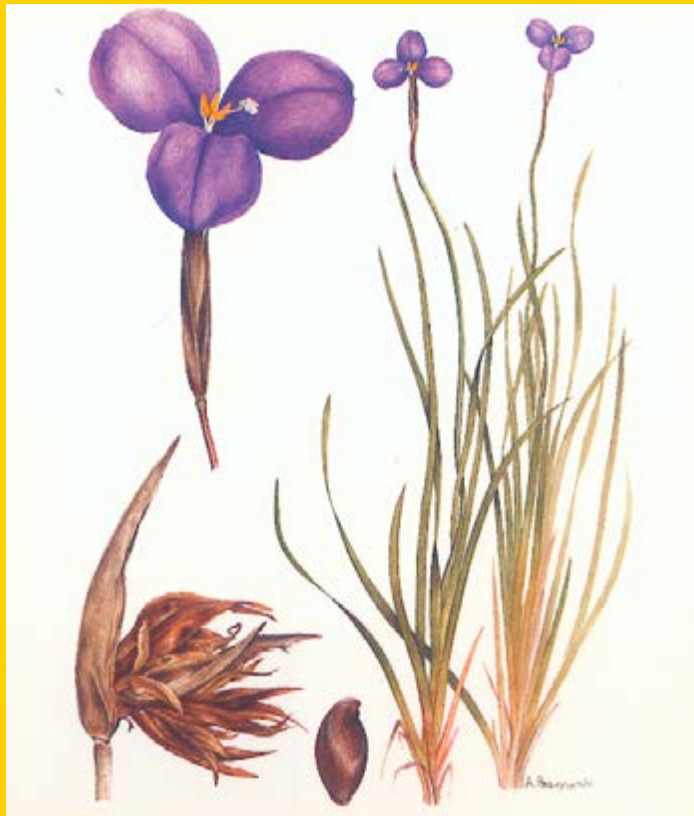




FLORA OF AUSTRALIA

Volume 46 *Iridaceae to Dioscoreaceae*



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FLORA OF AUSTRALIA

The nine families in this volume of the *Flora of Australia* are Iridaceae, Aloeaceae, Agavaceae, Xanthorrhoeaceae, Hanguanaceae, Taccaceae, Stemonaceae, Smilacaceae and Dioscoreaceae. The Xanthorrhoeaceae has the largest representation with 10 genera and 99 species. Most are endemic with a few species of *Lomandra* and *Romnaldia* extending to neighbouring islands. The family includes the spectacular blackboys and grass-trees.

The Iridaceae is largely represented by naturalised species with 52 of the 78 species being introduced. Many of the introductions are ornamentals and several have become serious weeds. *Patersonia* is the largest genus with all 17 species endemic. Some of these are cultivated as ornamentals.

The Dioscoreaceae is a family of economic significance, particularly in the old world tropics where some species are cultivated or collected for their tubers and bulbils. In Australia there are 5 species, one of which is a recent introduction. The endemic and native species, commonly known as yams, are traditionally eaten by the Aborigines.

Twenty six new taxa in the Xanthorrhoeaceae, Stemonaceae and Smilacaceae are described for the first time. They include a new genus, *Xerolirion*, in the Xanthorrhoeaceae.

Cover: *Patersonia occidentalis* R.Br. (Iridaceae).
Painting by Anita Podwyszynski.

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arranged according to the system of A.Cronquist (1981).**

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FLORA OF AUSTRALIA



Patersonia occidentalis R.Br. Painting by Anita Podwyszynski.

BUREAU OF FLORA AND FAUNA, CANBERRA

FLORA OF AUSTRALIA

Volume 46
Iridaceae to Dioscoreaceae

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EXECUTIVE EDITOR

Alexander S. George

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Back: *Flora of Australia*: Index to families of flowering plants.

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INTRODUCTION

This is the first volume of monocots to be issued in the *Flora of Australia*. It contains nine families of the order Liliales in the Cronquist phylogenetic system. The largest is the Xanthorrhoeaceae, treated here in the broad sense. The 99 species in Australia are all endemic, and of the 10 genera only *Lomandra* and *Romnaldia* extend outside to neighbouring islands. The present account includes major advances in the classification of the important genera *Lomandra* and *Xanthorrhoea*.

Another major family in the Volume is Iridaceae. It is represented by 78 species in 29 genera; of these 52 species and 24 genera are naturalised, most being of South African or European origin. A number of these are now serious weeds of agricultural and suburban land. Of the native Iridaceae the largest genus is *Patersonia* with 17 endemic species.

The family agavaceae contains 18 species in 7 genera, 5 of which are represented only by naturalised species. The two native genera include 9 endemic species. In Smilacaceae there are 15 native species in 5 genera, including the monotypic endemic genus *Petermannia*.

The other families each have 1 genus in Australia. They are Dioscoreaceae with 5 species (1 naturalised), Stemonaceae (4 species), Taccaceae (2 species), Hanguanaceae (1 species) and Aloeaceae (3 naturalised species).

In all the Volume contains 56 genera and 226 species. New taxa are described in Xanthorrhoeaceae, Iridaceae, Smilacaceae and Stemonaceae.

During preparation of the Volume it became evident that members of the family Aloeaceae are naturalised in Australia, and it has therefore been added to the endpapers. The number of native and naturalised families represented in Australia is now 238.

Scope and Presentation of the *Flora*

The geographical area covered by the *Flora* includes the six Australian States, the Northern Territory, the Australian Capital Territory immediate offshore islands and Macquarie Island. Other Australian and State-administered territories such as Christmas Is. and Lord Howe Is. are excluded, but the occurrence in those territories of species included in the *Flora* is added to the notes on distribution. A complete *Flora* of those territories is in preparation.

Descriptions and discussion in the *Flora* are concise and supplemented by important references, synonymy, and information on type collections, chromosome numbers, distribution, habitat, and illustrations published elsewhere. Descriptions are based on Australian material except for some taxa not confined to Australia for which the collections in Australian herbaria are inadequate. Synonymy is restricted to names based on Australian types or used in Australian literature. Misapplied names are given in square brackets together with an example of the misapplication. Alien taxa established in one or more localities, other than under cultivation, are considered naturalised and are included and marked with an asterisk (*).

Families are arranged in the system of A.Cronquist, *An Integrated System of Classification of Flowering Plants* (Columbia University Press, New York, 1981). Within the families, the genera and species are arranged to show natural relationships as interpreted by the contributor. Although relationships cannot be shown adequately in a linear sequence, such an arrangement in a *Flora* usually assists comparison of related taxa. Intraspecific taxa are keyed out under relevant species. Up to five collections are cited for each species and infraspecific taxon.

Maps showing distribution in Australia are arranged in the same sequence as the descriptions. In contrast with volumes published previously, the pages of maps are grouped together at the end of the main text (pp. 203–219). The term 'Malesia' is sometimes used in the notes on geographical distribution for species which occur widely in the region covered by

INTRODUCTION

Flora Malesiana, i.e. Malaysia, Singapore, Indonesia, Philippines, New Guinea and adjacent islands.

New taxa and lectotypifications are included in an appendix where they are formally published in accordance with the *International Code of Botanical Nomenclature* (Bohn, Scheltema & Holkema, Utrecht, 1978).

Abbreviations, contractions and references to the format for author and bibliographic citations are listed after the Appendix.

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Special acknowledgement is made of the botanical library of the Australian National Herbarium, Commonwealth Scientific and Industrial Research Organization. The presence of this comprehensive library in Canberra has greatly aided the work of the *Flora* editorial staff in preparing volumes for publication.

A number of people assisted the preparation of flora treatments for this volume. They include Ms J.Everett (NSW) — *Lomandra*; Mrs D.Sinkora (MEL), Dr A.T.Lee, Ms A.-L.Quirico and Ms Z.Donabauer (NSW), Dr T.D.Macfarlane and Dr N.G.Marchant (PERTH) — *Xanthorrhoea*; Mr K.F.Kenneally (PERTH) and Mr C.Dunlop (DNA) — *Taccaceae*; Mr & Mrs B.M.Smith (Manmanning, W.A.) — *Xerolirion*; Mr G.J.Keighery (W.A. Wildlife Research Centre) — *Acanthocarpus*. Australian Botanical Liaison Officers Mr R.B.Filson (MEL), Dr S.W.L.Jacobs (NSW) and Mr N.S.Lander (PERTH) assisted with *Xanthorrhoea*, *Calectasia* and *Taccaceae*.

The assistance of staff of the Bureau of Flora and Fauna in preparing Volume 46 is acknowledged with pleasure. Special thanks go to David Berman, Arthur Chapman, Chris Curtis, Gloria Downing, Helen Hewson, Roger Hnatiuk, Vicky Ochiltree, Rosemary Purdie and Esmerelda Tieni.

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IRIDACEAE

D.A.Cooke

Perennial herbs, rarely annuals or small shrubs, evergreen, or leaves and flowers annual. Rootstock a corm, bulb or sympodial rhizome. Leaves usually distichous, parallel-veined with closed basal sheaths, unifacial and equitant, flat, variously winged or terete, sometimes bifacial and channelled. Inflorescence terminal, cymose, often comprising units (rhipidia) each within often opposed bracts (spathes), the rhipidia variously arranged, or sometimes a spike or reduced to 1 flower; flowers pedicellate or sessile. Flowers bisexual, actinomorphic to zygomorphic. Perianth of 3 sepals and 3 petals in 2 similar or differentiated whorls (sometimes the petals vestigial), free, or connate below in a tube. Stamens 3 (2 in *Diplarrena*), inserted on perianth tube opposite sepals; anthers bilocular, basifixed to \pm versatile; dehiscence usually extrorse by slits. Gynoecium of 3 fused carpels; ovary inferior (superior in *Isophysis*), trilocular with axile placentation, rarely (not in Australia) unilocular with parietal placentation; style terminal with 3 branches or lobes, sometimes further divided or petaloid; stigmas papillose. Ovules anatropous, usually numerous in each locule. Fruit a capsule; dehiscence loculicidal from apex. Seeds endospermic, sometimes arillate.

A family of about 85 genera and 1500 species, widely distributed in temperate and tropical regions with a major centre of diversity in southern Africa and lesser centres in South America and the eastern Mediterranean region. Represented in Australia by 5 native genera (2 of them endemic) with 26 species in the primitive tribes Isophysideae and Sisyrinchieae. 24 genera with about 53 species are naturalised. Many exotic Iridaceae, notably species and hybrids of *Babiana*, *Dierama*, *Dietes*, *Freesia*, *Gladiolus*, *Iris*, *Ixia* and *Sparaxis* are widely grown as garden ornamentals and for the florist trade. Some species of *Homeria*, *Romulea* and *Watsonia* are important as weeds.

The basic inflorescence of the Iridaceae is cymose in development, but the cymes are condensed into rhipidia comprising clusters of flowers apparently arising in the axil of a spathe. In the tribe Ixieae the flowers are sessile, subtended at the base by paired bracts and the flowers are usually arranged in distichous spikes. In the Ixieae the perianth segments are fused into a conspicuous tube within which the stamens are inserted. In some other irids, e.g. *Patersonia*, there is a floral tube, at the apex of which the stamens are inserted.

In flowers where the anthers are symmetrically spaced around the style the stamens are said to be equilateral; stamens oriented asymmetrically to bring all 3 anthers to one side of the flower are termed unilateral.

R.Brown, Irideae, *Prodr.* 302–305, 591–592 (1810); S.Endlicher, Irideae, in J.G.C.Lehmann, *Pl. Preiss.* 2: 29–32 (1846); G.Bentham, Irideae, *Fl. Austral.* 6: 398–415 (1873); G.Bentham, Irideae, in G.Bentham & J.D.Hooker, *Gen. Pl.* 3: 681–710 (1883); J.G.Baker, *Handbook of the Irideae* (1892); P.Goldblatt, Cytological and morphological studies in the South African Iridaceae, *J. S. African Bot.* 37: 317–460 (1971); D.J.Geerinck, Revision of Australian Iridaceae, *Bull. Jard. Bot. État* 44: 29–60 (1974); P.Goldblatt, Preliminary cytology of Australian Iridaceae, *Ann. Missouri Bot. Gard.* 66: 851–855 (1979).

KEY TO TRIBES

- 1 Ovary superior Trib. I. ISOPHYSIDEAE
- 1: Ovary inferior
 - 2 Stamens equilateral, opposite style branches
 - 3 Petals differentiated, bearing prominent nectaries; rootstock a bulb; leaves plicate Trib. IV. TIGRIDIEAE
 - 3: Petals without nectaries or all segments similar; rootstock a corm or rhizome; leaves equitant or bifacial Trib. III. IRIDEAE
- 2: Stamens equilateral and alternating with style branches or stigma lobes, or unilateral
 - 4 Flowers sessile, each within a pair of bracts, usually forming a spike, or flower solitary; rootstock a corm Trib. V. IXIEAE
 - 4: Flowers pedicellate, 2 to several, in rhipidia enclosed by large opposed spathes; rootstock a rhizome, or plant annual Trib. II. SISYRINCHIEAE

KEY TO GENERA

- 1 Inflorescence a solitary flower
 - 2 Plant evergreen; rootstock a rhizome
 - 3 Ovary superior 1. ISOPHYSIS
 - 3: Ovary inferior 7. IRIS
 - 2: Plant not evergreen; rootstock a corm or bulb
 - 4 Petals less than one-third length of sepals 14. HERBERTIA
 - 4: Petals and sepals equal
 - 5 Peduncle absent; stigmas 3 12. GALAXIA
 - 5: Peduncle present; stigmas 6 17. ROMULEA
- 1: Inflorescence of 2–many flowers
 - 6 Inflorescence with 1 to many rhipidia, each subtended by 1 or 2 spathes, of 2–many fugacious flowers, never spicate
 - 7 Style with petaloid branches, each covering a stamen, with 2 erect crests exceeding the flap-shaped stigma (Iris-shaped flowers)
 - 8 Evergreen perennials with rhizomes; stamens free
 - 9 Petals and sepals free, all spreading † DIETES
 - 9: Petals and sepals confluent in a tube at base, petals erect 7. IRIS
 - 8: Perennials with corms; leaves and flowers annual; stamens connate
 - 10 Ovary beakless; capsules exserted from spathes 8. MORAEA
 - 10: Ovary with a filiform sterile beak longer than fertile portion; capsules enclosed by spathes 11. GYNANDRIRIS
 - 7: Style without petaloid branches or crests; stamens exposed
 - 11 Leaves narrowed to a petiole-like base 5. PATERSONIA
 - 11: Leaves broadest at base or linear
 - 12 Leaves plicate, or bifacial and channelled
 - 13 Leaves plicate; petals less than one-third length of sepals; rootstock a bulb 14. HERBERTIA
 - 13: Leaves bifacial, channelled; petals equal to sepals; rootstock a corm

IRIDACEAE

Key to Genera

- | | |
|---|--|
| <p>14 Rhipidia terminal on branches of scape; style branches entire or bilobed at apex</p> <p>14: Rhipidia arranged laterally along scape; style branches bifid from base, forming 6 filiform branches</p> <p>12: Leaves equitant</p> <p>15 Petals and sepals very unequal, the petals vestigial</p> <p>15: Petals and sepals equal or subequal</p> <p>16 Flower zygomorphic; 2 stamens fertile, the third a staminode</p> <p>16: Flower actinomorphic; all 3 stamens fertile</p> <p>17 Style branches broad, fimbriate; margins of perianth lobes undulate and crisped</p> <p>17: Style branches filiform, never fimbriate; margins of lobes flat</p> <p>18 Flowers and capsules almost sessile, partly enclosed by spathes</p> <p>18: Flowers and capsules exserted from spathes on long pedicels</p> <p>19 Petals and sepals spreading from base; stamens exserted; filaments connate at base only</p> <p>19: Petals and sepals forming a cup below, spreading above; stamens included; filaments connate for more than half their length</p> <p>6: Inflorescence a spike, sometimes branched, of 2–many sessile non-fugacious flowers, each with 2 short spathes</p> <p>20 Style branches deeply bifid; stigmas 6 or more</p> <p>21 Leaves coarsely fibrous in texture; flowers spreading in a loosely distichous spike</p> <p>21: Leaves soft-textured; flowers erect in a secund spike</p> <p>22 Perianth tube narrow at base, abruptly curved and expanded into a wider upper portion; flowers white to yellow</p> <p>22: Perianth tube gradually widened from base to apex, straight; flowers pink or blue</p> <p>20: Style branches entire; stigmas 3</p> <p>23 Leaves densely pubescent, plicate, abruptly narrowed into a petiole-like base</p> <p>23: Leaves glabrous to puberulous, never plicate or abruptly narrowed at base</p> <p>24 Flowers pendulous on pendulous, filiform branches of a branched spike</p> <p>24: Flowers erect to horizontal; inflorescence unbranched or with erect branches</p> <p>25 Perianth tube straight; flowers more or less erect</p> <p>26 Rootstock a rhizome; style branches c. 2 cm long</p> <p>26: Rootstock a corm; style branches up to 1 cm long</p> <p>27 Perianth tube narrowly cylindrical, exserted from spathes</p> <p>27: Perianth tube funnel-shaped, not or hardly exserted from spathes</p> <p>28 Spathes scarious, brown-streaked, ragged or lacerate</p> <p>28: Spathes membranous, at least partially green, not brown-streaked, entire or emarginate</p> | <p>9. HOMERIA</p> <p>10. HEXAGLOTTIS</p> <p>5. PATERSONIA</p> <p>6. DIPLARRENA</p> <p>13. FERRARIA</p> <p>4. ORTHROSANTHUS</p> <p>2. LIBERTIA</p> <p>3. SISYRINCHIUM</p> <p>15. WATSONIA</p> <p>24. FREESIA</p> <p>29. BABIANA</p> <p>20. DIERAMA</p> <p>I SCHIZOSTYLIS</p> <p>21. IXIA</p> <p>22. SPARAXIS</p> |
|---|--|

- 29 Style 3-branched immediately above perianth tube; stamens equilateral; corm bell-shaped with tunic of woody scales **16. HESPERANTHA**
- 29: Style 3-branched well above perianth tube: stamens unilateral; corm globose with fibrous tunic **26. TRITONIA**
- 25: Perianth tube curved; flowers spreading, often at right angles to axis
- 30 Axis of spike strongly flexuose; plant stoloniferous **27. CROCOSMIA**
- 30: Axis of spike never flexuose; stolons absent
- 31 Perianth tube gibbous, abruptly dilated c. 1 cm above ovary
- 32 Perianth bilabiate, uppermost lobe far exceeding others; capsule depressed-globose **28. CHASMANTHE**
- 32: Perianth not bilabiate, lobes sub-equal; capsule oblong **19. HOMOGLOSSUM**
- 31: Perianth tube gradually widened, never gibbous
- 33 Spathes entire, acute, herbaceous **18. GLADIOLUS**
- 33: Spathes toothed or lacerate, scarious
- 34 Perianth bilabiate, with lobes shorter than tube; spathes deeply dentate to lacerate **23. SYNNOTIA**
- 34: Perianth not bilabiate, with lobes longer than tube; spathes shallowly toothed **26. TRITONIA**

† The genera *Dietes* and *Schizostylis* are keyed out here but will not be treated further in this volume. *Dietes robinsoniana* (F.Muell.) Klatt is endemic on Lord Howe Island. The two African species *D. bicolor* (Steudel) Sweet ex Klatt and *D. iridioides* (L.) Sweet ex Klatt are often cultivated and may persist in old gardens. The South African *Schizostylis coccinea* Backh. & Harvey, with red flowers c. 5 cm in diameter, has been recorded as a garden escape in Tasmania and may become naturalised.

Trib. I. ISOPHYSIDEAE

Trib. *Isophysideae* Hutch., *Fam. Fl. Pl., Monocot.* 137 (1934) *in clavi*.

Type: *Isophysis* T.Moore

Rhizomatous perennials with distichous equitant leaves. Floral tube short, surrounding base of ovary only. Inflorescence a solitary flower. Flowers actinomorphic, not fugacious. Sepals and petals similar, free. Stamens free, equilateral, alternating with style lobes. Ovary superior. Nectaries absent.

Contains only the monotypic genus *Isophysis* from Tasmania.

1. ISOPHYSIS

Isophysis T.Moore, *Proc. Linn. Soc. London* 2: 212 (1853); from the Greek *isos* (equal) and *physis* (growth), referring to the six similar tepals.

Type: *I. tasmanica* (Hook.) T.Moore

Hewardia Hook., *Hooker's Icon. Pl.* 9: t. 858 (1851), *nom. illeg.*, non J.Smith, *Hooker's J. Bot. Kew Gard. Misc.* 3: 432 (1841). T: *H. tasmanica* Hook.

Tufted, evergreen, glabrous perennials. Rhizome woody, persistent. Leaves numerous, basal, linear-ensiform. Inflorescence erect, scapose, 1-flowered, with 2 similar, opposite, acute spathes. Flowers pedicellate. Sepals and petals equal, spreading, narrowly lanceolate, the bases slightly clawed, inserted separately on a short cup-shaped floral tube. Stamens 3, spreading, exserted; filaments free, flattened, narrowly triangular; anthers

oblong, dorsifixed. Ovary conical; style terete, unbranched, shorter than ovary, with 3 terminal recurved stigmatic lobes. Sepals, petals, stamens and style separately caducous. Capsule ovoid-trigonus. Seeds numerous, angular; aril absent.

A monotypic genus endemic in Tasmania.

***Isophysis tasmanica* (Hook.) T.Moore, *Proc. Linn. Soc. London* 2: 212 (1853)**

Hewardia tasmanica Hook., *Hooker's Icon. Pl.* 9: t. 858 (1851). T: Macquarie Harbour, Tas., 1842, *R.C.Gunn s.n.*; holo: K n.v., fide D.Geerinck, *Bull. Jard. Bot. État.* 44: 34 (1974).

Illustration: W.M.Curtis & M.Stones, *Endemic Fl. Tasmania* 2: t. 41 (1969).

Leaves 5–30 cm long, 3–5 mm wide, tough, striate, glaucous with brown scarious margins. Scape terete, unbranched, exceeding leaves, smooth, bearing 1 or 2 lanceolate reduced leaves 3–8 cm long. Spathes 2.5–4.5 cm long, 5–8 mm wide, pale brown, caducous. Sepals and petals 2–4 cm long, 3–9 mm wide, dark purple-brown. Filaments 4–5 mm long; anthers 4–6 mm long, yellow. Ovary 4–6 mm long; style c. 3 mm long; stigmatic lobes 1–2 mm long. Capsule acute, 1.2–2 cm long, prominently veined, shiny; pedicel elongating, up to 6 cm long. Seeds angular, 2 mm long, brown. Fig. 1A–C.

Occurs in Tas., on exposed summits of mountains near the west coast and on peaty moors to sea level in the south-west. Flowers Dec.–Jan. Map 1.

Tas.: Port Davey, 3 May 1941, *J.Clarke* (MEL); western slopes of Mt Counsel, *M.Davis 1468* (MEL); summit of Mt Eliza, *S.J.Forbes 1267* (MEL); Mt La Perouse, Jan. 1926, *A.H.Giblin* (CANB); western slopes of Mt Eliza, 4 Jan. 1977, *J.H.Willis* (MEL).

Trib. II. SISYRINCHIEAE

Trib. *Sisyrinchieae* Benth. & J.D.Hook., *Gen. Pl.* 3: 683 (1883).

Type: *Sisyrinchium* L.

Trib. *Aristeae* Baker, *J. Linn. Soc., Bot.* 16: 75 (1877). T: *Aristea* Aiton

Rootstock a rhizome, sometimes woody with secondary growth. Leaves equitant, rarely terete or bifacial. Inflorescence compound-cymose with rhipidia of 2–many flowers subtended by persistent spathes. Flowers usually actinomorphic, fugacious. Sepals and petals free or almost so. Stamens monadelphous, rarely free. Ovary inferior; style entire or trifid, the branches or stigma lobes alternating with stamens. Nectaries absent.

About 15 genera in America, southern Africa, Australia, New Guinea and New Zealand. Four genera are native to Australia and one American genus is naturalised.

2. LIBERTIA

Libertia Sprengel, *Syst. Veg.* 1: 127 (1824) *nom. cons.*; after Anne-Marie Libert, Belgian botanist (1782–1865).

Type: *L. ixioides* (G.Forster) Sprengel

Renealmia R.Br., *Prodr. Add.* [591] (1810) *nom. illeg.*, non L., *Sp. Pl.* 1: 286 (1753) *nom. rej.*, nec L.f., *Suppl. Plant.* 7, 79 (1781) *nom. cons.* T: not designated.

Nematostigma A.Dietr., *Sp. Pl.* 2: 509 (1833). T: not designated.

Tufted, evergreen perennials. Leaves numerous, basal, distichous, equitant, flat, grass-like. Scape terete. Inflorescence compound, of several rhipidia each with a short, spreading, herbaceous spathe. Flowers actinomorphic, long-pedicellate, each with a short basal bracteole. Floral tube very short. Sepals and petals almost free, spreading, the petals slightly or manifestly larger, white. Stamens exserted, spreading; filaments connate at base only or (not in Australia) free; anthers elliptic, sub-basifixed. Style deeply trifid; branches

entire, filiform, slightly channelled or keeled, projecting horizontally between stamens; stigmas terminal, minute. Capsule ovoid to subglobose, on long pedicel. Seeds numerous, rounded to angular; aril absent.

A genus of about 12 species in South America, eastern Australia, New Guinea and New Zealand. The four N.Z. species have $x = 19$, *fide* J.B.Hair *et al.*, *New Zealand J. Bot.* 5: 187 (1967). Two native species in Australia, one of them endemic.

G.Bentham, *Libertia* (in Irideae), *Fl. Austral.* 6: 412–414 (1873); L.B.Moore, The New Zealand species of *Libertia* (Iridaceae), *New Zealand J. Bot.* 5: 255–275 (1967); D.Geerinck, Revision of Australian Iridaceae, *Bull. Jard. Bot. État* 44: 29–60 (1974).

Leaves less than 20 cm long; petals and sepals subequal

1. *L. pulchella*

Leaves more than 20 cm long; petals and sepals manifestly unequal

2. *L. paniculata*

1. *Libertia pulchella* (R.Br.) Sprengel, *Syst. Veg.* 1: 169 (1824)

Renealmia pulchella R.Br., *Prodr. Add.* [592] (1810); *Nematostigma pulchellum* (R.Br.) A.Dietr., *Sp. Pl.* 2: 510 (1833); *Sisyrinchium pulchellum* (R.Br.) R.Br. ex F.Muell., *Fragm.* 7: 92 (1870). T: Grose River, N.S.W., *R.Brown*; lecto: BM *n.v.*, *fide* D.Geerinck, *Bull. Jard. Bot. État* 44: 60 (1974).

Libertia laurencei J.D.Hook., *Fl. Tasman.* 2: 34 (1858); *L. lawrencei* J.D.Hook., *op. cit.* t. 129 (orthographic variant); *L. pulchella* var. *laurencei* (J.D.Hook.) Domin, *Biblioth. Bot.* 85: 536 (1915). T: Acheron River, Vic., *R.C.Gunn s.n.*; syn: *n.v.*; Hampshire Hills, Tas., *R.C.Gunn s.n.*; syn: *n.v.*; Western Mountains, Tas., *R.Lawrence 319*; syn: K *n.v.*, *fide* D.Geerinck, *loc. cit.*

Illustrations: J.Galbraith, *Wildfl. Victoria* t. 16 (1950); J.D.Hooker, *op. cit.* t. 129 as *L. lawrencei*.

Loosely tufted, ±glabrous herb. Rhizome wiry, sparsely branched, to 10 cm long. Leaves linear to falcate, 5–18 cm long, 2–7 mm wide. Scape exceeding leaves, 1–2 mm diam., leafless or with 1 or 2 reduced leaves. Rhipidia 3 or 4, each with 3–6 flowers on pedicels 2–3.5 cm long. Spathes lanceolate, 8–18 mm long; bracteoles 4–8 mm long. Sepals and petals cream-white, ovate, c. 5 mm long, the sepals slightly narrower, with fewer veins. Filaments very shortly connate; anthers c. 2 mm long; connective large, triangular. Ovary globose. Capsule globose-trigonous, 3–5 mm diam., brown; valves recurved at dehiscence. Seeds globose, c. 1 mm diam., dark brown; funicle persistent. $n = 19$, *fide* J.B.Hair *et al.*, *New Zealand J. Bot.* 5: 187 (1967). Fig. 1D–F.

Occurs along the Great Dividing Range of N.S.W. from Barrington Tops southwards to Vic.; widespread in Tas. In cool temperate rainforest, subalpine woodland and moist gullies in wet sclerophyll forest. Also in New Zealand and New Guinea. Flowers Nov.–Jan. Map 2.

N.S.W.: Wentworth Falls, *H.S.McKee 853* (NSW). Vic.: c. 6 km NW of Warburton, 12 Jan. 1963, *H.I.Aston* (MEL); Stanley Rocks, Mt Buffalo, *R.Melville 2650* (MEL). Tas.: below Crater Lake, Cradle Mountain Natl Park, *H.Eichler 16474* (AD); Mt Rufus, 6 Jan. 1977, *J.H.Willis* (MEL).

2. *Libertia paniculata* (R.Br.) Sprengel, *Syst. Veg.* 1: 168 (1824)

Renealmia paniculata R.Br., *Prodr. Add.* [592] (1810); *Nematostigma paniculata* (R.Br.) A.Dietr., *Sp. Pl.* 2: 510 (1833); *Sisyrinchium paniculatum* (R.Br.) R.Br. ex F.Muell., *Fragm.* 7: 91 (1870). T: Port Jackson, N.S.W., *R.Brown*; lecto: BM *n.v.*, *fide* D.Geerinck, *Bull. Jard. Bot. État* 44: 36 (1974); isolecto: NSW; Hawkesbury River, N.S.W., *R.Brown*; syn: MEL; Hunter River, N.S.W., *R.Brown*; syn: BM, E, both *n.v.*, *fide* D.Geerinck, *loc. cit.*

Illustration: J.D.Hooker, *Bot. Mag.* 102: t. 6263 (1876).

densely tufted, glabrous herb with much-branched rhizome. Leaves linear, 24–60 cm long, 4–12 mm wide. Scape shorter than leaves, 2–3 mm diam., sometimes with one reduced leaf. Inflorescence divaricate, with numerous rhipidia of 3–6 flowers on pedicels c. 1 cm long. Spathes lanceolate, 1–4 cm long; bracteoles 5–8 mm long. Perianth white. Sepals obovate, 8–13 mm long, 4–7 mm wide. Petals ovate, 6–8 mm long, 1.5–3 mm wide. Filaments connate at base; anthers c. 2 mm long. Ovary obovoid. Capsule globose-trigonous, 5–8 mm diam., black. Seeds angular, c. 1 mm diam., dark brown. Fig. 4.

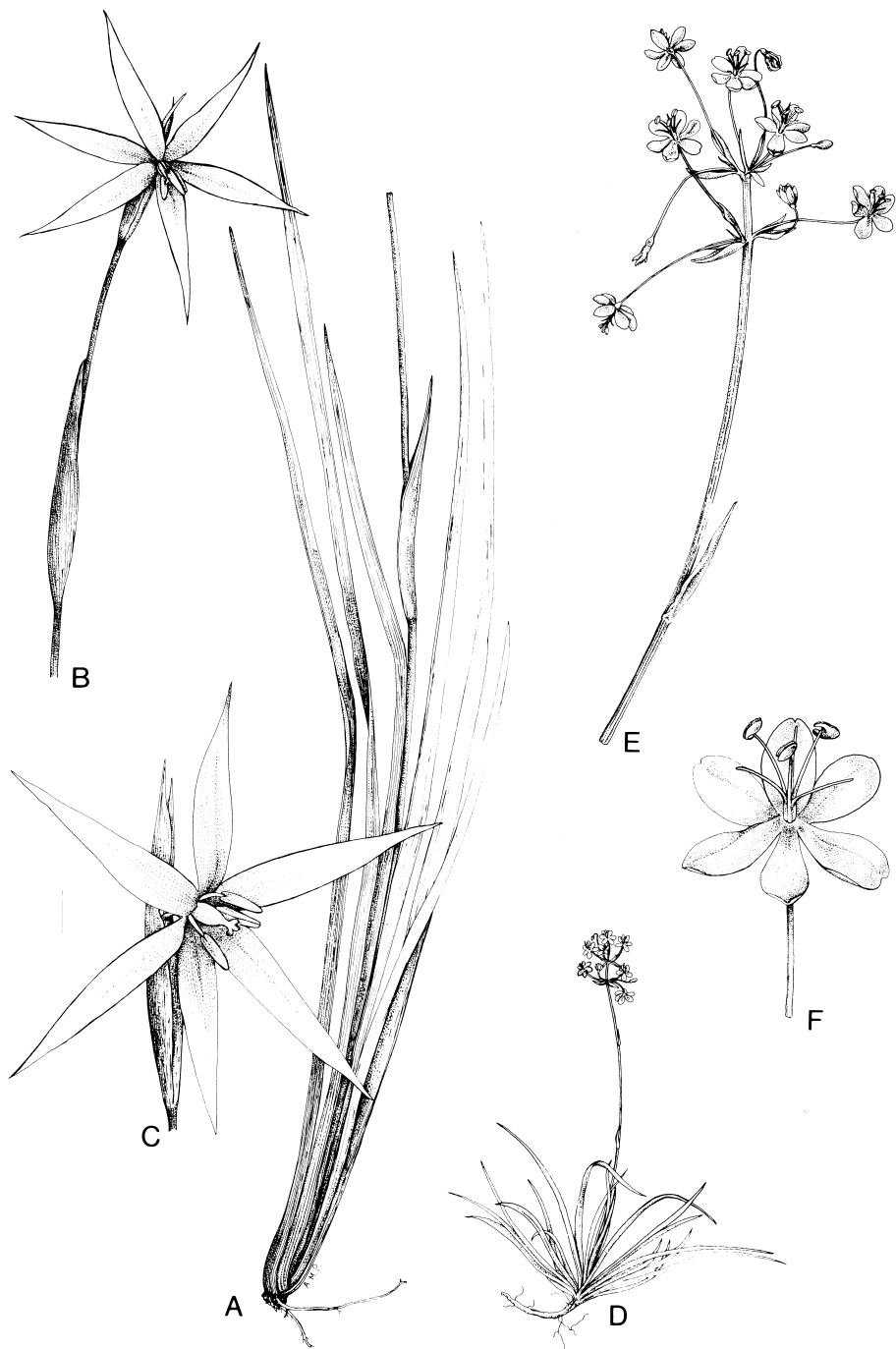


Figure 1. A–C, *Isophysis tasmanica*. A–B, flowering plant $\times 0.5$; C, flower $\times 1.1$ (Mt Eliza, J. Willis, MEL). D–F, *Libertia pulchella*. D, flowering plant $\times 0.5$; E, inflorescence $\times 0.8$; F, flower $\times 3.2$ (N. Walsh F145, MEL).

Occurs on the Great Dividing Range from south-eastern Qld to eastern Vic., in warm temperate rainforest and moist gullies in wet sclerophyll forest. Flowers Oct.–Nov. Map 3.

Qld: Mt Cordeaux, 16 Nov. 1949, *C.T.White* (BRI). N.S.W.: Imlay Creek, 4 km WSW of Mt Imlay, *M.D.Crisp* 3507 (CBG, MEL, NSW); Kioloa State Forest, *M.Evans* 2489 (AD, BRI, CANB, MEL, NSW). Vic.: Border Track 12 km NE of Genoa, *S.J.Forbes* 466 (MEL); Betka Track at Shipwreck Creek, *N.G.Walsh* 394 (MEL).

Excluded species

Libertia stricta Endl., in J.G.C.Lehmann, *Pl. Preiss* 2: 32 (1846).

T: Cape Riche, 20 Nov. 1840, *L.Preiss* 2231; *n.v.*, no material known to be extant.

From Endlicher's description this species can be referred to *Orthrosanthus*, as are *Libertia laxa* and *L. graminea* (both described by Endlicher, *loc. cit.*). *L. stricta* is possibly a synonym of *Orthrosanthus multiflorus* Sweet.

3. SISYRINCHIUM

Sisyrinchium L., *Sp. Pl.* 1: 954 (1753); *Gen. Pl.* 5th edn, 409 (1754); from *sisyrinchion*, the Greek name for the barbary nut, a species of *Gynandris*.

Type: *S. bermudiana* L.

Annuals, or rhizomatous, evergreen perennials. Stems flattened or rarely terete. Leaves basal and cauline, equitant, linear. Inflorescence of 1 to several rhipidia each with 2–6 pedicellate flowers emerging successively from paired leaf-like spathes; bracteoles concealed by spathes. Flowers actinomorphic, fugacious. Sepals and petals almost free, equal in length, the sepals often slightly wider than petals, forming a cup around stamens and style, spreading above. Stamens included; filaments usually connate; anthers dorsifixed. Ovary rounded; style deeply trifid, branches entire, filiform; stigmas terminal, minute. Capsule globose to trigonous; pedicel long, filiform. Seeds numerous, pitted; aril absent.

Over 100 species in North and South America, several of them adventive in other parts of the world; 2 species naturalised in temperate Australia as weeds of pasture and disturbed land.

G.Bentham, *Sisyrinchium* (in Irideae), *Fl. Austral.* 6: 412 (1873).

- | | | |
|----|---|---------------------------------|
| 1 | Perennial, at least 25 cm tall; leaves 3–5 mm wide | 1. <i>S. iridifolium</i> |
| 1: | Annual, less than 25 cm tall; leaves 1–3 mm wide | |
| 2 | Flowers 5–7 mm diam., yellow with purple-brown markings | 2. <i>S. sp. A</i> |
| 2: | Flowers 10–15 mm diam., cream-white with purple or blue centres | 1. <i>S. iridifolium</i> |

1. **Sisyrinchium iridifolium* Kunth, in F.W.H.A. von Humboldt, A.J.A.Bonpland & K.S.Kunth, *Nov. Gen. Sp.* 1: 324 (1816)

T: from Venezuela, *collector unknown*; *n.v.*

[*S. bermudiana auct. non* L.: A.J.Ewart, *Fl. Victoria* 302 (1931)]

Illustration: A.J.Healy & E.Edgar, *Fl. New Zealand* 3: fig. 22A–D (1980).

Tufted, grass-like annual or perennial with short rhizome. Stems usually branched, jointed, flattened to winged, 10–60 cm tall, 1–2.5 mm wide. Leaves linear-ensiform, 5–20 cm long, 1.5–5 mm wide. Rhipidia 2–5-flowered. Spathes opposite, narrowly lanceolate with abruptly contracted apices, sub-equal, 1.5–5 cm long. Perianth urceolate below, spreading above, 1–2 cm diam., white to cream with purple or blue centre; sepals and

petals oblong, acute to acuminate, puberulous outside. Stamens exceeding style branches; filaments 2–3 mm long, almost completely connate, dilated and papillose at base; anthers c. 1.5 mm long. Ovary 1–2 mm diam., puberulous. Capsule globose, 3–6 mm diam., glabrous, brown. Seeds angular, c. 1 mm diam., dark brown. *Blue Pigroot*.

A variable species or species aggregate native to South America and Mexico. Naturalised in Mt Lofty Range, S.A., south-eastern Qld, Great Dividing Range and coast of N.S.W., southern Vic. and Tas. A weed of gardens, waste ground and rough pasture. Flowers Nov.–Jan. Map 4.

Qld: The Summit, near Stanthorpe, *M.Bengston 5161* (BRI, CANB). N.S.W.: Audley, Royal Natl Park, *R.Coveny 10341* (NSW). Vic.: Sherbrooke Forest, 3 Feb. 1977, *P.K.Gullan & A.Opie* (MEL); Frankston, *R.Melville 2025* (MEL, NSW). Tas.: Blackmans Bay, 17 Nov. 1974, *W.M.Curtis* (HO).

2. **Sisyrinchium* sp. A

[*S. micranthum* ? auct. non Cav.: G.Bentham, *Fl. Austral.* 6: 412 (1873)]

Illustrations: N.T.Burbridge & M.Gray, *Fl. Austral. Cap. Terr.* fig. 110 (1970) as *S. micranthum*; A.J.Healy & E.Edgar, *Fl. New Zealand* 3: fig. 22E–F (1980) as *S. 'yellow'*.

Annual herb, usually densely tufted. Stems simple or branched, erect, jointed, 2-angled, 5–20 cm tall, c. 1 mm wide. Leaves linear, 2–6 cm long, 1–2 mm wide. Rhipidia 3–7-flowered. Spathes opposite, lanceolate with abruptly contracted apices; outer spathe 1.8–3 cm long, inner 1.5–2.3 cm long; margins scarious, white. Perianth urceolate below, spreading above, 5–7 mm diam., pale yellow with brown-purple markings in centre; lobes oblong-acuminate, puberulous outside. Stamens exceeding style branches; filaments 1–1.5 mm long, two-thirds connate, dilated and papillose at base; anthers to 1 mm long. Ovary c. 1 mm diam., puberulous. Capsule globose, 2–3 mm diam., glabrous, green to reddish. Seeds globose, c. 0.7 mm diam., rugose, black. *Scourweed*.

Introduced from South America and naturalised in south-western W.A., south-eastern Qld, coast and tablelands of N.S.W. and south-eastern Vic. A locally common weed along roads and tracks, in lawns and in poorly-drained rough pasture. Flowers Oct.–Dec. Map 5.

W.A.: Windelya road, North Lake, *A.S.George 4260* (PERTH); Carlisle, Nov. 1963, *L.Gilsenan* (PERTH). Qld: Cracow–Eidsvold road, 29 km E of Cracow, *R.W.Johnson 2702A* (BRI, CANB). N.S.W.: between Moss Vale and Fitzroy Falls, 27 Nov. 1956, *E.Gauba* (CBG). Vic.: Fraser Natl Park, 21 Nov. 1968, *J.H.Willis* (MEL).

Closely related to *S. iridifolium*. As the taxonomy of *Sisyrinchium* is under revision, it is uncertain whether this taxon is identical with *S. micranthum* or an undescribed subspecies of *S. iridifolium*. Reputed to be toxic to stock, but seldom grazed.

Doubtful species

Sisyrinchium rigidum Lehm., *Neue Allg. Deutsche Garten- Blumenzeitung* 6: 415 (1850).

T: described from cultivated plants grown from seed stated by Lehmann to have been collected by *L.Preiss* in south-western W.A.

Lehmann's description appears to be of one of the perennial South American *Sisyrinchium* species, possibly *S. tinctorium* Kunth; no Australian material fitting this description is known to exist.

4. ORTHROSANTHUS

Orthrosanthus Sweet, *Fl. Australasica* t. 11 (1829); from the Greek *orthros* (morning) and *anthos* (flower), referring to the fugacious flowers which open in the morning.

Type: *O. multiflorus* Sweet

Eveltria Raf., *Fl. Telluriana* 4: 30 (1838). T: *E. multiflora* (Sweet) Raf.

Tufted, rhizomatous, evergreen perennial herbs. Basal leaves numerous, equitant, linear, erect. Scapes erect, terete, often with 1–3 reduced leaves. Inflorescence compound, branched, with rhipidia (rarely single flowers) each enclosed at the base by 2 herbaceous spathes. Flowers actinomorphic, fugacious, almost sessile. Floral tube less than 2 mm long. Sepals and petals shortly united, spreading, equal or sub-equal, with distinct midveins, blue. Stamens exserted, erect; filaments connate at the base or free; anthers dorsifixed, with prominent connectives, yellow. Style deeply trifid, branches entire, terete, minutely channelled, projecting horizontally between stamens; stigmas terminal, minute. Ovary trigonous-ellipsoid, enclosed by bracteole or spathe. Capsule ovoid-trigonous, on short pedicel. Seeds several in each locule; testa rugose, brown.

A genus of about 7 species in Australia and America; 4 species endemic in Australia.

G.Bentham, *Orthrosanthus* (in Irideae), *Fl. Austral.* 6: 410–411 (1873).

- | | | |
|----|--|---------------------------|
| 1 | Inflorescence with a straight central axis and erect branches, each pair of spathes enclosing 1 flower | 4. O. polystachyus |
| 1: | Inflorescence sympodial with divaricate branches, each pair of spathes enclosing 2 or more flowers | |
| 2 | Leaves less than 20 cm long, with densely pubescent to tomentose margins | 2. O. muelleri |
| 2: | Leaves mostly over 20 cm long, with glabrous margins | |
| 3 | All rhipidia pedunculate, terminating inflorescence branches; stamens free | 1. O. laxus |
| 3: | Some rhipidia sessile between inflorescence branches; stamens monadelphous | 3. O. multiflorus |

1. *Orthrosanthus laxus* (Endl.) Benth., *Fl. Austral.* 6: 411 (1873)

Libertia laxa Endl., in J.G.C.Lehmann, *Pl. Preiss.* 2: 32 (1846). T: Mt Eliza, Perth, W.A., 23 Sept. 1839. *L.Preiss* 2230; lecto: P n.v., *fide* D.Geerinck, *Bull. Jard. Bot. État* 44: 38 (1974); isolecto: MEL.

Herb 20–55 cm tall. Basal leaves 10–45 cm long, glabrous or puberulous, margins somewhat scabrid. Inflorescence divaricate, each scape bract subtending 1–4 rhipidia on peduncles 1–7 cm long. Rhipidia 2–4-flowered, enclosed by ovate spathes 12–18 mm long with narrow scarious margins, the inner spathe longer. Flowers separated by hyaline bracteoles c. 10 mm long. Sepals and petals obovate to oblong, 15–19 mm long, 7–10 mm wide, often minutely apiculate, sparsely puberulous outside. Filaments free, c. 4 mm long; anthers 2.5–3.5 mm long. Style branches 4–7 mm long; stigmas entire. Capsule acuminate, 12–15 mm long; pedicel to 4 mm long. Seeds globose to angular, c. 2 mm diam. Fig. 7.

Widespread in south-western W.A.; there are 2 varieties.

- | | |
|------------------------|---------------------------|
| Leaves over 2 mm wide | 1a. var. laxus |
| Leaves up to 2 mm wide | 1b. var. gramineus |

1a. *Orthrosanthus laxus* (Endl.) Benth. var. *laxus*

Leaves 12–45 cm long, 3–5 mm wide, rigidly erect. Inflorescence 30–55 cm tall including scape.

Widespread in south-western W.A. from Geraldton to Albany. Flowers Aug.–Oct. Map 6.



Figure 2. A–C, *Orthrosanthus polystachyus*. A, inflorescence $\times 0.7$; B, flower $\times 2$; C, capsule $\times 2$ (cultivated plant, Royal Botanic Gardens, Melbourne). D–E, *Diplarrena moraea*. D, flowering stem $\times 0.7$; E, flower $\times 1.3$ (S.Forbes 1342, MEL).

W.A.: 9.6 km SSE of Marchagee, Geraldton Hwy, *A.C.Beauglehole* 12198 (MEL); Parkerville, *R.Coveny* 8038 (NSW, PERTH); Pages Way, Gosnells, *R.J.Cranfield* 522 (MEL, PERTH); Howatharra Hills, *G.J.Keighery* 3232 (PERTH); Helena Valley, *J.Seabrook* 211 (CANB).

1b. *Orthrosanthus laxus* var. *gramineus* (Endl.) Geer., *Bull. Jard. Bot. État* 44: 38 (1974)

Libertia graminea Endl., in J.G.C.Lehmann, *Pl. Preiss* 2: 32 (1846); *Orthrosanthus gramineus* (Endl.) Benth., *Fl. Austral.* 6: 411 (1873). T: York, W.A., 4 Sept. 1839, *L.Preiss* 2299; lecto: P *n.v.*, fide D.Geerinck, *op. cit.* 39; isolecto: MEL.

Leaves 12–35 cm long, 1–2 mm wide, somewhat lax. Inflorescence 10–40 cm tall including scape.

Occurs in south-western W.A. from Moora to Albany. Flowers Aug.–Oct. Map 7.

W.A.: Geraldton Hwy 161 km from Perth, *E.M.Canning* WA/68 3622 (CBG); Woorloo, *M.Koch* 738 (MEL); 11 km E of Bindoon, *H.L.Lewis* 43 (MEL); Midland Junction, 6 Sept. 1899, *A.Morrison* (MEL); N of Watheroo, *E.C.Nelson* ANU 17233 (CANB).

2. *Orthrosanthus muelleri* Benth., *Fl. Austral.* 6: 411 (1873)

T: Stirling Range, W.A., *F.Mueller*; lecto: K *n.v.*, fide D.Geerinck, *Bull. Jard. Bot. État* 44: 39 (1974); isolecto: MEL; south-western W.A., *J.Drummond* 1: 767; syn: MEL.

Herb 20–30 cm tall. Leaves rigidly erect, 10–20 cm long, 1.5–2.5 mm wide, margins densely pubescent to tomentose. Inflorescence few-branched, with 1 or 2 scape bracts each subtending 2 or 3 rhipidia on peduncles 1–5 cm long, rarely also 1 sessile rhipidium. Rhipidia 4–6-flowered, enclosed by ovate spathes 10–13 mm long with broad scarious margins and apices. Flowers separated by hyaline bracteoles. Mature flowers not seen. Capsule acute, 8–10 mm long, subsessile, included in spathe.

Occurs in the Stirling Range and Gnowangerup area of W.A. Flowers Oct. Map 8.

W.A.: 2 km S of Young R. towards Kendenup, 8 Oct. 1962, *M.E.Phillips* (CBG).

3. *Orthrosanthus multiflorus* Sweet, *Fl. Australasica* t. 11 (Aug. 1827)

Eveltria multiflora (Sweet) Raf., *Fl. Telluriana* 4: 30 (1838); *Sisyrinchium multiflorum* (Sweet) Steudel, *Nom. Bot.* 2nd edn, 2: 596 (1841). T: cultivated in England from seed collected near Lucky Bay, W.A., by *W.Baxter*; holo: BM *n.v.*, fide D.Geerinck, *Bull. Jard. Bot. État* 44: 40 (1974).

Sisyrinchium cyaneum Lindley, *Bot. Reg.* 13: t. 1090 (Sep. 1827). T: cultivated in England from seed, collected by *W.Baxter*, said to be from Kangaroo Is., S.A., but possibly in error and referring to Lucky Bay, W.A., not Lucky Bay, Kangaroo Is.; *n.v.*, fide J.Lindley, *loc. cit.*

O. multiflorus var. *hebecarpus* Benth., *Fl. Austral.* 6: 411 (1873). T: W.A., collector unknown; holo: possibly K *n.v.*

Herb 30–60 cm tall. Leaves 16–50 cm long, 2–6 mm wide, glabrous, the bases with scarious brown margins. Inflorescence few-branched, with 2–4 scape bracts 2–10 cm long each subtending 1 sessile and 1–4 pendunculate rhipidia. Rhipidia 3–7-flowered, enclosed by ovate to oblong spathes 12–20 mm long with broad scarious margins and apices. Flowers separated by hyaline bracteoles 10–15 mm long. Sepals and petals obovate to oblanceolate, obtuse, 12–20 mm long, 6–10 mm wide, slightly puberulous outside. Filaments c. 5 mm long, connate 1–2 mm at base; anthers 2.5–3 mm long. Style branches 4–5 mm long; stigmas bilobed. Capsule acuminate, 12–20 mm long; pedicel to 2 mm long. Seeds globose to angular, c. 2 mm diam.

Occurs on S coast of W.A. from Stirling Range to Israelite Bay, on Kangaroo Is. and Eyre Peninsula, S.A., and in south-western Vic., in heath and scrub-heath. Flowers Sept.–Dec. Map 9.

W.A.: 3 km NE of Howick Hill, Neridup, *A.E.Orchard* 1161 (AD, PERTH); 3 km W of Mt Hassell, Stirling Ra., *E.C.Nelson* ANU 16758 (CANB, MEL). S.A.: Kingscote, Kangaroo Is., *A.B.G.Trainee* 71

(AD, MEL). Vic.: 7 km SW of Portland, 4 km NNE of Cape Nelson lighthouse, *M.D.Crisp* 6866 (CBG, PERTH).

4. *Orthrosanthus polystachyus* Benth., *Fl. Austral.* 6: 411 (1873)

Sisyrrinchium polystachyum (Benth.) F.Muell., *Syst. Census Austral. Pl.* 114 (1883). T: south-western W.A., *J.Drummond* 206; lecto: K n.v., *fide* D.Geerinck, *Bull. Jard. Bot. État* 44: 40 (1974); isolecto: MEL; south-western W.A., *J.Drummond* 357; syn: MEL; Cape Naturaliste, W.A., *A.Oldfield*; syn: MEL; Warren River, W.A., *P.Walcott s.n.*; syn: MEL.

Herb 60–100 cm tall, forming large tufts. Leaves lax, grass-like, 25–60 cm long, 2.5–6 mm wide, glabrous, margins often scabrid. Inflorescence axis straight, with numerous lanceolate scape bracts 1–4 cm long each subtending 3–5 single flowers on pedicels up to 1 cm long, sometimes with a branch up to 8 cm long bearing 3–5 flowers. Each flower enclosed by 2 ovate spathes 6–10 mm long. Sepals and petals obovate with acute apices, 15–19 mm long, 7–10 mm wide, the petals slightly narrower, glabrous. Filaments 4–6 mm long, connate 1–2 mm at base; anthers 3–5 mm long. Style branches 4–7 mm long; stigmas entire. Capsule obtuse, 12–20 mm long; pedicel to 1 mm long. Seeds ovoid, c. 2 mm long. $2n = 40$, *fide* A.Kenton & C.A.Heywood, *Pl. Syst. Evol.* 146: 92 (1984). Fig. 2A–C.

Occurs in south-western W.A. between Busselton and the Warren River area, in forest gullies, often along streams. Flowers Oct.–Nov. Map 10.

W.A.: 15 km from Northcliffe towards Pemberton, 15 Oct. 1968, *E.M.Canning* (CBG); Warren R., 10 Dec. 1877, *F.Mueller* (MEL); Warren Natl Park, Pemberton, *N.Ollerenshaw* 228 (CBG); Cape Leeuwin, 18 Oct. 1962, *M.E.Phillips* (CBG).

5. PATERSONIA

Patersonia R.Br., in J.B.Ker Gawler, *Bot. Mag.* 26: t. 1041 (1807), *nom. cons.*; after William Paterson (1755–1810), botanical collector and Lieutenant Governor of New South Wales.

Type: *P. sericea* R.Br.

Genosiris Labill., *Nov. Holl. Pl.* 1: 13, t. 9 (1805), *nom. rej.* T: *G. fragilis* Labill.

Perennial herbs with basal leaves, rarely undershrubs, evergreen except *P. babilanoides*. Rootstock a short rhizome, usually woody, rarely corm-like. Leaves equitant, usually linear or ensiform. Scape erect, terete, unbranched, leafless, but often clasped at base by innermost leaf. Inflorescence capitate, with an involucre of 2 opposite spathes enclosing two 1–6-flowered rhipidia separated by shorter bracts. Flowers actinomorphic, sessile, fugacious, blue-violet, rarely white or yellow, each with a scarious bracteole. Floral tube filiform, \pm included in bracts. Sepals free, broad, spreading. Petals very small, erect. Stamens inserted at apex of tube; filaments exserted, partly or completely connate; anthers basifixed, yellow; connective triangular. Style filiform, unbranched, exceeding anthers; stigmatic lobes 3, equal, flattened, free and obovate to cuneate or almost fully fused, papillose on upper surface. Capsule sessile, \pm included. Seeds numerous, often arillate.

A genus of about 19 species, 17 endemic in Australia and 1 or 2 in Malaysia. Several Australian species are occasionally cultivated as ornamentals.

The style may vary greatly in length, even among flowers on one plant, and may become bent or reflexed; these differences are of no taxonomic value.

G.Bentham, *Patersonia* (in Irideae), *Fl. Austral.* 6: 400–409 (1873).

1 Leaves 1 or 2, linear-elliptic, bases narrowed and petiole-like

17. *P. babilanoides*

1: Leaves several, linear, bases sheathing

- 2 Leaves less than one-half length of scape, soft, soon withering **16. *P. graminea***
- 2: Leaves more than one-half length of scape, tough, persistent
- 3 Spathes green to pale brown, similar to leaves in texture
- 4 Leaves flat, not deeply grooved; spathes more than 6 cm long **1. *P. umbrosa***
- 4: Leaves biconvex to terete, deeply grooved; spathes less than 6 cm long
- 5 Leaf margins glabrous; ovary glabrous **6. *P. fragilis***
- 5: Leaf margins pubescent to villous; ovary villous
- 6 Spathes less than 32 mm long, very unequal, the shorter one gibbous **7. *P. inaequalis***
- 6: Spathes more than 32 mm long, sub-equal, both straight **8. *P. drummondii***
- 3: Spathes brown or black, differing from leaves in texture
- 7 Small undershrubs; leaves cauline on erect slender stems
- 8 Plant to 20 cm tall; leaves 5–15 cm long, crowded in erect fans **9. *P. pygmaea***
- 8: Plant 30–80 cm tall; leaves 10–40 cm long, widely spreading **10. *P. glabrata***
- 7: Herbs; leaves all basal
- 9 Scape and spathes glabrous
- 10 Leaves biconvex to terete, deeply grooved
- 11 Leaves biconvex; spathes dark brown with brown scarious margins less than 1 mm wide **4. *P. maxwellii***
- 11: Leaves terete; spathes chestnut brown with transparent, almost colourless scarious margins 2–3 mm wide **5. *P. juncea***
- 10: Leaves flat, not deeply grooved
- 12 Leaf margin thickened, c. 1 mm wide, glabrous, brown **3. *P. limbata***
- 12: Leaf margin not thickened, pale greenish and glabrous or dark brown and pubescent
- 13 Spathes lanceolate to elliptic, enclosing the head, smooth **2. *P. occidentalis***
- 13: Spathes triangular, gaping, striate **14. *P. lanata***
- 9: Scape and spathes silky to tomentose
- 14 Spathes pale brown, sparsely silky **15. *P. macrantha***
- 14: Spathes dark brown to black, silky to tomentose
- 15 Leaf surface with deep pilose grooves **13. *P. argyrea***
- 15: Leaf surface with shallow glabrous striations
- 16 Scape and spathes brown-tomentose; involucre obconic **14. *P. lanata***
- 16: Scape and spathes silky to velvety with white hairs; involucre obovoid
- 17 Leaf bases glabrous except on margins; scape glabrous at base **11. *P. sericea***
- 17: Leaf bases with dense general pubescence; scape pubescent to velvety at base **12. *P. rudis***

1. *Patersonia umbrosa* Endl., in J.G.C.Lehmann, *Pl. Preiss.* 2: 31 (1846)

Genosiris umbrosa (Endl.) F.Muell., *Fragm.* 7: 32 (1869). T: Stirling Range, W.A., 25 Sept. 1840, *L.Preiss* 2348; lecto: S n.v., *fide* D.Geerinck, *Bull. Jard. Bot. État* 44: 58 (1974); isolecto: MEL.

Loosely tufted herb. Leaves linear-ensiform, 30–90 cm long, 4–6 mm wide, flat, glabrous to puberulous; bases with thin, brown, scarious margins. Scape 30–80 cm long, glabrous, clasped at base by 1 reduced leaf. Spathes narrowly lanceolate, 6–8.5 cm long, veined, green, glabrous or puberulous on keel. Involucre 6–10 mm wide; inner bracts completely

enclosed. Tube c. 5 cm long, sericeous. Sepals ovate to rhomboid, 2.5–3.5 cm long, 2–2.5 cm wide, with prominent midveins. Petals narrowly lanceolate. Filaments c. 7 mm long, completely connate. Ovary villous. Capsule cylindrical, 2.5–3.5 cm long. Seeds globose, c. 5 mm diam., pale brown; aril c. 2 mm long, in a large pit. Fig. 3D.

Occurs in south-western W.A., in scrub-heath, woodland, and Jarrah and Karri forest. There are 2 varieties.

Perianth blue-violet

1a. var. umbrosa

Perianth yellow

1b. var. xanthina

1a. *Patersonia umbrosa* Endl. var. *umbrosa*

Perianth deep blue-violet.

Occurs in south-western W.A. from Deep River to Stirling Range and Fitzgerald River; in poorly-drained habitats within scrub-heath, woodland and Jarrah forest. Flowers Aug.–Nov. Map 11.

W.A.: 19 km W of Denmark on Manjimup road, *A.R.Fairall 628* (PERTH); 3 km S of Mt Barker, *K.F.Kenneally 6465* (MEL, PERTH); c. 10 km E of Mt Barker, *R.H.Kuchel 1941* (AD, MEL); Denmark, Aug. 1913, *D.Myers* (MEL, PERTH).

1b. *Patersonia umbrosa* var. *xanthina* (Oldfield & F.Muell. ex F.Muell.) Domin, *J. Linn. Soc., Bot.* 41: 254 (1912)

P. xanthina Oldfield & F.Muell. ex F.Muell., *Fragm.* 1: 214 (1859); *Genosiris xanthina* (Oldfield & F.Muell. ex F.Muell.) F.Muell., *Fragm.* 7: 33 (1869); *Patersonia umbrosa* f. *xanthina* (Oldfield & F.Muell. ex F.Muell.) Geer., *Bull. Jard. Bot. État* 44: 58 (1974). T: Geographe Bay, W.A., *A.Oldfield*; holo: MEL; iso: MEL.

Illustration: R.Erickson *et al.*, *Fl. Pl. W. Australia* 44, t. 100 (1973).

Perianth bright yellow. Fig. 5.

Occurs in south-western W.A. from southern Darling Range to Deep River, growing in Jarrah and Karri forest. Flowers Aug.–Oct. Map 12.

W.A.: Cape Leeuwin, *A.C.Beauglehole 12525* (MEL); 2 km N of Balingup, *N.T.Burbidge 2569* (BRI, CANB); c. 15 km SE of Donnybrook, *H.Eichler 16135* (AD); c. 10 km SE of Busselton, *K.Paijman 3642* (PERTH); Meelup, W of Busselton, *S.Paust 131* (PERTH).

2. *Patersonia occidentalis* R.Br., *Prodr.* 304 (1810)

Genosiris occidentalis (R.Br.) F.Muell., *Fragm.* 7: 31 (1869). T: King George Sound, [W.A.], Dec. 1801, *R.Brown*; syn: BM, K, both *n.v.*, *fide* D.Geerinck, *Bull. Jard. Bot. État* 44: 52 (1974).

P. longiscapa Sweet, *Fl. Australasica* t. 39 (1828); *Genosiris longiscapa* (Sweet) Kuntze, *Revis. Gen. Pl.* 701 (1891). T: cultivated in England from seed collected from south coast of Australia by *W.Baxter*; *n.v.*

P. sapphirina Lindley, *Bot. Reg.* 25: t. 60 (1839). T: cultivated in England from seed collected from south-western W.A. by *J.Drummond*; *n.v.*

P. diesingii Endl., in J.G.C.Lehmann, *Pl. Preiss.* 2: 30 (1846). T: Perth, W.A., 16 July 1839, *L.Preiss 2356*; lecto: S *n.v.*, *fide* D.Geerinck, *op. cit.* 51; isolecto: MEL.

P. flaccida Endl., in J.G.C.Lehmann, *Pl. Preiss.* 2: 30 (1846). T: Salt River, York, W.A., 26 Mar. 1840, *L.Preiss 2355*; lecto: BR *n.v.*, *fide* D.Geerinck, *op. cit.* 51.

P. nana Endl., in J.G.C.Lehmann, *Pl. Preiss.* 2: 30 (1846). T: Stirling Range, W.A., 23 Sept. 1840, *L.Preiss 2346*; lecto: MEL, *fide* D.Geerinck, *op. cit.* 52.

P. tenuispatha Endl., in J.G.C.Lehmann, *Pl. Preiss.* 2: 31 (1846). T: near Whitfield station, York, W.A., 15 Mar. 1840, *L.Preiss 2358 p.p.*; lecto: P *n.v.*, *fide* D.Geerinck, *op. cit.* 51; isolecto: MEL.

P. turfosa Endl., in J.G.C.Lehmann, *Pl. Preiss.* 2: 31 (1846). T: Mt Eliza, Perth, W.A., 21 Jan. 1839, *L.Preiss 2358 p.p.*; lecto: S *n.v.*, *fide* D.Geerinck, *op. cit.* 51; isolecto: MEL.

P. occidentalis var. *angustifolia* Benth., *Fl. Austral.* 6: 403 (1873). T: W.A., *L.Preiss 2358 p.p.* (cited in error by Benthham as 2338); syn: MEL; Murchison River, W.A., *A.Oldfield*; syn: MEL.

P. occidentalis var. *latifolia* Benth., *Fl. Austral.* 6: 403 (1873). T: Champion Bay, W.A., *A.Oldfield*; holo: K n.v., *fide* D.Geerinck, *op. cit.* 51; iso: MEL.

P. occidentalis var. *aemulans* Domin, *J. Linn. Soc., Bot.* 41: 254 (1912). T: Slab Hut Gully, Cranbrook, W.A., 1909, *A.A.Dorrien-Smith*; holo: K n.v., *fide* K.Domin, *loc. cit.*

Illustration: R.Erickson *et al.*, *Fl. Pl. W. Australia* 29, t. 47 (1973).

Tufted herb. Leaves linear-ensiform, 8–55 cm long, 2–10 mm wide, flat, finely veined, glabrous; margins glabrous or brown-pubescent. Scape 10–80 cm long, glabrous, clasped by 1 reduced leaf. Spathes elliptic to lanceolate, 3–5 cm long, glabrous or puberulous on keel, brown; margin c. 1 mm wide, scarious, brown-streaked. Involucre 7–18 mm wide; inner bracts slightly exserted. Tube 2.5–4 cm long, villous. Sepals ovate, obtuse, 2–3.5 cm long, 1.2–2.2 cm wide, blue-violet. Petals lanceolate. Filaments 4–7 mm long, almost completely connate. Ovary villous. Capsule cylindrical, 1.8–2.5 cm long. Seeds compressed-ovoid, 2–3 mm long, dark brown; aril absent. $2n = 22$, *fide* P.Goldblatt, *Ann. Missouri Bot. Gard.* 66: 852 (1979). Fig. 3A–C.

Widespread in south-western W.A. from Murchison River to Israelite Bay, mainly near coast; also in south-eastern S.A., coastal Vic., and northern and eastern Tas. Grows in heath, scrub and woodland, chiefly on poorly drained sites. Flowers Sept.–Dec. Map 13.

W.A.: Howatharra–Nanson road, Moresby Ra., *A.M.Ashby* 5521 (AD, MEL); c. 50 km E of Esperance, *R.H.Kuchel* 1675 (AD, MEL); 29°36'S, 115°24'E, *T.Macfarlane* 644 (MEL, PERTH). S.A.: Fleurieu Peninsula, *H.Eichler* 14400 (AD). Vic.: Telegraph road, Welshpool, *H.S.Meyer* 42 (AD, CANB, MEL).

Populations in W.A. show wide and continuous variation in height, leaf width, vestiture and number of flowers. Eastern plants, to which the name *P. longiscapa* has been applied by many authors, are more uniformly gracile and glabrous but cannot be separated reliably from western material.

3. *Patersonia limbata* Endl., in J.G.C.Lehmann, *Pl. Preiss.* 2: 29 (1846)

Genosiris limbata (Endl.) Kuntze, *Revis. Gen. Pl.* 701 (1891). T: Albany, W.A., 20 Oct. 1840, *L.Preiss* 2349; lecto: MEL, *fide* D.Geerinck, *Bull. Jard. Bot. État* 44: 52 (1974).

Genosiris occidentalis var. *eristephana* F.Muell., *Fragm.* 7: 32 (1869); *Patersonia occidentalis* var. *eristephana* (F.Muell.) Domin, *J. Linn. Soc., Bot.* 41: 254 (1912). T: King George Sound, W.A., Oct. 1867, *F.Mueller*; holo: MEL.

Tufted herb. Leaves ensiform, 18–40 cm long, 4–11 mm wide, finely veined, glabrous; margins thickened, c. 1 mm wide, hard, glabrous, brown; bases often with deciduous brown tomentum. Scape 27–38 cm long, glabrous, clasped by 2 short pallid leaves. Spathes elliptic, 4.2–5 cm long, glabrous, dark brown; margins c. 2 mm wide, scarious, brown. Involucre 10–15 mm wide; inner bracts hardly exserted. Tube c. 3.5 cm long, lower two-thirds tomentose. Sepals ovate to orbicular, often apiculate, to 3 cm long, 2.5 cm wide, violet. Petals linear. Filaments c. 7 mm long, two-thirds connate. Ovary tomentose. Capsule cylindrical, 2.5 cm long. Seeds compressed-ovoid, 2–3 mm long, dark brown; aril absent.

Occurs in south-western W.A. in Stirling Range – Albany area and along coast to Cape Arid, with scattered populations in southern Darling Range. Grows in heath, scrub and woodland, mainly on poorly-drained sites. Flowers Sept.–Oct. Map 14.

W.A.: c. 17 km from Cranbrook on Ballochmyle road, 11 Oct. 1968, *E.M.Canning* (CBG); gully leading to Yerritup Ck, *H.Eichler* 19983 (AD, CANB, PERTH); Cape Arid Natl Park, *R.J.Hnatiuk* 761069 (PERTH); base of Stirling Ra., Oct. 1867, *F.Mueller* (MEL); Cape Le Grand Natl Park, *R.D.Royce* 8654 (PERTH).

Closely related to *P. occidentalis*, but easily recognized by the prominently thickened leaf margins.

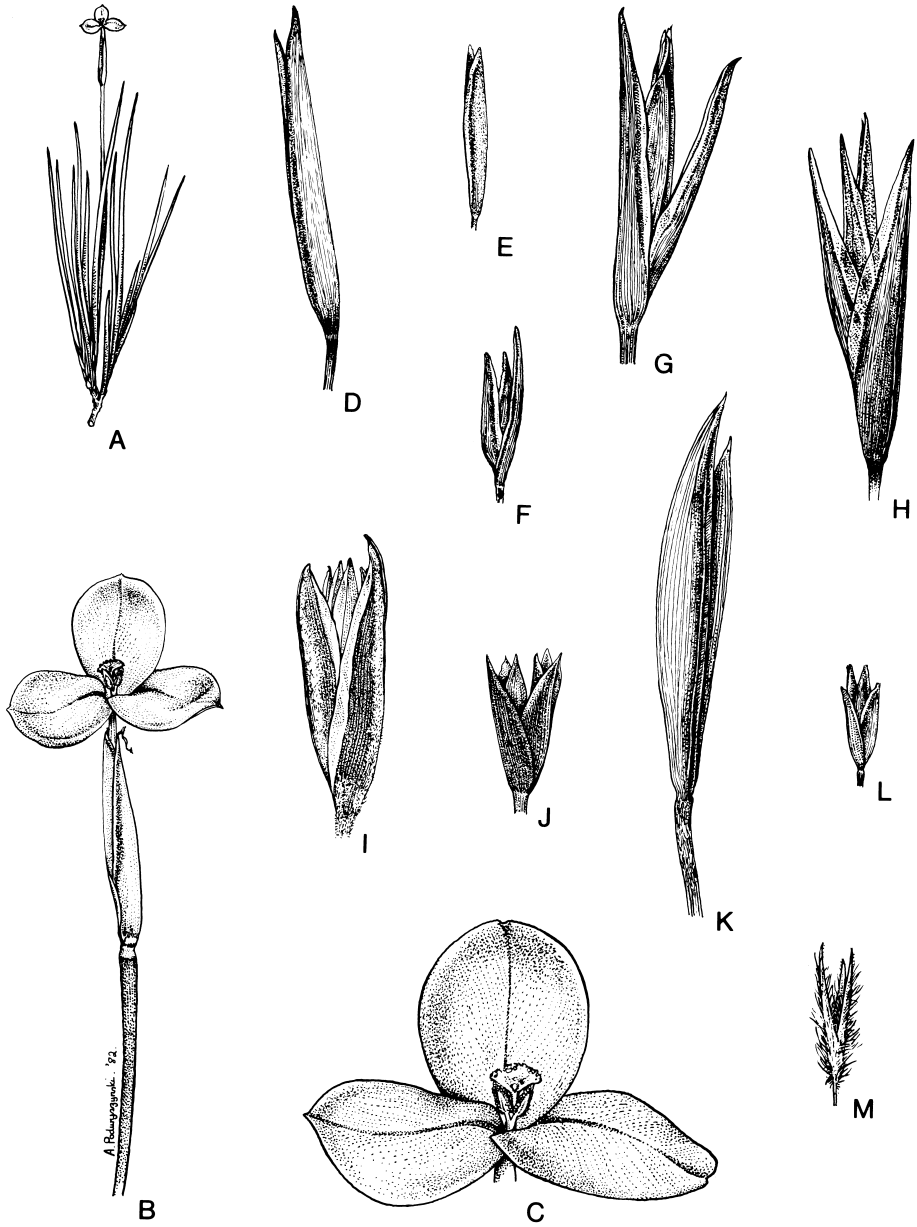


Figure 3. *Patersonia*. **A–C**, *P. occidentalis*. **A**, flowering plant $\times 0.1$; **B**, inflorescence $\times 0.3$; **C**, flower $\times 0.7$ (cultivated plant, Royal Botanic Gardens, Melbourne). **D–M**, spathes and bracts $\times 0.7$. **D**, *P. umbrosa* (A.Beaglehole 12525, MEL). **E**, *P. juncea* (D.Whibley 3160, AD). **F**, *P. inaequalis* (T.Muir 4319, MEL). **G**, *P. drummondii* (M.Koch 1203, MEL). **H**, *P. glabrata* (M.Evans 2500, MEL). **I**, *P. argyrea* (C.Gardner 8455, PERTH). **J**, *P. lanata* f. *calvata* (R.Chinnock 3317, AD). **K**, *P. macrantha* (Pt Essington, J.Armstrong, K). **L**, *P. graminea* (N.Burbidge 4697, CANB). **M**, *P. babianoides* (K.Kenneally 6928, PERTH).

4. *Patersonia maxwellii* (F.Muell.) F.Muell. ex Benth., *Fl. Austral.* 6: 405 (1873)

Genosiris maxwellii F.Muell., *Fragm.* 7: 34 (1869). T: Stokes Inlet to McCallum [Culham] Inlet, W.A., *G.Maxwell*; holotype: MEL.

Tufted herb. Leaves linear, 15–24 cm long, 1–2 mm wide, biconvex, deeply grooved, papillose; margins minutely ciliate with incurved hairs, brown. Scape 5–20 cm long, glabrous. Spathes lanceolate, 2.5–3.5 cm long, glabrous, chocolate brown; margins less than 1 mm wide, scarious, brown. Involucre c. 6 mm wide; acuminate tips of inner bracts exerted. Tube c. 2.5 cm long, glabrous. Sepals broadly obovate, 1.2–2 cm long, 1–1.5 cm wide, violet. Petals ovate. Filaments 3–4 mm long, almost completely connate. Ovary glabrous. Capsule cylindrical, acute, 2–2.5 cm long. Seeds compressed-ovoid, c. 3 mm long, dark brown; aril absent.

Occurs on the coastal plain of W.A. between Albany and Israelite Bay, growing in heath on poorly drained soils. Also found in a few localities in the southern Darling Range in seasonally wet habitats within Jarrah forest. Flowers Sept.–Nov. Map 15.

W.A.: c. 19 km W of Esperance – Ravensthorpe turnoff, *H.Demarz 4930* (Kings Park, PERTH); near Howick Hill, Neridup, *H.Eichler 19819* (AD, CANB, PERTH); 4.8 km W of Bremer Bay, *T.B.Muir 4043* (MEL); Mississippi Bay, Cape Le Grand Natl Park, *E.C.Nelson ANU 16572* (CANB).

Closely related to *P. occidentalis* but distinguished by the grooved, papillose leaves and smaller size. In these characters *P. maxwellii* resembles *P. juncea*, and may have originated by introgression from this species into *P. occidentalis*. Specimens from the Darling Range approach *P. occidentalis* in having flatter, less deeply grooved leaves than the type.

5. *Patersonia juncea* Lindley, *Sketch Veg. Swan R.* lviii (1840)

Genosiris juncea (Lindley) F.Muell., *Fragm.* 7: 33 (1869). T: south-western W.A., *J.Drummond 772*; lecto: K n.v., fide D.Geerinck, *Bull. Jard. Bot. État* 44: 49 (1974); isolecto: MEL.

P. juncea var. *elongata* Benth., *Fl. Austral.* 6: 405 (1873). T: Cape Naturaliste, W.A., *A.Oldfield*; holotype: K n.v., fide D.Geerinck, loc. cit.

Densely tufted herb. Leaves linear, 7–22 cm long, 0.6–1.4 mm wide, terete, deeply grooved, papillose, sometimes very sparsely pilose; bases with scarious brown margins. Scape 5–24 cm long, striate, glabrous. Spathes narrowly lanceolate, 3–4.5 cm long, glabrous, chestnut brown; margin up to 3 mm wide, scarious, subhyaline. Involucre 4–6 mm wide; inner bracts enclosed. Tube 2.5–3.5 cm long, glabrous. Sepals obovate to orbicular, 1.5–2 cm long, 1.3–1.8 cm wide, pale violet. Petals linear. Filaments 4–5 mm long, completely connate. Ovary glabrous. Capsule cylindrical, apiculate, 3–4 cm long. Seeds cylindrical, c. 4 mm long, brown; aril linear, appressed. Fig. 3E.

Widespread in south-western W.A. from Eneabba to Stirling Range, occurring less frequently on coastal plain between Stirling Range and Israelite Bay. Grows in Jarrah forest, woodland, mallee and scrub-heath. Flowers Aug.–Oct. Map 16.

W.A.: Palm Terrace, Forrestfield, *R.J.Cranfield R156* (PERTH); Wooroloo, *M.Koch 1737* (NSW, MEL); 7 km WSW of Mt Maxwell, *K.Newbey 4361* (PERTH); Watheroo Natl Park, *R.D.Royce 9607* (PERTH); between Badgingarra and Jurien Bay, *D.J.E.Whibley 3160* (AD, MEL).

6. *Patersonia fragilis* (Labill.) Asch. & Graebner, *Syn. Mitteleur. Fl.* 3: 522 (1906)

Genosiris fragilis Labill., *Nov. Holl. Pl.* 1: 13, t. 9 (1805). T: Tasmania, *J.J.H. de Labillardière s.n.*; lecto: FI n.v., fide D.Geerinck, *Bull. Jard. Bot. État* 44: 46 (1974).

P. glauca R.Br., *Prodr.* 304 (1810). T: Port Jackson, N.S.W., *R.Brown*; lecto: BM n.v., fide D.Geerinck, op. cit. 45; isolecto: MEL.

Tufted or tussock-forming herb. Leaves linear, often pungent, 20–60 cm long, 1–6 mm wide, biconvex to terete, grooved, glabrous, slightly glaucous to pruinose. Scape 4–25 cm long, glabrous, striate, clasped by 1 reduced leaf. Spathes lanceolate, 2.5–4.5 cm long, green to pale brown, similar to leaves in texture; margin scarious, usually dark brown.

Involucre 5–9 mm wide; inner bracts enclosed. Tube 2.5–3.5 cm long, glabrous, slightly exerted. Sepals obovate to rhomboid, 1.2–2.3 cm long, 1–1.5 cm wide, pale violet to blue-violet; midveins thickened. Petals oblanceolate. Filaments 2–3 mm long, almost completely connate. Ovary glabrous. Capsule cylindrical, apiculate, 2.5–3 cm long. Seeds compressed-ovoid, c. 2.5 mm long, black; aril 1–2 mm long, white. *Swamp Iris*. $2n = 42$, *fide* P.Goldblatt, *Ann. Missouri Bot. Gard.* 66: 852 (1979).

Widespread in S.A. south-east from Kangaroo Is., coast of south-eastern Qld, coast and southern tablelands of N.S.W., southern Vic., northern and eastern Tas. Grows on heathlands; common in the wallum heaths of Qld and N.S.W. and wet-heaths in the southern states. Flowers Aug.–Dec. Map 17.

S.A.: Marsh Swamp, *I.B.Wilson* 939 (AD, CANB). Qld: Beerwah, N of Brisbane, *V.K.Moriarty* 1487 (BRI, CANB). Vic.: Kentbruck Heath c. 10.5 km N of Mt Kincaid, *A.C.Beauglehole* 29377 (AD, MEL); midway between Cape Conran and Marlo, *A.C.Beauglehole* 31297 (AD, MEL). Tas.: Ferny Hill road, 41°03'S, 147°19'E, *A.M.Buchanan* 295 (HO, MEL).

Varies greatly in leaf width and colour, scape length, spathe size and colour and flower size; this variation shows little geographic correlation, and plants at one locality may be polymorphic with regard to these characters. Very glaucous, terete-leaved plants with scapes only 4–8 cm long occur on the coast of S.A. and Vic.

7. *Patersonia inaequalis* Benth., *Fl. Austral.* 6: 408 (1873)

Genosiris inaequalis (Benth.) Kuntze, *Revis. Gen. Pl.* 701 (1891). T: Stokes Inlet, W.A., *G.Maxwell*; holo: MEL.

Tufted herb or almost shrubby, with erect stem to 6 cm covered by leaf bases. Leaves linear, often spirally twisted, 11–32 cm long, 1.2–2.5 mm wide, biconvex with deep papillose grooves; margins minutely pubescent, brown; bases sparsely villous. Scape 18–23 cm long, glabrous. Spathes lanceolate, one straight, 2.2–3 cm long, the other bent, 1.8–2.6 cm long, grooved, green; margins scarious, brown. Involucre 7–9 mm wide; inner bracts exposed. Tube 2–2.8 cm long, glabrous. Sepals rhomboid, 1–1.5 cm long, 0.8–1.4 cm wide, white. Petals obovate. Filaments 3–4 mm long, completely connate. Ovary pubescent. Capsule cylindrical, 2 cm long. Seeds compressed-ovoid, 3–4 mm long, brown; aril linear, appressed. Fig. 3F.

Restricted to the coast of W.A. between Stokes Inlet and Mondrain Is., growing in heath and scrub-heath. Flowers Aug.–Oct. Map 18.

W.A.: Mt Le Grand, *A.S.George* 2240 (PERTH); 9 km E of Cape Le Grand, *T.B.Muir* 4319 (MEL); Frenchman Peak, Cape Le Grand Natl Park, *A.S.Weston* 6415 (PERTH); Mondrain Is., Recherche Archipelago, 14 Nov. 1950, *J.H.Willis* (MEL, PERTH).

Related to *P. fragilis* and *P. drummondii*, but recognizable by the aerial stem, unequal spathes and white flowers.

8. *Patersonia drummondii* F.Muell. ex Benth., *Fl. Austral.* 6: 407 (1873)

Genosiris drummondii (F.Muell. ex Benth.) Kuntze, *Revis. Gen. Pl.* 701 (1891). T: south-western W.A., *J.Drummond* 771; holo: K n.v., *fide* D.Geerinck, *Bull. Jard. Bot. État* 44: 44 (1974); iso: MEL.

Tufted herb or almost shrubby. Leaves linear, often spirally twisted, 10–30 cm long, 1.5–4 mm wide, biconvex with papillose grooves; margins minutely pubescent, brown, sparsely pilose or tomentose towards base. Scape to 27 cm long, striate, glabrous or sparsely pubescent, clasped by 1 reduced leaf. Spathes lanceolate, 3.2–6 cm long, grooved, glabrous, green; margins 1.5–3 mm wide, scarious. Involucre gaping; inner bracts exposed. Tube 3–4.5 cm long, glabrous or pubescent. Sepals obovate, 1.5–2.5 cm long, 1.2–2 cm wide, pale violet. Petals narrowly lanceolate. Filaments 2–4 mm long, two-thirds connate. Ovary pubescent. Capsule ovoid-oblong, 1.5–3 cm long. Seeds compressed-ovoid, 4 mm long, black; aril linear, appressed. Fig. 3G.

Occurs in W.A. from the coast around the Murchison River southwards and inland to the Southern Cross area. Grows in heath and scrub-heath of sandplains and in mallee on sandy loam. Flowers Aug.–Oct. Map 19.

W.A.: 4 km W of Tammin railway stn, *R.Coveny* 8308 (NSW, PERTH); 422 mile peg, Carnarvon road, *H.Demarz* 5190 (PERTH); c. 50 km NW of Murchison R., North West Coastal Hwy, *A.S.George* 7895 (PERTH); Cowcowing, *M.Koch* 1203 (AD, MEL, NSW); Watheroo Natl Park, *R.D.Royce* 9513 (PERTH).

Plants from the northern part of the range tend to be larger than the type in all dimensions, with flatter leaves minutely tomentose rather than pilose at the base.

9. *Patersonia pygmaea* Lindley, *Sketch Veg. Swan R.* lviii (1840)

Genosiris pygmaea (Lindley) F.Muell., *Fragm.* 7: 33 (1869). T: south-western W.A., *J.Drummond* 770; lecto: *K.n.v.*, fide D.Geerinck, *Bull. Jard. Bot. État* 44: 53 (1974); isolecto: MEL.

Undershrub 10–20 cm tall. Stems woody, few-branched, 2–3 cm long. Leaves ensiform, 5–15 cm long, 1.5–2.5 mm wide, flat, finely veined, glabrous; margins villous, glabrescent, scarious at base. Scape 1–6 cm long, striate, glabrous or tomentose. Spathes narrowly elliptic, 3–4.5 cm long, glabrous or pubescent on keel, dark brown; margins c. 3 mm wide, scarious, hyaline. Involucre 5–7 mm wide; inner bract tips exserted. Tube 2.5–3.5 cm long, glabrous. Sepals broadly ovate, 1.5–2.5 cm long, 1.2–1.8 cm wide, blue-violet. Petals lanceolate. Filaments 4–6 mm long, completely connate. Ovary glabrous. Capsule ovoid-cylindrical, 2–2.5 cm long. Seeds cylindrical, 3–4 mm long, brown; aril linear, appressed.

Occurs in south-western W.A. from the Darling Range near Perth to the Stirling Range and Albany. Grows mainly in Jarrah forest on laterite, but also occurs in heathland. Flowers Aug.–Nov. Map 20.

W.A.: Karnet road, 32°25'S, 116°00'E, *H.Demarz* 2703 (Kings Park); Darling Scarp near Paxwold, *K.F.Kenneally* 6926 (PERTH); Albany Hwy, 32°12'S, 116°07'E, *T.D.Macfarlane* 664 (PERTH); c. 6.5 km ESE of Byford, *L.McGann* R78 (PERTH); road near Chester Pass, Stirling Range Natl Park, *M.E.Phillips* 2141 (CBG).

10. *Patersonia glabrata* R.Br., *Prodr.* 304 (1810)

Genosiris glabrata (R.Br.) F.Muell., *Fragm.* 7: 35 (1869). T: Port Jackson, N.S.W., *R.Brown*; lecto: BM *n.v.*, fide D.Geerinck, *Bull. Jard. Bot. État* 44: 47 (1974); isolecto: BRI, MEL; Shoalwater Bay, [Qld], 1802, *R.Brown*; syn: BM, E, K, all *n.v.*, fide D.Geerinck, *loc. cit.*

P. media R.Br., *Prodr.* 304 (1810). T: Port Jackson district, N.S.W., *R.Brown*; lecto: BM *n.v.*, fide D.Geerinck, *loc. cit.*; isolecto: MEL.

Illustration: E.R.Rotherham *et al.*, *Fl. Pl. New South Wales & Southern Queensland* 54, t. 133 (1975).

Undershrub 30–80 cm tall. Stems woody, few-branched, up to 40 cm long and 5 mm diam. Leaves linear, 10–40 cm long, 2–5 mm wide, flat, finely veined, glabrous; margins minutely tomentose near base. Scape 10–30 cm long, glabrous. Spathes lanceolate, 4–6.5 cm long, finely striate, sparsely sericeous, glabrescent, dark brown; margins 2–3 mm wide, scarious, hyaline. Involucre gaping, up to 4 cm wide; inner bracts fully exposed. Tube 4–5 cm long, glabrous or pubescent. Sepals ovate to orbicular, 2–3 cm long, 1.5–2.6 cm wide, pale violet. Petals lanceolate. Filaments 5–7 mm long, completely connate. Ovary pubescent. Capsule cylindrical, 2–4 cm long. Seeds compressed ovoid, c. 4 mm long, brown; aril linear, appressed. Fig. 3H.

Widespread on the coast and tablelands of Qld south of 18°S, N.S.W. and coastal Vic. east of Wilsons Promontory. Grows in woodland and open forest on sandstone and granite and in coastal heath on sand. Flowers Aug.–Oct. Map 21.

Qld: Cooloola, 5 Sept. 1971, *A.G.Harrod* (BRI); Little Ramsay Bay, Hinchinbrook Is., *P.Sharpe* 1653 (BRI). N.S.W.: c. 2 km W of Tathra on Bega road, *T.B.Muir* 2451 (MEL); between Three Ways and Kekeelbon Mts, 12 Feb. 1966, *J.W.Vickery* (NSW). Vic.: Mallacoota – Wingan coast, *A.C.Beaglehole* 31070 (MEL).

11. *Patersonia sericea* R.Br., in J.B.Ker Gawler, *Bot. Mag.* 26: t. 1041 (1807)

Genosiris sericea (R.Br.) F.Muell., *Fragm.* 7: 35 (1869). T: material cultivated in England by Lee & Kennedy from seed said to have been collected at Port Jackson, [N.S.W.]; holo: K n.v., fide D.Geerinck, *Bull. Jard. Bot. État* 44: 55 (1974).

Illustration: *Growing Native Pl.* 8: 187 (1978).

Densely tufted herb. Leaves linear-ensiform, 15–50 cm long, flat to terete, finely striate, glabrous; margins pubescent to whitish-tomentose near base, glabrescent distally. Scape 3–55 cm long, pubescent in upper part, clasped by 1 reduced leaf. Spathes ovate to lanceolate, 2–6 cm long, prominently veined, white-silky to glabrescent, blackish. Involucre 7–14 mm wide; inner bracts slightly exerted. Tube 1.5–3 cm long, lower half pubescent. Sepals broadly ovate, obtuse, 2–3 cm long, 1.5–2.5 cm wide, blue-violet. Petals ovate. Filaments 4–7 mm long, c. two-thirds connate. Ovary pubescent. Capsule ovoid-cylindrical, 1.5–2.5 cm long. Seeds cylindrical, c. 2.5 mm long, wrinkled, with large pit; aril absent. $2n = 22$, fide P.Goldblatt, *Ann. Missouri Bot. Gard.* 66: 852 (1979).

Occurs in eastern Australia, in open forest, woodland and heath. There are 2 varieties.

1 Leaves more than 2 mm wide **11a. var. *sericea***

1: Leaves 1–2 mm wide

2 Leaves biconvex, smooth; margins ciliate with inflexed hairs **11b. var. *longifolia***

2: Leaves \pm terete, deeply grooved; margins without inflexed hairs **11a. var. *sericea***

11a. *Patersonia sericea* R.Br. var. *sericea*

P. sericea var. *latifolia* Benth., *Fl. Austral.* 6: 406 (1873). T: Blue Mtns, N.S.W., *Fraser*; n.v.

P. sericea var. *dissimilis* Domin, *Repert. Spec. Nov. Regni Veg.* 10: 60 (1911). T: Cape Sturt, N.S.W., *W.Backhouse*; n.v.

P. sericea var. *subalpina* F.Muell. ex Domin, *Biblioth. Bot.* 85: 535 (1915). T: Mt Wellington, Gippsland, Vic., *F.Mueller*; holo: MEL.

[*P. glabrata* auct. non. R.Br.: J.B.Ker Gawler, *Bot. Reg.* t. 51 (1815)]

Leaves erect to somewhat lax, 1.5–6 mm wide, flat and faintly striate to terete and prominently grooved; margins tomentose, pubescent or glabrescent, never ciliate with inflexed hairs. Scape 10–45 cm long. Spathes 3.5–6 cm long.

Occurs on the coast and tablelands of Qld S of about 23°S, coast and tablelands of N.S.W., and eastern Vic. Grows in coastal heath on sand and in woodland and open forest on sand and stony soils derived from sandstone or granite; extends to subalpine woodland in Vic. Flowers June–Nov. Map 22.

Qld: Beerwah, N of Brisbane, *K.V.Moriarty 1486* (BRI, CANB); c. 10 km SE of Stanthorpe, *L.Pedley 1454* (BRI, CANB). N.S.W.: near Nelligen Bridge, Clyde R., *L.G.Adams 1628* (CANB, NSW); c. 5 km from Growee Gulph on Rylstone road, *R.Story 6867* (CANB, NSW). Vic.: Mallacoota – Wingan coast NE of Benedore R. mouth, *A.C.Beaglehole 31076* (MEL).

11b. *Patersonia sericea* var. *longifolia* (R.Br.) C.Moore & E.Betche, *Handb. Fl. New South Wales* 408 (1893)

P. longifolia R.Br., *Prodr.* 303 (1810); *Genosiris longifolia* (R.Br.) F.Muell., *Fragm.* 7: 35 (1869). T: Grose River, N.S.W., *R.Brown*; lecto: BM, fide D.Geerinck, *Bull. Jard. Bot. État* 44: 55 (1974).

Leaves lax, trailing, 1–2 mm wide, biconvex, glaucous; margins ciliate with a single row of hairs 1–2 mm long inflexed across the leaf. Scape less than 15 cm long. Spathes 2–3.5 cm long.

Extends from the Hunter River, N.S.W., to Genoa River, Vic., in open forest and heath on sandstones of the Great Dividing Range and sandy soil near the coast. Flowers Oct. Map 23.

N.S.W.: Big Hill Stn, Upper Burragorang Valley, 4 Oct. 1956, *E.F.Constable* (NSW); Minuma Ra., 35°53'S, 149°40'E, *R.Coveny* 5975 (NSW); 2 km W of Tathra, *T.B.Muir* 2452 (MEL, NSW); Merricumbene fire trail, Araluen Valley, *R.Pullen* 4908 (CANB). Vic.: Yambulla Ck, *A.C.Beauglehole* 2846 (MEL).

Patersonia sericea shows wide and generally continuous variation in leaf length, cross-sectional shape and vestiture; var. *longifolia* is the only entity distinct enough to be segregated.

12. *Patersonia rudis* Endl., in J.G.C.Lehmann, *Pl. Preiss.* 2: 29 (1846)

Genosiris rudis (Endl.) F.Muell., *Fragm.* 7: 35 (1869); *Patersonia sericea* var. *rudis* (Endl.) Geer., *Bull. Jard. Bot. État* 44: 56 (1974). T: Darling Range, W.A., 16 Jan. 1840, *L.Preiss* 2347; lecto: BR n.v., fide D.Geerinck, *op. cit.* 57; islecto: MEL.

Densely tufted herb; rhizome covered by broad resinous leaf bases. Leaves linear-ensiform, 20–70 cm long, flat or biconvex, striate, pubescent near base only; margins pubescent to tomentose near base, distally glabrescent. Scape 20–50 cm long, pubescent to velvety, clasped by 1 reduced leaf. Spathes lanceolate, 3–6.3 cm long, prominently veined, sparsely white-silky to velvety, blackish. Involucre 11–15 mm wide; inner bracts slightly exerted. Tube 2–3 cm long, pubescent to tomentose. Sepals obovate, 2.5–3.5 cm long, 2–3 cm wide, violet. Petals lanceolate. Filaments 4–5 mm long, completely connate. Ovary pubescent. Capsule ovoid-cylindrical, 2–3 cm long. Seeds globose-angular, c. 4 mm diam., wrinkled, with large pit, black; aril absent.

Occurs in two disjunct areas of W.A. There are 2 subspecies.

Leaf lamina more than 3 mm wide

12a. subsp. *rudis*

Leaf lamina up to 3 mm wide

12b. subsp. *velutina*

12a. *Patersonia rudis* Endl. subsp. *rudis*

Illustration: R.Erickson *et al.*, *Fl. Pl. W. Australia* 51, t. 125 (1973).

Leaves 30–70 cm long, 3–7 mm wide, flat or slightly biconvex. Scape 20–50 cm long, densely or sparsely pubescent. Spathes 4–6.3 cm long, sericeous, often ±glabrescent.

Occurs in the Darling Range, W.A., between New Norcia and Dwellingup, growing in Jarrah forest and woodland on laterite. Flowers Oct.–Dec. Map 24.

W.A.: Pickering Brook, *H.Demarz* 7298 (Kings Park, PERTH); Red Hill, Toodyay road, *A.S.George* 1676 (PERTH); Mundaring, *R.D.Royce* 5210 (PERTH); Great Northern Hwy 70 km S of Moora, *D.J.E.Whibley* 5001 (AD, PERTH); Dwellingup, 10 Sept. 1947, *J.H.Willis* (MEL).

12b. *Patersonia rudis* subsp. *velutina* D.Cooke, *Fl. Australia* 46: 220 (1986)

T: W of Red Kangaroo Hill, W.A., Nov. 1891, *R.Helms*; holo: AD; iso: MEL.

Leaves 20–35 cm long, 2–3 mm wide, biconvex. Scape 20–25 cm long, continuously covered with velvety hairs. Spathes 3–4 cm long, densely pubescent or velvety, never glabrescent.

Occurs in the Southern Cross – Coolgardie region of inland W.A. Grows in semi-arid woodland and shrubland, apparently uncommon and seldom collected. Flowers Nov.–Dec. Map 25.

W.A.: Red Kangaroo Hill to Yilgarn, Nov. 1891, *R.Helms* (AD, NSW); Boorabbin Natl Park, 69.5 km E of Southern Cross on Great Eastern Hwy, *T.D.Macfarlane* 1116 (MEL, PERTH).

13. *Patersonia argyrea* D.Cooke, *Nuytsia* 5: 155 (1984)

T: Mt Lesueur, 16 Oct. 1946, *C.A.Gardner* 8455; holo: PERTH.

Tufted herb. Leaves linear-ensiform, 20–42 cm long, 2–5 mm wide, biconvex, deeply grooved, the grooves containing papillae or hairs; margins and bases villous to pubescent. Scape 20–35 cm long, completely villous. Spathes elliptic, cymbiform, 3.5–5.2 cm long,

prominently veined, sparsely silky, dark chestnut-brown; margins 2–3 mm wide, scarious, \pm hyaline. Involucre 10–17 mm wide; inner bracts slightly exserted. Tube 2–3.5 cm long, glabrous. Sepals violet. Ovary pubescent. Fruit not seen. Fig. 3 I.

Restricted to the Gairdner Range, W.A., growing in heath on sandy soils. Flowers Sept.–Nov. Map 26.

W.A.: hill N of Mt Benia, E of Jurien, *E.A.Griffin 2343* (PERTH); slope of Mt Lesueur, *R.D.Royce 7731* (PERTH).

Recognizable by the combination of grooved, biconvex leaves and dense white indumentum giving the plant a silvery-grey appearance. Flower description incomplete as whole flowers not seen.

14. *Patersonia lanata* R.Br., *Prodr.* 303 (1810)

Genosiris lanata (R.Br.) F.Muell., *Fragm.* 7: 35 (1869). T: Lucky Bay, W.A., Jan. 1802, *R.Brown*; lecto: BM n.v., *fide* D.Geerinck, *Bull. Jard. Bot. État* 44: 56 (1974).

Densely tufted herb. Leaves ensiform, 15–40 cm long, 2–7 mm wide, flat, glabrous, \pm glaucous; margins glabrous or tomentose near base. Scape 12–40 cm long, clasped by 1 reduced leaf. Spathes triangular, 2.5–3.2 cm long, prominently veined, dark brown. Inflorescence 16–24 mm wide, gaping; inner bracts exposed, similar to spathes. Tube 2–2.5 cm long, lower half tomentose. Sepals broadly elliptic, obtuse, 2–3 cm long, 1.8–2.7 cm wide, blue-violet. Petals cuneate. Filaments 4–5 mm long, completely connate. Ovary tomentose. Capsule ovoid-cylindrical, c. 2 cm long. Seeds cylindrical, c. 2.5 mm long, wrinkled, with large pit, brown; aril absent.

Occurs in south-western W.A. There are 2 forms.

Brown tomentum present on leaf margins, scape and spathes

14a. f. *lanata*

Tomentum absent from leaf margins, scape and spathes

14b. f. *calvata*

14a. *Patersonia lanata* R.Br. f. *lanata*

P. pannosa Endl., in J.G.C.Lehmann, *Pl. Preiss.* 2: 29 (1846); *P. lanata* var. *pannosa* (Endl.) Baker, *J. Linn. Soc., Bot.* 16: 151 (1878); *P. lanata* var. *latifolia* Benth., *Fl. Austral.* 6: 406 (1873); *P. sericea* var. *latifolia* (Benth.) Geer., *Bull. Jard. Bot. État* 44: 56 (1974) *nom. illeg.*, non Benth., *Fl. Austral.* 6: 406 (1873). T: near Cheyne Beach, W.A., 6 Nov. 1840, *L.Preiss 2530*; lecto: S n.v., *fide* D.Geerinck, *loc. cit.*; isolecto: MEL.

Leaf margins brown-tomentose near base, glabrous above. Scape brown-tomentose. Spathes and inner bracts brown-tomentose to very densely pubescent. All organs sometimes glabrescent with age.

Occurs on the coastal plain of W.A. between Two Peoples Bay and Israelite Bay, growing in open and lightly wooded heath and on stabilised dunes. Flowers Aug.–Nov. Map 27.

W.A.: East Mt Barren, *E.M.Bennett 2432* (PERTH); near Howick Hill, Neridup, *H.Eichler 19820* (AD, CANB); base of Frenchman Peak, Cape Le Grand Natl Park, *E.C.Nelson ANU16608* (CANB, PERTH); Duke of Orleans Bay opposite High Is., *A.E.Orchard 1320* (AD, CANB); c. 2 km S of Gibson, *E.M.Scrymgeour 823* (PERTH).

14b. *Patersonia lanata* f. *calvata* D.Cooke, *Fl. Australia* 46: 220 (1986)

T: 3.8 km W of Norseman–Esperance junction on Ravensthorpe road, W.A., 9 Oct. 1976, *R.J.Chinnock 3317*; holotype: AD; iso: MEL, PERTH.

Leaf margins completely glabrous. Scape glabrous to sparsely scabrid. Spathes and inner bracts very sparsely puberulous. Fig. 3J.

Scattered within the range of f. *lanata*. Map 28.

W.A.: Hopetoun, Oct. 1903, *C.Andrews* (PERTH).

15. *Patersonia macrantha* Benth., *Fl. Austral.* 6: 407 (1873)

Genosiris macrantha (Benth.) Kuntze, *Revis. Gen. Pl.* 701 (1891). T: Port Essington, N.T., *J.Armstrong*; holo: K. Cited in error as 'Darling Range, Collie' by Bentham, *loc. cit.*

Herb forming large tufts. Leaves linear-ensiform, \pm lax, 18–45 cm long, 4–9 mm wide, flat, finely striate, glabrous or papillose, slightly glaucous; margins pubescent to glabrous. Scape 22–50 cm long, smooth, pubescent near top. Spathes elliptic, 4.3–6.8 cm long, prominently veined, very sparsely silky, pale brown. Involucre 11–15 mm wide; inner bracts enclosed. Tube 2.5–3 cm long, lower half pubescent. Sepals obovate to elliptic, 3–4 cm long, 2.5–3 cm wide, pale violet. Petals lanceolate. Filaments 5–6 mm long, completely connate. Ovary pubescent. Capsule cylindrical, acute, 3–4 cm long. Seeds globose, c. 4 mm diam., wrinkled, with large pit, pale brown; aril absent. Fig. 3K.

Widespread in N.T. north of about 14°S, growing in eucalypt forest and woodland on laterite and sandy soils derived from sandstone. Flowers Jan.–Mar. Map 29.

N.T.: 12°50'S, 133°05'E, *L.A.Craven* 2432 (CANB); NE of Finnis R. Crossing, *C.R.Dunlop* 3124 (BRI, CANB, NSW); Woolanang, *C.R.Dunlop* 5956 (CANB, MEL); c. 100 km NE of Maranboy Police Stn, *M.Lazarides & L.Adams* 64 (CANB, NSW); Stuart Hwy c. 29 km N of Katherine, *I.B.Wilson* 294 (CANB, NSW).

Geographically isolated from the other species of the genus, but closely related to *P. sericea*.

16. *Patersonia graminea* Benth., *Fl. Austral.* 6: 408 (1873)

Genosiris graminea (Benth.) Kuntze, *Revis. Gen. Pl.* 701 (1891). T: south-western W.A., *J.Drummond* 196; lecto: K n.v., *fide* D.Geerinck, *Bull. Jard. Bot. État* 44: 48 (1974); south-western W.A., *J.Drummond* 5: 326; syn: BM, K, P, all n.v., *fide* D.Geerinck, *loc. cit.*

Herb forming dense clumps. Rhizome with numerous swollen, tuber-like joints near soil level. Leaves linear, 5–16 cm long, 1–3 mm wide, bifacial, keeled, equitant near apex, soon withering; margins pilose to glabrous. Scape 20–33 cm long, deeply grooved, tomentose at base, obscurely papillose to glabrous distally, remaining green for a year or more after flowering. Spathes lanceolate, 1.5–2.5 cm long, veined, glabrous, green; margin scarious, brown-streaked. Involucre 6–16 mm wide, gaping; inner bracts exposed. Tube c. 1.5 cm long, glabrous. Sepals obovate, 2–2.5 cm long, to 2 cm wide, pale violet. Petals minute. Filaments c. 2 mm long, completely connate. Ovary glabrous. Capsule ovoid, 1–1.5 cm long. Seeds ovoid, 3 mm long, papillose, dark brown; aril minute. Fig. 3L.

Occurs in W.A. from the coast near the Murchison River southwards and inland to the Watheroo area, growing in heath and scrub-heath on sandplain and granite hills. Flowers Sept.–Oct. Map 30.

W.A.: c. 3 km N of Perenjori, *N.T.Burbidge* 4697 (CANB, PERTH); c. 5.5 km S of Mingenew, *H.Demarz* 2646 (PERTH); Gunyidi, *F.Lullfitz* 2851 (Kings Park, PERTH); c. 31 km S of Morawa, 2 Oct. 1962, *M.E.Phillips* (CBG); Watheroo Natl Park, *R.D.Royce* 9767 (PERTH).

17. *Patersonia babianoides* Benth., *Fl. Austral.* 6: 408 (1873)

Genosiris babianoides (Benth.) Kuntze, *Revis. Gen. Pl.* 701 (1891). T: Hampden, W.A., *W.Clarke s.n.*; syn: MEL; south-western W.A., *J.Drummond* 1: 760; syn: probably K n.v.

Herb with short, fleshy rhizome forming annual corm-like segments; leaves and flowers annual. Leaf usually solitary; lamina linear to elliptic, 7–16 cm long, 5–12 mm wide, plicate, soft-textured, margins and several prominent veins pilose with hairs 3–6 mm long, tapered into narrow petiole 3–5 cm long. Scape 2–3 cm long, pilose. Spathes narrowly triangular to lanceolate, 2–3.4 cm long, prominently veined, villous, green. Involucre 8–15 mm wide, gaping; inner bracts completely exposed, similar to spathes. Tube 1.5–2 cm long, glabrous. Sepals obovate, 1.5–2 cm long, 1.2–1.4 cm wide, blue-violet. Petals linear. Filaments 4–5 mm long, three-quarters connate. Ovary pubescent. Fruit not seen. Fig. 3M.



Figure 4. *Libertia paniculata*.
Photograph — M.Fagg.



Figure 5. *Patersonia umbrosa* var.
xanthina.
Photograph — M.Fagg.



Figure 6. *Ferraria crispa*
Photograph — D.Cooke.



Figure 7. *Orthrosanthus laxus*
Photograph — D.Cooke.

5. *Patersonia*

IRIDACEAE

Common in the Darling Range, W.A., between Helena Valley and Collie, occasional further south, e.g. at Darradup and Mt Lindesay. Grows in Jarrah forest on laterite. Flowers Sept.–Nov. Map 31.

W.A.: Mt Cooke, Darling Ra., *M. Corrick* 8359 (MEL); Darling Scarp near Paxwold, *K.F. Kenneally* 6928 (PERTH); Albany Hwy 29.4 km S from Southwestern Hwy turnoff, *T.D. Macfarlane* 973 (PERTH); Darradup, W of Nannup, *R.D. Royce* 2918 (PERTH); Gorge Hill, Helena Valley, *J. Seabrook* 620 (PERTH).

