



FLORA OF AUSTRALIA

Volume 19 *Myrtaceae—Eucalyptus, Angophora*



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FLORA OF AUSTRALIA

Volume 19 contains two genera of the large family Myrtaceae. One is *Eucalyptus*, containing the gum trees characteristic of most parts of the Australian landscape. It includes 513 species, several of which are here described for the first time. The second genus is the closely-related *Angophora*, whose 7 species are confined to eastern mainland Australia.

The buds and fruits of almost all taxa are illustrated. Maps showing distribution are provided for all species.

Cover: *Eucalyptus ptychocarpa* F. Muell.
Painting by Gillian Rankin.

**Contents of volumes in the *Flora of Australia*, the families (current at January 1988)
arranged according to the system of A.Cronquist (1981).**

Volume 1	Urticales	Volume 7	Volume 10	Haloragales
Introduction	Ulmaceae	Malvales	Ebenales	Haloragaceae
	Cannabaceae	Elaeocarpaceae	Sapotaceae	Gunneraceae
	Moraceae	Tiliaceae	Ebenaceae	
	Urticaceae	Sterculiaceae	Symplocaceae	Myrtales
Volume 2	Fagales	Bombacaceae	Primulales	Sonneratiaceae
Magnoliales	Balanopaceae	Malvaceae	Myrsinaceae	Lythraceae
Winteraceae	Betulaceae		Primulaceae	Thymelaeaceae
Himantandraceae	Fagaceae			Onagraceae
Eupomatiaceae	Casuarinales			Melastomataceae
Austrobaileyaceae	Casuarinaceae			Combretaceae
Magnoliaceae		Volume 8	Rosales	
Annonaceae		Lecythidales	Connaraceae	Volumes 19, 20, 21
Myristicaceae		Lecythidaceae	Eucryphiaceae	
	Volume 4		Cunoniaceae	Myrtaceae
Laurales	Caryophyllales	Nepenthales	Davidsoniaceae	
Trimeniaceae	Phytolaccaceae	Nepenthaceae	Pittosporaceae	
Monimiaceae	Nyctaginaceae	Droseraceae	Byblidaceae	
Idiospermaceae	Nyctaginaceae		Grossulariaceae	Volume 22
Lauraceae	Aizoaceae	Violales	Alseuosmiaceae	
Hernandiaceae	Cactaceae	Flacourtiaceae	Crassulaceae	Rhizophorales
	Chenopodiaceae	Bixaceae	Cephalotaceae	Rhizophoraceae
		Cistaceae	Saxifragaceae	
Piperales		Violaceae	Rosaceae	
Piperaceae		Tamaricaceae	Chrysobalanaceae	Cornales
	Volume 5	Frankeniaceae	Surianaceae	Alangiaceae
Aristolochiales	Amaranthaceae	Passifloraceae		
Aristolochiaceae	Portulacaceae	Cucurbitaceae	Volumes 11, 12	Santalales
	Basellaceae	Datisceae		Olacaceae
Nymphaeales	Molluginaceae		Fabales	Opiliaceae
Nelumbonaceae	Caryophyllaceae	Salicales	Mimosaceae	Santalaceae
Nymphaeaceae		Salicaceae	Caesalpiniaceae	Loranthaceae
Cabombaceae				Viscaceae
Ceratophyllaceae	Polygonales	Capparales		Balanophoraceae
	Polygonaceae	Capparaceae		
Ranunculales		Brassicaceae	Volumes 13, 14, 15	Rafflesiales
Ranunculaceae	Plumbaginales	Moringaceae		Rafflesiaceae
Berberidaceae	Plumbaginaceae	Resedaceae	Fabaceae	
Menispermaceae				Celastrales
	Volume 6	Batales		Celastraceae
Papaverales	Dilleniales	Gyrostemonaceae	Volumes 16, 17	Hippocrateaceae
Papaveraceae	Dilleniaceae	Bataceae		Stackhousiaceae
Fumariaceae			Proteales	Aquifoliaceae
			Elaeagnaceae	Icacinaceae
Volume 3	Theales	Volume 9	Proteaceae	Cardiopteridaceae
Hamamelidales	Ochnaceae	Ericales		Corynocarpaceae
Hamamelidaceae	Theaceae	Epacridaceae	Volume 18	Dichapetalaceae
	Actinidiaceae	Ericaceae	Podostemales	
	Elatinaceae		Podostemaceae	Euphorbiales
	Clusiaceae			Euphorbiaceae

Volume 24

Rhamnales
Rhamnaceae
Leeaceae
Vitaceae

Linales
Erythroxylaceae
Linaceae

Polygalales
Malpighiaceae
Tremandraceae
Polygalaceae
Xanthophyllaceae

Volume 25

Sapindales
Melianthaceae
Akaniaceae
Sapindaceae
Aceraceae
Burseraceae
Anacardiaceae
Simaroubaceae

Volume 26

Meliaceae
Rutaceae
Zygophyllaceae

Volume 27

Geraniales
Oxalidaceae
Geraniaceae
Tropaeolaceae

Apiales
Araliaceae
Apiaceae

Volume 28

Gentianales
Loganiaceae
Gentianaceae
Apocynaceae
Asclepiadaceae

Volume 29

Solanales
Solanaceae

Volume 30

Convolvulaceae
Cuscutaceae
Menyanthaceae
Polemoniaceae
Hydrophyllaceae

Lamiales
Boraginaceae
Verbenaceae

Volume 31

Lamiaceae

Volume 32

Callitrichales
Callitrichaceae

Plantaginales
Plantaginaceae

Scrophulariales
Oleaceae
Scrophulariaceae
Globulariaceae

Volume 33

Myoporaceae
Orobanchaceae
Gesneriaceae
Acanthaceae
Pedaliaceae

Bignoniaceae
Lentibulariaceae

Volume 34

Campanulales
Sphenocleaceae
Campanulaceae
Stylidiaceae
Donatiaceae

Volume 35

Brunoniaceae
Goodeniaceae

Volume 36

Rubiales
Rubiaceae

Dipsacales
Caprifoliaceae
Valerianaceae
Dipsacaceae

Volumes 37, 38

Asterales
Asteraceae

Volume 39

Alismatales
Limncharitaceae
Alismataceae

Hydrocharitales
Hydrocharitaceae

Najadales
Aponogetonaceae
Juncaginaceae
Potamogetonaceae
Ruppiaceae
Najadaceae
Zannichelliaceae
Posidoniaceae

Cymodoceaceae
Zosteraceae

Triuridales
Triuridaceae

Arecales
Arecaceae

Pandanales
Pandanaceae

Arales
Araceae
Lemnaceae

Volume 40

Commelinales
Xyridaceae
Commelinaceae

Eriocaulales
Eriocaulaceae

Restionales
Flagellariaceae
Restionaceae
Centrolepidaceae

Juncals
Juncaceae

Volumes 41, 42

Cyperales
Cyperaceae

Volumes 43, 44

Poaceae

Volume 45

Hydatellales
Hydatellaceae

Typhales
Sparganiaceae
Typhaceae

Bromeliales
Bromeliaceae

Zingiberales
Musaceae
Zingiberaceae
Costaceae
Cannaceae

Liliales
Philydraceae
Pontederiaceae
Haemodoraceae
Liliaceae

Volume 46

Iridaceae
Aloeaceae
Agavaceae
Xanthorrhoeaceae
Hanguanaceae
Taccaceae
Stemonaceae
Smilacaceae
Dioscoreaceae

Volume 47

Orchidales
Burmanniaceae
Corsiaceae
Orchidaceae

Volume 48

Gymnospermae
Pteridophyta

Volume 49, 50

Oceanic Islands

Volume 51 et seq.

Non-vascular plants

FLORA OF AUSTRALIA



Eucalyptus erythrocorys F. Muell. Painting by Susan Tingay.

BUREAU OF FLORA AND FAUNA, CANBERRA

FLORA OF AUSTRALIA

Volume 19
Myrtaceae—Eucalyptus, Angophora



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CONTENTS

Contributors to Volume 19	vi
Illustrators	vi
Photographers	vi
Flora Editorial Committee	vii
Introduction	viii
Colour figures	x
Myrtaceae	1
Eucalyptus <i>G.M.Chippendale</i>	1
Angophora <i>G.M.Chippendale</i>	448
Maps	457
Appendix: new taxa, lectotypifications, etc.	495
Supplementary Glossary	511
Abbreviations and contractions	512
Publication date of previous volumes	514
Index	515
Botanical Regions	542

Endpapers

Front: Contents of volumes in the *Flora of Australia*, the families arranged according to the system of A.Cronquist, *An Integrated System of Classification of Flowering Plants* (1981).

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INTRODUCTION

This is the first of three volumes on the family Myrtaceae to be published in the *Flora of Australia*. It consists almost entirely of the genus *Eucalyptus* —the gum trees. More than any other group, these plants give a distinctive character to the Australian landscape.

Because of its importance (taxonomic, floristic, economic, aesthetic, etc.), the genus was chosen for publication early in the *Flora of Australia* program. Mr George Chippendale undertook its preparation and his contribution will remain one of the largest by an individual to any one volume of the *Flora*.

Research on Eucalypts has been intense for many years. From the beginning of its taxonomic history with Charles L'Héritier in 1788, it has been the subject of study by many botanists. Descriptions of new taxa have continued at a variable rate, never more rapidly than at present. The first treatment of the whole genus appeared in G.Bentham's *Flora Australiensis* Vol. 3 (1867). F.Mueller attempted a monograph, but among his other work on the Australian flora his *Eucalyptographia* in ten parts (1879–1884) was never completed. His successor as a major student of eucalypts, and the first authority on the genus, was J.H.Maiden who produced the massive *A Critical Revision of the Genus Eucalyptus* from 1903–1933. A protégé of Maiden, W.F.Blakely, described many new taxa. His major publication was *A Key to the Eucalypts* (1934). This was the last complete account of the genus prior to the present work, although updated editions appeared in 1955 and 1965.

Since 1950 research has accelerated. S.T.Blake and C.A.Gardner produced a number of important papers but until the late 1950s all taxonomic research had concentrated on macroscopic characters, especially of the buds, fruit and anthers. In 1958, E.Gauba & L.D.Pryor published a paper 'Seed coat anatomy and taxonomy in *Eucalyptus* I', *Proc. Linn. Soc. New South Wales* 83: 20–32 (1958), parts II and III following in 1959 and 1961. Also in 1959 appeared a paper by D.J. & S.G.M.Carr 'Developmental Morphology of the Floral Organs of Eucalyptus, 1. The Inflorescence', *Austral. J. Bot.* 7: 109–141 (1959), followed, among others, by 'The Taxonomic position of certain eucalypts', *Proc. Roy. Soc. Victoria* n.s. 77: 207–216 (1963). These papers drew attention to a wide range of characters, many anatomical, that appeared useful in classifying this large and complex genus. Subsequent research has built on and expanded this platform.

The past 25 years have seen more taxonomic workers in *Eucalyptus* than previously and the findings have not been without controversy. Among many publications was one seminal to the question of an infrageneric hierarchy —*A Classification of the Eucalypts* by L.D.Pryor and L.A.S.Johnson (1971). This proposed a new infrageneric structure without informal names, since widely used.

When George Chippendale undertook the preparation of *Eucalyptus* for the *Flora of Australia* in 1981, the latest upsurge in research in the genus was not foreseen. A review of the generic concept (but also reassessing species and infrageneric taxa) by L.A.S.Johnson in association with D.F.Blaxell and K.D.Hill was in progress with publication imminent, but the results are still awaited. Work by others, particularly D.J. and S.G.M.Carr, M.I.H. Brooker, P.Ladiges and co-workers, and S.D.Hopper, is assessing the classification at all levels. Major changes, as well as recognition of many new taxa, can be expected as this work proceeds. Despite all this, it was decided to publish Chippendale's account now since it brings together all currently accepted species and all other published specific names, and presents a formal classification at the series level. This provides a baseline against which future publications can be assessed.

All species published to January 1987 are included. While the volume was being typeset, *Eucalyptus* II by D.J. and S.G.M.Carr was published, containing 24 new species of northern Australian bloodwoods of the series *Corymbosae*.

INTRODUCTION

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 and immediate offshore islands. 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. Complete Floras of those islands are in preparation as Volumes 49 and 50.

Descriptions and discussion in the *Flora* are concise and supplemented by important references, synonymy, and information on type collections, chromosome numbers, distribution, habitat, and published illustrations. 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 asterisked (*).

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

Maps showing distribution in Australia are arranged in the same sequence as the descriptions and are grouped together at the end of the main text (pp. 457–494). The term ‘Malesia’ is sometimes used in the notes on geographical distribution for species which occur widely in the region covered by *Flora Malesiana*, i.e. Malaysia, Singapore, Indonesia, the Philippines, New Guinea and adjacent islands. The regions in which each species occurs, cited in the text by their abbreviations, are shown on a map inside the back endpapers. 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, 1983). Abbreviations, contractions and references to the format for author and bibliographic citations are listed after the Appendix.

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The author is most grateful to the Director, the Executive Editor, *Flora*, and other staff of the Bureau of Flora and Fauna for friendly and helpful discussions. The referees have also been most helpful with constructive advice. The data assembled at the Bureau for the *Australian Plant Name Index* was invaluable in resolving the nomenclature for the series.

Fresh material of *Eucalyptus ptychocarpa* was collected by Mr G.Wightman (DNA) for the cover painting by Gillian Rankin.

The Executive Editor acknowledges with pleasure the assistance of the staff of the Bureau of Flora and Fauna in preparing this volume.

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Figure 1. *Eucalyptus bloxsomei*
Bloodwood
Photograph—G.Chippendale.

Figure 2. *Eucalyptus miniata*
Woollybutt
Photograph—A.George.

Figure 3. *Eucalyptus sideroxylon*
Ironbark
Photograph—A.George.

Figure 4. *Eucalyptus radiata*
Peppermint
Photograph—G.Chippendale.

Figure 5. *Eucalyptus caesia*
subsp. *magna*
Photograph—E.George.

Figure 6. *Eucalyptus accedens*
Photograph—A.George.

Figure 7. *Eucalyptus gongylocarpa*
Photograph—A.George.

Figure 8. *Eucalyptus melliodora*
Box
Photograph—G.Chippendale.

Figure 9. *Eucalyptus propinqua*
Grey Gum
Photograph—G.Chippendale.

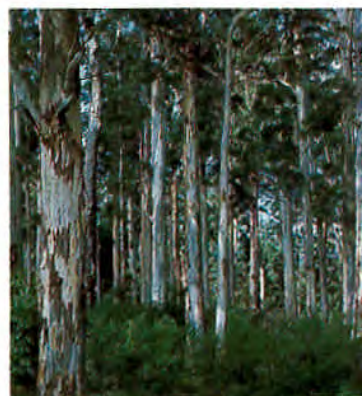


Figure 10. *Eucalyptus rossii*
Scribbly Gum
Photograph—M.Fagg.

Figure 11. *Eucalyptus erythronema* var. *erythronema*
Old bark, autumn
Photograph—A.George.

Figure 12. *Eucalyptus alba*
Semi-deciduous, dry season
Photograph—G.Chippendale.

Figure 13. *Eucalyptus papuana*
Photograph—G.Chippendale.

Figure 14. *Eucalyptus pauciflora* subsp. *niphophila*
Photograph—R.Hnatiuk.

Figure 15. *Eucalyptus albida*
Mallee
Photograph—A.George.

Figure 16. *Eucalyptus salmonophloia*
New bark, autumn
Photograph—G.Chippendale.

Figure 17. *Eucalyptus salubris* var. *salubris* Gimlet
Photograph—A.George.

Figure 18. *Eucalyptus diversicolor*
Tall forest
Photograph—G.Chippendale.



Figure 19. *Eucalyptus terminalis*
Photograph—R.Purdie.

Figure 20. *Eucalyptus ficifolia*
Photograph—E.George.

Figure 21. *Eucalyptus tetragona*
Photograph—A.George.

Figure 22. *Eucalyptus miniata*
Photograph—A.George.



Figure 23. *Eucalyptus preissiana*
Photograph—R.Hnatiuk.

Figure 24. *Eucalyptus alpina*
Photograph—M.Fagg.

Figure 25. *Eucalyptus pulchella*
Photograph—A.George.

Figure 26. *Eucalyptus pauciflora* subsp. *pauciflora*
Photograph—E.George.



Figure 27. *Eucalyptus macrandra*
Photograph—A.George.

Figure 28. *Eucalyptus kruseana*
Photograph—A.George.



Figure 29. *Eucalyptus synandra*
Type plant
Photograph—A.George.

Figure 30. *Eucalyptus caesia* subsp. *caesia*
Photograph—A.George.



Figure 31. *Eucalyptus websteriana*
Photograph—A.George.

Figure 32. *Eucalyptus pyriformis*
Photograph—A.George.

Figure 33. *Eucalyptus tetraptera*
Photograph—A.George.

Figure 34. *Eucalyptus pterocarpa*
Photograph—M.Fagg.



Figure 35. *Eucalyptus crenulata*
Photograph—M.Fagg.

Figure 36. *Angophora costata* subsp. *costata*
Photograph—M.Fagg.

Figure 37. *Eucalyptus leucoxylon* subsp. *leucoxylon*
Photograph—A.George.

Figure 38. *Angophora costata* subsp. *costata*
Photograph—M.Fagg.

MYRTACEAE

Family description by A.S.George

Trees or shrubs with oil glands in leaves and often other parts, mostly evergreen. Leaves alternate or opposite, rarely whorled, simple, entire or sometimes ciliate or lacinate, without or rarely with stipules. Inflorescence axillary or terminal, of single flowers or variously grouped, often in a compound structure (conflorescence). Flowers bisexual or unisexual, regular or sometimes zygomorphic, often with a hypanthium, often subtended by 2 bracteoles. Sepals 5, sometimes 4 or up to 10, free or fused, imbricate. Petals 5, sometimes 4, free or fused, imbricate, sometimes absent. Sepals and petals sometimes variously fused in an operculum. Stamens 5, 10 or numerous, rarely 4, often grouped in clusters or fused in bundles; anthers basifixed to versatile, opening by slits or pores; staminodes sometimes present. Ovary superior to inferior, 1–10-locular; style terminal, simple; stigma small or capitate; ovules 1–many per locule; placentation axile, rarely lateral. Fruit a capsule or indehiscent, sometimes berry- or drupe-like. Seeds with little or no endosperm.

A family of c. 155 genera and over 3000 species, mainly in the southern hemisphere and tropics, but also represented in the northern hemisphere. In Australia c. 75 genera (55 endemic) and over 1500 species, represented in most areas but predominantly in the wetter regions.

Many species are important economically, e.g. for timber, pulp, honey and horticulture. Few species provide commercial edible products, e.g. *Syzygium aromaticum* (L.) Merrill (cloves), *Pimenta dioica* (L.) Merrill (allspice) and *Psidium guajava* L. (guava).

G.Bentham, Myrtaceae, *Fl. Austral.* 3: 1–289 (1867); F.Nielsen, Myrtaceae, *Nat. Pflanzenfam.* III (7): 57–105 (1898); L.Diels, Myrtaceae, *Bot. Jahrb. Syst.* 57: 356–426 (1920–22); B.G.Briggs & L.A.S.Johnson, Evolution in the Myrtaceae —evidence from inflorescence structure, *Proc. Linn. Soc. New South Wales* 102: 157–256 (1979); L.A.S.Johnson & B.G.Briggs, Myrtaceae, in B.D.Morley & H.R.Toelken, *Fl. Pl. Australia* 175–185 (1983).

Because revisionary work now in progress will result in the recognition of further genera, no key to genera is provided in this volume which contains accounts of *Eucalyptus* and *Angophora*. Such keys will be provided in the two later volumes on the Myrtaceae, viz. 20 and 21. Keys to subfamilies, alliances and genera are given in Johnson & Briggs, *loc. cit.*

EUCALYPTUS

G.M.Chippendale

Eucalyptus L'Hér., *Sert. Angl.* 18 (1788), t. 20 (1792); from the Greek *eu* (well) and *kalyptos* (covered), in reference to the operculum which covers the stamens in bud.

Type: *E. obliqua* L'Hér.

Eudesmia R.Br. in M.Flinders, *Voy. Terra Australis* 2: 519, t. 3 (1814). T: *E. tetragona* R.Br.

Symphomyrtus Schauer in J.G.C.Lehmann, *Pl. Preiss.* 1: 126 (1844). T: *S. lehmannii* Schauer

Trees, shrubs or mallees. Bark smooth, fibrous, stringy or tessellated. Plants heterophyllous, i.e. seedling, juvenile, intermediate and adult phases occurring in most species, the latter phases sometimes not achieved; adult leaves glabrous, mostly alternate, usually petiolate, lanceolate, often falcate, pendulous, rarely erect, with a distinct midvein, penninerved or

with parallel veins. Conflorescences usually of umbel-like condensed dichasia, usually pedunculate, single or rarely paired in leaf axils, or in terminal sometimes corymbose panicles (Fig. 43A); flowers 3 or more per umbel, rarely single, sessile or pedicellate; flowers sometimes male only. Calyx and corolla each or together forming an operculum that is shed at anthesis, the sepals sometimes free, falling separately or together. Stamens numerous, usually on a staminophore; anthers dehiscing by latrorse or introrse slits, or by confluent slits or by terminal pores; connective usually bearing a gland on back or at apex. Ovary 2–7-locular, inferior or partly superior; ovules many; ovulodes usually present. Fruit a capsule with a usually woody hypanthium, loculicidal, rarely circumscissile, with scars of operculum and staminophore at rim; disc convex (Fig. 56F), flat (Fig. 51L) or descending (Fig. 41N); valves exserted (Fig. 70B), level with rim, or included. Seeds several to many, variously shaped and coloured.

G.Bentham, *Eucalyptus*, *Fl. Austral.* 3: 185–261 (1867); F. Mueller, *Eucalyptographia* (1879–84); J.H.Maiden, *Crit. Revis. Eucalyptus* vols 1–8 (1903–33); W.F.Blakely, *A Key to the Eucalypts* (1934, 3rd edn, 1965); S.T.Blake, *Studies on Northern Australian Species of Eucalyptus*, *Austral. J. Bot.* 1: 185–352 (1953); A.R.Penfold & J.L.Willis, *The Eucalypts* (1961); G.M.Chippendale, *Eucalyptus Buds and Fruits* (1968); N.Hall *et al.*, *Forest Trees of Australia* 3rd edn, (1970); N.Hall *et al.*, *Forest Tree Series* 1–229 (1970–84); L.D.Pryor & L.A.S.Johnson, *A Classification of the Eucalypts* (1971); G.M.Chippendale, *Eucalypts of the W. Austral. Goldfields* (1973); G.M.Chippendale, *Eucalyptus Nomenclature*, *Austral. Forest Res.* 7: 69–107 (1976); L.D.Pryor, *The Biology of Eucalypts* (1976); C.A.Gardner, revised T.E.Aplin, *Eucalypts of W. Australia* (1979); D.J.Boland *et al.*, *Eucalyptus Seed* (1980); G.M.Chippendale & L.Wolf, *The Natural Distribution of Eucalypts in Australia* (1981); S.Kelly *et al.*, *Eucalypts* 2nd edn, vols 1 & 2 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* vol. 1 (1983); D.J.Boland *et al.*, *Forest Trees of Australia* 4th edn, (1984); D.J. & S.G.M.Carr, *Eucalyptus I* (1985), *Eucalyptus II* (1987).

A genus of over 500 species, most endemic in Australia, but several extending to part of Malesia and the Philippines and 2 confined to that region. Occurs in most parts of Australia, the greatest diversity being in the near-coastal regions of N.S.W. and in south-western W.A. Includes the most important timber trees in Australia, many of which are cultivated in other countries. Many species are major sources of nectar and pollen in honey production. Oil is extracted from the foliage of some species. Many are also widely planted for shelter, fuel and ornamental purposes. For Aboriginal usage of eucalypts, see D.Levitt, *Plants and People* (1981), E.V. Lassak & T.McCarthy, *Australian Medicinal Plants* (1983).

Research in *Eucalyptus* will lead to refinement of its classification over the decades ahead. In particular, a review in progress by Dr. L.A.S.Johnson and colleagues (NSW) is expected to propose major changes at and above the level of species. This *Flora* treatment presents the current situation, the first account of the whole genus (non-Australian species excepted) since that of Blakely (1934). As such it provides a baseline against which future work may be assessed. For the purposes of this account it was decided to adopt only one infrageneric rank, that of series. Many of the series are here formalised and, where necessary, lectotypified. The series circumscriptions have been based on an assessment of those informally given by Pryor & Johnson (1971), as well as more recent publications of various authors. Many useful discussions have been held with colleagues, as acknowledged in the Introduction. Taxonomic concepts in the genus were discussed by L.A.S.Johnson in the paper 'Problems of species and genera in *Eucalyptus* (Myrtaceae)', *Pl. Syst. Evolution* 125: 155–167 (1976).

Morphology

The descriptions given in this volume for series and species cover the main characters for habit, bark, leaves, conflorescences, buds, fruits and seeds. In order to provide a concise coverage of anther, cotyledon and operculum form and ovule arrangement the following review is provided. In addition, a brief survey is given of recent studies of special aspects that are considered significant contributions towards an improved classification of eucalypts.

Stamens and anthers

Previous studies in *Eucalyptus* have used divers ways of separating taxa or groups of taxa. Bentham (1867) based his series largely on staminal characters. Blakely (1934) also used the stamens, especially the anthers, as a basis for his higher classification of sections. Although his classification at this level is artificial when other characters are taken into account, the stamen and anther characters are here summarised and the series within the genus grouped accordingly. Blakely's sectional names are given in brackets. The series numbers are those of their sequential position in this volume.

Filaments usually all fertile, subulate. Anther attached near centre of connective or at base of gland, versatile, usually large, cordate, obcordate, ovate, obovate, orbicular or oblong, usually slightly emarginate, the locules distinct and opening in narrow to broad auricular lobes; dorsal gland large, globular or ovate, occupying the upper half of the connective and sometimes visible in front (sect. *Macrantherae*)— series: 1 *Scutiformes*, 2 *Terminaliptera*, 3 *Jacobsianae*, 4 *Trachyphloiae*, 5 *Naviculares*, 6 *Torellianae*, 7 *Maculatae*, 8 *Heteroptera*, 9 *Ebbanoenses*, 10 *Jucundae*, 11 *Odontocarpae*, 12 *Tetrodontae*, 13 *Scutelliformes*, 14 *Miniatae*, 15 *Curtisianae*, 16 *Leptospermae*, 17 *Meglanthae*, 18 *Rubiginosae*, 19 *Diversiformes* (part), 39 *Howittianae*, 41 *Inclusae*, 42 *Transversae*, 43 *Annulares*, 44 *Lepidotae-fimbriatae*, 45 *Cornutae*, 46 *Micromembranae*, 47 *Elongatae*, 48 *Levispermae*, 49 *Accedentes*, 50 *Obliquae*, 51 *Contortae*, 52 *Kruseanae*, 53 *Loxophlebae*, 54 *Decurvae*, 55 *Micrantherae* (part), 59 *Microcorythae*, 62 *Curviptera* (*E. caesia* only), 65 *Rufispermae*, 66 *Torquatae*, 67 *Merrickianae*, 68 *Tetrapterae* (except *E. forrestiana*), 69 *Dundasianae*, 70 *Ovulares*, 71 *Subexsertae* (except *E. umbrawarrensensis*), 72 *Exsertae*, 73 *Pumilae*, 74 *Michaelianae*, 75 *Foveolatae*, 76 *Microcarpae*, 77 *Viminales*.

Filaments all fertile. Anther attached about centre of connective, versatile, cordate or nearly so, with broad parallel to suboblique locules and a large globular or ovate, terminal or subterminal gland (sect. *Renantheroideae*)— series: 19 *Diversiformes* (in part), 20 *Neuroptera*.

Filaments all fertile. Anther attached at base of connective, subversatile, reniform to cordate-reniform, rather broad and almost flat, the locules divergent or at length contiguous and usually confluent at apex; gland when present very small, usually terminal (sect. *Renantherae*)— series: 21 *Cochleatae*, 22 *Johnsonianae*, 23 *Subereae*, 24 *Insulares*, 25 *Occidentales*, 26 *White-mahoganies*, 27 *Pachyphloiae*, 28 *Olsenianae*, 29 *Pseudostringybarks*, 30 *Regnantes*, 31 *Planchoniana*, 32 *Eucalyptus*, 33 *Psathyroxyla*, 34 *Fraxinales*, 35 *Longitudinales*, 36 *Piperitales*, 37 *Radiatae*, 38 *Myrtiformes*, 40 *Ochroxylon*, 92 *Alveolatae*.

Filaments uniformly terete or somewhat subulate, filiform or robust. Anthers adnate, globular, subcuneate to reniform-orbicular, the locules more or less distinct, opening in round terminal or subterminal pores or slits; gland when present small, terminal (sect. *Porantheroideae*)— series: 55 *Micrantherae* (*E. decipiens* only), 64 *Porantherae*, 78 *Striolatae*, 79 *Buxaeales*, 80 *Rummeryanae*, 81 *Cambageanae*, 82 *Paniculatae*, 83 *Lucasianae*, 84 *Porantheroideae*, 86 *Moluccanae*, 87 *Subbuxaeales*, 88 *Siderophloiae*.

Many filaments sterile. Anthers adnate, erect or oblique on filament, rounded-cuneate to almost square, the locules usually distinct, opening in ovate slits or round terminal pores; gland absent (sect. *Terminales*)— series: 85 *Dawsonianae*, 89 *Heterophloiae*, 90 *Rhodoxylla*, 91 *Melliodorae*.

Outer filaments sterile, longer than inner fertile ones. Anthers very small, subversatile, oblong to broadly reniform, opening in semi-lateral slits; gland globular, attached to top of broad connective (sect. *Graciles*)— series: 63 *Heterostemones*.

Filaments usually all fertile, terete, compressed or subquadrangular, smooth or minutely crenulate along edges. Anthers subversatile, cordate, opening in front in rather broad ovate pores; gland terminal or almost so, small (sect. *Micrantherae*)— series: 55 *Micrantherae* (*E. micranthera*, *E. cneorifolia*).

Filaments slender, attached to extreme base of connective. Anthers subversatile, oblong-reniform to subglobular, the locules distinct, opening in front or laterally in elongated

slits or orbicular pores; gland small, usually visible from front (sect. *Platyantherae*)— series: 56 *Squamosae*, 57 *Bakerianae*, 58 *Brockwayanae*, 60 *Subulatae*, 61 *Salmonophloiae*, 62 *Curviptera* (except *E. caesia*), 68 *Tetrapterae* (*E. forrestiana*), 71 *Subexsertae* (*E. umbra-warrensis*).

Cotyledons

Maiden (1929–31) provided a classification for most taxa according to the shape of the cotyledons. This may be summarised as follows:

Cotyledons reniform, large, medium or small (sect. *Reniformes*)— series: 1 *Scutiformes*, 2 *Terminaliptera*, 3 *Jacobsianae*, 4 *Trachyphloiae*, 5 *Naviculares*, 6 *Torellianae*, 7 *Maculatae*, 8 *Heteroptera*, 9 *Ebbanoenses*, 10 *Jucundae*, 11 *Odontocarpae*, 12 *Tetradontae*, 13 *Scutelliformes*, 14 *Miniatae*, 15 *Curtisianae*, 16 *Leptospermae*, 17 *Meglanthae*, 18 *Rubiginosae*, 19 *Diversiformes*, 20 *Neuroptera*, 21 *Cochleatae*, 22 *Johnsonianae*, 23 *Subereae*, 24 *Insulares*, 25 *Occidentales*, 26 *White-mahoganies*, 27 *Pachyphloiae*, 28 *Olsenianae*, 29 *Pseudostringybarks*, 30 *Regnantes*, 31 *Planchonianae*, 32 *Eucalyptus*, 33 *Psathyroxyla*, 34 *Fraxinales*, 35 *Longitudinales*, 36 *Piperitales*, 37 *Radiatae*, 70 *Ovulares*, 92 *Alveolatae*.

Cotyledons bilobed (sect. *Bilobae*)— series: 38 *Myrtiformes*, 39 *Howittianae*, 40 *Ochroxylon*, 41 *Inclusae*, 42 *Transversae*, 43 *Annulares*, 44 *Lepidotae-fimbriatae*, 65 *Rufispermae*, 66 *Torquatae*, 67 *Merrickianae*, 68 *Tetrapterae*, 69 *Dundasianae*, 71 *Subexsertae*, 72 *Exsertae*, 73 *Pumilae*, 74 *Michaelianae*, 75 *Foveolatae*, 76 *Microcarpae*, 77 *Viminales*, 78 *Striolatae*, 79 *Buxaeales*, 80 *Rummeryanae*, 81 *Cambageanae*, 82 *Paniculatae*, 83 *Lucasianae*, 85 *Dawsonianae*, 86 *Moluccanae*, 87 *Subbuxaeales*, 88 *Siderophloiae*, 89 *Heterophloiae*, 90 *Rhodoxyla*, 91 *Melliodorae*.

Cotyledons bifid (sect. *Bisectae*)—series: 45 *Cornutae*, 46 *Micromembranae*, 47 *Elongatae*, 48 *Levispermae*, 49 *Accedentes*, 50 *Obliquae*, 51 *Contortae*, 52 *Kruseanae*, 53 ? *Loxophlebae*, 54 *Decurvae*, 55 *Micrantherae*, 56 *Squamosae*, 57 *Bakerianae*, 58 *Brockwayanae*, 59 *Microcorythae*, 60 *Subulatae*, 61 *Salmonophloiae*, 62 *Curviptera*, 63 *Heterostemones*, 64 *Porantherae*.

Operculum

D.J.Carr & S.G.M.Carr (Floral Morphology and the Taxonomy of *Eucalyptus*, *Nature* 184: 1549–1552, 1959; Convergence and Progression in *Eucalyptus* and *Symphyomyrtus*, *Nature* 196: 969–972, 1962) concluded that the genus could be divided into two groups with either one operculum, i.e. *Eucalyptus s. str.* ('*Monocalyptus*') which embraces in this *Flora* series 15–37, or two opercula, i.e. *Symphyomyrtus*, series 1–14 and 38–92. Within the second group, however, a number of conditions exist that require further research to assess their taxonomic significance. These may be summarised as follows:

Opercula closely fused and often scarcely distinguishable, falling as one unit.

Inner operculum entire; outer operculum a small cap, falling during floral development or just before anthesis.

Inner operculum entire; outer operculum of 4 free teeth, persistent and at anthesis evident as small lobes.

Inner operculum entire; outer operculum of 4 teeth that are carried to the apex of the inner during bud development.

The development of the operculum was discussed by L.D.Pryor & R.B.Knox, *Austral. J. Bot.* 19: 143–171 (1971).

Ovules

D.J.Carr & S.G.M.Carr (Convergence and Progression in *Eucalyptus* and *Symphyomyrtus*, *Nature* 196: 969–972 (1962), and The Taxonomic Position of Certain Eucalypts, *Proc. Roy. Soc. Victoria* 77: 207–216, 1963) discussed the arrangement of ovules in vertical rows. Boland *et al.* (*Eucalyptus Seed*, 1980) further discussed the usefulness of longitudinal rows of ovules as a diagnostic character for large groups within *Eucalyptus*. There is no

publication giving a complete treatment of the arrangement of ovules in the genus, but the following is a guide:

Ovules in 2 longitudinal rows: series 19–37.

Ovules in 2–4 longitudinal rows: series 11.

Ovules in 4 longitudinal rows: series 3, 12, 16–18, 39, 55–60, 63–70, 73, 75–92.

Ovules in 4–8 longitudinal rows: series 1, 2, 4, 5–10, 13–15, 38, 40–54, 61, 62, 71, 72, 74.

Other features

N.D.Hallam & T.C.Chambers (The Leaf Waxes of the Genus *Eucalyptus* L'Héritier, *Austral. J. Bot.* 18: 335–386, 1970) surveyed the leaf wax structure of 315 taxa, and found three main morphological types, generally supporting already recognised groupings of taxa, though with some misfits.

S.G.M.Carr & D.J.Carr (Oil glands and Ducts in *Eucalyptus* L'Hérit. 1. The Phloem and the Pith, *Austral. J. Bot.* 17: 471–523, 1969) examined '651 forms of eucalypts (species, subspecies, and varieties)' known at that time for the presence of oil glands in certain vegetative tissues. They discussed the taxonomic implications and concluded that glands in the pith and bark are useful characters in identification. S.G.M.Carr, L.Milkovits & D.J.Carr (Eucalypt Phytoglyphs: The Microanatomical Features of the Epidermis in Relation to Taxonomy, *Austral. J. Bot.* 19: 173–190, 1971) showed that the microanatomical features of the cuticle of eucalypts may be useful in taxonomic and evolutionary studies. L.D.Pryor & L.A.S.Johnson (1971) discussed previous groupings in the genus and gave a summary of infrageneric relations, with informal nomenclature.

P.Y.Ladiges (A Comparative Study of Trichomes in *Angophora* Cav. and *Eucalyptus* L'Hérit. — a Question of Homology, *Austral. J. Bot.* 32: 561–574, 1984) studied the development of 'hairs' in seedling leaves of *Eucalyptus* and discussed the evolutionary trends of this evidence.

D.J.Boland & M.Sedgley (Stigma and Style Morphology in Relation to Taxonomy and Breeding Systems in *Eucalyptus* and *Angophora* (Myrtaceae), *Austral. J. Bot.* 34: 569–584, 1986) discussed the stigma and style of 94 taxa of *Eucalyptus* and 2 of *Angophora* and found that stigma morphology could be useful in understanding relationships within *Eucalyptus*.

Notes on the text

Specimens have been selected from lists obtained from the Eucalust program originated by G.M.Chippendale & L.Wolf (Computerized Data Retrieval System for *Eucalyptus* (Myrtaceae), *Austral. For. Res.* 14: 147–152, 1984). In most cases, specimens cited here have at least buds and fruits and are represented by duplicates in several herbaria.

It is likely that new taxa will be segregated from some species as circumscribed in this treatment.

Identification of eucalypts is difficult, given the large number of species, the fine distinction between many, and the wide range of characters and states that may be used. Variation within species and the occurrence of hybrids compound this difficulty. Microscopic analysis, e.g. of leaf surface features, can be useful but is beyond the resources of most flora users.

The key below depends on a wide range of readily-observable characters of habit, bark, leaf arrangement and form, inflorescence, buds and fruits. The need to examine these features should be kept in mind when gathering material for identification. Geographical data are often used in the key to supplement morphological data.

The term confluence is used for the whole flowering structure, which usually consists of one or more 'umbels'; some taxa have solitary flowers. The length given for the fruits is taken from the base of the hypanthium to its rim; it excludes the disc and the valves. The

width is taken at the greatest diameter of the hypanthium. The valves are described from the dehiscent state of the fruit.

The series descriptions should be used in conjunction with those for species, since characters common to all species of a series are not repeated in the species descriptions.

In some species, the bark colour intensifies in autumn, and in others the new bark revealed when the outer layer falls may differ in colour from the old bark. A striking example is *E. erythronema* in which the peeling deep red bark reveals new silvery-white bark beneath. Figures 1–17 illustrate a number of bark forms in the genus.

Most eucalypts have creamy white staminal filaments. In this work staminal colour is given in the discussion under a species if it is markedly different.

KEY TO GROUPS

- 1** Bark smooth throughout
 - 2** Fruits usually more than 30 mm wide **Group 1 (p. 8)**
 - 2:** Fruits up to 30 mm wide
 - 3** Operculum shorter than hypanthium
 - 4** Buds 1–3 per umbel **Group 2 (p. 8)**
 - 4:** Buds more than 3 per umbel
 - 5** Leaves discolorous **Group 3 (p. 11)**
 - 5:** Leaves concolorous
 - 6** Valves exserted **Group 4 (p. 12)**
 - 6:** Valves \pm level or included **Group 5 (p. 13)**
 - 3:** Operculum equal to or longer than hypanthium
 - 7** Buds 3 per umbel **Group 6 (p. 20)**
 - 7:** Buds more than 3 per umbel
 - 8** Leaves discolorous **Group 7 (p. 22)**
 - 8:** Leaves concolorous
 - 9** Valves included **Group 8 (p. 23)**
 - 9:** Valves exserted or level **Group 9 (p. 24)**
- 1:** Bark rough, at least at base, not smooth throughout
 - 10** Conflorescences compound
 - 11** Fruits 12 mm or more long **Group 11 (p. 33)**
 - 11:** Fruits less than 12 mm long
 - 12** Leaves discolorous **Group 12 (p. 38)**
 - 12:** Leaves concolorous
 - 13** Bark tessellated, papery or flaky **Group 13 (p. 39)**
 - 13:** Bark not tessellated, papery or flaky **Group 14 (p. 41)**
 - 10:** Conflorescences simple
 - 14** Bark splitting into narrow strips which then inroll at the margins **Group 10 (p. 33)**
 - 14:** Bark not so splitting
 - 15** Bark hard, usually furrowed, grey to black (ironbark) **Group 15 (p. 46)**
 - 15:** Bark fibrous or flaky, not ironbark
 - 16** Operculum distinctly longer than hypanthium **Group 16 (p. 47)**
 - 16:** Operculum c. equal to or shorter than hypanthium
 - 17** Buds and fruits quadrangular **Group 17 (p. 51)**
 - 17:** Buds and fruits not quadrangular
 - 18** Buds and fruits sessile **Group 18 (p. 51)**
 - 18:** Buds and fruits pedicellate
 - 19** Buds and fruits glaucous **Group 19 (p. 54)**
 - 19:** Buds and fruits not glaucous **Group 20 (p. 55)**

GROUP 1**1** Adult leaves opposite**2** Adult leaves green, petiolate**65. E. erythrocorys****2:** Adult leaves glaucous, sessile**3** Buds and fruits sessile**290. E. macrocarpa****3:** Buds and fruits pedicellate**291. E. rhodantha****1:** Adult leaves alternate**4** Buds and fruits pedicellate**5** Adult leaves more than 12 cm long**286. E. caesia****5:** Adult leaves less than 12 cm long**6** Peduncle 20 mm or more long**294. E. pyriformis****6:** Peduncle less than 20 mm long**289. E. rameliana****4:** Buds and fruits sessile**7** Valves or lobes of disc exerted**8** Fruits smooth or faintly ribbed, 30 mm or more long**86. E. aquilina****8:** Fruits deeply corrugated, less than 30 mm long**87. E. coronata****7:** Valves included**9** Adult leaves more than 10 cm long**344. E. tetraptera****9:** Adult leaves less than 10 cm long**346. E. forrestiana****GROUP 2****1** Buds and fruits glaucous**2** Leaves opposite or subopposite on mature trees**3** Leaves discolorous**4** Fruits 4–5 mm long (W.A., N.T.)**366. E. apodophylla****4:** Fruits 10–13 mm long (Tas.)**439. E. cordata****3:** Leaves concolorous**5** Leaves sessile on mature plants**6** Buds 7–9 mm long; fruits 5–9 mm long**440. E. pulverulenta****6:** Buds 10–12 mm long; fruits 10–13 mm long**439. E. cordata****5:** Leaves petiolate on mature plants**7** Petiole less than 10 mm long**8** Fruits ±globular**71. E. gongylocarpa****8:** Fruits ±cylindrical**73. E. gamophylla****7:** Petiole 10 mm or more long**9** Leaves green**69. E. roycei****9:** Leaves grey-green, blue-green or glaucous**10** Fruits subglobular, quadrangular, pedicellate**64. E. tetragona****10:** Fruits hemispherical, sessile**438. E. perriniana****2:** Leaves alternate on mature trees**11** Fruits quadrangular**69. E. roycei****11:** Fruits not quadrangular**12** Buds 8 mm or more wide

MYRTACEAE—1

1. Eucalyptus

- 13 Leaves green 415. *E. globulus*
- 13: Leaves glaucous or grey-green or yellow-green
- 14 Peduncle 20–30 mm long 286. *E. caesia*
- 14: Peduncle 5–8 mm long 439. *E. cordata*
- 12: Buds less than 8 mm wide
- 15 Fruits campanulate 435. *E. saxatilis*
- 15: Fruits not campanulate
- 16 Buds urceolate 437. *E. urnigera*
- 16: Buds not urceolate
- 17 Operculum warty 180. *E. coccifera*
- 17: Operculum not warty
- 18 Connate juvenile leaves persisting on mature trees 438. *E. perriniana*
- 18: Leaves on mature trees not connate
- 19 Stem-clasping juvenile leaves persisting on mature trees 440. *E. pulverulenta*
- 19: Leaves on mature trees not stem-clasping
- 20 Buds cylindrical (N.S.W., Vic.) 432. *E. glaucescens*
- 20: Buds clavate, turbinate or subcylindrical
- 21 Buds and fruits pedicellate 436. *E. morrisbyi*
- 21: Buds and fruits sessile, rarely shortly pedicellate 433. *E. gunnii*
- 1: Buds and fruits not glaucous
- 22 Umbels ±sessile 8. *E. aspera*
- 22: Umbels distinctly pedunculate
- 23 Peduncle at least 20 mm long
- 24 Disc ascending 85. *E. megacarpa*
- 24: Disc descending
- 25 Buds usually sessile
- 26 Fruits 4-winged 346. *E. forrestiana*
- 26: Fruits not 4-winged 88. *E. preissiana*
- 25: Buds pedicellate
- 27 Fruits at least 25 mm long 345. *E. stoatei*
- 27: Fruits less than 25 mm long
- 28 Peduncle recurved, at least in fruits
- 29 Pedicels 10–20 mm long (W.A.) 335. *E. deflexa*
- 29: Pedicels 2–7 mm long (Tas.) 437. *E. urnigera*
- 28: Peduncle not recurved 24. *E. dichromophloia*
- 30 Buds and fruits 4-winged 219. *E. steedmanii*
- 30: Buds and fruits not 4-winged 24. *E. dichromophloia*
- 23: Peduncle less than 20 mm long
- 31 Buds and fruits corrugated
- 32 Fruits 18–25 mm long; petiole 10–25 mm long 87. *E. coronata*
- 32: Fruits 4–5 mm long; petiole absent or to 7 mm long 366. *E. apodophylla*
- 31: Buds and fruits not corrugated
- 33 Buds and fruits quadrangular

- 34 Leaves less than 7 cm long
- 34: Leaves 7 cm or more long
- 35 Fruits 15 mm or more long
- 35: Fruits less than 15 mm long
- 33: Buds and fruits not quadrangular
- 36 Buds and fruits sessile
- 37 Fruits 15–25 mm long
- 38 Peduncle 2–8 mm long
- 39 Leaves oblique at base (Vic.)
- 39: Leaves not oblique at base (S.A.)
- 38: Peduncle 10–26 mm long
- 37: Fruits 4–16 mm long
- 40 Fruits campanulate; rim flared
- 40: Fruits not campanulate or if campanulate the rim not flared
- 41 Fruits up to 5 mm long
- 41: Fruits more than 5 mm long
- 42 Lateral veins 40°–50° to midrib
- 42: Lateral veins at 15°–25° to midrib
- 43 Fruits hemispherical, subglobular or suburceolate
- 44 Buds and fruits not verrucose; fruits 7–10 mm long
- 44: Buds and fruits verrucose; fruits 12–16 mm long
- 43: Fruits cylindrical or campanulate
- 36: Buds and fruits pedicellate
- 45 Buds 3–5 mm long
- 46 Leaves 2–3 cm wide.
- 46: Leaves 0.6–1.8 cm wide
- 45: Buds more than 5 mm long
- 47 Conflorescence compound
- 48 Intramarginal vein up to 3 mm from margin
- 48: Intramarginal vein confluent with, or up to 1 mm from, margin
- 49 Leaves lemon-scented
- 49: Leaves not lemon-scented
- 50 Leaves narrowly lanceolate to lanceolate, 12–21 cm long
- 50: Leaves lanceolate to broadly lanceolate, 16–28 cm long
- 47: Conflorescence simple
- 51 Fruits cylindrical
- 52 Buds warty
- 52: Buds not warty
- 53 Leaves 5–7 cm long; buds 8–11 mm long
- 53: Leaves 7–13 cm long; buds 7–8 mm long
- 51: Fruits not cylindrical
- 54 Buds slightly warty
- 66. *E. eudesmioides*
- 67. *E. gittinsii*
- 72. *E. odontocarpa*
- 116. *E. alpina*
- 201. *E. cosmophylla*
- 85. *E. megacarpa*
- 426. *E. baeuerlenii*
- 166. *E. kybeanensis*
- 434. *E. archeri*
- 157. *E. triflora*
- 116. *E. alpina*
- 165. *E. approximans*
- 387. *E. michaeliana*
- 165. *E. approximans*
- 81. *E. curtisii*
- 61. *E. citriodora*
- 62. *E. maculata*
- 63. *E. henryi*
- 165. *E. approximans*
- 339. *E. merrickiae*
- 424. *E. wilcoxii*

MYRTACEAE—1

1. *Eucalyptus*

55 Fruits campanulate	165. <i>E. approximans</i>
55: Fruits subglobular to urceolate	163. <i>E. apiculata</i>
54: Buds not warty	
56 Buds clavate	
57 Leaves less than 10 mm wide	254. <i>E. halophila</i>
57: Leaves 10–20 mm wide	332. <i>E. concinna</i>
56: Buds not clavate	
58 Buds ovoid	
59 Petiole 8–10 mm long	287. <i>E. lanepoolei</i>
59: Petiole 12–25 mm long	
60 Fruits 5–6 mm long	360. <i>E. confluens</i>
60: Fruits 16–25 mm long	85. <i>E. megacarpa</i>
58: Buds pyriform or cylindrical	
61 Fruits urceolate; valves included (Tas.)	437. <i>E. urnigera</i>
61: Fruits not urceolate; valves exerted (W.A., N.S.W.)	
62 Buds 6–7 mm wide	68. <i>E. ebbanoensis</i>
62: Buds 3–4 mm wide	424. <i>E. wilcoxii</i>

GROUP 3

1 Leaves on mature trees oblong to ovate	366. <i>E. apodophylla</i>
1: Leaves narrowly to broadly lanceolate or ovate	
2 Buds and fruits sessile	166. <i>E. kybeanensis</i>
2: Buds and fruits pedicellate	
3 Buds urceolate to cylindrical	262. <i>E. cladocalyx</i>
3: Buds not urceolate or cylindrical	
4 Conflorescences compound	
5 Peduncle absent or to 2 mm long	
6 Leaves 12–15 cm long, 5–8 cm wide	3. <i>E. grandifolia</i>
6: Leaves 5–10 cm long, 1–1.5 cm wide	9. <i>E. ferriticola</i>
5: Peduncle 5–30 mm long	
7 Intramarginal vein up to 3 mm from margin	81. <i>E. curtisii</i>
7: Intramarginal vein confluent with margin	
8 Leaves shining green	18. <i>E. bleeseri</i>
8: Leaves dull grey-green	24. <i>E. dichromophloia</i>
4: Conflorescences simple	
9 Leaves less than 1 cm wide	164. <i>E. cunninghamii</i>
9: Leaves more than 1.5 cm wide	
10 Fruits 4–6 mm long	186. <i>E. deanei</i>
10: Fruits 8–12 mm long	185. <i>E. diversicolor</i>

GROUP 4**1** Buds glaucous**2** Buds 3–5 mm long**427. E. benthamii****2:** Buds 7–27 mm long**3** Petiole 8–15 mm long**4** Leaves narrowly lanceolate, 0.5–1.3 cm wide**238. E. salubris****4:** Leaves lanceolate, 1.5–2.5 cm wide**313. E. sheathiana****3:** Petiole 20 mm or more long**5** Fruits glaucous**6** Fruits 7–8 mm long**313. E. sheathiana****6:** Fruits 12–15 mm long**312. E. georgei****5:** Fruits not glaucous**415. E. globulus****1:** Buds not glaucous**7** Peduncle terete or quadrangular**8** Petiole 4–7 mm long**9** Leaves less than 10 mm wide**254. E. halophila****9:** Leaves 10–18 mm wide**10** Fruits 4–5 mm long, subglobular**306. E. fruticosa****10:** Fruits 6–10 mm long, campanulate**117. E. deuaensis****8:** Petiole 8–22 mm long**11** Buds 3–5 mm long**427. E. benthamii****11:** Buds 7–13 mm long**12** Fruits 5–6 mm long**360. E. confluens****12:** Fruits 8–10 mm long**287. E. lanepolei****7:** Peduncle flattened, angular or channelled**13** Buds and fruits verrucose**116. E. alpina****13:** Buds and fruits not verrucose**14** Leaves ovate or deltoid, 6–13 cm wide**357. E. bigalerita****14:** Leaves mostly narrowly to broadly lanceolate, rarely elliptic, ovate or suborbicular, up to 3 cm wide**15** Peduncle recurved**16** Leaves 7–11 cm long**270. E. cooperiana****16:** Leaves 5–6.5 cm long**216. E. nutans****15:** Peduncle not recurved**17** Fruits cylindrical**18** Peduncle glaucous**237. E. carnei****18:** Peduncle not glaucous**19** Leaves shining, 13–24 cm long**413. E. nitens****19:** Leaves not shining, 6–16 cm long**20** Pedicels 5–10 mm long**392. E. barberi****20:** Pedicels 0–3 mm long**21** Tree; leaves 10–16 cm long**230. E. laeliae****21:** Mallee; leaves 6–11 cm long**232. E. trivalvis****17:** Fruits not cylindrical

MYRTACEAE—1

1. *Eucalyptus*

- 22** Buds clavate
 - 23** Petiole 20–35 mm long **361. *E. hallii***
 - 23:** Petiole 5–16 mm long
 - 24** Tree to 20 m; leaves 10–15 cm long **230. *E. laeliae***
 - 24:** Mallee, sometimes tree, to 9 m; leaves 6–13 cm long
 - 25** Peduncle broadly flattened and dilated upwards, 10–18 mm long **330. *E. rugosa***
 - 25:** Peduncle flattened, not dilated, 4–15 mm long
 - 26** Petiole 5–8 mm long **234. *E. prominens***
 - 26:** Petiole 10–15 mm long **332. *E. concinna***
- 22:** Buds not clavate
 - 27** Buds usually sessile
 - 28** Leaves shining green, 13–24 cm long **413. *E. nitens***
 - 28:** Leaves green to grey-green, 10–18 cm long **361. *E. hallii***
 - 27:** Buds pedicellate
 - 29** Buds fusiform to obovoid **392. *E. barberi***
 - 29:** Buds ovoid to turbinate
 - 30** Petiole slightly flattened, 20–35 mm long **361. *E. hallii***
 - 30:** Petiole terete or quadrangular, 8–20 mm long
 - 31** Buds 10–14 mm long, ovoid, shining **238. *E. salubris***
 - 31:** Buds 6–11 mm long, turbinate, ovoid or clavate, not shining
 - 32** Tree to 20 m; pedicels usually less than 3 mm long **230. *E. laeliae***
 - 32:** Mallee or small tree to 8 m; pedicels 3–6 mm long
 - 33** Fruits pyriform to obconical **316. *E. dongarraensis***
 - 33:** Fruits hemispherical **318. *E. pileata***

GROUP 5

- 1** Fruits 17–30 mm wide
 - 2** Petiole 20–30 mm long **100. *E. pendens***
 - 2:** Petiole less than 20 mm long
 - 3** Petiole 6–8 mm long **98. *E. buprestium***
 - 3:** Petiole 14–18 mm long **99. *E. sepulcralis***
- 1:** Fruits less than 17 mm wide
 - 4** Pedicels 10–20 mm long **340. *E. pimpiniana***
 - 5** Buds 22–30 mm long
 - 5:** Buds 7–14 mm long
 - 6** Peduncle 7–15 mm long
 - 7** Leaves green, subcrenulate (Tas.) **392. *E. barberi***
 - 7:** Leaves grey-green, never subcrenulate (W.A.) **90. *E. ligata***
 - 6:** Peduncle 20–30 mm long
 - 8** Buds constricted in the middle; fruits urceolate, cylindrical or hemispherical **224. *E. cerasiformis***
 - 8:** Buds not constricted; fruits ovoid **335. *E. deflexa***
- 4:** Pedicels less than 10 mm long

9 Intramarginal vein more or less confluent with margin**10** Petiole 3–8 mm long**11** Buds and fruits glaucous**71. E. gongylocarpa****11:** Buds and fruits not glaucous**12** Fruits subglobular to urceolate (N.S.W.)**163. E. apiculata****12:** Fruits ovoid (W.A.)**104. E. insularis****10:** Petiole 10–20 mm long**13** Fruits 9–12 mm long, 9–11 mm wide**27. E. drysdalensis****13:** Fruits 11–17 mm long, 11–15 mm wide**14** Pedicels 4–8 mm long**25. E. ollaris****14:** Pedicels less than 4 mm long**30. E. coniphloia****9:** Intramarginal vein distinct from margin**15** Buds glaucous**16** Conflorescences compound**17** Leaves opposite, glaucous**73. E. gamophylla****17:** Leaves alternate, green to grey-green**18** Leaves lanceolate, 10–15 cm long**472. E. dawsonii****18:** Leaves ovate to broadly lanceolate, 5.5–9 cm long**500. E. polyanthemis****16:** Conflorescences simple**19** Petiole 1–5 mm long**20** Leaves 3–4 cm long**243. E. brachyphylla****20:** Leaves 6–12 cm long**21** Buds fusiform**402. E. sturgissiana****21:** Buds clavate to pyriform**73. E. gamophylla****19:** Petiole more than 5 mm long**22** Buds not clavate**23** Petiole 2–7 mm long**402. E. sturgissiana****23:** Petiole 15–25 mm long**313. E. sheathiana****22:** Buds clavate**24** Leaves glaucous**25** Persistent connate ovate to orbicular juvenile foliage on mature trees**178. E. risdonii****25:** Mature tree foliage of broadly lanceolate to elliptic lanceolate adult leaves**177. E. tenuiramis****24:** Leaves not glaucous**26** Leaves oblique at base**143. E. pauciflora****26:** Leaves not oblique at base**27** Venation prominent (W.A.)**244. E. loxophleba****27:** Venation faint (Tas.)**28** Juvenile leaves not connate**180. E. coccifera****28:** Juvenile leaves connate**29** Persistent connate ovate to orbiculate juvenile foliage on mature trees**178. E. risdonii****29:** Mature tree foliage of broadly lanceolate to elliptic lanceolate adult leaves**177. E. tenuiramis**

- 15: Buds not glaucous
 - 30 Peduncle recurved
 - 31 Buds ovoid 216. *E. nutans*
 - 31: Buds not ovoid
 - 32 Buds 22–30 mm long 340. *E. pimpiniana*
 - 32: Buds 6–13 mm long
 - 33 Leaves alternate, 6.5–8 cm long 246. *E. decurva*
 - 33: Leaves opposite or subopposite, 9–15 cm long 89. *E. acies*
 - 30: Peduncle not recurved
 - 34 Leaves ovate to deltoid, 6–13 cm wide 357. *E. bigalerita*
 - 34: Leaves linear to broadly lanceolate, oblong lanceolate, elliptic, or rarely ovate, less than 6 cm wide
 - 35 Buds urceolate 353. *E. cyclostoma*
 - 35: Buds not urceolate
 - 36 Fruits at least 12 mm wide
 - 37 Disc level or just ascending
 - 38 Buds 4–5 mm wide 90. *E. ligulata*
 - 38: Buds 7–10 mm wide
 - 39 Leaves clearly alternate 91. *E. calcicola*
 - 39: Leaves opposite or subopposite 89. *E. acies*
 - 37: Disc descending
 - 40 Fruits wrinkled or ribbed
 - 41 Pedicels and peduncle pruinose 100. *E. pendens*
 - 41: Pedicels and peduncle not pruinose 342. *E. angulosa*
 - 40: Fruits smooth
 - 42 Leaves 4–7 cm long 101. *E. exilis*
 - 42: Leaves 8–17 cm long 162. *E. burgessiana*
 - 36: Fruits less than 12 mm wide
 - 43 Buds ribbed, striate or quadrangular
 - 44 Buds sessile
 - 45 Leaves not oblique at base 413. *E. nitens*
 - 45: Leaves oblique at base 147. *E. remota*
 - 44: Buds pedicellate
 - 46 Fruits pyriform to obconical 316. *E. dongarraensis*
 - 46: Fruits not pyriform or obconical
 - 47 Buds 9–20 mm long
 - 48 Buds and fruits quadrangular 301. *E. calycogona*
 - 48: Buds and fruits ribbed
 - 49 Peduncle 2–4 mm long 342. *E. angulosa*
 - 49: Peduncle 5–10 mm long 90. *E. ligulata*
 - 47: Buds 3–8 mm long
 - 50 Disc and valves c. level 147. *E. remota*
 - 50: Disc descending; valves included

- 51** Fruits quadrangular, 4-toothed
51: Fruits cylindrical to ovoid, not toothed
43: Buds not ribbed, striate or quadrangular
52 Buds clavate or turbinate, occasionally ovoid
53 Operculum smooth, but striate when dry, slightly wider than hypanthium
53: Operculum smooth, not striate when dry, equal in width to hypanthium
54 Fruits cylindrical
55 Buds 9–15 mm long
55: Buds 3–7 mm long
56 Fruits 3–4 mm wide
56: Fruits 6–9 mm wide
57 Pedicels absent or to 4 mm long; petiole 4–10 mm long
57: Pedicels 4–7 mm long; petiole 10–25 mm long
54: Fruits not cylindrical
58 Buds 9–15 mm long
59 Peduncle broadly flattened, 3–5 mm wide
59: Peduncle slightly flattened to terete, or quadrangular
60 Lateral veins at 35°–45°
60: Lateral veins at 15°–30°
61 Midrib present, lateral veins acute
62 Fruits 10–13 mm long, 8–11 mm wide (N.S.W.)
62: Fruits 4–10 mm long, 3–9 mm wide (W.A.)
63 Fruits obconical
63: Fruits ovoid to suburceolate
61: Midrib obscure, lateral veins mostly parallel
64 Mallee; petiole 8–12 mm long
64: Tree; petiole 10–20 mm long
58: Buds less than 9 mm long
65 Buds sessile
66 Lateral veins faint at 15°–30° to midrib
67 Fruits hemispherical, subglobular or suburceolate
68 Petiole 3–5 mm long
68: Petiole 8–15 mm long
67: Fruits cylindrical or campanulate
66: Lateral veins distinct, almost parallel with midrib
69 Mallee; petiole 8–12 mm long
69: Tree; petiole 10–20 mm long
65: Buds pedicellate
70 Fruits ovoid
- 72. E. odontocarpa**
468. E. thozetiana
318. E. pileata
233. E. pilbarensis
468. E. thozetiana
165. E. approximans
2. E. papuana
162. E. burgessiana
233. E. pilbarensis
160. E. obtusiflora
244. E. loxophleba
300. E. yilgarnensis
144. E. gregsoniana
143. E. pauciflora
166. E. kybeanensis
157. E. triflora
165. E. approximans
144. E. gregsoniana
143. E. pauciflora

MYRTACEAE—1

1. *Eucalyptus*

- 71 Petiole 20–30 mm long 467. *E. lucasii*
- 71: Petiole 5–15 mm long
- 72 Operculum conical or hemispherical
- 73 Fruits 3–6 mm long 468. *E. thozetiana*
- 73: Fruits 11–15 mm long 101. *E. exilis*
- 72: Operculum low hemispherical or shallowly conical
- 74 Peduncle 5–8 mm long 309. *E. discreta*
- 74: Peduncle 10–15 mm long 351. *E. oraria*
- 70: Fruits not ovoid
- 75 Fruits 10–15 mm long
- 76 Leaves 6–10 mm wide 161. *E. stricta*
- 76: Leaves 12–45 mm wide
- 77 Midrib present, lateral veins acute 160. *E. obtusiflora*
- 78 Leaves 6–10 cm long; umbels 7-flowered
- 78: Leaves 8–17 cm long; umbels usually 11-flowered 162. *E. burgessiana*
- 77: Midrib obscure, lateral veins usually parallel 143. *E. pauciflora*
- 75: Fruits less than 10 mm long
- 79 Peduncle broadly flattened, 3–5 mm wide 162. *E. burgessiana*
- 79: Peduncle slightly flattened to terete
- 80 Leaves 1.5–4.5 cm wide
- 81 Peduncle 12–25 mm long
- 82 Pedicels 6–8 mm long 152. *E. haemastoma*
- 82: Pedicels to 3 mm long 143. *E. pauciflora*
- 81: Peduncle absent or to 12 mm long
- 83 Lateral veins parallel; midrib obscure
- 84 Mallee; petiole 8–12 mm long 144. *E. gregsoniana*
- 84: Tree; petiole 10–20 mm long 143. *E. pauciflora*
- 83: Lateral veins acute; midrib present
- 85 Operculum hemispherical
- 86 Peduncle 8–12 mm long 151. *E. sclerophylla*
- 86: Peduncle 3–7 mm long 165. *E. approximans*
- 85: Operculum conical 150. *E. signata*
- 80: Leaves up to 1.5 cm wide
- 87 Pedicels to 3 mm long
- 88 Leaves up to 1 cm wide
- 89 Disc ascending or level
- 90 Leaves not oblique at base (Tas.) 176. *E. pulchella*
- 90: Leaves oblique at base (N.S.W.)
- 91 Bark with ‘scribbles’ 154. *E. rossii*
- 91: Bark without ‘scribbles’ 165. *E. approximans*
- 89: Disc descending

- 92** Leaves linear **176. *E. pulchella***
- 92:** Leaves narrowly lanceolate to lanceolate
- 93** Fruits obconical or ovoid **351. *E. oraria***
- 93:** Fruits not obconical or ovoid
- 94** Fruits urceolate (W.A.) **302. *E. celastroides***
- 94:** Fruits not urceolate (Qld, N.S.W.)
- 95** Fruits cylindrical or campanulate **165. *E. approximans***
- 95:** Fruits subglobular to suburceolate
- 96** Fruits 7–10 mm long; peduncle 7–13 mm long **161. *E. stricta***
- 96:** Fruits 5–7 mm long; peduncle 3–8 mm long **164. *E. cunninghamii***
- 88:** Leaves usually more than 1 cm wide
- 97** Lateral veins parallel; midrib obscure **143. *E. pauciflora***
- 97:** Lateral veins 15°–50°; midrib present
- 98** Bark with ‘scribbles’ **154. *E. rossii***
- 98:** Bark without ‘scribbles’
- 99** Peduncle 10–15 mm long **351. *E. oraria***
- 99:** Peduncle 3–8 mm long
- 100** Leaves slightly crenulate **158. *E. paliformis***
- 100:** Leaves not crenulate **165. *E. approximans***
- 87:** Pedicels 4–8 mm long
- 101** Fruits 4–5 mm long
- 102** Fruits obconical (W.A.) **351. *E. oraria***
- 102:** Fruits hemispherical to subglobular (N.S.W.)
- 103** Operculum conical (central coastal N.S.W.) **153. *E. racemosa***
- 103:** Operculum hemispherical (tablelands, N.S.W.) **154. *E. rossii***
- 101:** Fruits more than 5 mm long
- 104** Fruits urceolate **302. *E. celastroides***
- 104:** Fruits not urceolate
- 105** Leaves 12–15 cm long **152. *E. haemastoma***
- 105:** Leaves 6–11 cm long
- 106** Fruits cylindrical or campanulate **165. *E. approximans***
- 106:** Fruits not cylindrical or campanulate
- 107** Fruits pyriform (N.S.W.) **149. *E. multicaulis***
- 107:** Fruits obconical (W.A.) **351. *E. oraria***
- 52:** Buds not clavate or turbinate
- 108** Fruits globular or subglobular

MYRTACEAE—1

1. Eucalyptus

- 109 Conflorescences compound 387. *E. michaeliana*
- 109: Conflorescences simple
 - 110 Buds shortly pedicellate (W.A.) 261. *E. brockwayi*
 - 110: Buds sessile (N.S.W., Vic.)
 - 111 Operculum acutely conical 167. *E. mitchelliana*
 - 111: Operculum hemispherical to almost conical 157. *E. triflora*
- 108: Fruits not globular or subglobular
- 112 Buds sessile
 - 113 Buds 10–15 mm long
 - 114 Mallee; leaves 6–12 cm long (W.A.) 233. *E. pilbarensis*
 - 114: Tree; leaves 11–20 cm long (N.S.W., Vic.) 412. *E. cypellocarpa*
 - 113: Buds less than 10 mm long
 - 115 Petiole 2–7 mm long
 - 116 Leaves 5–7 cm long; buds ovoid 396. *E. parvifolia*
 - 116: Leaves 7.5–12 cm long; buds fusiform 402. *E. sturgissiana*
 - 115: Petiole 8–22 mm long
 - 117 Leaves 13–24 cm long
 - 118 Fruits 4–6 mm wide, cylindrical or ovoid 413. *E. nitens*
 - 118: Fruits 7–9 mm wide, hemispherical to suburceolate 157. *E. triflora*
 - 117: Leaves 5–12 cm long
 - 119 Fruits hemispherical or subglobular to suburceolate 157. *E. triflora*
 - 119: Fruits cylindrical, ovoid or obconical
 - 120 Valves included
 - 121 Fruits 5–6 mm long 308. *E. uncinata*
 - 121: Fruits 8–15 mm long 233. *E. pilbarensis*
 - 120: Valves level
 - 122 Leaves green, lanceolate 321. *E. anceps*
 - 122: Leaves usually grey to glaucous, lanceolate to ovate 232. *E. trivalvis*
 - 112: Buds pedicellate
 - 123 Fruits hemispherical
 - 124 Petiole 7–12 mm long 477. *E. argophloia*
 - 124: Petiole 17–30 mm long 387. *E. michaeliana*
 - 123: Fruits not hemispherical
 - 125 Operculum saucer-shaped 2. *E. papuana*
 - 125: Operculum conical to hemispherical
 - 126 Petiole less than 15 mm long
 - 127 Peduncle flattened or slightly so
 - 128 Leaves usually grey to glaucous 232. *E. trivalvis*
 - 128: Leaves green
 - 129 Fruits 8–15 mm long; buds 9–15 mm long 233. *E. pilbarensis*
 - 129: Fruits 5–10 mm long; buds 7–9 mm long 321. *E. anceps*
 - 127: Peduncle not flattened

- 130** Petiole 10–15 mm long; buds cylindrical, 7–11 mm long
- 130:** Petiole 5–10 mm long; buds not cylindrical, 3–7 mm long
- 131** Fruits cylindrical to ovoid, 3–4 mm wide
- 131:** Fruits obconical to ovoid, 4–5 mm wide
- 126:** Petiole 15–30 mm long
- 132** Peduncle quadrangular
- 132:** Peduncle flattened or slightly so
- 133** Leaves usually grey to glaucous
- 133:** Leaves green
- 134** Tall tree; leaves 11–20 cm long (N.S.W., Vic.)
- 134:** Small tree or mallee; leaves 5–13 cm long
- 135** Buds fusiform (Tas.)
- 135:** Buds not fusiform
- 136** Valves level
- 136:** Valves included
- 137** Buds obovoid to clavate, 9–15 mm long
- 137:** Buds cylindrical to obovoid
- 368. E. cylindrocarpa**
- 468. E. thozetiana**
- 351. E. oraria**
- 337. E. scyphocalyx**
- 232. E. trivalvis**
- 412. E. cypellocarpa**
- 392. E. barberi**
- 321. E. anceps**
- 233. E. pilbarensis**
- 336. E. leptocalyx**

GROUP 6

- 1** Umbels sessile
- 2** Leaves opposite (Tas.)
- 2:** Leaves alternate (W.A.)
- 1:** Umbels pedunculate
- 3** Peduncle 30 mm or more long
- 4** Buds and fruits pedicellate
- 4:** Buds and fruits sessile
- 3:** Peduncle up to 30 mm long
- 5** Buds and fruits glaucous
- 5:** Buds and fruits not glaucous
- 6** Fruits 10 mm long or longer
- 7** Pedicels 8 mm long or longer
- 8** Leaves 9.5–14.5 cm long
- 8:** Leaves 4–8 cm long
- 9** Operculum pyramidal
- 9:** Operculum conical
- 7:** Pedicels absent or to 7 mm long
- 10** Fruits ribbed, corrugated or striate
- 11** Operculum wider than hypanthium
- 11:** Operculum not wider than hypanthium
- 12** Peduncle terete
- 12:** Peduncle flattened
- 416. E. vernicosa**
- 240. E. diptera**
- 286. E. caesia**
- 209. E. newbeyi**
- 286. E. caesia**
- 326. E. pterocarpa**
- 219. E. steedmanii**
- 222. E. erythronema**
- 338. E. platycorys**
- 296. E. pachyphylla**

MYRTACEAE—1

1. *Eucalyptus*

- 13 Buds sessile 201. *E. cosmophylla*
- 13: Buds pedicellate
- 14 Leaves 9.5–14.5 cm long; tree 326. *E. pterocarpa*
- 14: Leaves 6–10 cm long; mallee
- 15 Fruits strongly ribbed 342. *E. angulosa*
- 15: Fruits slightly striate 341. *E. incrassata*
- 10: Fruits smooth
- 16 Petiole up to 10 mm long
- 17 Fruits globular, 11–15 mm wide 92. *E. pachyloma*
- 17: Fruits pyriform, 5–9 mm wide 218. *E. spathulata*
- 16: Petiole 15–30 mm long
- 18 Peduncle flattened, also angular in *E. cosmophylla*
- 19 Peduncle 2–8 mm long 201. *E. cosmophylla*
- 19: Peduncle 10–26 mm long 85. *E. megacarpa*
- 18: Petiole not flattened
- 20 Valves included; disc descending 338. *E. platycorys*
- 20: Valves exerted; disc ascending
- 21 Buds 3–6 mm wide 385. *E. gillenii*
- 21: Buds 9–12 mm wide 292. *E. oldfieldii*
- 6: Fruits less than 10 mm long
- 22 Petiole absent or to 9 mm long
- 23 Peduncle absent or to 4 mm long; pedicels absent or to 2 mm long
- 24 Leaves sessile or very shortly petiolate, 2–4 mm wide 253. *E. angustissima*
- 24: Leaves petiolate, 10–15 mm wide 416. *E. vernicosa*
- 23: Peduncle 5–20 mm long; pedicels 2–18 mm long
- 25 Pedicels 2–6 mm long 218. *E. spathulata*
- 25: Pedicels 10–18 mm long 222. *E. erythronema*
- 22: Petiole 10–40 mm long
- 26 Pedicels 6–8 mm long
- 27 Leaves 8–9.5 cm long, 1.5–2 cm wide 249. *E. falcata*
- 27: Leaves 6–8 cm long, 1.5 cm wide 338. *E. platycorys*
- 26: Pedicels absent or to 5 mm long
- 28 Leaves 3–9 cm wide, more or less deciduous
- 29 Fruits 3–4 mm long, 4–5 mm wide 356. *E. tintinnans*
- 29: Fruits 5–6 mm long, 7–9 mm wide 355. *E. platyphylla*
- 28: Leaves less than 3 cm wide
- 30 Leaves lanceolate to broadly lanceolate, subcrenulate
- 31 Fruits 5–8 mm wide 417. *E. subcrenulata*
- 31: Fruits 9–13 mm wide 418. *E. johnstonii*
- 30: Leaves narrowly lanceolate to lanceolate, not subcrenulate
- 32 Fruits 2–4 mm long, 3–5 mm wide 365. *E. houseana*
- 32: Fruits 4–9 mm long, 5–12 mm wide
- 33 Umbels usually or sometimes in pairs

- 34** Tree; bark shining (Qld) **257. *E. pachycalyx***
34: Mallee; bark not shining (N.T., S.A.) **385. *E. gillenii***
33: Umbels not in pairs
35 Leaves held somewhat erect; mallee (Mt Imlay, N.S.W.) **419. *E. imlayensis***
35: Leaves not erect; mallee or tree
36 Peduncle terete
37 Operculum about equal in length to hypanthium **360. *E. confluens***
37: Operculum clearly longer than hypanthium
38 Buds 5–8 mm long; tree **422. *E. viminalis***
38: Buds 7–12 mm long; mallee or tree to 6 m
39 Fruits subglobular or ovoid, 6–15 mm long **385. *E. gillenii***
39: Fruits hemispherical to obconical or ovoid, 5–8 mm long **379. *E. flindersii***
36: Peduncle slightly flattened, angular or quadrangular
40 Operculum wider than hypanthium **338. *E. platycorys***
40: Operculum not wider than hypanthium
41 Fruits ovoid to subglobular; juvenile leaves lanceolate, green, slightly discolorous **422. *E. viminalis***
41: Fruits ±hemispherical; juvenile leaves orbiculate to ovate, glaucous, concolorous
42 Buds and fresh fruits often glaucous; leaves dull green or glaucous; juvenile leaves glaucous **430. *E. rubida***
42: Buds, fresh fruits and leaves green; juvenile leaves light green to subglaucous **429. *E. dalrympleana***

