conducts water and mineral salts from the roots to the leaves.

zygomorphic: *of a flower or calyx or corolla*, symmetrical about one plane only, usually the plane that bisects the flower vertically. *cf.* **actinomorphic.**

Abbreviations and Contractions

Literature

Author abbreviations follow R.K.Brummitt & C.E.Powell, *Authors of Plant Names* (Royal Botanic Gardens, Kew, 1992).

Journal titles are abbreviated in accordance with G.H.M.Lawrence *et al.*, *Botanico-Periodicum-Huntianum* (Hunt Botanical Library, Pittsburgh, 1968).

Other literature is abbreviated in accordance with F.A.Stafleu & R.S.Cowan, *Taxonomic Literature*, 2nd edn (Bohn, Scheltema & Holkema, Utrecht, 1976–1987), except that upper case initial letters are used for proper names and significant words. The *Flora of Australia* is abbreviated to *Fl. Australia*.

Herbaria

Abbreviations of herbaria are in accordance with P.K.Holmgren, N.H.Holmgren & L.C.Barnett, *Index Herbariorum* Part I, 8th edn (New York Botanical Garden, 1990). Those most commonly cited in the *Flora* are:

AD	State Herbarium of South Australia, Adelaide
BM	The Natural History Museum, London
BRI	Queensland Herbarium, Brisbane
CANB	Australian National Herbarium, Canberra
CBG	Australian National Botanic Gardens Herbarium, Canberra
DNA	Northern Territory Herbarium, Darwin
HO	Tasmanian Herbarium, Hobart
K	Royal Botanic Gardens, Kew
MEL	National Herbarium of Victoria, Melbourne
NSW	National Herbarium of New South Wales, Sydney
PERTH	Western Australian Herbarium, Perth
QRS	Australian National Herbarium, Atherton

States, Territories

Abbreviations of Australian States and Territories and nearby countries as used in statements of distribution and citation of collections.

A.C.T.	Australian Capital Territory
N.Caled.	New Caledonia
N.S.W.	New South Wales
N.T.	Northern Territory
N.Z.	New Zealand
P.N.G.	Papua New Guinea
Qld	Queensland
S.A.	South Australia
Tas.	Tasmania
Vic.	Victoria
W.A.	Western Australia

General abbreviations

alt.	altitude
app.	appendix
auct.	*auctoris/auctorum* (of an author or authors)
auct. mult.	*auctorum multorum* (of many authors)
c.	*circa* (about)
Ck	Creek
cm	centimetre
col.	colour
coll.	collector
colln	collection
comb.	*combinatio*/combination
cons.	conservation
cult.	cultivated
Dept	Department
diam.	diameter
E	east
ed.	editor
edn	edition
et al.	*et alii*/and others
eds	editors
fam.	*familia/*family
f.	*forma/*form
fig./figs	figure/figures (in other works)
Fig.	Figure (referring to a Figure in this volume of the *Flora*)
gen.	*genus/*genus
holo	holotype
hort.	*hortus* (garden) or *hortensis* (of a garden)
Hwy	Highway
in litt.	*in litteris* (in correspondence)
Is.	Island/s
iso	isotype
km	kilometre
lat.	latitude
lecto	lectotype
loc. cit.	*loco citato* (in bibliographic citations: in the same work and page as just cited)
loc. id.	*loco idem* (in specimen citations: in the same place as just cited)
long.	longitude
L.S.	longitudinal section
m	metre
mm	millimetre
Mt	Mount
Mts	Mounts
Mtn	Mountain
Mtns	Mountains
N	north
n	haploid chromosome number
2n	diploid chromosome number
Natl	National
nom. cons.	*nomen conservandum* (conserved name)
nom. cons. prop.	*nomen conservandum propositus* (proposed conserved name)
nom. illeg.	*nomen illegitimum* (illegitimate name)

nom. inval.	*nomen invalidum* (name not validly published)
nom. nud.	*nomen nudum* (name published without a description or reference to a published description)
nom. prov.	*nomen provisorium* (provisional name)
nom. rej.	*nomen rejiciendum* (rejected name)
nom. superfl.	*nomen superfluum* (superfluous name)
nov.	*novus*/new
n. ser.	new series
n.v.	*non vidi* (not seen)
op. cit.	*opere citato* (in the work cited above)
orth.	orthography, orthographic
p./pp.	page/pages
pers. comm.	by personal communication
pl./pls	plate/plates
p.p.	*pro parte* (in part)
R.	River
Ra.	Range
Rd	Road
S	south
sect.	*sectio*/section
SEM	Scanning Electron Micrograph
ser.	series
s. lat.	*sensu lato* (in a wide sense)
s. loc.	*sine loco* (without locality)
s.n.	*sine numero* (without number)
sp./spp.	species (singular/plural)
s. str.	*sensu stricto* (in a narrow sense)
St	Street
stat.	*status*/status
Stn	(pastoral) Station
subg.	subgenus
subsp	subspecies
suppl.	supplement
syn	syntype
synon.	synonym
T	Type (collection)
t.	*tabula* (plate)
trib.	*tribus*/tribe
trig.	trigonometric station
T.S.	transverse section
typ. cons.	*typus conservandus* (conserved type)
var.	*varietas*/variety
W	west
x	basic chromosome number

Symbols

†	taxon included in key but not treated further in text
*	naturalised taxon
[ ]	misapplied name or *nomen invalidum*; also, in localities, denotes a place name later than that originally cited or on the herbarium sheet
±	*in species descriptions*, more or less

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Volume 1	22 August 1981
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Volume 4	12 November 1984
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Volume 19	27 June 1988
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Volume 29	27 July 1982
Volume 35	6 August 1992
Volume 45	15 May 1987
Volume 46	2 May 1986
Volume 50	29 July 1993
Volume 54	4 September 1992

For the publication date of Volume 49, see Volume 55.

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Principal page references are in **bold**, figures in *italic*.

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