Doubtful names

Patersonia compar Endl., in J.G.C. Lehmann, *Pl. Preiss.* 2: 30 (1846).

T: Darling Range near Kelmoth, W.A., Sept. 1841, *L. Preiss* 2342; *n.v.*, apparently destroyed.

Probably referable to *P. occidentalis* R.Br.

Patersonia montana Endl., in J.G.C. Lehmann, *Pl. Preiss.* 2: 31 (1846).

T: Darling Range, Perth, W.A., Aug. 1841, *L. Preiss* 2343; *n.v.*, apparently destroyed.

Probably referable to *P. occidentalis* R.Br.

Patersonia roei Endl., in J.G.C. Lehmann, *Pl. Preiss.* 2: 31 (1846).

T: interior of south-western W.A., Nov. 1840, *L. Preiss* 2345; *n.v.*, apparently destroyed.

Probably referable to *P. juncea* Lindley.

Patersonia sylvestris Endl., in J.G.C. Lehmann, *Pl. Preiss.* 2: 30 (1846).

T: Mt Wilgenup, W.A., 13 Oct. 1840, *L. Preiss* 2354; *n.v.*, apparently destroyed.

Probably referable to *P. occidentalis* R.Br.

6. DIPLARRENA

Diplarrena Labill., *Voy. Rech. Pérouse* 1: 157 (1800); from the Greek *diploos* (double) and *arren* (male), referring to the two fertile stamens.

Type: *D. moraea* Labill.

Densely tufted, rhizomatous, evergreen perennial herbs. Basal leaves equitant, linear-ensiform, flat, glabrous, finely striate. Scape erect, terete, rarely branched, with 2–4 reduced leaves. Inflorescence a rhipidium of 3–6 flowers enclosed by 2 opposite herbaceous spathes. Flowers zygomorphic, pedicellate, separated by membranous bracteoles. Sepals and petals free, clawed. Sepals unequal, spreading. Petals oblong, shorter, 2 spreading, the third hooded over the stamens. Fertile stamens 2, the third lacking an anther; filaments free, flattened, unequal; anthers versatile, oblong, unequal, oblique. Ovary cylindrical, enclosed in spathes; style filiform, unbranched, exceeding anthers; stigmatic lobes 3, flattened, unequal, papillose on upper surface. Capsules exserted. Seeds numerous, flattened; aril absent.

A genus of 2 species, endemic in eastern Australia.

G. Bentham, as *Diplarrhena* (in Irideae), *Fl. Austral.* 6: 399–400 (1873).

Leaves up to 1 cm wide

1. *D. moraea*

Leaves over 1 cm wide

2. *D. latifolia*

1. *Diplarrena moraea* Labill., Voy. Rech. Pérouse 1: 157 (1800)

Moraea diandra Vahl, *Enum. Pl.* 2: 154 (1805), *nom. illeg.* T: Tasmania, J.J.H. de Labillardière; *holo:* FI n.v., *fide* D.Geerinck, *Bull. Jard. Bot. État* 44: 33 (1974).

D. moraea var. *alpina* J.D.Hook., *Fl. Tasman.* 2: 34 (1858). T: Tasmania, R.C.Gunn s.n.; *syn:* NSW.

Leaves 10–70 cm long, 5–10 mm wide, dark green to slightly glaucous. Scape 20–100 cm long, exceeding leaves. Spathes narrowly lanceolate, subequal, 4–8 cm long, 6–12 mm wide, green, glabrous, prominently veined. Flowers white. Sepals broadly oblanceolate, tapered into claw, entire, slightly concave, 2.5–3.5 cm long, 1.5–2.2 cm wide. Petals narrowly oblong, obtuse to retuse, 2–2.5 cm long, usually purple-tinged or finely purple-veined, often yellow toward apex. Fertile filaments 4–8 mm long; anthers 2–3 mm long; staminode 2–4 mm long. Ovary 1.5–2 cm long; style 1.2–1.5 cm long. Capsules cylindrical to clavate, triquetrous, 2–2.5 cm long, c. 7 mm wide. Seeds orbicular, c. 3 mm diam., brown. *White Iris.* Fig. 2D–E.

Occurs on the coast and Great Dividing Range of south-eastern N.S.W. and southern Victoria E of the Otway Ranges; widespread in Tas. except the south-west. Grows in heath and open forest. Flowers Oct.–Jan. Map 32.

N.S.W.: Brown Mtn, *M.Gray* 5670 (CANB). Vic.: Wilsons Promontory, 15 Oct. 1952, *C.I.Skewes* (MEL). Tas.: 3 km ESE of Wynyard, *B.G.Briggs* 7108 (NSW); head of Arve R., Hartz Mts, *S.J.Forbes* 1314 (MEL); summit of The Nut, Circular Head, 3 Jan. 1967, *J.H.Willis* (MEL).

2. *Diplarrena latifolia* Benth., Fl. Austral. 6: 400 (1873)

D. moraea var. *latifolia* (Benth.) Baker, *Handb. Irid.* 115 (1892). T: Mt La Perouse, *A.Oldfield*; *lecto:* K n.v., *fide* D.Geerinck, *Bull. Jard. Bot. État* 44: 33 (1974); *isolecto:* MEL; Mt La Perouse, 1 Mar. 1859, *C.Stuart* 1904; *syn:* MEL.

Illustration: W.M.Curtis & M.Stones, *Endemic Fl. Tasmania* 6: 398, t. 120 (1978).

Leaves 30–100 cm long, 10–20 mm wide, slightly glaucous. Scape 60–120 cm long, exceeding leaves. Spathes narrowly lanceolate, equal, 6.5–8.5 cm long, 10–12 mm wide, green, glabrous, prominently veined. Flowers white. Sepals broadly elliptic, abruptly contracted into claw, sometimes emarginate, concave, 3.5–4.2 cm long, 2.5–3 cm wide. Petals narrowly oblong, retuse, c. 2.5 cm long; two spreading, purple-veined at sides, often yellow toward apex. Fertile filaments 4–8 mm long; anthers c. 3 mm long; staminode 2–4 mm long. Ovary c. 2 cm long; style c. 1.5 cm long. Capsules obovoid, triquetrous, c. 2.5 cm long, c. 9 mm wide. Seeds orbicular, c. 3 mm diam., brown.

Occurs in southern and western Tas., growing mainly in heaths including peaty moorland near the coast and in montane heaths. Flowers Jan.–Mar. Map 33.

Tas.: Navarre R. to King William Ra., 5 Jan. 1965, *L.A.S.Johnson* (NSW); Port Davey, Feb. 1948, *C.King* (MEL); Mt King William, Dec. 1917, *F.A.Rodway* (NSW); Lyell Highway, King William Ra., *L.J.Webb* 3313 (BRI).

Very closely related to *D. moraea*, and may be a geographical or chromosomal variant of that species.

Trib. III. IRIDEAE**Trib. *Irideae***

Type: *Iris* L.

Moraeae Benth. & J.D.Hook., *Gen. Pl.* 3: 682 (1883). T: *Moraea* Miller

Rootstock a rhizome, bulb or corm formed from a single internode. Leaves equitant or bifacial. Inflorescence of 1 to many rhipidia each surrounded by paired, opposed persistent spathes enclosing 2 to several (rarely 1) fugacious flowers. Flowers actinomorphic. Sepals and petals differentiated or similar, free or united in a tube; nectaries at base of sepals, rarely also on petals. Stamens free or united, equilateral.

Ovary inferior; style trifid, the branches opposite the stamens, or rarely (not in Australia) alternate, often deeply divided or petaloid.

A tribe of about 11 genera; in Africa, Europe, Asia, North America and Lord Howe Is.; 8 genera are naturalised in Australia.

7. IRIS

Iris L., *Sp. Pl.* 1: 38 (1753); *Gen. Pl.* 5th edn, 24 (1754); from the Greek *iris* (rainbow), in reference to the diverse colours of the flowers.

Type: *I. germanica* L.

Perennials, evergreen and rhizomatous or (not in Australia) bulbous with annual leaves and flowers. Leaves mostly basal, equitant, usually erect and ensiform. Scape erect, simple or few-branched, rarely absent. Spathes herbaceous, sheathing rhipidia of few flowers separated by shorter bracts or rarely sheathing a flower. Sepals and petals clawed, united in a tube. Sepals spreading or deflexed. Petals erect, often smaller. Stamens free, inserted on tube; anthers basifixed, linear. Ovary ovoid-trigonus; style deeply trifid; branches broad, petaloid, arched over sepals and appressed to stamens. Stigmas transverse, exceeded by prominent bifid crests. Capsule ovoid to clavate, trigonus, exerted from spathes.

A genus of about 250 species; widespread in north temperate regions; many species and hybrids cultivated as ornamentals, and at least 3 naturalised in Australia.

D.A.Webb & A.O.Chater in T.G.Tutin *et al.*, *Fl. Europaea* 5: 87–92 (1980); B.Mathew, *The Iris* (1981).

KEY TO SUBGENERA AND SPECIES

- | | | |
|----|---|---------------------------|
| 1 | Sepals bearded with a patch of coloured hairs (subg. I. <i>Iris</i>) | 1. <i>I. germanica</i> |
| 1: | Sepals not bearded (subg. II. <i>Limniris</i>) | |
| 2 | Scape less than 10 cm tall or absent; flower solitary | 3. <i>I. unguicularis</i> |
| 2: | Scape 30–100 cm tall; flowers several | |
| 3 | Flowers drab, purple to brownish; seeds bright red | 2. <i>I. foetidissima</i> |
| 3: | Flowers bright yellow or yellow and white; seeds dull brown | |
| 4 | Flowers yellow; petals 2–3 cm long | † <i>I. pseudacorus</i> |
| 4: | Flowers yellow and white; petals 5–6 cm long | † <i>I. orientalis</i> |

† *Iris pseudacorus* L., native to Europe, is occasionally planted around garden ponds and may persist as a garden escape in Vic. and Tas. *Iris orientalis* Miller, native to Turkey and the Aegean, has been recorded in similar situations in S.A.

Subg. I. *Iris*

Iris L. subg. *Iris*

Rootstock a rhizome. Scape present, usually branched. Sepals bearing a prominent patch of multicellular hairs.

1. **Iris germanica* L., *Sp. Pl.* 1: 38 (1753)

T: from Germany; *n.v.*

Illustrations: R.Genders, *Bulbs* 369 (1973); L.H.Bailey, *Hortus Third* 599, fig. D (1976).

Evergreen herb. Rhizome at soil surface, 3–5 cm diam., fleshy. Leaves in fan-shaped clusters, ensiform, acute, 30–50 cm long, 2.5–4 cm wide, glaucous. Scape to 120 cm tall, 1- or 2-branched, with 2–4 condensed 2–5-flowered rhipidia. Spathes ovate, 3–5 cm long, herbaceous; apices scarious. Flowers usually white, sometimes blue, violet, yellow or multicoloured, shortly pedicellate. Perianth tube narrowly funnel-shaped, c. 2 cm long; lobes obovate, emarginate, 6–8 cm long; margins undulate. Sepals recurved, bearded with yellow hairs on midvein. Petals erect to incurved, glabrous. Anthers 6–10 mm long. Style branches broadly spatulate, 2–3 cm long; crests bifid, acute. Capsule obloid-trigonous, 4–5 cm long. Seeds globose-angular, c. 5 mm diam., wrinkled, brown. *Tall Bearded Iris*.

Of obscure origin, cultivated in Europe since classical times and probably native to the eastern Mediterranean region or a hybrid between species from this area. Widely grown as a garden ornamental in temperate Australia and naturalised locally on roadsides and wasteland in W.A., S.A., N.S.W., Vic., and Tas. Flowers Sept.–Oct. Map 34.

W.A.: Cowaramup, *R.D.Royce* 4605 (PERTH). S.A.: Ferguson Recreation Park, Stonyfell, *K.Preiss* 90 (AD). N.S.W.: near Mittagong Bridge, Murrumbidgee, 25 Oct. 1948, *A.B.Costin* (NSW). Vic.: Beechworth, Oct. 1923, *J.W.Audas* (MEL). Tas.: Charmouth Hill, *A.Moscal* 3141 (AD, HO).

Subg. II. *Limniris*

Iris subg. *Limniris* (Tausch) Spach, *Hist. Veg. Phan.* 13: 36 (1841); *Iris* sect. *Limniris* Tausch, *Hort. Canalius* 1 (1823).

Type: *I. sibirica* L.

Rootstock a rhizome. Scape well-developed or absent. Sepals glabrous.

2. **Iris foetidissima* L., *Sp. Pl.* 1: 39 (1753)

T: from Europe; holo: probably UPS *n.v.*

Illustration: S.Ross-Craig, *Draw. Brit. Pl.* 29: 1 (1972).

Evergreen herb. Rhizome 1–1.5 cm diam. Basal leaves ensiform, 30–70 cm long, 1–2.5 cm wide, malodorous when bruised. Scape 30–90 cm tall, unbranched, with 2 or 3 reduced leaves and 2–4, 2- or 3-flowered rhipidia. Spathes lanceolate, c. 6 cm long, herbaceous. Flowers dull purple-grey to brownish yellow, dark-veined; pedicels 2–7 cm long. Perianth tube c. 1 cm long. Sepals 4.5 cm long, c. 1.5 cm wide, recurved, obovate, emarginate. Petals erect, oblanceolate, 4 cm long. Anthers c. 16 mm long, exceeding stigmas. Style branches spatulate, 3 cm long; crests obtuse. Capsule obovoid, acute, c. 6 cm long. Seeds globose, 5 mm diam., smooth, bright red, persistent on valves of dehiscent capsule. *Stinking Iris*.

Native to western Europe and the Mediterranean region; naturalised locally in Tas. Flowers Dec. Map 35.

Tas.: Robey's, Bellerive, 9 Dec. 1965, *W.M.Curtis* (HO); near Orford, Dec. 1965, *W.D.Jackson* (HO).

3. **Iris unguicularis* Poirét, *Voy. Barbarie* 2: 86 (1789)

T: from North Africa; *n.v.*

I. stylosa Desf., *Fl. Atlant.* 1: 40, t. 5 (1798). T: from North Africa; *n.v.*

Illustration: W.R.Dykes, *The Genus Iris* t. 14 (1913).

Tufted evergreen herb. Rhizome short, 1–1.5 cm diam. Leaves basal, linear, lax, grass-like, 45–60 cm long, 1–1.5 cm wide. Scape usually absent, rarely to 8 cm tall. Spathes keeled, unequal, 8–14 cm long, herbaceous. Flower solitary, pale mauve, dark-veined, sessile. Perianth tube 10–20 cm long, exceeding spathes; segments long-clawed. Sepals recurved, 6–7 cm long, 2.5–3 cm wide. Petals erect, 7–8 cm long, 2 cm wide. Anthers 1.5 cm long. Style branches spatulate, c. 3 cm long; crests lanceolate, lacerate. Capsule oblong-trigonal, apiculate, c. 4 cm long. Seeds globose, c. 5 mm diam., rugose, brown.

Native to the eastern Mediterranean region; widely cultivated, and naturalised locally in the southern Mt Lofty Range, S.A. Flowers July–Aug. Map 36.

S.A.: Stirling, Mt Lofty Range, *E.S.Booth* 117 (AD); Lenswood Research Centre, *H.Van Dam* 187 (AD); c. 2 km past Meadows on Goolwa road, *D.A.Wright* 59 (AD).

8. MORAEEA

Moraea Miller, *Fig. Pl. Gard. Dict.* 159, t. 238 (1758) as *Morea*; spelling altered to *Moraea* L., *Sp. Pl.* 2nd edn, 59 (1762), *nom. cons.*; after Robert More (1703–1780), English botanist.

Type: *M. vegeta* L.

Perennial herbs with annual leaves and flowers. Corm globose. Leaves basal or near-basal, 1 to several, linear, bifacial, channelled or rarely terete. Stem erect, often branched, with short sheathing bracts at nodes. Spathes acuminate, scarious to herbaceous, the inner longer. Sepals and petals free, clawed. Sepals spreading or deflexed. Petals smaller, erect or spreading, often 3-lobed or vestigial. Stamens appressed to style branches; filaments free or united; anthers oblong-linear. Ovary clavate to ovoid, included in spathes; style branches petaloid, spreading; stigmas transverse, sometimes bilobed, exceeded by bifid crests. Capsule clavate to globose, exserted. Seeds numerous, angular, dark brown. $x = 10$, *fide* P.Goldblatt, *Ann. Missouri Bot. Gard.* 63: 663 (1976).

A genus of c. 120 species in southern Africa; several cultivated as ornamentals and about 3 naturalised in Australia.

P.Goldblatt, The genus *Moraea* in the winter rainfall region of southern Africa, *Ann. Missouri Bot. Gard.* 63: 657–786 (1976).

1 Leaves 3 or 4; stem pubescent

1. *M. vegeta*

1: Leaves 1 or 2; stem glabrous

2 Sepals and petals subequal, entire

† ***M. fugax***

2: Petals 3-lobed, much smaller than sepals

3 Flower yellow marked with brown in centre

2. *M. bellendenii*

3: Flower white with deep blue centre

3. *M. aristata*

† *Moraea fugax* (Delaroche) Jacq. is recorded as a garden escape in S.A. but is not known to be naturalised.

1. **Moraea vegeta* L., *Sp. Pl.* 2nd edn, 59 (1762)

T: illustration in Miller, *Fig. Pl. Gard. Dict.* t. 238 (1758).

[*M. juncea* auct. non L.: H.Eichler, *Suppl. Fl. S. Australia* 2nd edn, 87 (1965)]

Illustration: P.Goldblatt, *Ann. Missouri Bot. Gard.* 63: 694, fig. 8 (1976).

Herb 10–30 cm tall. Corm 1–2 cm diam., tunic fibrous. Leaves 3 or more, basal and cauline, lax, 10–35 cm long, 5–9 mm wide, glabrous, glaucous. Stem usually branched, pubescent. Outer spathes 1.5–3 cm long, inner 2–4 cm long. Flowers dull yellow to brown, flushed with blue in centre. Perianth segments shortly clawed, slightly reflexed. Sepals oblanceolate, 2–2.5 cm long, each with a bright yellow spot. Petals entire, lanceolate, narrower, 1.5–2 cm long. Filaments 5–6 mm long, one-third connate; anthers 3–4 mm long, blue. Style branches 6–7 mm long; crests lanceolate, 7–10 mm long. Capsule globose to obloid, c. 8 mm diam., pendulous when mature. $2n = 20$, *fide* P.Goldblatt, *op. cit.* 693. Fig. 8A–C.

Native to Cape Province, South Africa; naturalised in the Perth area of W.A. and in the Mt Lofty Range and Kangaroo Is., S.A. Flowers Aug.–Oct. Map 37.

W.A.: Maddington, 21 Aug. 1952, *H.W.England* (PERTH); Maddington, 20 Sept. 1947, *A.G.Manning* (PERTH). S.A.: Kingscote, Kangaroo Is., *G.Jackson* 200 (AD).

2. **Moraea bellendenii* (Sweet) N.E.Br., *Bull. Misc. Inform.* 1929: 139 (1929)

Viesseuxia bellendenii Sweet, *Hort. Brit.* 395 (1827); *Moraea pavonia* var. *lutea* Baker, in W.T.Dyer, *Fl. Capensis* 6: 24 (1896). T: illustration in J.B.Ker Gawler, *Bot. Mag.* 20: t. 772 (1803).

Illustrations: J.M.Black, *Fl. S. Australia* 3rd edn, 1: 378, fig. 339 (1978); P.Goldblatt, *Ann. Missouri Bot. Gard.* 63: 768, fig. 32C (1976).

Herb 50–90 cm tall. Corm c. 2 cm diam., tunic fibrous. Leaf solitary, basal, lax, 60–100 cm long, up to 1 cm wide, glabrous. Stem branched, glabrous. Outer spathe 3–4 cm long, inner 5–7 cm long. Flowers yellow, speckled with brown in centre. Sepals with claws erect, c. 1 cm long, bearded; blades spreading, obtuse, 1.2–2.4 cm long, 2–3 cm wide. Petals erect, trifid, 8–10 mm long; central lobe acute, incurved; lateral lobes shorter, obtuse. Filaments 3–5 mm long, three-quarters connate; anthers 4–5 mm long, yellow. Style branches c. 6 mm long; crests narrowly triangular, 3–6 mm long. Capsule clavate, c. 1.5 cm long, erect. $2n = 12$, *fide* P. Goldblatt, *op. cit.* 767. Fig. 8D.

Introduced from South Africa and naturalised in the southern Mt Lofty Range of S.A. Flowers Oct.–Nov. Map 38.

S.A.: Greenhill Road, 9 Oct. 1948, *J.B.Cleland* (AD); Mt Bonython near Mt Lofty summit, 1 Nov. 1964, *E.H.Ising* (AD).

3. **Moraea aristata* (Delaroche) Asch. & Graebner, *Syn. Mitteleur. Fl.* 3: 518 (1906)

Viesseuxia aristata Delaroche, *Descr. Pl. Aliq. Nov.* 33 (1766). T: cultivated in Europe from material collected in South Africa by *Van Royen*; lecto: L n.v., *fide* P.Goldblatt, *Ann. Missouri Bot. Gard.* 63: 773 (1976).

Illustration: P.Goldblatt, *op. cit.* 776, fig. 34A.

Herb 25–35 cm tall. Corm 1.5 cm diam., tunic fibrous. Leaf solitary, basal, lax, 25–40 cm long, to 5 mm wide, glabrous. Stem rarely branched, glabrous. Outer spathes c. 3 cm long, inner 5–6 cm long. Flowers white with a deep blue, pubescent centre. Sepals with bearded claws c. 1.2 cm long; blades spreading, obtuse, to 2 cm long, 2.5 cm wide. Petals trifid, 1.5–2 cm long, blue-spotted; central lobe acute, spreading; lateral lobes shorter, obtuse. Filaments 3–4 mm long, three-quarters connate; anthers c. 5 mm long, blue. Style branches c. 7 mm long; crests narrowly triangular, c. 7 mm long. Capsule clavate-cylindrical, 1.5–2 cm long, erect. Seeds with spongy testa. $2n = 12$, *fide* P.Goldblatt, *op. cit.* 773. Fig. 8E.

Native to the Cape Peninsula, South Africa, where almost extinct. Widely cultivated; naturalised in the southern Mt Lofty Range, S.A. Map 39.

S.A.: between Balhannah and Nairne, Mt Lofty Ra., 16 Oct. 1973, *V.Niedermueller* (AD).

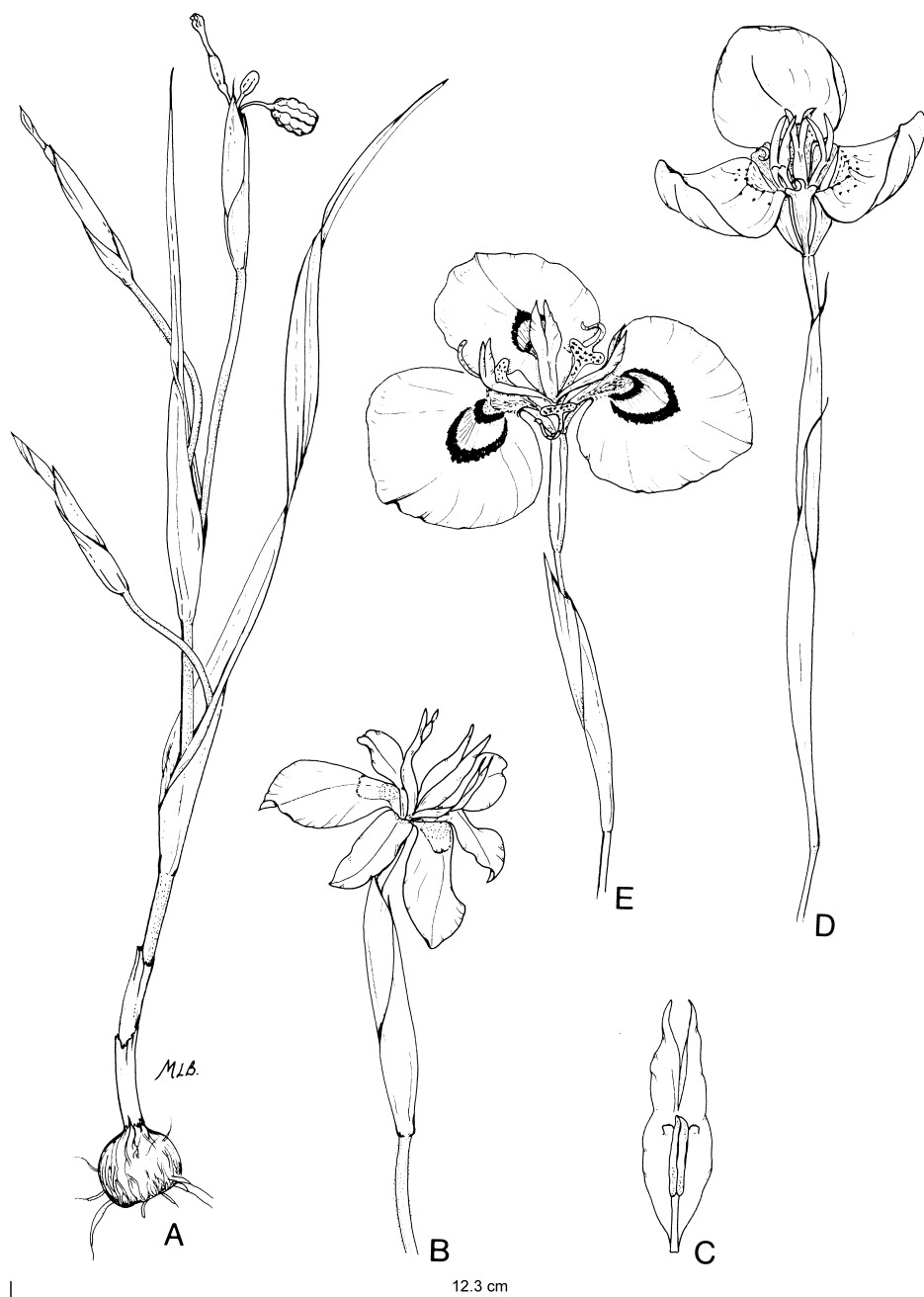


Figure 8. *Moraea*. A–C, *M. veata*. A, habit $\times 0.4$; B, flower $\times 1.2$; C, style branch and stamen $\times 2.3$. D, *M. bellendenii*, flower $\times 1.2$. E, *M. aristata*, flower $\times 1.2$. Reproduced by permission from *Ann. Missouri Bot. Gard.* 63: 694, 768, 776, figs 8, 32C, 34A (1976).

9. HOMERIA

Homeria Vent., *Dec. Gen. Nov.* 5 (1808); from the Greek *homereo* (I meet together), referring to the united filaments and often connivent anthers of the stamens.

Type: *H. collina* (Thunb.) Salisb.; *Moraea collina* Thunb.

Perennial herbs with annual leaves and flowers. Corm globose, pointed; tunic hard, netted. Leaves 1 to several, basal or near-basal, linear, bifacial, channelled. Scape erect, often branched, with reduced sheathing bracts at nodes. Rhipidia terminal, few-flowered. Spathes acuminate, herbaceous; inner spathe longer. Sepals and petals free, entire, sub-equal; claws either long and widely cupped or short and erect; lamina spreading. Stamens monadelphous; filaments almost completely connate; anthers oblong-linear, appressed to style branches. Ovary oblong-linear; style trifid above filament tube; branches flattened, oblong with broad stigmas and minute paired crests or shortly bilobed with minute terminal stigmas. Capsule cylindrical, usually exserted. Seeds numerous, angular, brown. $x = 6$, *fide* P.Goldblatt, *Bot. Not.* 133: 87 (1980).

A genus of 31 species in southern Africa; several cultivated as ornamentals and 3 naturalised in Australia, including 2 of importance as weeds of pastures.

P.Goldblatt, Systematics and biology of *Homeria* (Iridaceae), *Ann. Missouri Bot. Gard.* 68: 413–503 (1981).

KEY TO SECTIONS AND SPECIES

- | | |
|---|--------------------------------|
| 1 Leaves 2 or 3; anthers coherent (sect. II. Conanthera) | 3. <i>H. miniata</i> |
| 1: Leaf solitary; anthers divergent (sect. I. <i>Homeria</i>) | |
| 2 Scape bracts 6–7 cm long; style crests vestigial and obtuse or absent | 1. <i>H. ochroleuca</i> |
| 2: Scape bracts 2–6 cm long; style crests c. 1 mm long, acute | 2. <i>H. flaccida</i> |

Sect. I. *Homeria*

Homeria Vent. sect. *Homeria*

Leaf usually solitary. Anthers never coherent. Style branches various, often with small crests, never covered by anthers.

The section contains 15 species, 2 of which are naturalised in Australia.

1. **Homeria ochroleuca* Salisb., *Trans. Hort. Soc. London* 1: 308 (1812)

H. collina var. *ochroleuca* (Salisb.) Baker, *Handb. Irid.* 75 (1892). T: *Bot. Mag.* 28: t. 1103 (1808).

Illustration: P.Goldblatt, *Ann. Missouri Bot. Gard.* 68: 454, fig. 12 (1981).

Herb 40–70 cm tall. Corm c. 2 cm diam. Leaf solitary, inserted above ground level, longer than scape, 6–15 mm wide. Scape branched, never flexuose; bracts 6–7 cm long. Outer spathe 3–4 cm long, inner 6–8 cm long. Flowers yellow, sometimes with orange centre, or completely orange. Sepals and petals obovate, 3–4 cm long, the claws forming an open cup 2–3 cm diam. Filaments connate in tapered tube 7–10 mm long, glabrous; anthers 5–8 mm long, divergent from base. Ovary 1.3–1.6 cm long; style trifid at base of anthers; branches divergent, 5–6 mm long; stigmas held above anthers, bilobed; style crests absent or vestigial and obtuse. Capsules 2–4 cm long; beak obtuse, c. 1 mm long.

Native to southern Africa; naturalised in south-western W.A., southern S.A., N.S.W. and western Vic. Apparently uncommon and discontinuous in distribution, but has been recorded as a locally serious weed. Flowers Sept.–Nov. Map 40.

W.A.: Narrogin, 18 Oct. 1957, *W.H.Butler* (PERTH); Highbury, 26 Oct. 1950, *M.Wood* (PERTH). S.A.: Yallunda Flat, Hundred of Koppio, *C.R.Alcock* C8 (AD). N.S.W. Little Billabong, Holbrook area, 12 Oct. 1977, *H.J.Milvain* (NSW). Vic. Yambuck, Nov. 1901, *H.B.Williamson* (MELU).

2. **Homeria flaccida* Sweet, *Hort. Brit.* 395 (1827)

H. collina var. *miniata minor* Ker Gawler, *Bot. Mag.* 39: t. 1612 (1814). T: Ker Gawler, *loc. cit.*

[*H. collina* auct. non Salisb.: J.M.Black, *Nat. Fl. S. Australia* 149 (1909)]

[*H. breyniana* auct. non G.J.Lewis: H.Eichler, *Suppl. Fl. S. Australia* 88 (1965)]

Illustration: W.Parsons, *Noxious Weeds Victoria* 171 (1973).

Herb 25–60 cm tall. Corm c. 2 cm diam. Leaf solitary, inserted above ground level, longer than scape, 9–13 cm wide. Scape simple or with flexed branches; bracts 2–6 cm long. Outer spathe 3–4 cm long, inner 6–8 cm long. Flowers orange with yellow centre, rarely all yellow. Sepals and petals 2.7–4 cm long, the claws forming an open cup 1–2 cm diam.; sepals oblong, petals oblanceolate. Filaments connate in tube 6–8 mm long, glabrous, or puberulous below; anthers 6–11 mm long, parallel at base, divergent above. Ovary 1.5–2 cm long; style trifid 2–3 mm above base of anthers; branches \pm divergent, 5–7 mm long; stigmas bilobed, held above anthers; style crests erect to incurved, triangular, c. 1 mm long. Capsule 2.5–5.5 cm long; beak acute, c. 2 mm long. *Oneleaf Cape Tulip*. Fig. 9A–F.

Native to southern Africa. Naturalised in south-western W.A.; S.A. south-east from Eyre Peninsula; central and southern coast and Riverina of N.S.W.; Vic.; northern and eastern Tas. A serious weed of pastures, roadsides and disturbed ground, but never under dense tree or shrub cover; difficult to control and toxic to stock. Flowers Sept.–Oct. Map 41.

W.A.: Lake Goolelal, near Wanneroo, Nov. 1979, *P.Bridgewater* (PERTH). S.A.: Upper Waterfall Gully, *H.Eichler* 18707 (AD); 10 km E of Harriet Bridge, Kangaroo Is., *G.Jackson* 834 (AD). N.S.W.: Pleasant Hills SW of Wagga Wagga, 7 Nov. 1974, *H.J.Milvain* (NSW). Vic.: Stockyard Point, Westernport Bay, 17 Sept. 1973, *A.Corrick* (MEL).

Some Australian material here referred to *H. flaccida* resembles the related *H. collina* (Thunb.) Salisb., in the generally smaller size and the narrower cup formed by the sepals and petals. Hybridisation occurs between these species (*P.Goldblatt, Bot. Notiser* 133: 89, 1980); Australian populations, which have been derived from horticultural stock and subjected to many generations of selection outside their original habitat, may form a hybrid continuum in which few specimens can be matched precisely with either southern African species.

Sect. II. *Conanthera*

Homeria sect. *Conanthera* Goldblatt, *Ann. Missouri Bot. Gard.* 68: 427 (1981).

Type: *H. miniata* (Andrews) Sweet

Leaves 1 to several. Anthers short, parallel, coherent in a tube, at first covering the style branches which protrude after anthesis. Style branches short, broad, bilobed; crests absent.

A section of 9 species, 1 naturalised in Australia.

3. **Homeria miniata* (Andrews) Sweet, *Brit. Fl. Gard.* 2: t. 152 (1826)

Moraea miniata Andrews, *Bot. Repos.* 6: t. 404 (1804). T: Andrews, *loc. cit.*

Illustrations: W.T.Parsons, *Noxious Weeds Victoria* 174, fig. 160 (1973); *P.Goldblatt, Ann. Missouri Bot. Gard.* 68: 486, fig. 26 (1981).

Herb 30–60 cm tall. Corm 1–2.5 cm diam. Leaves 2 or 3, near basal, 20–100 cm long, 5–15 mm wide. Scape branched, the branches erect to divaricate; bracts 3–5 cm long. Spathes with brown scarious apices; outer spathe 3–4 cm long, inner 4–6 cm long. Flowers pink with yellow centre. Sepals and petals elliptic, with claws c. 2 mm long



Figure 9. *Homeria*. **A–F**, *H. flaccida*. **A**, habit $\times 0.5$; **B**, part of inflorescence $\times 0.8$; **C**, flower, from above $\times 0.8$; **D**, flower, side view $\times 1.1$; **E**, dehiscent fruit $\times 1.1$; **F**, seeds $\times 8$. **G–H**, *H. miniata*. **G**, habit $\times 0.5$; **H**, bulbils $\times 5$. Drawn by the late C.A.Gardner. Reproduced from the original by permission of the Director, Department of Agriculture, Western Australia.

appressed to filament tube; sepals 1.3–2.3 cm long, petals slightly smaller. Filaments connate in tube 6–8 mm long, swollen and pubescent at base; anthers 2 mm long, erect, coherent. Ovary 5–10 mm long; style trifid above base of anthers, branches 1–2 mm long, deeply bifid; stigmas terminal, minute, projecting between dehiscent anthers; style crests absent. Capsules c. 1.5 cm long, obtuse. Bulbils c. 2 mm long, usually produced in large clusters in leaf axils after flowering. *Twoleaf Cape Tulip*. $2n = 12, 18, 24$, *fide* P. Goldblatt, *Ann. Missouri Bot. Gard.* 68: 486 (1981). Fig. 9G–H.

Native to southern Africa. Naturalised in south-western W.A., where widespread but most abundant in the Avon valley; southern S.A.; coast, tablelands and Riverina of N.S.W.; Vic. A serious weed of pastures, roadsides and disturbed ground, difficult to control and toxic to stock. Flowers Aug.–Oct. Map 42.

W.A.: 16 km SW of Meckering, *K.L. Wilson* 2592 (NSW, PERTH). S.A.: Port Lincoln, *C.R. Alcock* 2695 (AD); Paskeville, *B. Copley* 1452 (AD, CANB). N.S.W.: 19 km from Deniliquin on Finlay road, *W. Mulham* 1323 (NSW). Vic.: 4 km SSW of Maryborough, 9 Aug. 1980, *E. Courtney* (MEL).

10. HEXAGLOTTIS

Hexaglottis Vent., *Dec. Gen. Nov.* 6 (1808); from the Greek *hex* (six) and *glottis* (tongue), referring to the six spreading style branches.

Type: *H. longifolia* (Jacq.) Vent.; *Moraea longifolia* Jacq.

Perennial herbs with annual leaves and flowers. Corm globose; tunic fibrous. Basal leaves 1 to few, linear, bifacial, channelled. Scape erect, few-branched, with numerous sheathing bracts. Rhipidia numerous, the lateral ones sessile, several-flowered. Spathes herbaceous, the inner longer. Sepals and petals sub-equal, free and shortly clawed or rarely connate in a tube at base. Stamens monadelphous; anthers linear-lanceolate, erect. Ovary cylindrical to clavate; style short, deeply trifid, the branches deeply bifid, forming 6 filiform arms each with a minute apical stigma. Capsule cylindrical to clavate. Seeds numerous, angular, brown.

A genus of 4 species native to winter-rainfall areas of southern Africa, occasionally cultivated; one species naturalised in Australia.

G.J. Lewis, A revision of *Hexaglottis*, *J. S. African Bot.* 25: 215–230 (1959).

Ovary and capsule partly or fully exserted from spathes; perianth tube absent

H. lewisiae

Ovary and capsule included in spathes; perianth tube 5–6 mm long

† **H. virgata**

† *Hexaglottis virgata* (Jacq.) Sweet was recorded as a garden escape in Victoria in 1930, but has not been collected in the last 50 years.

***Hexaglottis lewisiae** Goldblatt, *J. S. African Bot.* 37: 234 (1971)

H. flexuosa (L.f.) Sweet, *Hort. Brit.* 2nd edn, 498 (1830); *Moraea flexuosa* L.f., *Suppl. Pl.* 100 (1781), *nom. illeg.* T: from South Africa, *C.P. Thunberg* 1217; lecto: UPS *n.v.*, *fide* G.J. Lewis, *J. S. African Bot.* 25: 224 (1959).

Illustrations: G.J. Lewis, *op. cit.* fig. 2A as *H. flexuosa*; H. Mason, *Western Cape Sandveld Fl.* 70, t. 24 (1972).

Corm 1.5–2 cm diam. Leaves 1–3, 70–80 cm long, 3–5 mm wide, lax. Scape 20–60 cm tall with 1–6 flexuose branches; bracts imbricate, acuminate, 4–7 cm long. Rhipidia 4- or 5-flowered, sessile along branches. Spathes 2.5–4 cm long. Flowers on pedicels c. 3 cm long, partly exserted. Perianth segments shortly clawed, spreading, deep yellow. Sepals oblong, 1.8–2.4 cm long, 7–9 mm wide. Petals obovate, slightly shorter. Filaments 5–6 mm long, connate at base only; anthers 5–7 mm long. Ovary c. 1 cm long; style branches 6–7 mm long, spreading horizontally between stamens. Capsule cylindrical, 1.5–2 cm long, exserted.

Native to Cape Province, South Africa; naturalised locally in south-western W.A. Flowers Sept.–Oct. Map 43.

W.A.: c. 32 km S of Wongan Hills, Oct. 1956, *C.V.Cahill* (PERTH); Winchester, *C.Chapman* (PERTH); Waterloo, N of Bunbury, *R.D.Royce* 3958 (PERTH); Waterloo, *R.D.Royce* 4578 (PERTH).

11. GYNANDRIRIS

Gynandriris Parl., *Nuov. Gen. Spec. Monocot.* 49 (1854); from the Greek *gynandros* (hermaphrodite) and *Iris*, referring to the style and stamens borne together on an extension of the ovary.

Type: *G. sisyrinchium* Parl.

Perennial herbs with annual leaves and flowers. Corm ovoid; tunic of netted fibres. Basal leaves 1 or 2, bifacial, channelled. Scape usually branched, sometimes short. Spathes membranous, becoming scarious and sub-hyaline with prominent veins. Flowers almost sessile, blue-violet to white. Sepals and petals free, clawed. Sepals spreading or reflexed. Petals erect or reflexed, smaller. Stamens monadelphous; anthers linear-oblong. Ovary containing ovules in the basal third only, extended above as a slender sterile beak; style branches petaloid, appressed to stamens; stigmas bilobed, transverse, exceeded by prominent erect crests. Capsule membranous, with persistent beak, enclosed by spathes. Seeds numerous, angular. $x = 6$, *fide* P.Goldblatt, *Bot. Not.* 133: 247 (1980).

A genus of 9 species in southern Africa, the Mediterranean region and south-western Asia; one species naturalised in Australia.

P.Goldblatt, *Systematics of Gynandriris*, *Bot. Not.* 133: 239–260 (1980).

**Gynandriris setifolia* (L.f.) R.Foster, *Contr. Gray Herb.* 114: 40 (1936)

Iris setifolia L.f., *Suppl. Pl.* 99 (1781). T: Cape Province, South Africa, *C.P.Thunberg* s.n.; holo: UPS n.v., *fide* P.Goldblatt, *Bot. Not.* 133: 251 (1980).

Moraea xerospatha MacOwan ex Baker, in W.T.Dyer, *Fl. Capensis* 6: 529 (1897). T: near Cape Town, South Africa, *P.MacOwan* 3118; lecto: K n.v., *fide* P.Goldblatt, *loc. cit.*

Moraea xerospatha var. *monophylla* J.Black, *Fl. S. Australia* 1: 113 (1922). T: Brighton, S.A., 18 Sept. 1904, *J.M.Black*; syn: AD; between Marryatville and Burnside, S.A., 8 Oct. 1904, *J.M.Black*; syn: AD; Kensington, S.A., 7 Nov. 1905, *J.M.Black*; syn: AD; Norwood, S.A., 25 Oct. 1907, *J.M.Black*; syn: AD; Norwood, S.A., Nov. 1907, *J.M.Black*; syn: AD; Norwood, S.A., Oct. 1912, *J.M.Black*; syn: AD; Adelaide Plains, S.A., Nov. 1912, *J.M.Black*; syn: AD; Marryatville, S.A., Oct. 1913, *J.M.Black*; syn: AD; North Parklands, N branch of Torrens, S.A., 21 Sept. 1917, *J.M.Black*; syn: AD.

Illustrations: P.Goldblatt, *op. cit.* fig. 3E–H; G.M.Cunningham *et al.*, *Pl. W. New South Wales* 192 (1982).

Herb 4–20 cm tall. Corm c. 1 cm diam., tunic pale brown. Leaf usually solitary, narrowly linear, trailing, 20–60 cm long, 1–2 mm wide. Scape 2–5 cm long, sometimes branched, with 2 to several rhpidia of 4–6 flowers. Spathes 2–4 cm long. Sepals and petals reflexed to spreading, spatulate, 1.3–1.6 cm long, pale lilac, often spotted with purple. Sepals 5–9 mm wide, with a central orange mark. Petals c. 2 mm wide. Filaments 3.5–6 mm long, connate at base; anthers 2–4 mm long. Style branches with acute bifid crests 4–8 mm long. Capsule cylindrical, 1–1.4 cm long; beak filiform, 7–10 mm long. Seeds 1–1.5 mm long, brown. *Thread Iris*. $2n = 12$, *fide* P.Goldblatt, *op. cit.* 252.

Native to Cape Province, South Africa; naturalised in south-western W.A., S.A., inland N.S.W. and Vic.; sometimes abundant as a weed of dry pastures in winter-rainfall areas. Flowers Sept.–Nov. Map 44.

W.A.: 5 km W of Coomberdale, *K.Paijmans* 3849 (CANB). S.A.: Browns Beach, Innes Natl Park, *J.Z.Weber* 4215 (AD). N.S.W.: 6 km W of Barmah, *T.B.Muir* 6120 (MEL); Parkes, 23 Sept. 1981, *J.Ward* (NSW). Vic.: c. 10 km SW of Kaniva, *M.G.Corrick* 536 (MEL)

12. GALAXIA

Galaxia Thunb., *Nov. Gen.* 2: 50 (1782); from the Greek *galaxias* (the Milky Way), referring to the massed appearance of the small star-like flowers.

Type: *G. ovata* Thunb.

Small perennial herbs with annual leaves and flowers. Corm globose; tunic of netted fibres. Stem underground at flowering time, the basal leaves and sessile inflorescence forming a low tuft. Leaves numerous, flat or channelled to terete with broad sheathing bases. Flowers solitary, erect, sessile within 2 herbaceous spathes. Sepals and petals equal to sub-equal, spreading; tube long, cylindrical, widened at apex. Stamens monadelphous, inserted in tube; anthers basifixed, erect, oblong. Ovary globose; style terete, slender, with 3 short, broad stigmatic lobes exceeding or appressed to anthers; stigmas along edges of lobes. Capsule ovoid, sub-membranous, enclosed by spathes. Seeds numerous, angular.

A genus of 14 species in south-western Cape Province and Namaqualand, South Africa. One species, sometimes cultivated as an ornamental, naturalised in Australia.

P.Goldblatt, Biology and systematics of *Galaxia* (Iridaceae), *J. S. African Bot.* 45: 385–423 (1979).

****Galaxia fugacissima* (L.f.) Druce, *Rep. Bot. Exch. Club* 1916: 624 (1917)**

Ixia fugacissima L.f., *Suppl. Pl.* 94 (1781). T: Cape Town, South Africa, *C.P.Thunberg s.n.*; lecto: UPS *n.v.*, *fide* P.Goldblatt, *J. S. African Bot.* 45: 416 (1979).

Illustration: P.Goldblatt, *op. cit.* fig. 10.

Corm c. 1 cm diam. Leaves linear to narrowly lanceolate, channelled, terete near apex, up to 7 cm long, 1–2.5 mm wide; margins hyaline. Flower yellow, scented. Perianth tube 10–24 mm long; lobes similar, oblanceolate, apiculate, 14–18 mm long, 4–8 mm wide. Sepals sometimes purple-marked. Filaments 4–5 mm long, usually completely connate; anthers 1.5–3 mm long. Style branches short, cuneate, level with or exceeding anthers; stigmas fringed. Capsule 7–9 mm long. Stem of fruiting plant elongating up to 12 cm long, erect, terete, c. 1 mm diam. $2n = 18, 36$, *fide* P.Goldblatt, *op. cit.* 417. Fig. 11A–B.

Native to Cape region of South Africa; naturalised locally in central Vic. Flowers Aug.–Sept. Map 45.

Vic.: 2 km NE of Broadford, *H.S.Meyer* 28 (MEL); Huntly, near Bendigo, 1961, *F.Robbins* (MEL).

13. FERRARIA

Ferraria Burman ex Miller, *Fig. Pl. Gard. Dict.* 187 (1759); after J.B.Ferrari (1584–1655), an Italian botanist who first illustrated the genus in 1633.

Type: *F. crispa* Burman

Perennials with annual leaves and flowers. Corm tuber-like, naked or with membranous tunic. Leaves basal and cauline, few to numerous, equitant, linear. Scape erect, terete, leafy, branched, with 2–6-flowered rhipidia. Flowers actinomorphic, dull-coloured, on very short pedicels. Sepals and petals free, sub-equal, spreading, with claws forming a cup. Stamens monadelphous; anthers versatile, appressed to style branches. Ovary narrow, enclosed by spathe, often with sterile beak; style erect, filiform, with 3 short flattened branches; stigmas minute, terminal or marginal, exceeded by 2 broad, fringed lobes. Capsule globose to clavate. Seeds numerous, angular. $x = 10$, *fide* P.Goldblatt, *J. S. African Bot.* 37: 317–460 (1971).

A genus of 10 species widespread in southern Africa; one species, formerly cultivated, now naturalised in Australia.

M.P.De Vos, The African genus *Ferraria*, *J. S. African Bot.* 45: 295–375 (1979).

****Ferraria crispa*** Burman, *Nova Acta Phys.-Med. Acad. Caes. Leop.-Carol. Nat. Cur.* 2: 199 (1761)

subsp. ***crispa***

T: J.Burman, *op. cit.* t. 3 fig. 1.

F. undulata L., *Sp. Pl.* 2nd edn, 2: 1353 (1762). T: Cape of Good Hope, South Africa, *collector unknown*; holo: probably UPS *n.v.*

Illustration: M.P.De Vos, *J. S. African Bot.* 45: 339, fig. 19 (1979).

Glabrous herb to 60 cm tall. Corm depressed or rounded, 2–4 cm diam. Leaves numerous, completely covering stem, broadly linear, obtuse, 15–40 cm long, 6–15 mm wide, glaucous. Spathes ovate to elliptic, keeled, 4–6 cm long; margins narrow, white. Flowers mottled purple-black, malodorous. Sepals and petals acute, fleshy; margins crisped and undulate; sepals 24–28 mm long, 10–17 mm wide; petals narrower. Filaments c. 10 mm long, three-quarters connate; anther cells parallel. Ovary 15–25 mm long, beakless; style 7–9 mm long, the branches each divided into 2 slender fimbriate arms 3–4 mm long. Capsule ellipsoid, acute. Seeds c. 3 mm diam., brown. *Black Flag*. *2n* = 60, *fide* M.P.De Vos, *J. S. African Bot.* 45: 341 (1979). Fig. 6.

Native to Cape Province, South Africa. Naturalised in coastal W.A. near Perth, S.A. and Vic.; also Norfolk Is. A garden escape persisting locally but not spreading. Flowers Sept. Map 46.

W.A.: Esplanade, Perth, 14 Sept. 1926, *C.A.Gardner* (PERTH). S.A.: Reeves Point, Kangaroo Is., *G.Jackson* 223 (AD); Altona Scrub c. 11 km E of Gawler, *H.Penning* 100 (AD). Vic.: South Yarra, *D.A.Cooke* 312 (MEL); St Leonards, Bellarine Peninsula, 21 Sept. 1960, *Ellis* (MEL).

Trib. IV. TIGRIDIEAE

Trib. *Tigridieae* Baker, *J. Linn. Soc., Bot.* 16: 77 (1877).

Type: *Tigridia* Juss.

Rootstock a bulb or rhizome. Leaves unifacial. Inflorescence of 1 to many rhipidia each enclosed by large persistent spathes containing 1 to several flowers. Flowers actinomorphic, fugacious. Sepals and petals differentiated, only the petals bearing nectaries, free or confluent to form a short tube. Stamens free or united, equilateral. Style trifid with terete or petaloid branches usually opposite the stamens.

About 24 genera, mainly in South America with some extending to North America. 1 genus naturalised in Australia.

14. HERBERTIA

Herbertia Sweet, *Brit. Fl. Gard.* t. 222 (1827); after the Rev. William Herbert (1778–1847), an English botanist.

Type: *H. pulchella* Sweet

Trifurcia Herbert, *Bot. Mag.* 66: t. 3779 (1840). T: *T. caerulea* Herbert

[*Alophia auct. non* Herbert: N.T.Burbidge, *Dict. Austral. Pl. Gen.* 12 (1963)]

Small perennial herbs with annual leaves and flowers. Rootstock a bulb. Leaves basal, linear, plicate. Stem erect, simple or branched, with reduced sheathing leaves. Spathes herbaceous; apices acute, scarious. Flowers few, blue to violet. Sepals and petals free, the sepals clawed, spreading, far exceeding petals. Stamens monadelphous, erect; anthers

spreading, exceeding style branches. Style erect, terete, trifid at top of filament tube; branches appressed to anthers, channelled, bifid near apices; stigmas 6, terminal.

6 species in South America, one of them extending to North America and naturalised in Australia.

P.Goldblatt, Revision of the bulbous Iridaceae of North America, *Brittonia* 27: 373–385 (1975); P.Goldblatt, *Herbertia* (Iridaceae) reinstated as a valid generic name, *Ann. Missouri Bot. Gard.* 64: 378–379 (1977).

****Herbertia lahue*** (Molina) Goldblatt, *Ann. Missouri Bot. Gard.* 64: 379 (1977)

subsp. ***caerulea*** (Herbert) Goldblatt, *Ann. Missouri Bot. Gard.* 64: 379 (1977)

Trifurcia caerulea Herbert, *Bot. Mag.* 66: t. 3779 (1840); *Herbertia caerulea* (Herbert) Herbert, *Bot. Mag.* 67: t. 3862 (1841). T: cultivated in England from material collected in Texas by *T.Drummond*; n.v.

[*Alophia pulchella* auct. non Benth. & J.D.Hook. N.C.W.Beadle *et al.*, *Fl. Sydney Region* 541 (1972)]

Herb to 20 cm tall. Bulb c. 2 cm diam.; tunic scarious, brown. Leaves 3–6, lax, 5–18 cm long, 2–4 mm wide. Inflorescence few-branched; stem bracts 1–3, lanceolate, 3–6 cm long. Spathes unequal, outer one 2–4 cm long, inner 3–4.5 cm long, together enclosing a single flower. Perianth pale blue. Sepals oblanceolate, 2–2.5 cm long, with dark triangle near base and white, spotted claw. Petals lanceolate, 5–7 mm long, with dark nectary. Filaments c. 5 mm long, completely connate; anthers 7–10 mm long. Style branches c. 5 mm long, bifid for 2 mm; margins membranous. Capsules ovoid, truncate, 1.5–2 cm long, dehiscing at apex only. Seeds compressed-ovoid, 1–2 mm long, rugose, dark brown.

Native to Texas and Louisiana in the U.S.A. Naturalised in the central coast region of N.S.W., growing in grassland. Map 47.

N.S.W.: c. 5 km from Lemon Tree Passage, Port Stephens, Nov. 1978, *A.Broadhead* (NSW); Dungog, Dec. 1937, *B.A.Fisher* (NSW); Parramatta Park, 5 Dec. 1940, *E.Hurst* (NSW); Tomago area, Dec. 1957, *J.T.Mullett* (NSW).

Trib. V. IXIEAE

Trib. Ixieae Benth. & J.D.Hook., *Gen. Pl.* 3: 684 (1883).

Type: *Ixia* L.

Rootstock a corm, rarely a rhizome. Leaves equitant, sometimes terete or winged in section. Inflorescence a spike of sessile flowers each enclosed at the base by 2 persistent bracts or reduced to a solitary flower. Perianth actinomorphic to zygomorphic, with a distinct tube. Stamens free, very rarely monadelphous, inserted on the perianth tube, equilateral or unilateral. Ovary inferior, with nectaries in the septa; style trifid, the branches opposite the stamens, never petaloid.

About 35 genera, mainly in southern Africa with 3 extending to Europe and western Asia. Many genera are widely cultivated as ornamentals, and 15 are naturalised in Australia.

15. WATSONIA

Watsonia Miller, *Fig. Pl. Gard. Dict.* 184, t. 276 (1758), *nom. cons.*; after Sir William Watson (1715–1787), an English botanist.

Type: *W. meriana* (L.) Miller; *Antholyza meriana* L.

Large perennial herbs with annual leaves and flowers. Corm depressed globose; tunic coarsely fibrous. Leaves ensiform, tough, fibrous, glabrous. Spike distichous, many-flowered, with straight erect axis. Perianth actinomorphic to zygomorphic; tube

slender below, abruptly widened. Stamens unilateral, rarely equilateral; anthers linear, sub-basifixed. Style filiform, the branches terete, recurved, bifid, rarely further divided. Capsule woody, globose to cylindrical. Seeds oblong, angular to winged. $x = 9$, *fide* P.Goldblatt, *J. S. African Bot.* 37: 317–360 (1971).

About 45 species in southern Africa. Many species and their hybrids have long been cultivated in Australia as ornamentals; several are naturalised locally and one species is a widespread weed.

- | | | |
|----|--|----------------------------------|
| 1 | Bulbils developed in lower spathes of inflorescence | 6. <i>W. bulbillifera</i> |
| 1: | Bulbils absent | |
| 2 | Stamens equilateral, alternating with 3 staminodes | 1. <i>W. marginata</i> |
| 2: | Stamens unilateral, staminodes absent | |
| 3 | Flowers white | 2. <i>W. versfeldii</i> |
| 3: | Flowers pink to red | |
| 4 | Perianth tube approximately equal to lobes, funnel-shaped in upper half | 3. <i>W. sp. A</i> |
| 4: | Perianth tube manifestly longer than lobes, cylindrical in upper half | |
| 5 | Bracts up to 22 mm long; perianth tube abruptly contracted in lower half | 4. <i>W. sp. B</i> |
| 5: | Bracts 22–37 mm long; perianth tube gradually contracted | 5. <i>W. meriana</i> |

1. **Watsonia marginata* (L.f.) Ker Gawler, *Bot. Mag.* 17: t. 608 (1802)

Gladiolus marginatus L.f., *Suppl Pl.* 95 (1781). T: from South Africa; *n.v.*

Illustrations: R.Marloth, *Fl. S. Africa* 4: t. 45 (1915); H.Mason, *Western Cape Sandveld Fl.* 74, t. 26 (1972).

Herb to 1.2 m tall. Corm 5–6 cm diam. Basal leaves lanceolate to ensiform, 25–45 cm long, 3–5 cm wide, glaucous; midvein prominent; margins thickened to 1 mm, yellow-brown. Spike usually with many short appressed branches; flowers crowded. Bracts lanceolate, acuminate, 12–18 mm long, scarious, becoming lacerated, pallid. Flowers pale pink. Perianth tube 13–15 mm long, dilated slightly at the mouth; lobes spreading, obovate, apiculate, 13–20 mm long, 7–10 mm wide. Stamens equilateral; anthers 6–8 mm long, yellow; staminodes 3, minute, alternating with stamens. Style usually not exceeding stamens; branches very short, bifid. Capsule ovoid, acute, 8–12 mm long, blackish. Bulbils absent. $2n = 18$, *fide* P.Goldblatt, *J. S. African Bot.* 37: 370 (1971).

Introduced from SW Cape Province, South Africa; a garden escape naturalised locally in south-western W.A., southern Mt Lofty Range, S.A., and Vic. Map 48.

W.A.: c. 3 km N of Bridgetown, *T.E.H.Aplin* 1362 (PERTH); Ludlow, *R.D.Royce* 3959 (PERTH); Greenmount, *R.D.Royce* 3967 (PERTH). S.A.: Blakiston, *D.E.Symon* 1522 (ADW, CANB). Vic.: Blackburn, Oct. 1955, *Corbett* (MELU).

2. **Watsonia versfeldii* J.Mathews & L.Bolus, *Ann. Bolus Herb.* 3: 139 (1922)

var. ***alba*** J.Mathews & L.Bolus, *Ann. Bolus Herb.* 3: 140 (1922)

T: near Piquetberg, Cape Province, South Africa, *W.Versfeld*; holo: NBG 2670/16 *n.v.*, *fide* J.Mathews & L.Bolus, *loc. cit.*

Herb to 1.8 m tall. Basal leaves ensiform, 70–120 cm long, 2–4.5 cm wide; margins and midvein prominent, yellowish. Spike with several short appressed branches; flowers 3–4 cm apart. Bracts lanceolate, 1.6–2.3 cm long, green, becoming scarious. Flowers white. Perianth tube 3–4 cm long, curved, narrow for 1–1.5 cm at base, broadly funnel-shaped above; lobes spreading, obovate to oblong, apiculate, 3–3.7 cm long, 1–1.5 cm wide. Stamens unilateral but near centre of flower; anthers c. 12 mm long, pale yellow. Style shorter than perianth; branches 5–7 mm long, bifid. Capsule ovoid-cylindrical, c. 3 cm long, blackish. Bulbils absent.

Introduced from SW Cape Province, South Africa; a garden escape naturalised locally in south-western W.A., Vic. and Tas. Map 49.

W.A.: Waroona, 15 Sept. 1959, *T.E.H.Aplin* (PERTH); 8 km N of Balingup, *R.D.Royce* 2747 (PERTH). Vic.: South Belgrave, *D.A.Cooke* 314 (MEL).

Var. *alba* differs from the typical variety only in having white, not pink, flowers. Similar white-flowered plants are widely cultivated in Australia, usually under the name *W. ardernei*.

3. **Watsonia* sp. A

[*W. pyramidata* ? auct. non Stapf: J.H.Willis, *Handb. Pl. Victoria* 1: 342 (1962)]

Herb to 1.7 m tall. Basal leaves ensiform, 60–100 cm long, 2–4 cm wide; midvein prominent. Spike with few short appressed branches; flowers 2–2.5 cm apart. Bracts lanceolate to oblong, 1.6–2.1 cm long, membranous to scarious, reddish. Flowers pale pink to magenta. Perianth tube 3–4 cm long, curved, narrow for c. 1.5 cm at base, broadly funnel-shaped above; lobes spreading, ovate to oblong, acute to apiculate, 2.8–3.5 cm long, 1.2–1.6 cm wide. Stamens unilateral; anthers c. 12 mm long, dark purple. Style shorter than perianth; branches 4–5 mm long, bifid, often further divided. Capsule ovoid-cylindrical, c. 3 cm long. Bulbils absent.

Introduced from South Africa; a garden escape naturalised locally in south-western W.A., coastal N.S.W. and southern Vic. Flowers Sept.–Nov. Map 50.

W.A.: Witchcliffe, S of Margaret River, *R.D.Royce* 4630 (PERTH). N.S.W.: c. 7 km N of Cooranbong, *K.L.Wilson* 1951 (NSW). Vic.: South Belgrave, *D.A.Cooke* 313 (MEL).

4. **Watsonia* sp. B

Herb to 1.2 m tall. Basal leaves ensiform, 40–70 cm long, 2–3 cm wide; midvein prominent. Spike with few short appressed branches; flowers 2–3 cm apart. Bracts lanceolate to oblong, 1.5–2.2 cm long, membranous to scarious, reddish. Flowers pink. Perianth tube c. 4 cm long, slightly curved, narrow for c. 1.5 cm at base, abruptly expanded into a cylindric section above; lobes spreading, obovate to elliptic, acute, 2–2.5 cm long, 1–1.2 cm wide. Stamens unilateral, arched on upper side of flower; anthers c. 10 mm long, cream. Style as long as perianth; branches 4 mm long, bifid. Capsule not seen. Bulbils absent.

Introduced from South Africa; a garden escape naturalised in coastal W.A. between Perth and Cape Leeuwin; also recorded from the Mt Lofty Range, S.A. Flowers Oct.–Nov. Map 51.

W.A.: Waroona, *T.E.H.Aplin* 1200 (PERTH); Margaret River, *R.D.Royce* 2843 (PERTH); Witchcliffe, *R.D.Royce* 4631 (PERTH). S.A.: Crafers, Mt Lofty Summit Estate, *H.Eichler* 18901 (AD).

5. **Watsonia meriana* (L.) Miller, *Gard. Dict.* 8th edn (1768)

Antholyza meriana L., *Syst. Nat.* 10th edn, 863: (1759). T: from South Africa; *n.v.*

Herb 50–100 cm tall. Corm 4–7 cm diam.; tunic of coarse rigid fibres extended 2–3 cm above corm. Leaves ensiform to somewhat falcate, 20–40 cm long, 1–3 cm wide; 1–4 veins prominent; margins thickened. Spike unbranched or with few short branches; flowers 2.5–3.5 cm apart. Bracts lanceolate to oblong, obtuse, 2.2–3.7 cm long, herbaceous with scarious brown distal portion. Flowers brick red to dull pink. Perianth tube 3.2–4.2 cm long, slightly curved, somewhat narrowed at base, cylindrical above; lobes oblong to obovate, obtuse to apiculate, 1.7–2.6 cm long, 1–1.2 cm wide. Stamens unilateral, arched on upper side of flower; anthers c. 10 mm long, cream to purple. Style slightly longer than perianth; branches 4–5 mm long, bifid. Capsule ovoid, truncate, 3–4 cm long, blackish. Bulbils absent. $2n = 18$, *fide* P.Goldblatt, *J. S. African Bot.* 37: 370 (1971).

Introduced from South Africa; a garden escape naturalised in coastal W.A. between Perth and Cape Leeuwin, Mt Lofty Range of S.A., and Tas. Flowers Oct.–Dec. Map 52.

W.A.: Yoongarillup, Busselton district, *R.D.Royce* 3901 (PERTH); Bramley, Margaret River district, *R.D.Royce* 4613 (PERTH). S.A.: Ferguson Recreation Park, Stonyfell, *K.Preiss* 287 (AD). Tas.: Snug–Kettering road, 7 Dec. 1968, *W.M.Curtis* (HO).

6. **Watsonia bulbillifera* J.Mathews & L.Bolus, *Ann. Bolus Herb.* 3: 140 (1922)

T: Joostenberg, Cape Province, South Africa, *collector unknown*; holo: NBG 707/13 *n.v.*, *fide* J.Mathews & L.Bolus, *loc. cit.*

[*W. meriana* auct. non Miller: A.J.Ewart, *Fl. Victoria* 304 (1931)]

[*W. angusta* auct. non Ker Gawler: N.C.W.Beadle *et al.*, *Fl. Sydney Region* 544 (1972)]

Illustration: W.T.Parsons, *Noxious Weeds Victoria* 176, figs 162, 163 (1972).

Herb 1–2 m tall. Corms 4–8 cm diam.; tunic of netted fibres. Basal leaves ensiform, 50–80 cm long, 2–4.5 cm wide; midvein prominent. Spike usually unbranched; flowers 3–4 cm apart. Bracts triangular to oblong, 1.7–2.2 cm long, herbaceous with scariosus red-brown distal portion. Flowers brick red to salmon pink. Perianth tube 3.5–4.5 cm long, narrow at base, curved and expanded into a cylindrical portion 2.5–3 cm long; lobes oblong to obovate, acute or apiculate, 1.8–2.5 cm long, c. 1.3 cm wide; dorsal lobe hooded. Stamens unilateral, arched under dorsal perianth lobe; anthers c. 10 mm long, purplish. Style longer than perianth; branches c. 0.5 mm long, bifid. Capsules not produced. Bulbils ovoid, acuminate, in clusters of 4–12, replacing flowers in lower spathes of spike. *Wild Watsonia*, *Bugle Lily*. $2n = 27$, *fide* P.Goldblatt, *J. S. African Bot.* 37: 370 (1971).

Native to SW Cape Province, South Africa. Naturalised in south-western W.A., mainly in Perth region; south-eastern S.A.; south coast of Qld; coastal N.S.W.; southern and north-eastern Vic.; eastern Tas. A locally abundant weed of roadsides, unimproved pastures and wasteland, but not invading native vegetation or arable land. Flowers Oct.–Dec. Map 53.

W.A.: Bellevue, *R.D.Royce* 4705 (PERTH). S.A.: Black Hill, *A.E.Orchard* 1821 (AD, MEL). Qld: Behms Creek road near Woongoolba, *N.Byrnes* 3489 (BRI). N.S.W.: North Turramurra near Kuringai Chase, 19 Oct. 1960, *T.S.Barratt* (NSW). Vic.: Gardenvale, 22 Nov. 1960, *J.H.Willis* (MEL).

A proclaimed noxious weed in W.A. and Vic.

16. HESPERANTHA

Hesperantha Ker Gawler, *Ann. Bot. (König & Sims)* 1: 224 (1804); from the Greek *hesperos* (evening) and *anthos* (flower), as the flowers open in the late afternoon or evening.

Type: *H. falcata* (L.f.) Ker Gawler

Small perennial herbs with annual leaves and flowers. Corm asymmetric; tunic of woody layers. Leaves 2 to several, mostly basal, lanceolate or linear, flat, soft-textured. Spike lax; bracts green. Flowers usually actinomorphic and stellate, rarely zygomorphic. Perianth tube moderately short, narrowly cylindrical below, funnel-shaped above, usually straight; lobes spreading, sub-equal. Stamens usually equilateral. Style trifid at apex of perianth tube; branches entire, filiform, spreading between stamens. Capsule ovoid, thin-walled. Seeds many, globose, rugose.

A genus of 55 species in southern Africa; one species, occasional in cultivation, naturalised in Australia.

P.Goldblatt, A revision of *Hesperantha* (Iridaceae) in the winter rainfall area of southern Africa, *J. S. African Bot.* 50: 15–141 (1984).

****Hesperantha falcata*** (L.f.) Ker Gawler, *Ann. Bot. (König & Sims)* 1: 225 (1804)

Ixia falcata L.f., *Suppl. Pl.* 92 (1781). T: hills around Cape Town, South Africa, *C.Thunberg s.n.*; lecto: UPS *n.v.*, *fide* P.Goldblatt, *J. S. African Bot.* 50: 97 (1984).

Illustration: R.Marloth, *Fl. S. Africa* 4: t. 42 (1915).

Herb 15–40 cm tall. Corm c. 1 cm diam.; tunic of overlapping scales. Basal leaves falcate to linear, 5–14 cm long, 3–8 mm wide, glabrous, with several prominent veins. Scape erect, wiry, simple or few-branched. Cauline leaf solitary, short, sheathing. Spike distichous, slightly flexuose, 4–10-flowered. Flowers erect, actinomorphic. Outer bracts broadly ovate, 8–12 mm long, herbaceous; inner bracts narrower, 7–11 mm long, ±membranous. Perianth tube straight, 5–9 mm long; lobes elliptic, 10–15 mm long, white to cream; sepals reddish on reverse. Stamens erect; filaments 3–4 mm long; anthers exserted, 4–5 mm long, cream. Ovary ovoid, 3–4 mm long, dark; style branches 5–7 mm long. Capsule 7–9 mm long, sheathed by spathes. Seeds c. 0.8 mm diam., dark brown. *2n* = 26, *fide* P.Goldblatt, *J. S. African Bot.* 37: 383 (1971).

Native to southern Africa; naturalised in the Perth region of W.A. and also recorded from S.A. Flowers Sept.–Oct. Map 54.

W.A.: Mundaring, 18 Oct. 1946, *W.R.Cooper* (PERTH); Upper Swan, Sept. 1947, *R.D.Royce* (PERTH); near Midland Junction, Oct. 1945, *T.N.Stoate* (PERTH). S.A.: Waterfall Gully, Mt Lofty Range, 5 Oct. 1908, *J.M.Black* (AD).

17. ROMULEA

Romulea Maratti, *Pl. Romul. Saturn.* 13 (1772), *nom. cons.*; after Romulus, the legendary founder of Rome.

Type: *R. bulbocodium* (L.) Sebast. & Mauri; *Crocus bulbocodium* L.

Small perennial herbs with annual leaves and flowers. Corm globose to bell-shaped; tunic hard, smooth. Leaves few, basal, filiform, terete, flat or compressed in section; rarely 1 or 2 leaves cauline on a short stem. Scape 1 to several, shorter than leaves, 1-flowered. Bracts 2, entire, acute, enclosing ovary, inner one often scarious or with hyaline margins. Flower erect, actinomorphic. Perianth tube short, narrowly funnel-shaped; lobes equal, spreading, narrowly elliptic to obovate. Stamens free, equilateral; anthers linear, basifixed, connivent, included. Style branches deeply bifid, filiform, emerging above or between stamens. Capsule oblong to ovoid, partly enclosed by spathes. Seeds numerous, compressed-globose, brown.

A genus of about 90 species in southern and eastern Africa, the Mediterranean region and south-western Europe; 4 species naturalised in Australia.

M.P.De Vos, The genus *Romulea* in South Africa, *J. S. African Bot.* Suppl. 9 (1972).

- | | |
|--|---------------------------------|
| 1 Flower entirely yellow; inner bract hyaline | 1. <i>R. flava</i> |
| 1: Flower not yellow except inside perianth tube; inner bract green with scarious margins or wholly scarious | |
| 2 Perianth orange-brown; sepals dark purple outside | 4. <i>R. obscura</i> |
| 2: Perianth pink to lilac, rarely white; sepals greenish or dark-striped outside | |
| 3 Flower 8–15 mm long; perianth lobes obtuse | 2. <i>R. minutiflora</i> |
| 3: Flower 15–30 mm long, perianth lobes acute | 3. <i>R. rosea</i> |

1. **Romulea flava* (Lam.) De Vos, *J. S. African Bot.* 36: 273 (1970)var. **minor** (Bég.) De Vos, *J. S. African Bot. Suppl.* 9: 103 (1972)*R. bulbocodioides* var. *minor* Bég., *Annuaire Conserv. Jard. Bot. Genève* 11: 163 (1908). T: Langekloof, South Africa, *R. Schlechter* 8396; lecto: G n.v., *fide* M.P.De Vos, *op. cit.* 104.Illustration: J.B.Ker Gawler, *Bot. Mag.* 34: t. 1392 (1811) as *Trichonema caulescens*.

Corm with obliquely flattened base; tunic split into numerous fibres at apex and base. First leaf basal, 10–35 cm long, 1–2 mm wide with sheathing base to 5 mm wide; subsequent leaves 2 or 3, basal or cauline, 5–15 cm long. Stem absent or up to 10 cm long. Scapes 3–5 cm long. Outer bract ovate, 8–12 mm long, green; inner bract hyaline, exceeding outer. Perianth yellow; tube 3–4 mm long; lobes oblanceolate, acute, 1–1.5 cm long. Filaments 4–5 mm long, bases hairy; anthers 3–4 mm long. Style c. 8 mm long; stigmas level with top of anthers. Capsule ovoid, c. 1 cm long, on straight scape. $2n = 24$, *fide* M.P.De Vos, *op. cit.* 104.

Native to southern Africa; naturalised in W.A. on the coastal plain and Perth region, also found locally in N.S.W. and Vic. Flowers Aug.–Sept. Map 55.

W.A.: Boallia, Busselton district, 15 Aug. 1957, *C.W.Haines* (PERTH); Observatory grounds, [West Perth], *R.D.Royce* 4811 (PERTH); Gosnells, Sept. 1947, *C.Sporn* (PERTH). N.S.W.: Gulpa, 20 km S of Deniliquin, *W.H.Mulham* 1426 (NSW). Vic.: East Camberwell, Aug. 1930, *P.R.H.St John* (MEL).

The var. *flava*, with flowers over 2.5 cm long, is occasionally cultivated as an ornamental but has not become naturalised in Australia.

2. **Romulea minutiflora* Klatt, *Abh. Naturf. Ges. Halle* 15: 399 (1882)T: Hexflussberg, South Africa, *J.F.Drège* 538; lecto: S n.v., *fide* M.P.De Vos, *J. S. African Bot. Suppl.* 9: 146 (1972).[*R. columnae* auct. non Sebast. & Mauri: J.M.Black, *Fl. S. Australia* 2nd edn, 1: 206 (1943)]Illustrations: M.P.De Vos, *op. cit.* figs 42, 60; G.M.Cunningham *et al.*, *Pl. W. New South Wales* 193 (1982).

Corm with obliquely flattened base; tunic split into fibres at base, extended as fibrous neck at apex. Leaves several, basal, 6–20 cm long, 0.5–1.2 mm wide, almost terete. Stem absent. Scapes 2–5 cm long. Outer bract ovate, 6–10 mm long, herbaceous with scarious margin, often brown-blotched; inner bract 5–9 mm long, scarious, brown-blotched. Perianth tube 2–3 mm long, dull yellow; lobes elliptic, obtuse, 5–9 mm long, pale pink to lilac; sepals greenish outside. Filaments 2–4 mm long, glabrescent; anthers 1.5–2 mm long. Style 4–6 mm long; stigmas hardly exceeding anthers. Capsule cylindrical to obloid, 1–1.5 cm long, on decurved scapes which straighten at maturity. *Smallflower Onion* Grass. $2n = 26$, *fide* M.P.De Vos, *op. cit.* 146.

Native to southern Africa; naturalised in S.A. from Eyre Peninsula and Flinders Range to the south-east, the Riverina of N.S.W. and western and central Vic. A locally common weed of pastures, lawns and roadsides. Flowers Aug.–Oct. Map 56.

S.A.: between Wirrabara and Bangor, Flinders Ra., *B.Copley* 1432 (AD); Millbrook Reservoir, Mt Gawler, *J.Z.Weber* 26 (AD). N.S.W.: Billabong Ck, Walbundrie, *K.L.Wilson* 3905 (NSW). Vic.: Hume Hwy N of Benalla, *N.T.Burbidge* 7402 (CANB); Domain, Melbourne, *D.A.Cooke* 305 (MEL).

3. **Romulea rosea* (L.) Ecklon, *Topogr. Verz. Pflanzensamml. Ecklon* 19 (1827)var. **australis** (Ewart) De Vos, *J. S. African Bot. Suppl.* 9: 254 (1972)*R. cruciata* var. *australis* Ewart, *Proc. Roy. Soc. Victoria* ser. 2, 19: 43, t. 12 (1907). T: near Melbourne, Vic, 1906, *J.R.Tovey*; lecto: MEL, *fide* M.P.De Vos, *loc. cit.*; syn: MEL.*R. longifolia* (Salisb.) Baker, *J. Linn. Soc., Bot.* 16: 89 (1877); *Trichonema longifolium* Salisb., *Trans. Hort. Soc. London* 1: 316 (1812). T: J.B.Ker Gawler, *Bot. Mag.* 16: t. 575 (1802).*R. bulbocodium* var. *cruciata* (Ker Gawler) Ewart, *Fl. Victoria* 298 (1931); *Trichonema cruciatum* Ker



Figure 10. *Romulea rosea* var. *australis*. **A**, habit $\times 1.2$; **B**, T.S. leaf $\times 20$; **C**, flower and spathes, side view $\times 2.4$; **D**, flower, from above $\times 2.4$. Drawn by the late C.A.Gardner. Reproduced from the original by permission of the Director, Department of Agriculture, Western Australia.

Gawler, *Bot. Mag.* 16: t. 575 (1802). T: J.B. Ker Gawler, *Bot. Mag.* 16: t. 575 (1802).

Illustration: G.M. Cunningham *et al.*, *Pl. W. New South Wales* 193 (1982).

Corm globose; tunic toothed at base. Leaves several, basal, 8–35 cm long, 1–2.5 mm wide, dumbell-shaped in section, grooved, tough, fibrous. Stem absent. Scape 3–12 cm long. Outer bract narrowly triangular, 10–15 mm long, herbaceous; inner bract slightly shorter, herbaceous with wide scarious margins, often finely brown-striate. Perianth tube 2–4 mm long, yellow; lobes elliptic, acute, 1–1.8 cm long, 3–4 mm wide, pale to bright pink, rarely white; sepals dark-striped or greenish outside. Filaments 4–5 mm long; anthers c. 4 mm long. Style 7–9 mm long; stigmas exceeded by anthers. Capsules cylindrical, c. 1 cm long, on decurved scapes which straighten at maturity. *Onion Grass*, *Guildford Grass*. $2n = 18$, *fide* M.P. De Vos, *op. cit.* 247. Fig. 10.

Introduced from South Africa; naturalised in south-western W.A. from Jurien Bay to Albany; in S.A. south-east from Eyre and Yorke Peninsulas; in south-eastern N.S.W.; in Victoria and in northern and eastern Tas. A common weed of pastures, lawns and roadsides. Flowers Aug.–Nov. Map 57.

W.A.: between Moora and Jurien Bay, *T.G. Hartley 13949* (CANB). S.A.: Millbrook Reservoir, *K. Czornij 23* (AD, MEL). N.S.W.: Billabong Ck, Walbundrie, *K.L. Wilson 3904* (MEL, NSW). A.C.T.: CSIRO grounds, Black Mtn, *P.J. Darbyshire 1232* (CANB, MEL, NSW). Vic.: Malvern East, *T.B. Muir 6485* (MEL).

Romulea rosea var. *reflexa* (Ecklon) Bég. has been recorded as a garden escape in the suburbs of Melbourne, Vic., but is not known to be naturalised. It differs from var. *australis* in the terete leaves to 1 mm diam. and the larger magenta flowers with the sepals intricately indigo-veined outside.

4. **Romulea obscura* Klatt, *Abh. Naturf. Ges. Halle* 15: 399 (1882)

T: from South Africa, *J.F. Drège 4041*; lecto: S n.v., *fide* M.P. De Vos, *J. S. African Bot. Suppl.* 9: 233 (1972).

Corm globose; tunic toothed at base and forming a short fibrous neck at apex. Leaves several, basal, 8–25 cm long, up to 1 mm wide, almost terete. Stem absent. Scapes 5–12 cm long. Outer bract narrowly triangular, c. 12 mm long, herbaceous; inner bract c. 10 mm long, herbaceous with scarious brown-striate margins. Perianth tube c. 3 mm long, striped dull yellow and purple; lobes narrowly obovate, acute, 1–1.4 cm long, pale orange-brown to terracotta; sepals dull purple outside. Filaments 3–4 mm long; anthers 3–4 mm long. Style 6–8 mm long; stigmas level with top of anthers. Capsules cylindrical, c. 1 cm long, on flexuose scape spreading at maturity.

Native to southern Africa; naturalised in a few localities near Perth, W.A. Map 58.

W.A.: John Forrest Natl Park, E of Midland Junction, *R.O. Belcher 144* (MEL); c. 11 km N of Muchea on Gingin road, *A.S. George 3043* (PERTH).

18. GLADIOLUS

Gladiolus L., *Sp. Pl.* 1: 36 (1753); *Gen. Pl.* 5th edn, 23 (1754); from the Latin *gladiolus* (a short sword, also the Roman name for a species of this genus) in reference to the shape of the leaf.

Type: *G. communis* L.

Acidanthera Hochst., *Flora* 27: 25 (1844). T: *A. bicolor* Hochst.

Perennial herbs with annual leaves and flowers. Corm globose or ovoid; tunic fibrous to papery. Leaves 1 to several, mainly basal, ensiform, lanceolate or linear; flat to almost terete in section; tough, fibrous. Scape erect, usually with a few reduced leaves. Spike secund or distichous. Bracts green, keeled, the inner one shorter than outer. Flowers zygomorphic, rarely (not in Australia) actinomorphic. Perianth tube straight to curved,

funnel-shaped; lobes sometimes clawed, sub-equal or unequal and bilabiate. Stamens usually unilateral, arched; anthers linear, slightly sagittate. Style filiform, the 3 branches entire, widened at apices. Capsule ellipsoidal to ovoid, papery to leathery. Seeds numerous, flat, winged. $x = 15$, *fide* P.Goldblatt, *J. S. African Bot.* 37: 403 (1971).

About 180 species in Africa, Madagascar, southern Europe and south-western Asia. Hybrids derived from several South African species are common in horticulture, and 9 species are naturalised in Australia.

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).

- | | |
|---|-------------------------------------|
| 1 Perianth c. 3 cm long; leaves slightly succulent, far exceeding the inflorescence | 1. <i>G. gueinzii</i> |
| 1: Perianth over 3 cm long; leaves never succulent, not or hardly exceeding the inflorescence | |
| 2 Leaves finely pubescent | 6. <i>G. caryophyllaceus</i> |
| 2: Leaves glabrous | |
| 3 Basal leaf solitary, narrowly linear, cruciform in section | 9. <i>G. tristis</i> |
| 3: Basal leaves 2 to several, linear-ensiform to lanceolate, flat | |
| 4 Flower bilabiate; perianth tube manifestly shorter than lobes | |
| 5 Bracts narrowly lanceolate; flowers purple | 7. <i>G. communis</i> |
| 5: Bracts ovate; flowers orange to pink and lime-green | 8. <i>G. alatus</i> |
| 4: Flower not bilabiate; perianth tube equal to or longer than lobes | |
| 6 Perianth tube about twice as long as lobes | 2. <i>G. angustus</i> |
| 6: Perianth tube about equal to lobes | |
| 7 Perianth lobes long-acuminate with tapering undulate tips | 5. <i>G. undulatus</i> |
| 7: Perianth lobes acute | |
| 8 Spike straight, distichous | 3. <i>G. carneus</i> |
| 8: Spike curved, secund | 4. <i>G. floribundus</i> |

Numerous large-flowered *Gladiolus* hybrids are cultivated and may occur as garden escapes, but are not truly naturalised.

1. **Gladiolus gueinzii* Kunze, *Linnaea* 20: 14 (1847)

T: Durban (Port Natal), South Africa, Mar. 1844, *W.Gueinzii* 490; neo: S n.v., *fide* G.J.Lewis *et al.*, *J. S. African Bot.* Suppl. 10: 76 (1972).

Acidanthera brevicollis Baker, *J. Bot.* 14: 339 (1876). T: Fish River, Cape of Good Hope, South Africa, *P.MacOwan* 1890; syn: K n.v., *fide* G.J.Lewis *et al.*, *loc. cit.* as 'holotype'; Cape of Good Hope, South Africa, *Cooper* 3197; syn: n.v.; Natal, South Africa, *W.Gueinzii* s.n.; syn: n.v.

[*Acidanthera platypetala* auct. non Baker: N.C.W.Beadle *et al.*, *Handb. Vasc. Pl. Sydney Distr. Blue Mtns* 447 (1962)]

Herb 20–50 cm tall. Corm c. 2 cm diam.; tunics papery. Basal leaves linear, 25–75 cm long, 3–7 mm wide, thick, semi-succulent, midvein and margins prominent. Stem rarely branched, sheathed by 2 or 3 reduced leaves. Spike secund, 2–6-flowered. Bracts ovate to oblong, 2–2.5 cm long. Flowers almost actinomorphic, pale mauve with a purple stripe on each lobe. Perianth tube 0.8–1.2 cm long, slightly curved, slightly widened towards mouth; lobes obovate, c. 2 cm long, c. 1 cm wide, narrowed at base. Anthers c. 5 mm long. Style branches oblanceolate, c. 4 mm long, level with anthers. Capsule oblong-triquetrous, acute, c. 3 cm long. Seeds almost orbicular, c. 1 cm diam., pale brown.

Introduced from South Africa; naturalised on the coast of N.S.W. between the Macleay River and Currarong as a pioneer on fore dunes, usually associated with *Spinifex*. Flowers Nov.–Dec. Map 59.

N.S.W.: Stockton, 6 Nov. 1966, *K.McDonald* (NSW); Long Reef, Narrabeen, 1 Dec. 1965, *A.Rodd* (NSW); Palm Beach, *A.Rodd* 2272 (NSW); The Entrance, 23 Dec. 1964, *B.Whitehead* (NSW).

2. **Gladiolus angustus* L., *Sp. Pl.* 1: 37 (1753)

T: described from plants grown in Holland from corms collected in South Africa; holo: LINN 59.16, UPS n.v., *fide* G.J.Lewis *et al.*, *J. S. African Bot. Suppl.* 10: 92 (1972).

Illustration: G.J.Lewis *et al.*, *op. cit.* 90, fig. 14.

Herb 30–60 cm tall. Corm to 1.5 cm diam.; tunic papery. Basal leaves linear-ensiform, 20–60 cm long, 5–8 mm wide, flat; midveins prominent. Stem rarely branched, with 1 or 2 reduced leaves. Spike secund, straight, 2–8-flowered. Bracts lanceolate, acuminate, 3–6 cm long. Flowers funnel-shaped, white to cream or pink-flushed. Perianth tube 4–7 cm long, slightly curved, widened towards mouth; dorsal lobe broadly elliptic to oblong, acute, hooded, 2.5–3.5 cm long; lateral lobes elliptic, slightly shorter; lower 3 lobes elliptic, acute, equal, 1.8–2.8 cm long, each with a red-purple mark near centre. Stamens arched under dorsal lobe; anthers 6–9 mm long. Style branches spatulate, 6–7 mm long, level with tips of anthers. Fruit not seen.

Introduced from SW Cape Province, South Africa; naturalised locally in south-western W.A., near Adelaide in S.A. and the Sydney area of N.S.W. Flowers Oct. Map 60.

W.A.: South Perth, *R.D.Royce* 4583 (PERTH); Margaret River, *R.D.Royce* 4678 (PERTH). S.A.: Myponga, 6 Nov. 1966, *H.Amtsberg* (AD). N.S.W.: near Wyee, 19 Oct. 1953, *E.M.Croke* (NSW); Hurstville, 5 Oct. 1950, *Oliver* (NSW).

3. **Gladiolus carneus* Delaroche, *Descr. Pl. Aliq. Nov.* 3: 30, t. 4 (1766)

T: from South Africa; icono: Delaroche, *loc. cit.* t. 4.

G. blandus Sol., in W.Aiton, *Hort. Kew* 1: 64 (1789). T: Cape of Good Hope, South Africa, *F.Masson* s.n.; holo: BM n.v., *fide* G.J.Lewis *et al.*, *J. S. African Bot. Suppl.* 10: 93 (1972).

Illustration: G.J.Lewis *et al.*, *op. cit.* t. 9.

Herb 35–80 cm tall. Corm 2–3 cm diam.; tunics papery to fibrous. Basal leaves linear to ensiform, 20–60 cm long, 6–20 mm wide, flat; midveins prominent. Stem rarely branched, sheathed by 1 or 2 reduced leaves. Spike distichous, erect or leaning, 3–7-flowered. Bracts lanceolate, 4–6 cm long. Flowers broadly funnel-shaped, white to pink or lavender. Perianth tube 2–4 cm long, curved, widened at mouth; lobes ovate, acute, spreading; upper lobes 3.2–3.5 cm long, the dorsal lobe sometimes broader than the laterals and hooded; lower lobes 3.2–3 cm long, usually each with a red-purple central mark. Stamens arched in centre of flower; anthers c. 8 mm long. Style branches spatulate, 6–7 mm long, exceeding anthers. Fruit not seen.

Introduced from SW Cape Province, South Africa; naturalised locally in south-western W.A., near Adelaide in S.A., and in the Sydney area in N.S.W. Flowers Oct.–Nov. Map 61.

W.A.: Rosa Glen, Margaret River district, *R.D.Royce* 2766 (PERTH); Tunny, S of Kojonup, *R.D.Royce* 8034 (PERTH). S.A.: Piccadilly, Mt Lofty Range, 22 Nov. 1947, *J.B.Cleland* (AD); near Beaumont House, 3 Oct. 1948, *J.B.Cleland* (AD). N.S.W.: S of Prince Henry Hospital, Little Bay, *R.Coveny & V.Shanker* 7273 (NSW).

4. **Gladiolus floribundus* Jacq., *Collectanea* 4: 162 (1791); *Icon. Pl. Rar.* 2: t. 254 (1795)

T: Jacquin, *Icon. Pl. Rar.* 2: t. 254 (1795).

Herb 20–60 cm tall. Corm 2–4 cm diam.; tunic fibrous. Basal leaves ensiform, 12–40 cm long, 5–15 mm wide, flat; midveins prominent. Stem unbranched, sheathed by 2 or 3

reduced leaves. Spike secund, bent or arching, 2–8-flowered. Bracts narrowly lanceolate, acuminate, 4–7 cm long. Flowers funnel-shaped, deep pink. Perianth tube 3–5 cm long, curved, widened at mouth; lobes ovate, acute, spreading, 3–5 cm long, equal or the lower 3 slightly shorter. Stamens arched in centre of flower; anthers 5–8 mm long. Style branches spatulate, exceeding anthers. Fruit not seen.

Introduced from Cape Province, South Africa, and formerly much cultivated; locally naturalised in the Mt Lofty Range near Adelaide, S.A. Flowers Dec. Map 62.

S.A.: Summertown, *A.E.Orchard* 108 (AD); Blakiston cemetery, *D.E.Symon* 1938 (ADW, CANB).

5. **Gladiolus undulatus* L., *Mant. Pl.* 1: 27 (1767)

T: Cape of Good Hope, South Africa, *J.Burman* 45; holo: LINN 59.11, UPS n.v., *fide* G.J.Lewis *et al.*, *J. S. African Bot.* Suppl. 10: 110 (1972).

G. cuspidatus Jacq., *Icon. Pl. Rar.* 2: t. 257 (1795). T: Jacquin, *loc. cit.*

Illustration: J.M.Black, *Fl. S. Australia* 3rd edn, 1: 372, fig. 333 (1978).

Herb 40–80 cm tall. Corm 2–3 cm diam.; tunic fibrous; numerous subterranean bulbils often produced. Basal leaves linear-ensiform, 25–75 cm long, 5–15 mm wide, flat, with several prominent veins. Stem unbranched, with 1 or 2 reduced leaves. Spike distichous, rarely secund, straight, 3–8-flowered. Bracts narrowly lanceolate, 4–6 cm long. Flowers funnel-shaped, white to cream, green-tinged. Perianth tube 5–7 cm long, hardly curved, widened towards mouth; lobes ovate with long-acuminate, undulate tips, sub-equal, 4–6 cm long; dorsal lobe slightly hooded; lower 3 lobes recurved. Stamens arched in centre of flower; anthers c. 7 mm long. Style branches oblanceolate, hardly exceeding anthers. Fruit not seen. *Wild Gladiolus*.

Native to southern Africa. Naturalised in south-western W.A. mainly in the Perth region, southern S.A., coastal N.S.W. south of Sydney, southern Vic., and eastern Tas. Flowers Nov.–Jan. Map 63.

W.A.: Mt Henry, Canning R. foreshore, *M.L.Clark* 175 (PERTH). S.A.: Mylor, *N.N.Donner* 431 (AD, MEL). N.S.W.: near Upper Falls, Royal Natl Park, *R.Coveny* 7304 (BRI, MEL, NSW). Vic.: 8 km NE of Halls Gap P.O., *A.C.Beauglehole* 67145 (MEL). Tas.: Coles Bay road, 15 Jan. 1977, *D.I.Morris* (HO).

6. **Gladiolus caryophyllaceus* (Burman f.) Poiret, in J.Lamarck, *Encycl. Suppl.* 2: 795 (1812)

Antholyza caryophyllacea Burman f., *Fl. Indica* 1 (1768). T: from South Africa, ex herb. M.Houttuyn; lecto: G n.v., *fide* G.J.Lewis *et al.*, *J. S. African Bot.* Suppl. 10: 114 (1972).

Illustration: H.Mason, *Western Cape Sandveld Fl.* 84, t. 31 (1972).

Herb 30–75 cm tall. Corm 1.5–3 cm diam.; tunic papery to fibrous. Basal leaves ensiform to falcate-lanceolate, 12–35 cm long, 10–20 mm wide, flat, pubescent; margins and several veins prominent. Stem unbranched or few-branched, sheathed by 2 or 3 shorter leaves. Spike secund or distichous, straight, 2–8-flowered. Bracts lanceolate, 3–5 cm long. Flowers broadly campanulate, pink. Perianth tube cylindrical in lower half, abruptly curved and funnel-shaped above, 3.5–5 cm long; lobes obovate; dorsal lobe hooded, 3–3.5 cm long; other lobes spreading, subequal, 2.5–3 cm long, the lower 3 shortly connate. Stamens arched under dorsal lobe; anthers 1–1.3 cm long. Style branches spatulate, 4–6 mm long, hardly exceeding anthers. Capsule ovoid, 2–3 cm long. Seeds not seen. *Wild Gladiolus*.

Native to southern Africa. Naturalised in south-western W.A. from the coastal plain around Perth to the Moora area, often invading native vegetation. Flowers Sept.–Oct. Map 64.

W.A.: near Wallamara, *T.E.H.Aplin* 1134 (PERTH); Gabalong, ESE of Moora, Oct. 1968, *G.H.Crane* (PERTH); Kings Park, Perth, *R.D.Royce* 4581 (PERTH); North Beach road, Perth, *F.C.Vasek* 681005–17 (CANB).

7. **Gladiolus communis* L., *Sp. Pl.* 36 (1753)

subsp. **byzantinus** (Miller) A.P.Ham., *J. Linn. Soc., Bot.* 76: 358 (1978)

G. byzantinus Miller, *Gard. Dict.* 8th edn (1768). T: not designated; *n.v.*

[*G. illyricus auct. non* Koch ex Sturm: H.Eichler, *Suppl. J.M.Black's Fl. S. Australia* 2nd edn, 86 (1965)]

Illustration: R.Maire, *Fl. L'Afrique Nord* 6: 121, fig. 988 (1959) as *G. byzantinus*.

Herb 50–90 cm tall. Corm c. 2 cm diam.; tunic papery to fibrous. Basal leaves ensiform, 30–60 cm long, 8–20 mm wide, flat, with several prominent veins. Stem rarely branched, with 2 or 3 sheathing leaves. Spike \pm distichous, straight, densely 5–15-flowered. Bracts narrowly lanceolate, 2.5–5 cm long. Flowers bilabiate, deep purple. Perianth tube to 1.5 cm long, curved; lobes clawed, 2.5–3.5 cm long; upper 3 lobes obovate, 1.5–2.5 cm wide, the dorsal one hooded, the laterals spreading; lower 3 lobes narrower, oblanceolate, often each with a pale central mark. Stamens arched in centre of flower; anthers c. 10 mm long. Style branches slightly spatulate, exceeding anthers. Fruit not seen.

Native to Spain, Sicily and north-western Africa. Naturalised locally in south-western W.A., Kangaroo Is. and southern Mt Lofty Range in S.A.; also recorded from Vic. and Tas. Flowers Oct.–Nov. Map 65.

W.A.: Gwyndinup, Boyanup district, *R.D.Royce* 3955 (PERTH). S.A.: McLaren Vale, 26 Oct. 1963, *J.B.Cleland* (AD); Kingscote, Kangaroo Is., *G.Jackson* 555 (AD, MEL). Vic.: c. 3 km N of Kyneton, 22 Nov. 1935, *A.J.Ewart* (MEL). Tas.: Fisher Avenue, Sandy Bay, 9 Nov. 1982, *J.Harwood* (HO).

8. **Gladiolus alatus* L., *Pl. Rar. Afr.* 2 (1760)

T: from South Africa, ex herb. Burman; lecto: *G n.v., fide* G.J.Lewis *et al.*, *J. S. African Bot. Suppl.* 10: 160 (1972).

Illustration: G.J.Lewis *et al.*, *op. cit.* t. 15.

Herb 10–35 cm tall. Corm 1–1.5 cm diam.; tunic papery. Basal leaves broadly linear to ensiform, 8–35 cm long, 4–10 mm wide, flat, with 2 to several prominent veins. Stem unbranched, with 1 reduced leaf. Spike secund, flexuose, 3–9-flowered. Bracts ovate, acute, 2–3 cm long. Flowers bilabiate, salmon pink to orange with green markings. Perianth tube 1–1.6 cm long, curved; lobes clawed, unequal; dorsal lobe obovate, erect or hooded, 3–4.5 cm long; lateral lobes ovate-deltoid, spreading, 2–3 cm long; lower 3 lobes deflexed, 2–3 cm long, lime-green except at tips. Stamens strongly arched under dorsal lobe; anthers 7–10 mm long. Style hardly spatulate, branches 5–7 mm long, arched with stamens. Bulbils often produced in subterranean leaf axils or on short stolons. Fruit not seen.

Introduced from SW Cape Province, South Africa; naturalised locally in south-western W.A. in Perth and Yealering areas. Map 66.

W.A.: Perth, Nov. 1918, per *W.Kingsmill* (NSW); Yealering, Sept. 1970, *A.J.Sibley* (PERTH); Leederville, *D.F.Stovan* (AD).

9. **Gladiolus tristis* L., *Sp. Pl.* 2nd edn, 53 (1762)

T: from South Africa; holo: LINN 59.9, UPS *n.v., fide* G.J.Lewis *et al.*, *J. S. African Bot. Suppl.* 10: 191 (1972).

[*G. grandis auct. non* Thunb.: *A.J.Ewart*, *Fl. Victoria* 306 (1931)]

s[*Acidanthera platypetala auct. non* Baker: *J.Black*, *Fl. S. Australia* 2nd edn, 1: 205 (1943)]

[*G. longicollis auct. non* Baker: H.Eichler, *Suppl. J.M.Black's Fl. S. Australia* 2nd edn, 86 (1965)]

Illustrations: R.Marloth, *Fl. S. Africa* 4: t. 46 fig. D (1915); G.J.Lewis *et al.*, *J. S. African Bot. Suppl.* 10: t. 16 (1972).

Herb 30–60 cm tall. Corm 1–3 cm diam.; tunic papery to woody. Basal leaf narrowly linear, 30–60 cm long, 2–4 mm wide, rigid, cruciform in section with thickened midvein and margins. Stem unbranched, with 2 or 3 reduced leaves. Spike secund, erect, 2–7-flowered. Bracts oblong, 3–5 cm long. Flowers funnel-shaped, dull yellow; each lobe

with a dark stripe, often blackish veined or speckled. Perianth tube slender in lower half, curved and widened above, 4–6 cm long; lobes ovate-elliptic, acute, spreading, 2–3 cm long; dorsal lobe 1.5–2 cm wide, others narrower, the lower 3 shortly connate. Stamens slightly arched; anthers 12–14 mm long. Style branches narrowly obcordate, 4–6 mm long. Fruit not seen. *Largeflower Gladiolus*, *Evening Flower Gladiolus*.

Native to southern Africa. Naturalised locally in south-western W.A., southern S.A., southern and central Vic. and eastern Tas.; a common weed in some areas. Flowers Sept.–Oct. Map 67.

W.A.: Donnybrook, *R.D.Royce* 4373 (PERTH). S.A.: c. 3 km E of Hahndorf, *E.N.S.Jackson* 550 (AD); Kingscote, Kangaroo Is., *G.Jackson* 32 (AD). Vic.: c. 0.5 km SW of Tallarook, *T.B.Muir* 6195 (MEL). Tas.: near Glenorchy, Oct. 1953, *R.Cruikshank* (HO).

19. HOMOGLOSSUM

Homoglossum Salisb., *Trans. Hort. Soc. London* 1: 325 (1812); from the Greek *homoios* (alike) and *glossa* (tongue), referring to the shape and colour of the perianth lobes.

Type: *H. watsonium* (Thunb.) N.E.Br.; *Gladiolus watsonius* Thunb.

Perennial herbs with annual leaves and flowers. Corm globose; tunic of woody fibres. Leaves 1 to few, linear, terete to flat. Scape erect, partly sheathed by leaves. Spike secund, straight. Bracts green, the inner one included, with bifid apex. Flowers strongly zygomorphic, yellow to red. Perianth tube curved, slender at base, abruptly gibbous and widened into a cylindrical portion; lobes sub-equal or the dorsal lobe enlarged and hooded. Stamens unilateral, arched; anthers linear, slightly sagittate. Style filiform, the 3 branches short, entire, widened at apices. Capsule ellipsoidal. Seeds flat, winged.

A genus of about 10 species in southern Africa; one species naturalised in Australia.

M.P.De Vos, *De Suid-Afrikaanse Spesies van Homoglossum*, *J. S. African Bot.* 42: 301–359 (1976).

***Homoglossum watsonium** (Thunb.) N.E.Br., *Trans. Roy. Soc. S. Africa* 20: 278 (1932)

Gladiolus watsonius Thunb., *Diss. Gladiolus* 14 (1784). T: from South Africa, *C.P.Thunberg* 1092; holo: UPS n.v., fide M.P.De Vos, *J. S. African Bot.* 42: 339 (1976).

Illustration: M.P.De Vos, *op. cit.* 341, fig. 13A–C.

Herb 40–80 cm tall. Corm to 2.5 cm diam. Leaves basal or near basal; first leaf 50–80 cm long, 2–4 mm wide, glabrous, tough, fibrous, midvein and margins thickened; other leaves 2 or 3, shorter. Scape terete, unbranched. Spike 3–7-flowered. Bracts narrowly lanceolate, 4.5–6.5 cm long. Flowers red. Perianth tube 3.5–5 cm long; cylindric upper section 2–3 cm long, with a pouch-like swelling at base; lobes slightly clawed, elliptic, acute to apiculate; dorsal lobe hooded, 2–3 cm long, 1.2–1.5 cm wide; other lobes spreading, unequal, 1.5–3 cm long, 0.7–1 cm wide. Anthers sub-basifixed, included, 8–10 mm long, purplish. Style 6–7 cm long; branches cuneate, 4–5 mm long, stigmas bilobed. Fruit not seen. $2n = 30$, fide P.Goldblatt, *J. S. African Bot.* 37: 400 (1971).

Native to southern Africa; naturalised locally in Albany region of south-western W.A., Mt Lofty Range of S.A. and possibly in Vic. Flowers Aug.–Nov. Map 68.

W.A.: Dwarda, 20 Sept. 1958, *W.Mueller* (PERTH); Albany, Aug. 1963, *Thomson* (PERTH). S.A.: Clare Cemetery Reserve, *R.Bates* 804 (AD); between Meadows and McLaren Flat, *D.E.Symon* 1502 (ADW, CANB).

Not known to produce seed in Australia; reproduces by underground bulbils.

20. DIERAMA

Dierama K.Koch & C.Bouché, in J.F.Klotzsch *et al.*, *App. Sp. Nov.* 10 (1854); from the Greek *dierama* (funnel), referring to the shape of the perianth.

Type: *D. ensifolia* K.Koch

Tufted, evergreen perennial herbs. Corm depressed-globose; tunic fibrous. Leaves several, basal, linear, flat, tough, fibrous. Scape tall, slender, arching, with several pendulous, wiry branches; bracts small, scarious. Spikes lax, pendulous, few-flowered. Bracts scarious, straw-coloured with brown streaks. Flowers pendulous, actinomorphic, campanulate. Perianth tube straight, funnel-shaped; lobes equal, erect. Stamens equilateral, erect; anthers included, linear, sagittate. Style included, filiform, the 3 branches short, entire, recurved. Capsules ovoid to globose. Seeds few, globose, shiny.

A genus of about 20 species in southern and eastern Africa; several cultivated as ornamentals, at least one naturalised in Australia.

N.E.Brown, The genus *Dierama*, *J. Roy. Hort. Soc.* 54: 193–202 (1929).

Perianth 2.7–3.6 cm long, pale pink

D. pendulum

Perianth 3.8–4.5 cm long, purple

† ***D. pulcherrimum***

† *D. pulcherrimum* (J.D.Hook) Baker has been recorded as a garden escape in S.A. but is not known to be naturalised.

****Dierama pendulum* (L.f.) Baker, *J. Linn. Soc., Bot.* 16: 99 (1877)**

Ixia pendula L.f., *Suppl. Pl.* 91 (1781). T: Cape of Good Hope, South Africa, *C.P.Thunberg s.n.; n.v.*

Erect herb, 1–1.2 m tall. Corm 3–4 cm diam. Leaves numerous, rather lax and grass-like, 40–90 cm long, 4–8 mm wide, many-veined, glabrous. Scape terete, to 1.5 m long, glabrous; branches numerous, filiform, pendulous, subtended by subulate bracts 2–3 cm long. Spikes 2–5-flowered, axes filiform. Bracts acuminate, 2–2.5 cm long, whitish, finely striate, becoming torn. Flowers pink. Perianth tube c. 1 cm long; lobes obovate to elliptic, 1.8–2.5 cm long. Filaments 5–7 mm long; anthers 8–10 mm long, purple. Capsule globose, 3-lobed, c. 7 mm diam., papery. $2n = 20$, *fide* P.Goldblatt, *J. S. African Bot.* 35: 227 (1969).

Introduced from South Africa; naturalised locally on the central coast and tablelands of N.S.W., and in south-eastern S.A., growing in moist habitats. Map 69.

S.A.: between Naracoorte and Bool Lagoon, 22 Nov. 1961, *D.Hunt* (AD). N.S.W.: Wentworth Falls, *H.S.McKee* 6725 (CANB, NSW); Moss Vale, Jan. 1930, *M.A.O'Connell* (NSW).

21. IXIA

Ixia L., *Sp. Pl.* 2nd edn, 1: 51 (1762), *nom. cons.*; from the Greek *ixia* (a plant of variable colouring).

Type: *I. polystachya* L.

Small perennial herbs with annual leaves and flowers. Corm globose to ovoid; tunic fibrous. Leaves few, mainly basal, linear to ensiform, flat. Scape erect, slender, wiry, sometimes branched. Spike distichous or flowers spirally arranged. Bracts oblong to obovate, truncate, shortly dentate, scarious or membranous, sub-equal, the outer shortly bifid. Flowers erect, actinomorphic. Perianth tube exerted from spathes, straight, narrowly cylindrical, ±widened at mouth; lobes equal, spreading, oblong to obovate. Stamens equilateral; anthers basifixed. Style branches 3, linear, short, spreading, entire. Capsule globose to oblong, thin-walled. Seeds numerous. $x = 10$, *fide* P.Goldblatt, *J. S. African Bot.* 37: 415 (1971).

About 45 species in southern Africa; many species and their hybrids in cultivation, at least 4 naturalised in Australia.

G.J.Lewis, The genus *Ixia*, *J. S. African Bot.* 28: 45–195 (1962).