GROUP 7

- 1** Bark smooth, not matt or granular, white to blue-grey
2 Valves incurved; buds 4–5 mm wide **187. *E. grandis***
2: Valves usually spreading outwards, or erect; buds 3–4 mm wide **188. *E. saligna***
1: Bark matt smooth or granular, cream to orange to grey-brown
3 Buds 4–6 mm long, 3–4 mm wide **195. *E. propinqua***
3: Buds 7–20 mm long, 4–8 mm wide
4 Operculum long, rostrate **199. *E. longirostrata***
4: Operculum conical or shortly rostrate, or hemispherical
5 Fruits 12–15 mm wide **197. *E. canaliculata***
5: Fruits 6–10 mm wide
6 Buds 7–10 mm long, sessile or pedicels to 4 mm long **194. *E. major***
6: Buds 9–13 mm long, pedicels 2–9 mm long
7 Buds 4–6 mm wide; disc level or slightly ascending **196. *E. punctata***
7: Buds 6–8 mm wide; disc convex or steeply ascending **198. *E. biturbinata***

GROUP 8

- 1** Peduncle absent or to 5 mm long
- 2** Buds pedicellate
- 3** Leaves glaucous, sessile (W.A.) **242. E. kruseana**
- 3:** Leaves green, petiolate
- 4** Buds 4–6 mm long (N.T.) **502. E. lucens**
- 4:** Buds 9–12 mm long (W.A.) **320. E. fraseri**
- 2:** Buds sessile
- 5** Lateral veins 40°–45° to midrib **308. E. uncinata**
- 5:** Lateral veins 10°–15° to midrib
- 6** Leaves with 3 main veins, elliptic to broadly lanceolate **168. E. stellulata**
- 6:** Leaves with single midvein, narrowly lanceolate or lanceolate **169. E. moorei**
- 1:** Peduncle more than 5 mm long
- 7** Fruits 3–8 mm long
- 8** Leaves sessile **242. E. kruseana**
- 8:** Leaves petiolate
- 9** Peduncle terete, angular or quadrangular
- 10** Leaves glaucous **243. E. brachyphylla**
- 10:** Leaves not glaucous
- 11** Leaves opposite **245. E. doratoxylon**
- 11:** Leaves alternate
- 12** Bark with ‘scribbles’
- 13** Operculum conical **153. E. racemosa**
- 13:** Operculum hemispherical **154. E. rossii**
- 12:** Bark without ‘scribbles’
- 14** Buds 4–6 mm long; fruits obconical
- 15** Leaves 1–1.5 cm wide; petiole 10–15 mm long (N.T.) **502. E. lucens**
- 15:** Leaves 1.5–2.5 cm wide; petiole 15–33 mm long (N.S.W.) **472. E. dawsonii**
- 14:** Buds 7–11 mm long; fruits hemispherical to ovoid
- 16** Leaves 10–20 cm long; peduncle 7–10 mm long (N.S.W., Vic.) **478. E. bosistoana**
- 16:** Leaves 5–10 cm long; peduncle 10–15 mm long (W.A.)
- 17** Leaves 5–7 cm long; petiole 5–8 mm long **221. E. cylindriflora**
- 17:** Leaves 8–10 cm long; petiole 10–15 mm long **350. E. cylindrocarpa**
- 9:** Peduncle flattened
- 18** Leaves linear-lanceolate to narrowly lanceolate **221. E. cylindriflora**
- 18:** Leaves lanceolate to broadly lanceolate or elliptic
- 19** Peduncle pruinose **229. E. desmondensis**
- 19:** Peduncle not pruinose
- 20** Buds glaucous **313. E. sheathiana**
- 20:** Buds not glaucous
- 21** Pedicels 5–10 mm long **90. E. ligulata**
- 21:** Pedicels absent or to 4 mm long
- 22** Buds 6–7 mm wide **216. E. nutans**

- 22: Buds 3–4 mm wide
- 23 Buds sessile 308. *E. uncinata*
- 23: Buds with pedicels 2–3 mm long 228. *E. gardneri*
- 7: Fruits 9–25 mm long
- 24 Peduncle pruinose 229. *E. desmondensis*
- 24: Peduncle not pruinose
- 25 Buds 22–30 mm long; peduncle recurved 340. *E. pimpiniana*
- 25: Buds 8–20 mm long; peduncle not recurved except *E. nutans*
- 26 Fruits campanulate, glaucous 311. *E. woodwardii*
- 26: Fruits not campanulate, not glaucous
- 27 Peduncle terete or quadrangular
- 28 Fruits 6–8 mm wide 221. *E. cylindriflora*
- 28: Fruits 15–20 mm wide 94. *E. erectifolia*
- 27: Peduncle flattened
- 29 Petiole 5–8 mm long
- 30 Fruits ribbed or striate
- 31 Pedicels 5–10 mm long 90. *E. ligulata*
- 31: Pedicels 1–3 mm long 320. *E. fraseri*
- 30: Fruits smooth 221. *E. cylindriflora*
- 29: Petiole 9–25 mm long
- 32 Buds glaucous 142. *E. luehmanniana*
- 32: Buds not glaucous
- 33 Fruits strongly ribbed or corrugated
- 34 Leaves 15–18 cm long (N.S.W.) 142. *E. luehmanniana*
- 34: Leaves 5–14.5 cm long (W.A., S.A.)
- 35 Pedicels 2–4 mm long 342. *E. angulosa*
- 35: Pedicels 5–10 mm long
- 36 Leaves 5–10 cm long; petiole 9–15 mm long 90. *E. ligulata*
- 36: Leaves 9.5–14.5 cm long; petiole 15–20 mm long 326. *E. pterocarpa*
- 33: Fruits smooth, striate or 2-ribbed
- 37 Buds cylindrical, rostrate 341. *E. incrassata*
- 37: Buds ovoid, clavate or fusiform
- 38 Leaves 5–6.5 cm long 216. *E. nutans*
- 38: Leaves 8–12.5 cm long
- 39 Petiole 15–22 mm long 231. *E. accedens*
- 39: Petiole 8–10 mm long 320. *E. fraseri*

GROUP 9

- 1 Peduncle distinctly or slightly flattened
- 2 Buds sessile or almost so
- 3 Leaves less than 10 cm long
- 4 Peduncle 3–15 mm long
- 5 Petiole absent or to 2 mm long

- 6 Leaves 2–4 mm wide; peduncle 3–4 mm long 253. *E. angustissima*
- 6: Leaves 7–15 mm wide; peduncle 5–10 mm long 402. *E. sturgissiana*
- 5: Petiole distinct, 4–25 mm long
- 7 Buds 5–7 mm long (N.S.W.) 402. *E. sturgissiana*
- 7: Buds 7–20 mm long (W.A., N.T., S.A.)
- 8 Leaves 5–7 mm wide 227. *E. xanthanema*
- 8: Leaves at least 10 mm wide
- 9 Buds ovoid
- 10 Fruits 11–16 mm wide 248. *E. goniantha*
- 10: Fruits 8–10 mm wide
- 11 Leaves 5–6.5 cm long 216. *E. nutans*
- 11: Leaves 8–11 cm long 252. *E. micranthera*
- 9: Buds conical, cylindrical or globular
- 12 Leaves narrowly lanceolate, 1–1.5 cm wide 215. *E. annulata*
- 12: Leaves lanceolate to broadly lanceolate or ovate
- 13 Leaves grey-green, 3–4.5 cm wide 281. *E. oxymitra*
- 13: Leaves green, 1–4 cm wide
- 14 Fruits 7–10 mm wide 319. *E. conglobata*
- 14: Fruits 11–16 mm wide 248. *E. goniantha*
- 4: Peduncle 16–45 mm long
- 15 Buds 10–20 mm long
- 16 Fruits 8–10 mm wide 216. *E. nutans*
- 16: Fruits 11–16 mm wide 248. *E. goniantha*
- 15: Buds 30 mm long or longer
- 17 Buds and fruits in aggregate heads
- 18 Operculum 4–7 mm wide 206. *E. lehmannii*
- 18: Operculum 8–13 mm wide 208. *E. conferruminata*
- 17: Buds and fruits free
- 19 Operculum warty
- 20 Buds 4.8–5.4 cm long 204. *E. burdettiana*
- 20: Buds 6–7 cm long 205. *E. megacornuta*
- 19: Operculum smooth
- 21 Fruits 12–15 mm long 207. *E. talyuberlup*
- 21: Fruits 20–25 mm long 209. *E. newbeyi*
- 3: Leaves 10 cm long or longer
- 22 Valves \pm level
- 23 Leaves 12–18 cm long; petiole 10–15 mm long 401. *E. kitsoniana*
- 23: Leaves 7.5–12 cm long; petiole 2–7 mm long 403. *E. sturgissiana*
- 22: Valves distinctly exserted
- 24 Buds conical to cylindrical or globular-conical
- 25 Leaves narrowly lanceolate, 1–1.5 cm wide 215. *E. annulata*
- 25: Leaves lanceolate to broadly lanceolate or ovate, 1.5–4.5 cm wide

- 26 Fruits 3–5 mm long, 3–6 mm wide
 26: Fruits 7–20 mm long, 10–16 mm wide
 27 Buds and fruits strongly ribbed
 27: Buds and fruits usually with only 2 ribs
 24: Buds ovoid
 28 Buds and fruits strongly ribbed
 28: Buds not strongly ribbed or sometimes with 2 ribs
 29 Buds 8–10 mm long, 7–11 per umbel
 29: Buds 5–8 mm long, 3–7 per umbel
 30 Operculum slightly longer than hypanthium; juvenile leaves lanceolate, green
 30: Operculum \pm equal in length to hypanthium; juvenile leaves orbicular to ovate, light green to glaucous
 2: Buds distinctly pedicellate
 31 Leaves orbicular, obovate or \pm spathulate
 32 Leaves sessile
 32: Leaves petiolate
 31: Leaves linear, or narrowly to broadly lanceolate or ovate
 33 Buds and fruits prominently ribbed or corrugated
 34 Fruits turbinate, 6–11 mm long
 34: Fruits hemispherical, subpyriform, subglobular or obconical, 7–15 mm long
 35 Buds fusiform, rostrate
 35: Buds conical to ovoid
 33: Buds and fruits not prominently ribbed
 36 Leaves usually linear or linear-lanceolate, usually less than 1 cm wide
 37 Leaves sessile or petiole to 2 mm long
 37: Leaves with petiole 2–12 mm long
 38 Buds 5–6 mm long
 38: Buds 8–18 mm long
 39 Lateral veins obscure, at 5°–10°
 39: Lateral veins faint, at 35°–50°
 40 Pedicels to 1 mm long
 40: Pedicels 4–9 mm long
 36: Leaves narrowly to broadly lanceolate or ovate, usually at least 1 cm wide
 41 Buds ovoid or clavate to globular
 42 Fruits 12–20 mm long
 43 Leaves grey-green, 3–4.5 cm wide
 43: Leaves green, 1.5–2.5 cm wide
 42: Fruits 4–11 mm long
 44 Fruits cylindrical to subpyriform
 45 Buds glaucous
 45: Buds not glaucous
372. *E. amplifolia*
 248. *E. goniantha*
 281. *E. oxymitra*
 248. *E. goniantha*
 252. *E. micranthera*
 422. *E. viminalis*
 429. *E. dalrympleana*
 242. *E. kruseana*
 217. *E. platypus*
 250. *E. ornata*
 326. *E. pterocarpa*
 248. *E. goniantha*
 253. *E. angustissima*
 399. *E. scoparia*
 218. *E. spathulata*
 227. *E. xanthonema*
 221. *E. cylindriflora*
 281. *E. oxymitra*
 216. *E. nutans*
 313. *E. sheathiana*
 313. *E. sheathiana*
 231. *E. accedens*

- 44:** Fruits hemispherical to subglobular, or obconical to turbinate
- 46** Leaves glaucous **239. *E. campaspe***
- 46:** Leaves not glaucous
- 47** Operculum distinctly longer than hypanthium **282. *E. ewartiana***
- 47:** Operculum equal in length to hypanthium
- 48** Operculum narrower than hypanthium **329. *E. brachycalyx***
- 48:** Operculum not narrower than hypanthium
- 49** Mallee; fruits 8–12 mm long (W.A.)
- 50** Peduncle recurved, broadly flattened **216. *E. nutans***
- 50:** Peduncle not recurved, sometimes narrowly flattened **252. *E. micranthera***
- 49:** Tall tree; fruits 5–8 mm long (N.S.W., Vic., Tas.) **429. *E. dalrympleana***
- 41:** Buds conical, fusiform, cylindrical, rostrate or horn-shaped
- 51** Buds glaucous
- 52** Leaves glaucous **239. *E. campaspe***
- 52:** Leaves not glaucous, sometimes grey-green or dull green
- 53** Fruits 7–10 mm long
- 54** Leaves 7–10 cm long (W.A.) **313. *E. sheathiana***
- 54:** Leaves 12–18 cm long (N.S.W.) **376. *E. glaucina***
- 53:** Fruits 12–20 mm long **281. *E. oxymitra***
- 51:** Buds not glaucous
- 55** Fruits globular
- 56** Pedicels 7–8 mm long **273. *E. socialis***
- 56:** Pedicels 2–4 mm long **93. *E. diversifolia***
- 55:** Fruits not globular
- 57** Buds 7–12 mm long
- 58** Leaves 10–20 cm long; venation prominent **372. *E. amplifolia***
- 58:** Leaves 7–12 cm long; venation faint
- 59** Leaves apiculate; venation at 20°–30° **93. *E. diversifolia***
- 59:** Leaves acuminate or uncinat; venation at 35°–50°
- 60** Fruits subglobular to hemispherical or ovoid
- 61** Disc descending (W.A.) **304. *E. rigidula***
- 61:** Disc ascending (N.S.W.) **386. *E. pumila***
- 60:** Fruits pyriform or cylindrical **225. *E. wandoo***
- 57:** Buds more than 12 mm long
- 62** Fruits campanulate **211. *E. astringens***
- 62:** Fruits not campanulate
- 63** Leaves noticeably glandular **220. *E. eremophila***
- 63:** Leaves not noticeably glandular
- 64** Fruits hemispherical to cylindrical; disc level or ascending **214. *E. macrandra***
- 64:** Fruits pyriform to cylindrical; disc descending
- 65** Mallee; leaves green **226. *E. redunca***
- 65:** Tree; leaves blue-green, grey-green or green

- 66 Leaves lanceolate, blue-green, 7–9 cm long 228. *E. gardneri*
- 66: Leaves lanceolate to narrowly lanceolate, green to grey-green, 8–12 cm long 225. *E. wandoo*
- 1: Peduncle terete, angular or quadrangular, or absent
- 67 Leaves sessile, opposite
- 68 Buds rostrate (S.A.) 274. *E. gillii*
- 68: Buds not rostrate (W.A.)
- 69 Leaves orbicular
- 70 Fruits 10–18 mm wide; disc ascending 285. *E. crucis*
- 70: Fruits 6–7 mm wide; disc descending 242. *E. kruseana*
- 69: Leaves broadly lanceolate 364. *E. mooreana*
- 67: Leaves petiolate, usually alternate
- 71 Buds and fruits distinctly ribbed
- 72 Fruits 5–8 mm long 249. *E. falcata*
- 72: Fruits 12–21 mm long
- 73 Buds and fruits sessile 298. *E. sessilis*
- 73: Buds and fruits distinctly pedicellate 213. *E. stowardii*
- 71: Buds and fruits not distinctly ribbed, sometimes striate
- 74 Buds glaucous or pruinose
- 75 Buds sessile
- 76 Peduncle 3–6 mm long 365. *E. houseana*
- 76: Peduncle 10–15 mm long 368. *E. cupularis*
- 75: Buds pedicellate
- 77 Leaves suborbicular or obovate or ovate-lanceolate
- 78 Buds 5–7 mm long 284. *E. websteriana*
- 78: Buds 9–18 mm long
- 79 Buds 10–18 mm long; fruits 5–10 mm long 283. *E. orbifolia*
- 79: Buds 9–11 mm long; fruits 10–16 mm long 285. *E. crucis*
- 77: Leaves narrowly lanceolate to broadly lanceolate or elliptic
- 80 Fruits campanulate 311. *E. woodwardii*
- 80: Fruits not campanulate
- 81 Fruits globular to subglobular or urceolate
- 82 Buds 4–7 mm long 398. *E. mannifera*
- 82: Buds 8–18 mm long
- 83 Petiole 2–5 mm long 274. *E. gillii*
- 83: Petiole 10–25 mm long
- 84 Buds fusiform 304. *E. rigidula*
- 84: Buds not fusiform
- 85 Buds rostrate 272. *E. transcontinentalis*
- 85: Buds conical or ovoid-conical
- 86 Leaves elliptic to lanceolate, grey-green, 5–8 cm long 288. *E. drummondii*
- 86: Leaves narrowly lanceolate to lanceolate, green, 9–16 cm long 375. *E. blakelyi*
- 81: Fruits hemispherical, obconical or ovoid

- 87** Disc descending
88 Fruits glaucous; petiole 15–33 mm long (N.S.W.) **472. E. dawsonii**
88: Fruits not glaucous; petiole 8–15 mm long (W.A., N.T., Qld)
89 Buds 4–6 mm long; disc narrow **359. E. leucophloia**
89: Buds 9–11 mm long; disc broad **304. E. rigidula**
87: Disc ascending
90 Buds 3–4 mm long; fruits 1–5 mm long **455. E. microtheca**
90: Buds 4–14 mm long; fruits 4–16 mm long
91 Peduncle 5–6 mm long **398. E. mannifera**
91: Peduncle 7–20 mm long
92 Fruits glaucous **285. E. crucis**
92: Fruits not glaucous
93 Leaves green
94 Fruits 4–7 mm long; petiole terete **375. E. blakelyi**
94: Fruits 7–10 mm long; petiole flattend **376. E. glaucina**
93: Leaves grey-green or glaucous **377. E. dealbata**
74: Buds not glaucous or pruinose
95 Fruits more than 10 mm long
96 Peduncle 5–10 mm long
97 Leaves 5–10 cm long; petiole 7–10 mm long **92. E. pachyloma**
97: Leaves 10–15 cm long; petiole 15–30 mm long **385. E. gillenii**
96: Peduncle 12–30 mm long
98 Buds rostrate; fruits 12–14 mm long **279. E. beardiana**
98: Buds not rostrate; fruits 7–12 mm long
99 Petiole 12–20 mm long **223. E. dielsii**
99: Petiole 6–9 mm long **222. E. erythronema**
95: Fruits up to 10 mm long
100 Operculum distinctly longer than hypanthium
101 Leaves broadly lanceolate, ovate or deltoid
102 Fruits cylindrical **363. E. rupestris**
102: Fruits not cylindrical
103 Buds cylindrical **370. E. bancroftii**
103: Buds not cylindrical
104 Buds and fruits always sessile, petiole \pm flattened **251. E. decipiens**
104: Buds and fruits pedicellate, rarely sessile; petiole terete or channelled
105 Buds 9–12 mm long; leaves acuminate **372. E. amplifolia**
105: Buds 5–9 mm long; leaves uncinat, emarginate or rounded
106 Petiole 10–20 mm long **282. E. ewartiana**
106: Petiole 23–40 mm long
107 Buds fusiform **390. E. camphora**
107: Buds globular or ovoid **356. E. platyphylla**
101: Leaves linear, narrowly lanceolate, elliptic or lanceolate

- 108** Fruits cylindrical
- 109** Leaves 5–7 cm long **363. *E. rupestris***
- 109:** Leaves 10–15 cm long **378. *E. dwyeri***
- 108:** Fruits not cylindrical
- 110** Buds sessile
- 111** Leaves grey-green to yellow-green **379. *E. flindersii***
- 111:** Leaves green
- 112** Lateral veins prominent; intramarginal vein to 2 mm from margin; tree **372. *E. amplifolia***
- 112:** Lateral veins not prominent; intramarginal vein to 1 mm from margin; mallee **385. *E. gillennii***
- 110:** Buds pedicellate
- 113** Fruits urceolate **271. *E. flocktoniae***
- 113:** Fruits not urceolate
- 114** Buds cylindrical or almost so
- 115** Fruits 4–5 mm long; buds 8–11 mm long **369. *E. seeana***
- 115:** Fruits 5–11 mm long; buds 10–18 mm long
- 116** Mallee or small tree; lateral veins at 20°–30°(W.A.) **223. *E. dielsii***
- 116:** Tree; lateral veins at 30°–60°(Qld, N.S.W.) **370. *E. bancroftii***
- 114:** Buds not cylindrical
- 117** Buds fusiform
- 118** Leaves green; petiole 6–15 mm long
- 119** Buds 7–11 mm long **386. *E. pumila***
- 119:** Buds 16–22 mm long **222. *E. erythronema***
- 118:** Leaves grey-green to dull green; petiole 15–25 mm long **378. *E. dwyeri***
- 117:** Buds not fusiform
- 120** Leaves green
- 121** Disc descending **277. *E. salmonophloia***
- 121:** Disc ascending or level
- 122** Fruits subglobular to ovoid
- 123** Operculum hemispherical or rostrate **380. *E. camaldulensis***
- 123:** Operculum conical
- 124** Lateral veins prominent **372. *E. amplifolia***
- 124:** Lateral veins not prominent
- 125** Mallee or small tree; petiole flattened or angular **385. *E. gillennii***
- 125:** Tree; petiole terete or channelled
- 126** Operculum rostrate or obtusely conical **380. *E. camaldulensis***
- 126:** Operculum acutely conical
- 127** Buds 8–12 mm long, 3–5 mm wide; fruits 4–7 mm long **375. *E. blakelyi***
- 127:** Buds 10–16 mm long, 4–6 mm wide; fruits 5–7 mm long **373. *E. tereticornis***
- 122:** Fruits usually hemispherical, sometimes cylindrical or subcampanulate

- 128** Lateral veins prominent **372. *E. amplifolia***
128: Lateral veins not prominent
129 Fruits 9–11 mm wide; buds 12–18 mm long **223. *E. dielsii***
129: Fruits 4–8 mm wide; buds 5–12 mm long
130 Mallee or small tree **378. *E. dwyeri***
130: Tall tree
131 Fruits wider than long **371. *E. parramattensis***
131: Fruits about as wide as long
132 Buds 8–12 mm long; operculum conical **375. *E. blakelyi***
132: Buds 6–9 mm long; operculum rostrate to hemispherical **380. *E. camaldulensis***
120: Leaves grey-green or yellow-green
133 Pedicels to 3 mm long
134 Disc descending **317. *E. calcareana***
134: Disc ascending or level
135 Umbels in pairs in axils **257. *E. pachycalyx***
135: Umbels single in axils
136 Buds conical **378. *E. dwyeri***
136: Buds ovoid to globular
137 Peduncle 5–9 mm long, thick **379. *E. flindersii***
137: Peduncle 10–20 mm long **282. *E. ewartiana***
133: Pedicels 4–15 mm long
138 Umbels in pairs in axils **257. *E. pachycalyx***
138: Umbels single in axils
139 Buds 6–9 mm long
140 Tall tree; fruits hemispherical to ovoid **380. *E. camaldulensis***
140: Mallee; fruits subglobular
141 Operculum hemispherical **282. *E. ewartiana***
141: Operculum conical **278. *E. leptopoda***
139: Buds 10–23 mm long
142 Hypanthium 2–4 mm wide **278. *E. leptopoda***
142: Hypanthium 5–7 mm wide
143 Leaves linear to narrowly elliptic, 4–15 mm wide **280. *E. synandra***
143: Leaves lanceolate, 15–20 mm wide **249. *E. falcata***
100: Operculum \pm equal in length to, or shorter than, hypanthium
144 Inflorescence compound, terminal
145 Buds 3–4 mm long; disc ascending **455. *E. microtheca***
145: Buds 7–9 mm long; disc descending **478. *E. bosistoana***
144: Inflorescence simple, axillary
146 Leaves linear, or narrowly lanceolate to lanceolate
147 Buds fusiform, conical or cylindrical
148 Buds sessile

- 149** Peduncle 4–9 mm long; petiole 15–20 mm long (W.A., S.A.) **319. *E. conglobata***
- 149:** Peduncle absent or to 2 mm long; petiole 3–8 mm long (N.S.W.) **117. *E. deuaensis***
- 148:** Buds pedicellate
- 150** Leaves 2–3 cm wide; disc ascending to level **374. *E. chloroclada***
- 150:** Leaves 0.5–1.8 cm wide; disc descending to level
- 151** Buds 9–11 mm long
- 152** Canopy leaves linear lanceolate to narrowly lanceolate **221. *E. cylindriflora***
- 152:** Canopy leaves oblong to lanceolate **306. *E. fruticosa***
- 151:** Buds 6–8 mm long
- 153** Operculum obtuse; juvenile leaves prominently glaucous **310. *E. albida***
- 153:** Operculum acute; juvenile leaves grey-green to more or less glaucous **305. *E. foecunda***
- 147:** Buds ovoid or clavate to globular or turbinate
- 154** Bark with ‘scribbles’
- 155** Operculum conical **153. *E. racemosa***
- 155:** Operculum hemispherical **154. *E. rossii***
- 154:** Bark without ‘scribbles’
- 156** Lateral veins at 12°–20°
- 157** Buds pedicellate **399. *E. scoparia***
- 157:** Buds sessile **403. *E. parvifolia***
- 156:** Lateral veins at 25°–60°
- 158** Leaves uncinat **252. *E. micranthera***
- 158:** Leaves acuminate or acute
- 159** Valves 5–6, included to level **478. *E. bosistoana***
- 159:** Valves 3–4, exserted to level
- 160** Fruits 2–4 mm long, 3–5 mm wide
- 161** Buds sessile **365. *E. houseana***
- 161:** Buds with pedicels 2–3 mm long **362. *E. umbrawarrensis***
- 160:** Fruits 4–9 mm long and wide
- 162** Leaves green, thin, 2–5 cm wide, deciduous **354. *E. alba***
- 162:** Leaves grey-green, yellow-green, blue-green, sometimes green, not deciduous, usually thick, usually 1–3.5 cm wide
- 163** Peduncle angled or slightly flattened **429. *E. dalrympleana***
- 163:** Peduncle terete
- 164** Buds 4–7 mm long
- 165** Bark creamy yellow or pink-white to white (W.A., N.T.)
- 166** Valves prominently exserted **367. *E. herbertiana***
- 166:** Valves just exserted **360. *E. confluens***
- 165:** Bark white, cream, grey with patches of red, powdery (eastern Australia) **398. *E. mannifera***
- 164:** Buds 8–10 mm long
- 167** Valves prominently exserted **367. *E. herbertiana***

MYRTACEAE—1

1. *Eucalyptus*

- 167:** Valves just exserted **358. *E. brevifolia***
- 146:** Leaves broadly lanceolate, ovate, orbicular or rhomboid
- 168** Buds fusiform **389. *E. ovata***
- 168:** Buds not fusiform
- 169** Leaves orbicular to rhomboidal, 5–9 cm wide **355. *E. platyphylla***
- 169:** Leaves narrowly to broadly lanceolate to ovate
- 170** Valves prominently exserted **367. *E. herbertiana***
- 170:** Valves just exserted
- 171** Leaves green, deciduous **354. *E. alba***
- 171:** Leaves grey-green, not deciduous **358. *E. brevifolia***

GROUP 10

- 1** Pedicel 10 mm or more long **286. *E. caesia***
- 1:** Pedicel 3–8 mm long
- 2** Leaves obovate **284. *E. websteriana***
- 2:** Leaves not obovate
- 3** Buds and fruits not glaucous or pruinose **282. *E. ewartiana***
- 3:** Buds and fruits glaucous or pruinose
- 4** Leaves of canopy retuse or emarginate **283. *E. orbifolia***
- 4:** Leaves of canopy usually mucronate **285. *E. crucis***

GROUP 11

- 1** Leaves sessile
- 2** Leaves glaucous **496. *E. shirleyi***
- 2:** Leaves not glaucous
- 3** Pedicels 10–20 mm long **4. *E. confertiflora***
- 3:** Pedicels absent or to 8 mm long
- 4** Leaves with red-brown hairs and scales **12. *E. ferruginea***
- 4:** Leaves without red-brown hairs and scales, though sometimes hispid or scabrous
- 5** Leaves 12–25 cm long, 5–8 cm wide **15. *E. perfoliata***
- 5:** Leaves 2–11 cm long, 1.2–6 cm wide
- 6** Leaves scabrous or sparsely hispid
- 7** Conflorescences setose **10. *E. setosa***
- 7:** Conflorescences not setose **13. *E. abbreviata***
- 6:** Leaves glabrous
- 8** Fruits 12–17 mm long **11. *E. deserticola***
- 8:** Fruits 20–35 mm long **14. *E. zygophylla***
- 1:** Leaves petiolate
- 9** Buds 21–30 mm long, strongly ribbed **16. *E. ptychocarpa***
- 9:** Buds up to 20 mm long
- 10** Bark furrowed, grey-black throughout; ironbark **494. *E. quadricostata***
- 10:** Bark tessellated, scaly, or fibrous
- 11** Buds glaucous

- 12 Leaves glaucous or grey-green, 1.7–3 cm wide; lateral venation at 20°–30° 473. *E. albens*
- 12: Leaves not glaucous, 2–8 cm wide; lateral venation at 50°–70° 56. *E. peltata*
- 11: Buds not glaucous
- 13 Leaves discolourous
- 14 Peduncle absent or to 2 mm long 3. *E. grandifolia*
- 14: Peduncle at least 5 mm long
- 15 Leaves with red-brown hairs and bristles, wearing smooth with age 12. *E. ferruginea*
- 15: Leaves smooth, never with red-brown hairs and bristles
- 16 Buds sessile 49. *E. abergiana*
- 16: Buds pedicellate
- 17 Petiole to 3 mm long 11. *E. deserticola*
- 17: Petiole at least 8 mm long
- 18 Leaves up to 2 cm wide
- 19 Leaves dull, green to grey-green or yellow-green
- 20 Leaves 5–9 cm long
- 21 Petiole 8–15 mm long; fruits 7–15 mm wide 33. *E. eremaea*
- 21: Petiole 13–35 mm long; fruits 15–22 mm wide 20. *E. pontis*
- 20: Leaves 10–20 cm long
- 22 Pedicels 3–5 mm long 20. *E. pontis*
- 22: Pedicels 5–17 mm long
- 23 Fruits 12–15 mm long 24. *E. dichromophloia*
- 23: Fruits 18–25 mm long 40. *E. terminalis*
- 19: Leaves mostly shining, green
- 24 Operculum depressed, 1–2 mm long 47. *E. nesophila*
- 24: Operculum hemispherical to conical, 2–5 mm long
- 25 Bark flaky at base of trunk only, otherwise smooth and white to light grey 18. *E. bleeseri*
- 25: Bark tessellated throughout
- 26 Leaves 2–4 cm wide; peduncle 17–30 mm long 53. *E. gummifera*
- 26: Leaves 1–3 cm wide; peduncle 9–20 mm long
- 27 Operculum conical; buds not scurfy 48. *E. intermedia*
- 27: Operculum ±hemispherical; buds scurfy 46. *E. polycarpa*
- 18: Leaves more than 2 cm wide
- 28 Leaves dull, grey-green
- 29 Fruits 12–20 mm long, 10–15 mm wide 45. *E. erythrophloia*
- 29: Fruits 12–15 mm long, 8–12 mm wide 24. *E. dichromophloia*
- 28: Leaves green, mostly shining
- 30 Bark flaky at base of trunk only, otherwise smooth and white to light grey 18. *E. bleeseri*
- 30: Bark tessellated or fibrous throughout
- 31 Fruits less than 20 mm wide

- 32 Buds scurfy 46. *E. polycarpa*
- 32: Buds not scurfy
- 33 Fruits globular to ovoid, orifice greatly contracted, 18–40 mm long 52. *E. haematoxylon*
- 33: Fruits urceolate to ovoid, 11–20 mm long, orifice not greatly reduced
- 34 Fruits urceolate; peduncle 17–30 mm long; seeds not terminally winged 53. *E. gummifera*
- 34: Fruits ovoid to urceolate; peduncle 10–18 mm long; seeds terminally winged 48. *E. intermedia*
- 31: Fruits 20 mm wide or wider
- 35 Fruits 12–20 mm wide 52. *E. haematoxylon*
- 35: Fruits 20–40 mm wide
- 36 Filaments cream to pink; fruits 30–50 mm long 51. *E. calophylla*
- 36: Filaments red; fruits 20–35 mm long 50. *E. ficifolia*
- 13: Leaves concolorous
- 37 Fruits 25–40 mm long
- 38 Bark rough, tessellated throughout
- 39 Buds 4–8 mm long, 3–5 mm wide, pyriform 19. *E. pyrophora*
- 39: Buds 11–20 mm long, 8–20 mm wide, ovoid, turbinate or subglobular
- 40 Leaves 1–2.5 cm wide
- 41 Bark yellow to yellow-brown; leaves 1.8–2.5 cm wide 58. *E. watsoniana*
- 41: Bark grey-red; leaves 1–2 cm wide 40. *E. terminalis*
- 40: Leaves 3–5 cm wide 21. *E. porrecta*
- 38: Bark rough, tessellated on trunk and perhaps on larger branches, but smooth above
- 42 Leaves 3–10 cm wide 22. *E. foelscheana*
- 42: Leaves 1–2.5 cm wide
- 43 Buds 16–20 mm long; fruits 30–40 mm long 17. *E. collina*
- 43: Buds 7–15 mm long; fruits 18–28 mm long
- 44 Leaves apiculate, 7–12 cm long 41. *E. chippendalei*
- 44: Leaves acuminate, 10–19 cm long
- 45 Buds 7–11 mm long, 6–7 mm wide 42. *E. orientalis*
- 45: Buds 11–15 mm long, 8–10 mm wide 40. *E. terminalis*
- 37: Fruits less than 25 mm long
- 46 Leaves at least 2.5 cm wide
- 47 Leaves ovate to orbicular
- 48 Fruits more than 20 mm long; buds 9–13 mm long 22. *E. foelscheana*
- 48: Fruits 7–14 mm long; buds 4–7 mm long
- 49 Leaves green 4. *E. confertiflora*
- 49: Leaves ashy grey 23. *E. latifolia*
- 47: Leaves narrowly lanceolate to broadly lanceolate
- 50 Bark tessellated, yellow to yellow-brown; seeds dorsally keeled, not winged

- 51** Buds sessile or very shortly pedicellate **59. *E. eximia***
51: Buds with pedicels 5–6 mm long **57. *E. bloxsomei***
50: Bark tessellated, red-brown, grey-brown, orange-grey or grey; seeds with a rudimentary wing all round, or a terminal wing
52 Pedicels 10–20 mm long
53 Buds 12–13 mm long; peduncle 17–35 mm long **21. *E. porrecta***
53: Buds 5–9 mm long; peduncle 0–18 mm long
54 Buds pyriform, 5–7 mm long **4. *E. confertiflora***
54: Buds ovoid to subglobular, 7–9 mm long **24. *E. dichromophloia***
52: Pedicels 2–8 mm long
55 Fruits 20–25 mm wide **19. *E. pyrophora***
55: Fruits 8–17 mm wide
56 Fruits c. as long as wide **29. *E. umbonata***
56: Fruits longer than wide
57 Fruits 10–15 mm long **24. *E. dichromophloia***
57: Fruits 16–27 mm long
58 Leaves lanceolate, not more than 2.5 cm wide; peduncle 5–12 mm long **44. *E. orientalis***
58: Leaves lanceolate to broadly lanceolate, 2.5–3.2 cm wide; peduncle 8–15 mm long **43. *E. opaca***
46: Leaves less than 2.5 cm wide
59 Bark fibrous; buds cylindrical to conical **469. *E. ochrophloia***
59: Bark tessellated or flaky, buds not cylindrical
60 Bark yellow to yellow-brown
61 Buds sessile or very shortly pedicellate **59. *E. eximia***
61: Buds with pedicels 5–6 mm long **57. *E. bloxsomei***
60: Bark red-brown, or grey-brown to grey or grey-red, orange-green to orange-brown
62 Fruits cylindrical **7. *E. gilbertensis***
62: Fruits not cylindrical
63 Leaves green
64 Leaves less than 10 cm long
65 Leaves apiculate **41. *E. chippendalei***
65: Leaves acuminate
66 Leaves 1.2–2 cm wide; petiole 10–20 mm long **37. *E. lenziana***
66: Leaves 0.6–1.6 cm wide; petiole 8–15 mm long
67 Tessellated bark grey-brown throughout **33. *E. eremaea***
67: Tessellated bark grey-red or red-brown on trunk only or to some branches, but smooth above
68 Peduncle 6–7 mm long **38. *E. fordeana***
68: Peduncle 8–13 mm long **26. *E. arnhemensis***
64: Leaves at least 10 cm long
69 Leaves apiculate **41. *E. chippendalei***
69: Leaves acuminate
70 Fruits usually longer than wide

MYRTACEAE—1

1. *Eucalyptus*

- 71** Fruits 12–16 mm long, 10–14 mm wide
- 71:** Fruits 15–24 mm long, 12–20 mm wide
- 72** Leaves 1–2 cm wide; bark grey-brown or grey-red to orange-brown
- 73** Buds 7–9 mm long, 4–7 mm wide
- 73:** Buds 11–15 mm long, 8–10 mm wide
- 72:** Leaves 1.4–3.2 cm wide; bark red-brown
- 70:** Fruits c. as long as wide
- 74** Fruits 15–20 mm long, 14–18 mm wide
- 75** Leaves 9–15 cm long, 1.2–2 cm wide
- 75:** Leaves 15–21 cm long, 2–3 cm wide
- 74:** Fruits 10–15 mm long, 7–15 mm wide
- 76** Leaves 15–21 cm long, 2–2.4 cm wide
- 76:** Leaves 10–19 cm long, 1–2 cm wide
- 77** Tree to 12 m; fruits 11–15 mm wide (W.A., N.T.)
- 77:** Tree or mallee to 6 m; fruits 7–11 mm wide (N.T., Qld)
- 63:** Leaves grey-green or yellow-green
- 78** Leaves apiculate
- 79:** Fruits 14–20 mm long, 13–17 mm wide, not ribbed
- 79:** Fruits 18–28 mm long, 17–22 mm wide, often ribbed
- 78:** Leaves acuminate or acute
- 80** Fruits longer than wide
- 81** Leaves lanceolate to broadly lanceolate; peduncle 8–15 mm long
- 82** Fruits 16–24 mm long
- 82:** Fruits 10–15 mm long
- 81:** Leaves narrowly lanceolate to lanceolate; peduncle 5–12 mm long
- 83** Peduncle more than 8 mm long
- 84** Fruits 8–12 mm wide
- 84:** Fruits 13–17 mm wide
- 85** Fruits 19–27 mm long; leaves 1.7–2.5 cm wide
- 85:** Fruits 13–20 mm long; leaves 1.1–2 cm wide
- 83:** Peduncle up to 8 mm long
- 86** Buds ovoid to subglobular
- 86:** Buds clavate, obovoid, obpyriform or globular
- 87** Fruits 19–27 mm long
- 87:** Fruits 10–18 mm long
- 88** Bark tessellated, usually throughout; leaves grey-green (N.T.)
- 88:** Bark tessellated on trunk, usually smooth branches; leaves green or yellow-green (W.A., N.T., S.A.)
- 28. E. urnularis**
- 42. E. centralis**
- 40. E. terminalis**
- 43. E. opaca**
- 37. E. lenziana**
- 29. E. umbonata**
- 29. E. umbonata**
- 25. E. ollaris**
- 31. E. capricornia**
- 34. E. symonii**
- 41. E. chippendalei**
- 43. E. opaca**
- 24. E. dichromophloia**
- 24. E. dichromophloia**
- 44. E. orientalis**
- 35. E. australis**
- 24. E. dichromophloia**
- 44. E. orientalis**
- 39. E. nelsonii**

- 89** Buds 5–7 mm long **38. E. fordeana**
89: Buds 8–11 mm long **33. E. eremaea**
80: Fruits c. as long as wide
90 Fruits 15–24 mm long, 20–25 mm wide **19. E. pyrophora**
90: Fruits 12–21 mm long, 10–22 mm wide
91 Pedicels 5–8 mm long; petiole 7–20 mm long
92 Fruits ovoid to globular-urceolate; petiole 2–13 mm long **36. E. connerensis**
92: Fruits ovoid to suburceolate; petiole 10–20 mm long **35. E. australis**
91: Pedicels 1–5 mm long; petiole 10–35 mm long
93 Fruits 14–21 mm long, 15–22 mm wide **20. E. pontis**
93: Fruits 12–15 mm long, 10–13 mm wide **32. E. arenaria**

GROUP 12

- 1** Fruits 1–5 mm long
2 Leaves ovate; fruits campanulate **182. E. brachyandra**
2: Leaves narrowly to broadly lanceolate; fruits not campanulate
3 Valves included
4 Buds 3–5 mm long; fruits 3–5 mm long **497. E. rudderi**
4: Buds 6–7 mm long; fruits 2–3 mm long **183. E. howittiana**
3: Valves exserted or level
5 Fruits 1–2 mm long; petiole 17–25 mm long **181. E. raveretiana**
5: Fruits more than 2 mm long; petiole 10–17 mm long
6 Fruits 3–4 mm long and wide **463. E. rummeryi**
6: Fruits 5–10 mm long, 6–12 mm wide **83. E. cloeziana**
1: Fruits more than 5 mm long
7 Pedicels 15–30 mm long
8 Peduncle absent or to 2 mm long **3. E. grandifolia**
8: Peduncle 4–5 mm long **7. E. gilbertensis**
7: Pedicels absent or to 15 mm long
9 Fruits cylindrical; peduncle 4–5 mm long **7. E. gilbertensis**
9: Fruits not cylindrical; peduncle at least 5 mm long
10 Fruits urceolate or globular-urceolate to ovoid
11 Fruits 9–12 mm long; seeds terminally winged
12 Leaves grey-green **24. E. dichromophloia**
12: Leaves green or yellow-green
13 Peduncle 5–7 mm long; leaves yellow-green **33. E. eremaea**
13: Peduncle 7–18 mm long; leaves green
14 Leaves 0.9–1.8 cm wide; peduncle 7–10 mm long **47. E. nesophila**
14: Leaves 1.5–3 cm wide; peduncle 10–18 mm long **48. E. intermedia**
11: Fruits 6–10 mm long; seeds not winged
15 Pedicels absent or to 3 mm long; buds 7–11 mm long **60. E. torelliana**
15: Pedicels 2–6 mm long; buds 3–6 mm long

- 16** Bark tessellated (Qld, N.S.W.)
16: Bark fibrous, fissured (N.T.)
10: Fruits not urceolate
17 Lateral veins at 65°–70°
17: Lateral veins at 35°–50°
18 Buds 4–7 mm long; bark rough on trunk and larger branches, then smooth above
18: Buds 7–11 mm long; bark rough throughout
19 Bark fibrous, red-brown (Qld)
19: Bark hard, furrowed, light grey (N.S.W.)
- 55. E. trachyphloia**
54. E. jacobsiana
184. E. guilfoylei
83. E. cloeziana
84. E. rubiginosa
505. E. paniculata

GROUP 13

- 1** Fruits 3–5 mm long
2 Peduncle absent
2: Peduncle present
3 Peduncle 3–8 mm long
4 Leaves shining; lateral veins at 15°–30°
4: Leaves not shining; lateral veins at 30°–50°
5 Buds pyriform to obovoid, rostrate (W.A., N.T., Qld)
5: Buds clavate to ovoid (Qld, N.S.W.)
6 Rough bark on trunk and lower branches (N.S.W.)
6: Rough bark on lower or all trunk, not on branches, with abrupt demarcation
3: Peduncle 6–15 mm long
7 Buds 7–8 mm long; peduncle and pedicels glaucous
7: Buds 3–6 mm long; peduncle and pedicels not glaucous
8 Leaves shining, 8–12 cm long
8: Leaves not shining, 9–18 cm long
9 Fruits 3–4 mm long, 2–3 mm wide (N.S.W.)
9: Fruits 4–5 mm long, 4–6 mm wide (W.A., N.T., Qld)
10 Operculum rostrate
10: Operculum hemispherical to conical
- 8. E. aspera**
460. E. brownii
452. E. tectifica
497. E. rudderi
464. E. cambageana
475. E. koelpinensis
451. E. normantonensis
458. E. largeana
452. E. tectifica
464. E. cambageana
- 1:** Fruits more than 5 mm long
11 Fruits cylindrical or subcylindrical
12 Pedicels 2–3 mm long
12: Pedicels 7–15 mm long
11: Fruits not cylindrical
13 Petiole absent or to 5 mm long
14 Peduncle absent
14: Peduncle present
13: Petiole more than 5 mm long
15 Peduncle and pedicels glaucous
15: Peduncle and pedicels not glaucous
16 Leaves more than 2 cm wide
17 Pedicels absent or up to 3 mm long
- 1. E. tessellaris**
7. E. gilbertensis
8. E. aspera
1. E. tessellaris
475. E. koelpinensis

- 18 Buds glaucous 56. *E. peltata*
 18: Buds not glaucous 444. *E. leptophleba*
- 17: Pedicels more than 3 mm long
- 19 Leaves ovate to orbicular
- 20 Leaf apex retuse to emarginate 448. *E. fitzgeraldii*
 20: Leaf apex obtuse
- 21 Leaves ashy grey; seeds terminally winged 23. *E. latifolia*
 21: Leaves green, scabrous to smooth; seeds not winged 4. *E. confertiflora*
- 19: Leaves narrowly to broadly lanceolate or oblong lanceolate
- 22 Pedicels 10–22 mm long
- 23 Leaves grey-green, acute 5. *E. clavigera*
 23: Leaves green, obtuse 4. *E. confertiflora*
- 22: Pedicels 2–10 mm long
- 24 Bark red-brown, tessellated on trunk or throughout; seeds terminally winged 24. *E. dichromophloia*
 24: Bark yellow to yellow-brown or brown to brown-grey, irregularly tessellated throughout; seeds not winged
- 25 Fruits ovoid to urceolate, 10–20 mm long 57. *E. bloxsomei*
 25: Fruits ovoid to subcampanulate, 6–11 mm long 444. *E. leptophleba*
- 16: Leaves up to 2 cm wide
- 26 Fruits up to 7 mm long
- 27 Bark rough throughout
- 28 Buds clavate to ovoid, 7–11 mm long 444. *E. leptophleba*
 28: Buds pyriform to obovoid, 4–6 mm long 452. *E. tectifera*
- 27: Bark rough on part or all trunk only 464. *E. cambageana*
- 26: Fruits more than 7 mm long
- 29 Leaves green
- 30 Bark yellow to yellow-brown; seeds not winged
- 31 Petiole 25–40 mm long 57. *E. bloxsomei*
 31: Petiole 15–22 mm long 56. *E. peltata*
- 30: Bark red-brown to grey-brown; seeds terminally winged
- 32 Leaves 6.5–9 cm long, 0.7–1.2 cm wide 26. *E. arnhemensis*
 32: Leaves 8–19 cm long, 0.9–2 cm wide
- 33 Peduncle 7–10 mm long; bark tessellated throughout 47. *E. nesophila*
 33: Peduncle 10–17 mm long; upper branches smooth 31. *E. capricornia*
- 29: Leaves grey-green, yellow-green or blue-green
- 34 Pedicels 12–22 mm long 5. *E. clavigera*
- 34: Pedicels 0–10 mm long
- 35 Lateral veins at 35°–50°; seeds not winged or keeled 444. *E. leptophleba*
 35: Lateral veins at 45°–70°; seeds winged or keeled
- 36 Leaves 10–20 cm long, 1.5–8 cm wide
- 37 Pedicels 5–10 mm long 24. *E. dichromophloia*
 37: Pedicels 0–3 mm long 56. *E. peltata*
- 36: Leaves 5–16 cm long, 0.6–1.6 cm wide

MYRTACEAE—1

1. Eucalyptus

- 38** Leaves 12–16 cm long; bark tessellated to c. 2 m **1. *E. tessellaris***
- 38:** Leaves 5–10 cm long; bark tessellated at least on all trunk
- 39** Leaves yellow-green; pedicels 3–4 mm long **33. *E. eremaea***
- 39:** Leaves grey-green; pedicels 5–8 mm long **39. *E. nelsonii***

GROUP 14

- 1** Buds and fruits quadrangular
 - 2** Fruits 6–8 mm long **483. *E. froggattii***
 - 2:** Fruits 9–14 mm long
 - 3** Pedicels 5–6 mm long **494. *E. quadricostata***
 - 3:** Pedicels 8–12 mm long **504. *E. tetrapleura***
- 1:** Buds and fruits not quadrangular, rarely ribbed
 - 4** Buds and/or fruits glaucous or pruinose; leaves usually glaucous, pruinose, grey or grey-green
 - 5** Leaves sessile or almost so
 - 6** Leaves on mature trees orbicular to broadly lanceolate, not apiculate **496. *E. shirleyi***
 - 6:** Leaves on mature trees ovate to broadly ovate, apiculate
 - 7** Fruits hemispherical, ovoid or urceolate, 3–8 mm long **495. *E. melanophloia***
 - 7:** Fruits cylindrical to almost obconical, 7–10 mm long **457. *E. pruinosa***
 - 5:** Leaves petiolate
 - 8** Petiole 5–13 mm long
 - 9** Bark deeply fissured; ironbark
 - 10** Peduncle 4–7 mm long (W.A., N.T.) **493. *E. jensenii***
 - 10:** Peduncle 10–18 mm long (Qld) **491. *E. whitei***
 - 9:** Bark not fissured; fibrous
 - 11** Operculum distinctly longer than hypanthium **454. *E. microneura***
 - 11:** Operculum and hypanthium about equal in length
 - 12** Fruits 1–5 mm long; disc obscure **455. *E. microtheca***
 - 12:** Fruits 5–8 mm long; disc level **449. *E. argillacea***
 - 8:** Petiole more than 13 mm long
 - 13** Valves included
 - 14** Bark hard, deeply furrowed throughout, dark grey to black; pedicels 5–10 mm long **509. *E. caleyi***
 - 14:** Bark fibrous on trunk and larger branches, light grey or grey-brown or bleached; pedicels absent or to 5 mm long
 - 15** Buds cylindrical, 8–16 mm long **473. *E. albens***
 - 15:** Buds clavate or fusiform, 4–6 mm long
 - 16** Rough bark light grey; leaves 3–5 cm wide, green **499. *E. baueriana***
 - 16:** Rough bark grey-brown; leaves 1.5–3.5 cm wide, glaucous **500. *E. polyanthemus***
- 13:** Valves exserted or ±level
 - 17** Buds 9–19 mm long **486. *E. fibrosa***
 - 17:** Buds 3–8 mm long
 - 18** Operculum distinctly longer than hypanthium **454. *E. microneura***
 - 18:** Operculum and hypanthium about equal in length

- 19 Peduncle 3–9 mm long; pedicels 1–4 mm long 455. *E. microtheca*
- 19: Peduncle 10–15 mm long; pedicels 5–8 mm long 447. *E. koolpinensis*
- 4: Buds and fruits not glaucous
- 20 Leaves sessile 457. *E. pruinosa*
- 20: Leaves petiolate
- 21 Operculum distinctly longer than hypanthium 486. *E. fibrosa*
- 21: Operculum and hypanthium about equal in length, or operculum shorter than hypanthium
- 22 Leaves with lemon or citronella scent when crushed 492. *E. staigeriana*
- 22: Leaves without lemon or citronella scent
- 23 Buds fusiform
- 24 Rough bark hard, furrowed, dark grey to black; ironbark
- 25 Bark rough throughout
- 26 Leaves glaucous 491. *E. whitei*
- 26: Leaves grey-green to green
- 27 Buds 6–8 mm long, 4–5 mm wide
- 28 Leaves 5.5–10 cm long 507. *E. panda*
- 28: Leaves 10–15 cm long 488. *E. drepanophylla*
- 27: Buds 4–6 mm long, 2–4 mm wide
- 29 Pedicels 1–6 mm long, often continued as ribs on hypanthium; petiole 10–15 mm long 489. *E. crebra*
- 29: Pedicels 5–8 mm long; petiole 12–20 mm long 506. *E. beyeri*
- 25: Bark rough on trunk and larger branches, then smooth above
- 30 Operculum distinctly shorter than hypanthium; leaves green, often crenulate 503. *E. melanoleuca*
- 30: Operculum about as long as hypanthium; leaves green to grey-green, never crenulate
- 31 Fruits obconical; peduncle usually quadrangular 487. *E. siderophloia*
- 31: Fruits not obconical (Qld)
- 32 Leaves 8.5–12 cm long, 1–1.5 cm wide 485. *E. decorticans*
- 32: Leaves 10–15 cm long, 1.4–2.5 cm wide 488. *E. drepanophylla*
- 24: Rough bark fibrous or somewhat flaky, grey, grey-white, yellow-grey to grey-brown or grey-black
- 33 Valves \pm level to exserted
- 34 Fruits 1–5 mm long; buds 3–4 mm long 455. *E. microtheca*
- 34: Fruits 5–10 mm long; buds more than 4 mm long
- 35 Fruits obconical to campanulate, 4–5 mm wide 450. *E. chlorophylla*
- 35: Fruits cylindrical or campanulate, 6–10 mm wide 445. *E. patellaris*
- 33: Valves included
- 36 Peduncle quadrangular
- 37 Fruits 2–4 mm long 484. *E. viridis*
- 37: Fruits 5–9 mm long
- 38 Fruits distinctly obconical, 3–5 mm wide (Qld, N.S.W.) 498. *E. conica*
- 38: Fruits obovoid to obconical, 5–6 mm wide (S.A., Vic.) 501. *E. fasciculosa*

- 36:** Peduncle terete or angular
- 39** Leaves 3–5 cm wide
- 40** Fruits obconical **499. *E. baueriana***
- 40:** Fruits ovoid to suburceolate **474. *E. moluccana***
- 39:** Leaves less than 3 cm wide
- 41** Fruits obconical
- 42** Mallee; leaves green (N.T.) **502. *E. lucens***
- 42:** Tree; leaves grey-green (Qld, N.S.W.) **498. *E. conica***
- 41:** Fruits ovoid, suburceolate or cylindrical
- 43** Leaves 2–3.3 cm wide; petiole 15–25 mm long **474. *E. moluccana***
- 43:** Leaves 1–2 cm wide; petiole 10–15 mm long **475. *E. microcarpa***
- 23:** Buds not fusiform
- 44** Leaves 7 cm or more wide
- 45** Leaves usually retuse to emarginate; peduncle 10–15 mm long **448. *E. fitzgeraldii***
- 45:** Leaves not retuse or emarginate; peduncle 5–10 mm long
- 46** Leaves 5–10 cm long; petiole 15–20 mm long **459. *E. populnea***
- 46:** Leaves 10–15 cm long; petiole 25–70 mm long **446. *E. oligantha***
- 44:** Leaves less than 7 cm wide
- 47** Bark hard, usually furrowed, mostly dark grey to black; ironbark
- 48** Leaves apiculate; petiole 5–10 mm long (W.A., N.T.) **493. *E. jensenii***
- 48:** Leaves acute, acuminate or uncinata; petiole 9–23 mm long (Qld, N.S.W.)
- 49** Rough bark throughout
- 50** Buds ovoid to subglobular, rostrate **490. *E. cullenii***
- 50:** Buds clavate, not rostrate
- 51** Pedicels 1–6 mm long, often continued as ribs on hypanthium; petiole 10–15 mm long **489. *E. crebra***
- 51:** Pedicels 5–8 mm long; petiole 12–20 mm long **506. *E. beyeri***
- 49:** Bark rough to larger branches
- 52** Mature buds globular to rhomboidal, c. 5 mm long **508. *E. virens***
- 52:** Mature buds clavate, obovoid or fusiform, 6–9 mm long
- 53** Operculum distinctly shorter than hypanthium **503. *E. melanoleuca***
- 53:** Operculum and hypanthium about equal in length **485. *E. decorticans***
- 47:** Bark fibrous or flaky, dark brown, brown-black, grey, grey-black or black
- 54** Bark rough on all or part of trunk, then smooth above
- 55** Leaves grey-green to subglaucous
- 56** Petiole 20–30 mm long **467. *E. lucasii***
- 56:** Petiole 5–15 mm long **465. *E. intertexta***
- 55:** Leaves green
- 57** Fruits obconical

- 58** Rough fibrous bark on lower or all trunk with abrupt demarcation; tree (Qld) **464. *E. cambageana***
- 58:** Rough bark at base of trunk only; mallee (N.T.) **502. *E. lucens***
- 57:** Fruits hemispherical, cylindrical, ovoid, subglobular, suburceolate or subpyriform
- 59** Buds 11–13 mm long **469. *E. ochrophloia***
- 59:** Buds 3–9 mm long
- 60** Intramarginal vein up to 1 mm from margin
- 61** Buds 6–8 mm long; tall tree **465. *E. intertexta***
- 61:** Buds 3–5 mm long; mallee or small tree **451. *E. normantonensis***
- 60:** Intramarginal vein usually 2–4 mm from margin
- 62** Change from rough to smooth bark abrupt **464. *E. cambageana***
- 62:** Change from rough to smooth bark not abrupt
- 63** Pedicels 3–10 mm long; tall tree **478. *E. bosistoana***
- 63:** Pedicels 1–3 mm long; mallee or small tree
- 64** Leaves 1.5–3.5 cm wide; petiole 15–25 mm long (W.A., N.T., S.A.) **480. *E. sparsa***
- 64:** Leaves 1.5–5 cm wide; petiole 12–20 mm long (S.A., N.S.W., Vic.) **462. *E. behriana***
- 54:** Bark rough on trunk and larger branches, or throughout
- 65** Valves exerted
- 66** Fruits 6–11 mm long
- 67** Buds 4–6 mm long, c. 3 mm wide **452. *E. tectifica***
- 67:** Buds 7–11 mm long, 4–7 mm wide **444. *E. leptophleba***
- 66:** Fruits 1–5 mm long
- 68** Leaves obtuse, apiculate **453. *E. distans***
- 68:** Leaves acute
- 69** Disc steeply descending **452. *E. tectifica***
- 69:** Disc ascending **455. *E. microtheca***
- 65:** Valves level or included
- 70** Leaves grey-green, blue-green, yellow-green or glaucous
- 71** Fruits obconical
- 72** Leaves narrowly lanceolate to lanceolate, 0.8–2.5 cm wide **498. *E. conica***
- 72:** Leaves broadly lanceolate to ovate, 3–5 cm wide **499. *E. baueriana***
- 71:** Fruits not obconical
- 73** Buds 7–11 mm long
- 74** Bark rough throughout; leaves 11–24 cm long **444. *E. leptophleba***
- 74:** Bark rough to larger branches, then smooth above; leaves 5–14 cm long
- 75** Intramarginal vein up to 1 mm from margin (Qld) **466. *E. orgadophila***
- 75:** Intramarginal vein up to 3 mm from margin (S.A.) **470. *E. lansdowneana***
- 73:** Buds 3–6 mm long
- 76** Bark rough throughout

MYRTACEAE—1

1. *Eucalyptus*

- 77** Fruits hemispherical to subovoid, thin-walled, 4–7 mm long, 4–6 mm wide **452. *E. tectifica***
- 77:** Fruits subcampanulate to suburceolate, 3–5 mm long, 2–4 mm wide **456. *E. cyanoclada***
- 76:** Bark rough to larger branches, then smooth and white or grey above **461. *E. largiflorens***
- 78** Buds 4–5 mm long; fruits 3–6 mm long **470. *E. lansdowneana***
- 78:** Buds 6–10 mm long; fruits 6–11 mm long
- 70:** Leaves green
- 79** Fruits 2–4 mm long
- 80** Bark rough throughout; foliage more or less deciduous in dry season; fruits thin-walled **452. *E. tectifica***
- 80:** Bark rough on trunk and mostly to larger branches; foliage not deciduous; fruits not thin-walled
- 81** Intramarginal vein up to 2 mm from margin; disc white **464. *E. cambageana***
- 81:** Intramarginal vein up to 1 mm from margin; disc not white
- 82** Pedicels 5–8 mm long
- 83** Leaves dull **461. *E. largiflorens***
- 83:** Leaves shining
- 84** Operculum distinctly shorter than hypanthium **451. *E. normantonensis***
- 84:** Operculum and hypanthium about equal in length **476. *E. pilligaensis***
- 82:** Pedicels absent or to 4 mm long
- 85** Leaves broadly lanceolate to ovate or rhombic
- 86** Bark rough, fibrous, grey or brown, often bleached (inland Qld, N.S.W.) **459. *E. populnea***
- 86:** Bark rough, subtessellated, light grey (coastal range, N.S.W.) **497. *E. rudderi***
- 85:** Leaves narrowly lanceolate to lanceolate
- 87** Peduncle 3–8 mm long
- 88** Petiole 15–24 mm long; leaves 6–14 cm long, 1–3 cm wide
- 89** Leaves shining, acute; lateral veins at 15°–30° **460. *E. brownii***
- 89:** Leaves not shining, acuminate; lateral veins at 30°–40° **497. *E. rudderi***
- 88:** Petiole 8–15 mm long; leaves 8–18 cm long, 0.7–2 cm wide
- 90** Leaves shining **460. *E. brownii***
- 90:** Leaves dull **461. *E. largiflorens***
- 87:** Peduncle 9–15 mm long
- 91** Leaves shining **451. *E. normantonensis***
- 91:** Leaves dull

- 92** Fruits 3–4 mm long, 2–3 mm wide (N coast N.S.W.) **458. E. largeana**
- 92:** Fruits 3–6 mm long, 3–5 mm wide (S.A., Qld, N.S.W., Vic.) **461. E. largiflorens**
- 79:** Fruits 5–11 mm long
- 93** Bark rough throughout; fruits thin-walled **452. E. tectifica**
- 93:** Bark rough on trunk and mostly to larger branches, then smooth above; fruits not thin-walled
- 94** Operculum clearly shorter than hypanthium **470. E. lansdowneana**
- 94:** Operculum equal to or just shorter than hypanthium
- 95** Petiole 8–15 mm long
- 96** Buds 7–10 mm long **466. E. orgadophila**
- 96:** Buds 4–6 mm long
- 97** Intramarginal vein up to 2 mm from margin; disc white **464. E. cambageana**
- 97:** Intramarginal vein up to 1 mm from margin; disc not white **461. E. largiflorens**
- 95:** Petiole 15–25 mm long
- 98** Peduncle 13–18 mm long (W.A.) **471. E. petraea**
- 98:** Peduncle 4–11 mm long
- 99** Disc white **464. E. cambageana**
- 99:** Disc not white
- 100** Fruits 3–5 mm long, 2–4 mm wide (N.S.W.) **497. E. rudderi**
- 100:** Fruits 6–9 mm long, 5–6 mm wide (S.A., Vic.) **501. E. fasciculosa**

GROUP 15

- 1** Bark rough throughout
- 2** Buds and fruits quadrangular
- 3** Pedicels 5–6 mm long **494. E. quadricostata**
- 3:** Pedicels 8–12 mm long **504. E. tetrapleura**
- 2:** Buds and fruits not quadrangular
- 4** Buds and fruits glaucous
- 5** Petiole 6–10 mm long
- 6** Leaves glaucous **491. E. whitei**
- 6:** Leaves green **493. E. jensenii**
- 5:** Petiole 18–30 mm long **486. E. fibrosa**
- 4:** Buds and fruits not glaucous
- 7** Operculum rostrate **512. E. sideroxylon**
- 7:** Operculum hemispherical to conical
- 8** Buds 4–8 mm long
- 9** Leaves glaucous **491. E. whitei**
- 9:** Leaves green to grey-green

MYRTACEAE—1

1. *Eucalyptus*

- 10** Petiole 5–10 mm long (W.A., N.T.) **493. *E. jensenii***
- 10:** Petiole 1–20 mm long (N.S.W.) **506. *E. beyeri***
- 8:** Buds 10–16 mm long **486. *E. fibrosa***
- 1:** Bark rough on trunk and larger branches
- 11** Mature buds globular to rhomboidal, c. 5 mm long **508. *E. virens***
- 11:** Mature buds ovoid, obovoid, clavate or fusiform, 6–11 mm long
- 12** Operculum narrower than hypanthium; leaves usually crenulate, 1.5–2.5 cm wide **503. *E. melanoleuca***
- 12:** Operculum and hypanthium equal in width; leaves not crenulate, 1–2 cm wide
- 13** Operculum conical or rostrate; lateral veins at 25°–40° **512. *E. sideroxylon***
- 13:** Operculum conical; lateral veins at 40°–50° **485. *E. decorticans***

GROUP 16

- 1** Buds and/or fruits glaucous
- 2** Buds and fruits sessile **236. *E. stricklandii***
- 2:** Buds and fruits pedicellate
- 3** Fruits 5–7 mm long **274. *E. gillii***
- 3:** Fruits 8–11 mm long
- 4** Leaves 1.5–2 cm wide; petiole 15–20 mm long **325. *E. lesouefii***
- 4:** Leaves 2–2.4 cm wide; petiole 25–28 mm long **275. *E. yumbarrana***
- 1:** Buds and/or fruits not glaucous
- 5** Valves included or about level
- 6** Buds and fruits sessile
- 7** Leaves discolorous **190. *E. robusta***
- 7:** Leaves concolorous
- 8** Fruits 13–22 mm long (W.A.) **202. *E. gomphocephala***
- 8:** Fruits 4–6 mm long (N.S.W., Vic.) **121. *E. agglomerata***
- 6:** Buds and fruits pedicellate
- 9** Buds and fruits ribbed, corrugated or striate
- 10** Peduncle 2–10 mm long **320. *E. fraseri***
- 10:** Peduncle 14–35 mm long
- 11** Pedicels 4–7 mm long; base of hypanthium and fruits not swollen **343. *E. ceratocorys***
- 11:** Pedicels 13–20 mm long; base of hypanthium and fruits swollen **334. *E. torquata***
- 9:** Buds and fruits not ribbed, corrugated or striate, sometimes fruits only faintly ribbed
- 12** Fruits 4–8 mm long
- 13** Leaves undulate **391. *E. brookeriana***
- 13:** Leaves not undulate
- 14** Leaves concolorous **110. *E. umbra***
- 14:** Leaves discolorous
- 15** Buds 7–8 mm long, ovoid to clavate (W.A.) **106. *E. jacksonii***
- 15:** Buds 5–7 mm long, fusiform to ovoid (Qld, N.S.W.) **109. *E. acmenoides***
- 12:** Fruits 9–22 mm long

- 16** Fruits cylindrical or campanulate
17 Leaves discolorous **190. *E. robusta***
17: Leaves concolorous
18 Buds fusiform (N.S.W.) **200. *E. longifolia***
18: Buds clavate (W.A.) **202. *E. gomphocephala***
16: Fruits globular or ovoid
19 Fruits 9–16 mm long, 9–15 mm wide **107. *E. marginata***
19: Fruits 17–22 mm long, 17–25 mm wide **108. *E. staeri***
- 5:** Valves exserted
- 20** Leaves discolorous
- 21** Bark rough, flaky at base of trunk or up to 6 m, but smooth above
22 Leaves lanceolate, not undulate (Qld, N.S.W.) **188. *E. saligna***
22: Leaves ovate or lanceolate to broadly lanceolate, undulate (Vic., Tas.) **391. *E. brookeriana***
- 21:** Bark rough throughout, or to larger branches
- 23** Fruits cylindrical
- 24** Fruits 4–5 mm long **190. *E. robusta***
24: Fruits 6–14 mm long **406. *E. angophoroides***
- 23:** Fruits hemispherical or obconical
- 25** Buds 9–12 mm long **192. *E. notabilis***
25: Buds 14–20 mm long
26 Operculum long rostrate; fruits 7–10 mm wide **193. *E. resinifera***
26: Operculum conical to shortly rostrate or hemispherical; fruits 7–17 mm wide **191. *E. pellita***
- 20:** Leaves concolorous
- 27** Fruits 25–38 mm long **295. *E. youngiana***
27: Fruits up to 22 mm long
28 Bark rough throughout
29 Fruits 13–22 mm long **202. *E. gomphocephala***
29: Fruits 4–12 mm long
30 Leaves grey-green; lateral veins at 40°–50° (W.A.) **251. *E. decipiens***
30: Leaves green; lateral veins at 15°–40° (eastern Australia)
31 Buds ovoid
32 Petiole 15–30 mm long **407. *E. bridgesiana***
32: Petiole 7–12 mm long **125. *E. caliginosa***
31: Buds fusiform
33 Leaves uncinate; peduncle terete, angular or quadrangular **113. *E. macrorhyncha***
33: Leaves acuminate; peduncle flattened
34 Disc steeply ascending
35 Pedicels usually absent, sometimes to 3 mm long (Qld) **114. *E. youmanii***
35: Pedicels 1–8 mm long (S.A., N.S.W., Vic.) **113. *E. macrorhyncha***
34: Disc slightly ascending to level **125. *E. caliginosa***
- 28:** Bark rough at base of trunk only, or on trunk, or up to larger branches, then smooth above
- 36** Fruits 9–24 mm long

- 37 Petiole 25–28 mm long 275. *E. yumbarrana*
- 37: Petiole 5–22 mm long
- 38 Buds and fruits sessile
- 39 Peduncle 5–10 mm long 384. *E. morrisii*
- 39: Peduncle 17–30 mm long 203. *E. cornuta*
- 38: Buds and fruits pedicellate
- 40 Leaves 0.5–1.1 cm wide
- 41 Fruits hemispherical, 10–12 mm long 247. *E. balladoniensis*
- 41: Fruits cylindrical to subpyriform, 7–9 mm long 212. *E. sargentii*
- 40: Leaves 1.2–3 cm wide
- 42 Buds globular, subglobular, rostrate or subpyriform
- 43 Fruits 10–12 mm long, 9–12 mm wide 247. *E. balladoniensis*
- 43: Fruits 12–20 mm long, 15–30 mm wide
- 44 Buds and fruits strongly ribbed 297. *E. kingsmillii*
- 44: Buds and fruits striate or slightly ribbed 293. *E. burracoppinensis*
- 42: Buds conical, cylindrical or ovoid
- 45 Leaves grey-green (N.S.W.) 384. *E. morrisii*
- 45: Leaves green (W.A., Qld)
- 46 Buds conical (Qld) 382. *E. brassiana*
- 46: Buds cylindrical (W.A.) 210. *E. occidentalis*
- 36: Fruits 3–8 mm long
- 47 Buds 14–38 mm long
- 48 Buds and fruits sessile 203. *E. cornuta*
- 48: Buds and fruits pedicellate
- 49 Leaves 0.5–1.1 cm wide
- 50 Leaves green; lateral veins at 20°–30° 212. *E. sargentii*
- 50: Leaves grey-green; lateral veins at 40°–50° 267. *E. horistes*
- 49: Leaves 1.2–2.5 cm wide
- 51 Disc ascending 382. *E. brassiana*
- 51: Disc descending
- 52 Fruits campanulate, 8–15 mm long 210. *E. occidentalis*
- 52: Fruits urceolate to subglobular, 5–8 mm long 267. *E. horistes*
- 47: Buds 3–13 mm long
- 53 Disc ascending
- 54 Leaves 0.7–1 cm wide
- 55 Leaves 7.5–9 cm long; petiole 2–10 mm long 260. *E. bakeri*
- 55: Leaves 8–20 cm long; petiole 10–20 mm long
- 56 Valves very strongly exserted 383. *E. exserta*
- 56: Valves just exserted 422. *E. viminalis*
- 54: Leaves 1–3 cm wide
- 57 Buds conical (N Qld) 382. *E. brassiana*
- 57: Buds ovoid or obovoid to fusiform
- 58 Umbels often 3-flowered but up to 7-flowered

- 59 Leaves 8–12 cm long, grey-green 384. *E. morrisii*
 59: Leaves 12–20 cm long, green 422. *E. viminalis*
 58: Leaves green; umbels 7-flowered
 60 Peduncle flattened
 61 Buds sessile 422. *E. viminalis*
 61: Buds pedicellate 405. *E. dunnii*
 60: Peduncle not flattened
 62 Valves very strongly exserted; disc very steeply ascending 383. *E. exserta*
 62: Valves just exserted; discs just ascending
 63 Buds sessile 422. *E. viminalis*
 63: Buds pedicellate
 64 Leaves lanceolate, not undulate (W.A.) 381. *E. rudis*
 64: Leaves ovate or lanceolate to broadly lanceolate, undulate 391. *E. brookeriana*
 53: Disc level or descending
 65 Leaves undulate 391. *E. brookeriana*
 65: Leaves not undulate
 66 Pedicels 4–8 mm long
 67 Buds 5–7 mm long, 3–4 mm wide
 68 Leaves 2–4 mm wide 307. *E. formanii*
 68: Leaves 8–15 mm wide 264. *E. oleosa*
 67: Buds 8–13 mm long, 4–8 mm wide
 69 Fruits hemispherical, obconical or campanulate, 4–6 mm long 381. *E. rudis*
 69: Fruits subglobular or urceolate, 5–8 mm long
 70 Leaves grey-green; buds fusiform 267. *E. horistes*
 70: Leaves green; buds conical 263. *E. longicornis*
 66: Pedicels absent or to 3 mm long
 71 Fruits hemispherical, obconical or subcylindrical
 72 Leaves linear to narrowly lanceolate; buds and fruits sessile or with pedicels 1–2 mm long
 73 Buds 5–6 mm long; fruits 3–4 mm long (W.A.) 307. *E. formanii*
 73: Buds 6–10 mm long; fruits 5–6 mm long (S.A.) 255. *E. cneorifolia*
 72: Leaves narrowly lanceolate to lanceolate; buds and fruits with pedicels 1–3 mm long
 74 Buds cylindrical or narrowly ovoid
 75 Peduncle flattened (W.A.) 241. *E. effusa*
 75: Peduncle terete (Qld, N.S.W.) 260. *E. bakeri*
 74: Buds fusiform or conical
 76 Leaves narrowly lanceolate, green, 7–12 mm wide 269. *E. eremicola*
 76: Leaves lanceolate, grey-green, 10–20 mm wide 276. *E. yalatensis*
 71: Fruits subglobular, urceolate or ovoid
 77 Buds 5–7 mm long
 78 Leaves 7–10 cm long; operculum obtuse 264. *E. oleosa*
 78: Leaves 6–8 cm long; operculum acute 269. *E. eremicola*

MYRTACEAE—1

1. Eucalyptus

77: Buds 8–13 mm long

79 Operculum and hypanthium about equal in length

265. *E. kochii*

79: Operculum clearly longer than hypanthium

80 Leaves 5–7 cm long, 0.8–1 cm wide; operculum obtuse

268. *E. peeneri*

80: Leaves 6–9.5 cm long, 0.6–2 cm wide; operculum acute

81 Buds \pm 8 mm long, conical (S.A.)

269. *E. eremicola*

81: Buds 9–16 mm long, fusiform (W.A.)

267. *E. horistes*

GROUP 17

1 Fruits 6–8 mm long (Vic.)

483. *E. froggattii*

1: Fruits 13–22 mm long (W.A., N.T., Qld)

74. *E. tetrodonta*

GROUP 18

1 Buds, and usually fruits, glaucous

2 Buds and fruits strongly ribbed

78. *E. miniata*

2: Buds and fruits not strongly ribbed

3 Buds fusiform

4 Leaves lanceolate, grey-green; petiole 10–15 mm long

443. *E. cephalocarpa*

4: Leaves broadly lanceolate, orbicular, cordate or broadly ovate, usually glaucous; petiole absent or to 11 mm long

442. *E. cinerea*

3: Buds cylindrical, clavate or ovoid

5 Buds 5–7 mm long

6 Leaves uncinatate or apiculate (Tas.)

433. *E. gunnii*

6: Leaves acute to acuminate

7 Peduncle flattened, dilated

428. *E. kartzoffiana*

7: Peduncle terete

8 Petiole 15–25 mm long; buds cylindrical

432. *E. glaucescens*

8: Petiole 10–15 mm long; buds ovoid

438. *E. perriniana*

5: Buds 8–16 mm long

9 Operculum shorter than hypanthium

411. *E. nortonii*

9: Operculum about as long as hypanthium

473. *E. albens*

1: Fruits not glaucous; buds not glaucous (except *E. cinerea*, *E. miniata*)

10 Fruits 30–60 mm long, strongly ribbed

78. *E. miniata*

10: Fruits less than 30 mm long

11 Fruits 13–22 mm long

12 Leaves lanceolate, 1.5–2.5 cm wide

13 Bark rough at base of trunk only; buds 9–11 mm long (N.S.W.)

132. *E. olsenii*

13: Bark rough throughout; buds 15–19 mm long (W.A.)

202. *E. gomphocephala*

12: Leaves broadly lanceolate to ovate, 2.5–5 cm wide

14 Peduncle 2–5 mm long (Vic.)

116. *E. alpina*

14: Peduncle 15–25 mm long (W.A.)