KEY TO SECTIONS AND SPECIES

Key adapted from G.J.Lewis, *op. cit.* 59–66

- | | | |
|----|---|---------------------------------|
| 1 | Perianth tube 4–7 cm long (sect. II. <i>Hyalis</i>) | 4. <i>I. paniculata</i> |
| 1: | Perianth tube up to 1.4 cm long (sect. I. <i>Ixia</i>) | |
| 2 | Flowers bright green; anthers about three times length of filaments | † <i>I. viridiflora</i> |
| 2: | Flowers not green; anthers up to twice length of filaments | |
| 3 | Bracts papery, the upper half rust-coloured or densely streaked brown, 8–14 mm long | 3. <i>I. maculata</i> |
| 3: | Bracts membranous, translucent whitish to pink, 3–7 mm long | |
| 4 | Perianth tube 6–14 mm long; bracts whitish | 1. <i>I. polystachya</i> |
| 4: | Perianth tube 4–6 mm long; bracts tinged or veined with pink | 2. <i>I. flexuosa</i> |

† *I. viridiflora* Lam. is a common garden ornamental and may occur as an escape in S.A.; it is recognisable by the bright green flowers with dark centres.

Sect. I. *Ixia*

Ixia L. sect. *Ixia*

Perianth tube less than 2 cm long, shorter than perianth lobes. Stamens inserted at top of tube, exserted.

A section of 19 species, 3 of which are naturalised in Australia.

1. **Ixia polystachya* L., *Sp. Pl.* 2nd edn, 1: 51 (1762)

T: Miller, *Fig. Pl. Gard. Dict.* t. 155 fig. 2 (1757).

Illustration: J.M.Black, *Fl. S. Australia* 3rd edn, 1: 376, fig. 338A–C (1978).

Herb 30–100 cm tall. Corm to 2.5 cm diam. Leaves 5–8, erect, linear, 20–60 cm long, 2–6 mm wide. Stem unbranched or with 1–4 erect branches. Spike \pm distichous, open or dense, few–many-flowered. Bracts ovate or oblong, very shortly dentate, 3–7 mm long, translucent, whitish, often faintly veined. Flowers white or pale blue to mauve-pink, the centres often a contrasting colour. Perianth tube filiform, 6–14 mm long; lobes spreading from base, obtuse, 1–2.5 cm long, 5–9 mm wide. Filaments 3–4 mm long; anthers 4–7 mm long. Ovary 2–3 mm long; style branches spreading below anthers, recurved, 3–4 mm long. *Variable Ixia*.

Native to Cape Province, South Africa; naturalised in Perth region of W.A., southern S.A., Sydney region of N.S.W., Vic. and Tas. but never spreading far from settlement. Flowers Nov.–Dec. Map 70.

W.A.: Kings Park, *R.D.Royce* 4697 (PERTH). S.A.: Stirling East, 31 Dec. 1964, *E.H.Ising* (AD); Blakiston cemetery, *D.E.Symon* 1939 (ADW, CANB). N.S.W.: Araganui Bay near Mimosa Rocks, Jan. 1974, *H.Begg & E.Hunter* (NSW). Tas.: Middleton, 28 Dec. 1951, *S.Mangham & W.M.Curtis* (HO).

2. **Ixia flexuosa* L., *Sp. Pl.* 2nd edn, 1: 51 (1762)

T: Miller, *Fig. Pl. Gard. Dict.* t. 156, fig. 2 (1757).

[*I. columellaris* auct. non Ker Gawler: N.C.W.Beadle *et al.*, *Handb. Vasc. Pl. Sydney Distr. Blue Mtns* 445 (1962)]

Illustration: G.J.Lewis, *J. S. African Bot.* 28: 111, fig. 3 (1962).

Herb 30–55 cm tall. Corm 1–1.3 cm diam. Leaves 3–5, erect, linear, 10–30 cm long, 2–6 mm wide, about 5-veined with prominent midvein, often spirally twisted. Stem unbranched or with 1–4 spreading branches. Spike dense, 3–15-flowered, slightly flexuose. Bracts ovate, 5–7 mm long, translucent, tinged pink, often with pink veins. Flowers white or pale mauve to pink, often with yellowish centre. Perianth tube filiform, 4–6 mm long; lobes slightly campanulate at base, spreading, obtuse, 1–1.5 cm long, 5–8 mm wide. Filaments 3.5–4.5 mm long; anthers 3–4.5 mm long. Ovary c. 3 mm long; style branches spreading at or below the level of anthers, 2–4 mm long.

Native to Cape Province, South Africa; naturalised in the Sydney region in N.S.W. and in eastern Tas. Flowers Nov.–Dec. Map 71.

N.S.W.: Maroubra, Nov. 1954, *N.C.Ford* (NSW). Tas.: Eaglehawk Neck, 18 Dec. 1942, *W.M.Curtis* (HO); Campbelltown, *D.I.Morris* 80125 (HO).

3. **Ixia maculata* L., *Sp. Pl.* 2nd edn, 2: 1664 (1763)

T: from South Africa; lecto: LINN 58.21, UPS *n.v.*, *fide* G.J.Lewis, *J. S. African Bot.* 28: 138 (1962).

Illustration: G.J.Lewis, *op. cit.* 139, fig. 4.

Herb 20–60 cm tall. Corm to 1.8 cm diam., sometimes producing 1 or 2 stolons. Leaves 5–8, erect, linear to lanceolate, 10–35 cm long, 2–9 mm wide. Stem unbranched. Spike of 4 to many flowers crowded towards apex. Bracts ovate to oblong, often deeply toothed, 8–14 mm long, scarious, completely rust-red, densely brown-streaked or ±colourless at base. Flowers pale yellow to orange with dark reddish or purple centres. Perianth tube narrowly cylindrical, 5–8 mm long; lobes obtuse to acute, spreading, 1.5–3 cm long, 8–12 mm wide. Filaments often connate at base, 3–5 mm long; anthers 7–9 mm long. Ovary c. 4 mm long; style branches spreading at level of anthers, recurved, 3–5 mm long. *Yellow Ixia*.

Native to SW Cape Province, South Africa; naturalised in south-western W.A., Eyre Peninsula and Mt Lofty Range of S.A., Brisbane area of Qld, and Vic. and Tas. Flowers Sept.–Oct. Map 72.

W.A.: Donnybrook, *R.D.Royce* 4370 (PERTH). S.A.: Bakers Gully, 20 Oct. 1967, *H.Amtsberg* (AD, MEL). Qld: Brisbane, 13 Sept. 1957, *W.E.Hagger* (BRI). Vic.: 0.7 km S of Tallarook, *H.S.Meyer* 27 (MEL). Tas.: Electrona, Nov. 1964, *W.M.Curtis* (HO).

Sect. II. *Hyalis*

Ixia sect. *Hyalis* (Salisb. ex Baker) Diels, in H.G.A.Engler & K.A.E.Prantl, *Nat. Pflanzenfam.* 2nd edn, 15: 486 (1930); *Ixia* subg. *Hyalis* Salisb. ex Baker, *Handb. Irid.* 161 (1892).

Type: *I. paniculata* Delaroché

Perianth tube 2 cm or longer, usually longer than lobes. Stamens inserted below top of tube, included or exserted.

The section contains 5 species, of which 1 is naturalised in Australia.

4. **Ixia paniculata* Delaroche, *Descr. Pl. Aliq. Nov.* 26 (1766)

T: not designated; Delaroche, *op. cit.* t. 1; lecto: *fide* G.J.Lewis, *J. S. African Bot.* 28: 150 (1962).

Illustration: H.Mason, *Western Cape Sandveld Fl.* 64, t. 21 (1972).

Herb 30–90 cm tall. Corm to 1.5 cm diam. Leaves 3–5, erect, linear, 15–60 cm long, 3–10 mm wide, with prominent midveins. Stem with 1–4 spreading, flexuose branches. Spikes open to dense, 5–14-flowered. Bracts oblong, 8–13 mm long, scarious, ±colourless or apices brownish. Flowers cream to yellowish, shaded dull pink inside tube and on reverse of lobes. Perianth tube sub-cylindrical, slightly and evenly widened from base, 4–7 cm long, c. 3 mm diam. at mouth; lobes spreading, obtuse to emarginate, 1.5–2 cm long, 3–7 mm wide. Filaments 5–6 mm long; anthers 6–7 mm long. Ovary 3–4 mm long; style branches spreading above or below anthers, 1.5–2 mm long.

Native to SW Cape Province, South Africa; naturalised locally between Perth and Albany in W.A., near Adelaide in S.A. and the Melbourne area in Vic. Flowers Oct.–Nov. Map 73.

W.A.: Boyanup, *R.D.Royce 4691* (PERTH); Boyanup, Oct. 1954, *R.D.Royce* (PERTH); Albany, 10 Nov. 1947, *G.M.Webb* (PERTH). S.A.: Nixon Skinner Reserve, Mt Lofty Range, 14 Nov. 1964, *J.B.Cleland* (AD). Vic.: railway enclosure, Elsternwick, *D.A.Cooke 318* (AD, MEL).

22. SPARAXIS

Sparaxis Ker Gawler, *Ann. Bot. (König & Sims)* 1: 225 (1804); from the Greek *sparasso* (I tear), referring to the lanceolate spathes.

Type: *S. bulbifera* (L.) Ker Gawler; *Ixia bulbifera* L.

Perennial herbs with annual leaves and flowers. Corm globose; tunic fibrous. Leaves mostly basal, linear to lanceolate, flat, soft-textured, with prominent midveins. Scape unbranched or few-branched, with up to 2 cauline leaves. Spike distichous to secund, lax, few-flowered. Bracts lacerate, scarious, brown-streaked. Flowers erect, actinomorphic or slightly zygomorphic. Perianth tube straight, funnel-shaped; lobes erect to spreading, equal, longer than tube. Stamens equilateral to unilateral; anthers basifixed. Style branches 3, filiform or cuneate, entire. Capsules obloid, thin-walled. Seeds numerous, globose, smooth. Bulbils often produced in leaf axils after flowering.

A genus of 6 species in south-western Cape Province, South Africa; several species and hybrids cultivated, 2 species naturalised in Australia.

P.Goldblatt, The genus *Sparaxis*, *J. S. African Bot.* 35: 219–252 (1969).

Stamens equilateral; bracts ovate, slightly lacerate

1. *S. tricolor*

Stamens unilateral; bracts deeply lacerate with spreading subulate cusps

2. *S. bulbifera*

1. **Sparaxis tricolor* (Schneev.) Ker Gawler, *Ann. Bot. (König & Sims)* 1: 225 (1804)

Ixia tricolor Schneev., *Icon. Pl. Rar.* t. 39 (1795). T: from South Africa; *n.v.*

Herb 10–30 cm tall. Corm 1–2 cm diam. Leaves 5–10, linear to oblanceolate, acute, 8–20 cm long, 5–15 mm wide. Scape unbranched. Spike flexuose, 2–5-flowered. Bracts lanceolate, acute, shallowly lacerate, 2.3–2.8 cm long. Flowers broadly funnel-shaped. Perianth tube c. 8 mm long, narrow at base, widened above, bright yellow; lobes oblanceolate to lanceolate, 2.5–3 cm long, c. 1 cm wide, orange to dark red with black sagittate mark at base. Stamens equilateral; filaments 6–7 mm long; anthers c. 8 mm long, yellow. Style erect, not exceeding anthers; branches cuneate, 1–2 mm long, yellow. Fruit not seen. Bulbils few, in lower leaf axils only. *Tricolor Harlequin-flower*. $2n = 20$, *fide* P.Goldblatt, *J. S. African Bot.* 35: 231 (1969).

Native to NW Cape Province, South Africa; a common garden flower naturalised locally in south-western W.A., the Mt Lofty Range of S.A., and western Vic. Flowers Aug.–Oct. Map 74.

W.A.: Donnybrook, *R.D.Royce 4371* (PERTH). S.A.: Belair, *H.Eichler 18702* (AD); Stonyfell, *K.Preiss 38* (AD). Vic.: 4.5 km SSW of Maryborough P.O., 9 Aug. 1980, *E.Courtney* (MEL); Geelong, *H.B.Williamson 1433* (MEL).

2. **Sparaxis bulbifera* (L.) Ker Gawler, *Ann. Bot. (König & Sims)* 1: 225 (1804)

Ixia bulbifera L., *Amoen. Acad.* 300 (1756). T: from South Africa; neo: LINN 58.16, UPS *n.v.*, *fide* P.Goldblatt, *J. S. African Bot.* 35: 237 (1969).

[*S. grandiflora* auct. non Ker Gawler: J.H.Willis, *Handb. Pl. Victoria* 1: 339 (1961)]

Herb 15–55 cm tall. Corm 1–1.5 cm diam. Leaves 5–9, linear to ensiform, acute, 10–30 cm long, 4–10 mm wide. Scape few-branched. Spike flexuose, 2–6-flowered. Bracts deeply lacerate, with 2–4 subulate cusps, to 2.5 cm long. Flowers funnel-shaped. Perianth tube c. 1.5 cm long, narrow in the lower 5–7 mm, widened above, pale yellow; lobes oblanceolate, subacute, 2.5–2.8 cm long, 1–1.2 cm wide, cream to white, the sepals purple or purple-streaked outside. Stamens unilateral; filaments 7–8 mm long; anthers 7–8 mm long, white. Style arched behind stamens, exceeding anthers; branches filiform, c. 10 mm long, white. Capsules c. 1 cm long. Seeds c. 2 mm diam., black. Bulbils numerous, in all leaf axils. *Harlequin-flower*.

Native to southern Africa; a common garden flower naturalised in south-western W.A., southern S.A., Sydney area in N.S.W., Vic. and Tas. Flowers Sept.–Nov. Map 75.

W.A.: Wattle Grove, *K.L.Wilson 2745* (NSW, PERTH). S.A.: Morialta Falls, *H.Eichler 13075* (AD); Kirton Point, Port Lincoln, *P.G.Wilson 423* (AD). Vic.: Lismore cemetery, 24 Sept. 1977, *G.J.Hirth* (MEL). Tas.: Channel, Nov. 1965, *W.M.Curtis* (HO).

23. SYNNOTIA

Synnotia Sweet, *Brit. Fl. Gard.* t. 150 (1826); after W.Synnot, botanical collector at the Cape of Good Hope.

Type: *S. variegata* Sweet

Small perennial herbs with annual leaves and flowers. Corm globose; tunic fibrous. Leaves mostly basal, lanceolate to ensiform, flat, soft-textured, with prominent midvein. Stem erect, unbranched or few-branched. Spike distichous, few-flowered, lax. Bracts ovate, dentate to lacerate, scarious, brown-streaked. Flowers zygomorphic, bilabiate. Perianth tube curved, funnel-shaped; lobes unequal; dorsal lobe largest, erect; lateral lobes spreading; lower 3 lobes connivent, forming a projecting lip. Stamens unilateral, arched under dorsal lobe. Style arched, branches 3, entire, short, expanded at apices. Capsules obloid. Seeds globose, smooth.

A genus of 5 species in south-western Cape Province, South Africa; one naturalised in Australia.

G.J.Lewis, A revision of the genus *Synnotia*, *Ann. S. African Mus.* 40: 137–151 (1956).

**Synnotia villosa* (Burman f.) N.E.Br., *Bull. Misc. Inform.* 1929: 133 (1929)

Gladiolus villosus Burman f., *Fl. Indica* 1 (1768). T: Groenkloof, South Africa, *C.P.Thunberg s.n.*; lecto: UPS *n.v.*, *fide* G.J.Lewis, *Ann. S. African Mus.* 40: 142 (1956).

[*S. bicolor* auct. non Sweet: J.M.Black, *Trans. Proc. Roy. Soc. S. Australia* 37: 123 (1913)]

Illustrations: G.J.Lewis, *op. cit.* 145, fig. 2; H.Mason, *Western Cape Sandveld Fl.* 70, t. 24 (1972).

Herb 10–35 cm tall. Corm to 1.5 cm diam.; tunic of hard netted strands. Leaves 5–7, basal, narrowly oblanceolate, ±obtuse, 5–20 cm long, 5–15 mm wide, glabrous. Spike

±flexuose, 2–4-flowered. Bracts lacerate with fine acuminate cusps, dentate, 1.5–2.5 cm long, ±colourless below, brown in upper half. Flowers sulphur yellow, the dorsal lobe and often the apices of lower lobes mauve. Perianth tube narrow in lower half, widened above, 1.5–2 cm long; dorsal perianth lobe obovate, often emarginate, concave, 1.4–1.9 cm long; other lobes oblong to oblanceolate, slightly recurved, the laterals 1–1.4 cm long, the lowermost 7–9 mm long. Filaments c. 1.5 cm long; anthers oblong, 4 mm long. Ovary 4–5 mm long; style branches reaching middle of anthers, spatulate, 3 mm long. $2n = 20$, *vide* P.Goldblatt, *J. S. African Bot.* 35: 227 (1969).

Introduced from South Africa as a garden ornamental; naturalised in the southern Mt Lofty Range of S.A. on roadsides and in open forest. Flowers Sept. Map 76.

S.A.: behind Stonyfell quarry, Burnside, 16 Sept. 1951, *J.B.Cleland* (AD); Belair Natl Park, *H.Eichler* 18696 (AD); Greenhill road, c. 10 km SE of Adelaide, *R.H.Kuchel* 1173 (AD); Stonyfell, *A.G.Spooner* 3037 (AD).

24. FREESIA

Freesia Klatt, *Linnaea* 34: 672 (1866); after F.H.T.Freese, d. 1876, a fellow-student of C.F.Ecklon who proposed the name.

Type: *F. refracta* (Jacq.) Klatt; *Gladiolus refractus* Jacq.

Small perennial herbs with annual leaves and flowers. Corm ovoid; tunic of netted fibres. Leaves mostly basal, lanceolate to ensiform, flat, soft-textured, with prominent midveins. Stem usually erect, flexed horizontally below spike. Spike secund, usually dense. Bracts herbaceous or membranous, the outer entire, inner bifid. Flowers erect, zygomorphic. Perianth tube curved, narrowly cylindrical below, widened abruptly into cylindrical upper portion; lobes sub-equal to unequal, shorter than tube. Stamens unilateral; anthers oblong, basifixed. Style arched behind stamens, trifid near apex, the branches linear, bifid, recurved; stigmas 6. Capsules obloid, papillose. Seeds globose, smooth. $x = 11$, *vide* P.Goldblatt, *J. S. African Bot.* 48: 56 (1982).

A genus of 11 species in southern Africa; several species and their hybrids cultivated; a range of hybrids between 2 of these species is naturalised in Australia.

P.Goldblatt, Systematics of *Freesia* Klatt (Iridaceae), *J. S. African Bot.* 48: 39–91 (1982).

**Freesia* hybrid

[*F. refracta* auct. non Klatt: J.H.Willis, *Handb. Pl. Victoria* 1: 341 (1962)]

[*F. refracta* var. *odorata* auct. non (Klatt) Baker: N.C.W.Beadle *et al.*, *Handb. Fl. Sydney Region Blue Mts* 445 (1962)]

Herb 10–40 cm tall. Corm 1.5 cm diam.; tunic of fine pale fibres. Leaves 4–8, basal, erect, linear-ensiform, 8–27 cm long, 5–10 mm wide. Stem wiry, unbranched, slightly papillose near base. Spike 3–7-flowered. Bracts oblong, truncate, 5–8 mm long, herbaceous with hyaline margins. Flowers white to cream, with yellow markings, shaded purple on outside of tube. Perianth tube 2–3.5 cm long, narrow in basal 6–8 mm, expanded above; lobes elliptic, obtuse, sub-equal, 1–1.5 cm long, 6–9 mm wide, dorsal lobe slightly hooded, other lobes narrower, spreading. Filaments c. 2 cm long; anthers c. 6 mm long. Ovary c. 4 mm long; style exceeding anthers. Capsules 1–1.5 cm long, rugose, green. Seeds 3–4 mm diam., brown. Bulbils produced in lower leaf axils.

A common garden plant naturalised in south-western W.A., southern S.A., the Sydney region in N.S.W. and southern Vic.; growing on roadsides and wasteland in towns, and locally in native vegetation. Flowers Aug.–Oct. Map 77.

W.A.: E of Yallingup, *J.C.Anway* 241 (AD, MEL, PERTH). S.A.: Meningie, 27 Sept. 1960, *J.B.Cleland* (AD); Barossa Reserve, near Williamstown, *K.Czornij* 43 (AD). N.S.W.: Thirlmere Cemetery, *E.J.McBarron* 11111 (NSW). Vic.: Anglesea, *G.W.Carr* 7181 (MEL).

A few naturalised *Freesia* specimens are referable either to *F. alba* (G.L.Meyer) Gumbleton or to *F. leichtlinii* Klatt, but most appear to lie on a continuum of hybrids between these species, and are treated here as a single entity. A range of garden *Freesia* hybrids was produced from these species in the 19th century (Goldblatt, *loc. cit.*); more modern hybrids are now common in cultivation but have not become naturalised.

25. ANOMATHECA

Anomatheca Ker Gawler, *Ann. Bot. (König & Sims)* 1: 227 (1804); from the Greek *anomalos* (abnormal) and *theke* (case), referring to the papillose wall of the capsule in some species.

Lapeirousia subg. *Anomatheca* (Ker Gawler) Baker, *Handb. Irid.* 168 (1892). T: *A. verrucosa* (Vogel) Goldblatt; *Ixia verrucosa* Vogel

Perennial herbs with annual leaves and flowers. Corm rounded; tunic of netted fibres. Basal leaves 2 to several, ±ensiform, soft-textured. Scape erect, terete or winged, often branched. Cauline leaves few, lanceolate. Spike secund, lax, flexuose. Bracts herbaceous. Flowers erect, zygomorphic, sometimes bilabiate. Perianth tube straight, narrow at base, widened towards apex or ±cylindrical, usually longer than lobes. Stamens unilateral, arched. Style erect, filiform, trifid near apex; branches bifid, recurved; stigmas 6. Capsule obloid, papillose. Seeds few, globose, smooth. $2n = 22$, *fide* P.Goldblatt, *J. S. African Bot.* 37: 379 (1971).

A genus of 5 species in southern Africa, occasionally cultivated; one naturalised in Australia.

P.Goldblatt, A revision of the genera *Lapeirousia* Pourret and *Anomatheca* Ker Gawler 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 laxus Thunb., *Fl. Cap.* 2nd edn, 50 (1823); *Lapeirousia laxa* (Thunb.) N.E.Br., *J. Linn. Soc., Bot.* 48: 24 (1928). T: Langkloof, South Africa, *C.P.Thunberg s.n.*; holo: UPS *n.v.*, *fide* P.Goldblatt, *op. cit.* 83.

A. cruenta Lindley, *Bot. Reg.* 16: t. 1369 (1830). T: Cape Province, South Africa; holo: herb. Lindley, CGE *n.v.*, *fide* P.Goldblatt, *op. cit.* 83.

Illustration: P.Goldblatt, *op. cit.* fig. 6F.

Herb to 30 cm tall. Corm conical, c. 1 cm diam. Basal leaves linear-ensiform, 10–30 cm long, 3–6 mm wide, glabrous; midvein prominent. Scape terete, shorter than leaves. Spike unbranched, 3–6-flowered. Bracts ovate, 5–7 mm long. Perianth pink or pale blue; tube slender, slightly widened at apex, 1.5–2.5 cm long; lobes spreading, ovate to oblong, sub-equal, 7–12 mm long, the lower 3 marked with red or purple. Style branching above anthers. Capsule c. 1.2 cm long. Seeds c. 1 mm diam., lustrous, dark red. $2n = 22$, *fide* P.Goldblatt, *Contr. Bolus Herb.* 4: 84 (1972).

Introduced from South Africa and naturalised locally on waste ground in the Sydney area and northern coast of N.S.W. Flowers Oct.–Dec. Map 78.

N.S.W.: Avalon district, Oct. 1956, *K.Bell* (NSW); Tweed Heads, Oct. 1944, *H.Clarke* (BRI); Neutral Bay, 7 Dec. 1956, *C.Gadern* (NSW).

26. TRITONIA

Tritonia Ker Gawler, *Bot. Mag.* 16: t. 581 (1802); from the Greek *triton* (weather-cock), referring to the variable orientation of the anthers.

Type: *T. squalida* (Aiton) Ker Gawler; *Ixia squalida* Aiton

Perennial herbs with annual leaves and flowers. Corm globose; tunic fibrous. Leaves several, basal and near-basal, falcate or lanceolate to linear, flat, glabrous. Scape terete, rarely branched. Spike secund or sub-distichous, erect or bent to one side. Bracts truncate, shortly dentate, membranous-herbaceous to scarious, sub-equal, the inner shortly bifid. Flowers actinomorphic to zygomorphic. Perianth tube narrow at base, widened above; lobes longer than tube, equal or bilabiate with the dorsal lobe largest and hooded. Stamens equilateral or unilateral; anthers included, sub-basifixed to versatile, curved, often unilateral. Style branches 3, entire, recurved, filiform or expanded at apices. Capsules ellipsoid to ovoid, trigonous, membranous. Seeds numerous.

A genus of 28 species in southern Africa; 2 naturalised in Australia.

M.P.De Vos, The African genus *Tritonia* Ker Gawler (Iridaceae): Part 1, *J. S. African Bot.* 48: 105–163 (1982); Part 2, *ibid.* 49: 347–422 (1983).

Perianth pink, flushed or veined deeper pink; bracts green with brown apices

1. *T. squalida*

Perianth cream with fine dark greenish veins; bracts brown

2. *T. lineata***1. **Tritonia squalida* (Sol.) Ker Gawler, *Bot. Mag.* 16: t. 581 (1802)**

Ixia squalida Sol., in W.Aiton, *Hort. Kew.* 1: 61 (1789). T: Cape of Good Hope, South Africa, *F.Masson*; holo: BM n.v., *fide* M.P.De Vos, *J. S. African Bot.* 48: 128 (1982).

Herb 30–65 cm tall. Corm to 2.5 cm diam.; tunic of loose fibres forming a distinct neck. Leaves 4–8, linear-lanceolate, 8–40 cm long, 7–24 mm wide, soft-textured with 3–7 prominent veins. Spike flexuose, 4–10-flowered. Bracts oblong, 8–11 mm long, membranous, green with dark brown scarious apices. Flowers \pm actinomorphic, cup-shaped, pale pink or rarely light vermillion, flushed deeper pink in centre. Perianth tube c. 1 cm long, narrow below, widely dilated at mouth; lobes obovate to broadly spatulate, obtuse, equal, 2.4–3 cm long, spreading, concave. Stamens irregularly spreading or unilateral; filaments curved, 10–12 mm long; anthers 5–8 mm long, yellow or purple. Ovary globose, c. 3 mm diam.; style exceeding stamens, branches filiform, c. 5 mm long. $2n = 22$, *fide* P.Goldblatt, *J. S. African Bot.* 37: 422 (1971). Fig. 11C–E.

Native to southern Africa; naturalised locally in south-western W.A. and the Mt Lofty Range of S.A., also recorded from western Vic. Flowers Oct.–Nov. Map 79.

W.A.: Elgin, *R.D.Royce 3954* (PERTH); Margaret River, *R.D.Royce 4676a* (PERTH). S.A.: Morphett Vale–Clarendon road, 29 Oct. 1966, *J.B.Cleland* (AD); hill above Montacute Heights, *D.J.E.Whibley 2811* (AD). Vic.: Charlton, Nov. 1913, *collector unknown* (MEL).

Originally described by Solander as *Ixia squalida* var. *patula*, but this included the type of the species.

Tritonia crocata (L.) Ker Gawler, with pure orange or vermillion flowers, may also persist in old gardens. It is very closely related to *T. squalida*, the above description of which includes possible hybrids.

2. **Tritonia lineata* (Salisb.) Ker Gawler, *Ann. Bot. (König & Sims)* 1: 228 (1804)

Gladiolus lineatus Salisb., *Prod. Chapel Allert.* 40 (1796). T: cultivated at Kew from material collected in South Africa by *F.Masson*; lecto: BM n.v., *fide* M.P.De Vos, *J. S. African Bot.* 49: 371 (1983).

Illustration: M.P.De Vos, *op. cit.* fig. 16.



Figure 11. A–B, *Galaxia fugacissima*. A, habit $\times 0.8$; B, stamens and stigma $\times 1.5$. C–H, *Tritonia*. C–E, *T. squalida*. C, habit $\times 0.7$; D, L.S. flower $\times 0.9$; E, dehiscent capsule $\times 0.9$. F–H, *T. lineata*. F, inflorescence $\times 0.7$; G, L.S. flower $\times 0.9$; H, capsule $\times 0.9$. Reproduced by permission from *J. South African Bot.* 45: 416, fig. 10 (1979) [A–B], *op. cit.* 48: 130, fig. 5 (1982) [C–E], and *op. cit.* 49: 372, fig. 20 (1983) [F–H].

Herb 30–60 cm tall. Corm to 2 cm diam.; tunic of netted fibres forming a distinct neck. Leaves 4–8, linear-lanceolate, 7–30 cm long, 7–18 mm wide, rather soft-textured with 3–5 pale prominent veins. Spike slightly flexuose, 7–15-flowered. Bracts oblong, 8–12 mm long, scarious, dark brown. Flowers zygomorphic, funnel-shaped, cream, finely dark-veined. Perianth tube 1–1.5 cm long, expanded evenly from base; lobes oblong to oblanceolate, 1.5–2.5 cm long, straight with spreading apices; dorsal lobe wider than others. Stamens unilateral; filaments curved, c. 10 mm long; anthers 7–9 mm long, yellow. Ovary globose, c. 3 mm diam.; style exceeding stamens; branches filiform to cuneate, c. 4 mm long. *Lined Tritonia*. $2n = 44$, *fide* P.Goldblatt, *J. S. African Bot.* 37: 422 (1971). Fig. 11F–H.

Native to southern Africa; naturalised locally in south-western W.A., S.A., south-eastern Qld, Sydney region of N.S.W., Vic. and Tas. Flowers Oct.–Nov. Map 80.

W.A.: Burekup, N of Bunbury, *R.D.Royce* 3957 (PERTH). S.A.: Kingscote, Kangaroo Is., *G.Jackson* 160 (AD). Qld: Poziers, Darling Downs, *T.Stanley*, *E.Ross* & *S.Reynolds* 7867 (BRI). N.S.W.: railway enclosure, Roseville, *J.Waterhouse* 7634 (NSW). Tas.: S of Murdunna, 19 Oct. 1973, *W.M.Curtis* (HO).

27. CROCOSMIA

Crocoshmia Planchon, *Fl. Serres Jard. Paris* 7: 161 (1851); from the Greek *crokos* (saffron) and *osme* (smell), as the dried flowers smell of saffron when moistened.

Type: *C. aurea* (Pappe ex Hook.) Planchon; *Tritonia aurea* Pappe ex Hook.

Perennial herbs with annual leaves and flowers. Corm globose; tunic of netted fibres. Leaves mostly basal, ensiform, glabrous, soft-textured. Scape erect, branched. Spikes distichous. Bracts small. Flowers zygomorphic or almost actinomorphic, yellow to orange. Perianth tube narrow at base, funnel-shaped above, \pm curved; lobes sub-equal or perianth bilabiate. Stamens unilateral or equilateral; anthers linear, bifid at base, versatile. Style filiform, trifid above level of anthers; branches short, recurved, slightly expanded at apices. Capsule depressed-globose, 3-lobed. Seeds few, globose, lustrous.

A genus of 9 species in the summer rainfall zone of southern Africa; one hybrid, widely cultivated, is naturalised in Australia.

M.P.De Vos, The African genus *Crocoshmia* Planchon, *J. S. African Bot.* 50: 463–502 (1984).

Perianth lobes 18–20 mm long; branches of scape 2- or 3-ribbed; stamens unilateral

C. \times crocoshmiiflora

Perianth lobes over 25 mm long; branches of scape 7–10-ribbed; stamens equilateral

† **C. *aurea***

† *Crocoshmia aurea* (Pappe ex Hook.) Planchon was formerly common in cultivation, and may persist as a garden escape in the same areas as *C. crocoshmiiflora*, with which it has been confused.

****Crocoshmia* \times crocoshmiiflora** (Lemoine ex Morren) N.E.Br., *Trans. Roy. Soc. S. Africa* 20: 264 (1932)

Montbretia crocoshmiiflora Lemoine ex Morren, *Belgique Hort.* 31: 299 (1881); *Tritonia crocoshmiiflora* Nicholson, *Dict. Gard.* 4: 94 (1887). T: not designated; Lemoine ex Morren, *op. cit.* t. 14; lecto, *fide* M.P.De Vos, *J. S. African Bot.* 50: 497 (1984).

Illustrations: G.Hegi, *Ill. Fl. Mitt.-Eur.* 7: 164, t. 1198 (1931); M.Rix & R.Phillips, *The Bulb Book* 168 (1981).

Herb 30–100 cm tall, with scaly stolons. Corms 2–3 cm diam. Leaves 6–12, 30–80 cm long, 1–2 cm wide, acute, flat with prominent midvein. Scape terete, partly sheathed by leaves; branches few, 2- or 3-ribbed. Spike 4–20-flowered, flexuose, becoming open. Bracts scarious, brown, the outer ovate, acute, 6–10 mm long, the inner similar, bifid,

shorter. Flowers zygomorphic, red-orange. Perianth tube slightly decurved, 12–18 mm long; lobes oblong to lanceolate, obtuse, 18–20 mm long, 5–7 mm wide, all spreading. Filaments 12–18 mm long; anthers 5–8 mm long, exserted. Style branches c. 4 mm long, cuneate. Capsule 7–10 mm diam. Seeds dark brown, usually shrivelled. *Montbretia*. Fig. 18.

A common garden ornamental naturalised in the Mt Lofty Range, S.A., coast and Blue Mountains of N.S.W., southern Vic. and Tas. Found mainly around former gardens, settlements and roadsides in moist forest, multiplying by stolons but apparently not producing viable seed. Flowers Jan.–Mar. Map 81.

S.A.: Stirling East, *D.J.E. Whibley 1768* (AD). N.S.W.: Flat Rock Ck, Northbridge, 15 Jan. 1965, *L.A.S. Johnson* (NSW). Vic.: Palpara, *A.C. Beaughlehole 57813* (MEL); Sherbrooke Forest, 5 Apr. 1977, *A.M. Opie* (MEL). Tas.: between Snug and Gordon, Feb. 1964, *W.M. Curtis* (HO).

Believed to be a horticultural hybrid between *C. aurea* and *C. pottsii* (Baker) N.E.Br. produced by V. Lemoine at Nancy, France, in 1880.

28. CHASMANTHE

Chasmanthe N.E.Br., *Trans. Roy. Soc. S. Africa* 20: 272 (1932); from the Greek *chasme* (gaping) and *anthos* (flower), referring to the shape of the bilabiate perianth.

Type: *C. aethiopica* (L.) N.E.Br.; *Antholyza aethiopica* L.

Petamenes Salisb., *Trans. Hort. Soc. London* 1: 324 (1812), p.p. T: *P. quadrangularis* Salisb.

Large perennials with annual leaves and flowers. Corm depressed-globose; tunic fibrous. Leaves basal, ensiform, flat, glabrous. Scape erect, robust. Spikes distichous or secund, many-flowered. Bracts short. Flowers spreading, zygomorphic, bilabiate, red to orange, sometimes yellow. Perianth tube narrow at base, abruptly widened into a long curved cylindrical portion; lobes shorter than tube, unequal, the dorsal lobe longer than the others and hooded. Stamens unilateral; anthers sub-basifixed, versatile. Style filiform; branches entire, slender, recurved. Capsule depressed globose, exceeded by spathes. Seeds few, globose.

A genus of 3 species in southern Africa; all cultivated as ornamentals, one naturalised in Australia.

****Chasmanthe floribunda*** (Salisb.) N.E.Br., *Trans. Roy. Soc. S. Africa* 20: 274 (1932)

Antholyza floribunda Salisb., *Trans. Hort. Soc. London* 1: 324 (1812). T: from South Africa; n.v.

[*Antholyza aethiopica* auct. non L.: A.J. Ewart, *Fl. Victoria* 305 (1931)]

[*Chasmanthe aethiopica* auct. non N.E.Br.: H. Eichler, *Suppl. J.M. Black's Fl. S. Australia* 2nd edn, 85 (1965)]

[*Petamenes aethiopica* auct. non Allan: J.H. Willis, *Handb. Pl. Victoria* 1: 342 (1962)]

Illustration: U. van der Spuy, *Wild Fl. S. Africa Gard.* 160 (1971).

Perennial herb, 1–1.5 m tall. Corm to 6 cm diam.; tunic of netted fibres. Leaves 80–100 cm long, 2.2–4 cm wide; midvein prominent, asymmetric. Scape terete, glabrous, few-branched, often purplish, with 1–3 reduced leaves. Spikes distichous, 15–25 cm long, dense, 20–30-flowered. Bracts oblong, 1–1.5 cm long, membranous, red-brown. Flowers orange-red, rarely yellow, faintly striped. Perianth tube 3–4.5 cm long, narrow for c. 8 mm at base, distinctly pouched at junction with wider cylindrical upper portion; dorsal lobe oblanceolate to spatulate, hooded, 1.8–2.8 cm long; other lobes oblong, decurved, 1–1.7 cm long. Stamens arched under dorsal perianth lobe; anthers exserted, sagittate, c. 7 mm long, dark purplish. Style slightly exserted. Seeds smooth, orange. *African Cornflag*, $2n = 20$, *fide* P. Goldblatt, *J. S. African Bot.* 37: 422 (1971). Fig. 12.

Native to Cape Province, South Africa; naturalised in south-western W.A., southern S.A., Sydney region of N.S.W. and southern Vic. Flowers July–Oct. Map 82.

W.A.: Albany, 15 June 1945, *R.D.Royce* (PERTH). S.A.: Eden Hills, *B.J.Blaylock* 1442 (AD); Barunga Gap cemetery, *B.Copley* 1419 (AD). N.S.W.: Roman Catholic cemetery, Campbelltown, *E.J.McBarron* 10908 (NSW). Vic.: Port Campbell Creek, *A.C.Beauglehole* 21353 (MEL).

29. BABIANA

Babiana Ker Gawler, *Bot. Mag.* 16: t. 539 (1801) *nom. cons.*; from the Dutch *babiaan* (baboon) because the corms are eaten by baboons.

Type: *B. plicata* (Thunb.) Ker Gawler; *Gladiolus plicatus* Thunb.

Perennial herbs with annual leaves and flowers. Corm globose; tunic fibrous, extended in a short neck. Leaves several, basal, usually plicate, usually oblong to lanceolate, pubescent, abruptly contracted into narrow sheathing petiole. Scape short, erect. Spike short, 3–many-flowered. Bracts herbaceous or scarious, the inner bifid. Flowers actinomorphic to zygomorphic. Perianth tube straight or slightly curved, cylindrical at base, funnel-shaped above. Stamens equilateral to unilateral; anthers basifixed, lanceolate. Style branches 3, entire. Capsule oblong to globose. Seeds numerous.

A genus of about 60 species in southern Africa and 1 in Socotra; a few cultivated as ornamentals, one naturalised in Australia.

G.J.Lewis, The genus *Babiana* Ker, *J. S. African Bot. Suppl.* 3 (1959).

****Babiana stricta*** (Sol.) Ker Gawler, *Bot. Mag.* 17: t. 621 (1803)

Gladiolus strictus Sol., in W.Aiton, *Hort. Kew.* 1: 63 (1789). T: described from plants cultivated in England; lecto: Ker Gawler, *loc. cit.*, *fide* G.J.Lewis, *J. S. African Bot. Suppl.* 3: 41 (1959).

Illustration: G.J.Lewis, *op. cit.* t. 6.

Herb 12–40 cm tall. Corm 1.5–2.5 cm diam. Leaves 6–8 in a fan-shaped cluster; laminae oblong, acute, 7–17 cm long, 7–17 mm wide, plicate, pubescent; petiole 0.5–6 cm long. Scape simple or 2-branched, exceeding leaves, pubescent. Spike straight, erect, 3–10-flowered. Outer bract oblong, 1–1.8 cm long, herbaceous, pubescent, the apex brown, scarious; inner bract slightly shorter, split to base, acute, scarious. Perianth actinomorphic, erect, glabrous, purple to blue; tube straight, 1–1.8 cm long; lobes equal, obovate-oblong, 1.8–2.5 cm long, 0.7–1.2 cm wide. Stamens unilateral; filaments 7–9 mm long; anthers 4–6 mm long, purple, rarely yellow. Ovary 3–4 mm long, villous; style branches at level of anthers, 2.5–3 mm long, spatulate, purple. $2n = 14$, *fide* P.Goldblatt, *J. S. African Bot.* 37: 430 (1971).

Native to southern Africa; naturalised in south-western W.A., near Adelaide in S.A., coast and Sydney region of N.S.W., and an occasional garden escape in Vic. Grows on roadsides, wasteland and in open forest. Flowers Sept.–Oct. Map 83.

W.A.: near Waroona, *T.E.H.Aplin* 588 (PERTH); Margaret River, *R.D.Royce* 4675 (PERTH). S.A.: Bakers Gully, Mt Lofty Ra., 20 Oct. 1967, *H.Amtsberg* (AD); Eden Hills, *B.J.Blaylock* 1675 (AD). N.S.W.: Balgowlah, 21 Sept. 1952, *A.Reddan* (NSW).

Doubtful names

The names below have been recorded for Australia in the references cited. It has not been possible to assign them to taxa accepted in this treatment.

Babiana plicata (Thunb.) Ker Gawler: C.H.Ostenfeld, *Biol. Meddel. Kongel. Danske Vidensk. Selsk.* 3(2): 37 (1921).

Probably misapplied to *B. stricta*.

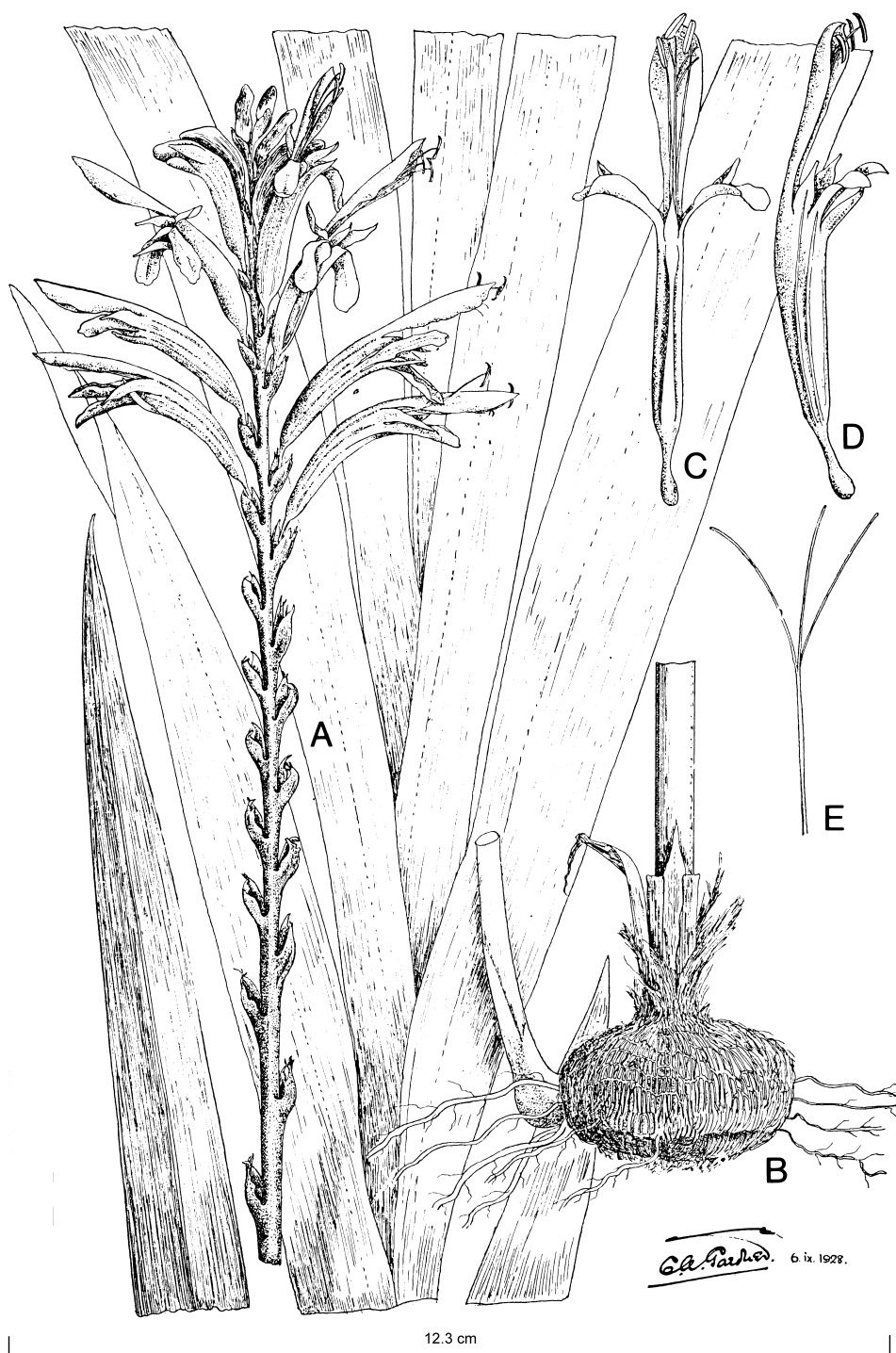


Figure 12. *Chasmanthe floribunda*. **A**, leaves and inflorescence $\times 0.7$; **B**, corm $\times 0.7$; **C–D**, flower $\times 1$; **E**, divided style c. $\times 3$. Drawn by the late C.A.Gardner. Reproduced by permission of the Director, Department of Agriculture, Western Australia.

Gladiolus ×colvillii Sweet: S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 20 (1981).

Probably cultivated material.

Iris spuria L.: G.Bentham, *Fl. Austral.* 6: 399 (1873).

Iris spuria var. *halophila*: fide G.Bentham, *Fl. Austral.* 6: 399 (1873).

Possibly a garden escape.

Ixia erecta Berg: A.J.Ewart, *Victorian Naturalist* 24: 193 (1908).

Probably cultivated material.

Ixia lutea Baker: A.J.Ewart, *Proc. Roy. Soc. Victoria* n. ser. 31: 373 (1919).

Sisyrinchium anceps Cav.: W.Woolls, *J. Linn. Soc. London, Bot.* 10: 39 (1867).

Possibly misapplied to *S. iridifolium*.

Sisyrinchium angustifolium Miller: P.Ascherson & P.Graebner, *Syn. Mitteleurop. Fl.* 3: 53 (1906).

Possibly misapplied to *S. iridifolium*.

ALOEACEAE

P.I.Forster & H.T.Clifford

Evergreen perennials, sometimes shrubby or arborescent. Leaves simple, alternate, sessile, in dense rosettes at stem ends, succulent, often spine-pointed; margins often toothed. Flowers bisexual, in a terminal spike, raceme, or panicle on a scape-like axillary shoot. Sepals 3, petaloid, connivent or connate into a straight or swollen tube; limb regular or bilabiate. Petals 3, often free. Stamens 6, hypogynous; anthers longitudinally dehiscent. Ovary trilobular, superior; placentation axile; ovules numerous; septal nectaries usually present; style 1; stigma discoid or trilobate. Fruit a loculicidal capsule, rarely fleshy and berry-like. Seeds few to many, commonly winged or flattened.

A family of c. 500 species in c. 8 genera, concentrated in southern Africa and extending to northern Africa, Madagascar, the Arabian peninsula and Seychelles. Represented in Australia only by introduction, with 1 genus and 3 species naturalised.

Several hundred species cultivated as ornamentals, especially species and cultivars of *Aloe*, *Gasteria* and *Haworthia*. Intergeneric hybrids in succulent Aloeaceae are common in cultivation, particularly between *Aloe* and *Gasteria* (×*Gastrolea*), which are intermediate in generic characters.

Generic delimitation in Aloeaceae has not been resolved satisfactorily. Several monotypic genera were recognised by H.Jacobsen, *Handbook of Succulent Plants* (1960), but G.D.Rowley, *Name that Succulent* (1980), included these within 4 main genera (not including *Kniphofia*). *Kniphofia* appears to be transitional between Aloeaceae and Liliaceae *s. lat.* The family Aloeaceae is close to, and sometimes included in, the Asphodelaceae, *s. str.* Few collections of naturalised Aloeaceae exist in Australian herbaria, but the species are probably more widely naturalised.

A.Berger, Liliaceae – Asphodeloideae – Aloineae, in A.Engler (ed.), *Pflanzenr.* 33: 1–347 (1908); P.E.Brandham, The chromosomes of the Liliaceae. II. Polyploidy and karyotype variation in the Aloineae, *Kew Bull.* 25: 381–389 (1971); N.P.Vaikos *et al.*, The floral

ALOEACEAE

anatomy of the Liliaceae. Tribe Aloineae, *Indian J. Bot.* 1: 61–68 (1978); H.P.Riley & S.K.Majumdar, *The Aloineae, a biosystematic survey* (1979); G.D.Rowley, Liliaceae, in *Name that Succulent* 182–187 (1980); M.B.Bayer, *The New Haworthia Handbook* (1982).

KEY TO GENERA

- 1 Scape thin and wiry; flowers greenish-white, erect or ascending † **HAWORTHIA**
- 1: Scape thick and stout; flowers red, yellow or rarely white, pendulous or at an angle
- 2 Perianth curved to S-shaped, with swollen base; stamens included † **GASTERIA**
- 2: Perianth rarely more than slightly curved, or with slightly swollen base; stamens exserted **ALOE**

Genera marked with a dagger (†) are not described in the text. Species of *Haworthia* and *Gasteria* may persist in old gardens, but none has been reported as naturalised.

ALOE

Aloe L., *Sp. Pl.* 1: 319 (1753); *Gen. Pl.* 5th edn, 150 (1754) *p.p.*; old Arabic name, possibly from the Arabic *alloch*, in reference to species used medicinally.

Type: *A. perfoliata* L.

Perennials with very short stems, shrubby to tree-like, with fleshy fibrous roots. Leaves distichous to multifarious, amplexicaul, the surfaces glabrous to spiny; margins usually sinuate-dentate, rarely entire, sometimes ciliate. Inflorescence axillary, simple or branched; racemes condensed to long-cylindrical. Flowers zygomorphic, protandrous, pedicellate. Sepals free to base or connate into a tube. Petals sometimes free, usually dorsally adnate to sepals for about half their length with margins free; apices subacute to obtuse, spreading or recurved. Stamens exserted in morning, withering and withdrawing in afternoon. Style filiform, longer than stamens, exserted on second day of anthesis. Fruit a loculicidal capsule. Seeds numerous, irregularly triquetrous to flattened, sometimes winged, grey or black. $x = 7$, *fide* A.Federov, *Chromosome Numbers of Flowering Plants* 381–383 (1969).

An African, Madagascan and Arabian genus of c. 330 species; in Australia 3 introduced species naturalised around sites of human habitation, over 100 species cultivated.

G.W.Reynolds, *The Aloes of South Africa* (1950, 4th edn, 1982); G.W.Reynolds, *The Aloes of Tropical Africa and Madagascar* (1966); D.F.Cutler *et al.*, Morphological, anatomical, cytological and biochemical aspects of evolution in East African shrubby species of *Aloe* L. (Liliaceae), *Bot. J. Linn. Soc.* 80: 293–317 (1980); T.Reynolds, Observations on the phytochemistry of the *Aloe* leaf-exudate compounds, *Bot. J. Linn. Soc.* 90: 179–199 (1985).

- 1 Plants with long stems; leaves unspotted; inflorescence unbranched **1. A. arborescens**
- 1: Plants with very short stems; leaves spotted; inflorescence branched or unbranched
- 2 Perianth less than 30 mm long; pedicels less than 7 mm long; leaves erect to slightly spreading **4. A. vera**
- 2: Perianth more than 30 mm long; pedicels more than 7 mm long; leaves spreading to recurved
- 3 Racemes condensed, usually slightly wider than long, flowers crowded **2. A. saponaria**
- 3: Racemes long-cylindrical, flowers not crowded **3. A. parvibracteata**

1. *Aloe arborescens Miller, *Gard. Dict.* 8th edn, no. 3 (1768)

T: not designated.

Illustrations: G.W.Reynolds, *The Aloes of South Africa* 408–411, figs 448–452 (1950); G.W.Reynolds, *The Aloes of Tropical Africa and Madagascar* 383, figs 386–388 (1966).

Many-branched shrub 2–3 m high. Leaves erect to spreading, falcately deflexed, 50–60 cm long, 5–7 cm broad at base, narrowing to apex; adaxial surface dull green to grey-green; abaxial surface dull green; margins with pale teeth 3–5 mm long. Inflorescence simple, to 90 cm tall; scape subtended by bracts c. 20 mm long and 15 mm wide. Racemes conical to elongate-conical, 20–30 cm long, 10–12 cm diam.; flowers congested; bracts ovate, acute to obtuse, 15–20 mm long; pedicels 35–40 mm long. Perianth trigonous-cylindrical, slightly constricted above ovary, 40 mm long, scarlet; sepals and petals sub-acute, spreading, the 2 whorls not cohering. Stigma exserted 5 mm. Fruit not seen.

Native to southern Africa; a garden escape in eastern and southern Australia. Map 84.

S.A.: between Glenelg and Brighton, c. 15 km SW of Adelaide, 2 Aug. 1906, (AD 97525056). N.S.W.: Taggers Point, Arakoon, NE of Kempsey, *L.Johnson NSW 179098* (NSW).

2. *Aloe saponaria (Aiton) Haw., *Trans. Linn. Soc.* 7: 17 (1804)

A. perfoliata var. *saponaria* Aiton, *Hort. Kew* 1: 467 (1789). T: not designated.

Illustrations: G.W.Reynolds, *The Aloes of South Africa* 226–228, figs 228–231 (1950); G.W.Reynolds, *The Aloes of Tropical Africa and Madagascar* 88–89, figs 90–91 (1966).

Plants usually with very short stems, freely suckering, forming dense groups. Leaves 12–16, spreading to recurved, broadly lanceolate, 12–16 cm long; adaxial surface pale green with numerous white spots; abaxial surface pale green with dull white spots; margins with brown-tipped teeth 4–5 mm long. Inflorescence simple or branched, 40–80 cm tall; scape subtended by deltoid bracts 10 mm long. Racemes 1–3, condensed, 8–10 cm long, 10–14 cm wide; flowers crowded; bracts deltoid-acuminate, 7–10 mm long; pedicels 30–35 mm long. Perianth cylindrical-trigonous with basal swelling near ovary, 35–45 mm long, orange-pink; sepals and petals sub-acute to obtuse, spreading to recurved, cohering for part of their length. Stigma exserted 5 mm. Fruit not seen.

Native to southern Africa; a garden escape in eastern and southern Australia. Map 85.

S.A.: Fleurieu Plateau, behind Victor Harbour, *J.B.Cleland* (AD). Qld: 5.2 km from Dayboro on Woodford Road, *P.I.Forster 1922* (BRI); c. 5 km S of Murgon, 31 Aug. 1970, *R.Upton* (BRI 53772). N.S.W.: Whalan, *R.G.Coveny 11917* (NSW).

An apparent hybrid, with this species as one parent, has been collected in Qld, (15 km NNW of Murgon, *P.I.Forster 1718* & *H.Sharpe*, BRI); it differs mainly in the shorter pedicels 18–25 mm long. Fig. 13A–B.

3. *Aloe parvibracteata Schönl., *Rec. Albany Mus.* 2: 139 (1907)

T: plant cultivated at Grahamstown, flowering July 1906, *Burt-Davy 2853*, from Lourenco Marques, Mozambique; *n.v.*, *fide* G.W.Reynolds, *The Aloes of South Africa* 277 (1950).

Illustrations: G.W.Reynolds, *op. cit.* 276–277, figs 293–294.

Plants with very short stems, freely suckering, forming dense groups. Leaves 10–15, spreading, recurved, narrowly lanceolate, 30–40 cm long; adaxial surface green to brownish green with numerous white spots; abaxial surface pale green with few dull white spots; margins with brown teeth 3–5 mm long. Inflorescence branched, 1–1.5 m tall; scape subtended by deltoid bracts 19 mm long. Racemes 3–6, 7–17 cm long, 6–8 cm wide; flowers not crowded; bracts deltoid-acuminate, 12–15 mm long; pedicels 8–14 mm long. Perianth cylindrical-trigonous with basal swelling near ovary, 30–33 mm long, orange-pink; sepals and petals subacute to obtuse, spreading to recurved, cohering for part of their length. Stigma exserted 1–2 mm. Capsule 3.5–4 cm long. Seeds 3–4 mm long, 2–3 mm wide, grey. Fig. 13C–E.

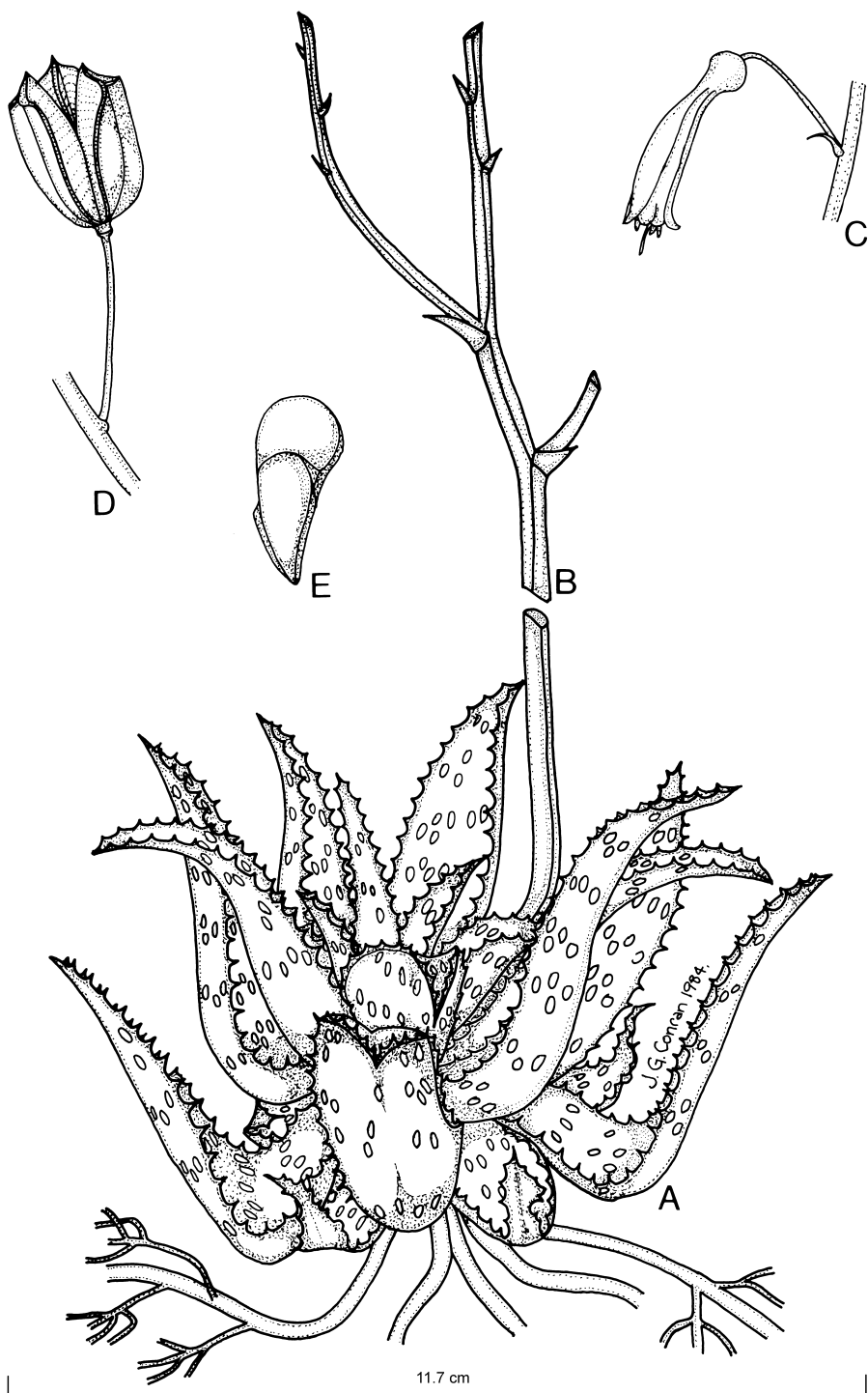


Figure 13. *Aloe*. A–B, *A. saponaria* x *Aloe* sp. A, plant $\times 0.5$; B, base of inflorescence with raceme branching $\times 0.5$ (A–B, P.Forster 1718 & H.Sharpe, BRI). C–E, *A. parvibracteata*. C, flower $\times 0.5$; D, capsule $\times 0.6$; E, seed $\times 4$ (C–E, P.Forster 1724, BRI).

Native to southern Africa; naturalised on road cuttings in suburban Brisbane, Qld. Map 86.

Qld: St Lucia, Brisbane, *P.I. Forster 1724* (BRI).

4. **Aloe vera* (L.) Burman f., *Fl. Indica* 83 (1768)

A. perfoliata var. *vera* L., *Sp. Pl.* 1: 320 (1753). T: a cultivated plant from India in hort. Cliff.; Kadanaku or Catevala, Rheede, *Hort. Malab.* 11: t. 3 (1692); lecto, *fide* D.O. Wijnands, *Bot. Commelins* 127 (1983).

A. barbadensis Miller, *Gard. Dict.* 8th edn, no. 2 (1768). T: a cultivated plant in Chelsea Physic garden; holotype: BM *n.v.*, *fide* J.R.I. Wood, *Kew Bull.* 38: 21 (1983).

Plants with very short stems, freely suckering, forming large clumps. Leaves c. 16, erect to slightly spreading, ensiform, 40–60 cm long; adaxial surface grey-green to light-green with few to many spots; abaxial surface generally lighter; margins with pale teeth c. 2 mm long. Inflorescence simple or with 1 or 2 branches, 0.6–1 m tall; scape subtended by deltoid bracts 7–8 mm long. Racemes 30–40 cm long, 5–6 cm wide; flowers crowded; bracts ovate-acuminate, c. 8 mm long; pedicels c. 6 mm long. Perianth cylindrical, slightly swollen, basally obconical, 25–30 mm long, yellow, orange or red; sepals and petals obtuse, cohering for one-third their length. Stigma exerted 5 mm. Capsule 1.2–1.5 cm long. Seeds not seen.

Native to Yemen Arab Republic and Saudi Arabia, but now naturalized in a wide range of tropical countries. Widely cultivated in gardens and commercial plantations in Australia, both for horticultural appeal and purported medicinal qualities. Not known to be naturalised in Australia in 1985, but considered likely to become naturalised and therefore included in this treatment. Other species of *Aloe*, *Haworthia*, *Gasteria* and *×Gastrolea* are often misidentified as this species.

Two varieties are recognised here.

Leaves blue-green; perianth yellow

4a. var. vera

Leaves light-green; perianth orange

4b. var. officinalis

4a. **Aloe vera* (L.) Burman f. var. *vera*

Illustrations: G.W. Reynolds, *The Aloes of Tropical Africa and Madagascar* figs 146–151a (1966); R. Dowling, *Queensland Agric. J.* 111: 66 (1985); all as *A. barbadensis*.

Plants weakly clustering. Leaves blue-green, almost glaucous, with few spots. Perianth yellow.

Probably originated from the Arabian peninsula, but now found in many localities where evidently it has been planted. Cultivated in eastern coastal Australia. Map 87.

Qld: cultivated plant at Nora Creina, Didcot, *P.I. Forster 2010* (BRI).

This variety is the preferred 'aloe vera' of the medicinal trade, and is probably a result of artificial selection over a long period.

4b. **Aloe vera* var. *officinalis* (Forsskal) Baker, *J. Linn. Soc., Bot.* 18: 176 (1880)

A. officinalis Forsskal, *Fl. Aegypt.-Arab.* 73 (1775). T: Yemen, Mor, *P. Forsskal s.n.*; holotype: C *n.v.*, probably destroyed, *fide* J.R.I. Wood, *Kew Bull.* 38: 22 (1983).

Plants not weakly clustering. Leaves light-green with many spots, especially on young plants. Perianth orange.

Native to Yemen Arab Republic and Saudi Arabia. Not reported to be naturalised in Australia but widely cultivated and distributed as 'aloe vera'. Map 88.

Qld: cultivated plant at Nora Creina, Didcot, *P.I. Forster 2011* (BRI).

Not considered suitable for plantation production of medicinal products.

AGAVACEAE

L.Pedley & P.I.Forster

Evergreen perennials; rootstock usually a rhizome. Leaves usually crowded at base or top of stem, entire or with prickly teeth on margins. Flowers bisexual or (not in Australia) unisexual, regular or somewhat zygomorphic, racemose, paniculate, spicate or in a thyrses, usually on a scape. Sepals 3, petals 3, unequal to about equal, free or united in a tube. Stamens 6; filaments filiform or thickened towards base, inserted on perianth; anthers introrse, linear to oblong, 2-locular. Ovary superior or inferior, 3-locular, placentas axile; ovules solitary to numerous in each locule. Fruit a capsule or berry. Seeds occasionally compressed, with fleshy endosperm surrounding small embryo.

A family of c. 18 genera and 600 species, mostly in the tropics and subtropics; 7 genera in Australia, 5 of them naturalised. The family is heterogeneous. Some genera treated here are sometimes referred to other families.

KEY TO GENERA

- 1 Ovary superior
 - 2 Anthers foveolate at insertion of filaments; leaves equitant † **PHORMIUM**
 - 2: Anthers not foveolate at insertion of filaments; leaves not equitant
 - 3 Sepals and petals free or fused at base but no definite tube; leaves spine-tipped **1. YUCCA**
 - 3: Sepals and petals united at base into a tube; leaves sometimes rigid but not spine-tipped
 - 4 Stem usually very short; leaves thick, fibrous; fruit with a thin pericarp falling away from the berry-like seeds **4. SANSEVIERIA**
 - 4: Stem short to long; leaves thin, papery; pericarp fleshy, not falling away from seeds
 - 5 Ovule 1 per locule; each flower with 1 bract and 1 bracteole at base of pedicel **5. PLEOMELE**
 - 5: Ovules 2–16 per locule; each flower with 1 bract and 2 bracteoles at base of pedicel **6. CORDYLINE**
 - 1: Ovary inferior
 - 6 Stamens much longer than perianth **2. AGAVE**
 - 6: Stamens shorter than perianth
 - 7 Filaments with a cushion-like swelling at base; anthers dorsifixed; leaves weakly spine-tipped **3. FURCRAEA**
 - 7: Filaments not swollen at base; anthers basifixed; leaves with withered tubular tip **7. DORYANTHES**

† *Phormium tenax* Forster & G.Forster (New Zealand Flax), is cultivated as an ornamental in south-eastern Australia and persists in old gardens. It is not treated further in this work.

1. YUCCA

P.I.Forster

Yucca L., *Sp. Pl.* 1: 319 (1753); *Gen. Pl.* 5th edn, 150 (1754); from the Haitian name for manihot.

Type: *Y. aloifolia* L.

Plants arborescent to shrubby, with hard fibrous roots. Leaves long-lived, fleshy, linear-lanceolate, spine-tipped. Inflorescence a terminal raceme or panicle. Flowers bisexual, campanulate to globose, cream to white. Sepals and petals similar, distinct or fused at base, lanceolate to ovate. Stamens 6, hypogynous; filaments thickened; anthers dorsifixed near base. Ovary superior, sessile, 3-locular or imperfectly 6-locular, with numerous ovules; style shortly columnar; stigma subglobose or 3-lobed. Fruit a dehiscent, loculicidal or septicidal capsule, or spongy and indehiscent. Seeds obovoid to compressed, black.

An American genus of c. 35 species; in Australia 1 introduced species commonly cultivated and naturalised around sites of habitation.

W.Trelease, *The Yuccaeae*, *Ann. Rep. Missouri Bot. Gard.* 13: 27–133 (1902).

**Yucca aloifolia* L., *Sp. Pl.* 1: 319 (1753)

T: Dillenius, *Hort. Eltham.* t. 323 fig. 416 (1732); lecto, *fide* D.O.Wijnands, *Bot. Commelins* 140 (1983).

Illustrations: W.Trelease, *Ann. Rep. Missouri Bot. Gard.* 17: t. 49–50, 84, fig. 6 (1902).

Plant to 3 m high, branched freely. Leaves 70–100 cm long, 40–50 mm wide, suberect, bluish-grey; margin finely denticulate, red; terminal spine attenuate-subulate, 10–15 mm long, yellow-brown. Inflorescence a panicle 4–6 m long with upper 2–3 m racemose; racemes 11–35 cm long. Flowers campanulate, 45–50 mm long; pedicels 25–40 mm long. Sepals and petals free, oblong-lanceolate, 50 mm long. Filaments 25–30 mm long; anthers 2–3 mm long. Stigma 15 mm long. Capsule oblong, 6–8 cm long, pulpy, indehiscent, purple turning black. Seeds black. Fig. 14A–C.

A garden escape in southern Qld and northern-coastal N.S.W. Map 89.

Qld: Little Plains property, Darling Downs, 21 May 1980, *E.Lawrence* (BRI); Moorlands property, Rosalie Plains, 24 km NNW of Oakey, *P.I.Forster* 2007 (BRI); Seaforth, May 1985, *H.Prendegast* (BRI); Warwick, 30 June 1985, *D.Noble* (BRI). N.S.W.: cult. Collaroy Plateau from plants at Forster, *J.Fairley* NSW 179099 (NSW).

2. AGAVE

P.I.Forster

Agave L., *Sp. Pl.* 1: 323 (1753); *Gen. Pl.* 5th edn, 150 (1750); from the Greek *aganos* (noble or admirable).

Type: *A. americana* L.

Plants succulent, with very short stems and hard fibrous roots, often suckering. Leaves long-lived, succulent, spine-tipped, with or without teeth. Inflorescence occasionally bulbiliferous, bracteate, scapose, spicate, racemose, or paniculate with flowers in umbellate clusters. Flowers bisexual, generally protandrous. Perianth tubular to shallowly funnel-shaped; sepals and petals erect to curved, similar or dimorphic, imbricate in bud. Stamens 6, exserted; filaments inserted in tube or on base of perianth; anthers versatile. Ovary inferior, 3-locular, thick-walled with numerous axile ovules in 2 rows per locule;

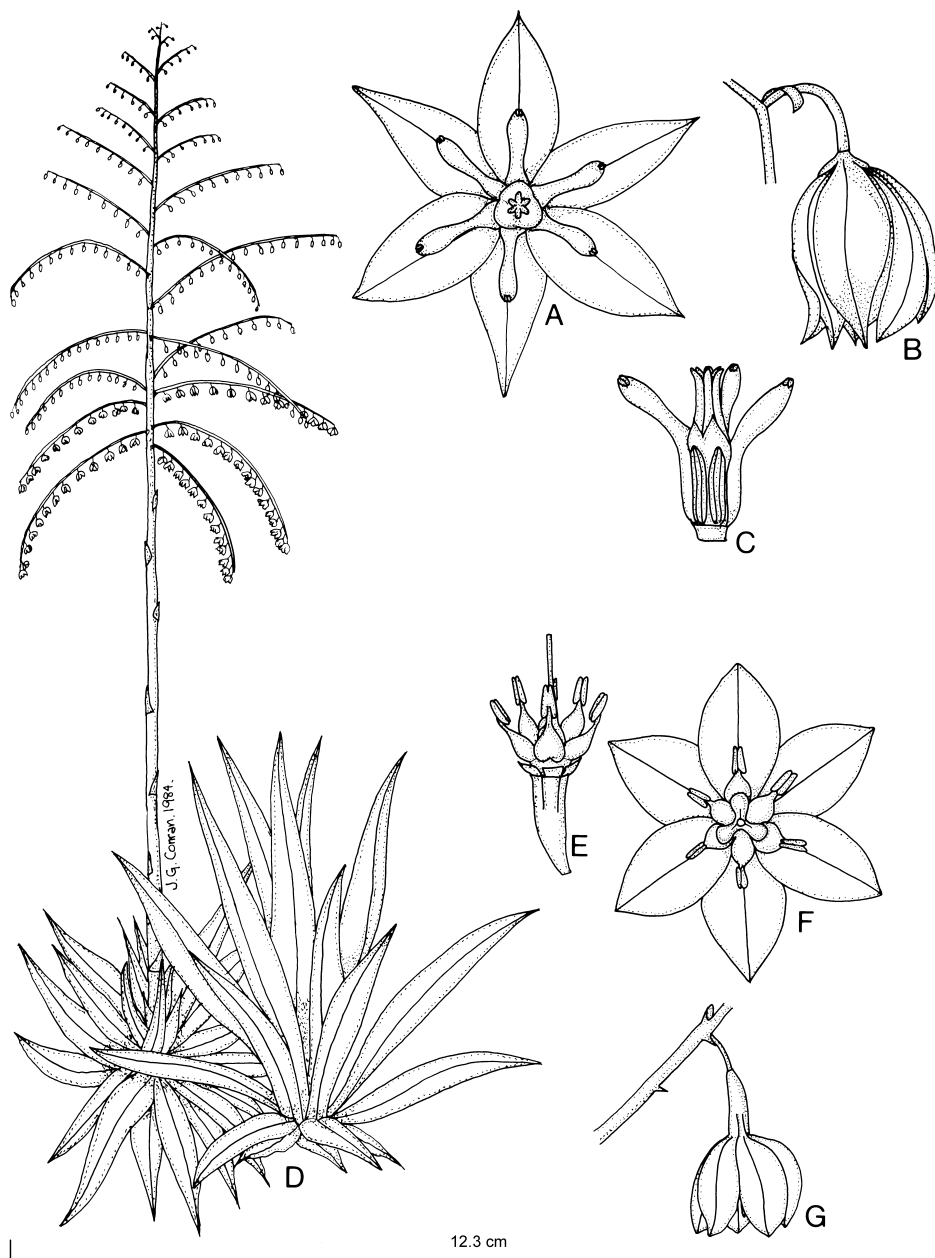


Figure 14. A–C, *Yucca aloifolia*. A, flower $\times 0.4$; B, bud $\times 0.4$; C, stamens, ovaries and styles $\times 0.4$ (A–C, cultivated plant, MEL). D–G, *Furcraea foetida*. D, plant with inflorescence $\times 0.01$; E, flower with corolla removed $\times 0.4$; F, flower from above $\times 0.4$; G, bud $\times 0.3$ (D–G, J.Conran 111, BRI).

style elongate, filiform; stigma 3-lobed, papillate. Fruit a loculicidal capsule. Seeds flattened, black.

An American genus of c. 150 species; in Australia 3 introduced species naturalised around sites of habitation; one species (*A. sisalana*) tested for fibre production in plantations in northern N.S.W., southern and central Qld between 1890 and 1920. About 6 species in common horticultural cultivation.

H.S.Gentry, *Agaves of Continental North America* (1982).

- | | | |
|----|---|------------------------|
| 1 | Leaves flexible, tip spine-less | † <i>A. attenuata</i> |
| 1: | Leaves rigid, spine-tipped | |
| 2 | Leaves ensiform, linear to lanceolate, 10–20 times longer than wide | |
| 3 | Leaves always with marginal teeth; sepals and petals unequal; filaments 35–45 mm long | 2. <i>A. vivipara</i> |
| 3: | Leaves usually toothless; sepals and petals equal; filaments 50–60 mm long | 3. <i>A. sisalana</i> |
| 2: | Leaves generally not ensiform, lanceolate, less than 10 times longer than wide | 1. <i>A. americana</i> |

† *Agave attenuata* Salm-Dyck is sometimes found as an escape from cultivation and is not described in the text.

1. **Agave americana* L., *Sp. Pl.* 1: 323 (1753)

T: sheet no. 443.1, LINN; holo: *n.v.*, *fide* H.S.Gentry, *Agaves of Continental North America* 278 (1982).

Illustrations: H.S.Gentry, *op. cit.* 281, figs 12.6, 12.7 & 12.9.

Plants large, freely suckering. Rosettes 1–2 m tall, 2–3.7 m wide. Leaves lanceolate, 100–200 cm long, 15–25 cm wide, light grey-glaucous to light green; margin toothed, teeth 5–10 mm long, 2–6 cm apart, brown to pruinose-grey; terminal spine conical to subulate, 3–5 cm long, shiny brown to pruinose-grey. Inflorescence 5–9 m tall; scape with triangular bracts; panicles with 15–35 umbellate branches in upper ½–⅓ of scape. Flowers 7–10 cm long, long-pedicellate, yellow. Perianth tube 8–20 mm long, funnel-shaped; sepals and petals unequal, 22–35 mm long, linear to lanceolate, cucullate at apex. Filaments 60–90 mm long; anthers 30–36 mm long. Ovary 30–45 mm long. Capsule oblong, 4–6 cm long, 2–2.5 cm diam., shortly beaked. Seeds 7–8.5 mm long, 5–7 mm wide, shiny black. *Century Plant*.

A garden escape in eastern and southern Australia. Two varieties are recognised here.

- | | |
|---|---------------------------|
| Leaves frequently reflexed; margins undulate; capsule 4–5 cm long | 1a. var. <i>americana</i> |
| Leaves straight; margins straight or crenate; capsule 4.5–6 cm long | 1b. var. <i>expansa</i> |

1a. **Agave americana* L. var. *americana*

Leaves frequently reflexed; margins undulate. Capsule 4–5 cm long. Seeds 7–8 mm long, 5–6 mm wide.

Naturalised in eastern Australia in Qld and N.S.W. Map 90.

Qld: bank of Burnett R. at Eidsvold Stn, *P.I.Forster 1773* (BRI); 1 km SW of Marburg, *P.I.Forster 1815* (BRI); Didcot State School grounds, Didcot, *P.I.Forster 1819* (BRI). N.S.W.: c. 24 km SW of Garah, *K.L.Wilson 2005* & *P.Solling* (NSW); c. 8 km NW of Murrurundi on Willow Tree road, *K.L.Wilson 2369* (NSW).

1b. **Agave americana* var. *expansa* (Jacobi) H.Gentry, *U.S.D.A., Agric. Handb.* 399: 80 (1972)

A. expansa Jacobi, *Nachtr. I in Abh. Schles. Ges. Vaterl. Cult., Abth. Naturwiss.* 1868: 151 (1868). T: not designated.

Illustration: H.S.Gentry, *op. cit.* 83, fig. 25; H.S.Gentry, *Agaves of Continental North America* 284, fig. 12.10 (1982).

Leaves straight; margins straight or crenate. Capsule 4.5–6 cm long. Seeds 8–8.5 mm long, 5.5–7 mm wide. Fig. 15E.

A garden escape in suburban Brisbane, Qld. Map 91.

Qld: near Botanic Gardens, Mt Coot-tha, *P.I.Forster 1818* (BRI); Camira Street, St Lucia, *P.I.Forster 1765* (BRI).

2. **Agave vivipara* L., *Sp. Pl.* 1: 323 (1753)

T: illustration in Commelin, *Praecludia Bot.* 65 t. 15 (1703); lecto, *fide* D.O.Wijnands, *Bot. Commelins* 35 (1983).

Agave angustifolia Haw., *Syn. Pl. Succ.* 1: 72 (1812). T: pl. 6, T.Tozzetti, *Ann. Mus. Imp. Fis. Firenze* 2(2): 25, 31–35 (1810); lecto, *fide* H.S.Gentry, *Agaves of Continental North America* 560 (1982).

Illustration: H.S.Gentry, *op. cit.* 561–563, figs 20.7, 20.8 & 20.9, as *A. angustifolia*.

Plants large, freely suckering. Rosettes 1–1.5 m tall, 1.5–3 m wide. Leaves linear to lanceolate, 60–120 cm long, 3.5–10 cm wide, light green to glaucous-grey; margin toothed, teeth 2–5 mm long, 10–20 mm apart, reddish brown; terminal spine conical to subulate, 1.5–3.5 cm long, dark brown. Inflorescence 3–5 m tall; scape with narrowly triangular bracts; panicle with 10–20 umbellate branches in upper ½ of scape. Flowers 5–6.5 cm long, shortly pedicellate, greenish-yellow. Perianth tube 8–16 mm long, funnel-shaped to slightly urceolate; sepals and petals unequal, 18–24 mm long, obtuse, cucullate at apex. Filaments 35–45 mm long; anthers 20–30 mm long. Ovary 20–30 mm long. Capsule broadly ovoid, 5 cm long, raggedly beaked. Seeds 9–12 mm long, 7–8 mm wide, dull black. Fig. 15A.

A garden escape in coastal Qld. Map 92.

Qld: Rockhampton, *S.T.Blake 19938* (BRI); Peel Is., Sept. 1984, *C.Price* (BRI).

A variable species complex according to H.S.Gentry, *op. cit.* 562–563; one form widely cultivated.

3. **Agave sisalana* Perrine, *U.S. 25th Congress, 2nd Session - House of Reps Rep.* 564 (*Tropical Plants*): 8, 9, 16, 47, 60, 86; *Senate Rep.* 300: 36, 105, 140 (1838)

T: Ocosocoautla, Chiapas, Mexico, 22 Mar. 1957, H.S.Gentry 16434; neo: US, DES, both *n.v.*, *fide* H.S.Gentry, *Agaves of Continental North America* 628 (1982).

Illustration: H.S.Gentry, *op. cit.* 629 fig. 22.9.

Plants medium to large, freely suckering. Rosettes 1.5–2 m tall, 2–3 m wide. Leaves linear to lanceolate, 90–130 cm long, 9–12 cm wide, green; margin toothless on mature leaves and with minute teeth on young leaves, or sometimes with antrorsely hooked teeth 2.5–3 mm long, 6–24 mm apart, shiny brown to blackish; terminal spine subulate, 2–2.5 cm long, dark brown. Inflorescence 5–6 m tall; scape with triangular bracts; panicles with 10–25 umbellate branches in upper ½ of scape, bulbiliferous after flowering. Flowers 5.5–6.5 cm long, shortly pedicellate, greenish-yellow. Perianth tube 15–18 mm long, broadly urceolate; sepals and petals equal, linear to lanceolate, 17–18 mm long, cucullate at apex. Filaments 50–60 mm long; anthers 23–25 mm long. Ovary 20–25 mm long. Fruit not seen. Fig. 15B–D.

In or near abandoned experimental sisal fibre plantations in central Qld or as a garden escape in southern Qld. Map 93.

Qld: St Arnuds Ck, between Bajool and Sisalana, *P.I.Forster 1807* (BRI); Latimers Crossing, Nerang R., *P.I.Forster 1772* (BRI); 3 km SW of Marburg, *P.I.Forster 1816* (BRI).

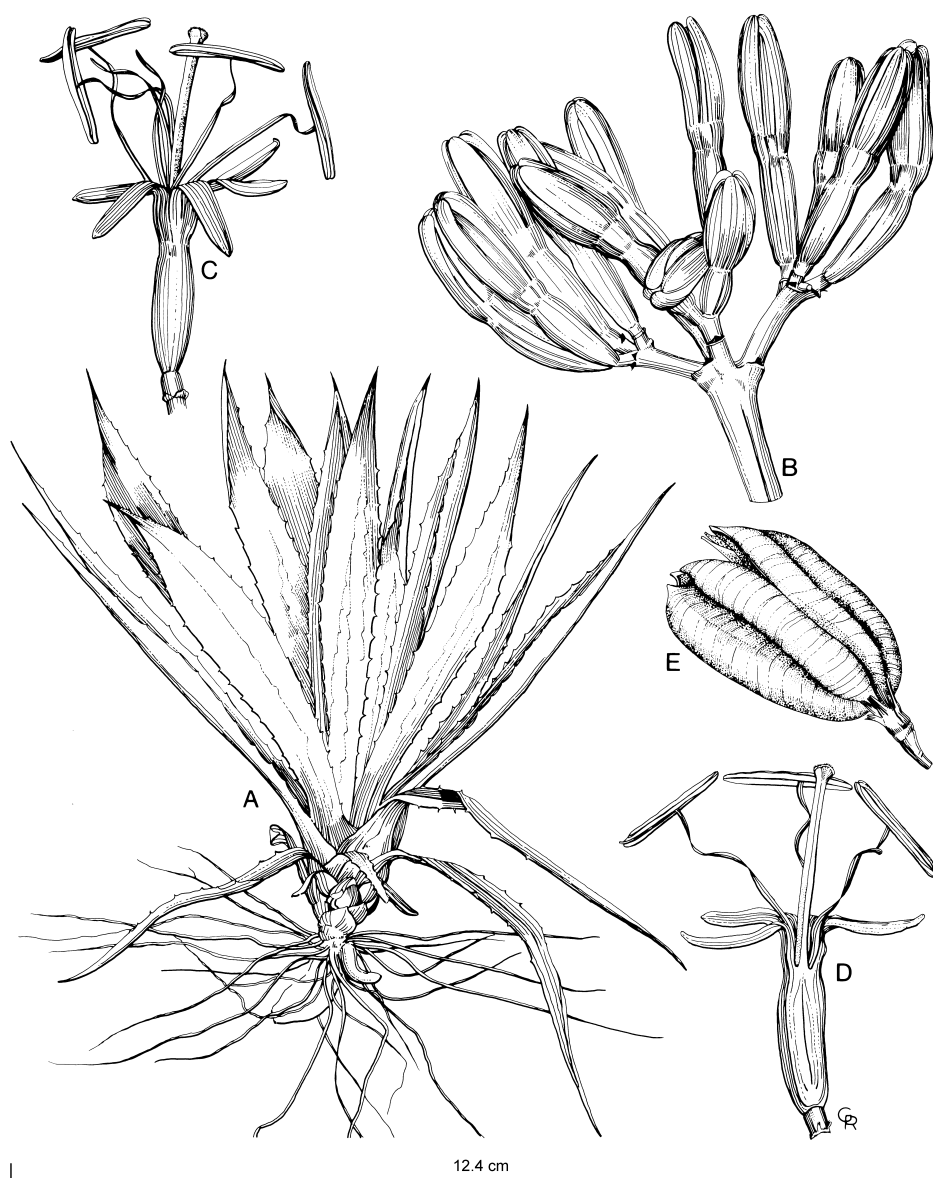


Figure 15. *Agave*. **A**, *A. vivipara*, habit, small sucker $\times 0.5$ (H.Dillewaard & A.Self 19, BRI). **B–D**, *A. sisalana*. **B**, raceme $\times 0.7$; **C**, flower $\times 0.7$; **D**, L.S. flower $\times 0.7$ (B–D, P.Forster 1816, BRI). **E**, *A. americana* var. *expansa*, fruit $\times 0.7$ (P.Forster 1818, BRI).

3. FURCRAEA*P.I. Forster**Furcraea* Vent., *Bull. Soc. Philom.* 1: 65 (1793); after Antoine Francois de Fourcroy.Type: *F. cubensis* (Jacq.) Vent.

Plants arborescent or shrubby, stem sometimes very short. Leaves tufted or in rosettes, long-lived, succulent, weakly spine-tipped; margin spinose-dentate. Inflorescence scapose, terminal, paniculate. Flowers bisexual, 1–3 axillary in bracts or replaced by bulbils, pendent, campanulate. Sepals and petals elongate-ovoid, spreading, united basally, inner surface white, outer surface greenish. Stamens attached basally to perianth; filaments thickened below middle; anthers dorsifixed, linear-oblong. Ovary inferior, 3-locular; ovules numerous, in 2 rows per locule; style stout, thickened below; stigma small, 3-lobed. Fruit a capsule. Seeds flattened, black.

An American genus of c. 20 species; in Australia 2 introduced species commonly cultivated and naturalised around sites of habitation. Incorrect orthographic variants include *Furcroya* Raf. (1814), *Fourcroya* Sprengel (1817), *Fourcroea* Haw. (1819) and *Furcroea* Benth. & J.D.Hook. (1883).

J.R.Drummond, The literature of *Furcraea* with a synopsis of the known species, *Ann. Rep. Missouri Bot. Gard.* 18: 25–75 (1907).

Mature leaves narrowly lanceolate; margin toothed over entire length

1. *F. selloa*

Mature leaves broadly oblanceolate; margin toothless or toothed only in lower half

2. *F. foetida***1. **Furcraea selloa* K.Koch, *Wochenschr. Gärtnerei Pflanzenk.* 3: 22 (1860)**T: from Columbia, *collector unknown*; *n.v.*

Plant with stem to 1 m high. Leaves narrowly lanceolate, basally narrowed, 90–130 cm long, 7–15 cm wide, glossy dark green with yellow margins on variegated cultivar; margin with teeth for entire length, teeth antrorsely hooked, 7–8 mm long, 3–5 cm apart, reddish brown; terminal spine weak, 5–10 mm long, grey-brown. Inflorescence 6–10 m high. Flowers 4–6.5 cm long, 3–5 cm wide. Sepals and petals similar, fused at base, 4–6.5 cm long. Fruit not seen. Axillary bulbils common.

A garden escape in coastal eastern Qld. Map 94.

Qld: Latrobe Terrace, Paddington, *P.I. Forster 1767* (BRI).

A variegated clone cultivated as an ornamental. No reliable flowering material available.

2. **Furcraea foetida* (L.) Haw., *Syn. Pl. Succ.* 1: 73 (1812)

Agave foetida L., *Sp. Pl.* 1: 323 (1753). T: illustration in Commelin, *Hort. Med. Amstel. Pl.* 2: 35 t. 18 (1706); lecto, *fide* D.O.Wijnands, *Bot. Commelins* 38 (1983).

Furcraea gigantea Vent., *Bull. Soc. Philom.* 1: 65 (1793), *nom. illeg.*, *fide* D.O.Wijnands, *loc. cit.* T: from Costa Rica, *collector unknown*; *n.v.*

Plant with stem to 50 cm high. Leaves broadly oblanceolate to lanceolate, 120–150 cm long, 7–16 cm wide, glossy green; margin toothless or with teeth in lower half only, the teeth antrorsely hooked, 7–8 mm long, 1.5–6 cm apart, reddish-brown; terminal spine flexible, 5 mm long, brown. Inflorescence 6–10 m high. Flowers 3.5–4 cm long, 4–4.5 cm wide; pedicels 6–10 mm long. Sepals and petals similar, 2.5–3.3 cm long, outer 11–14 mm wide, inner 14–18 mm wide. Filaments 10–11 mm long; anthers 4–5 mm long. Ovary 5–6 mm long; style 10–11 mm long; stigma 1 mm long. Fruit not seen. Bulbils present. Fig. 14D–G.

A garden escape naturalised in southern and central Qld and northern coastal N.S.W. Map 95.

Qld: near quarry, Mt Coot-tha, *J.G.Conran 111* (BRI); Latimers Crossing, Nerang R., *P.I.Forster 1766* (BRI). N.S.W.: North Head, Brunswick Heads, *K.Wilson 5760* (NSW).

Tested for fibre production in plantations in northern N.S.W. and coastal Qld between 1890 and 1920.

4. SANSEVIERIA

P.I.Forster

Sansevieria Thunb., *Prodr. Pl. Cap.* 65 (1794); after Raimond de Sangro, Prince of Sanseviero, an 18th-Century Italian patron of horticulture.

Type: *S. hyacinthoides* (L.) Druce

Shrubby perennials, usually with very short stems, often stoloniferous. Leaves entire, succulent, erect, flat, terete or semi-terete, fibrous, on a subterranean rhizome. Inflorescence terminal; racemes simple or paniculate. Flowers clustered in alternate axils of scarious bracts; pedicels articulate. Sepals and petals united at base in a tube, narrowly linear, equal, recurved at anthesis. Stamens 6, inserted in top of perianth tube; filaments filiform; anthers medifixed. Ovary superior, 3-locular; ovules 3 per locule; style filiform; stigma simple, slightly thickened, entire. Fruit a berry. Seeds 1–3, globular.

An African and tropical Asian genus of c. 100 species; in Australia 1 introduced species apparently naturalised. The genus *Sansevieria* is sometimes placed in the segregate family Dracaenaceae.

N.E.Brown, *Sansevieria*, Monograph of the known species, *Bull. Misc. Inform.* 1915: 185–261 (1915).

****Sansevieria trifasciata* Prain, *Bengal Pl.* 2: 1054 (1903)**

T: cultivated; *n.v.*

Plant with very short stem, strongly stoloniferous; rhizome sympodial, yellow-red. Leaves 2–6 per plant, 40–175 cm long, 2.5–9 cm wide, dark green with many conspicuous light or greyish-green, irregularly defined transverse bands; margin narrow, light green or reddish. Raceme erect, 40–75 cm long including scape; flower clusters scattered or in groups; pedicels 6–8 mm long. Perianth 2.5–3 cm long, greenish-white, scented, the segments broadening to greenish tip. Stamens 7–8 mm long; filaments 6–7 mm long; anthers 2 mm long. Style 15–18 mm long; stigma 0.5–1 mm long. Berry 7–9 mm diam., orange. Seeds 2, oblong, 6–7 mm long, 5 mm wide, cream-brown. *Mother-in-law's Tongue*. Fig. 16.

Isolated records from northern Qld and a garden escape in southern Qld. Map 96.

Qld: Endeavour R., 1884, *Persieh* (MEL); Murray Is., Torres Strait, 5 Apr. 1971, *N.Lawrie* (BRI); near Toowong Cemetery, Rainworth, *P.I.Forster 1817* (BRI).

A plant that may be this species is cultivated for fibre on Torres Strait Islands and is known as *Kosker*.

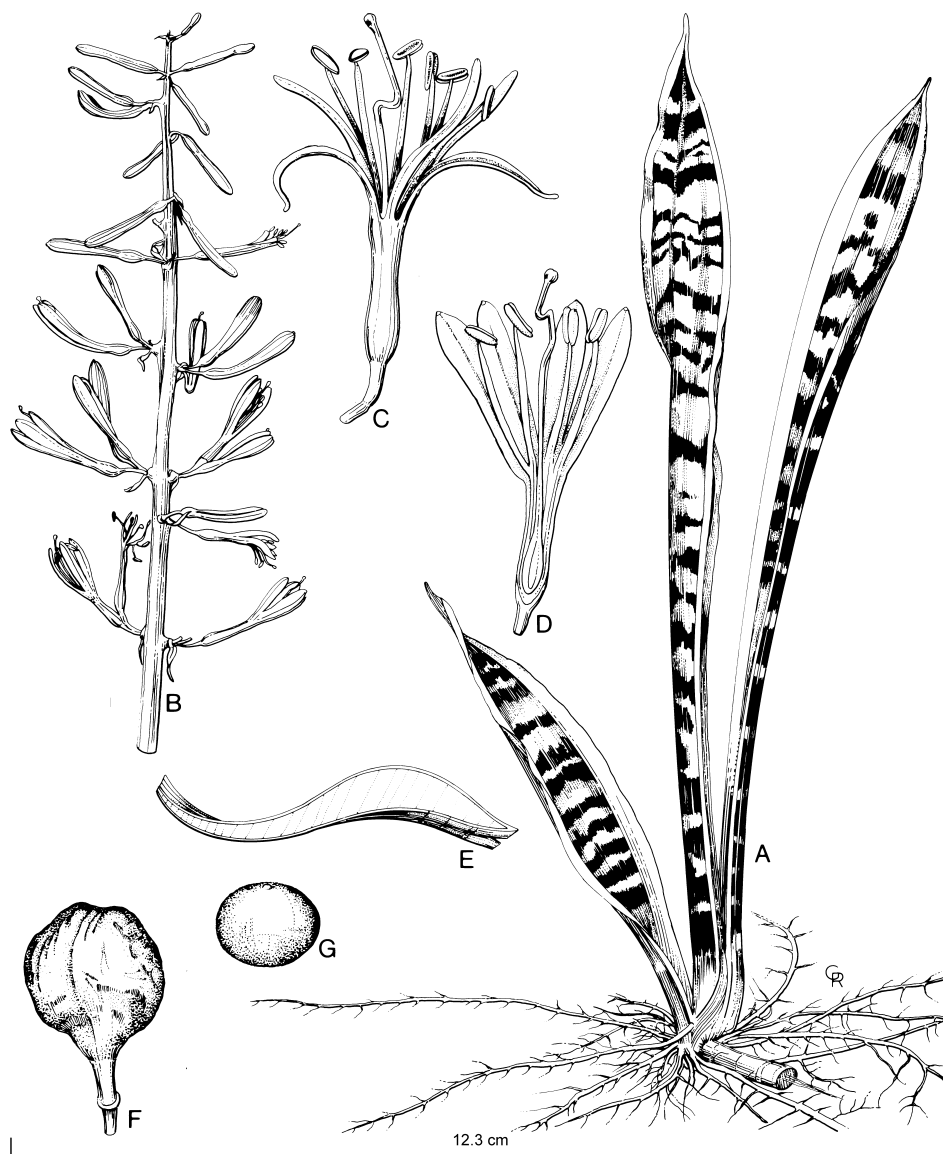


Figure 16. *Sansevieria*. A, *S. trifasciata* 'Laurentii', habit $\times 0.5$ (P.Forster 1962, BRI). B–G, *S. trifasciata*. B, inflorescence $\times 0.7$; C, flower $\times 1.3$; D, L.S. flower $\times 1.3$; E, T.S. leaf midsection $\times 1$ (B–E, P.Forster 1817, BRI); F, fruit $\times 1.3$; G, seed $\times 1.3$ (F–G, J.Conran 108, BRI).

5. PLEOMELE*L. Pedley*

Pleomele Salisb., *Prodr. Stirp.* 245 (1796); from the Greek *pleos* (full) and *meli* (honey), an allusion to abundant nectar produced by flowers of one species seen by Salisbury.

Type: *P. fragrans* (L.) Salisb.

Plants arborescent or shrubby; stems woody, often very short. Leaves thin or thinly coriaceous, usually with prominent midrib beneath, not fleshy. Inflorescence a raceme or panicle. Flowers bisexual, regular. Sepals and petals united into a tube at least $\frac{1}{3}$ as long as the lobes. Stamens 6; anthers medifixed; filaments filiform, inserted on perianth tube. Ovary superior; ovules 1 in each loculus. Fruit a berry. Seeds ellipsoidal or discoidal, to more than 1 cm long, black or brown.

About 140 species in the tropics and subtropics of the Old World, extending to the Hawaiian Is.; 1 species native in northern Australia. Many species are cultivated as ornamentals. The genus is sometimes included in *Dracaena* L. and referred to the family Dracaenaceae.

N.E. Brown, Notes on the genera *Cordyline*, *Dracaena*, *Pleomele*, *Sansevieria* and *Taetsia*, *Bull. Misc. Inform.* 1914: 273–279 (1914).

***Pleomele angustifolia* (Medikus) N.E.Br., *Bull. Misc. Inform.* 1914: 277 (1914)**

Terminalis angustifolius Medikus, *Theodora* 83 (1786); *Dracaena angustifolia* (Medikus) Roxb., *Hort. Bengal.* 24 (1814); *Sansevieria fruticosa* Blume, *Enum. Pl. Java.* 1: 11 (1837); *Cordyline rumphii* Hook., *Bot. Mag.* t. 4279 (1847). T: based on description and plate, Rumphius, *Herb. Amboin.* 4: 81 t. 35 (1743).

Dracaena angustifolia var. *honorae* Bailey, *Queensland Agric. J.* 27: 68 (1911). T: cultivated; *n.v.*

[*Dracaena reflexa* auct. non Lam. (1786): F. Mueller, *Fragm.* 6: 121 (1868)]

Illustrations: W.J. Hooker, *Bot. Mag.* t. 4279 (1847); T.H. Everett, *New York Bot. Gard. Ill. Encycl. Hort.* 4: 1127 (1981) as var. *honorae*.

Slender shrub to 8 m tall, sparingly branched, often sprawling when large, glabrous. Leaves sessile, long-pointed, 17–40 cm long, 2–3 cm wide; cultivated plants sometimes with yellowish bands parallel to margins. Panicles terminal, 15–40 cm long. Flowers in pairs; pedicels 5–10 mm long. Perianth 15–30 mm long; lobes spreading, slightly longer than tube. Berry 1–1.5 cm diam., red.

Occurs in extreme north of N.T. and eastern coast of Qld from Cape York to about Cairns, in closed forest, often in sand near the sea. Map 97.

N.T.: Darwin, *F.A.K. Bleeser* 514 (MEL, NSW); west coast opposite Peron Is., *N.B. Byrnes* 1669 (BRI, NSW); Banjo Jungle, Melville Is., 11°35'S, 131°00'E, 17 Mar. 1977, *T. Angeles* (BRI, CANB). Qld: Yorke Is., 9°45'S, 143°24'E, *J.R. Clarkson* 3988 (BRI, K, NT, PERTH, QRS); Gap Creek, 12 km N of Ayton, 15°15'S, 145°20'E, *D.F. Blaxell* 1171 (BRI, NSW).

Dracaena angustifolia var. *honorae* has leaves distinctly banded along their margins with ivory-yellow. It was described from material collected on Stephens Is. [Torres Strait, Qld], but no type specimen has been found. It is probably best treated as a cultivar of *Pleomele angustifolia*.

6. CORDYLINE*L. Pedley*

Cordyline Comm. ex R.Br., *Prodr.* 280 (1810), *nom. cons.* non *Cordyline* Adans. (1963), *nom. rej.*; from the Greek *kordyle* (club), an allusion to the club-like roots of some species.

Type: *C. cannifolia* R.Br.

Taetsia Medikus, *Theodora* 82 (1786), *nom. rej.* T: *T. ferrea* (L.) Medikus

Charlwoodia Sweet, *Fl. Australasica* t. 18 (1827); *Cordyline* sect. *Charlwoodia* (Sweet) F.Muell., *Fragm.* 5: 195 (1866). T: *C. congesta* Sweet = *Cordyline congesta* (Sweet) Steudel

Calodracon Planchon, *Fl. Serres Jard. Eur.* 6: 137 (1850–1851); *Cordyline* § *Calodracon* (Planchon) Baker, *J. Linn. Soc., Bot.* 14: 539 (1875). T: not designated.

Erect or sprawling glabrous shrubs to 5 m; stems woody with annular scars when young. Leaves crowded on tips of branches, narrowed into a petiole or not; base of petiole widened into a sheath. Inflorescence a terminal or lateral panicle. Flowers bisexual, regular. Sepals and petals united at base. Stamens 6; anthers medifixed; filaments inserted at base of perianth. Ovary superior; stigma capitate or 3-lobed; ovules 2–16 in each locule. Fruit a berry. Seeds black, shining.

About 20 species in the tropics and subtropics, mostly S & E Asia to New Zealand, but also Africa and South America; 8 species in eastern Australia. The genus is sometimes placed in either the Asphodelaceae or Asteliaceae.

J.D.Hooker, The species of *Cordyline* in cultivation from New Zealand and Australia, *Gard. Chron.* 1860: 791–792 (1860); J.G.Baker, *Cordyline*, in Revision of the genera and species of Asparagaceae, *J. Linn. Soc., Bot.* 14: 538–545 (1874); G.Bentham, *Cordyline*, *Fl. Austral.* 7: 20–22 (1878); W.J.Griffin & Pagow Maunwongyathi, A comparison of four species of *Cordyline*, *Pl. Medica* 17(4): 346–360 (1969).

- | | | |
|----|--|--------------------------------|
| 1 | Petiole not distinct from lamina, or petiole distinct but flat and not distinctly grooved or tubular in section; petals longer than sepals | 1. <i>C. stricta</i> |
| 2 | Fruit black when mature; leaf up to 2 cm wide; petiole not distinct from lamina | |
| 2: | Fruit red or orange-red when mature; leaf 2 cm or more wide; petiole usually distinct from lamina | |
| 3 | Leaf margin especially at junction of lamina and petiole breaking down irregularly, rough; inflorescence congested, with several branches at the same node | 2. <i>C. congesta</i> |
| 3: | Leaf margin at junction of lamina and petiole smooth; inflorescence not congested | 3. <i>C. rubra</i> |
| 1: | Petiole distinct from lamina, grooved or tubular and crescentic in section; sepals and petals equal | |
| 4 | Lamina usually less than 15 cm long, abruptly narrowed and almost rounded at junction with petiole; petiole less than 5 mm wide | 4. <i>C. murchisoniae</i> |
| 4: | Lamina usually more than 20 cm long, more gradually narrowed at base; petiole more than 5 mm wide | |
| 5 | Leaves usually 20–50 cm long, glaucous beneath especially when fresh | 7. <i>C. cannifolia</i> |
| 5: | Leaves 25–80 cm long, not glaucous beneath | |
| 6 | Pedicels 7–12 mm long (longer in fruit) | 8. <i>C. manners-suttoniae</i> |
| 6: | Pedicels to 2 mm long | |
| 7 | Petiole 30–50 cm long, strongly inrolled; perianth 6–7.5 mm long | 6. <i>C. petiolaris</i> |
| 7: | Petiole 8–20 cm long, concave above; perianth 9–12 mm long | 5. <i>C. fruticosa</i> |

1. *Cordyline stricta* (Sims) Endl., *Ann. Wiener Mus. Naturgesch.* 1: 162 (1836)

Draacaena stricta Sims, *Bot. Mag.* t. 2575 (1825). T: not designated, probably the illustration.

Illustration: W.R.Elliot & D.L.Jones, *Encycl. Austral. Pl.* 3: 89 (1984).

Shrub to 5 m tall, often sprawling and branched towards base. Leaves linear, not or only slightly narrowed towards base, 35–50 cm long, 1–2 cm wide; margins smooth. Panicles 20–40 cm long; scape 15–30 cm long; pedicels 1.5–2.5 mm long. Perianth glabrous; petals 8–9.5 mm long, 1.5–4 mm longer than sepals. Fruit 1–1.5 cm diam., black. Fig. 17A–B.

Occurs from the Qld/N.S.W. border to the latitude of Sydney, on coastal lowlands and mountains, in rainforest and wet eucalypt forest. Map 98.

N.S.W.: Mallara State Forest, 32 km ESE of Tenterfield, *E.F.Constable 1170* (NSW); Mines Road Flora Reserve, Bellangry State Forest, 31°20'S, 152°37'E, *R.Coveny 10860* (BRI, K, NSW); Olney State Forest, 40 km SW of Newcastle, 26 May 1960, *E.F.Constable* (NSW).

The only Australian species of *Cordyline* with black fruits, but often confused with *C. congesta*.

2. *Cordyline congesta* (Sweet) Steudel, *Nom. Bot.* 2nd edn, 1: 419 (1840)

Charlwoodia congesta Sweet, *Fl. Australasica* t. 18 (1827); *Draacaena congesta* (Sweet) Schultes & J.H.Schultes, in J.J.Roemer & J.H.Schultes, *Syst. Veg.* 7(2): 1675 (1830); *Cordyline stricta* var. *congesta* (Sweet) Asch. & Graebner, *Syn. Mitteleur. Fl.* 3: 289 (1905) (combination not formally made). T: plate in R.Sweet, *loc. cit.*

Cordyline rigidifolia K.Koch, *Wochenschr. Gärtnerei Pflanzenk.* 1: 359 (1854); *Charlwoodia rigidifolia* (K.Koch) K.Koch & Bouché, *Index Sem. Hort. Bot. Berol.* Anno 1855 Coll., App. 11 (1855); *Cordyline stricta* var. *rigidifolia* (K.Koch) Asch. & Graebner, *Syn. Mitteleur. Fl.* 3: 288 (1905) (combination not formally made). T: not designated.

Cordyline augustifolia Kunth, *Enum. Pl.* 5: 32 (1850); *Cordyline stricta* var. *augustifolia* (Kunth) Asch. & Graebner, *Syn. Mitteleur. Fl.* 3: 289 (1905) (combination not formally made). T: not designated.

Shrub, sparingly branched, to 3 m tall. Leaves 30–40 cm long, 2–4 cm wide; lamina narrowed into a shallowly convex petiole 10–20 cm long; margins of petiole and lower half of leaf cartilaginous, irregularly dentate and rough. Panicles 20–35 cm long; scape 10–30 cm long; pedicels 0.5–1 mm long. Perianth glabrous; petals 8.5–10.5 mm long, 1–2 mm longer than sepals. Fruit 1–1.5 cm diam., orange-red. Fig. 17C–D.

Occurs in extreme south-eastern Qld and north-eastern N.S.W. on margins of and in rainforest. Distribution in N.S.W. not known with certainty. Map 99.

Qld: Lamington Plateau, 6 Mar. 1978, *C.Harman* (BRI); Springbrook, 9 Dec. 1959, *F.D.Hockings* (BRI). N.S.W.: between Kingscliff & Boganor Headland, 4 Feb. 1961, *H.W.Caulfield* & *W.G.Trappnell* (BRI).

Frequently confused with *C. rubra* and *C. stricta* but differs from both in having leaves with rough margins.

3. *Cordyline rubra* Otto & A.Diet., *Allg. Gartenzeitung* 16: 121 (1848)

T: not designated.

Illustration: W.R.Elliot & D.L.Jones, *Encycl. Austral. Pl.* 3: 88 (1984).

Shrub to 4 m tall, sometimes branched. Leaves 15–50 cm long, 3–4.5 cm wide; lamina gradually narrowed into a flat or slightly concave petiole 5–20 cm long. Panicles to 40 cm long; scape 20–30 cm long; pedicels 1–2 mm long. Perianth glabrous; petals 7–10 mm long, c. 1 mm longer than sepals. Fruit c. 1 cm diam., red. Fig. 17J–K.

Occurs in south-eastern Qld and north-eastern N.S.W. from about Bundaberg to Lismore, in coastal lowlands and mountains in rainforest and wet open-forest, sometimes in sandy soils. Map 100.

Qld: Fraser Is., *L.J.Webb* & *J.G.Tracey 6342* (BRI, CANB); Mt Cooroy, *L.S.Smith 11404* (BRI); D'Aguilar Ra., 27°17'S, 152°45'E, *V.K.Moriarty 1204, 1205 & 1206* (BRI, CANB). N.S.W.: Whian Whian State Forest, 24 km N of Lismore, *E.F.Constable 6489* (NSW).

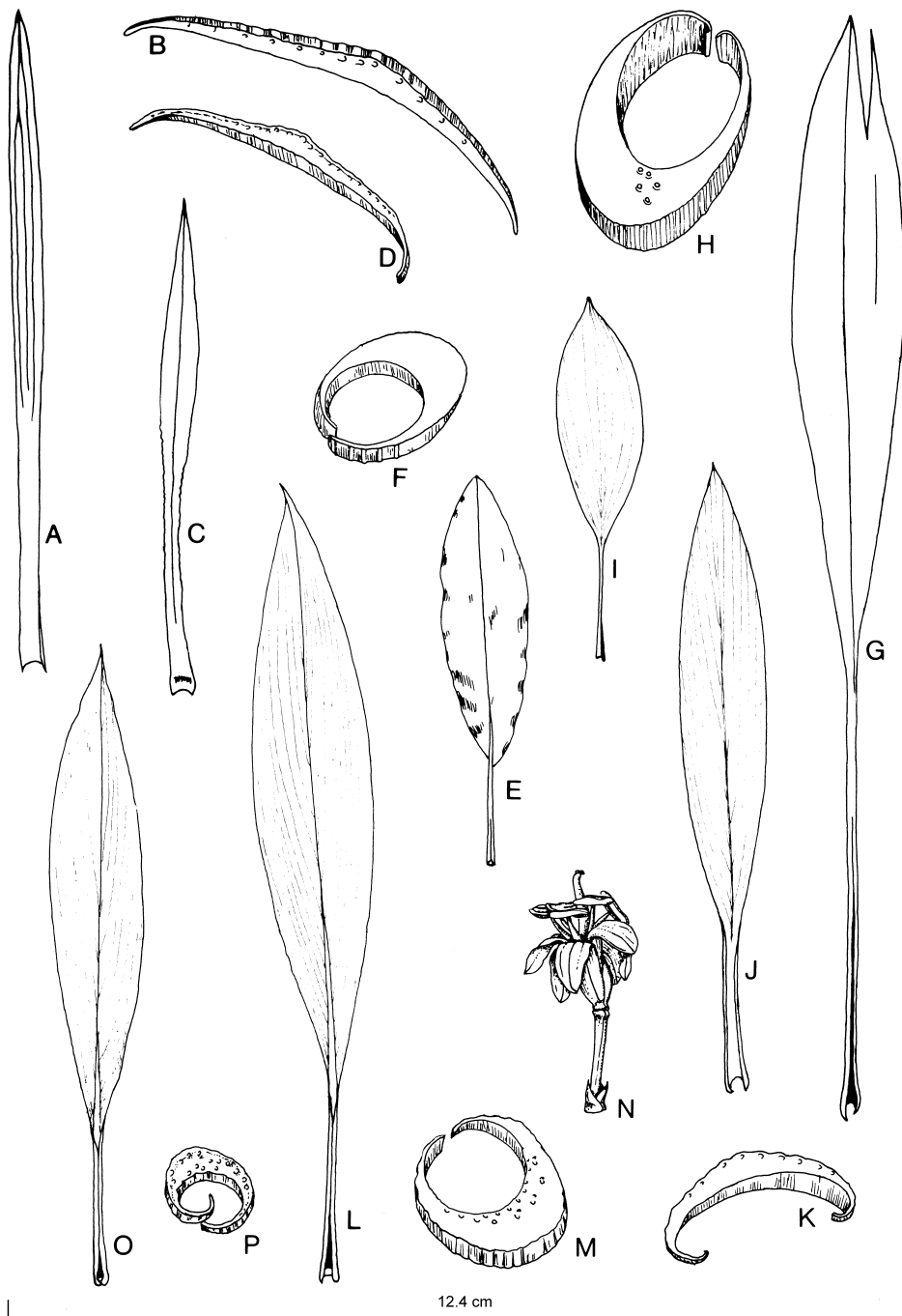


Figure 17. *Cordyline*. **A–B**, *C. stricta*. **A**, leaf $\times 0.2$; **B**, T.S. near leaf base $\times 3$. **C–D**, *C. congesta*. **C**, leaf $\times 0.2$; **D**, T.S. near leaf base $\times 3$. **E–F**, *C. fruticosa*. **E**, leaf $\times 0.1$; **F**, T.S. petiole $\times 3$. **G–H**, *C. petiolaris*. **G**, leaf $\times 0.2$; **H**, T.S. petiole $\times 3$. **I**, *C. murchisoniae*, leaf $\times 0.4$. **J–K**, *C. rubra*. **J**, leaf $\times 0.3$; **K**, T.S. petiole $\times 3$. **L–N**, *C. manners-suttoniae*. **L**, leaf $\times 0.3$; **M**, T.S. petiole $\times 3$; **N**, flower $\times 1.5$. **O–P**, *C. cannifolia*. **O**, leaf $\times 0.3$; **P**, T.S. petiole $\times 3$. All from living material.

4. *Cordyline murchisoniae* F.Muell., *Fragm.* 5: 195 (1866)

T: Mitchell Creek, Herbert River, Qld, Oct. 1864, *J.Dallachy*; holotype: MEL.

Cordyline haageana K.Koch, *Wochenschr. Gärtneri Pflanzensk.* 10: 195 (1867). T: not designated.

Shrub less than 1 m tall, often single-stemmed. Leaves 10–15 cm long, rarely to 18 cm, 3–5 cm wide; lamina abruptly contracted into a petiole 4–6 cm long and grooved above. Panicles to 16 cm long; scape c. 8 cm long; pedicels 3–5 mm long. Sepals and petals equal, 7–9 mm long, glabrous. Fruit c. 1 cm diam., red. Fig. 17 I.

Occurs in coastal Qld from about Bundaberg to Babinda, in rainforest, often rather dry, and adjacent open forest. Map 101.

Qld: Coldwater, Abergowrie, *V.K.Moriarty* 973 (BRI, CANB); Michael Ck, Mt Fox, 18°49'S, 145°51'E, *M.S.Clemens* 1559 (BRI, CANB, K, L, MO); Kelsey Ck, near Proserpine, *N.Michael* 1142 (BRI).

5. *Cordyline fruticosa* (L.) A.Chev., *Cat. Pl. Jard. Bot. Saigon* 66 (1919)

Convallaria fruticosa L., *Amoen. Acad.* 4: 1126 (1759); *Asparagus terminalis* L., *Sp. Pl.* 2nd edn, 450 (1762), *nom. illeg.*; *Dracaena terminalis* (L.) Jacq., *Icon. Pl. Rar.* t. 448 (1781–1795); *Cordyline terminalis* (L.) Kunth, *Abh. Königl. Acad. Wiss. Berlin* 1842: 30 (1842); *Calodracon terminalis* (L.) Planchon, *Fl. Serres Jard. Eur.* 6: 137 (1850–1851); *Cordyline jacquinii* Kunth, *loc. cit.* T: based on description and plate, Rumphius; *Herb Amboin.* 4: 79 t. 34 (1743).

Cordyline hedychioides F.Muell., *Fragm.* 5: 196 (1866); *Cordyline terminalis* var. *hedychioides* (F.Muell.) Baker, *J. Linn. Soc., Bot.* 14: 541 (1875). T: Cape York, Qld, *E.Daemel*; holotype: MEL; iso: K.

Illustrations: O.Degener, *Ferns & Fl. Pl. Hawaii Natl Park* t. 22 (1930); A.C.Smith, *Fl. Vitiensis Nova* 1: t. 48 (1979); T.H.Everett, *New York Bot. Gard. Ill. Encycl. Hort.* 3: 865 (1981).

Shrub, often single-stemmed, usually 2–3 m tall, rarely to 5 m; stems and leaves sometimes reddish. Leaves 25–80 cm long, 5–12 cm wide; lamina abruptly contracted to petiole 8–20 cm long and concave above. Panicles 20–30 cm long; scape 15–20 cm long; flowers sessile or on pedicels to 2 mm long. Sepals and petals equal, 9–12 mm long, glabrous. Fruit c. 1 cm diam., reddish. Fig. 17E–F.

A variable species cultivated by native peoples through Malasia and the Pacific and sometimes naturalised. It is cultivated in warmer parts of Australia and is possibly native to the extreme north of Cape York Peninsula, Qld. Map 102.

Qld: Yam Is., 9°54'S, 142°47'E, 31 May 1972, *M.Lawrie* (BRI); Cape York, *C.Hartmann* (MEL).

Cordyline hedychioides has thick somewhat undulate leaves and rather small flowers. It is referred to *C. fruticosa* but may prove to be at least varietally distinct. It is not known whether the specimens of Daemel and Hartmann were collected from cultivated plants.

6. *Cordyline petiolaris* (Domin) Pedley, *Fl. Australia* 46: 220 (1986)

Cordyline terminalis var. *petiolaris* Domin, *Biblioth. Bot.* 85: 517 t. 17 (1915). T: Tambourine Mt, Qld, Mar. 1910, *K.Domin*; holotype: n.v.

Illustration: K.Domin, *op. cit.* fig. 1, 2; K.A.Williams, *Native Pl. Queensland* 1: 74 (1979).

Shrub to 5 m tall, often sprawling and branched. Leaves 45–85 cm long, 6–15 cm wide, or larger; lamina often bent downwards about the middle and irregularly frayed at the tip, narrowed into inrolled petiole, 30–50 cm long. Panicles c. 30 cm long; scape 30–50 cm long, becoming pendulous; flowers subsessile. Sepals and petals equal, 6–7.5 mm long, glabrous. Fruit 0.7–1 cm diam., red. Fig. 17G–H.

Occurs in south-eastern Qld and north-eastern N.S.W. from south-west of Gladstone to about Kempsey, in rainforest and wet eucalypt forest. Map 103.

Qld: Kroombit Tops, 60 km SW of Gladstone, *W.J.F.McDonald* 2241 & *P.Stanton* (BRI); Bunya Mts, *C.T.White* 9132 (BRI); Mt Roberts, McPherson Ra., *S.T.Blake* 21414 (BRI). N.S.W.: Edinburgh Castle State Forest, 8 km E of Urbenville, *E.F.Constable* 6612 (NSW).

Distinguished from other species by its large leaves, which often bend about the middle and split irregularly at the tips, and long inrolled petioles.

7. *Cordyline cannifolia* R.Br., *Prodr.* 280 (1810)

Sansevieria cannifolia (R.Br.) Sprengel, *Syst. Veg.* 2: 93 (1825); *Cordyline terminalis* var. *cannifolia* (R.Br.) Baker, *J. Linn. Soc., Bot.* 14: 541 (1875). T: Shoalwater Bay, [Qld], Aug. 1802, R.Brown; holo: ?BM n.v.; iso: K, MEL.

Erect shrub, often single-stemmed, usually 0.6–2 m tall, occasionally to 5 m. Leaves 20–50 cm long, rarely to 18 cm, 5–12 cm wide, glaucous beneath with conspicuous, widely spaced secondary nerves; petiole grooved above, 5–20 cm long. Panicles to 25 cm long; scape to 50 cm long; pedicels 1–2 mm long. Sepals and petals equal, 6–8 mm long, minutely fimbriate at the tips. Fruit c. 1 cm diam., red. Fig. 17 O–P

Occurs in extreme northern N.T., and in Qld from Cape York Peninsula to about Rockhampton, in rainforest and wet eucalypt forest, on coastal ranges and lowlands. Map 104.

N.T.: 40 km SW of Goyder River Crossing, N.B.Byrnes 2637 (CANB, K). Qld: Iron Ra., L.J.Brass 19145 (BRI); Lower Bloomfield R., L.S.Smith 11091 (BRI, K); Miriwinni, L.J.Webb & J.G.Tracey 8168 (BRI, K, L, MO).

A common species in rainforest of northern Qld. It is extremely variable in leaf size, but is characterised by the glaucous lower surface of the leaf lamina, particularly when alive.

8. *Cordyline manners-suttoniae* F.Muell., *Fragm.* 5: 195 (1866)

Cordyline terminalis var. *manners-suttoniae* (F.Muell.) Baker, *J. Linn. Soc., Bot.* 14: 541 (1875). T: Mt Elliot, Qld, E.F.A.Fitzalan; lecto: MEL 645614, fide L.Pedley, *Fl. Australia* 46: 220 (1986).

Illustration: W.R.Elliot & D.L.Jones, *Encycl. Austral. Pl.* 3: 87 (1984).

Erect shrub, sometimes branched, to 4 m tall. Leaves 35–65 cm long, 6–12 cm wide, with widely spaced secondary nerves, but not glaucous beneath; petiole grooved above, 12–30 cm long. Panicles to 25 cm long; scape to 35 cm long; pedicels 7–12 mm long. Sepals and petals equal, 10–12 mm long, glabrous. Fruit 1–1.5 cm diam., red. Fig. 17L–N.

Occurs along coastal Qld from about Cooktown to Rockhampton, in swamp forest and rainforest in poorly drained situations. Map 105.

Qld: Cairns, c. 16°54'S, 145°45'E, V.K.Moriarty 1163 (BRI, CANB); Lower Tully–Googarra road, 18°00'S, 146°02'E, B.P.M.Hyland 8844 (BRI, QRS); Shoalwater Military Reserve, 22°43'S, 150°36'E, J.R.Clarkson 839 & T.D.Stanley (BRI); Rockhampton, A.Dietrich 1129 (BRI, K, MEL).

Doubtful and excluded names

Cordyline spectabilis Kunth & Bouché ex Kunth, *Index Sem. Hort. Bot. Berol.* Anno 1847 Coll., App. 11 (1848).

T: not designated.

The name is possibly a synonym of *Cordyline congesta* (Sweet) Steudel.

Cordyline stricta var. *discolor* Wieg., in L.H.Bailey, *Cycl. American Hort.* 1: 371 (1900).

T: not designated.

The name probably was applied to a minor variant of *C. stricta*.

Cordyline stricta var. *grandis* Wieg., in L.H.Bailey, *Cycl. American Hort.* 1: 371 (1900).

T: not designated.

The name probably was applied to a minor variant of *C. stricta*.

Cordyline terminalis var. *baileyi* Bailey, *Queensland Bot. Bull.* 9: 11 (1984).

T: cultivated; n.v.

The brief description could apply to a variegated variant of either *C. fruticosa*, which was widely cultivated in south-eastern Qld at the time, or *C. rubra* which occurs naturally close to Pimpama, Qld, where the plant was reported to have been found 'a few years ago by Mr W.T.Bailey'. No specimens annotated by F.M.Bailey have been found.

7. DORYANTHES

L.Pedley

Doryanthes Corr. Serr., *Trans. Linn. Soc. London* 6: 211 (1802); from the Greek *dory* (a spear) and *anthos* (flower), in reference to the long spear-like peduncle of the inflorescence.

Type: *D. excelsa* Corr. Serr.

Plants large, with very short stem. Radical leaves numerous, long, each with a brown tubular tip. Inflorescence a large, scapose, terminal oblong thyrses or globular compound raceme. Flowers bisexual, large, red. Sepals and petals united at base into a tube enclosing the ovary; free parts spreading. Staminal filaments adnate to perianth for about ½ their length, inserted into a pit at base of anther. Ovary inferior; ovules 40–50 per locule. Fruit a large loculicidal capsule. Seeds winged, flattened.

A genus of 2 species confined to eastern Australia, both species sometimes cultivated. It is sometimes considered to be the sole member of the family Doryanthaceae.

I.V.Newman, Life History of *Doryanthes excelsa*. Part 1. Some ecological and vegetative features and spore production, *Proc. Linn. Soc. New South Wales* 53: 499–538 (1928).

Inflorescence a globular compound raceme; leaves to c. 2.5 m long

1. *D. excelsa*

Inflorescence a large thyrses; leaves more than 2.5 m long

2. *D. palmeri*

1. *Doryanthes excelsa* Corr. Serr., *Trans. Linn. Soc. London* 6: 211, t. 23–24 (1802)

T: Port Jackson, N.S.W., *G.Bass*; *n.v.*

Furcraea australis Haw., *Syn. Pl. Succ.* 1: 74 (1812). T: cultivated; *n.v.*

Illustrations: E.Rotherham *et al.*, *Fl. Pl. New South Wales & Southern Queensland* 55 t. 135 & 136 (1975); J.Ruymen, *Growing Native Pl.* 12: 294 & cover (1983); W.R.Elliot & D.L.Jones, *Encycl. Austral. Pl.* 3: 330 (1984).

Rootstock short, vertical. Leaves radical, tough, swordlike, to 2.5 m long, 10 cm wide. Scape erect, up to 5 m tall, with scattered short linear-lanceolate erect leaves sheathing at base. Flowers c. 10 cm long, red, arranged in a globular, compound raceme up to 0.7 m diam. Capsule c. 10 cm long. *Giant Lily*, *Gymea Lily*.

Occurs on coastal N.S.W. in the vicinity of Sydney and north to Karnah, in eucalypt open-forest in deep soils derived from sandstone. Map 106.

N.S.W.: 18 km NE of Glenorie, *J.Campbell & J.Pickard* 1202 (NSW); SW of Gosford, 14 June 1964, *B.G.Briggs* (NSW); [Royal] Natl Park, Sydney, *A.Morrison* 5574 (K, MEL); Bulli Pass, *R.H.Goode* 212 (NSW).

2. *Doryanthes palmeri* W.Hill ex Benth., *Fl. Austral.* 6: 452 (1873)

D. excelsa var. *palmeri* Bailey, *Syn. Queensland Fl.* 538 (1833). T: plant cultivated in Brisbane Botanic Gardens, *W.Hill*; syn: K; sources of the Mackenzie River, *C.H.Hartmann*; syn: MEL.

D. guilfoylei Bailey, *Queensland. Dept Agric. Bot. Bull.* 7: 67 (1893); *D. excelsa* var. *guilfoylei* (Bailey) Bailey, *Queensland Fl.* 5: opp. 1613 (1902). T: plant cultivated in Melbourne Botanical Gardens from seed collected near Burdekin R.; *n.v.*

D. larkinii C.Moore, *J. & Proc. Roy. Soc. New South Wales* 18: 82 (1885); *D. palmeri* var. *larkinii* (C.Moore) C.Moore & E.Betche, *Handb. Fl. New South Wales* 413 (1893). T: not designated.



Figure 18. *Crocosmia* × *crocosmiiflora*.
Photograph — M.Fagg.

Figure 19. *Doryanthes palmeri*.
Photograph — M.Fagg.



Figure 20. *Lomandra multiflora* subsp.
multiflora. ♂ inflorescence
Photograph — A.George.

Figure 21. *Lomandra leucocephala* subsp.
robusta. ♀ inflorescence
Photograph — A.George.

Illustrations: *Bot. Mag.* t. 6665 (1883); E.Rotherham *et al.*, *Fl. Pl. New South Wales & Southern Queensland* 55 t. 138 (1975); K.A.W.Williams, *Native Pl. Queensland* 98 (1979).

Vegetatively similar to *D. excelsa*, but leaves somewhat larger, to 3 m long, 20 cm wide. Flowers 4–6 cm long, red or red-brown, arranged in a thyse to 1 m long. Capsule c. 9 cm long. Fig. 19.

Occurs in south-eastern Qld and north-eastern N.S.W. on coastal ranges, usually in wet eucalypt open-forest on steep slopes. Map 107.

Qld: Springbrook, 11 Oct. 1972, W.Morley (BRI); near the Condamine, 1887, C.H.Hartmann (MEL). N.S.W.: Mt Warning, 3 Oct. 1939, F.A.Rodway (NSW); Macksville, 19 Oct. 1939, H.E.Wright (NSW).

There are some puzzling aspects of the distributional data of *D. palmeri*. Hartmann's collection from the 'sources of the Mackenzie River' probably does not refer to the Mackenzie River in central Queensland. In a letter to Mueller in 1872 (National Herbarium of Victoria records), Hill stated that Hartmann's specimen had come from a locality about 20 miles [c. 32 km] from where Hill found the plant (i.e. Cunninghams Gap in SE Qld). The type of *D. guilfoylei* was grown from seed allegedly collected from the Burdekin River. *Doryanthes* is not known to occur in northern Qld though a specimen of *D. palmeri* at MEL is labelled 'Bellenden-Ker Ranges, in 1891, S.Johnson'.

XANTHORRHOACEAE

D.J.Bedford, A.T.Lee, T.D.Macfarlane, R.J.F.Henderson & A.S.George

Monoecious, dioecious or monoclinal perennials with rhizomes or short rootstocks, often arborescent. Stems erect, decumbent or subterranean. Leaves linear, alternate but often distichous or crowded in a rosette, usually with broad often sheathing base that persists after lamina falls or is burnt off. Flowers actinomorphic, solitary or in head-, spike-, panicle-, raceme-, cyme- or umbel-like inflorescences that are usually scapose, bracteate, terminal or axillary; when dioecious the male and female sometimes dissimilar. Sepals 3, free or united in lower part, often similar to petals. Petals 3, free or united in lower part, occasionally united with sepals. Stamens 6, inserted on perianth or hypogynous; anthers dorsifixed or basifixed, opening by slits or terminal pores, sometimes apiculate. Ovary superior, 1- or 3-locular, with 1 to several ovules per locule; placentation axile; styles free or connate and 3-fid to entire. Fruit a loculicidal capsule or indehiscent, subtended by persistent perianth. Seeds spherical, ellipsoidal, ovoid or flattened; endosperm copious.

A family of 10 genera and c. 100 species, all endemic in Australia except 2 species of *Lomandra* that also occur in New Guinea and 1 that also occurs in New Caledonia, and 1 species of *Romnaldia* endemic in New Guinea. It contains a diverse assemblage of taxa including *Xanthorrhoea* (blackboy or grass tree), *Lomandra* (mat-rush) and *Calectasia* (tinsel lily).

The family as circumscribed here, following Cronquist (1981), is considered by some authors to be heterogeneous. Huber (1969) segregated Dasypogonaceae (genera 5, 7, 10 below) and Xanthorrhoeaceae (genus 9), while Dahlgren *et al.* (1985) recognised three families, viz. Dasypogonaceae (genera 1–8), Xanthorrhoeaceae (genus 9) and Calectasiaceae (genus 10). Within Dasypogonaceae *s. str.* Dahlgren *et al.* recognised three groups—i) *Chamaexeros*, *Acanthocarpus*, *Romnaldia* and *Lomandra*; ii) *Kingia* and *Dasypogon*, and iii) *Baxteria*. *Xerolirion*, described below, belongs to the first of these groups. Of the genera included here in Xanthorrhoeaceae, *Xanthorrhoea* is the most distinct from the other genera on the basis of differences in its stomata, seeds, pollen and in the production of resin. *Calectasia* and *Baxteria* are also very distinct, especially in their floral morphology, and possibly each warrants family status.

XANTHORRHOACEAE

G.Bentham, *Juncaceae p.p., Fl. Austral.* 7: 92–121 (1878); A.Fahn, The anatomical structure of Xanthorrhoeaceae Dumort, *J. Linn. Soc., Bot.* 55: 158–184 (1954); J.Hutchinson, *Fam. Fl. Pl.* 2nd edn, 2: 660–662 (1959); H.Huber, Die Samenmerkmale und Verwandtschaftsverhältnisse der Liliiflorae, *Mitt. Bot. Staatssamml. München* 8: 219–538 (1969); S.Chanda & K.Ghosh, Pollen morphology and its evolutionary significance in the Xanthorrhoeaceae, *Linn. Soc. Symposium Ser.* 1: 527–559 (1976); P.F.Stevens, Generic Limits in the Xeroteae (Liliaceae *sensu lato*), *J. Arnold Arbor.* 59: 129–154 (1978); R.M.T.Dahlgren & H.T.Clifford, *The Monocotyledons: A Comparative Study* (1982); R.M.T.Dahlgren, H.T.Clifford & P.F.Yeo, *The Families of the Monocotyledons* (1985).

KEY TO GENERA

- 1 Flowers solitary
 - 2 Perianth 70–80 mm long **6. BAXTERIA**
 - 2: Perianth up to 30 mm long
 - 3 Perianth 10–30 mm long, tubular in lower half, the lobes iridescent blue to purple **10. CALECTASIA**
 - 3: Perianth less than 5 mm long, united only at base, white **4. XEROLIRION**
- 1: Flowers several to many in simple or compound inflorescences
 - 4 Flowers unisexual
 - 5 Inflorescence panicle-, spike-, or umbel-like, many-flowered; plants clearly leafy **5. LOMANDRA**
 - 5: Inflorescence a 1–3-flowered cyme: plants almost leafless except at branch apices **4. XEROLIRION**
 - 4: Flowers bisexual
 - 6 Inflorescence densely spike-like or head-like
 - 7 Inflorescence spike-like **9. XANTHORRHOEA**
 - 7: Inflorescence head-like
 - 8 Leaves flat to inrolled; bracts on scape widely spaced **7. DASYPOGON**
 - 8: Leaves transverse-rhombic to cuneate in T.S.; bracts on scape many, imbricate **8. KINGIA**
 - 6: Inflorescence panicle-, raceme-, umbel- or cyme-like
 - 9 Stems elongated, leafy; inflorescence condensed and umbel-like, sometimes a short raceme with flowers in whorls; ovule 1 per locule; capsule verrucose or muricate, rarely smooth **3. ACANTHOCARPUS**
 - 9: Leaves arising from rhizome or short basal stem; inflorescence panicle-like: ovules 2 per locule; capsule smooth
 - 10 Leaf margins finely scarious, lacerating towards base (W.A.) **1. CHAMAEXEROS**
 - 10: Leaf margins not scarious (Qld) **2. ROMNALDA**

1. CHAMAEXEROS

A.S.George

Chamaexeros Benth., *Fl. Austral.* 7: 110 (1878); from the Greek *chamai* (on the ground) and a resemblance to *Xerotes*, the genus (now *Lomandra*) from which it was segregated.

Lomandra sect. *Chamaexeros* (Benth.) Kuntze, *Lex. Gen. Phan.* 336 (1903). T: *C. serra* (Endl.) Benth.

Caespitose, perennial herbs with short rhizomes and wiry roots. Leaves sessile, crowded, linear, the margins scarious and often lacerated. Flowers bisexual, in open or very compact bracteate cymose panicles. Sepals and petals free, petaloid, opening widely, cream or yellow; petals slightly smaller than sepals. Stamens: 3 inserted on petals, 3 hypogynous; anthers dorsifixed, small. Ovary 3-locular; ovules 2 per locule; style c. as long as perianth; stigma small, simple. Capsule globular, smooth. Seeds spherical.

A genus of 3 or 4 species endemic in southern W.A.; 1 taxon known only from sterile material and as yet unnamed.

G.Bentham, *Chamaexeros* (in Juncaceae), *Fl. Austral.* 7: 110–111 (1878); A.J.Ewart, Contributions to the Flora of Australia No. 23, *Proc. Roy. Soc. Victoria* n. ser., 28: 216–221 (1916) (as *Acanthocarpus*); R.H.Kuchel, A taxonomic revision of the genus *Chamaexeros* Benth. (Xanthorrhoeaceae), *Nuytsia* 2: 118–123 (1976).

This account is based on R.H.Kuchel, *loc. cit.*

1 Leaves terete

1. *C. fimbriata*

1: Leaves flat

2 Inflorescence an open panicle 20–30 cm long

2. *C. macranthera*

2: Inflorescence a very compact panicle on scape up to 10 cm long

3. *C. serra*

1. *Chamaexeros fimbriata* (F.Muell.) Benth., *Fl. Austral.* 7: 111 (1878)

Xerotes fimbriata F.Muell., *Fragm.* 8: 211 (1874); *Acanthocarpus fimbriatus* (F.Muell.) F.Muell., *Syst. Census Austral. Pl.* 119 (1882). T: south-western W.A., *J.Drummond* 329; holo: MEL 8384.

Leaves narrowly linear, terete, to 70 cm long, the margins evident against midrib as 2 fine grooves, very finely scarious; leaves tightly imbricate at base with lacerated scarious margins. Inflorescence an open panicle to 60 cm long; bracts c. 1 mm long, acute; pedicels 3–15 mm long; flowers cream, scented. Sepals and petals 2–3 mm long. Capsule 4–6 mm long; often only 1 carpel fertile; perianth persistent. Seed c. 3 mm diam. *n* = 7, *fide* G.J.Keighery, *Feddes Repert.* 95: 527 (1984).

Widespread in inland south-western W.A., extending N to Sandstone and E to the edge of the Great Victoria Desert. Locally common, especially around granitic rocks, but also in loam in woodland and in heath. Flowers July–Aug. Map 108.

W.A.: E of Coolgardie, *A.M.Ashby* 2138 (AD, PERTH); Wubin, *G.J.Keighery* 5097 (PERTH); NE of Paynes Find, *A.S.George* 5669 (PERTH); 90 mile Tank, E of Lake King, *P.G.Wilson* 3189 (AD); Cowcowing, *M.Koch* 1014 (MEL); 1 km N of Bencubbin, *M.D.Crisp* 6543 (CBG).

2. *Chamaexeros macranthera* Kuchel, *Nuytsia* 2: 121, fig. 3 (1976)

T: 25 km W of Coolgardie, W.A., 23 Sept. 1964, *R.H.Kuchel* 2154; holo: AD.

Leaves linear, flat, obtuse, to 30 cm long and 3 mm wide; scarious margins finely lacerated; leaf bases rather loosely imbricate, the lacerated margins often wearing off. Inflorescence an open panicle to 30 cm long; bracts c. 1 mm long, obtuse; pedicels 2–10 mm long; flowers yellow, scented. Sepals and petals 3–4.5 mm long. Fruit not seen. *n* = 14, *fide* G.J.Keighery, *Feddes Repert.* 95: 527 (1984).

Occurs in scattered populations in inland south-western W.A., between Paynes Find, Beverley and Kalgoorlie. Grows in loam in woodland. Flowers Aug.–Oct. Map 109.

W.A.: c. 13.5 km S of Paynes Find, *I.B.Armitage* 424 (PERTH); Bullabulling, *A.S.George* 2691 (PERTH).

The collection from Pemberton cited by Kuchel, *loc. cit.*, is *Lomandra nigricans*.

3. *Chamaexeros serra* (Endl.) Benth., *Fl. Austral.* 7: 110 (1878)

Xerotes serra Endl., in J.G.C.Lehmann, *Pl. Preiss.* 2: 49 (1846); *Acanthocarpus serrus* (Endl.) F.Muell., *Syst. Census Austral. Pl.* 119 (1882). T: York and Hay districts, W.A., 25 Apr. & 8 Nov. 1840, *L.Preiss* 1539; lecto: MEL, *fide* R.H.Kuchel, *Nuytsia* 2: 120 (1976).

Illustrations: R.Erickson *et al.*, *Fl. Pl. W. Australia* t. 75 (1973); R.M.T.Dahlgren *et al.*, *Fam. Monocotyledons* 153, fig. 65A–E (1985).

Leaves linear, flat, obtuse, usually less than 20 cm long, 2–4 mm wide; scarious margins lacerated, sometimes wearing off; leaf bases rather loosely imbricate, the margins breaking up irregularly. Inflorescence a very compact panicle, on scape 3–10 cm long; bracts 5–7 mm long, obtuse, with lacerated margins; pedicels 8–15 mm long; flowers yellow, ? not scented. Sepals and petals 4–5 mm long. Capsule c. 6 mm long. Mature seed not seen. *n* = 7, *fide* G.J.Keighery, *Feddes Repert.* 95: 527 (1984). Fig. 33.

Widespread in south-western W.A. from the Darling Range E of Perth to Lake Muir, extending E to Ravensthorpe. Grows in clay-loam, sand and laterite in woodland. Flowers Sept.–Nov. Map 110.

W.A.: c. 25 km E of Cranbrook, *R.H.Kuchel* 1919 (AD); Tuttanning, SE of Pingelly, *A.S.George* 10905 (CANB, PERTH); between Lake Muir and Muir Bridge, *A.M.Ashby* 4356 (AD); 20 km NE of Jerdacuttup, *R.J.Hnatiuk* 761314 (PERTH).

Easily recognised by the short, compact inflorescence. A collection at PERTH from N of Boggy Lake, Nov. 1950, *D.M.Churchill*, may represent a closely related taxon. It has leaves 3–5 mm wide with coarsely lacerated scarious margins; flowers not seen.

2. ROMNALDA

R.J.F.Henderson

Romnalda P.Stevens, *J.Arnold Abor.* 59: 148 (1978); an anagram of *Lomandra*; this genus is a segregate from *Lomandra*.

Type: *R. papuana* (Lauterb.) P.Stevens; *Lomandra papuana* Lauterb.

Herbaceous perennials, glabrous throughout; primary roots mostly absent. Stems short, simple or branched, decumbent. Leaves linear, alternate in 2 spiral rows, crowded. Inflorescence paniculate, axis elongated; flowers pedicellate, in congested cymules. Flowers bisexual. Sepals and petals mostly white, uninerved, persistent. Stamens 6, fused at base and inserted on perianth; anthers dorsifixed; pollen bean-shaped. Ovary 3-locular; ovules 2 per locule, collateral, pendulous, mostly aborting; style filiform, $\frac{3}{4}$ –3 times length of ovary. Capsule usually asymmetrical, smooth, loculicidally dehiscent. Seed up to 4 per fruit, ellipsoidal to \pm hemispherical; testa thin; embryo \pm straight and longitudinal but oblique or (not in Australia) curved.

A genus of 3 species, 1 endemic in New Guinea, 2 endemic in Queensland.

Plants less than 0.5 m tall; flower clusters in axils of and scattered along inflorescence branches; bracts withering; style 2–3 times length of ovary (N Qld)

1. *R. grallata*

Plants 0.5–1 m tall; flower clusters towards ends of inflorescence branches; bracts forming cone-like clusters; style shorter than ovary (SE Qld)

2. *R. strobilacea*

1. *Romnalda grallata* R.Henderson, *Kew Bull.* 37: 229 (1982)

T: Mt Lewis, c. 55 km NNE of Mareeba, Qld, 16 Dec. 1980, *J.R.Clarkson 3646*; holo: BRI; iso: A, CANB, K, MO, NSW.

Illustration: R.J.F.Henderson, *loc. cit.*

Plant to c. 0.4 m tall. Stems to c. 40 cm long. Leaves 12–35 cm long, 7–16 mm wide, \pm discolorous, obtuse or \pm truncate, with 4–8 small teeth at apex. Inflorescence 9–30 cm long, sparsely and irregularly branched throughout; flower clusters in axils of and scattered along branches. Flowers sometimes marked with purple, each subtended by a minute, withering bract. Sepals ovate-deltoid, 3.5–4 mm long. Petals elliptic-oblong, 4–4.5 mm long. Stamens: filaments linear, outer to 2 mm long, inner to 2.5 mm long; anthers c. 1 mm long. Ovary c. 1.5 mm long; style c. 3.5 mm long. Capsule ovoid, c. 1 cm long. Seed ellipsoidal, pitted, c. 5.5 mm long. $n = 8$, *fide* R.J.F.Henderson, *loc. cit.* Fig. 22G–O.

Known only from rainforest on granitic soils in far north-eastern Qld. Map 111.

Qld: Mt Lewis, *B.Hyland 6732* (BRI, QRS); Mt Sorrow, W of Cape Tribulation, Oct. 1982, *F.Mackenzie* (BRI).

2. *Romnalda strobilacea* R.Henderson & Sharpe, *Fl. Australia* 46: 225 (1986)

T: Mary Cairncross Park, c. 4 km ESE of Maleny, Qld, 3 Nov. 1983, *R.J.F.Henderson H3040 & P.R.Sharpe*; holo: BRI; iso: A, K, L, NSW.

Plant to c. 1 m tall. Stems to c. 10 cm long. Leaves 50–80 cm long, 8–10 mm wide, inconspicuously discolorous, attenuate but ultimately obtuse or truncate, without teeth at apex. Inflorescence 60–90 cm long, sparsely and irregularly branched in upper third; functioning flower clusters towards ends of primary or short secondary branches, axis elongating. Flowers white, mostly caducous, each subtended by a minute persistent bract. Sepals elliptic, c. 3 mm long. Petals obovate to obcordate, c. 2.5 mm long. Stamens: filaments \pm triangular, outer to 1 mm long, inner to 0.6 mm long; anthers c. 0.6 mm long. Ovary c. 1 mm long; style c. 0.75 mm long. Capsule depressed-globular, c. 0.6 cm long. Seed smooth, \pm hemispherical, c. 4.5 mm long. Fig. 22A–F.

Known only from a few rainforest areas on basaltic soil in south-eastern Qld; often closely associated with *Lomandra spicata*. Map 112.

Qld: Eumundi, Nov. 1892, *J.F.Bailey* (BRI); same locality, Nov. 1894, *F.M.Bailey & J.H.Simmonds* (BRI); Blackall Range, Nov. 1916, *C.T.White* (BRI); Kin Kin, Jan. 1917, *C.T.White* (BRI).

3. ACANTHOCARPUS

A.S.George

Acanthocarpus Lehm., *Pl. Preiss* 2: 274 (1848); from the Greek *acantha* (prickle, thorn) and *carpos* (fruit); the type has muricate fruiting valves.

Lomandra sect. *Acanthocarpus* (Lehm.) Kuntze, *Lex. Gen. Phan.* 336 (1903). T: *A. preissii* Lehm.

Caespitose perennial herbs with short rhizomes, erect stems and wiry roots. Primary stems simple, producing shorter lateral branches in later seasons. Leaves alternate, sessile, linear, the bases closely sheathing the stem and imbricate. Flowers bisexual, small, clustered in reduced bracteate cymes or racemes, terminal to short branches or in upper axils. Sepals and petals shortly united, almost equal, petaloid, opening widely, persistent beneath fruit. Stamens inserted on perianth; anthers small, not apiculate. Ovary 3-locular; ovule 1 per locule; style as long as or shorter than stamens; stigma simple. Fruit a capsule, muricate or verrucose, rarely smooth. Seeds spherical or ellipsoidal, golden-brown.

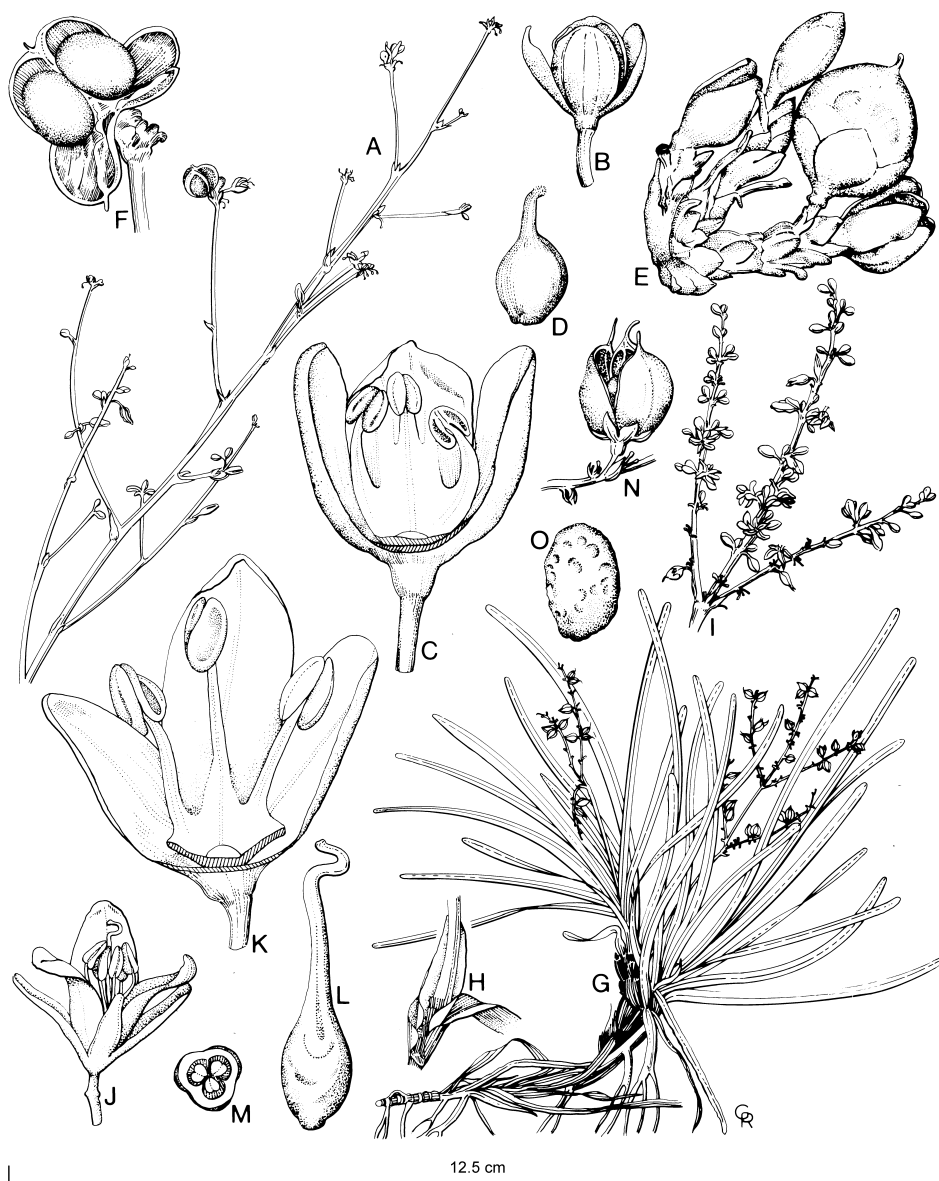


Figure 22. *Romnaldia*. A–F, *R. strobilacea*. A, part inflorescence $\times 0.7$ (P.Sharpe 3528, BRI); B, flower $\times 4$; C, half flower, gynoecium removed $\times 8$; D, gynoecium $\times 8$; E, cone-like flower clusters $\times 4$ (B–E, R.Henderson 3040, BRI); F, dehiscent fruit $\times 2$ (P.Sharpe 3528, BRI). G–O, *R. grallata*. G, habit $\times 0.2$; H, leaf bases with scarious auricles $\times 0.7$ (G–H, J.Clarkson 3648, BRI); I, part inflorescence $\times 0.7$; J, flower $\times 4$; K, half flower, gynoecium removed $\times 8$; L, gynoecium $\times 8$; M, T.S. ovary $\times 8$ (I–M, J.Clarkson 3646, BRI); N, dehiscent fruit $\times 1.3$; O, seed $\times 2.7$ (N–O, J.Clarkson 3648, BRI).

A genus of 7 or more species endemic in W.A. Previously considered monotypic, it is here expanded on the basis of collections gathered this century, especially over the past 25 years. Further study is needed to resolve the status of some little-collected variants, especially several from the Geraldton–Shark Bay region.

Characters taxonomically useful in the genus include the number of leaf nerves and the open or closed grooves between them, the size of the flower, and the tubercles of the fruit. One species (*A. verticillatus*) is distinguished by its shortly racemose inflorescence with flowers in whorls. The primary stems of *Acanthocarpus* are simple and bear leaves much larger than those of the short lateral branches that develop in later seasons. Within each species, however, all leaves have essentially the same gross morphology. In the following text the leaves of the laterals are described in detail, and only measurements given for those of the primary stems.

G.Bentham, *Acanthocarpus* (in Juncaceae), *Fl. Austral.* 7: 111–112 (1878).

- | | | |
|----|---|-----------------------------------|
| 1 | Inflorescence a raceme with 1–3 whorls of flowers | 1. <i>A. verticillatus</i> |
| 1: | Inflorescence a terminal cluster of flowers | |
| 2 | Sepals and petals 6–7 mm long; stems up to 20 cm long | 4. <i>A. humilis</i> |
| 2: | Sepals and petals 3–5.5 mm long; stems mostly longer than 20 cm, sometimes up to 1 m | |
| 3 | Leaf nerves 3–5 | |
| 4 | Grooves on abaxial leaf-surface open | |
| 5 | Sepals and petals 4–5.5 mm long | 7. <i>A. canaliculatus</i> |
| 5: | Sepals and petals 3 mm long | 6. <i>A. parviflorus</i> |
| 4: | Grooves on abaxial leaf-surface closed | 5. <i>A. rupestris</i> |
| 3: | Leaf nerves 7–13 | |
| 6 | Sepals and petals 3–4 mm long; capsule muricate with uncinat tubercles | 2. <i>A. preissii</i> |
| 6: | Sepals and petals 4.5–5.5 mm long; capsule verrucose with obtuse to almost acute straight tubercles | 3. <i>A. robustus</i> |

1. *Acanthocarpus verticillatus* A.S.George, *Fl. Australia* 46: 222 (1986)

T: 4 miles [c. 6 km] S of Wooramel R., North West Coastal Hwy, W.A., 3 July 1967, *D.E.Symon* 5442; holo: PERTH; iso: ADW.

Stems to 50 cm long, rarely longer; branches divaricate. Leaves of branches: lamina ascending to \pm spreading, 10–70 mm long, acuminate, slightly bluish green; margins finely scabrous; nerves 6–8, rounded; grooves narrow, finely scabrid; auricles narrowly triangular, acute or obtuse, 3–5 mm long, becoming lacerated; lamina of primary-stem leaves usually 30–80 mm long. Flowers in raceme-like inflorescences in upper axils, with 1–3 whorls up to 1 cm apart; peduncle 2–5 mm long; pedicels 2–3 mm long. Sepals and petals 5–7 mm long, white with purple midrib. Stamens c. 3 mm long. Pistil 3 mm long, slender. Capsule 6 mm long, verrucose; tubercles narrow, obtuse, 0.1–0.4 mm long. Seed 4 mm long, \pm reticulate. $n = 16$, *fide* G.J.Keighery, *J. Roy. Soc. W. Australia* 60: 106 (1978) as *Acanthocarpus* sp. Fig. 23N–Q.

Occurs near the coast from North West Cape to Shark Bay, and on Barrow and the Monte Bello Is., W.A.; grows in sandy loam, clay-loam and limestone soils, in *Triodia*-shrub steppe. Map 113.

W.A.: Carnarvon, *R.D.Royce* 6024 (PERTH); 32 km along Tamala road from Denham road, *G.J.Keighery* 836 (PERTH); 6–8 km N of Yardie Ck, *A.S.George* 6667 (PERTH); Exmouth road, 60 km N of turnoff from North West Coastal Hwy, *G.J.Keighery* 804 (PERTH); Barrow Is., *R.Buckley* 6784 (PERTH).

A robust plant, recognised by the verticillate inflorescence and large flowers.

2. *Acanthocarpus preissii* Lehm., *Pl. Preiss.* 2: 274 (1848)

T: near Fremantle, W.A., 7 Dec. 1838, *L.Preiss* 428; lecto: MEL 657724, *fide* A.S.George, *Fl. Australia* 46: 221 (1986); iso: NSW. The syntype *Preiss* 2398 is *A. canaliculatus* A.S.George.

Illustration: R.M.T.Dahlgren *et al.*, *Fam. Monocotyledons* 153, fig. 65F–L (1985).

Stems to 70 cm long, sometimes longer; branches ascending or divaricate. Leaves of branches: lamina spreading, 1–3 cm long, pungent, grey-green, sometimes dark green; margins smooth or finely scabrid; nerves 7–12, \pm flattened; grooves narrow, scabrid; auricles not or shortly produced; scarious sheath margins lacerating; lamina of primary-stem leaves usually 2–7 cm long. Flowers terminal; pedicels 1 mm long. Sepals and petals 3–4 mm long, white with fine purple-brown midrib. Stamens c. 1.5 mm long. Pistil 1.5 mm long, thick. Capsule 5–8 mm long, muricate; tubercles flattened to terete, uncinete, up to 1.5 mm long. Seed 4–5 mm diam., slightly rugose. $n = 8$, *fide* G.J.Keighery, *Feddes Repert.* 95: 525 (1984).

Widespread and often locally common in coastal areas from Quobba, N of Carnarvon, to Cape Leeuwin, W.A.; usually grows on coastal dunes, sometimes in limestone or sandstone, in shrubland. Flowers Apr.–May; fruit Aug.–Sept. Map 114.

W.A.: Wembley, *R.D.Royce* 2577 (PERTH); Dirk Hartog Is., 9 July 1973, *T.Evans* (PERTH); Red Bluff, Kalbarri, *P.G.Wilson* 6518 (PERTH); Geographe Bay, *J.Pulley* 1427 (CBG).

Recognised by the usually grey-green leaves with 7–12 nerves and very narrow grooves, by the size of the flowers and by the capsules with long, uncinete tubercles.

3. *Acanthocarpus robustus* A.S.George, *Fl. Australia* 46: 222 (1986)

T: 25 miles [40 km] N of Carnarvon on Quobba road, W.A., 2 Sept. 1970, *A.S.George* 10138 (in fruit); holotype: PERTH; iso: CANB, K.

Stems to 70 cm long; branches erect to spreading. Leaves of branches: lamina divergent, 10–30 mm long, pungent, yellowish green; margins scabrid; nerves 9–13, slightly rounded; grooves \pm closed, scabrid; auricles triangular, 4–6 mm long, becoming lacerated; lamina of primary-stem leaves 30–50 mm long. Flowers terminal; pedicels 5 mm long. Sepals and petals 4.5–5.5 mm long, the sepals white, petals pink. Stamens c. 3 mm long. Pistil 3 mm long, tapering upwards. Capsule 6–7 mm long, verrucose; tubercles irregularly conical, obtuse to almost acute, to 1 mm long. Seed 4–5 mm long, irregularly reticulate. Fig. 23 I–M.

Occurs in coastal and adjacent areas from North West Cape to Shark Bay; grows in sand in *Triodia* steppe and low heath. Map 115.

W.A.: Cape Range, *R.D.Royce* 8386 (PERTH); W of Quoin Bluff, Dirk Hartog Is., *A.S.George* 11464 (PERTH); between Tamala and Carrarang, *J.S.Beard* 6804 (NSW, PERTH).

May be recognised by the robust habit, medium-sized flowers with small stamens, and large fruit. Foliage dries yellow-green. Collections resembling this species, but with smaller leaves and fruit, from farther south (e.g. Ajana, *C.A.Gardner* 8596, PERTH) may represent another, unnamed species.

4. *Acanthocarpus humilis* A.S.George, *Fl. Australia* 46: 221 (1986)

T: 64.5 km N of turnoff from North West Coastal Hwy on Exmouth road, W.A., 8 Aug. 1976, *H.Demarz* 6102; holotype: PERTH.

Stems to 20 cm long, simple or sparsely branched. Leaves of branches: lamina divergent, 4–12 mm long, often twisted, acute, deep green; margins scabrid to almost smooth; nerves 5–9, flattened; grooves open, becoming almost closed towards apex; auricles tapering, 2–4 mm long, entire or lacerated; lamina of primary-stem leaves 7–16 mm long. Flowers terminal; pedicels 3–5 mm long. Sepals and petals 6–7 mm long, white with brown midrib. Stamens 5 mm long. Pistil 6 mm long, slender. Capsule 4–5 mm long, verrucose; tubercles rounded, to c. 0.3 mm long. Seed 4 mm long, finely reticulate. Fig. 23A–D.

Restricted to an area from Point Cloates to the Lyndon R., S of Exmouth Gulf, W.A.; grows in loamy sand over limestone in *Triodia* steppe. Map 116.

W.A.: c. 125 km S of Learmonth, *A.S.George* 2409 (PERTH); c. 6 km E of Ningaloo Stn homestead, *A.S.George* 10225 (PERTH).

Recognised by the small habit, 5–9-nerved leaves, large flowers and short rounded tubercles of the fruit.

5. *Acanthocarpus rupestris* A.S.George, *Fl. Australia* 46: 222 (1986)

T: 3.5 miles [c. 5.5 km] S of Exmouth township, W.A., 25 May 1965, *A.S.George* 6590; holo: PERTH; iso: CANB.

Stems to 50 cm long; branches divaricate. Leaves of branches: lamina divaricate, 7–25 mm long, slender, pungent, dark green; margins finely scabrid; nerves 5, flattened; grooves almost closed, scabrid; auricles triangular to ovate, 1 mm long, lacerating; primary-stem leaves not seen. Flowers terminal; pedicels 1–1.5 mm long. Sepals and petals 3–3.5 mm long, white. Stamens 1–1.5 mm long. Pistil 1.5–2 mm long; ovary tapering to \pm stout style. Capsule 4–4.5 mm long, verrucose; tubercles irregularly conical, obtuse, to 0.4 mm long. Seed 2.5 mm diam., somewhat rugose. Fig. 23E–H.

Endemic in the Cape Range, S of North West Cape, W.A.; grows in red sand with limestone, in *Triodia*-shrub steppe, sometimes by creek-lines. Flowers May–June; fruit Sept. Map 117.

W.A.: 6 km along old Wapet Shothole Canyon road, *D.W.Goodall* 1371 (PERTH); Cape Range, *R.D.Royce* 8378 (PERTH); W of No. 2 oil well site, Cape Range, *A.S.George* 6543 (PERTH).

A small-flowered species, characterised also by the slender leaves and shortly verrucose fruit. The foliage dries pale green.

6. *Acanthocarpus parviflorus* A.S.George, *Fl. Australia* 46: 221 (1986)

T: Murchison R. gorge, 15 miles [c. 24 km] NW of Ajana, W.A., 13 May 1961, *A.S.George* 2370; holo: PERTH; iso: CANB.

Stems to 40 cm long; branches divaricate. Leaves of branches: crowded, lamina divaricate, 3–10 mm long, pungent, dark green; margins finely scabrid; nerves 5 decreasing to 3 below apex, rounded; grooves open, smooth or slightly scabrid; auricles narrowly triangular, less than 1 mm long, entire or slightly lacerated; primary-stem leaves not seen. Flowers in terminal clusters; pedicels 1–2 mm long. Sepals and petals 3 mm long, white. Stamens 1.5–2 mm long. Pistil 2–2.5 mm long, tapering above ovary but stout. Capsule 4–5 mm long, verrucose; tubercles obtuse, to 0.3 mm long. Seed ellipsoidal, 3.5–4 mm long, finely reticulate.

Known only from the lower Murchison River, south-western W.A.; grows in sand among sandstone rocks. Flowers May–June; fruit Oct. Map 118.

W.A.: Red Bluff, Kalbarri, per *Red Bluff Caravan Park* 1542 (PERTH); The Loop, Murchison R., *A.S.George* 16390 (PERTH); Murchison R., *A. Oldfield* (MEL).

Distinguished especially by the small crowded leaves with few open grooves and by the small flowers.

7. *Acanthocarpus canaliculatus* A.S.George, *Fl. Australia* 46: 221 (1986)

T: S of Cockleshell Gully, W.A., 30°11'S, 115°07'E, 16 Oct. 1984, *A.S.George* 16321 (fruit); holo: PERTH; iso: CANB, K, MEL, PERTH.

Primary stems to 50 cm long; branches divaricate to erect. Leaves of branches: lamina divergent to divaricate, 3–15 mm long, pungent, medium to deep green; margins scabrid; nerves 3–5, \pm rounded; grooves open, glabrous to scabrid; auricles not or shortly produced; scarious sheath margins remaining entire; lamina of primary-stem leaves 15–45 mm long. Flowers terminal; pedicels 1–4 mm long. Sepals and petals 4–5.5 mm long, white with

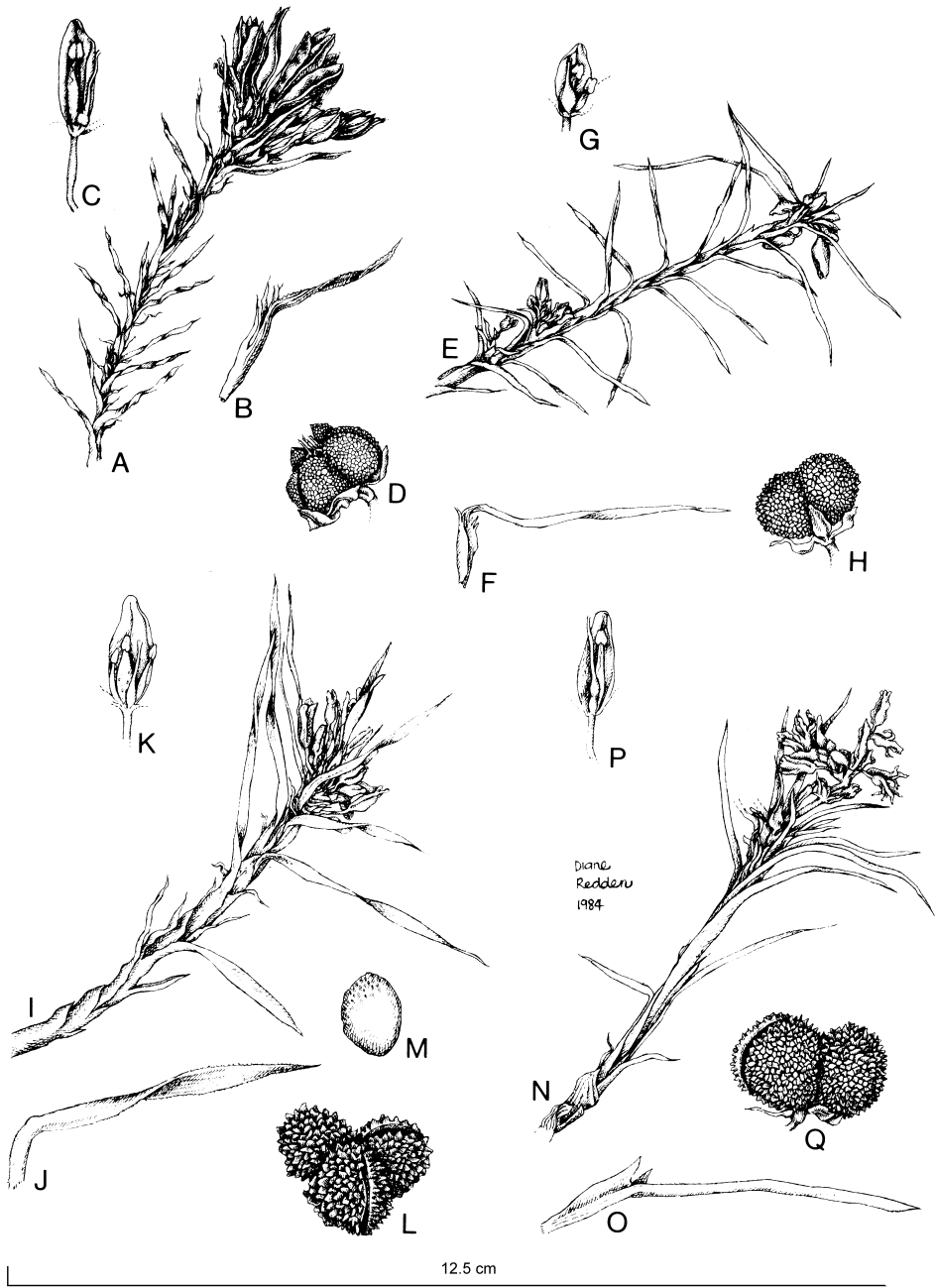


Figure 23. *Acanthocarpus*. **A–D**, *A. humilis*. **A**, branchlet and inflorescence $\times 1.5$; **B**, leaf $\times 2$; **C**, pedicel, tepal, stamen and pistil $\times 2$ (**A–C**, H.Demarz 6102, PERTH); **D**, fruit $\times 2$ (A.George 10225, PERTH). **E–H**, *A. rupestris*. **E**, branchlet and inflorescences $\times 1$; **F**, leaf $\times 1.5$; **G**, tepal, stamens and pistil $\times 2$ (**E–G**, A.George 6590, PERTH); **H**, fruit $\times 2$ (D.Goodall 1371, PERTH). **I–M**, *A. robustus*. **I**, branchlet and inflorescence $\times 1$; **J**, leaf $\times 1.5$; **K**, tepal, stamens and pistil $\times 2$ (**I–K**, R.Royce 8386, PERTH); **L**, fruit $\times 2$; **M**, seed $\times 2$ (**L–M**, A.George 10138, PERTH). **N–Q**, *A. verticillatus*. **N**, branchlet and inflorescence $\times 1$; **O**, leaf $\times 1.5$; **P**, pedicel, tepal, stamen and pistil $\times 2$ (**N–P**, A.George 6667, PERTH); **Q**, fruit $\times 2$ (R.Buckley 6784, PERTH).

prominent purple-brown midrib. Stamens 2.5 mm long. Pistil 3 mm long; ovary abruptly narrowed to slender style. Capsule 3–4 mm long, verrucose, rarely smooth; tubercles rounded or flattened, irregular, to 0.3 mm long. Seed 3 mm diam., slightly rugose. $n = 8$, *vide* G.J.Keighery, *Feddes Repert.* 95: 525 (1984) as *A. preissii*.

Widespread in south-western W.A. from Yuna to Pinjarra, extending inland to Wilroy and Tammin; grows in sand and sandy clay, sometimes with granite or laterite, in depressions and along watercourses, in shrubland and woodland. Flowers June–Oct.; fruit Nov.–Dec. Map 119.

W.A.: Watheroo Natl Park, *R.D.Royce* 9732 (PERTH); creek by South Dandalup R., 6 km NNE of Pinjarra, *G.J.Keighery* 5692 (PERTH); near Howatharra, c. 28°33'S, 114°40'E, *A.S.George* 14876 (CANB, PERTH); Cannington, 3 Aug. 1928, *C.A.Gardner* (PERTH); 15 km N of Badgingarra, *P.G.Wilson* 3831 (MEL, PERTH).

The most widespread and variable of the taxa formerly included in *A. preissii*, this may be recognised by the darker green leaves with 3–5 nerves and open grooves, by the larger flowers and by the capsules that have short, ±flattened tubercles. In one collection from Tammin (*R.D.Royce* 9378, PERTH), the fruit is smooth.

4. XEROLIRION

A.S.George

Xerolirion A.S.George, *Fl. Australia* 46: 229 (1986); from the Greek *xeros* (dry) and *lirion* (a lily), in reference to the dry habit and habitat of this member of the Liliales.

T: *X. divaricata* A.S.George

Diocious perennial herbs, caespitose, with short rhizomes, erect divaricately-branched stems, and wiry roots. Leaves sessile, alternate, distichous, linear, the bases closely sheathing the stem, caducous. Flowers small, terminal. Male flowers in small cymes; sepals and petals shortly united, petaloid, almost equal, opening moderately widely; stamens inserted on perianth; anthers short; gynoecium reduced. Female flowers solitary, pedicellate; sepals and petals shortly united, persistent about fruit; stamens rudimentary; ovary 3-locular; stigma 3-lobed; ovule 1 per locule. Capsule ±globular, 1–3-seeded, smooth. Seeds ±obovoid.

A monotypic genus endemic in southern W.A. Related to *Lomandra* but distinguished by the divaricate habit, caducous leaves and terminal flowers, the male in small cymes, the female solitary. Also resembles *Acanthocarpus* which has clustered, bisexual flowers and persistent pungent leaves.

Xerolirion divaricata A.S.George, *Fl. Australia* 46: 230 (1986)

T: 24 km N along Clark Road from Bonnie Rock road, W.A., 30°15'S, 118°04'E, 21 Oct. 1984, *A.S.George* 16434 (fruit); holo: PERTH; iso: CANB, K, MEL, PERTH.

Stems to 40 cm long, much-branched, forming intricate clumps. Primary-stem leaves: lamina 3–4 mm long, 3-nerved, obtuse and dark brown at apex, slightly recurved, shortly pubescent; sheath 7-nerved, the margins broadly scarious, often splitting away; leaves of branches 3–5 mm long, obtuse to acute, 5-nerved becoming 3-nerved below apex; lower leaves bract-like. Male flowers: peduncle 2–3 mm long, recurved; pedicels 1–1.5 mm long; sepals and petals 2–4 mm long, obovate, white; staminal filaments slender. Female flowers similar in size; pistil 2.5 mm long. Fruiting pedicel c. 1 mm long; perianth ±crustaceous, golden; capsule 3 mm long, smooth; style persistent. Seed 2–2.5 mm long, slightly rugose, pale yellow. *Basil's Asparagus*. Fig. 24.

Occurs between Morowa and Southern Cross, W.A., growing on decaying granitic or lateritic rock outcrops. Flowers July–Aug.; fruit Nov. Map 120.

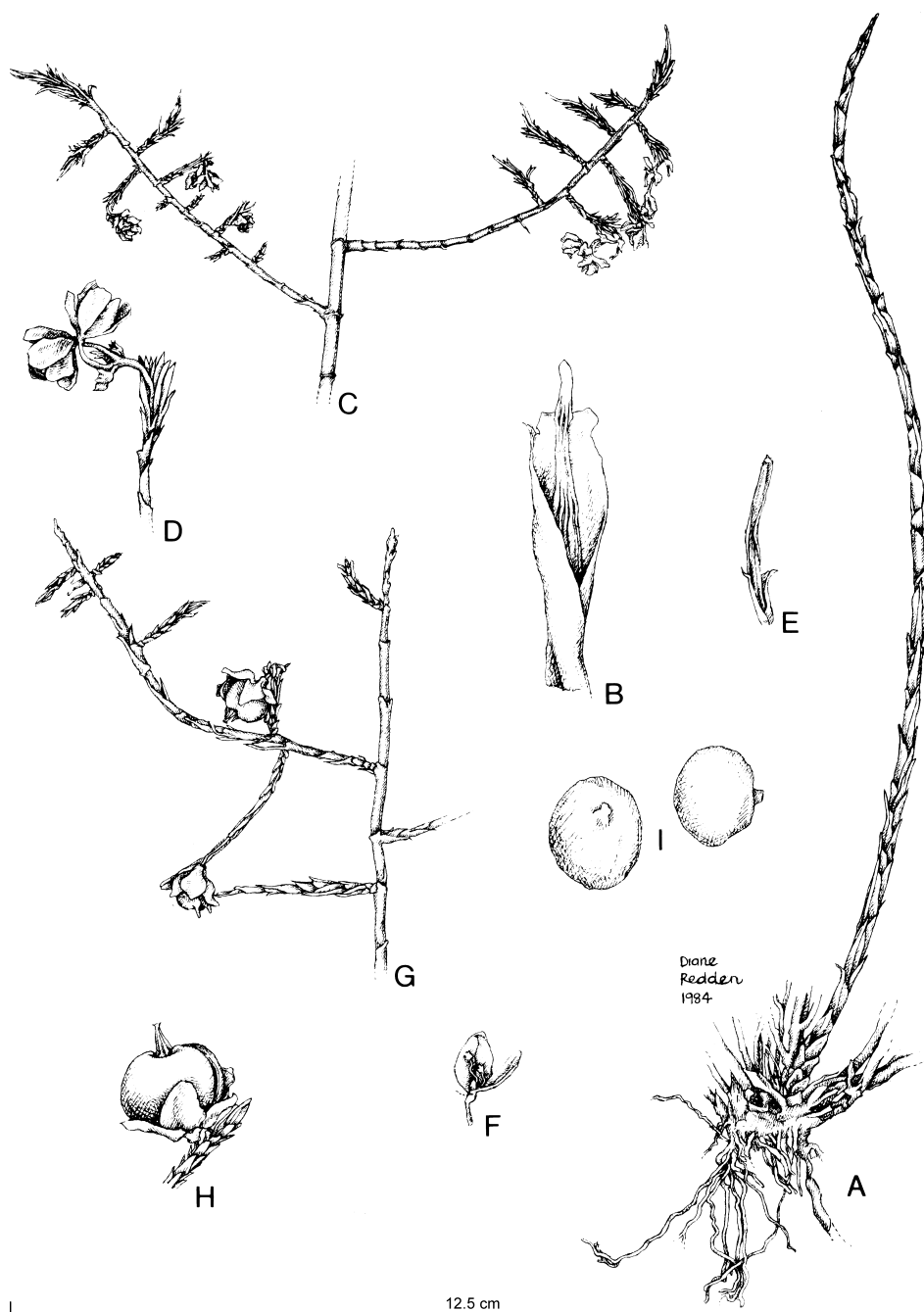


Figure 24. *Xerolirion divaricata*. **A**, primary stem and rootstock $\times 0.5$; **B**, primary-stem leaf $\times 2$; **C**, older stem with lateral branches (σ) $\times 1$; **D**, branchlet with σ inflorescence $\times 2$; **E**, leaf of branchlet $\times 2$; **F**, 2 tepals and stamens and rudimentary ovary of σ flower $\times 2$; **G**, fruiting branchlets $\times 1$; **H**, fruit $\times 2$; **I**, seeds $\times 5$; (**A**, **B**, **E**, **G**, **H**, **I**, A.George 16434, PERTH; **C**, **D**, **F**, J.Beard 4726, PERTH).

W.A.: 13 km N of Paynes Find on Yalgoo road, no date, *G.E.Brockway* (♂) (PERTH); 19 km NE of Lake Brown siding, *B.G.Muir* 805 (♀) (PERTH); Koolyanobbing Ra., *P.G.Wilson* 6150 (♀) (PERTH); 64 km N of Bullfinch, *A.S.George* 14321 (♂) (PERTH).

5. LOMANDRA

Alma T.Lee & T.D.Macfarlane

Lomandra Labill., *Nov. Holl. Pl.* 1: 92 (1805); from the Greek *loma* (margin) and *andros* (male), referring to a 'circular margin of the anthers' in *L. longifolia*, the first species described.

Xerotes R.Br., *Prodr.* 259 (1810), *nom. illeg.* based on *Lomandra* Labill. T: *L. longifolia* Labill.; lecto, *fide* A.T.Lee, *Fl. Australia* 46: 223 (1986).

Dioecious. Leaves distichous, with distinctive sheathing basal margins, linear or terete, glabrous, papillose, warty or hairy; apex entire or indented. Male and female inflorescences similar or dissimilar, spike-like, raceme-like or panicle-like; flowers separate or in dense or open clusters, small. Female perianth usually larger than male, hardened in fruit. Sepals and petals free or connate, similar or the sepals thinner. Outer stamens inserted on receptacle or rim of perianth tube; inner on perianth close to or distant from the outer, their filaments more or less different in length. Ovary 3-locular, \pm sessile; ovule 1 per locule; style short. Capsule globular, cylindrical or trigonous. Seeds spherical to ellipsoidal, brown, orange or reddish.

A genus of 4 sections, with 50 species, all native to Australia, 2 occurring also in Papua New Guinea and 1 of these in New Caledonia.

G.Bentham, *Xerotes*, *Fl. Austral.* 7: 94–110 (1878); A.T.Lee, Notes on *Lomandra* in New South Wales, *Contr. New South Wales Natl Herb.* 3: 151–164 (1962); A.T.Lee, *Lomandra*, *Contr. New South Wales Natl Herb.*, *Fl. Ser.* 34: 16–42 (1966); T.S.(Roland) Choo, A study of the Western Australian species of *Lomandra* Labill. (Xanthorrhoeaceae), with reference to their anatomy, taxonomy and phylogeny, *Unpubl. M.Sc. thesis*, Univ. W. Australia (1969); P.F.Stevens, Generic limits in the Xeroteae (*Liliaceae sens. lat.*), *J. Arnold Arbor.* 59: 129–155 (1978).

Following the work of Stevens, *loc. cit.*, on inflorescence structure, two bract arrangements, considered important classificatory characters, are recognised here. The terminology used (italicised) differs from that used earlier by Lee, *loc. cit.* (1966). *Bracts*: prophylls intimately associated with a flower and arranged in one of two ways. (1) Always two *bracts* in an opposite, imbricate pair around the bud, the *outer bract* and *inner bract* (previously floral bracts or bract and bracteole). (2) One *bract* subtending the flower (previously bract or floral bract), and one *inner bract*, smaller than, inside and lateral to the bract, sometimes lacking (previously bracteole). *Cluster bracts* are prophylls subtending sub-units of the inflorescence, i.e. clusters of flowers. *Intermediary bracts* (previously cluster bracts or bract-like structures) are prophylls of uncertain status but apparently branch-subtending or cluster bracts of higher orders, occurring between *cluster bract* and *bract*.

Inflorescence length includes both scape and floriferous rachis (not as previously used by Lee for the rachis only).

The uncertain position of *Lomandra* in Xanthorrhoeaceae remains unresolved. Chromosome numbers, stomatal characters and seed colour (indicative of a particular chemical content) are among characters relating *Lomandra* more to members of Liliaceae *sens. lat.* than to *Xanthorrhoea*.

KEY TO SECTIONS AND SERIES

- 1 Cluster bracts entire, other prophylls fringed with or consisting of crinkly hairs Sect. II. TYPHOPSIS
- 1: Prophylls all entire, glabrous
 - 2 Flowers crowded on branches, none attached directly on rachis; branches appressed, often obscured, less than 10 mm long Sect. I. MACROSTACHYA
 - 2: Flowers attached directly on rachis and also on branches (when present); branches spreading or erect, usually conspicuous, usually more than 10 mm long
 - 3 Male and female inflorescences dissimilar; male flowers in whorled or, when reduced, alternate clusters; female flowers in a single head or terminal cluster among leaf bases; sepals and petals united for half their length; outer bract and inner bract opposite, imbricate Sect. III. CEPHALOGYNE
 - 3: Male and female inflorescences usually similar, occasionally female a pedunculate head; flowers single or 2 or 3 together, or few to many in whorls or whorled clusters; sepals and petals free; outer bract and inner bract opposite and imbricate, or inner bract smaller than and lateral to the outer, or lacking Sect. IV. LOMANDRA
 - 4 Outer and inner bracts opposite, imbricate, together surrounding pedicel or flower base; intermediary bracts present or absent; flowers in whorled clusters but sometimes few per cluster and clusters appearing alternate; male flowers typically sessile, but pedicellate in species 15, 17, 18 Ser. I. LOMANDRA
 - 4: Outer bract with a smaller inner bract lateral to it or sometimes lacking, bracts together or the outer when alone not completely surrounding the pedicel or flower base; intermediary bracts absent; flowers typically not in whorled clusters, but if so then only when the male flowers pedicellate (species 28–32) Ser. II. SPARSIFLORAE

KEY TO SPECIES

- 1 Flower-subtending bracts forming a mass of crinkly hairs
 - 2 Leaves terete 3. *L. juncea*
 - 2: Leaves flat 4. *L. leucocephala*
- 1: Flower-subtending bracts entire or only slightly split
 - 3 Sepals and petals of male flowers fused into a tube in the lower half
 - 4 Male flowers 3.5–6 mm long; male inflorescence usually unbranched, more or less obscure at base of leaves 13. *L. suaveolens*
 - 4: Male flowers c. 2 mm long; male inflorescence branched or unbranched, not obscure at base of leaves
 - 5 Leaf sheath margins intact except sometimes when old
 - 6 Leaf sheath margins narrowing gradually at top; plants tufted 10. *L. rupestris*
 - 6: Leaf sheath margins narrowing abruptly or auriculate at top; plants not tufted, the mature stems manifestly extending, prostrate or decumbent
 - 7 Leaf sheath margins auriculate at top, white; leaves often twisted or recurved from the stem 5. *L. obliqua*
 - 7: Leaf sheath margins narrowing abruptly at top, white to golden brown with a reddish band along junction with leaf base; leaves not or scarcely twisted or recurved 6. *L. mucronata*
 - 5: Leaf sheath margins lacerated, characteristically lattice-like at first
 - 8 Leaf sheath margins abruptly narrowed at top (obvious on young leaves)

- 9 Male inflorescence branched or unbranched, usually 10 cm long; male scape usually not exposed above leaf bases or rarely exposed up to 2.5 cm; leaves usually 8–20 cm long, up to 4 times as long as male inflorescence **7. *L. glauca***
- 9: Male inflorescence unbranched, usually 5–8 cm long; male scape exposed c. 1 cm above leaf bases; leaves usually 30–40 cm long, at least 5 times as long as male inflorescence **8. *L. elongata***
- 8: Leaf sheath margins narrowing gradually at top
- 10 Leaves usually 5–15 cm long, rarely to 20 cm, bluish green, erect or often curved to one side; male inflorescence usually unbranched **9. *L. nana***
- 10: Leaves usually 10–45 cm long, more or less glaucous, never curved to one side; male inflorescence usually branched
- 11 Flowers remaining yellowish after anthesis; bracts pale, becoming chestnut brown in age; flowering in spring **11. *L. collina***
- 11: Flowers blackening at or after anthesis; bracts pale, remaining so in age; flowering in autumn **12. *L. tropica***
- 3: Sepals and petals of male and female flowers free to base, at least at their margins
- 12 Male flowers grouped in clusters or whorls of several to many; female flowers arranged similarly or in a single terminal cluster
- 13 Flowers restricted to numerous branches less than 10 mm long which are often obscured
- 14 Pedicels of male flowers 1.5–2 mm long; flowers purple-black **1. *L. hastilis***
- 14: Pedicels of male flowers up to 4.5 mm long; flowers greenish purple **2. *L. teres***
- 13: Flowers in clusters or whorls on rachis as well as on branches (when present) usually more than 10 mm long
- 15 Male flowers distinctly pedicellate, pedicel visible above bracts for 2 mm or more at anthesis
- 16 Leaf sericeous at least at base **15. *L. sericea***
- 16: Leaf glabrous
- 17 Sheath margins finely lacerated into dark brown or black fibres **30. *L. nigricans***
- 17: Sheath margins intact or if finely lacerated into fibres, then fibres whitish
- 18 Sepals and petals usually deep purple, inflorescence distinctly exceeding leaves **29. *L. purpurea***
- 18: Sepals and petals yellowish, white, or only sepals purple; inflorescence shorter to longer than leaves
- 19 Sepals more or less uniformly purplish; petals yellow; rachis and branches usually minutely rough **18. *L. multiflora***
- 19: Sepals and petals predominantly white or yellowish green with purple marking in upper part only, or flower without purple colouring; rachis and branches smooth
- 20 Sepals and petals white, usually with purple markings in upper part only; sheath margins intact; inflorescence usually more than $\frac{1}{3}$ as long as leaves **32. *L. integra***
- 20: Sepals and petals yellowish green, usually with purple or green markings; sheath margins lacerated into fibres; inflorescence usually less than $\frac{1}{3}$ as long as leaves **31. *L. odora***
- 15: Male flowers all sessile or with pedicel visible above bracts by less than 2 mm at anthesis

- 21 Leaf apex not toothed; scape terete to strongly flattened
- 22 Leaves terete **16. *L. spartea***
- 22: Leaves flat, incurved or inrolled
- 23 Scape strongly flattened, thin **14. *L. sonderi***
- 23: Scape terete or only slightly flattened
- 24 Inflorescence unbranched
- 25 Flower whorls distinct, often distant; scape usually shorter than rachis **18. *L. multiflora***
- 25: Flower whorls crowded, forming a continuous cylinder sometimes interrupted toward base; scape longer than rachis
- 26 Bracts shorter than flowers **28. *L. preissii***
- 26: Bracts longer than flowers, at least in lower half of inflorescence **46. *L. caespitosa***
- 24: Inflorescence usually branched, at least in males
- 27 Flower whorls crowded dense, forming a continuous cylinder sometimes interrupted towards base **28. *L. preissii***
- 27: Flower whorls distinct, often distant
- 28 Leaves sericeous at least at base **15. *L. sericea***
- 28: Leaves glabrous
- 29 Rachis and inflorescence branches minutely rough **18. *L. multiflora***
- 29: Rachis and inflorescence branches smooth
- 30 Leaves 10–20 mm wide; flowers white or cream **17. *L. ordii***
- 30: Leaves 2.5–4.5 mm wide; flowers purple and yellow **19. *L. patens***
- 21: Leaf apex toothed, the lateral teeth sometimes small and 1–3 cm from apical point; scape strongly flattened
- 31 Leaves disarticulating readily below, the sheathing base with 0.5 cm of strongly recurving lamina persisting on the extended stem; stem decumbent or erect, up to 3 m long **20. *L. banksii***
- 31: Leaves not disarticulating readily near base, not leaving strongly recurving remnants; stem short, plants tufted, or stem elongated but less than 0.5 m long
- 32 Stem elongated and decumbent or slightly extended and erect, older parts often lacking leaves or bearing only leaf remnants
- 33 Leaves 3–4.5 mm wide; sheath margins narrowing abruptly at top **21. *L. rigida***
- 33: Leaves 0.3–2.5 mm wide; sheath margins narrowing gradually at top (difficult to determine but can be assumed when margins lacerated) or if narrowing abruptly, leaves less than 1.5 mm wide **24. *L. confertifolia***
- 32: Stem short, largely or wholly concealed by the leaves
- 34 Male inflorescence branched
- 35 Leaves up to 2.5 mm wide
- 36 Scape 2–3 or more times as long as rachis **25. *L. fluviatilis***
- 36: Scape shorter to about as long as rachis **24. *L. confertifolia***

- 35: Leaves 4.5 mm wide or more
- 37 Inflorescences with extensive secondary branching; major primary branches usually 4 per node **23. *L. hystrix***
- 37: Inflorescence with primary branching or occasionally with some secondary branching; major primary branches usually 2 per node **22. *L. longifolia***
- 34: Male inflorescence not (or rarely) branched **27. *L. spicata***
- 38 Leaves 4–12 mm wide; rachis of male inflorescence 10–30 cm long
- 38: Leaves up to 4 mm wide; rachis of male inflorescence less than 8 cm long
- 39 Leaves soft and flexible, thin and flat, 2–4 mm wide **26. *L. montana***
- 39: Leaves rather stiff, straight or arched, concavo-convex, usually not more than 1.5 mm wide **24. *L. confertifolia***
- 12: Male flowers separate or 2 or 3 together; female flowers arranged similarly or in a single terminal cluster
- 40 Leaves, at least a few on each plant, coiling from the apex when old
- 41 Leaves pinkish brown to brick red when dry, bases white or pale grey; branches and pedicels in male inflorescence often whorled but pedicels of upper flowers sometimes opposite; flowering in autumn (Apr.–June) **49. *L. hermaphrodita***
- 41: Leaves straw-coloured when dry, bases light brown, pinkish or mauve; male flowers 1–3 at nodes of the inflorescence axes; flowering in spring (Aug.–Oct.) **50. *L. maritima***
- 40: Leaves straight or arched, not coiling from the apex when old
- 42 Male flower on pedicel at least 1 mm long, spreading or recurved from the axil
- 43 Leaf apex with a distinct sinus between two strong lateral points **37. *L. effusa***
- 43: Leaf apex rounded, acute or acuminate, entire or with a few minute points terminating veins and soon eroded
- 44 Sepals and petals of male flowers similar
- 45 Leaves 3–12 mm wide, flat (W.A.) **36. *L. drummondii***
- 45: Leaves usually less than 3 mm wide, if broader and flat then E. Australia **35. *L. micrantha***
- 44: Sepals and petals of male flowers dissimilar
- 46 Sepals longer than petals, at least the sepals and sometimes also the petals attenuate
- 47 Leaves 0.5–1 mm wide, the apex acuminate, margins minutely and regularly serrulate **33. *L. fibrata***
- 47: Leaves 1–6 mm wide, flat to terete (sometimes on one plant), the apex with a few minute points soon eroded, margins smooth **34. *L. densiflora***
- 46: Sepals shorter than petals, sepals and petals never attenuate but often apiculate
- 48 Plants tufted, sometimes sparsely so
- 49 Leaves usually terete **38. *L. cylindrica***
- 49: Leaves not terete though sometimes rolled into a complete cylinder
- 50 Male inflorescence unbranched or narrowly pyramidal with 1 to few short branches in the lower part

- 51** Leaves channelled to slightly inrolled, 0.5–1 mm wide, the apex entire; inflorescence axes smooth; flowers yellow, blackish when dried; male flowers usually 3 mm long, 3–4 mm diam. with pedicel 3–4 mm long **39. *L. brevis***
- 51:** Leaves flat, channelled or rolled, 0.5–4 mm wide or wider, the apex entire or with 2 or 3 minute irregular points sometimes eroded; inflorescence axes smooth or scabrid; flowers yellow, not usually blackened when dried; male flowers usually 1.5 mm long, 1.5–2 mm diam. with pedicel usually 2–3 mm long **40. *L. filiformis***
- 50:** Male inflorescence clearly branched, more or less broadly pyramidal
- 52** Male inflorescence short; flowers crowded; scape short or obscure among the leaf bases
- 53** Outer bracts large and white, conspicuous relative to the very small flowers; female flowers scarcely distinguishable from the male without dissection **41. *L. bracteata***
- 53:** Outer bracts not large and white but bracts subtending lower branches of inflorescence sometimes conspicuous; female flowers easily distinguishable from the male **40. *L. filiformis***
- 52:** Male inflorescence sometimes short but flowers well spaced; scape short or long
- 54** Branches of the inflorescence predominantly alternate
- 55** Leaves semiterete **38. *L. cylindrica***
- 55:** Leaves usually channelled, folded, inrolled or flat
- 56** Leaf sheath margins dark purplish brown; inflorescence usually large, open, the axes smooth at least in male **42. *L. gracilis***
- 56:** Leaf sheath margins pale or white, occasionally partly purplish brown; inflorescence small to large, the axes sometimes \pm scabrid near apex **40. *L. filiformis***
- 54:** Branches of the inflorescence predominantly opposite or whorled
- 57** Inflorescence nodding, axes and pedicels stout pedicels straight; clearly articulate with flowers **44. *L. nutans***
- 57:** Inflorescence erect, axes and pedicels slender; pedicels often curved, not distinctly articulate with flowers **43. *L. laxa***
- 48:** Plants decumbent
- 58** Leaves 0.5–1 mm wide; inflorescence usually unbranched; bracts longer than pedicels **45. *L. pauciflora***
- 58:** Leaves 2–4 mm wide; inflorescence well-branched; bracts much shorter than pedicels **43. *L. laxa***
- 42:** Male flower sessile, \pm erect within the bract
- 59** Leaf apex distinctly toothed **24. *L. confertifolia***
- 59:** Leaf apex entire or minutely 1–3-pointed

- 60** Inflorescence short and dense, bracts and often the flowers overlapping; scape longer than rachis; bracts chartaceous, straw-coloured **46. *L. caespitosa***
- 60:** Inflorescence with flowers distant, not overlapping; scape not conspicuously longer than the rachis; bracts somewhat membranous, purple-mottled
- 61** Bracts acute or acuminate but without a long fine point, not or scarcely overtopping the flowers; female flowers scarcely distinguishable from the males, c. 2 mm long, many in the inflorescence **47. *L. sororia***
- 61:** Bracts, at least the lower ones, with a long fine point exceeding the flowers; female flowers longer than the males, 4–6 mm long, 1–5 in the inflorescence **48. *L. brittanii***

Sect. I. *Macrostachya*

***Lomandra* sect. *Macrostachya* (Benth.) Engl., *Nat. Pflanzenfam.* 2(5): 51 (1887).**

Xerotes sect. *Macrostachya* Benth., *Fl. Austral.* 7: 109 (1878). T: *L. hastilis* (R.Br.) Ewart

Male and female inflorescences similar, long, dense, narrowly cylindrical; rachis on long scape; flowers in cymose clusters or separate, crowded, distichous or whorled, on short branches appressed to rachis and largely obscured by flowers. Cluster bracts subtending branches, conspicuous only when young, deltate or ovate, truncate, obtuse, acute or apiculate; intermediary bracts sometimes present; bract and inner bract broad, opposite, overlapping, completely surrounding flower base or pedicel. Male flowers pedicellate, females sessile. Sepals and petals nearly equal, free. Stamens inserted near base of perianth, the inner 3 higher than the outer.

A section of 2 species, 1 each in W.A. and Qld.

1. *Lomandra hastilis* (R.Br.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 220 (1916)

L. hastilis R.Br., *Prodr.* 263 (1810). T: [Lucky Bay, W.A.], Jan. 1802, *R.Brown*; syn: K, photo seen; King George Sound, [W.A.], Dec. 1801–Jan. 1802, *R.Brown Iter Australiense* 5770; syn: BM, K, photos seen.

Tussock robust. Leaves flat, 30–60 cm long, 4–5 mm wide; apex entire or minutely 2- or 3-toothed; sheath margins somewhat lacerated, pale to bright brown. Inflorescences about as long as leaves; flower clusters or individual flowers distichous; branches whorled, crowded, 2–8 mm long; pedicel of male flowers 1.5–2 mm long. Sepals and petals purple-black. Capsule slightly wrinkled. Seeds orange. *n* = 8, *fide* G.J.Keighery, *Feddes Rept.* 95: 528 (1984). Figs 25A, 27A–B.

Occurs in south-western W.A., in near-coastal areas between Kalbarri and Israelite Bay. Grows in sandy soil. Flowers in spring. Map 121.

W.A.: c. 13 km from Albany–Chester Pass road along road to South Stirling, *J.Wrigley CBG 50550* (♂) (NSW); c. 1 km S of Gibson, *B.G.Briggs 333* (♀) (NSW); 9.6 km S of Northcliffe, *A.S.George 2640* (♀) (PERTH); Cockleshell Gully, *C.A.Gardner 8401* (♂ & ♀) (PERTH); 32 km W of Moora, *R.D.Royce 4914* (♂) (PERTH).

2. *Lomandra teres* T.Macfarlane, *Fl. Australia* 46: 224 (1986)

T: Mt Playfair Stn, between Mt Pluto and head of Louisa Creek, Qld, 7 Nov. 1984, *S.J.Barry* (♂); holo: BRI.

Tussock robust. Leaves flat, c. 95 cm long, 4.5–5 mm wide; apex obtuse; sheath margins somewhat lacerated, predominantly reddish brown. Inflorescences exceeding leaves; flowers in whorled clusters; branches whorled, crowded, 6–7 mm long; rachis and

branches obscured in male, partially obscured in female; pedicel of male flowers up to 4.5 mm long. Sepals and petals greenish purple. Mature capsule not seen.

Known only from Salvator Rosa Natl Park and vicinity on the Great Dividing Range E of Tambo, central Qld. Grows in white sandy soils in *Angophora* and *Callitris* woodland. Flowers Oct.–Nov. Map 122.

Qld: Sentinal Mt, Salvator Rosa Natl Park, *M.E.Ballinghall* 457 & *M.R.Cockburn* (♀) (BRI).

Differs from *L. hastilis* in the longer pedicels of male flowers, in the slightly longer, fewer, stouter, more appressed branches with the flowers less regularly arranged, and in the paler purple mixed with green of the flowers.

Sect. II. Typhopsis

***Lomandra* sect. *Typhopsis* (Benth.) Engl., *Nat. Pflanzenfam.* 2(5): 51 (1887).**

Xerotes sect. *Typhopsis* Benth., *Fl. Austral.* 7: 109 (1878). T: *L. leucocephala* (R.Br.) Ewart

Xerotes sect. *Schoenoxeros* Benth., *Fl. Austral.* 7: 108 (1878), *p.p.*; *Lomandra* sect. *Schoenoxeros* (Benth.) Kuntze, *Lex. Gen. Phan.* 336 (1903); *Lomandra* sect. *Schoenolomandra* Engl., *Nat. Pflanzenfam.* 2(5): 51 (1887), *nom. illeg.* based on *Xerotes* sect. *Schoenoxeros* Benth. T: not designated.

Male and female inflorescences similar, head-like, spherical to cylindrical, segmented or entire; flowers crowded in sessile sub-units; rachis unbranched. Cluster bracts conspicuous usually only when young; other prophylls of uncertain status present, modified and appearing as a mass or crinkly hairs between the flowers. Flowers pedicellate. Sepals and petals dissimilar; sepals free; petals partly joined.

A section of 2 species, incorporating *L. juncea* from sect. *Schoenoxeros* Benth. (an artificial taxon based on erroneous interpretation of morphology). The structure of the inflorescence is uncertain because of the deeply fringed or entirely fragmented prophylls, perhaps consisting of outer and inner bracts encircling flower and overlapping each other.

3. *Lomandra juncea* (F.Muell.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 220 (1916)

Xerotes juncea F.Muell., *Trans. & Proc. Victorian Inst. Advancem. Sci.* 135 (1855). T: Port Lincoln, S.A., *C.Wilhelmi*; syn: MEL 20630 (♂); 20631 (♀); near Poonintie, *C.Wilhelmi*; syn: MEL 20629 (♀); S of Poonintie, Dec. 1854, *collector unknown*, herb. Sonder; syn: MEL 625548 (♀).

Illustration: J.M.Black, *Fl. S. Australia* 3rd edn, 1: fig. 311 (1978).

Tussock robust; rhizomes horizontal. Leaves terete, rigid, 20–50 cm long, 1–1.5 mm diam.; apex pungent; sheath margins absent. Inflorescences much shorter than the leaves, usually interrupted, the male with 3–7 spherical segments, the female with 1 or 2; pedicels of male and female flowers embedded among hairs of modified bracts. Perianth 5 mm long. Sepals white. Petals yellowish. Stamens of outer whorl inserted on rim of perianth tube, inner whorl on lobes. *Desert Mat-rush*. Figs 25B, 27F.

Occurs in the mallee and the Big and Little Deserts of western Vic., and the Eyre Peninsula and dry south-eastern region of S.A. Grows in sandy soils. Flowers Aug.–Oct. Map 123.

S.A.: Barossa Ranges, *O.E.Menzel* NSW 151594 (♂) (NSW); Scorpion Springs Conservation Park, 35°30'S, 140°55'E, *D.E.Symon* 8733 (NSW); Mt Compass, *D.E.Symon* 3959 (♂) (NSW). Vic.: near Horsham, *Miss Thurman* NSW 87520 (♂) (NSW); Casterton, *E.Waters* NSW 151593 (♂) (NSW).

4. *Lomandra leucocephala* (R.Br.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 220 (1916)

Xerotes leucocephala R.Br., *Prodr.* 260 (1810). T: Facing Is., Keppel Bay, [Qld], 1802, *R.Brown Iter Australiense* 5753; holotype BM, photo seen; iso: NSW 55248 (♂).



Figure 25. *Lomandra* inflorescences, all $\times 0.1$. **A**, *L. hastilis*, ♀ in fruit (B.Briggs 333, NSW). **B**, *L. juncea* ♂ (Miss Thurman NSW 87520, NSW). **C–D**, *L. glauca*. **C**, ♂ **D**, ♀ (C–D, L.Fraser NSW 50588, NSW).



Figure 26. *Lomandra* inflorescences, all $\times 0.1$. **A**, *L. sonderi* ♂ (S.Jackson NSW 152394, NSW). **B**, *L. rigida* ♀ (J.Wrigley WA/68 5406, NSW). **C**, *L. multiflora* subsp. *multiflora* ♂ (L.Craven 1506, NSW). **D**, *L. odora* ♂ (M.Griffiths NSW 151542, NSW). **E**, *L. sororia* (R.Melville 1768 et al., NSW). **F**, *L. cylindrica* ♂ (R.Coveny 8492, NSW).

Tussock small to robust; rhizomes ascending. Leaves flat, rigid, coarsely veined, 20–60 cm long, c. 1–2.5 mm wide; apex acute to rounded; sheath margins white or orange-brown. Inflorescence shorter than leaves, entire or in segments; pedicels embedded among hairs of modified bracts, male 1–3 mm long, female 1 mm long. Male and female flowers similar, sweetly scented. Perianth to 7 mm long, cream-coloured. Stamens inserted at top of perianth tube. *Woolly Mat-rush*, *Irongrass*.

Occurs in all States except Tas., with two subspecies, one occupying a small north-eastern part of the range, and the other a larger south-western part.

Leaf sheath margins long-decurrent, white, the fragments abundant, silky or woolly; male inflorescence usually with 1 or 2 segments (north-eastern part of range)

4a. subsp. *leucocephala*

Leaf sheath margins short, yellowish to orange-brown, the fragments few, woolly or fibrous; male inflorescence usually with more than 3 segments (southern and western parts of range)

4b. subsp. *robusta*

4a. *Lomandra leucocephala* (R.Br.) Ewart subsp. *leucocephala*

Xerotes filamentosa Cunn. ex Brongn. in L.Duperrey, *Voy. Monde* 183 t. 35 (1829). T: W of Bathurst, N.S.W., *A.Cunningham* (in herb. d'Urville); syn: P (2 sheets); 'Port Jackson' [probably W of Blue Mountains], N.S.W., *C.Gaudichaud*; syn: P.

Xerotes fribrillosa Gand., *Bull. Soc. Bot. France* 66: 295 (1919). T: Dubbo, N.S.W., Aug. 1903, *J.L.Boorman* (Gandoger 2496a, specimen 'B' only); lecto: LY, *fide* A.T.Lee, *Contr. New South Wales Natl Herb., Fl. Ser.* 34: 42 (1966); isolecto: NSW 16244.

Illustration: G.M.Cunningham *et al.*, *Pl. W. New South Wales* 188 (1982).

Plant slender, often less than 40 cm high. Leaves c. 1–2 mm wide; sheath margins long-decurrent, white, readily lacerating into abundant, loose, silky or woolly fragments. Male inflorescence usually with 1 or 2 segments; female inflorescence usually not segmented, spherical; scape minutely hirsute. $2n = 16$, *fide* B.G.Briggs, *Telopea* 2: 742 (1985). Fig. 27C.

Occurs in dry coastal areas and ranges in Qld from near Rockhampton southwards, and in northern and central N.S.W. chiefly on the inland slopes of the Great Divide. Grows in open eucalypt forest on rocky slopes and sandy soils. Flowers chiefly July–Sept. Map 124.

Qld: Blackdown Tableland, c. 32 km SE of Blackwater, *R.J.F.Henderson* 754 *et al.* (NSW); c. 26 km SSW of Cracow township, *M.Lazarides* 6949 (♂) (NSW). N.S.W.: Dumaresq R., *M.Midson* NSW 51106 (♂) (NSW); Barryrenie, c. 23 km NW of Cowra, *E.J.McBarron* NSW 73700 (♂) (NSW); Dubbo, *J.L.Boorman* NSW 16244 (♀) (NSW).

4b. *Lomandra leucocephala* subsp. *robusta* A.Lee, *Contr. New South Wales Natl Herb.* 3: 161 (1962)

T: between Euston and Mildura, Vic., 19 Aug. 1946, *J.Vickery* NSW 2026 (♂ & ♀); holo: NSW.

Xerotes typhina Lindley in T.Mitchell, *Three Exped. E. Austral.* 2: 41 (1838). T: [camp on Lachlan R. c. 10–15 km W of Lake Cargelligo], N.S.W., 17 Apr. 1836, *T.L.Mitchell*; *n.v.*

Xerotes apiculata Gand., *Bull. Soc. Bot. France* 66: 295 (1919). T: Wimmera, Vic., Oct. 1900, *C.Walter* (Gandoger 2496a, specimen 'A' only - published with the erroneous data 'Dubbo, Boorman, 8.1903'); holo: LY; probable iso: MEL, *fide* A.T.Lee, *Contr. New South Wales Natl Herb., Fl. Ser.* 34: 42 (1966).

Illustration: G.M.Cunningham *et al.*, *Pl. W. New South Wales* 188 (1982).

Plant generally robust, often 40–60 cm high. Leaves c. 1.5–5 mm wide; sheath margins short, yellowish to orange-brown, the fragments few, woolly or fibrous. Male inflorescence usually with more than 3 segments; female inflorescence segmented or often entire, cylindrical; scape glabrous. Figs 21, 27D–E.

Occurs in central Australia, and adjacent regions of W.A., N.T., Qld, N.S.W. and Vic., and in S.A. Grows on upper slopes and crests of sand dunes, including red sands of central Australia; often under mallee. Flowers chiefly July–Sept. Map 125.

W.A.: c. 26 km N of Cundeelee, Mar. 1963, *M.George* (NSW). N.T.: 4 km N of Gosse Bluff, *Nelson 1966* (♀) (NSW). S.A.: Scorpion Springs Conservation Park, *D.E.Symon 8735* (♂) & *8736* (♀) (NSW). Qld: Gilruth Plains Stn, Cunnamulla, *A.Dyce NSW 67429* (♂) (NSW). N.S.W.: 32 km W of Euston on road to Mildura in N.S.W., *M.D.Crisp 2130* (♂) & *2131* (♀) (NSW).

Sect. III. Capitatae

Lomandra* sect. *Capitatae (G.Don) A.Lee, *Fl. Australia* 46: 223 (1986).

Xerotes sect. *Capitatae* G.Don in *J.C.Loudon, Hort. Brit.* 398 (1830). T: *L. obliqua* (Thunb.) J.F.Macbr.; lecto, fide A.T.Lee, *Fl. Australia* 46: 223 (1986).

Lomandra sect. *Cephalogyne* (Benth.) Engl., *Nat. Pflanzenfam.* 2(5): 51 (1887); *Xerotes* sect. *Cephalogyne* Benth., *Fl. Austral.* 7: 105 (1878). T: not designated.

Male and female inflorescences dissimilar. Male inflorescence scapose; flowers in sessile clusters; rachis branched or unbranched. Female inflorescence a single subsessile or shortly scapose head; flowers crowded in 1 to several sessile clusters. Cluster bracts narrowly acute from a broad base, often scarious; intermediary bracts absent; outer bract broadly acute or obtuse-truncate, scarious or membranous, overlapping both edges of an even broader, similar inner bract, both often split to the base into 2 or 3 segments. Flowers sessile. Sepals and petals similar, joined in their lower half in male flowers, free in female flowers.

A section of 9 species all similar in inflorescence structure and flowers. Four taxa treated here as species are part of an Australia-wide complex previously treated in different ways.

5. *Lomandra obliqua* (Thunb.) J.F.Macbr., *Contr. Gray Herb.* n. ser. 3(56): 5 (1918)

Dracaena obliqua Thunb., *Dis. Bot. Dracaena* 6 (1808); *Xerotes obliqua* (Thunb.) Domin, *Biblioth. Bot.* 85: 527 (1915); *Xerotes flexifolia* R.Br., *Prodr.* 260 (1810), *nom. illeg.* based on *Dracaena obliqua* Thunb. T: Thunberg, *op. cit.* fig. 2 (♂).

Illustration: E.R.Rotherham et al., *Fl. Pl. New South Wales & S. Queensland* 74 (1975).

Plant decumbent to scrambling; stems extensive, branched. Leaves nearly flat, spreading or recurved, commonly twisted, 2–4 cm long, rarely to 15 cm, 1–2 mm wide, green or glaucous; apex long-acute, almost pungent; sheath margins auriculate at top at least when young, intact, white. Male inflorescence: scape short or hidden among leaf bases; rachis c. 2–10 cm long, shorter to longer than leaves, usually with a few branches. Female inflorescence c. 5–8 mm diam.; scape absent or up to c. 3 cm long. Cluster bracts thin, pale golden brown, obscured by flowers. Flowers yellow, flushed with purple. Male perianth c. 2 mm long; tube 1 mm long or slightly less. Female perianth c. 3 mm long. $2n = 14$, fide B.G.Briggs, *Telopea* 2: 742 (1985). Fig. 27G, P.

Occurs in eastern Australia from the Blackdown Tableland, Qld, through the coast and tableland areas of N.S.W. as far south as Jervis Bay. Grows in eucalypt woodland and forest on sandy soils, often shallow, or on rocky slopes. Flowers in spring. Map 126.

Qld: Blackdown Tableland, 23°50'S, 149°00'E, *R.J.F.Henderson 1103* et al. (♂ & ♀) (NSW). N.S.W.: c. 6 km NE of Putty, *H.Salasoo 2887* (♀) & *2888* (♂) (NSW); N of Red Rock, c. 40 km by road S of Grafton, *L.A.S.Johnson 7531* & *M.Watson* (♂) (NSW); Whale Beach, *A.Lee NSW 50639* (♂ & ♀) (NSW); Boyne Natl Park, E side of Nelligen bridge, *M.Evans 2548* (♂) (NSW).

6. *Lomandra mucronata* (R.Br.) A.Lee, *Contr. New South Wales Natl Herb.* 4: 260 (1972)

Xerotes mucronata R.Br., *Prodr.* 260 (1810); *Acanthocarpus mucronatus* (R.Br.) J.F.Macbr., *Contr. Gray Herb.* 3(56): 4 (1918). T: Lucky Bay, [W.A.], 9 Jan. 1802, *R.Brown* (♂); holo: BM, photo seen.

Plant with extending leafy stems forming dense mats up to 30 cm diam. Leaves concavo-convex to semiterete, not or scarcely twisted or recurved, usually 2.5–3.5 cm long, 1–2 mm wide, glaucous; apex acuminate, almost pungent; sheath margins abruptly

narrowed at top, intact, white to golden brown, developing a reddish line along junction with leaf base. Male inflorescence subsessile, \pm equalling leaves, or rarely scape exposed above leaf bases for c. 5 mm; rachis branched or unbranched, 1–2.5 cm long, usually shorter than leaves. Female inflorescence 5–7 mm diam.; scape not exposed. Bracts and flowers as in *L. obliqua*. $n = 14$, *fide* G.J.Keighery, *Feddes Repert.* 95: 528 (1984). Fig. 27 O.

Occurs in south-western W.A., from York to Cape Arid. Grows mostly in sandy or lateritic soils in low or tall shrubland or mallee. Flowers in spring. Map 127.

W.A.: Grass Patch to Gibson near 531-mile peg, *B.G.Briggs* 316 (♂) & 317 (♀) (NSW); Duke of Orleans Bay, c. 64 km E of Esperance, Nov. 1950, *J.H.Willis* (MEL); c. 30 km N of Bremer Bay, *P.G.Wilson* 4387 (♂) (PERTH); Cape Le Grand, E of Esperance, *B.G.Briggs* 397 (♂) (NSW); c. 27 km from Ravensthorpe towards Lake King, *E.M.Canning* 7262 (♂) (NSW).

7. *Lomandra glauca* (R.Br.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 220 (1916)

Xerotes glauca R.Br., *Prodr.* 260 (1810). T: eastern Australia, 1802–1805, *R.Brown*; holo: BM; iso: K n.v., *fide* A.T.Lee, *Contr. New South Wales Natl Herb.* 4: 252 (1972).

Plant caespitose, or stems shortly decumbent in small dense mats. Leaves flat or slightly concave, erect to spreading, often crowded towards the stem apex, usually 8–20 cm long, 1–1.5 mm wide, glaucous; apex shortly acute to rounded-truncate; sheath margins (at least of sterile shoots) abruptly narrowed at the top, readily lacerated, lattice-like, white or pale brown. Male inflorescence at least $\frac{1}{4}$ of leaf length, usually 10 cm long, occasionally up to 15 cm; scape usually not exposed above leaf bases, rarely exposed up to 2.5 cm; rachis branched or unbranched, the lowest node often with 2 or 3 whorled branches. Female inflorescence to 1.5 cm diam.; scape concealed or exposed for up to 2.5 cm. Bracts and flowers as in *L. obliqua*. *Pale Mat-rush*. $2n = 14, 28$, *fide* B.G.Briggs, *Telopea* 2: 742 (1985). Figs 25C–D, 27H, N.

Occurs in coastal and tableland areas of N.S.W., from N of Newcastle S to Braidwood; common in the Sydney area. Usually grows on sandy soils, from deep coastal sandy heaths to open forests on sandstones. Flowers in spring. Map 128.