235. *E. grossa*

11: Fruits 2–12 mm long

15 Bark rough throughout

- 16** Leaves and buds glaucous **442. *E. cinerea***
- 16:** Leaves and buds not glaucous
- 17** Petiole 20–30 mm long
- 18** Leaves oblique at base; stringybarks
- 19** Buds 5–8 mm long, clavate **115. *E. baxteri***
- 19:** Buds 8–11 mm long, fusiform **120. *E. capitellata***
- 18:** Leaves not noticeably oblique at base
- 20** Leaf margins glandular, more or less sinuate **414. *E. quadrangulata***
- 20:** Leaf margins not glandular or sinuate
- 21** Leaves green; buds 7–11 mm long **410. *E. goniocalyx***
- 21:** Leaves grey-green; buds 4–6 mm long **409. *E. banksii***
- 17:** Petiole less than 20 mm long
- 22** Leaf margins glandular, more or less sinuate **414. *E. quadrangulata***
- 22:** Leaf margins not glandular or sinuate
- 23** Bark fibrous, hard; fruits obconical or fusiform
- 24** Peduncle terete, 3–4 mm long **393. *E. aggregata***
- 24:** Peduncle angled, 5–18 mm long **443. *E. cephalocarpa***
- 23:** Bark stringy, spongy; fruits hemispherical to subglobular or globular
- 25** Fruits 6–11 mm long, 8–16 mm wide (S.A., Vic.) **115. *E. baxteri***
- 25:** Fruits 4–8 mm long, 4–12 mm wide (Qld, N.S.W., Vic.)
- 26** Leaves 4–7.5 cm long, 0.7–1.5 cm wide; petiole 5–10 mm long **130. *E. ligustrina***
- 26:** Leaves 6–17 cm long, 1–3.3 cm wide; petiole 5–17 mm long
- 27** Buds clavate or ovoid
- 28** Fruits separate; buds 2–3 mm wide **122. *E. tindaliae***
- 28:** Fruits crowded, often with flattened sides; buds 3–5 mm wide
- 29** Disc slightly ascending or almost level **124. *E. nigra***
- 29:** Disc steeply ascending
- 30** Leaves 1.5–2 cm wide; fruits 6–8 mm long **118. *E. blaxlandii***
- 30:** Leaves 2–3 cm wide; fruits 4–6 mm long **119. *E. camfieldii***
- 27:** Buds fusiform
- 31** Buds 8–11 mm long **120. *E. capitellata***
- 31:** Buds 4–7 mm long
- 32** Leaves 2.5–3.3 cm wide
- 33** Fruits crowded **124. *E. nigra***
- 33:** Fruits separate **123. *E. eugenioides***
- 32:** Leaves 1–2.5 cm wide
- 34** Valves included; leaves 6–10 cm long
- 35** Leaves mucronate; petiole 10–17 mm long (Qld) **128. *E. conglomerata***
- 35:** Leaves acuminate; petiole 8–12 mm long (N.S.W.) **127. *E. cameronii***
- 34:** Valves more or less level

MYRTACEAE—1

1. Eucalyptus

- 36 Peduncle 10–15 mm long; buds 2–3 mm wide
- 36: Peduncle 3–13 mm long; buds 3–4 mm wide
- 37 Buds 4–6 mm long, minutely glandular; fruits 4–8 mm long, 6–11 mm wide, noticeably wider than long
- 37: Buds 5–7 mm long, not noticeably glandular; fruits 4–7 mm long, 6–8 mm wide, just wider than long
- 15: Bark rough on lower trunk or extending to larger branches, but smooth above
- 38 Fruits more than 10 mm long
- 39 Tall tree; leaves discolorous
- 39: Shrub or small tree; leaves concolorous
- 40 Buds 10–13 mm long, warty (Vic.)
- 40: Buds 6–10 mm long, smooth (S.A.)
- 38: Fruits 3–10 mm long
- 41 Leaves discolorous
- 42 Bark rough on at least all the trunk
- 42: Bark rough or scaly at base of trunk or up to 4 m
- 43 Valves incurved
- 43: Valves erect or outcurved
- 41: Leaves concolorous
- 44 Bark rough mostly on lower trunk, sometimes on whole trunk but smooth on branches
- 45 Petiole 2–5 mm long; leaves 0.3–0.6 cm wide
- 45: Petiole 6–25 mm long; leaves 0.7–3.8 cm wide
- 46 Buds rostrate
- 46: Buds not rostrate
- 47 Petiole quadrangular
- 47: Petiole terete or slightly flattened
- 48 Umbels 3-flowered
- 49 Leaves 5–8 cm long
- 49: Leaves 8.5–20 cm long
- 50 Operculum just shorter than hypanthium; fruits 3–5 mm long
- 50: Operculum just longer than hypanthium; fruits 5–8 mm long
- 48: Umbels 7-flowered or more
- 51 Operculum distinctly shorter than hypanthium
- 52 Petiole 7–12 mm long
- 53 Buds clavate, 3–6 mm long (Tas.)
- 53: Buds ovoid to conical, 6–10 mm long (W.A.)
- 52: Petiole 14–25 mm long
- 54 Buds 9–12 mm long
- 55 Tall tree; leaves 11–20 cm long (N.S.W., Vic.)
- 55: Stunted tree; leaves 8.5–12 cm long (W.A.)
- 54: Buds 5–8 mm long
- 129. *E. oblonga*
- 124. *E. nigra*
- 126. *E. globoidea*
- 189. *E. botryoides*
- 116. *E. alpina*
- 470. *E. lansdowneana*
- 189. *E. botryoides*
- 187. *E. grandis*
- 188. *E. saligna*
- 258. *E. jutsonii*
- 347. *E. dundasii*
- 322. *E. kondininensis*
- 434. *E. archeri*
- 425. *E. badjensis*
- 422. *E. viminalis*
- 179. *E. nitida*
- 308. *E. uncinata*
- 412. *E. cypellocarpa*
- 237. *E. carnei*

- 56** Tree; leaves cuneate, shining (N.S.W., Vic.) **413. *E. nitens***
56: Mallee; leaves oblique, slightly shining (S.A.) **147. *E. remota***
51: Operculum just longer than or equal to hypanthium
57 Peduncle quadrangular, 2–5 mm long **400. *E. neglecta***
57: Peduncle flattened, terete or angular, 4–25 mm long
58 Leaves 5–10 cm long (W.A.) **308. *E. uncinata***
58: Leaves 11–20 cm (S.A., Qld, N.S.W., Vic., Tas.)
59 Lateral veins at 15°–20°; valves included or level **141. *E. oreades***
59: Lateral veins at 30°–50°; valves exserted **422. *E. viminalis***
44: Bark rough on trunk and larger branches
60 Disc ascending
61 Umbels 7-flowered
62 Fruits 4–6 mm long; buds 6–8 mm long; petiole 10–25 mm long **422. *E. viminalis***
62: Fruits 3–5 mm long; buds 4–6 mm long; petiole 8–12 mm long **420. *E. macarthurii***
61: Umbels 3-flowered
63 Operculum and hypanthium equal in length (coastal eastern Vic. only) **423. *E. pryoriana***
63: Operculum just longer than hypanthium **422. *E. viminalis***
60: Disc level or descending
64 Leaves and buds glaucous **442. *E. cinerea***
64: Leaves and buds not glaucous
65 Tall tree; buds 10–12 mm long (N.S.W., Vic.) **412. *E. cypellocarpa***
65: Small tree or mallee; buds 6–10 mm long (W.A., S.A.) **470. *E. lansdowneana***

GROUP 19

- 1** Umbels 3-flowered
2 Leaves 18–30 cm long **431. *E. chapmaniana***
2: Leaves 5–15 cm long
3 Leaves apiculate or uncinata; buds clavate to subcylindrical **433. *E. gunnii***
3: Leaves acuminate; buds ovoid or turbinate
4 Fruits 5–7 mm wide
5 Peduncle 7–10 mm long; fruits cylindrical **436. *E. morrisbyi***
5: Peduncle 2–5 mm long; fruits hemispherical **438. *E. perriniana***
4: Fruits 8–16 mm wide **511. *E. leucoxydon***
1: Umbels 7-or-more-flowered
6 Fruits 20–60 mm long
7 Fruits 20–25 mm long **80. *E. ceracea***
7: Fruits 30–60 mm long **78. *E. miniata***
6: Fruits 3–15 mm long
8 Leaves discolorous, crenulate **404. *E. crenulata***
8: Leaves concolorous, not crenulate

- 9 Pedicels 6–10 mm long 155. *E. stenostoma*
- 9: Pedicels 1–5 mm long
- 10 Leaves 0.6–1.5 cm wide
- 11 Buds and fruits ribbed 324. *E. clelandii*
- 11: Buds and fruits not ribbed
- 12 Lateral veins at 15°–30° (W.A.)
- 13 Fruits obconical 244. *E. loxophleba*
- 13: Fruits urceolate 302. *E. celastroides*
- 12: Lateral veins at 35°–40° (Qld, N.S.W.) 441. *E. nova-anglica*
- 10: Leaves 1.6–4 cm wide
- 14 Buds and fruits more or less cylindrical 473. *E. albens*
- 14: Buds and fruits not cylindrical
- 15 Buds 12–15 mm long 134. *E. pyrocarpa*
- 15: Buds 5–7 mm long
- 16 Buds clavate 244. *E. loxophleba*
- 16: Buds fusiform
- 17 Leaves 1.6–2.5 cm wide; petiole 10–15 mm long 443. *E. cephalocarpa*
- 17: Leaves 2.5–4 cm wide; petiole 20–32 mm long 408. *E. malacoxylon*

GROUP 20

- 1 Fruits strongly ribbed
- 2 Fruits 8–12 mm long; valves exerted 333. *E. corrugata*
- 2: Fruits 17–30 mm long; valves included
- 3 Leaves 12–16 cm long, 2–3.3 cm wide; petiole 15–25 mm long 137. *E. planchoniana*
- 3: Leaves 8–12 cm long, 1.2–2 cm wide; petiole 8–15 mm long 79. *E. phoenicea*
- 1: Fruits weakly ribbed or not ribbed
- 4 Leaves discolorous
- 5 Bark rough usually at base of trunk, up to 6 m
- 6 Operculum hemispherical, apiculate 186. *E. deanei*
- 6: Operculum conical, sometimes rostrate
- 7 Leaves undulate; intramarginal vein up to 5 mm from margin (Vic., Tas.) 391. *E. brookeriana*
- 7: Leaves not undulate; intramarginal vein up to 1 mm from margin (Qld, N.S.W.)
- 8 Valves incurved 187. *E. grandis*
- 8: Valves erect or outcurved 188. *E. saligna*
- 5: Bark rough throughout, or to larger branches
- 9 Fruits 4–5 mm long
- 10 Leaves somewhat crenulate; bark softly fibrous, red-brown 513. *E. microcorys*
- 10: Leaves not crenulate; bark fibrous or flaky, gray, grey-brown or red-brown
- 11 Bark more or less fibrous hairy; leaves 6–10 cm long, 0.7–1.5 cm wide 82. *E. tenuipes*
- 11: Bark fibrous or flaky, not hairy; leaves 7–20 cm long, 1.3–3 cm wide

- 12 Valves exserted 406. *E. angophoroides*
- 12: Valves included or level 124. *E. nigra*
- 9: Fruits 6–14 mm long
- 13 Leaves somewhat crenulate; operculum hemispherical, usually with cross sutures 513. *E. microcorys*
- 13: Leaves not crenulate; operculum without sutures
- 14 Lateral veins at 70°–80°; bark flaky, yellow-brown 75. *E. similis*
- 14: Lateral veins at 20°–60°; bark fibrous, grey, grey-brown or red-brown, or yellow-brown in *E. brevistylis*
- 15 Bark rough to larger branches, then smooth above
- 16 Leaves 2.5–4 cm wide; petiole 20–30 mm long 189. *E. botryoides*
- 16: Leaves 1–2.5 cm wide; petiole 10–20 mm long
- 17 Fruits hemispherical to subglobular; disc level or ascending 112. *E. laevopinea*
- 17: Fruits globular, 4-lobed at rim, ovoid or suburceolate; disc descending 77. *E. baileyana*
- 15: Bark rough throughout
- 18 Leaves 7–9 cm long, uncinat; pedicels 3–6 mm long (W.A.) 105. *E. brevistylis*
- 18: Leaves 7–13 cm long, acuminate; pedicels absent or to 3 mm long (Qld, N.S.W., Vic.)
- 19 Fruits hemispherical or subglobular; petiole 8–15 mm long 124. *E. nigra*
- 19: Fruits subglobular to ovoid; petiole 15–20 mm long 111. *E. muelleriana*
- 4: Leaves concolorous
- 20 Bark rough throughout
- 21 Peduncle 1–6 mm long
- 22 Leaves oblique at base
- 23 Buds fusiform
- 24 Fruits usually distinctly pedicellate, not crowded 123. *E. eugenioides*
- 24: Fruits very shortly pedicellate, crowded
- 25 Buds 4–6 mm long, minutely glandular; fruits 4–8 mm long, 6–11 mm wide, noticeably wider than long 124. *E. nigra*
- 25: Buds 5–7 mm long, not noticeably glandular; fruits 4–7 mm long, 6–8 mm wide, just wider than long 126. *E. globoidea*
- 23: Buds clavate
- 26 Operculum shorter than hypanthium 139. *E. obliqua*
- 26: Operculum and hypanthium about equal in length
- 27 Buds warty; leaves thick 115. *E. baxteri*
- 27: Buds not warty; leaves thin 124. *E. nigra*
- 22: Leaves not oblique at base
- 28 Leaves at least 2.5 cm wide
- 29 Disc ascending; buds 5–7 mm long
- 30 Fruits hemispherical to subglobular 395. *E. aromaphloia*
- 30: Fruits obconical 443. *E. cephalocarpa*
- 29: Disc level; buds 4–5 mm long; leaves undulate 388. *E. yarraensis*
- 28: Leaves less than 2.5 cm wide

MYRTACEAE—1

1. *Eucalyptus*

- 31 Peduncle angular, 5–18 mm long; leaves 12.5–20 cm long
- 31: Peduncle terete or quadrangular, 2–8 mm long; leaves 4.5–15 cm long
- 32 Intramarginal vein up to 3 mm from margin
- 33 Fruits obconical; disc narrow
- 33: Fruits hemispherical or subglobular to subpyriform; disc broad
- 32: Intramarginal vein up to 1 mm from margin
- 34 Disc ascending; buds 5–7 mm long, 3–4 mm wide
- 34: Disc level or descending; buds 3–6 mm long, 2–3 mm wide
- 35 Buds 7–9 mm long (W.A.)
- 35: Buds 3–6 mm long (N.S.W., Vic.)
- 36 Buds clavate
- 36: Buds ovoid, obovoid to fusiform
- 37 Leaves narrowly lanceolate, 0.5–1 cm wide, grey-green to blue-green
- 37: Leaves lanceolate, 1–1.5 cm wide, green
- 21: Peduncle 7 mm or more long
- 38 Fruits 13–26 mm long
- 39 Umbels 3–6-flowered
- 40 Fruits c. 13 mm long, 7–9 mm wide
- 40: Fruits 15–20 mm long, 17–23 mm wide
- 39: Umbels 7–11-flowered
- 41 Buds 15–28 mm long
- 42 Buds cylindrical (Qld, N.S.W.)
- 42: Buds clavate (W.A.)
- 41: Buds 8–13 mm long
- 43 Fruits 15–20 mm long, 17–23 mm wide
- 43: Fruits 9–14 mm long, 9–12 mm wide
- 38: Fruits less than 13 mm long
- 44 Leaves oblique at base
- 45 Operculum distinctly shorter than hypanthium
- 46 Valves exerted to level; intramarginal vein to 3 mm from margin
- 46: Valves included to level; intramarginal vein 1–2 mm from margin
- 47 Fruits ovoid to subglobular; 6–11 mm long
- 47: Fruits hemispherical, obconical or campanulate, 4–6 mm long
- 45: Operculum more or less equal to hypanthium
- 48 Buds warty; operculum hemispherical
- 48: Buds not warty; operculum usually conical, sometimes hemispherical
- 49 Fruits globular to ovoid, 9–11 mm long
- 49: Fruits hemispherical to subglobular, 4–8 mm long
- 50 Fruits crowded, sessile or on pedicel to 2 mm long
- 443. *E. cephalocarpa*
- 393. *E. aggregata*
- 171. *E. radiata*
- 395. *E. aromaphloia*
- 323 *E. fruticosa*
- 171. *E. radiata*
- 397. *E. nicholii*
- 396. *E. acaciiformis*
- 76. *E. lirata*
- 96. *E. todtiana*
- 137. *E. planchoniana*
- 202. *E. gomphocephala*
- 96. *E. todtiana*
- 95. *E. patens*
- 146. *E. consideniana*
- 139. *E. obliqua*
- 145. *E. andrewsii*
- 115. *E. baxteri*
- 138. *E. sphaerocarpa*

- 51 Shrub; peduncle quadrangular (W.A.) 306. *E. fruticosa*
- 51: Tree; peduncle terete, angular or flattened (Qld, N.S.W., Vic.)
- 52 Operculum slightly longer than hypanthium (southwards from Kempsey, N.S.W., & Vic.) 126. *E. globoidea*
- 52: Operculum and hypanthium about equal in length (Qld & far north coast of N.S.W.) 124. *E. nigra*
- 50: Fruits not usually crowded; pedicels 1–8 mm long
- 53 Leaves 1–2 cm wide; petiole 7–10 mm long 131. *E. mckieana*
- 53: Leaves 2.5–4 cm wide; petiole 10–20 mm long
- 54 Leaves thin; venation at 20°–30° 123. *E. eugenoides*
- 54: Leaves thick; venation at 35°–50° 110. *E. umbra*
- 44: Leaves not usually oblique at base
- 55 Fruits 8–12 mm long
- 56 Operculum shorter than hypanthium
- 57 Umbels 3-flowered (W.A.) 76. *E. lirata*
- 57: Umbels 11–15-flowered (N.S.W., Vic.) 146. *E. consideniana*
- 56: Operculum and hypanthium about equal in length
- 58 Operculum striate or ribbed; fruits cylindrical 323. *E. striatocalyx*
- 58: Operculum not striate or ribbed; fruits globular to ovoid 95. *E. patens*
- 55: Fruits 2–7 mm long
- 59 Buds clavate 146. *E. consideniana*
- 59: Buds ovoid, cylindrical or fusiform
- 60 Operculum striate or ribbed (W.A., S.A.) 323. *E. striatocalyx*
- 60: Operculum not striate or ribbed (Qld, N.S.W., Vic.)
- 61 Leaf margins glandular, giving a denticulate appearance 414. *E. quadrangulata*
- 61: Leaf margins not glandular
- 62 Pedicels 1–2 mm long; lateral veins at 15°–25° 443. *E. cephalocarpa*
- 62: Pedicels 2–5 mm long; lateral veins at 20°–55°
- 63 Leaves 0.5–1.5 cm wide; petiole 7–17 mm long
- 64 Bark more or less tessellated; peduncle 7–10 mm long; leaves 1–1.5 cm wide 256. *E. squamosa*
- 64: Bark fibrous; peduncle 5–7 mm long; leaves 0.5–1 cm wide 397. *E. nicholii*
- 63: Leaves 1.5–3 cm long; petiole 15–30 mm long
- 65 Leaves 6–10 cm long, undulate 388. *E. yarraensis*
- 65: Leaves 12–20 cm long 407. *E. bridgesiana*
- 20: Bark rough at base or all trunk, or extending to larger branches, then smooth above
- 66 Umbels 3-flowered
- 67 Leaves 5–7 cm long
- 68 Petiole 4–7 mm long; peduncle 2–5 mm long 339. *E. merrickiae*
- 68: Petiole 10–15 mm long; peduncle 5–10 mm long 332. *E. concinna*
- 67: Leaves more than 7 cm long
- 69 Operculum usually ribbed or corrugated

MYRTACEAE—1

1. Eucalyptus

- 70 Fruits campanulate, 2-ribbed 331. *E. griffithsii*
- 70: Fruits hemispherical, subpyriform or subcampanulate 332. *E. concinna*
- 69: Operculum not ribbed or corrugated
- 71 Fruits 5–7 mm long
- 72 Buds clavate 332. *E. concinna*
- 72: Buds ovoid
- 73 Bark fibrous to about 2 m, then smooth above; buds and fruits distinctly pedicellate 511. *E. leucoxydon*
- 73: Bark fibrous on trunk and larger branches; buds and fruits almost sessile 423. *E. pryoriana*
- 71: Fruits 8–18 mm long
- 74 Buds clavate 332. *E. concinna*
- 74: Buds ovoid, fusiform or cylindrical
- 75 Fruits cylindrical (central and south coastal N.S.W.) 200. *E. longifolia*
- 75: Fruits hemispherical, ovoid to subglobular or campanulate
- 76 Operculum hemispherical to conical (W.A.) 70. *E. jucunda*
- 76: Operculum conical to rostrate (S.A., N.S.W., Vic.) 511. *E. leucoxydon*
- 66: Umbels more than 3-flowered
- 77 Operculum ribbed
- 78 Pedicels 4–6 mm long (W.A.) 332. *E. concinna*
- 78: Pedicels 1–2 mm long (S.A., N.S.W., Vic.) 314. *E. cyanophylla*
- 77: Operculum not ribbed
- 79 Umbels mostly in pairs
- 80 Bark tessellated, on lower trunk only (N.T.) 6. *E. kombolgiensis*
- 80: Bark fibrous on trunk or to larger branches (N.S.W., Vic., Tas.)
- 81 Bark rough on trunk to 15 m, then smooth above 135. *E. regnans*
- 81: Bark rough on trunk and larger branches, then smooth above 136. *E. fastigata*
- 79: Umbels not in pairs
- 82 Fruits ribbed
- 83 Fruits 15–20 mm long (N.S.W.) 132. *E. olsenii*
- 83: Fruits 6–10 mm long (W.A.)
- 84 Leaves 2–3 cm wide; buds 3–5 mm long 105. *E. brevistylis*
- 84: Leaves 1–1.5 cm wide; buds 8–10 mm long 347. *E. dundasii*
- 82: Fruits not ribbed
- 85 Bark rough on trunk and larger branches
- 86 Valves exserted
- 87 Leaves 2.5–3 cm wide, undulate 388. *E. yarraensis*
- 87: Leaves 0.6–2 cm wide
- 88 Valves notched 259. *E. mannensis*
- 88: Valves not notched
- 89 Shrub, leaves uncinat; petiole 4–6 mm long 306. *E. fruticosa*
- 89: Tree; leaves acuminate; petiole 7–25 mm long

- 90** Operculum narrower than hypanthium (W.A., S.A.) **329. *E. brachycalyx***
- 90:** Operculum and hypanthium equal in width
(N.S.W., Qld, Tas.)
- 91** Disc ascending
- 92** Petiole flattened, 8–12 mm long **420. *E. macarthurii***
- 92:** Petiole terete, 15–25 mm long **441. *E. nova-anglica***
- 91:** Disc level **394. *E. rodwayi***
- 86:** Valves included or \pm level
- 93** Leaves oblique at base
- 94** Buds clavate **145. *E. andrewsii***
- 94:** Buds fusiform **170. *E. piperita***
- 93:** Leaves not oblique at base
- 95** Fruits 8–15 mm long
- 96** Buds 12–15 mm long
- 97** Fruits obconical **244. *E. loxophleba***
- 97:** Fruits pyriform, hemispherical, or cylindrical to ovoid
- 98** Operculum distinctly shorter than hypanthium **412. *E. cypellocarpa***
- 98:** Operculum and hypanthium about equal in length **134. *E. pyrocarpa***
- 96:** Buds 3–11 mm long
- 99** Operculum and hypanthium about equal in length
- 100** Intramarginal vein up to 3 mm from margin **479. *E. porosa***
- 100:** Intramarginal vein almost confluent with margin **329. *E. brachycalyx***
- 99:** Operculum distinctly shorter than hypanthium
- 101** Buds clavate
- 102** Leaves uncinat; disc distinctly descending **244. *E. loxophleba***
- 102:** Leaves acuminate; disc level or slightly ascending or descending **148. *E. sieberi***
- 101:** Buds ovoid to cylindrical or suburceolate to pyriform
- 103** Tall tree; peduncle flattened, 8–22 mm long
(N.S.W., Vic.) **412. *E. cypellocarpa***
- 103:** Mallee or small tree; peduncle slightly flattened,
6–15 mm long (S.A.) **470. *E. lansdowneana***
- 95:** Fruits 2–7 mm long
- 104** Buds 10–12 mm long
- 105** Operculum and hypanthium \pm equal in length **329. *E. brachycalyx***
- 105:** Operculum distinctly shorter than hypanthium
- 106** Buds clavate **244. *E. loxophleba***
- 106:** Buds ovoid to cylindrical or suburceolate to pyriform
- 107** Tall tree; peduncle flattened, 8–22 mm long
(N.S.W., Vic.) **412. *E. cypellocarpa***
- 107:** Mallee or small tree; peduncle slightly flattened,
6–13 mm long (S.A.) **470. *E. lansdowneana***
- 104:** Buds 2–9 mm long
- 108** Fruits 2–4 mm long

MYRTACEAE—1

1. *Eucalyptus*

- 109 Operculum distinctly shorter than hypanthium
- 110 Leaves without peppermint scent; buds 5–7 mm long 510. *E. melliodora*
- 110: Leaves with peppermint scent; buds 3–5 mm long
- 111 Lateral veins at 15°–25° (Tas.) 175. *E. amygdalina*
- 111: Lateral veins at 20°–40° (N.S.W., Vic.) 171. *E. radiata*
- 109: Operculum and hypanthium \pm equal in length
- 112 Buds 2–4 mm long; pedicels 5–8 mm long 476. *E. pilligaensis*
- 112: Buds 4–9 mm long; pedicels 1–5 mm long
- 113 Operculum narrower than hypanthium (W.A., S.A.) 329. *E. brachycalyx*
- 113: Operculum and hypanthium \pm equal in width (Tas.) 394. *E. rodwayi*
- 108: Fruits 5–7 mm long
- 114 Leaves with peppermint scent
- 115 Leaves 1.6–3.3 cm wide 173. *E. dives*
- 115: Leaves 0.5–1.5 cm wide
- 116 Lateral veins at 15°–25° (Tas.) 175. *E. amygdalina*
- 116: Lateral veins at 20°–40° (N.S.W., Vic.) 171. *E. radiata*
- 114: Leaves without peppermint scent
- 117 Operculum and hypanthium about equal in length
- 118 Operculum narrower than hypanthium; intramarginal vein almost confluent with margin 329. *E. brachycalyx*
- 118: Operculum and hypanthium equal in width; intramarginal vein up to 3 mm from margin 479. *E. porosa*
- 117: Operculum distinctly shorter than hypanthium
- 119 Buds 6–10 mm long; peduncle angular or slightly flattened, 6–15 mm long (S.A.) 470. *E. lansdowneana*
- 119: Buds 3–7 mm long; peduncle terete to quadrangular, 3–11 mm long (Qld, N.S.W., Vic.)
- 120 Fruits obconical; fruits not shedding dark staminal ring 498. *E. conica*
- 120: Fruits hemispherical, ovoid or subglobular; dark staminal ring shedding from fruits 510. *E. melliodora*
- 85: Bark rough on lower trunk or all trunk, but not on branches
- 121 Leaves oblique at base
- 122 Mallee (Kangaroo Is., S.A.) 147. *E. remota*
- 122: Tree (N.S.W., Vic., Tas.)
- 123 Leaf margins slightly crenulate 158. *E. paliformis*
- 123: Leaf margins not crenulate
- 124 Bark rough on about half trunk or less, no ‘scribbles’ on upper smooth bark
- 125 Peduncle terete or angular 140. *E. delegatensis*
- 125: Peduncle distinctly flattened 141. *E. oreades*

- 124:** Bark rough on lower trunk, then smooth and usually with 'scribbles' on upper trunk
- 126** Fruits ovoid, hemispherical or pyriform **140. *E. delegatensis***
- 126:** Fruits subglobular to urceolate
- 127** Fruits urceolate, rarely subglobular (southern highlands and south-eastern coastal ranges, N.S.W., to Howe Ranges, Vic.) **156. *E. fraxinoides***
- 127:** Fruits subglobular to suburceolate (West Dapto to Budawang Ranges, N.S.W.) **159. *E. dendromorpha***
- 121:** Leaves not oblique at base
- 128** Petiole 2–5 mm long
- 129** Shrub; operculum conical or rostrate; leaves yellow-green **306. *E. fruticosa***
- 129:** Tree or mallee; operculum conical or hemispherical, not rostrate; leaves green or grey-green
- 130** Leaves narrowly to broadly lanceolate, 1–2 cm wide
- 131** Buds fusiform **306. *E. fruticosa***
- 131:** Buds clavate
- 132** Fruits hemispherical to ovoid **465. *E. intertexta***
- 132:** Fruits urceolate **302. *E. celastroides***
- 130:** Leaves linear to narrowly lanceolate, 0.2–0.8 cm wide; mallee or small tree
- 133** Valves notched; peduncle flattened, 3–5 mm long; leaves not noticeably glandular **258. *E. jutsonii***
- 133:** Valves not notched; peduncle quadrangular, 5–8 mm long; leaves noticeably glandular
- 134** Lateral veins at c. 50° (W.A.) **307. *E. formanii***
- 134:** Lateral veins at 15°–25° (S.A., Qld, N.S.W., Vic.) **484. *E. viridis***
- 128:** Petiole more than 5 mm long
- 135** Bark corky on about half stems, flaky in old specimens **103. *E. suberea***
- 135:** Bark flaky or fibrous, not corky
- 136** Buds 11–15 mm long
- 137** Leaves 12–20 cm long
- 138** Leaves narrowly lanceolate, 1–1.5 cm wide **469. *E. ochrophloia***
- 138:** Leaves lanceolate, 1.6–3 cm wide **134. *E. pyrocarpa***
- 137:** Leaves 7.5–10 cm long
- 139** Fruits 6–8 mm long **350. *E. cylindrocarpa***
- 139:** Fruits 12–15 mm long **97. *E. lateritica***
- 136:** Buds 3–10 mm long
- 140** Leaves with peppermint scent
- 141** Bark fibrous at base of trunk only (S.A., Vic.) **174. *E. willisii***
- 141:** Bark fibrous to 10 m or more on trunk (N.S.W., Vic., Tas.)
- 142** Disc slightly ascending or level (Tas.) **179. *E. nitida***
- 142:** Disc slightly descending or level (N.S.W., Vic.) **172. *E. elata***
- 140:** Leaves without peppermint scent
- 143** Fruits 12–15 mm long

MYRTACEAE—1

1. Eucalyptus

- 144 Buds 8–10 mm long; peduncle 10–17 mm long
- 144: Buds 4–6 mm long; peduncle 8–10 mm long
- 143: Fruits 2–11 mm long
- 145 Intramarginal vein up to 5 mm from margin; leaves undulate
- 145: Intramarginal vein up to 3 mm from margin
- 146 Operculum distinctly shorter than hypanthium
- 147 Valves exerted
- 148 Buds fusiform or obovoid; petiole 15–20 mm long
- 148: Buds clavate, ovoid, cylindrical or conical; petiole 8–15 mm long
- 149 Leaves noticeably glandular
- 149: Leaves not noticeably glandular
- 150 Pedicels 1–3 mm long (S.A., N.S.W., Vic.)
- 151 Peduncle 10–16 mm long
- 151: Peduncle 4–6 mm long
- 150: Pedicels 4–7 mm long (W.A.)
- 152 Fruits 5–7 mm long, hemispherical to subcylindrical
- 152: Fruits 8–12 mm long, globular
- 147: Valves included or level
- 153 Fruits globular, 8–12 mm long, 10–14 mm wide
- 153: Fruits not globular, sometimes subglobular
- 154 Leaves acute or acuminate
- 155 Intramarginal vein up to 4 mm from margin
- 155: Intramarginal vein up to 2 mm from margin
- 156 Leaves noticeably glandular; mallee
- 156: Leaves not noticeably glandular; tree or mallee
- 157 Lateral veins at 45°–50° (Tas.)
- 157: Lateral veins at 20°–40° (not in Tas.)
- 158 Fruits cylindrical to ovoid
- 158: Fruits hemispherical to ovoid or subglobular
- 159 Intramarginal vein up to 2 mm from margin; dark staminal ring shedding from fruits
- 159: Intramarginal vein up to 1 mm from margin; fruits without dark staminal ring
- 154: Leaves uncinat
- 97. *E. lateritica*
- 102. *E. johnsoniana*
- 391. *E. brookeriana*
- 392. *E. barberi*
- 266. *E. plenissima*
- 315. *E. dumosa*
- 427. *E. benthamii*
- 328. *E. comitae-vallis*
- 102. *E. johnsoniana*
- 102. *E. johnsoniana*
- 480. *E. sparsa*
- 482. *E. polybractea*
- 392. *E. barberi*
- 481. *E. odorata*
- 510. *E. melliodora*
- 465. *E. intertexta*

- 160** Bark fibrous or flaky on whole trunk **300. *E. yilgarnensis***
- 160:** Bark fibrous or flaky at base of trunk only
- 161** Peduncle usually quadrangular, 5–10 mm long
- 162** Buds and fruits cylindrical to obconical **349. *E. myriadena***
- 162:** Buds clavate to ovoid
- 163** Operculum hemispherical; leaves 5–8 cm long, 0.8–1.5 cm wide **299. *E. gracilis***
- 163:** Operculum usually conical, sometimes hemispherical; leaves 5–11 cm long, 0.5–1.5 cm wide
- 164** Buds ovoid, 4–7 mm long, 2–3 mm wide; umbels 11–15-flowered **348. *E. ovularis***
- 164:** Buds clavate, 6–9 mm long, 3–4 mm wide; umbels 7-flowered **302. *E. celastroides***
- 161:** Peduncle terete, angular or slightly flattened, 10–16 mm long
- 165** Buds and fruits slightly striate; fruits 7–10 mm long (S.A., N.S.W., Vic.) **315. *E. dumosa***
- 165:** Buds and fruits not striate or fruits only faintly striate; fruits 4–8 mm long (W.A.)
- 166** Buds constricted in middle **352. *E. brachycorys***
- 166:** Buds not constricted
- 167** Lateral veins at 40°–50° **349. *E. myriadena***
- 167:** Lateral veins at 20°–40°
- 168** Fruits faintly striate **350. *E. cylindrocarpa***
- 168:** Fruits not striate
- 169** Fruits hemispherical to subcylindrical **328. *E. comitae-vallis***
- 169:** Fruits ovoid to urceolate
- 170** Buds ovoid, 4–7 mm long, 2–3 mm wide; umbels 11–15-flowered **348. *E. ovularis***
- 170:** Buds clavate, 6–9 mm long, 3–4 mm wide; umbels 7-flowered **302. *E. celastroides***
- 146:** Operculum and hypanthium about equal in length
- 171** Valves exserted
- 172** Valves notched with remains of style in a cleft at top of each valve **259. *E. mannensis***
- 172:** Valves not notched
- 173** Fruits 4–5 mm long
- 174** Peduncle terete or angled

MYRTACEAE—1

I. Eucalyptus

- 175 Buds ovoid to clavate, 3–5 mm long; tree (N.S.W.)
- 175: Buds fusiform, 7–9 mm long; shrub (W.A.)
- 174: Peduncle flattened or quadrangular
- 176 Petiole 22–40 mm long
- 176: Petiole 4–18 mm long
- 177 Petiole 4–6 mm long; buds fusiform
- 177: Petiole 7–18 mm long; buds ovoid or cylindrical
- 178 Valves spreading outwards; peduncle quadrangular, 10–20 mm long
- 178: Valves not spreading outwards; peduncle flattened, 3–12 mm long
- 179 Fruits subglobular
- 179: Fruits hemispherical to obconical
- 173: Fruits 6–9 mm long
- 180 Petiole 15–20 mm long
- 181 Leaves 1.2–2.5 cm wide, subcrenulate (Tas. only)
- 181: Leaves 0.7–1.5 cm wide, not subcrenulate
- 182 Leaves uncinat, 7–10 cm long
- 182: Leaves acuminate, 10–18 cm long
- 180: Petiole 7–14 mm long
- 183 Leaves 10–18 cm long; tall tree
- 183: Leaves 5–10 cm long; small tree or mallee
- 184 Buds 8–10 mm long; bark fibrous, twisted or latticed
- 184: Buds 5–8 mm long; bark fibrous but not twisted or latticed
- 185 Leaves noticeably glandular
- 185: Leaves not noticeably glandular
- 171: Valves included or level
- 186 Peduncle flattened
- 187 Leaves subcrenulate (Tas.)
- 187: Leaves not subcrenulate (Qld, N.S.W.)
- 186: Peduncle terete, angular or quadrangular
- 188 Petiole 15–25 mm long
- 189 Leaves subcrenulate (Tas.)
- 189: Leaves not subcrenulate
- 190 Peduncle 13–18 mm long
- 190: Peduncle 5–13 mm long
- 427. *E. benthamii*
- 306. *E. fruticosa*
- 405. *E. dunnii*
- 306. *E. fruticosa*
- 327. *E. melanoxylon*
- 264. *E. oleosa*
- 241. *E. effusa*
- 392. *E. barberi*
- 264. *E. oleosa*
- 421. *E. smithii*
- 265. *E. kochii*
- 264. *E. oleosa*
- 241. *E. effusa*
- 392. *E. barberi*
- 133. *E. pilularis*
- 392. *E. barberi*
- 471. *E. petraea*

- 191** Intramarginal vein up to 1 mm from margin; fruits ovoid to suburceolate or cylindrical
- 192** Leaves 2–3.3 cm wide; petiole 15–25 mm long **474. *E. moluccana***
- 192:** Leaves 0.5–1.8 cm wide; petiole 7–15 mm long **481. *E. odorata***
- 191:** Intramarginal vein usually 2–4 mm from margin; fruits hemispherical, ovoid or subglobular
- 193** Pedicels 2–3 mm long; leaves 5–12 cm long, 1.5–3.5 cm wide; mallee or small tree **480. *E. sparsa***
- 193:** Pedicels 3–10 mm long; leaves 10–20 cm long, 0.7–2 cm wide; tall tree **478. *E. bosistoana***
- 188:** Petiole 5–15 mm long
- 194** Leaves less than 1 cm wide
- 195** Intramarginal vein up to 3 mm from margin; tall tree
- 196** Buds 5–7 mm long; dark staminal ring shedding from fruits **510. *E. melliodora***
- 196:** Buds 7–9 mm long; fruits without dark staminal ring **478. *E. bosistoana***
- 195:** Intramarginal vein up to 1 mm from margin
- 197** Leaves at least 0.8 cm wide; lateral veins at 20°–35°
- 198** Leaves blue-green to grey-green **482. *E. polybractea***
- 198:** Leaves green
- 199** Buds cylindrical, 7–11 mm long; peduncle 10–15 mm long (W.A.) **350. *E. cylindrocarpa***
- 199:** Buds fusiform to clavate, 5–9 mm long; peduncle 5–12 mm long (S.A., N.S.W., Vic.) **481. *E. odorata***
- 197:** Leaves 0.4–0.8 cm wide; lateral veins at 15°–25°
- 200** Leaves noticeably glandular; peduncle quadrangular, 5–10 mm long (S.A., Qld, N.S.W., Vic.)
- 201** Leaves blue-green to grey-green **482. *E. polybractea***
- 201:** Leaves green **484. *E. viridis***
- 200:** Leaves not noticeably glandular; peduncle terete or angular, 3–5 mm long (W.A.) **303. *E. brevipes***
- 194:** Leaves 1–2.5 cm wide
- 202** Intramarginal vein usually 2–3 mm from margin
- 203** Leaves uncinat; small tree or mallee **479. *E. porosa***
- 203:** Leaves acuminate; tree

MYRTACEAE—1

1. *Eucalyptus*

- | | |
|---|-------------------------------------|
| 204 Buds 5–7 mm long; dark staminal ring shedding from fruits | 510. <i>E. melliodora</i> |
| 204: Buds 7–9 mm long; fruits without dark staminal ring | 478. <i>E. bosistoana</i> |
| 202: Intramarginal vein up to 1 mm from margin | |
| 205 Operculum narrower than hypanthium; mallee | 502. <i>E. lucens</i> |
| 205: Operculum and hypanthium equal in width | |
| 206 Leaves uncinat; buds and fruits cylindrical | 350. <i>E. cylindrocarpa</i> |
| 206: Leaves acute or acuminate; buds clavate | |
| 207 Operculum conical; bark fibrous on lower trunk only | 465. <i>E. intertexta</i> |
| 207: Operculum hemispherical, apiculate; bark fibrous on whole trunk | 466. <i>E. orgadophila</i> |

Ser. 1 Scutiformes

Eucalyptus ser. **Scutiformes** Maiden, *Crit. Revis. Eucalyptus* 7: 113 (1925).

Type: *E. grandifolia* R.Br. ex Benth., lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 505 (1988).

E. ser. Clavigerae (Maiden) S.T.Blake, *Austral. J. Bot.* 1: 209 (1953); *E. subser. Clavigerae* Maiden, *Crit. Revis. Eucalyptus* 6: 525, 535 (1923). T: *E. clavigera* Cunn. ex Schauer

Eucalyptus ser. *Corymbosae* subser. *Tessellatae* Blakely, *Key Eucalypts* 15, 74 (1934). T: not designated.

Eucalyptus subser. *Setosae* Blakely, *op. cit.* 15, 75, *p.p.*. T: not designated.

Trees, rarely mallees, some deciduous. Bark smooth throughout, or smooth on upper trunk and with tessellated persistent bark on at least lower trunk. Juvenile leaves alternate, sometimes opposite, petiolate, concolorous. Adult leaves opposite, subopposite or alternate, sessile or petiolate, slightly discolorous or concolorous; intramarginal vein sometimes irregular or double. Conflorescences axillary, rarely terminal; umbels simple or compound, 3–many-flowered. Buds usually clavate or pyriform; outer operculum caducous, inner usually saucer-shaped. Anthers oblong, versatile, opening by slits. Fruits truncate-ovoid, hemispherical, urceolate or cylindrical, thin-walled, fragile; disc steeply descending; valves usually 3, deltoid, included. Seeds saucer-shaped, wingless or with a rudimentary wing all round, brown or red-brown.

A series of 9 species in W.A., N.T., Qld and N.S.W.; of these, 3 species also extend to Papua New Guinea. Characterised especially by the thin-walled fruit, saucer-shaped seeds and the axillary conflorescences of decussately arranged umbels, though often condensed. Outer operculum shed early. The fruits quickly mature and dehisce.

1. *Eucalyptus tessellaris* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 88 (1859)

T: between Gilbert R. and Carron R., [Qld], 1857, *F.Mueller*; holo: MEL; iso: BM, K.

E. viminalis Hook. in T.Mitchell, *J. Exped. Trop. Australia* 157 (1848), *nom. illeg.*, non Labill. (1806); *E. hookeri* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 90 (1859). T: Camp XIV, Frosty Ck near Mt Abundance, [SE of Roma, Qld,] 9 May 1846, *T.L.Mitchell* 146; holo: K; iso: CGE, MEL, NSW.

Illustration: D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 207 (1984).

Tree to 30 m. Bark tessellated, dark grey up to 2 m, smooth and white above. Juvenile leaves sessile or almost so, narrowly lanceolate or oblong. Adult leaves alternate, petiolate, narrowly lanceolate, acute or acuminate, thin; lamina 12–16 cm long, 1–1.6 cm wide, dull, grey-green; lateral veins fine, at 45°–65°; intramarginal vein almost confluent with margin; petiole terete, channelled or slightly flattened, 5–10 mm long. Conflorescence axillary, decussate; umbels 3-flowered; peduncle terete, 2–4 mm long; pedicels 2–3 mm long. Buds pyriform; operculum apiculate, 1–2 mm long, 3–4 mm wide; hypanthium truncate-ovoid or campanulate, 4–6 mm long, 3–5 mm wide. Fruits truncate-ovoid or subcylindrical, rarely suburceolate, 8–11 mm long, 6–8 mm wide. Seeds narrowly winged. *Carbeen*, *Moreton Bay Ash*. Fig. 39A–B.

Widespread from Cape York Peninsula through eastern Qld including coastal islands, to north-central N.S.W.; grows mostly in sandy soil on plains and undulating country in open forest and woodland. Also in Papua New Guinea. Regions: CYRK, CARP, BURD, DWSN, WRGO, MCPH, DARL. Map 1.

Qld: Sandgate, *S.T.Blake 18478* (BRI, FRI); 103 km from Laura towards Coen, *M.I.H.Brooker 4057* (AD, BRI, FRI, MEL, NT, PERTH, QRS); Isis R., 11.1 km E of Childers, *G.M.Chippendale 546* & *R.D.Johnston* (BRI, FRI, NSW, MEL). N.S.W.: Coolabah, *W.W.Froggatt* (BRI, NSW); Howell, *E.C.Andrews* (NSW).

Distinguished by the distinct stocking of grey tessellated bark, the narrow adult leaves, 3-flowered umbels and the fragile caducous fruits. Wrongly recorded by W.F.Blakely, *Key Eucalypts* 74 (1934) for the N.T. and W.A.

The wood has been used in construction including bridges.

2. *Eucalyptus papuana* F.Muell., *Descr. Notes Papuan Pl.* 1: 8 (1875)

T: opposite Yule Is. on New Guinea mainland, *P.Reedy 139*; holo: MEL; iso: NSW (leaf only).

E. tessellaris var. *dallachiana* Benth., *Fl. Austral.* 3: 251 (1867); *E. clavigera* var. *dallachiana* (Benth.) Maiden, *J. & Proc. Roy. Soc. New South Wales* 47: 77 (1913). T: Mt Archer, Rockhampton, Qld, 4 Jan. 1863, *J.Dallachy 171*; lecto: MEL, *fide* S.T.Blake, *Austral. J. Bot.* 1: 223 (1953) by implication; iso: K.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1, fig. 12 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 209 (1984).

Tree to 15 m. Bark smooth, white or grey-white throughout. Juvenile leaves shortly petiolate, oblong or elliptic to broadly lanceolate, acute or acuminate, glabrous or minutely and sparsely setose, undulate. Adult leaves alternate, petiolate, narrowly to broadly lanceolate; lamina 5–18 cm long, 1.2–4.5 cm wide, light green or yellow-green; lateral veins fine, at 40°–60°; intramarginal vein up to 1 mm from margin; petiole terete, 1–2.5 cm long. Conflorescence axillary or apparently terminal condensed corymbose panicle; umbels 7–11-flowered; peduncle terete, 4–7 mm long; pedicels 4–7 mm long. Buds ovoid to clavate; operculum 1–2 mm long, 5–6 mm wide; hypanthium obconical, 5 mm long, 4–6 mm wide. Fruits cylindrical, abruptly rounded at base, 7–10 mm long, 6–9 mm wide. Seeds not winged but with narrow margins. *Ghost Gum*, *Desert Gum*, *Cabbage Gum*, *Carbeen*. Figs 13, 39C–D.

Widespread in the Pilbara and Kimberley regions and the Rawlinson Ra., W.A., through most of N.T. and in northern and eastern Qld, as far S as Thylungra and Quilpie. Grows in open forest and woodland, alluvial plains, hills and plateaus, in loamy and lateritic soils. Common in Papua New Guinea. Regions: PILB, KIMB, ARNM, BKLY, CYRK, BURD, THOM, DWSN, WRGO. Map 2.

W.A.: 59 km SW of Kalumburu Mission, *N.H.Speck 4930* (BRI, CANB, FRI, NT, K). N.T.: Waterhouse Ra., *P.K.Latz 6351* (CANB, DNA, FRI, NT); Oenpelli, *R.L.Specht 1085* (AD, BRI, CANB, FRI, K, MEL, NSW, PERTH.). Qld: 50 km E of Barcardine towards Jericho, *M.I.H.Brooker 7862* (BRI, FRI); 84 km NW of Quilpie towards Windorah, *D.A.Kleinig 157* (FRI).

Distinguished by the smooth white bark, condensed conflorescences and fragile fruits. Peduncle longer than in related species. Well-known as the frequent subject of paintings by Aboriginal artists in the N.T.

3. *Eucalyptus grandifolia* R.Br. ex Benth., *Fl. Austral.* 3: 250 (1867)

T: islands of the Gulf of Carpentaria [i.e. Sweers Is. and Allen Is.], [Qld], 17–20 Nov. 1802, *R.Brown*; holo: K; iso: BM, E, FRI, K, MEL, NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* no. 61 (1973); S.Kelly *et al.*, *Eucalypts* 2: fig. 10 (1983).

Tree to 15 m, deciduous. Bark smooth, white or light grey throughout, sometimes scaly at the base. Juvenile leaves shortly petiolate, ovate or broadly lanceolate, glabrous or setose on the petiole and midvein. Adult leaves alternate or sometimes opposite, petiolate, ovate to broadly elliptic-lanceolate, acute or acuminate, thick; lamina 12–15 cm long, 5–8 cm wide, shining, bright green, with crinkled or undulate margins, rounded to cordate at base, slightly discolorous; lateral veins prominent, at 45°–60°; intramarginal vein double, one almost at margin, the other up to 4 mm from margin; petiole flattened or channelled, 1–1.5 cm long. Conflorescence an axillary, condensed panicle, many-flowered, sessile or on terete peduncle 1–2 mm long; pedicels 15–30 mm. Buds obovoid to pyriform; operculum hemispherical-conical, acuminate, 2–7 mm long, 7–10 mm wide; hypanthium obconical, 4–12 mm long, 6–10 mm wide. Fruits truncate-ovoid to suburceolate, 10–18 mm long, 8–14 mm wide. Seeds not winged. *Cabbage Gum*, *Large-leaved Cabbage Gum*. Fig. 39E–F.

Occurs in the Kimberley, W.A., with outlying localities near Port Hedland, in north-western N.T. and on Groote Eylandt, N.T., and around the southern edge of the Gulf of Carpentaria, Qld, including coastal islands. Grows in open forest and woodland on river and creek flats and near swamps. Regions: KIMB, PILB, ARNM, BKLY, CARP, BURD. Map 3.

W.A.: Mt Harris, June 1905, *W.V.Fitzgerald* (NSW, PERTH). N.T.: 53 km from Katherine towards Willeroo, *M.I.H.Brooker* 4184 (FRI, K, NSW, NT); 114 km S of Adelaide R. turn-off, *J.R.Maconochie* 628 (BRI, FRI, NT). Qld: Gilbert R., *C.T.White* 1393 (BRI, K, NSW); 14 km NW of Green Hills Stn, *N.H.Speck* 4711 (BRI, CANB, NT).

May be recognised especially by the smooth bark, broad, shining leaves with crinkled margins and long petioles, and by the long pedicels. Buds and fruits larger than in related species. One of few ±deciduous eucalypts.

4. *Eucalyptus confertiflora* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 96 (1859)

T: between the Victoria R. and Gilbert R., [N.T.], *F.Mueller*; not found; W of Katherine, N.T., 25 Oct. 1946, *S.T.Blake* 17300; neo: BRI, *fide* S.T.Blake, *Austral. J. Bot.* 1: 216 (1953); isoneo: K, MEL, NSW.

E. clavigera var. *diffusa* Blakely & Jacobs in W.F.Blakely, *Key Eucalypts* 75 (1934). T: North Coast [i.e. Inglis Is.], 24 Feb. 1803, *R.Brown*; lecto: NSW, *fide* S.T.Blake, *loc. cit.*; isoleccto: BM, K, FRI, MEL, NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 62 (1973); S.Kelly *et al.*, *Eucalypts* 2: fig. 12 (1983).

Tree to 15 m, often straggly or crooked, ±deciduous. Bark tessellated, grey or grey-brown to 8 m, smooth and white above. Juvenile leaves sessile or shortly petiolate, broadly lanceolate, cordate, scabrous, discolorous. Leaves on mature trees opposite or alternate, sessile or petiolate, ovate, elliptic or broadly lanceolate, obtuse, thick; lamina 7.5–15 cm long, 2.5–10 cm wide, green, scabrous but wearing smooth, concolorous; lateral veins prominent, at 50°–70°; intramarginal vein close to margin, lateral veins often uniting to form a second irregular vein up to 6 mm from margin; petiole absent or terete, up to 2 cm long. Conflorescence axillary, compound, many-flowered, sessile or on terete peduncle up to 18 mm long; pedicels 1–2 cm long, striate when dry. Buds pyriform; operculum apiculate, c. 2 mm long, 4–5 mm wide; hypanthium obconical, 3–5 mm long, 4–5 mm wide. Fruits truncate-ovoid, 7–14 mm long, 6–10 mm wide. Seeds not winged. *Broad-leaved Carbeen*, *Carbeen Gum*. Fig. 39G–H.

Widespread in northern Australia from the Kimberley, W.A., through N.T. to Cape York Peninsula, Qld; an outlier near Port Hedland, W.A.; also in Papua New Guinea. Grows in open woodlands and forests on plains and levees in lateritic and sandy soils, often associated with limestone. Regions: PILB, KIMB, ARNM, BKLY, CARP, CYRK, BURD. Map 4.

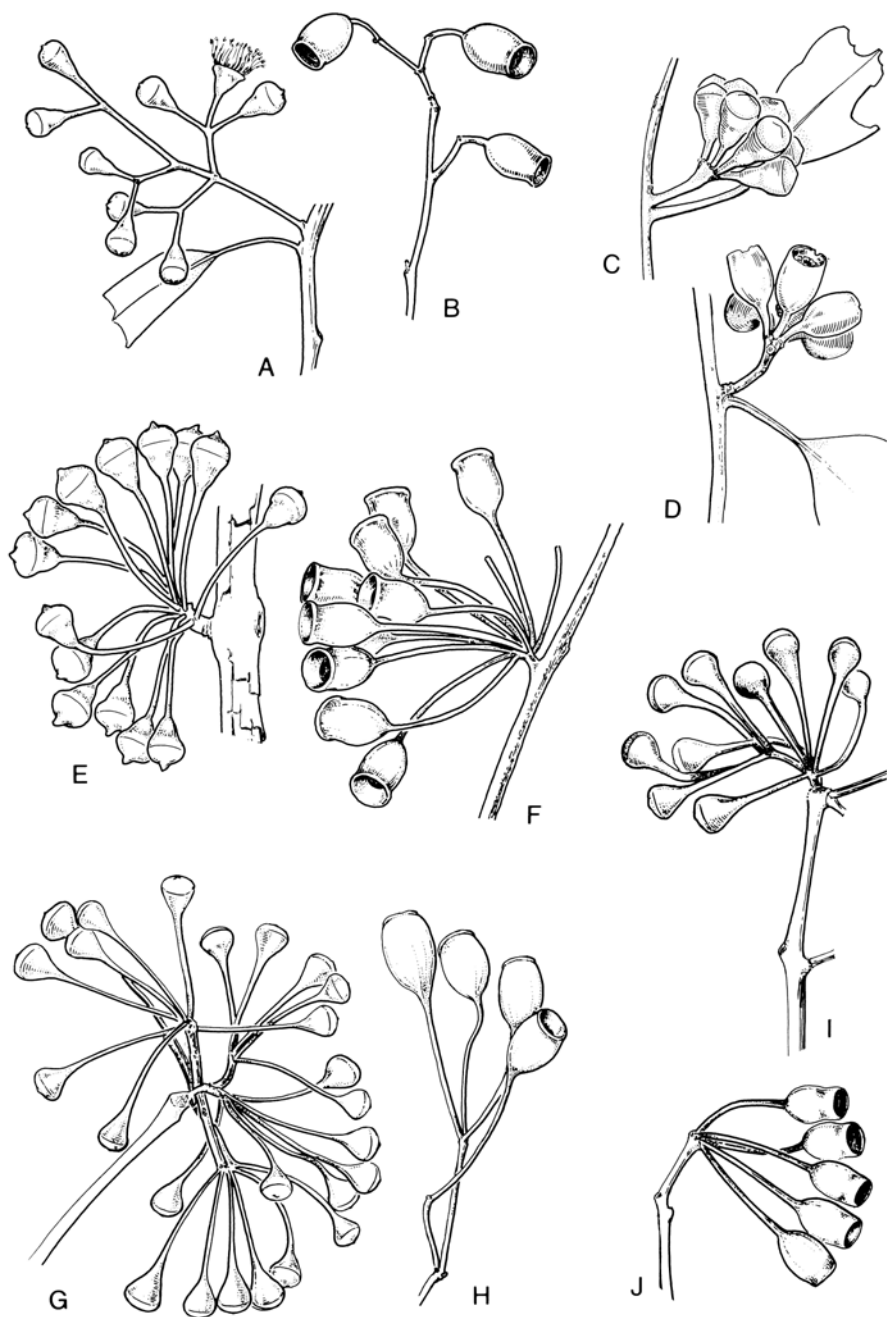


Figure 39. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. tessellaris* (**A**, I.Brooker 4057, FRI; **B**, S.Blake 18478, FRI). **C–D**, *E. papuana* (**C**, J.Maconochie 2282, FRI; **D**, P.Latz 1827, FRI). **E–F**, *E. grandifolia* (**E**, I.Brooker 4233, FRI; **F**, 8 km W of Bathurst Is. Mission, N.T., Stevenson, FRI). **G–H**, *E. confertiflora* (**G**, I.Brooker 4166, FRI; **H**, C.Dunlop 1864, FRI). **I–J**, *E. clavigera* (**I**, N.Byrnes 934, FRI; **J**, I.Brooker 4318, FRI). **G**, **H** drawn by M.May. Others drawn by M.Risby.

W.A.: Boodarie, *S.L.Everist* 9200 (BRI); 11 km N of Karunjie Stn, *R.A.Perry* 3158 (AB, BRI, CANB, FRI, K, MEL, PERTH). N.T.: c. 38 km SE of Mountnorris Bay, *G.M.Chippendale* 8130 (AD, CANB, K, MEL, NSW, NT). Qld: near Lynd Stn, *N.H.Speck* 4670 (BRI, CANB, NT, PERTH); 3 km W of Chillagoe, *M.I.H.Brooker* 3371 (BRI, CANB, DNA, FRI, NSW).

Similar to *E. grandifolia* but distinguished by the tessellated bark and in having in the mature crown mostly opposite leaves which are scabrous when young, and remain so at base of midvein; also \pm deciduous.

5. *Eucalyptus clavigera* Cunn. ex Schauer in W.G.Walpers, *Repert. Bot. Syst.* 2: 926 (1843)

T: Careening Bay, [W.A.], Oct. 1820, *A.Cunningham* 242; holo: K; iso: BM, BRI, FRI, NSW.

E. polysciada F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 98 (1859). T: between Providence Hill and the Fitzmaurice R., [N.T.], Oct. 1855, *F.Mueller*; holo: MEL; iso: K.

Illustrations: N.Hall & M.I.H. Brooker, *Forest Tree Ser.* No. 116 (1973); S.Kelly *et al.*, *Eucalypts* 2: fig. 11 (1983).

Tree to 10 m. Bark tessellated, grey to 3 m, smooth and grey to grey-white above. Juvenile leaves petiolate, ovate, setulose on petiole and veins of the undersurface. Adult leaves mostly alternate, sometimes opposite, petiolate, lanceolate or broadly lanceolate, acute, usually rounded, thick; lamina 11–19 cm long, 2–4 cm wide, grey-green, concolorous; lateral veins prominent, at 40°–60°; intramarginal vein up to 1 mm from margin; petiole 1–2 cm long. Conflourescence axillary, compound; umbels up to 11-flowered, sessile or on peduncle up to 3.5 cm long; pedicels 1.2–2.2 cm long. Buds clavate; operculum c. 2 mm long, 5–6 mm wide; hypanthium obconical, 5–6 mm long and wide. Fruits truncate-ovoid, venulose, 9–10 mm long, 8–9 mm wide. Seeds not winged but with a rudimentary margin. *Apple Gum*, *Cabbage Gum*. Fig. 39 I–J.

Occurs from the Kimberley, W.A., to Arnhem Land, N.T., including coastal islands; in open forest, on coastal plains, river terraces and low rocky hills; in shallow lateritic and sandy soils. Regions: KIMB, ARNM. Map 5.

W.A.: 11 km NNW of Kalumburu Mission, *N.H.Speck* 4912 (BRI, CANB, FRI); Broome, *C.A.Gardner* 7025 (PERTH). N.T.: S of Pickataramoor Mission, Melville Is., *M.I.H.Brooker* 3231 (BRI, DNA, FRI, NSW); 50 km S of Katherine, *G.M.Chippendale* 3884 (AD, BRI, MEL, NSW, NT); Oenpelli, *R.L.Specht* 1302 (BRI, K, MEL, NSW, PERTH).

Recognised by the tessellated bark on lower trunk, and the long, slender peduncle and pedicels.

6. *Eucalyptus kombolgiensis* Brooker & Dunlop, *Austral. Forest Res.* 8: 212 (1978)

T: Mt Brockman, Koongarra Jump-up, N.T., 6 Dec. 1977, *C.R.Dunlop* 4625; holo: FRI; iso: BRI, CANB, DNA, K, NSW, NT.

Illustrations: M.I.H. Brooker & C.R. Dunlop, *op. cit.* figs 5–7; S.Kelly *et al.*, *Eucalypts* 1: fig. 270 (1983).

Tree to 10 m. Bark tessellated, grey to 3 m, smooth and cream-yellow or cream-orange above. Juvenile leaves broadly lanceolate. Adult leaves subopposite to alternate, petiolate, lanceolate, apiculate; lamina 10–21 cm long, 1–2.5 cm wide, green, concolorous; lateral veins at 50°–60°; intramarginal vein up to 2 mm from margin; petiole 6–14 mm long. Conflourescence axillary, of 2 decussate pairs of umbels; umbels 7–11-flowered; peduncle 8–10 mm long; pedicels 7–15 mm long. Buds clavate; operculum low conical, c. 2 mm long, 3–4 mm wide; hypanthium obconical to campanulate, c. 3 mm long, 3–4 mm wide. Fruits suburceolate or truncate-ovoid, 8–12 mm long, 6–7 mm wide. Seeds not winged. Fig. 40A–B.

Occurs W and NW of and near Pine Creek, N.T.; grows in open forest on sandstone scarp country. Region: ARNM. Map 6.

N.T.: Little Nourlangie Rock, *C.R.Dunlop* 4647 (DNA, FRI); Umbrawarra Gorge, *C.R.Dunlop* 4598 (DNA, FRI, K, NSW, NT); NE of Maranboy Police Stn, *M.I.H.Brooker* 4170 (FRI, NSW).

Differs from *E. clavigera* in the smooth creamy-orange bark on upper trunk and branches, the lanceolate leaves with many lateral veins and the slightly smaller buds.

7. *Eucalyptus gilbertensis* (Maiden & Blakely) S.T.Blake, *Austral. J. Bot.* 1: 220 (1953)

E. clavigera var. *gilbertensis* Maiden & Blakely in J.H.Maiden, *Crit. Revis. Eucalyptus* 7: 432, t. 283 fig. 8 (1928). T: Gilbert R., Qld, 11 Feb. 1922, *C.T.White* 1392; holo: NSW; iso: BRI, MEL.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 175 (1975); S.Kelly *et al.*, *Eucalypts* 2: fig. 13 (1983).

Tree to 10 m, often several-stemmed or crooked. Bark tessellated, grey to c. 1.5 m, smooth and white, grey or pink-grey above. Juvenile leaves sessile or very shortly petiolate, broadly lanceolate, often subcordate, scabrous. Adult leaves opposite or alternate, petiolate, broadly to narrowly lanceolate, thick; lamina 6–13 cm long, 0.8–2 cm wide, grey-green; lateral veins at 60°–80°; intramarginal vein up to 1 mm from margin; petiole terete, 5–10 mm long. Conflourescence an axillary, condensed panicle; umbels 3–7-flowered; peduncle terete, but striate when dry, 4–5 mm long; pedicels terete, but striate when dry, 7–15 mm long. Buds turbinate; operculum saucer-shaped, apiculate, 1–2 mm long, 5–6 mm wide; hypanthium obconical, 5–6 mm long and wide. Fruit cylindrical, 8–12 mm long, 6–9 mm wide. Seeds with a rudimentary margin. *Gilbert River Bloodwood*. Fig. 40C–D.

Occurs mainly in the Gilbert R. area, Qld, but with disjunct occurrences on Cape York Peninsula and at Tranby. Grows in woodland on stony ridges and among hills. Regions: CYRK, CARP, DWSN, THOM. Map 7.

Qld: Esmeralda, *S.T.Blake* 19622 (BRI, CANB, NSW); 35 km NW of Mt Carbine, *M.I.H.Brooker* 4013 (BRI, NSW, FRI, MEL); Gilbert R., *C.T.White* 1392 (BRI, CANB, NSW); Claudie R., 10 Nov. 1974, *A.C.Robinson s.n.* (BRI); Tranby, *S.T.Blake* 11444 (BRI).

Juvenile leaves often persistent. Has a shorter stocking of rough bark than *E. kombolgiensis*, and smaller leaves and smaller umbels.

8. *Eucalyptus aspera* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 95 (1859)

T: Depot Creek, [N.T.], Mar. 1856, *F.Mueller*; syn: BRI, MEL; Upper Victoria River, [N.T.], Dec. 1855, *F.Mueller*; syn: K, NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 171 (1974); S.Kelly *et al.*, *Eucalypts* 1: fig. 13 (1983).

Tree to 9 m, often straggly. Bark mostly smooth, white or pale grey, but often scaly and tessellated at base. Juvenile leaves shortly petiolate, ovate, cordate, obtuse, 6–10 cm long, 4–5 cm wide, setulose mostly on veins beneath and stems. Leaves on mature trees subopposite or alternate, sessile or almost so, lanceolate to broadly lanceolate, truncate or cordate, thick, scabrous, becoming smooth; lamina 6–7 cm long, 2–3 cm wide, grey-green, rarely green; lateral veins at 60°–80°; intramarginal vein up to 2 mm from margin. Conflourescence an axillary, condensed panicle; umbels 3-flowered, sessile or almost so; pedicels 3–7 mm long. Buds clavate; operculum c. 1 mm long, 3 mm wide; hypanthium cupular, 3–4 mm long, c. 3 mm wide. Fruits truncate-ovoid, 5–10 mm long, 4–9 mm wide. Seeds with a rudimentary margin. *Brittle Range Gum* (W.A.), *Desert Bloodwood*, *Snappy Gum* (N.T.). Fig. 40E–F.

Occurs in the Pilbara, Great Sandy Desert and east Kimberley, W.A., throughout northern and central N.T., and in far north-western Qld; grows in sandy and stony soil in low open woodland on quartzite and sandstone hills, ridges and plateaus. Regions: PILB, KIMB, SNDY, ARNM, TNMI, BKLY, MACD, CARP, THOM. Map 8.

W.A.: Deception Ranges, *N.H.Speck* 5019 (BRI, FRI, PERTH). N.T.: 13 km N of Renner Springs, *G.M.Chippendale* 3903 (AD, BRI, CANB, NSW, NT); S of Newcastle Waters, *M.R.Jacobs* 144 (BRI, FRI); 64 km SE of Timber Ck Police Stn, *R.A.Perry* 2874 (AD, CANB, K, NSW, NT, MEL, PERTH). Qld: Lake Moondarra, *P.Ollerenshaw* 1207 (BRI, CBG).

Distinguished by opposite, scabrous juvenile and intermediate leaves persisting on mature trees, the true adult leaves rarely being seen. Other features are the smooth white bark often with a tessellated stocking, and the ±sessile umbels.

9. *Eucalyptus ferriticola* Brooker & Edgecombe, *Nuytsia* 5: 373 (1986)

T: Wittenoom Gorge, W.A., 30 Oct. 1983, *M.I.H.Brooker 8314* & *W.B.Edgecombe*; holo: PERTH; iso: FRI, K, MEL, NSW.

Illustration: *M.I.H.Brooker & W.B.Edgecombe, op. cit.* 374 fig. 1, 375 fig. 2 (1986).

Tree or mallee to 8 m. Bark smooth throughout, green to pink. Juvenile leaves opposite, petiolate, ovate, dull, light green. Adult leaves alternate, petiolate, narrowly lanceolate to lanceolate, acuminate to rostrate; lamina 5–10 cm long, 1–1.5 cm wide, dull, grey-green; lateral veins faint, at 45°–60°; intramarginal vein up to 1 mm from margin; petiole 6–15 mm long. Conflouescence axillary, compound; umbels many-flowered; peduncle c. 2 mm long; pedicels 1–2 mm long. Buds clavate; operculum hemispherical, 1–2 mm long, 2–3 mm wide; hypanthium obovoid, 2–3 mm long, 3–4 mm wide. Fruits cylindrical to ovoid, 5–9 mm long, 4–7 mm wide. Fig. 40G–H.

Occurs at Mt Augustus and in the Hamersley Ra. and Ophthalmia Ra., W.A., as isolated trees in gorges and on steep slopes, often in ironstone crevices. Region: PILB. Map 9.

W.A.: Hamersley Gorge, *M.I.H.Brooker 2169* (PERTH); Mt Nameless, *M.I.H.Brooker 8316* & *W.B.Edgecombe* (FRI, MEL, NSW, PERTH).

Distinguished from *E. aspera* by the greenish pink bark, smooth adult leaves, and cylindrical to ovoid fruits. Usually a smaller tree than *E. aspera* and grows in more rugged situations.

Ser. 2 Terminaliptera

Eucalyptus ser. *Terminaliptera* Maiden, *Crit. Revis. Eucalyptus* 7: 105 (1925).

Type: *E. setosa* Schauer, lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 506 (1988).

E. ser. Corymbosae Blakely, *Key Eucalypts* 15, 73 (1934). T: *E. dichromophloia* F.Muell., lecto, *fide* G.M.Chippendale, *op. cit.* 496.

E. subser. Corymbosae Benth., *Fl. Austral.* 3: 198, 253 (1867). T: *E. gummifera* (Sol. ex Gaertner) Hochr.

Trees, sometimes shrubby, sometimes deciduous. Bark tessellated throughout and persistent, or smooth and deciduous, or persistent, rough below and smooth above. Juvenile leaves opposite for many pairs, often subsessile, sometimes peltate or connate, commonly setose. Adult leaves usually alternate, petiolate, concolorous or discolorous; intramarginal vein close to or confluent with margin. Conflouescences terminal corymbose panicle; umbels 3–11-flowered. Buds ovoid, clavate, obovoid, pyriform or subglobular. Fruits truncate-ovoid, pyriform, globular, subglobular or urceolate, usually woody; disc steeply descending; valves 4 or 5, deeply included. Seeds usually strongly winged at one end, sometimes wingless or with a rudimentary wing-like margin, usually yellow-brown.

A series of 44 species mainly in northern W.A., N.T. and Qld, several extending to P.N.G.; also 3 in south-western W.A., several in S.A. and N.S.W. Characterised by the large terminal panicles woody fruit and usually winged seeds. Outer operculum usually shed early.

D.J. & S.G.M.Carr, *Eucalyptus* 1, New or little-known species of the *Corymbosae* (1985).

10. *Eucalyptus setosa* Schauer in W.G.Walpers, *Repert. Bot. Syst.* 2: 926 (1843)

T: islands of the Gulf of Carpentaria, [Qld], 20 Nov. 1802, *R.Brown & F.Bauer s.n.*; holo: W; iso: BM, BRI, E, FRI, K, MEL, NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 42 (1972), S.Kelly *et al.*, *Eucalypts* 1: t. 14 (1983).

Tree mostly to 6 m, sometimes to 9 m, straggly. Bark rough, flaky or tessellated, grey throughout. Juvenile leaves similar to, but smaller than leaves on mature trees. Leaves on mature trees opposite, sessile, lanceolate to broadly ovate, cordate, 5–10 cm long, 2.5–6 cm wide, sometimes scabrous, grey-green; lateral veins at 55°–75°, curved towards margin. Umbels 3–7-flowered; peduncle 12–25 mm long, setose; pedicels 4–8 mm long, setose. Buds ovoid to pyriform; operculum hemispherical-conical, 5–7 mm long, 7–8 mm wide; hypanthium truncate-ovoid, 9–11 mm long, 7–8 mm wide. Fruits pedicellate, ovoid to suburceolate, 15–25 mm long and wide, woody, setose when young, becoming smooth. Seeds winged at one end, yellow-brown. *Desert Bloodwood*, *Rough-leaved Bloodwood*. Fig. 40 I–J.

Widespread in the northern half of Australia from E of Winning Pool, W.A., through N.T. to near Charters Towers, Qld; grows on rocky hills, sand plains and sometimes on dunes. Regions: PILB, MRCH, KIMB, SNDY, ARNM, TNMI, MACD, BKLY, CARP, GGNA, CYRK, THOM. Map 10.

W.A.: Hooley Stn, *M.I.H. Brooker* 2142 (FRI, PERTH). N.T.: c. 27 km E of Wonarah Telegraph Stn, *G.M. Chippendale* 3840 (BRI, CANB, MEL, NSW, NT). Qld: c. 133 km NNW of Clermont, *L.G. Adams* 962 (BRI, CANB, NSW, K); near Normanton, *M. Lazarides* 4302 (BRI, CANB, MEL, NSW, NT, PERTH).

Distinguished by the opposite, sessile leaves on mature trees, and by the red or red-brown bristles or hairs on the younger leaves, the conflorescence and at least the immature fruits.

11. *Eucalyptus deserticola* D.Carr & S.Carr, *Fl. Australia* 19: 495; *Eucalyptus* II: 311 (1987) *nom. inval.*

Eucalyptus desertorum D.Carr & S.Carr, *Eucalyptus* 1: 102–106 (1985), *nom. illeg.* non Naudin (1891). T: 20°54'S, 123°13'E, Great Sandy Desert, W.A., 11 May 1979, *A.S. George* 15707; holotype: PERTH.

Illustrations: D.J. & S.G.M. Carr, *op. cit.* 104, 105.

Tree or mallee to 6 m. Bark tessellated throughout, pale brown. Juvenile leaves not seen. Adult leaves opposite, ovate, acute or apiculate, cordate; lamina 2–6 cm long, 1.2–2.7 cm wide, green, discolorous; lateral veins faint, at 60°–70°; intramarginal vein confluent with margin; petiole absent or up to 3 mm long. Umbels 7-flowered; peduncle terete, 5–17 mm long; pedicels 2–4 mm long. Mature buds not seen. Fruits ovoid, 12–17 mm long, 12–14 mm wide; disc broad; valves 4. Seeds not seen. Fig. 40K–L.

Known from scattered localities in the Hamersley Ra. and Great Sandy Desert, W.A., and near Central Mt Wedge, N.T. Grows in rocky, hilly areas and on red sand plains. Regions: PILB, SNDY, MACD. Map 11.

W.A.: Joffre Falls road, 3 km W of turn-off to Dales Gorge, Hamersley Range Natl Pk, 15 Aug. 1974, *J.H. Willis* (MEL, NSW). N.T.: Pulcarrinya Waterhole, *C.R. Dunlop* 2454 (FRI, MEL, NT).

Characterised by small tree or mallee habit, small opposite leaves which are sessile or very shortly petiolate and ovoid, shortly pedicellate fruits.

12. *Eucalyptus ferruginea* Schauer in W.G. Walpers, *Repert. Bot. Syst.* 2: 926 (1843)

T: Gulf of Carpentaria [Vanderlin Is.], [N.T.], 25 Dec. 1802, *R. Brown* & *F. Bauer s.n.*; holotype: W; isotype: BRI, E, K, MEL, NSW.

Illustrations: N. Hall & M.I.H. Brooker, *Forest Tree Ser.* No. 46 (1972); S. Kelly *et al.*, *Eucalypts* 2: t. 14 (1983).