N.S.W.: Tea Gardens, *B.G.Briggs* NSW 73924 (♀) (NSW); Belrose, *R.Coveny* 11064 & *P.Hind* (♂) & 11065 (♀) (NSW); Mt Victoria, *A.A.Hamilton* NSW 50563 (♂ & ♀) (NSW); Lees Pinch, Wollar–Merriwa road, *L.A.S.Johnson* NSW 18755 (♂) (NSW); E of Big Badja Hill, 1.4 km at 159° from Dampier Trig., *M.D.Crisp* 2394 & *D.J.Cummings* (♂) (NSW).

Lomandra glauca is distinguished from its closest relatives by its leaf-length and relative leaf and inflorescence lengths, its readily lacerating and lattice-like sheath margins abruptly narrowed at the top, its shortly acute leaf apex, and its male scape usually not exposed above leaf bases. It appears to be replaced northwards by *L. elongata* (with some intergradation) and by *L. obliqua* (maintaining distinctness). The taxa *L. collina* and *L. nana*, earlier treated as subsp. *collina* and subsp. *nana* of *L. glauca*, are probably more distant morphologically than the northern relatives and are probably never sympatric with *L. glauca*, but all are part of a complex bordering the continent, with *L. tropica* providing a northern complement.

8. *Lomandra elongata* (Benth.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 220 (1916)

Xerotes elongata Benth., *Fl. Austral.* 7: 106 (1878). T: Moreton Is., Qld, Aug. 1855, *F.Mueller*; lecto: MEL, *fide* A.T.Lee, *Contr. New South Wales Natl Herb.* 3: 164 (1962).

Tussock narrow; stems short. Leaves plano-convex to semiterete, erect, usually 30–40 cm long, rarely to 70 cm, 1 mm wide, grey-green; apex shortly acute; sheath margins abruptly narrowed at top, readily lacerated, lattice-like, pale to pinkish brown. Male inflorescence not more than one-fifth of leaf length, 5–8 cm long; scape up to 3 cm long; rachis unbranched. Female inflorescence 1–1.5 cm diam., very rarely in 2 segments and 3–5 cm tall; scape short. Bracts and flowers as in *L. obliqua*. $2n = c. 28$, *fide* B.G.Briggs, *Telopea* 2: 742 (1985).

Occurs in a small area of eastern Australia, in coastal south-eastern Qld south of Noosa Heads, and in northern N.S.W. Flowers in spring. Map 129.

Qld: Noosa Heads, *A.G.Harold* NSW 85309 (♀) & NSW 98633 (♂) (NSW). N.S.W.: N of Bald Knob, Angourie, *D.J.McGillivray* 2148 (♂) (NSW); Poverty Point, New England, *C.Stuart* 701 (♂) (NSW); c. 10 km SW of Ebor, *A.T.Lee* NSW 102498 (♀) (NSW); Jerusalem Ck, N of Evans Head, *D.R.Brooks* NSW 151966 (♂) (NSW).

Lomandra elongata shows some intergradation with *L. glauca*, from which it is distinguished only by its longer leaves and short, unbranched male inflorescence.

9. *Lomandra nana* (A.Lee) A.Lee, *Fl. Australia* 46: 223 (1986)

L. glauca subsp. *nana* A.Lee, *Contr. New South Wales Natl Herb.* 4: 256 (1972). T: Wimmera District, Vic., Oct. 1900, *C.Walter* 9 (♂ & ♀); holo: NSW 50575.

Tussock 5–10 cm diam. Leaves usually flat, erect or often curved to one side, c. 5–15 cm long, 0.8–1.5 mm wide, blue-green, scarcely glaucous; apex obtuse or truncate, occasionally shortly acute or with a minute central point; sheath margins gradually narrowed at top, rather tardily and coarsely lacerated, white when young, often dark brown when old. Male inflorescence usually shorter than leaves and unbranched; scape usually shortly exposed above leaf bases. Female inflorescence subsessile. Bracts and flowers as in *L. obliqua*. Fig. 27M.

Occurs in SE Australia, in Tas., western Vic. and south-eastern S.A. Grows in sandy and rocky soils in eucalypt woodland. Flowers spring to summer. Map 130.

S.A.: Aldgate, Jan. 1907, *J.H.Maiden* (♂) (NSW). Vic.: 10 km S of Halls Gap, Grampians, *H.Streimann* 3138 (♂) (NSW); Mt Arapiles, Little Desert, *T.Henshall* NSW 113953 (♂) (NSW). Tas.: near Launceston, *R.Gunn* 93 (NSW); near Perth, *W.H.Archer* 96 (♂) (NSW).

Sterile shoots, in which leaf sheath margins are most visible, are rarely seen in *L. nana*; the character as described is common in fertile shoots of this species complex.

10. *Lomandra rupestris* (Endl.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 220 (1916)

Xerotes rupestris Endl. in J.G.C.Lehmann, *Pl. Preiss.* 2: 50 (1846). T: 'Gordenup', between Mt Manypeak & Cape Riche, W.A., 17 Nov. 1840, *L.Preiss* 1553 (♂); holo: LD; iso: MEL 20644, P.

Tussock dense, 30–45 cm diam., of numerous short, slender shoots. Leaves erect or spreading, plano-convex to semiterete, c. 12–35 cm long, 0.5–0.8 mm wide, glaucous; apex acuminate; sheath margins gradually narrowed at top, intact, rather firm, white to pale yellow. Male inflorescence much shorter than leaves; scape concealed by leaf sheaths or exposed up to 2.5 cm; rachis with 1 or few branches 1.5–7 cm long. Female inflorescence 6–10 mm diam.; scape exposed up to 1 cm. Bracts and flowers as in *L. obliqua*. *n* = 14, *fide* G.J.Keighery, *Feddes Repert.* 95: 528 (1984), as *L. glauca* subsp. *collina*.

Occurs in south-western W.A., between Cape Riche, the Stirling Range, Narrogin and the Young River W of Esperance. Grows near creeks or lakes and in eucalypt woodland. Flowers in spring to summer. Map 131.

W.A.: Stirling Ra., *J.Forrest* (♂) (MEL 20920); Gold Holes, Chester Pass, Stirling Ra., *G.J.Keighery* 5600 (♂) (PERTH); Taarblin Lake, E of Narrogin, *C.V.Malcolm* 19 (♂) (PERTH); 1.5 km W of Bivouac Rock, Fitzgerald River Natl Park, *K.Newbey* 3947 (♀) (PERTH).

Similar to *L. collina* but differs in the intact leaf sheath margins and usually finer leaf blades, and often in its uniformly short stems.

11. *Lomandra collina* (R.Br.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 220 (1916)

Xerotes collina R.Br., *Prodr.* 260 (1810); *Lomandra glauca* subsp. *collina* (R.Br.) A.Lee, *Contr. New South Wales Natl Herb.* 4: 257 (1972). T: Lucky Bay, [W.A.], Jan. 1802, *R.Brown*; holo: BM n.v., *fide* A.Lee, *op. cit.* 258.

Xerotes glauca var. *occidentalis* Benth., *Fl. Austral.* 7: 106 (1878). T: Cape Paisley, W.A., *G.Maxwell*;

syn: K, photo seen; isosyn: MEL 20901; Esperance Bay, W.A., *G.Maxwell*; syn: K, photo seen; isosyn: MEL 20902.

Illustration: G.M.Cunningham *et al.*, *Pl. W. New South Wales* 188 (1982) as *L. glauca* subsp. *collina*.

Stems short, forming dense tussocks or mats, or stems more extensive, forming sparse or open tussocks. Leaves flat or plano-convex to almost terete, usually 10–30 cm long, to 1.5 mm wide, ±glaucous; apex long-acute to acuminate, at first with 2 or 3 minute points; sheath margins gradually narrowed at top, readily lacerated, lattice-like, whitish or white, sometimes developing a pink to brown stripe along junction with leaf base. Male inflorescence much shorter than leaves; scape exposed for up to 5 cm; rachis usually well branched, 2.5–10 cm long. Female inflorescence 5–10 mm diam.; scape usually exposed for up to 3 cm. Bracts whitish, becoming chestnut brown after anthesis. Flowers yellow. Bracts and flowers as in *L. obliqua*. Fig. 27L.

Occurs in southern Australia, from Watheroo to Albany and along the S coast in W.A., across the Nullarbor and southern S.A. to north-western Vic. and south-western N.S.W. Flowers in spring. Map 132.

W.A.: Mt Andrew, c. 118 km NE of Norseman, *K.Newbey* 7785 (♂) (CANB, PERTH); SE part of Watheroo Natl Park, *T.D.Macfarlane* 1000 (♀) (NSW, PERTH). S.A.: Corny Point, Yorke Peninsula, *H.Eichler* 14126 (♂ & ♀) (AD, NSW). N.S.W.: 29 km N of Barellan, *E.Edwards* NSW 113504 (♂ & ♀) (NSW). Vic.: Big Desert, *R.Melville* 1101 *et al.* ('loc. 2', ♂) & *R.Melville* 1093 *et al.* ('loc. 5', ♀) (NSW).

Lomandra collina appears closest to *L. nana*, from which it is easily distinguished by its long-acute leaf apices and longer leaves, to *L. tropica* and to *L. rupestris*.

12. *Lomandra tropica* A.Lee, *Telopea* 2: 49 (1980)

T: Welcome Creek [vicinity of Prince Regent R.], W.A., 1891, *R.J.Bradshaw & Allen* NSW 50574 (♂); holotype: NSW.

L. tropica subsp. *arnhemica* A.Lee, *Telopea* 2: 51 (1981). T: 113 km W of Giddy R. crossing, N.T., 12°22'S, 136°42'E, June 1972, *D.E.Symon* 7751 (♂ & ♀); holotype: NSW.

[*Xerotes brownii* auct. non *F.Muell.*: *F.Mueller*, *Proc. Linn. Soc. New South Wales* ser. 2, 6: 475 (1892)]

[*Xerotes elongata* auct. non *Benth.*: *W.V.Fitzgerald, J. & Proc. Roy. Soc. W. Australia* 3: 127 (1918)]

Tussock often large and robust; stems sometimes extending to 10 cm. Leaves spreading, flat to slightly concavo-convex, usually 25–45 cm long, to 3.5 mm wide, glaucous; apex acute to acuminate; sheath-margins gradually narrowed upwards, lacerated, lattice-like, whitish to brown. Male inflorescence several-branched; scape clearly exposed up to 12 cm above leaf bases, or rarely concealed; rachis 6–15 cm long. Female inflorescence c. 1.5 cm diam., subsessile. Bracts whitish. Flowers yellow, becoming flushed with, or entirely, purple-black. Bracts and flowers otherwise as in *L. obliqua*. Fig. 27 I.

Occurs in tropical Australia from the Kimberley, W.A. to the Arnhem plateau, northern coast of the Gulf of Carpentaria and as far south as Pine Creek, N.T. Grows in palm and eucalypt woodland and forest, in sandy, granitic, lateritic and bauxitic soils. Flowers in autumn. Map 133.

W.A.: near Gibb River Stn Homestead, *L.Johnson* 2089 (♀) (NSW); Isdell R. – base of Mts Rason and Daglish, of Tabletop Mtn – Calder R., *W.V.Fitzgerald* NSW 81629 (♂) (NSW). N.T.: Elcho Is., 11°59'S, 135°43'E, *P.K.Latz* 6072 (DNA, NSW).

This species was divided by A.T.Lee, *loc. cit.* into subsp. *tropica*, forming coarse tussocks and with leaves 1–3.5 mm wide, occurring in W.A. and N.T. as far E as 132°E longitude, and subsp. *arnhemica*, forming fine tussocks with leaves 0.3–1.3 mm wide and occurring mainly E of 132°E longitude. Recently, however, specimens resembling the latter subspecies have been collected in the Kimberley region; further distributional data should determine whether the subspecies can continue to be recognised.

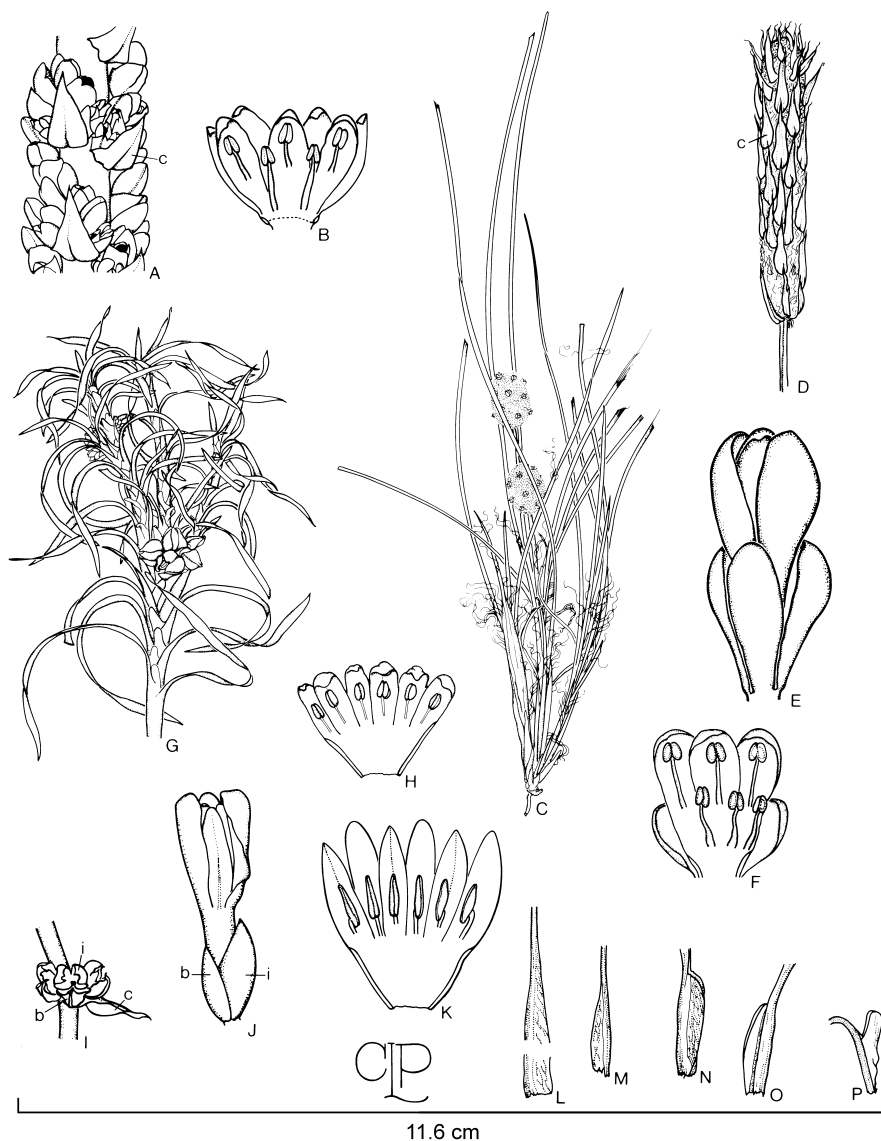


Figure 27. *Lomandra*. **A–B**, *L. hastilis*. **A**, part-spike with prominent cluster bracts subtending short flowering branches with other prophylls $\times 0.5$; **B**, σ flower spread open $\times 1.7$ (A–B, J.Wrigley WA/68 4898, NSW). **C–E**, *L. leucocephala*. **C**, subsp. *leucocephala*, shoot $\times 0.1$ (E.Betche NSW 51104, NSW). **D–E**, subsp. *robusta*. **D**, young inflorescence with prominent cluster bracts $\times 0.3$; **E**, flower $\times 1.7$ (D–E, H.Eichler 13803, NSW). **F**, *L. juncea*, σ flower spread open $\times 1.7$ (D.Symon 3959, NSW). **G**, *L. obliqua*, shoot $\times 0.3$ (R.Coveny 11066 & P.Hind, NSW). **H**, *L. glauca*, σ flower spread open $\times 1.7$ (R.Coveny 10336, NSW). **I**, *L. tropica*, flower cluster with cluster bract, bracts and inner bracts of 3 (fallen) flowers, $\times 1.7$ (P.Latz 6072, NSW). **J–K**, *L. suaveolens*. **J**, flower from cluster $\times 1.7$; **K**, σ flower spread open $\times 1.7$ (J–K, L.Preiss 1535, LD). **L–P**, leaf sheath margins, diagrammatic. **L–M**, gradually narrowed at top, lacerated. **L**, *L. collina*. **M**, *L. nana*. **N–O**, abruptly narrowed at top. **N**, *L. glauca*, lacerated. **O**, *L. mucronata*, intact. **P**, *L. obliqua*, auriculate, intact. (b, bract; c, cluster bract; i, inner bract).

13. *Lomandra suaveolens* (Endl.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 220 (1916)

Xerotes suaveolens Endl. in J.G.C.Lehmann, *Pl. Preiss.* 2: 50 (1846). T: Perth & Canning R., W.A., 14 Mar. 1841, *L.Preiss* 1535 (♂); holo: LD; iso: P.

Xerotes umbrosa Endl., *loc. cit.* T: near Pointwater [Point Walter], Perth, W.A., 18 July 1839, *L.Preiss* 1536; iso: P.

Tussock c. 10–20 cm diam. Leaves erect or flexuous, flat or channelled to semiterete, 30 cm long, 1–2 mm wide, green or glaucous; apex rounded; sheath margins long-decurrent and gradually narrowed upwards, lacerated, white to pale brown. Male inflorescence 2–8 cm long; scape obscure among leaf bases; rachis usually unbranched, occasionally with 1 or 2 short branches; flower clusters and branches alternate rather than whorled, crowded above; bracts white. Female inflorescence ovoid, of few clusters, 1–5 cm long; scape concealed or to 1.5 cm long. Male flowers 3.5–6 mm long, purple or yellow. Female flowers c. 10 mm long. *n* = c. 7, *fide* G.J.Keighery, *Feddes Repert.* 95: 529 (1984). Fig. 27J–K.

Occurs in south-western W.A., from Mt Lesueur to the Porongorup Range. Grows in shrubland or eucalypt woodland in various soils. Flowers in winter. Map 134.

W.A.: c. 6 km W of Mt Lesueur, *A.S.George* 14602 (♀) (NSW, PERTH); Claremont, *W.V.Fitzgerald* NSW 153282 (♂) (NSW); edge of railway on Kenwick fly-over, Perth, *R.J.Cranfield* 1209 (CANB ♂, PERTH ♂ & ♀); S of western end of Porongorups, *A.S.George* 6227 (♂) (PERTH).

Sect. IV. *Lomandra****Lomandra* Labill. sect. *Lomandra***

Xerotes sect. *Euxerotes* Benth., *Fl. Austral.* 7: 96 (1878), *nom. illeg.*; *Lomandra* sect. *Eulomandra* Engl., *Nat. Pflanzenfam.* 2(5): 51 (1881), *nom. illeg.* based on *Xerotes* sect. *Euxerotes* Benth.

Male inflorescence spike-like, raceme-like or panicle-like; flowers pedicellate or sessile, 1–3 at a node or several in a whorl, or in distinct clusters, often whorled; rachis branched or unbranched. Female inflorescence usually similar but often smaller, with fewer and smaller branches; flowers usually sessile, arranged as in the male. Cluster bracts absent or present, ovate or broadly triangular, acute, acuminate or irregular; intermediary bracts present or absent; outer and inner bracts opposite and imbricate, or inner bract smaller than and lateral to outer bract or absent. Sepals and petals free, or joined near base by filaments.

A section of 2 series and 37 species.

Ser. I. *Lomandra****Lomandra* Labill. ser. *Lomandra***

Xerotes sect. *Denticulata* G.Don in J.C.Loudon, *Hort. Brit.* 399 (1830). T: not designated.

Xerotes ser. *Glomeratae* Benth., *Fl. Austral.* 7: 96 (1878) *p.p.* T: not designated.

Xerotes ser. *Fasciculatae* Benth., *op. cit.* 100, *p.p.* T: not designated.

Xerotes sect. *Schoenoxeros* Benth., *op. cit.* 108, *p.p.*; *Lomandra* sect. *Schoenoxeros* (Benth.) Kuntze, *Lex. Gen. Phan.* 336 (1903); *Lomandra* sect. *Schoenolomandra* Engl., *Nat. Pflanzenfam.* 2(5): 51 (1887), *nom. illeg.* based on *Xerotes* sect. *Schoenoxeros* Benth., *p.p.* T: not designated.

Flowers always in clusters, usually whorled but sometimes reduced and appearing irregularly alternate. Male flowers usually sessile or subsessile, pedicellate in species 15, 17 and 18. Outer and inner bracts opposite, imbricate, together surrounding pedicel or base of flower, usually with similar intermediary bracts surrounding them.

A series of 14 species.

14. *Lomandra sonderi* (F.Muell.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 219 (1916)

Xerotes sonderi F.Muell., *Fragm.* 8: 206 (1874). T: Wuljenup, Plantagenet District [Mt Willyung, near Albany], W.A., 14 Oct. 1840, *L.Preiss* 1559; lecto: MEL 15460, *fide* T.D.Macfarlane, *Fl. Australia* 46: 224 (1986); isolecto: P.

[*X. rigida* auct. non (Labill.) R.Br.: *S.Endlicher* in *J.G.C.Lehmann, Pl. Preiss.* 2: 50 (1846)]

Tuft large and dense. Leaves flat, 30–85 cm long, 2–7 mm wide, glabrous, slightly glaucous; apex rounded or obtuse; sheath margin intact or lacerated, predominantly white or straw-coloured. Male inflorescence usually $\frac{1}{3}$ – $\frac{2}{3}$ as long as leaves, branched; scape well exerted, longer than rachis, flattened; branches and flower clusters whorled. Female similar to male but unbranched. Cluster bracts inconspicuous, much shorter than flowers, about as wide as long; bract and inner bract whitish, purplish or partly brownish. Flowers ellipsoidal, sessile; male flowers c. 2.5 mm long, females 2.5–3.5 mm long. Sepals and petals scarcely opening, all yellow or sepals purple; petals thicker than sepals. $n = 16$, *fide* G.J.Keighery, *Feddes Repert.* 95: 529 (1984). Fig. 26A.

Occurs in south-western W.A., from Perth to Albany. Grows in sandy or lateritic soils in woodland and forest. Flowers Oct.–Nov. Map 135.

W.A.: Alexandra Bridge, near Augusta, *B.G.Briggs* NSW 81628 (♂) (PERTH); Albany Hwy, 11 km S of South West Hwy, *T.D.Macfarlane* 662 (♂) (NSW, PERTH); Jindong, S of Busselton, *R.D.Royce* 2859 (♂) (PERTH).

15. *Lomandra sericea* (Endl.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 219 (1916)

Xerotes sericea Endl. in *J.G.C.Lehmann, Pl. Preiss.* 2: 51 (1846). T: Grantham District [between Armadale, Williams & Beverley], W.A., 6 Mar. 1841, *L.Preiss* 1542; holotype: LD.

Tuft sparse. Leaves flat, 20–60 cm long, 2–5 mm wide, sericeous, sometimes only at base or when young; apex rounded; sheath margins intact, white. Male inflorescence much shorter than leaves, branched; branches whorled; scape almost concealed or exposed, to as long as rachis, not flattened; flower clusters whorled, numerous. Female inflorescence smaller than male, unbranched, almost concealed with 1 or 2 whorls of flowers. Cluster bracts inconspicuous, triangular, acute or obtuse, shorter than pedicel; bract and inner bract purplish. Flowers campanulate. Male flowers 2–3.5 mm long; pedicel 1–3 mm long. Female flowers 3–3.5 mm long, sessile. Sepals and petals similar, all purple or the petals yellowish; petals thicker than sepals. $n = 16$, *fide* G.J.Keighery, *Feddes Repert.* 95: 529 (1984); $2n = 16$, *fide* B.G.Briggs, *Telopea* 2: 742 (1985).

Occurs in south-western W.A., from Eneabba to E of Albany. Grows in lateritic or sandy soils in eucalypt forest or woodland, or in shrubland. Flowers Aug.–Sept. Map 136.

W.A.: Mt Lesueur, NE of Jurien, *E.A.Griffin* 1837 (♂) (PERTH); E of Hamel, *R.D.Royce* 4828 (♂) (PERTH); c. 9 km N of Cataby, *G.J.Keighery* 2856 (♀) (PERTH); c. 5 km N of Palgarup, *T.D.Macfarlane* 965 (♂ & ♀) (PERTH).

16. *Lomandra spartea* (Endl.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 220 (1916)

Xerotes spartea Endl. in *J.G.C.Lehmann, Pl. Preiss.* 2: 51 (1846). T: Darling Range near Perth, W.A., Sept. 1841, *L.Preiss* 1533; holotype: LD; iso: K, photo seen, LD, MEL, P.

Tuft dense. Leaves terete, 30–60 cm long, 1–2 mm diam., usually pilose at least near base or when young, occasionally glabrous; apex pointed, entire; basal sheath absent. Male inflorescence much shorter than leaves, branched or unbranched; branches whorled; scape shorter than rachis, sometimes almost concealed, terete; flower clusters whorled. Female inflorescence smaller, almost concealed, with a single terminal flower cluster. Cluster bracts inconspicuous, broad-based, acute, shorter than pedicel; bract and inner bract brown. Flowers campanulate, sessile or subsessile; male flowers 2–2.5 mm long, females 3–6 mm long. Sepals and petals nearly equal in length, similar except petals thicker, all purple. $n = 16$, *fide* G.J.Keighery, *Feddes Repert.* 95: 29 (1984).

Occurs in south-western W.A., from Perth south-eastwards to E of Collie but poorly collected and perhaps more widespread. Grows in lateritic soil in Jarrah (*Eucalyptus marginata*) forest. Flowers July–Sept. Map 137.

W.A.: Bedforddale, near Perth, *A.S.George* 14858 (♂) & 14859 (♀) (NSW, PERTH); Worsley Alumina mine site, Boddington, 29 Sept. 1982, *D.Backshall* (♂) (PERTH).

17. *Lomandra ordii* (F.Muell.) Schltr., *Bot. Jahrb. Syst.* 40, suppl. 92: 21 (1908)

Xerotes ordii F.Muell., *Fragm.* 11: 23 (1878). T: Shannon River, within 4 miles [c. 6.5 km] of the coast, W.A., 12 Dec. 1877, *F.Mueller*, syn: MEL 20555–20558, 20560, 20561, ♂ & ♀ on several sheets; isosyn: K, photo seen; Shannon, W.A., Mar. 1878, *Muir*; syn: MEL 20562, 20563.

Large tufts or small trees; stems up to 1.5 m long, erect or reclining. Leaves flat, 60–150 cm long, 10–20 mm wide, glabrous; apex rounded; sheath margins intact, reddish brown. Male and female inflorescences similar, longer than leaves, well-branched; branches whorled; scape shorter to longer than rachis, somewhat compressed; flower clusters whorled. Cluster bracts inconspicuous, ovate, acute, shorter than flowers; bract and inner bract white. Flowers campanulate, 4–6 mm long, shortly pedicellate; pedicel up to 3.5 mm long in male, c. 0.5 mm long in female. Sepals and petals similar, white or cream. $n = 8$, *fide* G.J.Keighery, *Feddes Repert.* 95: 528 (1984).

Occurs in south-western W.A., from Northcliffe to Walpole. Grows on river banks, often in sandy soil. Flowers Sept.–Nov. Map 138.

W.A.: Inlet R., NW of Walpole, *A.S.George* 7375 (♂ & ♀) (PERTH); c. 5 km S of Northcliffe on Windy Harbour road, *N.G.Marchant* 74/55 (PERTH).

18. *Lomandra multiflora* (R.Br.) Britten, *Ill. Bot. Cook's Voy.* 3: 95, t. 313 (1905)

Xerotes multiflora R.Br., *Prodr.* 262 (1810); *Xerotes brownii* F.Muell., *Fragm.* 8: 206 (1874) *p.p.*, *nom. illeg.* T: Port Jackson, N.S.W., *R.Brown Iter Australiense* 5768; ?holo: BM, photo seen (♂ & ♀).

Tuft slender to robust. Leaf apex entire; sheath margins entire or with little laceration, white, purplish or brown. Male inflorescence usually $\frac{1}{4}$ – $\frac{3}{4}$ as long as leaves, branched or rarely unbranched; branches whorled; scape shorter than rachis, not flattened; flower clusters whorled. Female inflorescence similar, unbranched. Cluster bracts triangular to narrowly triangular, only the lowest on main axis conspicuous, those among flowers obscure; bract and inner bract brown or purplish. Male flowers campanulate, usually 2–3 mm long; pedicel absent or up to 12 mm long. Female flowers larger, sessile. Sepals and petals similar except petals thicker; sepals purplish; petals yellow.

Occurs in tropical N.T. and Qld to south-eastern Australia; also in southern New Guinea. There are 2 subspecies.

Male flowers pedicellate, the pedicels usually 3–8 mm long

18a. subsp. *multiflora*

Male flowers ±sessile, or the pedicels if present usually concealed by bracts

18b. subsp. *dura*

18a. *Lomandra multiflora* (R.Br.) Britten subsp. *multiflora*

Xerotes aemula R.Br., *Prodr.* 262 (1810); *X. multiflora* var. *aemula* (R.Br.) Domin, *Biblioth. Bot.* 85: 526 (1915); *X. brownii* F.Muell., *Fragm.* 8: 206 (1874) *p.p.*, *nom. illeg.* T: Port Jackson, N.S.W., *R.Brown Iter Australiense* 5767; ?holo: BM, photo seen (♂).

Xerotes decomposita R.Br., *loc. cit.*; *X. multiflora* var. *decomposita* (R.Br.) Domin, *loc. cit.* T: Endeavour River, [Qld], 1770, *J.Banks & D.Solander*; holo: BM, photo seen (♂).

Xerotes distans R.Br., *loc. cit.*; *X. multiflora* var. *distans* (R.Br.) Domin, *loc. cit.* T: Blackwattle Swamp near Sydney, N.S.W., *R.Brown Iter Australiense* 5765; ?holo: BM, photo seen (♂).

Xerotes media R.Br., *loc. cit.*; *X. multiflora* var. *media* (R.Br.) Domin, *loc. cit.* T: Endeavour River, [Qld], 1770, *J.Banks & D.Solander*; holo: BM, photo seen (♂ & ♀).

Xerotes savannorum Domin, *loc. cit.* T: near Pentland, Qld, Mar. 1910, *K.Domin* 2385, 2386, 2387; syn: PR.

Illustrations: *J.Banks & D.Solander, Ill. Bot. Cook's Voy.* t. 313 (1905); *E.R.Rotherham et al., Fl. Pl. New*

South Wales & S. Queensland 69 (1975); K.A.W. Williams, *Nat. Pl. Queensland* 1: 178 (1979); G.M. Cunningham *et al.*, *Pl. W. New South Wales* 189 (1982); all as *L. multiflora*.

Leaves flat or slightly concavo-convex, occasionally plano-convex, rarely terete, 25–90 cm long, usually 1.5–3 mm wide, smooth, or scabrid underneath, green, greyish green or rarely glaucous. Male inflorescence once- or twice-branched or rarely unbranched; flowers on pedicels usually 3–8 mm long, always distinctly exceeding bracts at anthesis. *Many-flowered Mat-rush*. $2n = 16$, *fide* B.G. Briggs, *Telopea* 2: 742 (1985). Figs 20, 26C, 29A.

Occurs in Arnhem Land, N.T., throughout eastern Qld, slopes, tablelands and coastal areas of N.S.W., and eastern and southern Vic. almost to the border of S.A. Earlier records from W.A. were erroneous. Not yet found in S.A. and perhaps not occurring there. Grows in a variety of soils, chiefly in woodland and forest. Flowers June–Jan. Map 139.

N.T.: c. 97 km S of Giddy R. crossing, *N. Byrnes* 2681 (♀) (DNA). Qld: Cooktown, near Mt Cook, *V. Scarth-Johnson* 481A (♂) (BRI). N.S.W.: Mt Sugarloaf, c. 18 km SW of Wyan, *R. Coveny* 1833 *et al.* (♂) (NSW); Armour R., c. 7 km N of Mt Armour, *J. Pickard* 366 & *S. Pickard* (♂ & ♀) (NSW). Vic.: Mt William turnoff on Halls Gap–Dunkeld road, Grampians, *D.E. Symon* 1847 (NSW).

18b. *Lomandra multiflora* subsp. *dura* (F. Muell.) T. Macfarlane, *Fl. Australia* 46: 224 (1986)

Xerotes dura F. Muell., *Trans. & Proc. Victorian Inst. Advancem. Sci.* 42 (1855); *Lomandra dura* (F. Muell.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 219 (1916). T: near Adelaide, S.A., Nov. 1848, *F. Mueller*; lecto: MEL 630935, *fide* A.T. Lee, *Contr. New South Wales Natl Herb.* 3: 163 (1962).

Illustration: J.M. Black, *Fl. S. Australia* 3rd edn, 1: fig. 308 (1978) as *L. dura*.

Leaves flat or slightly concavo-convex, 25–65 cm long, 2–4.5 mm wide, smooth, usually greyish green. Male inflorescence once-branched; flowers sessile or on pedicels rarely up to 2 mm long, usually concealed by bracts. Fig. 28A–B.

Occurs in the southern Flinders and Mt Lofty Ranges and the Yorke and Fleurieu peninsulas, S.A. Grows in loamy or sandy soils in woodland or shrubland. Flowers mainly Oct. Map 140.

S.A.: Tanunda, *D.N. Kraehenbuehl* 658 (♂) (AD, MEL); near Milang, *D. Hunt* 3371 (♂) (AD); c. 6 km SSE of Moonta, Yorke Peninsula, *B.J. Blaylock* 768 (♂) (AD); Northfield, *T. Smith* 590 (♂) (AD); Tooperang, c. 10 km SE of Mt Compass, 10 Oct. 1960, *C.M. Eardley* (♀) (AD).

Recorded for N.S.W. by A.T. Lee, *Contr. New South Wales Natl Herb., Fl. Ser.* 34: 38 (1966), but N.S.W. specimens attributed to this taxon are now considered to be *L. multiflora* subsp. *multiflora*.

19. *Lomandra patens* A. Lee, *Contr. New South Wales Natl Herb.* 3: 160 (1962)

T: Palm Valley, c. 125 km SW of Alice Springs, N.T., 15 July 1958, *R. Hill* & *T.R.N. Lothian* 943; holo: NSW; iso: AD.

Illustration: G.M. Cunningham *et al.*, *Pl. W. New South Wales* 189 (1982).

Tuft robust. Leaves ±flat or inrolled, 40–100 cm long, 2.5–4.5 mm wide, smooth; apex rounded; sheath margins intact or slightly lacerated, white, grey or brown. Male and female inflorescences similar, longer or slightly shorter than leaves, once- or twice-branched; branches in whorls; scape shorter than rachis, flattened or somewhat compressed; flower clusters whorled. Cluster bracts conspicuous only at lower nodes of main axis, acuminate, those among flowers obscure, much shorter than flower; bract and inner bract white. Flowers campanulate. Male flowers 4–6 mm long, sessile or on a pedicel with up to 1 mm visible above bracts. Female flowers sessile, mature length unknown. Sepals and petals similar except sepals thicker; sepals purple or yellowish purple; petals yellow. Fig. 29B.

Occurs in the Macdonnell and adjacent ranges of Central Australia, N.T., in scattered locations in inland N.S.W. and south-central Qld. In Central Australia it grows in gorges, elsewhere on rocky hillsides. Flowers mainly June–July. Map 141.

N.T.: Glen Helen Gorge, 23°42'S, 132°40'E, *G.Giffins* G8 (♀) (NT). Qld: 7 km WNW of Rocky homestead, *R.W.Purdie* 674E (♂) (BRI). N.S.W.: Mootwingee, 6 Sept. 1962, *J.B.Cleland* (♂) (AD); Boppy Mtn, near Cobar, *G.M.Cunningham* 2371 (♀) (NSW).

Similar to *L. multiflora* but differs in being a larger plant with larger inflorescences that are always well-branched in both sexes, and in having well-developed pistillodes c. 1.5 mm long in male flowers compared with minute ones in *L. multiflora*.

20. *Lomandra banksii* (R.Br.) Lauterb., *Bot. Jahrb. Syst.* 50: 294 (1913)

Xerotes banksii R.Br., *Prodr.* 263 (1810). T: Endeavour River, [Qld], 1770, *J.Banks* & *D.Solander*; holo: BM, photo seen (♀); iso: P.

Illustration: N.Hallé, *Adansonia* ser. 2, 20: 24, pl. 1–2 (1980).

Shrub up to 3 m tall; stem erect or decumbent, unbranched or sparingly branched. Leaves flat, 20–45 cm long, 5–10 mm wide; margin smooth or minutely scaberulous, otherwise glabrous; lamina disarticulating readily 0.5 cm from base, remainder recurving strongly; apex minutely to conspicuously 3 or more toothed; sheath margins intact, white or straw-coloured. Male and female inflorescences similar, exceeding leaves, branched once or twice; branches whorled; scape shorter than rachis, flattened; flower clusters whorled. Cluster bracts inconspicuous, triangular to broadly triangular, shorter than flowers; bract and inner bract white. Flowers campanulate. Male flowers 3–4 mm long, virtually sessile. Female flowers sessile, length unknown. Sepals and petals similar except sepals shorter and thinner, cream.

Occurs in Qld N of Rockingham Bay, growing in shrubland, often in sandy soil. Also in southern New Guinea and New Caledonia. Flowers Dec.–Mar. Map 142.

Qld: Cooktown, mouth of Endeavour R., *S.T.Blake* 23323 (♂) (PERTH); road between Heathlands and Captain Billy, *A.Morton* 597 (♂) (BRI); Cowley Beach, c. 16 km S of Innisfail, *W.Hinton* 16 (♀) (BRI).

In New Caledonia this taxon has been recognized as a distinct species, *L. insularis* Schltr. (= *Xerotes banksii* f. *neocaledonica* Guillaumin), e.g. by N.Hallé, *Adansonia* ser. 2, 20: 21–28 (1980). There are certain vegetative differences but the supposed floral distinction does not hold. P.F.Stevens, *J. Arnold Arbor.* 59: 150–152 (1978), described the New Guinean plant in detail.

This species shares with *L. ordii* the ability, when well developed, to attain shrub or small tree stature by means of a long woody stem. The disarticulation of leaf blades is unique to *L. banksii*. From the related *L. multiflora* and *L. patens* it differs further in flower colour, but shares with *L. patens* a well developed pistillode c. 1.5 mm long in male flowers.

21. *Lomandra rigida* Labill., *Nov. Holl. Pl.* 1: 93, t. 120 (1805)

Xerotes rigida (Labill.) R.Br., *Prodr.* 261 (1810). T: 'terra Van-Leuwin', [probably Observatory Is. near Esperance, W.A.], *J.Labillardière*; syn: FI (2 sheets), photo seen, P (2 sheets).

Illustration: J.Labillardière, *loc. cit.* t. 120.

Plant forming extensive clumps; stems elongated, longer ones decumbent, rooting. Leaves plano-convex, 10–20 cm long, 3–4.5 mm wide, striate, glabrous; apex conspicuously 2-toothed with a broad sinus between; sheath margins intact, often reddish or brown. Male inflorescence $\frac{1}{2}$ – $\frac{2}{3}$ as long as leaves, branched; branches whorled or opposite; scape shorter than rachis, flattened; flower clusters whorled. Female inflorescence smaller, denser, branched or unbranched; scape distinct. Cluster bracts often conspicuous, broad-based with tapering, pointed upper part, a little shorter to much longer than flowers; bract and inner bract whitish. Flowers cylindrical or obconical, sessile; male flowers c. 4 mm long, females c. 5 mm long. Sepals and petals yellow or cream; sepals shiny, scarious;

petals dull, petaloid. $2n = 16$, *fide* G.J.Keighery, *Feddes Repert.* 95: 528 (1984). Fig. 26B.

Occurs in a restricted area of the south coast of W.A., from Esperance to Cape Arid and including several islands of the Recherche Archipelago. Grows in cracks or in soil pockets on granite outcrops. Flowers Oct.–Dec. Map 143.

W.A.: Cape Arid Natl Park, E of Esperance, *R.D.Royce* 9879 (♀) (PERTH); Wilson Is., Recherche Archipelago, *R.D.Royce* 6160 (♀) (PERTH); High Is., Duke of Orleans Bay, *H.Eichler* 20101 (♂) (PERTH); Mt Le Grand, c. 25 km SE of Esperance, *P.G.Wilson* 5581 (♂ & ♀) (PERTH).

22. *Lomandra longifolia* Labill., *Nov. Holl. Pl.* 1: 92, t. 119 (1805)

Xerotes longifolia (Labill.) R.Br., *Prodr.* 262 (1810); *X. longifolia* var. *typica* Domin, *Biblioth. Bot.* 85: 525 (1915), *nom. illeg.* T: from Tasmania, *J.Labillardière*; iso: P.

Xerotes arenaria R.Br., *loc. cit.*; *X. longifolia* var. *arenaria* (R.Br.) Domin, *op. cit.* 526. T: Broad Sound, [Qld], 1802, *R.Brown Iter Australiense* 5764; holo: BM, photo seen.

Xerotes longifolia var. *macrocarpa* Domin, *op. cit.* 526. T: Tambourine Mts, Qld, Mar. 1910, *K.Domin* 2365, 2366, 2374; syn: PR.

L. longifolia subsp. *exilis* A.Lee, *Contr. New South Wales Natl Herb.* 3: 156 (1962). T: Thredbo R., Mt Kosciusko, N.S.W., Jan. 1899, *J.H.Maiden* & *W.Forsyth* NSW 49644; holo: NSW.

Illustrations: *J.Labillardière*, *Nov. Holl. Pl.* 1: t. 119 (1805); N.T.Burbidge & M.Gray, *Fl. Austral. Cap. Terr.* fig. 106 (1970); G.R.Cochrane *et al.*, *Fl. Pl. Victoria & Tasmania* 23 (1980); G.M.Cunningham *et al.*, *Pl. W. New South Wales* 189 (1982) as *L. longifolia* subsp. *longifolia*.

Plant tufted. Leaves flat or slightly concavo-convex, occasionally rolled, usually 50–100 cm long and 4.5–7.5 mm wide, glabrous; apex 2- or 3-toothed, central tooth in pronounced sinus or longer than laterals; sheath margins intact or coarsely split, brown, orange-brown or reddish brown, occasionally white. Male and female inflorescences similar, simple or branched; all branches or when many the larger branches often 2 per node, distichous, from under 8 cm up to 15 cm long; scape distinct, much shorter to much longer than rachis, flattened; flower clusters whorled. Cluster bracts conspicuous, longer to much longer than flowers, pungent; bract and inner bract shorter than flower, truncate, whitish. Flowers ellipsoidal or cylindrical, sessile; male flowers 3–3.5 mm long, females c. 4.5 mm long. Sepals shiny, scarious, purplish or yellow. Petals dull, fleshy, yellow or cream. *Spiny-headed Mat-rush*, *Sagg.* $2n = 16, 32$, *fide* B.G.Briggs, *Telopea* 2: 742 (1985). Fig. 28E–F.

Occurs in eastern parts of eastern Australia, from Lizard Is. in N Qld to the Mt Gambier and Millicent area of S.A., and eastern and northern Tas. Grows in a variety of habitats. Flowers in spring. Map 144.

S.A.: c. 6 km S of Tarpeena, *E.N.S.Jackson* 225 (♂) (AD). Qld: Cooktown, *S.T.Blake* 23532 (♂) (BRI). N.S.W.: Bowens Ck, Bilpin–Mt Irvine road, *E.F.Constable* NSW 16597 (♂) (NSW, PERTH). Vic.: W Tree Ck, Murrindal, *E.F.Constable* 5372 (MEL ♂ & ♀, NSW ♂). Tas.: c. 13 km SE of Scotsdale, *N.T.Burbidge* 3057 (♂) (HO).

A very variable species which, in parts of N.S.W. and southern Qld, is not clearly distinct from *L. confertifolia* subsp. *pallida*. Other taxa closely related and in some cases difficult to distinguish from *L. longifolia* include *L. hystrix*, *L. fluvialis*, *L. spicata* and *L. montana*.

23. *Lomandra hystrix* (R.Br.) L.Fraser & Vick., *Proc. Linn. Soc. New South Wales* 62: 286 (1937)

Xerotes hystrix R.Br., *Prodr.* 262 (1810); *X. longifolia* var. *hystrix* (R.Br.) Domin, *Biblioth. Bot.* 85: 526 (1915); *Lomandra longifolia* subsp. *hystrix* (R.Br.) A.Lee, *Contr. New South Wales Natl Herb.* 3: 155 (1962). T: Hunter, Paterson and William Rivers, N.S.W., Oct.–Nov. 1804, *R.Brown Iter Australiense* 5763; ?holo: BM, photo seen.

Plant robust, tufted. Leaves flat, rather thin, usually 90–130 cm long, 5–10.5 mm wide, glabrous; apex acute with 2–4 often minute lateral teeth usually well below apex, rarely

the laterals longest; sheath margins intact, white or occasionally brown to reddish-brown. Male and female inflorescences similar, up to as long as leaves, branched twice; major primary branches usually 4 per node and up to 20 cm long; scape half to twice as long as rachis, flattened; flower clusters whorled. Cluster bracts conspicuous, pungent, the longest 2–9.5 cm long. Bract, inner bract and flowers as in *L. longifolia*.

Occurs in two apparently widely disjunct areas of eastern Australia east of the Great Divide: in northern Qld from S of Cooktown to Townsville, and in the south from Nambour in Qld to N of Taree in N.S.W. Grows near streams. Flowers spring to summer. Map 145.

Qld: Flaggy Ck, 16°45'S, 145°30'E, A.V. *Altena* 3865 (♂) (BRI); Pine Mtn area, c. 9.6 km NW of Ipswich, L. *Durrington* & M. *Thomas* 726 (♀) (BRI). N.S.W.: Gradys Ck, c. 8 km N of Wangaree, J. *Campbell* NSW 151513 (♂ & ♀) (NSW); c. 21 km S of Kempsey, A. *Lee* NSW 87516 (♂ & ♀) (NSW).

This species is closely related to *L. longifolia* but differs in leaf apex form, in lacking conspicuous marginal sclerenchyma bands on leaves, and in inflorescence branching. In northern Qld on mountains such as Thornton Peak there occur plants similar to *L. hystrix* but differing in inflorescence dimensions, appearance of male flowers, and occurrence at high rather than low altitude.

24. *Lomandra confertifolia* (Bailey) Fahn, *J. Linn. Soc., Bot.* 55: 168 (1954)

Xerotes confertifolia Bailey, *Queensland Agric. J.* 25: 11 (1910). T: Glasshouse Mtn, Qld, F.M. *Bailey*; lecto: BRI 20364, *fide* A.T. *Lee*, *Contr. New South Wales Natl Herb.* 3: 156 (1962).

Plant with decumbent or erect, elongated stems, or tufted with short erect stems. Leaves 3.5–70 cm long, 0.3–2.5 mm wide; margins microscopically scaberrulous; apex 2- or 3-toothed, 1 or both lateral teeth exceeding the central. Male inflorescence variable in size but usually rather small, branched or unbranched; scape flattened; flowers in whorled clusters or few-flowered alternate clusters. Female inflorescence often dissimilar, smaller, sometimes virtually concealed among leaf bases, often unbranched. Cluster bracts pointed, conspicuous or inconspicuous. Bract and inner bract (except for colour) and flowers as in *L. longifolia*.

Occurs in eastern Australia, from near Rockhampton, Qld, to Gippsland, Vic. There are 5 subspecies.

- | | | |
|----|--|----------------------------------|
| 1 | Stem elongated, slender (old part of stem up to 4 mm diam.); leaves up to 20 cm long | |
| 2 | Leaf sheath margins white; bracts whitish | 24a. subsp. <i>confertifolia</i> |
| 2: | Leaf sheath margins dark brown or reddish brown; bracts brown | |
| 3 | Leaves flat | 24d. subsp. <i>similis</i> |
| 3: | Leaves concavo-convex or channelled | 24c. subsp. <i>rubiginosa</i> |
| 1: | Stem short, largely concealed by the leaves, or elongated, relatively stout (old part of stem 4.5 mm diam. or more); leaves more than 20 cm long | |
| 4 | Scape longer, usually several times longer, than rachis | 24e. subsp. <i>leptostachya</i> |
| 4: | Scape shorter than, or about as long as, rachis | |
| 5 | Bracts brown; leaf sheath margins dark brown or reddish brown | 24c. subsp. <i>rubiginosa</i> |
| 5: | Bracts whitish; leaf sheath margins usually whitish, occasionally reddish brown | 24b. subsp. <i>pallida</i> |

24a. *Lomandra confertifolia* (Bailey) Fahn subsp. *confertifolia*

Stems extensive, decumbent, slender, often branched. Leaves flat or concavo-convex, 3.5–15 cm long, 0.5–1.3 mm wide; sheath margins intact, white. Inflorescences often outgrown by stem, scape largely concealed. Male inflorescence $\frac{1}{4}$ – $\frac{2}{3}$ as long as leaves, unbranched or few-branched; branches alternate. Female inflorescence a single terminal

flower cluster, almost concealed among leaf bases. Cluster bracts shorter or longer than flower, up to 9 mm long, fine-pointed, whitish; bract and inner bract whitish.

Restricted to south-eastern Qld, from Biggenden almost to Brisbane. Grows in rocky places on high ground including the Glasshouse Mts. Flowers spring to autumn. Map 146.

Qld: summit Mt Coolum, 24 Mar. 1945, *M.S.Clemens* (♂ & ♀) (BRI); Mt Coonowrin, Glass House Mts, *C.E.Hubbard* 4164 (♂) (BRI, P); Mt Ngun Ngun, Glass House Mts, R.Melville 3532, *S.Blake* & *S.Everist* (♀) (NSW).

24b. *Lomandra confertifolia* subsp. *pallida* A.Lee, *Contr. New South Wales Natl Herb.* 3: 157 (1962)

T: Carnarvon Ra., Qld, Sept. 1940, *C.T.White* 11375; holo: BRI.

Plant tufted with short stems or stems elongated, erect or decumbent, sometimes branched. Leaves flat, concavo-convex or channelled, sometimes inrolled, 30–70 cm long, 1–2.5 mm wide; sheath margins intact or lacerated, usually whitish, occasionally reddish brown. Male inflorescence mostly c. $\frac{1}{4}$, occasionally $\frac{1}{2}$ as long as leaves, usually branched; branches opposite or alternate; scape concealed or exerted, shorter than or equal to rachis; flower clusters whorled. Female inflorescence smaller, unbranched; scape concealed. Cluster bracts much longer than flowers, often fine, whitish; bract and inner bract whitish.

Occurs from near Rockhampton in Qld inland to the Great Dividing Range and south almost to the latitude of Sydney in N.S.W. Grows in rocky places, usually on sandstone and often at high altitudes, but also near the coast, sometimes in sandy soil. Flowers late winter to spring. Map 147.

Qld: Isla Gorge, c. 29 km SW of Theodore, *S.L.Everist* 8091 (♂) (BRI); Toohey Forest Park, Tarragindi, Brisbane, *I.R.Telford* 1287 (♂) (BRI). N.S.W.: Wolgan Gap, *B.G.Briggs* NSW 52765 (♂) (NSW).

A variable taxon which can be difficult to distinguish from other subspecies of *L. confertifolia* and also from *L. longifolia* in southern Qld.

24c. *Lomandra confertifolia* subsp. *rubiginosa* A.Lee, *Contr. New South Wales Natl Herb.* 3: 157 (1962)

T: Berowra, N.S.W., 18 Sept. 1956, *A.Lee* NSW 49822; holo: NSW.

Stems elongated, usually somewhat decumbent, rather stout. Leaves concavo-convex or channelled, 15–50 cm long, 0.3–1.5 mm wide; sheath margins lacerated, dark brown or reddish brown. Male inflorescence 0.2–0.5 times as long as leaves, unbranched or with a few short branches; branches alternate; scape exposed for 1–12 cm; flowers in whorled clusters or 1–few-flowered alternate clusters. Female inflorescence poorly known, unbranched; scape short, exposed. Cluster bracts 0.5–4 cm long, shorter to longer than flower; bract and inner bract brown. $2n = 32$, *fide* B.G.Briggs, *Telopea* 2: 742 (1985).

Occurs in eastern N.S.W. from N of Newcastle nearly to the Vic. border. Grows usually in dry open eucalypt forest. Flowers autumn to spring. Map 148.

N.S.W.: 6 km from Batemans Bay to Braidwood, 1 July 1973, *H.Streimann* (BRI); Gloucester Bucketts, c. 2.5 km W of Gloucester, *R.Coveny* NSW 126460 (NSW).

24d. *Lomandra confertifolia* subsp. *similis* A.Lee, *Contr. New South Wales Natl Herb.* 3: 158 (1962)

T: Benandra State Forest, Batemans Bay, N.S.W., 13 Dec. 1950, *E.F.Constable* NSW 16604; holo: NSW.

Stems extensive, \pm erect, slender. Leaves flat, rather flaccid, often curved, 8–20 cm long, 0.5–1.5 mm wide; sheath margins slightly to much lacerated, red-brown. Male inflorescence $\frac{1}{4}$ – $\frac{1}{3}$ as long as leaves, branched; branches few, alternate; scape shorter than rachis, sometimes concealed among leaf bases; flowers in whorled clusters. Female

inflorescence smaller, almost concealed among leaf bases. Cluster bracts inconspicuous, fine-pointed, longer than flowers or, at upper nodes, shorter; cluster bracts, bract and inner bract brown to golden brown.

Occurs in a restricted area of southern coastal N.S.W., from Batemans Bay to Bermagui. Grows in forest, usually at higher altitudes. Flowers winter to spring. Map 149.

N.S.W.: Nelligen–Clyde Mtn road, c. 24 km W of Cabbage Tree Ck, *A.Lee* 62 (♂ & ♀) (NSW); Jilliga, c. 27 km W of Bodalla, *E.F.Constable* NSW 93971 (♂) (NSW).

24e. *Lomandra confertifolia* subsp. *leptostachya* A.Lee, *Contr. New South Wales Natl Herb.* 3: 158 (1962)

T: Dry Creek, Womboyn–Princes Highway road, N.S.W., 12 Oct. 1954, *E.F.Constable* NSW 30153; holotype: NSW.

Stems usually somewhat elongated, erect to spreading, or occasionally rather decumbent. Leaves concavo-convex or channelled, straight, rather stiff, usually 30–70 cm long and 0.5–1.5 mm wide; sheath margins lacerated, pale brown or white. Male and female inflorescences similar, $\frac{1}{3}$ – $\frac{3}{4}$ as long as leaves, unbranched or with short alternate or opposite branches; scape much longer than rachis; flower clusters few-flowered, whorled, or flowers solitary. Cluster bracts rather inconspicuous, longer than flowers throughout or only in basal part of inflorescence; bract and inner bract brown or pale brown. Fig. 28D.

Occurs in far south-eastern N.S.W. southwards from Bega and in E Gippsland in Vic. Grows in eucalypt forest. Flowers winter to spring. Map 150.

N.S.W.: Mt Naghi, c. 11 km ENE of Timbillica, *E.F.Constable* 4361 (BRI, NSW); c. 1 km W of Jane Spiers Beach, Nadgee Nature Reserve, *J.Pickard* 1148 (♂) (NSW). Vic.: Gawlers Ck area, Lind Natl Park, *A.C.Beauglehole* 33474 (♂) (MEL); 2.4 km NNE of Sandpatch Point, *N.G.Walsh* 419 (♀) (MEL).

25. *Lomandra fluviatilis* (R.Br.) A.Lee, *Contr. New South Wales Natl Herb.* 3: 156 (1962)

Xerotes fluviatilis R.Br., *Prodr.* 262 (1810); *X. longifolia* var. *fluviatilis* (R.Br.) Domin, *Biblioth. Bot.* 85: 525 (1915). T: Grose River, N.S.W., 1803–1804, *R.Brown Iter Australiense* 5761; ?holotype: BM, photo seen.

Plant tufted. Leaves concavo-convex or channelled, 25–75 cm long, 0.5–2.5 mm wide; apex 2- or 3-toothed, lateral teeth usually longest; sheath margins lacerated, dark reddish brown. Male inflorescence $\frac{1}{3}$ to nearly as long as leaves, branched; branches opposite or whorled; scape usually 2–3 times as long as rachis, flattened; flower clusters whorled. Female inflorescence often unbranched, the scape longer in relation to rachis, otherwise similar to male inflorescence. Cluster bracts conspicuous, pointed, slightly to much longer than flowers, reddish or golden brown on margins; bract and inner bract golden brown. Flowers as in *L. longifolia*. $2n = 32$, *fide* B.G.Briggs, *Telopea* 2: 742 (1985).

Occurs in a restricted area of central coastal N.S.W. Grows typically in creek beds. Flowers in spring. Map 151.

N.S.W.: Colo R., c. 1.5 km below entrance of Wollangambe Ck, *A.Rodd* NSW 73921 (♀) (NSW); Nepean R., c. 16 km S of Camden, *E.F.Constable* 6188 (♂) (NSW).

Suspected hybrids between this species and *L. longifolia* have been found near Sydney.

26. *Lomandra montana* (R.Br.) L.Fraser & Vick., *Proc. Linn.*

Soc. New South Wales 62: 285 (1937)

Xerotes montana R.Br., *Prodr.* 262 (1810); *X. longifolia* var. *montana* (R.Br.) Bailey, *Queensland Agric. J.* 28: 203 (1912). T: River Grose, N.S.W., 1804, *R.Brown Iter Australiense* 5760 (♀); ?holotype: BM, photo seen.

Plant tufted. Leaves flat or rolled when dried, rather thin, usually 35–50 cm long, 2–4 mm wide; apex toothed, central one often much exceeding laterals; sheath margins lacerated, brown. Male and female inflorescences much shorter than leaves, unbranched;



Figure 28. *Lomandra*. **A–B**, *L. multiflora* subsp. *dura*. **A**, ♂ shoot $\times 0.1$; **B**, sessile ♂ flower, detached from bracts, $\times 1.8$ (**A–B**, H.Eichler 12695, NSW). **C**, *L. montana*, ♂ shoot $\times 0.1$ (W.Blakely NSW 49800, NSW). **D**, *L. confertifolia* subsp. *leptostachya*, ♂ shoot $\times 0.1$ (E.Constable NSW 30153, NSW). **E–F**, *L. longifolia*. **E**, sessile flower and bracts, detached from other prophylls, $\times 1.8$; **F**, ♀ flower spread open $\times 1.8$ (**E–F**, A.Floyd NSW 49739, NSW).
(c, cluster bract; i, inner bract; m, intermediary bract(s); o, outer bract).

scape much longer than rachis, flattened; flower clusters whorled. Cluster bracts conspicuous, pointed, rather soft, whitish; bract and inner bract brown. Flowers as in *L. longifolia*. $2n = 16$, *vide* B.G.Briggs, *Telopea* 2: 742 (1985). Fig. 28C.

Occurs in a restricted area of N.S.W. in the Blue Mountains. Grows usually near creeks and waterfalls. Map 152.

N.S.W.: Bowens Ck, Bilpin, *M.Tindale & E.F.Constable NSW 19372* (♀) (NSW, PERTH); 20 km NNE of Rylstone, *R.Coveny 10515 & P.Hind* (♂) (NSW); Wentworth Falls near 2nd Falls, *W.F.Blakely NSW 49800* (♂) (NSW); Springwood, *E.G.Jacobs NSW 49801* (♂) (NSW); Mt Tomah, *A.Rodd (1) NSW 77834* (♀) (NSW).

The above nomenclatural combinations made by Bailey and by Fraser & Vickery, and the description by the latter authors, were intended to apply to *L. spicata*, a species then undescribed but erroneously known as *Lomandra* (or *Xerotes*) *montana*, *vide* A.T.Lee, *Contr. New South Wales Natl Herb.* 3: 159 (1962).

27. *Lomandra spicata* A.Lee, *Contr. New South Wales Natl Herb.* 3: 159 (1962)

T: Mt Lindsay slopes, N.S.W., 11 Nov. 1952, *E.F.Constable NSW 23729*; *holo*: NSW.

[*Xerotes montana* *auct. non R.Br.*: *K.Domin, Biblioth. Bot.* 85: 526 (1915)]

[*Xerotes longifolia* *var. montana* *auct. non (R.Br.) Bailey*; *F.M.Bailey, Queensland Agric. J.* 28: 203 (1912); *F.M.Bailey, Compr. Cat. Queensland Pl.* 565 (1913)]

[*Lomandra montana* *auct. non (R.Br.) L.Fraser & Vick.*: *L.Fraser & J.Vickery, Proc. Linn. Soc. New South Wales* 62: 285 (1937)]

Plant tufted, robust. Leaves flat, rather thin, 40–80 cm long, 4–12 mm wide; apex usually acute, with small lateral teeth; sheath margins intact or splitting coarsely with age, brown or whitish. Male inflorescence unbranched or rarely with short branches at lowest nodes or the rachis forked; scape 2 or more times longer than rachis, flattened; flower clusters whorled. Female inflorescence unbranched, the rachis shorter in relation to the scape, otherwise similar to male inflorescence. Cluster bracts conspicuous, pointed, usually longer than flowers; bract and inner bract golden brown or whitish. Flowers as in *L. longifolia*.

Occurs in northern Qld near Atherton, and southern Qld south to the north coast of N.S.W. Grows in rainforest. Flowers in ?spring. Map 153.

Qld: Mistake Ra., Nov. 1920, *C.T.White* (♂) (BRI); Mt Glorious, Jan. 1948, *M.S.Clemens* (♀) (BRI). N.S.W.: Whian Whian State Forest, N of Lismore, *E.F.Constable NSW 22168* (NSW); Barrington, *J.W.Vickery NSW 49662* (NSW).

This species may occur throughout Qld rainforests.

Ser. II. Sparsiflorae

Lomandra ser. *Sparsiflorae* (Benth.) A.Lee, *Fl. Australia* 46: 223 (1986).

Xerotes ser. *Sparsiflorae* Benth., *Fl. Austral.* 7: 102 (1878). T: *L. effusa* (Lindley) Ewart; *lecto*, *vide* A.T.Lee, *loc. cit.*

Xerotes sect. *Racemosae* G.Don in *J.C.Loudon, Hort. Brit.* 398 (1830). T: not designated.

Xerotes ser. *Glomeratae* Benth., *op. cit.* 96, *p.p.* T: not designated.

Xerotes ser. *Fasciculatae* Benth., *op. cit.* 100, *p.p.* T: not designated.

Flowers single or 2 or 3 at a node, or several in a whorl, or in distinct whorled clusters. Male flowers sessile or pedicellate. Outer bract with smaller, lateral inner bract, or inner bract absent; intermediary bracts absent.

A series of 23 species.

28. *Lomandra preissii* (Endl.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 219 (1916)

Xerotes preissii Endl. in J.G.C.Lehmann, *Pl. Preiss.* 2: 50 (1846). T: near Perth, W.A., 28 Apr. 1839, *L.Preiss* 1532; holotype: LD; isotype: MEL, P (2 sheets).

Tussocks narrow. Leaves flat, with distinct marginal bands, 30–60 cm long, 2–5 mm wide, rarely 1 mm wide, glabrous or shortly hirsute along veins and margins; apex rounded-acute; sheath margins intact, whitish to almost black. Inflorescence unbranched (rarely branched in the male), half as long to longer than leaves; rachis much shorter than the conspicuous long scape; flower clusters whorled, the whorls crowded and \pm continuous or up to 1 cm apart. Bracts broadly ovate, shortly pointed, slightly shorter to longer than pedicel; inner bract usually absent. Flowers with sepals and petals similar, spreading, greenish yellow to purple. Male flowers 2–3 mm long; pedicel 1–2 mm long. Female flowers 3 mm long, sessile. $n = 8$, *fide* G.J.Keighery, *Feddes Repert.* 95: 528 (1984); $2n = 16$, *fide* B.G.Briggs, *Telopea* 2: 742 (1985). Fig. 29D–E.

Widespread in south-western W.A., from the Hill River N of Perth, to Albany on the south coast. Common in Jarrah (*Eucalyptus marginata*) forest on lateritic soil and woodland and shrubland on sandy soil. Flowers Apr.–July. Map 154.

W.A.: Mundaring, July 1901, W.V.Fitzgerald (♂ & ♀) (NSW); Bayswater, A.Morrison 17067 (♂) (NSW); c. 11 km S of Busselton on Ambergate road, B.G.Briggs 776 (♂) (NSW); Gingin–Bullsbrook road, M.Griffiths NSW 117422 (♂ & ♀) (NSW); Gooseberry Hill, M.Griffiths NSW 51078 (♀) (NSW).

Different male inflorescences and season of flowering clearly differentiate this species from the similar *L. purpurea*. Flower colour is not a diagnostic character; in *L. preissii* plants with purple and greenish-yellow flowers are common and often grow together.

29. *Lomandra purpurea* (Endl.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 219 (1916)

Xerotes purpurea Endl. in J.G.C.Lehmann, *Pl. Preiss.* 2: 49 (1846). T: at foot of Darling Range near Kelmscott, Perth, W.A., Sept. 1841, *L.Preiss* 1534; holotype: LD; isotype: MEL, P.

Xerotes purpurea var. *capitata* Benth., *Fl. Austral.* 7: 102 (1878). T: upper Hay River, W.A., 1870, M.Warburton; syn: K, photo seen, MEL 20571, 20575; upper Hay River, W.A., Oct. 1867, F.Mueller; syn: MEL 20570; upper Kalgan River, W.A., Oct. 1867, F.Mueller; syn: MEL 20573.

Plant caespitose. Leaves flat, with distinct marginal bands, 20–60 cm long, 4–5 mm wide, glabrous; apex broadly acute to rounded-truncate; sheath margins intact, white to straw-coloured. Inflorescence much longer than leaves; scape conspicuous, longer than rachis. Male inflorescence usually with 1 to several branches; branches and flowers in whorls up to 2 cm apart. Female inflorescence often unbranched; flower whorls closer. Bracts broad, shortly 1–several-pointed, much shorter than pedicel; inner bract present or absent. Flowers dark purple-black or rarely yellow or partly yellow. Male flowers 3–4 mm long; sepals and petals similar, spreading; pedicel 5–10 mm long. Female flowers similar but sessile. $n = 8$, *fide* G.J.Keighery, *Feddes Repert.* 95: 528 (1984). Fig. 29C.

Occurs in south-western W.A. from near Perth to near Albany. Found chiefly in Jarrah (*Eucalyptus marginata*) forest on lateritic soil but also in sandy soil of coastal areas. Flowers Oct.–Nov. Map 155.

W.A.: Perth, J.H.Maiden NSW 151508 (♂) (NSW); c. 5 km W of Pinjarra, B.G.Briggs NSW 87518 (♂) (NSW); Wooroloo, M.Koch 1669 p.p. (♂) (NSW); King George Sound, B.Goadby 142 (♂ & ♀) (NSW).

In the south of the range, from Mt Barker to Albany, there is a variant that has a short, dense, almost capitate inflorescence (*Xerotes purpurea* var. *capitata*, see above).

30. *Lomandra nigricans* T.Macfarlane, *Nuytsia* 5: 17 (1984)

T: 11 miles [c. 18 km] NW of Northcliffe, W.A., 21 July 1961, A.S.George 2633 (♂ & ♀); holotype: PERTH.

Xerotes endlicheri F.Muell., *Fragm.* 8: 205 (1874) *nom. illeg.*, p.p.; *Lomandra endlicheri* (F.Muell.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 219 (1916) *nom. illeg.*, p.p.

Illustration: T.D.Macfarlane, *op. cit.* fig. 2.

Tussocks narrow. Leaves channelled to semiterete, 25–70 cm long, 1–3 mm wide, glabrous; apex rounded; sheath margins at first intact and white or nearly transparent, later finely lacerated and dark brown to purplish black. Male inflorescence branched or unbranched, at least half the leaf length; scape equalling or longer than rachis; flower clusters in distant whorls, the whorls of branches and flowers at least 2 cm apart. Female inflorescence similar but often unbranched. Bracts broad, acute, shorter than pedicel; inner bract sometimes absent. Male flowers c. 2.5–4 mm long; sepals and petals nearly equal, white with purple markings, petals slightly thicker; pedicel 2–7.5 mm long. Female flowers similar; pedicel absent or up to 0.8 mm long. $n = 8$, *fide* G.J.Keighery, *Feddes Repert.* 95: 528 (1984).

Occurs in south-western W.A., from Gingin south to Albany and east along the south coast to Israelite Bay. Grows in eucalypt forest on laterite, eucalypt or banksia woodland on sand and in shrubland on black peaty (sometimes swampy) or lateritic sands. Flowers late May–Aug. Map 156.

W.A.: Jarrahdale, *W.V.Fitzgerald* NSW 151541 (♂) & 151540 (♀) (NSW); Smiths Mill, Darling Ra., *A.Morrison* 10245 (♂) (NSW); c. 5 km S of Mt Barker township on Albany road, *R.Melville* 4381 & *R.D.Royce* (♂) (NSW, PERTH); Chester Pass, Stirling Ra., *M.Griffiths* NSW 151539 (♀) (NSW).

Until recently this species was confused with *L. odora* and *L. integra*, the composite taxon being known by the illegitimate name *L. endlicheri*. All three species have strongly scented flowers.

31. *Lomandra odora* (Endl.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 219 (1916)

Xerotes odora Endl. in J.G.C.Lehmann, *Pl. Preiss.* 2: 50 (1846). T: Perth, W.A., 1 Sept. 1839, *L.Preiss* 1529; holo: LD; iso: MEL 21078, P (2 sheets).

Xerotes endlicheri F.Muell., *Fragm.* 8: 205 (1874) *nom. illeg., p.p.*; *Lomandra endlicheri* (F.Muell.) Ewart, *loc. cit.*, *nom. illeg., p.p.*

Illustration: T.D.Macfarlane, *Nuytsia* 5: 16, fig. 1 (1984).

Tussocks small. Leaves channelled to semiterete, 20–54 cm long, 0.5–1.2 mm wide, glabrous; apex rounded; sheath margins finely lacerated, white to pale grey. Male inflorescence usually unbranched, less than half the leaf length, clearly scapose; flowers in close whorled clusters, the whorls commonly less than 1 cm apart. Female inflorescence similar, sometimes with a very short rachis on a long scape. Bracts as in *L. nigricans*. Flowers yellowish-green, sometimes purple-flushed, males pedicellate, females sessile, otherwise as in *L. nigricans*. $n = 8$, *fide* G.J.Keighery, *Feddes Repert.* 95: 528 (1984). Fig. 26D.

Occurs in south-western W.A., from Perth S to near Bridgetown. Grows in sandy soils of banksia and Tuart (*Eucalyptus gomphocephala*) woodland, or marginal to swamps, on the coastal plain, and in Jarrah (*Eucalyptus marginata*) forest on the Darling Range. Flowers Aug.–Nov. Map 157.

W.A.: Kewdale, *R.Coveny* 8203 (♂ & ♀) (NSW, PERTH); Bicton, *M.Griffiths* NSW 151542 (♂) (NSW); Lower Canning R., *A.Morrison* 10242 (♂) (NSW, PERTH); c. 7 km from Collie towards Tallanalla, *E.M.Canning* CBG 39993 (♂) (NSW).

See note under *L. nigricans* regarding past taxonomic confusion of this species.

32. *Lomandra integra* T.Macfarlane, *Nuytsia* 5: 21 (1984)

T: c. 5 km N along South Western Highway from Palgarup, W.A., 34°09'S, 116°12'E, *T.D.Macfarlane* 963; holo: PERTH (♂ & ♀); iso: CANB (♂), NSW (♂).

Illustration: T.D.Macfarlane, *op. cit.* fig. 3.

Tussocks narrow. Leaves glabrous, dimorphic, sometimes on the one plant, erect, channelled to semiterete, long and narrow (20 cm long, c. 1 mm wide), or erect or spreading, usually flat, short and broad (c. 7–15 cm long, 3 mm wide); apex rounded; sheath margins

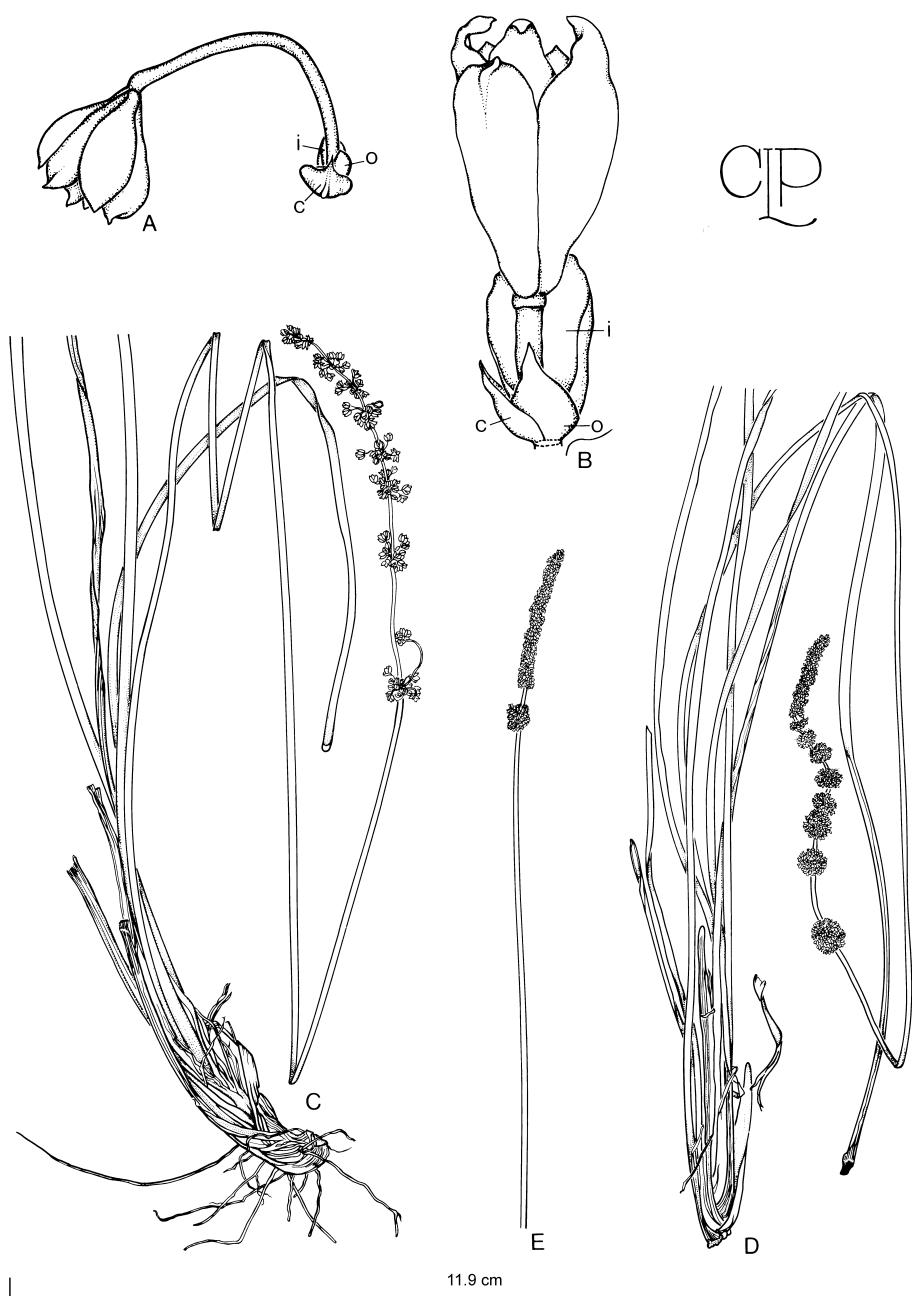


Figure 29. *Lomandra*. **A**, *L. multiflora* subsp. *multiflora*, pedicellate ♂ flower, intermediatary bracts absent $\times 2.2$ (R.Storey 6674, NSW). **B**, *L. patens*, pedicellate ♂ flower, intermediatary bracts absent $\times 2.2$ (S.Cadwell & R.Randall NSW 84976, NSW). **C**, *L. purpurea*, ♂ shoot $\times 0.1$ (B.Briggs NSW 87518, NSW). **D–E**, *L. preissii*. **D**, ♂ shoot $\times 0.1$; **E**, ♀ inflorescence $\times 0.1$ (D–E, M.Griffiths NSW 51078, NSW). (c, cluster bract; i, inner bract; o, outer bract).

intact, white to light brown. Inflorescence, bracts and flowers as in *L. nigricans*. $n = 8$, *vide* G.J.Keighery, *Feddes Repert.* 95: 528 (1984).

Occurs in south-western W.A., from near Perth to Albany. Grows on lateritic soils in Jarrah (*Eucalyptus marginata*) forest and sandy clay soils in Karri (*E. diversicolor*) forest. Flowers Aug.–Nov. Map 158.

W.A.: Big Brook, Pemberton, *M.Koch* 2251 (♂) (NSW); c. 18 km from Denmark towards Manjimup, *M.E.Phillips* CBG 11599 (♂) (NSW); Bow R., *S.W.Jackson* NSW 151543 (♀) (NSW); c. 1.6 km N of Bow Bridge on Valley of the Giants road, E of Walpole, *B.G.Briggs* 639 (♂) (NSW); Toolbrunup Track, Stirling Ra., *M.Griffiths* NSW 151544 (♂ & ♀) (NSW).

See note under *L. nigricans* regarding past taxonomic confusion of this species.

33. *Lomandra fibrata* J.Black, *Trans. & Proc. Roy. Soc. S. Australia* 66: 248 (1942)

T: Mt Lofty Range, Mt Remarkable, S.A., Nov., *J.B.Cleland*; numerous possible syntypes: AD *n.v.*, *vide* J.P.Jessop, *pers. comm.*

Illustration: J.M.Black, *Fl. S. Australia* 3rd edn, 1: fig. 309 (1978).

Tussocks narrow, dense. Leaves very fine, variously shaped in section, 20–50 cm long, 0.5–1 mm wide, glabrous except regularly and minutely serrulate margins; apex entire; sheath margins readily lacerated, white. Inflorescence usually branched; scape hidden by leaf bases; axes irregularly flattened, with separate flowers. Male inflorescence 2–3 cm long, with 1 or few short nearly erect branches. Female inflorescence sometimes unbranched. Bracts long-acuminate, equalling the flower. Male flowers globular, 2.5 mm long; sepals longer and thinner than petals, pale green; petals yellowish; pedicel c. 1 mm long. Female flowers campanulate, 3 mm long, subsessile. Fig. 30A.

Endemic in S.A. with a limited distribution in the Mt Lofty Range. Flowers Sept.–Nov. Map 159.

S.A.: Upper Waterfall Gully, *H.Eichler* 15108 (♂) (MEL, NSW).

34. *Lomandra densiflora* J.Black, *Trans. & Proc. Roy. Soc. S. Australia* 66: 248 (1942)

T: Mt Lofty Range and southern districts, S.A., *J.B.Cleland et al.*; numerous possible syntypes: AD *n.v.*, *vide* J.P.Jessop, *pers. comm.*

Plant tufted. Leaves rigid, flat or concavo-convex to terete (sometimes on one plant), 20–60 cm long, 1–6 mm wide, glabrous; apex acuminate or with several minute points; sheath margins lacerated only in age, white or light brown. Inflorescence with erect branches; scape hidden by leaf bases; flowers separate. Male inflorescence dense, c. 4 cm long. Female inflorescence sparser, 2–3 cm long. Bracts acuminate, conspicuous; inner scarcely evident. Flowers funnel-shaped, pale green; males 2–3 mm long, females 4 mm long; pedicels to 3 mm long. Sepals and petals as in *L. fibrata*. Fig. 30B.

Widespread in south-eastern S.A., from Yorke Peninsula to Flinders Ranges and Murray region. Flowers in spring. Map 160.

S.A.: S end of Fullarton Road, Adelaide, *H.Eichler* 15107 (♀) (NSW); just NW of Port Elliot, *H.Eichler* 15029 (♂) & 15030 (♂ & ♀) (NSW).

35. *Lomandra micrantha* (Endl.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 219 (1916)

Xerotes micrantha Endl., in J.G.C.Lehmann, *Pl. Preiss.* 2: 49 (1846). T: near Perth, W.A., 23 May 1839, *L.Preiss* 1531 (♂); holo: LD; iso: MEL, P.

Illustration: J.M.Black, *Fl. S. Australia* 3rd edn, 1: fig. 314 (1978).

Plant tufted. Leaves 20–70 cm long; apex broadly acute or obtuse; sheath margins dark or light brown. Inflorescence with scape hidden by leaf bases or exserted. Male inflorescence branched; flowers separate or 2 together. Female inflorescence branched or unbranched. Bracts broadly acuminate, 1–3 mm long; inner bract evident or not. Flowers pedicellate,

greenish-yellow to dark red, usually with pale margins; males 1.5–3 mm long, females 3–5.5 mm long. Sepals and petals similar, spreading or reflexed at anthesis. *Smallflower Mat-rush*. $2n = 32$, *fide* B.G.Briggs, *Telopea* 2: 742 (1985).

Occurs in southern W.A., southern S.A., Vic. and south-eastern N.S.W. There are 3 subspecies.

- 1 Inflorescence axis and branches smooth or scaberulous with dense, fine blisters
- 2 Leaves flexuose or firm, plano-convex or flat or if less than 0.6 mm wide then almost terete **35a. subsp. micrantha**
- 2: Leaves rigid, terete, 0.9 mm diam. or more **35b. subsp. teretifolia**
- 1: Inflorescence axis and branches with conspicuous discrete tubercles **35c. subsp. tuberculata**

35a. *Lomandra micrantha* (Endl.) Ewart subsp. *micrantha*

Leaves usually flexuose, plano-convex, flat and inrolled, 0.4–2.5 mm wide, or almost terete and less than 0.6 mm wide; sheath margins usually lacerated but some remaining intact. Inflorescences $\frac{1}{3}$ – $\frac{1}{2}$ as long as leaves, male 7–25 cm long, female 3–12 cm long; scape usually hidden; axis smooth or scaberulous with fine blisters. $n = 8, 16$, *fide* G.J.Keighery, *Feddes Repert.* 95: 528 (1984) as *L. micrantha*. Fig. 30H–I.

Widespread in southern Australia, in south-western W.A. south of Geraldton, in much of southern S.A. and in Vic. Flowers Apr.–July. Map 161.

W.A.: Burma Road near Walkaway turnoff, *A.M.Ashby* 1852 (♂) (AD); 2 km W of Mara Bridge, Pallinup R., *K.Newbey* 3841 (♀) (PERTH). S.A.: near Highbury Hotel, c. 13 km NE of Adelaide, *D.Kraehenbuehl* 623 (♀) (AD). Vic.: Stony Ck, between Tottenham and Sunshine Stations, *J.H.Willis* (♀ & ♂) (MEL 20870).

35b. *Lomandra micrantha* subsp. *teretifolia* Everett, *Fl. Australia* 46: 222 (1986)

T: 49 km E of Newdegate on Lake King road, W.A., 27 June 1976, *A.S.George* 14294 (♂); holo: NSW; iso: CANB, K, (both *n.v.*), MEL, PERTH.

Leaves rigid although sinuate, terete, 0.9–3.5 mm diam.; sheath margins usually lacerated but some remaining intact. Inflorescence $\frac{1}{3}$ – $\frac{1}{2}$ as long as leaves, male 6–15 cm long, female 5–10 cm long; scape usually hidden; axis scaberulous with fine dense blisters.

Occurs in south-western W.A., from Dalwallinu to Ongerup and Lake King eastward, and in western Vic. Grows on sand in low heath and open mallee. Flowers June–July. Map 162.

W.A.: 49 km E of Newdegate on Lake King road, *A.S.George* 14294 (♂) & 14295 (♀) (NSW, PERTH); 40 km ESE of Lake King, *P.G.Wilson* 6860 (♀) (PERTH). Vic.: Wyperfield Natl Park, *J.H.Willis* (♂) (MEL 502260, NSW 153056); Wildflower Reserve near Anglesea, *J.H.Willis* (MEL 20665).

35c. *Lomandra micrantha* subsp. *tuberculata* Everett, *Fl. Australia* 46: 222 (1986)

T: Ridge road near Waitpinga, S.A., 22 July 1966, *D.E.Symon* 3961; holo: NSW (♂); iso: AAU, ADW, HUI, K, all *n.v.*

Xerotes micrantha var. *sororia* F.Muell. ex Benth., *Fl. Austral.* 7: 103 (1878); *Lomandra micrantha* var. *sororia* (F.Muell. ex Benth.) H.Williamson, *Victorian Naturalist* 45: 37 (1928). T: Mount Wellington, Gippsland, Vic., *F.Mueller*; holo: MEL 20866; iso: MEL 20867.

Leaves flexuose, or stiff and erect, plano-convex or flat and inrolled or folded, 0.8–2.5 mm wide (flat and up to 5 mm wide in montane areas); sheath margins usually intact, occasionally slightly lacerated. Inflorescence $\frac{1}{3}$ – $\frac{1}{2}$ as long as leaves, the scape hidden or, in the more easterly populations, $\frac{1}{2}$ – $\frac{3}{4}$ as long as leaves and the scape exposed, male 10–27 cm long, female 7–18 cm long; axis strongly tuberculate. Fig. 30F–G.

Occurs in coastal and tableland areas of N.S.W. south of Gosford, in Vic. mainly in the Victorian Highlands and Grampians, and in S.A. mainly in the south-east. Flowers autumn and winter (spring in montane areas). Map 163.

S.A.: Upper Waterfall Gully, *H.Eichler* 18684 (♂) & 18685 (♀) (AD); Bool Lagoon–Lucindale road, Hundred of Coles, *D.Hunt* 182 (♀) (AD). N.S.W.: Pennant Hills Park, *R.Coveny* 1008 (♂) (AD, NSW). Vic.: Mt Tingaringy, Y47, *A.C.Beauglehole* 43409 (♀) & 43410 (♂) (NSW); extreme NW corner of Victoria Ra., *A.C.Beauglehole* 25195 (♂) (MEL).

36. *Lomandra drummondii* (F.Muell. ex Benth.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 219 (1916)

Xerotes drummondii F.Muell. ex Benth., *Fl. Austral.* 7: 99 (1878). T: Swan River, [W.A.], *J.Drummond* 209 (♀); syn: K, photo seen; isosyn: MEL; Swan River, [W.A.], *J.Drummond* 364; syn: K, photo seen; isosyn: MEL, P. (Bentham cited *Drummond* 59 in error in the protologue, and cited no. 209 and no. 364 under *Xerotes sonderi*).

Plant tufted. Leaves flat, with conspicuous marginal bands, 20–50 cm long, 3–12 mm wide, glabrous; apex rounded; sheath margins intact, brown or purple. Inflorescence shorter than to as long as leaves; male and female similar, branched, with alternate branches; axes glabrous or finely scaberulous; flowers separate, or 2 or 3 together. Bracts shorter to slightly longer than pedicel; inner bract regularly present. Male and female flowers similar, 2.5–4 mm long, greenish-yellow flecked with dark red or purple; pedicel 1–3 mm long. Sepals and petals similar, spreading or reflexed at anthesis. $n = 8$, *fide* G.J.Keighery, *Feddes Repert.* 95: 528 (1984).

Occurs in south-western W.A. from near Perth to E of Walpole. Grows in eucalypt forest on lateritic or loamy soils. Flowers May–Aug. Map 164.

W.A.: Lowden, *M.Koch* 2096 (♂) (MEL); 22.5 km S along Albany Hwy from the South Western Hwy turnoff at Armadale, *T.D.Macfarlane* 1148 (♂) & 1149 (♀) (AD, BRI, CANB, HO, K, MEL, NSW, NT, NY, PERTH); 23.5 km W of Manjimup along road to Nannup, *T.D.Macfarlane* 1168 (♂) & 1169 (♀) (CANB, K, MEL, NSW, PERTH).

37. *Lomandra effusa* (Lindley) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 219 (1916)

Xerotes effusa Lindley, in T.Mitchell, *Three Exped. E. Australia* 2: 101 (1838). T: near N bank of Murray R., N.S.W., [c. 34°30'S, 143°30'E], 27 May 1836, *T.L.Mitchell* 135; holo: CGE, photo seen, P.

Xerotes fragrans F.Muell. ex Sonder, *Linnaea* 28: 219 (1856). T: near Gawlertown [Gawler], S.A., July, *F.Mueller*; holo: MEL; iso: P (2 sheets).

Illustrations: G.R.Cochrane *et al.*, *Fl. Pl. Victoria & Tasmania* 43 (1980); G.M.Cunningham *et al.*, *Pl. W. New South Wales* 187 (1982).

Tussocks robust, up to 60 cm wide. Leaves flat, up to 50 cm long and 1.3 mm wide, glaucous, red-brown and fibrous at base; apex strongly bicuspidate; sheath margins lacerated, brown. Inflorescence much-branched, shorter than leaves; scape hidden among leaf bases; axes smooth; flowers separate. Bracts often exceeding pedicels; inner bract smaller, minute or absent. Flowers funnel-shaped, white, pale pink or mauve; pedicel to 1 cm long. Male flowers 4–6 mm long; sepals and petals narrow, obtuse. Female flowers: sepals and petals broad-based, thick. *Scented Mat-rush*. $n = 16$, *fide* G.J.Keighery, *Feddes Repert.* 95: 528 (1984).

Widespread in southern Australia from inland south-western W.A., through Eyre and Yorke Peninsulas, S.A., to the dry western plains of N.S.W. and north-western Vic. Grows in sandy soil, sometimes in clay or near salt pans and granite outcrops. Flowering dependent on rain. Map 165.

W.A.: 1 km N of Bencubbin, *M.D.Crisp* 6542 (♂) (NSW). S.A.: Cape Jarvis, *H.Eichler* 14536 (♀) (NSW); Chaunceys Line, 4 km SE of Hartley, *D.J.E.Whibley* 219 (♂) (NSW). N.S.W.: 13 km from Euston on Balranald road, *N.T.Burbidge* 6646 (♂) & 6647 (♀) (NSW). Vic.: c. 5 km NNW of Red Cliffs, *J.Cullimore* 21 (♀) (NSW).

Flowers strongly scented.

38. *Lomandra cylindrica* A.Lee, *Contr. New South Wales Natl Herb.* 3: 153 (1962)

T: Palm Beach Road, N.S.W., 22 Oct. 1953, *A.Lee NSW 49118* (♂); holo: NSW.

[*Xerotes filiformis* auct. non. (Thunb.) R.Br.: R.Brown, *Prodr.* 261 (1810); G.Bentham, *Fl. Austral.* 7: 103 (1878) *p.p.*]

Plant sparsely tufted; shoots often with only 2–4 leaves. Leaves terete, occasionally semiterete, usually c. 30 cm long, to c. 2 mm diam., glabrous or scabrous; apex acute; sheath margins scarcely lacerated, reddish or purplish. Male inflorescence $\frac{1}{3}$ – $\frac{1}{2}$ or rarely nearly as long as leaves, unbranched or occasionally few-branched; scape approximately as long as rachis; axes smooth; flowers separate, well spaced. Female inflorescence similar but shorter, rarely branched; axes sometimes papillose. Bracts ovate, 1–2 mm long; inner bract sometimes absent. Flowers yellow, not usually blackening when dried. Male flowers globular, 2 mm long; sepals broadly elliptical to almost circular, shorter and more membranous than the thick petals; pedicel 3 mm long. Female flowers more tubular, 3 mm long; pedicel to 1 mm long. $2n = 32$, *fide* B.G.Briggs, *Telopea* 2: 742 (1985). Figs 26F, 30D.

Occurs in central coastal N.S.W. and adjacent tableland areas, extending into the eastern tip of Vic. Grows in sandy soil in dry sclerophyll forest. Map 166.

N.S.W.: Currant Mtn Gap, 24 km E of Rylstone, *R.Coveny 9554* (♂) (NSW); Wentworth Falls, *W.F.Blakely NSW 49111* (♂) (NSW); Hornsby, *W.F.Blakely NSW 49109* (♂ & ♀) (NSW); c. 8 km ESE of Nerriga, *A.Lee 69* (♂) (NSW). Vic.: foot of Genoa Peak, *E.F.Constable 5428* (♂) (NSW).

39. *Lomandra brevis* A.Lee, *Contr. New South Wales Natl Herb.* 3: 154 (1962)

T: Hornsby, track to Waterfall Creek, N.S.W., 1 Jan. 1915, *W.F.Blakely NSW 49356* (♂); holo: NSW.

Tussocks small, dense, to 20 cm diam. Leaves concavo-convex, inrolled, 5–25 cm long, 0.5–1 mm wide, glabrous; apex acute; bases purplish above the whitish, lacerated sheath margins. Inflorescence with scape about as long as rachis; axes quite smooth; flowers well-spaced. Male inflorescence c. 10–15 cm long, unbranched or with a few short branches. Female inflorescence c. 5 cm long, unbranched. Flowers pedicellate, similar to those of *L. cylindrica* but wider, 3–4 mm at open end, characteristically blackening when dried. Fig. 30C.

Occurs in the Sydney region, N.S.W.; rather infrequent in dry sclerophyll forest, growing on sandstone-derived soils, perhaps favouring sheltered situations. Flowers spring and autumn. Map 167.

N.S.W.: Heathcote, *J.L.Boorman NSW 49359* (♂) (NSW); Cabarita, *R.Coveny NSW 85338* (♀) (NSW); Sutherland, *R.Coveny NSW 101177* (♂) (NSW); Muogamarra Nature Reserve, Cowan, *R.Coveny 1058* (♂) (NSW); near Mt Ku-ring-gai, towards Apple Tree Bay, *O.D.Evans NSW 64306* (♂) (NSW).

40. *Lomandra filiformis* (Thunb.) Britten, *Bot. Cook's Voy.* 3: 95 (1905)

Dracaena filiformis Thunb., *Diss. Bot. Dracaena* 4 (1808); *Xerotes filiformis* (Thunb.) R.Br., *Prodr.* 261 (1810); *X. thunbergii* F.Muell., *Fragm.* 8: 208 (1874) *nom. illeg., p.p.* T: from Australia, *per Smith*; holo: UPS, photo seen.

Illustrations: G.R.Cochrane *et al.*, *Fl. Pl. Victoria* 27 (1968); K.A.W.Williams, *Nat. Pl. Queensland* 1: 178 (1979).

Tussocks sparse or occasionally in short, dense mats to 20 cm diam. Leaf sheath margins eventually lacerated, whitish, occasionally \pm intact, purplish brown. Inflorescence axes smooth, papillose or scabrid; flowers separate. Male inflorescence branched with the branches alternate or occasionally some whorled, or unbranched. Female inflorescence less branched with a short or hidden scape. Bracts and flowers similar to those of *L. cylindrica*, but male flowers pedicellate, female flowers subsessile. *Wattle Mat-rush*.

Widespread in eastern Australia, from northern Qld through N.S.W. to Vic. as far west as the Grampians. Grows usually in well drained soils, often sandy or rocky. Flowers chiefly Oct.–Nov.

The subspecies into which this variable species was divided by A.T.Lee (*Contr. New South Wales Natl Herb., Fl. Ser.* No. 34, 1966) have subsequently proved somewhat less distinct from each other, following increased collecting. However, the distinctions remain useful and are still related to geography. Some changes from the original treatment are embodied in this account. Lee (*loc. cit.*) also discussed the nomenclature of the species.

- 1 Leaves folded to much inrolled or rarely flat, flexible or rigid, the apex minutely 1–3-pointed; male inflorescence with axes smooth to scabrid
- 2 Male inflorescence unbranched to well-branched, usually slightly less than $\frac{1}{2}$ as long as leaves; branches irregularly alternate or occasionally some whorled, axes smooth or slightly papillose especially distally; scape similar to rachis in length; bracts all small; female inflorescence similar to associated male but slightly smaller **40a. subsp. filiformis**
- 2: Male inflorescence branched, $\frac{1}{4}$ – $\frac{1}{2}$ as long as leaves; branching obscure or branches irregularly whorled, axes smooth to scabrid; scape shorter than rachis, sometimes partly hidden by leaf bases; bracts subtending branches of inflorescence large, smaller in size at upper nodes; female inflorescence more condensed than male, as little as one-seventh of leaf-length **40c. subsp. flavior**
- 1: Leaves flat or nearly so, coriaceous or firm, the apex usually entire (points readily eroded); male inflorescence with distinctly scabrid axes **40b. subsp. coriacea**

40a. *Lomandra filiformis* (Thunb.) Britten subsp. *filiformis*

Xerotes tenuifolia R.Br., *Prodr.* 261 (1810). T: Port Jackson, N.S.W., *R.Brown Iter Australiense* 5756 (♂); holo: BM, photo seen.

Xerotes denticulata R.Br., *loc. cit.* T: Port Jackson, N.S.W., *R.Brown Iter Australiense* 5758 (♂); holo: BM, photo seen.

Leaves very fine, channelled, folded, inrolled or rarely flat, usually flexible, usually less than 10 cm long and up to 2 mm wide, occasionally to 5 mm, smooth or rarely scaberulous, especially on margins; apex minutely 1–3-pointed. Male inflorescence sometimes only 2–5 cm long and unbranched, but mostly with a few short branches and c. 10–20 cm long, to well-branched and over 30 cm long, usually slightly less than $\frac{1}{2}$ to as long as leaves; branches irregularly alternate or occasionally some whorled; axes quite smooth, or slightly papillose especially distally; scape similar to rachis in length, usually whitish. Female inflorescence similar but slightly smaller. Bracts all small. $2n = 32$, *fide* B.G.Briggs, *Telopea* 2: 742 (1985). Fig. 30E.

Occupies the northern part of the species range, especially in coastal and tableland districts, intergrading erratically with subsp. *flavior* to the west, and with subsp. *coriacea* to the south, extending from northern Qld to central N.S.W.; occasionally also in southern N.S.W. and Vic. Map 168.

Qld: Rocky Ck, near Tolga, *H.S.McKee* 9292 (♂) (NSW); Northey road near Tolga, *H.S.McKee* 9408 (♂) (NSW). N.S.W.: Tower Hill, Dalmorton, *E.F.Constable* NSW 24033 (♂) (NSW); Wondabyne, *R.Coveny* 9526 (♂) (NSW); E of Turrumurra, *H.Salasoo* 899 (♂) (NSW); Cumberland State Forest, West Pennant Hills, *R.Coveny* 8537 (♀) (NSW).

40b. *Lomandra filiformis* subsp. *coriacea* A.Lee, *Contr. New South Wales Natl Herb.* 3: 152 (1962)

T: Colo Vale, road to Mt Flora, N.S.W., Nov. 1955, *A.Lee* NSW 51852 (♂); holo: NSW.

Leaves flat or nearly so, coriaceous or firm, usually 15–30 cm long, 2.5–3 mm wide, smooth or scabrid; apex usually entire. Male inflorescence often up to $\frac{1}{2}$ as long as leaves, with a few branches; branches often whorled; axes distinctly scabrid; scape shorter than rachis, often yellowish. Female inflorescence smaller, but axes often less scabrid. Bracts all small. $2n = 32, 58$, *fide* B.G.Briggs, *Telopea* 2: 742 (1985).

Occurs in the southern part of the species range, i.e. widespread in Vic. and in south-eastern N.S.W., chiefly in coast and tableland districts, intergrading with subsp. *filiformis* at their junction and appearing erratically in northern N.S.W. and rarely in Qld; gradually replaced by subsp. *flavior* to the west; appears to be more common in soils from shale or igneous rocks than in sands. Map 169.

Qld: northern edge of Blackdown Tableland, *L.A.S.Johnson & D.Blaxell* 888 (♂) (NSW). N.S.W.: St Marys, *R.Coveny* NSW 95553 (♂) (NSW); The Craggs, NW of Mittagong, *A.T.Lee* NSW 98645 (♀) (NSW); Burrinjuck, *C.W.E.Moore* CANB 2186 (♀) (NSW). Vic.: Dividing Ra., *C.Walter* NSW 51872 (♂) (NSW).

40c. *Lomandra filiformis* subsp. *flavior* A.Lee, *Contr. New South Wales Natl Herb.* 3: 152 (1962)

T: Orange district, N.S.W., Nov. 1948, *R.C.Madsen* NSW 51673; holo: NSW.

Leaves rolled or flat, usually very tough, 30–40 cm long, c. 2 mm wide, smooth; to scabrid; apex minutely 1–3-pointed. Male inflorescence c. 3–7 cm long, $\frac{1}{4}$ – $\frac{1}{3}$ as long as leaves, well branched; branching obscure or branches irregularly whorled; axes smooth to scabrid, often yellowish; scape shorter than rachis, sometimes partly hidden by leaf bases. Female inflorescence more condensed, as little as one-seventh as long as leaves. Bracts subtending branches large, white or whitish, smaller at upper nodes.

Occurs on the western slopes of the Great Dividing Ra. in N.S.W., essentially in the inland part of the species range. Map 170.

N.S.W.: Hanging Rock, c. 9 km SE of Nundle, *A.Lee* NSW 102494 (♂ & ♀) (NSW); E of Mt Towingingy, near Currant Mtn Gap, *J.Pickard* 327 & *D.Blaxell* (♀) & 328 (♂) (NSW); c. 16 km N of Putty, *E.F.Constable* NSW 48908 (♂) (NSW); Farm of Hawkesbury Agric. College (spontaneous), collector unknown NSW 51650 (♂) (NSW).

Specimens from the southern part of the range tend to have scabrid inflorescence axes, and although now within the circumscription of subsp. *flavior* (see Lee, *loc. cit.*), they thus show a similarity to subsp. *coriacea*, a similarity also evident in the leaf forms of some southern subsp. *flavior*.

41. *Lomandra bracteata* A.Lee, *Contr. New South Wales Natl Herb.* 3: 160 (1962)

T: Yass, N.S.W., 9 Sept. 1936, *Pastures Protection Board*, Yass, NSW 49458 (♂); holo: NSW.

Tussocks narrow, c. 20 cm diam. Leaves almost flat to slightly concave or rolled, c. 10–20 cm long, 1–2 mm wide, glabrous or margins slightly scaberulous; apex irregularly and minutely 3-pointed; sheath margins lacerated only in age, conspicuous, white. Male and female inflorescences almost identical, branched, 1–3 cm long; scape hidden by leaf bases; flowers separate but congested. Bracts conspicuous, usually attenuate, enclosing pedicel and often the flower; inner bract smaller. Male and female flowers similar; males as in *L. cylindrica* but subsessile or with pedicel up to 5 mm long; females with pedicel up to 1 mm long. $2n = 16$, *fide* B.G.Briggs, *Telopea* 2: 742 (1985).

Occurs in N.S.W., chiefly in the Southern Tablelands district and the inland slopes of the Great Divide in the southern half of the State. Grows in grassland, sometimes rocky areas, railway reserves and cultivation areas, on heavy soils. Flowers Aug.–Oct. Map 171.

N.S.W.: Mt Nider, Warrumbungles, *C.K.Ingram* NSW 59108 (♀) (NSW); West Spirey Ck, Warrumbungles, *A.Rodd* NSW 72292 (♂ & ♀) (NSW); Nevertire, L.Abrahams NSW 49459, plant A (♂) (NSW); Queanbeyan, *H.S.McKee* 9576 (♂) & 9700 (♀) (NSW).

42. *Lomandra gracilis* (R.Br.) A.Lee, *Contr. New South Wales Natl Herb.* 3: 153 (1962)

Xerotes gracilis R.Br., *Prodr.* 261 (1810). T: Port Jackson, N.S.W., *R.Brown Iter Australiense* 5757 (♂); holo: BM, photo seen.

[*Xerotes filiformis* auct. non (Thunb.) R.Br.: G.Bentham, *Fl. Austral.* 7: 104 (1878) p.p.]

Tussocks sparse. Leaves channelled to almost semiterete with narrow marginal bands and coarse venation, usually c. 40 cm long, 1–2 mm wide, glabrous; apex acute; sheath margins lacerated, dark purplish brown. Inflorescence with several irregularly alternate branches (sometimes a few whorled); flowers separate, well-spaced. Male inflorescence often nearly as long as leaves; axes smooth. Female inflorescence smaller; axes sometimes papillose. Bracts as in *L. cylindrica*, but inner bract absent. Male flowers usually 2.5–3 mm long, to 4 mm diam., yellow; sepals thinner and shorter than the fleshy petals; pedicel 3–5 mm long. Female flowers on pedicel 1–2 mm long. $2n = 16, 32$, *fide* B.G.Briggs, *Telopea* 2: 742 (1985).

Occurs in the Blue Mountains and central coast areas of N.S.W. and in southern Qld. Often grows in rocky situations with sandy soils in dry sclerophyll forest. Flowers in spring. Map 172.

N.S.W.: Grassy Hill, Colo Heights to Putty, *L.A.S.Johnson & E.F.Constable* NSW 48907 (♂) (NSW); Georges R., Kentlyn, *E.J.McBarron* NSW 85302 (♀) & 85307 (♂) (NSW); Hat Hill Ck, Blackheath, *E.F.Constable* NSW 26471 (♂) (NSW); Audley, Royal Natl Park, *R.G.Coveny* 10340 & *J.G.Seur* (♂ & ♀) (NSW); Boolijah Ck, Nowra–Nerriga road, *E.F.Constable* NSW 45261 (♂) (NSW).

43. *Lomandra laxa* (R.Br.) A.Lee, *Contr. New South Wales Natl Herb.* 3: 153 (1962)

Xerotes laxa R.Br., *Prodr.* 261 (1810). T: without specific locality but from the vicinity of Port Jackson, N.S.W., *R.Brown Iter Australiense* 5759 (♂); holo: BM, photo seen.

[*Xerotes filiformis* auct. non (Thunb.) R.Br.: G.Bentham, *Fl. Austral.* 7: 104 (1878) p.p.]

Tussocks sparse; stems short with leaves c. 40 cm long, or stems extended and decumbent with leaves c. 20 cm long. Leaves flat, rather thin, 2–4 mm wide, bluish-grey when dry; apex rounded-acute or rounded-truncate; sheath margins intact, whitish, or slightly lacerated in age and brownish. Inflorescence often nearly as long as leaves with well-spaced, separate flowers on fine axes; scape approximately equalling rachis. Male inflorescence with opposite or whorled branches. Female inflorescence similar, less well developed. Bracts as in *L. cylindrica*. Male flowers c. 2–2.5 mm long; pedicel spreading to recurved, c. 2 mm long. Female flowers 4–6 mm long; pedicel 0.5 mm long. Sepals and petals as in *L. cylindrica* but thin, creamy-white. $2n = 16$, *fide* B.G.Briggs, *Telopea* 2: 742 (1985).

Occurs in eastern Australia, from coastal and subcoastal Qld to northern coastal N.S.W. Commonly found in marginal rainforest habitats, also in sandy soils over sandstone and in deep sands. Flowers mostly autumn and winter. Map 173.

Qld: Blackdown Tableland, *R.J.F.Henderson* 1003 *et al.* (♂) (NSW); Fraser Is., Qld Forest Service, *NSW* 67671 (♂) (NSW); Noosa Natl Park, *L.A.S.Johnson* 330 (♀) (NSW); Blackall Ra., *M.D.Crisp* 2576 (♂) (NSW). N.S.W.: Bellinger R. Valley, *A.Lee* 313 (♂) (NSW).

The autumn to winter flowering, together with regularly whorled and very fine inflorescence axes, thin flat leaves, usually thinner texture of the perianth and short pedicels are features that distinguish *L. laxa*, especially from some of the large northern forms of *L. filiformis*.

44. *Lomandra nutans* T.Macfarlane, *Nuytsia* 5: 171 (1984)

T: 20 km E of Ellen Peak, Stirling Range, 8 Oct. 1982, *K.Newbey* 9672; holo: PERTH (♂); iso: CANB (♂ & ♀), K (♂ & ♀), NSW (♂ & ♀), NY (♂ & ♀), PERTH (♀).

Illustrations: T.D.Macfarlane, *loc. cit.* figs 1–4.

Tussocks compact. Leaves semiterete or channelled, 9–30 cm long, 0.5–1 mm wide, somewhat discoloured and papillose-puberulent; apex acute or truncated; sheath margins lacerated, white. Inflorescence with partially to fully recurved scapes, the rachis and flowers thus more or less pendent; branches predominantly opposite or whorled; axes smooth or papillose; flowers separate. Male inflorescence $\frac{1}{2}$ – $\frac{1}{2}$ as long as leaves. Female inflorescence smaller. Bracts acuminate, shorter than or equalling pedicels; inner bract regularly present. Flowers greenish-cream and partly red, with a deep receptacle; pedicel rather stout, straight, manifestly articulate near flower. Male flowers depressed-globular, 2–3 mm long; sepals and petals incurved; pedicel 1–2 mm long. Female flowers ellipsoidal, 3–4 mm long; pedicel 1 mm long.