Tree to 12 m, spreading. Bark irregularly tessellated or flaky throughout, grey or grey-brown. Juvenile leaves very shortly petiolate, oblong-lanceolate, 5–8 cm long, 4–5 cm wide, with red-brown radiating hairs and short bristles. Leaves on mature trees opposite, petiolate or subsessile, oblong-ovate, obtuse and cuspidate or acute to acuminate, cordate; lamina 8–15 cm long, 3–7 cm wide, with radiating hairs and short bristles, red-brown to grey-green, often undulate, ±discolorous; lateral veins at 50°–65°; petiole up to 5 mm long. Umbels 3–7-flowered; peduncle terete to compressed, 10–15 mm long, with rust-brown

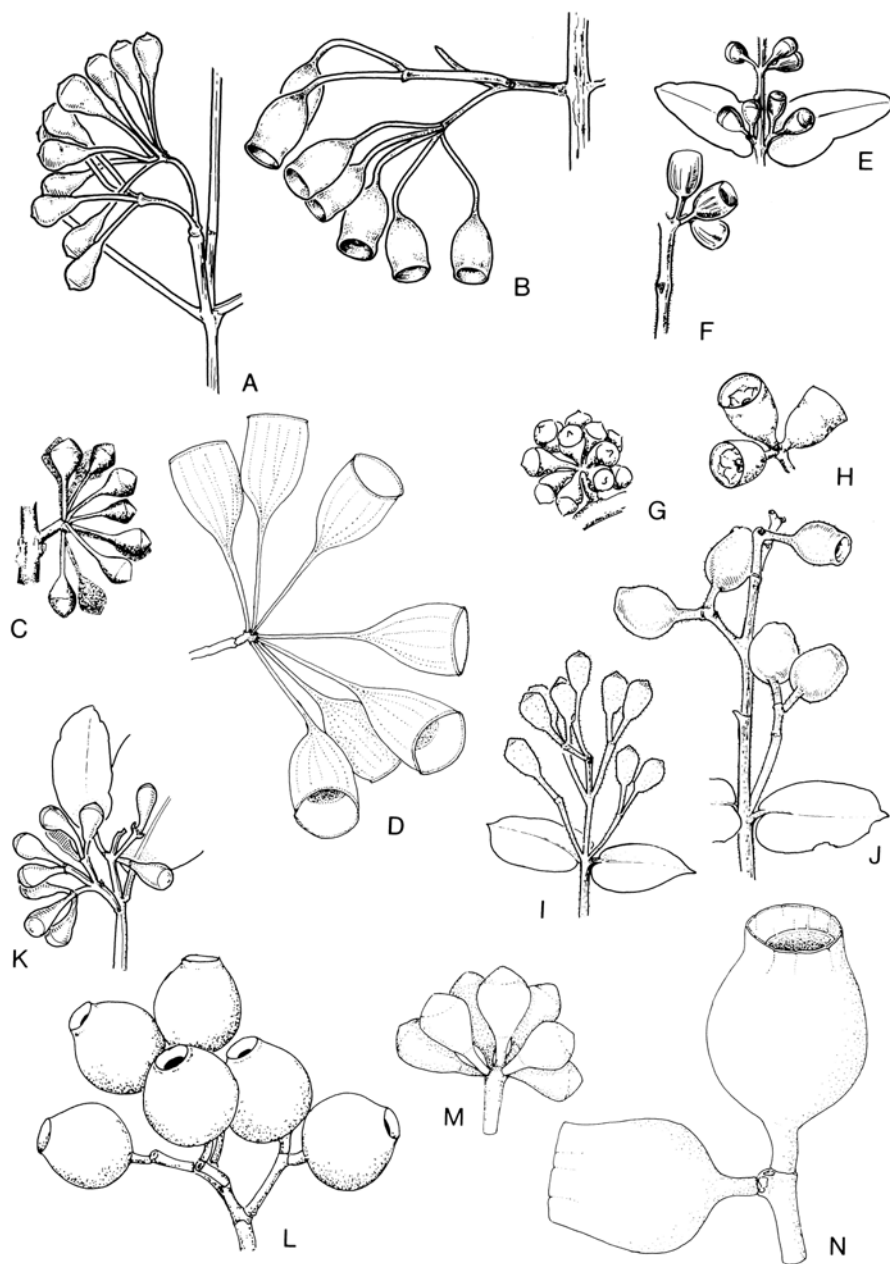


Figure 40. *Eucalyptus* buds and fruits, all $\times 1$, unless otherwise stated. **A–B**, *E. kombolgiensis* (**A**, I.Brooker 5340, FRI; **B**, C.Dunlop 4633, FRI). **C–D**, *E. gilbertensis* (**C**, Croydon, Qld, L.Johnson & L.Pryor, FRI; **D**, J.Turnbull 400, FRI). **E–F**, *E. aspera* (**E**, W.McReaddie 1, FRI; **F**, R.Perry 1659, FRI). **G–H**, *E. ferritcola* (**G**, I.Brooker 8314, FRI; **H**, I.Brooker 8196, FRI). **I–J**, *E. setosa* $\times 0.5$ (**I**, P.Latz 1814, FRI; **J**, C.Dunlop 1789, FRI). **K–L**, *E. deserticola* (I.Brooker 8213, FRI). **M–N**, *E. ferruginea* (**M**, T.Hartley 14608, FRI; **N**, C.Dunlop 4316, FRI). **A**, **B**, **E**, **F**, **I–L**, drawn by M.Risby. Others drawn by M.May.

bristle-like glands; pedicels up to 4 mm long. Buds clavate to pyriform, 10–12 mm long, 5–10 mm wide. Fruits shortly pedicellate, ovoid, subglobular or suburceolate, 18–25 mm long, 15–18 mm wide. Seeds winged at one end, yellow-brown. *Rusty Bloodwood*. Fig. 40M–N.

Occurs from the Kimberley, W.A., through northern N.T., including several islands, to far north-western Qld; usually grows in flat, sandy, open forests. Regions: KIMB, ARNM, BKLY, CARP. Map 12.

W.A.: c. 117 km NE of Karunjie, *R.A.Perry 3162* (CANB, FRI, MEL, NSW, PERTH). N.T.: c. 13 km S of Elliott, *P.K.Latz 190* (AD, BRI, FRI, NT); 1.6 km S of Mataranka, *J.R.Maconochie 570* (FRI, NSW, NT). Qld: near Westmoreland, *R.C.Carolin 9189* (NSW).

Distinguished by the leaves in all stages having red-brown radiating hairs and bristles, the adult leaves glabrescent; the opposite, shortly petiolate leaves are also characteristic.

13. *Eucalyptus abbreviata* Blakely & Jacobs in W.F.Blakely, *Key Eucalypts* 77 (1934)

T: c. 32 km along Maranboy Road from Katherine, N.T., July 1933, *M.R.Jacobs 105*; holo: NSW; iso: BRI, FRI.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 177 (1975); S.Kelly *et al.*, *Eucalypts* 2: t. 15 (1983).

Tree to 6 m, scraggy. Bark flaky or irregularly tessellated throughout, grey or grey-brown to yellow-brown. Juvenile leaves broadly lanceolate, 6–9 cm long, 2–3 cm wide, white stellate-hairy. Leaves on mature trees opposite, sessile or petiolate, narrowly ovate, lanceolate or oblong-lanceolate, thick; lamina 7–16 cm long, 3–8 cm wide, acute or acuminate, cordate or amplexicaul, sparsely hispid, yellow-green, concolorous; lateral veins at 50°–65°; intramarginal vein irregular, usually close to margin; petiole absent or up to 5 mm long. Umbels 3–7-flowered; peduncle thick, 15–25 mm long, bristly when young; pedicels absent or up to 3 mm long. Buds clavate, pyriform or obovoid; operculum patelliform, c. 2 mm long, 5–7 mm wide; hypanthium obconical or suburceolate, 8–10 mm long, 7–8 mm wide. Fruits sessile or shortly pedicellate, globular to urceolate, 2–3 cm long, 1.7–2.5 cm wide. Seeds winged at one end, yellow-brown. *Scraggy Bloodwood*. Fig. 41A–B.

Occurs in the north-eastern Kimberley, W.A., and in adjoining areas of the N.T.; grows in open woodland on flat seasonally flooded and slightly sloping areas. Regions: KIMB, ARNM, BKLY. Map 13.

W.A.: 143 km from King R. crossing, *M.I.H.Brooker 4248* (BRI, FRI, NT, PERTH); 48 km SW of Wyndham, *N.H.Speck 5018* (BRI, CANB). N.T.: 93 km SW of Dorisvale Stn, *R.A.Perry 2832* (AD, BRI, CANB, FRI, K, MEL, NSW, NT); 19 km SE of Willeroo Stn, *R.A.Perry 2840* (AD, BRI, CANB, FRI, K, MEL, NSW, PERTH).

The sparsely hispid yellow-green leaves are distinctive. Peduncle longer than in related species. Leaves of mature trees usually intermediate, not adult.

14. *Eucalyptus zygophylla* Blakely, *Key Eucalypts* 88 (1934)

T: Broome, W.A., Apr. 1905 & July 1906, *W.V.Fitzgerald*; lecto: NSW, *fide* S.T.Blake, *Austral. J. Bot.* 1: 262 (1953); isolecto: PERTH.

Illustrations: J.H.Maiden, *Crit. Revis. Eucalyptus* 4: t. 158, fig. 8b (1919) as *E. setosa*; S.Kelly *et al.*, *Eucalypts* 2: t. 25 (1983).

Tree or shrub to 2.5 m, rarely to 8 m. Bark tessellated throughout, grey-brown. Juvenile leaves not seen. Leaves on mature trees opposite, sessile, oblong to lanceolate, acuminate, usually cordate, thick; lamina 6–11 cm long, 2–3 cm wide, grey-green, concolorous or slightly discolorous; lateral veins fine, at 50°–70°; intramarginal vein confluent with margin. Umbels 3–7-flowered; peduncle thick, 7–15 mm long; pedicels absent or up to 3 mm long. Buds pyriform; operculum hemispherical-conical, apiculate, 2–3 mm long, 6–8 mm wide; hypanthium truncate-pyriform, 7–9 mm long, 7–8 mm wide. Fruits sessile to shortly pedicellate, ovoid, globular or urceolate, 20–35 mm long, 20–30 mm wide. Seeds winged at one end, yellow-brown. *Broome Bloodwood*. Fig. 41C–D.

Occurs in the Pilbara and Kimberley regions and the northern Great Sandy Desert, W.A.; grows in shallow sandy and rocky soil. Regions: KIMB, PILB, SNDY. Map 14.

W.A.: Hardman Ck, *N.Byrnes* 2232 (NT, PERTH); 3.2 km NE 13 Bore, Warimbah Stn, *M.Lazarides* 6488 (BRI, CANB, MEL, NSW, NT, PERTH); 55 km NE Fitzroy Crossing, *M.Lazarides* 6493 (CANB, PERTH).

Distinguished by the opposite sessile glabrous leaves.

15. *Eucalyptus lamprocalyx* Blakely, *Key Eucalypts* 323 (1934)

E. lamprocarpa Blakely, *Key Eucalypts* 87 (1934), *nom. illeg.* non Miq. (1856). T: near Meda, West Kimberley, W.A., April 1905, *W.V.Fitzgerald*; *holo*: NSW; *iso*: PERTH.

Eucalyptus perfoliata R.Br. ex Benth., *Fl. Austral.* 3: 253 (1867) *nom. illeg.* non Desf. (1829). T: Roe R., NW coast, [W.A.], 13 Sept. 1820, *A.Cunningham* 238; *syn*: K; *isosyn*: BM, FRI; NW coast, W.A., *B.Bynoe*; *syn*: K.

Illustrations: J.Turnbull & N.Hall, *Forest Tree Ser.* No. 101 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 16 (1983).

Tree or shrub to 6 m, usually crooked, spreading. Bark tessellated throughout, grey to grey-brown. Juvenile leaves shortly petiolate, broadly lanceolate, hairy on margin. Leaves on mature trees opposite, sessile, broadly lanceolate to oblong-lanceolate, the pairs connate, thick; lamina 12–25 cm long, 5–8 cm wide, grey-green, concolorous; lateral veins prominent, at 70°–85°; intramarginal vein confluent or almost so with margin. Umbels 7–11-flowered; peduncle thick or slightly flattened, 12–25 mm long; pedicels thick, up to 3 mm long. Buds obovoid or pyriform; operculum depressed hemispherical, apiculate, 4–5 mm long, 5–6 mm wide; hypanthium truncate-pyriform, 8–12 mm long, 8–10 mm wide. Fruit shortly pedicellate or sessile, truncate-ovoid or urceolate, 30–40 mm long, 20–30 mm wide. Seeds winged at one end, yellow-brown. *Twin-leaved Bloodwood*. Fig. 41E–F.

Occurs in the western Kimberley, W.A., including Byam Martin Is., in open woodland on flat areas and steep slopes. Region: KIMB. Map 15.

W.A.: 9.7 km W of Beverley Springs Homestead, *A.S.George* 12219 (FRI, PERTH); 9.7 km NE of Mt Eliza, *W.V.Fitzgerald* 707 (NSW, PERTH); 9.7 km SE of Mt House Stn, *M.Lazarides* 5169 (BRI, CANB, K, NSW, PERTH).

Distinct in the large, thick, mostly connate leaves on mature trees. For discussion on the application of the name *E. lamprocalyx*, see D.J. & S.G.M.Carr, *Eucalyptus* II: 239–249 (1987).

16. *Eucalyptus ptychocarpa* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 90 (1859)

T: Gulf of Carpentaria [NE of the present Nutwood Downs Homestead], [N.T.], 22 July 1856, *F.Mueller*; *holo*: K.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 117 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 16 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 213 (1984).

Tree to 20 m. Bark ±tessellated or fibrous throughout, grey-brown. Juvenile leaves petiolate, elliptic. Adult leaves mostly alternate, narrowly ovate to lanceolate, acute or acuminate, thick; lamina 20–30 cm long, 5–13 cm wide, green or grey-green, strongly discolorous; lateral veins many, prominent, at 65°–80°; intramarginal vein confluent with margin; petiole 25–40 mm long. Umbels 3–7-flowered; peduncle thick, terete, up to 30 mm long; pedicels thick, 10–30 mm long. Buds obovoid or clavate, coarsely ribbed; operculum depressed hemispherical or conical, 6–10 mm long, 10–15 mm wide; hypanthium truncate-obovoid, 15–20 mm long, 10–18 mm wide. Fruits truncate-ovoid or cylindrical, strongly ribbed, 3.5–4.5 cm long, 2.5–3.5 cm wide. Seeds winged at one end, yellow-brown. *Spring Bloodwood*. Cover, Fig. 41G–H.

Occurs in the Kimberley, W.A., northern N.T. including coastal islands, and near Wollongorong, far north-western Qld; usually grows near moist sites such as springs, creeks and at the base of hills. Regions: KIMB, ARNM, BKLY, CARP. Map 16.

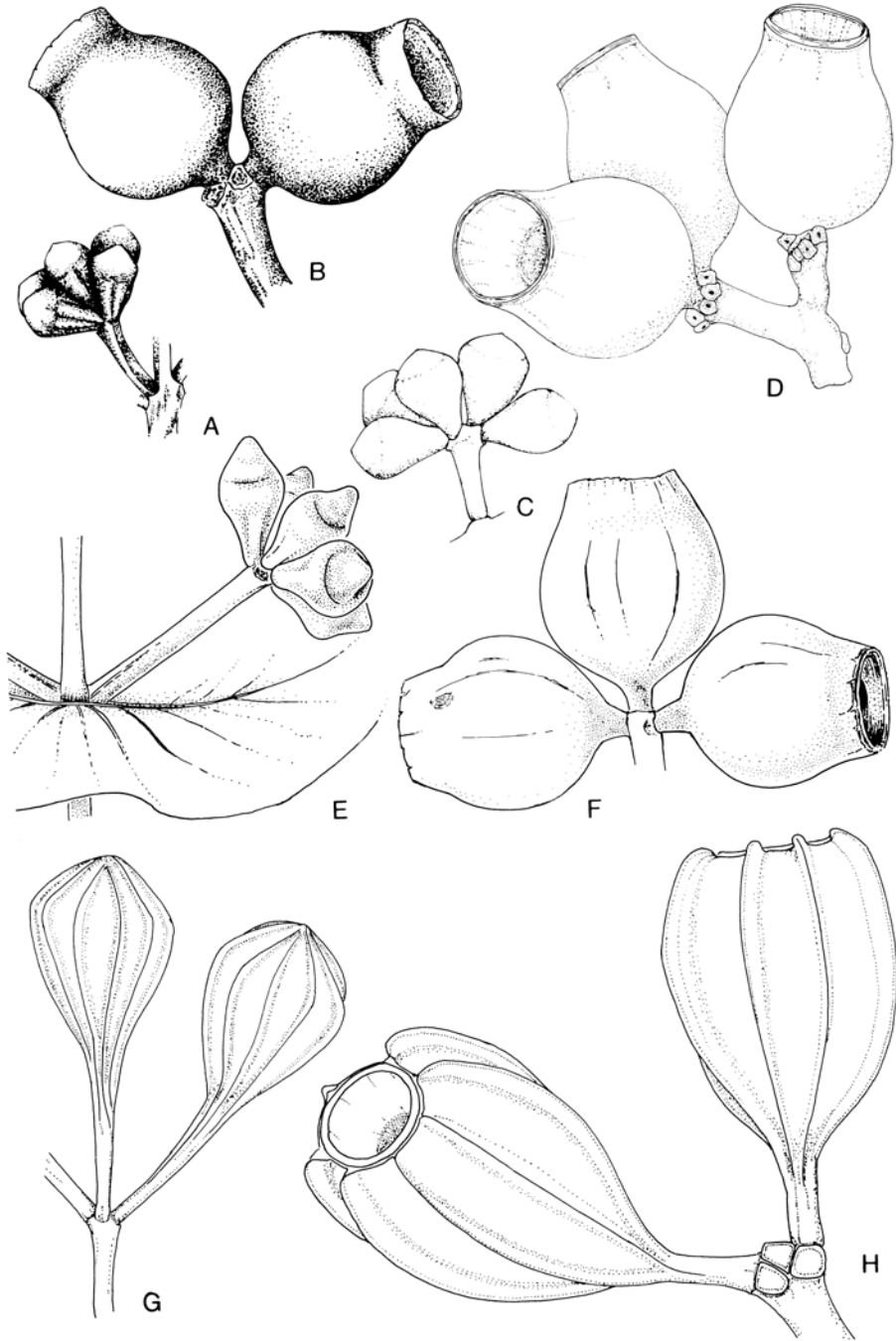


Figure 41. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. abbreviata* (**A**, between Katherine and Marranboy, N.T., M.Jacobs, FRI; **B**, R.Perry 2840, FRI). **C–D**, *E. zygomphylla* (**C**, E.Larsen 495, FRI; **D**, I.Brooker 4234, FRI). **E–F**, *E. lamprocalyx* (**E**, C.Gardner 9795, FRI; **F**, G.Taylor 40, FRI). **G–H**, *E. ptychocarpa* (**G**, J.McKean B.182, FRI; **H**, T.Hartley 14419, FRI). **E**, **F** drawn by M.Risby. Others drawn by M.May.

W.A.: 55 km SE of Kimberley Research Stn, *R.A.Perry* 2941 (BRI, K); Cockatoo Spring, *C.A.Gardner* 7231 (PERTH). N.T.: NE of Maranboy Police Stn, *M.I.H.Brooker* 4172 (BRI, FRI); Yirrkala, *R.L.Specht* 909 (BRI, CANB, PERTH). Qld: 11.2 km E of New Highland Plains, *N.M.Henry* 227 (FRI).

Distinguished by the large discoloured leaves and large ribbed fruits. The stamens are various shades of red, sometimes white.

17. *Eucalyptus collina* W.Fitzg., *The Western Mail (Perth)* 10 (2 Jun. 1906), and in J.H.Maiden, *Crit. Revis. Eucalyptus* 6: 419, t. 236 (1923)

T: summit of Bold Bluff, W.A., May 1905, *W.V.Fitzgerald* 844; holotype: NSW; isotype: BRI, E, PERTH.

E. macropoda Blakely, *Key Eucalypts* 87 (1934). T: Packhorse Range, W.A., May 1905, *W.V.Fitzgerald* 1012; holotype: NSW; isotype: PERTH.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 172 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 17 (1983).

Tree to 18 m with a short trunk and widespreading branches. Bark thin, tessellated, grey, yellow-brown or orange on trunk and often on base of larger branches, smooth and white above. Juvenile leaves petiolate, ovate-lanceolate, scabrous. Adult leaves usually subopposite, lanceolate, acuminate, thick; lamina 12–18 cm long, 1–2.5 cm wide, silvery when young, concolorous; lateral veins numerous, faint, at 70°–75°; intramarginal vein confluent with margin; petiole 10–25 mm long. Umbels 3–7-flowered; peduncle thick, terete, 8–12 mm long; pedicels thick, 12–17 mm long. Buds ovoid; operculum hemispherical, 6–8 mm long, 10–14 mm wide; hypanthium hemispherical or truncate-ovoid, 10–12 mm long and wide. Fruits long-pedicellate, ovoid, 3–4 cm long, 2–2.5 cm wide. Seeds winged at one end, yellow-brown. *Silver-leaved Bloodwood*. Fig. 42A–B.

Occurs in the King Leopold Ranges area, W.A., on rocky ranges, tablelands and foothills. Region: KIMB. Map 17.

W.A.: 12 km W of Tableland Stn, *M.Lazarides* 5131 (BRI, CANB, NSW, NT); 37 km NNE of Gibb River Stn, *N.H.Speck* 4980 (BRI, CANB, NT, PERTH).

The large smooth fruits are diagnostic.

18. *Eucalyptus bleeseri* Blakely, *J. & Proc. Roy. Soc. New South Wales* 61: 175 (1928)

E. terminalis var. *longipedata* Maiden & Blakely in J.H.Maiden, *Crit. Revis. Eucalyptus* 7: 407 (1928). T: Darwin, N.T., 14 Mar. 1917, *C.E.F.Allen* 181; holotype: NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 118 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 29 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 215 (1984).

Tree to 15 m. Bark mainly smooth, white or light grey, with ±persistent, flaky, red-brown bark at base or over whole trunk. Juvenile leaves shortly petiolate, ovate, setose. Adult leaves alternate or sometimes subopposite, lanceolate, acuminate, sometimes falcate, thick; lamina 8–15 cm long, 1–2.5 cm wide, shining, green above, discoloured; lateral veins faint, at 50°–60°; intramarginal vein confluent with margin; petiole terete, 10–20 mm long. Umbels 7-flowered; peduncle terete, 15–30 mm long; pedicels terete, 10–15 mm long. Buds ovoid to obovoid; operculum usually conical, rarely hemispherical, 3–5 mm long, 5–7 mm wide; hypanthium truncate-ovoid, 5–7 mm long, 6–7 mm wide. Fruits long-pedicellate, oblong-ovoid or suburceolate, 15–22 mm long, 10–15 mm wide. Seeds with a long terminal wing, yellow-brown. *Smooth-stemmed Bloodwood*. Fig. 42C–D.

Occurs in the Kimberley from near Derby to Cambridge Gulf including coastal islands, W.A., and in northern N.T.; grows in open forest and woodland on the better-drained flats and plateaus. Regions: KIMB, ARNM, BKLY. Map 18.

W.A.: Derby, Aug. 1953, *W.Bateman* (DNA, FRI); Sir Graham Moore Is., *P.G.Wilson* 11162 (PERTH). N.T.: Snake Bay, Melville Is., *M.I.H.Brooker* 3215 (DNA, FRI, MEL, NSW); 14.5 km S of Batchelor, *G.M.Chippendale* 7751 (BRI, CANB, DNA, K, MEL, NSW, NT); 34 km NW of Katherine, *M.Lazarides* 6631 (AD, BRI, CANB, K, MEL, NSW, NT, PERTH).

Distinguished by the shining discoloured leaves, smooth white bark with a short stocking of flaky red-brown bark, and buds on long pedicels.

19. *Eucalyptus pyrophora* Benth., *Fl. Austral.* 3: 257 (1867)

T: Upper Victoria R., N.T., *F.Mueller*; lecto: MEL, *fide* S.T.Blake, *Austral. J. Bot.* 1: 234 (1953); isolecto: K.

E. cliftoniana W.Fitzg. in J.H.Maiden, *Crit. Revis. Eucalyptus* 4: 209 (1919). T: Mt Anderson, Grant Ra., W.A., Aug. 1906, *W.V.Fitzgerald s.n.*; holo: NSW; iso: BM.

Illustrations: C.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 101 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 24 (1983).

Tree or shrub to 12 m. Bark tessellated throughout, orange-grey, grey-red, or red-brown. Juvenile leaves not seen. Adult leaves subopposite or alternate, lanceolate, falcate, acute or acuminate, thick; lamina 8–14 cm long, 1–2.6 cm wide, grey-green, concolorous; lateral veins faint, at 60°–70°; intramarginal vein confluent with margin; petiole 10–25 mm long. Umbels 3–7-flowered; peduncle 8–12 mm long; pedicels 4–8 mm long. Buds pyriform; operculum hemispherical-conical, 2–4 mm long, 3–5 mm wide; hypanthium truncate-pyriform or suburceolate, 2–4 mm long, 3–5 mm wide. Fruits globose or ovoid, rarely with a short neck, 15–25 mm long, 20–25 mm wide, sometimes faintly ribbed. Seeds with a long terminal wing, yellow-brown. Fig. 42E–F.

Occurs in the southern and eastern Kimberley, W.A., and adjacent parts of N.T., growing among sandstone rocks; uncommon. Regions: KIMB, ARNM. Map 19.

W.A.: 13 km NW of Point Springs, *M.Lazarides* 8425 (CANB, FRI); 29 km WSW of Lissadell Stn, *R.A.Perry* 2677 (AD, BRI, CANB, MEL, NSW, NT, PERTH). N.T.: 46.7 km WSW of Victoria R., near bridge, *R.A.Perry* 2166 (AD, CANB, K, MEL, NSW, PERTH).

Differs from *E. collina* and *E. porrecta* especially in the much shorter pedicels. The orange-grey or grey-red tessellated bark and globose woody fruits are also characteristic.

20. *Eucalyptus pontis* D.Carr & S.Carr, *Eucalyptus* 1: 88–93 (1985)

T: 1.25 km past Victoria R. bridge on Timber Creek road, N.T., 3 June 1972, *D.J.Boland* 1296; holo: FRI.

Illustration: D.J. & S.G.M.Carr, *op. cit.* 91.

Tree to 7 m. Bark flaky, red-brown to grey-brown on trunk, sometimes on larger branches, then smooth, grey-white above. Juvenile leaves not seen. Adult leaves lanceolate, acuminate; lamina 9–13.5 cm long, 1–1.4 cm wide, grey-green to yellow-green; concolorous; lateral veins faint, at 50°–60°; intramarginal vein confluent with margin; petiole terete, 13–25 mm long. Umbels mostly 7-flowered; peduncle terete, 6–12 mm long; pedicels 3–5 mm long. Mature buds not seen. Fruits globular, 14–21 mm long, 15–22 mm wide; disc broad; valves 4. Seeds not seen. Fig. 42G–H.

Occurs near the Victoria R. bridge on the Timber Creek road, N.T., on a sandstone plateau, and possibly near Kununurra, W.A. Region: KIMB. Map 20.

W.A.: (?)Hidden Valley, *M.I.H.Brooker* 7784 (FRI). N.T.: 6 km N of Victoria R. crossing, *C.R.Dunlop* 3154 (AD, BRI, DNA, NT).

Characterised by the small tree habit, flaky red-brown to grey-brown bark on trunk, lanceolate leaves and globular fruits. A recently described taxon, not yet fully evaluated; its differences from *E. pyrophora* seem slight.

21. *Eucalyptus porrecta* S.T.Blake, *Austral. J. Bot.* 1: 251 (1953)

T: near Koolpinyah, N.T., 12°24'S, 131°10'E, 8 Sept. 1946, *S.T.Blake* 16951; holo: BRI; iso: AD, CANB, K, MEL, NSW.

Illustrations: S.T.Blake, *op. cit.* t. 22; N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 44 (1972); S.Kelly *et al.*, *Eucalypts* 2: t. 22 (1983).

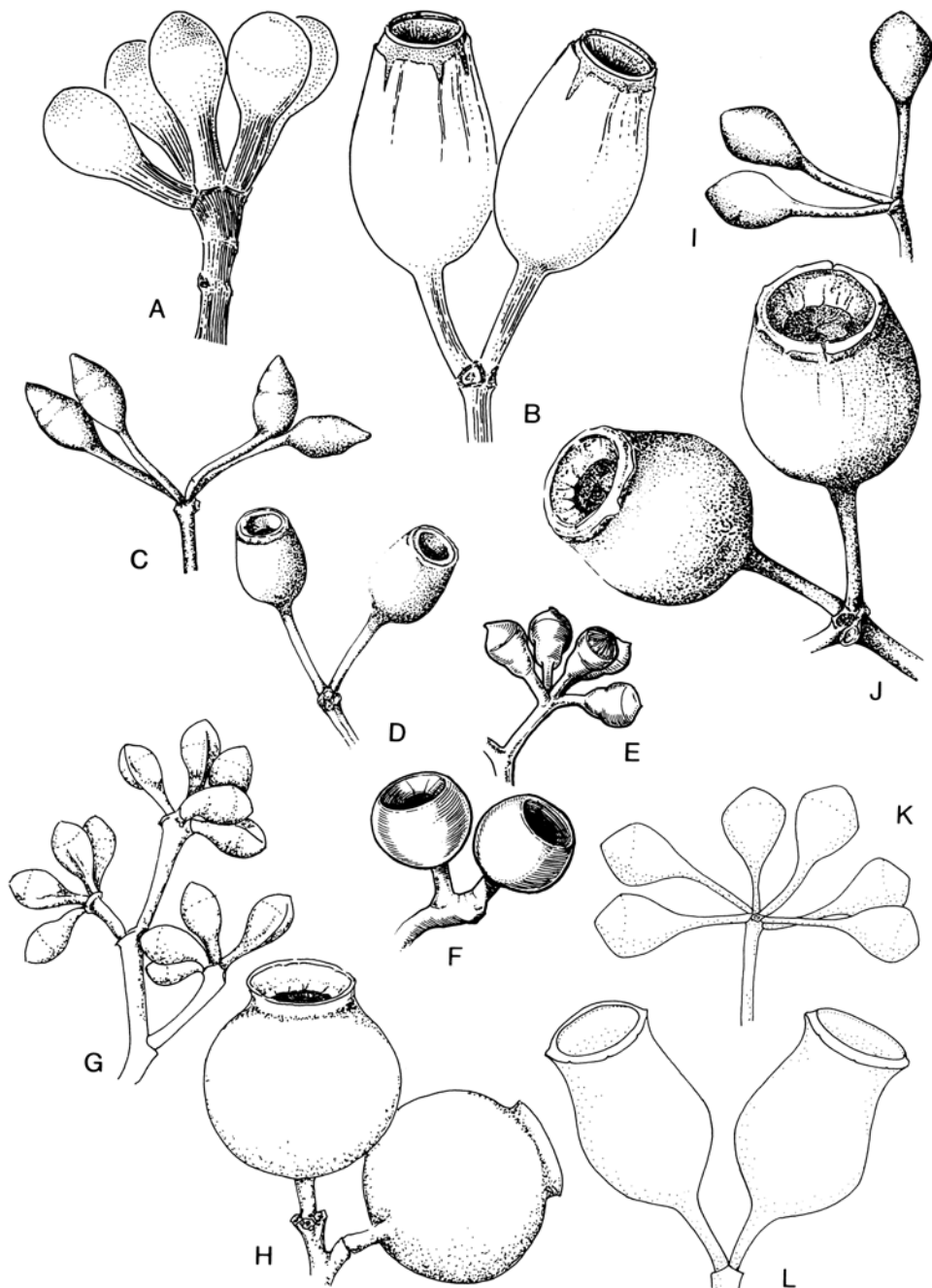


Figure 42. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. collina* (**A**, M.Lazarides 5131, FRI; **B**, J.Turnbull 296, FRI). **C–D**, *E. bleeseri* (**C**, Darwin, N.T., L.Pryor, GAUBA; **D**, Rum Jungle, N.T., W.Bateman, FRI). **E–F**, *E. pyrophora* (**E**, Mt Anderson, W.A., G.Rose, FRI; **F**, Mt Anderson, W.A., FRI; based on *Eucalyptus Buds & Fruit* No. 43 (1968)). **G–H**, *E. pontis* (**G**, T.Hartley 14426; **H**, C.Dunlop 3156, FRI). **I–J**, *E. porrecta* (**I**, C.Allen, NSW 10077, NSW; **J**, W.Bateman 35, FRI). **K–L**, *E. foelscheana* (**K**, I.Brooker 4156, FRI; **L**, I.Brooker 3164, FRI). **A**, **B**, **E**, **F** drawn by M.Risby. **C**, **D**, **J** drawn by C.Stahl. Others drawn by M.May.

Tree to 5 m, rarely to 8 m. Bark tessellated throughout, grey. Juvenile leaves not seen. Adult leaves alternate, lanceolate to broadly lanceolate, acute, acuminate or apiculate, thick; lamina 15–20 cm long, 3–5 cm wide, grey-green, concolorous; lateral veins faint, at 50°–60°; intramarginal vein \pm confluent with margin; petiole terete, 18–25 mm long. Umbels 3–7-flowered; peduncle terete, 17–35 mm long; pedicels 10–20 mm long. Buds ovoid or subglobular, rugose; operculum conical, 4–5 mm long, 8–10 mm wide; hypanthium hemispherical, 6–8 mm long, 8–10 mm wide. Fruits long-pedicellate, ovoid, subglobular or suburceolate, 20–25 mm long, 15–23 mm wide. Seeds with a terminal wing, yellow-brown. Fig. 42 I–J.

Occurs in north-western N.T. including Melville Is., on undulating and gently sloping areas, sometimes on flats, in tall forest and open woodland. Region: ARNM. Map 21.

N.T.: Berrimah, *W.Bateman* (BRI, K); Noonammah, *N.Byrnes* 2457 (DNA, FRI); 19.6 km S of Danger Point, *G.M.Chippendale* 8223 (BRI, CANB, K, MEL, NSW, NT, PERTH).

Distinguished by the rough, grey bark throughout, large reddish buds on long pedicels and large ovoid or suburceolate fruits. The trees are rhizomatous.

22. *Eucalyptus foelscheana* F.Muell., *Chem. & Druggist* 5: *Austral. Suppl.* 56 (1882)

T: near Port Darwin, N.T., 19 Sept. 1882, *P.Foelsch s.n.*; syn: BRI, K, MEL; north of Arnhem Land, N.T., *G.McKinlay s.n.*; syn: BRI, K, MEL.

E. leiophloia Blakely & Jacobs in W.F.Blakely, *Key Eucalypts* 82 (1934). T: Umbrawarra, N.T., 5 July 1916, *H.I.Jensen* 417; lecto: NSW, *fide* S.T.Blake, *Austral. J. Bot.* 1: 248 (1953); isolecto: BRI.

E. leiophloia var. *lepidophloia* Blakely & Jacobs, *op. cit.* 83. T: track to Katherine R., 1911, *W.Baldwin Spencer s.n.*; syn: NSW; Katherine R., 1911, *W.Baldwin Spencer s.n.*; syn: MEL, NSW.

Illustrations: S.T.Blake, *Austral. J. Bot.* 1: t. 19–21 (1953); N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 43 (1972); S.Kelly *et al.*, *Eucalypts* 1: t. 15 (1983).

Tree to 10 m, usually somewhat straggly. Bark smooth, white, with short stocking of red-brown scaly bark; on smaller trees red-brown scaly bark on most of trunk, sometimes throughout. Juvenile leaves soon alternate, shortly petiolate, ovate, sparsely setose at least on midrib below. Intermediate leaves broadly ovate to ovate-oblong, to 30 cm long and 20 cm wide. Adult leaves alternate, ovate or lanceolate-ovate to suborbicular, acute, thick; lamina 10–16 cm long, 3–10 cm wide, dull, green, concolorous; lateral veins prominent, at 60°–75°; intramarginal vein confluent with margin; petiole 20–30 mm long. Umbels 3–7-flowered; peduncle 10–30 mm long; pedicels 5–13 mm long. Buds clavate, pyriform or obovoid; operculum depressed hemispherical-conical, 2–3 mm long, 6–7 mm wide; hypanthium hemispherical or truncate-pyriform, 7–10 mm long, 6–8 mm wide. Fruits urceolate or truncate-ovoid, 20–26 mm long, 16–20 mm wide. Seeds winged, yellow-brown. *Smooth-barked Bloodwood*. Fig. 42K–L.

Occurs in the Kimberley, W.A., northern N.T. including coastal islands, and on the lower eastern side of the Gulf of Carpentaria, Qld. Grows on gentle slopes and low rocky hills in mixed open forest. Regions: KIMB, ARNM, CARP. Map 22.

W.A.: Karunjie Stn, *R.A.Perry* 3152 (AD, BRI, CANB, FRI, K, MEL, NSW, NT, PERTH); 100 km S of Kalumburu Mission, *N.H.Speck* 4839 (BRI, CANB, PERTH). N.T.: 1.6 km S of Coomalie Ck, *M.I.H.Brooker* 4156 (BRI, FRI, NSW); 104 km S of Katherine, *G.M.Chippendale* 3878 (AD, BRI, CANB, NSW, NT, PERTH). Qld: Gooseberry Ck, *L.A.S.Johnson* 7824 (NSW).

Characterised by the smooth bark, large intermediate leaves, large, usually \pm ovate adult leaves and large, woody, usually urceolate fruits.

23. *Eucalyptus latifolia* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 94 (1859)

T: Upper Roper R. [near the junction of Dry R., King R. and Darrinyan Ck, N.T.], 8 July 1856, *F.Mueller*; holo: MEL; iso: K, NSW.

Illustrations: S.T.Blake, *Austral. J. Bot.* 1: t. 17 (1953); N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 45 (1972); S.Kelly *et al.*, *Eucalypts* 2: t. 23 (1983).

Tree to 15 m, semi-deciduous. Bark flaky, red-brown to light brown, becoming ash-grey, sometimes throughout, or upper branches smooth and white. Juvenile leaves shortly petiolate, orbicular-ovate to elliptic-ovate, apiculate, setose at least on midrib below. Adult leaves alternate or subopposite, broadly ovate to orbicular-ovate, obtuse, rounded at base, thick; lamina 8–13 cm long, 6–9 cm wide, ash-grey, concolorous; lateral veins faint, at 60°–75°; intramarginal vein confluent with margin; petiole terete, 18–40 mm long. Umbels 3–7-flowered; peduncle 10–20 mm long; pedicels 5–10 mm long. Buds ovoid to subglobular; operculum depressed hemispherical or hemispherical-conical, 1–2 mm long, 3–4 mm wide; hypanthium hemispherical, 3–4 mm long and wide. Fruits ovoid, globular or urceolate, 7–13 mm long, 8–14 mm wide. Seeds winged, yellow-brown. *Round-leaved Bloodwood*. Fig. 43A–B.

Occurs from Broome through the Kimberley, W.A., and northern N.T., including some islands, with a disjunct occurrence at Prince of Wales Is., Qld. Grows on flats and lower slopes, often in seasonally inundated areas in monsoon forest and woodland. Also in Papua New Guinea. Regions: KIMB, ARNM, CYRK. Map 23.

W.A.: Prince Regent R. reserve, *K.F.Kenneally* 2088 (FRI, PERTH); 32 km SW of Kalumburu Mission, *N.H.Speck* 4922 (CANB, NT, PERTH). N.T.: 8 km SE of Katherine, *L.G.Adams* 885 (BRI, K, NSW, NT); Edith R. Falls Road, *J.R.Maconochie* 1613 (AD, BRI, FRI, NSW, NT). Qld: Big Ck, Prince of Wales Is., *E.Cameron* (FRI).

Has smaller fruit than related bloodwoods, and is semi-deciduous.

24. *Eucalyptus dichromophloia* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 89 (1859)

T: Fitzmaurice Ranges, [N.T.], Oct. 1855, *F.Mueller*; lecto: MEL, *vide* S.T.Blake, *Austral. J. Bot.* 1: 241 (1953); isolecto: K, NSW.

E. niphophloia Blakely & Jacobs in Blakely, *Key Eucalypts* 79 (1934). T: W of Pine Creek, N.T., July 1933, *M.R.Jacobs* 82; lecto: NSW, *vide* S.T.Blake, *Austral. J. Bot.* 1: 241 (1953); iso: BRI, FRI.

Illustrations: S.T.Blake, *op. cit.* t. 15; N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 27 (1970); S.Kelly *et al.*, *Eucalypts* 2: t. 18 (1983).

Tree to 15 m, sometimes shrubby. Bark flaky, light red-brown on part or whole of trunk and often on larger branches, smooth and white above and sometimes also on much of trunk. Juvenile leaves shortly petiolate, elliptic or ovate, setose or scabrous on both sides, pubescent on underside. Adult leaves alternate, narrowly lanceolate to lanceolate, acuminate, cuneate, thick; lamina 10–20 cm long, 1.5–4 cm wide, dull, grey-green, slightly discolorous; lateral veins faint, at 60°–70°; intramarginal vein usually confluent with margin, sometimes 1–2 mm from margin; petiole terete or slightly flattened, 10–25 mm long. Umbels 3–7-flowered; peduncle terete, 5–17 mm long; pedicels 5–10 mm long. Buds ovoid or subglobular; operculum hemispherical-conical, 2–3 mm long, 4–5 mm wide; hypanthium hemispherical or truncate-pyriform, 5–6 mm long and wide. Fruits ovoid, subglobular or urceolate, 10–15 mm long, 8–12 mm wide. Seeds winged, yellow-brown. *Variable-barked Bloodwood*, *Gum-topped Bloodwood*. Fig. 43C–D.

Occurs in central-northern N.T., on hills, ridges and plains and near river banks, in woodland. Regions: ARNM, BKLY. Map 24.

N.T.: 8 km N of Elliott, *G.M.Chippendale* 3856 (BRI, NSW, NT); 34 km NW of Katherine, *M.Lazarides* 6630 (CANB, NSW, NT, PERTH).

Has variable amounts of red-brown flaky bark but is often smooth-barked; adult leaves broader than in related species except *E. latifolia*. The name has been widely misapplied, see D.J. & S.G.M.Carr, *Eucalyptus* 1 (1985).

25. *Eucalyptus ollaris* D.Carr & S.Carr, *Eucalyptus* 1: 76 (1985)

T: Venn Airstrip, Mataranka, N.T., 30 July 1980, *M.O.Rankin* 2523; holo: DNA; iso: CANB, FRI.

Illustration: D.J. & S.G.M.Carr, *op. cit.* 77.

Tree to 12 m. Bark smooth, white or cream-yellow throughout, or often with rough, tessellated bark on lower trunk or at base of trunk. Juvenile leaves petiolate, lanceolate, glandular-bristly. Adult leaves alternate, lanceolate, often falcate, acuminate; lamina 11–15.5 cm long, 1.2–2 cm wide, green, concolorous; lateral veins faint, at 45°–60°; intramarginal vein confluent with margin; petiole terete, 12–20 mm long. Umbels 7-flowered; peduncle terete, 10–15 mm long; pedicels 4–8 mm long. Mature buds not seen. Fruits urceolate, 12–15 mm long, 11–15 mm wide. Seeds not seen. Fig. 43E.

Occurs in the Kimberley near Wyndham and Turkey Creek, W.A., and scattered in central and northern N.T., in sandy, lateritic or clayey soil on flats and gentle slopes in open woodland. Regions: KIMB, ARNM, BKLY, TNMI, MACD. Map 25.

W.A.: 69 km from Turkey Ck, towards Wyndham, *C.H.Gittins* (NSW, PERTH). N.T.: Stuart Hwy, just N of Helen Springs Stn, *D.J. & S.G.M.Carr* 827 (FRI).

Characterised by the mostly smooth white or cream bark, and urceolate fruits that are larger than those of the closely related *E. arnhemensis*. A newly described taxon which has not been fully evaluated.

26. *Eucalyptus arnhemensis* D.Carr & S.Carr, *Eucalyptus* 1: 78 (1985)

T: Oenpelli, N.T., 1 Oct. 1948, *R.L.Specht* 1102; holo: AD; iso: BRI, CANB, K, NSW, PERTH.

Illustrations: D.J. & S.G.M.Carr, *op. cit.* 81, 82.

Tree to 10 m. Bark rough, tessellated, red-brown on trunk, then smooth, white or cream above. Juvenile leaves petiolate, linear to linear-lanceolate, glandular-bristly. Adult leaves alternate, lanceolate, often falcate, acuminate; lamina 6.5–9 cm long, 0.7–1.2 cm wide, green, concolorous; lateral veins faint, at c. 60°; intramarginal vein confluent with margin; petiole terete, 8–15 mm long. Umbels 7-flowered; peduncle terete, 8–13 mm long; pedicels 3–6 mm long. Buds obovoid, but not seen mature; operculum conical; hypanthium obovoid. Fruits urceolate, 8–12 mm long, 8–10 mm wide. Seeds winged. Fig. 43F–G.

Occurs in north-central N.T., usually on sandstone areas among rocks. Region: ARNM. Map 26.

N.T.: Katherine Gorge, *S.T.Blake* 17210 (BRI, CANB, MEL, NSW); 16 km S of Yaimani Ck, *N.Byrnes* 2690 (DNA, FRI, NT).

Distinct in tree habit, red-brown tessellated bark on trunk, then smooth, white or cream bark above, small urceolate fruits. Leaves usually shorter and narrower than those of *E. dichromophloia*.

27. *Eucalyptus drysdalensis* D.Carr & S.Carr, *Eucalyptus* 1: 84 (1985)

T: Cockburn Ra., W.A., 21 Nov. 1975, *C.R.Dunlop* 4045; holo: NT; iso: FRI.

Illustrations: D.J. & S.G.M.Carr, *op. cit.* 82, 86.

Tree to 7 m. Bark smooth, white, with small red-brown flakes. Juvenile leaves not seen. Adult leaves alternate, narrowly lanceolate to lanceolate, acuminate; lamina 11–12 cm long, 1–1.7 cm wide, green, concolorous; lateral veins faint, at 50°–60°; intramarginal vein confluent with margin; petiole terete, 10–19 mm long. Umbels 7-flowered; peduncle terete, 8–12 mm long; pedicels 2–8 mm long. Buds obovoid; operculum saucer-shaped, slightly apiculate, 1–2 mm long, c. 3 mm wide; hypanthium obovoid to cylindrical, 4–5 mm long, c. 4 mm wide. Fruits urceolate to ovoid, 9–12 mm long, 9–11 mm wide. Seeds not seen. Fig. 43H–I.

Occurs in the north and east Kimberley, W.A., among sandstone or quartzite rocks in woodland on plateaus and ridges. Region: KIMB. Map 27.

W.A.: 11 km N of Gibb R., *J.C.G.Banks 1515* (FRI); 122 km N of Ord R. crossing on Halls Ck–Wyndham road, *J.Turnbull 251* (FRI).

Characterised by small habit, smooth white bark with red-brown flakes, and small, urceolate fruits. Style sometimes inserted in pit on apex of hypanthium.

28. *Eucalyptus urnularis* D.Carr & S.Carr, *Eucalyptus* 1: 87 (1985)

T: 6.8 km NW of El Sharana Mine, N.T., 23 Jan. 1973, *P.N.Martensz 519* & *R.Schodde*; holo: NT; iso: CANB.

Illustrations: D.J. & S.G.M.Carr, *op. cit.* 82, 89.

Tree to 6 m. Bark flaky, orange-brown to red-brown on trunk, then smooth and grey above. Juvenile leaves not seen. Adult leaves alternate, broadly lanceolate, sometimes falcate, acuminate; lamina 12–18 cm long, 1.4–2.2 cm wide, green, concolorous; lateral veins faint, at 50°–60°; intramarginal vein confluent with margin; petiole terete, 13–27 mm long. Umbels 7-flowered; peduncle terete, 5–17 mm long; pedicels 3–5 mm long. Mature buds not seen. Fruits urceolate, 12–16 mm long, 10–14 mm wide. Seeds red-brown Fig. 43J–K.

Occurs in northern N.T. in sandstone or lateritic soil near outcrops. Regions: ARNM, BKLY. Map 28.

N.T.: Stuart Hwy, 614 km from Darwin, *R.H.Siebel D32* (FRI); 18 km NE of Katherine, *I.B.Wilson 381* (BRI, CANB, K, NSW, NT).

Characterised by small tree habit, orange-brown to red-brown flaky bark on trunk, broadly lanceolate leaves, and urceolate fruits that are larger than those of the closely related *E. dichromophloia* and *E. arnhemensis*. A newly described taxon which has not been fully evaluated.

29. *Eucalyptus umbonata* D.Carr & S.Carr, *Eucalyptus* 1: 95 (1985)

T: 21 km SE of Katherine, N.T., 22 Jan. 1964, *L.G.Adams 841*; holo: CANB; iso: NSW, NT.

Illustrations: D.J. & S.G.M.Carr, *op. cit.* 96, 98.

Tree to 17 m. Bark tessellated, scaly, red-brown on at least trunk and main branches. Juvenile leaves not seen. Adult leaves alternate, lanceolate, acuminate; lamina 15–21 cm long, 2–3 cm wide, green, concolorous; lateral veins faint, at 55°–65°; intramarginal vein confluent with margin; petiole terete, 13–25 mm long. Umbels 7–11-flowered; peduncle terete, c. 10 mm long; pedicels 2–5 mm long. Buds turbinate; operculum conical, 3–4 mm long, c. 5 mm wide; hypanthium turbinate, 5–6 mm long, 6–7 mm wide. Fruits urceolate, c. 15 mm long, c. 14 mm wide. Seeds winged. Fig. 43L.

Occurs at Hardman Ck, Kimberley, W.A., and between Willeroo, Katherine and Daly Waters, N.T., in open forest. Regions: KIMB, BKLY. Map 29.

W.A.: Hardman Ck, *N.Byrnes 2232* (DNA, NT). N.T.: 33 km NW of Katherine, *C.R.Dunlop 4188* (DNA, FRI).

Characterised by the tall tree habit, red-brown tessellated bark on trunk and larger branches, lanceolate leaves and urceolate fruits. Closely related to the following species. Both species have the valves of the dehiscent fruit reaching almost to the orifice and prominent.

30. *Eucalyptus coniophloia* D.Carr & S.Carr, *Eucalyptus* 1: 97 (1985)

T: 33.6 km S of Coolibah Stn, N.T., 3 June 1952, *R.A.Perry 2867*; holo: AD; iso: CANB, MEL, NSW, PERTH.

Illustrations: D.J. & S.G.M.Carr, *op. cit.* 99, 101.

Tree to 6 m. Bark smooth, white, powdery throughout, sometimes with patches of red-grey exfoliating flakes. Juvenile leaves not seen. Adult leaves alternate, narrowly lanceolate, acuminate; lamina 6.5–22 cm long, 0.9–2 cm wide, grey-green, concolorous, lateral veins faint, at c. 60°; intramarginal vein confluent with margin; petiole terete, 14–20 mm long. Umbels 7-flowered; peduncle terete, 5–12 mm long; pedicels c. 3 mm long. Buds pyriform to

subglobose; operculum low-conical, 1–2 mm long, 4–5 mm wide; hypanthium pyriform, 4–6 mm long, 5–6 mm wide. Fruits urceolate, 11–17 mm long, 12–15 mm wide. Seeds not seen. Fig. 43M–N.

Isolated occurrences in the Kimberley, W.A., and near the Victoria R., N.T., possibly in the Pilbara, W.A.; grows in skeletal sandstone soil in open woodland. Regions: KIMB, PILB. Map 30.

W.A.: 3.2 km E of Gibb R., *N.H.Speck 4989* (CANB, PERTH).

Characterised by small habit, smooth white powdery bark and small urceolate fruits. Leaves usually narrower than those of *E. umbonata*. A recently described taxon which has not been fully evaluated. The Pilbara collection (*C.H.Gittins*, BRI) is in flower and its determination is uncertain.

31. *Eucalyptus capricornia* D.Carr & S.Carr, *Eucalyptus* 1: 100 (1985)

T: SE of Alexandria Stn, N.T., 22 May 1947, *S.T.Blake 17918*; holo: BRI; iso: CANB, K, MEL.

Illustration: D.J. & S.G.M.Carr, *op. cit.* 103.

Tree or mallee to 6 m. Bark tessellated, red-brown to grey-brown on trunk, smooth and white above. Juvenile leaves not seen. Adult leaves alternate, narrowly lanceolate, often falcate, acuminate; lamina 10–19 cm long, 1–2 cm wide, green, concolorous; lateral veins faint, at c. 60°; intramarginal vein confluent with margin; petiole terete, 8–26 mm long. Umbels 7-flowered; peduncle terete, 10–17 mm long; pedicels 4–12 mm long. Buds turbinate to subglobose; operculum saucer-shaped, 1–2 mm long, c. 4 mm wide; hypanthium obovoid, c. 5 mm long, 6–7 mm wide. Fruits urceolate, 10–13 mm long, 7–11 mm wide. Seeds winged. Fig. 43 O–P.

Occurs from near Daly Waters, N.T., SE to near Camooweal, Qld, and NE to the Mt Garnet area. Usually grows on rocky sandstone ridges in shrubland. Regions: BKLY, GGNA, THOM, BURD. Map 31.

N.T.: 0.3 km S of Daly Waters turn-off, Stuart Hwy, *J.Must 427* (AD, FRI, NT, PERTH). Qld: Barkly Downs Stn, *S.T.Blake 17946* (BRI, K, MEL); 16 km N of Lynd Scrub, *D.Walker 5283* (ANU, FRI).

Characterised by the low tree or mallee habit, bark tessellated on trunk and smooth above, narrowly lanceolate leaves and small urceolate fruits. A newly described taxon which has not been fully evaluated.

32. *Eucalyptus arenaria* Blakely, *Key Eucalypts* 81 (1934)

T: King Edward R., W.A., 31 July 1921, *C.A.Gardner 1501*; holo: NSW; iso: BRI.

Tree to 10 m. Bark flaky, dark grey or grey-brown on trunk and main branches, smooth and white above. Juvenile leaves not seen. Adult leaves alternate, lanceolate, acuminate, thin; lamina 6–13 cm long, 1–2 cm wide, grey-green, concolorous; lateral veins faint, at 60°–70°; intramarginal vein confluent with margin; petiole 10–20 mm long. Umbels 7-flowered; peduncle 10–15 mm long; pedicels 1–5 mm long. Buds ovoid or pyriform; operculum conical, 1–2 mm long, 2–3 mm wide; hypanthium truncate-pyriform, 5–7 mm long, 3–4 mm wide. Fruits globose-urceolate, 12–15 mm long, 10–13 mm wide, thin-walled. Seeds winged. Fig. 43Q–R.

Occurs in north Kimberley, W.A., usually on sandstone ridges. Region: KIMB. Map 32.

W.A.: Theda Stn, Morgan R., *M.I.H.Brooker 7766* (FRI); 24.1 km N of Kalumburu Mission, *N.H.Speck 4909* (K, NT, PERTH); Kalumburu, *N.Byrnes 2300* (DNA, NT, PERTH).

Has narrower adult leaves and rougher bark than *E. dichromophloia*, shorter pedicels, a smaller operculum and slightly broader fruits.

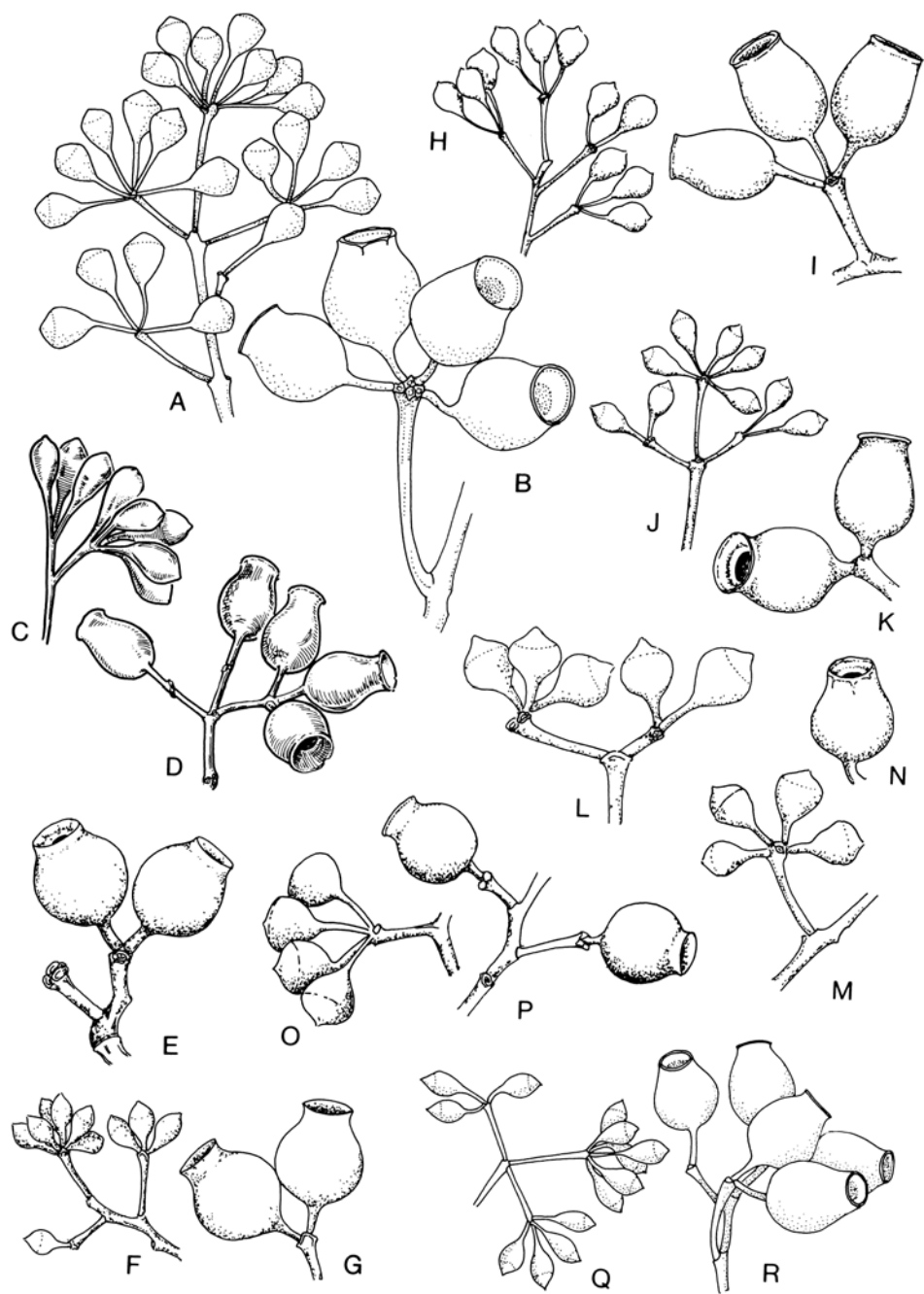


Figure 43. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. latifolia* (**A**, C.Dunlop 4089, FRI; **B**, I.Brooker 3228, FRI). **C–D**, *E. dichromophloia* (**C**, M.Parker 1064, FRI; **D**, D.Young Y96, FRI). **E**, *E. ollaris* (W.Bateman 2480, FRI). **F–G**, *E. arnhemensis* (**F**, A.George 14554, FRI; **G**, N.Speck 4909 FRI). **H–I**, *E. drysdalensis* (**H**, C.Dunlop 3154, FRI; **I**, J.Turnbull JT251, FRI). **J–K**, *E. urnularis* (P.Martensz & R.Schodde 519, FRI). **L**, *E. umbonata* (C.Dunlop 4188, FRI). **M–N**, *E. coniphloia* (R.Perry 2867, FRI). **O–P**, *E. capricornia* (**O**, J.Must 427, FRI; **P**, S.Blake 17918, FRI). **Q–R**, *E. arenaria* (**Q**, C.Dunlop 3356, FRI; **R**, N.Byrnes 2690, FRI). **C**, **D** drawn by H.Hewson. Others drawn by M.May.

33. *Eucalyptus eremaea* D.Carr & S.Carr, *Eucalyptus* 1: 38 (1985)

T: W of Ayers Rock, N.T., 18 Jan. 1969, *J.R.Maconochie* 658; holo: NT; iso: AD, FRI.

E. polycarpa var. *oligocarpa* Blakely & Jacobs in W.F.Blakely, *Key Eucalypts* 86 (1934). T: Alice Springs, N.T., 10 Aug. 1933, *M.R.Jacobs* 168; holo: NSW; iso: BRI, FRI.

Illustrations: J.Jessop (ed.), *Fl. Central Australia* 238, fig. 281 (1981); S.Kelly *et al.*, *Eucalypts* 2: t. 20 (1983); D.J. & S.G.M.Carr, *op. cit.* 39, 40.

Mallee to 5 m. Bark tessellated, grey-brown on all but smallest branchlets. Juvenile leaves not seen. Adult leaves alternate, narrowly lanceolate, acuminate, moderately thick; lamina 5–9 cm long, 0.6–1.5 cm wide, yellow-green, slightly discoloured or concolorous; lateral veins faint, at 45°–60°; intramarginal vein confluent with margin; petiole channelled, 8–15 mm long. Umbels 7-flowered; peduncle terete, 5–7 mm long; pedicels 3–4 mm long. Buds globular to obpyriform; operculum depressed hemispherical, shortly umbonate, 2–3 mm long, 5–7 mm wide; hypanthium truncate-ovoid, 6–8 mm long, 7–8 mm wide. Fruits globular, ovoid or urceolate, 10–16 mm long, 7–15 mm wide. Seeds winged, yellow-brown. *Mallee Bloodwood*. Fig. 44A.

Occurs on the eastern desert ranges of W.A., widespread in arid N.T., mainly in the Macdonnell Ranges, and in the Musgrave Ra. area, S.A. Grows on steep rocky slopes and plateaus. Regions: GBSN, TNMI, BKLY, MACD. Map 33.

W.A.: Cavanagh Ra., *B.G.Briggs* 3578 (NSW). N.T.: Heavitree Gap, *G.M.Chippendale* 1605 (NSW, NT); Arltunga, *N.Forde* 68 (BRI, CANB, MEL, NSW, NT, PERTH).

Distinguished from related species by the mallee habit, grey-brown tessellated bark on all but smallest branchlets, narrow leaves and comparatively small, usually globular or urceolate fruits.

34. *Eucalyptus symonii* D.Carr & S.Carr, *Eucalyptus* 1: 36 (1985)

T: Mulga Park Stn, N.T., 30 July 1962, *D.E.Symon* 2158; holo: AD.

Illustrations: D.J. & S.G.M.Carr, *op. cit.* 37, 40.

Tree or mallee to 7 m. Bark tessellated, red-brown and grey-brown on trunk, smooth and white above. Juvenile leaves lanceolate, grey-green. Adult leaves lanceolate to narrowly lanceolate, apiculate; lamina 5–12 cm long, 1–1.5 cm wide, grey-green, concolorous; lateral veins faint, at 50°–65°; intramarginal vein almost confluent with or up to 1 mm from margin; petiole terete, 8–20 mm long. Umbels 7-flowered; peduncle terete. Mature buds not seen. Fruits ovoid or subglobular to urceolate, 14–20 mm long, 13–17 mm wide. Seeds not seen. Fig. 44B.

Occurs in the Rawlinson and Blackstone Ranges, W.A., extending E to ranges of south-western N.T. and north-western S.A.; grows in sandy or gravelly soil on slopes. Region: MACD. Map 34.

W.A.: Rawlinson Ra., *S.J.Midgley* 576 (FRI). S.A.: Womikata, 6 Feb. 1976, *B.Evans* (AD, FRI).

Very similar to *E. eremaea* but has larger fruit.

35. *Eucalyptus australis* D.Carr & S.Carr, *Eucalyptus* 1: 41 (1985)

T: Wingelina, Blackstone Ra., W.A., 8 Jan. 1973, *D.E.Symon* 8395; holo: AD; iso: PERTH.

Illustration: D.J. & S.G.M.Carr, *op. cit.* 42.

Tree to 9 m. Bark tessellated, red-brown and grey on trunk, often smooth and white above. Juvenile leaves petiolate, lanceolate, mucronate. Adult leaves alternate, lanceolate to narrowly lanceolate, acuminate; lamina 9–13 cm long, 1.1–2 cm wide, grey-green, concolorous; lateral veins faint, at 55°–70°; intramarginal vein almost confluent with or up to 1 mm from margin; petiole terete, 10–20 mm long. Umbels 7-flowered; peduncle terete, c. 10–11 mm long; pedicels c. 5–7 mm long. Mature buds not seen. Fruits ovoid to suburceolate, 13–20 mm long, 13–17 mm wide. Seeds not seen. Fig. 44C.

Occurs in south-western N.T. with an outlier in the southern Tanami Desert, in the Blackstone Ra., W.A., and far north-western S.A. Grows on ridges and upper hill slopes. Regions: TNMI, MACD. Map 35.

W.A.: 60 km W of Blackstone Ra., *S.J.Midgley* 614 (FRI). N.T.: 0.5 km N of Docker R. Airstrip, *S.J.Midgley* 559 (FRI).

Very similar to *E. eremaea* and *E. symonii* but has generally larger fruit. May be distinguished from *E. eremaea* by the tree habit and grey-green leaves. A newly described taxon which has not been fully evaluated.

36. *Eucalyptus connerensis* D.Carr & S.Carr, *Eucalyptus* 1: 45 (1985)

T: Mt Conner, N.T., 15 June 1953, *D.E.Symon* 9378; holotype: AD.

Illustration: D.J. & S.G.M.Carr, *op. cit.* 46.

Tree to 5 m. Bark tessellated throughout. Juvenile leaves petiolate, lanceolate to ovate-lanceolate, mucronate. Adult leaves alternate, lanceolate to narrowly lanceolate, sometimes falcate, acuminate; lamina 7–12 cm long, 0.8–2 cm wide, grey-green, concolorous; lateral veins faint, at 50°–60°; intramarginal vein confluent with margin; petiole terete, 7–13 mm long. Umbels 7-flowered; peduncle terete, 10–13 mm long; pedicels 5–8 mm long. Mature buds not seen. Fruits ovoid to subglobular or urceolate, 13–18 mm long, 13–16 mm wide. Seeds not seen. Fig. 44D.

Occurs in the Blackstone Ra., W.A., on Mt Conner, N.T., and in the Everard and Musgrave Ranges, S.A. Region: MACD. Map 36.

S.A.: Everard Ra., Apr. 1950, *J.B.Cleland* (AD).

Another newly described taxon which requires further evaluation. Very similar to *E. australis*.

37. *Eucalyptus lenziana* D.Carr & S.Carr, *Eucalyptus* 1: 47 (1985)

T: 16 km S of Cunyu, W.A., 9 Apr. 1959, *N.H.Speck* 1208; holotype: CANB; isotype: AD, BRI, PERTH.

Illustrations: D.J. & S.G.M.Carr, *op. cit.* 49, 52.

Tree, rarely a mallee, to 10 m. Bark tessellated on trunk, light grey to grey-brown, smooth and white above. Juvenile leaves petiolate, narrowly lanceolate, acuminate. Adult leaves alternate, narrowly lanceolate to lanceolate, acuminate; lamina 9–15 cm long, 1.2–2 cm wide, shining, green, concolorous; lateral veins faint to just visible, at 50°–60°; intramarginal vein confluent with margin; petiole terete or channelled, 10–20 mm long. Umbels usually 7-flowered; peduncle terete, 5–8 mm long; pedicels 2–5 mm long. Buds clavate, but no mature buds seen. Fruits subglobular to ovoid or urceolate, 15–20 mm long, 14–18 mm wide. Seeds not seen. Fig. 44E.

Occurs in the Wiluna area, near Tobin Lake, Great Sandy Desert, and the central ranges of far eastern W.A., south-western N.T. and north-western S.A. Grows in deep red sand on plains. Regions: MRCH, SNDY, MACD. Map 37.

W.A.: Yaringa North Homestead, *M.Blackwell* 60 (FRI); 142 km S of Kumarina, *M.I.H.Brooker* 8329 (FRI). N.T.: Davenport Hills, *N.M.Henry* 405 (FRI, NT). S.A.: mountain E of Mt Woodroffe, *D.E.Symon* 2643 (AD).

Characterised by the shining narrow leaves and subglobular to ovoid or urceolate fruits. Fruits usually smaller than those of *E. terminalis*. A newly described taxon which has not been fully evaluated.

38. *Eucalyptus fordeana* D.Carr & S.Carr, *Eucalyptus* 1: 53 (1985)

T: Heavitree Gap, N.T., 17 June 1970, *G.C.Stocker* 533; holo: FRI.

Illustrations: D.J. & S.G.M.Carr, *op. cit.* 52, 56.

Mallee, rarely a tree, to 6 m. Bark rough, tessellated, grey-red on at least trunk, smooth on smallest branches. Juvenile leaves lanceolate, mucronate. Adult leaves alternate, narrowly lanceolate to lanceolate, rarely falcate, acuminate; lamina 6.5–9.5 cm long, 0.8–1.6 cm wide, bright green, concolorous; lateral veins faint, at c. 60°; intramarginal vein confluent with margin; petiole terete or channelled, 8–10 mm long. Umbels 7-flowered; peduncle terete, 6–7 mm long; pedicels 4–6 mm long. Buds obovoid; operculum conical to hemispherical, 2–3 mm long, 4–5 mm wide; hypanthium obconical to obovoid, 3–4 mm long, 4–5 mm wide. Fruits ovoid to urceolate, sometimes slightly ribbed, 13–16 mm long, 11–15 mm wide. Seeds not seen. Fig. 44F–G.

Occurs in the Macdonnell Ranges E and W of Alice Springs, N.T., with an outlier on Mt Augustus, W.A.; grows in rocky habitats on hills and ridges. Regions: PILB, MACD. Map 38.

W.A.: Mt Augustus, 1883, *J.Forrest* (MEL, NSW). N.T.: Window Hill, Simpson Desert, *G.M.Chippendale* 1605 (MEL, NSW, NT).

A newly described taxon which has not been fully evaluated; differences from *E. eremaea* appear very slight. Smaller than *E. terminalis* in most features.

39. *Eucalyptus nelsonii* D.Carr & S.Carr, *Eucalyptus* 1: 57 (1985)

T: 0.8 km W of Heavitree Gap, N.T., 20 Nov. 1972, *D.J.Nelson* 2249A; holo: NT; iso: FRI.

Illustrations: D.G. & S.G.M.Carr, *op. cit.* 52, 60.

Tree, rarely a mallee, to 8 m. Bark rough, tessellated, red-brown to grey-brown. Juvenile leaves petiolate, lanceolate, mucronate. Adult leaves alternate, lanceolate, sometimes falcate, acuminate; lamina 6–10 cm long, 1–1.5 cm wide, grey-green, concolorous; lateral veins faint, at 50°–60°; intramarginal vein confluent with margin; petiole terete, 9–11 mm long. Umbels 7-flowered; peduncle terete, 5–8 mm long; pedicels 5–8 mm long. Buds obovoid; operculum conical, 2–3 mm long, c. 4 mm wide; hypanthium obconical to obovoid; c. 5 mm long, c. 4 mm wide. Fruits ovoid to urceolate, 11–18 mm long, 10–16 mm wide. Seeds not seen. Fig. 44H–I.

Occurs in the Macdonnell Ranges, N.T., on lower slopes of hills and on flood plains. Region: MACD. Map 39.

N.T.: 16 km SE of Alice Springs, *D.J.Nelson* 1903 (FRI, NT, PERTH); Standley Chasm, *A.E.Orchard* 819 (NSW, NT).

Closely related to *E. fordeana* but larger in leaves and fruits, the latter less urceolate than those of *E. fordeana*. A newly described taxon which has not been fully evaluated. Also very like *E. eremaea*, which usually has smaller fruits.

40. *Eucalyptus terminalis* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 89 (1859)

T: Arnhem Land, N.T., July 1856, *F.Mueller*; holo: MEL; iso: K.

Illustrations: S.T.Blake, *Austral. J. Bot.* 1: t. 13 (1953); N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 63 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 20 (1983).

Tree to 15 m, sometimes crooked. Bark tessellated, grey-red on at least half of trunk then smooth and white above, often tessellated throughout, particularly in drier areas. Juvenile leaves petiolate, ovate-lanceolate, rarely glandular-bristly on margins. Adult leaves alternate, lanceolate, acuminate, thick; lamina 10–15 cm long, 1–2 cm wide, dull, green, concolorous or slightly discolorous; lateral veins faint, at 50°–70°; intramarginal vein very close to margin; petiole terete, 15–25 mm long. Umbels 3–7-flowered; peduncle terete, 5–20 mm long; pedicels 5–17 mm long. Mature buds obovoid or turbinate; operculum depressed hemispherical, sometimes umbonate, 4–5 mm long, 8–9 mm wide; hypanthium

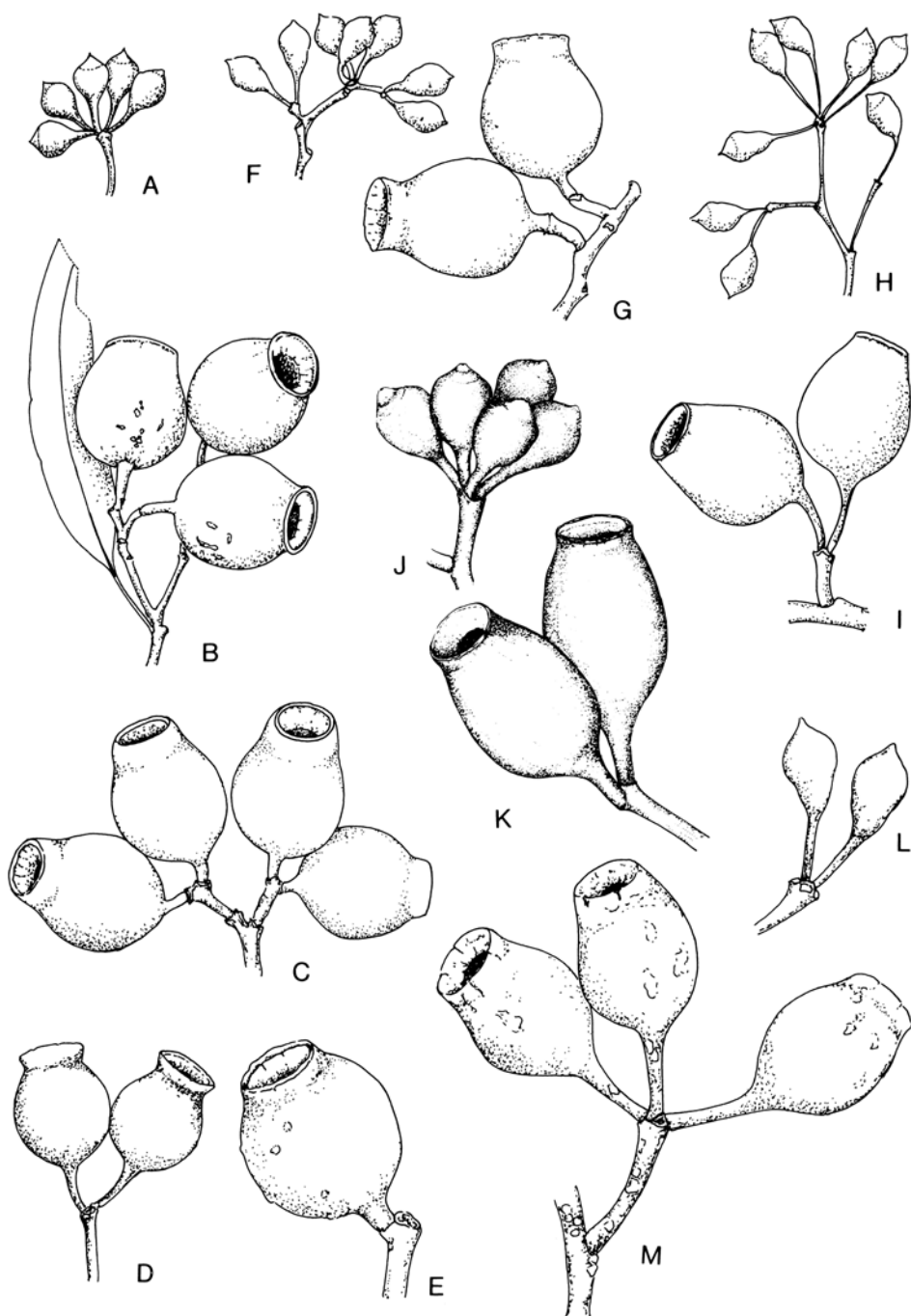


Figure 44. *Eucalyptus* buds and fruits, all $\times 1$. **A**, *E. eremea* (J.Maconochie 658, FRI). **B**, *E. symonii* (B.Strong M390, FRI). **C**, *E. australis* (D.Symon 8395, FRI). **D**, *E. connerensis* (P.Conrick 801, FRI). **E**, *E. lenziana* (N.Speck 1208, FRI). **F–G**, *E. fordeana* (**F**, D.Nelson 2249F, FRI; **G**, D.Whibley 6757, FRI). **H–I**, *E. nelsonii* (**H**, D.Nelson 2249A FRI; **I**, D.Nelson 2264A, FRI). **J–K**, *E. terminalis* (**J**, R.Perry 2143, FRI; **K**, 45 km NE of Bulloo Downs Stn, Qld, K.Keys, FRI). **L–M**, *E. chippendalei* (S.Midgley SM535, FRI). Drawn by M.May.

truncate-obovoid, 7–10 mm long, 8–10 mm wide. Fruits oblong-ovoid or urceolate, 18–25 mm long, 15–20 mm wide. Seeds winged, yellow-brown. *Bloodwood, Inland Bloodwood*. Figs 19, 44J–K.

Widespread including coastal islands in northern half of W.A., throughout the N.T., throughout Qld except the south-east, and in northern S.A. and north-western N.S.W. Grows in open woodland, on river flats and scree slopes. Regions: KIMB, PILB, MURCH, ARNM, BKLY, TNMI, MACD, CARP, CYRK, GGNA, BURD, DWSN, THOM, COOP, WRGO, DARL. Map 40.

W.A.: Karunjie Stn, *N.H. Speck 5001* (BRI, CANB, FRI, PERTH). N.T.: 39 km W of Argadargada Homestead, *G.M. Chippendale 3799* & *L.A.S. Johnson* (AD, BRI, MEL, NSW, NT). S.A.: 30 km W of Musgrave Park, *J.Z. Weber 192* (AD, FRI). Qld: 9.7 km W of Almaden, *M.I.H. Brooker 3366* (BRI, DNA, FRI, NSW). N.S.W.: 14.5 km S of Angledool, *L.A.S. Johnson 383* (FRI, NSW).

Distinguished by the grey-red tessellated bark, large confluences, pale cream or cream-brown buds, and large oblong-ovoid or urceolate fruits, the last with thicker walls than those of related species.