Occurs in south-western W.A.; known from the plain S and E of the Stirling Range, from Narrogin and from W of York. Grows in well-drained situations in various sandy or loamy soils, usually in open places between mallee trees and shrubs but also in eucalypt woodland in the north of the range. Flowers Sept.–Dec. Map 174.

W.A.: 9 km NE of Ellen Peak, Stirling Ra., *T.D.Macfarlane* 1080 (♂) (NSW, PERTH); 9 km ESE of Ellen Peak, *K.Newbey* 4337 (♂) (PERTH); South Stirling Reserve, Nov. 1982, *A.V.Milewski* (PERTH).

Unique in having a recurved inflorescence.

45. *Lomandra pauciflora* (R.Br.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 220 (1916)

Xerotes pauciflora R.Br., *Prodr.* 261 (1810). T: King George Sound, [W.A.], Dec. 1801, *R.Brown* *Iter Australiense* 5754; syn: BM, K, photo seen; King George Sound, [W.A.], *R.Brown*; syn: K, photo seen.

Xerotes asparagoides Endl., in J.G.C.Lehmann, *Pl. Preiss.* 2: 49 (1846). T: Mt Clarence, Albany, W.A., [originally cited as 'Montis Clarence, Perth' in error], 7 Dec. 1840, *L.Preiss* 1556; iso: MEL, P.

Xerotes graminea Endl., in J.G.C.Lehmann, *Pl. Preiss.* 2: 48 (1846). T: Preston River, Wellington District, W.A., 1 Jan. 1840, *L.Preiss* 1557; iso: MEL, P.

Stems decumbent, spreading or in a dense cushion. Leaves flat or concave, fine, up to c. 30 cm long, 0.5–1 mm wide, glabrous; apex acute, readily eroding; sheath margins intact except in age, white. Inflorescence sparse, usually unbranched, usually shorter than leaves; scape equal to or longer than rachis; axis smooth; flowers separate or 2 or 3 together. Male inflorescence with 3–7 flowers. Female inflorescence with 1–5 flowers. Bracts acuminate to long-attenuate, longer than pedicels; inner bract usually present. Flowers pale yellow, often drying black. Male flowers globular, c. 2 mm long; sepals shorter and thinner than the fleshy petals; pedicel 2–4 mm long. Female flowers more elongated, to 7 mm long; pedicel c. 1 mm long. $n = 7$, *vide* G.J.Keighery, *Feddes Repert.* 95: 528 (1984). Fig. 30J.

Occurs in south-western W.A., in high rainfall areas from Collie to Albany, but restricted, north of Busselton, to valleys of the Darling Plateau. Grows in eucalypt forest and woodland, occasionally in low scrub. Flowers Nov.–Feb. Map 175.

W.A.: King R., c. 13 km N of Albany, *M.D.Tindale* 329 & *B.R.Maslin* (♀) (NSW); King George Sound, Albany, *J.H.Maiden* NSW 151800 (♂) (NSW); Stirling Ra., S of Chester Pass, *B.G.Briggs* 528 (♂) (NSW).

46. *Lomandra caespitosa* (Benth.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 220 (1916)

Xerotes caespitosa Benth., *Fl. Austral.* 7: 104 (1878). T: Albany, W.A., Oct. 1867, *F.Mueller*; lecto: K, *vide* A.T.Lee, *Contr. New South Wales Natl Herb.* 3: 163 (1962); isolecto: MEL 20699.

Xerotes benthamiana W.Fitzg., *J. Proc. Mueller Bot. Soc. W. Australia* 1(10): 36 (1902). T: Claremont, W.A., Sept. 1901, *W.V.Fitzgerald* NSW 53309 (♂); lecto: NSW, *vide* A.T.Lee, *loc. cit.*

Tussocks small, dense. Leaves channelled, semiterete or terete, c. 20–40 cm long, to 1 mm wide, glabrous; apex apiculate to broadly acute; sheath margins intact or scarcely lacerated, white. Inflorescence unbranched; scape exceeding rachis; flowers irregularly grouped at close nodes (some appearing whorled), more distant above. Male rachis c. 1–3.5 cm long; scape 2–6 cm long. Female inflorescence smaller. Bracts conspicuous,

longer than flowers, shorter at upper nodes, broad-based, long-attenuate; inner bract regularly present. Flowers yellow or cream, not blackening, sessile or almost so; male 2.5–4 mm long, female c. 4 mm long. Sepals and petals as in *L. cylindrica*. $n = 8$, *fide* G.J.Keighery, *Feddes Rept.* 95: 528 (1984).

Occurs in south-western W.A., from Eneabba to Albany and inland as far as Beverley. Often grows in sandy soils in woodland, sometimes at swamp-margins, or in low scrub or forest on laterite. Flowers July–Oct. Map 176.

W.A.: near the Tone R. just W of Albion Mill, SW of Kojonup, 4 Oct. 1982, A.Brown (♂) (PERTH); Kewdale, R.Coveny 8182 (♂) (NSW, PERTH); 8 km S of Eneabba, R.Hnatiuk 771492 (PERTH); NW of Thomas Road and McLaughlan Road junction, E of Medina, T.D.Macfarlane 1218 (♂) (AD, CANB, MEL, NSW, PERTH) & 1219 (♀) (AD, CANB, NSW, PERTH).

A specimen labelled Echunga, S.A. (AD 95802178) is at present an enigma; it may be incorrectly labelled.

47. *Lomandra sororia* (F.Muell. ex Benth.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 219 (1916)

Xerotes sororia F.Muell. ex Benth., *Fl. Austral.* 7: 100 (1878). T: Grampians Mts, Vic., F.Mueller; lecto: K, *fide* A.T.Lee, *Contr. New South Wales Natl Herb.* 3: 162 (1962); isolecto: MEL 20704.

Xerotes sororia var. *teres* Luehm., *Victorian Naturalist* 14: 148 (1898). T: Lillimur, Vic., Miss Burkill; holo: MEL n.v.

[*Lomandra caespitosa* auct. non (F.Muell. ex Benth.) Ewart: J.Black, *Fl. S. Australia* 2nd edn, 1: 189 (1943)]

Illustration: J.M.Black, *Fl. S. Australia* 3rd edn, 1: fig. 315 (1978).

Tussocks sparse; shoots with few leaves. Leaves rigid, flat to terete, usually 20–35 cm long, 1–2 mm wide, usually scabrid on margins and in grooves, occasionally smooth; apex acute, initially minutely 1–3-pointed; sheath margins intact or rarely lattice-like, white or purplish brown. Male and female inflorescences similar, usually unbranched, occasionally with 1 or 2 short branches, c. 5–15 cm long; scape nearly equal to rachis; flowers separate or 2 or 3 together. Bracts ovate, shorter than flowers; inner bract regularly present. Male and female flowers similar, erect, globular, 1–2 mm long, sessile. Sepals and petals nearly equal, densely purple-flecked. *Small Mat-rush*. Fig. 26E.

Occurs in south-eastern S.A., coastal western Vic. and Grampians. Flowers in spring. Map 177.

S.A.: Stoneyfell Hill, Mt Lofty Range, Nov. 1940, J.B.Cleland NSW 49401 (♂ & ♀) (NSW); near Adelaide, 1898, J.B.Cleland NSW 53325 (♂) (NSW). Vic.: below Silverband Falls near Halls Gap, Grampians, R.Melville 1769 *et al.* (♂) (NSW); Mt Zero, Grampians, T.S.Henshall SY6-66-16 (♂) (NSW).

This species was erroneously recorded from W.A. by A.T.Lee, *Contr. New South Wales Natl Herb.* 3: 162–163 (1962), based on a specimen (coll. Oldfield) now referred to *L. brittanii*. *Lomandra sororia* differs from *L. brittanii* in having longer, rigid, \pm terete leaves and larger inflorescences, male and female scarcely distinct, not the short, flexible, flat leaves and small inflorescences, male and female markedly different, of *L. brittanii*. Some plants of *L. sororia* from Vic. (eg. from Mt Clay and Anglesea) show similarities to *L. brittanii* but the male and female inflorescences are similar and the scabridities on the leaves are horizontally elongated and confined to or project into the furrows, rather than being erect and papilla-like as in *L. brittanii*.

48. *Lomandra brittanii* Choo, *Nuytsia* 5: 43 (1984)

T: 28 mile peg on Albany Highway, c. 45 km SE of Perth, W.A., 9 Nov. 1967, T.S.Choo 67104 (♂); holo: PERTH.

Illustration: T.S.Choo, *loc. cit.* fig. 1.

Tussocks small, dense. Leaves fine, flat or inrolled, flexible, 5–20 cm long, 0.5–1 mm wide, papillose-puberulent adaxially; apex acute, obtuse or truncated; sheath margins



Figure 30. *Lomandra*. **A–E**, flowers $\times 1.9$. **A**, *L. fibrata*, part σ flower (H.Eichler 15108, NSW). **B**, *L. densiflora* σ (H.Eichler 15029, NSW). **C**, *L. brevis* σ (R.Coveny 9200, NSW). **D**, *L. cylindrica*, σ flower spread open (A.Lee NSW 49116, NSW). **E**, *L. filiformis* subsp. *filiformis*, f , inner bract absent (W.Blakely NSW 51801, NSW). **F–G**, *L. micrantha* subsp. *tuberculata*. **F**, shoot $\times 0.1$; **G**, flower with younger flower in bud $\times 1.9$ (F–G, A.Rose NSW 88685, NSW). **H–I**, *L. micrantha* subsp. *micrantha*. **H**, young f flower $\times 1.9$; **I**, older f flower $\times 1.9$ (H–I, A.George 9373, PERTH). **J**, *L. pauciflora*, σ shoot $\times 0.1$ (T.Aplin 1375, NSW). **K**, *L. hermaphrodita*, σ shoot $\times 0.1$ (W.Fitzgerald NSW 53329, 53330, NSW).
(**b**, bract; **i**, inner bract).

lacerated, white. Male inflorescence unbranched or sometimes with 1 or 2 short branches, 3–8 cm long; scape longer than rachis; flowers mostly 2 or 3 together. Female inflorescence 1–2 cm long, hidden among leaf bases; flowers 1–5 near the apex. Bracts equalling or exceeding flower, broad-based, attenuate; inner bract regularly present. Male flowers globular, 2.5–3 mm long, purple and yellow, sessile; sepals shorter, thinner and narrower than the petals. Female flowers campanulate, 4–6 mm long, purple, sessile. $n = 16$, *fide* G.J.Keighery, *Feddes Repert.* 95: 529 (1984).

Occurs in south-western W.A., from the Darling Range near Perth S to Boddington, and near Albany. Grows in eucalypt forest on lateritic and sandy soils. Flowers Oct.–Nov. Map 178.

W.A.: c. 45 km SE of Perth, *T.S.Choo* 67101 (♂) & 67109 (♀) (CANB), 67102 (♂) & 67110 (♀) (K), 67103 (♂) & 67112 (♀) (NSW), 67111 (♀) (PERTH); 10 km from Boddington (Worsley Alumina Mine) along conveyor line towards Collie refinery, *J.Koch* 122 (♀) (PERTH); Albany, *W.V.Fitzgerald* NSW 151862 (♂) (NSW); Yalgorup Natl Park, c. 16 km S of Mandurah, *R.H.Whittaker* & *W.A.Niering* CBG 7807799 (♀) (CANB, CBG).

Range poorly known but perhaps continuous between Perth and Albany.

49. *Lomandra hermaphrodita* (C.R.P.Andrews) C.Gardner, *Enum. Pl. Austral. Occid.* 20 (1930)

Xerotes hermaphrodita C.R.P.Andrews, *J. Proc. Mueller Bot. Soc. W. Australia* 1(9): 20 (June 1902). T: Claremont, W.A., 22 May 1902, *C.Andrews* (♂); lecto: PERTH, *fide* T.D.Macfarlane, *Fl. Australia* 46: 223 (1986).

Xerotes andrewsii W.Fitzg., *J. Mueller Bot. Soc. W. Australia* 1(10): 36 (Dec. 1902), *nom. illeg.*

Tussocks sparse. Leaves flat, 15–45 cm long, 1–2 mm wide, glabrous, old leaves loosely coiled and purplish to reddish-brown; apex apiculate or truncate; sheath margins lacerated, white to straw-coloured. Male inflorescence c. 3–8 cm long, branched; branches usually whorled, sometimes opposite; scape equal to rachis or shorter, often largely hidden; flowers separate or 2 or 3 together. Female inflorescence similar but smaller. Bracts shorter to slightly longer than pedicels, acute to acuminate; inner bract present. Male flowers globular or ovoid, 2–4 mm long, pedicellate; sepals and petals incurved, tapering; sepals shorter, thinner, purple; petals fleshy, yellowish. Female flowers similar, ovoid, 4–6 mm long. $n = 8$, *fide* G.J.Keighery, *Feddes Repert.* 95: 528 (1984). Fig. 30K.

Occurs in south-western W.A. from near Jurien to Denmark. Grows in laterite in eucalypt forest or sand in eucalypt or banksia woodland or in heath, but not close to the coast where the similar species *L. maritima* is found. Flowers Apr.–June. Map 179.

W.A.: 11.8 km WSW of South West Hwy on Mandurah Road, 12 May 1980, *R.J.Cranfield* (♂) (NSW, PERTH); Claremont, Sept. 1902, *W.V.Fitzgerald* NSW 53330 (♂) (NSW); Shenton Park, Perth, *T.D.Macfarlane* 1139 (♂) (AD, BRI, CANB, K, MEL, NSW, PERTH).

Despite the epithet this species is usually dioecious, although occasional flowers have a large pistillode or are possibly hermaphrodite.

50. *Lomandra maritima* Choo, *Nuytsia* 5: 45 (1984)

T: near Challenger Drive, City Beach, near Perth, W.A., 29 Sept. 1966, *T.S.Choo* 6698 (♂); holo: PERTH.

Illustration: *T.S.Choo, loc. cit.* fig. 2.

Tussocks dense. Leaves flat or channelled, 30–60 cm long, 1–2 mm wide, glabrous, old leaves coiled and straw-coloured; apex obtuse; sheath margins lacerated, pale brown to purple. Male inflorescence largely concealed among leaf bases, c. 4–5 cm long, branched; branches whorled or alternate; scape shorter than rachis, hidden; flowers separate or 2 or 3 together. Female inflorescence similar, smaller, almost completely hidden. Bracts tapering, shorter to slightly longer than pedicel; inner bract present. Male flowers globular or ovoid, 3.5–6 mm long, pedicellate; sepals and petals incurved; sepals shorter, thinner than petals, purple; petals fleshy, yellow. Female flowers similar, ovoid, 5–8 mm long.

Occurs close to the coast of south-western W.A. from N of Geraldton to Bunbury, in sandy soils often over limestone. Flowers Aug.–Oct. Map 180.

W.A.: Horrocks, 28°23'S, 114°26'E, *C.M.Lynch* 164 (♂) (CANB, PERTH); Reabold Hill, Perth, *T.D.Macfarlane* 928 (♂ & ♀) (NSW, PERTH); Point Peron, S of Fremantle, *R.D.Royce* 3050 (♀) (PERTH); E of Mandurah, *R.D.Royce* 5739 (♂) (CANB, PERTH).

Closely related to *L. hermaphrodita*, from which it differs in the colour of old leaves, colour of leaf sheath margins, to some extent in the inflorescence branching and in the flowering period. Its distribution is adjacent but apparently not overlapping.

Excluded name

Lomandra turbinata (Endl.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 220 (1916).

Xerotes turbinata Endl., in J.G.C.Lehmann., *Pl. Preiss.* 2: 51 (1846). T: near Bulls Creek, Perth, W.A., 17 Nov. 1841, *L.Preiss* 1540; iso: MEL, P.

This is *Hensmania turbinata* (Endl.) W.Fitzg., *Proc. Linn. Soc. New South Wales* 28: 106 (1903), a member of the Liliaceae s. lat.

6. BAXTERIA

A.S.George

Baxteria R.Br. ex Hook., *Hooker's J. Bot. Kew Gard. Misc.* 2: 492, 494 (1843), *nom. cons.*; named after William Baxter (fl. 1820–1830) who collected a type of the only species.

Type: *B. australis* R.Br. ex Hook.

Perennial stemless herbs with short thick rhizomes and thick roots. Leaves sessile, crowded, linear with sheathing bases. Flowers bisexual, large, solitary, sessile, surrounded by several bracts. Sepals and petals free, indurated, almost equal, not opening widely, persistent in fruit. Stamens united with perianth segments in lower half; anthers long, basally attached, apiculate. Ovary sessile, 3-locular; ovule 1 per locule; style slender but indurated, ± as long as perianth; stigma 3-lobed. Fruit a capsule. Seeds spherical. $2n = 14$, *vide* G.J.Keighery, *Feddes Repert.* 95: 526 (1984).

A monotypic genus endemic in south-western W.A., recognised by the very large, sessile, indurated flowers.

G.Bentham, *Baxteria* (in Juncaceae), *Fl. Austral.* 7: 120 (1878); G.J.Keighery, Ballistochory (explosive seed dispersal) in *Baxteria* R.Br. (Xanthorrhoeaceae), *W. Austral. Naturalist* 15: 163–166 (1983).

Baxteria australis R.Br. ex Hook., *Hooker's J. Bot. Kew Gard. Misc.* 2: 492, 494, t. 13–15 (1843)

T: King George Sound, W.A., 1829, *W.Baxter*; syn: *n.v.*; same locality, *J.Drummond* 464; syn: *n.v.*

Illustrations: G.J.Keighery, *op. cit.* 164, 165.

Leaves up to 50 cm long, pungent; base 15–25 mm wide with narrow scarious margins, sometimes lacerated. Flowers scented like rotten meat. Sepals and petals 7–8 cm long, slightly widened above base for c. 2.5 cm, obtuse, smooth inside, striate outside, green at base, purplish-brown at apex. Stamens almost as long as perianth; anthers c. 25 mm long. Capsule indurated, c. 15 mm long, smooth; dehiscence septifragal, the valves also splitting into 2 halves, each half with the inner wall forming a plate held under tension and springing upwards to eject the seed. Fig. 31.

Occurs in near-coastal areas between Capel and Albany, W.A., on swamp margins, in sedgeland and on low sandy slopes in Banksia-eucalypt woodland. Flowers in summer. Map 181.

W.A.: Donnelly R., between Nannup and Pemberton, Jan. 1964, *C.F.Davies* (PERTH); Quarram, c. 37 km W of Denmark, *R.Melville 4463* & *R.D.Royce* (MEL, NSW, PERTH); E of Oyster Harbour, *V.Mann 122* & *A.S.George* (K, MEL, NSW, PERTH); King George Sound, *L.Preiss 1525* (MEL).

Flowering is enhanced by fire, the plants sprouting vigorously from the rhizomes and flowering the following season. The explosive seed dispersal is unique in the Western Australian Xanthorrhoeaceae and Liliaceae (G.J.Keighery, *loc. cit.*).

7. DASYPOGON

A.S. George

Dayspogon R.Br., *Prodr.* 263 (1810); from the Greek *dasys* (shaggy) and *pogon* (beard), referring to the bristles on the perianth.

Type: *D. bromeliifolius* R.Br.

Perennial herbs, sometimes arborescent, with short rhizomes and erect stems or with short caudex; roots thick. Leaves sessile, linear, flat to inrolled, imbricate at base; margins scabrid. Flowers sessile, bisexual, not opening widely, crowded in spherical inflorescence on stout scape bearing scattered bracts; floral bracts navicular, some exserted and pungent. Sepals united above middle, thickened, indurated towards apex, with stiff dorsal hairs. Petals almost free, narrower than sepals, indurated towards apex. Stamens inserted on perianth, prominently exserted; anthers dorsifixed, short, apiculate. Style stout, c. as long as stamens; stigma simple; ovary 3-locular; ovule 1 per locule. Fruit indehiscent within persistent perianth. Seed 1.

A genus of 3 species endemic in south-western W.A.

G.Bentham, *Dasypogon* (in Juncaceae), *Fl. Austral.* 7: 117–119 (1878).

- | | | |
|----|--|-----------------------------|
| 1 | Leaves to 1 m long 15–20 mm wide above base; hairs of perianth not exserted between flowers; stems 5–8 cm diam. | 3. D. hookeri |
| 1: | Leaves less than 50 cm long 3–5 mm wide above base; hairs of perianth exserted between flowers; stems less than 1 cm diam. | |
| 2 | Leaves 5–15 cm long extending about halfway up flowering stem ±glaucous; perianth 7 mm long | 1. D. obliquifolius |
| 2: | Leaves mostly 15–50 cm long arising near base of stem ±dark green; perianth 8–9 mm long | 2. D. bromeliifolius |

1. Dasypogon obliquifolius Lehm. ex Nees, in J.G.C.Lehmann, *Pl. Preiss.* 2: 52 (1846)

T: towards foot of Darling Range near Perth, W.A., 23 Nov. 1839, *L.Preiss* 1873; iso: MEL.

Stems to 1 m high, simple or branched, 5 mm diam. Leaves crowded along lower half of stem, to 15 cm long, becoming curled with age, 3–4 mm wide above broad base, tapering; margins shortly and irregularly scabrid. Scape terminal, with scattered leaf-like bracts becoming subulate toward apex, tomentose with reflexed scabrid hairs. Inflorescence 2–2.5 cm diam.; floral bracts lanceolate to narrowly obovate, some with pungent exerted apices. Perianth 7 mm long; sepals coarsely hirsute outside, scabrid to pubescent where exerted. Stamens 10–11 mm long; anthers 1.5 mm long. Style and ovary 10–11 mm long. Fig. 32A–H.

Occurs in south-western W.A. near the west coast, between Eneabba and Perth. Grows in sand in heath, sometimes in low open woodland. Flowers Sept.-Oct. Map 182.

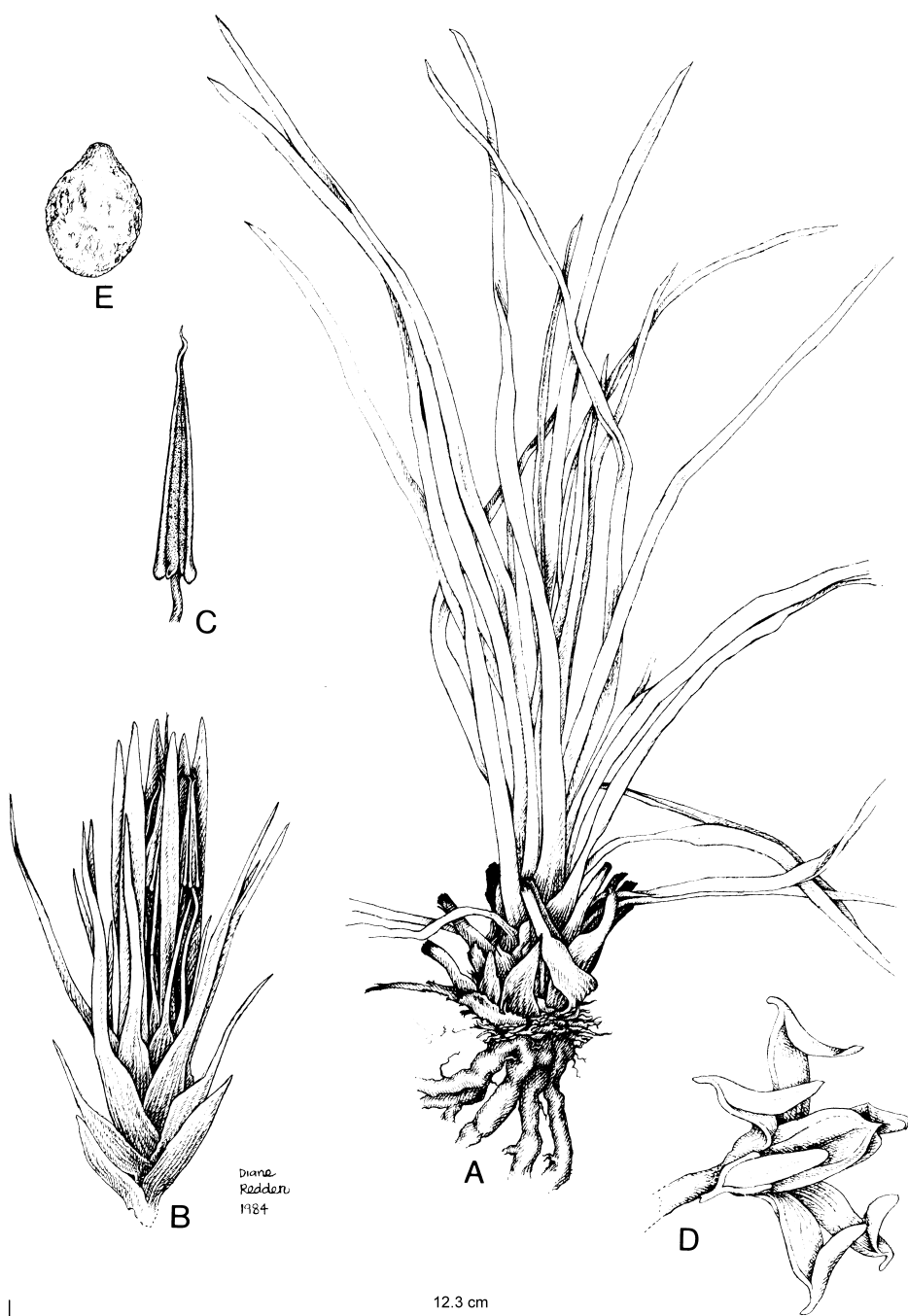


Figure 31. *Baxteria australis*. **A**, habit including burnt-off leaf bases $\times 0.8$; **B**, flower with subtending bracts $\times 0.8$; **C**, anther $\times 1.6$; **D**, dehiscent fruit $\times 1.6$; **E**, seed $\times 5$ (**A**–**C**, V.Mann 122, PERTH; **D**–**E**, Northcliffe, W.Stoutamire, PERTH).

W.A.: c. 11 km from Eneabba towards Jurien Bay, *M.E.Phillips* WA 68/1540 (CBG, PERTH); Coomallo Ck, *R.J.Hnatiuk* 761394 (PERTH); 104 km NNW of Gingin, *T.E.H.Aplin & R.Coveny* 3127 (NSW, PERTH); Forrestfield, E of Perth, *A.S.George* 14980 (PERTH); 21 km W of Mogumber, *R.W.Purdie* 5080 (CBG).

Until recently included under *D. bromeliifolius*, this species may be recognised by its short, curled leaves that extend higher up the stem and its slightly smaller flowers. The two species are sometimes sympatric. A collection at PERTH, 115 mile peg, Jurien Bay road (c. 184 km N of Perth, Brand Hwy), *A.C.Burns* 72, has very woolly flowers and may represent another taxon.

2. *Dasypogon bromeliifolius* R.Br., *Prodr.* 263 (1810)

T: King George Sound, [W.A.], Dec. 1801, *R.Brown*; *n.v.*

Illustrations: R.Brown in M.Flinders, *Voy. Terra Australis*, App. t. 8 (1814); R.M.T.Dahlgren *et al.*, *Fam. Monocotyledons* 152, fig. 64 (1985).

Stems to 1 m high, simple, 3–10 mm diam. Leaves crowded on lower part of stem, to 55 cm long, 3–5 mm wide above broad base, tapering; margins irregularly scabrid. Scape terminal, with scattered leaf-like bracts becoming small and subulate towards apex, tomentose with coarse, reflexed, scabrid hairs. Inflorescence 2.5–3.5 cm diam.; floral bracts narrow, upturned and pungent at apex, some prominently enlarged and exserted. Perianth 8–9 mm long; sepals coarsely hirsute and scabrid outside. Stamens 15–16 mm long; anthers 2 mm long. Style and ovary 13–15 mm long. *Drumsticks*. *n* = 7, *fide* G.J.Keighery, *Feddes Repert.* 95: 527 (1984). Fig. 32 I–M.

Widespread and often common in south-western W.A., in near-coastal areas from the Moore River to the Fitzgerald River. Grows in sand in low woodland, especially on low-lying flats; also in coastal heath. Flowers Oct.–Jan. Map 183.

W.A.: Canning R., *M.L.Clark* 109 (PERTH); c. 21 km E of Young Siding, *E.M.Canning* 038353 (CBG); 3.1 km N of Bullsbrook, *T.D.Macfarlane* 790 (PERTH); Qualup, Gairdner R., *A.S.George* 6949 (PERTH); near Two Peoples Bay, *S.J.Forbes* 1134 (MEL).

Plants from south-coastal regions are usually more robust than those from the west coast but some have very narrow leaves. The exserted bracts of the inflorescence are variable.

3. *Dasypogon hookeri* J.L.Drumm., *Hooker's J. Bot. Kew Gard. Misc.* 2: 169 (1843)

T: S of the Vasse [Busselton] on road to Augusta, W.A., *J.Drummond s.n.*; possible iso: MEL.

Illustration: R.Erickson *et al.*, *Fl. Pl. W. Australia* 52, t. 130 (1973).

Stems to 3 m high, rarely more, 5–8 cm diam., sometimes forming clumps. Leaves crowded forming a crown, to 1 m long, 15–20 mm wide above broad base, tapering, curved; margins very shortly and irregularly scabrid; leaf-bases persistent after fire. Scapes several, axillary among upper leaves, with scattered linear-subulate bracts on broad bases becoming shorter towards inflorescence, appressed-pubescent with reflexed hairs. Inflorescence 2–2.5 cm diam.; floral bracts obtuse, some shortly exserted and pungent. Perianth 8–10 mm long; sepals densely tomentose in lower two-thirds, glabrous above. Stamens 11–12 mm long; anthers 1.5–1.8 mm long. Style and ovary c. 10 mm long. *Pineapple Bush*.

Occurs in far south-western W.A., between Donnybrook and Augusta. Grows in sandy clay or gravelly clay in Jarrah forest. Flowers mainly Oct.–Jan. Map 184.

W.A.: Miamup Swamp, NW of Margaret River, *A.E.Orchard* 4320 (AD, CANB); 6 km SW of Donnybrook, *A.S.George* 248 (PERTH); c. 21 km SE of Busselton, *J.C.Anway* 562 (AD, MEL, PERTH); 32 km from Pemberton on road to Nannup, *B.Barnsley* 804 (CBG); Metricup, SW of Busselton, *B.G.Briggs* 862 (NSW).

The arborescent habit resembles that of *Kingia* and many species of *Xanthorrhoea*. Plants sprout from the stem apex after fire. Anatomy and morphology discussed by I.A.Staff & J.T.Waterhouse in J.S.Pate & A.J.McComb, *Biol. Austral. Pl.* 229–233 (1981).



Figure 32. *Dasypogon*. A–H, *D. obliquifolius*. A, habit $\times 0.5$; B, part of leaf $\times 3.5$; C, D, floral bracts $\times 3.5$; E, flower $\times 3.5$; F, tepal from side $\times 3.5$; G, stamen $\times 3.5$; H, pistil $\times 3.5$ (A–H, M. Phillips WA 68/540, CBG). I–M, *D. bromeliifolius*. I, leaf $\times 0.8$; J, part of leaf $\times 3.5$; K, floral bract $\times 3.5$; L, flower $\times 3.5$; M, tepal, outer face, $\times 3.5$ (I–M, Albany, W.A., M. Phillips, CBG).

Doubtful name

Dasypogon glaber Laharpe, *Mem. Soc. Hist. Nat. Paris* 3: 101 (1827).

T: from Australia, *collector unknown*; *n.v.*

Described as having glabrous flowers, but all three species of *Dasypogon* have hairy flowers and the application of the name is uncertain.

8. KINGIA

A.S.George

Kingia R.Br., *Ann. Sci. Nat.* 8: 211 (1826); R.Br. in P.P.King, *Narrative Survey Intertrop. W. Coasts Australia* 2: 535 (1826); after Phillip Parker King (1791–1856) who surveyed Australian coasts in 1818–1822, and Philip Gidley King (1758–1808), third Governor of N.S.W. (1800–1807).

Type: *K. australis* R.Br.

Arborescent plants with stout caudex of fibrous pith surrounded by persistent packed leaf bases; roots fibrous, arising at base of leafy crown and passing through leaf bases. Leaves many, crowded, narrowly linear, rhomboidal in T.S., silky, often glabrescent; base widely expanded with scarious margins. Inflorescences many, axillary just below stem apex, head-like, with many sessile flowers; scapes covered by imbricate bracts. Flowers bisexual. Sepals and petals free, narrow, navicular, somewhat dry. Stamens free, exserted; anthers basifixed. Style as long as perianth; ovary 3-locular; ovule 1 per locule. Fruit indehiscent, 1-seeded within persistent perianth. *n* = 7, *fide* G.J.Keighery, *Feddes Repert.* 95: 528 (1984).

A monotypic genus endemic in south-western W.A.

G.Bentham, *Kingia* (in Juncaceae), *Fl. Austral.* 7: 119–120 (1878); I.A.Staff & J.T.Waterhouse, *The Biology of Arborescent Monocotyledons, with Special Reference to Australian Species*, in J.S.Pate & A.J.McComb, *Biol. Austral. Pl.* 233–238 (1981).

***Kingia australis* R.Br., *Ann. Sci. Nat.* 8: 211 (1826)**

T: King George Sound, [W.A.]; Brown cited collections by himself (1801), A.Cunningham (1818 & 1821), P.P.King (1822) and W.Baxter (1823); all *n.v.*

K. argentea Preiss ex Endl., in J.G.C.Lehmann, *Pl. Preiss.* 2: 52 (1846); *K. australis* var. *argentea* (Preiss ex Endl.) Preiss ex Krause, *Nat. Pflanzenfam.* 2nd edn, 15a: 316 (1930). T: Lake Tjilberup near Mt Manypeaks, W.A., 23 Nov. 1840, *L.Preiss* 1527; iso: MEL.

Illustrations: R.Erickson *et al.*, *Fl. Pl. W. Australia* 72, t. 194 (1973); I.A.Staff & J.T.Waterhouse, *op. cit.* figs 8.14–8.23; R.M.T.Dahlgren *et al.*, *Fam. Monocotyledons* 157, fig. 68I–L (1985).

Caudex to 8 m tall, usually solitary but sometimes in clumps. Leaves to 60 cm long, 2–3 mm wide above broad base, tapering. Scape 30–50 cm long; bracts imbricate, 2.5–4.5 cm long with abruptly narrowed apex, silky-villous, passing into spreading, similar bracts subtending inflorescence. Inflorescence 5–6 cm diam.; floral bracts linear, canaliculate, acute, 12–15 mm long, silky on keel. Sepals and petals narrowly lanceolate, 20–30 mm long, silky outside, glabrous inside except appressed hairs towards apex. Stamens 29–32 mm long; anthers 3–4 mm long. Style 22–25 mm long; ovary densely hirsute; stigma shortly lobed. *Black Gin.* Fig. 34.

Widespread in south-western W.A. from Mt Lesueur to Cape Riche. Grows in sandy loam and clay loam in open woodland and heath. Flowers mainly winter–spring. Map 185.



Figure 33. *Chamaexeros serra*.
Photograph — M.Fagg.



Figure 34. *Kingia australis*.
Photograph — M.Fagg.



Figure 35. *Xanthorrhoea drumondii*.
(neotype plant).
Photograph — D.Bedford.

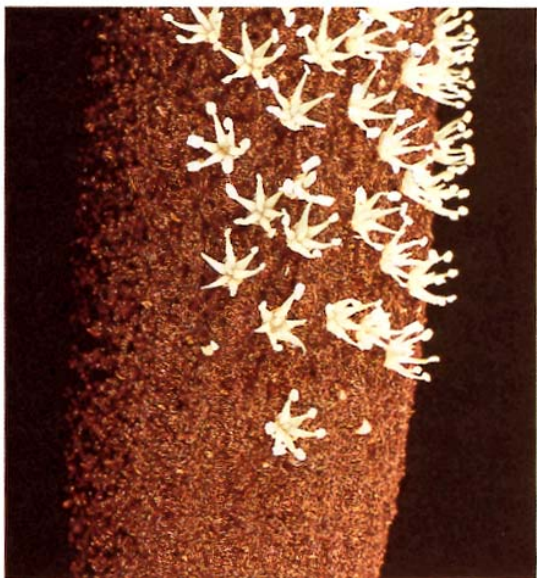


Figure 36. *Xanthorrhoea resinosa*.
Photograph — D.Bedford.

W.A.: 32 km W of Pemberton, *B.Barnsley 803* (CBG, PERTH); Mt Lesueur, 7 Oct. 1961, *J.H.Willis* (MEL); Redmond, Feb. 1921, *D.A.Herbert* (PERTH); Warriups road, E of Mt Manypeaks, *A.S.George 6269* (PERTH); Crooked Brook road, between Dardanup and Boyanup, *G.J.Keighery 6155* (PERTH).

The species varies in the persistence of the indumentum on the leaves, sometimes retaining a silvery aspect. Flowering is enhanced by fire but is not dependent on it. Seed set appears low.

9. XANTHORRHOEA

D.J.Bedford

Xanthorrhoea Smith, *Trans. Linn. Soc. London* 4: 219 (1798); from the Greek *xanthos* (yellow) and *rhoea* (flowing), in reference to the yellow resin noted in the type species.

Type: *X. resinosa* Pers.

Stems arborescent or subterranean, woody, covered with packed leaf-bases. Leaves crowded in a terminal crown, narrowly linear, tapered, rhombic to cuneate in T.S.; margins with microscopic trichomes, rarely hairy; leaf-base broad, thickened. Inflorescence cylindrical, spike-like, on a woody scape; flowers bisexual, in spirally-arranged clusters surrounded by packed bracts. Sepals free, chartaceous or scarious. Petals free, membranous; apices exerted. Stamens exerted; filaments flattened; anthers dorsifixed, dehiscing by slits. Ovary 3-locular; ovules several per locule; style simple; stigma entire, sometimes grooved. Capsule obtuse or pointed, the hardened style base \pm exserted. Seeds 1 or 2 per locule, ovate and semi-matt black, rarely ovoid and shining. *Blackboy, Grass-tree, Yacca*. *n* = 22 (several species counted), *fide* B.G.Briggs, *Contr. New South Wales Natl Herb.* 4: 27 (1966); G.J.Keighery, *Feddes Repert.* 95: 523–532 (1984).

A genus of 28 species endemic in Australia. One species (*X. johnsonii*) is sometimes involved in stock poisoning in Qld.

Although A.T.Lee, *Contr. New South Wales Natl Herb.* 4: 35–54 (1966a) and *Contr. New South Wales Natl Herb., Fl. Ser.* No. 34 (1966b), discussed hybrid swarms of *Xanthorrhoea*, documented examples indicate that hybrids are scarce and restricted. All have been on the coastal sand dunes from Beerwah, south-eastern Qld, to Newcastle, N.S.W., in restricted ecotonal conditions. The species known to be involved are *X. glauca*, *X. resinosa*, *X. fulva*, *X. johnsonii*, and *X. latifolia*. Hybrids probably also occur in similar conditions elsewhere on the east coast and this is certainly indicated by specimens from coastal sand dunes in Vic. Most other plants presumed to be hybrids are probably either taxa not yet recognised or examples of the considerable variation that often occurs within *Xanthorrhoea* species. A number of new taxa described here have been referred to purported hybrids, e.g. *X. caespitosa* and *X. arenaria*, both as *X. minor* \times *X. australis*, (Lee, 1966a, p. 54 and p. 46 respectively).

All species have contractile roots and a secondary thickening meristem, the latter character absent from the other genera of the Xanthorrhoeaceae as circumscribed here. The flowers are protandrous having a style that is short at anthesis and elongates as the anthers age.

With the exception of *X. thornstonii* all species occur in regions receiving more than 250 mm annual rainfall, and most in regions receiving more than 500 mm.

Characters Used

A number of characters and terms are used here for the first time. The term packing-bracts is used for the mass of small bracts that cover the axis. These are densely packed, filling out the space between the flowers and giving the surface of the spike its distinctive appearance. There is a considerable range of shape and size of packing-bracts on every spike; only the largest and most mature are described here, since immature

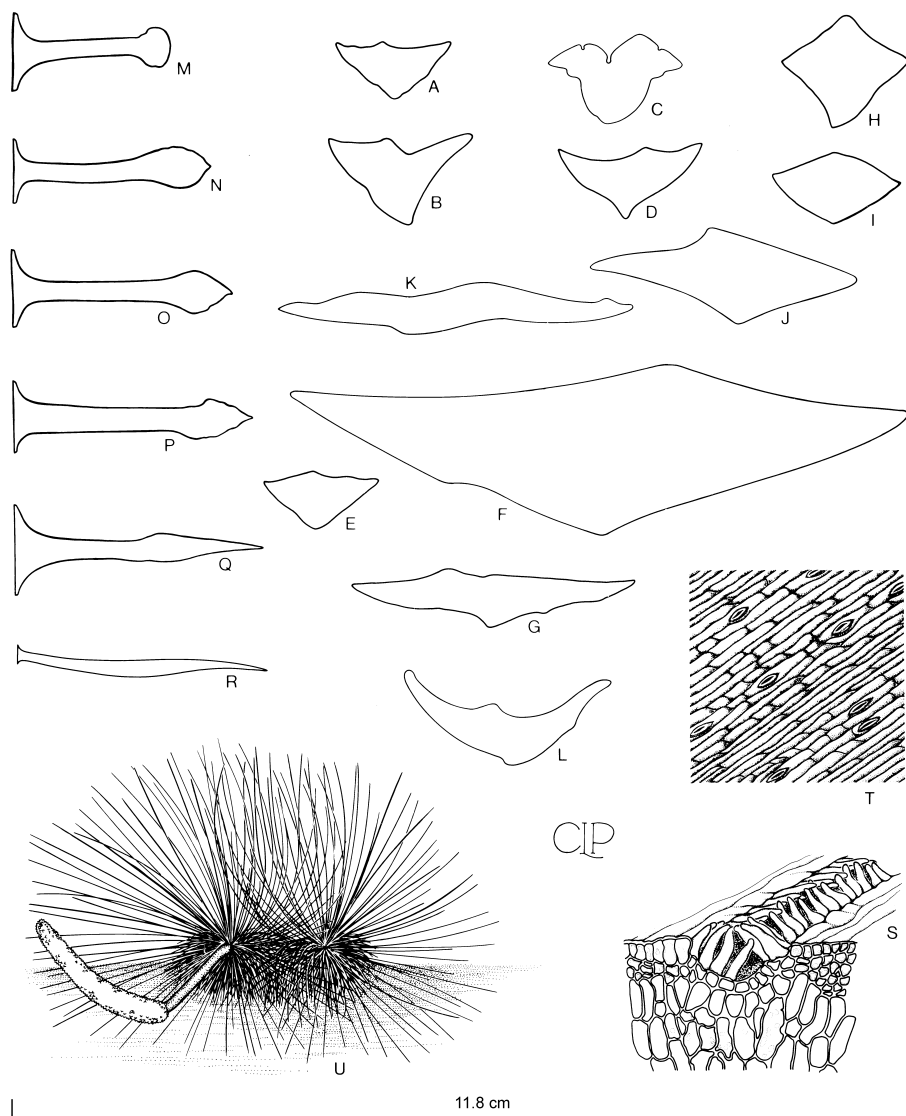


Figure 37. *Xanthorrhoea*. **A–L**, T.S. leaf shapes, all $\times 8$. **A–B**, depressed-cuneate. **A**, *X. fulva* (D.Blaxell NSW89530, NSW). **B**, *X. minor* (H.McKee 789, NSW). **C**, *X. macronema*, rounded depressed-cuneate (H.Salasoo 1542, NSW). **D**, *X. minor*, very depressed-cuneate (H.McKee 789, NSW). **E**, *X. fulva*, depressed-obtrullate (E.Constable NSW 6166, NSW). **F–G**, very depressed-obtrullate. **F**, *X. semiplana* subsp. *tateana* (D.Bedford 104, NSW). **G**, *X. arborea* (L.Johnson NSW61355, NSW). **H**, *X. drummondii*, quadrate-rhombic (D.Bedford 41 & T.Macfarlane, NSW). **I**, *X. media*, transverse- rhombic (J.Camfield NSW59863, NSW). **J**, *X. latifolia* subsp. *latifolia*, narrowly transverse-rhombic (I.Telford 5517, NSW). **K**, *X. arborea*, transverse-linear (E.Constable NSW39982, NSW). **L**, *X. concava*, concave (J.Waterhouse NSW81659, NSW). **M–R**, packing bract shapes, $\times c. 3.5\text{--}5$. **M**, *X. fulva*, obtuse (E.Constable NSW 6166, NSW). **N**, *X. arborea*, shortly acute (L.Johnson NSW61355, NSW). **O**, *X. media*, acute (J.Camfield NSW59863, NSW). **P**, *X. preissii*, triangular (L.Preiss 1620, MEL). **Q**, *X. acanthostachya*, narrowly triangular (T.Macfarlane 659, PERTH). **R**, *X. australis*, subulate (D.Martin NSW67463, NSW). **S**, *X. macronema*, sub-epidermal stomatal chamber, diagrammatic $\times 330$. **T**, *X. johnsonii*, leaf surface and stomate arrangement, diagrammatic $\times 170$. **U**, *X. nana*, habit $\times 0.1$ (D.Bedford 67, 70 & T.Macfarlane, NSW).

bracts are very variable in every species. Cluster-bracts subtend the clusters of fertile and aborted flowers. All species possess cluster-bracts though in some species they are obscure at maturity, i.e. not distinguishable from the packing-bracts (see Fig. 39G–I). The terms used for the shape of the bracts are partially as in Lee (1966a), but the range of shapes recognised is expanded and some are re-defined. The shortest and least pointed bracts are obtuse (Fig. 37M) followed by shortly acute (Fig. 37N), acute (replacing intermediate) (Fig. 37O), triangular (replacing long-acute) (Fig. 37P), narrowly triangular (replacing long-pointed) (Fig. 37Q) to the most pointed form subulate (Fig. 37R) which tapers directly from the base to the apex without the distal enlargement evident in the other categories.

Sepals and petals are described variously as beaked (Fig. 38R), and/or with proboscis (Fig. 38S), and/or with median abaxial ridge, or recurved (Fig. 38P–Q). A beak is a continuation of the sepal or petal into a terminal appendage with a small tuft of papillose hairs. A proboscis is a small adaxial projection from the beak or apex; it is always hirsute with papillose hairs. The proboscis is variable and occurs only on some of the sepals and/or petals of some species.

Crown shape is variable but is nonetheless a distinctive feature of some species. Leaf shape in T.S.—both width and thickness—are taken at the mid-point along the length of the leaf. Leaf shape terms are from the Systematics Association chart (*Taxon* 11: 245–247, 1962) and are illustrated in Fig. 37A–L. Scape diameter is measured just below the spike, and spike diameter is measured at the surface of the bracts at the widest point of the spike.

The shape of the leaf-base is characteristic in some species but this part of the leaf has been insufficiently collected for reliable descriptions to be provided. Capsule shape is also sometimes characteristic, but it varies during development and must be used with caution. In this treatment the only fruiting character noted is the upward-curved capsule typical of some species.

Particularly variable characters are trunk height, leaf dimensions, and scape and spike length (occasionally also the proportion). Field observation and glasshouse experiments indicate that much of this variation is environmental.

Xanthorrhoeas can rarely be identified on one or two characters alone; usually a combination of many characters is required for critical determination. As most species occur in well-defined regions, locality of collection is often a useful aid to identification. The key below is designed especially for use in the field and with fresh material, relying in part on characters such as trunk height, ratio of length of scape to length of flowering spike, and leaf colour. When collecting xanthorrhoeas for later study these data should be recorded and kept with the specimens.

G.Bentham, *Xanthorrhoea* (in Juncaceae), *Fl. Austral.* 7: 112–117 (1878); A.T.Lee, Notes on *Xanthorrhoea* in Eastern Australia, *Contr. New South Wales Natl Herb.* 4: 35–54 (1966a); A.T.Lee, Xanthorrhoeaceae, *Contr. New South Wales Natl Herb., Fl. Ser.* No. 34 (1966b); A.M.Gill & F.Ingwensen, Growth of *Xanthorrhoea australis* R.Br. in relation to fire, *J. Appl. Ecol.* 13: 195–203 (1976); I.A.Staff & J.T.Waterhouse, The Biology of Arborescent Monocotyledons, with Special Reference to Australian Species, in J.S.Pate & A.J.McComb, *Biol. Austral. Pl.* 216–257 (1981).

1 Scape 8 or more times as long as spike; flowering spike broad and brush-like from the very long erect filaments: stomates in linear, subsurface, hair-lined chambers (Fig. 37S)

2 Packing-bracts glabrous (eastern Australia)

1. **X. macronema**

2: Packing-bracts hirsute (W.A.)

2. **X. gracilis**

1: Scape 5 or less times as long as spike; flowering spike \pm cylindrical, the filaments short and erect or, if longer, recurved; stomates at leaf surface or if sunken, then each in a pit (Fig. 37T)

3 Spike longer than scape

- 4 Packing-bracts subulate, glabrous
 - 5 Leaves 5–12 mm wide 26. *X. semiplana*
 - 5: Leaves 1.2–3 mm wide
 - 6 Spike only slightly longer than scape (W.A.) 28. *X. acanthostachya*
 - 6: Spike usually much longer than scape (eastern Australia) 27. *X. australis*
- 4: Packing-bracts shortly acute to triangular, glabrous to hirsute or fringed with hairs
 - 7 Cluster-bracts obscure or almost so
 - 8 Leaves 4–8 mm wide
 - 9 Trunk to 60 cm long (W.A.) 8. *X. platyphylla*
 - 9: Trunk usually 2–6 m long (N.S.W.) 19. *X. malacophylla*
 - 8: Leaves usually less than 4 mm wide
 - 10 Leaves grey-green, glaucous; bracts dark brown, hirsute 10. *X. drummondii*
 - 10: Leaves green, not glaucous; bracts green or dark brown, glabrous to moderately hirsute
 - 11 Spike 2 or more times length of scape; bracts green, glabrous to subglabrous (W.A.) 9. *X. preissii*
 - 11: Spike less than 2 times length of scape; bracts dark brown, glabrous to moderately hirsute (eastern mainland Australia) 15. *X. media*
 - 7: Cluster-bracts prominent for at least part of spike
 - 12 Leaves blue-green or greyish, glaucous
 - 13 Cluster-bracts prominent for most or all of mature spike length; packing-bracts dark-brown (eastern Australia) 20. *X. glauca*
 - 13: Cluster-bracts prominent only at base of mature spike; packing-bracts light-brown (central Australia & inland W.A.) 12. *X. thorntonii*
 - 12: Leaves green, not glaucous
 - 14 Scape diam. 20–30 mm; leaves soft and spongy to the touch 19. *X. malacophylla*
 - 14: Scape diam. 20 mm or less; leaves tough, hard to the touch
 - 15 Trunk usually none, sometimes to 30 cm long; crown ±hemispherical (N.S.W., Hunter R. to Sydney region) 15. *X. media*
 - 15: Trunk usually longer than 30 cm; crown with young leaves in spreading upright tuft and old leaves usually strongly reflexed over trunk (Qld, & N.S.W. north of Hunter R.) 16. *X. johnsonii*
- 3: Spike shorter than or equal to scape
 - 16 Packing-bracts narrowly triangular to subulate
 - 17 Packing-bracts fringed with hairs to moderately hirsute 24. *X. caespitosa*
 - 17: Packing-bracts glabrous or subglabrous
 - 18 Plants without trunk; leaves depressed-obtrullate to depressed-cuneate in T.S. (Tas.) 25. *X. arenaria*
 - 18: Plants with trunk; leaves quadrate-rhombic in T.S. (W.A.) 28. *X. acanthostachya*
 - 16: Packing-bracts obtuse to triangular
 - 19 Packing-bracts densely hirsute on abaxial surface, appearing velvety
 - 20 Leaves transverse-rhombic in T.S.; spike dark-brown velvety at flowering 5. *X. resinosa*
 - 20: Leaves depressed-obtrullate to concave in T.S.; spike cream to ±light brown velvety at flowering

- 21 Leaves very depressed-cuneate to concave in T.S., 3–6 mm wide, 1.5–2 mm thick (N.S.W., Sydney & southwards)
- 21: Leaves depressed-obtrullate to depressed-cuneate in T.S., 1.9–3.5 mm wide, 1–1.5 mm thick (Qld, & N.S.W. north of Wyong) **4. X. fulva**
- 19: Packing-bracts glabrous to hirsute or fringed with hairs but not velvety
- 22 Scape and spike together usually less than 90 cm long
- 23 Scape and spike distinctly curved; spike often at $\pm 90^\circ$ to scape (W.A.) **13. X. nana**
- 23: Scape emerging from crown \pm vertically; spike and scape \pm straight
- 24 Leaves quadrate-rhombic in T.S. (S.A.) **11. X. quadrangulata**
- 24: Leaves ranging from transverse-rhombic, depressed-obtrullate to very depressed-cuneate or transverse-linear in T.S.
- 25 Cluster-bracts prominent on spike
- 26 Packing-bracts triangular to narrowly triangular (Tas.) **23. X. bracteata**
- 26: Packing-bracts shortly acute to acute
- 27 Leaves depressed-cuneate in T.S., often concave, green, not glaucous; cluster-bracts shortly acute to triangular (eastern mainland Australia) **22. X. minor**
- 27: Leaves transverse-rhombic or depressed-obtrullate in T.S., rarely depressed-cuneate, greyish, glaucous; cluster-bracts narrowly triangular to subulate
- 25: Cluster-bracts obscure or restricted to junction of scape and spike
- 28 Crown-leaves broadly spreading or recurved (Qld) **14. X. pumilio**
- 28: Crown an erect tuft of leaves (W.A. & SE Australia)
- 29 Scape and spike together usually more than 80 cm long (W.A.) **6. X. brunonis**
- 29: Scape and spike together usually less than 75 cm long (eastern mainland Australia) **22. X. minor**
- 22: Scape and spike together usually 90 cm or more long
- 30 Cluster-bracts usually prominent at least in some part of spike
- 31 Leaves usually more than 2.5 mm wide, soft and spongy; plant of moist habitats
- 31: Leaves usually 2.5 mm wide or less, tough and hard; plant of dry sclerophyll forest and heath **16. X. johnsonii**
- 30: Cluster-bracts obscure or restricted to junction of scape and spike
- 32 Leaves usually \pm quadrate-rhombic to transverse-rhombic in T.S., less than 3 mm wide
- 33 Trunk none or to 30 cm long; crown \pm hemispherical (N.S.W., Sydney region and adjacent areas south of the Hunter R.) **15. X. media**
- 33: Trunk 10 cm to 5 m long; crown with young leaves in spreading upright tuft, old leaves usually strongly reflexed over trunk (Qld & N.S.W. north of the Hunter R.)
- 32: Leaves narrowly transverse-rhombic, depressed-obtrullate, depressed-cuneate to transverse-linear or concave in T.S., 1.7–10 mm wide

- | | |
|--|-------------------------|
| 34 Leaves blue-green | 7. <i>X. brevistyla</i> |
| 34: Leaves green | |
| 35 Spike usually greater than ½ or as long as scape in length | 18. <i>X. arborea</i> |
| 35: Spike usually less than ½ as long as scape | |
| 36 Leaves usually more than 4 mm wide; spike 30–150 cm long | 17. <i>X. latifolia</i> |
| 36: Leaves usually less than 4 mm wide; spike usually 5–40 cm long | |
| 37 Spike 20–40 mm diam.; petals without proboscis (W.A.) | 6. <i>X. brunonis</i> |
| 37: Spike 14–23 mm diam.; petals with proboscis (Qld) | 14. <i>X. pumilio</i> |

1. *Xanthorrhoea macronema* F.Muell. ex Benth., *Fl. Austral.* 7: 113 (1878)

T: Hastings R., N.S.W., *H.Beckler s.n.*; lecto: K *n.v.*, *fide* A.T.Lee, *Contr. New South Wales Natl Herb.* 4: 54 (1966); isolecto: MEL.

Trunk none; stem sometimes branched below ground; crowns 1 to many, in a loosely upright or deflexed tuft. Leaves obtrullate, irregularly rounded depressed-cuneate or concave in T.S., usually 2.3–3.5 mm wide, 1.2–1.8 mm thick, light to dark green, not glaucous. Scape 100–160 cm long, 4–5 mm diam. Spike 0.1–0.2 times as long as scape, 5–13 cm long, 14–20 mm diam. Cluster-bracts obscure. Packing-bracts shortly acute to acute, glabrous. Sepals acute, beaked, without proboscis, glabrous. Petals large and prominent, erect, with proboscis, glabrous except for very few hairs at apex. Fig. 37C, S.

Occurs in Qld and N.S.W. from Fraser Is. to the Sydney region, on coastal sand and ranges. Flowers July–Jan. Map 186.

Qld: Stradbroke Is., Moreton Bay, *J.B.Cleland* NSW 56765 (NSW). N.S.W.: Mayers Hill, Boolambayte, Myall Lakes, *E.F.Constable* NSW 23594 (NSW); Tanilba, Port Stephens, *H. van Rees* 182 (MEL).

A distinctive *Xanthorrhoea* in its habit, with long thin scape and short brush-like spike, large cream to yellow flowers and staminal filaments, long-pointed fruit with persistent styles and rounded glossy seed. Leaves longer (1–2 m) and more flexible than in most species, with stomates in subsurface hair-lined chambers rather than singly as all other species except *X. gracilis*.

A close relative of *X. gracilis* from W.A. The name was not validly published by Mueller in *Fragm.* 4: 112 (1864) where alternative ranks were cited.

2. *Xanthorrhoea gracilis* Endl., in J.G.C.Lehmann, *Pl. Preiss* 2: 39 (1846)

T: Darling Range, Perth, W.A., 16 Jan. 1840, *L.Preiss* 1619; lecto: MEL 625759, *fide* D.Bedford, *Fl. Australia* 46: 227 (1986).

Trunk none; stems branched underground; crowns 1 to many, each a loosely upright to decumbent tuft. Leaves irregularly rounded depressed-obtrullate to depressed-cuneate in T.S., usually c. 3 mm wide and 1.4–1.6 mm thick, green, not glaucous, hairy at base. Scape c. 150 cm long, c. 5 mm diam., hairy at base, glaucous above. Spike 0.1–0.2 times as long as scape, c. 11 cm long and 13–14 mm diam. Cluster-bracts obscure. Packing-bracts shortly acute, hirsute, dark brown. Sepals shortly acute, with very short beak, without proboscis, hirsute. Petals large and prominent, recurved, with proboscis, glabrous except short hairs at apex.

Occurs in south-western W.A., south of the Avon R. and as far east as Albany, in sandy soil with laterite, often in Jarrah forest. Flowers (Sept.) Oct.–Jan. Map 187.

W.A.: Yarloop, between Bunbury and Pinjarra, *H.Eichler* 16153 (AD); c. 1.6 km N of North Dandalup, *B.G.Briggs* NSW 87522 (NSW); East Jarrahdale, *D.J.Bedford* 2 & *T.D.Macfarlane* (NSW); Collie, *A.R.Fairall* 742 (PERTH); Harvey Dam Reserve, *T.D.Macfarlane* 658 (PERTH).

A close relative of *X. macronema* from eastern Australia, from which it is distinguished by the long hairs on leaf-bases, proximal portions of leaves and on base of scape, the usually distally glaucous scape, the dark-brown hirsute packing-bracts and sepals, and the dorsiventrally flattened seeds.

3. *Xanthorrhoea concava* (A.Lee) Bedford, *Fl. Australia* 46: 226 (1986)

X. resinosa subsp. *concava* A.Lee, *Contr. New South Wales Natl Herb.* 4: 45 (1966). T: 1 mile [c. 1.6 km] W of Buxton, N.S.W., 5 Dec. 1960, A.T.Lee NSW 61300; holo: NSW.

Illustration: A.T.Lee, *Contr. New South Wales Natl Herb.*, *Fl. Ser.* 34: 5 (1966) as *X. resinosa* subsp. *concava*.

Trunk none; stem branched below ground; crowns 1 to many, each a loosely erect tuft. Leaves very depressed-cuneate to concave in T.S., 3–6 mm wide, 1.5–2 mm thick, blue-green, glaucous. Scape 50–250 cm long, c. 10 mm diam. Spike c. ½ as long as scape, 50–90 cm long, 15–30 mm diam. Cluster-bracts obscure, or prominent only at base of spike, shortly acute, densely hirsute. Packing-bracts shortly acute, densely hirsute with pale hairs. Sepals shortly acute, with beak, without proboscis, densely hirsute with pale hairs. Petals reflexed, with proboscis, glabrous except a terminal tuft of short hairs. Fig. 37L.

Occurs in N.S.W. from Sydney as far south as Eden on the coast and tablelands, often growing in seasonally waterlogged sites. Flowers Oct.–Dec. Map 188.

N.S.W.: Treble Mtn, N of Cobargo, *E.F.Constable* 5481 (NSW); Mogo State Forest, SSW of Batemans Bay, 12 Dec. 1961, A.T.Lee (NSW); Windellama, SE of Goulburn, *B.G.Briggs* NSW 61298 (NSW); Mittagong, 30 Nov. 1919, *J.B.Cleland* (AD).

The spike appears distinctly velvety light brown from the long pale hairs on the packing-bracts and sepals.

4. *Xanthorrhoea fulva* (A.Lee) Bedford, *Fl. Australia* 46: 226 (1986)

X. resinosa subsp. *fulva* A.Lee, *Contr. New South Wales Natl Herb.* 4: 45 (1966). T: Coffs Harbour, N.S.W., 17 Oct. 1961, *E.F.Constable* NSW 61664; holo: NSW.

Illustration: A.T.Lee, *Contr. New South Wales Natl Herb.*, *Fl. Ser.* 34: 5 (1966) as *X. resinosa* subsp. *fulva* (incorrect leaf habit shown).

Trunk none; stem branched below ground; crowns 1 to many, each a stiff erect tuft. Leaves depressed to very depressed-obtrullate to depressed-cuneate in T.S., 1.9–3.5 mm wide, 1–1.5 mm thick, usually ±blue-green, glaucous. Scape 20–160 cm long, 5–20 mm diam. Spike ⅓–½ as long as scape, 10–60 cm long, 10–30 mm diam. Cluster-bracts obscure or slightly prominent, shortly acute, densely hirsute. Packing-bracts obtuse, densely hirsute with pale hairs. Sepals shortly acute, without or with very short beak, without proboscis, hirsute. Petals slightly reflexed, with beak at tip, glabrous except for a few hairs near beak. Figs 37A, E, M, 38A–G.

Occurs in coastal areas from Rockhampton, Qld, to Wyong, N.S.W.; grows in periodically waterlogged sites in sand. Flowers Aug.–Oct. Map 189.

Qld: Cooloola, *C.Sandercoe* C504 (NSW). N.S.W.: Corindi–Red Rock road, 18 Sept. 1961, *E.F.Constable* (NSW); Lake Cathie, c. 8 km NNE of Kew, *E.F.Constable* 4795 (AD, NSW); N of Booti Booti, 13 Oct. 1953, *L.A.S.Johnson* (NSW); between Grassy Hill and Putty, c. 10.8 km from Singleton, 10 Feb. 1966, A.Lee (NSW).

This species is known to hybridise with *X. johnsonii* in Qld and with *X. glauca* in N.S.W., the progeny sometimes resembling *X. resinosa*. It is usually recognisable in the field by its velvety cream to beige coloured flowering spikes, from the pale hairs on the packing-bracts. It exhibits great variability of inflorescence size: in small plants (young or in poor growing conditions) the inflorescences may be only 22 cm tall and very slender, while older plants in good growing conditions may have stout inflorescences 2.5 m tall.

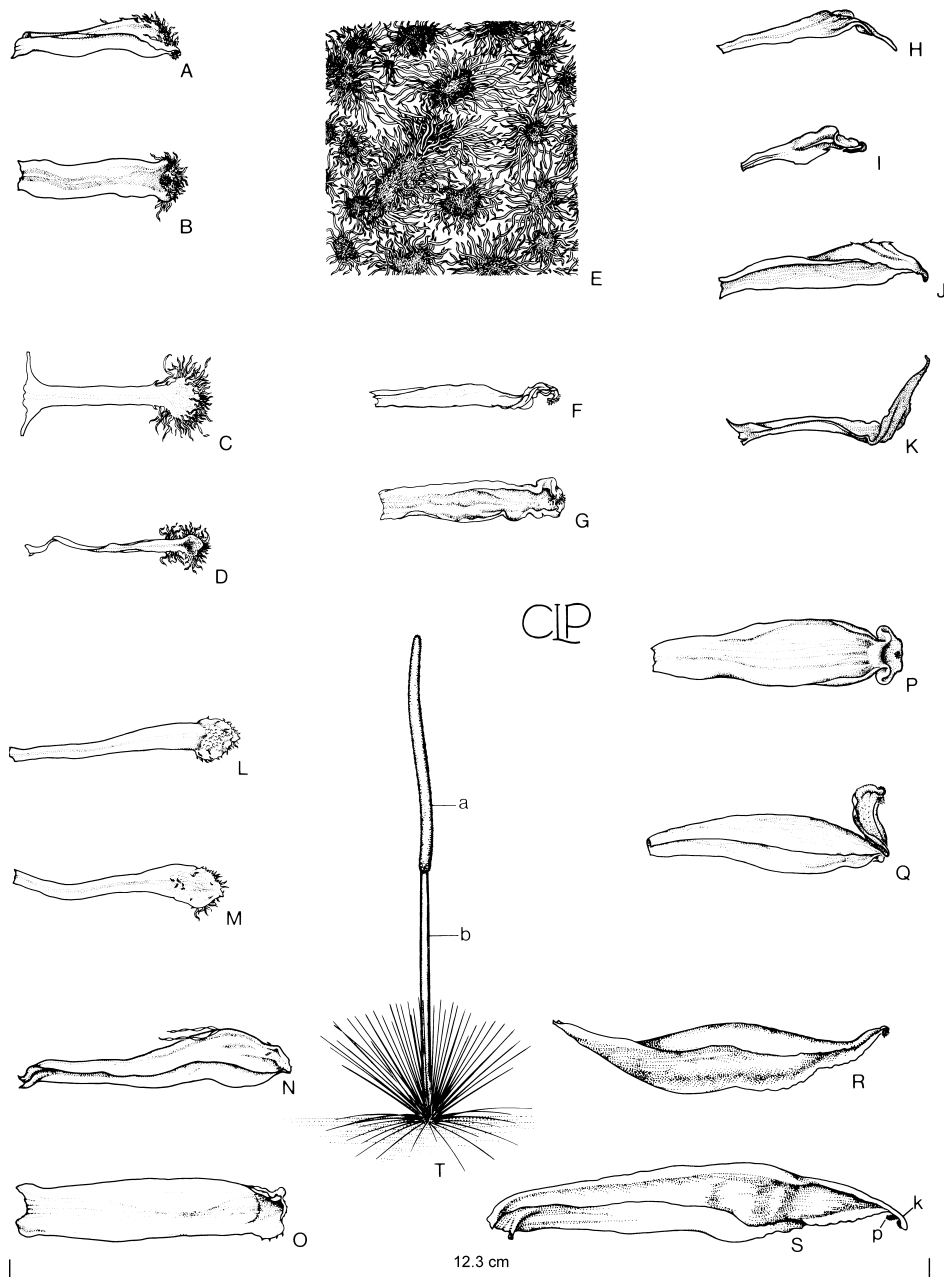


Figure 38. *Xanthorrhoea*. **A–G**, *X. fulva*. **A–B**, sepals $\times 5$; **C–D**, packing bracts $\times 5$; **E**, surface view of spike $\times 10$; **F–G**, petals $\times 5$ (E.Constable NSW 6166, NSW). **H–K**, *X. bracteata*. **H–I**, packing bracts $\times 5$; **J**, sepal $\times 5$; **K**, cluster bract $\times 5$ (R.Brown Iter Australiense 5772, BM). **L–Q**, *X. arborea*. **L–M**, packing bracts $\times 5$; **N–O**, sepals $\times 5$; **P–Q**, petals, showing strongly recurved distal portion, $\times 5$ (L.Johnson NSW 61355, NSW). **R–S**, *X. australis*, sepals (**k**, beak, **p**, proboscis) $\times 5$ (D.Martin NSW 673567, NSW). **T**, *X. resinosa*, habit (**a**, spike, **b**, scape) $\times 0.02$ (Sydney, photo D.Bedford).

5. *Xanthorrhoea resinosa* Pers., *Syn. Pl.* 1: 370 (1805)

T: Port Jackson or Botany Bay, N.S.W., 1788, *J.White*; n.v., apparently lost, *fide* A.T.Lee, *Contr. New South Wales Natl Herb.* 4: 44 (1966); Centennial Park, Sydney, N.S.W., 6 July 1962, *E.F.Constable* NSW 57853; neo: NSW, *fide* A.T.Lee, *loc. cit.*

X. hastilis R.Br., *Prodr.* 288 (1810). T: Port Jackson, N.S.W., 1803, *R.Brown*; n.v., apparently lost, *fide* A.T.Lee, *loc. cit.*; Centennial Park, Sydney, N.S.W., 6 July 1962, *E.F.Constable* NSW 57853; neo: NSW, *fide* A.T.Lee, *loc. cit.*

[*X. arborea* auct. non R.Br.: C.Moore & E.Betche, *Handb. Fl. New South Wales* 425 (1895); J.H.Maiden & E.Betche, *Census New South Wales Pl.* 42 (1916)]

Illustration: A.T.Lee, *Contr. New South Wales Natl Herb., Fl. Ser.* 34: 5 (1966).

Trunk none or to 60 cm long; stem usually simple; young leaves in a stiff \pm erect spreading tuft. Leaves transverse-rhombic in T.S., 2–4 mm wide, 1.5–2.5 mm thick, blue-green, glaucous. Scape 70–150 cm long, rarely to 220 cm, 10–30 mm diam. Spike \pm as long as scape, sometimes shorter than scape, 60–120 cm long, 20–45 mm diam. Cluster-bracts obscure or prominent only at base of spike, shortly acute, densely hirsute. Packing-bracts shortly acute, densely hirsute, dark brown. Sepals shortly acute, without beak or proboscis, hirsute. Petals erect or slightly reflexed, sometimes with proboscis, at least one petal in each flower abaxially hirsute on mid-vein and apex. Figs 36, 38T.

Occurs in the Blue Mountains and coastal areas of N.S.W. from Sydney, to eastern Vic., growing in sandy soils and on sandstone, usually in seasonally wet sites. Flowers Aug.–Oct. Map 190.

N.S.W.: Point Perpendicular, *L.A.S.Johnson* 1031 (NSW); Blackheath Aerodrome, 29 Nov. 1961, *E.F.Constable* (AD, NSW); La Perouse, Oct. 1897, *E.Betche* (NSW). Vic.: Mallacoota, Wingan, *A.C.Beauglehole* 31091 (MEL); Cape Everard, 8 Feb. 1961, *A.Dyce* (NSW).

The spikes are distinctively dark brown and velvety at flowering from the densely hairy, dark brown packing-bracts. Typical specimens have the spike about as long as the scape; some southern specimens, which have a more slender spike much shorter than the scape, may be subspecifically distinct.

6. *Xanthorrhoea brunonis* Endl., in J.G.C.Lehmann, *Pl. Preiss.* 2: 39 (1846)

T: near the Swan River, W.A., 20 Nov. 1839, *L.Preiss* 1621; lecto: MEL 625771, *fide* D.Bedford, *Fl. Australia* 46: 225 (1986).

Trunk none or up to 10 cm long; stem branched below ground; crowns 1 to many, each an erect tuft. Leaves narrowly transverse-rhombic to depressed-cuneate in T.S., 1.7–4 mm wide, 1–2.3 mm thick, green, not glaucous. Scape 35–150 cm long, 5–20 mm diam. Spike $\frac{1}{3}$ – $\frac{1}{2}$ as long as scape, 10–30 cm long, 20–40 mm diam. Cluster-bracts obscure or restricted to junction of scape and spike, shortly acute to narrowly triangular, glabrous. Packing-bracts shortly acute to acute, glabrous to fringed with hairs. Sepals acute, beaked, sometimes with distinct abaxial median ridge, without proboscis, glabrous. Petals \pm erect to reflexed, without proboscis, glabrous except a tuft of hairs at apex.

Occurs on the coastal plain from Perth region southwards as far as Albany, W.A., in sand. There are 2 subspecies.

Packing-bract apex margin glabrous and abaxial surface glabrous and shiny, so that bracts appear glabrous at spike surface

6a. subsp. *brunonis*

Packing-bract apex margin and abaxial surface fringed with hairs, so that bracts appear hairy at spike surface

6b. subsp. *semibarbata*

6a. *Xanthorrhoea brunonis* Endl. subsp. *brunonis*

Leaves 3–4 mm wide, c. 2 mm thick. Scape 70–90 cm long, 5–20 mm diam. Spike 10–30 cm long, 20–40 mm diam. Packing-bracts shortly acute to acute; margin below apex subglabrous to fringed with hairs, margin and abaxial surface of apex glabrous and shiny.

Common on the coastal plain around Perth and southwards, W.A. Flowers Oct.–Nov. Map 191.

W.A.: Bruce St, South Perth, *D.J.Bedford 102* & *T.D.Macfarlane* (NSW, PERTH); Harvey R., *F.Mueller* (MEL 625782); near Wilson Inlet, Denmark–Albany road, *D.Bedford 23* & *T.D.Macfarlane* (NSW, PERTH).

6b. *Xanthorrhoea brunonis* subsp. *semibarbata* Bedford, *Fl. Australia* 46: 225 (1986)

T: Poad Road, S of Dardanup, W.A., 24 Nov. 1982, *D.J.Bedford 8* & *T.D.Macfarlane*; holo: NSW; iso: PERTH.

Leaves 1.7–3.5 mm wide, 1–2.3 mm thick. Scape 80–150 cm long, 10–17 mm diam. Spike 30–50 cm long, 25–40 mm diam. Packing-bracts acute, occasionally subglabrous, more often fringed with hairs on apex and margin.

Occurs on coastal sand slightly N and S of Perth as far as Albany, W.A. Flowers Oct.–Dec. Map 192.

W.A.: North Dandalup, *D.J.Bedford 5* & *T.D.Macfarlane* (NSW, PERTH); Edgewater Road, Canning R. foreshore, Perth, *M.L.Clark 161* (PERTH); 1.6 km N of Boyanup, along South Western Hwy, *V.Mann 61* & *A.S.George* (NSW, PERTH).

7. *Xanthorrhoea brevistyla* D.Herbert, *J. & Proc. Roy. Soc. W. Australia* 7: 82 (1921)

T: Narrogin State Farm, W.A., 13 Nov. 1920, *D.A.Herbert s.n.*; lecto: PERTH, *fide* D.Bedford, *Fl. Australia* 46: 225 (1986); isolecto: MEL.

Trunk usually none, rarely to 5 cm long; stem often branched below ground; crowns 1 to many, each a ±erect tuft. Leaves depressed-obtrullate to depressed-cuneate in T.S., sometimes concave, 3.2–4.4 mm wide, c. 1.8 mm thick, blue-green, very glaucous. Scape 80–125 cm long, 10–24 mm diam. Spike c. $\frac{1}{3}$ – $\frac{1}{2}$ as long as scape, rarely equal to scape, 24–96 cm long, 22–42 mm diam. Cluster-bracts obscure or very slightly prominent, acute to triangular, sparsely hairy. Packing-bracts shortly acute to acute, subglabrous to hirsute. Sepals triangular, beaked, without proboscis, glabrous. Petals recurved, with proboscis, glabrous except for short hairs adaxially at apex.

Occurs from Narrogin to Cranbrook, W.A. Flowers Oct.–Dec. Map 193.

W.A.: Narrogin, *D.Bedford 51* & *T.D.Macfarlane* (NSW, PERTH); Williams–Narrogin area, *T.D.Macfarlane 743* (PERTH); 21 km E of Narrogin on road to Toolibin, *D.Bedford 49* & *T.D.Macfarlane* (NSW, PERTH); 14.6 km S of Woodanilling on Great Southern Hwy, *D.Bedford 38* & *T.D.Macfarlane* (NSW, PERTH).

This species includes considerable variation in bract hairiness, which may indicate some unresolved taxonomic problems. The specific epithet is misleading, as style length is neither a distinguishing nor a constant feature.

8. *Xanthorrhoea platyphylla* Bedford, *Fl. Australia* 46: 228 (1986)

T: 36.5 km NW of Esperance on road to Ravensthorpe, W.A., 27 Nov. 1982, *D.Bedford 35* & *T.D.Macfarlane*; holo: NSW; iso: PERTH.

Trunk usually none, rarely to 60 cm long; stem usually simple; crown usually 1, in an erect dense tuft. Leaves depressed-obtrullate to depressed-cuneate in T.S., 4–7.7 mm wide, 1.8–2.5 mm thick, green to slightly blue-green, slightly glaucous. Scape 50–80 cm long, 25–30 mm diam. Spike 2–3 times longer than scape, 95–165 cm long, rarely to 2.65 m, 40–60 mm diam. Cluster-bracts almost obscure, shortly acute to acute, subglabrous. Packing-bracts shortly acute, subglabrous to fringed with hairs. Sepals acute, with very short beak, without proboscis, subglabrous, with a median line of hairs. Petals reflexed, with proboscis, glabrous except for short hairs at apex.

Occurs in southern W.A., from the Stirling Range E beyond Esperance. Flowers June. Map 194.

W.A.: 25 km E of Ravensthorpe, *K.Newbey* 9734 (PERTH); Esperance Airport, *A.S.George* 9863 (NSW, PERTH); c. 65 km E of Esperance, *R.H.Kuchel* 1650 (AD).

Several collections from the geographic range of this species are somewhat similar, but cannot be ascribed to it or to any other described species. Their leaves are very similar to those of this species but the spikes are shorter than the scapes and there are differences in bract shape and hairiness. Such specimens most probably represent one or more undescribed taxa but more collections and data are needed to resolve this.

9. *Xanthorrhoea preissii* Endl., in J.G.C.Lehmann, *Pl. Preiss.* 2: 39 (1846)

T: York [probably near Toodyay, perhaps the present-day Boyagerring Ck which flows to Toodyay from 10 km NE], W.A., 22 Mar. 1840, *L.Preiss* 1620; lecto: MEL 625774, *fide* D.Bedford, *Fl. Australia* 46: 228 (1986).

X. pecoris F.Muell., *Fragm.* 4: 110 (1864). T: Gordon River, W.A., *A.Oldfield* 628; holotype: MEL 625762.

X. reflexa D.Herbert, *J. & Proc. Roy. Soc. W. Australia* 6: 33 (1920). T: Blackboy Hill, 15 miles [c. 24 km] from Perth, W.A., Oct. 1919, *D.A.Herbert s.n.*; holotype: MEL 625775.

Trunk to over 3 m long; stem simple or branched; crowns 1 to few, each an uneven hemisphere. Leaves quadrate-rhombic to transverse-rhombic in T.S., 2.2–2.8 mm wide, 2.1–2.4 mm thick, green, not glaucous. Scape 60–100 cm long, 20–30 mm diam. Spike c. 2–3 times longer than scape, 150–250 cm long, rarely to 320 cm, 30–60 mm diam. Cluster-bracts obscure. Packing-bracts shortly acute to triangular, distally glabrous to very slightly subglabrous, the proximal margins and adaxial surface glabrous to hairy. Sepals shortly acute to acute, without beak or proboscis, subglabrous to sparsely hairy. Petals recurved, with proboscis, glabrous except at apex. Figs 37P, 39C–D, M.

Widespread in south-western W.A. Flowers Jan.–Nov. Map 195.

W.A.: Albany Hwy, SE of Mt Cooke, *T.D.Macfarlane* 737 (NSW, PERTH); 5.7 km S of Nanson on Yuna to Geraldton Road, *D.J.Bedford* 86 & *T.D.Macfarlane* (NSW, PERTH); Cape Leeuwin, *D.J.Bedford* 14 & *T.D.Macfarlane* (NSW, PERTH); Blackboy Hill, Swan View, near Perth, *D.J.Bedford* 53 & *T.D.Macfarlane* (NSW, PERTH); road to Bannister from Wandering, *D.J.Bedford* 52 & *T.D.Macfarlane* (NSW, PERTH).

The bracts on the spike are distinctly green at flowering. There is considerable variation in leaf width and thickness, and a little variation in leaf shape. The type has narrow leaves, quadrate-rhombic in T.S., 1.7 mm wide, 1.5 mm thick, whilst specimens in lateritic or loam soils and in higher rainfall areas have larger leaves, transverse-rhombic in T.S., sometimes tending to be wider than they are thick, to 3.3 mm wide and 2.5 mm thick.

The type of *X. reflexa* belongs to this taxon, although parts of Herbert's description and his photograph refer to *X. drummondii*.

10. *Xanthorrhoea drummondii* Harvey, *Hooker's J. Bot. Kew Gard. Misc.* 7: 57 (1855)

T: near Perth and elsewhere, W.A., *J.Drummond s.n.*; n.v., apparently lost; Wedin Siding, W.A., 28 Nov. 1982, *D.Bedford* 46 & *T.D.Macfarlane*; neo: NSW, *fide* D.Bedford, *Fl. Australia* 46: 226 (1986); isoneo: PERTH.

[*X. reflexa* auct. non D.Herbert: D.A.Herbert, *J. & Proc. Roy. Soc. W. Australia* 6: 33 (1920); W.E.Blackall & B.J.Grieve, *How to know W. Austral. Wildfl.* 70 (1954)]

Trunk to 2 m long; stem usually simple; crown usually 1; young leaves in ±stiffly erect tuft; older leaves often strongly reflexed. Leaves quadrate-rhombic in T.S., 1.8–2.5 mm wide, 1.5–2.3 mm thick, grey-green, glaucous. Scape 50–90 cm long, c. 30 mm wide. Spike c. 1.5–2 times as long as scape, 120–180 cm long, 55–65 mm diam. Cluster-bracts obscure. Packing-bracts shortly acute to acute, medium to densely hirsute. Sepals obtuse, with short beak, without proboscis, centre line and beak medium to densely hirsute. Petals ±erect, with proboscis, glabrous except for hairs at apex. Figs 35, 37H, 39A–B, N–O.

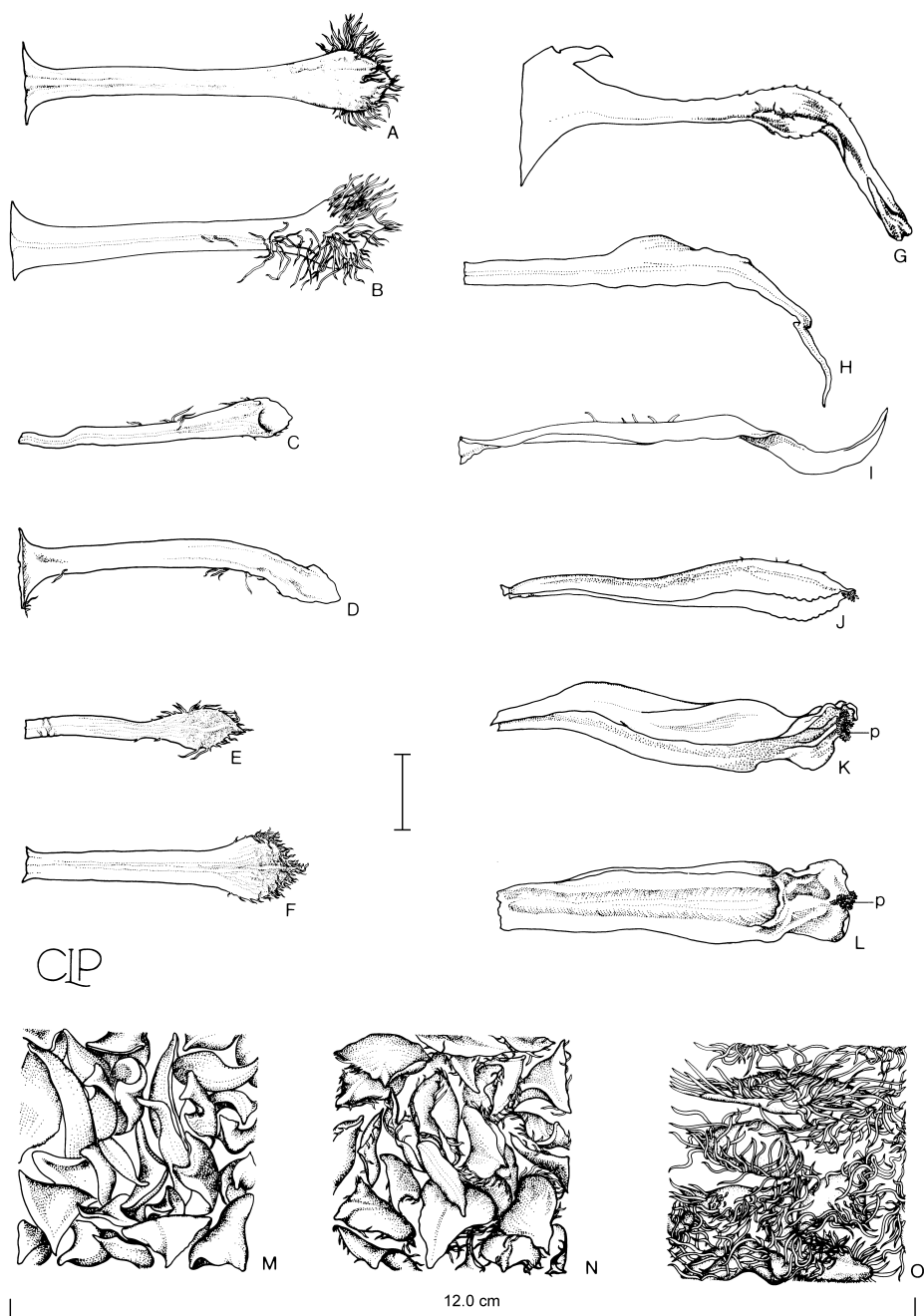


Figure 39. *Xanthorrhoea*. **A–B**, *X. drummondii*, packing-bracts $\times 5$ (D.Bedford 41 & T.Macfarlane, NSW). **C–D**, *X. preissii*, packing-bracts $\times 5$ (L.Preiss 1620, MEL). **E–F**, *X. nana*, packing-bracts $\times 5$ (K.Allan 815, PERTH). **G–L**, *X. acanthostachya*. **G**, small cluster-bract of aborted floral cluster $\times 5$; **H–I**, packing-bracts $\times 5$; **J**, sepal $\times 5$; **K–L**, petals (**p**, proboscis) $\times 5$ (G–L, T.Macfarlane 659, PERTH). **M**, *X. preissii*, surface view of spike showing bract apices $\times 10$ (L.Preiss 1620, MEL). **N–O**, *X. drummondii*, surface view of spikes showing variation in hairiness of bract apices $\times 10$ (N, D.Bedford 59 & T.Macfarlane, NSW; O, D.Bedford 41 & T.Macfarlane, NSW).

Occurs in W.A., from Dongara southwards, E of the Darling Range, as far as Wagin. Flowers Sept.–Nov. Map 196.

W.A.: Lake Indoon, Dongara, *D.Bedford* 93 & *T.D.Macfarlane* (NSW, PERTH); near Boyagering Ck, Toodyay, *T.D.Macfarlane* 1135 (NSW, PERTH); between York and Spencer Brook, *D.Bedford* 59 & *T.D.Macfarlane* (PERTH, NSW); 4.5 km WSW of Noman Lake on road between Murdoch Road and Toolibin, *D.Bedford* 45 & *T.D.Macfarlane* (PERTH, NSW); Wagin, *C.A.Gardner* 1231 (PERTH).

The spike is distinctively dark brown at flowering and is hirsute at $\times 10$ magnification.

Some populations in the Dongara — Lake Indoon — Jurien region N of Perth resemble this taxon but differ from it by having less glaucous leaves and less hairy bracts. These populations may be an undescribed subspecies of *X. drummondii*.

11. *Xanthorrhoea quadrangulata* F.Muell., *Fragm.* 4: 111 (1864)

T: [St Vincent Gulf], S.A., 3 Feb. 1848, *F.Mueller*; lecto: MEL 625754, *fide* D.Bedford, *Fl. Australia* 46: 228 (1986); isolecto: K, MEL 625760.

Trunk to 2 m long; stem sometimes branched; crowns usually 1 or 2, hemispherical. Leaves quadrate-rhombic in T.S., c. 1.8 mm wide, 1–1.5 mm thick, very blue-grey, glaucous. Scape c. 55 cm long, c. 12 mm diam. Spike length usually less than scape, c. 30 cm long, c. 30 mm diam. Cluster-bracts obscure. Packing-bracts shortly acute to acute, subglabrous. Sepals shortly acute, beaked, without proboscis, subglabrous. Petals shortly recurved, sometimes with very small proboscis, glabrous except for tuft of short hairs at apex.

Occurs in S.A. from St Vincent Gulf to the northern Mt Lofty Ranges. Inhabits dry rocky sites, especially ridges, but also heavy clay soils. Flowers Mar.–Aug. Map 197.

S.A.: Oraparinna Natl Park, *D.E.Symon* 7214 (NSW); Mt Griselda, Arakoola, *B.G.Briggs* 4664 (NSW); Arakoola Sanctuary, *R.H.Kuchel* 2976 (AD); Black Hill, c. 12 km E of Adelaide, *D.J.E.Whibley* 914 (AD); Parrabana Springs, 125 km E of Blinman, *J.Carrick* 2035 (AD).

Bracts are dark brown at flowering.

12. *Xanthorrhoea thorntonii* Tate, *Rep. Horn Sci. Exped. Centr. Australia* 3: 191 (1896)

T: James Range, N.T., June 1894, *R.Tate*; syn: AD, MEL. No specimens from the other localities cited by Tate have been found.

Trunk to 5 m long; stem and crowns 1 or 2; young leaves \pm erect; older leaves sometimes strongly reflexed or absent by abscission. Leaves \pm quadrate-rhombic in T.S., 2–2.2 mm wide, c. 1.6 mm thick, slightly grey-green, glaucous. Scape 60–80 cm long, 25–35 mm diam. Spike 1.5–2 times as long as scape, 100–150 cm long, 50–60 mm diam. Cluster-bracts obscure, rarely prominent at base of spike, narrowly triangular, glabrous or almost so. Packing-bracts shortly acute to triangular, glabrous to subglabrous, light brown. Sepals shortly acute, with very short beak, without proboscis, glabrous. Petals erect, with proboscis, sometimes with beak, glabrous except hairs at apex.

Occurs in scattered localities in central Australia (S.A. & N.T.) and central-eastern W.A. Grows in yellow to red sand, usually on plains with *Triodia* spp. Flowers Sept.–Dec. Map 198.

W.A.: Queen Victoria Spring, *D.Bedford* 76 & *T.D.Macfarlane* (NSW, PERTH); c. 21 km E of Cosmo Newberry on Warburton road, *A.S.George* 8102 (PERTH); near Docker Ck, Petermann Ra., 29 June 1958, *J.B.Cleland* (AD). N.T.: Gosse Bluff area, *D.J.Nelson* 1359 (AD, NSW, NT).

Packing-bracts are light brown; the petals are chartaceous rather than \pm soft and membranous.

13. *Xanthorrhoea nana* D.Herbert, J. & Proc. Roy. Soc. W. Australia 7: 83 (1921)

T: about 2 miles [c. 3 km] NE of Bruce Rock, W.A., 25 Oct. 1920, *D.A.Herbert*; lecto: PERTH, *fide* D.Bedford, *Fl. Australia*, 46: 228 (1986); isolecoto: MEL.

Trunk none or to 50 cm long; stem many-branched; crowns usually 2–6, each a stiff open tuft but together appearing as a single hemispherical crown. Leaves depressed-obtrullate in T.S., c. 3 mm wide, c. 2 mm thick, blue-grey-green, glaucous. Scape c. 30 cm long, 10–15 mm diam., emerging horizontally then curved upwards. Spike \pm equal to scape, 25–35 cm long, 25–50 mm diam. Cluster-bracts obscure or prominent only at base of spike, shortly acute, hirsute at margins. Packing-bracts shortly acute to acute, sparsely to densely hirsute on distal $\frac{1}{3}$ mainly at margins. Sepals obtuse, beaked, often with median abaxial ridge, without proboscis, hirsute along ridge and apex. Petals erect, with proboscis, glabrous. Figs 37U, 39E–F.

Occurs in inland south-western W.A. between Lake Grace and Lake Moore, growing in yellow sand and yellow sandy clay in heath and mallee shrubland. Flowers Sept.–Oct. Map 199.

W.A.: c. 26 km N of Hyden Track along No. 1 Rabbit Proof Fence, *K.M.Allen* 815 (PERTH); Wialki-Bonnie Rock district, 11 Sept. 1957, *A.R.Main* (PERTH); c. 10 km W of Lake King, *R.H.Kuchel* 1863 (AD); 7.5 km from Bruce Rock towards Merredin, *D.Bedford* 67 & *T.D.Macfarlane* (NSW, PERTH); 69.5 km E of Southern Cross towards Coolgardie, *D.Bedford* 71 & *T.D.Macfarlane* (NSW, PERTH).

Distinguished by very pungent leaves, and curved scape and spike which emerge from crown \pm horizontally then turn at $\pm 90^\circ$.

14. *Xanthorrhoea pumilio* R.Br., Prodr. 288 (1810)

T: Port Curtis, near Gladstone, Qld, 1802, *R.Brown Iter Australiense* 5774; holotype: BM.

Trunk none or up to 60 cm long; stem simple or branched; crown 1; leaves broadly spreading or recurved. Leaves transverse-linear to very depressed-obtrullate or very depressed-cuneate in T.S., 1.7–2.3 mm wide, 0.7–1.2 mm thick, green, not glaucous. Scape 50–180 cm long, rarely to 210 cm, 5–11 mm diam. Spike less than $\frac{1}{4}$ as long as scape, 5–40 cm long, 14–23 mm diam. Cluster-bracts obscure. Packing-bracts obtuse to shortly acute, glabrous to subglabrous. Sepals shortly acute, without beak or beak very short, sometimes with a short median abaxial ridge, without proboscis, glabrous. Petals recurved, with proboscis, glabrous except hirsute apex.

Occurs in Qld, from Cooktown to Gladstone and W to the Great Dividing Ra. Flowers Apr.–May. Map 200.

Qld: Ravenshoe, *P.Mesmer* NSW 59789 (NSW); 16 km S of Innisfail, *D.E.Boyland* 550 & *J.G.Gillieat* (BRI); 41.7 km N of Townsville, *D.Bedford* 7612 (SYD); 35 km S of Bowen, *D.Bedford* 7609 (SYD); between Lowmead and Agnes Waters, *D.Bedford* 7724 (SYD).

Distal one-third of packing-bracts are dark brown at flowering. This very small species is sometimes hard to distinguish from small plants of *X. johnsonii* and *X. latifolia*. The relationships and status of these three taxa in Qld warrant further research.

15. *Xanthorrhoea media* R.Br., Prodr. 288 (1810)

T: Port Jackson, N.S.W., *R.Brown*; *n.v.*, apparently lost, *fide* A.T.Lee, *Contr. New South Wales Natl Herb.* 4: 47 (1966); Parramatta, N.S.W., Nov. 1897, *J.H.Camfield* NSW 59863; neo: NSW, *fide* A.T.Lee, *loc. cit.*

Trunk none or up to 30 cm long; stem and crown usually 1, \pm hemispherical. Leaves transverse-rhombic in T.S., 2–2.8 mm wide, 1.1–1.5 mm thick, mid to dark green, not glaucous. Scape 100–180 cm long, rarely to 210 cm, 7–11 mm diam. Spike less than $\frac{1}{2}$, rarely equal to or slightly longer than scape, 35–90 cm long, 20–27 mm diam. Cluster-bracts almost obscure, sometimes at base only, shortly acute to narrowly triangular, abaxially hirsute. Packing-bracts shortly acute to acute, glabrous to moderately hirsute. Sepals shortly acute to acute, with short beak and median abaxial ridge, without

proboscis, subglabrous to slightly abaxially hirsute. Petals recurved, sometimes with proboscis, glabrous except hairs at apex. Fig. 37 I, O.

Occurs from Stony Hill to Hill Top on the central coast of N.S.W. as far north as Sandy Hollow. Grows on sandstone, usually on the drier, more exposed ridges and hillsides. Flowers Aug.–Mar. Map 201.

N.S.W.: Hawkesbury R., *A.Lee* NSW 61291 (NSW); Blaxlands Ridge, c. 16 km NE of Kurrajong, *E.F.Constable* 4208 (NSW); 42 Manor Road, Hornsby, *A.Lee* NSW 81658 (NSW); Warrimoo, *E.F.Constable* NSW 59862 (NSW); Hill Top, *E.Cheel* NSW 59844 (NSW).

Some larger plants on the central coast of N.S.W. (Sandy Hollow to Grassy Hill) have prominent cluster-bracts over the entire length of the spike. Further research is necessary to determine the status of these specimens. A.T.Lee, *Contr. New South Wales Natl Herb.* 4: 47–48 (1966), regarded them as possible hybrids with *X. australis* subsp. *australis*.

16. *Xanthorrhoea johnsonii* A.Lee, *Contr. New South Wales Natl Herb.* 4: 49 (1966)

T: between Dimbulah and Petford, W of Mareeba, Qld, 20 May 1962, *L.A.S.Johnson* NSW 61293; holo: NSW.

Trunk 10 cm to 5 m long; stem and crown usually 1; young leaves in spreading upright tuft; old leaves often strongly reflexed. Leaves \pm quadrate-rhombic to transverse-rhombic in T.S., 1–2.5 mm wide, 0.8–1.8 mm thick, green, not glaucous. Scape 75–190 cm long, 7–20 mm diam. Spike 0.75–1.25 as long as scape, 20–120 cm long, rarely to 225 cm, 20–40 mm diam. Cluster-bracts prominent only in lower portion of spike, acute to narrowly triangular, subglabrous to moderately hirsute. Packing-bracts shortly acute to acute, the distal $\frac{1}{3}$ subglabrous to moderately hirsute. Sepals shortly acute, beak absent or very short, sometimes with proboscis, often with median abaxial ridge, glabrous to subglabrous. Petals erect to recurved, with proboscis, glabrous except some hairs abaxially at apex. Fig. 37T.

Widespread in Qld and N.S.W. on the coast, tablelands and western slopes as far S as Singleton, usually in sclerophyll forest and heath. Flowers Apr.–Dec. Map 202.

Qld: 40 km from Cooktown, W of Annan R. crossing, *D.J.Bedford* 7759 (SYD); Emu Ck, 14.4 km SE of Mareeba, *L.Pedley* 2265 (BRI); Tinaroo Dam, *D.Bedford* 7764 (SYD); Chermside Hills, Brisbane, *S.T.Blake* 23562 (BRI). N.S.W.: 56 km from Singleton on Putty Road, *D.Bedford* 201 (NSW, SYD).

The most common and widespread species of *Xanthorrhoea* in Qld, occurring over a wide geographic and environmental range. Extremely variable, showing apparently random variation in most characters, including habit, leaves, scape length to spike length ratio (which can vary within one population) and bracts. May include more than one taxon (A.T.Lee, *pers. comm.*) but further study is needed. Hybridises with *X. fulva* in coastal south-eastern Qld, the offspring sometimes resembling *X. resinosa*.

17. *Xanthorrhoea latifolia* (A.Lee) Bedford, *Fl. Australia* 46: 227 (1986)

X. media subsp. *latifolia* A.Lee, *Contr. New South Wales Natl Herb.* 4: 48 (1966). T: Beerwah, Qld, May 1962, *E.F.Constable* NSW 61667; holo: NSW; iso: AD.

Trunk none or up to 3.6 m long; stem branched or single; crowns 1 to many, each with spreading mature leaves; young leaves in \pm erect tuft. Leaves narrowly transverse-rhombic to very depressed-cuneate in T.S., 2.4–10 mm wide, 0.7–3.5 mm thick, bright-green, not glaucous. Scape 75–210 cm long, 7–20 mm diam. Spike shorter than or almost equal to scape, 30–150 cm long, 18–41 mm diam. Cluster-bracts obscure. Packing-bracts obtuse, shortly acute to acute, glabrous to fringed with hairs, sometimes abaxially hirsute. Sepals shortly acute to acute, without proboscis, with short beak and median abaxial ridge, subglabrous to slightly hirsute. Petals recurved, with proboscis, glabrous except at apex.

Occurs in coastal regions from Wyong, N.S.W., to Cape Cleveland, Qld, usually in sandy or gravelly soil. There are 2 subspecies.

Leaves 2.4–5.7 mm wide, 0.7–1.7 mm thick; spike c. $\frac{1}{2}$ as long or almost equal to scape; packing-bracts obtuse to shortly acute

17a. subsp. latifolia

Leaves 4.2–10 mm wide, 1–3.5 mm thick; spike less than $\frac{1}{2}$ as long as scape; packing-bracts acute

17b. subsp. maxima

17a. *Xanthorrhoea latifolia* (A.Lee) Bedford subsp. *latifolia*

Trunk none or up to 2 m long; crowns 1–4. Leaves narrowly transverse-rhombic to very depressed-cuneate in T.S., 2.4–5.7 mm wide, 0.7–1.7 mm thick, bright green. Scape 100–210 cm long, 10–16 mm diam. Spike c. $\frac{1}{2}$ as long or almost equal to scape, 50–120 cm long, 21–33 mm diam. Packing-bracts obtuse to shortly acute. Fig. 37J.

Occurs from Wyong, N.S.W., to Cape Cleveland, Qld. Usually grows in sandy or gravelly soil in sclerophyll forest. Flowers Mar.–Oct. Map 203.

Qld: Kroombit Tableland, *I.R.Telford* 5517 (CBG, NSW). N.S.W.: c. 1.6 km E of Karuah, *E.F.Constable* 4788 (NSW); junction of Pacific Hwy and Lake Munmorah Road, c. 16 km NE of Wyong, *E.F.Constable* 4303 (NSW).

Many specimens from Gympie to Ravenshoe, Qld, have much narrower leaves than typical plants. These appear similar to small specimens of *X. johnsonii* or large specimens of *X. pumilio* but further research is necessary to determine their status. Some specimens from between the Hawkesbury and Hunter Rivers, N.S.W., have prominent cluster-bracts and triangular packing-bracts. These specimens are hybrids with *X. glauca* subsp. *glauca*. Specimens north of the Hunter R. in N.S.W. are smaller and more slender than the type and may be subspecifically distinct.

17b. *Xanthorrhoea latifolia* subsp. *maxima* Bedford, *Fl. Australia* 46: 227 (1986)

T: Mt Warning, near Murwillumbah, N.S.W., 2 June 1962, *E.F.Constable* NSW 61357; holotype: NSW.

Trunk none or up to 3.6 m long; crowns usually many. Leaves narrowly transverse-rhombic in T.S., 4.2–10 mm wide, 1–3.5 mm thick, bright green. Scape 75–210 cm long, 12–17 mm diam. Spike less than $\frac{1}{2}$ as long as scape, 45–60 cm long, 28–35 mm diam. Packing bracts acute.

Occurs in wet sclerophyll forest on the summit of Mt Warning and at Minyon Falls and Mebbin State Forest, N.S.W. Flowers June–Oct. Map 204.

N.S.W.: Minyon Falls, Whian Whian State Forest, *E.F.Constable* NSW 61360 (NSW); near Minyon Falls, Whian Whian State Forest, *L.A.S.Johnson & H.C.Hayes* NSW 613581 (NSW).

This subspecies has distinctively large, swollen leaf bases which are sometimes dark red.

18. *Xanthorrhoea arborea* R.Br., *Prodr.* 288 (1810)

T: Port Jackson, N.S.W., 17 May 1802, *R.Brown*; n.v., apparently lost, *fide* A.T.Lee, *Contr. New South Wales Natl Herb.* 4: 49 (1966); Manly, N.S.W., Jan. 1900, *E.Cheel* NSW 56675; neo: NSW, *fide* A.T.Lee, *loc. cit.*

Trunk usually 1–2 m long; stem simple or branched; crown 1 to many, each an uneven hemisphere or older leaves falling away from new upright tuft. Leaves narrowly transverse-rhombic to transverse-linear or concave in T.S., 5–7 mm wide, 0.8–1.9 mm thick, green or dull green, glaucous. Scape 135–165 cm long, rarely to 210 cm, 12–16 mm diam. Spike $\frac{2}{3}$ to as long as scape, 100–150 cm long, 25–28 mm diam. Cluster-bracts obscure. Packing-bracts shortly acute, occasionally acute, fringed to moderately hirsute. Sepals shortly acute, without proboscis, beaked, usually subglabrous to \pm abaxially hirsute. Petals recurved, with proboscis, glabrous except a terminal tuft of very short hairs. Figs 37G, K, N, 38L–Q.

Occurs on the central coast and adjacent tablelands of N.S.W., from Rylstone to just S of Sydney. Grows in sand or on sandstone, usually in sheltered sites. Flowers Jan.–Apr. Map 205.

N.S.W.: between Mt Coricudgy and Currant Mountain Gap (E of Rylestone), *A.Lee NSW 83579* (NSW); Grassy Hill, on Windsor–Putty Road, *E.F.Constable 4211* (NSW); c. 8 km N of Ten Mile Hollow, W of Mangrove Ck, *H.S.McKee 764* (NSW); c. 5.5 km NE of Mt Irvine, *E.F.Constable 1* (NSW); Heathcote, *E.Cheel NSW 61370* (NSW).

Packing-bracts are dark brown at flowering.

19. *Xanthorrhoea malacophylla* Bedford, *Fl. Australia* 46: 227 (1986)

T: Camp Ridge Trig., Queens Lake State Forest, 5 miles [8 km] NNE of Kew, N.S.W., 15 May 1964, *E.F.Constable 4792*; holo: NSW.

Trunk usually 2–6 m long; stem branched, sometimes single; crowns 1–10; new leaves in \pm erect tuft; mature leaves spreading, lax. Leaves transverse-rhombic to depressed-obtrullate in T.S., distally transverse-linear, 2.5–3.5 mm wide, rarely to 6.7 mm, 1.3–2.4 mm thick, green to bright green. Scape 135–185 cm long, 20–30 mm diam. Spike 0.6–1.6 as long as scape but usually equal to scape, 110–180 cm long, 30–50 mm diam. Cluster-bracts prominent for at least basal 10% of spike length, rarely obscure, narrowly triangular, subglabrous to fringed. Packing bracts acute, subglabrous. Sepals acute to triangular, with beak to 0.5 mm long, without proboscis, glabrous to subglabrous. Petals recurved, sometimes without proboscis, glabrous except hairs at apex.

Occurs on coastal ranges of N.S.W. from Wyong north almost to Casino, on steep rocky hillsides, usually in moist or wet sclerophyll forest, or at rainforest margins. Flowers May–Sept. Map 206.

N.S.W.: Coramba Mtn, c. 8 km NW of Coffs Harbour, *E.F.Constable 4825* (NSW); Mt Boss State Forest, NW of Wauchope, *J.C.Cousins NSW 56762* (NSW); Camden Haven, *J.B.Cleland NSW 56760* (NSW); Alum Mt, Buladelah, *E.F.Constable 4296* (NSW).

Distinct in having a very tall trunk, and \pm bright-green leaves which are unusually spongy and soft compared with most other species. Packing-bracts and sepals are dark brown.

A.T.Lee, *Contr. New South Wales Natl Herb.* 4: 52 (1966) and *Contr. New South Wales Natl Herb., Fl. Ser.* 34: 6–7 (1966), considered this species to be a hybrid between *X. australis* and *X. media* subsp. *latifolia* (= *X. latifolia*).

20. *Xanthorrhoea glauca* Bedford, *Fl. Australia* 46: 226 (1986)

T: edge of Levers Plateau, Qld, 4 July 1977, *D.Bedford 7776*; holo: NSW.

Trunk 1–5 m long, branched or single; crowns 1 to many, \pm spherical. Leaves quadrate-rhombic to narrowly transverse-rhombic in T.S., 1.3–5.2 mm wide, 0.9–2.4 mm thick, blue-green to greyish, glaucous. Scape 50–100 cm long, 18–46 mm diam. Spike 1.5–4 times as long as scape, rarely equal to scape, 100–200 cm long, rarely to 250 cm, 35–77 mm diam. Cluster-bracts prominent for most of spike length, \pm narrowly triangular, subglabrous. Packing-bracts acute or triangular, subglabrous, rarely glabrous. Sepals acute to narrowly triangular, beaked, without proboscis, glabrous except hairs in beak. Petals erect to slightly recurved, with proboscis, glabrous except hairs at apex.

Occurs in N.S.W. and south-eastern Qld. There are 2 subspecies, with some overlap of characters where their distributions abut.

Leaves \pm transverse-rhombic to narrowly transverse-rhombic in T.S., 2.5–5.2 mm wide, blue-green

20a. subsp. glauca

Leaves \pm quadrate-rhombic to broadly transverse-rhombic in T.S., 1.3–2.8 mm wide, greyish

20b. subsp. angustifolia

20a. *Xanthorrhoea glauca* Bedford subsp. *glauca*

Leaves transverse-rhombic to narrowly transverse-rhombic in T.S., distally transverse-linear, 3–4 mm wide, 1–1.6 mm thick. Scape 27–46 mm diam. Spike 100–200 cm long, 40–60 mm diam. Cluster-bracts with hairs only on proximal abaxial surface; margins

glabrous. Packing bracts acute or triangular. Sepals triangular to narrowly triangular, with a beak to 1.5 mm long.

Occurs on the northern coast and tablelands of N.S.W., and in south-eastern Qld, from Newcastle to Gayndah. Grows on steep slopes and ridges mainly in rich basaltic soils and, at some sites in N.S.W., in serpentine soils, and in deep sand in coastal N.S.W. from Newcastle to Byron Bay. Flowers June–Oct. Map 207.

Qld: c. 16 km NW of Gayndah, *S.L.Everist* 7942 (NSW); Great Dividing Ra., near Toowoomba on the Warrego Hwy, *D.Bedford* 7770 (NSW, SYD); c. 3 km SW of Rathdowney, 1977, *D.J.Bedford* (SYD). N.S.W.: Black Cutting, Tomalla Road via Moonan Flat [sic], *R.W.Earp* NSW 56570 (NSW).

Populations on the coastal dunes from Byron Bay to Newcastle, N.S.W., hybridise with *X. fulva* and *X. latifolia* in distinct short-range hybrid swarms. These populations growing on sand cannot be distinguished morphologically from populations on the more typical rich basaltic soil substrates, although it appears unlikely for the one species of *Xanthorrhoea* to occupy such different habitats. A.T.Lee, *Contr. New South Wales Natl Herb.* 4: 48 (1966) regarded this taxon as part of a very large hybrid swarm between *X. australis* and *X. latifolia*.

20b. *Xanthorrhoea glauca* subsp. *angustifolia* Bedford, *Fl. Australia* 46: 226 (1986)

T: 5 miles [8 km] NW of Coonabarabran on Bugaldie Road, N.S.W., 13 Dec. 1961, *E.F.Constable* NSW 61353; holo: NSW.

Leaves quadrate-rhombic to broadly transverse-rhombic in T.S., 1.3–2.8 mm wide, 0.9–1.6 mm thick. Scape 18–40 mm diam. Spike 100–160 cm long, 40–50 mm diam. Cluster-bracts with hairs mainly at margins. Packing-bracts acute. Sepals acute, with beak to 0.5 mm long.

Occurs in N.S.W. along the ranges of the Great Divide from the slopes of the Snowy Mts to Inverell, usually on rocky (limestone, trachyte) and gravelly slopes. Flowers Sept.–Dec. Map 208.

N.S.W.: Mt Nombi, 27 km SW of Mullaley, *A.N.Rodd* NSW 112483 (NSW); Guneemooroo Stn, 10 km NNE of Tooraweenah, *E.F.Constable* NSW 61352 (AD, NSW); Winburndale Ck, c. 19 km N of Bathurst, *E.F.Constable* NSW 63506 (NSW). A.C.T.: Mt McDonald, *N.T.Burbidge* 6713 (CANB, NSW).

A.T.Lee, *Contr. New South Wales Natl Herb* 4: 51 (1966) and *Contr. New South Wales Natl Herb.*, *Fl. Ser.* 34: 6–7 (1966), regarded this subspecies as a good example of *X. australis*, but it differs from the latter in leaf, bract and floral characters.

S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 59 (1981), recorded subsp. *angustifolia* as *X. australis* subsp. *australis* (western form).

21. *Xanthorrhoea acaulis* (A.Lee) Bedford, *Fl. Australia* 46: 225 (1986)

X. australis subsp. *acaulis* A.Lee, *Contr. New South Wales Natl Herb.* 4: 53 (1966). T: 6.5 miles [10.5 km] W of Dubbo on Minore Road, N.S.W., 9 Dec. 1961, *E.F.Constable* NSW 61344; holo: NSW.

Illustration: A.T.Lee, *Contr. New South Wales Natl Herb.*, *Fl. Ser.* 34: 5 (1966) as *X. australis* subsp. *acaulis*.

Trunk none or rarely up to 30 cm long, branched below ground; crowns 1 to many, each a spreading tuft. Leaves transverse-rhombic or depressed-obtrullate in T.S., rarely depressed-cuneate, c. 1.8 mm wide, c. 1 mm thick, greyish, glaucous. Scape 25–45 cm long, 8–12 mm diam. Spike 0.2–0.75 times as long as scape, 10–25 cm long, 25–34 mm diam. Cluster-bracts prominent, rarely obscure, narrowly triangular to subulate, subglabrous. Packing-bracts acute, subglabrous. Sepals shortly acute, with median abaxial ridge, glabrous; beak usually very short, rarely to 0.9 mm long; proboscis often present. Petals ±erect to recurved, with proboscis, glabrous except hirsute margins and apex.

Occurs in N.S.W. to the west of the Great Divide, in the area bounded by Narrabri and Pilliga in the north and Grenfell in the south. Grows mainly in sandy soils. Flowers Nov.–Jan. Map 209.

N.S.W.: Narrabri, Nov. 1899, *J.H.Maiden* (NSW); Pilliga scrub, Nov. 1979, *J.Ford* (NSW, SYD); Gunnedah district, *W.Forsyth* NSW 56719 (NSW); near Coonabarabran, *E.Wait* NSW 82220 (NSW); 5–6.5 km SSE of Coonabarabran, *H.Salasoo* 2328 (NSW).

22. *Xanthorrhoea minor* R.Br., *Prodr.* 1: 288 (1810)

T: Port Jackson, N.S.W., 1803, *R.Brown Iter Australiense* 5773; lecto: BM, *vide* D.Bedford, *Fl. Australia* 46: 227 (1986).

Illustration: A.T.Lee, *Contr. New South Wales Natl Herb., Fl. Ser.* 34: 5 (1966).

Trunk none; stem branched below ground; crowns many, each a ±erect tuft. Leaves depressed-cuneate, often concave in T.S., 1.9–3.5 mm wide, 1–1.5 mm thick, green, not glaucous. Scape 30–60 cm long, 3–8 mm diam. Spike 0.2–0.5 times as long as scape, 5–12 cm long, 7–20 mm diam. Cluster-bracts sometimes prominent, shortly acute to triangular, distal 1/3 glabrous to sparsely fringed with hairs, proximally subglabrous to densely hairy. Packing-bracts shortly acute to acute, subglabrous to hirsute. Sepals shortly acute, beaked, sometimes with proboscis, glabrous to moderately hirsute. Petals recurved, sometimes with proboscis, glabrous except papillose hairs at apex. Fig. 37B, D.

Occurs in coast and tableland areas of N.S.W., Vic. and in south-eastern S.A. Depauperate plants of other species (e.g. *X. media*, *X. fulva*, *X. pumilio*) sometimes produce inflorescences with the dimensions of *X. minor*, and are thus mistaken for it. They are distinguished, however, by their leaf, bracts, and flower characters. The fruit of *X. minor* are also often distinctively curved with the apices pointing upwards. There are 2 geographically separate subspecies with some overlap of characters.

Packing-bracts ±shortly acute, subglabrous to fringed with hairs, abaxial surface glabrous; petals white to cream (N.S.W.)

22a. subsp. minor

Packing-bracts ±acute, medium hairy on margins and abaxial surface; petals yellow (Vic. & S.A.)

22b. subsp. lutea

22a. *Xanthorrhoea minor* R.Br. subsp. *minor*

Cluster-bracts usually prominent for at least part of spike. Packing-bracts ±shortly acute; margins usually fringed with hairs; abaxial surface usually glabrous. Petals broad, with proboscis, white to cream.

Occurs mainly in the central coast and tableland areas of N.S.W., in the area bounded by Gosford, Lithgow and Cambelltown; possibly also present in north and south coastal areas. Usually grows on poorly drained sites which are seasonally waterlogged, very often in clay soils. Flowers Oct.–Nov. Map 210.

N.S.W.: East Hills, *H.S.McKee* 789 (NSW); Agnes Banks, *R.Coveny* 8437, *D.Benson* & *H.Bryant* (NSW); Gladesville, *H.Deane* NSW 59870 (NSW); Glenbrook, *W.Forsyth* NSW 25003 (NSW); between Euroka clearing and Glenbrook, Lower Blue Mountains Natl Park, *D.Bedford* 7949 (SYD).

There is some variability within this subspecies. Some plants (including the lectotype at BM) have quite hairy bracts, while other plants (such as an R.Brown collection at K) have less hairy, longer and more acute bracts.

22b. *Xanthorrhoea minor* subsp. *lutea* Bedford, *Fl. Australia* 46: 228 (1986)

T: 3 miles [c. 5 km] SSW of Nowa, Vic., 29 Oct. 1964, *E.F.Constable* 5341; holotype: NSW.

Cluster-bracts sometimes prominent, often obscure. Packing-bracts ±acute, medium hairy on margins and abaxial surface. Petals very broad, sometimes with proboscis, yellow.

Occurs in Vic. from the N.S.W./Vic. border to Naracoorte in south-eastern S.A. Flowers Mar.–Apr. Map 211.

Vic.: Kiewa valley, *J.R.Grigg* NSW 75660 (NSW); Park Orchards, North Ringwood, 18 Nov. 1969, *O.McHaffie* (MEL); Oakleigh, 11 Nov. 1893, *A.Morrison* (AD); near Bellbrae, c. 11.3 km N of Anglesea, 31 Jan. 1965, *L.A.S.Johnson* (NSW).

23. *Xanthorrhoea bracteata* R.Br., *Prodr.* 288 (1810)

T: probably Port Dalrymple [George Town], Tas., *R.Brown Iter Australiense* 5772; holo: BM.

Trunk none; stem branched below ground; crowns 1 to many, each a \pm erect tuft. Leaves \pm very depressed-cuneate or very depressed-obtrullate in T.S., 2.2–2.8 mm wide, 1–1.5 mm thick; ? green and not glaucous. Scape 30–50 cm long, 5–8 mm diam. Spike c. $\frac{1}{3}$ as long as scape, 10–18 cm long, 14–22 mm diam. Cluster-bracts prominent, triangular to narrowly triangular, glabrous to very slightly subglabrous. Packing-bracts triangular to narrowly triangular, glabrous to very slightly subglabrous. Sepals triangular, beaked, without proboscis, glabrous. Petals reflexed, often without proboscis, glabrous except papillose hairs at apex. Fig. 38H–K.

Occurs from Waterhouse in north-eastern Tas. south to Hobart, in heathlands and low-lying sandy places. Flowers Jan.–Feb. Map 212.

Tas.: near Clarence Point, West Tamar, 19 Mar. 1975, *D.I.Morris* (HO); Badger Head Road, *D.I.Morris* 79154 (AD, HO); c. 1 km W of Bridport, *M.Bennett* NSW 72396 (NSW); Bridport, Jan. 1948, *M.Hart* (BRI, HO); Waterhouse, 1 Feb. 1961, *W.D.Jackson* (HO).

Although Brown stated that the type was collected at Port Jackson, all later specimens which correspond with the type are from eastern Tas. This strongly indicates that Brown collected the type from Port Dalrymple, now George Town.

A.T.Lee, *Contr. New South Wales Natl Herb.* 4: 46 (1966), reduced this taxon to synonymy with *X. minor*. It is very similar to the latter, but is morphologically and geographically distinct and worthy of specific rank.

24. *Xanthorrhoea caespitosa* Bedford, *Fl. Australia* 46: 226 (1986)

T: Meningie, S.A., 13 Nov. 1957, *J.B.Cleland s.n.*; holo: AD 966081326.

[*X. australis* auct. non R.Br.: J.M.Black, *Fl. S. Australia* 3rd edn, 1: 361 (1978)]

Trunk none; stem many-branched below ground; crowns many, each an uneven open tuft. Leaves very depressed-cuneate in T.S., sometimes concave above, 3.2–7 mm wide, 1–2 mm thick, grey, glaucous. Scape 90–120 cm long, 10–17.5 mm diam. Spike c. $\frac{1}{3}$ – $\frac{1}{2}$ as long as scape, 45–65 cm long, 22–28 mm diam. Cluster-bracts prominent, narrowly triangular, subglabrous to fringed with hairs. Packing-bracts narrowly triangular to subulate, fringed with hairs to moderately hirsute. Sepals acute, with beak, without proboscis, distal $\frac{1}{3}$ subglabrous to fringed with hairs. Petals \pm erect to recurved, with large proboscis, distal $\frac{1}{3}$ hirsute with short papillose hairs.

Occurs in SE and Murray regions of S.A. near or within the triangle bounded by Meningie, Mt Gambier and Bordertown. Flowers Oct.–Dec. Map 213.

S.A.: Dark Island Heath, 14.4 km NE of Keith, *R.Specht & P.Rayson* 16 (AD); 48.8 km from Salt Creek on road to Meningie, *D.Bedford* 121 (NSW); Fairview, c. 22 km from Naracoorte and c. 16 km N of Lucindale, *J.Cleland* AD 98309269 (AD); road from Millicent to Kingston, 16.7 km from Millicent, *D.Bedford* 118 (NSW).

In the past some specimens of this species have been identified as *X. australis* in S.A., while others have been ascribed to a putative hybrid swarm between *X. australis* and *X. minor*, see A.T.Lee, *Contr. New South Wales Natl Herb.* 4: 54 (1966). The fruit are sometimes distinctively curved so that the apices point upwards.

25. *Xanthorrhoea arenaria* Bedford, *Fl. Australia* 46: 225 (1986)

T: c. 5 km NW of Coles Bay township, Tas., 26 Jan. 1984, *D.Bedford* 124; holo: NSW.

Trunk none; stem usually branched below ground; crowns 1 to many, each an upright tuft. Leaves depressed-obtrullate to depressed-cuneate in T.S., 2–3 mm wide, 1–1.7 mm thick, sometimes slightly greyish, glaucous. Scape 20–60 cm long, 5–9 mm diam. Spike shorter than scape, occasionally equal to scape, 7–30 cm long, 18–24 mm diam. Cluster-bracts very prominent, elongated, subulate, glabrous. Packing-bracts subulate,

glabrous. Sepals triangular to narrowly triangular, with very long beak, with proboscis, glabrous. Petals erect to slightly recurved, with proboscis, glabrous except papillose hairs at apex and on proboscis.

Occurs on the N and NE coast of Tas., usually in low-lying sandy areas. Flowers June–Jan. Map 214.

Tas.: E of Tamar R., *M.Cameron* (AD, HO); Tam O'Shanter Bay, W of Weymouth, *M.Bennett* NSW 72129 (NSW); South Croppies Point, *Honeysett 'B'* NSW 77853 (NSW); 5 km from Cape Portland, *E.Rodway* NSW 61296 (NSW); NE coast of Tas., June 1951, *G.Sharman* (HO).

A.T.Lee, *Contr. New South Wales Natl Herb.* 4: 54 (1966), regarded this taxon as representing a hybrid between *X. minor* and *X. australis*.

26. *Xanthorrhoea semiplana* F.Muell., *Fragm.* 4: 111 (1864)

T: near Gawler, S.A., ? Nov. 1851, *F.Mueller*; lecto: MEL 625756, *fide* D.Bedford, *Fl. Australia* 46: 229 (1986).

Trunk to 6 m long; crowns 1 to many, each an even sphere. Leaves narrowly transverse-rhombic to very depressed-cuneate in T.S., 5–12 mm wide, c. 2.5 mm thick, bluish, very glaucous. Scape 80–120 cm long, rarely to 2 m, 20–45 mm diam. Spike 1.5–2 times as long as scape, 150–250 cm long, rarely to 4 m, 30–45 mm diam. Cluster-bracts obscure. Packing-bracts subulate, glabrous. Sepals shortly acute to acute, beaked, without proboscis, glabrous. Petals recurved, with proboscis, glabrous except short hairs at apex.

Occurs on the Eyre, Yorke and Fleurieu Peninsulas, Kangaroo Island, and south-eastern S.A., and probably in central-western Vic. Flowers Oct.–Nov. There are 2 subspecies.

Spike relatively short and slender, 150–200 cm long, c. 30 mm diam.; trunk to 1 m long

26a. subsp. semiplana

Spike relatively long and stout, 235–265 cm long, 40–45 mm diam.; trunk 1–5 m long

26b. subsp. tateana

26a. *Xanthorrhoea semiplana* F.Muell. subsp. *semiplana*

Trunk absent or to 1 m long. Scape 1–1.2 m long, c. 20 mm diam. Spike 150–200 cm long, c. 30 mm diam.

Occurs on the Fleurieu Peninsula, south-eastern S.A., and probably western Vic. Map 215.

S.A.: c. 3 km SE of Willunga, 4 July 1957, *R.Hill* (AD); 3 km SSW of Currency Ck, *H.Eichler* 15018 (AD); Tooperang, near Mt Compass, Oct. 1951, *C.M.Eardley* (AD); Mt Lofty Botanic Garden, *J.R.Wheeler* 121 (AD); 14 km from Strathalbyn on road to Goolwa, *D.J.Bedford* 122 (NSW).

26b. *Xanthorrhoea semiplana* subsp. *tateana* (F.Muell.) Bedford, *Fl. Australia* 46: 229 (1986)

X. tateana F.Muell., *Z. Allg. Osterr. Apotheker-Vereines* 23: 294 (1885). T: Kangaroo Island, S.A., 1883, *Somerville & Wilks*; lecto: MEL 625766, *fide* D.Bedford, *Fl. Australia* 46: 229 (1986).

Trunk 1–5 m long. Scape c. 90 cm long, c. 45 mm diam. Spike 235–265 cm long, 40–45 mm diam. Fig. 37F.

Occurs on the Eyre, Yorke and Fleurieu Peninsulas and on Kangaroo Is., S.A. Map 216.

S.A.: near Pearson Is., off W coast of Eyre Peninsula, May 1959, *J.B.Cleland* (AD); Marble Ra., Eyre Peninsula, *E.N.S.Jackson* 3617 (AD); Yacca Flat, Kangaroo Is., *H.Eichler* 15115 (AD); near Kelly Hill Natl Park, Kangaroo Is., *D.J.Bedford* 104 (NSW).

27. *Xanthorrhoea australis* R.Br., *Prodr.* 288 (1810)

T: Grass Tree Hill, near Risdon Cove, Tas., Feb. 1804, *R.Brown Iter Australiense* 5775; holo: BM.

Trunk to 3 m; stem often branched; crowns 1 to many, each with young leaves in erect tuft, spreading with age; old leaves often reflexed, crown \pm spherical. Leaves quadrate-rhombic to transverse-rhombic in T.S., occasionally depressed-obtrullate, 1.2–3 mm wide, 1–2.2 mm thick, blue-grey, glaucous. Scape 30–50 cm long, 18–40 mm diam. Spike 2–6 times as long as scape, 110–180 cm long, rarely to 2.5 m, 50–80 mm diam. Cluster-bracts very prominent, elongated, subulate, glabrous. Packing-bracts elongated, subulate, glabrous. Sepals triangular to narrowly triangular, with long beak, with proboscis, glabrous. Petals erect to slightly recurved, with proboscis, glabrous except papillose hairs at apex. Figs 37R, 38R–S.

Occurs in northern and eastern coastal Tas. from Rocky Cape to N. Bruny Is., in south-eastern S.A. west to Lucindale, in Vic. south of Wangaratta, and in N.S.W south of Nowra. Flowers July–Dec. Map 217.

S.A.: road to Glencoe, *D.Bedford* 116 (NSW). N.S.W.: Mt Bumbo Fire Trail, Dampier State Forest, W of Bodalla, *E.F.Constable* 448 (NSW). Vic.: SE corner of Glenelg Natl Park, *D.Bedford* 115 (NSW). Tas.: Sisters Ck, *D.Martin* NSW 67463 (NSW); road to Sloop Rock and the Gardens, 3 km N of the Binnalong Bay turnoff, *D.Wolfe* NSW 66053 (NSW).

A.T.Lee, *Contr. New South Wales Natl Herb* 4: 52–53 (1966), described two subspecies of *X. australis*, but the species is here restricted to its typical form. *X. australis* subsp. *acaulis* is described above as *X. acaulis*. The *X. australis* subsp. *australis* (western form) of S.W.L.Jacobs & J.Pickard, *Pl. New South Wales* 59 (1981), is described above as *X. glauca* subsp. *angustifolia*.

28. *Xanthorrhoea acanthostachya* Bedford, *Nuytsia* 5: 317 (1985)

T: Chatfield Road, South Western Highway, c. 16 km N of North Dandalup, W.A., 24 Nov. 1982, *D.J.Bedford* 4 & *T.D.Macfarlane*; holo: NSW; iso: PERTH.

Trunk to 1.5 m long; crowns 1 or 2, \pm hemispherical. Leaves quadrate-rhombic in T.S., 2–2.3 mm wide, 1.5–2 mm thick, green to slightly blue-green, slightly glaucous. Scape 40–50 cm long, 7–16 mm diam. Spike \pm equal in length to scape, 40–50 cm long, 20–40 mm diam. Cluster-bracts very prominent, rarely only slightly prominent, very elongated, subulate, glabrous, sometimes subglabrous. Packing-bracts subulate or almost so, often twisted or folded, glabrous to subglabrous. Sepals shortly acute, beaked, without proboscis, glabrous. Petals \pm erect, sometimes beaked, with proboscis, glabrous except hairs in beak. Figs 37Q, 39G–L.

Occurs in the Perth region, W.A., on the coastal plain and slopes of the Darling Scarp. Grows in lateritic soil and in grey sand overlain with lateritic gravel. Flowers Aug.–Nov. Map 218.

W.A.: Harvey Dam Reserve, *T.D.Macfarlane* 659 (PERTH); Keysbrook, Nov. 1900, *W.V.Fitzgerald* (NSW); c. 8 km E of Mogumber, 25 Aug. 1970, *K.M.Allan* (PERTH).

An uncommon species known from few collections. The only species in W.A. with very prominent cluster-bracts, and a distinctively prickly flowering spike.

Doubtful name

Xanthorrhoea undulatifolia Riccob., in L.H.Bailey, *Stand. Cycl. Hort.* 6: 3522 (1917).

T: not designated.

Insufficiently described.

10. CALECTASIA

A.S. George

Calcectasia R.Br., *Prodr.* 263 (1810); from the Greek *calos* (beautiful) and *ectasia* (stretching out), in reference to the attractive perianth.

Type: *C. cyanea* R.Br.

Perennial herbs with rhizomes, erect stems and wiry roots. Leaves sessile, alternate, linear, the base indurated and closely sheathing stem, persistent. Flowers bisexual, sessile, solitary, terminal, surrounded by scarious bracts, scentless. Sepals and petals united in tube in lower half, the lobes spreading horizontally, stiffly scarious, blue or purple, variously pubescent outside. Stamens inserted at base of perianth lobes; anthers attached near base, linear, conspicuously exserted, yellow, often turning orange, red or brown. Style slender, exserted, turned to one side, exceeding stamens; stigma simple; ovary 1-locular; ovules 3, basally attached. Fruit indehiscent, enclosed in persistent, faded perianth.

A genus of 3 species, 2 endemic in south-western W.A., 1 in south-eastern S.A. and western Vic. Easily recognised by the short pungent leaves and star-like blue or purple perianth. A chromosome number $n = 9$ for *C. cyanea* s. lat. was given by Anway (1969) but without citing a voucher.

G.Bentham, *Calectasia* (in Juncaceae), *Fl. Austral.* 7: 120–121 (1878); J.C.Anway, The evolution and taxonomy of *Calectasia cyanea* R.Br. (Xanthorrhoeaceae) in terms of its present-day variation and cytogenetics, *Austral. J. Bot.* 17: 147–159 (1969).

- | | | |
|----|--|---------------------------------|
| 1 | Perianth tube 5–8 mm long; lobes 6–11 mm long; anthers turning orange or red | 1. <i>C. cyanea</i> |
| 1: | Perianth tube 9–12 mm long; lobes 10–17 mm long; anthers remaining yellow or turning brown | |
| 2 | Staminal filaments 3–4 mm long; basal anther lobes obtuse; anthers remaining yellow; rhizome less than 2 cm long, the stems clustered (W.A.) | 2. <i>C. grandiflora</i> |
| 2: | Staminal filaments 1–1.5 mm long; basal anther lobes acute; anthers turning brown; rhizome spreading, up to 50 cm long (S.A., Vic.) | 3. <i>C. intermedia</i> |

1. *Calectasia cyanea* R.Br., *Prodr.* 264 (1810)

T: Princess Royal Harbour, King George Sound, [W.A.], Dec. 1801, *R. Brown*; lecto: BM *n.v.*, *fide* J.C. Anway, *Austral. J. Bot.* 17: 157 (1969).

Illustration: R.Brown in M.Flinders, *Voy. Terra Australis*, App. t. 9 (1814).

Rhizomes very short. Stems to 50 cm long, often caespitose, with many short lateral branches or sometimes openly branched. Leaf lamina 5–15 mm long, pungent, glabrous, scabrid or pubescent. Perianth tube 5–8 mm long; lobes 6–11 mm long, iridescent blue and fading or sometimes deep blue turning reddish purple. Staminal filaments 2–3 mm long; anthers yellow turning orange or red, the basal lobes obtuse. *Blue Tinsel Lily*. Fig. 41.

Widespread in south-western W.A. from the lower Murchison River to the Fitzgerald River, extending inland to Lake Grace and Lake King. Grows in sand, sometimes in gravelly sand, in heath and in low open woodland. Flowers June–Oct. Map 219.

W.A.: Burma Road (SE of Walkaway), *A.M.Ashby 1670* (AD, PERTH); Beckenham (suburb of Perth), *G.J.Keighery 6281* (PERTH); c. 2 km N of Boyanup, *J.C.Anway 232* (AD, NSW, PERTH); c. 59 km N of Albany on Chester Pass road, *J.C.Anway 257* (AD, NSW, PERTH); 11 km N of Cataby, Brand Hwy, *J.W.Wrigley 75/95* (CBG).

A variable species that, with further study, may prove to include several taxa, in particular an openly-branched variant found in southern areas between Albany and Lake King. Some northern specimens are densely pubescent.

2. *Calectasia grandiflora* Preiss, in J.G.C.Lehmann, *Pl. Preiss.* 2: 53 (1846)

T: Darling Range, near Perth, W.A., 1839, *L.Preiss* 1975; iso: MEL.

Rhizomes very short. Stems to 40 cm long with rather open short lateral branches. Leaf lamina 5–15 mm long, pungent to almost obtuse, often scabrid especially on margins, otherwise glabrous. Perianth tube 9–11 mm long; lobes 13–17 mm long, deep iridescent blue or purple, turning reddish purple. Staminal filaments 3–4 mm long; anthers remaining yellow, the basal lobes obtuse. *Blue Tinsel Lily*. $2n = 36$, *fide* G.J.Keighery, *Feddes Repert.* 95: 526 (1984) as *C. cyanea*.

Widespread in south-western W.A. from Albany to Esperance, extending inland to Lake Grace and Hyden, with outlying populations near Badgingarra, Mogumber, Perth, Collie and Tammin. Grows in sand, sandy loam and gravelly sand in heath, rarely in woodland. Flowers June–Oct. Map 220.

W.A.: Armadale, *J.C.Anway* 224 (AD, NSW, PERTH); Salt River Road, Stirling Ra., *A.M.Ashby* 1995 (AD, PERTH); Lucky Bay, *E.M.Scrymgeour* 902 (PERTH); c. 17 km E of Newdegate, *J.C.Anway* 297 (AD, NSW).

Less variable than the smaller-flowered *C. cyanea* but the indumentum of the leaf-sheaths and perianth varies. A population near Badgingarra (*A.S.George* 16311, PERTH) has perianth lobes 11 mm long but is otherwise typical.

3. *Calectasia intermedia* Sonder, *Linnaea* 28: 222 (1856)

C. cyanea var. *intermedia* (Sonder) Anway, *Austral. J. Bot.* 17: 158 (1969). T: between the Grampians and Victoria Range, Vic., Nov. 1853, *F.Mueller*; holo: MEL.

Illustration: E.R.Rotherham *et al.*, *Fl. Pl. Victoria* 39, t. 78 (1968).

Rhizomes spreading, up to 50 cm long. Stems not clustered, to 50 cm tall, openly branched. Leaf lamina 5–17 mm long, pungent, finely scabrid on margins, otherwise glabrous. Perianth tube 10–12 mm long; lobes 10–15 mm long, deep iridescent blue. Staminal filaments 1–1.5 mm long; anthers yellow turning golden-brown, the margins sometimes remaining yellow, basal lobes acute. *Blue Tinsel Lily*.

Occurs in south-eastern S.A. and western Vic., in sand and sandy loam or sometimes rocky soil, in open woodland and heath. Flowers mainly Sept.–Oct. Map 221.

S.A.: c. 24 km W of Penola, *R.Hill* 1102 (AD); Penola–Dergholm road, c. 3 km W of Vic. border, *H.Eichler* 18349 (AD). Vic.: Serra Road, 7 km E of Victoria Valley Road, Grampians, *M.G.Corrick* 8451 (CBG, MEL); Mt Zero road, Grampians, 30 Oct. 1960, *M.E.Phillips* (CBG).

Although very close to *C. grandiflora* this taxon is restored to specific rank on the basis of its long-rhizomatous habit, short staminal filaments and anthers with acute basal lobes. It is geographically isolated from the two western species.

HANGUANACEAE

H.J.Hewson

Dioecious perennial herbs, robust, erect, terrestrial or aquatic, rhizomatous, sometimes stoloniferous particularly when aquatic, hairy, predominantly with branched hairs sometimes set in pits; stems solid. Leaves mostly basal; petiolar base expanded and stem-clasping; blade lanceolate, acute, rolled unilaterally in bud; midrib strong; venation pinnate-parallel with tertiary cross veins. Flowers small, regular, solitary or clustered, subsessile to sessile in large, bracteate, terminal pedunculate panicles. Sepals 3. Petals 3, similar to sepals. Stamens 6; staminodes present in female flowers. Ovary superior with 3 fused carpels, trilocular with axile placentation, rudimentary in male flowers; stigma sessile. Fruit drupaceous. Seeds 1–3, endospermic.

A monogeneric family with 1 or 2 species from Ceylon through Malesia to Australia; 1 native species in Australia.

The classification of *Hanguana* presents some difficulty. It is frequently included in the Flagellariaceae. Airy Shaw (1978), who described the family, suggested possible relationships with the Arecaceae, while A.Cronquist, *An Integrated System of Classification of Flowering Plants* 1222–1223 (1981), noted similarities with *Lomandra* in the Xanthorrhoeaceae.

C.A.Backer, in Flagellariaceae, *Fl. Males.* 4: 248–250 (1951); H.K.Airy Shaw, Three interesting plants from the Northern Territory of Australia (Thymelaeaceae, Flacourtiaceae & Hanguanaceae), *Kew Bull.* 33: 1–5 (1978).

HANGUANA

Hanguana Blume, *Enum. Pl. Javae* 15 (1827); from an Indonesian (Sundanese) name of the plant (*hanguan kassintu*).

Type: *H. kassintu* Blume = *H. malayana* (Jack) Merr.

Hanguana malayana (Jack) Merr., *Philippines J. Sci.* 10 (Bot.): 3 (1915)

Veratrum malayanum Jack, *Malayan Misc.* 1: 25 (1820). T: native of Pulau Pinang, collector unknown; n.v.

Susum anthelminthicum Blume ex Schultes & J.H.Schultes, in J.J.Roemer & J.A.Schultes, *Syst. Veg.* 7: 1493 (1830); *Susum malayanum* f. *aquatica* Backer, *Handb.* 3: 3 (1924), based on *S. anthelminthicum*; *Hanguana malayana* subsp. *anthelminthica* f. *aquatica* (Backer) Airy Shaw, *Kew Bull.* 33: 4 (1978) nom. inval. T: Java, Blume s.n.; n.v.

Illustration: R.M.T.Dahlgren *et al.*, *The Families of Monocotyledons* fig. 63 (1985).

Plant variable; aquatic forms robust, to 2 m tall; terrestrial forms smaller, to 1 m tall. Leaves stiff, erect to spreading, to 1.2 m long and 15 cm wide. Panicle (without peduncle) to 1.2 m long, 1–3 times branched. Sepals shortly connate at base, ovate to broadly ovate, 2–2.5 mm long, green or yellow. Petals 2.5–3 mm long, sometimes red-dotted. Male flowers: stamens inserted on base of sepals and petals, c. equal to petals; filaments filiform from broad base. Female flowers: staminodes dimorphic, antherless; ovary globose; stigma deeply 3-lobed. Drupe almost black with fleshy exocarp and thin-walled endocarp. Fig. 40A–B.

Occurs in rainforest or swamps in Arnhem Land and offshore islands, N.T., and on Cape York Peninsula, Qld. Map 222.

N.T.: Croker Island, 28 Nov. 1973, *B.Forster* ♀ (BRI). Qld: Snake Creek, *B.Hyland* 9020 ♀ (BRI).



Figure 40. A–B, *Hanguana malayana*, female flowers. A, whole flower $\times 5$; B, L.S. flower with pistil removed to show staminodes $\times 7.5$ (Croker Is., N.T., B.Forster, BRI). C–F, *Tacca*. C–E, *T. maculata*. C, inflorescence $\times 0.4$; D, laminar part of leaf $\times 0.4$ (C–D, D.McKenzie 710209–710213, CANB); E, flower dissected to show stamen structure $\times 5$ (near Cotton Gin, Kununurra, W.A., R.Petheram, PERTH). F, *T. leontopetaloides*, one branch of laminar part of leaf $\times 0.4$ (D.McKenzie 690302–690304, CANB).

TACCACEAE

H.J.Hewson

Perennial herbs with starch-rich rhizomes or tubers. Leaves radical; petiole erect with a sheathing base, usually solid; lamina entire or divided, declinate; nerves pinnate or palmate; venation reticulate. Inflorescence a cymose umbel on a leafless scape with involucre bracts and with or without filiform 'floral bracts'. Flowers bisexual, epigynous, regular, pedicellate. Sepals 3, \pm petaloid, sometimes connate at base. Petals 3, similar to sepals. Stamens 6, inserted on sepals and petals; filaments short, flattened, somewhat petaloid, forming a hood; anther fused to adaxial surface within hood, introrse, opening by slits. Nectaries present or absent. Carpels 3, unilocular with parietal placentation; style short, simple with 3 somewhat petaloid, incurved, cordate stigmas. Fruit a berry, rarely a loculicidal capsule. Seeds 10 to many, endospermic; embryo small with lateral cotyledon and terminal plumule.

A family of 1 genus and 11 species, pantropical; 2 species native in northern Australia.

Tacca is a genus with a range of morphological variation which has resulted in a very large number of names in synonymy. Drenth (1973) considered that all material in Australia belonged to one species. Two species are recognised here, however, based on leaf morphology and inflorescence structure. Further studies are required particularly of the 'floral bracts' and pollination mechanisms. Earlier workers have regarded the 'floral bracts' as aborted pedicels rather than true bracts. Either way, they seem to be involved in pollination which is reported by Drenth to be by flies. Chemotaxonomic studies may also prove fruitful.

G.Bentham, *Taccaceae*, *Fl. Austral.* 6: 458–459 (1873); W.Limpricht, *Taccaceae*, *Pflanzenr.* 92: 1–42 (1928); E.Drenth, A revision of the family Taccaceae, *Blumea* 20: 367–405 (1973); E.Drenth, *Taccaceae*, *Fl. Males.* ser. 1. 7: 806–819 (1976).

TACCA

Tacca Forster & G.Forster, *Char. Gen. Pl.* 69, t. 35 (1775) *nom. cons.*; derivation not known, possibly based on a Malayan name for one species of the genus.

Type: *T. pinnatifida* Forster & G.Forster = *T. leontopetaloides* (L.) Kuntze

Leaf-lobes lanceolate or ovate; 'floral bracts' usually 1 per flower

1. *T. leontopetaloides*

Leaf-lobes linear; 'floral-bracts' c. 2 or 3 per flower

2. *T. maculata*

1. *Tacca leontopetaloides* (L.) Kuntze, *Revis. Gen. Pl.* 2: 704 (1891)

Leontice leontopetaloides L., *Sp. Pl.* 1: 313 (1753). T: from India, *J.Amman*; *n.v.*

T. pinnatifida Forster & G.Forster, *Char. Gen. Pl.* 70, t. 35 (1775). T: Tahiti, *Forster s.n.*; *n.v.*

T. brownii Seemann, *Fl. Vitiensis* 100 (1866); *T. pinnatifida* var. *brownii* (Seemann) Bailey, *Compr. Cat. Queensland Pl.* 548, fig. 534 (1913). T: North Australia, *R.Brown*; iso: BM, E, K, P, all *n.v.*, *fide* E.Drenth, *Blumea* 20: 377 (1973).

T. pinnatifida subsp. *interrupta* Warb. ex Limpr., *Beitr. Taccac.* 56 (1902). T: Port Darwin, N.T., *Holtze 191*; syn: G, WRSL, both *n.v.*; Cooktown, Qld, *Warburg 18406*; syn: BM *n.v.*; all *fide* E.Drenth, *Blumea* 20: 377 (1973).

T. pinnatifida var. *paeoniifolia* Domin, *Biblioth. Bot.* 85: 533 (1915); *T. brownii* var. *paeoniifolia* (Domin) Limpr., *Pflanzenr.* 92: 30 (1928). T: Cape False near Yarraba, Qld, Jan. 1910, *K.Domin*; *n.v.*

T. pinnatifida var. *per magna* Domin, *Biblioth. Bot.* 85: 532 (1915). T: Russell River, Qld, Jan. 1910, *K.Domin*; *n.v.*



Figure 41. *Calectasia cyanea*.
Photograph — A.George.

Figure 42. *Tacca maculata*.
Photograph — G.Keighery.



Figure 43. *Ripogonum fawcettianum*.
Photograph — M.Fagg.

Figure 44. *Dioscorea transversa*.
Photograph — M.Fagg.

Illustrations: R.M.T.Dahlgren & H.T.Clifford, *The Monocotyledons* fig. 101C–M (1982); R.M.T.Dahlgren *et al.*, *The Families of Monocotyledons* fig. 45C–M (1985).

Leaves few; petiole to 1.5 m long, usually less than 1 m; lamina trisect at base, irregularly pinnate and pinnatisect or pinnatifid; lobes variable within and between plants, from narrowly lanceolate and c. 2–3 mm long to broadly ovate and c. 10 cm long, with rounded to acuminate apex. Inflorescence scapes 1 or 2, to 1.7 m long; involucral bracts 4–12, lanceolate to ovate, 1–4 cm long, usually entire; flowers 20–40; pedicels to 6 cm long; 'floral bracts' c. 20–40, filiform, mostly 10–15 cm long. Sepals lanceolate, c. 6 mm long, 1–1.5 mm wide, yellow, green or purple-green. Petals 1.5–2 mm wide. Style c. 2 mm long, with 3 glandular knobs at base. Fruit ribbed, ovoid, c. 2.5 cm long, crowned with persistent perianth, indehiscent. Seeds many. Fig. 40F.

Occurs in tropical regions from Africa and Madagasca through India and SE Asia to the Pacific islands. In Australia it occurs from the Kimberley in W.A. through northern N.T. to northern Qld and its offshore islands from Cape York Peninsula south almost to Rockhampton. Grows in poorly drained and well-drained loams or soil occasionally subject to flooding. Map 223.

W.A.: near Amax Campsite, 14°51'S, 125°55'E, *K.F.Kenneally* 6975 (PERTH). N.T.: Little Lagoon, Groote Eylandt, *R.L.Specht* 206 (CANB). Qld: Mt Croll, Coen, *E.M.Howard* 805 (BRI); Mission Beach, *T.Stanley* 8036A (BRI).

Meal from the tubers of this species is used as arrowroot in several parts of the world. In N.T. and Qld the Aborigines have eaten the tubers and the fruit (spitting out the seeds).

2. *Tacca maculata* Seemann, *Fl. Vitiensis* 103 (1866)

T. pinnatifida subsp. *maculata* (Seemann) Limpr., *Beitr. Taccac.* 56 (1902); *T. pinnatifida* var. *maculata* (Seemann) Domin, *Biblioth. Bot.* 85: 534 (1915); *T. pinnatifida* var. *aconitifolia* F.Muell. ex Benth., *Fl. Austral.* 6: 459 (1873) based on *T. maculata* Seemann. T: Moturiki and other islands, Fiji, *B.C.Seemann* 632; syn: A, BM, C, G, P, all *n.v.*; same locality, *B.C.Seemann* 909; syn: BM *n.v.*; northern Australia, *F.Mueller*; syn: *n.v.*; all *fide* E.Drenth, *Blumea* 20: 377 (1973).

Leaves few; petiole to 1.9 m long, usually more than 1 m; lamina initially trisect then irregularly dissected, often trichotomously; lobes linear, attenuate. Inflorescence scape to 2 m long; involucral bracts 3 or 4, lanceolate to ovate, frequently bi- or trifold at tip; flowers 20–40 on pedicels to 5 cm long; 'floral bracts' c. 40–100, filiform, mostly 10–15 cm long. Sepals and petals similar, c. 5 mm long, 2.5 mm wide, green outside, maroon inside. Style c. 2 mm long, with 3 glandular patches at base. Fruit rounded, ovoid, 2–3 cm long, crowned with persistent perianth. Seeds many. Figs 40C–E, 42.

Occurs in Fiji, Samoa and Australia, from the Kimberley in W.A. through to the Victoria River region of N.T. Tends to grow in well-drained lateritic soils. Map 224.

W.A.: 16 km SE of Mitchell Plateau Mining Camp, 14°50'S, 125°54'E, *A.S.George* 14514 (PERTH); Packsaddle Creek, Carr Boyd Ra., 15°56'S, 128°40'E, *T.G.Hartley* 14338 (CANB); near Amax Camp, Mitchell Plateau, 14°49'S, 125°51'E, *K.F.Kenneally* 7141 (CANB, PERTH); near Wyndham, 15°12'S, 128°25'E, *K.Paijmans* 2358 (CANB); near Cotton Gin, Kununurra, *R.J.Petheram* 267 (PERTH).

The flowers of this species are thought to open at night only.

STEMONACEAE

I.R.H.Telford

Herbs, rarely (not in Australia) shrubs, with erect, trailing or twining stems, often annual from perennating rhizomes or swollen roots. Leaves alternate, opposite or (not in Australia) whorled, broad, subsessile or petiolate; primary nerves longitudinal; secondary veins transverse, closely parallel. Flowers axillary, solitary or in clusters or cymes, pedicellate, actinomorphic, usually bisexual. Perianth segments 4, rarely (not in Australia) 5, in 2 series, usually petaloid. Stamens 4, rarely (not in Australia) 5, mostly in 2 series, inserted at base of perianth; filaments short, broad; anthers 2-locular, dehiscent longitudinally; connectives broad, usually with apical appendages. Ovary superior, rarely half-inferior, 1-locular; placentation usually basal; ovules anatropous, 2 to many; stigma sessile or subsessile. Fruit a capsule, 2-valved. Seeds 1 to many, with hilum or funicle appendages; endosperm copious.

A family of 4 genera and c. 45 species, mostly tropical or sub-tropical, extending from humid southern and eastern Asia to Australia with 1 species in south-eastern United States; represented in Australia by 1 genus and 4 species. The extra-Australian genera *Croomia* and *Stichoneuron* are sometimes placed in the family Croomiaceae. In some earlier publications, the family Stemonaceae is known as Roxburghiaceae.

G.Bentham, Roxburghiaceae, *Fl. Austral.* 7: 1–2 (1878); A.Engler, Stemonaceae, in H.G.A.Engler & K.A.E.Prantl, *Nat. Pflanzenfam.* 2(5): 8–9 (1887); D.Prairie, Notes on the Roxburghiaceae, *J. Asiat. Soc. Bengal* 73: 39–44 (1904).

STEMONA

Stemona Lour., *Fl. Cochinch.* 401, 404 (1791); from the Greek *stemon* (thread or stamen), referring to the conspicuous coloured stamens of some species.

Type: *S. tuberosa* Lour.

Roxburghia Jones ex Roxb., *Pl. Coromandel* 1: 29, t. 32 (1795). T: *R. gloriosoides* Roxb. = *Stemona tuberosa* Lour.

Inflorescences in axils of leaves or scale leaves on apparently leafless stems. Pedicels articulate, subtended by bracts. Stamens \pm petaloid; filaments connate; connectives broad, keeled, with subulate apical appendages; anthers separated by connective keel, usually with filiform apical appendages connivent at their apices. Capsule ovoid, \pm compressed. Seeds ovoid, on long funicles, the funicle apex with filiform to vesicular appendages.

A genus of c. 30 species from India, southern China and Japan through Malesia to Australia; in Australia, 4 species in northern W.A., N.T. and Qld, 2 apparently endemic.

The 'pedicel' above the articulation represents the slender elongate base of the flower receptacle. Members of the genus are vegetatively similar to species of *Dioscorea*, with which they are often confused. *Stemona* may be distinguished by the close, parallel, transverse veins of the leaves. The species exhibit much variation in leaf morphology making determination difficult without flowering specimens.

The genus is in need of revision, with critical comparison of Malesian and Australian collections.

C.H.Wright, On the genus *Stemona* Lour., *J. Linn. Soc., Bot.* 32: 490–496 (1896).

1 Flowers solitary or clustered

- 2 Stems twining; leaves usually more than 5 cm long; flowers solitary or 2 or 3 per cluster; pedicels 8–30 mm long **1. *S. straliana***
- 2: Stems prostrate or decumbent; leaves usually less than 5 cm long; flowers 2–10 per cluster; pedicels 2–5 mm long **2. *S. prostrata***
- 1: Flowers in cymes or umbels
- 3 Leaves ovate to triangular, cordate, hastate or truncate at base, more than 1 cm wide **3. *S. philippinensis***
- 3: Leaves linear to narrowly ovate, cuneate at base, less than 1 cm wide **4. *S. angusta***

1. *Stemona australiana* (Benth.) C.H.Wright, *J. Linn. Soc., Bot.* 32: 496 (1896)

Roxburghia javanica var. *australiana* Benth., *Fl. Austral.* 7: 1 (1878) *p.p.* T: Port Essington, N.T., A.Armstrong 628: lecto: K, photographs seen, *fide* C.H.Wright, *loc. cit.*, as 'Port Endeavour'.

Stems twining, to 2 m long. Leaves ovate to narrowly ovate, acute or shortly acuminate, cuneate, rounded or cordate at base; lamina 40–75 mm long, 3–35 mm wide, 3–11-nerved; petiole 3–10 mm long. Flowers 1–3 per cluster; pedicels 8–30 mm long. Perianth segments ovate to narrowly ovate, obtuse, mucronate to acute, 10–14 mm long, deep red. Stamens 6–10 mm long; anthers 2–3 mm long; appendages minute, to 1.5 mm long. Fruit not seen. Fig. 45G.

Occurs in coastal and near-coastal areas of the north Kimberley, W.A., N.T. and Cape York Peninsula, Qld; also in New Guinea. Occurs in woodland, open forest, strand forest or on rainforest margins. Map 225.

W.A.: c. 20 km N of Kalumburu Mission, P.A.Fryxell & L.A.Craven 4117 (CANB, PERTH). N.T.: c. 3 km S of Nourlangie Ck, N.Byrnes 1955 (CANB, DNA, NT); Djapididjapin, c. 19 km from Nangalala, H.Reeve 580 (CANB); East Coast road, Murganella, G.Wightman 1063 (DNA). Qld: c. 0.8 km S of Cape York, L.S.Smith 12510 (BRI).

Cape York Peninsula collections exhibit consistently cordate leaves with more numerous veins (7–11) and narrower perianth segments. They approach *S. javanica* (Kunth) Engl. but have 1–3 flowers per cluster, not many flowers as in that species.

2. *Stemona prostrata* Telford, *Fl. Australia* 46: 230 (1986)

T: 5 miles [8 km] NW of Humpty Doo, N.T., 11 Jan. 1972, N.Byrnes & B.McKean 204; holo: CANB; iso: DNA, K, L, NT.

Stems decumbent to prostrate, to 50 cm long. Leaves broadly ovate, acute to acuminate, shallowly cordate, truncate to rounded at base, rarely cuneate; lamina 15–40 mm long, 12–40 mm wide, coriaceous, 3–7-nerved; petiole to 5 mm long or leaves subsessile. Flowers in 2–10-flowered clusters; pedicels 2–5 mm long. Perianth segments narrowly ovate, acute to acuminate, 5–7 mm long, dark red to black. Stamens 5–6 mm long; anthers c. 2 mm long, with appendages c. 2 mm long. Capsule acute, 12–15 mm long. Seeds 1 or 2, 5–7 mm long; appendages c. 5 mm long. Fig. 45A–F.

Endemic in northern N.T.; grows in woodland or open forest with *Eucalyptus tetrodonta* and *E. miniata*, in sandy or lateritic soils. Map 226.

N.T.: Mt Bunday road, near Hwy, N.Byrnes 2071 (BRI, DNA, NT); Woolaning, C.R.Dunlop 5872 & L.Craven (CANB, DNA); 2.5 km W of East Alligator R. crossing on Oenpelli road, I.R.Telford 7738 & J.W.Wrigley (CANB, CBG).

3. *Stemona philippinensis* Merr., *Philipp. Gov. Lab. Bur. Bull.* 6: 16 (1904)

T: Island of Masbate, Philippines, E.D.Merrill 3061; holo: probably PNH *n.v.*; iso: NSW.

Illustration: B.D.Morley & H.R.Toelken (eds), *Fl. Pl. Australia* 342 fig. 204a, b (1983) as *S. australiana*.

Stems twining, to several m long. Leaves ovate to triangular, cordate, hastate to truncate at base, acute to acuminate; lamina 4–16 cm long, 2–9 cm wide, 7–9-nerved, thin to coriaceous; petiole 3–5 cm long. Flowers in 1–5-flowered cymes to 13 cm long, cymes

SMILACACEAE

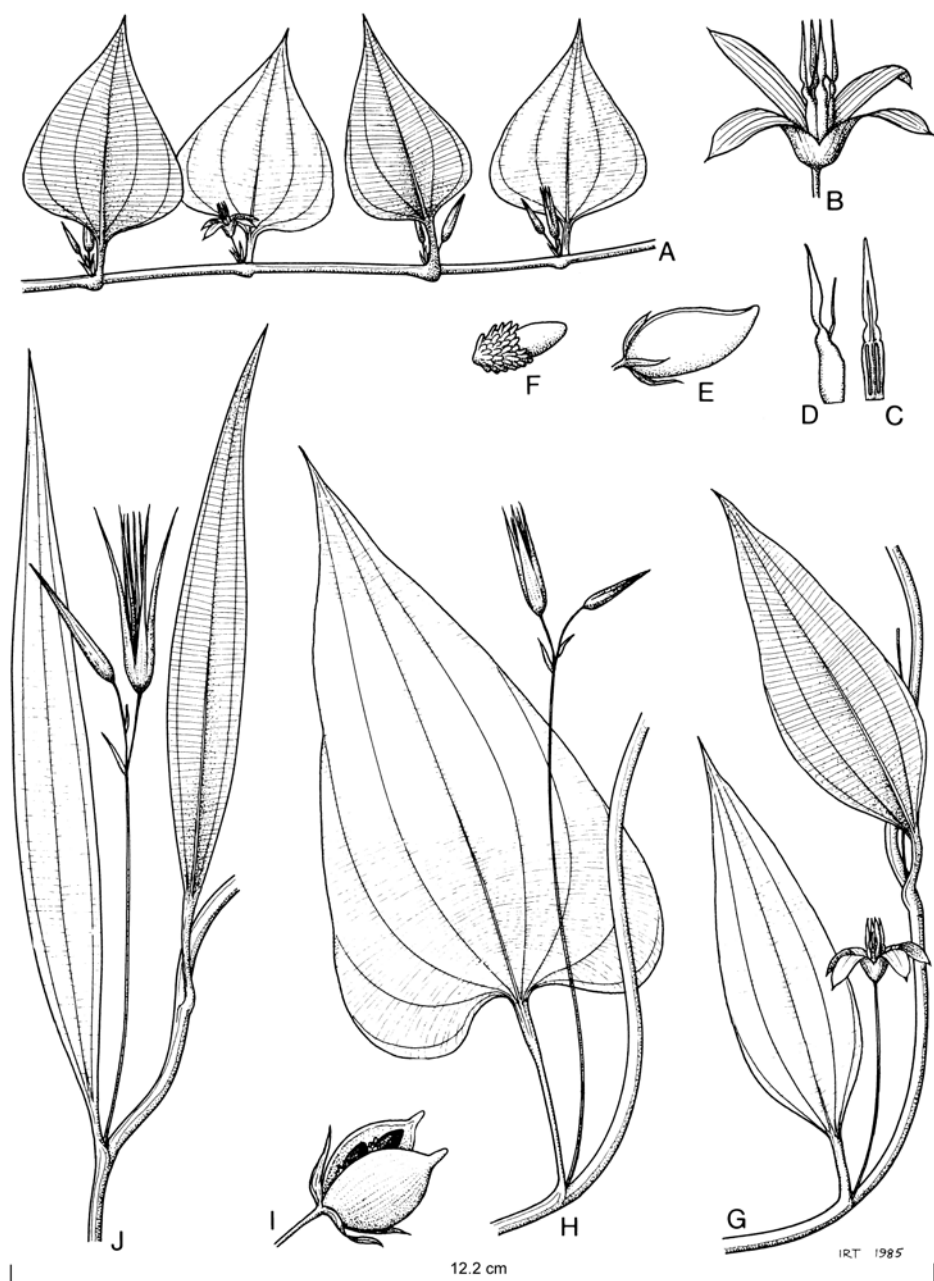


Figure 45. *Stemona*. **A–F**, *S. prostrata*. **A**, flowering stem $\times 1$; **B**, flower $\times 5$; **C**, stamen, front view $\times 6$; **D**, stamen, side view $\times 6$ (A–D, N.Byrnes & McKean B204, NT); **E**, fruit $\times 1.5$; **F**, seed $\times 1.5$ (E–F, I.Telford 7738 & J.Wrigley, CBG). **G**, *S. australiana*, flowering stem $\times 1$ (H.Reeve 580, CANB). **H–I**, *S. philippinensis*. **H**, flowering stem $\times 0.8$ (W.Hinton 70, BRI); **I**, fruit $\times 1.5$ (I.Telford 9376 & G.Butler, CBG). **J**, *S. angusta*, flowering stem $\times 0.8$ (I.Staples 2240, BRI).

often umbel-like, rarely with rachis elongate; peduncle 1–10 cm long; pedicels 6–22 cm long. Perianth segments narrowly ovate, acute to shortly acuminate, 10–15 mm long, dark purplish red. Stamens 10–12 mm long; anthers 2–5 mm long, with appendages 2.5–3.5 mm long. Capsule acute to acuminate, 14–16 mm long. Seeds 6–8, 5–6 mm long; appendages c. 3 mm long. Fig. 45H–I.

Occurs on Cape York Peninsula north of Cooktown, Qld, in open forest, gallery forest or at rainforest margins; also New Guinea and Philippines. Map 227.

Qld: near Coen, *S.T.Blake 14540* (BRI); 4.5 km from Watson R. crossing on Aurukun–Merluna road, *J.R.Clarkson 4064* (BRI, QRS); Black Mtn, c. 23 km SSW of Cooktown, *I.R.Telford 9376* & *G.Butler* (BRI, CBG).

Extremely variable in leaf morphology and inflorescence structure, this may represent a species complex. Additional field studies are needed. This name has not been applied to Australian material previously. Most collections in herbaria have been misplaced under *S. australiana*.

4. *Stemona angusta* Telford, *Fl. Australia* 46: 230 (1986)

T: Kalinga Stn (Hann Telegraph Office), Qld, 6 Jan. 1976, *I.B.Staples 2240*; holo: BRI 248182.

Stems twining. Leaves linear to narrowly ovate, acuminate, cuneate at base; lamina 6–16 cm long, 2–10 mm wide, 3-nerved; petiole 1–5 mm long. Flowers in 1–4-flowered cymes to 10 cm long; peduncle 3–7 cm long; pedicels 15–18 mm long. Perianth segments narrowly ovate, long-acute to acuminate, 25–28 mm long, deep red. Stamens 25–30 mm long; anthers c. 3 mm long, with appendages c. 3 mm long. Capsule acuminate, c. 15 mm long. Seeds 2–4, 5–7 mm long; appendages 1–2 mm long. Fig. 45J.

Known from a single collection from Cape York Peninsula, Qld. Grows in woodland with *Eucalyptus tetrodonta* and *E. dichromophloia* in deep red sand. Map 228.

Doubtful name

Dioscorea lucida R.Br., *Prodr.* 215 (1810)

T: Endeavour R., Qld, *J.Banks* & *D.Solander*; holo: probably BM *n.v.*; iso: NSW.

C.H.Wright, *J. Linn. Soc., Bot.* 496 (1896), placed this in synonymy under *Stemona javanica* (Roxb.) Engl. The type collection is sterile and could be referred to *S. philippinensis* or a Cape York Peninsula variant of *S. australiana*.

SMILACACEAE

J.G.Conran & H.T.Clifford

Perennial or (not in Australia) annual twiners, climbers or shrubs with short rhizomes. Roots fibrous or tuberous. Stems smooth or prickly. Leaves simple, opposite or alternate, rarely whorled, sometimes with stipules adnate to petiole and terminating in tendrils; primary veins convergent; secondary venation usually reticulate. Flowers unisexual or bisexual, in terminal or axillary spikes, racemes, cymes, panicles or umbels, rarely solitary in leaf axils. Sepals 3, free or fused at base. Petals 3, similar to sepals or sometimes fringed. Stamens 6, or (not in Australia) 3 or 9; filaments free or fused at base; anthers unilocular or bilocular, basifixed, dehiscing by slits or pores, introrse, extrorse or latrorse. Ovary superior or inferior, 1–3-locular; ovules 1 to many per locule, placentation axile or parietal; style filamentous or short and thick or sometimes absent; stigma capitate or minutely 3-lobed. Fruit a berry or fleshy capsule. Seeds 1 to many, shiny black or brown, with or without aril. Endosperm starchy or non-starchy.

A family of 11 genera and c. 350 species in the tropics, subtropics and temperate regions; 5 genera (1 endemic) and 15 species in Australia.

G.Bentham, Liliaceae, *Fl. Austral.* 7: 6–10, 17–19 (1863); A. de Candolle, Smilacaceae, *Monogr. Phan.* 1: 1–217 (1878); K.Krause, Die Liliaceen Papuasien II, in C.Lauterbach, Beiträge zur Flora von Papuasien XII, *Bot. Jahrb. Syst.* 59: 562–567 (1925); C.A.Backer & R.C.Bakhuizen van den Brink, Smilacaceae, *Fl. Java* 3: 98–99 (1968); P.B.Tomlinson & E.S.Ayensu, Notes on the vegetative morphology and anatomy of the Petermanniaceae (Monocotyledones), *J. Linn. Soc., Bot.* 62: 17–26 (1969).

KEY TO SUBFAMILIES

- | | | |
|----|--|------------------------------------|
| 1 | Ovary inferior | Subfam. I. PETERMANNIOIDEAE |
| 1: | Ovary superior | |
| 2 | Anthers unilocular | Subfam. II. SMILACOIDEAE |
| 2: | Anthers bilocular | |
| 3 | Flowers disarticulating at base of perianth | Subfam. III. RIPOGONOIDEAE |
| 3: | Flowers disarticulating at some distance along pedicel from perianth | |
| | | Subfam. IV. LUZURIAGOIDEAE |

KEY TO GENERA

- | | | |
|----|--|---------------------------|
| 1 | Ovary inferior | 1. PETERMANNIA |
| 1: | Ovary superior | |
| 2 | Leaves with stipules which usually end in tendrils; anthers unilocular | 2. SMILAX |
| 2: | Leaves without stipules and tendrils; anthers bilocular | |
| 3 | Petals fringed, sepals entire; fruit a capsule | 4. EUSTREPHUS |
| 3: | Sepals and petals entire; fruit a berry | |
| 4 | Leaves with 3–5 convergent primary veins and reticulate secondary venation; style short or absent; seeds brown | 3. RIPOGONUM |
| 4: | Leaves with many parallel veins and a distinct midrib; style filamentous; seeds black | 5. GEITONOPLESIMUM |

Subfam. I. PETERMANNIOIDEAE

Smilacaceae subfam. *Petermannioideae* (Hutch.) Conran & Cliff., *Fl. Australia* 46: 230 (1986).

Petermanniaceae Hutch., *Fam. Fl. Pl., Monocot.* 2: 133 (1934). T: *Petermannia* F.Muell.

Perennial vines with prickly stems. Leaves alternate, lacking stipules; lamina with 3–5 convergent primary veins and reticulate secondary venation. Flowers bisexual, in terminal or leaf-opposed, branched cymes, often sterile, the axes then tendril-like. Sepals and petals similar, red to reddish-green. Anthers unilocular or bilocular, dehiscing by slits, extrorse. Ovary inferior, incompletely 1-locular; ovules numerous, in 2 rows per locule; style erect, filamentous or very short and thick; stigma capitate. Fruit a berry. Seeds numerous, brown. Endosperm not starchy.

A subfamily with 1 monotypic genus endemic in subtropical Australia.

1. PETERMANNIA

Petermannia F.Muell., *Fragm.* 2: 92 (1860) *nom. cons.*; named in honour of Dr August Petermann (1922–1878), German geographer and cartographer.

Type: *P. cirrosa* F.Muell.

Description as for the subfamily but flowers bisexual, style filamentous.

J.Schlittler, Die systematische Stellung der Gattung *Petermannia* F.Muell. und ihre phylogenetischen Beziehungen zu den Luzuriagoideae Engl. und den Dioscoreaceae Lind., *Vierteljahrsschr. Naturf. Ges. Zürich* 94: 1–28 (1949).

Petermannia cirrosa F.Muell., *Fragm.* 2: 93 (1860)

T: Cloud Creek, Grafton–Armidale road, Clarence R., N.S.W., *H.Beckler*; iso: NSW.

Climber to 6 m. Leaves ovate, acute; lamina 40–85 mm long, 15–50 mm wide; petiole c. 5 mm long. Flowers 8–12 mm diam. Sepals and petals 5–7 mm long, 2–4 mm wide, reflexed. Stamens 3–4 mm long; filaments narrow; anthers 1.5–2 mm long. Ovary ovoid, 5–6 mm long, glabrous; style slender; stigma minutely ciliate. Berry 7–18 mm diam., red. Seeds ±globose but somewhat angular; testa hard, rough. $2n = 10$, *fide* J.G.Conran, *Taxon* 34: 346 (1985). Fig. 46.

Uncommon, in closed forest and adjacent eucalypt forest from the MacPherson Ra., south-eastern Qld, to the Macleay R. in northern N.S.W. Map 229.

Qld: Warrie Natl Park, Springbrook Plateau, *J.G.Conran* 96 (BRI). N.S.W.: Point Lookout, *J.Williams* 689 (NSW).

Subfam. II. SMILACOIDEAE

Smilacaceae subfam. *Smilacoideae*.

Liliaceae subfam. *Smilacoideae* Engl., *Fuhrer Garten Breslau* 26 (1886); *Liliaceae* trib. *Smilaceae* Benth., *Fl. Austral.* 7: 3 (1878).

Type: *Smilax* L.

Dioecious perennial climbing vines with prickly or smooth stems. Leaves alternate; petiole often with ±well-developed adnate stipules usually ending in tendrils; lamina with 3–7 prominent converging primary veins and reticulate secondary venation. Flowers unisexual, in axillary or terminal, pedunculate, cymose umbels or umbellate panicles. Sepals and petals similar, or sepals longer or fused at base and petals reduced, green, white, pink or purple. Anthers unilocular, dehiscing by slits or pores, latrorse. Ovary superior, 3-locular; ovule 1, rarely 2, per locule; stigma sessile, minutely 3-lobed. Fruit a berry. Seeds 1 to few, brown. Endosperm not starchy.

A subfamily of 3 genera and c. 340 species in the tropics, subtropics and temperate regions; 1 genus and 7 species in Australia.

2. SMILAX

Smilax L., *Sp. Pl.* 2: 1028 (1753); *Gen. Pl.* 5th edn, 455 (1754); the name of an ancient Greek plant possibly belonging to this genus.

Type: *S. aspera* L.

Description as for the subfamily.

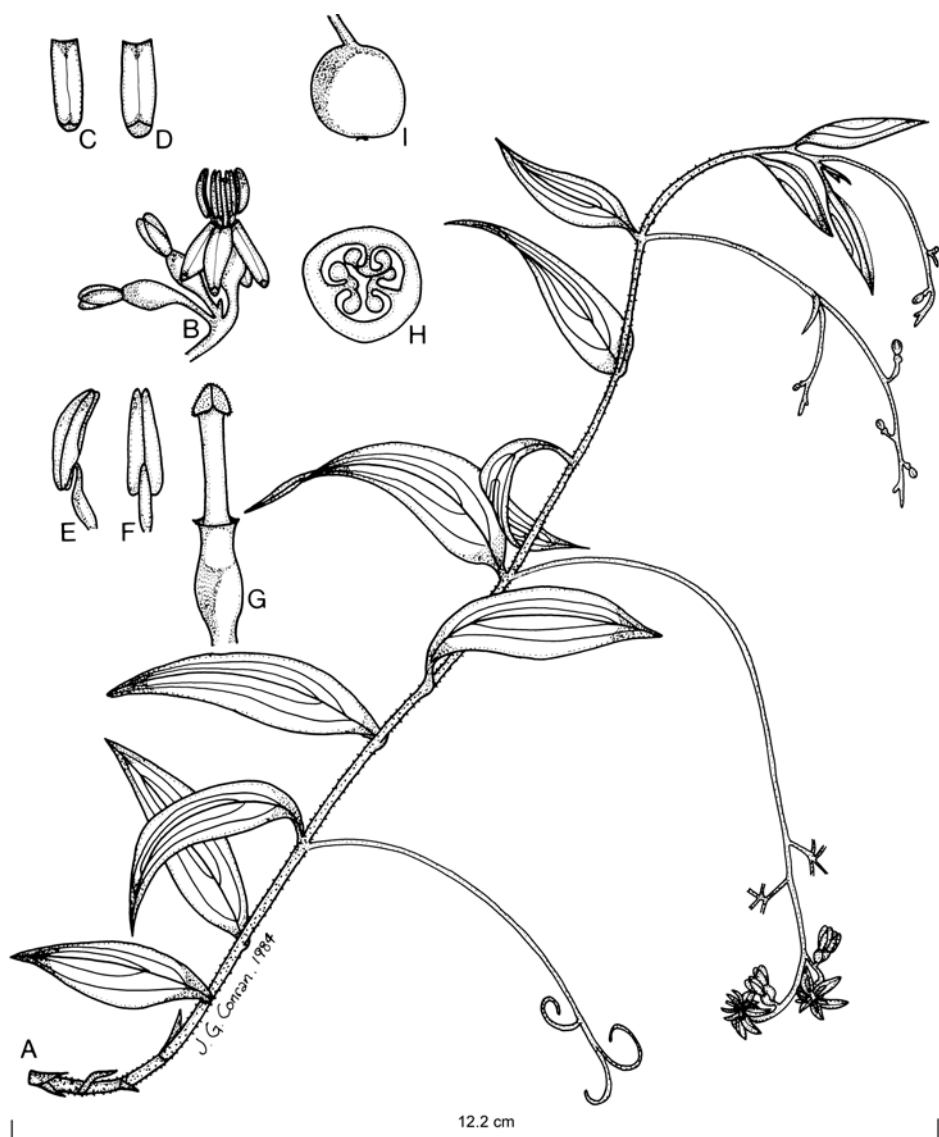


Figure 46. *Petermannia cirrosa*. **A**, flowering branch $\times 0.8$; **B**, flower and buds $\times 1$; **C**, sepal $\times 1.5$; **D**, petal $\times 1.5$; **E**, stamen, side view $\times 3$; **F**, stamen, front view $\times 3$; **G**, pistil $\times 3$; **H**, T.S. ovary $\times 6$ (A–H, J.Conran 96, BRI); **I**, fruit $\times 0.8$ (Springbrook, Qld, J.Conran, BRIU).

A largely pantropical genus of over 300 species with some temperate species in Asia, North America and Europe. In Australia 7 species, from the Kimberley region of W.A. along the north and east coast to E Gippsland in Vic.

G.Bentham, *Smilax* (in Liliaceae), *Fl. Austral.* 7: 6–8 (1863); T.Koyama, On the identity of *Smilax blumei* A.DC., *J. Jap. Bot.* 35: 148–154 (1960); T.Koyama, Materials towards a monograph of the genus *Smilax*, *Quart. J. Taiwan Mus.* 8: 1–62 (1980).

- | | | |
|----|--|-----------------------------------|
| 1 | Abaxial leaf-surface glaucous | |
| 2 | Stipules inflated; leaves 3–5-nerved | 6. <i>S. leucophylla</i> |
| 2: | Stipules not inflated, scarcely visible; leaves 3–nerved | 2. <i>S. glycopylla</i> |
| 1: | Abaxial leaf-surface not glaucous | |
| 3 | Leaves coriaceous, thick | 1. <i>S. australis</i> |
| 3: | Leaves chartaceous, thin | |
| 4 | Stem densely prickly | 5. <i>S. aculeatissima</i> |
| 4: | Stem scarcely or not prickly | |
| 5 | Buds globose; tendrils absent | 4. <i>S. kaniensis</i> |
| 5: | Buds elongate; tendrils present | |
| 6 | Stipules inflated; leaves 3–7-nerved | 7. <i>S. blumei</i> |
| 6: | Stipules little or not inflated; leaves usually 3–nerved | 3. <i>S. calophylla</i> |

1. *Smilax australis* R.Br., *Prodr.* 293 (1810)

T: Port Jackson, N.S.W., *R.Brown*; *n.v.*

S. elliptica R.Br., *Prodr.* 293 (1810). T: tropical Australia, *R.Brown*; *n.v.*

S. latifolia R.Br., *Prodr.* 293 (1810). T: tropical Australia, *R.Brown*; *n.v.*

S. spinescens Miq., *Linnaea* 18: 83 (1844). T: New South Wales, herb. *Watson*; *n.v.*

S. latifolia var. *crassinervia* A.DC., *Monogr. Phan.* 1: 182 (1878). T: eastern Australia, *Hügel*; *n.v.*

Climber to c. 7 m; stems to 5 mm diam., prickly or occasionally glabrous. Leaves coriaceous, lanceolate to broadly elliptic or ovate, 5-nerved; lamina 5–15 cm long, 3–10 cm wide; abaxial surface not glaucous; petiole 5–15 mm long, twisted; stipules narrow to broad, sometimes inflated, with tendrils. Inflorescence simple or branched, axillary; pedicels 15–25 mm long. Flowers green, sometimes reddish in bud; buds oblong. Male flowers 6–7 mm diam.; sepals and petals 5 mm long, recurved; stamens 6–7 mm long; anthers 1–1.5 mm long. Female flowers 5–6 mm diam.; sepals and petals 4–5 mm long, slightly recurved; ovary ovoid, 3–4 mm long, glabrous; stigma minutely ciliate. Berry 6–10 mm diam., black. Seeds 1 or 2, ±globose or flattened, dark brown. *Austral Sarsaparilla*. Fig. 47.

Common in northern W.A. and N.T. and eastern Australia from Cape York, Qld, to E Gippsland, Vic. Map 230.

N.T.: 6 km W of Pine Creek Township, *M.Lazarides* & *L.G.Adams* 235 (CANB). Qld: State Forest Reserve 99, *L.S.Smith* 10162 (BRI). N.S.W.: Mungo Brush, 32°32'S, 152°18'E, *A.N.Rodd* 3729 (NSW). Vic.: Bonang Highway, 1 km NW of Brown Mtn, *H.Van Rees* 69 (MEL).

A highly variable species with several taxa described on the basis of variation in leaf shape. Further detailed studies are needed to resolve this problem satisfactorily. The species is sometimes cultivated. Infusions of the leaves have been used medicinally.

2. *Smilax glycopylla* Smith, in J.White, *Voy. New South Wales* 230 (1790), as *S. glycopylla*

T: Port Jackson, N.S.W., *J.White*; *n.v.*

[*Ripogonum album* auct. non R.Br.: F.W.Sieber ex K.S.Kunth, *Enum. Pl.* 5: 161 (1850)]

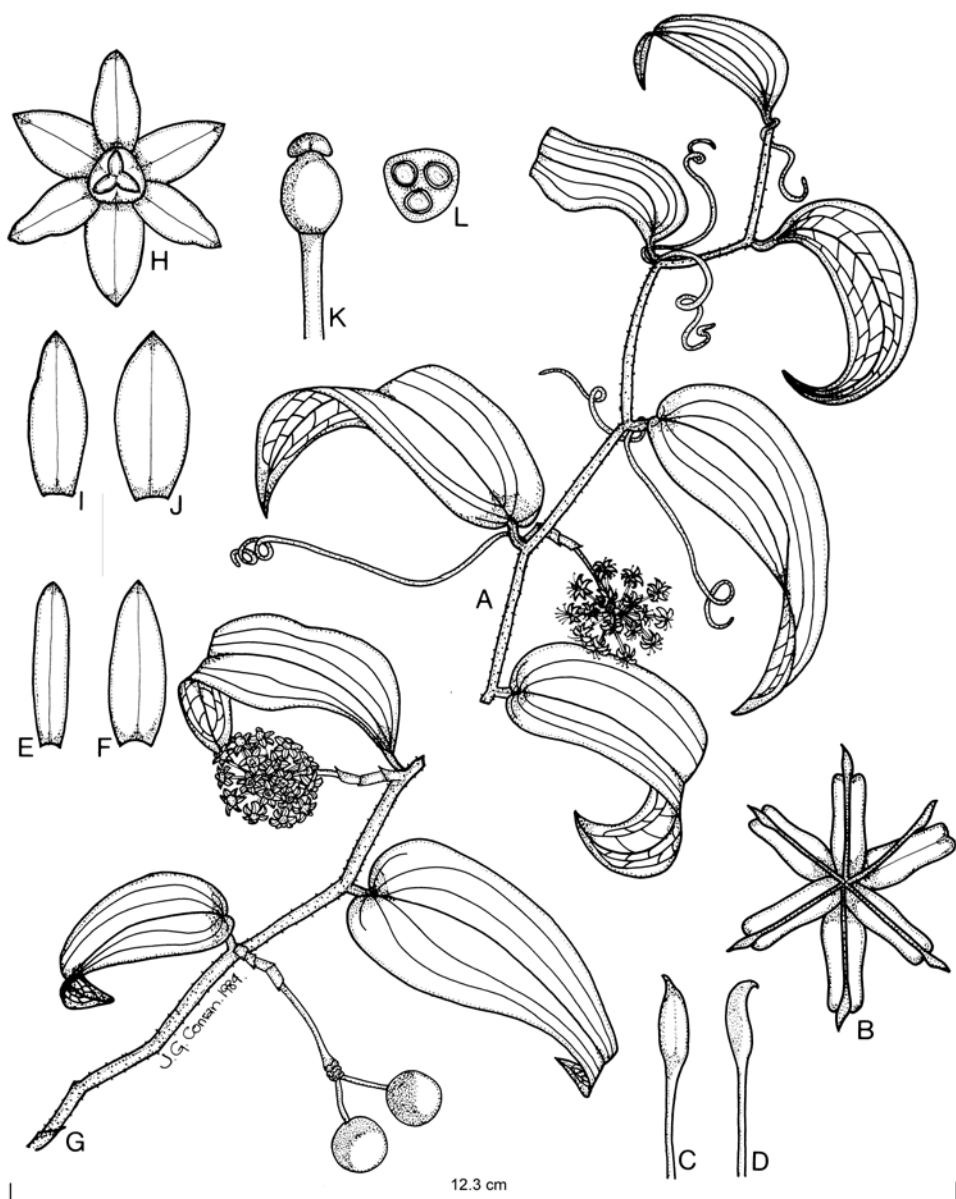


Figure 47. *Smilax australis*. A–F, male plant. A, flowering branchlet $\times 0.8$; B, flower $\times 3$; C, stamen, front view $\times 4.5$; D, stamen, side view $\times 4.5$; E, sepal $\times 4$; F, petal $\times 4$ (A–F, J.Conran 224, BRIU). G–L, female plant. G, flowering and fruiting branchlet $\times 0.8$; H, flower $\times 3$; I, sepal $\times 4$; J, petal $\times 4$; K, pistil $\times 3$; L, T.S. ovary $\times 5$ (G–L, J.Conran 223, BRIU).

Climber to 4 m; stems 3–4 mm diam., glabrous. Leaves chartaceous, narrowly lanceolate to ovate, 3-nerved; lamina 4–10 cm long, 1.5–4 cm wide, green above, glaucous-grey below; petiole 5–10 mm long, twisted; stipules not inflated, with tendrils. Inflorescence a terminal panicle of umbels, or umbels single and axillary; pedicels 4–6 mm long. Flowers scarcely opening, 3–4 mm diam., white to cream, globose in bud; sepals and petals 3–4 mm long, the petals narrower. Male flowers: stamens 1–1.5 mm long; anthers almost sessile, 0.5 mm long. Female flowers: ovary ovoid, 2–3 mm long; stigma minutely ciliate. Berry 6–10 mm diam., black. Seed 1, rarely 2, ±globose, dark brown. *Sweet Sarsaparilla*.

Common in eastern Australia from far N Qld to Termeil, N.S.W. Map 231.

Qld: Little Ramsay Bay, Hinchinbrook Is., *P. Sharpe 1638* (BRI). N.S.W.: Huskisson, Jervis Bay, *F.A. Rodway 1657* (NSW).

Readily distinguished from *S. leucophylla* by the smaller leaves, without inflated stipules. *S. glycyphylla* appears very closely related to *S. purpurata* Forster from New Caledonia, and further study may show the two to be conspecific. The species is sometimes cultivated. Infusions of the leaves have been used medicinally.

3. *Smilax calophylla* Wallich ex A.DC., *Monogr. Phan.* 1: 60 (1878)

T: Singapore, *N. Wallich; n.v.*

Climber to c. 3 m; stems 3–4 mm diam., glabrous to prickly. Leaves chartaceous, narrowly oblong to obovate, usually 3-nerved; lamina 5–20 cm long, 2–15 cm wide, dark green above, paler below; petiole 8–15 mm long, often keeled on abaxial surface, slightly twisted; stipules slightly inflated, with tendrils. Inflorescence a simple, axillary umbel; pedicels 15–25 mm long, recurved. Flowers 5–7 mm diam., green, elongate in bud; sepals and petals 4–5 mm long, slightly recurved. Male flowers: stamens 6–7 mm long; anthers 1–1.5 mm long. Female flowers: ovary ovoid, 2–3 mm long, glabrous; stigma minutely ciliate. Berry 6–12 mm diam., black. Seeds 1 or 2, ±globose or flattened, dark brown.

Occurs in Malesia and north-eastern Australia; sparsely distributed in wet forests in Qld from Cape York almost to the N.S.W. border. Map 232.

Qld: 16°0'S, 142°2'E, 11 Oct. 1982, *K.A.W. Williams* (BRI).

Closely allied to *S. australis*, but differs in the chartaceous leaves with 3 nerves (occasionally 5 on large specimens) and inconspicuous secondary venation. The taxon is highly variable in leaf size and shape, but no clear infraspecific taxa seem to be recognisable. Further studies are needed to resolve this matter. The species is sometimes cultivated.

4. *Smilax kaniensis* Krause, *Bot. Jahrb. Syst.* 54: 563 (1925)

T: Kani Ranges, Papua New Guinea, *R. Schlechter 17663; n.v.*

Climber to c. 2 m; stems 2–4 mm diam., unarmed. Leaves stiffly chartaceous, lanceolate to linear-lanceolate, 3-nerved; lamina 8–15 cm long, 1.8–3.5 cm wide, dark green above, paler below, veins on lower surface raised; petiole 10–15 mm long, slightly twisted; stipules slightly or not inflated, without tendrils. Inflorescence simple or branched, axillary; pedicels 6–10 mm long. Flowers green, ovoid-globose in bud. Male flowers with elongate filaments and anthers 1 mm long. Female flowers not known in mature state. Berry 6–10 mm diam., bright red. Seeds 1 to few, ±globose, dark brown.

Occurs on Cape York Peninsula, Qld, and in Papua New Guinea. Map 233.

Qld: c. 37 km NNE of Arukun, *J.R. Clarkson 4348* (BRI).

The species has distinctively long, narrow leaves, apparently lacks tendrils and has short peduncles and pedicels. The description is partly based on New Guinea material and partly on the description given by Krause.

5. *Smilax aculeatissima* Conran, *Fl. Australia* 46: 231 (1986)

T: Johnson River, Qld, Aug. 1916, *H.G.Hadbrook*; holo: BRI.

Climber to c. 5 m; stems yellowish, 3–7 mm diam., densely prickly. Leaves chartaceous, broadly ovate-lanceolate to elliptic, 5-nerved; lamina 7–22 cm long, 2.5–9 cm wide, dark green above, pale green below; petiole 25–45 mm long; stipules slightly inflated, without tendrils. Inflorescence simple or branched, axillary; pedicels 15–25 mm long. Flowers 5–7 mm diam., green, oblong in bud; sepals and petals 4–5 mm long, recurved. Male flowers: stamens 5–7 mm long; anthers 1–1.5 mm long. Female flowers: ovary ovoid, 2–3 mm long, glabrous; stigma minutely ciliate. Berry 6–12 mm diam., black. Seeds 1 or 2, subglobose or flattened, dark brown.

Occurs in rainforests around Innisfail and on the Atherton Tableland, N Qld. Map 234.

Qld: Yungaburra, 1918, *C.T.White* (BRI).

Readily identified by the densely prickly, yellowish stems and the large, broadly ovate-lanceolate to elliptic, dark green leaves. Further studies are needed to ascertain its relationships.

6. *Smilax leucophylla* Blume, *Enum. Pl. Javae* 1: 18 (1827)

T: from Java, *collector unknown*; n.v.

[*S. glycopylla* auct. non Smith: B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 341, fig. 203a (1983)]

Climber to c. 20 m; stems 5–10 mm diam., sparsely armed, reddish. Leaves coriaceous, broadly ovate to ovate-oblong, 3–5-nerved; lamina 10–32 cm long, 4–22 cm wide, reddish above, glaucous beneath, veins on lower surface raised; petiole 20–40 mm long; stipules inflated, with tendrils. Inflorescence branched, axillary; pedicels 9–16 mm long. Flowers 7–9 mm long, greenish-white, oblong in bud. Male flowers with filamentous stamens. Female flowers with 3–6 staminodes; ovary ovoid, 3–4 mm long, glabrous. Berry c. 10 mm diam., black. Seeds 2 or 3.

Known from a single collection from northern Australia; also in SE Asia, Malasia and Papua New Guinea. Map 235.

Northern Australia and/or Asia: without locality or collector, ex herb. *R.D.Schomburgh* (AD).

This species can be clearly distinguished by the large, coriaceous, glaucous leaves with prominent inflated stipules. *S. leucophylla* is illustrated in Morley & Toelken, *loc. cit.*, as a fruiting specimen of *S. glycopylla* in error, since both species were mounted on the same sheet from the Schomburgh Herbarium. The above description was based partly on New Guinea material and the descriptions given by C.A.Backer & R.C.Bakhuizen van den Brink, *Fl. Java* 3: 99 (1968), and T.Koyama, *Quart. J. Taiwan Mus.* 8: 27 (1980).

7. *Smilax blumei* A.DC., *Monogr. Phan.* 1: 202 (1878)

T: from Java, *C.L.Blume*; holo: BO n.v., *fide* T.Koyama, *Jap. J. Bot.* 35: 155 (1960).

Climber to c. 20 m; stems 5–10 mm diam., sparsely armed. Leaves chartaceous, ovate-elliptic, 3–7-nerved; lamina 13–25 cm long, 8–17 cm wide, dark green above, paler below; petiole c. 15–30 mm long; stipules inflated, with tendrils. Inflorescence simple or branched, axillary; pedicels 15–25 mm long. Flowers c. 10 mm long, greenish-white, oblong in bud. Male flowers with filamentous stamens; anthers 1.5 mm long. Female flowers not known. Berry 8–12 mm diam., dark purple to black. Seeds 1 to few, ±globose to flattened, dark brown.

Known only from a few collections from far north Qld; also in SE Asia, Malaysia and Papua New Guinea. Map 236.

Qld: Baileys Ck, c. 12 km ENE of Daintree, *L.S.Smith 11580* (BRI).

This species somewhat resembles *S. leucophylla* in leaf shape, but can be distinguished by the chartaceous texture and non-glaucous leaf undersurface. Description based partly on

New Guinea material and partly on the description given by T.Koyama, *Quart. J. Taiwan Mus.* 8: 10 (1980).

Subfam. III. RIPOGONOIDEAE

Smilacaceae subfam. *Ripogonoideae* (Conran & Cliff.) Conran & Cliff., *Fl. Australia* 46: 230 (1986).

Ripogonaceae Conran & Cliff., *Nordic J. Bot.* 5: 215–219 (1985). T: *Ripogonum scandens* Forster & G.Forster.

Perennial, erect or climbing vines or shrubs with smooth or prickly stems. Leaves alternate, opposite or whorled, lacking stipules; lamina with 3–5 convergent primary veins and reticulate secondary venation. Flowers bisexual or (not in Australia) unisexual, in axillary spikes or racemes or terminal racemose panicles; flowers disarticulating at base of perianth. Sepals and petals similar, white to pale green or yellow. Anthers bilocular, dehiscent by slits or pores, latrorse. Ovary superior, 3-locular; ovules 2 per locule; style very short and thick or absent; stigma minutely 3-lobed. Fruit a berry. Seeds 1 to few, brown. Endosperm starchy.

A subfamily with 1 genus and 6 species in subtropical and tropical Australia, Papua New Guinea and New Zealand.

3. RIPOGONUM

Ripogonum Forster & G.Forster, *Char. Gen. Pl.* 49, t. 25 (1776); from the Greek *rhops* (wickerwork) and *gonia* (corner or joint), in reference to the many-jointed stalks giving the plants the common name supplejacks.

Type: *R. scandens* Forster & G.Forster

Description as for subfamily.

A genus of 6 species, 1 each in New Zealand and Papua New Guinea and 5 (4 endemic) in eastern Australia from Cape York, Qld, to E Gippsland, Vic.

G.Bentham, *Rhipogonum* (in Liliaceae), *Fl. Austral.* 7: 8–10 (1863).

1 Stems pubescent

2 Ovary pubescent

1. *R. elseyanum*

2: Ovary glabrous

2. *R. fawcettianum*

1: Stems glabrous

3 Leaves more than 3 times longer than broad

3. *R. discolor*

3: Leaves less than 3 times longer than broad

4 Flowers sessile; leaves acute

4. *R. brevifolium*

4: Flowers pedicellate; leaves shortly attenuate

5. *R. album*

1. *Ripogonum elseyanum* F.Muell., *Fragm.* 1: 44 (1858)

T: eastern Australia, *C.Moore*; holotype: MEL.

Vine to c. 8 m; stems stout, rusty tomentose, often sparsely prickly. Leaves opposite, elliptic, acute or bluntly cuspidate, tapering or slightly cordate at base; lamina 9–18 cm long, 4–6 cm wide; petiole 5–8 mm long, twisted, densely tomentose. Inflorescence tomentose, axillary; pedicels absent or 1–2 mm long. Flowers numerous, 10–15 mm diam., white to pale cream. Sepals 5–7 mm long, 3 mm wide. Petals 6–8 mm long, 3–4 mm wide. Stamens 5–6 mm long; filaments 1–2 mm long; anthers 4–5 mm long. Ovary

ovoid, 3–4 mm long, densely pubescent, pale rusty; style 0.5–1 mm long. Berry 6–15 mm diam., black. Seeds 1 to few, ovoid, 5–10 mm long, yellow-brown. *Hairy Supplejack*.

Uncommon in rainforest on the Atherton Tableland in north Qld, and from Kin Kin and Cooroy, to Dorrig, N.S.W. Map 237.

Qld: Topaz, near Malanda, *L.S.Smith* 3290 (BRI); State Forest 234, West Cooroy, 17 Sept. 1975, *R.Henderson* (BRI). N.S.W.: Mt Nardi, NE of Nimbin, *H.Salasoo* 4497 (NSW).

2. *Ripogonum fawcettianum* F.Muell. ex Benth., *Fl. Austral.* 7: 9 (1878)

T: Mackay River, N.S.W., *R.Fitzgerald*; lecto: MEL, *fide* H.T.Clifford, *Fl. Australia* 46: 231 (1986); Richmond River, N.S.W., *C.Fawcett*; syn: MEL.

Shrub or climber to c. 4 m; stems rusty tomentose-hirsute, with or without prickles. Leaves opposite, lanceolate, acute to cuspidate, cordate at base; lamina 6–10 cm long, 3–3.5 cm wide; petiole 4–7 mm long. Inflorescence axillary; pedicels 2–5 mm long. Flowers numerous, 10 mm diam., pale cream to white. Sepals c. 4 mm long, 2 mm wide. Petals 4–5 mm long, 2–2.5 mm wide. Stamens 2–3 mm long; filaments 0.5–1 mm long; anthers 1.5–2.5 mm long. Ovary ovoid, 2 mm long, glabrous; style 1–1.5 mm long; stigma capitate. Berry 8–12 mm diam., black. Seeds ovoid, 1 to few, 5–7 mm long, yellow-brown. *Small Supplejack*. Fig. 43.

Uncommon in rainforest from the MacPherson Ra., south-eastern Qld, to Gosford, N.S.W. Map 238.

Qld: Lamington Natl Park, 1 Feb. 1976, *H.Simpson* (BRI). N.S.W.: between Megan and Brooklana, near Coopernook Ck, *H.Salasoo* 4675 (NSW).

3. *Ripogonum discolor* F.Muell., *Fragm.* 7: 78 (1870)

T: Clarence River, N.S.W., *H.Beckler*; holotype: MEL.

Shrub or stout climber to 4 m; stems glabrous, with or without prickles. Leaves opposite, oblong, bluntly acute; lamina to 20 cm long, 3–5 cm wide; petiole 5–7 mm long. Inflorescence axillary; pedicels absent or 1–2 mm long. Flowers numerous, 20–30 mm diam., pale green to white. Sepals 7–9 mm long, 3–4 mm wide. Petals 7–9 mm long, 2.5–3.5 mm wide. Stamens 12–15 mm long; filaments 6–8 mm long; anthers 6–8 mm long. Ovary ovoid, 4–5 mm long, glabrous; style short; stigma capitate or absent. Berry 8–20 mm diam., black. Seed 1, ovoid, 6–12 mm long, pale yellow-brown, drying dark brown. *Prickly Supplejack*. Fig. 48.

Uncommon in rainforest from the MacPherson Ra., south-eastern Qld, to the Manning R., far northern N.S.W. Map 239.

Qld: Springbrook, 9 Sept. 1931, *W.Rudder* (BRI). N.S.W.: Gibbergunyah Ra., *L.S.Smith* 5120 (BRI).

4. *Ripogonum brevifolium* Conran & Cliff., *Fl. Australia* 46: 231 (1986)

T: Stony Ck, 4 km E of Didcot, Biggenden Shire, Qld, 23 Aug. 1983, *P.I.Forster* 1692; holotype: BRI.

Shrub or stoutly branched climber to c. 10 m; stems glabrous, with or without prickles. Leaves opposite or alternate, elliptic, acute, tapering at base; lamina 5–10 cm long, 2–3 cm wide; petiole 4–6 mm long. Inflorescence axillary, with few to numerous sessile flowers. Flowers 8–12 mm diam., cream to white. Sepals 6–8 mm long, 3.5–5 mm wide. Petals 6–8 mm long, 3–4.5 mm wide. Stamens 6–9 mm long; filaments 1–2 mm long; anthers 5–7 mm long. Ovary ovoid, 2.5–4 mm long, glabrous; style 1–2 mm long; stigma capitate. Berry 8–20 mm diam., black. Seeds 1 to few, ovoid, 5–10 mm diam., pale yellow-brown, drying dark brown.

A rainforest vine occurring from Cape York, Qld, to central N.S.W. Map 240.

Qld: Imbil, Wide Bay District, *C.T.White* 11415 (BRI). N.S.W.: Upper Richmond R., Sept. 1900, *W.Forsyth* (NSW); Rivertree area, c. 62 km E of Liston, *S.Clark, J.Pickard & R.Coveny* 1770 (BRI, NSW).

5. *Ripogonum album* R.Br., *Prodr.* 293 (1810)

T: Hawkesbury River, Port Jackson, N.S.W., *R. Brown*; syn: MEL.

R. moorianum F.Muell., *Fragm.* 1: 44 (1858). T: subtropical Australia, *C. Moore*; *n.v.*

R. danesii Domin, *Repert. Spec. Nov. Regni Veg.* 10: 60 (1911). T: Mt Bellenden-Ker, Qld, Jan. 1910, *K. Domin* & *J.V. Danes*; holo: PR.

R. papuanum C. White, *Proc. Roy. Soc. Queensland* 34: 18 (1923). T: between Kunbunah and Fofofoto, New Guinea, Aug. 1918, *C.T. White* 687; holo: BRI.

R. album var. *leptostachya* Benth., *Fl. Austral.* 7: 9 (1878). T: Rockingham Bay, Qld, 30 June 1864, *J. Dallachy*; *n.v.*

Vine to 20 m; stems stout, glabrous, sparsely prickly or unarmed. Leaves whorled, opposite or alternate, elliptic, caudate to bluntly cuspidate, gradually tapering at base; lamina 8–17 cm long, 2.5–5.5 cm wide; petiole 6–13 mm long, often twisted. Inflorescence axillary or terminal; pedicels 2–7 mm long. Flowers numerous, 6–10 mm diam., white to pale cream or pale green. Sepals and petals 6–8 mm long, 3–4 mm wide. Stamens 7–9 mm long; filaments 2–4 mm long; anthers 4–6 mm long. Ovary ovoid, 2–3 mm long, glabrous; style 2–3.5 mm long; stigma capitate. Berry 6–15 mm diam., black. Seeds 1 to few, ovoid, 5–10 mm long, yellow-brown. *White Supplejack*.

Common in rainforest from Cape York, Qld, to E Gippsland, Vic., and in upland Papua New Guinea, often forming large tangled clumps. Map 241.

Qld: end of Davies Ck Rd, near Kuranda, 23 Jan 1962, *L.J. Webb* & *J.G. Tracey* (BRI, CANB). N.S.W.: upper Allyn, *A. Rodd* 1026 (NSW).

Subfam. IV. LUZURIAGOIDEAE

Smilacaceae subfam. *Luzuriagoideae* (Engl.) Cliff. & Conran, *Fl. Australia* 46: 231 (1986).

Liliaceae subfam. *Luzuriagoideae* Engl., *Führer Garten Breslau* 26 (1886). T: *Luzuriaga radicans* Ruiz Lopez & Pavón.

Perennial vines or shrubs with smooth or prickly stems. Leaves alternate, lacking stipules and tendrils; lamina sometimes resupinate, with convergent or (not in Australia) reticulate venation. Flowers bisexual, in reduced axillary or terminal cymes or in cymose panicles; flowers disarticulating at some distance from perianth base. Sepals and petals similar or the petals sometimes fringed. Anthers bilocular, dehiscing by apical pores or (not in Australia) longitudinal slits, introrse. Ovary superior, 3-locular; ovules numerous, in 2 rows per locule; style filamentous; stigma capitate. Fruit a berry or fleshy capsule. Seeds 1 to few, black, shiny or (not in Australia) yellow drying brown. Endosperm not starchy.

A subfamily of 4 genera and 6 species in southern Africa, South America, New Zealand, Australia, New Caledonia and SE Asia; 2 genera in Australia.

4. EUSTREPHUS

Eustrephus R.Br. ex Ker Gawler, *Bot. Mag.* 31: t. 1245 (1809); *Luzuriaga* sect. *Eustrephus* (R.Br. ex Ker Gawler) H. Hallier, *Nova Guinea*, 8 Bot.: 992 (1914); from the ancient Greek *eustrephus* (well twisted) referring to its climbing habit.

Type: *E. latifolius* R.Br. ex Ker Gawler

Luzuriaga Poiret, *Encycl. Suppl.* 3: 535 (1923). T: *L. angustifolia* Poiret

Spiranthera Raf., *Fl. Tellur.* 4: 31 (1838), *nom. illeg.* non Hook. (1835). T: *S. ovata* Raf.

Vine or erect shrub with tuberous roots. Leaves multinerved with a conspicuous midrib, not resupinate. Flowers in reduced cymes in upper leaf-axils, white to pale mauve or pink.



Figure 48. *Ripogonum discolor*. **A**, flowering and fruiting branch $\times 0.7$; **B**, flower $\times 1.9$; **C**, petal $\times 3.3$; **D**, sepal $\times 3.3$; **E**, stamen, side view $\times 4.8$; **F**, stamen, front view $\times 4.8$; **G**, pistil $\times 4.8$; **H**, T.S. ovary $\times 4.8$ (J.Conran 229, BRIU).

Sepals entire. Petals fringed. Filaments broad, fused basally. Fruit a fleshy loculicidal capsule, orange. Seeds numerous, with a prominent fleshy white aril.

A single species found in Papua New Guinea, Malesia, the Pacific islands and in eastern Australia from N Qld to E Gippsland, Vic.

G.Bentham, *Eustrephus* (in Liliaceae), *Fl. Austral.* 7: 17–18 (1863); J.Schlittler, Die Gattungen *Eustrephus* R.Br. ex Sims und *Geitonoplesium* (R.Br.) A.Cunn. Morphologische-anatomische Studie mit Berücksichtigung der systematischen, nomenklatorischen und arealgeographischen Verhältnisse, *Ber. Schweiz. Bot. Ges.* 61: 175–239 (1951).

***Eustrephus latifolius* R.Br. ex Ker Gawler, *Bot. Mag.* 31: t. 1245 (1809)**

Luzuriaga latifolia (R.Br. ex Ker Gawler) Poiret, in J.B.A.P. de Lamarck, *Encyl. Suppl.* 3: 535 (1814); *Spiranthera ovata* Raf., *Fl. Tellur.* 4: 31 (1838) based on *E. latifolius* R.Br. T: *Bot. Mag.* 31: t. 1245 (1809).

E. angustifolius R.Br., *Prodr.* 281 (1810); *Luzuriaga angustifolia* (R.Br.) Poiret, in J.B.A.P. de Lamarck, *Encyl. Suppl.* 3: 536 (1814); *Geitonoplesium angustifolium* (R.Br.) Walp., *Ind. Sem. Hort. Berol.* App. 10 (1854); *E. latifolius* var. *angustifolius* (R.Br.) Benth., *Fl. Austral.* 7: 18 (1878); *Luzuriaga latifolia* var. *angustifolia* (R.Br.) H.Hallier, *Nova Guinea* 8, Bot.: 993 (1914); *E. latifolia* subsp. *angustifolius* (R.Br.) Schlittler, *Mitt. Bot. Mus. Univ. Zürich* 189: 213 (1951). T: tropical Australia, R.Brown; n.v.

E. watsonianus Miq., *Linnaea* 18: 84 (1844); *E. latifolius* subsp. *watsonianus* (Miq.) Schlittler, *Mitt. Bot. Mus. Univ. Zürich* 189: 213 (1951). T: Manly, near Sydney, N.S.W., B.P.G.Hochreutiner 3158; neo: Z, fide J.Schlittler, loc. cit.

E. amplexifolius Schnitzl., *Iconogr.* 1: t. 55c, figs 17–20 (1843). T: *Iconogr.* 1: t. 55c, figs 17–20 (1843).

E. brownii F.Muell., *Fragm.* 7: 73 (1870) *nom. illeg.* based on *E. latifolius* R.Br., *E. angustifolius* R.Br. & *E. watsonianus* Miq.; *E. latifolius* var. *brownii* (F.Muell.) Schlittler, *Mitt. Bot. Mus. Univ. Zürich* 189: 214 (1951).

E. latifolius var. *intercedens* Domin, *Biblioth. Bot.* 85: 516 (1915). T: Tambourine Mts, Qld, Feb. 1910, K.Domin; n.v.

Shrub or climber to 5 m. Leaves ovate to linear, acute; lamina 2.5–12 mm long, 2–35 mm wide; petiole 0.5–1 mm long. Pedicels several, clustered in leaf axils, 8–15 mm long. Flowers 10–18 mm diam., pale pink to mauve, fading to white. Sepals and petals 5–8 mm long. Stamens 4–7 mm long; filaments flattened; anthers 2–4 mm long. Ovary ovoid, 2–3 mm long, glabrous; style c. 5–7 mm long; stigma minutely ciliate. Capsule 10–20 mm diam., yellow-orange. Seeds ±globose, somewhat angular; testa hard. *Wombat Berry*. Fig. 49.

Common along eastern Australia from N Qld to Vic.; also in Malesia and on the Pacific islands. Map 242.

Qld: Mossman Gorge, W of Mossman, 13 June 1972, J.Wrigley & I.Telford (CBG). N.S.W.: Mt Tomah, M.Tindale & E.Constable 1937A (NSW). Vic.: Curlip Jungle, Broadrib R., NE of Marlo, R.Melville 2939 (MEL).

Within this species Schlittler, loc. cit., recognised subspecies, varieties, subvarieties, forms and subforms. Except the subspecies all other categories are invalid because, although type specimens have been designated, the categories are not mutually exclusive. For example, subvar. *uniflorus* occurs in both subsp. *watsonianus* and subsp. *angustifolius*. With respect to his subspecies there are so many specimens of intermediate morphology that they cannot be maintained. It is sometimes possible to collect from the same plant material representative of both subspecies.

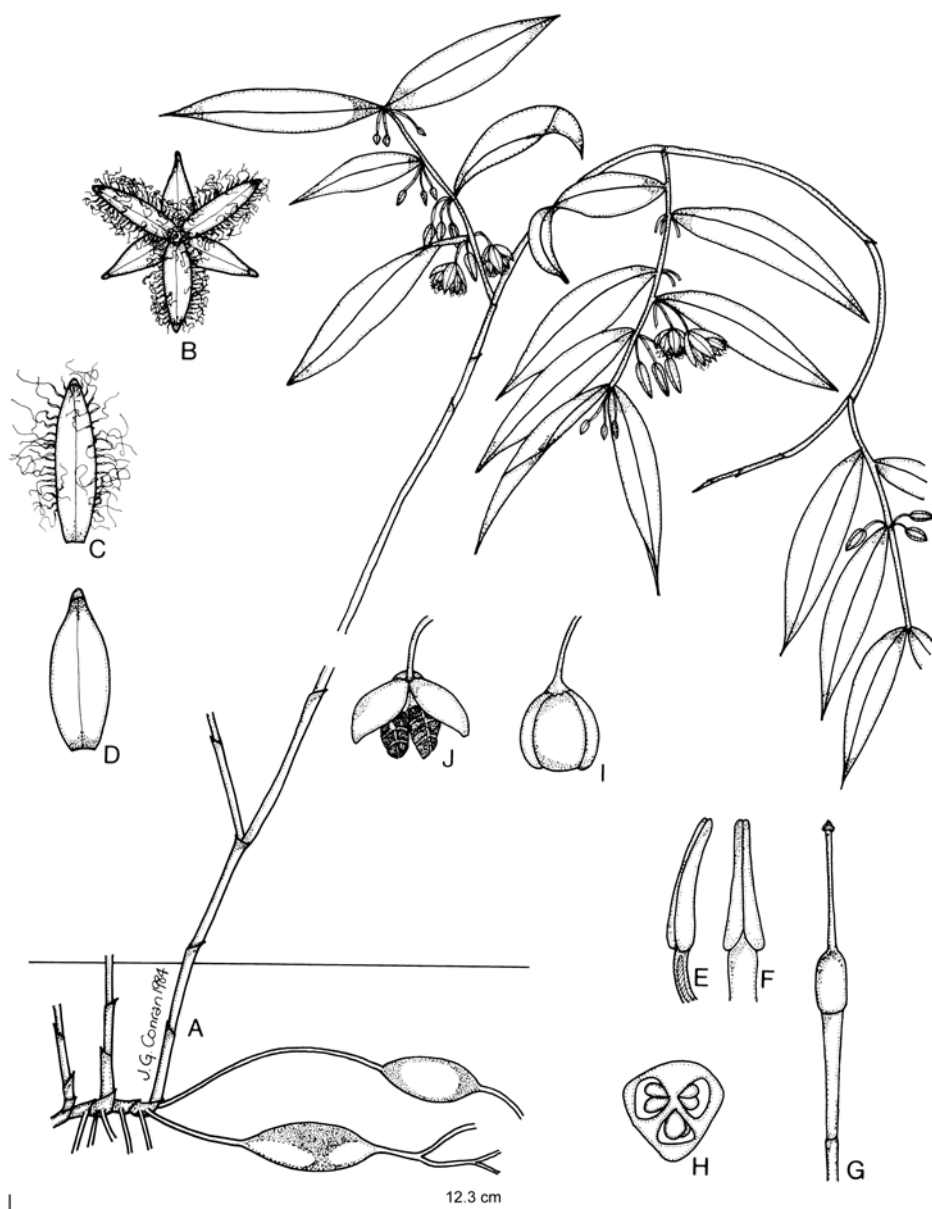


Figure 49. *Eustrephus latifolius*. **A**, flowering plant $\times 0.7$; **B**, flower $\times 2.1$; **C**, petal $\times 3.3$; **D**, sepal $\times 3.3$; **E–F**, stamen, other fused stamens removed, $\times 3.8$; **E**, side view; **F**, front view; **G**, pistil, and pedicel showing point of disarticulation, $\times 3.8$; **H**, T.S. ovary $\times 9.4$; **I**, unopened fruit $\times 0.9$; **J**, open fruit with strophiolate seeds $\times 0.9$ (J.Conran 112 BRIU).

5. GEITONOPLESIMUM

Geitonoplesium Cunn. ex R.Br., *Bot. Mag.* 59: t. 3131 (1832); *Luzuriaga* sect. *Geitonoplesium* (Cunn ex R.Br.) H.Hallier, *Nova Guinea* 8, Bot.: 991 (1914); from the Greek *geiton* (a neighbour) and *plesios* (near), an allusion to its affinity with *Luzuriaga*.

Type: *G. cymosum* (R.Br.) Cunn. ex R.Br.

Calcoa Salisb., *Gen. Pl.* 67 (1866). T: *Luzuriaga cymosa* R.Br.

[*Medeola* auct. non L.: W.Aiton, *Hort. Kew.* 490 (1789)]

Vines with fibrous roots. Leaves multinerved with a conspicuous midrib; lamina resupinate. Flowers in terminal cymes or cymose panicles. Sepals and petals entire, white to pale mauve. Filaments free. Fruit a fleshy berry. Seeds many; aril absent.

A single species found in Papua New Guinea, Malesia, Pacific islands and eastern Australia from N Qld to E Gippsland, Vic.

G.Bentham, *Geitonoplesium* (in Liliaceae), *Fl. Austral.* 7: 18–19 (1863); J.Schlittler, Die Gattungen *Eustrephus* R.Br. ex Sims und *Geitonoplesium* (R.Br.) A.Cunn. Morphologische-anatomische Studie mit Berücksichtigung der systematischen, nomenklatorischen und arealgeographischen Verhältnisse, *Ber. Schweiz. Bot. Ges.* 61: 175–239 (1951).