41. *Eucalyptus chippendalei* D.Carr & S.Carr, *Eucalyptus* 1: 50 (1985)

T: NW of Ayers Rock, N.T., 19 Sept. 1950, *C.R. Dunlop 1887*; holotype: NT; isotype: FRI.

Illustrations: *G.M. Chippendale* in *J.P. Jessop* (ed.), *Fl. Central Australia* fig. 283 (1981) as *E. aff. terminalis*; *D.J. & S.G.M. Carr, op. cit.* 51, 52.

Tree or mallee to 8 m. Bark rough, tessellated, red-brown on trunk, then smooth and white above. Juvenile leaves lanceolate, mucronate, blue-green to grey-green, glabrous. Adult leaves alternate, narrowly lanceolate to lanceolate, sometimes falcate, apiculate, thick; lamina 7.5–12 cm long, 1–2.3 cm wide, green to grey-green, concolorous; lateral veins faint, at 60°–65°; intramarginal vein confluent with margin; petiole terete, 11–20 mm long. Umbels 3–7-flowered; peduncle terete, 8–17 mm long; pedicels 3–7 mm long. Buds ovoid; operculum saucer-shaped to conical, 4–5 mm long, 6–7 mm wide; hypanthium hemispherical, 5–6 mm long, 6–7 mm wide. Fruits ovoid, sometimes faintly ribbed, 18–28 mm long, 17–22 mm wide. Seeds not seen. *Sandhill Bloodwood*. Fig. 44L–M.

Occurs in the Great Sandy Desert, W.A., and the central ranges of far eastern W.A. and south-western N.T., on sand dunes. Regions: SNDY, MACD. Map 41.

N.T.: 49.6 km N of Lake Amadeus [not 1.6 km N as cited by *D.J. & S.G.M. Carr, loc. cit.*] *G.M. Chippendale 6339* (AD, FRI, NT).

The large ovoid fruits and occurrence on sand dunes are characteristic. A common tree of sand dunes in the northern desert of W.A.

42. *Eucalyptus centralis* D.Carr & S.Carr, *Eucalyptus* 1: 61 (1985)

T: Trepahina Gorge, N.T., 25 May 1969, *D.J. & S.G.M. Carr 752*; holotype: FRI; isotype: AD, NT.

Illustrations: *D.J. & S.G.M. Carr, op. cit.* 62, 69.

Tree, rarely a mallee, to 12 m. Bark rough, tessellated, grey-brown to orange-brown on trunk and larger branches, then smooth, grey-white above. Juvenile leaves petiolate, lanceolate. Adult leaves alternate, lanceolate, sometimes falcate, acuminate; lamina 10–16 cm long, 1.5–2 cm wide, green, concolorous; lateral veins faint, at 55°–60°; intramarginal vein confluent with margin; petiole terete, 15–30 mm long. Umbels 7-flowered; peduncle terete, 5–12 mm long; pedicels 4–8 mm long. Buds clavate; operculum saucer-shaped, apiculate, 2–3 mm long, 4–6 mm wide; hypanthium obovoid, 5–6 mm long, 5–7 mm wide. Fruits ovoid to urceolate, 15–23 mm long, 12–17 mm wide. Seeds not seen. Fig. 45A–B.

Occurs in the western Pilbara, eastern Great Sandy Desert and central ranges, W.A., in central and southern N.T., and in far north-western S.A., in sandy or loamy soil on plains in grassland. Regions: PILB, SNDY, TNMI, BKLY, MACD. Map 42.

W.A.: Rawlinson Ra., *S.J.Midgley* 565 (FRI); 16 km NW of Mt Samuel, *S.J.Midgley* 632 (FRI). N.T.: 424 km N of Alice Springs, 21 May 1951, *W.Bateman* & *C.E.Carter* (FRI); 15 km N of Aileron, *N.Forde* 7 (AD, BRI, CANB, MEL, NSW, NT, PERTH).

A newly described taxon which has not been fully evaluated; differences from *E. opaca* and *E. orientalis* appear slight. Style inserted in pit on top of hypanthium.

43. *Eucalyptus opaca* D.Carr & S.Carr, *Eucalyptus* 1: 63 (1985)

T: 20 km W of Lasseter Hwy on Sedimentaries Road, towards Mt Olga, N.T., 26 Oct. 1983, *S.J.Midgley* 539; holotype: FRI; isotype: AD, NT, PERTH.

Illustrations: D.J. & S.G.M.Carr, *op. cit.* 64, 69.

Tree to 12 m. Bark rough, tessellated, red-brown. Juvenile leaves petiolate, ovate to lanceolate, mucronate. Adult leaves alternate, lanceolate to broadly lanceolate, acuminate; lamina 11–19 cm long, 1.4–3.2 cm wide, green to grey-green, concolorous; lateral veins faint, at 50°–55°; intramarginal vein confluent with margin; petiole terete, 13–25 mm long. Umbels 7-flowered; peduncle terete, 8–15 mm long; pedicels 3–7 mm long. Buds clavate; operculum saucer-shaped, apiculate, c. 2 mm long, 6–7 mm wide; hypanthium obovoid, c. 7 mm long, 7–8 mm wide. Fruits urceolate, 16–24 mm long, 12–16 mm wide. Seeds not seen. Fig. 45C–D.

Occurs in scattered localities in the SW Kimberley, Pilbara and northern deserts of W.A., in central and southern N.T. and far north-western S.A. Grows in sand or sandy loam in open shrubland, often near watercourses. Regions: KIMB, PILB, SNDY, GBSN, TNMI, MACD, GGNA. Map 43.

W.A.: Gunbarrel Hwy, 9.3 km W of Gary Hwy junction, *S.J.Midgley* 665 (FRI). N.T.: 21 km WNW of Arltunga, *N.Forde* 66 (BRI, CANB, MEL, NSW). S.A.: between Musgrave & Mann Ranges, 30 June 1933, *N.B.Tindale* & *Hackett* (AD).

A newly described taxon which has not been fully evaluated. Very similar to *E. centralis* and *E. orientalis*.

44. *Eucalyptus orientalis* D.Carr & S.Carr, *Eucalyptus* 1: 66 (1985)

T: turn-off to The Garden Homestead on road to Trephina Gorge, N.T., 25 May 1969, *D.J. & S.G.M.Carr* 763; holotype: FRI.

Illustrations: D.J. & S.G.M.Carr, *op. cit.* 68, 69.

Tree to 20 m. Bark rough, tessellated on trunk and larger branches, dark grey-brown. Juvenile leaves not seen. Adult leaves alternate, lanceolate, acuminate; lamina 10–19 cm long, 1.7–2.5 cm wide, grey-green, concolorous; lateral veins faint, at 50°–60°; intramarginal vein confluent with margin; petiole terete, 11–25 mm long. Umbels 7-flowered; peduncle terete, 5–12 mm long; pedicels 4–7 mm long. Buds clavate; operculum conical, 2–3 mm long, 5–6 mm wide; hypanthium campanulate, 5–8 mm long, 6–7 mm wide. Fruits ovoid to almost urceolate, 19–27 mm long, 13–17 mm wide. Seeds not seen. Fig. 45E–F.

Occurs infrequently in south-eastern N.T., north-eastern S.A. and far north-western N.S.W. Grows on flats or slight slopes in loam or sandy loam. Regions: GGNA, MACD, COOP. Map 44.

N.T.: Manners Creek Homestead paddock, *G.M.Chippendale* 173 (CANB, NSW, NT, PERTH); Benstead Ck, 51 km ENE of Alice Springs, *N.Forde* 85 (BRI, CANB, K, MEL, NSW, NT). S.A.: Innamincka, 30 May 1957, *W.S.Reid* (AD). N.S.W.: Tibbooburra, Oct. 1920, *Dr Macgillivray* (AD).

A newly described taxon which has not been fully evaluated. Very similar to *E. centralis* and *E. opaca*.

45. *Eucalyptus erythrophloia* Blakely, *Key Eucalypts* 80 (1934)

T: old Battery, Eidsvold, Qld, 1919, *T.L.Bancroft s.n.*; lecto: NSW 10065, *fide* D.J.Carr & S.G.M.Carr, *Eucalyptus* 1: 30 (1985).

Illustrations: J.H.Maiden, *Crit. Revis. Eucalyptus* 5: t. 202 fig. 3 (1921); S.Kelly *et al.*, *Eucalypts* 1: t. 262 (1983).

Tree to 15 m. Bark tessellated, red-brown or grey-brown throughout. Juvenile leaves shortly petiolate, ovate or oblong-lanceolate, slightly hairy or setose, pale green. Adult leaves alternate, narrowly to broadly lanceolate, acuminate, thin; lamina 7–17 cm long, 2.3–3.5 cm wide, grey-green, slightly discolorous; lateral veins faint, at 50°–60°; intramarginal vein confluent with margin; petiole channelled, 10–25 mm long. Umbels 3–7-flowered; peduncle terete, 7–15 mm long; pedicels 5–8 mm long. Buds ovoid or pyriform; operculum saucer-shaped or depressed hemispherical-conical, 1–2 mm long, 3–5 mm wide; hypanthium hemispherical, 4–6 mm long and wide. Fruits ovoid, urceolate or globular, 13–20 mm long, 10–15 mm wide. Seeds broadly winged, yellow-brown. *Red Bloodwood*. Fig. 45G–H.

Occurs throughout eastern Qld including Thursday Is., with disjunct occurrences W of Mt Isa, and in far central-northern N.S.W. Grows on flats or low hills, usually in clay or loam in woodland or grassland. Regions: CARP, CYRK, BURD, THOM, DWSN, MCPH, GGNA, WRGO. Map 45.

Qld: 14.9 km SE of Boyne R. crossing, *G.M.Chippendale 1131* (AD, BRI, FRI, MEL, NSW); 64 km W of Mt Isa, *L.A.S.Johnson, 18 Oct. 1964* (NSW); 6.4 km N of Conjuboy Stn, *M.Lazarides 4187* (CANB, FRI, K, MEL, PERTH). N.S.W.: 4.8 km S of New Angledool Stn, *D.McGillivray 2844* (NSW).

Resembles *E. terminalis* but has red-brown bark, broader slightly discolorous leaves, and smaller fruits.

46. *Eucalyptus polycarpa* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 88 (1859)

T: Arnhem Land, N.T., 25 July 1856, *F.Mueller*; holotype: MEL; isotype: K.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 29 (1970); S.T.Blake, *Austral. J. Bot.* 1: t. 14 (1953); S.Kelly *et al.*, *Eucalypts* 2: t. 19 (1983).

Tree to 15 m, sometimes to 25 m. Bark tessellated, grey-brown throughout. Juvenile leaves shortly petiolate, elliptic to broadly lanceolate, hairy in early stages. Adult leaves alternate, narrowly lanceolate to lanceolate, acute, thin; lamina 10–18 cm long, 1–3 cm wide, green, discolorous; lateral veins at 60°–70°; intramarginal vein confluent with margin; petiole channelled or terete, 15–20 mm long. Umbels 7-flowered; peduncle terete or angled, 9–20 mm long; pedicels 2–9 mm long. Buds pyriform, ovoid or clavate, scurfy; operculum hemispherical, 2–4 mm long, 4–6 mm wide; hypanthium truncate-pyriform, 9–10 mm long, 5–6 mm wide. Fruits ovoid or urceolate, 15–30 mm long, 10–18 mm wide. Seeds long-winged, yellow-brown. *Long-fruited Bloodwood*. Fig. 45 I–J.

Widespread across northern W.A. and N.T. including coastal islands and throughout Qld except the south-west; also in north-central N.S.W. Grows in woodland, on plains, small ridges and hills. Regions: KIMB, ARNM, BKLY, CARP, CYRK, BURD, GGNA, THOM, DWSN, WRGO, MCPH. Map 46.

W.A.: 46.7 km E of Derby, *B.R.Maslin 2653* (MEL, NSW, PERTH). N.T.: 8 km S of Adelaide River town, *M.I.H.Brooker 3131* (DNA, FRI, NSW); 75.6 km N of Oenpelli, *G.M.Chippendale 8123* (BRI, CANB, K, MEL, NSW). Qld: 6.4 km S Wowan, *N.H.Speck 2012* (BRI, MEL, NSW). N.S.W.: Angledool Stn, *C.W.E.Moore 5117* (NSW).

May be recognised by the grey-brown tessellated bark throughout, the discolorous adult leaves, the scurfy, ovoid or clavate buds and the long, ovoid or urceolate fruits. The wood is useful as posts, farm timber and fuel.

47. *Eucalyptus nesophila* Blakely, *Key Eucalypts* 90 (1934)

T: Bathurst Is., N.T., 2 Nov. 1916, *G.F.Hill* 465; holo: NSW; iso: BRI.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 39 (1970); S.Kelly *et al.*, *Eucalypts* 2: t. 28 (1983).

Tree to 30 m. Bark tessellated, grey or grey-brown throughout. Juvenile leaves alternate, petiolate, some peltate, broadly lanceolate to ovate, often cordate, setose. Adult leaves alternate, lanceolate to narrowly lanceolate, acute or acuminate, thin; lamina 8–18 cm long, 0.9–1.8 cm wide, green, shining, slightly discolorous; lateral veins faint, at 50°–60°; intramarginal vein confluent with margin; petiole channelled or terete, 9–15 mm long. Umbels 7-flowered; peduncle terete or slightly angled, 7–10 mm long; pedicels 5–8 mm long. Buds clavate; operculum depressed hemispherical, apiculate, 1–2 mm long, 4–6 mm wide; hypanthium truncate-pyriform, 5–6 mm long, 4–6 mm wide. Fruits ovoid or urceolate, 9–15 mm long, 7–9 mm wide, thin-walled. Seeds winged, brown. *Melville Island Bloodwood*. Fig. 45K–L.

Of disjunct occurrence in the north Kimberley, W.A., Bathurst Is., Melville Is. and the Cobourg Peninsula, N.T., and near Westmoreland and on Cape York Peninsula, Qld. Grows in open forest on lateritic hills in W.A., on flats and lower slopes in N.T., and in laterite on flats and slight slopes in Qld. Regions: KIMB, ARNM, CARP, CYRK. Map 47.

W.A.: Mitchell Plateau, *N.Byrnes* 2319 (CANB, DNA, NSW, NT, PERTH). N.T.: S of Pickataramoor, Melville Is., *M.I.H.Brooker* 3225 (BRI, DNA, FRI, NSW); 14.5 km SE of Raffles Bay, *G.M.Chippendale* 8185 (AD, BRI, CANB, MEL, NSW, PERTH). Qld: 80 km from Musgrave towards Coen, *M.I.H.Brooker* 4061 (BRI, FRI, NSW).

Distinct in the grey tessellated bark throughout, the shining green, slightly discolorous adult leaves, and the ovoid or urceolate fruits. Fruits smaller than those of *E. terminalis* and *E. erythrophloia*. Important timber tree locally, for piles, poles and construction; used for railway sleepers at Weipa, Qld.

48. *Eucalyptus intermedia* R.Baker, *Proc. Linn. Soc. New South Wales* 25: 674 (1901)

E. gummifera var. *intermedia* (R.Baker) Domin, *Biblioth. Bot.* 89: 469 (1928). T: Ballina, N.S.W., *W.Büerli* 314; lecto: NSW, *vide* S.T.Blake, *Austral. J. Bot.* 1: 261 (1953).

Illustrations: N.Hall, *Forest Tree Ser.* No. 13 (1971); S.Kelly *et al.*, *Eucalypts* 2: t. 27 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 46 (1983).

Tree to 30 m with a long, straight trunk. Bark tessellated, light grey or light brown throughout. Juvenile leaves opposite, then alternate, petiolate, broadly lanceolate, sometimes peltate, setose but becoming glabrous. Adult leaves alternate, lanceolate or broadly lanceolate, acuminate; lamina 9–16 cm long, 1.5–3 cm wide, shining, dark green, discolorous; lateral veins faint, at 60°–70°; intramarginal vein confluent with margin; petiole channelled or terete, 8–20 mm long. Umbels 7-flowered; peduncle terete or slightly angular, 10–18 mm long; pedicels 2–14 mm long. Buds pyriform to obovoid; operculum conical, 2–4 mm long, 4–6 mm wide; hypanthium truncate-pyriform, 5–9 mm long, 4–7 mm wide. Fruits urceolate or ovoid, 11–21 mm long, 8–16 mm wide. Seeds winged, yellow-brown to red-brown. *Pink Bloodwood*. Fig. 45M–N.

Occurs in eastern Qld from near Cooktown southwards, including coastal islands, to north-eastern N.S.W. as far S as Raymond Terrace. Grows in open coastal forest or scattered in closed forest. Regions: CYRK, BURD, DWSN, MCPH, NEPN. Map 48.

Qld: 4.8 km from Atherton towards Herberton, *M.I.H.Brooker* 3391 (BRI, FRI, NSW); 29.6 km SW of Umolo railway stn, *G.M.Chippendale* 1116 (FRI, NSW); Hallorans Hill, Atherton, *G.C.Stocker* 1219 (BRI, FRI, NSW, QRS). N.S.W.: 3.2 km SE of Vincents Lookout, *G.M.Chippendale* 481 (FRI, NSW); Hat Head, 21 Oct. 1953, *L.A.S.Johnson* (K, NSW).

Characterised by the grey or brown tessellated bark throughout, discolorous leaves at all stages and urceolate or ovoid fruits. Differs from *E. polycarpa* in the smooth buds and usually smaller fruit. Also resembles *E. gummifera*, which has a more pronounced neck and

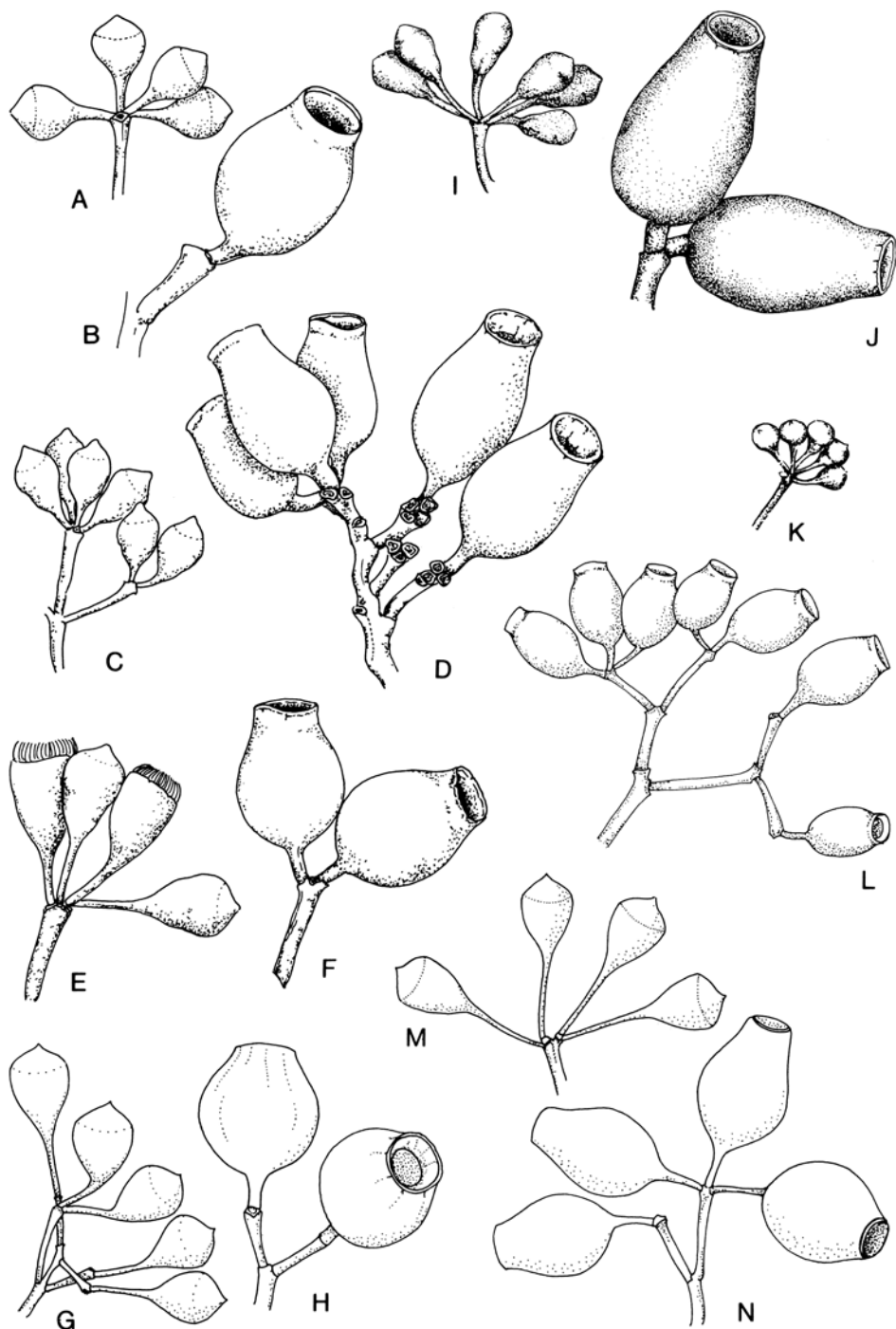


Figure 45. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. centralis* (**A**, 424 km N of Alice Springs, N.T., W.Bateman & C.Carter, FRI; **B**, S.Midgley SM565, FRI). **C–D**, *E. opaca* (**C**, S.Midgley SM665, FRI; **D**, Mt Olga, N.T., W.Bateman, FRI). **E–F**, *E. orientalis* (**E**, D. & S.Carr 763, FRI; **F**, N.Forde 85, FRI). **G–H**, *E. erythrophloia* (D.Kleinig 180, FRI). **I–J**, *E. polycarpa* (**I**, F.Knight EP21, FRI; **J**, R.Perry 2631, FRI). **K–L**, *E. nesophila* (**K**, Kilu-Impiri track, Melville Is., N.T., W.Bateman, FRI; **L**, C.Cossalter 1175, FRI). **M–N**, *E. intermedia* (**M**, D.Walker 1340, FRI; **N**, G.Chippendale 1054, FRI). Drawn by M.May.

thinner rim to the fruit and wingless seeds. A useful timber for fencing, mining, and heavy construction. It is a minor to medium source of pollen and honey.

49. *Eucalyptus abergiana* F.Muell., *Fragm.* 11: 41 (1878)

T: Rockingham Bay, Qld, 24 Mar. 1867, *J.Dallachy* 21; holo: MEL; iso: K, NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 173 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 21 (1983).

Tree to 14 m. Bark irregularly tessellated or subfibrous throughout, grey-brown. Juvenile leaves subopposite, petiolate, ovate. Adult leaves alternate, petiolate, broadly lanceolate, acuminate, rounded at base, thick; lamina 10–12 cm long, 2.5–5 cm wide, green, strongly discolorous; lateral veins many, at 70°–80°; intramarginal vein very close to or confluent with margin; petiole channelled, 20–30 mm long. Umbels 3–7-flowered; peduncle flattened towards end, 20–30 mm long; pedicels absent. Buds ovoid; operculum conical, 5–7 mm long, 7–12 mm wide; hypanthium hemispherical or truncate-ovoid, faintly striate, 10–12 mm long, 7–12 mm wide. Fruits ovoid to subglobular, 20–30 mm long, 15–25 mm wide. Seeds with terminal wing, yellow-brown. *Range Bloodwood*. Fig. 46A–B.

Occurs on ranges between Cairns and Mt Spec, Qld. Grows on moderate slopes and hills in sclerophyll eucalypt forest. Region: CYRK. Map 49.

Qld: 9.7 km from Atherton towards Herberton, *M.I.H.Brooker* 3404 (BRI, FRI, NSW); Herberton Ra., *A.K.Irvine* 604 (BRI, DNA, FRI, NSW, PERTH, QRS); Stannary Hills turn-off, *L.S.Smith* 11253 (BRI, CANB).

Differs from *E. intermedia* and *E. polycarpa* in the sessile buds and fruits.

50. *Eucalyptus ficifolia* F.Muell., *Fragm.* 2: 85 (1860)

T: Broke Inlet, W.A., *G.Maxwell*; holo: MEL; iso: K.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 33 (1970); S.Kelly *et al.*, *Eucalypts* 1: t. 18 (1983).

Tree to 10 m, straggly. Bark rough, fibrous throughout, grey. Juvenile leaves usually alternate, petiolate, ovate or orbicular, sometimes peltate, bristly. Adult leaves alternate, sometimes opposite, broadly lanceolate or ovate, acuminate, thick; lamina 7.5–15 cm long, 3–5 cm wide, glossy, dark green above, strongly discolorous; lateral veins fine, at 50°–60°; intramarginal vein very close to or confluent with margin; petiole flattened or channelled, 10–20 mm long. Umbels 3–7-flowered; peduncle angular, 15–25 mm long; pedicels 15–25 mm long. Buds clavate or pyriform; operculum depressed hemispherical-conical, 2–3 mm long, 6–7 mm wide; hypanthium truncate-pyriform, 8–10 mm long, 6–7 mm wide. Fruits ovoid, subglobular or urceolate, often contracted at orifice, 20–35 mm long, 20–30 mm wide. Seeds with terminal wing, yellow-brown. *Red-flowering Gum*. Figs 20, 46C–D.

Occurs in a limited area near Nornalup, Denmark and the Frankland R., W.A., in sandy soil in low forest. Region: LUWN. Map 50.

W.A.: Mt Frankland, *M.I.H.Brooker* 3577 (FRI, PERTH); Quarram, Jan. 1941, *C.A.Gardner* (PERTH); 32.2 km N of Walpole, *B.R.Maslin* 1692 (FRI, PERTH).

Characteristically a small tree with rough bark throughout, a dense confluence with crimson flowers, and subglobular, urceolate or ovoid fruits. May be separated from *E. calophylla* by the lack of conspicuous oil glands in the leaves and by the winged seeds. One of the most widely grown eucalypts for its ornamental flowers, although the colour varies to almost white in cultivated plants.

51. *Eucalyptus calophylla* R.Br. ex Lindley, *Bot. Reg.* 27: Misc. p. 72 (1841)

T: near Princess Royal Harbour, [Albany, W.A.], 29 Dec. 1801, *R.Brown*; holo: BM.

E. splachnicarpon Hook., *Bot. Mag.* 69: t. 4036 (1843). T: King George Sound, [W.A.], 22 Jan. 1818, *A.Cunningham* 77; holo: K; iso: BM, FRI.

E. calophylla var. *maideniana* Hochr., *Candollea* 2: 463 (1925). T: Darling Range, W.A., 16 Feb. 1905, B.P.G.Hochreutiner 2950; holo: G n.v., fide S.G.M. & D.J.Carr, *Proc. Roy. Soc. Victoria* 85: 49–50 (1972).

E. calophylla var. *parviflora* Blakely, *Key Eucalypts* 85 (1934). T: cultivated Government House, Sydney, N.S.W., 2 Jan. 1925, W.F.Blakely s.n.; holo: NSW.

Illustrations: C.A.Gardner (ed. T.E.H.Aplin), *Eucalypts W. Australia* 79 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 17 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 221 (1984).

Tree to 40 m, occasionally to 60 m. Bark tessellated throughout, grey or grey-brown. Juvenile leaves alternate, petiolate, peltate, ovate, strongly discolorous. Adult leaves alternate, ovate to broadly lanceolate, acuminate, thick; lamina 9–14 cm long, 2.5–4 cm wide, shining, dark green, strongly discolorous; lateral veins fine, at 50°–70°; intramarginal vein very close to margin; petiole flattened, 15–20 mm long. Umbels 3–7-flowered; peduncle terete or angular, 15–35 mm long; pedicels 10–30 mm long. Buds clavate; operculum flattened-hemispherical, apiculate, 2–4 mm long, 7–8 mm wide; hypanthium urceolate, 5–10 mm long, 7–10 mm wide. Fruits urceolate, usually contracted at orifice, 3–5 cm long, 2.8–4 cm wide. Seeds wingless, black. *Marri*. Fig. 46E–F.

Occurs widely in south-western W.A., in sandy and lateritic soils, in open forest and tall open forest. Regions: BENC, LUWN, ESPR. Map 51.

W.A.: Lowden, *M.Koch 1855* (NSW, PERTH); 15 km N of Mt Barker, *R.H.Kuchel 1992* (AD, FRI); 32.2 km N of Perth, *R.A.Saffrey 100* (PERTH).

Distinct in having tessellated bark throughout, a large conflorescence of cream (rarely pink) flowers, large urceolate fruits and black wingless seeds. Usually a large tree, but shrubby plants occur in the northern part of its range.

A principal species for woodchips. Limited use in building and for fence posts, tool handles and sporting goods. An important species in honey production, flowering in summer.

52. *Eucalyptus haematoxylon* Maiden, *J. & Proc. Roy. Soc. New South Wales* 47: 218 (1914)

T: Happy Valley, Jarrahwood Railway, W.A., July 1912, *W.Donovan s.n.*; holo: NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 71 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 26 (1983).

Tree to 15 m. Bark tessellated throughout, light grey-brown. Juvenile leaves subopposite or alternate, petiolate, broadly ovate or oblong-ovate, the first few peltate, strongly discolorous, glandular-bristly on margin and petiole. Adult leaves alternate, broadly lanceolate to lanceolate, acuminate, thick; lamina 7–12 cm long, 2.5–4 cm wide, bright green above, discolorous; lateral veins numerous, at 60°–75°; intramarginal vein very close to or confluent with margin; petiole flattened, 10–20 mm long. Umbels 3–7-flowered; peduncle terete, 10–30 mm long; pedicels 10–18 mm long. Buds clavate; operculum conical, 2–3 mm long, 5–7 mm wide; hypanthium truncate-pyriform, 6–7 mm long and wide. Fruits globular-urceolate or ovoid, contracted at orifice, 18–40 mm long, 12–20 mm wide. Seeds sometimes winged on margins, red-brown. *Mountain Gum*, *Mountain Marri*. Fig. 46G–H.

Occurs in scattered populations on the western Darling Ra., and with disjunct occurrences near Mt Lesueur and Mt Michaud, W.A.; grows in open forest on lowlands and on slopes in sandy soil. Region: LUWN. Map 52.

W.A.: 17 km from Capel towards Donnybrook, *M.I.H.Brooker 3572* (FRI, MEL, PERTH); 22.5 km W of Donnybrook, *A.S.George 7719* (K, NSW, PERTH); North Dandalup, 28 Dec. 1939, *H.Steedman* (BRI, FRI, K, NSW); 4 km ESE of Mt Lesueur, *E.A.Griffin 2481* (FRI).

Differs from *E. calophylla* especially in the narrower fruits and the red-brown seeds, and from *E. ficifolia* also in the narrower fruits and marginal seed wing. Has conspicuous red new foliage.

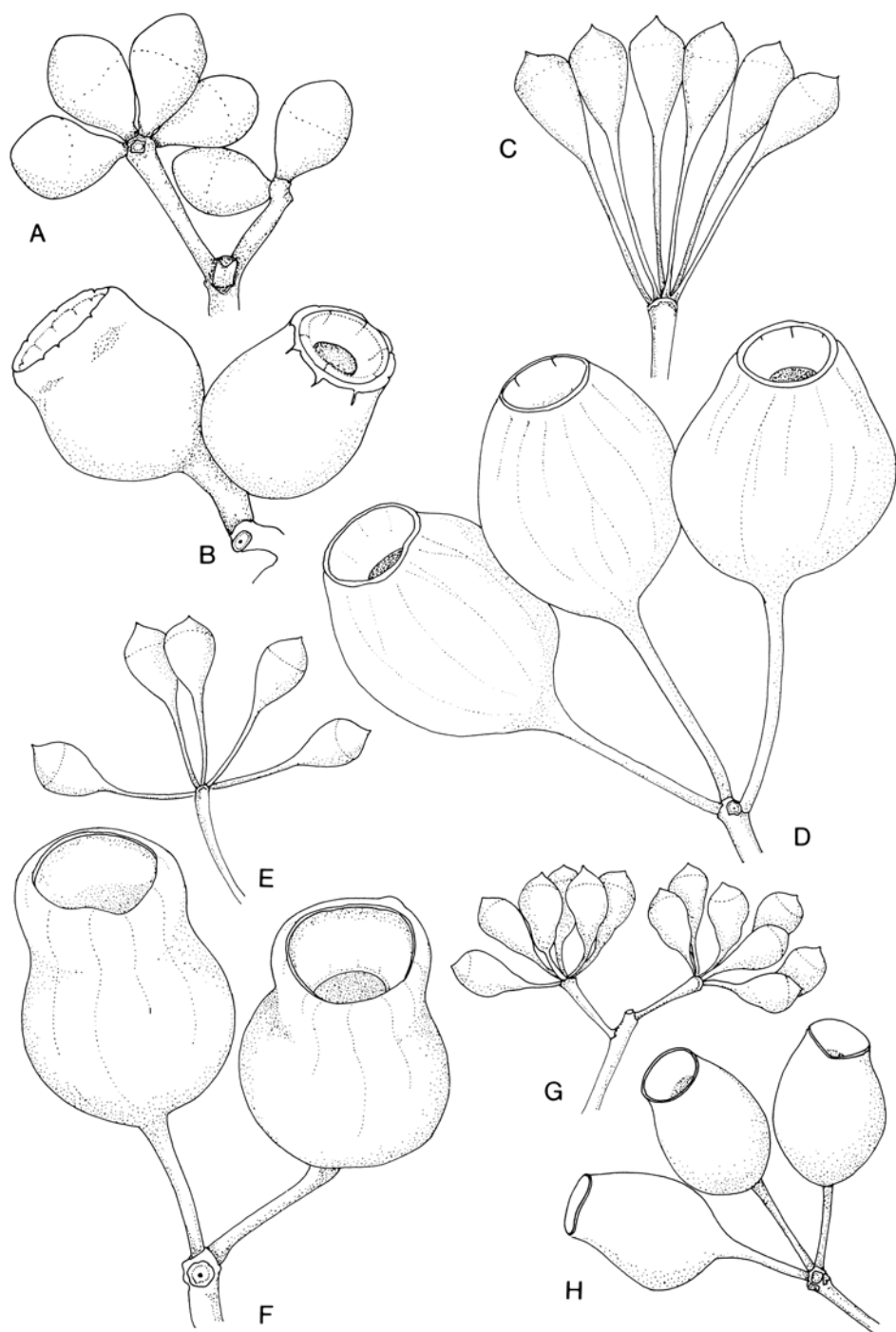


Figure 46. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. abergiana* (**A**, I.Brooker 4125, FRI; **B**, I.Brooker 4121, FRI). **C–D**, *E. ficifolia* (**C**, M.Crisp 5325, FRI; **D**, 10.1 km SE of Nornalup, W.A., E.Holme, FRI). **E–F**, *E. calophylla* (**E**, R.Kuchel 1992, FRI; **F**, R.Coveny 8061, FRI). **G–H**, *E. haematoxylon* (**G**, cult., Botanic Gardens, Sydney, N.S.W., J.Boorman, FRI; **H**, 22.4 km W of Donnybrook, W.A., K.Allen, FRI). Drawn by M.May.

53. *Eucalyptus gummifera* (Sol. ex Gaertner) Hochr., *Candollea* 2: 464 (1925)

Metrosideros gummifera Sol. ex Gaertner, *Fruct.* 1: 170, t. 34, fig. 1 (1788). T: Botany Bay, N.S.W., 1770, *J.Banks & D.Solander s.n.*; holo: BM.

E. corymbosa Smith, *Spec. Bot. New Holl.* 1: 43 (1795). T: Port Jackson, N.S.W., 1793, *J.White s.n.*; holo: LINN; iso: BM, CGE, G, K.

E. purpurascens var. *petiolaris* DC., *Prodr.* 3: 221 (1828). T: a cultivated seedling, Paris, France, collector unknown; holo: G n.v., fide S.T.Blake, *Austral. J. Bot.* 1: 259 (1953).

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 20 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 47 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 223 (1984).

Tree to 35 m. Bark tessellated throughout, grey-brown or brown. Juvenile leaves alternate, petiolate, ovate to broadly lanceolate, discolorous, setose. Adult leaves alternate, lanceolate or broadly lanceolate, acuminate, thick; lamina 10–14 cm long, 2–4 cm wide, shining, dark green above, discolorous; lateral veins numerous, faint, at 60°–70°; intramarginal vein c. 1 mm from margin; petiole flattened, 10–23 mm long. Umbels 7-flowered; peduncle flattened or angular, sometimes terete, 17–30 mm long; pedicels 9–14 mm long. Buds obovoid to clavate; operculum hemispherical-conical, apiculate, 2–4 mm long, 6–7 mm wide; hypanthium pyriform, 7–9 mm long, 5–8 mm wide. Fruits urceolate, 15–20 mm long, 11–15 mm wide. Seeds without or with rudimentary marginal wing, red-brown. *Red Bloodwood*. Fig. 47A–B.

Occurs from south-eastern Qld through eastern N.S.W. to far eastern Vic. including some islands; commonly in sandy soil near the coast, on flats and low hills in open forest. Regions: DWSN, MCPH, NEPN, HOWE. Map 53.

Qld: Chermide, *S.T.Blake 21679* (BRI, CANB, K, MEL, NSW); 23 km NE of Gympie, *G.M.Chippendale 1143* (FRI, NSW). N.S.W.: 2.5 km SW of Yanderra, *J.P.Baker 159* (FRI, NSW); 7.5 km N of Bodalla, *G.M.Chippendale 898* (AD, BRI, FRI, MEL, NSW). Vic.: Genoa R., Sept. 1860, *F.Mueller* (MEL).

Resembles *E. intermedia* but differs in having a more evident neck and narrower rim to the fruit and in having red-brown seeds that are wingless or have marginal wings.

Useful timber for poles, sleepers, fencing and for mining construction, and also for hardboard manufacture.

Ser. 3 *Jacobsianae*

Eucalyptus* ser. *Jacobsianae Chippendale, *Fl. Australia* 19: 499 (1988).

Type: *E. jacobsiana* Blakely

Trees. Bark fibrous or sub-tessellated. Juvenile leaves opposite or alternate, petiolate, hairy, discolorous. Adult leaves alternate, petiolate, discolorous. Conflorescences terminal, corymbose panicles. Buds obovoid or clavate; operculum depressed hemispherical-conical. Fruits urceolate, fragile; disc broad, steeply descending; valves obscure, deeply included. Seeds not winged, usually elliptic, red-brown.

A series of 1 species, in N.T., characterised by the fibrous bark, the narrow non-peltate juvenile leaves that are setose beneath, the small leaves, buds and fruits, and the seeds without a terminal wing.

54. *Eucalyptus jacobsiana* Blakely, *Key Eucalypts* 92 (1934)

T: 10 miles [16 km] W of Pine Creek, N.T., 23 July 1933, *M.R.Jacobs 90*; holo: NSW; iso: AD, FRI, K, MEL, NT, PERTH.

Illustrations: S.T.Blake, *Austral. J. Bot.* 1: t. 23 (1953); N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 43 (1970); S.Kelly *et al.*, *Eucalypts* 2: t. 35 (1983).

Tree to 15 m. Bark longitudinally fissured throughout, brown-grey to yellow-brown. Juvenile leaves lanceolate, glabrous above, densely tomentose below, glandular-setose on midrib.

Adult leaves lanceolate or narrowly lanceolate, acuminate, thin; lamina 6–11 cm long, 1–1.8 cm wide, green above; lateral veins numerous, faint, at 60°–70°; intramarginal vein confluent with margin; petiole 5–12 mm long. Umbels 3–7-flowered; peduncle 5–10 mm long; pedicels 3–5 mm long. Buds with operculum 1–2 mm long and wide; hypanthium truncate-pyriform or suburceolate, 2–4 mm long, 1–2 mm wide. Fruits 7–10 mm long, 5–8 mm wide. *Stringybarked Bloodwood*. Fig. 47C–D.

Occurs in several disjunct populations near Pine Creek and the Mitchell Ranges, N.T., usually in woodland, on plateaus, ridges and the upper slopes of hills. Region: ARNM. Map 54.

N.T.: 233 km S of Darwin, *M.I.H.Brooker* 3159 (DNA, FRI, NSW); 25.7 km NNW of Tipperary Stn, *M.Lazarides* 6660 (AD, BRI, CANB, K, MEL, NSW, NT, PERTH); Port Keats, 25 Sept. 1972, *C.S.Robinson* (DNA, NT).

Ser. 4 *Trachyphloiae*

Eucalyptus* ser. *Trachyphloiae Chippendale, *Fl. Australia* 19: 507 (1988).

Type: *E. trachyphloia* F.Muell.

Trees. Bark flaky, tessellated. Juvenile leaves opposite, petiolate, setose, discolorous. Adult leaves alternate, petiolate, discolorous. Conflorences terminal, corymbose panicles. Buds obovoid or pyriform; operculum depressed hemispherical, apiculate. Fruits urceolate; disc broad, descending; valves 3 or 4, deeply included. Seeds not winged, suborbicular to elliptic, brown.

A series of 1 species, in eastern Qld and N.S.W.

55. *Eucalyptus trachyphloia* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 90 (1859)

T: Burnett R., Qld, Dec. 1856, *F.Mueller*; holotype: MEL; isotype: BM, K.

E. trachyphloia f. *fruticosa* Bailey, *Queensland Agric. J.* 25: 9 (1910). T: Glasshouse Mts, Qld, July 1879, *F.M.Bailey* s.n.; holotype: BRI; isotype: MEL.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 35 (1970); S.Kelly *et al.*, *Eucalypts* 1: t. 19 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 48 (1983).

Tree to 25 m. Bark flaky, tessellated, brown or yellow-grey throughout, sometimes smooth on smaller branches. Juvenile leaves ovate, obtuse, cordate, peltate. Adult leaves narrowly lanceolate to lanceolate, acuminate; lamina 7–12 cm long, 1–2 cm wide, grey-green; lateral veins fine, faint, at 50°–60°; intramarginal vein very close to or confluent with margin; petiole 10–17 mm long. Umbels 3–7-flowered; peduncle terete, 5–13 mm long; pedicels 2–6 mm long. Buds with operculum 1–2 mm long, 2–3 mm wide; hypanthium truncate-pyriform, 3–4 mm long, 2–3 mm wide. Fruits 6–10 mm long, 5–8 mm wide. *Brown Bloodwood*. Fig. 47E–F.

Occurs widely in eastern coastal Qld and S to the upper Hunter R., N.S.W., mostly in sandy soils, on plains and on sandstone outcrops. Regions: CYRK, BURD, DWSN, MCPH, NEPN. Map 55.

Qld: Margate, *S.T.Blake* 18463 (BRI, FRI); Herberton to Irvinebank, *M.I.H.Brooker* 3361 (DNA, FRI, NSW); near Mt Misery, *B.Hyland* 8034 (BRI, DNA, FRI, NSW, PERTH, QRS). N.S.W.: 24.1 km NNE of Coonabarabran, 7 Nov. 1951, *L.A.S.Johnson* (K, NSW); Worondi R., Gungal Ck, 10 Apr. 1953, *L.A.S.Johnson* (BRI, NSW).

Somewhat resembles *E. intermedia* and *E. gummifera*, but has smaller fruits and always wingless seeds, and the bark is more clearly tessellated. The trees provide a useful source of pollen, although honey from this species is not highly regarded.

Ser. 5 Naviculares

Eucalyptus ser. **Naviculares** Maiden, *Crit. Revis. Eucalyptus* 7: 109 (1925).

Type: *E. eximia* Schauer, lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 502 (1988).

E. subser. *Ochrophloiae* Blakely, *Key Eucalypts* 18,19 (1934). T: *E. eximia* Schauer, lecto, *fide* G.M.Chippendale, *loc. cit.*

Small to medium trees. Bark flaky or irregularly tessellated throughout, yellow or yellow-brown. Juvenile leaves alternate, petiolate, some leaves peltate, usually discolorous but not seen in *E. watsoniana*. Adult leaves alternate, petiolate, concolorous. Conflorescences terminal, corymbose panicles; umbels 3–7-flowered. Buds ovoid, clavate or turbinate; operculum conical or hemispherical-conical, sometimes rostrate or apiculate. Fruits ovoid to urceolate, sometimes with faint striations, woody; disc broad, obliquely descending; valves 3 or 4, obscure, deeply included. Seeds orbicular to elliptic, keeled on dorsal side, lustrous red-brown.

A series of 4 species in south-eastern and central Qld and central-coastal N.S.W., characterised by the flaky yellow or yellow-brown bark.

56. Eucalyptus peltata Benth., *Fl. Austral.* 3: 254 (1867)

T: Newcastle Range, Qld, Oct. 1856, *F. Mueller*; holo: K; iso: MEL, NSW.

Tree to 14 m. Juvenile leaves broadly lanceolate to ovate or orbicular, sometimes peltate, sometimes setose. Leaves on mature trees alternate or subopposite, lanceolate or oblong-lanceolate and peltate, thick. Umbels 3–7-flowered; pedicels absent or up to 3 mm long. Buds ovoid, glaucous; operculum hemispherical to conical, sometimes apiculate; hypanthium hemispherical. Fruits 8–15 mm long, 8–13 mm wide.

Occurs in eastern Qld. Distinguished among the yellow bloodwoods in the buds having a brown operculum and green hypanthium. There are 2 subspecies.

Leaves on mature trees ±broadly ovate, peltate

36a. subsp. peltata

Leaves on mature trees lanceolate

36b. subsp. leichhardtii

56a. Eucalyptus peltata Benth. subsp. **peltata**

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 106 (1974); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 227–228 (1984).

Bark tessellated throughout. Juvenile leaves ovate-orbicular to broadly ovate, peltate. Leaves on mature trees usually persistent juvenile leaves, becoming oblong-lanceolate, peltate, thick; lamina 8–15 cm long, 3–8 cm wide, yellow-green; lateral veins prominent, at 50°–65°; intramarginal vein up to 5 mm from margin; petiole setose, 15–20 mm long. Peduncle ribbed, setose, 12–25 mm long. Operculum hemispherical-conical, c. 3 mm long, 5 mm wide; hypanthium hemispherical, ribbed, 5–6 mm long, 5–7 mm wide. *Rusty Jacket*. Fig. 47G–H.

Occurs in Qld, on slopes of the Great Dividing Range; grows in poor soils, in dry sclerophyll forest and woodland. Regions: BURD, DWSN. Map 56.

Qld: 19.3 km W of Conjuboy, *M.I.H.Brooker 4139* (BRI, FRI, NSW); Herberton, *S.L.Everist 5152* (BRI, CANB); Homestead, *B.Hyland 6126* (BRI, FRI, NSW, QRS); 24.1 km SE of Einasleigh, *N.H.Speck 4708* (AD, BRI, CANB, K, NSW, NT, PERTH).

Distinct in having the peltate juvenile leaves persistent on mature trees, and sessile or almost sessile buds.

56b. Eucalyptus peltata subsp. **leichhardtii** (Bailey) L.Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 453 (1973)

E. leichhardtii Bailey, *Queensland Agric. J.* 16: 493 (1906). T: near Alice, Central Railway, Qld, Dec. 1905, *W.Pagan s.n.*; holo: BRI; iso: K, MEL, NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 174 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 31 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 227 (1984).

Bark tessellated on trunk and larger branches. Juvenile leaves broadly lanceolate. Adult leaves lanceolate, thick; lamina 12–20 cm long, 2–4 cm wide, shining, green; lateral veins fine, at 60°–70°; intramarginal vein up to 1 mm from margin; petiole flattened, 16–22 mm long. Peduncle ribbed, 10–17 mm long. Operculum conical or hemispherical-conical, c. 3 mm long, 4–6 mm wide; hypanthium conical or hemispherical, 5–7 mm long and wide. *Rusty Jacket*. Fig. 47 I–J.

Occurs widely in Qld, on slopes of the Great Dividing Ra.; in poor soils, in dry sclerophyll forest and woodland. Regions: CYRK, BURD, DWSN, MCPH. Map 57.

Qld: 11.3 km NW of Cerito Stn, *L.G.Adams* 972 (BRI, CANB, K, MEL, NSW, PERTH); Jericho, *S.T.Blake* 6820 (BRI, CANB); near Bakerville, *B.Hyland* 5928 (BRI, CANB, FRI, NSW, QRS); 1.6 km S of Washpool Ck, *R.W.Johnson* 474 (BRI, CANB, K).

Distinguished from subsp. *peltata* mainly by the lanceolate adult leaves.

57. *Eucalyptus bloxsomei* Maiden, J. & *Proc. Roy. Soc. New South Wales* 59: 156 (1925)

T: Hippong, Qld, Oct. 1919, Apr. 1922, June 1922, 10 Oct. 1922, Feb. 1923, Mar. 1925 (6 syntypes), *H.S.Bloxsome s.n.*; syn: BRI (Apr. 1922, Mar. 1925), NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 107 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 33 (1983).

Tree to 24 m. Juvenile leaves ovate to broadly lanceolate. Adult leaves lanceolate, sometimes falcate, acuminate, thick; lamina 12–17 cm long, 1.8–3 cm wide, green; lateral veins numerous, at 40°–50°; intramarginal vein less than 1 mm from margin; petiole flattened, 25–40 mm long. Umbels 3–7-flowered; peduncle angled, 12–18 mm long; pedicels ribbed, 5–6 mm long. Buds obovoid or clavate, faintly costate; operculum hemispherical and apiculate or conical, 3–4 mm long, 5–8 mm wide; hypanthium obconical, 7–10 mm long, 6–8 mm wide. Fruits faintly costate, 10–20 mm long, 8–12 mm wide. *Yellow Jacket*. Figs 1, 47K–M.

Occurs in the area including Chinchilla and the Barakula State Forest, Qld, on flat or slightly sloping areas of dry sclerophyll forest. Regions: DWSN, BURD, MCPH. Map 58.

Qld: Ballon South, *M.I.H.Brooker* 4776 (AD, BRI, FRI); 0.2 km W of Burra Burri, *G.M.Chippendale* 578 & *R.D.Johnston* (BRI, FRI, MEL, NSW, PERTH); 32 km S of Wandoan, *N.H.Speck* 1973 (AD, BRI, CANB, K, MEL, NSW, PERTH).

Has larger buds than *E. peltata*, the operculum of almost the same colour as the hypanthium.

58. *Eucalyptus watsoniana* F.Muell., *Fragm.* 10: 98 (1876)

T: Wigton, Qld, 1876, *T.W.Watson s.n.*; holo: MEL; iso: K.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 108 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 34 (1983).

Tree to 24 m. Juvenile leaves not seen. Adult leaves lanceolate, acuminate, thick; lamina 8–18 cm long, 1.8–2.5 cm wide, green; lateral veins faint, numerous, at 40°–45°; intramarginal vein close to margin; petiole ±quadrangular, 18–40 mm long. Umbels 3–7-flowered; peduncle flattened or terete, striate, 12–25 mm long; pedicels angular, 6–10 mm long. Buds glossy, turbinate; operculum hemispherical, apiculate, 5–8 mm long, 15–20 mm wide; hypanthium campanulate, wrinkled, 8–12 mm long, 10–16 mm wide. Fruits 25–32 mm long, 20–25 mm wide. *Large-fruited Yellow Jacket*. Fig. 47N–O.

Occurs in and near the Barakula State Forest, Qld. Grows in dry sclerophyll forest, mostly on flat areas but also on some slightly sloping sites. Regions: DWSN, MCPH. Map 59.

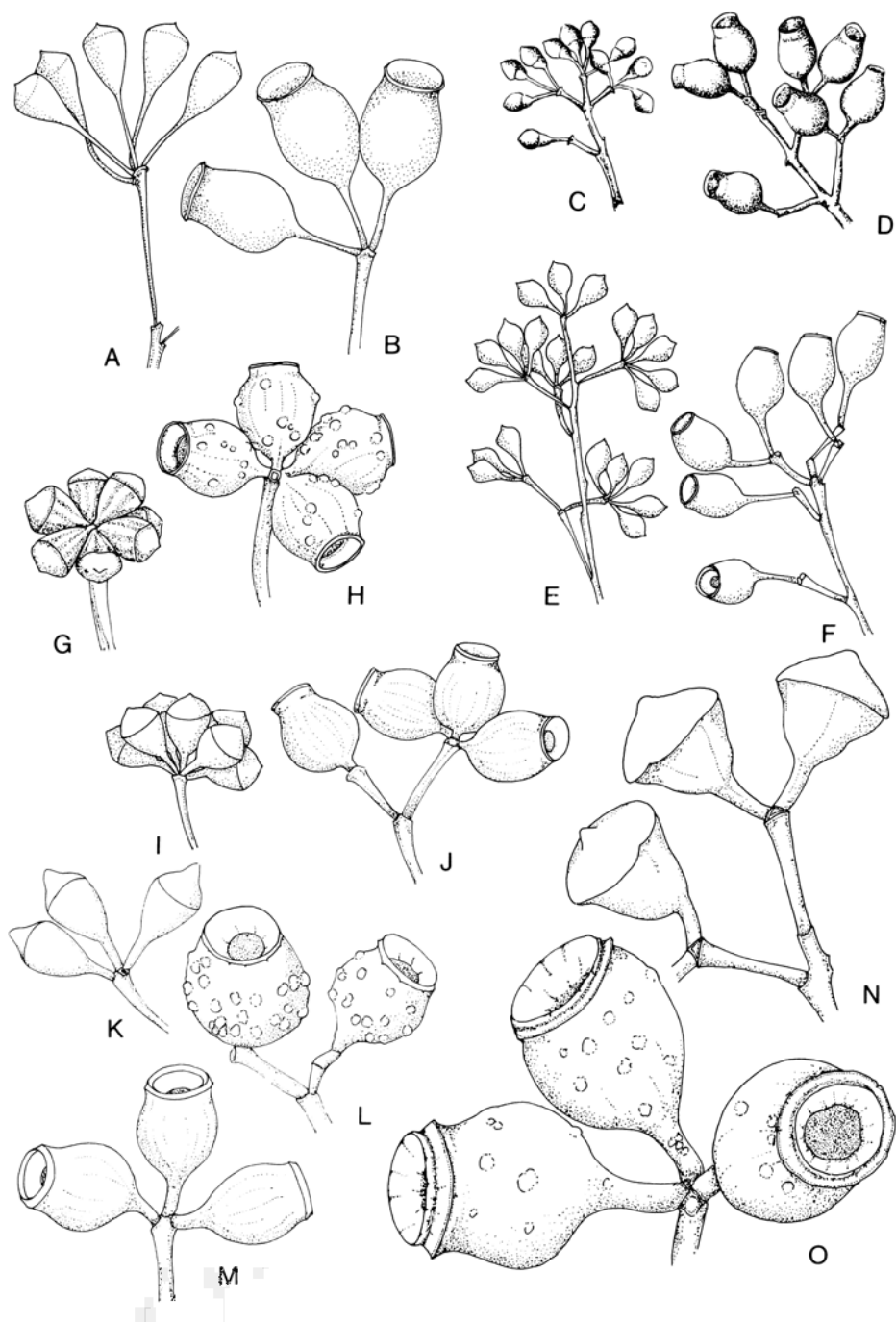


Figure 47. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. gummifera* (**A**, G.Chippendale 898, FRI; **B**, G.Chippendale 884, FRI). **C–D**, *E. jacobsoniana* (M.Jacobs 90, FRI). **E–F**, *E. trachyphloia* (**E**, B.Hyland 8034, FRI; **F**, I.Brooker 5166, FRI). **G–H**, *E. peltata* subsp. *peltata* (D.Kleinig 194, FRI). **I–J**, *E. peltata* subsp. *leichhardtii* (B.Hyland 5804, FRI). **K–M**, *E. bloxsoni* (K & M, R.Johnston & G.Chippendale 578, FRI; **L**, I.Brooker 3760, FRI). **N–O**, *E. watsoniana* (**N**, L.Johnson, NSW 132493, FRI; **O**, G.Chippendale 1082, FRI). Drawn by M.May.

Qld: 61 km N of Tardum, *M.I.H.Brooker 4801* (AD, BRI, FRI); 34 km S of Cracow, *L.A.S.Johnson 7151* & *B.G.Briggs* (BRI, FRI, NSW); Expedition Ra., *L.Pedley 2797* (BRI, K, NSW); Planet Ck, 48 km NE of Rolleston, *R.Story 289* (BRI, CANB, K).

Has larger pedicels and larger fruits than *E. bloxsomei*. Fruits much larger than those of *E. peltata*.

59. *Eucalyptus eximia* Schauer in W.G.Walpers, *Repert. Bot. Syst.* 2: 925 (1843)

T: Grose R., N.S.W., Nov. 1803, *R.Brown* & *F.Bauer s.n.*; holotype: W; isotype: BM, E, K, MEL, NSW.

Illustrations: N.Hall, *Forest Tree Ser.* No. 7 (1970); S.Kelly *et al.*, *Eucalypts* 1: t. 22 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 49 (1983).

Tree, usually to 12 m, sometimes to 20 m. Juvenile leaves oblong-lanceolate. Adult leaves lanceolate, falcate, acuminate, thick; lamina 13–20 cm long, 1.3–3 cm wide, green; midvein conspicuous; lateral veins faint, at 55°–60°; intramarginal vein c. 1 mm from margin; petiole flattened, 15–25 mm long. Umbels 7-flowered; peduncle angular or terete, 10–25 mm long; pedicels usually absent, sometimes up to 2 mm long. Buds clavate; operculum hemispherical-conical, 3–5 mm long, 6–8 mm wide; hypanthium truncate-pyriform, 7–9 mm long, 6–8 mm wide. Fruits 15–20 mm long, 10–15 mm wide, sometimes faintly striate. *Yellow Bloodwood*. Fig. 48A–B.

Occurs from the Hunter R. valley to Nowra, N.S.W., in sandstone soils, in dry sclerophyll forest and woodland. Regions: NEPN, HOWE. Map 60.

N.S.W.: Blaxland, *G.M.Chippendale 1194* & *M.J.Brennan* (AD, BRI, FRI, MEL, NT); Nortons Basin, *R.Coveny 3645* (FRI, NSW); 8.2 km N of Colo R., *G.P.Smith 1* (AD, BRI, FRI, MEL, NSW, PERTH).

Distinguished by the large lanceolate leaves with a conspicuous midvein, and sessile or almost sessile, ovoid or urceolate fruits which may be faintly striate.

Ser. 6 *Torellianae*

Eucalyptus* ser. *Torellianae Chippendale, *Fl. Australia* 19: 506 (1988).

Type: *E. torelliana* F.Muell.

Trees. Bark rough, fibrous, subtessellated, grey or black on lower trunk, smooth and slaty green above. Juvenile leaves alternate, petiolate, discolorous, hairy. Adult leaves alternate, petiolate, discolorous. Conflourescences terminal corymbose panicles; umbels 3- or 7-flowered. Buds ovoid. Fruits globular-urceolate or ovoid; disc broad, descending; valves 3, deeply included. Seeds elliptic, keeled on one side, red-brown.

A series of 1 species in northern Qld, characterised especially by the fibrous lower bark, smooth green upper bark and globular to ovoid fruits.

60. *Eucalyptus torelliana* F.Muell., *Fragm.* 10: 106 (1877)

T: Trinity Bay, Qld, 1877, *E.Fitzalan s.n.*; holotype: MEL.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 41 (1970); S.Kelly *et al.*, *Eucalypts* 2: t. 32 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 231 (1984).

Tree to 30 m. Juvenile leaves broadly ovate, peltate; petioles and veins hairy. Adult leaves narrowly to broadly lanceolate, acuminate, not commonly seen, as juvenile and intermediate leaves frequently form crown of mature trees; lamina 10–14 cm long, 1–3.5 cm wide, green; lateral veins distinct, at 45°–55°; intramarginal vein up to 1 mm from margin; petiole 5–20 mm long. Peduncle terete, 5–20 mm long; pedicels absent or up to 3 mm long. Operculum hemispherical, apiculate, 1–3 mm long, 3–6 mm wide; hypanthium cupular, 6–8 mm long, 4–8 mm wide. Fruits 8–10 mm long and wide. *Cadaga*. Fig. 48C–D.

Occurs in a limited area including the Atherton Tableland, Qld, in and around tropical rainforest on the slopes of coastal ranges. Region: CYRK. Map 61.

Qld: Windsor Tableland, *B.Hyland 5570* (BRI, FRI, QRS); Little Mulgrave R., *A.K.Irvine 1192* (BRI, FRI, QRS); Shipton Flat, *L.S.Smith 14334* (BRI).

Distinct in occurring in and around rainforests, and in having smooth green upper bark, peltate hairy juvenile leaves which often persist on mature trees, large terminal confluences, and globular-urceolate or ovoid fruits.

The wood is hard and strong, but not durable in the ground, and its scarcity precludes much use. Previously the timber has been used in building wagons and bridge decking.

Ser. 7 *Maculatae*

Eucalyptus* ser. *Maculatae (Blakely) Chippendale, *Fl. Australia* 19: 500 (1988).

E. subser. Maculatae Blakely, *Key Eucalypts* 18 (1934).

Type: *E. maculata* Hook.

Trees. Bark smooth throughout, often mottled grey and grey-white. Juvenile leaves alternate, petiolate, discolorous. Adult leaves alternate, petiolate, acuminate, concolorous. Confluences terminal or sometimes axillary, corymbose panicles; umbels 3-flowered. Buds clavate or ovoid. Fruits ovoid, subglobular or urceolate, woody; disc broad, descending; valves 3 or 4, deeply included. Seeds elliptic, keeled on dorsal side, red-black.

A series of 3 species in Qld, N.S.W. and north-eastern Vic., characterised by the smooth bark, concolorous adult leaves and ovoid to urceolate fruits. The 'hairs' of the juvenile leaves are long oil glands.

61. *Eucalyptus citriodora* Hook. in T.L.Mitchell, *J. Exped. Trop. Australia* 235 (1848)

E. maculata var. *citriodora* (Hook.) Bailey, *Queensland Fl.* 2: 634 (1900). T: Balmy Ck, [Qld], 16 July 1846, *T.L.Mitchell 153*; holo: K; iso: CGE, MEL.

E. melissiodora Lindley in T.L.Mitchell, *J. Exped. Trop. Australia* 235 (1848). T: Balmy Ck, [Qld], 16 July 1846, *T.L.Mitchell 153*; iso: CGE, K, MEL.

E. variegata F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 88 (1859). T: Burnett R., [Qld], 1856, *F.Mueller*; holo: MEL; iso: K.

E. maculata var. *citriodora* Bailey, *Syn. Queensland Fl.* 181 (1883), *nom. illeg.*, non (Hook.) Bailey. T: not designated.

E. maculata var. *citriodora* Kinney, *Eucalyptus* 89 (1895) *nom. illeg.*, non (Hook.) Bailey. T: not designated.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 45 (1970); S.Kelly *et al.*, *Eucalypts* 1: t. 23 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 233 (1984).

Tree 25–40 m, occasionally to 50 m. Bark white, powdery, sometimes pink, red or blue-grey. Juvenile leaves ovate to broadly lanceolate, sometimes peltate, sometimes setose, on petiole and lamina. Adult leaves lanceolate to narrowly lanceolate, strongly lemon-scented when crushed; lamina 8–16 cm long, 0.5–2 cm wide; lateral veins just visible, at 35°–50°; intramarginal vein up to 1 mm from margin; petiole flattened, 13–20 mm long. Peduncle terete, 3–7 mm long; pedicels 1–6 mm long. Buds clavate; operculum hemispherical, apiculate, 3–4 mm long, 4–5 mm wide; hypanthium hemispherical, 5–6 mm long, 4–5 mm wide. Fruits ovoid or urceolate, 7–15 mm long, 7–11 mm wide, often warty. *Lemon-scented Gum*. Fig. 48E–F.

Occurs in several disjunct areas in Qld, one including the Atherton Tableland, another from Mackay to Maryborough and extending inland. Grows on undulating country, in open forest and woodland. Regions: CYRK, BURD, DWSN, MCPH. Map 62.

Qld: Herberton to Irvinebank, *M.I.H.Brooker 3360* (AD, BRI, DNA, FRI, MEL, NSW); 11.1 km E of Childers, *G.M.Chippendale 545* & *R.D.Johnston* (FRI, MEL, NSW); 19.3 km N of Mt Sturgeon Stn, *M.Lazarides 3653* (AD, BRI, CANB, FRI, K, MEL, NSW, PERTH); 11.3 km E of Duaringa, *N.H.Speck*

1669 (CANB, K, MEL, NSW, PERTH); Channel Road, Granite Peak, *G.C.Stocker* 726 (BRI, CANB, FRI, NSW).

Easily recognised by the smooth-barked tree with lemon-scented foliage. Appears to grade into *E. maculata* where the species overlap in distribution.

The timber has been used for bridge construction, flooring and tool handles. Often planted for ornament; used overseas for paper and pulp-making.

62. *Eucalyptus maculata* Hook., *Icon. Pl.* 7: 619 (1844)

T: Maitland, N.S.W., *J.Backhouse* 37; syn: K, NSW; New Holland, *C.Fraser s.n.*; syn: K; Liverpool, N.S.W., *collector unknown*; syn: MEL; Newcastle, N.S.W., *?L.Leichhardt s.n.*; syn: MEL.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 24 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide Eucalypts* 1: 8 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 237 (1984).

Tree to 45 m. Bark cream, pink-grey or blue-grey, usually mottled in several colours, often dimpled. Juvenile leaves ovate, some peltate, setose becoming glabrous. Adult leaves lanceolate to narrowly lanceolate; lamina 12–21 cm long, 1.2–3 cm wide; lateral veins just visible, at 35°–50°; intramarginal vein up to 1 mm from margin; petiole angular, 15–25 mm long. Peduncle terete, 3–8 mm long; pedicels angular, 3–7 mm long. Buds ovoid; operculum hemispherical, apiculate, 4–5 mm long, 5–8 mm wide; hypanthium hemispherical, 5–8 mm long and wide. Fruits ovoid or sometimes suburceolate, 10–14 mm long, 9–11 mm wide. *Spotted Gum*. Fig. 48G–H.

Widespread from south-eastern Qld through coastal N.S.W. and just into Vic. Grows usually on valley slopes and ridges of coastal ranges, and on undulating areas nearer the coastline, in open forest in sandy soils, sometimes in pure stands. Regions: DWSN, MCPH, NEPN, HOWE. Map 63.

Qld: 16.3 km W of Gayndah, *G.M.Chippendale* 1090 & *M.J.Brennan* (AD, BRI, FRI, MEL, NSW); 72.4 km SW of Theodore, *M.Lazarides* 6932 (AD, BRI, CANB, K, MEL, NSW, PERTH). N.S.W.: 8 km SE of Cessnock, *R.Story* 6640 (CANB, NSW); Lake Nelson, near Tathra, *D.Walker* 1019 (BRI, CANB, MEL, NSW). Vic.: Cann R., near Noorimbee, 10 Jan. 1920, *H.B.Williamson* (MEL).

Distinguished from *E. citriodora* in the mottled bark which is often dimpled, and the lack of lemon scent in the leaves. The timber is used in mining, heavy construction, flooring, tool handles, poles and plywood manufacture. This is a picturesque tree because of the spotted trunk. Although a minor source of honey, the honey is highly prized.

63. *Eucalyptus henryi* S.T.Blake, *Austrobaileya* 1: 4 (1977)

T: Stafford, near Brisbane, Qld, 8 Jan. 1956, *S.T.Blake* 19889; holo: BRI; iso: CANB, FRI, K, NSW.

Illustrations: S.Kelly *et al.*, *Eucalypts* 2: t. 36 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide Eucalypts* 1: 51 (1983).

Tree to 30 m. Bark grey, cream or pink-grey, usually mottled. Juvenile leaves ovate, sparsely setose, sometimes peltate. Adult leaves lanceolate to broadly lanceolate, sometimes falcate; lamina 16–28 cm long, 2.7–4.5 cm wide; lateral veins prominent, at 35°–50°; intramarginal vein up to 1 mm from margin; petiole flattened or angular, 10–25 mm long. Peduncle angular, 3–6 mm long; pedicels 3–4 mm long. Buds ovoid; operculum hemispherical, apiculate or conical, 4–6 mm long and wide; hypanthium hemispherical, 6–9 mm long, 4–6 mm wide. Fruits subglobular or suburceolate, 10–20 mm long, 10–16 mm wide. *Large-leaved Spotted Gum*. Fig. 48 I–J.

Occurs around Brisbane, Qld, and southwards to near Grafton, N.S.W., in open forest in stony, shallow soil. Region: MCPH. Map 64.

Qld: near Stafford, *S.T.Blake* 19233 (BRI, FRI); Mt Coot-tha, *M.I.H.Brooker* 3377 (BRI, FRI). N.S.W.: 15.4 km S of Whiporie, *G.M.Chippendale* 1288 & *M.J.Brennan* (AD, BRI, FRI).

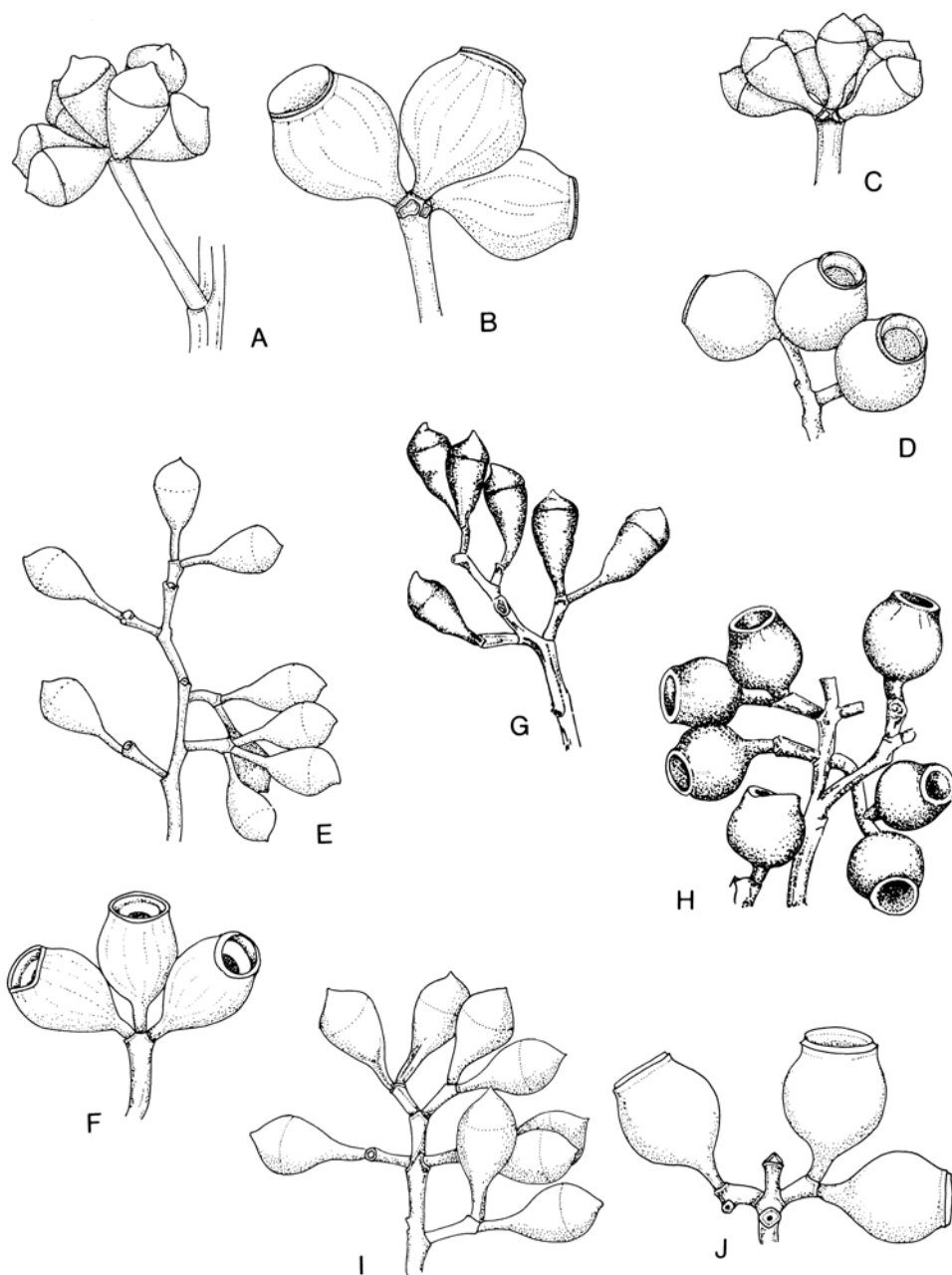


Figure 48. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. eximia* (**A**, G.Smith 1, FRI; **B**, G.Chippendale 1014, FRI). **C–D**, *E. torelliana* (**C**, I.Brooker 4127, FRI; **D**, D.Kleinig DK266, FRI). **E–F**, *E. citriodora* (**E**, I.Brooker 3360, FRI; **F**, G.Chippendale 901, FRI). **G–H**, *E. maculata* (**G**, R.Cambage 3590, NSW; **H**, Clarence Town, N.S.W., Forest Guard, Ikin, NSW). **I–J**, *E. henryi* (**I**, S.Blake 23580, FRI; **J**, I.Brooker 4727, FRI). Drawn by M.May.

Has larger leaves, buds and fruits than *E. maculata* and *E. citriodora* and is geographically separated.

Ser. 8 Heteroptera

Eucalyptus ser. **Heteroptera** Maiden, *Crit. Revis. Eucalyptus* 7: 115 (1925).

Type: *E. tetragona* (R.Br.) F.Muell., lecto *fide* G.M.Chippendale, *Fl. Australia* 19: 498 (1988).

E. ser. Eudesmiae Blakely, *Key Eucalypts* 13, 68 (1934); *E. subser. Eudesmiae* Benth., *Fl. Austral.* 3: 199, 258 (1867); *E. subser. Fasciculares* Blakely, *loc. cit. p.p.* T: *E. tetragona* (R.Br.) F.Muell., lecto, *fide* G.M.Chippendale, *op. cit.* 498.

E. ser. Pachyspermae Maiden, *op. cit.* 167. T: not designated.

Usually shrubs or mallees, sometimes small trees. Bark generally smooth. Juvenile leaves usually opposite, sometimes alternate, usually petiolate, stellate hairy, concolorous. Adult leaves opposite or alternate, petiolate, concolorous. Conflorescences axillary, simple; umbels 3-flowered. Buds clavate or turbinate, with 4 free sepals often persistent as tooth-like lobes on fruits. Stamens in 4 bundles. Fruits quadrangular, woody; valves 3 or 4, included. Seeds pyramidal with narrow wings or cuboid and not winged, grey-black.

A series of 4 species in south-western W.A., characterised especially by the quadrangular buds and fruits, and the stamens in 4 bundles.

64. *Eucalyptus tetragona* (R.Br.) F.Muell., *Fragm.* 4: 51 (1864)

Eudesmia tetragona R.Br. in M.Flinders, *Voy. Terra Australis* 2: 599, t. 3 (1814). T: Lucky Bay, [W.A.], 13 Jan. 1802, *R.Brown*; holo: BM; iso: FRI, K.

E. pleurocarpa Schauer in J.G.C.Lehmann, *Pl. Preiss.* 1: 132 (1844). T: Cape Riche, W.A., Nov. 1840, *L.Preiss* 253; *n.v.*

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 29, 30 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 171 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 2 (1983).

Mallee to 3 m. Bark light brown to white or grey. Juvenile leaves and leaves of mature plants similar, opposite, broadly elliptic, apiculate, thick; lamina 7–15 cm long, 2.5–7 cm wide, glaucous or green; lateral veins prominent, at c. 50°; intramarginal vein up to 1 mm from margin; petiole 10–20 mm long, the edges continuous onto stems. Peduncle flattened or angular, 5–15 mm long; pedicels angular, 4–10 mm long. Buds clavate, quadrangular, glaucous; operculum hemispherical, striate in the shape of a cross, 3–4 mm long, c. 6 mm wide; hypanthium 4-angled, toothed at corners, 5–6 mm long and wide. Fruits subglobular, 12–18 mm long, 11–18 mm wide, glaucous; disc broad, descending obliquely; valves 4. *Tallerack*. Figs 21, 49A–B.

Occurs from the Stirling Ra. eastwards to Israelite Bay, W.A., with disjunct occurrences near the Hill R.; grows in sandy soil in scrub heath. Regions: BENC, ESPR. Map 65.

W.A.: 16 km NE of Condingup, *J.S.Beard* 6347 (NSW, PERTH); East Mt Barren, *M.I.H.Brooker* 2302 (FRI, PERTH); 35.9 km S of Salmon Gums, *G.M.Chippendale* 181 (FRI, NSW, PERTH); Hill R., *C.A.Gardner* 9322 (FRI, PERTH); 16 km E of Jerramungup, *M.D.Tindale* 253 (NSW, PERTH).

Distinguished by the mallee habit, the opposite, usually glaucous leaves, the quadrangular buds with stamens in four bundles, and the subglobular, quadrangular fruits. From Lucky Bay and Condingup eastwards, the branches and leaves are green or slightly glaucous.

65. *Eucalyptus erythrocorys* F.Muell., *Fragm.* 2: 33 (1860)

T: Murchison R., W.A., 1859, *A.Oldfield s.n.*; holo: MEL; iso: K.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 31 (1973); C.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 17 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 1 (1983).

Tree to 8 m. Bark grey to white or grey-brown. Juvenile leaves ovate, green, stellate-hairy. Adult leaves opposite, narrowly lanceolate, often falcate, acuminate or uncinata; lamina 12–25 cm long, 1–4 cm wide, bright green; lateral veins prominent, at 25°–35°; intramarginal vein up to 1 mm from margin; petiole quadrangular, 10–30 mm long. Peduncle broadly flattened, up to 25 mm long; pedicels flattened, 5–10 mm long. Buds broadly turbinate; operculum rugose, depressed-hemispherical, with 4 broad lobes separated by ridges in the form of a cross, c. 10 mm long, c. 20 mm wide, scarlet; hypanthium quadrangular, ribbed, c. 15 mm long and wide, green. Fruits broadly campanulate, 4-toothed, 25–40 mm long, 30–50 mm wide; disc broad, prominently domed; valves 4. *Illyarrie*. Frontispiece, Fig. 49C–D.

Occurs from just N of Kalbarri to Dandaragan, W.A., usually in small, scattered populations on flats and gentle slopes in sandy soil, often with limestone. Regions: BENC, LUWN. Map 66.

W.A.: 1.3 km S of Bookara Siding, *G.M.Chippendale* 43 (AD, FRI, MEL, NSW, PERTH); Hill R., S of Dongara, Feb. 1940, *C.A.Gardner* (PERTH); 5.6 km [S] from Geraldton Hwy towards Eneabba [on Brand Hwy], *E.M.Scrymgeour* 263 (PERTH).

Easily recognised by the large, scarlet operculum with cruciform ridges, the bright yellow green to yellow stamens, and the large ±sessile campanulate fruits. A most ornamental plant suitable for drier areas with a minimum annual rainfall as low as 350 mm.

66. *Eucalyptus eudesmioides* F.Muell., *Fragm.* 2: 35 (1860) (as ‘*eudesmoides*’)

T: Murchison R., W.A., 1859, *A.Oldfield*; syn: MEL (3 sheets), NSW (3 sheets); Mt Curious, W.A., *A.Oldfield*; syn: K, NSW.

E. eudesmioides var. *globosa* Blakely, *Key Eucalypts* 69 (1934). T: Mingenew, W.A., Oct. 1909, *J.H.Maiden s.n.*; holotype: NSW; iso: BM, FRI.

Illustrations: *G.M.Chippendale*, *Eucalypts W. Austral. Goldfields* 32 (1973); *C.A.Gardner*, (ed T.E.Aplin), *Eucalypts W. Australia* 213 (1979); *S.Kelly et al.*, *Eucalypts* 1: t. 3 (1983).

Mallee, usually to 3 m, occasionally a tree to 6 m. Bark grey, grey-brown or green-brown. Juvenile leaves elliptic, grey-green. Adult leaves opposite, occasionally alternate, lanceolate, apiculate; lamina 3–6 cm long, 0.8–2.5 cm wide, green; lateral veins just visible, at 25°–30°; intramarginal vein up to 1 mm from margin; petiole channelled or flattened, 7–13 mm long. Peduncle quadrangular, 3–10 mm long; pedicels 3–8 mm long. Buds clavate; operculum depressed hemispherical, faintly cruciform-striate, 1–2 mm long, 3–6 mm wide; hypanthium campanulate, quadrangular, 4-toothed, 3–6 mm long and wide. Fruits quadrangular or ovoid, 8–12 mm long, up to 9 mm wide; disc narrow, descending; valves 3. *Mallalie*. Fig. 49E–F.

Occurs between the Murchison R. and Hill R. and inland to Wongan Hills, W.A., in sand, sandy laterite or sandy loam, on flat areas and low slopes in mallee woodland. Regions: MRCH, BENC, LUWN. Map 67.

W.A.: 11.3 km SW of Three Springs, *M.I.H.Brooker* 2372 (FRI, PERTH); 3 km W of Wongan Hills, *M.I.H.Brooker* 1829 (FRI, PERTH); 13.4 km N of Watheroo, *G.M.Chippendale* 316 (FRI, MEL, NSW, PERTH); Cervantes Road, *H.Demarz* 6023 (PERTH); 23 km S of Carnamah, *M.D.Tindale* 1282 (K, NSW, PERTH).

Distinguished by the small, usually opposite, lanceolate adult leaves, and the quadrangular buds and fruits.

67. *Eucalyptus gittinsii* Brooker & Blaxell, *Nuytsia* 2: 228 (1978)

T: 67 km S of Billabong Roadhouse, Wannoo, W.A., 9 Oct. 1975, *D.F.Blaxell* W 75/113; holotype: NSW; iso: FRI, K, PERTH.

Illustrations: *M.I.H.Brooker & D.F.Blaxell*, *op. cit.* 229; *S.Kelly et al.*, *Eucalypts* 1: t. 266 (1983).

Mallee to 5 m. Bark pink-grey to grey-brown. Juvenile leaves alternate, ovate to elliptic, densely pilose when young. Adult leaves alternate, lanceolate, acuminate or uncinata; lamina 7–15 cm long, 15–30 mm wide, green; lateral veins prominent, at 30°–35°; intramarginal vein

up to 1 mm from margin; petiole flattened, 10–20 mm long. Peduncle angular, 6–10 mm long; pedicels 5–10 mm long. Buds quadrangular, turbinate; operculum pyramidal or hemispherical, 1–2 mm long, 4–5 mm wide; hypanthium obconical, 4–5 mm long and wide. Fruits 15–20 mm long, 8–10 mm wide; disc broad, vertically descending; valves 3. Fig. 49G–H.

Occurs from S of Shark Bay to Badgingarra, W.A. Grows on sand plains and sand dunes in low open woodland. Regions: MRCH, BENC, LUWN. Map 68.

W.A.: 40.2 km from main road towards Kalbarri, *M.I.H. Brooker* 2391 (FRI, MEL, NSW, PERTH); 11.3 km NW of Three Springs, *G.M. Chippendale* 319 (FRI, MEL, NSW, PERTH); 66 km S of Wannoo, *C.H. Gittins* 1562 (BRI, CANB, NSW).

Has larger leaves, buds and fruits than those of *E. eudesmioides*.

Ser. 9 Ebbanoenses

Eucalyptus ser. **Ebbanoenses** Chippendale, *Fl. Australia* 19: 497 (1988).

Type: *E. ebbanoensis* Maiden

Mallees. Bark smooth. Juvenile leaves subopposite or alternate, petiolate, ovate, concolorous, stellate hairy at first. Adult leaves alternate, sometimes opposite, petiolate, concolorous. Conflourescences axillary, simple; umbels 3-flowered. Buds pyriform. Stamens in 4 bundles. Fruits hemispherical; disc broad, level or slightly convex; valves 3, exserted. Seeds oval or D-shaped, not winged, grey-black.

A series of 1 species in south-western W.A., distinguished by the stamens in 4 bundles and the hemispherical fruits.

68. Eucalyptus ebbanoensis Maiden, *Crit. Revis. Eucalyptus* 5: 169 (1921)

T: Ebbano, E of Mingenew, W.A., 28 Sept. 1904, *A. Morrison s.n.*; holo: NSW; iso: BRI, CANB, FRI.

Illustrations: G.M. Chippendale, *Eucalypts W. Austral. Goldfields* 33, 34 (1973); S. Kelly *et al.*, *Eucalypts* 1: t. 4 (1983).

Mallee to 6 m, occasionally a tree to 9 m. Bark light brown to grey-brown. Adult leaves narrowly lanceolate, sometimes falcate; lamina 7–10 cm long, 1–1.5 cm wide, dull, green; lateral veins faint, at 25°–30°; intramarginal vein almost confluent; petiole terete, 10–15 mm long. Peduncle terete, 7–12 mm long; pedicels terete, 1–7 mm long. Operculum hemispherical, c. 3 mm long, 6 mm wide; hypanthium hemispherical, c. 6 mm long and wide. Fruits 7–11 mm long, 9–12 mm wide, shining, red-brown; valves 3, *Sandplain Mallee*. Fig. 49 I–J.

Occurs in several disjunct areas near Mingenew, Wongan Hills and between Kalgoorlie and Menzies, W.A. Grows in sandy and lateritic soil, on flats and low hills. Regions: BENC, LEON. Map 69.

W.A.: 15.8 km W of Three Springs, *K.M. Allan* 650 (AD, BRI, FRI, MEL, NSW, PERTH); 29 km E of Mingenew, *G.M. Chippendale* 41 (AD, BRI, CANB, FRI, MEL, NSW, PERTH); Comet Vale, *C.A. Gardner* 11131 (FRI, PERTH).

Distinguished by the small, mostly alternate leaves, pyriform buds in threes, and shining, red-brown, hemispherical fruit with a broad flat disc.

Ser. 10 Jucundae

Eucalyptus ser. **Jucundae** Chippendale, *Fl. Australia* 19: 499 (1988).

Type: *E. jucunda* C.Gardner

Mallees or sometimes trees. Bark smooth, sometimes rough or scaly at base of trunk. Oil glands in pith and bark. Juvenile leaves not seen. Adult leaves opposite or alternate, petiolate, concolorous. Conflorescences apparently simple, but actually compound, of 3 simple, sessile, 3-flowered umbels. Buds quadrangular or cylindrical. Fruits cupular, ovoid or globular; disc narrow; valves 3 or 4. Seeds irregularly pyramidal, with a narrow hyaline wing, grey-black.

A series of 2 species in south-western W.A. The inflorescence is compound but appears simple.

69. *Eucalyptus roycei* S.Carr, D.Carr & A.S.George, *Proc. Roy. Soc. Victoria* 83: 159 & t. 15 (1970)

T: near Hamelin Pool, W.A., 2 Mar. 1966, *E.M.Scrymgeour & S.G.M.Carr* 284; holo: PERTH; iso: BRI, FRI, MEL, NSW, PERTH.

Illustrations: S.G.M.Carr *et al.*, *loc. cit.* figs 2–7; S.Kelly *et al.*, *Eucalypts* 2: t. 2 (1983).

Mallee or tree to 6 m. Bark smooth, yellow-fawn to grey. Adult leaves opposite or alternate, lanceolate or ovate-lanceolate, sometimes falcate, acute, coriaceous; lamina 11–15 cm long, 2–2.7 cm wide, green; lateral veins prominent, at 25°–40°; intramarginal vein up to 1 mm from margin; petiole flattened, 10–30 mm long. Peduncle thick, 10–15 mm long; pedicels 2–4 mm long. Buds usually quadrangular, glaucous; operculum hemispherical or pyramidal, c. 7 mm long, 10 mm wide; hypanthium cupular, 8–9 mm long, c. 10 mm wide. Fruits cupular, quadrangular, 15–30 mm long, 15–25 mm wide, woody, glaucous; disc steeply descending; valves deeply included. Fig. 49K–L.

Occurs in a restricted area S of Shark Bay, W.A., in red calcareous sand with tall shrubland. Regions: MRCH, BENC. Map 70.

W.A.: between Hamelin & Tamala, *J.S.Beard* 6793 (FRI, NSW); 9 km from Shark Bay on Loop Road, *M.I.H.Brooker* 2396 (FRI, PERTH); 3 km SW along Tamala Road from Shark Bay Road, *P.G.Wilson* 8220 (FRI, PERTH).

Distinguished by the relatively large glaucous angular buds and fruits.

70. *Eucalyptus jucunda* C.Gardner, *J. & Proc. Roy. Soc. W. Australia* 47: 60 (1964)

T: Greenough R., W.A., 6 Jan. 1959, *C.A.Gardner* 12066; holo: PERTH; iso: FRI.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 35 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 3 (1983).

Mallee, usually to 3.5 m, sometimes a tree to 8 m. Bark mostly smooth, grey to pale brown, with up to 1 m of fibrous or scaly dark grey bark at base. Adult leaves alternate, lanceolate, acute; lamina 9–11 cm long, 1–2 cm wide, grey-green; lateral veins just visible, at c. 30°; intramarginal vein up to 2 mm from margin; petiole 10–20 mm long. Peduncle 5–12 mm long; pedicels 2–5 mm long. Buds cylindrical; operculum hemispherical or conical, c. 5 mm long, 4 mm wide; hypanthium cylindrical, c. 6 mm long, 4 mm wide. Fruits ovoid or globular, 10–15 mm long, 10–12 mm wide; disc obliquely descending; valves small, almost level with narrow orifice. Fig. 49M–N.

Occurs between the Greenough R. and Wannoo, W.A., usually in sandy soil on plains. Regions: MRCH, BENC, LUWN. Map 71.

W.A.: 8 km E of Yuna, *K.M.Allan* 696 (FRI, PERTH); Mallee Stn, *J.S.Beard* 6866 (FRI, NSW); 12.7 km WSW of Tenindewa siding, *G.M.Chippendale* 325 (AD, FRI, MEL, NSW).

Distinguished by the conflorescence which appears to have up to 9-flowered umbels but which is three 3-flowered umbels, and by the globular or ovoid fruits with narrow orifices. Buds and fruits much smaller than those of *E. roycei*.

Ser. 11 *Odontocarpae*

Eucalyptus* ser. *Odontocarpae Chippendale, *Fl. Australia* 19: 502 (1988).

Type: *E. odontocarpa* F.Muell.

E. subser. *Fasciculares* Blakely, *Key Eucalypts* 13, 68 (1934) p.p.

Trees or mallees. Bark smooth. Juvenile leaves opposite, sessile, sometimes connate, hairy. Intermediate leaves opposite, connate. Adult leaves opposite or alternate, usually petiolate, concolorous. Conflorescences short terminal panicles or axillary, sometimes simple umbels; umbels 3–7-flowered. Buds pyriform, clavate, turbinate or subglobular. Stamens in 4 bundles. Fruits \pm globular or \pm cylindrical; disc narrow; valves 3 or 4. Seeds flattened or saucer-shaped, sometimes with narrow, hyaline wings, grey-black.

A series of 3 species in W.A., N.T., north-western S.A. and western Qld. Conflorescences usually compound; fruits relatively small; bark smooth.

71. *Eucalyptus gongylocarpa* Blakely, *Trans & Proc. Roy. Soc. S. Australia* 60: 153 (1936)

T: Camp 60, near Queen Victoria Spring, W.A., 24 Sept. 1891, *R. Helms s.n.*; *n.v.*

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 81 (1973); J.Jessop (ed.), *Fl. Central Australia* fig. 285 (1981); S.Kelly *et al.*, *Eucalypts* 2: t. 1 (1983).

Tree to 16 m. Bark white, with scattered yellow-brown flakes of shedding bark. Juvenile leaves broadly ovate, remotely crenate, amplexicaul, glaucous. Adult leaves opposite or subopposite, elliptic-lanceolate, apiculate; lamina 3.8–6.4 cm long, 0.7–1.3 cm wide, grey-green or glaucous; lateral veins faint, at 35°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 3–6 mm long. Conflorescence axillary; peduncle terete, 8–15 mm long; pedicels 3–6 mm long. Buds pyriform or subglobular, glaucous; operculum low hemispherical, faintly striate, 1–2 mm long, 3–4 mm wide; hypanthium obconical, 2–4 mm long, 3–4 mm wide. Fruits subglobular or globular-ovoid, 6–9 mm long, 6–8 mm wide, glaucous, woody; disc obliquely descending; valves 3–4, reduced to small teeth, included. *Marble Gum, Desert Gum.* Figs 7, 49 O–P.

Occurs from the Meekatharra–Sandstone area W.A., eastwards to near Lake Amadeus, N.T., and the Everard Ra., S.A. Grows on aeolian sand plains, sand dunes or undulating sands near salt lakes. Regions: MACD, LEON, VICD. Map 72.

W.A.: 50 km NE of Laverton, *A.S. George* 8688 (FRI, PERTH); Camel Well, *N.H. Speck* 818 (AD, CANB, K, PERTH). N.T.: 37.8 km S of George Gill Ra., *G.M. Chippendale* 6326 (AD, BRI, CANB, MEL, NSW, NT). S.A.: 130 km W of Emu, *T.R.N. Lothian* 5641 (AD, FRI, NSW).

A characteristic tree of the southern Australian deserts, with smooth white bark, glaucous, hairy juvenile, intermediate and sometimes adult leaves, small glaucous buds, and glaucous, almost globular fruits.

72. *Eucalyptus odontocarpa* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 98 (1859)

T: Sturt Creek, N.T., Feb. 1856, *F. Mueller*; holo: MEL; iso: K.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 161 (1974); J.Jessop (ed.), *Fl. Central Australia* fig. 286 (1981); S.Kelly *et al.*, *Eucalypts* 2: t. 4 (1983).

Mallee to 4 m. Bark white, pale grey or light brown. Juvenile leaves narrowly lanceolate, green, slightly discolorous. Juvenile or intermediate leaves often persist in mature mallees. Adult leaves subopposite or alternate, narrowly lanceolate, acuminate, thick; lamina 7–12 cm long, 0.6–1.5 cm wide, green, shining; lateral veins prominent, at 30°–40°; intramarginal vein

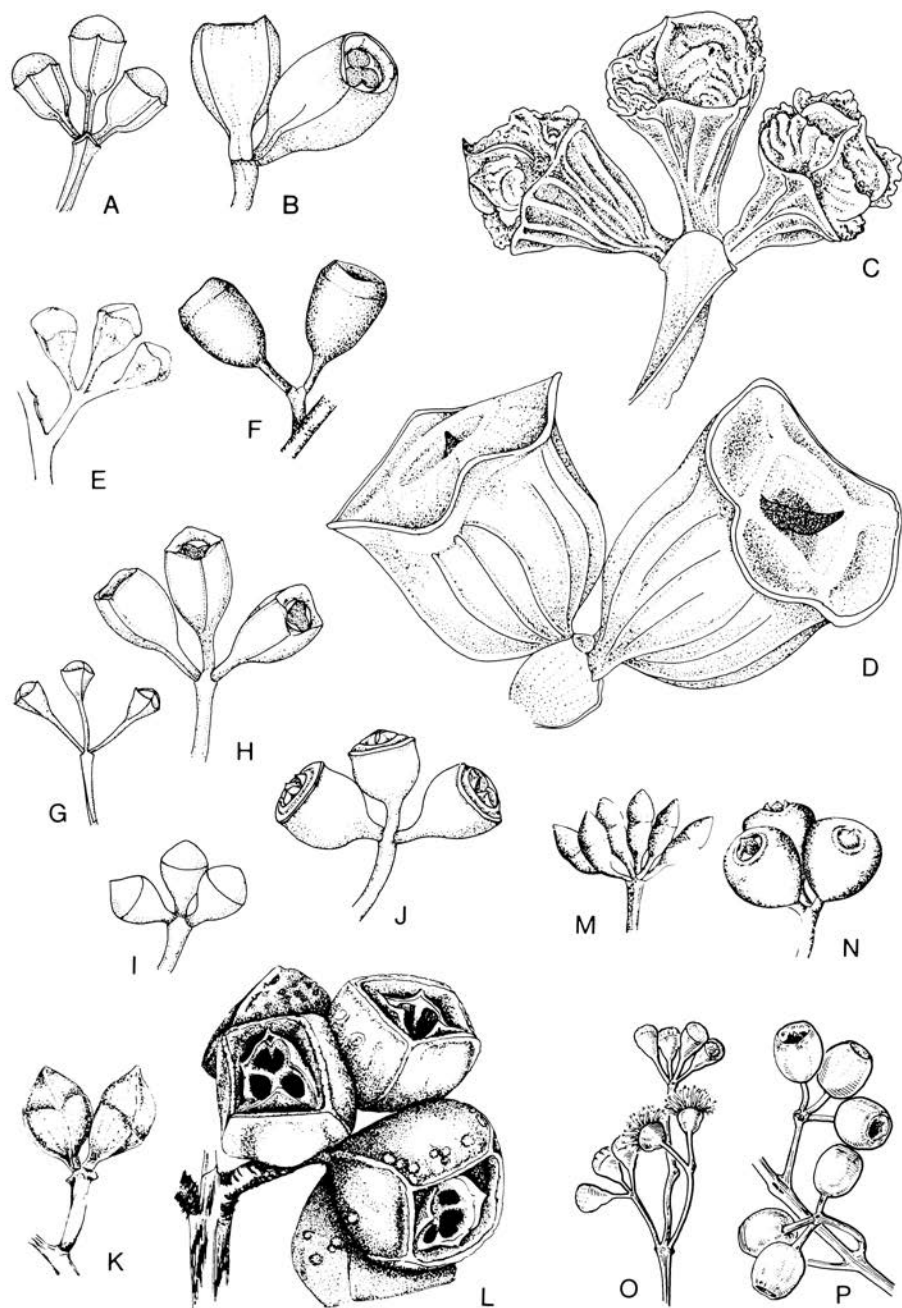


Figure 49. *Eucalyptus* buds and fruits, all $\times 1$, unless otherwise stated. **A–B**, *E. tetragona* (**A**, near Hopetoun, W.A., J.Wrigley, FRI; **B**, C.Gardner 9322, FRI). **C–D**, *E. erythrocorys* (**C**, G.Chippendale 305, FRI; **D**, G.Chippendale 43, FRI). **E–F**, *E. eudesmioides* (**E**, I.Brooker 2536, FRI; **F**, Minginew, W.A., C.Gardner, FRI). **G–H**, *E. gittinsii* (**G**, Kalbarri Natl Park, W.A., J.Bannister, FRI; **H**, I.Brooker 5711, FRI). **I–J**, *E. ebbanoensis* (**I**, G.Chippendale 52, FRI; **J**, M.Blackwell 151, FRI). **K–L**, *E. roycei* (**K**, S.Carr 284, FRI; **L**, S.Carr 286, FRI). **M–N**, *E. jucunda* (**M**, Geenough, W.A., C.Gardner, FRI; **N**, 150.4 km N of Northampton, W.A., E.Larsen, FRI). **O–P**, *E. gongylocarpa* $\times 0.75$ (Perseverance townsite, W.A. M.Blackwell, FRI). **O**, **P** drawn by M.Risby. Others drawn by M.May.

up to 2 mm from margin; petiole slightly flattened, usually 4–10 mm long, sometimes absent. Conflorescence axillary; peduncle terete or quadrangular, 2–5 mm long; pedicels 1–3 mm long. Buds clavate or turbinate, \pm quadrangular, 4-toothed; operculum low hemispherical, 1–2 mm long, 3–4 mm wide; hypanthium truncate-pyriform, 4–6 mm long, 3–4 mm wide. Fruits \pm quadrangular, subcylindrical, 8–12 mm long, 5–6 mm wide, shortly 4-toothed, almost sessile, thin; disc descending; valves 3, broad, deeply included. *Sturt Creek Mallee*. Fig. 50A–B.

Occurs from the Edgar Ranges, W.A., eastwards through N.T. to near Mt Isa, Qld. Grows on sand plains, stony rises, plateaus and scree slopes, in shrubland and *Triodia* grassland. Regions: SNDY, TNMI, MACD, BKLY, GGNA. Map 73.

W.A.: Edgar Ranges, SE of Broome, *K.F.Kenneally* 5643 (FRI, PERTH). N.T.: S of Banka Banka Stn, *S.T.Blake* 17364 (BRI, CANB, K, MEL); 82 km S of Hooker Ck, *G.M.Chippendale* 2326 (BRI, CANB, MEL, NT, PERTH). Qld: Oban Stn, 96 km SW of Mt Isa, *S.L.Everist* 1699 (BRI, NSW).

Recognised by the mallee habit, smooth pale bark, juvenile and intermediate (but not adult) leaves often connate, and buds and fruits with four short teeth.

73. *Eucalyptus gamophylla* F.Muell., *Fragm.* 11: 40 (1878)

T: Mt Pyrtten, Hamersley Ra., W.A., 15 June 1878, *J.Forrest*; holo: MEL.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 179 (1975); J.Jessop (ed.), *Fl. Central Australia* fig. 287 (1981); S.Kelly *et al.*, *Eucalypts* 1: t. 141 (1983).

Mallee to 8 m. Bark white or grey. Juvenile leaves connate, ovate, glaucous. Intermediate leaves similar to juvenile, but becoming lanceolate, glaucous. Juvenile or intermediate leaves frequently persist on mature mallees. Adult leaves not common, opposite or subopposite, lanceolate, acute or acuminate, thick; lamina 6–8 cm long, 1–1.5 cm wide, glaucous; lateral veins just visible, at 30°–40°; intramarginal vein 1–2 mm from margin; petiole slightly flattened, 2–5 mm long. Peduncle terete, 4–8 mm long; pedicels 1–4 mm long, occasionally absent. Buds clavate or pyriform, glaucous; operculum saucer-shaped, 1–2 mm long, 2–4 mm wide; hypanthium truncate-pyriform, 3–5 mm long, 2–4 mm wide. Fruits cylindrical or ovoid-cylindrical, sometimes striate, 6–10 mm long, 5–7 mm wide, pruinose; disc steeply descending; valves usually 3, broadly deltoid, included just below rim. *Blue Mallee*, *Twin-leaf Mallee*. Fig. 50C–D.

Widespread from the Hamersley Range, W.A., through N.T. to near the Georgina R., Qld. Grows on sand plains and dunes, in open semi-arid shrubland. Regions: PILB, TNMI, MACD, GGNA. Map 74.

W.A.: 96 km SW of Warburton Mission, *A.S.George* 8169 (K, PERTH). N.T.: 15.5 km N of Georgina Downs Homestead, *G.M.Chippendale* 3810 (AD, BRI, CANB, NSW, NT, PERTH); 2.5 km E of Mt Olga, *A.A.Munir* 5152 (AD, DNA, FRI, NT). S.A.: Mann Ra., *P.L.Milthorpe* 3099 (AD). Qld: Oban Stn, 97 km SW of Mt Isa, *S.L.Everist* 3367 (BRI, CANB, K).

Usually distinguished from *E. odontocarpa* by the glaucous, connate juvenile and intermediate leaves which persist on mature mallees, and the glaucous buds and fruits. An attractive shrub which is grazed by cattle during dry spells in central Australia, an unusual feature, as few eucalypts are attractive to cattle.

Ser. 12 Tetrodontae

Eucalyptus* ser. *Tetrodontae Chippendale, *Fl. Australia* 19: 506 (1988)

Type: *E. tetrodonta* F.Muell.

E. subser. *Fasciculares* Blakely, *Key Eucalypts* 13, 68 (1934) *p.p.* not as to lectotype.

Trees. Bark fibrous, persistent throughout. Juvenile leaves opposite or subopposite, petiolate, grey-green, concolorous. Adult leaves opposite or alternate, petiolate, concolorous. Oil glands in bark, pith and petioles. Conflorescences axillary, simple, 3-flowered umbels. Buds ovoid or

subpyriform, quadrangular; operculum hemispherical or subglobular, smooth or rugose, 8-ribbed; hypanthium campanulate, 4-toothed. Fruits cupular or subcampanulate, quadrangular. Seeds flattened to saucer-shaped, sometimes with narrow, hyaline wings, grey-black.

A series of 1 species in northern Australia with fibrous bark and prominently toothed hypanthium. Plants are able to regenerate by root suckers. In fruit the 4 sepals persist just below the rim more or less as lobes.

74. *Eucalyptus tetrodonta* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 97 (1859)

T: entrance to Victoria R., N.T., Sept. 1855, *F.Mueller*; holo: MEL.

Illustrations: C.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* fig. 89 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 5 (1983).

Tree to 25 m. Bark grey, thick. Juvenile leaves ovate to broadly lanceolate. Adult leaves lanceolate to narrowly lanceolate, often falcate, acuminate; lamina 11–19 cm long, 1.4–3 cm wide, dull, grey-green; lateral veins conspicuous, at 45°–50°; intramarginal vein up to 2 mm from margin; petiole 10–20 mm long. Peduncle terete, angular or flattened, 4–14 mm long; pedicels angular, 1–7 mm long, sometimes absent. Operculum 5–6 mm long, 7–10 mm wide; hypanthium 5–10 mm long, 6–10 mm wide. Fruits sessile or shortly pedicellate, 13–22 mm long, 10–14 mm wide; disc broad, descending; valves 3, large, included or often just exerted. *Darwin Stringybark*. Fig. 50E–F.

Occurs widely across the Kimberley, W.A., northern N.T. and Cape York Peninsula, Qld, including some islands. Grows on flat or undulating areas of open forest and woodland, often associated with *E. miniata*. Regions: KIMB, ARNM, BKLY, CARP, CYRK. Map 75.

W.A.: Prince Regent R. Reserve, *A.S.George* 12297 (FRI, PERTH). N.T.: 38 km SE of Mountnorris Bay, *G.M.Chippendale* 8134 (BRI, K, MEL, NSW, NT); 72.4 km S of Katherine, *J.R.Maconochie* 728 (FRI, NT). Qld: Cooktown, *M.I.H.Brooker* 4032 (BRI, FRI, MEL); 74 km from Laura towards Coen, *M.I.H.Brooker* 4054 (BRI, FRI, MEL).

Recognised as a tall tree with grey, fibrous, stringy bark, and quadrangular buds and fruits which are 4-toothed. The wood is moderately hard and durable, and has been used for poles and general house construction.

Ser. 13 Scutelliformes

***Eucalyptus* ser. *Scutelliformes* Maiden, *Crit. Revis. Eucalyptus* 7: 119 (1925)**

Type: *E. baileyana* F.Muell., lecto *fide* G.M.Chippendale, *Fl. Australia* 19: 505 (1987).

E. subser. *Holocalyces* Blakely, *Key Eucalypts* 14 (1934). T: *E. baileyana* F.Muell., lecto, *fide* G.M.Chippendale, *op cit.* 498.

Trees. Bark fibrous or flaky. Adult leaves opposite or alternate, petiolate, concolorous or discolorous. Conflorescences axillary, 3–7-flowered umbels. Buds ±cylindrical to fusiform or clavate. Fruits ovoid to globular-urceolate or cylindrical; disc descending; valves 3 or 4, near rim level or exerted. Seeds saucer-shaped or flat, shallowly reticulate to almost smooth, grey-black.

A series of 3 species in northern W.A., Qld and north-eastern N.S.W., characterised by the fibrous or flaky bark, and faintly striate or 2-ribbed buds.

75. *Eucalyptus similis* Maiden, *J. & Proc. Roy. Soc. New South Wales* 47: 90 (1913)

T: W of Emerald, Qld, Mar. 1908, *G.H.Carr s.n.*; holo: NSW; iso: FRI, K.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 158 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 8 (1983).

Tree to 14 m. Bark flaky, irregularly tessellated, yellow-brown throughout. Juvenile leaves subopposite, lanceolate, discolorous. Adult leaves alternate, lanceolate, sometimes falcate, uncinata, thick; lamina 8–12 cm long, 1.5–2.5 cm wide, green, discolorous; lateral veins faint, at 70°–80°; intramarginal vein almost confluent; petiole flattened, 10–20 mm long. Umbels 3–7-flowered; peduncle terete or angular, 20–30 mm long; pedicels 3–6 mm long. Buds cylindrical to fusiform; operculum conical, 3–6 mm long, 4–5 mm wide; hypanthium cupular, faintly striate, 5–6 mm long, 4–5 mm wide. Fruits subglobular, truncate-ovoid or suburceolate, 10–12 mm long, 8–10 mm wide, woody, striate; disc moderately broad, valves 3 or 4, deltoid, level or slightly exserted. *Inland Yellow Jacket*. Fig. 50G–H.

Occurs from about the Laura R. southwards to about Jericho and in the Newcastle Ra., Qld, on gentle slopes in tropical woodland. Regions: CYRK, BURD, DWSN. Map 76.

Qld: 16 km E of Yarrowmere Stn, *L.G.Adams* 982 (BRI, CANB, K, MEL, NSW, PERTH); 9.7 km NW of Middle Park Stn, *M.Lazarides* 4092 (AD, BRI, CANB, K, MEL, NSW); Newcastle Ra., *L.Pedley* 2111 (BRI, CANB, FRI, NSW).

Distinguished by the yellow-brown, flaky, subtessellated bark, discolorous leaves, level or slightly exserted deltoid valves and occurrence in central to northern Qld.

76. *Eucalyptus lirata* W.Fitzg. ex Maiden, *Crit. Revis. Eucalyptus* 5: 111 (1920)

T: Bold Bluff, W.A., May 1905, *W.V.Fitzgerald* 843; holo: NSW; iso: FRI.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 162 (1974); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* fig. 47 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 7 (1983).

Tree to 8 m, sometimes shrubby. Bark subfibrous, subtessellated or flaky, grey-yellow throughout. Juvenile leaves not seen. Adult leaves opposite or alternate, narrowly lanceolate to lanceolate, often falcate, acuminate, thick; lamina 8–14 cm long, 1–2 cm wide, green, concolorous; lateral veins just visible, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole quadrangular, 10–20 mm long. Umbels 3-flowered; peduncle terete to slightly flattened, 7–10 mm long; pedicels 2–5 mm long. Buds ovoid-cylindrical, often contracted near middle, faintly striate; operculum hemispherical-conical, 4–5 mm long, 4–6 mm wide, lighter in colour than hypanthium; hypanthium campanulate or cylindrical, 5–7 mm long, 4–6 mm wide. Fruits truncate-ovoid, suburceolate or cylindrical, 10–13 mm long, 7–9 mm wide, striate, sometimes warty; disc broad; valves usually 3, exserted. *Kimberley Yellow Jacket*. Fig. 50 I–J.

Occurs in the Kimberley, W.A., on hills and rolling slopes as scattered trees and in open woodland. Region: KIMB. Map 77.

W.A.: between Doongan and Drysdale R., *J.S.Beard* 7040 (DNA, NSW, PERTH); Mt Herbert, *C.A.Gardner* 11827 (FRI, PERTH); Bold Bluff, *C.H.Gittins* 1439 (BRI, NSW, PERTH).

Distinguished by the flaky, subfibrous or subtessellated, grey-yellow bark, the concolorous leaves, the 3-flowered umbels, and the slightly striate, usually truncate-ovoid fruits with large exserted valves.

77. *Eucalyptus baileyana* F.Muell., *Fragm.* 11: 37 (1878)

T: near Moreton Bay, Qld, June 1878, *F.M.Bailey s.n.*; holo: MEL; iso: NSW.

Illustrations: S.Kelly *et al.*, *Eucalypts* 2, t. 9 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 52 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 243 (1984).

Tree to 25 m, sometimes to 40 m. Bark fibrous, stringy, red-brown on trunk and larger branches. Juvenile leaves alternate, petiolate, ovate to lanceolate, sometimes cordate, stellate hairy, discolorous. Adult leaves alternate, narrowly lanceolate to lanceolate, often falcate, acuminate; lamina 8–15 cm long, 1–2.5 cm wide, dark green, discolorous; lateral veins just visible, at 50°–60°; intramarginal vein up to 1 mm from margin; petiole channelled, 10–20 mm long. Umbels 7-flowered; peduncle flattened or angular, 15–27 mm long; pedicels 2–11 mm long. Buds clavate; operculum hemispherical, apiculate, 2–3 mm long, 3–4 mm wide; hypanthium obconical, faintly 2-ribbed, 4–5 mm long, 3–4 mm wide. Fruits ovoid, globular

or suburceolate, 4-lobed at rim, 8–14 mm long, 8–16 mm wide; disc broad; valves 3, level or just exerted. *Bailey's Stringybark*. Fig. 50K–L.

Occurs in south-eastern Qld and north coastal N.S.W., on coastal lowlands, ridges and hills and in the more inland areas on high tablelands; grows in sandy soil in open forest. Regions: DWSN, MCPH. Map 78.

Qld: 32 km SE of Blackwater, *R.J.Henderson 1183* (BRI, NSW); 19.3 km SSE of Bluff, *R.W.Johnson 1128* (BRI, CANB, K). N.S.W.: 6.9 km N of Glenreagh, *G.M.Chippendale 1063* & *M.J.Brennan* (AD, BRI, FRI, MEL, NSW, PERTH); 3.2 km N of Coaldale, *R.Coveny 4983* (AD, BRI, FRI, MEL, NSW).

Distinguished by the red-brown fibrous or stringy bark on trunk and larger branches, discolorous leaves, 7-flowered umbels and the globular, ovoid or suburceolate fruits with 4 raised lobes at rim. Also differs from *E. lirata* and *E. similis* in its clavate buds. Wood is strong and very durable, and has been used for fencing poles and general construction.

Ser. 14 *Miniatae*

Eucalyptus* ser. *Miniatae Blakely, *Key Eucalypts* 14, 72 (1934).

Type: *E. miniata* Cunn. ex Schauer

Trees. Bark flaky, fibrous. Juvenile leaves alternate, sometimes decussate, petiolate, stellate hairy or setose becoming glabrous, discolorous. Adult leaves alternate, petiolate, narrowly to broadly lanceolate, concolorous or discolorous. Conflorescences simple, axillary, 7–many-flowered umbels. Buds ovoid, clavate or pyriform. Filaments orange or scarlet. Fruits ovoid to ±cylindrical or urceolate, woody, ribbed; disc broad, descending; valves 2 or 3, deeply included. Seeds cubic or ovate, grey-black to red-brown.

A series of 3 species in northern Australia, characterised by the flaky-fibrous bark, orange or scarlet staminal filaments and ribbed fruits with 2 or 3 valves.

78. *Eucalyptus miniata* Cunn. ex Schauer in W.G.Walpers, *Repert. Bot. Syst.* 2: 925 (1843)

T: Hunter R., York Sound, [W.A.], 16 Sept. 1820, *A.Cunningham 241*; iso: BM, FRI, K.

E. aurantiaca F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 91 (1859). T: Tableland [i.e., near Cox R., E of present Nutwood Downs Stn], [N.T.], 26 July 1856, *F.Mueller*; holo: MEL.

Illustrations: C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 93 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 7 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 245 (1984).

Tree to 30 m. Bark ±stringy, spongy, fissured, grey or rusty red for 1/4–1/2 of height, then smooth and white above. Juvenile leaves ovate, green, stellate hairy. Adult leaves sometimes falcate, acute or acuminate; lamina 9–16 cm long, 1–3.5 cm wide, green, discolorous; lateral veins distinct, at 45°–65°; intramarginal vein up to 1 mm from margin; petiole flattened, 12–20 mm long. Umbels 7-flowered; peduncle terete or angled, 12–35 mm long; pedicels absent or to 5 mm long. Buds ovoid or clavate, striate or ribbed, glaucous; operculum hemispherical to conical, 8–13 mm long, 10–12 mm wide; hypanthium truncate-ovoid, 10–12 mm long and wide. Fruits ovoid to urceolate, sometimes glaucous, often sessile, 30–60 mm long, 17–50 mm wide, usually prominently ribbed; valves 3. Seeds cuboid. *Darwin Woollybutt*. Figs 2, 22, 50M–N.

Occurs widely in the Kimberley, W.A., northern N.T., and southern Cape York Peninsula, Qld, usually in sandy or lateritic soil in open forest or woodland. Regions: KIMB, ARNM, BKLY, CARP, CYRK, BURD. Map 79.

W.A.: Yeeda Stn, *C.A.Gardner 9554* (FRI, PERTH); Mt Herbert, *D.E.Symon 5327* (ADW, PERTH). N.T.: 66 km NW of Katherine, *G.M.Chippendale 6959* (AD, BRI, CANB, MEL, NSW, NT, PERTH); 37 km S of Katherine, *R.E. Winkworth 1106* (CANB, MEL, NT, PERTH). Qld: Stannary Hills, *B.Hyland 5007* (BRI, FRI, NSW).

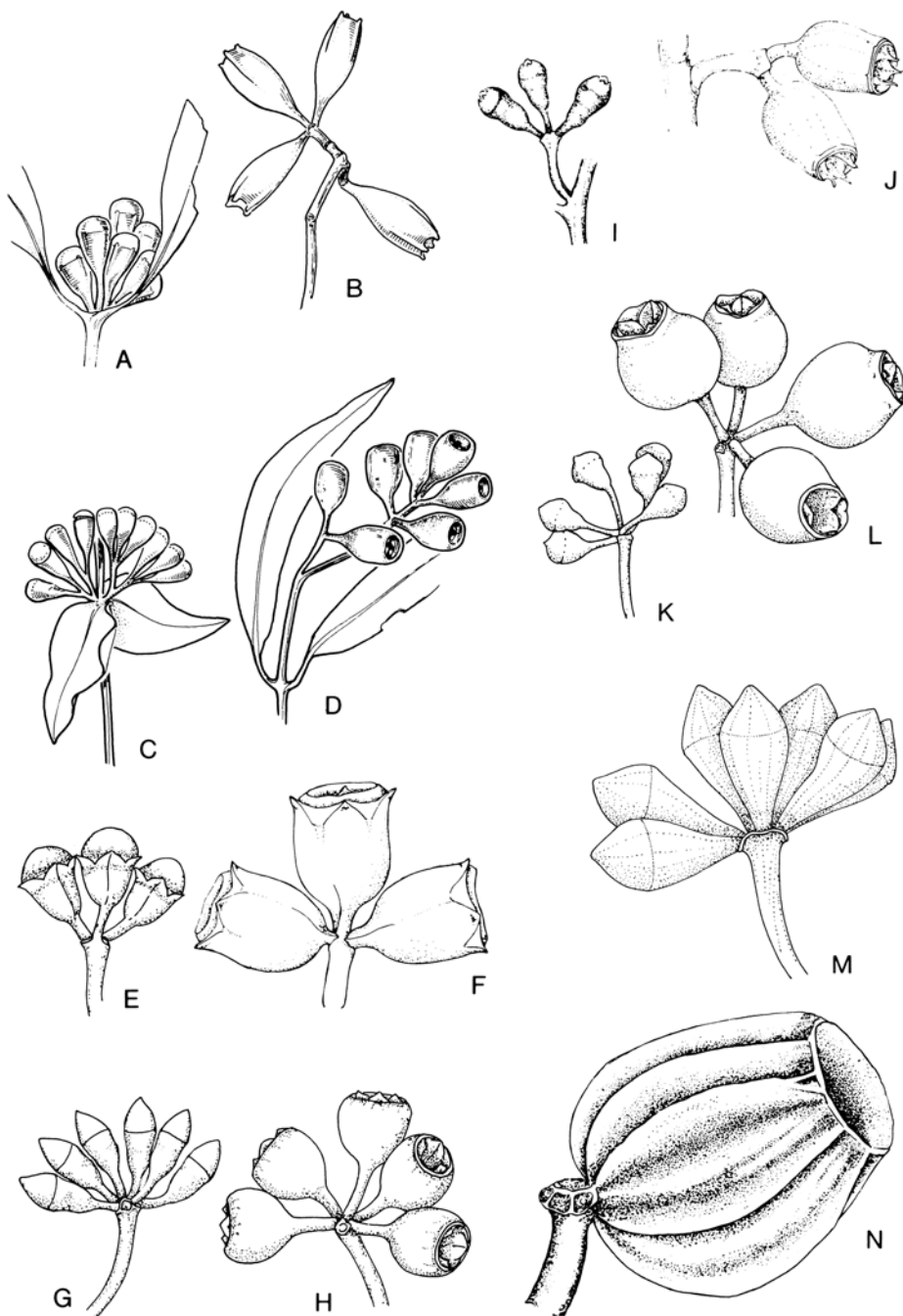


Figure 50. *Eucalyptus* buds and fruits, all $\times 1$, unless otherwise stated. **A–B**, *E. odontocarpa* $\times 1.5$ (**A**, Myall Park, Qld, M.McKenzie, FRI; **B**, D.Boland 1265, FRI). **C–D**, *E. gamophylla* (**C**, I.Brooker 5084, FRI; **D**, I.Brooker 968, FRI). **E–F**, *E. tetradonta* (**E**, J.Maconochie 2042, FRI; **F**, C.Cossalter CFTF 1080, FRI). **G–H**, *E. similis* (J.Turnbull JT27, FRI). **I–J**, *E. lirata* (**I**, Tableland Stn, W.A., L.Pryor, FRI; **J**, J.Banks B1407, FRI). **K–L**, *E. baileyana* (**K**, D.Boland J1577, FRI; **L**, 11.2 km N of Gatton, Qld, Kluver, FRI 15379, FRI). **M–N**, *E. miniata* (**M**, J.Doran 400, FRI; **N**, N.Speck 4751, FRI). **A–D** drawn by M.Risby. Others drawn by M.May.

A characteristic tree of many areas of tropical Australia, easily recognised by the ribbed, glaucous buds, orange-red filaments, and large ribbed fruits. Although the heartwood is subject to termite attack, the wood has been used in local construction. A most attractive ornamental tree for coastal tropics.

79. *Eucalyptus phoenicea* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 91 (1859)

T: Victoria R., near the Main Camp [i.e. c. 15°35'S, 130°25'E], [N.T.], May 1856, *F.Mueller*; syn: K, MEL; ranges near Fitzmaurice R., [N.T.], Oct. 1856, *F.Mueller*; syn: MEL.

Illustrations: C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 96 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 6 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 247 (1984).

Tree to 12 m. Bark flaky, fibrous, yellow to yellow-brown on trunk and larger branches, then smooth and cream or white above. Juvenile leaves ovate, green, setose at first. Adult leaves acuminate; lamina 8–12 cm long, 1.2–2 cm wide, grey-green, concolorous; lateral veins just visible, at 45°–60°; intramarginal vein up to 1 mm from margin; petiole flattened, 8–15 mm long. Umbels many-flowered; peduncle terete to angled, 16–33 mm long; pedicels 4–15 mm long. Buds clavate; operculum hemispherical-conical, 2–3 mm long, 4–5 mm wide; hypanthium truncate-pyriform, faintly striate, 5–7 mm long, 4–5 mm wide. Fruits subcylindrical to suburceolate, 19–30 mm long, 9–13 mm wide, strongly ribbed; valves 2, rarely 3. Seeds ovate, grey-black. *Scarlet Gum*, *Gnaingar*. Fig. 51A–B.

Occurs in the Kimberley, W.A., northern N.T., and disjunctly in an area NW of Cooktown, Qld. Grows on steep, rocky slopes and gently sloping stony ground, in low open forest. Regions: KIMB, ARNM, BKLY, CYRK. Map 80.

W.A.: 43.5 km NE of Karunjie, *N.H.Speck 5016* (AD, BRI, CANB, K, MEL, NSW, NT, PERTH). N.T.: between Ferguson R. and Edith R., *M.I.H.Brooker 3137* (BRI, DNA, FRI); 47.5 km S of Katherine, *G.M.Chippendale 3887* (AD, BRI, CANB, MEL, NSW, NT). Qld: Blackwater Ck, *B.Hyland 6250* (BRI, CANB, FRI, NSW, QRS).

Distinctive in the yellowish flaky-fibrous bark on trunk and larger branches, the many-flowered umbels, orange-red to scarlet filaments, and the elongate, subcylindrical to suburceolate fruits. A popular ornamental species.

80. *Eucalyptus ceracea* Brooker & Done, *Nuytsia* 5: 382 (1986)

T: 33 km SE of King George Falls, W.A., 14 July 1982, *C.Done 612*; holo: PERTH; iso: FRI, NSW.

Illustration: M.I.H.Brooker & C.Done, *op. cit.* 383–384 (1986).

Tree to 3 m. Bark flaky, fibrous, yellow. Juvenile leaves decussate, densely hairy, glaucous. Leaves on mature trees usually like juveniles, sessile, ovate; lamina 7–10 cm long, 2.7–4 cm wide, glaucous; lateral veins faint, at c. 60°; intramarginal vein up to 2 mm from margin. Umbels 7–9-flowered; peduncle quadrangular, 20–40 mm long; pedicels 2–8 mm long. Buds clavate or pyriform, glaucous, operculum conical or hemispherical, 4–7 mm long, 7–9 mm wide; hypanthium obconical, 7–8 mm long, 7–9 mm wide. Fruits cylindrical to ovoid, ribbed, glaucous, 20–25 mm long, 13–20 mm wide; valves usually 3. Seeds ovate, light red-brown. Fig. 51C–D.

Occurs only near King George Falls, W.A., among coarse-grained quartzitic and sandstone boulders. Region: KIMB. Map 81.

W.A.: 33 km SE of King George Falls, *M.I.H.Brooker 7771* (FRI, NSW, PERTH).

Differs from *E. miniata* and *E. phoenicea* in being glaucous throughout, with juvenile leaves persisting as the crown of mature tree.

Ser. 15 Curtisianae

Eucalyptus ser. **Curtisianae** Chippendale, *Fl. Australia* 19: 497 (1988).

Type: *E. curtisii* Blakely & C.White

E. subser. *Leptospermae* Blakely, *Key Eucalypts* 14, 70 (1934) *p.p.* but not as to lectotype.

Trees or mallees. Bark smooth throughout. Juvenile leaves alternate, petiolate, lanceolate, green, discolorous. Adult leaves subopposite or alternate, petiolate, discolorous. Conflorescences terminal, corymbose panicles; umbels 3–7-flowered. Buds ovoid to clavate. Sepals and petals each 4, free, imbricate. Fruits hemispherical to campanulate; disc broad, descending; valves 4 or 5, included. Seeds conspicuously elongate, yellow-brown.

A series of 1 species in south-eastern Qld with smooth bark, discolorous leaves and panicles of 3–7-flowered umbels. The petals adhere but do not form a true operculum.

81. Eucalyptus curtisii Blakely & C.White, *Proc. Roy. Soc. Queensland* 42: 82 (1931)

T: near Plunkett, Qld, Nov. 1929, *D.Curtis s.n.*; holo: NSW; iso: BRI.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 157 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 6 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 53 (1983).

Mallee, sometimes a tree, to 12 m. Bark grey-green to white. Adult leaves lanceolate, acute; lamina 8–14 cm long, 1.2–2.5 cm wide, shining, green; lateral veins faint, at 45°–60°; intramarginal vein up to 3 mm from margin; petiole flattened or channelled, 7–12 mm long. Peduncle thick, angular, 5–15 mm long; pedicels angular, 3–5 mm long. Operculum hemispherical-conical, 1–2 mm long, 3–4 mm wide; hypanthium hemispherical or cupular, 5–7 mm long, 4–5 mm wide. Fruits hemispherical or campanulate, 7–10 mm long, 6–8 mm wide. *Plunkett Mallee*. Fig. 51E–F.

Occurs from Beerwah to the Plunkett area S of Brisbane, Qld, often in poorly drained soils as scattered individuals in shrubland or open forest. Regions: DWSN, MCPH. Map 82.

Qld: near Beerwah, *G.M.Chippendale 1148* & *M.J.Brennan* (BRI, FRI, MEL, NSW); Dinmore Pottery, *L.S.Smith 12181* (BRI, CANB, K, MEL); Mt Gravatt, *C.T.White 7405* (BRI, K, MEL, NSW).

The elongate yellow-brown seeds and unusual operculum are diagnostic. Other distinguishing characters are the smooth usually grey-green bark, discolorous, lanceolate leaves, 3–7-flowered umbels in a terminal panicle, and hemispherical to campanulate fruits.

Ser. 16 Leptospermae

Eucalyptus ser. **Leptospermae** (Blakely) Chippendale, *Fl. Australia* 19: 500 (1988).

E. subser. *Leptospermae* Blakely, *Key Eucalypts* 14, 70 (1934). T: *E. tenuipes* (Maiden & Blakely) Blakely & C.White lecto, *vide* G.M.Chippendale, *loc. cit.*

Trees. Bark fibrous, scaly, ±shaggy. Juvenile leaves opposite, sessile, discolorous. Adult leaves subopposite or alternate, petiolate, discolorous. Conflorescences axillary, simple, 7–many-flowered umbels. Buds ovoid to globular. Fruits hemispherical to subglobular; disc narrow to moderate, flat or descending; valves 4 or 5, level or included. Seeds cuboid, shiny, red-brown.

A series of 1 species in south-eastern Qld. Operculum formed of petaline whorl only; sepals small, free, persistent.

82. Eucalyptus tenuipes (Maiden & Blakely) Blakely & C.White, *Proc. Roy. Soc. Queensland* 42: 84 (1931)

E. acmenoides var. *tenuipes* Maiden & Blakely in J.H.Maiden, *Crit. Revis. Eucalyptus* 7: 464 (1928). T: Meteor Ck, Qld, July 1921, *H.I.Jensen s.n.*; holo: NSW; iso: BRI.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 156 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 5 (1983).

Tree to 15 m. Bark shallowly fissured, red-brown throughout. Juvenile leaves linear. Adult leaves lanceolate, acuminate; lamina 6–10 cm long, 0.7–1.5 cm wide, green; lateral veins faint, at 60°–70°; intramarginal vein almost confluent with or up to 1 mm from margin; petiole terete or channelled, 5–12 mm long. Peduncle terete, 7–15 mm long; pedicels 5–10 mm long. Operculum hemispherical, 1–2 mm long, 3–4 mm wide; hypanthium hemispherical, 2–4 mm long, 3–4 mm wide. Fruits 4–5 mm long and wide. *Narrow-leaved White Mahogany*. Fig. 51G–H.

Occurs from near Rockhampton southwards to near St George, Qld, and with a disjunct population in the central Burdekin region, in sandy or lateritic soils on gently sloping country in open forest. Regions: BURD, DWSN, MCPH. Map 83.

Qld: 51.3 km N of Bauhinia Downs, *M.I.H.Brooker* 3769 (BRI, FRI, MEL, NSW, PERTH); 16 km SW of Yuleba, *S.L.Everist* 5815 (BRI, CANB, MEL, NSW); 10 km S of Isla Gorge, *L.A.S.Johnson* 7182 (BRI, NSW); 29 km N of Yeppoon, *N.H.Speck* 1762 (AD, BRI, MEL, PERTH).

Distinctive characters are the fibrous, shaggy red-brown bark throughout, discoloured leaves, slender peduncle and pedicels, and small rounded buds and fruits.

Ser. 17 *Meglanthae*

Eucalyptus* ser. *Meglanthae (Blakely) Chippendale, *Fl. Australia* 19: 501 (1988).

E. subser. *Meglanthae* Blakely, *Key Eucalypts* 39 (1934). T: *E. cloeziana* F.Muell.

Trees. Bark flaky, fibrous, sometimes tessellated. Juvenile leaves alternate, petiolate, green, discoloured. Adult leaves alternate, petiolate, green, discoloured. Conflorescences axillary, paniculate; umbels 7-flowered. Buds ovoid to clavate. Sepals 4, free; inner operculum of fused petals. Fruits hemispherical or globular; disc usually broad, but sometimes narrow, level or convex; valves 3 or 4, level or exserted. Seeds ± cuboid but often elongate, yellow-brown.

A series of 1 species in eastern Qld; trees with flaky-fibrous bark, discoloured leaves and simple, many-flowered umbels. Operculum formed of petaline whorl only; sepals free, caducous.

83. *Eucalyptus cloeziana* F.Muell., *Fragm.* 11: 44 (1878)

T: Rockingham Bay, Qld, 22 Dec. 1867, *J.Dallachy s.n.*; holotype: MEL; isotype: K, NSW.

E. stannariensis Bailey, *Queensland Agric. J.* 21: 293 (1908). T: Stannary Hills, Qld, 1908, *T.L.Bancroft* 11; holotype: BRI; isotype: K, NSW.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 147 (1970); S.Kelly *et al.*, *Eucalypts* 1: t. 143 (1983); D.J.Boland (ed.), *Forest Trees Australia* 4th edn, 249 (1984).

Tree to 55 m. Bark longitudinally fissured or tessellated, brown, grey or grey-yellow on trunk and sometimes on larger branches; smaller branches smooth, grey-white or yellow. Juvenile leaves ovate or broadly lanceolate. Adult leaves narrowly lanceolate to lanceolate, acuminate; lamina 8–13 cm long, 1–3 cm wide; lateral veins just visible, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole flattened, 10–15 mm long. Peduncle terete or angular, 5–10 mm long; pedicels 1–4 mm long. Operculum hemispherical or conical, 2–3 mm long, 3–4 mm wide; hypanthium hemispherical, 2–4 mm long, 3–4 mm wide. Fruits 5–10 mm long, 6–12 mm wide. *Gympie Messmate*. Fig. 51 I–J.

Occurs in several disjunct areas including Hinchinbrook Is., from near Cooktown southwards to near Gympie, Qld. Grows in open forest and woodland, often dominant, on plateaus, tablelands and slopes. Regions: CYRK, DWSN, BURD, MCPH. Map 84.

Qld: between Herberton and Watsonville, *M.I.H.Brooker* 3352 (BRI, DNA, FRI, MEL, NSW); at entrance gate of Blackdown Tableland, *M.I.H.Brooker* 3783 (BRI, FRI, MEL, NSW); 16.7 km NE of Gympie,

G.M.Chippendale 534 & R.D.Johnston (BRI, FRI, MEL, NSW); Hinchinbrook Is., *D.A.Kleinig 301* (AD, FRI); Bluff Mtn, *N.H.Speck 1677* (BRI, K, MEL, NSW, PERTH).

Characterised by the smooth-barked upper branches, discoloured leaves, large axillary panicle confluence, and globular or hemispherical fruits. Fertile seeds and 'chaff' similar. The wood is extremely durable and is used for railway sleepers, posts and heavy engineering construction.

Ser. 18 Rubiginosae

Eucalyptus ser. **Rubiginosae** Chippendale, *Fl. Australia* 19: 504 (1988).

Type: *E. rubiginosa* Brooker

Trees. Bark fibrous throughout, red-brown. Juvenile leaves alternate, petiolate, narrowly lanceolate to lanceolate, shining, green. Adult leaves alternate, petiolate, often falcate, acuminate, discoloured. Conflorescences terminal, paniculate; umbels usually 7-flowered, sometimes to 9-flowered. Buds clavate. Fruits hemispherical; disc broad, level to slightly ascending; valves 4, exserted. Seeds oblong or deltoid to ovoid, shining, red-brown, ribbed on ventral side.

A series of 1 species in Qld. The large paniculate confluences are distinctive. Ovular structures in 4 vertical rows.

84. *Eucalyptus rubiginosa* Brooker, *Austral. Forest Res.* 14: 311 (1984)

T: 119 km S of Bauhinia Downs towards Taroom, Qld, 23 Apr. 1975, *M.I.H.Brooker 4840 & D.A.Kleinig*; holo: FRI; iso: AD, BRI, MEL, NSW.

Illustrations: *M.I.H.Brooker, op. cit.* 312–315 (1984).

Tree to 20 m. Adult leaves lanceolate; lamina 8–15 cm long, 1.6–2 cm wide, dull, dark green above; lateral veins faint, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole channelled, 11–16 mm long. Peduncle quadrangular to terete, 12–20 mm long; pedicels quadrangular, 7–10 mm long. Operculum conical, 4–6 mm long, 4–5 mm wide; hypanthium obconical to hemispherical, 3–5 mm long, 4–5 mm wide. Fruits 6–9 mm long, 11–14 mm wide. Fig. 51K–L.

Known from the type locality, from Isla Gorge Natl Park and Barakula State Forest, Qld, in sand over shallow sandstone in forest and woodland. Region: DWSN. Map 85.

Qld: Isla Gorge, 23 Aug. 1981, *A.Bean* (FRI); 119 km S of Bauhinia Downs, *M.I.H.Brooker 7336* (BRI, FRI, NSW).

Characterised by the fibrous red-brown bark throughout, discoloured leaves, clavate buds and hemispherical fruits.

Ser. 19 Diversiformes

Eucalyptus ser. **Diversiformes** Blakely, *Key Eucalypts* 40, 169 (1934) as *Diversiformae*.

Type: *E. diversifolia* Bonpl., lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 497 (1988).

Mainly mallees, occasionally trees. Bark smooth. Juvenile leaves opposite or alternate, petiolate or occasionally sessile, concolorous or discoloured. Adult leaves alternate, opposite or sometimes subopposite, petiolate, concolorous. Conflorescences simple, axillary, 3–13-flowered umbels. Buds ovoid, turbinate, clavate, conical, globular or fusiform, mostly sessile or nearly so, sometimes pedicellate. Fruits sessile or shortly pedicellate, globular, campanulate, obconical, hemispherical or pyriform; disc usually convex or level with rim, or lobed and overlapping valves; valves 3–7, mostly exserted or level, occasionally included.

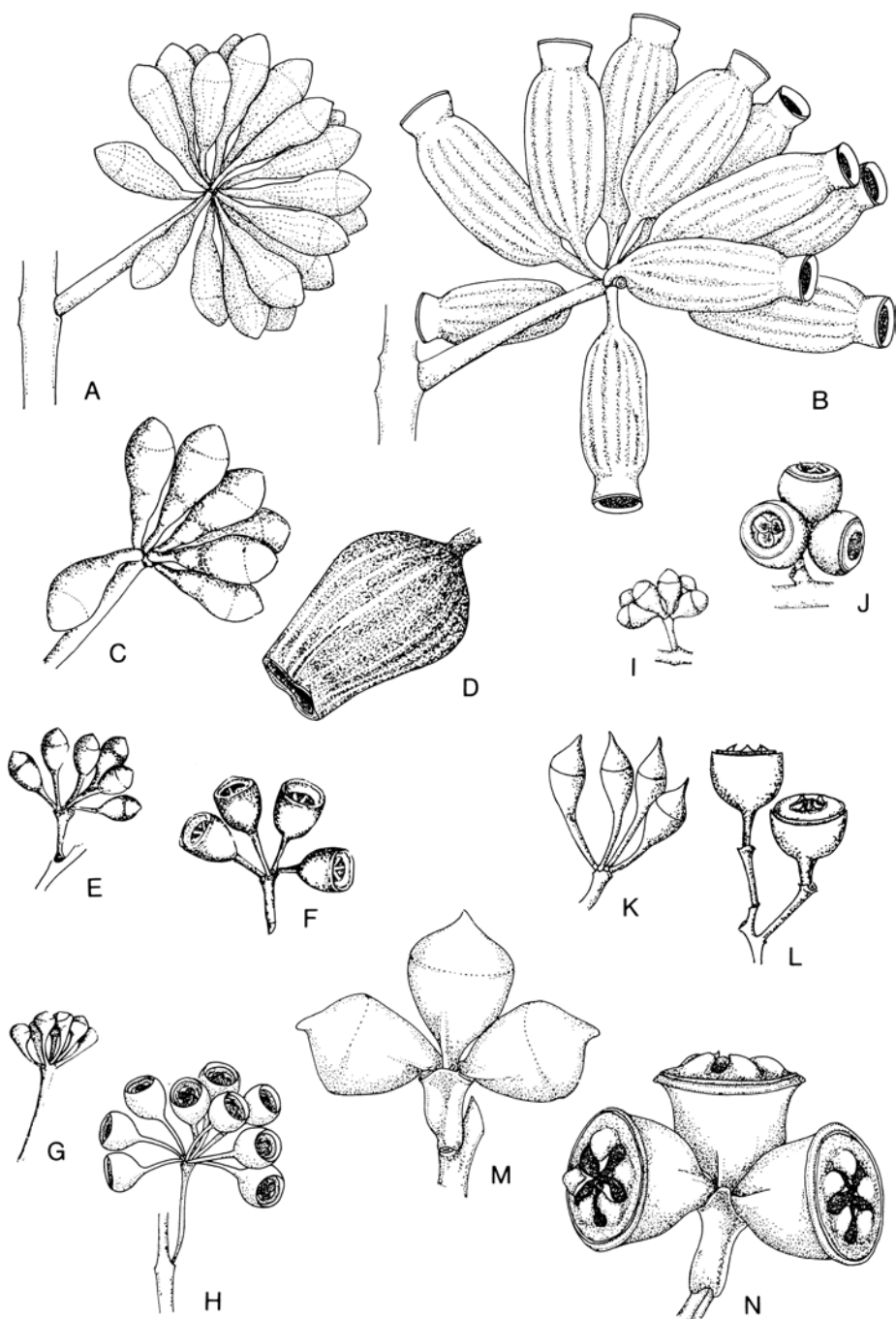


Figure 51. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. phoenicea* (**A**, J.Must 987, FRI; **B**, I.Brooker 4168, FRI). **C–D**, *E. ceracea* (**C**, C.Done 612, FRI; **D**, I.Brooker 7771, FRI). **E–F**, *E. curtisii* (cult., Botanic Gardens, Sydney, N.S.W., W.Blakely, FRI). **G–H**, *E. tenuipes* (**G**, Chinchilla, Qld, R.Beasley, NSW 58844, FRI; **H**, I.Brooker B4780, FRI). **I–J**, *E. cloeziana* (J.Turnbull 64, FRI). **K–L**, *E. rubiginosa* (**K**, A.Bean 101, FRI; **L**, I.Brooker 7336, FRI). **M–N**, *E. megacarpa* (**M**, I.Brooker 3574, FRI; **N**, J.Briggs 299, FRI). **E**, **F** drawn by J.Kennedy. Others drawn by M.May.

A series of 10 species from south-western W.A. through southern S.A. to southern Vic., characterised by the smooth bark, concolorous leaves and large sessile or shortly pedicellate fruits.

P.Y.Ladiges *et al.*, Cladistic and biogeographic analysis of Western Australian species of *Eucalyptus* L'Hérit., informal subgenus *Monocalyptus* Pryor & Johnson, *Austral. J. Bot.* 35: 251–281 (1987).

85. *Eucalyptus megacarpa* F.Muell., *Fragm.* 2: 70 (1860)

T: Wilson Inlet, W.A., 1858, *G.Maxwell*; syn: MEL (2 specimens), PERTH (1 specimen).

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 84 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 107 (1979); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 255 (1984).

Tree to 30 m, or mallee to 5 m. Bark white or yellow-white. Juvenile leaves alternate, petiolate, ovate, discolorous. Adult leaves alternate, falcate or lanceolate, acuminate; lamina 8.5–14 cm long, 2–3 cm wide, dull, green; lateral veins just visible, at 35°–45°; intramarginal vein up to 2 mm from margin; petiole flattened or angular, 15–25 mm long. Umbels 3-flowered; peduncle flattened, 10–26 mm long, to 7 mm wide; pedicels absent or up to 3 mm long. Buds ovoid to subglobular; operculum depressed hemispherical, apiculate, 10–12 mm long, 14–18 mm wide; hypanthium turbinate, 10–15 mm long, 14–18 mm wide. Fruits subglobular to campanulate, smooth or faintly striate, 16–25 mm long, 18–28 mm wide; disc broad, convex; valves 3–5, exserted but almost covered by disc. Seeds crescent-shaped, grey-black. *Bullich.* Fig. 51M–N.

Occurs from near Perth southwards to Cape Leeuwin and eastwards to the Stirling Ra. and Albany area, W.A. Grows in sandy loam in moist conditions near swamps and streams, in open forest. The mallee or smaller tree form is found on hills. Regions: LUWN, ESPR. Map 86.

W.A.: Mt William, SE of Waroona, *K.M.Allan* 253 (FRI, PERTH); between Hamelin Bay & Cape Freycinet, *M.I.H.Brooker* 2526 (FRI, PERTH); Mt Toolbrunup, *C.A.Gardner* 1943 (NSW, PERTH).

The large buds and fruits and the broad disc which almost obscures the valves are distinctive. Somewhat resembles *E. diversicolor* in habit but smaller, and with larger adult leaves.

86. *Eucalyptus aquilina* Brooker, *Nuytsia* 1: 297 (1974)

T: near Mt Le Grand, W.A., 33°59'S, 122°08'E, 22 Apr. 1972, *M.I.H.Brooker* 3622; holo: FRI; iso: AD, GAUBA, K, MEL, NSW, PERTH.

Illustrations: M.I.H.Brooker, *op. cit.* 298; M.I.H.Brooker & N.Hall, *Forest Tree Ser.* No. 181 (1975); S.Kelly *et al.*, *Eucalypts* 2: t. 137 (1983).

Mallee to 5 m. Bark mottled white and grey. Juvenile leaves subopposite, sessile, ovate to ovate-lanceolate, slightly discolorous. Adult leaves alternate, lanceolate, often falcate, apiculate, oblique, thick; lamina 8–13 cm long, 1.5–2.5 cm wide, green, shining; lateral veins just visible, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole flattened, glandular, 10–25 mm long. Umbels 3-flowered; peduncle flat, 20–30 mm long, 10–15 mm wide; pedicels absent. Buds turbinate, smooth; operculum hemispherical-conical, 10–12 mm long, 25–28 mm wide; hypanthium obconical, 15–20 mm long, 25–28 mm wide. Fruits obconical, smooth or faintly ribbed, 30–40 mm long, 35–50 mm wide; disc broad, rugose, red-brown, shiny, lobed and convex, extending over valves; valves 5–7, exserted. Seeds pyramidal, grey-black. *Mt Le Grand Mallee.* Fig. 52A–B.

Occurs between Mt Le Grand and Frenchman Peak, W.A.; grows on gentle to moderate slopes and along streams, in closed shrubland and heath. Region: ESPR. Map 87.

W.A.: near Cape Le Grand, *K.M.Allan* 821 (AD, FRI, MEL, PERTH); 48 km E of Esperance, *A.S.Weston* 7017 (AD, MEL, PERTH).

Distinguished by the large broad peduncles, and large obconical smooth fruits with a broad lobed rugose disc extending over the valves.

87. *Eucalyptus coronata* C.Gardner, *J. Proc. Roy. Soc. W. Australia* 19: 86 (1933)

E. mitrata C.Gardner, *J. Proc. Roy. Soc. W. Australia* 22: 127 (1936). T: Middle Mt Barren, W.A., Sept. 1926, C.A.Gardner 1914; syn: PERTH; near East Mt Barren, W.A., Dec. 1931, H.Steedman s.n.; syn: PERTH; Whoogarup Ra., W.A., 28 Nov. 1931, C.A.Gardner 2971; isosyn: K.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 37 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 105 (1979); S.Kelly et al., *Eucalypts* 1: t. 128 (1983).

Mallee to 2 m. Bark grey. Juvenile leaves not seen. Adult leaves alternate, lanceolate, falcate, apiculate; lamina 9–12 cm long, 1.8–3 cm wide, green, shining; lateral veins faint, at c. 30°, intramarginal vein up to 3 mm from margin; petiole flattened or angular, 10–25 mm long. Umbels 3-flowered; peduncle broadly flattened, 10–17 mm long and to 15 mm wide; pedicels absent. Buds fusiform or turbinate, deeply corrugated; operculum conical, 10–15 mm long, 15–30 mm wide; hypanthium obconical, 12–17 mm long, 15–30 mm wide. Fruits obconical, deeply corrugated, 18–25 mm long, 25–35 mm wide, occasionally up to 50 mm wide; disc oblique, descending, lobed and extending over valves; valves 4 or 5, exserted. Seeds ±crescent-shaped, grey-black. *Crowned Mallee*. Fig. 52C–D.

Occurs on the Whoogarup Ra, Middle Mt Barren and East Mt Barren, W.A., among boulders on steep quartzite hills, in open shrubland. Region: ESPR. Map 88.

W.A.: East Mt Barren, M.I.H.Brooker 2304 (FRI, PERTH); Whoogarup Ra., A.S.George 1947 (PERTH).

Similar to *E. aquilina* but with deeply corrugated buds and fruits.

88. *Eucalyptus preissiana* Schauer in J.G.C.Lehmann, *Pl. Preiss.* 1: 131 (1844)

T: Cape Riche, W.A., Nov. 1840, L.Preiss 239; iso: MEL.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 34 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 109 (1979); S.Kelly et al., *Eucalypts* 1: t. 126 (1983).

Mallee to 2.5 m. Bark grey. Juvenile leaves opposite, sessile, ovate to elliptic, concolorous. Adult leaves opposite or subopposite, ovate to elliptic, obtuse, broadly cuneate, thick; lamina 7–12 cm long, 3–5 cm wide, grey-green; lateral veins prominent, at 50°–60°; intramarginal vein up to 5 mm from margin; petiole flattened, 10–30 mm long. Umbels 3-flowered; peduncle flattened, 10–25 mm long, to 10 mm wide; pedicels usually absent, rarely to 4 mm long. Buds ovoid to ±fusiform, usually red; operculum hemispherical or conical, 8–10 mm long, 10–14 mm wide; hypanthium obconical, 10–15 mm long, 10–14 mm wide; stamens yellow. Fruits campanulate, 18–25 mm long, 23–30 mm wide, woody; disc obliquely descending, swollen over valves; valves 5 or 6, included. Seeds D-shaped, red-brown. *Bell-fruited Mallee*. Figs 23, 52E–F.

Occurs from South Stirling eastwards to Stokes Inlet, W.A., usually in thickets in heathland on low hills, in lateritic and rocky clay soil. Regions: LUWN, ESPR. Map 89.

W.A.: Woolbernup Hill, M.I.H.Brooker 2731 (FRI, PERTH); 12.6 km SE of Ravensthorpe, G.M.Chippendale 416 (FRI, MEL, NSW, PERTH); 4 km SE of Ravensthorpe, P.G.Wilson 5520 (FRI, PERTH).

Distinguished by the thick, ovate, usually opposite leaves, 3-flowered umbels with smooth red opercula and yellow stamens, and woody campanulate fruits with disc swollen over valves.

89. *Eucalyptus acies* Brooker, *Nuytsia* 1: 245 (1972)

T: Woolbernup Hill, W.A., 4 Aug. 1970, M.I.H.Brooker 2725; holo: PERTH; iso: CANB, FRI, GAUBA, K, MEL, NSW, PERTH.

Illustrations: M.I.H.Brooker, *op. cit.* 246; N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 194 (1977); S.Kelly et al., *Eucalypts* 2: t. 136 (1983).

Mallee to 2.5 m. Bark grey. Juvenile leaves opposite, subsessile, oblong-elliptic, concolorous. Adult leaves opposite or subopposite, lanceolate to broadly lanceolate, acuminate, broadly cuneate, coriaceous; lamina 9–15 cm long, 2–3.5 cm wide, green or yellow-green; lateral

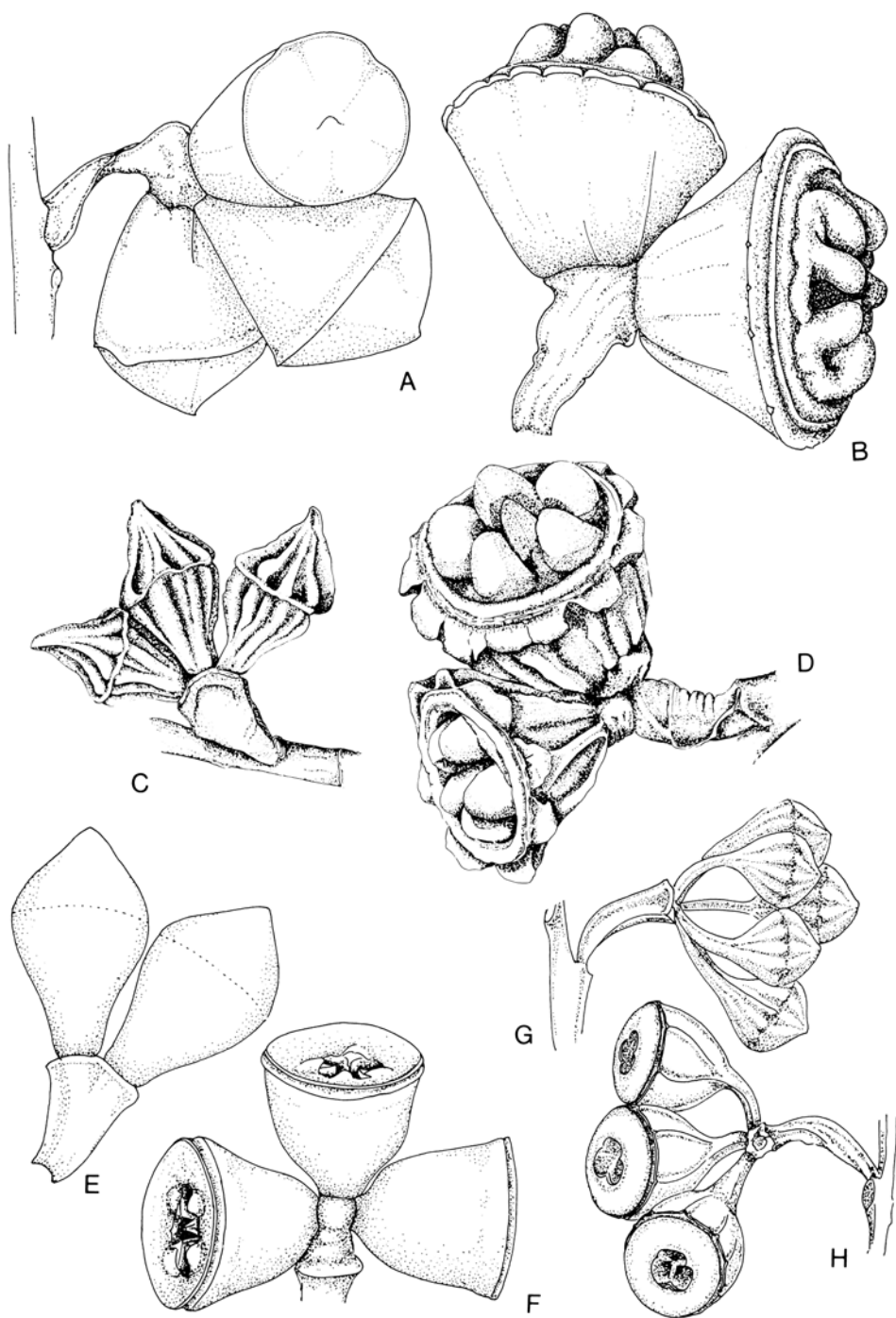


Figure 52. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. aquilina* (R.Godenzi 29, FRI). **C–D**, *E. coronata* (A.George 1947, PERTH). **E–F**, *E. preissiana* (**E**, R.Kuchel 1931, FRI; **F**, G.Chippendale 416, FRI). **G–H**, *E. acies* (A.George 7150, FRI). **C**, **D** drawn by C.Stahl. Others drawn by M.May.

veins just visible, at 40°–50°; intramarginal vein up to 2 mm from margin; petiole flattened, 15–30 mm long. Umbels 7-flowered; peduncles flattened or angular, widening upwards, usually reflexed, 13–26 mm long; pedicels flattened, 5–8 mm long. Buds clavate or shortly fusiform; operculum conical to hemispherical, smooth or shallowly ribbed, 3–5 mm long, 7–9 mm wide; hypanthium obconical, prominently ribbed, 5–8 mm long, 8–10 mm wide. Fruits hemispherical or campanulate, 10–15 mm long, 12–16 mm wide; disc broad, level with rim or slightly convex; valves 3 or 4, level. Seeds angular, slightly winged, grey-black or brown-black. *Woolbernup Mallee*. Fig. 52G–H.