***Geitonoplesium cymosum* (R.Br.) Cunn. ex R.Br., *Bot. Mag.* 59: t. 3131 (1932)**

Luzuriaga cymosa R.Br., *Prodr.* 282 (1810). T: Port Jackson, N.S.W., *R.Brown*; syn: *n.v.*; tropical Australia, *R.Brown*; syn: *n.v.*

Luzuriaga montana R.Br., *Prodr.* 282 (1810); *Geitonoplesium montanum* (R.Br.) Hook., *Bot. Mag.* 59: sub t. 3131 (1832). T: Port Jackson, N.S.W., *R.Brown*; holo: *n.v.*

G. asperum Cunn. ex Hook., *Bot. Mag.* 59: sub t. 3131 (1832); *G. cymosum* subf. *asperum* (Cunn. ex Hook.) Schlittler, *Mitt. Bot. Mus. Univ. Zürich* 189: 229 (1951). T: *Bot. Mag.* 59: sub t. 3131 (1832).

Climber to 10 m; stems to 10 mm diam. Leaves ovate to linear, acute; lamina 2–13 cm long, 2–35 mm wide; petiole 0.5–1.5 mm long. Inflorescence branched; pedicels 5–10 mm long. Flowers 10–22 mm diam., white to pale mauve, apical portion green. Sepals and petals 5–11 mm long. Stamens 4–10 mm long; filaments filiform; anthers 3–5 mm long. Ovary ±globose, 2–3 mm long, glabrous; style 5–7 mm long. Berry 7–20 mm diam., black. Seeds angular, ±globose; testa hard. *Scrambling Lily*. $2x = 20$, *fide* J.G.Conran, *Taxon* 34: 347 (1985). Fig. 50.

Common in eastern Australia from Qld to Vic.; also in Malesia and the Pacific islands. Map 243.

Qld: Mt Glorious, *C.T.White 13154* (CANB). N.S.W.: Bulga State Forest, c. 40 km N of Taree, *E.F.Constable 6307* (NSW). Vic.: Tara Range road, E Gippsland, *A.C.Beauglehole 33938* (MEL).

As with *Eustrephus*, Schlittler *loc. cit.*, divided *G. cymosum* into subspecies, varieties, subvarieties, forms and subforms. Again the taxa of lower rank are non-exclusive and hence illegitimate. The two subspecies recognised intergrade and are not recognised here.

Excluded names

Elachanthera F.Muell., *Victorian Naturalist* 3: 108 (1866).

Luzuriaga sect. *Elachanthera* (F.Muell.) Krause, *Nat. Pflanzenfam.* 2nd edn, 15a: 379 (1930). T: *E. sewelliae* F.Muell.

This is *Myrsiphyllum* (L.) Willd., in the Liliaceae.

Elachanthera sewelliae F.Muell., *Victorian Naturalist* 3: 108 (1886).

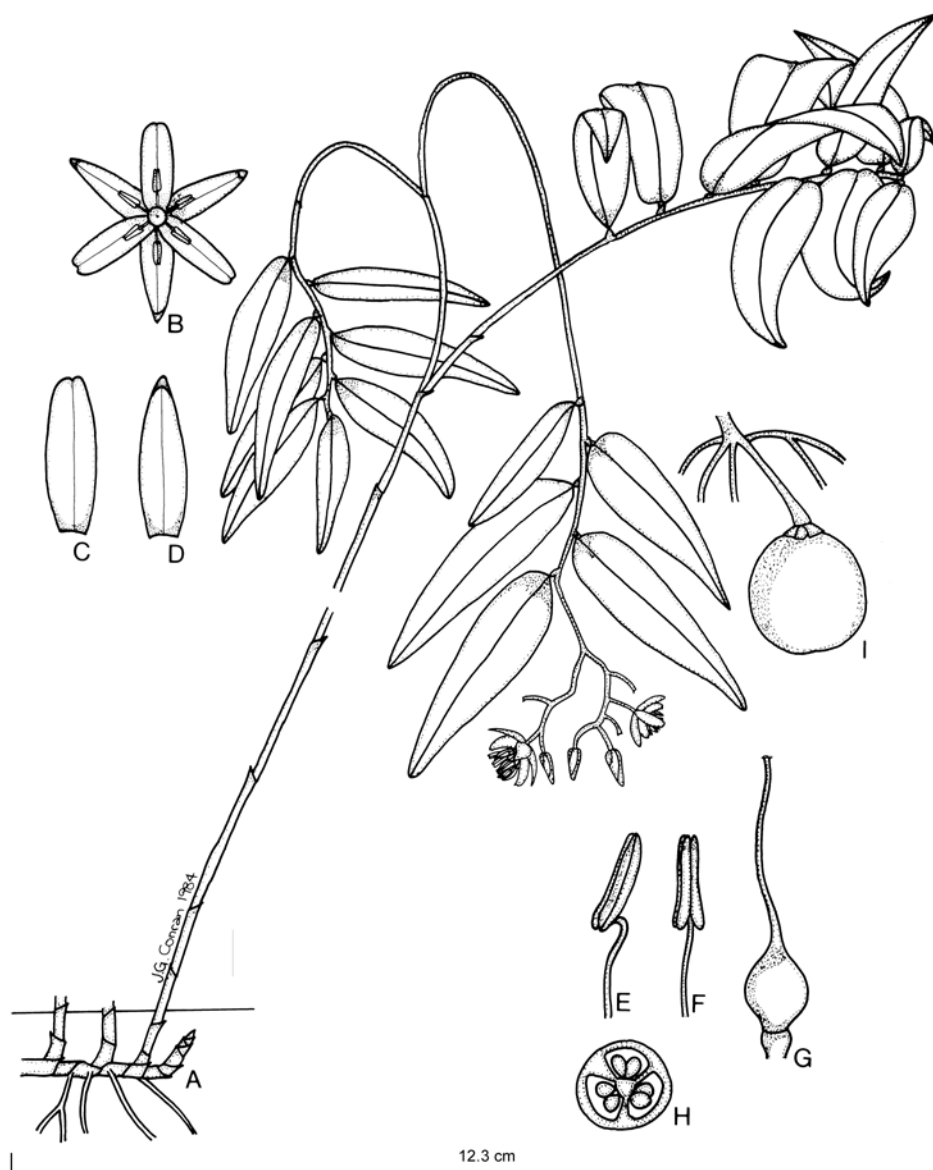


Figure 50. *Geitonoplesium cymosum*. **A**, flowering plant $\times 0.7$; **B**, flower $\times 1.5$; **C**, petal $\times 2.4$; **D**, sepal $\times 2.4$; **E**, stamen, side view, $\times 4.8$; **F**, stamen, front view, $\times 4.8$; **G**, ovary $\times 4.8$; **H**, T.S. pistil $\times 10$; **I**, fruit $\times 1.5$ (J.Conran 107, BRIU).

Luzuriaga sewelliae (F.Muell.) Krause, *Nat. Pflanzenfam.* 2nd edn, 15a: 379 (1930). T: near Nickol Bay, W.A., comm. *J.Sewell*; iso: MEL.

This is *Myrsiphyllum asparagoides* (L.) Willd., in the Liliaceae.

Ripogonum scandens Forster & G.Forster, *Char. Gen. Pl.* t. 25 (1776).

T: not designated.

This is a New Zealand species and was wrongly recorded for Australia by C.H.Persoon, *Syn. Pl.* 1: 374 (1805).

DIOSCOREACEAE

I.R.H.Telford

Dioecious herbs with twining or trailing stems, annual or perennial from subterranean tubers. Leaves opposite or alternate, petiolate, simple or palmately compound. Inflorescence an axillary spike or raceme, often paniculate by reduction of leaves on flowering stems. Flowers actinomorphic, small. Sepals 3, connate or tubular at base. Petals 3, similar to sepals. Male flowers: stamens 6 in 2 whorls, the inner sometimes reduced to staminodes; filaments free, short; anthers 2-locular, dehiscing longitudinally; pistillode minute or absent. Female flowers: staminodes 6 or absent; ovary inferior, 3-locular; placentation usually axile; ovules usually 2 per locule; style 1; stigmas 3, entire or 2-lobed. Fruit usually a 3-lobed capsule, dehiscing along outer margin. Seeds 1 or 2 per locule, usually flat and winged; embryo in hard endosperm.

A pantropical and warm temperate family of 6 genera and about 750 species; 1 genus and 5 species in Australia.

G.Bentham, Dioscorideae, *Fl. Austral.* 6: 459–462 (1873); I.H.Burkill, Dioscoreaceae, *Fl. Males.* ser. 1, 4: 293–335 (1951); I.H.Burkill, The organography and the evolution of Dioscoreaceae, the family of yams, *J. Linn. Soc., Bot.* 56: 319–412 (1960).

DIOSCOREA

Dioscorea L., *Sp. Pl.* 2: 1032 (1753); *Gen. Pl.* 5th edn, 456 (1754); named after Pedanios Dioscorides, Greek physician and herbalist of the first century A.D.

Type: *D. sativa* L.

Stems sometimes bearing axillary bulbils. Fruit a 3-lobed capsule, dehiscing around the lobe margins. Seeds ovate, flat, winged.

A genus of c. 600 species, 5 in northern and eastern Australia, of which 2 are endemic, 2 indigenous or of pre-European introduction and 1 of recent introduction. Some species yield raw material used for synthesizing the steroid cortisone. Widely cultivated or collected for edible tubers and bulbils in the old world tropics. Some species must be treated to make them suitable for human consumption.

I.H.Burkill, Dioscoreaceae, *Fl. Males.* ser. 1, 4: 299–335 (1951).

KEY TO SECTIONS

- 1 Capsule longer than wide; male flowers pedicellate or sessile
- 2 Leaves simple Sect. I. DIOSCOREA
- 2: Leaves usually compound, sometimes simple on flowering stems Sect. II. LASIOPHYTON
- 1: Capsule about as long as wide; male flowers sessile Sect. III. ENANTIOPHYLLUM

KEY TO SPECIES BASED ON VEGETATIVE CHARACTERS

- 1 Leaves 3–5-foliolate, the distal ones sometimes simple but then pubescent 2. *D. pentaphylla*
- 1: Leaves simple, glabrous
- 2 Stems with 4 crisped membranous longitudinal wings 3. *D. alata*
- 2: Stems not winged, sometimes ridged but ridges not as above
- 3 Axillary bulbils present 1. *D. bulbifera*
- 3: Axillary bulbils absent
- 4 Leaves ovate to triangular, more than 2 cm wide, usually cordate at base 4. *D. transversa*
- 4: Leaves linear to narrowly triangular, less than 2 cm wide, usually hastate or rounded at base 5. *D. hastifolia*

KEY TO SPECIES BASED ON FRUITING MATERIAL

- 1 Capsule at least twice as long as wide; seeds winged at base
- 2 Capsule glabrous 1. *D. bulbifera*
- 2: Capsule pubescent 2. *D. pentaphylla*
- 1: Capsule at least as wide as long; seeds winged all round
- 3 Fruiting racemes mostly 15–60 cm long 3. *D. alata*
- 3: Fruiting racemes mostly less than 15 cm long
- 4 Capsule apex usually obcordate; seeds (not including wing) more than 5 mm long 4. *D. transversa*
- 4: Capsule apex usually truncate, rarely obcordate; seeds (not including wing) less than 4 mm long 5. *D. hastifolia*

Sect. I. *Dioscorea*

Dioscorea L. sect. *Dioscorea*

Dioscorea sect. *Opsophyton* Uline, in A.Engler & K.Prantl, *Nat. Pflanzenfam.* Nachtr. to II–IV: 84 (1897). T: *D. sativa* L. Uline did not designate a type for this section but included in it *D. sativa*, the type of the genus.

Leaves alternate, simple. Male flowers sessile. Capsule at least twice as long as wide. Seed winged towards base.

The section contains 5 or 6 species, in Africa, Asia, Australia and the Pacific islands; 1 species in Australia.

1. *Dioscorea bulbifera* L., *Sp. Pl.* 2: 1033 (1753)

T: not designated; *n.v.*

[*D. sativa* auct. non L.: G.Bentham, *Fl. Austral.* 6: 460 (1873)]

Tuber globose, pear-shaped or turnip-shaped. Stems twining, to 4 m long, terete to slightly ridged, glabrous. Bulbils subglobose, ellipsoidal or cylindroidal, to 7 cm diam., usually verrucose. Leaves ovate, acuminate, cordate at base; lamina 5–30 cm long and wide, 7–11-nerved, glabrous; petiole 2–15 cm long. Male flowers: spikes 2–6 per axil, to 5 cm long, often in large branched inflorescences; sepals and petals oblong to narrowly ovate, 2.5–3 mm long, white turning purple-brown; stamens 6. Female flowers: usually in spikes to 35 cm long, 2–5 spikes per axil; perianth slightly smaller than male; staminodes 6. Capsule oblong to obovate in lateral view, 18–30 mm long, glabrous; lobes 6–7 mm wide. Seeds 4–5 mm long; wing 6–10 mm long. Fig. 51A–C.

Occurs from western Africa through southern Asia to the Pacific islands, and in Australia from the Kimberley region, W.A., to Rockhampton, Qld. Grows in coastal and near-coastal rainforest, often in disturbed or marginal sites, and in open and gallery forest. Map 244.

W.A.: Lone Dingo vine thicket, Mitchell Plateau, *K.F.Kenneally 6994* (CANB, PERTH). N.T.: c. 15 km SSE of Oenpelli Mission, *M.Lazarides 7819* (BRI, CANB); The Pines Stn, Douglas R., *J.Must 1297* (BRI, DNA, NT). Qld: Pandanus Ck, *B.Hyland 8098* (BRI, QRS); base of Black Mtn, *A.Rodd 223* (NSW).

Naturalised plants, perhaps of extra-Australian provenance, have been recorded in northern coastal Qld (F.M.Bailey, *Queensland Fl.* 5: 1615, 1902) as *D. sativa*, with leaves and bulbils larger than in native populations. Tubers and bulbils provide food for aborigines. In wild plants the tubers are nauseous and poisonous and are rendered edible by special preparation.

A species of 6 varieties or cultivars, 2 in Australia. Tubers are poorly represented in herbaria and tuber morphology rarely noted on herbarium labels. Varietal status of herbarium material is impossible to determine without tubers, therefore both varieties are cited and mapped here as *D. bulbifera*.

Tuber subglobose to pear-shaped

1a. var. *bulbifera*

Tuber cylindroidal to long-conical

1b. var. *elongata*

1a. *Dioscorea bulbifera* L. var. *bulbifera*

D. sativa var. *rotunda* Bailey, *Queensland Fl.* 5: 1615 (1902). T: Cooktown, Qld, *Roth*; ?holo: *n.v.*; not located at BRI.

Tuber subglobose to pear-shaped, 5–15 cm diam. *Round or Cheeky Yam*.

1b. *Dioscorea bulbifera* var. *elongata* (Bailey) Prain & Burkill, *J. Asiat. Soc. Bengal Pt 2 Nat. Hist.* n. ser. 10: 27 (1914)

D. sativa var. *elongata* Bailey, *Queensland Fl.* 5: 1615 (1902). T: Cooktown, Qld, *Roth*; syn: *n.v.*; Palmer R., Qld, *Roth*; syn: *n.v.*; neither type located at BRI.

Tuber cylindroidal to long-conical, to 75 cm long, 3 cm diam. *Parsnip Yam*.

Prain & Burkill, *loc. cit.*, postulated a possible hybrid origin between *Dioscorea bulbifera* & *D. transversa* for this variant.

Sect. II. Lasiophyton

Dioscorea sect. *Lasiophyton* Uline, in A.Engler & K.Prantl, *Nat. Pflanzenfam.* Nachtr. to II–IV: 84 (1897).

Type: not designated.

Leaves alternate, compound, sometimes simple on flowering stems. Male flowers pedicellate. Capsule at least twice as long as wide. Seed winged towards base.

A section of over 20 species in Africa, Asia, Australia and the SW Pacific; 1 species in Australia.

2. *Dioscorea pentaphylla* L., *Sp. Pl.* 2: 1032 (1753)

var. **papuana** Burkill, *Gard. Bull. Straits Settle.* 3: 258 (1924)

T: not designated.

Dioscorea sp.? near *D. kumaoensis* Kunth, *vide* F.M.Bailey, *Rep. Austral. Assoc. Advancement Sci.* 7: 443 (1898).

Illustration: F.M.Bailey, *Compr. Cat. Queensland Pl.* fig. 536 (1913).

Tuber globose to pear-shaped, sometimes lobed. Stems twining, to many metres long, terete, pubescent with brown hairs to glabrescent, prickly at base. Bulbils globose to ellipsoidal, to 1 cm diam. Leaves rusty-pubescent, glabrescent above; petiole 2–13 cm long; compound leaves with petiolules to 5 mm long, leaflets ovate, acuminate, 3–20 cm long, 1.5–6 cm wide, 3–nerved; simple leaves broadly ovate, 3–10 cm long, 2–7 cm wide, 5–7-nerved. Male flowers: racemes to 30 cm long, mostly branched; pedicels 0.5–1 mm long; sepals and petals lanceolate, 1.5–2 mm long, greenish-yellow; stamens 3, staminodes 3. Female flowers: racemes 2–4 per axil, 5–25 cm long; perianth similar to male; staminodes 6. Capsule ovate in lateral view, emarginate, 20–25 mm long, pubescent; lobes to 6 mm wide. Seeds not seen.

A species of 6 varieties from SE Asia through Malesia to the Pacific Islands. One variety in Australia, recorded only from Thursday Is., Qld; perhaps of pre-European introduction. Map 245.

No specimen located at BRI.

Description drawn from New Guinea material.

Sect. III. Enantiophyllum

Dioscorea sect. *Enantiophyllum* Uline, in A.Engler & K.Prantl, *Nat. Pflanzenfam.* Nachtr. to II–IV: 87 (1897).

Type: not designated.

Leaves opposite or alternate, simple. Male flowers sessile. Capsule at least as long as wide. Seed winged all round.

A section of over 40 species in Africa, Asia, Australia and the Pacific islands; 2 endemic and 1 introduced species in Australia.

3. **Dioscorea alata* L., *Sp. Pl.* 2: 1033 (1753)

T: not designated.

Tuber globose or pear-shaped to cylindroidal, often lobed. Stems twining, to many metres long, glabrous, with 4 crisped, membranous, longitudinal wings 0.5 mm wide. Bulbils globose. Leaves ovate, acuminate, cordate at base; lamina 5–25 cm long, 3–15 cm wide, 5–9-nerved, glabrous; petiole 3–18 cm long, narrowly 5-winged. Male flowers: spikes 1 or 2 per axil, 1–3 cm long; sepals and petals ovate, 1.5–2 mm long, yellow; stamens 6.

Female flowers: racemes 1 or 2 per axil, 10–60 cm long; perianth similar to male; staminodes absent. Capsule broadly ovate in lateral view, retuse, 17–20 mm long; lobes to 15 mm wide. Seeds not seen. *Greater Yam*.

Naturalised in northern N.T. and coastal north-eastern Qld in disturbed rainforest. Native to SE Asia and Malesia. Map 246.

N.T.: Cannon Hill Ranger Stn, *C.R.Dunlop* 5036 (DNA). Qld: Ingham, *W.T.Jones* 3903 (CANB); Liverpool Ck, c. 17 km N of El Arish, *W.G.Trappnell* 289 (BRI); near mouth of Tully R., *L.J.Webb* 8164 & *J.G.Tracey* (BRI, CANB).

A recent introduction, first recorded by C.White, *Queensland Dept Agric. Bot. Bull.* 21: 22 (1919).

Description partly drawn from extra-Australian material.

4. *Dioscorea transversa* R.Br., *Prodr.* 295 (1810)

T: northern australia, *R.Brown*; holo: probably BM *n.v.*; iso: NSW.

D. punctata R.Br., *Prodr.* 294 (1810). T: east coast of Australia, *R.Brown*; holo: probably BM, *n.v.*

Illustrations: D.L.Jones & B.Gray, *Austral. Climbing Pl.* 97, t. 77 (1977); E.R.Rotherham *et al.*, *Fl. Pl. New South Wales & S. Queensland* 103, t. 320 (1975); B.D.Morley & H.R.Toelken (eds), *Fl. Pl. Australia* 342, fig. 204c–e (1983).

Tuber conical to cylindroidal, to 45 cm long. Stems twining, to 4 m long, terete, striate, glabrous. Bulbils absent. Leaves ovate to broadly triangular, acuminate, usually cordate at base, rarely hastate or truncate; lamina 4–13 cm long, 2–11 cm wide, 5–9-nerved, glabrous; petiole 1–9 cm long. Male flowers: spikes 1 or 2 per axil, to 6 cm long, often branched; sepals and petals orbicular, 1.5–2.5 mm long, pale green; stamens 6. Female flowers: racemes 1 or 2 per axil, to 20 cm long, sometimes branched; perianth slightly smaller than male; staminodes 6. Capsules suborbicular to broadly ovate in lateral view, obcordate at apex, 20–35 mm long; lobes 15–20 mm wide. Seeds 5–6 mm long; wing 3–12 mm wide. Figs 44, 51D–F.

Widespread in coastal and near-coastal Australia from NW Kimberley region, W.A., through northern N.T. and eastern Qld to Stanwell Park, N.S.W.; in rainforest, wet eucalypt forest, gallery forest and occasionally in woodland. Map 247.

N.T.: Elcho Is., *J.R.Maconochie* 2238 (CANB, DNA, NT). Qld: State Forest Reserve 144, Windsor Tableland, *B.Hyland* 5576 (BRI, QRS); c. 2 km NW of Mt Glorious, *I.R.Telford* 9689 (AD, CBG, MEL, NSW). N.S.W.: 16 km N of Bulahdelah, *R.Schodde* 5110 (CANB, NSW).

Plants from drier habitats have more coriaceous leaves than those of moister sites. Tubers collected for food by aborigines.

A collection from Banks (Moa) Is., Torres Strait, Qld, 22 Feb. 1975, *E.Cameron* (QRS), has been tentatively determined as *Dioscorea nummularia* Lam., a species common in New Guinea and superficially similar to *D. transversa*. The specimen consists of immature female flowers.

5. *Dioscorea hastifolia* Endl., in J.G.C.Lehmann, *Pl. Preiss.* 2: 33 (1846)

T: near Swan & Canning Rivers, Perth, W.A., June 1839, *L.Preiss* 1954; ?syn: probably at LD and W, both *n.v.*

Illustrations: R.Erickson *et al.*, *Fl. Pl. W. Australia* 37, t. 76, 77 (1973); B.D.Morley & H.R.Toelken (eds), *Fl. Pl. Australia* 342, fig. 204 (1983).

Tuber cylindroidal, 10–25 cm long, to 1.5 cm diam., sometimes branched. Stems twining, to 2 m long, terete, glabrous. Bulbils absent. Leaves linear to narrowly triangular, acute, usually hastate or rounded at base, rarely truncate or cuneate; lamina 15–90 mm long, 1.5–20 mm wide, 1–5-nerved, glabrous; petiole 1–4 mm long. Male flowers: spikes 1–3 per axil, to 10 cm long, sometimes branched; sepals and petals ovate, 1–2 mm long, yellow; stamens 6. Female flowers: racemes 1 or 2 per axil, to 9 cm long; perianth

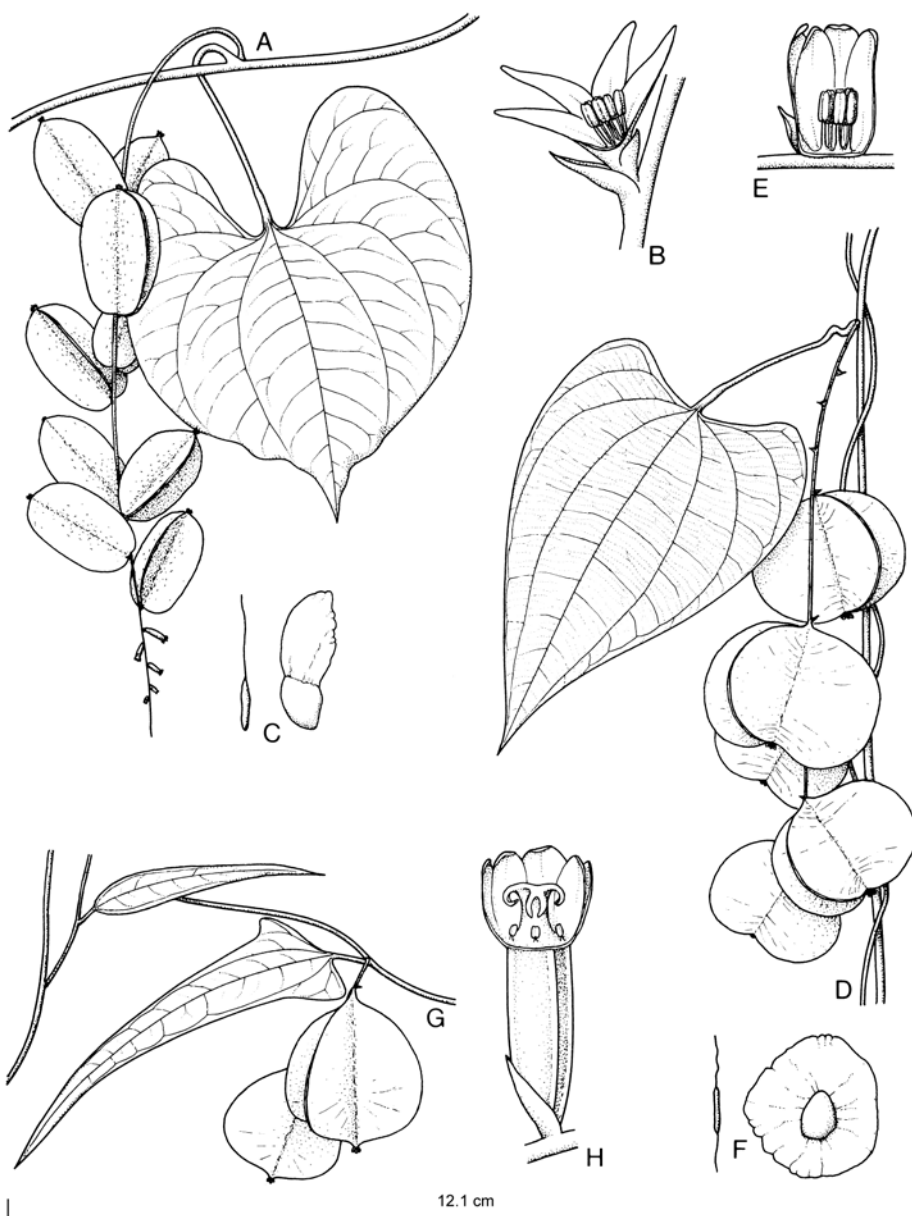


Figure 51. *Dioscorea*. **A–C**, *D. bulbifera*. **A**, fruiting stem $\times 0.5$ (P.Latz 3900, DNA); **B**, flower $\times 10$ (Howard Springs, N.T., J.Cusack, DNA); **C**, seed $\times 1.5$ (P.Latz 3900, DNA). **D–F**, *D. transversa*. **D**, fruiting stem $\times 0.5$ (I.Telford 9689, CBG); **E**, σ flower $\times 10$ (H.Streimann 8184, CBG); **F**, seed $\times 1.5$ (I.Telford 9689, CBG). **G–H**, *D. hastifolia*. **G**, fruiting stem $\times 1$ (Walkaway, W.A., M.Phillips, CBG); **H**, ρ flower $\times 5$ (D.Mayrhofer 2, CBG).

slightly smaller than male; staminodes 6. Capsule suborbicular to broadly ovate in lateral view, truncate or rounded at apex, rarely obcordate, 12–23 mm long; lobes 7–12 mm wide. Seeds 3.5–4 mm long; wing 1–3 mm wide. *Warrine*, *Warrien*. Fig. 51G–H.

Occurs in near-coastal south-western W.A. from the Murchison R. to the Darling Ra., S of Perth, in granitic and basaltic soil in open forest, woodland and shrub communities. Map 248.

W.A.: Mills Road, Gosnells, 29 June 1978, *R.J.Cranfield* (CANB, NSW, PERTH); 5 km SSE of Armadale, *D.Mayrhofer* 2 (AD, CBG, MEL, NSW, PERTH); Ross Graham Lookout area, Kalbarri Natl Park, *R.W.Purdie* 5210 (CBG).

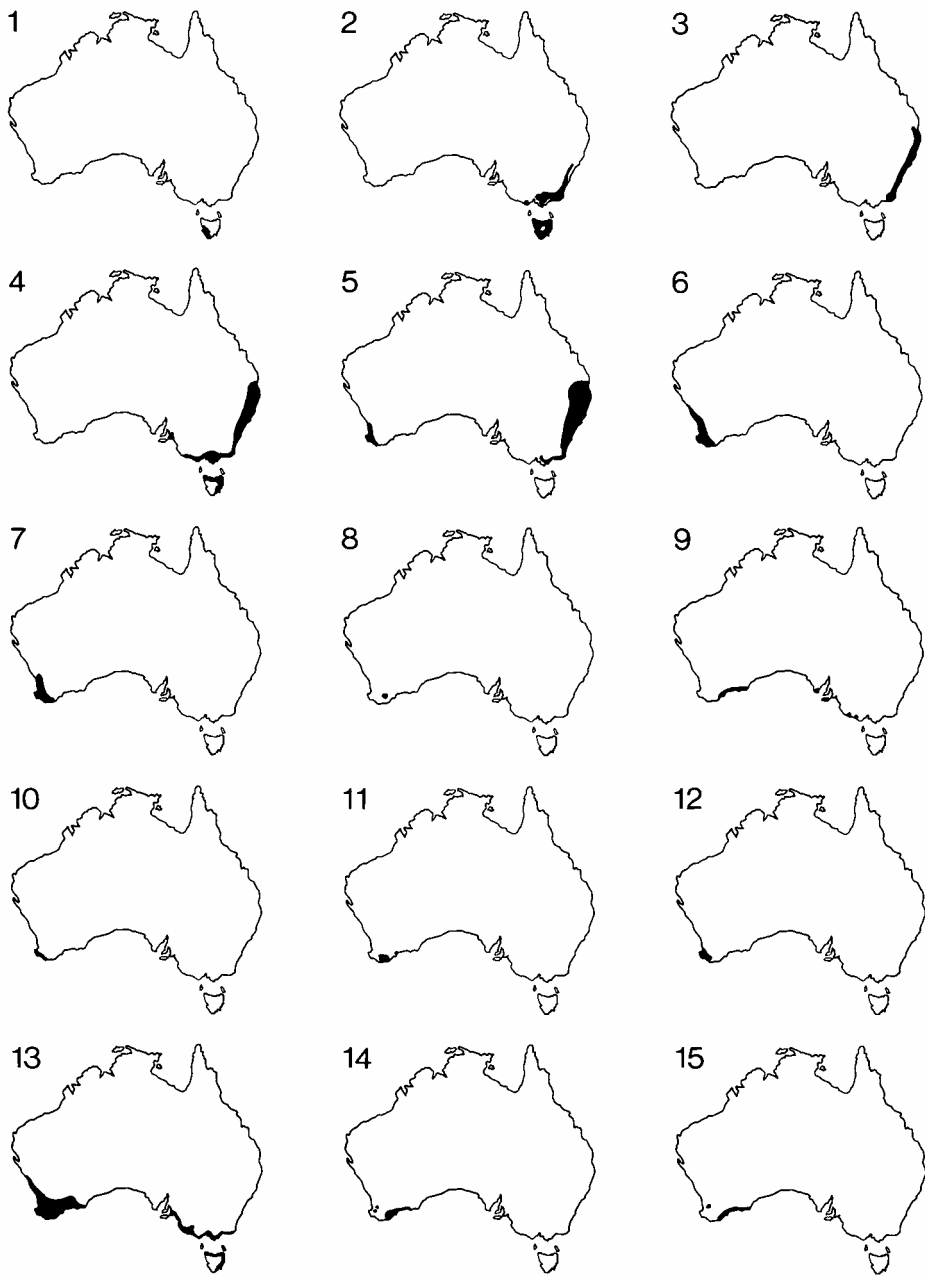
Doubtful names

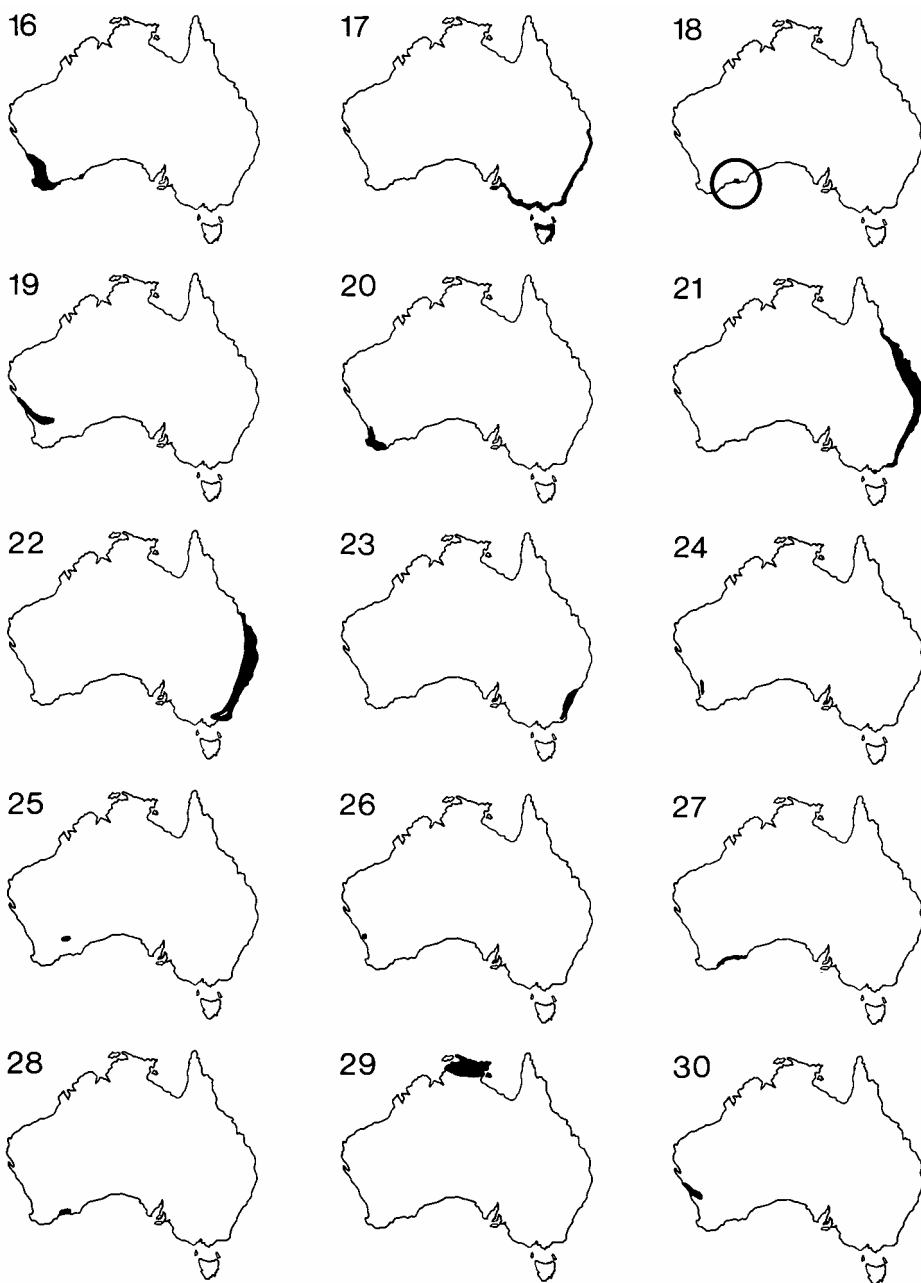
Dioscorea reticulata C.Gay, *Fl. Chil.* 6: 61 (1854).

This species has been reported as being naturalised in NE Qld (see D.L.Jones & B.Gray, *Austral. Climbing Pl.* 97 (1977); M.Elliott & D.Jones, *Encycl. Austral. Pl.* 3: 282, 1984), but no specimens have been seen. It is possibly a misidentification of *D. bulbifera*.

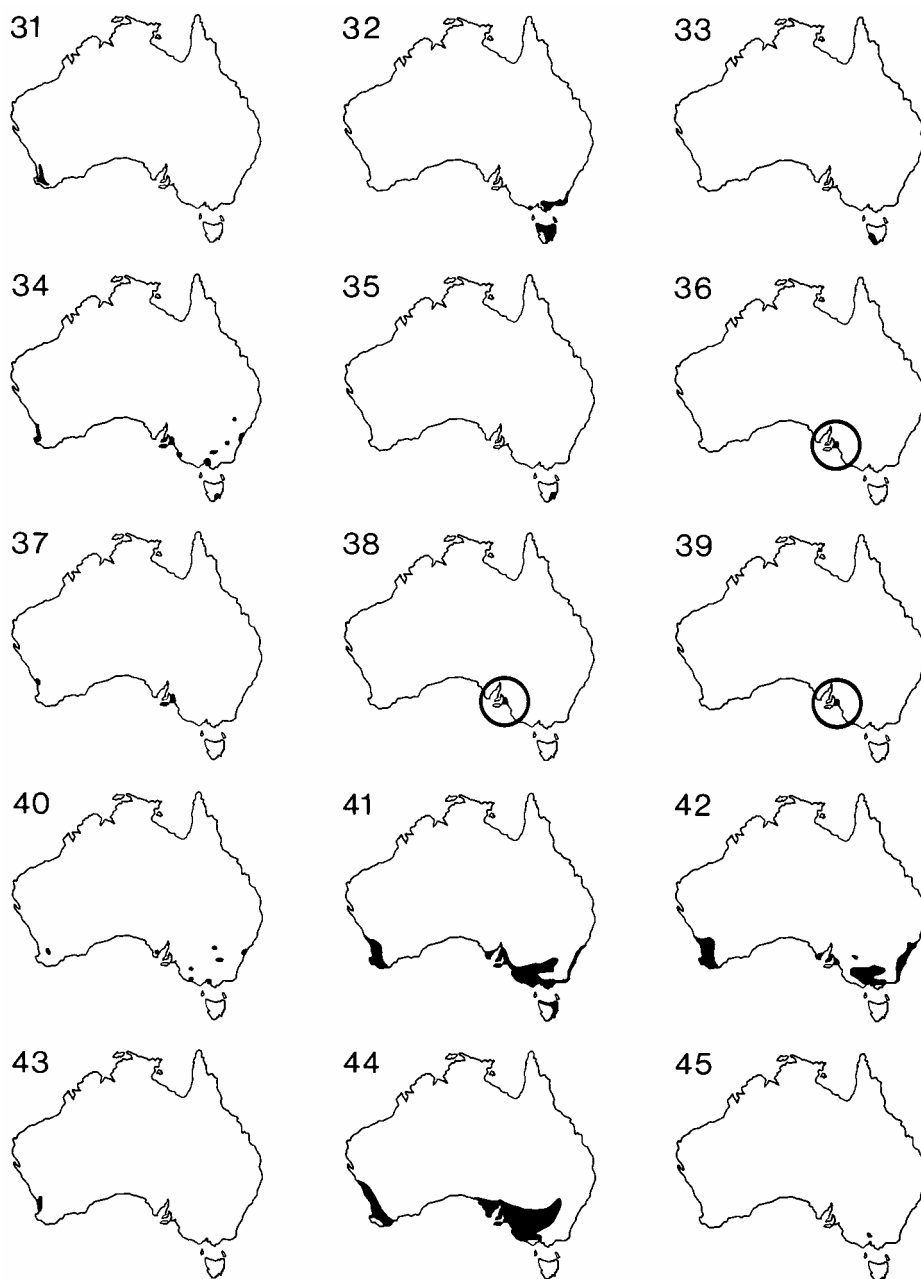
MAPS

Number in brackets refers to the page on which the taxon is described.





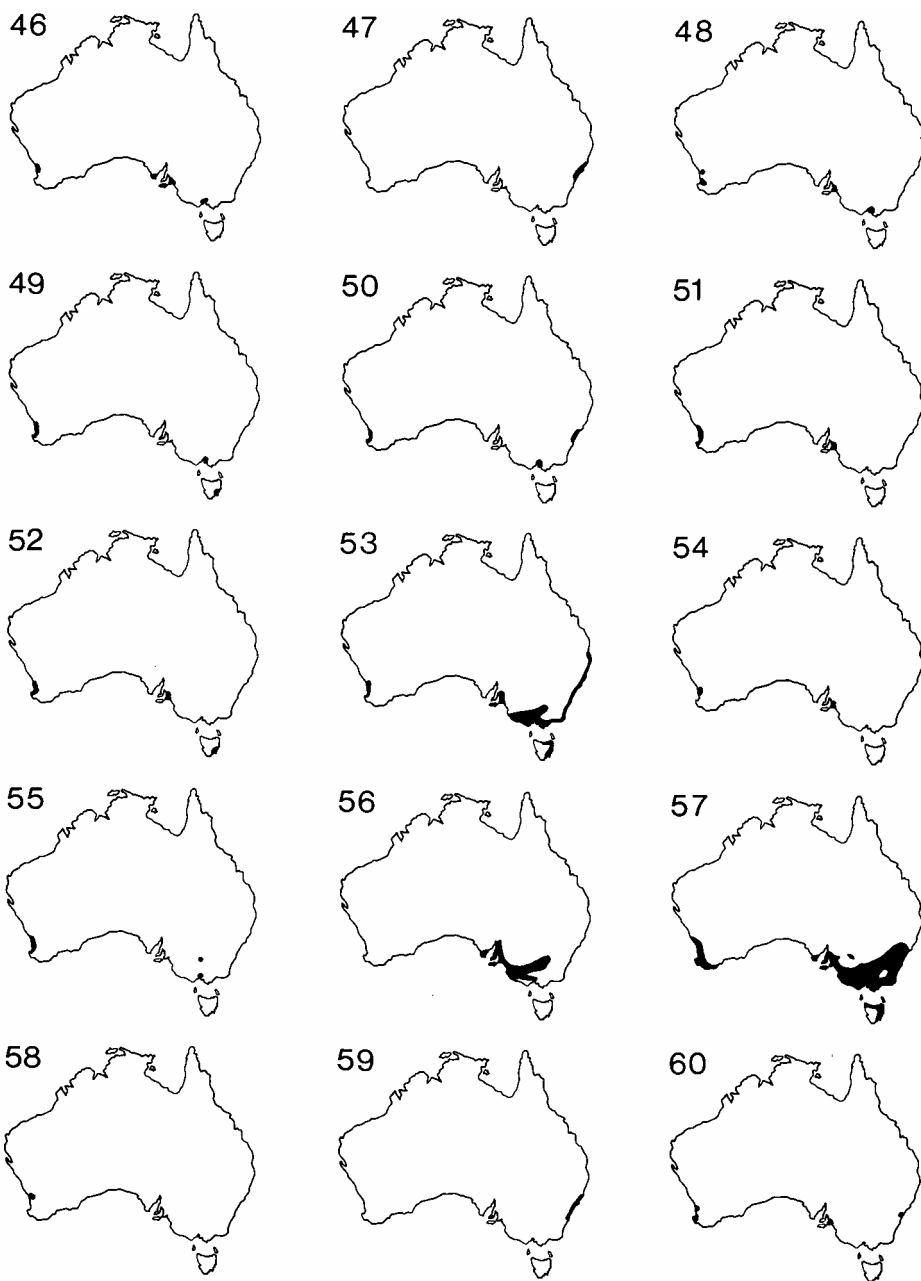
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|--|--|---|
| 16. <i>Patersonia juncea</i> (18) | 17. <i>Patersonia fragilis</i> (18) | 18. <i>Patersonia inaequalis</i> (19) |
| 19. <i>Patersonia drummondii</i> (19) | 20. <i>Patersonia pygmaea</i> (20) | 21. <i>Patersonia glabrata</i> (20) |
| 22. <i>Patersonia sericea</i>
var. <i>sericea</i> (21) | 23. <i>Patersonia sericea</i>
var. <i>longifolia</i> (21) | 24. <i>Patersonia rudis</i>
subsp. <i>rudis</i> (22) |
| 25. <i>Patersonia rudis</i>
subsp. <i>velutina</i> (22) | 26. <i>Patersonia argyrea</i> (22) | 27. <i>Patersonia lanata</i>
f. <i>lanata</i> (23) |
| 28. <i>Patersonia lanata</i>
f. <i>calvata</i> (23) | 29. <i>Patersonia macrantha</i> (24) | 30. <i>Patersonia graminea</i> (24) |



31. *Patersonia babianoides* (24)
 34. *Iris germanica* (29)
 37. *Moraea vegeta* (30)
 40. *Homeria ochroleuca* (33)
 43. *Hexaglottis lewisiae* (36)

32. *Diplarrena moraea* (27)
 35. *Iris foetidissima* (29)
 38. *Moraea bellendenii* (31)
 41. *Homeria flaccida* (34)
 44. *Gynandriris setifolia* (37)

33. *Diplarrena latifolia* (27)
 36. *Iris unguicularis* (30)
 39. *Moraea aristata* (31)
 42. *Homeria miniata* (34)
 45. *Galaxia fugacissima* (38)



46. *Ferraria crispa*
subsp. *crispa* (39)

49. *Watsonia versfeldii*
var. *alba* (41)

52. *Watsonia meriana* (42)

55. *Romulea flava*
var. *minor* (45)

58. *Romulea obscura* (47)

47. *Herbertia lahue*
subsp. *caerulea*

50. *Watsonia* sp. A (42)

53. *Watsonia bulbillifera* (43)

56. *Romulea minutiflora* (45)

59. *Gladiolus gueinzii* (48)

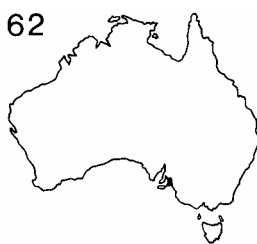
48. *Watsonia marginata* (41)

51. *Watsonia* sp. B (42)

54. *Hesperantha falcata* (44)

57. *Romulea rosea*
var. *australis* (45)

60. *Gladiolus angustus* (49)



61. *Gladiolus carneus* (49)

64. *Gladiolus caryophyllaceus* (50)

67. *Gladiolus tristis* (51)

70. *Ixia polystachya* (54)

73. *Ixia paniculata* (56)

62. *Gladiolus floribundus* (49)

65. *Gladiolus communis* subsp. *byzantinus* (51)

68. *Homoglossum watsonium* (52)

71. *Ixia flexuosa* (55)

74. *Sparaxis tricolour* (56)

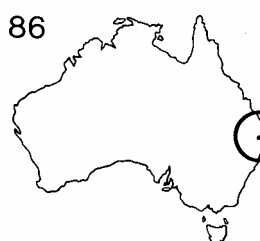
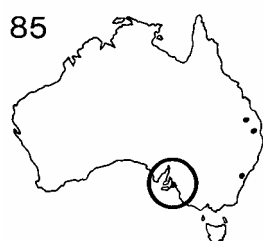
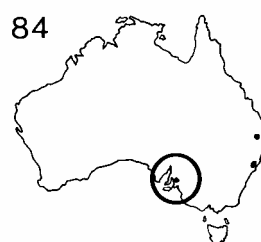
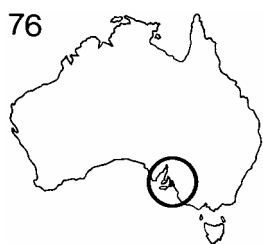
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69. *Dierama pendulum* (53)

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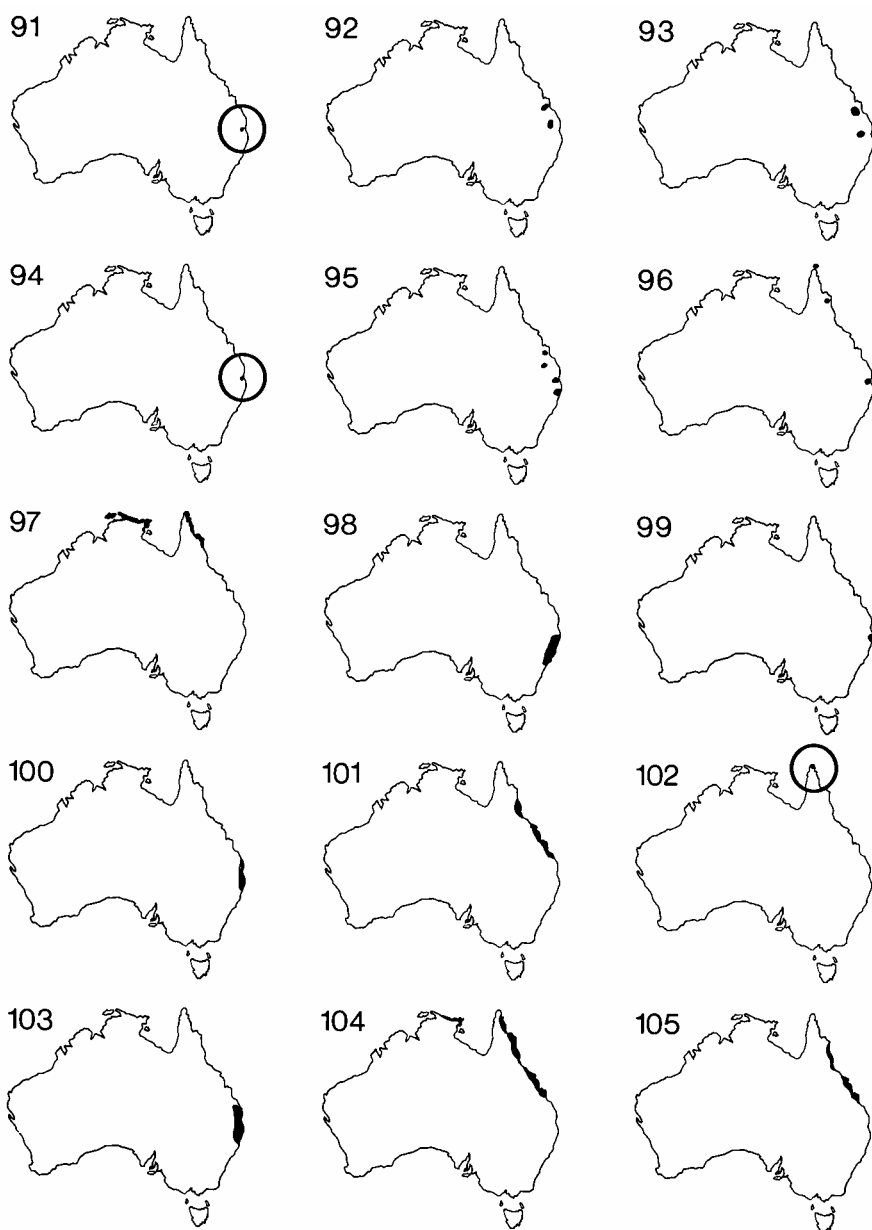
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98. *Cordyline stricta* (82)

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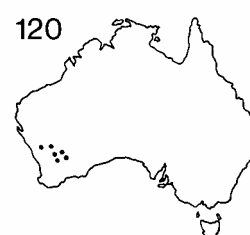
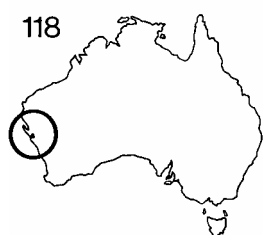
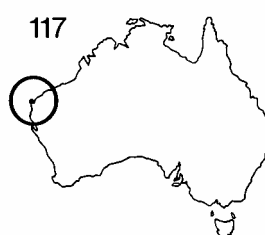
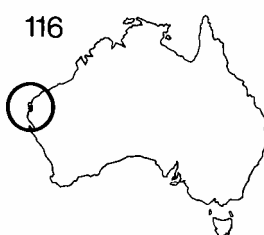
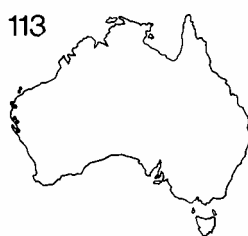
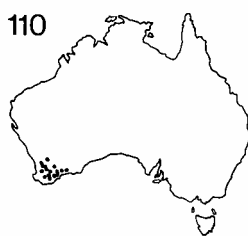
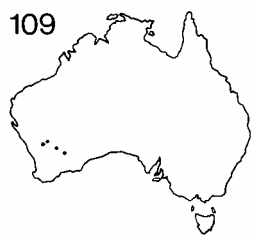
93. *Agave sisalana* (75)

96. *Sansevieria trifasciata* (78)

99. *Cordyline congesta* (82)

102. *Cordyline fruticosa* (84)

105. *Cordyline manners-*
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114. *Acanthocarpus preissii* (95)

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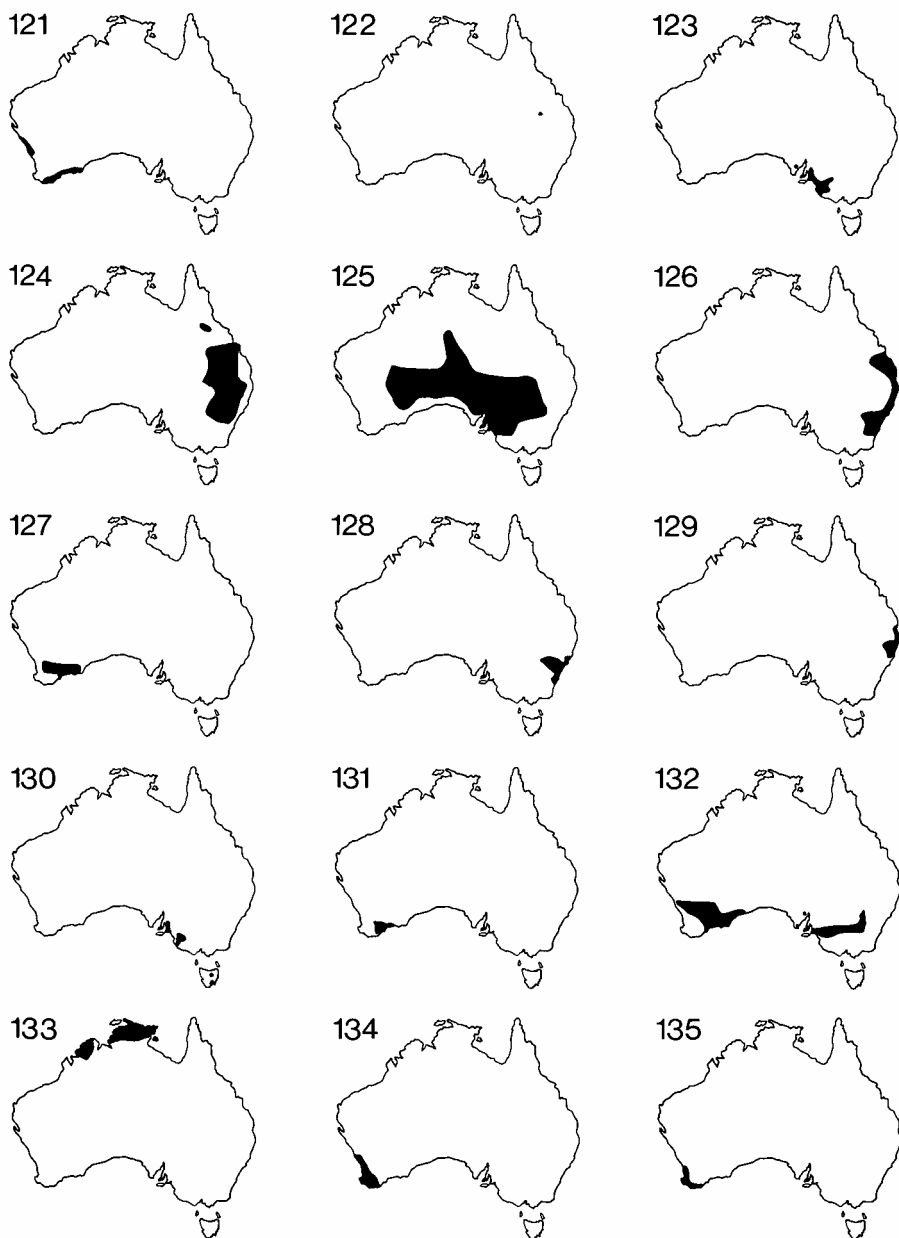
116. *Acanthocarpus humilis* (95)

117. *Acanthocarpus rupestris* (96)

118. *Acanthocarpus parviflorus* (96)

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130. *Lomandra nana* (113)

133. *Lomandra tropica* (114)

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125. *Lomandra leucocephala*
subsp. *robusta* (110)

128. *Lomandra glauca* (112)

131. *Lomandra rupestris* (113)

134. *Lomandra suaveolens* (116)

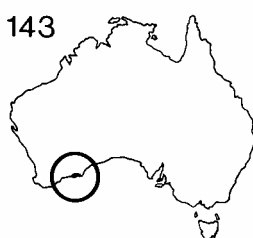
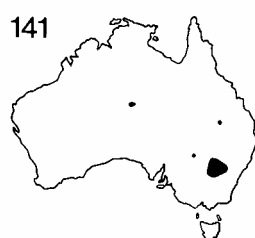
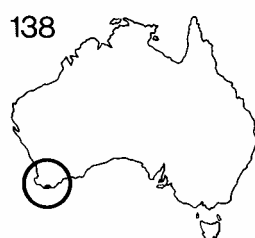
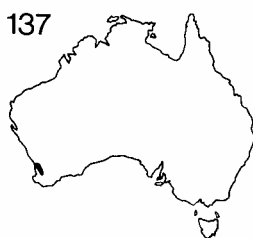
123. *Lomandra juncea* (107)

126. *Lomandra obliqua* (111)

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132. *Lomandra collins* (113)

135. *Lomandra sonderi* (117)



136. *Lomandra sericea* (117)

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145. *Lomandra hystrix* (121)

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137. *Lomandra spartes* (117)

140. *Lomandra multiflora*
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143. *Lomandra rigida* (120)

146. *Lomandra confertifolia*
subsp. *confertifolia* (122)

149. *Lomandra confertifolia*
subsp. *similis* (123)

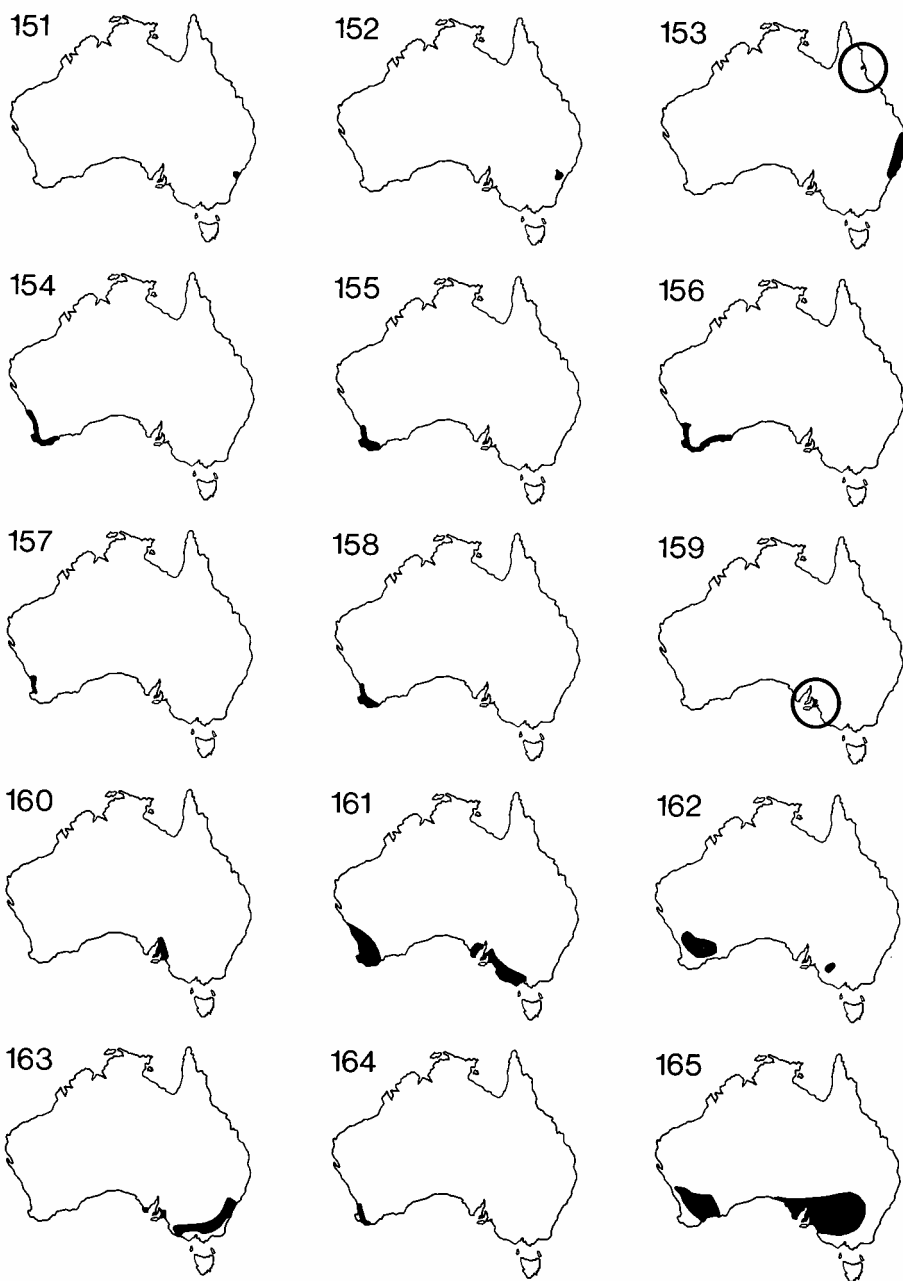
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141. *Lomandra patens* (119)

144. *Lomandra longifolia* (121)

147. *Lomandra confertifolia*
subsp. *pallida* (123)

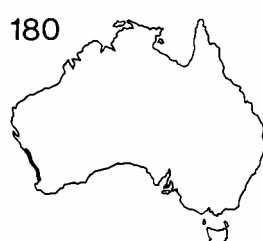
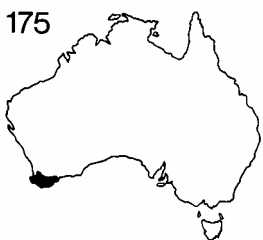
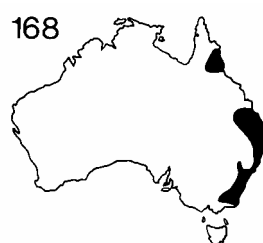
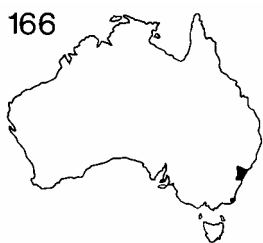
150. *Lomandra confertifolia*
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151. *Lomandra fluviatilis* (124)
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 156. *Lomandra nigricans* (127)
 159. *Lomandra fibrata* (130)
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 165. *Lomandra effusa* (132)



166. *Lomandra cylindrica* (133)

167. *Lomandra brevis* (133)

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170. *Lomandra filiformis*
subsp. *flavior* (135)

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173. *Lomandra laxa* (136)

174. *Lomandra nutans* (136)

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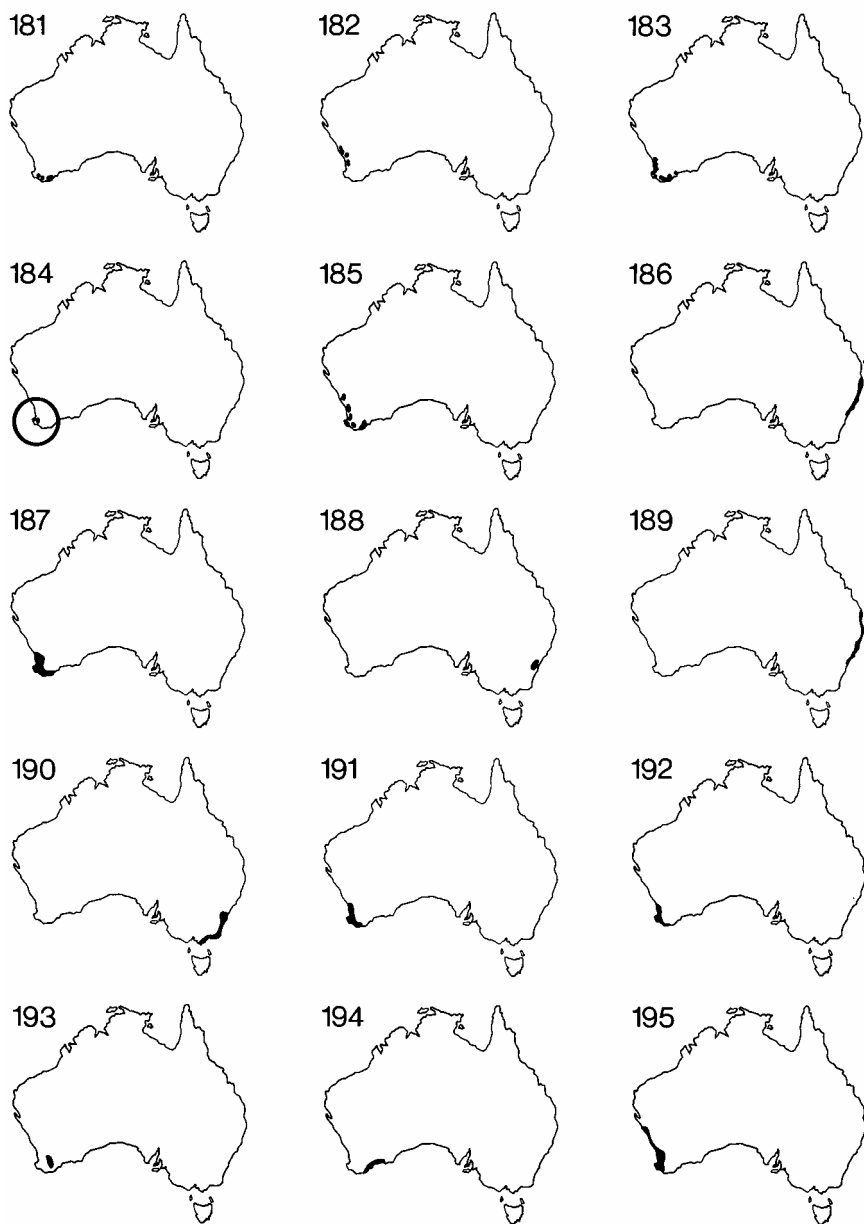
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194. *Xanthorrhoea*
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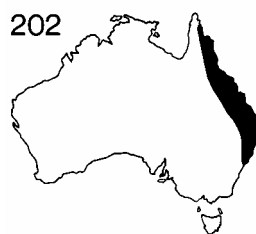
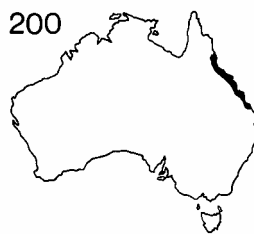
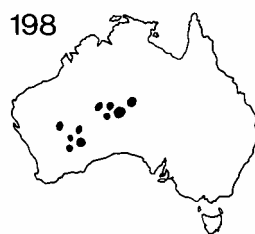
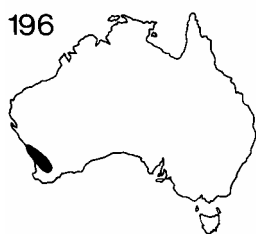
183. *Dasypogon*
bromeliifolius (144)

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209. *Xanthorrhoea acaulis* (165)

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201. *Xanthorrhoea media* (161)

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210. *Xanthorrhoea minor* subsp. *minor* (166)



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221. *Calectasia intermedia* (171)

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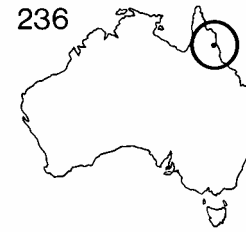
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APPENDIX

New taxa, combinations and lectotypifications

New taxa, combinations and lectotypifications occurring in this Volume of the Flora are formally published here. The families are arranged in the same order as the text; taxa are alphabetically arranged within families, and authors are alphabetical in Lomandra (Xanthorrhoeaceae). For economy the entries are brief; the treatment in the main text is more comprehensive. The date of publication of this Volume will be given in Volume 45.

IRIDACEAE

D.A.Cooke

Patersonia lanata forma **calvata** D.Cooke, forma nov.

Ab *Patersonia lanata* R.Br. forma *lanata* tomenti absentia differt. Folia glaberrima; scapus sparsim scaber; spathae bractaeaeque vix puberulentes.

T: 3.8 km W of Norseman-Esperance road junction on Ravensthorpe road, W.A., 33°46'S, 121°49'E, 9 Oct. 1976, *R.J.Chinnock 3317*; holo: AD 97651191; iso: MEL 604122, PERTH.

Occurs in southern W.A.

Named from the Latin *calvatus* (bared), in reference to the absence of the dense vestiture typical of the species.

Patersonia rudis subsp. **velutina** D.Cooke, subsp. nov.

Ab *Patersonia rudi* Endl. subsp. *rudi* foliis biconvexioribus angustioribus, scapo omnino velutino, spathis brevioribus densiore velutinis pilibus persistentibus, differt. Folia ad 35 cm longa, 23 mm lata; spathae 34 cm longae.

T: W of Red Kangaroo Hill, W.A., Nov. 1891, *R.Helms*; holo: AD 96948051; iso: MEL 531976.

Occurs in southern inland W.A.

Named from the Latin *velutinus* (velvety), in reference to the vestiture of the scape and spathes.

AGAVACEAE

L.Pedley

Cordyline manners-suttoniae F.Muell., *Fragm.* 5: 195 (1866)

C. terminalis var. *manners-suttoniae* (F.Muell.) Baker, *J. Linn. Soc., Bot.* 14: 541 (1875). T: Mt Elliot, Qld, *Fitzalan*; lecto (here chosen): MEL 645614.

Of the collections cited in the protologue, that of *Fitzalan* is the most complete.

Cordyline petiolaris (Domin) Pedley, comb. nov.

Cordyline terminalis var. *petiolaris* Domin, *Biblioth. Bot.* 85: 517, t. 17 (1915). T: Tambourine Mt, Qld, *K.Domin*; holo: PR *n.v.*

This taxon is considered worthy of specific rank.

XANTHORRHOACEAE

ACANTHOCARPUS

A.S.George

Acanthocarpus canaliculatus A.S.George, sp. nov.

Caules ad 50 cm longi. Foliarum lamina 3–15 mm longa, nervis 3–5 rotundatis; sulcae apertae; vaginae auriculae non vel breviter productae, integrae. Sepala et petala 4–5.5 mm longa, alba, costa violaceo-brunnea. Stamina 2.5 mm longa. Capsulae carpella 3–4 mm longa, verrucosa tuberculis rotundatis vel applanatis ad 0.3 mm longis.

T: S of Cockleshell Gully, W.A., 30°11'S, 115°07'E, 16 Oct. 1984, *A.S.George 16321* (fruit); holo: PERTH; iso: CANB, K, MEL.

Named from the Latin *canaliculatus* (channelled), in reference to the open grooves on the abaxial leaf-surface.

Acanthocarpus humilis A.S.George, sp. nov.

Caules ad 20 cm longi. Foliarum lamina 10–15 mm longa, nervis 5–9; sulcae apertae, ad apicem praecluescentes; vaginae auriculae 2–3 mm longae, integrae vel laceratae. Sepala et petala 6–7 mm longa, alba, costa brunnea. Stamina 5 mm longa. Capsulae carpella 4–5 mm longa, verrucosa tuberculis rotundatis ad 0.3 mm longis.

T: 64.5 km N of turnoff from North West Coastal Hwy on Exmouth road, W.A., 8 Aug. 1976, *H.Demarz 6102*; holo: PERTH.

Occurs in north-western W.A., between Point Cloates and the Lyndon River.

Named from the Latin *humilis* (low-growing), in reference to the small habit.

Acanthocarpus parviflorus A.S.George, sp. nov.

Caules ad 40 cm longi. Foliarum lamina 3–10 mm longa, nervis 3–5, rotundatis; sulcae apertae; vaginae auriculae anguste triangulares, integrae vel parum laceratae. Sepala et petala 3 mm longa, alba. Stamina 1.5–2 mm longa. Capsulae carpella 4–5 mm longa, verrucosa tuberculis obtusis ad 0.3 mm longis.

T: Murchison R. gorge, c. 15 miles [24 km] NW of Ajana, W.A., 27°49'S, 114°28'E, 13 May 1961, *A.S.George 2370*; holo: PERTH; iso: CANB, K.

Occurs along and near the lower Murchison River, W.A.

Named from the Latin *parvus* (small) and *-florus* (-flowered), in reference to the small flowers.

Acanthocarpus preissii Lehm., *Pl. Preiss.* 2: 274 (1848)

T: near Fremantle, W.A., 7 Dec. 1838, *L.Preiss 428*; lecto (here chosen): MEL 657724.

Two collections were cited in the protologue. That selected as lectotype represents a species common on coastal sand dunes in south-western W.A., and cited in many publications on the coastal flora. The other collection (*Preiss 2398*) represents the species described above as *A. canaliculatus*, a widespread inland plant of the south-west but rarely cited. The lectotypification maintains the better-known usage of the name.

Acanthocarpus robustus A.S.George, sp. nov.

Caules ad 70 cm longi. Foliarum lamina 30–50 mm longa, crassa, nervis 9–13; sulcae inapertae; vaginae auriculae 4–16 mm longae, laceratae. Sepala et petala 4.5–5 mm longa, exteriora alba, interiora caryophyllacea. Stamina 3 mm longa. Capsulae carpella 6–7 mm longa, verrucosa tuberculis ad 1 mm longis.

T: 25 miles [40 km] N of Carnarvon on Quobba road, W.A., 2 Sept. 1970, *A.S.George 10138* (fruit); holo: PERTH; iso: CANB, K.

Occurs in north-western Australia from North West Cape to Shark Bay.

The specific epithet from the Latin *robustus* (strong, robust) refers to the habit and thick, stiff leaves.

Acanthocarpus rupestris A.S.George, sp. nov.

Caules ad 50 cm longi. Foliarum lamina 7–25 mm longa, nervis 5, complanatis; sulcae fere inapertae; vaginae auriculae triangulares ad ovatae, 1 mm longae, laceratae. Sepala et petala 3–3.5 mm longa, alba. Stamina 1–1.5 mm longa. Capsulae carpella 4–4.5 mm longa, verrucosa tuberculis conicis obtusis ad 0.4 mm longis.

T: 3.5 miles [c. 5.5 km] S of Exmouth township, W.A., 25 May 1965, *A.S.George 6590*; holo: PERTH; iso: AD 96532070.

Endemic in the Cape Range, north-western W.A.

The Latin epithet *rupestris* (rocky, rock-dwelling) refers to the habitat.

Acanthocarpus verticillatus A.S.George, sp. nov.

Caules ad 50 cm longi. Foliarum lamina 10–50 mm longa, nervis 6–8 rotundatis; sulcae fere inapertae; vaginae auriculae 3–5 mm longae, tandem laceratae. Inflorescentia racemiformis verticillis florum 1–3. Sepala et petala 5–7 mm longa, alba, costa violacea. Stamina 3 mm longa. Capsulae carpella 6 mm longa, verrucosa tuberculis angustis 0.1–0.4 mm longis.

T: 4 miles [c. 6 km] S of Wooramel R., North West Coastal Hwy, W.A., 3 July 1967, *D.E.Symon 5442*; holo: PERTH; iso: ADW.

Occurs in north-western W.A. from the Monte Bello Islands to Shark Bay.

The Latin epithet *verticillatus* (whorled) refers to the inflorescence.

LOMANDRA

J.Everett

Lomandra micrantha subsp. *teretifolia* Everett, subsp. nov.

A subspecies typica foliis rigidis teretibusque, differt.

T: 49 km E of Newdegate on Lake King road, W.A., 27 June 1976, *A.S.George 14294*; holo: NSW (♂); iso: CANB, K, MEL, PERTH, all *n.v.*

The specific epithet is derived from the Latin *teres* (terete) and *folium* (a leaf).

Lomandra micrantha subsp. *tuberculata* Everett, subsp. nov.

A subspecies typica axe inflorescentiae manifeste tuberculato differt.

T: Ridge road near Waitpinga, S.A., 22 July 1966, *D.E.Symon 3961*; holo: NSW (♂); iso: AAU, ADW, HUI, K, all *n.v.*

The Latin specific epithet refers to the raised tubercles on the inflorescence axis.

LOMANDRA

Alma T.Lee

Lomandra Labill., *Nov. Holl. Pl.* 1: 92 (1805)

Lecto (here chosen): *L. longifolia* Labill., *op. cit.* t. 119.

Two species were described in the protologue, *L. longifolia* (p. 92), before *L. rigida* (p. 93). *L. longifolia* is described in greater detail, and its illustration shows the generic character from which the name was derived (anthers with circular margin) in all six anthers (in three only in *L. rigida*). For these reasons *L. longifolia* is selected as lectotype.

Lomandra sect. **Capitatae** (G.Don) A.Lee, comb. nov.

Xerotes sect. *Capitatae* G.Don in J.C.Loudon, *Hort. Brit.* 398 (1830). Lecto (here chosen): *L. obliqua* (Thunb.) J.F.Macbr.

Lomandra sect. *Cephalogyne* (Benth.) Engl., *Nat. Pflanzenfam.* 2(5): 51 (1887); *Xerotes* sect. *Cephalogyne* Benth., *Fl. Austral.* 7: 105 (1878). T: not designated.

Two species were included in the protologue of sect. *Capitatae* and both show the sectional characters given there. The first of these (listed as *Xerotes filifolia* R.Br., *nom. illeg.*, i.e. *L. obliqua*) is selected as lectotype; it was also the earliest species of the section published, as *Dracaena obliqua* Thunb.

Lomandra ser. **Sparsiflorae** (Benth.) A.Lee, comb. nov.

Xerotes ser. *Sparsiflorae* Benth., *Fl. Austral.* 7: 102 (1878). Lecto (here chosen): *Lomandra effusa* (Lindley) Ewart

Bentham included five species in this series, as *Xerotes*. All agree with the diagnosis, and the first is here selected as lectotype.

Lomandra nana (A.Lee) A.Lee, comb. nov.

Lomandra glauca subsp. *nana* A.Lee, *Contr. New South Wales Natl Herb.* 4: 256 (1972). T: Wimmera district, Vic., Oct. 1900, C. Walter 9 (♂ & ♀); holo: NSW 50575.

This change, like the restoration of *L. collina* to specific rank in the main text of this work, gives the taxon equal ranking with the others of the *L. glauca* group. The group (*L. collina*, *L. elongata*, *L. glauca*, *L. nana* and *L. tropica*) continues to pose problems of classification.

LOMANDRA

T.D.Macfarlane

Lomandra hermaphrodita (C.R.P.Andrews) C.Gardner, *Enum. Pl. Austral. Occid.* 20 (1930)

Xerotes hermaphrodita C.R.P.Andrews, *J. Proc. Mueller Bot. Soc. W. Australia* 1(9): 20 (June 1902). T: Claremont, W.A., 22 May 1902, C.Andrews (♂); lecto (here chosen): PERTH; isolecto: K, PERTH.

In the protologue Andrews cited two localities and dates, and material is in three herbaria, K (an isolectotype), NSW (a syntype) and PERTH (the lectotype and two

isolectotypes). The three PERTH sheets, all collected at Claremont, are dated May 1902 or 22 May 1902. The best specimen has been selected as the lectotype.

Lomandra multiflora (R.Br.) Britten subsp. **dura** (F.Muell.) T.Macfarlane, stat. et comb. nov.

Xerotes dura F.Muell., *Trans. & Proc. Victorian Inst. Advancem. Sci.* 42 (1855); *Lomandra dura* (F.Muell.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 219 (1916). T: near Adelaide, S.A., Nov. 1848, F.Mueller; lecto: MEL 630935, *fide* A.T.Lee, *Contr. New South Wales Natl Herb.* 3: 163 (1962).

This taxon differs from the type subspecies only in the sessile or very shortly pedicellate male flowers, only a small proportion of plants of either subspecies having pedicels of male flowers at anthesis in the overlap zone of their respective range of pedicel lengths, i.e. 1.6–2 mm. The two subspecies have distinct geographic distributions. *L. multiflora* subsp. *dura* is endemic in South Australia. Previous records of the subspecies (as *L. dura*) from N.S.W. were apparently based on immature specimens.

Lomandra sonderi (F.Muell.) Ewart, *Proc. Roy. Soc. Victoria* n. ser. 28: 219 (1916)

Xerotes sonderi F.Muell., *Fragm.* 8: 206 (1874). T: Wuljenup, Plantagenet District [Mt Willyung near Albany], W.A., 14 Oct. 1840, *L.Preiss 1559*; lecto (here chosen): EL 15460; islecto: P.

[*Xerotes rigida* auct. non (Labill.) R.Br.: S.L.Endlicher in J.G.C.Lehmann, *Pl. Preiss.* 2: 50 (1846)]

In describing *X. sonderi*, Mueller cited the Preiss collection and collections of his own from near Albany. Among the females cited are specimens of *L. nigricans* T.Macfarlane (= *L. endlicheri* (F.Muell.) Ewart *nom. illeg., p.p.*), including the Kew duplicate of Mueller's collection from King George Sound, as suspected by Bentham, *Fl. Austral.* 7: 99 (1878), but there is also a female of true *L. sonderi*. The several Mueller specimens have various locality details and none explicitly bear Mueller's name as the collector. In view of the taxonomic mixture and the variety of labels of the type material, lectotypification seems advisable. As well as the lectotype there is at MEL a second sheet of Preiss 1559 (MEL 15461) bearing Preiss number slips but lacking the full original Preiss label.

Lomandra teres T.Macfarlane, sp. nov.

Fasciculi robusti. Folia plana, obtusa, c. 95 cm longa, 4.5–5 mm lata; vaginae margines lacerati, rufo-brunnei. Inflorescentia folia excedens; flores in fasciculis verticillatis in ramulis verticillatis, confertis, appressis, 6–7 mm longis. Pedicelli masculi ad 4.5 mm longi. Sepala et petala virido-violacea, fere aequalia.

T: Mt Playfair, between Mt Pluto and head of Louisa Creek, Qld, 24°56'S, 147°10'E, 7 Nov. 1984, S.J.Barry (♂); holo: BRI.

Occurs in central Qld.

Named from the Latin *teres* (terete), in reference to the terete or cylindrical inflorescences.

ROMNALDA

R.J.F.Henderson & P.R.Sharpe

Romnalda strobilacea R.Henderson & Sharpe, sp. nov.

Ad *R. grallatam* R.Henderson affinis, sed plantis usque 1 m altis, fasciculis florum versus apices ramulorum inflorescentiae portatis, bracteis persistentibus structuram strobilaceam formantibus, stylo ovarium brevior, differt. Folia usque 80 cm longa. Inflorescentia usque 90 cm alta. Sepala elliptica, c. 3 mm longa. Petala obovata ad obcordata, c. 2.5 mm longa.

Stamina usque c. 1.5 mm longa. Capsula obliqua, depressa-globosa, c. 6 mm longa et 8 mm lata.

T: Mary Cairncross Park, c. 4 km ESE of Maleny, Qld, 3 Nov. 1983, *R.J.F.Henderson H3040* & *P.R.Sharpe*; holo: BRI; iso: A, K, L, NSW.

Named from the Latin adjective *strobilaceus* (like a cone of the Coniferae), in reference to the small cone-like structures formed by the persistent bracts.

XANTHORRHOEA

D.J.Bedford

Xanthorrhoea acaulis (A.Lee) Bedford, stat. nov.

X. australis subsp. *acaulis* A.Lee, *Contr. New South Wales Natl Herb.* 4: 53 (1966). T: 6.5 miles [10.5 km] W of Dubbo on Minore Road, 9 Dec. 1961, *E.F.Constable NSW 61344*; holo: NSW.

This species is clearly distinct from *X. australis* R.Br. s. str. in trunk and leaf characters, in scape to spike ratio and dimensions, in bract shape, hairiness and colour and in sepal shape. It also occurs in a different habitat and geographic area and is sufficiently distinct to warrant specific status.

Xanthorrhoea arenaria Bedford, sp. nov.

Ab *X. minori* R.Br. et *X. bracteata* R.Br. bracteis stipantibus subulatis et bracteis fasciculorum subulatis prominentioribus et multo longioribus, differt. Ab *X. australi* R.Br. caudice nullo et spica quam scapo brevior vel aequanti, differt; et ab *X. caespitosa* Bedford habitu minore, sepalorum rostro longiore, et foliis angustioribus, differt.

T: c. 0.5 km NW of Coles Bay township, Tas., 26 Jan. 1984, *D.Bedford 124*; holo: NSW.

The name is derived from the Latin *arenarius* (growing in sand) in reference to the most common habitat of the species.

Xanthorrhoea brevistyla D.Herbert, *J. Roy Soc. W. Australia* 7: 82 (1921)

T: Narrogin State Farm, W.A., 13 Nov. 1920, *D.A.Herbert s.n.*; lecto (here chosen): PERTH; isolecto: MEL.

Two syntypes of *X. brevistyla* are in existence. The specimen at PERTH is chosen as lectotype because it is the more complete and conforms better with the protologue.

Xanthorrhoea brunonis Endl. in J.G.C.Lehmann, *Pl. Preiss.* 2: 39 (1845)

T: near Swan River, W.A., 20 Nov. 1839, *L.Preiss 1621*; lecto (here chosen): MEL 625771.

The specimen of *X. brunonis* at MEL with the collecting label, in Preiss's hand, '1621 Xanthorrhoea...Acaulis...In arenosis ad. fl. Cygnorum... Sem. num. 333... Novbr. 20.39. L.Preiss legit' is the only known extant material of this taxon collected by Preiss. As there may be duplicate specimens deposited elsewhere the material at MEL is chosen as lectotype to ensure nomenclatural stability.

Xanthorrhoea brunonis subsp. **semibarbata** Bedford, subsp. nov.

Ab *X. brunonis* Endl. subsp. *brunonis* apicibus bractearum florum stipantium fimbriatis differt.

T: Poad Road, S of Dardanup, W.A., 24 Nov. 1982, *D.J.Bedford 8* & *T.D.Macfarlane*; holo: NSW; iso: PERTH.

The name is derived from the Latin *semi* (half) and *barbatus* (bearded), in reference to the hairs fringing the bracts.

Xanthorrhoea caespitosa Bedford, sp. nov.

Ab *X. minori* R.Br. foliis latoribus glaucisque, inflorescentia plerumque altiori et bracteis stipantibus lineari-triangularibus ad subulatis, differt. Ab *X. semiplana* F.Muell. absentia caudicis et foliis in T.S. obtriangularibus ad concavis, differt.

T: Meningie, S.A., 13 Nov. 1957, *J.B.Cleland s.n.*; holotype: AD 966081326.

Named from the Latin *caespitosus* (growing in tufts or clumps) to describe the habit of this species.

This taxon probably corresponds with most of the reported populations of *X. minor* in S.A. (*J.B.Cleland, S. Austral. Naturalist* 40: 27, 1965) and with the purported hybrid swarm mentioned by A.T.Lee, *Contr. New South Wales Natl Herb.* 4: 54 (1966).

Xanthorrhoea concava (A.Lee) Bedford, stat. nov.

X. resinosa subsp. *concava* A.Lee, *Contr. New South Wales Natl Herb.* 4: 45 (1966). T: 1 mile [c. 1.6 km] W of Buxton, N.S.W., 5 Dec. 1960, *A.T.Lee NSW 61300*; holotype: NSW.

This taxon is distinct from *X. resinosa* Pers. in habit, in the much longer and more flexible leaves, in leaf shape and dimensions, and in inflorescence, bract and petal characters. Although partially sympatric with *X. resinosa* it maintains its distinctness.

Xanthorrhoea drummondii Harvey, *Hooker's J. Bot. Kew Gard. Misc.* 7: 57 (1855)

T: near Perth and elsewhere, W.A., *J.L.Drummond s.n.*; n.v.; Wedin siding, W.A., 28 Nov. 1982, *D.Bedford 46* & *T.D.Macfarlane*; neotype (here chosen): NSW; isoneotype: PERTH.

No sheet of the Drummond collection has been located. The specimen selected as neotype conforms to the protologue; it is complete and well-documented.

Xanthorrhoea fulva (A.Lee) Bedford, stat. nov.

X. resinosa subsp. *fulva* A.Lee, *Contr. New South Wales Natl Herb.* 4: 45 (1966). T: Coffs Harbour, N.S.W., 17 Oct. 1961, *E.F.Constable NSW 61664*; holotype: NSW.

This taxon is distinct from *X. resinosa* Pers. in leaf shape and dimensions, inflorescence dimensions and colour, bract shape and in petal characters. It is allopatric with *X. resinosa* and occupies a different habitat.

Xanthorrhoea glauca Bedford, sp. nov.

Ab *X. australi* R.Br. bracteis fasciculorum et bracteis stipantibus subglabris, his cum lamina gracili, capitulo lato fusco et apice triangulari vel acuto, differt. Ab *X. johnsonii* A.Lee bracteis fasciculorum longioribus et multo prominentioribus, foliis glaucis, et spicis grossis quam scapis multo longioribus, differt.

T: edge of Levers Plateau, Qld, 4 July 1977, *D.Bedford 7776*; holotype: NSW.

Named from the Latin *glaucus* (covered with a fine bloom), in reference to the distinctly glaucous fresh leaves.

Xanthorrhoea glauca subsp. **angustifolia** Bedford, subsp. nov.

Ab *X. glauca* Bedford subsp. *glauca* foliis angustioribus quadrato-rhombeis cineraceis, et scapis spicisque parum gracilioribus, differt.

T: 5 miles [8 km] NW of Coonabarabran on Bugaldie Road, N.S.W., 13 Dec. 1961, *E.F.Constable NSW 61353*; holotype: NSW.

Named from the Latin *angustus* (narrow) and *folium* (leaf), in reference to the narrow leaves.

Xanthorrhoea gracilis Endl. in J.G.C.Lehmann, *Pl. Preiss.* 2: 39 (1845)

T: Darling Range, Perth, W.A., 16 Jan. 1840, *L.Preiss 1619*; lecto (here chosen): MEL 625759.

The only extant syntypes of Preiss's collections appear to be at MEL, since Endlicher's specimens of *Xanthorrhoea* at W were destroyed during World War II and other herbaria holding Preiss collections, including LD, have no *Xanthorrhoea* duplicates. MEL 625759 is the better specimen of the two syntypes at MEL.

Xanthorrhoea latifolia (A.Lee) Bedford, stat. et. comb. nov.

X. media subsp. *latifolia* A.Lee, *Contr. New South Wales Natl Herb.* 4: 48 (1966). T. Beerwah, Qld, May 1962, *E.F.Constable NSW 61667*; holo: NSW; iso: AD.

This taxon is distinct from *X. media* in its broader more transversely-rhombic leaves, longer inflorescence and longer trunk. It is allopatric with *X. media* and often occupies wetter or more sheltered habitats. It is sufficiently distinct to warrant specific status.

Xanthorrhoea latifolia subsp. **maxima** Bedford, subsp. nov.

Ab *X. latifolia* subsp. *latifolia* caudice altiori, foliis plerumque multo latioribus, spica quam scapo multo breviori, et bracteis stipantibus acutis, differt.

T: Mt Warning, near Murwillumbah, N.S.W., 2 June 1962, *E.F.Constable NSW 61357*; holo: NSW.

Named from the Latin *maximus* (very large), in reference to the width of the leaves.

Xanthorrhoea malacophylla Bedford, sp. nov.

Planta cum caudice altissimo et foliis spongiosis mollibus viridibus. Ab *X. australi* R.Br. bracteis stipantibus acutis et sepalis brevioribus sine proboscide, et ab illa et *X. glauca* Bedford foliis mollibus viridibus, scapo spicam fere aequanti, et bracteis fasciculorum minus prominentibus, differt.

T: Camp Ridge Trig., Queens Lake State Forest, 5 miles [8 km] NNE of Kew, N.S.W., 15 May 1964, *E.F.Constable 4792*; holo: NSW.

Named from the Greek *malacos* (soft to the touch) and *phyllon* (leaf), in reference to the spongy soft leaves.

Xanthorrhoea minor R.Br.

T: Port Jackson, N.S.W., 1803, *R.Brown Iter Australiense 5773*; lecto (here chosen): BM (photo N/740).

There are three known specimens labelled *X. minor* by R.Brown, two at BM and one at K. At BM, besides the lectotype, is a specimen with two labels bearing conflicting locality details, both in Brown's hand. One reads Port Dalrymple Jan. 1804, the other Port Jackson (localities in Tasmania and N.S.W. respectively). A typed label, added later, reads 'Paratype specimen of *X. minor* R.Br.'. This specimen is not *X. minor* but appears to be *X. bracteata* R.Br. The specimen at K is labelled '5 *Xanthorrhoea minor* Port Jackson, vicinity of Sydney' in R.Brown's writing and has fewer hairs on the bracts than does the specimen at BM designated (above) as lectotype.

A.T.Lee, *Contr. New South Wales Natl Herb.* 4: 46 (1966), referred to the lectotype specimen as a holotype, unaware of the other labelled specimens. The choice of lectotype, above, therefore maintains existing usage, although the specimen at K has since been incorrectly labelled, in an unknown hand, as the cited specimen.

Xanthorrhoea minor subsp. **lutea** Bedford, subsp. nov.

Ab *X. minori* R.Br. subsp. *minori* bracteis stipantibus acutis hirsutis, et petalis majoribus flavis, differt.

T: 3 miles [c. 5 km] SSW of Nowa, Vic., 29 Oct. 1964, *E.F.Constable 5341*; holo: NSW.

Named from the Latin *luteus* (yellow), in reference to the petals.

Xanthorrhoea nana D.Herbert, *J. Roy. Soc. W. Australia* 7: 83 (1921)

T: about 2 miles [c. 3 km] NE of Bruce Rock, W.A., 25 Oct. 1920, *D.A.Herbert*; lecto (here chosen): PERTH; isolecto; MEL.

The PERTH specimen is chosen as lectotype because it is the more complete. The specimen at MEL, which has Herbert's handwritten label, is the same taxon but is a poor specimen. Neither specimen has leaves. A specimen collected at the type locality by D.J.Bedford 76 & T.D.Macfarlane in 1982 (NSW, PERTH), consisting of leaves and infructescence, serves to confirm Herbert's leaf description.

Xanthorrhoea platyphylla Bedford, sp. nov.

Ab *X. preissii* Endl. foliis latioribus in T.S. obtrullatis ad obtriangularibus, et absentia caudicis, differt. Ab *X. brevistyla* D.Herbert foliis multo crassioribus et latioribus, spica quam scapo longiori, et bracteis stipantibus minus hirsutis, differt.

T: 36.5 km W of Esperance on road to Ravensthorpe, W.A., 27 Nov. 1982, *D.Bedford 35* & *T.D.Macfarlane*; holo: NSW; iso: PERTH.

Named from the Greek *platys* (wide) and *phyllon* (leaf), in reference to the broad leaves which distinguish it from its nearest relatives.

Xanthorrhoea preissii Endl. in J.G.C.Lehmann, *Pl. Preiss.* 2: 39 (1846)

T: York [vicinity of Toodyay, perhaps the present-day Boyagerring Ck which flows to Toodyay from 10 km NE], W.A., 22 Mar. 1840, *L.Preiss 1620*; lecto (here chosen): MEL 625774.

There are no Preiss collections of *Xanthorrhoea* at LD or W. The sheet MEL 625774, which has Preiss's collecting label, is the only specimen found of the type collection of this species. Since it is unlikely to be the holotype, as Preiss usually collected and distributed duplicates, it is best to designate this specimen as lectotype to ensure nomenclatural stability.

Xanthorrhoea quadrangulata F.Muell., *Fragm.* 4: 111 (1864)

T: [near St Vincent Gulf], S.A., 3 Feb. 1848, *F.Mueller*; lecto (here chosen): MEL 625754; isolecto: K, MEL 625760.

Three known specimens represent material collected by Mueller and cited in his protologue. Two are at MEL (MEL 625754, MEL 625760) and one at K. One (MEL 625754) consists of part of the scape and spike and 3 pieces of leaf; it is signed 'Dr M' and dated 'Feb. 3 1848' and has a vague locality ('non procul a cataracta'). Other specimens collected around this date by Mueller are labelled 'Gawler, Torrens, Holdfast Bay [now Glenelg] and St Vincents Gulf' which provides a fairly accurate location for the collection as being 'not far from St Vincents Gulf' in the terms Mueller used in his original description. The other sheet (MEL 625760) bears two pieces of spike and two pieces of leaf. It is not signed or dated but is labelled in Mueller's early hand '*Xanthorrhoea quadrangulata* F.M. Mount Lofty Range'. The sheet at K bears part of a spike and two pieces of leaf; it is not dated but is signed and labelled '*Xanthorrhoea quadrangulata* Ferd. Mll. Lofty-ranges Dr M' in Mueller's hand. The sheet MEL 625754 is chosen as lectotype primarily because it is the most complete both in the specimen and in the date.

***Xanthorrhoea semiplana* F.Muell., *Fragm.* 4: 111 (1864)**

T: near Gawler town, S.A., *F.Mueller*; lecto (here chosen): MEL 625756.

Three specimens at MEL (MEL 625755, 625756, 625757), collected by Mueller from localities cited in his protologue, represent the only known syntypes. One (625755) has an early draft of Mueller's description but consists of leaf pieces only; another (625757) is dated (Nov [18]51) and consists of slivers of spike only; the third (625756) is the most complete specimen as it consists of pieces of spike, scape and leaf. Although this last specimen is not dated, its label in Mueller's hand '*Xanthorrhoea semiplana* mihi', is clearly proof that Mueller regarded it as belonging to this taxon. Additionally, as the locality is the same as MEL 625757 it is most likely that it was collected at the same time as that specimen.

***Xanthorrhoea semiplana* subsp. *tateana* (F.Muell.) Bedford, stat. et comb. nov.**

X. tateana F.Muell., *Z. Allg. Osterr. Apotheker-Vereines* 23(19): 293-295 (1885). T: Kangaroo Island, S.A., 1883, *Somerville & Wilks*; lecto (here chosen): MEL 625766.

The status of *X. tateana* has long been in doubt. J.M.Black, *Fl. S. Australia* (1943), noted that 'on the mainland this species tends to run into *X. semiplana*, to which it is closely related'. J.B.Cleland, *S. Austral. Naturalist* 39: 61 (1965), treated *X. tateana* as a form of *X. semiplana*. A study of specimens and of plants in the field, indicates that the only differences between the two species are inflorescence dimensions and geographical distribution, with considerable overlap in both. It is thus more appropriate that *X. tateana* be regarded as a subspecies of *X. semiplana*.

Mueller's protologue left some doubt as to the source of his material and information. Mueller mentions information from Tate, but no suitable specimen collected by Tate has so far been located. However, as he mentions Somerville & Wilks as providing resin material of the taxon, and the only known specimen collected before 1885 was that of Somerville & Wilks, it seems certain that this collection was used by Mueller for his description and it is therefore chosen as lectotype.

XEROLIRION

A.S.George

***Xerolirion* A.S.George, gen. nov.**

Ad *Lomandram* Labill. affinis, a qua habitu divaricater ramosa, foliis parvis caducis, et inflorescentia redacta (mascula 1–3–flora, foeminea 1–flora), differt. Plantae dioicae, breviter rhizomatosae. Caules caespitosi, primum simplices, postea divaricater ramosi. Folia linearia basi vaginanti, caduca. Flores parvi; masculi in cymis 1–3–floris, staminibus 6 ad basin sepalorum et petalorum insertis; foeminei solitarii, stylo simplici. Fructus capsula laevis, 1–3–sperma.

T: *X. divaricata* A.S.George

A monotypic genus endemic in the South-West–Ereman interzone of W.A. Closely related to *Lomandra* Labill. but distinct in the reduced inflorescence and the divaricate, almost leafless habit.

The name is derived from the Greek *xeros* (dry) and *lirion* (a lily), in reference to the dry appearance and habitat of this new member of the Liliales. Gender: feminine.

Xerolirion divaricata A.S.George, sp. nov.

Caules ad 40 cm longi. Ramuli divaricati. Folia ramulorum laminis 3–5 mm longis, obtusis vel acutis, infra 5–nervibus, ad apicem 3–nervibus, marginibus vaginae late scariosis. Sepala et petala 2–4 mm longa, alba. Carpella c. 3 mm longa. Semina 2–2.5 mm longa, parum rugosa, flava.

T: 24 km N along Clark Road from Bonnie RockBurakin road, W.A., 30°15'S, 118°04'E, A.S.George 16434 (fruit); holotype: PERTH; isotype: CANB, K, MEL, PERTH.

Occurs in southern W.A. between Morowa and Southern Cross.

The Latin epithet refers to the branching habit of the plants.

STEMONACEAE

I.R.H.Telford

Stemona prostrata Telford, sp. nov.

Ad *Stemonam australianam* (Benth.) C.H.Wright affinis, a qua caulibus prostratis vel decumbentibus, non volubilibus; foliis plerumque brevioribus, 15–40 mm longis; floribus per fasciculum pluribus, 2–10; sepalis et petalis brevioribus, 5–7 mm longis, differt.

T: 5 miles [8 km] NW of Humpty Doo, N.T., 11 Jan. 1972, N.Byrnes & McKean B 204; holotype: CANB; isotype: DNA, K, L, NT.

Occurs in northern N.T.

Named from the Latin *prostratus* (prostrate), in reference to the habit of the species.

Stemona angusta Telford, sp. nov.

Ad *Stemonam philippinensem* Merr. affinis, a qua foliis angustioribus basi cuneatis, floribus majoribus sepalis et petalis acutis ad acuminatis 25–28 mm longis, differt.

T: near airstrip, Kalinga Stn (Hann Telegraph Office) via Laura, Qld, 15°12'S, 142°54'E, 6 Jan. 1976, I.B.Staples 2240 (BRI 248126); holotype: BRI.

Known from a single collection from Cape York Peninsula, Qld. I.B.Staples 2240 consists of 2 sheets, BRI 248126 and BRI 248182, apparently from different plants.

Named from the Latin *angustus* (narrow), in reference to the narrow leaves, sepals and petals.

SMILACACEAE

J.G.Conran & H.T.Clifford

Smilacaceae subfam. **Petermannioideae** (Hutch.) Conran & Cliff., stat. & comb. nov.

Petermanniaceae Hutch., *Fam. Fl. Pl., Monocot.* 2: 133 (1934). T: *Petermannia* F.Muell.

Smilacaceae subfam. **Ripogonoideae** (Conran & Cliff.) Conran & Cliff., stat. & comb. nov.

Ripogonaceae Conran & Cliff., *Nordic J. Bot.* 5: 215219 (1985). T: *Ripogonum scandens* Forster & G.Forster

Smilacaceae subfam. **Luzuriagoideae** (Engl.) Conran & Cliff., comb. nov.

Liliaceae subfam. *Luzuriagoideae* Engl., *Führer Garten Breslau* 26 (1886). T: *Luzuriaga radicans* Ruiz Lopez & Pavón

Ripogonum brevifolium Conran & Cliff., sp. nov.

Suffrutex scandens, c. 10 m altus, glaberrimus vel paucis spinosis, ad *Ripogonum album* R.Br. accedens. Folia elliptica, acuta, 50–100 mm longa, 20–30 mm lata. Inflorescentia spicata axillaris; flores sessiles, paucae vel numerosae. Stamina 6–9 mm longa; filamenta 1–2 mm longa; antherae 5–7 mm longae. Ovarium glabrum, ovatum, 2.5–4 mm longum; stylis brevis, 1–2 mm longus.

T: Stony Ck, 4 km E of Didcot, Biggenden Shire, Qld, 23 Aug. 1983, *P.I. Forster 1692*; holotype: BRI.

Named from the Latin *brevis* (short) and *folium* (leaf), in reference to the short leaves.

Ripogonum fawcettianum F.Muell. ex Benth., *Fl. Austral.* 7: 9 (1878)

T: Mackay R., N.S.W., *R. Fitzgerald*; lectotype (here chosen): MEL 652842.

Smilax aculeatissima Conran, sp. nov.

Suffrutex scandens, c. 5 m altus, aculeatissimus, ad *Smilacem australem* R.Br. accedens. Folia ovato-lanceolata vel elliptica, chartacea.

T: Johnson R., Qld, Aug. 1916, *H.G. Hadbrook*; holotype: BRI.

Named from the Latin *aculeatus* (prickly) in the superlative, referring to the very densely prickly stems of the species.

SUPPLEMENTARY GLOSSARY

bifacial: *of leaves*, flat or channelled with distinct adaxial and abaxial surfaces.

chartaceous: papery.

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, overlapping the edges of a similarly folded leaf on the opposite side of the stem.

latrorse: *of anthers*, opening laterally towards adjacent anthers.

medifixed: attached by or at the middle, e.g. *of anthers*, attached to the filament at the middle of the connective.

monoclinus: having male and female reproductive organs in the same flower.

rhypidium: an inflorescence of cymose units, the lateral branches developed alternately in opposite directions.

tunic: thin membranous or fibrous outer layers of a bulb or corm.

unilateral: *of stamens*, with anthers grouped to one side of the style.

Abbreviations and Contractions

Author abbreviations follow the *Draft Index of Author Abbreviations compiled at the Herbarium, Royal Botanic Gardens Herbarium, Kew* (HMSO, London, 1980).

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–), except that upper case initial letters are used for proper names and significant words. The *Flora of Australia* is abbreviated to *Fl. Australia*.

Abbreviations of herbaria are in accordance with P.K. Holmgren, W. Keuken & E. K. Schofield, *Index Herbariorum* Part I, 7th edn (Bohn, Scheltema & Holkema, Utrecht, 1981). Those most commonly cited in the *Flora* are:

AD	State Herbarium of South Australia, Adelaide
ADW	Waite Agricultural Research Institute, Adelaide
BM	British Museum (Natural History), 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
NT	Northern Territory Herbarium, Alice Springs
PERTH	Western Australian Herbarium, Perth
QRS	Australian National Herbarium, Atherton

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
<i>auct.</i>	<i>auctoris</i> (of an author or authors)
c.	<i>circa</i> (about)
Ck	Creek
cm	centimetre
col.	colour
coll.	collector
comb.	<i>combinatio</i> /combination
cult.	cultivated
Dept	Department
diam.	diameter
E	east
ed.	editor
edn	edition
<i>et al.</i>	<i>et alii</i> /and others
eds	editors
fam.	<i>familia</i> /family
f.	<i>forma</i> /form
fig./figs	figure/figures (in other works)
Fig.	Figure (referring to a Figure in this Volume of the <i>Flora</i>)
gen.	<i>genus</i> /genus
holo	holotype
Hwy	Highway
Is.	Island
iso	isotype
km	kilometre
lat.	latitude
lecto	lectotype
<i>loc. cit.</i>	<i>loco citato</i> (in the same work and page as just cited)
<i>loc. id.</i>	<i>loco idem</i> (in the same place as just cited)
long.	longitude
L.S.	longitudinal section
m	metre
mm	millimetre
Mt	Mount
Mtn	Mountain
Mtns	Mountains
N	north
<i>n</i>	haploid chromosome number
<i>2n</i>	diploid chromosome number
Nat.	National
<i>nom. cons.</i>	<i>nomen conservandum</i> (conserved name)
<i>nom. illeg.</i>	<i>nomen illegitimum</i> (illegitimate name)
<i>nom. inval.</i>	<i>nomen invalidum</i> (name not validly published)
<i>nom. nud.</i>	<i>nomen nudum</i>
<i>nom. rej.</i>	<i>nomen rejiciendum</i> (rejected name)
nov.	<i>novus</i> /new
n. ser.	new series
<i>n.v.</i>	<i>non vidi</i> (not seen)
<i>op. cit.</i>	<i>opere citato</i> (in the work cited above)
p./pp.	page/pages
pers. comm.	by personal communication
<i>p.p.</i>	<i>pro parte</i> (in part)
R.	River

Ra.	Range
S	south
sect.	<i>sectio</i> /section
ser.	<i>series</i> /series
<i>s. lat.</i>	<i>sensu lato</i> (in a wide sense)
<i>s.n.</i>	<i>sine numero</i> (without number)
sp./spp.	species (singular/plural)
<i>s. str.</i>	<i>sensu stricto</i> (in a narrow sense)
stat.	<i>status</i> /status
Stn	(pastoral) Station
subg.	subgenus
subsp.	subspecies
suppl.	supplement
syn	syntype
synon.	synonym
T	Type (collection)
t.	<i>tabula</i> (plate)
trib.	<i>tribus</i> /tribe
T.S.	transverse section
var.	<i>varietas</i> /variety
W	west
<i>x</i>	basic chromosome number

Symbols

†	taxon included in key but not treated further in text
*	naturalised taxon
[]	misapplied name or <i>nomen invalidum</i>

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