Occurs on quartzite hills of the Fitzgerald River Natl Park and near Cheyne Beach, W.A., in low shrubland and heathland. Region: ESPR. Map 90.

W.A.: Woolbernup Hill, *M.I.H.Brooker* 2723 (FRI, NSW, PERTH); 6.4 km E of Thumb Peak, *K.Newbey* 3137 (FRI, PERTH); Bluff Ck, S of Green Ra., Sept. 1966, *H.E.Daniels* (PERTH).

Recognised by the very angular branchlets, 7-flowered umbels, flattened peduncle and pedicels, and relatively small ribbed, hemispherical or campanulate fruits with a broad flat disc.

90. *Eucalyptus ligulata* Brooker, *Nuytsia* 1: 300 (1974)

T: c. 1.5 miles [2.4 km] E of beach near Cape Le Grand, W.A., 15 Mar. 1972, *K.M.Allan* 820; holo: PERTH; iso: FRI, K, NSW.

Illustrations: *M.I.H.Brooker, op. cit.* fig. 3; *M.I.H.Brooker & N.Hall, Forest Tree Ser.* No. 182 (1975); *S.Kelly et al., Eucalypts* 2: t. 134 (1983).

Mallee to 3 m. Bark mottled grey, glandular. Juvenile leaves opposite or subopposite, shortly petiolate, oblong-lanceolate, concolorous. Adult leaves alternate or subopposite, lanceolate, apiculate, coriaceous; lamina 5–10 cm long, 1–2.5 cm wide, grey-green; lateral veins faint, at 40°–45°; intramarginal vein faint, up to 1 mm from margin; petiole flattened, 8–15 mm long. Umbels 7–11-flowered; peduncle flattened, 10–25 mm long; pedicels flattened or angular, 5–10 mm long. Buds ovoid or ±fusiform; operculum conical, smooth, 4–7 mm long, 4–5 mm wide; hypanthium obconical or hemispherical, ribbed, 6–7 mm long, 4–5 mm wide. Fruits hemispherical or subglobose, rugose, ribbed, 8–15 mm long, 9–14 mm wide; disc broad, red-brown, slightly convex to flat; valves 3, included. Seeds pyramidal, brown-black. *Lucky Bay Mallee*. Fig. 53A–B.

Occurs near Mt Trio in the Stirling Ra., near Haul Off Rock, Mt Le Grand and Lucky Bay, W.A., usually on hill slopes near the sea, in low shrubland or heathland. Region: ESPR. Map 91.

W.A.: near Cape Le Grand, *M.I.H.Brooker* 4476 (AD, FRI, MEL, PERTH); Lucky Bay, *P.G.Wilson* 5605 (PERTH).

May be recognised by the 7–11-flowered umbels, and small hemispherical or subglobose, ribbed fruits with a broad red-brown disc.

91. *Eucalyptus calcicola* Brooker, *Nuytsia* 1: 302 (1974)

T: near Cape Freycinet, W.A., 18 June 1971, *K.M.Allan* 634; holo: PERTH; iso: AD, BRI, FRI, GAUBA, HO, MEL, NSW, PERTH.

Illustrations: *M.I.H.Brooker, op. cit.* fig. 4; *N.Hall & M.I.H.Brooker, Forest Tree Ser.* No. 154 (1974); *S.Kelly et al., Eucalypts* 2: t. 135 (1983).

Mallee to 2.5 m. Bark light grey to green-grey. Juvenile leaves alternate or subopposite, petiolate, broadly lanceolate, slightly discolorous. Adult leaves alternate, lanceolate, sometimes falcate or oblique, acuminate, thick; lamina 5.5–10.5 cm long, 1–3 cm wide, green, shiny; lateral veins just visible, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole flattened, 12–20 mm long. Umbels 7-flowered; peduncle flattened, strongly ribbed, 10–20 mm long; pedicels flattened, 3–5 mm long. Buds ovoid-conical or ±fusiform; operculum conical, ribbed, 5–9 mm long, 7–8 mm wide; hypanthium obconical, ribbed, 7–8 mm long and wide. Fruits subglobose or hemispherical, strongly ribbed, 10–15 mm long,

12–16 mm wide; disc convex or flat, \pm at rim level; valves 4, included. Seeds pyramidal, black. *Hamelin Bay Mallee*. Fig. 53C–D.

Occurs in the Boranup–Cape Freycinet area, W.A., in shrubland on moderate slopes of calcareous dunes. Region: LUWN. Map 92.

W.A.: 6.6 km NW of Boranup, *M.I.H.Brooker* 3697 (FRI, GAUBA, NSW, PERTH); Boranup, May 1971, *B.Walsh* (FRI, MEL, PERTH).

Distinguished from *E. ligulata* by the small, shining, green leaves, 7-flowered umbels, and more strongly ribbed buds and fruits.

92. *Eucalyptus pachyloma* Benth., *Fl. Austral.* 3: 237 (1867)

T: Swan R. Colony, W.A., 1845, *J.Drummond* 64; syn: BM, CGE, E, FI, G, K, MEL, NSW, PERTH, W; Kalgan R., W.A., *A.Oldfield* 324; syn: G; Stirling Ra., W.A., *G.Maxwell*; syn: K, MEL.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 38 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 132 (1983).

Mallee to 3.5 m. Branchlets quadrangular. Bark grey. Juvenile leaves opposite, shortly petiolate, narrowly lanceolate, concolorous. Adult leaves alternate, erect, narrowly lanceolate to lanceolate, sometimes falcate, acuminate; lamina 5–10 cm long, 1–1.5 cm wide, green, lateral veins just visible, at c. 30°; intramarginal vein up to 2 mm from margin; petiole flattened, 7–10 mm long. Umbels usually 3-flowered, sometimes up to 11-flowered; peduncle quadrangular, thick, 5–10 mm long; pedicels absent or up to 3 mm long. Buds globular or ovoid; operculum hemispherical-conical, 5–8 mm long and wide; hypanthium hemispherical, 4–6 mm long, 5–8 mm wide. Fruits globular, 11–13 mm long, 11–15 mm wide; disc prominent, broad, convex, overlapping valves; valves 3, broadly triangular, level or slightly exserted. Seeds D-shaped, with several ridges, narrowly winged, red-brown. *Kalgan Plains Mallee*. Fig. 53E–F.

Occurs mainly in the Stirling Ra. area, but also in Tutanning Nature Reserve and near Bremer Bay, W.A., on plains and foothills in sandy soil. Regions: BENC, ESPR. Map 93.

W.A.: Tutanning, *M.I.H.Brooker* 1762 (FRI, PERTH); 5.8 km W of Bluff Knoll, *G.M.Chippendale* 432 (FRI, PERTH); Kalgan Plains, 16 Jan. 1936, *C.A.Gardner* (K, PERTH).

Distinguished by erect leaves, and \pm globular buds and fruits, the latter with a very convex disc. Petiole shorter than in *E. diversifolia*, and leaves greener.

93. *Eucalyptus diversifolia* Bonpl., *Pl. Malm.* 35, t. 13 (1814)

T: cultivated at Jardin Botanique de Toulon, 1813, *C.Naudin s.n.*; ?syn: P; cultivated at Malmaison, Jan. 1809, *C.Naudin s.n.*; syn: P; cultivated at Jardin Noisette, Nov. 1812, *C.Naudin s.n.*; syn: P; cultivated at Malmaison, 1813, *C.Naudin s.n.*; syn: P.

E. santalifolia F.Muell., *Trans. & Proc. Roy. Victorian Inst. Advancem. Sci.* 1: 35 (1854). T: Murray R., St Vincent and Spencer Gulfs, S.A., collector unknown; n.v.

Illustrations: J.H.Maiden, *Crit. Revis. Eucalyptus* 1: t. 36 figs 5–11 (1905); G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 40 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 144 (1983).

Mallee to 6 m, spreading. Bark grey to light brown. Juvenile leaves opposite, sessile, later ones alternate, petiolate, oblong-lanceolate. Adult leaves alternate, lanceolate, sometimes falcate, apiculate, thick; lamina 7–10 cm long, 1–2 cm wide, dull, grey-green or blue-green; lateral veins just visible, at 20°–30°; intramarginal vein up to 2 mm from margin; petiole channelled, 10–20 mm long. Umbels 7–11-flowered; peduncle channelled, 5–12 mm long; pedicels 2–4 mm long. Buds conical or fusiform, grey-pink or grey-red; operculum conical, 4–8 mm long, 5–6 mm wide; hypanthium obconical, 3–4 mm long, 5–6 mm wide. Fruits truncate-pyriform or subglobular, 8–12 mm long, 10–15 mm wide; disc broad, flat or convex, overlapping valves; valves 4, small, level to slightly exserted. Seeds D-shaped, with several ridges, often shortly winged on margin, red-brown. *Soap Mallee*. Fig. 53G–H.

Occurs from near Caiguna, W.A., eastwards along the coast through S.A. including Kangaroo Is., to Cape Nelson, Vic. Grows in limestone soil, often on exposed headlands. Regions: NULL, EYRE, TRNS, RIVR, OTWY, HOWE. Map 94.

W.A.: near Point Dover, *P.G.Wilson* 5907 (FRI, PERTH). S.A.: 18.7 km NW of Padthaway, *G.M.Chippendale* 1332 & *M.J.Brennan* (AD, BRI, FRI, MEL, NSW); 22.7 km SW of Kingscote, *G.M.Chippendale* 1362 & *M.J.Brennan* (AD, FRI, NSW). Vic.: 9.7 km SW of Portland, 15 June 1964, *J.H.Willis* (CANB, MEL).

Distinguished from *E. pachyloma* and *E. erectifolia* by the grey-green or blue-green leaves on longer petiole, the fusiform, grey-pink or grey-red buds and the almost pyriform fruits.

94. *Eucalyptus erectifolia* Brooker & Hopper, *Nuytsia* 5: 351 (1986)

T: road to Mt Trio, Stirling Ra. Natl Park, W.A., Nov. 1981, *M.I.H.Brooker* 7184; holotype: PERTH; isotype: FRI, MEL, NSW.

Illustrations: *M.I.H.Brooker & S.D.Hopper*, *op. cit.* 352–353 figs 6, 7.

Mallee to 3 m. Bark grey. Juvenile leaves subopposite to alternate, elliptic to ovate, concolorous. Adult leaves alternate, erect, narrowly lanceolate to lanceolate, uncinately; lamina 6–7.5 cm long, 1.3–1.8 cm wide, shining, dark green; lateral veins just visible, at c. 35°; intramarginal vein up to 1 mm from margin; petiole terete or slightly flattened, 6–12 mm long. Umbels 7–13 flowered; peduncle terete or quadrangular, 8–20 mm long; pedicels 2–5 mm long. Buds broadly fusiform to ovoid; operculum conical, 4–5 mm long and wide; hypanthium obconical to hemispherical, c. 4 mm long, 4–5 mm wide. Fruits hemispherical to subglobular, 10–16 mm long, 15–20 mm wide; disc broad, level to descending; valves 3 or 4, just included. Seeds pyramidal, brown, laterally winged. Fig. 53 I–J.

Occurs on the lower slopes of the Stirling Ra., W.A., in open shrubland, often in pure stands. Regions: LUWN, ESPR. Map 95.

W.A.: 5.8 km W of Chester Pass road on Scenic Drive, Stirling Ra. Natl Park, *M.I.H.Brooker* 8379 (AD, FRI, MEL, NSW, PERTH); SW corner of Stirling Ra. Natl Park, *M.I.H.Brooker* 7723 (AD, FRI, MEL, NSW, PERTH).

Distinguished by the small mallee habit, the small erect leaves, the broadly fusiform to ovoid buds and hemispherical to subglobular fruits. Similar to *E. pachyloma* but has longer pedicels, larger buds and a cupular fruit with a level disc.

Ser. 20 Neuroptera

Eucalyptus* ser. *Neuroptera Maiden, *Crit. Revis. Eucalyptus* 7: 169 (1925).

Type: *E. todtiana* F. Muell.

Trees or mallees. Bark fibrous, longitudinally furrowed, persistent throughout, rarely at base only. Juvenile leaves opposite, becoming alternate, petiolate, discolorous. Adult leaves alternate, petiolate, concolorous. Conflorescences simple, axillary, 3–11-flowered umbels. Buds clavate, ovoid or fusiform. Fruits globular or nearly so to ovoid or cylindrical; disc broad, descending or flat; valves 3–5, just included to just exerted. Seeds red-brown.

A series of 3 species in south-western W.A., characterised by fibrous, furrowed bark, concolorous leaves, simple axillary conflorescences of 3–11-flowers, and globular to cylindrical fruits.

P.Y.Ladiges et al., Cladistic and biogeographic analysis of Western Australian species of *Eucalyptus* L'Hérit., informal subgenus *Monocalyptus* Pryor & Johnson, *Austral. J. Bot.* 35: 251–281 (1987).

95. *Eucalyptus patens* Benth., *Fl. Austral.* 3: 247 (1867)

T: Harvey R., W.A., *A.Oldfield*; syn: K, MEL; Tone R., W.A., *G.Maxwell*; syn: K, MEL, NSW; Swan R., W.A., *J.Drummond* 4: 72; syn: BM, CGE, K, MEL, NSW, PERTH; south-western W.A., *J.Gilbert s.n.*; syn: BM; south-western W.A., *J.S.Roe*; syn: n.v.; Swan R. Colony, W.A., 1843, *L.Preiss* 252; syn: MEL.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 149 (1970); S.Kelly *et al.*, *Eucalypts* 1: t. 145 (1983).

Tree to 45 m. Bark grey to grey-brown. Juvenile leaves ovate, acuminate. Adult leaves narrowly lanceolate to lanceolate, sometimes falcate, acuminate; lamina 10–16 cm long, 1.2–3 cm wide, dull, green; lateral veins just visible, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole flat or channelled, 10–20 mm long. Umbels 7–11-flowered; peduncle angular, 10–20 mm long; pedicels 1–4 mm long. Buds clavate; operculum hemispherical-conical, 5–6 mm long, 6–7 mm wide; hypanthium campanulate, 5–7 mm long, 6–7 mm wide. Fruits globular to ovoid, 9–14 mm long, 9–12 mm wide; disc descending; valves 3–5, included. Seeds usually D-shaped. *Yarri, Blackbutt*. Fig. 53K–L.

Occurs from near Perth to Albany, W.A., mostly in valleys and depressions of the Darling Ra., in tall open forest. Region: LUWN. Map 96.

W.A.: 0.5 km W of Barton Mill Prison, *M.I.H.Brooker* 2555 (FRI, MEL, PERTH); Mt Frankland, *M.I.H.Brooker* 4427 (AD, FRI, MEL); Wooroloo, *M.Koch* 1419 (AD, K, MEL, NSW, PERTH).

Superficially resembles *E. marginata* but is usually a straight tree with grey or grey-brown, deeply furrowed, fibrous bark throughout, dull-green adult leaves and ±globular fruits, and usually grows in depressions. Long-pointed juvenile leaves also distinctive. The timber is durable and excellent for flooring, panelling, sleepers and other constructional work, but is not plentiful.

96. *Eucalyptus todtiana* F.Muell., *S. Sci. Rec.* 2: 171 (1882)

T: near Greenough R., W.A., 1877, *F.Mueller*; syn: MEL; near Arrowsmith R., W.A., 1877, *F.Mueller*; syn: K, MEL, NSW; near Moore R., W.A., 1 Feb. 1880, *J.Forrest s.n.*; syn: K, MEL, NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 85 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 133 (1983).

Tree to 15 m. Bark grey to grey-brown. Juvenile leaves opposite, sessile, becoming alternate, petiolate, narrowly to broadly lanceolate. Adult leaves narrowly lanceolate or lanceolate, acuminate, thick; lamina 7–12.5 cm long, 1.2–2 cm wide, green; lateral veins prominent, at 35°–45°; intramarginal vein up to 1.5 mm from margin; petiole flattened or channelled, 8–12 mm long. Umbels 3–7-flowered; peduncles flattened or angular, 10–32 mm long; pedicels 1–4 mm long. Buds clavate or ovoid; operculum hemispherical, 4–6 mm long, 6–7 mm wide; hypanthium hemispherical, 4–5 mm long, 6–7 mm wide. Fruits globular, truncate, slightly wrinkled, 15–20 mm long, 17–23 mm wide; disc level or descending; valves 3 or 4, level or just exserted. Seeds cubic or pyramidal, winged on edges. *Pricklybark*. Fig. 53M–N.

Occurs from Pinjarra northwards to the Greenough R., W.A., on sandy flats and gentle slopes of the coastal plain, in scrub and open woodland. Regions: BENC, LUWN. Map 97.

W.A.: 16 km from Badgingarra, *E.M.Canning* 3514 (CBG, NSW, PERTH); 7 km E of Gingin, *G.M.Chippendale* 5 (AD, BRI, CANB, FRI, K, MEL, PERTH); 35.2 km NW of Dandaragan, *G.M.Chippendale* 21 (AD, FRI, MEL, NSW, PERTH); 3.2 km N of Bullsbrook, *L.A.S.Johnson* W5 (K, NSW).

A characteristic small tree of the coastal plain, often of irregular form, with coarse fibrous bark throughout, 3–7-flowered umbels with long peduncles and short pedicels, and globular fruits. The bark fibres end in fine spicules. Fruits much larger than those of *E. patens*.

97. *Eucalyptus lateritica* Brooker & Hopper, *Nuytsia* 5: 346 (1986)

T: Mt Michaud, c. 1 km NW of Mt Lesueur, W.A., 30°15'S, 115°12'E, 22 Apr. 1982, *S.D.Hopper* 2232; holo: PERTH; iso: AD, FRI, K, MEL, NSW.

Illustrations: M.I.H.Brooker & S.D.Hopper, *op. cit.* 349–350, figs 4, 5.

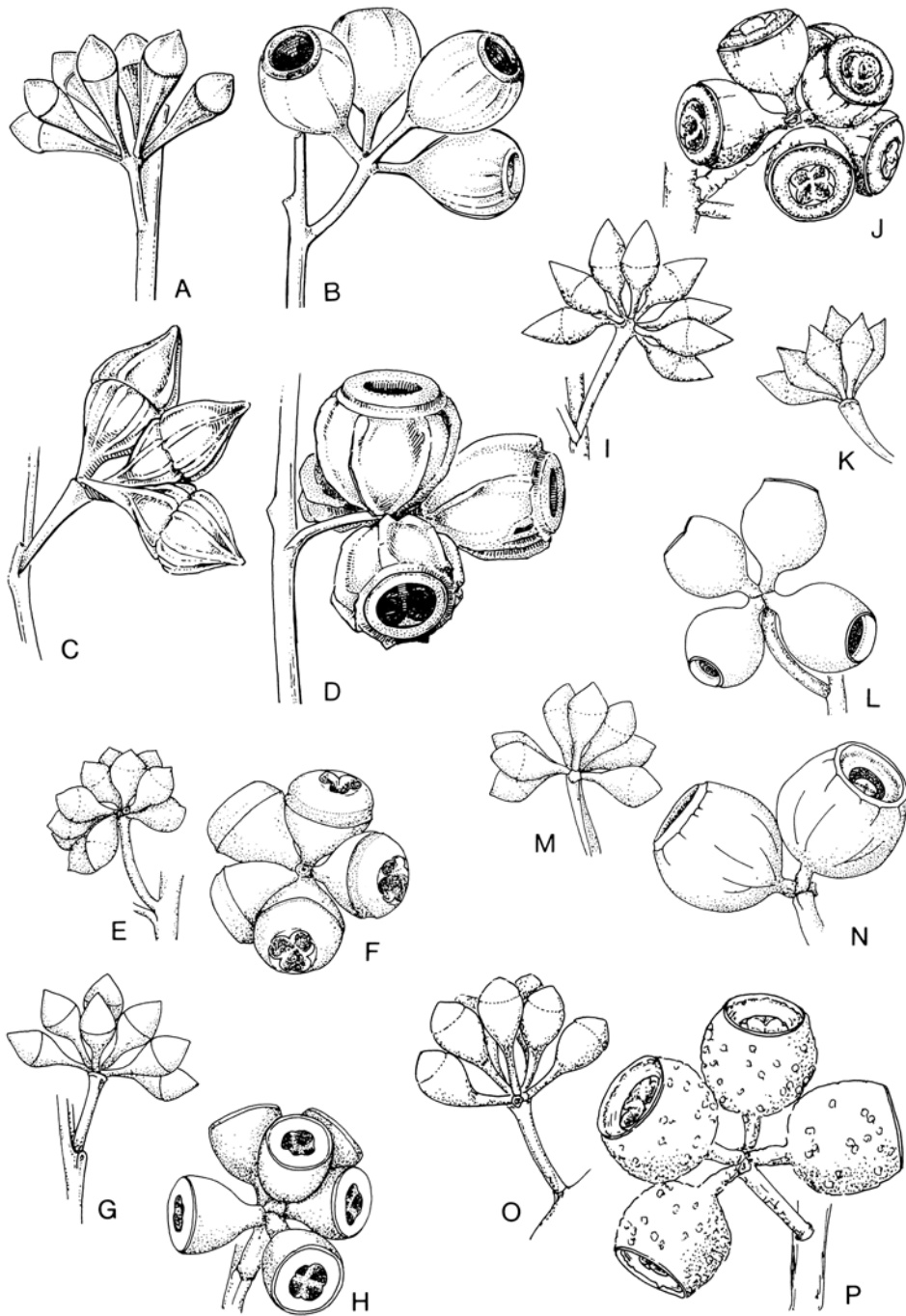


Figure 53. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. ligulata* (**A**, I.Brooker 3610, FRI; **B**, I.Brooker 5650, FRI). **C–D**, *E. calcicola* (I.Brooker 3698, FRI). **E–F**, *E. pachyloma* (**E**, I.Brooker 3587, FRI; **F**, Mt Helen Powell, W.A., M.E.Phillips, FRI). **G–H**, *E. diversifolia* (I.Brooker 3839, FRI). **I–J**, *E. erectifolia* (**I**, I.Brooker 7184, FRI; **J**, I.Brooker 7701, FRI). **K–L**, *E. patens* (**K**, North Dandalup, W.A., collector unknown, FRI 11831, FRI; **L**, A.Hill U9M-B3, FRI). **M–N**, *E. todiana* (**M**, Moore R., WA., C.Gardner, FRI 16414, FRI; **N**, G.Chippendale 21, FRI). **O–P**, *E. lateritica* (S.Hopper 2232, FRI). Drawn by M.May.

Mallee to 3 m. Bark rough, grey-brown to 1.5 m, or mostly smooth, grey. Juvenile leaves lanceolate, slightly shining, slightly discolorous. Adult leaves narrowly lanceolate to lanceolate, long-pointed; lamina 7.5–10 cm long, 1.2–2.5 cm wide, shining, green or dark green; lateral veins distinct, at 30°–50°; intramarginal vein up to 2 mm from margin; petiole slightly flattened, 8–10 mm long. Umbels 11-flowered; peduncle terete, 10–17 mm long; pedicels 4–5 mm long. Buds fusiform to clavate; operculum conical to hemispherical, 3–4 mm long, 6–7 mm wide; hypanthium obovoid, 5–7 mm long, 6–7 mm wide. Fruits cupular to subglobular, 12–15 mm long, 14–16 mm wide; disc level or descending; valves 3, included. Seeds narrowly pyramidal, shining, strongly ribbed, winged. Fig. 53 O–P.

Occurs near Mt Lesueur and inland for c. 30 km, W.A., on lateritic scree slopes in shrubland with heath. Region: LUWN. Map 98.

W.A.: Mt Lesueur, W.A., *M.I.H. Brooker 7514* (FRI, NSW, PERTH); Mt Benia, *M.I.H. Brooker 8015* (AD, FRI, MEL, NSW, PERTH).

Closely related to *E. todtiana* but distinguished by the mallee habit, rough flaky bark on lower stems, slightly shining leaves, fusiform to clavate buds on longer pedicels in 11-flowered umbels, and smaller fruits. The oil glands are clearly visible in the leaves, whereas those of *E. todtiana* are not.

Ser. 21 Cochleatae

Eucalyptus ser. **Cochleatae** Maiden, *Crit. Revis. Eucalyptus* 7: 168 (1925).

Type: *E. buprestium* F. Muell., lecto *fide* G.M. Chippendale, *Fl. Australia* 19: 496 (1988).

E. ser. Muricatae Maiden, *op. cit.* 170. T: *E. sepulcralis* F. Muell.

Mallees. Bark smooth throughout. Juvenile leaves opposite or alternate, petiolate, discolorous. Adult leaves alternate, petiolate, concolorous. Conflorences axillary, simple, 7–11-flowered umbels. Buds clavate to ovoid or obovoid. Fruits globular, subglobular to truncate-ovoid; disc broad, descending; valves 4 or 5, included. Seeds D-shaped or pyramidal, brown to brown-black.

A series of 4 species in south-western W.A.; mallees with smooth bark, concolorous leaves, simple conflorences and globular to truncate-ovoid fruit.

P.Y. Ladiges *et al.*, Cladistic and biogeographic analysis of Western Australian species of *Eucalyptus* L'Hérit., informal subgenus *Monocalyptus* Pryor & Johnson, *Austral. J. Bot.* 35: 251–281 (1987).

98. *Eucalyptus buprestium* F. Muell., *Fragm.* 3: 57 (1862)

T: S of Kojonerup, W.A., *G. Maxwell*; syn: MEL; near Helens Peak [probably Ellen Peak], W.A., *G. Maxwell*; syn: *n.v.*; near Salt R., W.A., *G. Maxwell*; syn: MEL.

Illustrations: G.M. Chippendale, *Eucalypts W. Austral. Goldfields* 41 (1973); C.A. Gardner (ed. T.E.H. Aplin), *Eucalypts W. Australia* 123 (1979); S. Kelly *et al.*, *Eucalypts* 2: t. 140 (1983).

Mallee to 6 m, usually to 3 m. Bark grey to grey-brown. Juvenile leaves opposite, sessile, becoming alternate, petiolate, ovate, discolorous. Adult leaves narrowly lanceolate, sometimes falcate, acute; lamina 5–9 cm long, 0.8–1 cm wide, grey-green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole slightly flattened, 6–8 mm long. Umbels 7–11-flowered; peduncle terete to quadrangular, 10–15 mm long; pedicels quadrangular, 4–5 mm long. Buds clavate or obovoid; operculum hemispherical, sometimes apiculate, c. 2 mm long and wide; hypanthium truncate pyriform or obconical, c. 5 mm long and wide. Fruits globular, 18–25 mm long, 20–30 mm wide, wrinkled when dried. Seeds D-shaped, black or dark brown with several ridges, winged. *Apple Mallee*. Fig. 54A–B.

Occurs mainly between the Kalgan R. and the Stirling Ra., W.A., in sand in flat areas. One collection from Geographe Bay appears an error. Region: ESPR. Map 99.

W.A.: Pallinup Inlet area, *L.F.Allan* 229 (PERTH); 67.6 km N of Albany, *G.M.Chippendale* 440 (BRI, CANB, FRI); 40 km SSE of Jerramungup, *P.G.Wilson* 4351 (PERTH).

Characterised by the smooth bark, very small buds, and large globular fruits which are wrinkled when dried. More robust than the other species of the series.

99. *Eucalyptus sepulcralis* F.Muell., *Eucalyptographia* Decas 8: 10th plate (1882)

T: near Thomas R., W.A., 1880, *C.Taylor*; holo: MEL.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 42, 43 (1973); C.A.Gardner (ed. T.E.H.Aplin), *Eucalypts W. Australia* 161 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 146 (1983).

Mallee or slender tree to 8 m; branches pendulous, branchlets pruinose. Bark white to grey-brown. Juvenile leaves opposite, sessile, elliptic, becoming alternate, petiolate, oblong-lanceolate, grey-green. Adult leaves linear-lanceolate, acuminate; lamina 7–9 cm long, 0.8–1.2 cm wide, bright green; lateral veins faint, at c. 45°; intramarginal vein up to 1 mm from margin; petiole terete, 14–18 mm long. Umbels 7-flowered, pendulous; peduncle pruinose, 25–40 mm long; pedicels pruinose, 10–15 mm long. Buds obovoid; operculum conical, pruinose, 4–6 mm long, c. 6 mm wide; hypanthium obconical to suburceolate, pruinose, 6–8 mm long, c. 6 mm wide; stamens pale yellow. Fruits globular-urceolate, 25–35 mm long, 18–25 mm wide; disc vertical. Seeds irregularly pyramidal, black, shining. *Weeping Gum*. Fig. 54C–D.

Occurs between the Hamersley R. and No Tree Hill near Hopetoun, W.A., usually in quartzitic, sandy soil on rises. Region: ESPR. Map 100.

W.A.: 24.1 km W of Hopetoun, *M.I.H.Brooker* 2315 (FRI, PERTH); Middle Mt Barren, *C.A.Gardner* 1872 (PERTH); 1.6 km NE of No Tree Hill, *B.R.Maslin* 959 (PERTH).

Distinguished by the slender, weeping habit, smooth white to grey-brown bark, pendulous buds and fruits, and large globular-urceolate fruits. The locality Thomas R. given for the type appears to be an error since the species has not been recorded again in the area, which is c. 300 km E of the known distribution.

100. *Eucalyptus pendens* Brooker, *Nuytsia* 1: 243 (1972)

T: at 125 mile peg N of Perth between Gingin and Badgingarra, W.A., 30°14'S, 115°28'E, 23 July 1969, *M.I.H.Brooker* 1949; holo: PERTH; iso: FRI, K, PERTH.

Illustrations: M.I.H.Brooker, *op. cit.* 242; S.Kelly *et al.*, *Eucalypts* 2: t. 138 (1983).

Mallee to 5 m, few-stemmed; branchlets pendulous, pruinose. Bark pink-grey. Juvenile leaves opposite, ovate. Adult leaves lanceolate, acuminate, sometimes slightly falcate, thick, uncinat; lamina 6–12 cm long, 1–2 cm wide, green, lateral veins faint, at 30°–45°; intramarginal vein up to 1 mm from margin; petiole flattened, 20–30 mm long. Umbels 7–11-flowered; peduncle flattened, pruinose, 15–40 mm long; pedicels angular, pruinose, 3–8 mm long. Buds clavate; operculum hemispherical, sometimes umbonate, verrucose, sometimes 2- or 3-ribbed, 2–4 mm long, 6–8 mm wide; hypanthium obconical, 5–8 mm long, 6–8 mm wide. Fruits subglobular or truncate-ovoid, wrinkled or ribbed, 12–20 mm long and wide; disc oblique or vertical. Seeds dorsally rounded, several-ridged, black. *Badgingarra Mallee*. Fig. 54E–F.

Occurs between Gingin and Dongara, W.A., on low rises in heathland. Regions: BENC, LUWN. Map 101.

W.A.: 191 km N of Perth, *D.F.Blaxell* 85 (AD, FRI, NSW); 204 km N of Perth, *M.I.H.Brooker* 1853 (AD, FRI, NSW, PERTH); 61 km N of Regans Ford, *A.S.George* 9315 (PERTH).

Very similar to *E. sepulcralis* but has a longer petiole, smaller subglobular fruits and is usually less weeping in habit.

101. *Eucalyptus exilis* Brooker, *Nuytsia* 1: 305 (1974)

T: NW of Boyagin Rock, W.A., 32°27'S, 116°52'E, 10 May 1972, *M.I.H.Brooker* 3702; holo: FRI; iso: GAUBA, K, NSW, PERTH.

Illustrations: M.I.H.Brooker, *op. cit.* 306; S.Kelly *et al.*, *Eucalypts* 2: t. 139 (1983).

Mallee to 6 m; branchlets glaucous. Bark pink-grey, light grey or cream. Juvenile leaves subopposite, becoming alternate, ovate to elliptic. Adult leaves lanceolate to elliptic, uncinat, thick; lamina 4–7 cm long, 0.8–1.2 cm wide, grey-green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole flattened, 6–15 mm long. Umbels 11-flowered; peduncle flattened, 8–15 mm long; pedicels 3–5 mm long. Buds clavate to ovoid; operculum hemispherical to conical, 2–3 mm long, 4–5 mm wide; hypanthium hemispherical, 4–5 mm long and wide. Fruits truncate-globular or ovoid, 11–15 mm long, 10–14 mm wide; disc vertical. Seeds pyramidal, ribbed, black. Fig. 54G–H.

Occurs in several restricted areas south-east of Perth, W.A., including Mundaring Weir Catchment, Boyagin Rock Reserve and Wickepin Reserve, on slopes of hills on the eastern side of the Darling Ra., in heathland or shrubland. Regions: BENC, LUWN. Map 102.

W.A.: Boyagin Rock Reserve, *M.I.H.Brooker* 3703 (FRI, PERTH); Wickepin Reserve, *H.B.Shugg* (PERTH).

Recognised by the small leaves and buds, 11-flowered umbels, and medium-sized, truncate-globular or ovoid fruits. Of more upright habit than *E. sepulcralis* and *E. pendens*, and more slender than *E. buprestium*.

Ser. 22 *Johnsonianae*

Eucalyptus* ser. *Johnsonianae Chippendale, *Fl. Australia* 19: 499 (1988).

Type: *E. johnsoniana* Brooker & Blaxell

Mallees. Bark flaky fibrous below, smooth above. Juvenile leaves opposite, petiolate. Adult leaves alternate, petiolate, concolorous. Conflorences axillary, simple, 7-flowered umbels. Buds clavate. Fruits hemispherical to globular; disc broad, descending; valves 3 or 4, just included to just exerted. Seeds pyramidal, winged, brown.

A series of 1 species in south-western W.A.; the flaky-fibrous bark, concolorous leaves, simple conflorences and winged seeds characterise the series.

102. *Eucalyptus johnsoniana* Brooker & Blaxell, *Nuytsia* 2: 222 (1978)

T: 6 km S of Coorow–Green Head intersection on Hwy 1 [Brand Hwy], W.A., 30°06'S, 115°24'E, 7 Oct. 1975, *D.F.Blaxell* W75/89; holo: NSW; iso: FRI, K, PERTH.

Illustrations: M.I.H.Brooker & D.F.Blaxell, *op. cit.* 223; S.Kelly *et al.*, *Eucalypts* 1: t. 269 (1983).

Mallee to 2 m, forming dense clumps. Bark flaky to 0.5 m, then smooth and grey-brown above. Juvenile leaves ovate. Adult leaves lanceolate, uncinat; lamina 5–12 cm long, 1–1.5 cm wide, yellow-green; lateral veins faint, at 40°–50°; intramarginal vein almost confluent with margin; petiole channelled, 10–15 mm long. Peduncle terete or flattened, 8–10 mm long; pedicels 5–7 mm long. Operculum hemispherical, sometimes umbonate, 1–2 mm long, 3–4 mm wide; hypanthium hemispherical or campanulate, 3–4 mm long and wide. Fruits wrinkled, 8–12 mm long, 10–14 mm wide; disc vertical. Fig. 54 I–J.

Occurs in several small restricted areas south of Eneabba, W.A., in flat heathland in white sand over laterite and on lateritic breakways. Region: LUWN. Map 103.

W.A.: S of Coorow–Green Head road intersection, Hwy 1 [Brand Hwy], *M.I.H.Brooker* 5002 (AD, FRI, K, NSW, PERTH); N of Jurien road turn-off on Brand Hwy, *M.I.H.Brooker* 6776 (FRI, NSW, PERTH).

A mallee forming dense clumps, with yellow-green lanceolate adult leaves, clavate buds in 7-flowered umbels, and hemispherical to globular fruits.

Ser. 23 Subereae

Eucalyptus ser. **Subereae** Chippendale, *Fl. Australia* 19: 506 (1988).

Type: *E. suberea* Brooker & Hopper

Mallees. Bark rough, flaky or corky, grey to half stem height. Juvenile leaves subopposite, petiolate, lanceolate, shining, light green, slightly discoloured. Adult leaves alternate, petiolate, concolorous. Conflorescences axillary, simple; umbels 11–20-flowered or more. Buds fusiform to clavate. Fruits subglobular, sometimes suburceolate; disc steeply descending; valves 3 or 4, included. Seeds D-shaped or subpyramidal, shining, brown, not or scarcely ribbed.

A series of 1 species in south-western W.A., distinguished by the many-flowered umbels, D-shaped brown seeds and corky bark.

103. *Eucalyptus suberea* Brooker & Hopper, *Nuytsia* 5: 343 (1986)

T: Hi Valley farm, Tootbardi road, N of Badgingarra, W.A., 24 Jan. 1983, *M.I.H. Brooker* 7930; holo: PERTH; iso: AD, FRI, K, MEL, NSW.

Illustrations: M.I.H. Brooker & S.D. Hopper, *op. cit.* 344–345, figs 1, 2.

Mallee to 3 m. Bark rough to half height, grey-yellow, then smooth, grey or white above. Adult leaves lanceolate, sometimes falcate, acuminate; lamina 6–9 cm long, 1–1.5 cm wide, slightly shining, dark green; lateral vein faint, at 10°–35°; intramarginal vein up to 1 mm from margin; petiole terete, 7–10 mm long. Peduncle terete, 8–15 mm long; pedicels c. 3 mm long. Operculum conical to hemispherical, 1–2 mm long, 3–5 mm wide; hypanthium hemispherical, 2–3 mm long, 3–5 mm wide. Fruits 7–9 mm long, 8–11 mm wide, irregularly wrinkled when dry. Fig. 54K–L.

Occurs in the Mt Lesueur area and extending towards Badgingarra, W.A., in small populations in lateritic soil on scree slopes, in open mallee and heath. Region: LUWN. Map 104.

W.A.: c. 5 km NE of Mt Lesueur, *M.I.H. Brooker* 7988 (AD, FRI, MEL, NSW, PERTH); Mt Benia, *M.I.H. Brooker* 8014 (AD, FRI, MEL, NSW, PERTH).

Recognised by the grey-yellow rough flaky or corky bark to half stem height, large umbels and usually subglobular fruits. A rare species.

Ser. 24 Insulares

Eucalyptus ser. **Insulares** Chippendale, *Fl. Australia* 19: 499 (1988).

Type: *E. insularis* Brooker

Mallees. Bark smooth throughout, glandular. Juvenile leaves alternate or subopposite, petiolate, lanceolate. Adult leaves alternate, petiolate, concolorous. Conflorescences axillary, simple, many-flowered umbels. Buds clavate. Fruits ovoid; disc broad, flat or oblique, descending vertically; valves 3, included. Seeds pyramidal, somewhat elongate, ribbed, black-brown.

A series of 1 species in south-western W.A., characterised by the smooth bark, concolorous leaves and many-flowered simple umbels.

104. *Eucalyptus insularis* Brooker, *Nuytsia* 1: 308 (1974)

T: North Twin Peak Is., W.A., 33°59'S, 122°51'E, 10 Feb. 1960, *R.D.Royce 6264*; holo: PERTH; iso: FRI.

Illustrations: M.I.H.Brooker, *op. cit.* 309; M.I.H.Brooker & N.Hall, *Forest Tree Ser.* No. 184 (1975); S.Kelly *et al.*, *Eucalypts* 2: t. 142 (1983).

Mallee to 2 m, sometimes to 8 m. Bark light grey, green-grey or yellow-green. Adult leaves narrowly lanceolate to lanceolate, sometimes falcate, uncinata, thick; lamina 4.5–7.5 cm long, 0.4–0.8 cm wide, green; lateral veins faint, at 20°–35°; intramarginal vein almost confluent with margin; petiole flattened or channelled, glandular, 4–8 mm long. Peduncle flattened or angular, recurved, 5–8 mm long; pedicels 3–5 mm long; operculum hemispherical, apiculate to long-pointed, 2–3 mm long, 3–4 mm wide; hypanthium obconical, 3–4 mm long and wide. Fruits 7–8 mm long, 5–6 mm wide; disc red-brown, shining. *Twin Peak Island Mallee*. Fig. 54M–N.

Occurs on Twin Peak Is. and on the adjacent mainland in the Mt Le Grand Ntl Park, W.A., on gentle to moderate granitic slopes, in closed shrubland and heathland. Region: ESPR. Map 105.

W.A.: North Twin Peak Is., *M.I.H.Brooker 3637* (AD, BRI, FRI, MEL, NSW, PERTH); 1 km E of Cape Le Grand, *A.S.Weston 7044* (FRI, PERTH).

A mallee with smooth bark, small leaves, many-flowered umbels on recurved peduncles, and small ovoid fruits.

Ser. 25 Occidentales***Eucalyptus* ser. *Occidentales* Blakely, *Key Eucalyptus* 40, 171 (1934).**

Type: *E. marginata* Donn ex Smith, lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 502 (1988).

Trees. Bark fibrous throughout. Juvenile leaves alternate, petiolate, mostly discolorous. Adult leaves alternate, sometimes subopposite, petiolate, discolorous, in 1 taxon concolorous. Conflorescences axillary, simple; umbels 7–11-flowered or many-flowered. Buds ovoid, clavate or rostrate. Fruits globular or ovoid; disc moderately broad except in *E. staeri* which is narrow, usually descending, mostly obliquely; valves 3 or 4, usually included. Seeds pyramidal, red-brown or black-brown.

A series of 4 species in south-western W.A.; trees with fibrous bark, usually discolorous leaves, simple conflorescences and large fruits.

P.Y.Ladiges *et al.*, Cladistic and biogeographic analysis of Western Australian species of *Eucalyptus* L'Hérit., informal subgenus *Monocalyptus* Pryor & Johnson, *Austral. J. Bot.* 35: 251–281 (1987).

105. *Eucalyptus brevistylis* Brooker, *Nuytsia* 1: 310 (1974)

T: c. 10 miles [22.5 km] NE of Walpole, W.A., 34°49'S, 116°53'E, 15 Feb. 1971, *B.R.Maslin 1694*; holo: PERTH; iso: AD, BRI, FRI, HO, K, MEL, NSW, PERTH.

Illustrations: M.I.H.Brooker, *op. cit.* 311; N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 153 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 143 (1983).

Tree to 40 m. Bark longitudinally fissured, yellow-brown. Juvenile leaves ovate, cordate, discolorous. Adult leaves lanceolate to broadly lanceolate, often falcate, uncinata, oblique; lamina 7–9 cm long, 2–3 cm wide, shining, green, discolorous; lateral veins faint to visible, at 35°–55°; intramarginal vein up to 1 mm from margin; petiole channelled, 10–20 mm long. Umbels 7–11-flowered; peduncle terete or angular, 7–14 mm long; pedicels 3–6 mm long. Buds ovoid or clavate; operculum hemispherical, 1–2 mm long, 3–4 mm wide; hypanthium campanulate or hemispherical, 2–3 mm long, 3–4 mm wide. Fruits globular or truncate-ovoid, wrinkled, sometimes ribbed, 6–9 mm long and wide; valves 3, included. Seeds ribbed, brown. *Rate's Tingle*. Fig. 54 O–P.

Occurs in a restricted area E and NE of Walpole, W.A., in deep soil on flat areas near streams in tall forest. Region: LUWN. Map 106.

W.A.: E of Mt Frankland, *M.I.H.Brooker* 3576 (AD, FRI, MEL, NSW, PERTH); 5.1 km E of Walpole, *M.I.H.Brooker* 6349 (FRI).

Distinguished as a tall tree with fibrous bark, small discolourous shining leaves, small ovoid to clavate buds, and wrinkled, globular or truncate-ovoid fruits. Style very short.

106. *Eucalyptus jacksonii* Maiden, J. & Proc. Roy. Soc. New South Wales 47: 219 (1914)

T: Deep R., W.A., Dec. 1912, *S.W.Jackson s.n.*; holo: NSW; iso: BM, FRI.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 49 (1970); C.A.Gardner (ed. T.E.H.Aplin), *Eucalypts W. Australia* 63 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 38 (1983).

Tree to 55 m, occasionally to 70 m. Bark longitudinally fissured, red-brown to grey-brown. Juvenile leaves broadly ovate, green, discolourous. Adult leaves lanceolate, falcate, slightly acuminate; lamina 7.5–11 cm long, 1.4–2.5 cm wide, green, shining, discolourous; lateral veins just visible, at 40°–50°; intramarginal vein up to 2 mm from margin; petiole flattened, 13–17 mm long. Umbels 7-flowered; peduncle angular, 7–11 mm long; pedicels 2–5 mm long. Buds ovoid to clavate; operculum conical, 4–5 mm long, 3–4 mm wide; hypanthium hemispherical to cylindrical, c. 3 mm long and wide. Fruits globular, 6–8 mm long, 8–10 mm wide; disc oblique; valves 3 or 4, just below rim. Seeds red-brown. *Red Tingle*. Fig. 55C–D.

Occurs in a restricted area of the lower catchments of the Deep, Frankland and Bow Rivers, W.A., usually on hills in rich, well-drained loamy soil, in tall open forest. Region: LUWN. Map 107.

W.A.: Peaceful Bay, *J.S.Beard* 2546 (PERTH); Valley of the Giants, *M.I.H.Brooker* 2335 (FRI, PERTH); 3.3 km E of Walpole, *M.I.H.Brooker* 6347 (FRI).

Differs from *E. brevistylis* in the 7-flowered umbels, conical operculum and slightly larger fruits. The wood is strong and durable, of high quality, but limited in availability; it has been used for home construction, furniture and sleepers.

107. *Eucalyptus marginata* Donn ex Smith, Trans. Linn. Soc. London 6: 302 (1802)

T: cultivated at Kew Gardens, England, 1799, *W.T.Aiton*; holo: LINN.

E. floribunda Huegel ex Endl. in S.L.Endlicher *et al.*, *Enum. Pl. Huegel* 49 (1837). T: Swan R., Fremantle, W.A., *K.Hügel* 103; holo: W.

E. hypoleuca Schauer in J.G.C.Lehmann, *Pl. Preiss.* 1: 131 (1844). T: Mt Wuljenup [Mt Willyung], W.A., *L.Preiss* 226; *n.v.*

E. mahoganii F.Muell., *Fragm.* 2: 41 (1860). T: Kalgan R., W.A., *A.Oldfield* 329; holo: MEL.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 151 (1970); C.A.Gardner (ed. T.E.H.Aplin), *Eucalypts W. Australia* 10 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 147 (1983).

Tree to 40 m; trunk up to 2 m diam. Bark red-brown or brown, ageing to grey. Juvenile leaves ovate, dark green, discolourous. Adult leaves lanceolate to broadly lanceolate, sometimes falcate, uncinuate or acuminate; lamina 8–13 cm long, 1.5–3 cm wide, dark green, shining, discolourous; lateral veins just visible, at 40°–60°; intramarginal vein mostly up to 1 mm from margin; petiole channelled, 12–16 mm long. Umbels 7–11-flowered; peduncle terete or angled, 10–20 mm long; pedicels 5–13 mm long. Buds ±cylindrical; operculum narrowly conical, rostrate, 5–9 mm long, 3–4 mm wide; hypanthium hemispherical or campanulate, 2–4 mm long, 3–4 mm wide. Fruits globular or ovoid, 9–16 mm long, 9–15 mm wide; disc descending obliquely or sometimes level; valves 3, included or level. Seeds ribbed, brown-black. *Jarrah*. Fig. 54Q–R.

Occurs mostly between Perth and Albany and in the Darling Ra., W.A., but extends N to Mt Lesueur and inland to Pingelly and Jilakin Rock; grows in gravelly sand, laterite loam and sand, usually in pure stands in forest. Regions: BENC, LUWN, ESPR. Map 108.

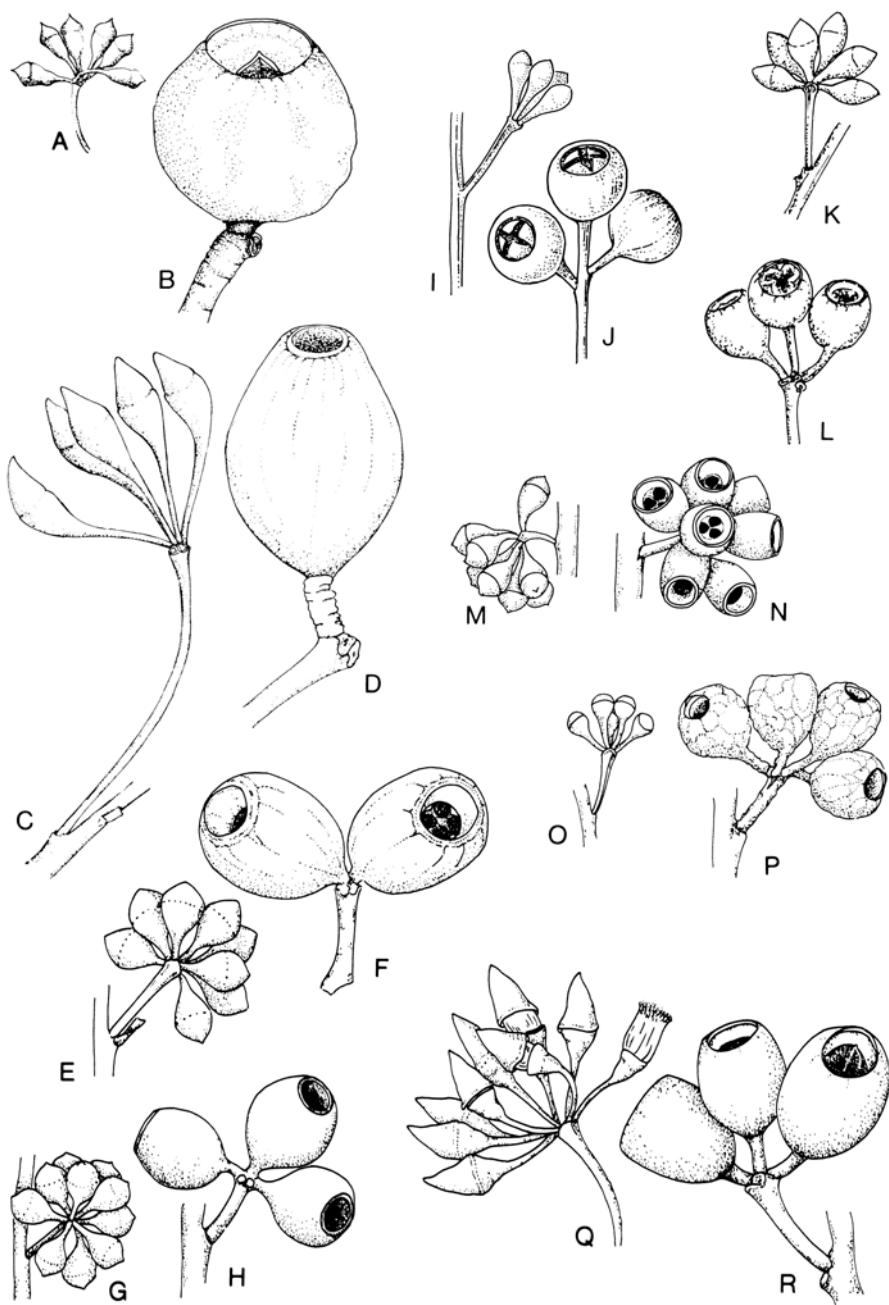


Figure 54. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. buprestium* (**A**, Stirling Ra., W.A., C.Gardner, FRI; **B**, G.Chippendale 440, FRI). **C–D**, *E. sepulcralis* (**C**, I.Brooker 2315, FRI; **D**, M.Crisp 5022, FRI). **E–F**, *E. pendens* (J.Briggs 301, FRI). **G–H**, *E. exilis* (63 mile post of Mundaring Weir catchment area boundary, D.Perry, FRI). **I–J**, *E. johnsoniana* (**I**, I.Brooker 5002, FRI; **J**, D.Blaxell 75/89 & I.Brooker, FRI). **K–L**, *E. suberea* (**K**, I.Brooker 6782, FRI; **L**, I.Brooker 7639, FRI). **M–N**, *E. insularis* (I.Brooker 3637, FRI) **O–P**, *E. brevistylis* (**O**, I.Brooker B4427a, FRI; **P**, I.Brooker B4425, FRI). **Q–R**, *E. marginata* (**Q**, I.Brooker 5031, FRI; **R**, I.Brooker 5030, FRI). **I, J** drawn by M.Risby. Others drawn by M.May.

W.A.: Tutanning Nature Reserve, *M.I.H.Brooker* 1865 (PERTH); Bluff Knoll, *G.M.Chippendale* 428 (FRI, MEL, NSW); S of Northcliffe, *S.Paust* 303 (PERTH); 7 km W of Walpole, *P.G.Wilson* 6321 (PERTH).

A tall fibrous-barked tree, usually in pure stands, with discoloured leaves, cylindrical, rostrate buds, and globular to ovoid fruits that are large than those of *E. jacksonii* and smaller than those of *E. staeri*. Cotyledons large; hypocotyl remains underground. The wood is hard, strong, durable and resistant to termites, and is used in heavy construction and furniture manufacture. The most important timber tree of south-western W.A. Also useful in honey production.

108. *Eucalyptus staeri* (Maiden) Kessell & C.Gardner, *W. Australian For. Dept. Bull.* 34: 110 (1924)

E. marginata var. *staeri* Maiden, *J. Proc. Roy. Soc. New South Wales* 47: 230 (1914). T: King R. road, near Albany, W.A., Aug. 1911, *J.Staer s.n.*; holotype: NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 73 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 141 (1983).

Tree to 15 m. Bark deeply fissured longitudinally, grey-brown. Juvenile leaves not seen. Adult leaves broadly lanceolate to ovate-lanceolate, sometimes falcate, uncinata, thick; lamina 7.5–12.7 cm long, 2.5–3.8 cm wide green, concolorous to slightly discoloured; lateral veins just visible, at 30°–40°; intramarginal vein up to 2 mm from margin; petiole flattened, 15–20 mm long. Umbels many-flowered; peduncle flattened, 20–25 mm long; pedicels angular, 6–9 mm long. Buds fusiform; operculum conical or rostrate, 10–13 mm long, 5–7 mm wide; hypanthium obconical, 5–6 mm long, 5–7 mm wide. Fruits globular, 17–22 mm long, 17–25 mm wide; disc oblique; valves 3 or 4, included. Seeds black-brown. *Albany Blackbutt*. Fig. 55A–B.

Occurs mostly between Denmark and Albany, W.A., on gentle slopes near swamps and streams in deep sandy podsols, usually in near-coastal scrubland. Regions: LUWN, ESPR. Map 109.

W.A.: 0.8 km S of Napier H.S., *M.I.H.Brooker* 3583 (BRI, FRI, PERTH); near Albany, *C.A.Gardner* 385A (PERTH); near Beaufort Inlet, *A.S.George* 6157 (PERTH).

Similar to *E. marginata* but usually a stunted tree with more deeply fissured bark throughout, thick concolorous leaves, fusiform buds in many-flowered umbels, and larger fruits.

Ser. 26 White-mahoganies

Eucalyptus* ser. *White-mahoganies Blakely, *Key Eucalypts* 42 (1934).

Type: *E. umbra* R.Baker, lectotype, *fide* G.M.Chippendale, *Fl. Australia* 19: 507 (1988).

Trees. Bark fibrous throughout, somewhat stringy, thick. Juvenile leaves opposite, sessile, amplexicaul, becoming subopposite and shortly petiolate, discoloured. Adult leaves alternate, petiolate, discoloured or concolorous. Conflorences axillary, simple, 7–11-flowered umbels. Buds ovoid, rostrate or fusiform. Fruits hemispherical or globular, truncate; valves 3–5. Seeds ±pyramidal, red-brown.

A series of 2 species in coastal N.S.W. and Qld; trees with fibrous bark, rostrate or fusiform buds and hemispherical or globular fruits.

109. *Eucalyptus acmenoides* Schauer in W.G.Walpers, *Repert. Bot. Syst.* 2: 924 (1843)

T: Castle Hill, N.S.W., 14 Jan. 1817, *A.Cunningham* 20; iso: K, MEL.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 157 (1970); S.Kelly *et al.*, *Eucalypts* 2: t. 147 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 56 (1983).

Tree to 25 m in dry sites, elsewhere to 60 m. Bark grey-brown. Juvenile leaves ovate, shining, green, acuminate. Adult leaves lanceolate to broadly lanceolate, sometimes falcate,

acuminate, thin; lamina 8–12.5 cm long, 1.6–2.7 cm wide, green, discolorous; lateral veins clearly visible, at 35°–55°; intramarginal vein up to 1 mm from margin; petiole flattened or channelled, 8–15 mm long. Peduncle angular or flattened, 6–12 mm long; pedicels 2–6 mm long. Operculum conical or rostrate, 3–4 mm long and wide; hypanthium obconical or hemispherical, 2–3 mm long, 3–4 mm wide. Fruits hemispherical to truncate-globular, 4–7 mm long and wide; disc usually narrow, level or descending; valves 3 or 4, level or included. *White Mahogany*. Fig. 55E–F.

Occurs in Qld and N.S.W., mainly between Sydney and the Atherton Tableland area, on ridges, plateaus and hills, in open forest and tall open forest. Regions: CYRK, BURD, DWSN, MCPH, NEPN. Map 110.

Qld: 12.4 km N of Burrum Heads, *G.M.Chippendale 1138* (BRI, FRI, MEL, NSW); Watsonville, *B.Hyland 5585* (BRI, CANB, NSW); 10 km SSE of Mt Perry, *L.Pedley 4013* (BRI, MEL, NSW). N.S.W.: Pokolbin, *M.I.H.Brooker 4627* (AD, BRI, FRI, MEL, NSW); 9.7 km SW of Cessnock, *R.Story 7376* (AD, BRI, CANB, NSW).

A tall tree with fibrous bark throughout, thin discolorous adult leaves, ±fusiform buds, and small, hemispherical to truncate-globular fruits with a narrow disc. The wood is hard, strong and durable, and has been used for poles, sleepers, joists and flooring.

110. *Eucalyptus umbra* R.Baker, *Proc. Linn. Soc. New South Wales* 25: 687 (1901)

T: Spit Road, Mosmans Bay, N.S.W., 24 Sept. 1892, *R.T.Baker s.n.*; lecto: NSW, *fide* S.T.Blake, *Proc. Roy. Soc. Queensland* 69: 86 (1958); isolecto: K.

Tree to 25 m, sometimes a shrub to 4 m. Bark grey to grey-brown. Juvenile leaves ovate, dark green, shining. Adult leaves lanceolate, somewhat falcate, acuminate, oblique, thick, concolorous; petiole flattened. Peduncle flattened, angular or terete; pedicels angular. Operculum conical or rostrate; hypanthium hemispherical. Fruits hemispherical; valves 3 or 4, level.

Occurs in eastern Qld. Differs from *E. acmenoides* in the thicker, concolorous leaves, thicker peduncle and pedicels, and thin-walled fruit. Two subspecies currently described.

Adult leaves green; disc prominent, broad, flat or convex

110a. subsp. *umbra*

Adult leaves blue-green; disc narrow, descending

110b. subsp. *carnea*

110a. *Eucalyptus umbra* R.Baker subsp. *umbra*

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 192 (1977); S.Kelly *et al.*, *Eucalypts* 1: t. 151 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 55 (1983).

Shrub to 4 m in coastal areas, elsewhere tree to 25 m. Adult leaves: lamina 10–14 cm long, 2.5–3.5 cm wide, green; lateral veins just visible, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole 13–20 mm long. Peduncle angular to flattened, 15–25 mm long; pedicels 5–8 mm long. Operculum 4–5 mm long, 3–4 mm wide; hypanthium hemispherical, 3–4 mm long and wide. Fruits 6–8 mm long, 7–9 mm wide; disc prominent, broad, convex or flat, reddish. *Broad-leaved White Mahogany*. Fig. 55G–H.

Occurs from the Sydney area, N.S.W., northwards to Cairns, Qld, including some islands. Grows mostly in poor soils on coastal flats, well-drained slopes and sandstone plateaus, in open forest. Regions: CYRK, BURD, DWSN, MCPH, NEPN. Map 111.

Qld: Teewal Ck, *S.L.Everist 7673* (BRI, CANB); near Mt Gravatt, 27 Oct. 1918, *C.T.White* (BRI, NSW). N.S.W.: 3.2 km N of Hawkesbury R., *M.I.H.Brooker 2841* (BRI, FRI); Staples Lookout, 7.6 km from Woy Woy towards Kariong, *G.M.Chippendale 1020* (BRI, FRI, MEL, NSW).

Not always clearly distinguishable from *E. acmenoides* in northern Qld.

110b. *Eucalyptus umbra* subsp. *carnea* (R.Baker) L.Johnson, *Contr. New South Wales Natl Herb.* 3: 123 (1962)

E. carnea R.Baker, *Proc. Linn. Soc. New South Wales* 31: 303, t. 23 (1906); *E. acmenoides* var. *carnea* (R.Baker) Maiden, *Crit. Revis. Eucalyptus* 1:265 (1907). T: Woodburn, N.S.W., *W.Bäuerlen s.n.*; lecto: NSW n.v., fide S.T.Blake, *Proc. Roy. Soc. Queensland* 69: 86 (1958); isolecto: MEL.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 185 (1975); S.Kelly *et al.*, *Eucalypts* 2: t. 146 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 55 (1983).

Tree to 25 m. Adult leaves: lamina 8–12 cm long, 2.5–4 cm wide, blue-green; lateral veins faint or just visible, at 35°–50°; intramarginal vein up to 2 mm from margin; petiole 10–20 mm long. Peduncle terete, 10–20 mm long; pedicels 4–5 mm long. Operculum 3–4 mm long and wide; hypanthium hemispherical, 3–4 mm long and wide. Fruits 6–7 mm long, 5–7 mm wide; disc narrow, descending. *Broad-leaved White Mahogany*. Fig. 55 I–J.

Occurs from Sydney, N.S.W., to Maryborough, Qld, mostly in poor soils on coastal flats, slopes and ridges, in open forest. Regions: DWSN, MCPH, NEPN. Map 112.

Qld: 3.2 km E of Goodwood railway stn, *G.M.Chippendale* 552 (BRI, FRI, NSW); 27.4 km SW of Bundaberg, *L.S.Smith* 702 (BRI, NSW). N.S.W.: 13.7 km E of Bulahdelah, *G.M.Chippendale* 478 & *R.D.Johnston* (FRI, NSW, PERTH); 1.6 km W of Gloucester, *R.Coveny* 4611 (AD, BRI, FRI, MEL, NSW, PERTH).

Distinguished from subsp. *umbra* by the more bluish adult leaves and the narrow descending disc of the fruit.

Ser. 27 *Pachyphloiae****Eucalyptus* ser. *Pachyphloiae* Blakely, *Key Eucalypts* 42, 177 (1934) p.p.**

Type: *E. capitellata* Smith, lecto, fide G.M.Chippendale, *Fl. Australia* 19: 503 (1988).

E. subser. *Congestae* Blakely, *op. cit.* 44, 185. T: *E. capitellata* Smith, lecto, fide G.M.Chippendale, *loc. cit.*

Mostly trees, occasionally mallees or shrubs. Bark usually fibrous, stringy, furrowed longitudinally throughout, rarely smooth throughout. Seedling leaves stellate-hairy. Juvenile leaves alternate, sometimes subopposite, rarely opposite, petiolate, usually discolorous, rarely concolorous, the lower ones stellate-hairy. Adult leaves alternate, petiolate, oblique, usually concolorous, sometimes discolorous. Conflorences axillary, simple; umbels 3–many-flowered. Buds ovoid to clavate or fusiform. Fruits globular, subglobular, hemispherical or rarely ±fusiform or truncate-ovoid; valves 3–5. Seeds pyramidal or D-shaped, brown-black. *Stringybarks*.

A series of 21 species in S.A., Qld, N.S.W. and Vic.; trees or mallees with long-fibred stringy bark, simple conflorences and usually crowded buds and fruits. The seedling leaves have minute hairs radiating from raised oil glands.

P.Y.Ladiges & C.J.Humphries, Relationships in the Stringybarks, *Eucalyptus* L'Hérit. informal subgenus *Monocalyptus* Series *Capitellatae* and *Olsenianae*: phylogenetic hypotheses, biogeography and classification. *Austral. J. Bot.* 34: 603–632 (1986).

111. *Eucalyptus muelleriana* A.Howitt, *Trans. Roy. Soc. Victoria* n. ser., 2: 89 (1890)

T: Nine Mile Ck [near Hedley], South Gippsland, Vic., *A.W.Howitt* 6; lecto: MEL, fide J.H.Willis, *Muelleria* 1: 167 (1967).

E. dextropeina R.Baker, *Proc. Linn. Soc. New South Wales* 23: 417, t. xi (1898). T: Monga, N.S.W., *W.Bäuerlen s.n.*; syn: NSW; Barbers Ck, N.S.W., July 1898, *H.J.Rumsey*; isosyn: K.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 163 (1970); S.Kelly *et al.*, *Eucalypts* 1: t. 150 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 57 (1983).

Tree to 40 m. Bark thick, grey-brown. Juvenile leaves ovate, often oblique, green, discolorous. Adult leaves broadly lanceolate to lanceolate, acuminate; lamina 8–13 cm long,

1.5–2.5 cm wide, green, discolorous; lateral veins prominent, at 20°–35°; intramarginal vein faint, 1–2 mm from margin; petiole channelled, 15–20 mm long. Umbels 7–11-flowered; peduncle angular or flattened, 8–18 mm long; pedicels 1–3 mm long. Buds ovoid to clavate; operculum hemispherical to conical, 2–3 mm long, 3–4 mm wide; hypanthium obconical, 3–5 mm long, 3–4 mm wide. Fruits subglobular to truncate-ovoid, 7–10 mm long, 8–12 mm wide; disc broad, level or slightly descending or sometimes slightly convex; valves 4, slightly included or slightly exserted. *Yellow Stringybark*. Fig. 55K–L.

Occurs on coastal plains and nearby ranges from near Mt Kembla, south of Sydney, N.S.W., to Sealers Cove, Wilsons Promontory, Vic. Grows in tall open forest, in a wide range of soils. Regions: NEPN, HOWE. Map 113.

N.S.W.: 9 km from Countegany Road towards Wadbilliga, *M.I.H.Brooker 4401* (FRI, MEL, NSW); 9.8 km NW of Merimbula, *G.M.Chippendale 914* (FRI, NSW). Vic.: 14.8 km S of Nungatta Homestead, *M.I.H.Brooker 4411* (AD, BRI, FRI, MEL); 4.8 km NNE of Yarram, *G.M.Chippendale 984* (BRI, FRI, MEL).

Distinguished by the fibrous, stringy bark throughout, discolorous adult leaves, 7–11-flowered umbels and distinctly pedicellate fruits.

112. *Eucalyptus laevopinea* R.Baker, *Proc. Linn. Soc. New South Wales* 23: 414 (1898)

T: Nullo Mtn, near Rylstone, N.S.W., Oct. 1897, *J.Dawson*; syn: E, K, NSW; Never Never Mtn, near Rylstone, N.S.W., *R.T.Baker s.n.*; n.v; Gulf Road N of Rylstone, N.S.W., Sept. 1895, *R.T.Baker s.n.*; syn: NSW.

E. macrorhyncha var. *brachycorys* Benth., *Fl. Austral.* 3: 207 (1867). T: New England, N.S.W., *C.Stuart s.n.*; hol: MEL; iso: NSW.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 167 (1970); S.Kelly *et al.*, *Eucalypts* 2: t. 153 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 58 (1983).

Tree to 40 m. Bark smooth and white on smaller branches, fibrous and grey to red-brown elsewhere. Juvenile leaves ovate, green, discolorous. Adult leaves lanceolate, often falcate, acuminate; lamina 9.5–14 cm long, 1.5–2.5 cm wide, green, concolorous lateral veins clearly visible, at 25°–40°; intramarginal vein up to 2 mm from margin; petiole channelled or flat, 10–20 mm long. Umbels 7–11-flowered; peduncle angular or flattened, 5–20 mm long; pedicels 1–6 mm long. Buds clavate; operculum hemispherical, apiculate, 3–4 mm long, 4–5 mm wide; hypanthium obconical, 3–4 mm long, 4–5 mm wide. Fruits hemispherical to subglobular, 6–11 mm long, 7–12 mm wide; disc broad, level or convex; valves 3 or 4, slightly included to exserted. *Silvertop Stringybark*. Fig. 55M–N.

Occurs from near Stanthorpe, Qld, to S of Rylstone, N.S.W.; grows on undulating and hilly areas and ridges of coastal tablelands and escarpments, in open forest and tall open forest in basaltic or granitic soils. Regions: MCPH, NEPN. Map 114.

Qld: 17 km WSW of Stanthorpe, *L.Pedley 7422* (BRI, FRI). N.S.W.: 12.9 km SW of Guyra, 28 Oct. 1929, *W.F.Blakely* (NSW); 23.7 km WNW of Armidale, *G.M.Chippendale 1251* (AD, BRI, FRI, MEL, NSW); Cairds Gap, Liverpool Ra., 31 Oct. 1954, *L.A.S.Johnson* (BRI, NSW).

Differs from related species especially in the smooth, white bark on the smaller branches. The concolorous adult leaves also distinguish it from *E. muelleriana*, and the shorter, less acute operculum and often less prominent disc of the fruit from *E. macrorhyncha*.

113. *Eucalyptus macrorhyncha* F.Muell. ex Benth., *Fl. Austral.* 3: 207 (1867)

T: Macalister River, Vic., *F.Mueller*; syn: MEL; near Mt Ligar, Vic., Jan. 1863, *F.Mueller*; syn: MEL; Avon R., Vic., Mar. 1854, *F.Mueller*; syn: K, MEL; Newfield, Melbourne, Vic., 9 May 1856, *F.Adamson 471*; syn: K.

E. macrorhyncha var. *minor* Blakely, *Key Eucalypts* 184 (1934). T: Bumble Ra., N.S.W., Apr. 1932, *W.F.Blakely s.n.*; syn: NSW; Canowindra, N.S.W., 13 July 1931, *M.Dwyer*; syn: NSW; Pilliga State Forest, N.S.W., Oct. 1911, *E.H.F.Swain*; syn: NSW; Wolongawah, N.S.W., 21 Apr. 1932, *W.A.W. de Beuzeville 484, 486*; syn: NSW; Wolongawah, N.S.W., 18 Sept. 1916, *W.A.W. de Beuzeville s.n.*; syn: NSW; Tumut, N.S.W., 1895, *J.H.Maiden s.n.*; syn: NSW; Tumut, N.S.W., Oct. 1899, *W.W.Froggatt s.n.*; syn: NSW; Tumut, N.S.W., 19 May 1927, *E.Cheel s.n.*; syn: NSW.

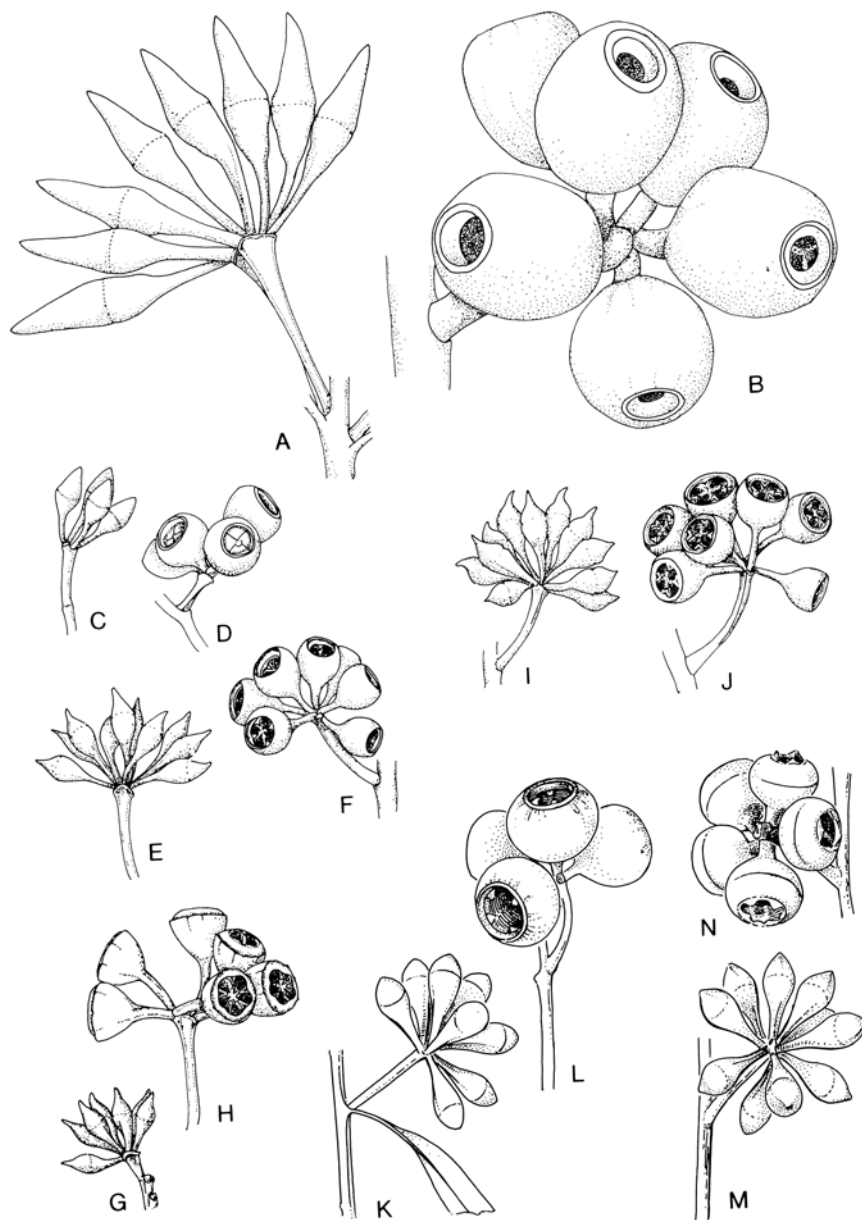


Figure 55. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. staeri* (**A**, I.Brooker 3583, FRI; **B**, 4.8 km E of Denmark, W.A., E.Holm, FRI). **C–D**, *E. jacksonii* (**C**, Valley of Giants, Walpole, W.A., collector unknown, FRI; **D**, 2.4 km E of Denmark, W.A., E.Holm, FRI). **E–F**, *E. acmenoides* (Ryde, Sydney, N.S.W., D.Nicholson, FRI). **G–H**, *E. umbra* subsp. *umbra* (**G**, I.Brooker 2841, FRI; **H**, I.Booker 2994, FRI). **I–J**, *E. umbra* subsp. *carnea* (**I**, 1.6 km SE of Yarramalong, N.S.W., R.Johnston & H.Vos, FRI; **J**, R.Johnston & G.Chippendale 484, FRI). **K–L**, *E. muelleriana* (**K**, M.Crisp 4650, FRI; **L**, J.Briggs 436, FRI). **M–N**, *E. laevopinea* (**M**, G.Chippendale 1251 & M.Brennan, FRI; **N**, G.Smith 20, FRI). **K–N** drawn by M.Risby. Others drawn by M.May.

[*E. scyphoidea* Naudin ex Maiden, *Proc. Linn. Soc. New South Wales* 28: 899 (1904), *nom. inval.* - *nom. nud.* T: cultivated at Villa Thuret, 1889, *C.Naudin s.n.*; holo: P]

Tree 12–35 m. Bark grey-brown. Juvenile leaves alternate, ovate, oblique, green, concolorous. Adult leaves lanceolate, green, concolorous; uncinat; petiole flattened or channelled. Umbels 3–11-flowered; peduncle terete, angular or flattened. Buds fusiform; operculum conical or rostrate; hypanthium obconical. Fruits subglobular to globular; disc broad, convex, ascending; valves 3 or 4, exserted.

Occurs in eastern N.S.W. and Vic., and in south-eastern S.A. The rostrate buds, longer pedicels and prominent disc distinguish this from related species. Two subspecies are recognised.

Umbels 7–11-flowered

113a. subsp. *macrorhyncha*

Umbels 3–7-flowered

113b. subsp. *cannonii*

113a. *Eucalyptus macrorhyncha* F.Muell. ex Benth. subsp. *macrorhyncha*

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 169 (1970); S.Kelly *et al.*, *Eucalypts* 1: t. 154 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 59 (1983).

Tree to 35 m. Adult leaves: lamina 9–14 cm long, 1.2–2.7 cm wide; lateral veins prominent, at 25°–40°; intramarginal vein up to 2 mm from margin; petiole 10–17 mm long. Umbels 7–11-flowered; peduncle 7–16 mm long; pedicels 2–8 mm long. Operculum rostrate, 5–6 mm long, 4–5 mm wide; hypanthium 3–4 mm long, 4–5 mm wide. Fruits globular, 6–10 mm long, 7–12 mm wide. *Red Stringybark*. Fig. 56A–B.

Occurs from near Inverell, N.S.W., south and west to near Ararat, Vic., with a disjunct occurrence near Clare, S.A.; grows in dry sclerophyll open forest and woodland on the lower slopes of hills and ranges. Regions: EYRE, OTWY, MCPH, NEPN, HOWE. Map 115.

S.A.: Seven Hills, *C.D.Boomsma* (AD). N.S.W.: 20.4 km SE of Bredbo, *M.J.Brennan* 5 (BRI, FRI, NSW, MEL); 16 km NNE of Orange, *R.Coveny* 4168 (AD, NSW, PERTH). Vic.: Bacchus Marsh, *R.T.Baker* (MEL); 16 km S of Yea, 18 Jan 1964, *J.H.Willis* (MEL).

Distinguished by fibrous, stringy bark throughout, rostrate operculum, and globular fruits with a broad, convex, ascending disc. Although not a reliable source, honey produced is highly coloured with a good flavour and will remain liquid for a long period.

113b. *Eucalyptus macrorhyncha* subsp. *cannonii* (R.Baker) L.Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 379 (1973)

E. cannonii R.Baker, *Hardwoods Australia* 200 (1919). T: Mt Vincent, Rylstone district, N.S.W., Nov. 1892, *R.T.Baker s.n.*; lecto: Museum of Applied Arts and Sciences, Sydney, *fide* L.A.S.Johnson & D.F.Blaxell, *op. cit.* 379; isolecto: NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 124 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 154 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 60 (1983).

Tree to 12 m, sometimes to 25 m. Adult leaves: lamina 10–18 cm long, 1.5–2.5 cm wide; lateral veins clearly visible or faint, at 30°–40°; intramarginal vein up to 2 mm from margin; petiole 10–15 mm long. Umbels 3–7-flowered; peduncle 10–19 mm long; pedicels 1–4 mm long. Operculum rostrate or conical, convex, flared at base, 5–6 mm long and wide; hypanthium convex, flared at top, 3–4 mm long, 5–6 mm wide. Fruits subglobular, 7–10 mm long, 10–14 mm wide. *Cannon's Stringybark*. Fig. 56C–D.

Occurs in a very restricted area in the Capertee valley, N.S.W., usually on rocky ridges or slopes, in dry sclerophyll forest. Region: NEPN. Map 116.

N.S.W.: Parsons Lookout, 2.9 km S of Capertee, *G.M.Chippendale* 1227 (BRI, FRI, MEL, NSW); Blackmans Crown, Capertee, Jan. 1919, *J.B.Yeo* (FRI, NSW).

Distinguished from subsp. *macrorhyncha* by the fewer-flowered umbels and the shorter pedicels.

114. *Eucalyptus youmanii* Blakely & McKie, *Proc. Linn. Soc. New South Wales* 55: 590 (1930)

T: Rosehill, 10.5 km SW of Guyra, N.S.W., 2 Nov. 1929 (published as Oct. 1929), T.Youman, *E.N.McKie & W.F.Blakely s.n.*; holotype: NSW; iso: K.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 138 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 155 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 61 (1983).

Tree to 21 m. Bark grey to red-brown. Juvenile leaves ovate to orbicular, green, slightly discolorous. Adult leaves lanceolate, falcate, acuminate, thick; lamina 7.5–13 cm long, 1–2 cm wide, green, concolorous; lateral veins clearly visible, at 25°–35°; intramarginal vein up to 2 mm from margin; petiole channelled, 10–15 mm long. Umbels 7-flowered; peduncle flattened, 5–11 mm long; pedicels usually absent or occasionally 2–3 mm long. Buds fusiform, angular; operculum conical, 5–6 mm long, 5–7 mm wide; hypanthium obconical, 3–4 mm long, 5–7 mm wide. Fruits subglobular, often compressed by crowding and ribbed, 9–12 mm long, 10–15 mm wide; disc very broad, convex, ascending; valves 3, exserted. *Youman's Stringybark*. Fig. 56E–F.

Occurs near Stanthorpe, Qld, and the New England tablelands, N.S.W., in sclerophyll forest on low hills and ridges, chiefly in podsolic soils. Region: MCPH. Map 117.

Qld: Ballandean, *C.T.White* 9396 (BRI, NSW). N.S.W.: 28 km from Guyra towards Tingha, *M.I.H.Brooker* 3928 (FRI, NSW); 11.3 km NE of Enmore, *R.W.Jessup & M.Gray* 98 (CANB, NSW).

Differs from *E. macrorhyncha* mainly in the crowded, usually sessile buds and fruits and from *E. muelleriana* in the concolorous leaves. Has larger buds and fruits than other stringybarks in Qld.

115. *Eucalyptus baxteri* (Benth.) Maiden & Blakely ex J.Black, *Fl. S. Australia* 415 (1926)

E. capitellata var. *latifolia* Benth., *Fl. Austral.* 3:206 (1867). T: near Portland, Vic., *J.G.Robertson* 503; holotype: K; iso: NSW.

E. santalifolia var. (?) *baxteri* Benth., *Fl. Austral.* 3: 207 (1867). T: Kangaroo Is., [S.A.], 1828, *W.Baxter*; holotype: BM; iso: NSW.

E. baxteri var. *pedicellata* Maiden & Blakely ex J.Black, *Fl. S. Australia* 416 (1926). T: Oslers Creek, Vic., *A.W.Howitt s.n.*; n.v.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 155, and 2: t. 157 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 62 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 281 (1984).

Tree to 40 m. Bark grey-brown. Juvenile leaves elliptic to ovate, often oblique, green, slightly discolorous to concolorous. Adult leaves broadly lanceolate, acuminate or mucronate, thick; lamina 7–12.5 cm long, 1.5–3 cm wide, green, shining, concolorous; lateral veins just visible, at 20°–40°; intramarginal vein up to 2 mm from margin; petiole channelled, 10–20 mm long. Umbels 7–11-flowered; peduncle thick, terete or angular, 2–14 mm long; pedicels absent or to 4 mm long. Buds clavate, warty; operculum hemispherical, 2–4 mm long, 4–5 mm wide; hypanthium obconical, 3–4 mm long, 4–5 mm wide. Fruits hemispherical to subglobular, 6–11 mm long, 8–16 mm wide; disc broad, level or ascending; valves 4, level or exserted. *Brown Stringybark*. Fig. 56G–H.

Occurs from south-eastern S.A. including Kangaroo Is., through southern Vic. and just into south-eastern N.S.W. usually in pure stands on low hills and plains, in open forest and tall open forest. Regions: EYRE, RIVR, OTWY, HOWE. Map 118.

S.A.: Naracoorte, 10 Feb. 1961, *J.B.Cleland* (AD); Mengler Hill, E of Tanunda, *D.J.E.Whibley* 3816 (AD, NSW). Vic.: Mt William, S of Halls Gap, *G.M.Chippendale* 1306 (AD, FRI, MEL); Tidal R., Wilsons Promontory, 12 Jan. 1967, *L.A.S.Johnson* (NSW); 22.5 km N of Serviceton, 17 Sept. 1948, *J.H.Willis* (MEL).

Distinguished by the thick broadly lanceolate, oblique leaves, thick peduncle, pedicels very short or absent, and fruits with a broad, level or ascending disc. Buds warty but less so than in *E. alpina*. The wood is moderately durable, and has been used for fences, sleepers and in structural engineering.

116. *Eucalyptus alpina* Lindley in T.L.Mitchell, *Three Exped. Inter. Eastern Australia* 2: 175 (1838)

T: summit of Mt William, Vic., July 1836, *T.L.Mitchell* 243; holo: CGE.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 79 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 156 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 63 (1983).

Mallee to 2 m or tree to 10 m. Bark fibrous, grey on stems and smooth, grey-white above, or smooth throughout. Juvenile leaves suborbicular to broadly ovate, dark green, concolorous. Adult leaves broadly lanceolate to ovate, mucronate, thick; lamina 7.5–10 cm long, 2.5–3.8 cm wide, dark green, concolorous; lateral veins clearly visible, at 15°–30°; intramarginal vein up to 3 mm from margin; petiole thick, channelled, 10–20 mm long. Umbels 3–7-flowered; peduncle thick, flattened, 2–5 mm long; pedicels absent. Buds subglobose or ovoid, warty; operculum hemispherical, 4–5 mm long, 5–9 mm wide; hypanthium hemispherical, 6–8 mm long, 7–9 mm wide. Fruits hemispherical, warty, 12–16 mm long, 15–18 mm wide; disc broad, ascending; valves 4 or 5, exserted. *Grampians Gum*. Figs 24, 56 I–J.

Occurs in a restricted area in The Grampians, Vic., mostly in pure stands on higher parts of ranges. Region: OTWY. Map 119.

Vic.: The Grampians, *M.I.H.Brooker* 3800 (FRI, MEL); Mt Rosea, *D.E.Symon* 3501 (AD, CANB, NSW).

Distinguished from *E. baxteri* by the mallee habit and the larger, very warty buds and fruits.

117. *Eucalyptus deuaensis* Boland, Gilmour & Brophy, *Brunonia* 9: 105 (1986)

T: near Mongamulla Mtn, Deua Natl Park, N.S.W., 8 June 1984, *G.F.J. Moran* 51; holo: FRI; iso: AD, BRI, MEL, NSW, PERTH.

Illustrations: D.J.Boland, P.M.Gilmour & J.J.Brophy, *op. cit.* 106–107 (1986).

Mallee or small tree to 4 m. Bark smooth, grey to white throughout, shedding in recurving strips. Juvenile leaves opposite at first, becoming alternate, petiolate becoming sessile, oblong-ovate, discolorous. Adult leaves narrowly lanceolate or slightly falcate, apiculate, erect; lamina 7–10 cm long, 1.1–1.7 cm wide, dark green, prominently glandular, concolorous; lateral veins faint at 40°–50°; intramarginal vein indistinct; petiole more or less flattened, 3–8 mm long. Umbels 7-flowered; peduncle absent or to 2 mm long; pedicels absent. Buds fusiform or diamond-shaped, angular; operculum conical, 3–4 mm long, 4–5 mm wide; hypanthium obconical, 4–5 mm long, 4–5 mm wide. Fruits sessile, depressed hemispherical, 6–10 mm long, 10–14 mm wide; disc broad, ascending; valves 3–5, usually 4, exserted.

The only known population is on steep, crumbling cliffs ENE of Mongamulla Mtn, N.S.W. Region: HOWE. Map 563.

N.S.W.: Deua Natl Park, *P.M.Gilmour* (FRI); Deua Natl Park, *D.J.Boland* 2027 (FRI).

Distinguished by smooth bark, prominently glandular erect narrowly lanceolate or slightly falcate leaves, diamond-shaped buds and usually sessile buds and fruits. Differs from *E. alpina* especially in the smooth buds.

118. *Eucalyptus blaxlandii* Maiden & Cabbage, *J. & Proc. Roy. Soc. New South Wales* 52: 495 (1919)

T: Blackheath, N.S.W., Jan. 1905, *J.H.Maiden s.n.*; holo: NSW.

Illustrations: N.Hall, *Forest Tree Ser.* No. 10 (1970); S.Kelly *et al.*, *Eucalypts* 2: t. 156 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 64 (1983).

Tree to 35 m. Bark grey-brown. Juvenile leaves ovate, green, slightly hairy on lower surface, discolorous. Adult leaves broadly lanceolate, apiculate to acuminate; lamina 7–12 cm long, 1.5–2 cm wide, shining, green, concolorous; lateral veins clearly visible, at 30°–40°; intramarginal vein up to 2 mm from margin; petiole channelled, 5–12 mm long. Umbels 7–11-flowered; peduncle terete or angular, 7–14 mm long; pedicels absent. Buds clavate;

operculum hemispherical or rarely conical, 2–4 mm long, 3–5 mm wide; hypanthium obconical, 3–4 mm long, 3–5 mm wide. Fruits subglobular or hemispherical, 6–8 mm long, 7–12 mm wide; disc broad, convex, ascending; valves 4 or 5, exserted. *Blaxland's Stringybark*. Fig. 56K–L.

Occurs from near Nullo Mtn southwards to the Budawang Ra., N.S.W., on ridges and slopes, in dry to moist sclerophyll forest. Regions: NEPN, HOWE. Map 120.

N.S.W.: Mt Wilson, *M.I.H.Brooker 3027* (BRI, FRI, NSW); Coxs R., Oct. 1904, *J.H.Maiden* (MEL, NSW); Wingello, *D.McGillivray 933* (NSW).

Distinguished by the shining adult leaves, and crowded, sessile clavate buds and hemispherical operculum. Petiole very long in juvenile leaves.

119. *Eucalyptus camfieldii* Maiden, *J. & Proc. Roy. Soc. New South Wales* 54: 66 (1920)

T: Middle Harbour, Sydney, N.S.W., 25 May 1897, *J.H.Camfield s.n.*; holo: NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 94 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 160 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 65 (1983).

Mallee or tree to 9 m. Bark grey-brown. Juvenile leaves broadly ovate to suborbicular, cordate or almost so, green, minutely hairy, discolorous. Adult leaves broadly lanceolate, sometimes falcate, mucronate or apiculate; lamina 7.5–11 cm long, 2–3 cm wide, shining, green, concolorous; lateral veins just visible, at 25°–40°; intramarginal vein up to 2 mm from margin; petiole channelled, 10–15 mm long. Umbels 7–11-flowered or sometimes more; peduncle thick, terete or flattened, 5–10 mm long; pedicels absent. Buds ovoid, angular; operculum hemispherical to conical, 3–4 mm long and wide; hypanthium hemispherical, 3–4 mm long and wide. Fruits hemispherical or subglobular, 4–6 mm long, 6–9 mm wide; disc broad, convex, ascending; valves 3 or 4, level or exserted. *Camfield's Stringybark*. Fig. 56M–N.

Occurs from the northern to southern limits of Sydney, N.S.W. Grows on plateaus, ridges and slopes in shallow soils, often in small pure stands. Region: NEPN. Map 121.

N.S.W.: Berowra Ck, Hornsby, 21 Oct. 1918, *W.F.Blakely* (FRI, NSW); Mt Colah, *M.I.H.Brooker 2831* (BRI, FRI, MEL); Royal Natl Park, *N.Hall 44* (FRI, MEL, NSW).

Distinguished by the mallee or straggly tree habit, rounded often cordate juvenile leaves, and sessile, crowded buds and fruits. Petiole short in juvenile leaves. Buds and fruits smaller than those of *E. capitellata*.

120. *Eucalyptus capitellata* Smith, *Spec. Bot. New Holland* 1: 42 (1795)

T: Port Jackson, N.S.W., 1793, *J.White*; holo: LINN; iso: BM, G, K.

Illustrations: N.Hall, *Forest Tree Ser.* No. 11 (1970); S.Kelly *et al.*, *Eucalypts* 2: t. 158 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 66 (1983).

Tree to 20 m. Bark grey-brown. Juvenile leaves broadly lanceolate, undulate, green, discolorous. Adult leaves lanceolate to broadly lanceolate, falcate, mucronate to acuminate, thick; lamina 8–17 cm long, 1.9–3 cm wide, shining, green, concolorous; lateral veins clearly visible, at 30°–45°; intramarginal vein up to 3 mm from margin; petiole flattened or channelled, 10–20 mm long. Umbels 7–11-flowered or sometimes more; peduncle flattened or angular, 7–15 mm long; pedicels absent. Buds fusiform; operculum conical, 4–5 mm long and wide; hypanthium obconical, 4–6 mm long, 4–5 mm wide. Fruits hemispherical or subglobular, 5–8 mm long, 7–12 mm wide; disc broad, level or convex, often red; valves 3 or 4, ±level. *Brown Stringybark*. Fig. 56 O–P.

Occurs from Pokolbin State Forest southwards to Batemans Bay, N.S.W., usually in poor sandy soil, in open dry sclerophyll forest. Regions: NEPN, HOWE. Map 122.

N.S.W.: Pokolbin State Forest, *M.I.H.Brooker 4633* (AD, BRI, FRI, MEL, NSW); Hurstville, Sydney, *J.H.Camfield 340* (NSW); 3.9 km S of Wyee railway stn, *G.M.Chippendale 451 & R.D.Johnston* (BRI, FRI, MEL, NSW); Brisbane Waters, *W.D.Francis 3* (NSW).

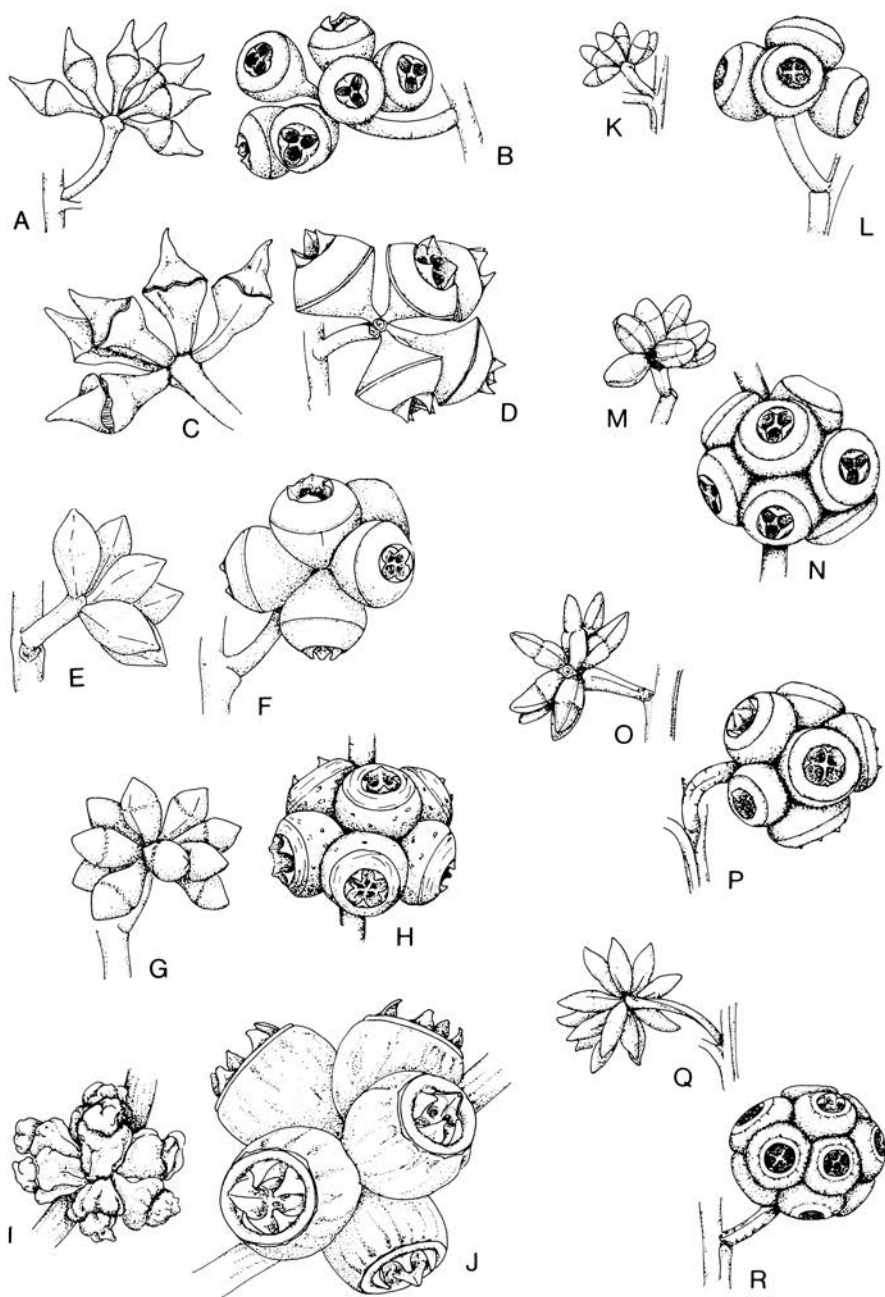


Figure 56. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. macrorhyncha* subsp. *macrorhyncha* (**A**, 1.6 km from Lake George towards Goulburn, N.S.W., C.Dunlop, FRI; **B**, I.Brooker 5185, FRI). **C–D**, *E. macrorhyncha* subsp. *cannonii* (**C**, cult., Botanic Gardens, Canberra, A.C.T., C.Dunlop, FRI; **D**, I.Brooker 4663, FRI). **E–F**, *E. youmanii* (**E**, J.Briggs 11, FRI; **F**, 9.6 km from Guyra, N.S.W., C.Smith, FRI). **G–H**, *E. baxteri* (**G**, D.Kraehenbuehl 2799, FRI; **H**, G.Chippendale 1307 & M.Brennan, FRI). **I–J**, *E. alpina* (J.Marginson 147, FRI). **K–L**, *E. blaxlandii* (J.Briggs 140, FRI). **M–N**, *E. camfieldii* (**M**, N.Hall H72/44, FRI; **N**, J.Briggs 143, FRI). **O–P**, *E. capitellata* (**O**, near road, between Pymble and Pittwater, N.S.W., collector unknown, FRI 2402, FRI; **P**, W. de Beuzeville 68, FRI). **Q–R**, *E. agglomerata* (M.Crisp 3478, FRI). Drawn by M.May.

Characterised by the thick shiny green adult leaves, sessile buds and fruits, and compressed, crowded, subglobular or hemispherical fruits. Buds and fruits larger than those of *E. camfieldii* and *E. agglomerata*.

121. *Eucalyptus agglomerata* Maiden, J. & Proc. Roy. Soc. New South Wales 55: 266 (1922)

T: Hill Top, N.S.W., Jan. 1896, *J.H.Maiden s.n.*; holo: NSW.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 157 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 67 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 283 (1984).

Tree to 40 m. Bark grey. Juvenile leaves ovate, green, slightly discoloured to concolorous. Adult leaves lanceolate to broadly lanceolate, acuminate; lamina 7.5–12 cm long, 1.4–3 cm wide, green or blue-green, concolorous; lateral veins clearly visible, at 25°–35°; intramarginal vein up to 3 mm from margin; petiole flattened or channelled, 13–18 mm long. Umbels 11–15-flowered or more; peduncle angular or flattened, 6–13 mm long; pedicels absent. Buds fusiform; operculum conical, 4–5 mm long, 3 mm wide; hypanthium obconical, 3 mm long and wide. Fruits hemispherical or subglobular, angular, 4–6 mm long, 5–10 mm wide; disc broad, flat or convex; valves 3 or 4, \pm level. *Blue-leaved Stringybark*. Fig. 56Q–R.

Occurs from the Cooperook State Forest, N.S.W., southwards to the Cann River area, Vic., on slopes in tablelands and coastal regions, in open forest. Regions: MCPH, NEPN, HOWE. Map 123.

N.S.W.: 11.3 km N of Nerriga, *M.I.H.Brooker 3287* (BRI, FRI, NSW); E of Endrick R., *L.A.S.Johnson 105* (NSW); 17.7 km WNW of Morisset, *R.Story 6691* (CANB, NSW). Vic.: between Genoa & Wangarabell, 27 Oct. 1971, *S.Rowley* (MEL).

Similar to *E. capitellata* but may be recognised by the usually blue-green foliage and slightly angular fruits. The wood has been used for fencing and in general construction. Petiole very long in juvenile leaves.

122. *Eucalyptus tindaliae* Blakely, Crit. Revis. *Eucalyptus* 8: 61 (1929)

T: Denman, N.S.W., Jan. 1909, *W.Heron s.n.*; n.v.; near Copmanhurst, N.S.W., 28 July 1922, *W.F.Blakely & D.W.C.Shireess*; syn: FRI, K, NSW; Orara Ck, 16 km S of Ramornie, N.S.W., 28 July 1922, *W.F.Blakely & D.W.C.Shireess*; syn: NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 137 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 152 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 68 (1983).

Tree to 27 m. Bark grey to grey-brown. Juvenile leaves ovate, undulate, crenulate, green, strongly discoloured. Adult leaves lanceolate, falcate, acuminate, thick; lamina 10–13 cm long, 1.8–3 cm wide, green, slightly shining, concolorous; lateral veins clearly visible, at 20°–35°; intramarginal vein up to 2 mm from margin; petiole channelled, 10–15 mm long. Umbels 7–11-flowered or more; peduncle angular or flattened, 6–13 mm long; pedicels absent. Buds ovoid to clavate; operculum conical, sometimes obtuse, 2–3 mm long and wide; hypanthium obconical, c. 2 mm long, 2–3 mm wide. Fruits hemispherical or subglobular, 5–7 mm long, 7–10 mm wide; disc broad, convex, red; valves 4 or 5, \pm level. *Ramornie Stringybark*, *Tindale's Stringybark*. Fig. 57A–B.

Occurs from the Richmond R. area southwards to near Eungai, N.S.W., in heavy clay soils on flats and low rises, in closed forest. Region: MCPH. Map 124.

N.S.W.: Wells Crossing, *M.I.H.Brooker 4723* (AD, BRI, FRI, MEL, NSW); Barcoongere State Forest, 6 June 1957, *L.A.S.Johnson* (BM, NSW); Ewingar State Forest, 23 Feb. 1954, *R.J.Turner* (NSW).

Has smooth, sessile ovoid to clavate buds, and sessile, hemispherical or subglobular fruits with a broad, red disc. The wood is moderately durable and has been used in fencing and for roof shingles.

123. *Eucalyptus eugenioides* Sieber ex Sprengel, *Syst. Veg.* 42: 193 (1827)

T: N.S.W., 1823, *F.W.Sieber* 479; holotype: G; isotypes: BM, F, K, MEL, NSW, W.

E. acervula Sieber ex DC., *Prodr.* 3: 217 (1828). T: N.S.W., 1823, *F.W.Sieber* 469; holotype: G; isotypes: BM, F, G, NSW.

E. laevopinea var. *minor* R.Baker, *Proc. Linn. Soc. New South Wales* 23: 416 (1898). T: Barbers Creek, N.S.W., Feb. 1899, *H.J.Rumsey*; n.v.

E. wilkinsoniana R.Baker, *Proc. Linn. Soc. New South Wales* 25: 678 (1900). T: Barbers Creek, N.S.W., Feb. 1899, *H.J. Rumsey*; lectotype: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 8: 63 (1929).

E. wilkinsoniana var. *crassifructa* Blakely, *Key Eucalypts* 179 (1934). T: Gowan Brae, near Parramatta, N.S.W., Aug. 1928, *W.F.Blakely s.n.*; syn: NSW; Ingleburn, N.S.W., collector unknown; n.v.; Marulan, N.S.W., Dec. 1922, *P.Murphy s.n.*; syn: NSW.

E. wiburdii Blakely, *Key Eucalypts* 177 (1934). T: Jenolan Caves, N.S.W., Sept. 1899 & Sept. 1900, *W.F.Blakely s.n.*; syn: NSW; Jenolan Caves, N.S.W., Dec. 1928 & Oct. 1930, *J.C.Wiburd s.n.*; syn: NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 93 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 153 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 69 (1983).

Tree to 30 m. Bark grey to brown. Juvenile leaves narrowly ovate, dark green, discolorous. Adult leaves lanceolate, acuminate; lamina 10–14 cm long, 2.5–3.3 cm wide, green, concolorous or slightly discolorous; lateral veins faint, at 20°–30°; intramarginal vein up to 3 mm from margin; petiole channelled, 10–17 mm long. Umbels 7–11-flowered, sometimes more; peduncle angular or flattened, 6–16 mm long; pedicels 1–5 mm long, sometimes absent. Buds fusiform; operculum conical, 2–4 mm long, 3–4 mm wide; hypanthium obconical, 2–3 mm long, 3–4 mm wide. Fruits hemispherical, globular or subglobular, 4–8 mm long, 5–9 mm wide; disc broad, just descending, level, convex, or slightly ascending; valves 3 or 4, included, level or exserted. *Thin-leaved Stringybark*, *White Stringybark*. Fig. 57C–D.

Occurs from south-eastern Qld through the tableland and coastal areas of N.S.W. almost to the Vic. border. Grows on hills or undulating country, in open forest. Regions: DWSN, MCPH, NEPN, HOWE. Map 125.

Qld: Mt Kiangarow, *L.S.Smith* 6259 (BRI); 2.7 km E of Cunningham Gap, *L.S.Smith* 11299 (BRI, CANB). N.S.W.: Mt Harriet, Ramornie, July 1922, *W.F.Blakely* (NSW); 3.2 km W of Copeland State Forest, *M.I.H.Brooker* 4643 (AD, FRI, MEL, NSW); 3.2 km NNW of Araluen, 30 Oct. 1960, *L.A.S.Johnson* (NSW).

Distinguished by the narrow, thin leaves, and shortly pedicellate buds and fruits. Juvenile leaves narrower than in related species.

124. *Eucalyptus nigra* R.Baker, *Proc. Linn. Soc. New South Wales* 25: 689 (1901)

T: Richmond River district, N.S.W., Aug. 1900, *W.Bäuerlen s.n.*; syn: MEL, NSW; Cooks R., N.S.W., *H.G.Smith*; syn: n.v.

E. phaeotricha Blakely & McKie in *W.F.Blakely, Key Eucalypts* 182 (1934). T: Beerwah, Qld, July 1930, *E.N.McKie s.n.*; holotype: NSW.

Illustrations: S.Kelly *et al.*, *Eucalypts* 2: t. 149, t. 151 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 70 (1983); D.J. Boland *et al.*, *Forest Trees Australia* 4th edn, 287 (1984).

Tree to 35 m. Bark grey-brown. Juvenile leaves ovate, undulate, green, the lower slightly hairy, the upper glabrous, discolorous. Adult leaves lanceolate to broadly lanceolate, acuminate, thin; lamina 7–13 cm long, 1.3–3 cm wide, green, slightly discolorous; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole flattened or channelled, 8–15 mm long. Umbels 7–11-flowered or more; peduncle flattened, 3–13 mm long; pedicels absent or to 2 mm long. Buds fusiform or clavate, minutely glandular; operculum conical or hemispherical and apiculate, 2–3 mm long, 3–4 mm wide; hypanthium obconical, 2–3 mm long, 3–4 mm wide. Fruits hemispherical or subglobular, 4–8 mm long, 6–11 mm wide; disc broad, convex, ascending; valves 3 or 4, level. *Queensland White Stringybark*. Fig. 57E–F.

Occurs in the Atherton area, on Hinchinbrook Is., and on the Blackdown Tableland, Qld, extending southwards to north coastal N.S.W. Grows on the slopes of tablelands, in open forest. Regions: CYRK, DWSN, MCPH. Map 126.

Qld: 0.2 km S of Beerwah, *R.D.Johnston & G.M.Chippendale 526* (BRI, FRI, NSW, PERTH); 2.5 km NW of Rainbow Falls, Expedition Ra., *M.D.Crisp 2945* (CBG, FRI); Herberton Ra., *B.Hyland 5141* (BRI, FRI, QRS). N.S.W.: Tooloom Falls, 6 km SSE of Urbenville, *R.Coveny 5150* (AD, BRI, FRI, MEL, NSW); Upper Woolgoolga Ck, *I.R.Telford 1219* (CBG, NSW).

Similar to *E. eugenioides*, which also has thin leaves, but differs in the more crowded buds and fruits.

125. *Eucalyptus caliginosa* Blakely & McKie in W.F.Blakely, *Key Eucalypts* 181 (1934)

T: Rosehill, 10.5 km SW of Guyra, N.S.W., Oct. 1929, *E.N.McKie, T.Youman & W.F.Blakely s.n.*; n.v. A number of specimens in NSW, none with all three collectors on one label.

E. cyathiformis Blakely & McKie, *op. cit.* 179. T: Booralong, N.S.W., 28 Oct. 1929, *W.F.Blakely, E.N.McKie & T.Youman s.n.*; holotype: NSW.

Illustrations: N.Hall, *Forest Tree Ser.* No. 23 (1971); S.Kelly *et al.*, *Eucalypts* 2: t. 150 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 71 (1983).

Tree to 27 m. Bark grey. Juvenile leaves ovate, undulate, green, discolorous. Adult leaves broadly lanceolate, falcate, acuminate, thick; lamina 10–15 cm long, 2–3 cm wide, green, slightly shining, concolorous; lateral veins just visible, at 15°–30°; intramarginal vein up to 2 mm from margin; petiole flattened or channelled, 7–12 mm long. Umbels 7–11-flowered or sometimes more; peduncle flattened, 7–15 mm long; pedicels 1–4 mm long. Buds fusiform or ovoid; operculum conical, 4–5 mm long and wide; hypanthium obconical, 2–3 mm long, 4–5 mm wide. Fruits hemispherical to subglobular, 6–9 mm long, 4–7 mm wide; disc broad, level or convex; valves 3 or 4, exserted. *Broad-leaved Stringybark*. Fig. 57G–H.

Occurs from near Stanthorpe, Qld, to the New England Tableland, N.S.W., on slopes and ridges and sometimes in valleys, in mixed forest. Region: MCPH. Map 127.

Qld: near Applethorpe, *L.Pedley 7420* (BRI); Silverwood, *C.T.White 1740* (BRI). N.S.W.: 14.8 km NE of Tenterfield, *R.D.Johnston & G.M.Chippendale 639* (BRI, FRI, NSW); Torrington, 5 Nov. 1951, *L.A.S.Johnson* (NSW).

Differs from *E. globoidea* and *E. cameronii* especially in having exserted valves on the fruit which are more evidently pedicellate.

126. *Eucalyptus globoidea* Blakely, *J. & Proc. Roy. Soc. New South Wales* 61: 157 (1927)

T: Berrima, N.S.W., Sept. 1901, *J.H.Maiden & J.L.Boorman s.n.*; holotype: NSW.

E. yangoura Blakely, *Key Eucalypts* 180 (1934). T: Macalister R., Vic., *A.W.Howitt*; syn: NSW; source of Wild Horse Ck, Vic., *A.W.Howitt*; syn: NSW; Toongabbie, Vic., *A.W.Howitt*; syn: NSW; Wangarabelle, Vic., Nov. 1914, *H.Hopkins*; syn: NSW; Bruthen, Vic., 1905, *A.W.Howitt*; syn: NSW; Bruthen, Vic., 15 Jan. 1913, *R.H.Cambage 3673*; syn: NSW; Mt. Lookout, Bairnsdale, Vic., 12 May 1908, *H.Hopkins*; syn: NSW; Bairnsdale, Vic., 1905, *A.W.Howitt*; syn: NSW; Metung, Vic., July 1908, *J.H.Maiden*; syn: NSW; Agnes Bridge, Vic., *A.W.Howitt*; syn: NSW; Story Ck, Vic., *no collector given*; syn: MEL; Nicholson R., Vic.; syn: n.v.; Walhalla, Vic.; syn: n.v.; Ringwood, Vic.; syn: n.v.; Wyndham, N.S.W., Feb. 1903, *A.W.Howitt*; syn: NSW; Cobargo, N.S.W.; syn: n.v.; Eden, N.S.W.; syn: n.v., but several specimens in NSW labelled 'Twofold Bay'.

E. globoidea var. *subsphaerica* Blakely, *Key Eucalypts* 189 (1934). T: Lane Cove, N.S.W., 6 July 1889, *J.H.Maiden s.n.*; syn: NSW; Wyee, N.S.W., Oct. 1920, *J.L.Boorman s.n.*; syn: NSW.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 175 (1970); S.Kelly *et al.*, *Eucalypts* 2: t. 162 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 72 (1983).

Tree to 30 m. Bark grey. Juvenile leaves ovate, undulate, green, discolorous. Adult leaves lanceolate to broadly lanceolate, acuminate; lamina 7.5–12.5 cm long, 1.2–2.5 cm wide, green, shining, concolorous; lateral veins just visible, at 20°–40°; intramarginal vein up to 2 mm from margin; petiole channelled, 7–17 mm long. Umbels 7–11-flowered or sometimes more; peduncle angular or flattened, 4–12 mm long; pedicels absent or to 2 mm long. Buds

fusiform; operculum conical, 3–4 mm long and wide; hypanthium obconical, 2–3 mm long, 3–4 mm wide. Fruits hemispherical or subglobular, 4–7 mm long, 6–8 mm wide; disc broad, level or convex; valves 4, \pm level. *White Stringybark*. Fig. 57 I–J.

Occurs from near Coffs Harbour, N.S.W., southwards along coastal areas to near Melbourne, Vic., on hills and mountain slopes, often in sandy soils, in open forest. Regions: MCPH, NEPN, HOWE. Map 128.

N.S.W.: 10.5 km E of Bulahdelah, *R.D.Johnston & G.M.Chippendale* 475 (FRI, NSW); Cheltenham, Sydney, 10 Sept. 1950, *L.A.S.Johnson* (NSW); 12.9 km SW of Dungog, *R.Story* 7360 (CANB, NSW). Vic.: Providence Ponds, 20.9 km ENE of Stratford, *E.F.Constable* 5323 (FRI, MEL, NSW); Dargo R. watershed, 26 Feb. 1974, *J.H.Willis* (MEL).

Differs from *E. conglomerata* especially in the greener foliage, from *E. cameronii* in the broad, level disc of the fruit and from *E. eugenioides* in the \pm sessile buds and fruits. Juvenile leaves broader than in related species.

127. *Eucalyptus cameronii* Blakely & McKie in W.F.Blakely, *Key Eucalypts* 180 (1934)

T: Diehard State Forest, c. 25 miles [c. 40 km] E of Glen Innes, N.S.W., 28 June 1932, *E.N.McKie, A.P.Cameron & R.H.Luke s.n.*; holo: NSW; iso: BRI, FRI, K.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 136 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 148 (1983); M.I.H.Brooker & D.A.Kleining, *Field Guide to Eucalypts* 1: 73 (1983).

Tree to 40 m. Bark grey or grey-brown. Juvenile leaves ovate, undulate, green, discolorous. Adult leaves lanceolate to broadly lanceolate, acuminate; lamina 6–10 cm long, 1.7–2.5 cm wide, green, shining, concolorous or slightly discolorous; lateral veins faint, at 25°–40°; intramarginal vein up to 2 mm from margin; petiole channelled, 8–12 mm long. Umbels 7–many-flowered; peduncle angular or flattened, 5–10 mm long; pedicels absent or very short. Buds fusiform; operculum conical, c. 3 mm long, 2 mm wide; hypanthium obconical, c. 2 mm long and wide. Fruits hemispherical or subglobular, sessile, crowded, 4–5 mm long, 5–7 mm wide; disc narrow, descending; valves 4, included. *Diehard Stringybark*. Fig. 57K–L.

Occurs on the eastern New England Tableland, N.S.W., on hills and slopes, in open forest and tall open forest. Region: MCPH. Map 129.

N.S.W.: 14.7 km from Tenterfield towards Boonoo Boonoo, *M.I.H.Brooker* 3954 (BRI, FRI, NSW); 16 km SE of Yarrowitch, 25 May 1957, *L.A.S.Johnson* (NSW); Gibraltar Ra., *L.A.S.Johnson* 2423 (NSW).

Differs from *E. globoidea* mainly in the smaller buds and fruits and in the descending narrow disc of the fruit.

128. *Eucalyptus conglomerata* Maiden & Blakely, *Crit. Revis. Eucalyptus* 8: 5 (1929)

T: Beerwah, Qld, 8 Sept. 1919, *C.T.White* 24; holo: NSW; iso: BRI, CANB, K, MEL.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 159 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 164 (1983).

Tree or shrub to 12 m. Bark grey to grey-brown. Juvenile leaves ovate-lanceolate, thick, green, almost concolorous. Adult leaves lanceolate, mucronate, thick; lamina 6–10 cm long, 1.5–2.5 cm wide, dull, green, concolorous; lateral veins faint, at 20°–35°; intramarginal vein up to 2 mm from margin; petiole channelled, 10–17 mm long. Umbels 7–many-flowered; peduncle angular or flattened, 5–10 mm long; pedicels absent. Buds fusiform; operculum conical, 2–3 mm long, 3–4 mm wide; hypanthium obconical, 3–4 mm long and wide. Fruits globular or subglobular, 4–6 mm long, 5–8 mm wide; disc broad, descending; valves 3 or 4, included. *Swamp Stringybark*. Fig. 57M–N.

Occurs in very restricted area near Beerwah, Qld, on flat or gently undulating country, in shrubby heathland. Region: MCPH. Map 130.

Qld: Beerwah, *S.T.Blake* 18764 (BRI, CANB); 1 km N of Beerwah, *L.A.S.Johnson* 7095 (BRI, FRI, NSW).

Leaves duller green than *E. cameronii*, buds slightly larger, and disc of fruit broader.

129. *Eucalyptus oblonga* DC., *Prodr.* 3: 217 (1828)

T: New Holland, 1823, *F.W.Sieber* 583; holo: G; iso: BM, G, NSW.

E. deformis Blakely, *J. & Proc. Roy. Soc. New South Wales* 61: 152 (1927). T: 0.8 km S of Kariong Trig., N.S.W., 25 Apr. 1927, *D.W.C.Shiress & W.F.Blakely s.n.*; holo: NSW; iso: FRI, K.

E. sparsifolia Blakely, *Key Eucalypts* 190 (1934) as *sparsiflora*. T: Glenore to Canoe Grounds, N.S.W., 14 Oct. 1927, *W.F.Blakely s.n.*; syn: NSW; Maroota, N.S.W., Sept. 1927, *W.F.Blakely s.n.*; syn: NSW; Castlereagh State Forest, Windsor, N.S.W., Jan 1932, *W.F.Blakely s.n.*; syn: NSW.

E. oblonga var. *rugulosa* Blakely, *Key Eucalypts* 191 (1934). T: Spring Gully Ck, Hornsby, N.S.W., Oct. 1930, *W.F.Blakely s.n.*; holo: NSW.

Illustrations: N.Hall, *Forest Tree Ser.* No. 30 (1972); S.Kelly *et al.*, *Eucalypts* 2: t. 165 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 74 (1983).

Tree to 25 m. Bark grey. Juvenile leaves ovate, undulate, green, discolorous. Adult leaves narrowly lanceolate to lanceolate, acuminate; lamina 7–12 cm long, 1–2.5 cm wide, green, shining, concolorous; lateral veins faint, at 40°–45°; intramarginal vein up to 1 mm from margin; petiole channelled, 10–15 mm long. Umbels 7–15-flowered; peduncle angular or flattened, 10–15 mm long; pedicels absent or very short. Buds fusiform; operculum conical, 2–4 mm long, 2–3 mm wide; hypanthium obconical, 2–3 mm long and wide. Fruits globular, rarely hemispherical, 5–8 mm long, 5–7 mm wide; disc narrow, level or convex; valves 4, \pm level. *Narrow-leaved Stringybark*. Fig. 57 O–P.

Occurs from near Coonabarabran to the Blue Mts and central coast, N.S.W., on slopes, plateaus and ridges, in open dry sclerophyll forest. Regions: MCPH, NEPN, DARL, HOWE. Map 131.

N.S.W.: 9.8 km S of Rylstone, *R.D.Johnston & G.M.Chippendale* 684 (FRI, MEL, NSW); Roberts Ck, 29 Oct. 1954, *L.A.S.Johnson* (BRI, NSW); 0.8 km W of Murrurundi, *R.Story* 7468 (BRI, CANB, NSW).

Fruits more globular, with smaller orifice than in closely related species; also distinguished by the narrow leaves.

130. *Eucalyptus ligustrina* DC., *Prodr.* 3: 219 (1828)

T: New Holland, 1823, *F.W.Sieber* 617; holo: G; iso: NSW.

Illustrations: N.Hall, *Forest Tree Ser.* No. 29 (1972); S.Kelly *et al.*, *Eucalypts* 2: t. 159 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 75 (1983).

Small tree, mallee or shrub to 8 m. Bark grey. Juvenile leaves ovate, undulate, green, discolorous. Adult leaves lanceolate to ovate, apiculate, thick; lamina 4–7.5 cm long, 0.7–1.5 cm wide, green, slightly discolorous; lateral veins very faint, at 15°–20°; intramarginal vein up to 1 mm from margin; petiole channelled, 5–10 mm long. Umbels 7–15-flowered; peduncle thick, flattened, 4–6 mm long; pedicels absent. Buds ovoid to clavate; operculum hemispherical or conical, c. 2 mm long, 3 mm wide; hypanthium obconical, c. 3 mm long and wide. Fruits hemispherical or subglobular, 4–5 mm long and wide; disc narrow, level, convex or descending; valves 3 or 4, included. *Privet-leaved Stringybark*. Fig. 57Q–R.

Occurs in several disjunct areas of N.S.W., in the Gibraltar Range area, the Blue Mts, and in the Nowra to Jamberoo Mtn area. Grows on ridge tops and tablelands, usually in shrubby heathland. Regions: MCPH, NEPN, HOWE. Map 132.

N.S.W.: Kings Tableland, *M.I.H.Brooker* 3021 (FRI, NSW); Jamberoo Mtn, 4 June 1962, *C.Burgess* (CBG); Gibraltar Ra., 8 June 1961, *L.A.S.Johnson* (NSW).

Distinguished by shrubby habit and small juvenile and adult leaves, short peduncle and crowded fruits.

131. *Eucalyptus mckieana* Blakely, *Proc. Linn. Soc. New South Wales* 55: 594 (1930)

T: Moredun Ck, near Tingha, N.S.W., 30 Oct. 1929, *E.N.McKie, T.Youman & W.F.Blakely*; holo: NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 139 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 163 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 76 (1983).

Tree to 27 m. Bark grey. Juvenile leaves lanceolate to narrowly lanceolate, green, undulate, discolorous. Adult leaves lanceolate, acuminate, thick; lamina 6–9 cm long, 1–2 cm wide, green, shining, concolorous; lateral veins just visible, at 20°–35°; intramarginal vein up to 1 mm from margin; petiole channelled, 7–10 mm long. Umbels usually 7–11-flowered; peduncle angular or flattened, 7–12 mm long; pedicels 1–2 mm long. Buds ovoid to fusiform; operculum conical, c. 3 mm long and wide; hypanthium obconical, c. 3 mm long and wide. Fruits hemispherical or subglobular, 5–7 mm long and wide; disc moderately wide, level or convex; valves 3 or 4, \pm level. *McKie's Stringybark*. Fig. 57S–T.

Occurs from Tenterfield to near Tamworth, N.S.W., on low hills and gentle slopes, in dry sclerophyll forest. Region: MCPH. Map 133.

N.S.W.: 9.3 km NW of Tingha, *R.D. Johnston & G.M. Chippendale* 651 (FRI, MEL, NSW); 11–13 km W of Wandsworth, 24 May 1957, *L.A.S. Johnson* (NSW); near Longford, *L.A.S. Johnson* 2375 (NSW).

Distinguished especially by the ascending disc of the fruits, the clearly pedicellate buds and fruits and the concolorous leaves. Juvenile leaves narrower than in related species.

Ser. 28 Olsenianae

Eucalyptus ser. **Olsenianae** Chippendale, *Fl. Australia* 19: 502 (1988).

Type: *E. olsenii* L. Johnson & Blaxell

Trees. Bark smooth, cream or white, with a short stocking of rough, flaky or fibrous bark at base of trunk. Juvenile leaves opposite becoming alternate, sessile becoming petiolate, broadly lanceolate or ovate-lanceolate, stellate-hairy, green, discolorous. Adult leaves alternate, petiolate, oblique, shining, green, concolorous. Conflorescences axillary, simple, 7-flowered umbels. Buds clavate. Fruits sessile, globular or barrel-shaped; disc broad, descending; valves 4 or 5, deeply included. Seeds D-shaped, brown.

A series of 1 species on the southern tablelands escarpment of N.S.W., characterised by the stellate-hairy juvenile leaves, short stocking of flaky-fibrous bark, concolorous leaves and sessile fruits.

P.Y. Ladiges & C.J. Humphries, Relationships in the Stringybarks, *Eucalyptus* L'Hérit. informal subgenus *Monocalyptus* Series *Capitellatae* and *Olsenianae*: phylogenetic hypotheses, biogeography and classification, *Austral. J. Bot.* 34: 603–632 (1986).

132. *Eucalyptus olsenii* L. Johnson & Blaxell, *Telopea* 1: 395 (1980)

T: Dampier trig., E of Big Badja Hill, N.S.W., 13 June 1972, *H. Fairlie-Cuninghame s.n.*; holo: NSW; iso: FRI, K, NSW.

Illustrations: L.A.S. Johnson & D.F. Blaxell, *loc. cit.* t. XIV; S. Kelly *et al.*, *Eucalypts* 1: t. 275 (1983); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 80 (1983).

Tree to 12 m. Adult leaves lanceolate, often falcate; lamina 8–12 cm long, 1.5–2 cm wide; lateral veins faint or just visible, at c. 35°; intramarginal vein up to 1 mm from margin; petiole channelled, 8–14 mm long. Peduncle terete, angular or flattened, thick, often recurved, 5–8 mm long; pedicels absent or up to 2 mm long. Operculum conical, 4–5 mm long, 6–7 mm wide; hypanthium obconical, 2-ribbed, 5–6 mm long, 6–7 mm wide. Fruits 15–20 mm long, 14–18 mm wide. *Woila Gum*. Fig. 58A–B.

Occurs in a very restricted area west of Moruya, N.S.W., on high ridges and slopes, in pure stands. Region: HOWE. Map 134.

N.S.W.: Mother Woila, Razorback approach, *I. Olsen* 2048 (CANB, FRI, NSW); Mother Woila Peak, *R. Story* 8198 (CANB, NSW).

Distinguished by basal rough bark, otherwise smooth trunk and branches, 7-flowered umbels, prominently ridged buds and fruits, and restricted distribution.

Ser. 29 Pseudostringybarks

Eucalyptus ser. **Pseudostringybarks** Blakely, *Key Eucalypts* 41, 173 (1934).

Type: *E. pilularis* Smith, lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 503 (1988).

Trees. Bark rough, fibrous on most of trunk and sometimes extending onto larger branches, then smooth above. Juvenile leaves opposite, sessile, broadly lanceolate to lanceolate, discolorous, green above, often purple below, glabrous. Adult leaves alternate, petiolate, green, concolorous. Conflourescences simple, axillary, 7–15-flowered umbels. Buds fusiform or clavate. Fruits hemispherical, subglobular or pyriform; disc narrow to wide, ascending, level or descending; valves 4, at rim level or included. Seeds pyramidal or D-shaped, red-brown.

A series of 2 species in south-eastern Qld and eastern coastal areas of N.S.W., characterised by opposite juvenile leaves, the fibrous bark on most of the trunk, the concolorous leaves and the large fruits.

133. Eucalyptus pilularis Smith, *Trans. Linn. Soc. London* 3: 284 (1797)

T: Port Jackson, N.S.W., 1794, *J. White s.n.*; holo: LINN; iso: BM, NSW.

E. persicifolia Lodd., *Bot. Cab.* 6, t. 501 (1821). T: cultivated in England; *n.v.*

E. incrassata Sieber ex DC., *Prodr.* 3: 217 (1828) *nom. illeg. non* Labill. (1806). T: New Holland, *F.W.Sieber* 477; holo: G; iso: BM, F, K, MEL, NSW.

E. semicorticata F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 86 (1859). T: Brisbane River, Qld, July 1855, *F.Mueller*; holo: MEL; iso: K.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 155 (1970); S.Kelly *et al.*, *Eucalypts* 1: t. 149 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 77 (1983).

Tree to 70 m. Bark fibrous, grey-brown on most of trunk, then smooth, white or yellow-grey above, often with insect 'scribbles'. Adult leaves lanceolate; lamina 9–16 cm long, 1.6–3 cm wide; lateral veins clearly visible, at 30°–45°; intramarginal vein up to 2 mm from margin; petiole flattened or channelled, 10–20 mm long. Umbels 7–15-flowered; peduncle flattened, 10–17 mm long; pedicels angular, 3–6 mm long. Operculum conical or rostrate, 4–5 mm long, 3–5 mm wide; hypanthium obconical, 3–4 mm long, 3–5 mm wide. Fruits hemispherical or subglobular, 6–11 mm long, 7–11 mm wide. *Blackbutt*. Fig. 57U–V.

Occurs from near Bundaberg, Qld., including coastal islands, southwards to about Bega, N.S.W., on gentle slopes, mainly in loam or sandy loam in tall open forest. Regions: DWSN, MCPH, NEPN, HOWE. Map 135.

Qld: 40 km E of Gympie, *S.L.Everist* 7712 (BRI); 5 km ESE of Crows Nest, *L.S.Smith* 14818 (BRI). N.S.W.: 11.3 km N of Moruya, *M.I.H.Brooker* 3304 (BRI, FRI, MEL, NSW); 6.6 km N of Nambucca Heads, *G.M.Chippendale* 1057 (BRI, FRI, MEL, NSW); Gladesville, May 1886, *H.Deane* (NSW).

Distinguished by fibrous bark on most of the trunk of tall trees, the long flattened peduncles, and the hemispherical or subglobular, pedicellate fruits. One of the principal hardwoods of Australia, being hard, strong, durable, and used for general building, flooring, poles, pulp and railway sleepers. Rarely this eucalypt yields useful nectar for honey production, though the honey is not first grade.

134. Eucalyptus pyrocarpa L.Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 454 (1973)

E. pilularis var. *pyriformis* Maiden, *J. & Proc. Roy. Soc. New South Wales* 47: 94 (1913). T: Bucca Ck near Coff's Harbour, N.S.W., June 1911, *J.L.Boorman* 3; lecto: NSW, *fide* L.A.S.Johnson & D.F.Blaxell, *loc. cit.*; isolecto: BM, FRI, K, MEL; several syns, same locality, date and collector; NSW.

Illustrations: D.J.Boland & M.I.H.Brooker, *Forest Tree Ser.* No. 196 (1977); S.Kelly *et al.*, *Eucalypts* 2: t. 144 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 2: 78 (1983).

Tree to 30 m. Bark fibrous, grey or grey-brown on trunk, often extending to larger branches, smooth and white above. Adult leaves lanceolate, acuminate; lamina 12–20 cm long, 1.6–3 cm wide; lateral veins faint, at 20°–45°; intramarginal vein up to 2 mm from margin; petiole

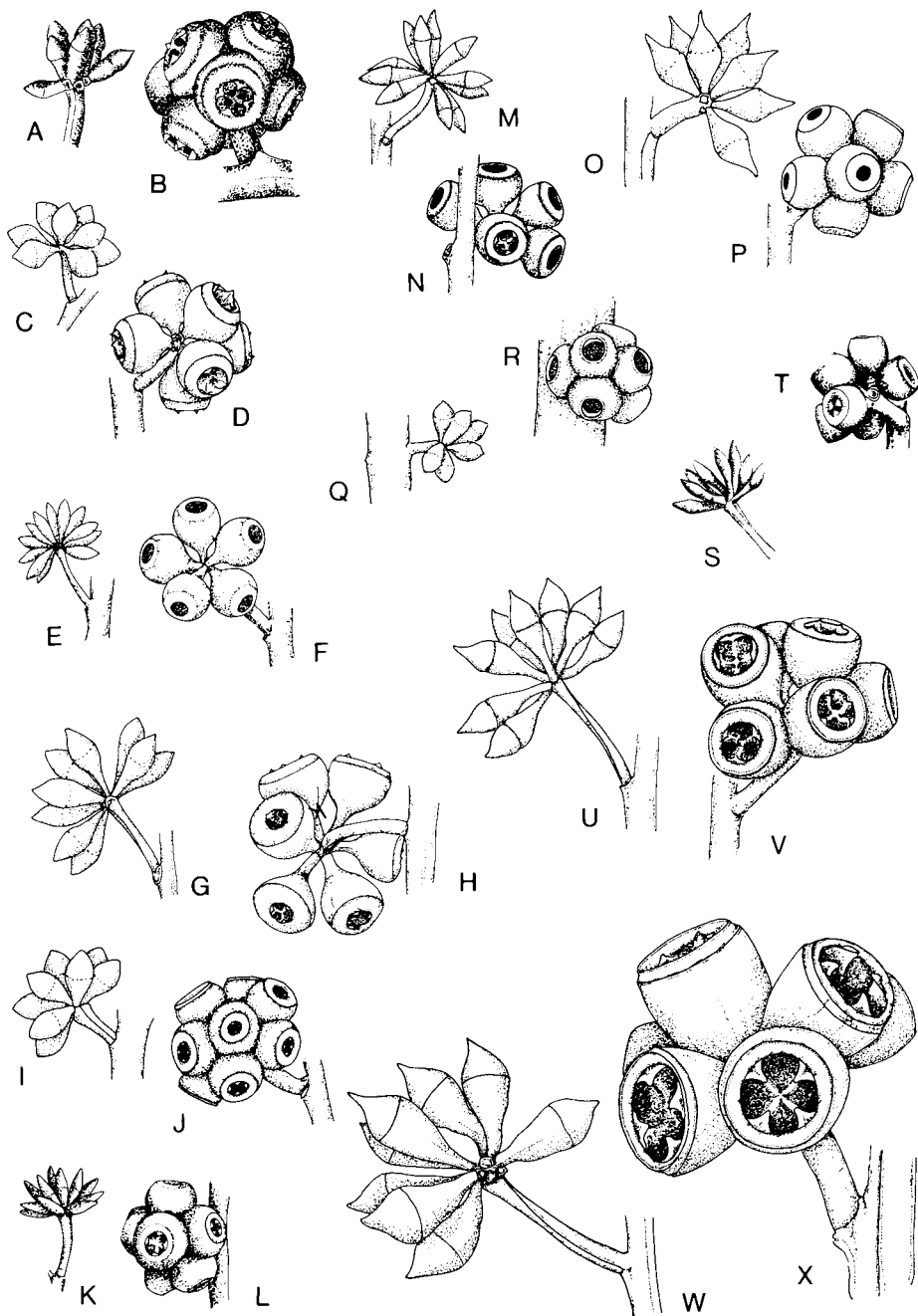


Figure 57. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. tindaliae* (Halfway Ck, N.S.W., W. de Beuzeville, FRI). **C–D**, *E. eugenioides* (**C**, I.Brooker 4939, FRI; **D**, I.Brooker 5713, FRI). **E–F**, *E. nigra* (**E**, I.Brooker 6581, FRI; **F**, I.Brooker 6586, FRI). **G–H**, *E. caliginosa* (I.Brooker 3906, FRI). **I–J**, *E. globoidea* (**I**, I.Brooker 4612, FRI; **J**, D.Boland G274/112, FRI). **K–L**, *E. cameronii* (Ingalba State Forest, N.S.W., R.Turner, NSW). **M–N**, *E. conglomerata* (J.Cole 29, FRI). **O–P**, *E. oblonga* (**O**, G.Chippendale 1016, FRI; **P**, I.Brooker 2832, FRI). **Q–R**, *E. ligustrina* (I.Brooker 3018, FRI). **S–T**, *E. mckieana* (Limestone Ck, Guyra district, N.S.W., W.Blakely, *et al.*, NSW 58837, NSW). **U–V**, *E. pilularis* (**U**, G.Chippendale 1033, FRI; **V**, G.Chippendale 875, FRI). **W–X**, *E. pyrocarpa* (**W**, I.Brooker 4720, FRI; **X**, D.Kleinig 152, FRI). **K, L, S, T** drawn by C.Stahl. Others drawn by M.May.

flattened, 15–20 mm long. Umbels 7–11-flowered; peduncle flattened, 10–25 mm long; pedicels quadrangular, 2–7 mm long. Operculum conical or rostrate, 6–7 mm long, c. 6 mm wide; hypanthium obconical, often glaucous, 6–8 mm long, c. 6 mm wide. Fruits pyriform or hemispherical, often glaucous, 8–15 mm long, 7–17 mm wide. *Large-fruited Blackbutt*. Fig. 57W–X.

Occurs in a small area from S of Maclean southwards to the Broken Bago State Forest, N.S.W. Grows from near sea level to the coastal ranges, in open forest and tall open forest. Region: MCPH. Map 136.

N.S.W.: 4.9 km N of Coramba, *G.M.Chippendale* 1059 (AD, BRI, FRI, MEL, NSW); 6.4 km E of Coramba, *R.Coveny* 4260 (AD, BRI, FRI, MEL, NSW); 4 km NNW of Brooms Head, *L.A.S.Johnson* 7532 (BRI, FRI, NSW).

Buds and fruits usually larger and with longer pedicels than in *E. pilularis*.

Ser. 30 *Regnantes*

Eucalyptus* ser. *Regnantes Chippendale, *Fl. Australia* 19: 504 (1988).

Type: *E. regnans* F.Muell.

Tall trees. Bark rough, persistent, fibrous, brown at least on lower half of trunk. Juvenile leaves alternate, petiolate, ovate to broadly lanceolate, oblique, green, discolorous. Adult leaves alternate, petiolate, acuminate, falcate, often oblique, green, concolorous; lateral veins conspicuous, at 15°–30°; intramarginal vein up to 4 mm from margin. Conflorescences axillary, simple; umbels paired, 9–15-flowered. Buds clavate. Fruits obconical to pyriform; disc broad, level or ascending; valves 3, at rim level or slightly exserted. Seeds ±pyramidal, brown.

A series of 2 species in N.S.W., Vic. and Tas. The paired conflorescences are diagnostic.

135. *Eucalyptus regnans* F.Muell., *Ann. Rep. Victorian Acclim. Soc.* 20, in obs. (1870–71)

T: Dandenong, Vic., Mar. 1867, *D.Boyle*; lecto: MEL, *fide* J.H.Willis, *Muelleria* 1: 167–168 (1967).

E. amygdalina var. *regnans* F.Muell., *Gard. Chron.* 491 (1877). T: Dandenong, Vic., collector unknown; n.v.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 183 (1970); S.Kelly *et al.*, *Eucalypts* 1: t. 160 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 83 (1983).

Tree usually to 75 m, recorded to 100 m. Bark rough up to 15 m on trunk, smooth, white or grey-green above, often shedding in strips. Adult leaves lanceolate or broadly lanceolate; lamina 9–14 cm long, 1.6–2.7 cm wide; petiole channelled, 12–22 mm long. Peduncle angular, 5–13 mm long; pedicels 2–4 mm long. Operculum conical, 2–3 mm long, 3–4 mm wide; hypanthium obconical, c. 3 mm long, 3–4 mm wide. Fruits 5–9 mm long, 4–7 mm wide. *Mountain Ash*. Fig. 58C–D.

Occurs in the mountains of southern Vic., and in the Huon and Derwent River valleys, Tas. Grows in tall open forest, often in pure stands. Regions: OTWY, HOWE, TASM. Map 137.

Vic.: Otway East Forestry District, Mar. 1930, *per Victoria Forest Department* (FRI); Belgrave, 24 May 1943, *C.Dawkins* (MEL); Cumberland Falls, *J.H.Willis* (MEL). Tas.: Natl Park, *N.T.Burbidge* 3237 (CANB, HO); near Russell Falls, 16 Jan. 1949, *L.A.S.Johnson* (HO, NSW).

A very tall tree with rough fibrous bark to about halfway up trunk, then smooth, white or grey-green bark above, with umbels paired in leaf axils. The wood has been used for building, flooring, furniture, plywood and pulp and paper-making, and is moderately strong and hard though not durable. The tallest tree species in Australia, and the tallest hardwood in the world.

136. *Eucalyptus fastigata* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 21: 809 (1897)

T: Tantawanglo [Tantawangalo] Mtn, N.S.W., Dec. 1896, *H.Deane & J.H.Maiden s.n.*; holo: NSW; iso: K.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 181 (1970); S.Kelly *et al.*, *Eucalypts* 1: t. 159 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 84 (1983).

Tree to 45 m. Bark rough, furrowed, on trunk and larger branches, shedding in long strips above, leaving smooth white upper branches. Adult leaves lanceolate; lamina 8–15 cm long, 1.5–2.7 cm wide; petiole flattened or channelled, 10–15 mm long. Umbels 11–15-flowered; peduncle terete or angular, 4–14 mm long, pedicels 1–2 mm long. Operculum conical or rostrate, c. 2 mm long, 3 mm wide; hypanthium obconical, c. 2 mm long, 3 mm wide. Fruits 5–8 mm long, 4–7 mm wide. *Brown Barrel*. Fig. 58E–F.

Occurs from the northern tablelands to the southern tablelands of N.S.W., extending to near Bendoc, Vic. Grows in valleys and on slopes, in tall open forest. Regions: MCPH, NEPN, HOWE. Map 138.

N.S.W.: 10 km E of Captains Flat, *G.M.Chippendale* 708 (FRI, NSW, PERTH); 40 km SSW of Mt Victoria, *R.Coveny* 5313 (FRI, NSW); 11.3 km NE of Ebor, *M.Gray* 1427 (CANB); 24.1 km E of Nimmitabel, *R.Schodde* 4188 (CANB, NSW). Vic.: head of Errinundra R., 19 Jan. 1948, *J.H.Willis* (MEL).

Differs from *E. regnans* in having rough bark to the larger branches. The wood has been used for building construction, flooring, furniture, being strong, hard and moderately durable; also used for pulp and paper-making.

Ser. 31 Planchonianae***Eucalyptus* ser. *Planchonianae*** Chippendale, *Fl. Australia* 19: 503 (1988).

E. subser. Costatae Blakely, *Key Eucalypts* 47, 198 (1934), *nom. illeg.* non Blakely, *op. cit.* 16, 84. T: *E. planchoniana* F.Muell.

Trees. Bark rough, fibrous, grey, red-brown, yellow-brown or grey-brown throughout. Juvenile leaves alternate, petiolate, ovate to broadly lanceolate, blue-green, discolorous. Adult leaves alternate, petiolate, lanceolate or broadly lanceolate, often falcate, oblique, concolorous. Conflorences axillary, simple, 7–11-flowered umbels. Buds ovoid, fusiform or cylindrical. Fruits globular or ovoid, ribbed or smooth; disc broad, descending; valves 3 or 4, included. Seeds pyramidal, brown or black.

A series of 2 species in Qld and N.S.W., characterised by the alternate juvenile leaves, fibrous bark throughout, concolorous leaves and large fruits.

137. *Eucalyptus planchoniana* F.Muell., *Fragm.* 11: 43 (1878)

T: 8 Mile Plains, Moreton Bay, Qld, 1879, *F.M.Bailey s.n.*; holo: MEL; iso: BRI, NSW.

Illustrations: N.Hall, *Forest Tree Ser.* No. 15 (1971); S.Kelly *et al.*, *Eucalypts* 1: t. 164 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 79 (1983).

Tree to 20 m. Bark red-brown yellow-brown to grey-brown. Adult leaves thick; lamina 12–16 cm long, 2–3.3 cm wide, blue-green; lateral veins just visible, at 45°–60°; intramarginal vein up to 1 mm from margin; petiole flattened, 15–25 mm long. Umbels 7-flowered; peduncle flattened, 13–30 mm long, up to 10 mm wide, pedicels angular, 2–10 mm long. Buds cylindrical, ribbed; operculum conical, 9–13 mm long, 7–9 mm wide; hypanthium cylindrical to conical, 11–15 mm long, 7–9 mm wide. Fruits ribbed, 17–26 mm long, 15–26 mm wide; valves 4. Seeds black. *Needlebark Stringybark*. Fig. 58G–H.

Occurs from Moreton Is. and Stradbroke Is., Qld., southwards to near Laurieton, N.S.W. Grows on low ridges and gentle slopes, in open forest. Region: MCPH. Map 139.

Qld: Plunkett, *C.T.White* 5586 (BRI); Stradbroke Is., Dec. 1918, *C.T.White* (BRI, NSW). N.S.W.: Laurieton, Nov. 1899, *G.R.Brown* (NSW); 3 km NW of Corindi, *G.M.Chippendale* 1064 (AD, FRI, MEL, NSW); 8 km S of Yamba, *D.McGillivray* 2176A (FRI, NSW).

Distinguished by the red-brown yellow-brown to grey-brown fibrous bark, blue-green leaves, large cylindrical, ribbed buds and large, woody, ribbed fruits.

138. *Eucalyptus sphaerocarpa* L.Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 284 (1972)

T: Blackdown Tableland, Qld, Aug. 1964, *C.H.Gittins* 932; holo: NSW; iso: BRI, CANB.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 150 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 145 (1983).

Tree to 45 m. Bark grey to grey-brown. Adult leaves acuminate to uncinat; lamina 9–14 cm long, 1.5–2.5 cm wide, grey-green; lateral veins just visible, at 40°–45°; intramarginal vein up to 1 mm from margin; petiole flattened or channelled, 10–20 mm long. Umbels 7–11-flowered; peduncle flattened, 8–12 mm long; pedicels flattened or angular 1–4 mm long. Buds ovoid or fusiform; operculum conical or hemispherical, c. 4 mm long, 4–5 mm wide; hypanthium hemispherical, 3–4 mm long, 4–5 mm wide. Fruits smooth, 9–11 mm long, 10–13 mm wide; valves usually 3. Seeds brown. *Blackdown Stringybark*. Fig. 58 I–J.

Occurs in restricted areas on the Blackdown Tableland, Qld., on sandstone plateaus, in tall open forest. Region: DWSN. Map 140.

Qld: Blackdown Tableland, *M.I.H.Brooker* 3778 (BRI, FRI, NSW); 19.8 km SW of Umolo railway stn, *G.M.Chippendale* 1113 (AD, FRI, MEL); 4.8 km S of entrance ramp to Blackdown Tableland, *N.Hall* 46 (BRI, FRI).

Differs from *E. planchoniana* in the smaller, smooth buds and fruits and shorter peduncle.

Ser. 32 *Eucalyptus*

Eucalyptus L'Hér. ser. ***Eucalyptus***.

E. ser. Renantherae Benth., *Fl. Austral.* 188, 200 (1867) *nom. illeg.* T: *E. obliqua* L'Hér.

E. ser. Pyramidales-D-shaped Maiden, *Crit. Revis. Eucalyptus* 7: 171 (1925) *nom. illeg.* T: *E. obliqua* L'Hér.

Trees, mallees or shrubs. Bark smooth throughout, fibrous throughout, or fibrous on lower trunk. Juvenile leaves alternate, petiolate, often discolorous at first, becoming concolorous. Adult leaves alternate, petiolate, usually acuminate, oblique, concolorous. Conflorescences axillary, simple; umbels 3–many-flowered. Buds clavate, ovoid or fusiform. Fruits ovoid, barrel-shaped, hemispherical, subglobular, pyriform, obconical or ±urceolate; disc broad, usually level or descending, less commonly convex; valves 3–5, level or included. Seeds pyramidal, brown or black. *Ashes, Snow Gums*.

A series of 6 species in temperate Qld, N.S.W., Vic., S.A. and Tas., characterised by the usually discolorous first leaves, later ones concolorous, fruits with broad level or descending disc, and usually black seeds.

139. *Eucalyptus obliqua* L'Hér., *Sert. Angl.* 18 (1788), t. 20 (1792)

T: Adventure Bay, [Tas.], 26 Jan. 1777, *D.Nelson* s.n.; holo: BM.

E. pallens DC., *Prodr.* 3: 219 (1828). T: Australia, 1823, *F.W.Sieber* 606; holo: G; iso: NSW.

E. procera Dehnh., *Cat. Pl. Hort. Camaldulensis* 2nd edn, 6, 20 (1832). T: cultivated, Hortus Camaldulensis, Italy; n.v.

E. fabrorum Schldl., *Linnaea* 20: 656 (1847). T: not designated.

E. heterophylla Miq., *Ned. Kruidk. Arch.* 4: 141 (1856). T: Tas., *C.Stuart* 2; n.v.

E. falcifolia Miq., *op. cit.* 4: 136 (1856). T: Lofty Ra., S.A., *F.Mueller*; holo: MEL.

E. nervosa F.Muell. ex Miq., *op. cit* 4: 139 (1856) *nom. illeg.* non Hoffsgg. (1824). T: Lofty Range, S.A., Nov. 1848, *F.Mueller*; holo: MEL.

E. obliqua var. *degressa* Blakely, *Key Eucalypts* 195 (1934). T: Ambleside, S.A., 24 Mar. 1923, *J.B.Cleland* & *E.H.Ising s.n.*; holo: NSW; iso: AD.

E. obliqua var. *megacarpa* Blakely, *Key Eucalypts* 194 (1934). T: near Lake Bonney, S.A., 7 Dec. 1922, *J.B.Cleland s.n.*; syn: NSW, AD; Millicent, S.A., 5 Dec. 1917, *J.M.Black 1*; syn: AD, NSW; Millicent, S.A., 8 Dec. 1922, *J.B.Cleland 95*; syn: AD, NSW.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 158 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 81 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 303 (1984).

Tree to 90 m. Bark fibrous, stringy, furrowed throughout, grey to red-brown. Juvenile leaves ovate, oblique, often shortly acuminate; shining. Adult leaves broadly lanceolate, acuminate, lamina 10–15 cm long, 1.5–3.3 cm wide, dark green, shining; lateral veins just visible, at 20°–30°; intramarginal vein c. 1 mm from margin; petiole channelled, 7–17 mm long. Umbels with 11 or more flowers; peduncle angular or flattened, 4–15 mm long; pedicels 1–6 mm long. Buds clavate; operculum hemispherical, apiculate, 1–2 mm long, 2–3 mm wide; hypanthium obconical, 2–4 mm long, 2–3 mm wide. Fruits ovoid, subglobular, barrel-shaped or ±urceolate, 6–11 mm long, 5–9 mm wide; disc level or steeply descending; valves 3 or 4, level to included. Seeds brown. *Messmate*, *Messmate Stringybark*. Fig. 58K–L.

Occurs in Qld, N.S.W., Vic. Tas., and S.A., from the Darling Downs southwards to the Mt Gambier area, Mt Lofty Ranges and Kangaroo Is. Grows on hills or mountains, in tall open forest. Regions: MCPH, NEPN, HOWE, OTWY, EYRE, TASM. Map 141.

S.A.: 1.8 km E of Belair, *R.Schodde 306* (AD, CANB). Qld: 19.3 km E of Stanthorpe, 4 Sept. 1911, *R.H.Cabbage* (NSW). N.S.W.: Sugarloaf near Braidwood, 12 Feb. 1915, *J.L.Boorman* (NSW). Vic.: 1.5 km S of Darby R., *M.I.H.Brooker 4383* (AD, FRI, MEL, NSW); Mt Beckworth, 16 Nov. 1963, *J.H.Willis* (MEL). Tas.: 1.8 km from Mt Wellington, *A.M.Gray* & *G.M.Chippendale 1173* (FRI, HO, K, MEL, NSW).

Distinguished by fibrous, stringy bark throughout, large, shining juvenile leaves, oblique leaf bases, clavate buds, and usually pedicellate, ±ovoid fruits 6–11 mm long. One of the most important Australian hardwoods, used in construction, joinery, flooring, furniture and pulp production.

B.M.Potts & J.B.Reid, Hybridization between *Eucalyptus obliqua* L'Hérit. and *E. pulchella* Desf., *Austral. J. Bot.* 31: 211–229 (1983).

140. *Eucalyptus delegatensis* R.Baker, *Proc. Linn. Soc. New South Wales* 25: 305 t. 16 (1900)

T: Delegate Mtn, N.S.W., Jan. 1899, *W.Bäuerlen s.n.*; lecto: NSW, *fide* D.J.Boland, *Austral. Forest Res.* 15: 174 (1985).

Tree usually to 40 m, sometimes to 90 m. Bark fibrous, grey to brown on lower half of trunk, smooth and white above, usually with insect 'scribbles'. Juvenile leaves dull-green or glaucous. Adult leaves narrowly to broadly lanceolate, falcate, oblique, green, shining; lateral veins conspicuous, at 15°–35°; intramarginal vein up to 2 mm from margin; petiole flattened or channelled. Umbels 5–27-flowered, but usually 11-flowered; peduncle terete or angular, 9–20 mm long; pedicels 2–7 mm long. Buds clavate; operculum hemispherical, apiculate, c. 2 mm long, 3 mm wide; hypanthium obconical, 3–4 mm long, c. 3 mm wide. Fruits ovoid or pyriform, sometimes hemispherical, 8–19 mm long, 6–11 mm wide; disc descending, sometimes level; valves 3–5, included. Seeds brown. *Alpine Ash*.

Occurs widely in N.S.W., A.C.T., Vic. and Tas., from the Brindabella Ra. to southern Tas., often in pure stands. Differs from *E. obliqua* especially in having rough bark only on the lower half of the trunk, and in the glaucous leaves of young plants. There are 2 subspecies.

The wood of both subspecies has been used for flooring, plywood, veneers, furniture, panelling and turnery, and also for pulp.

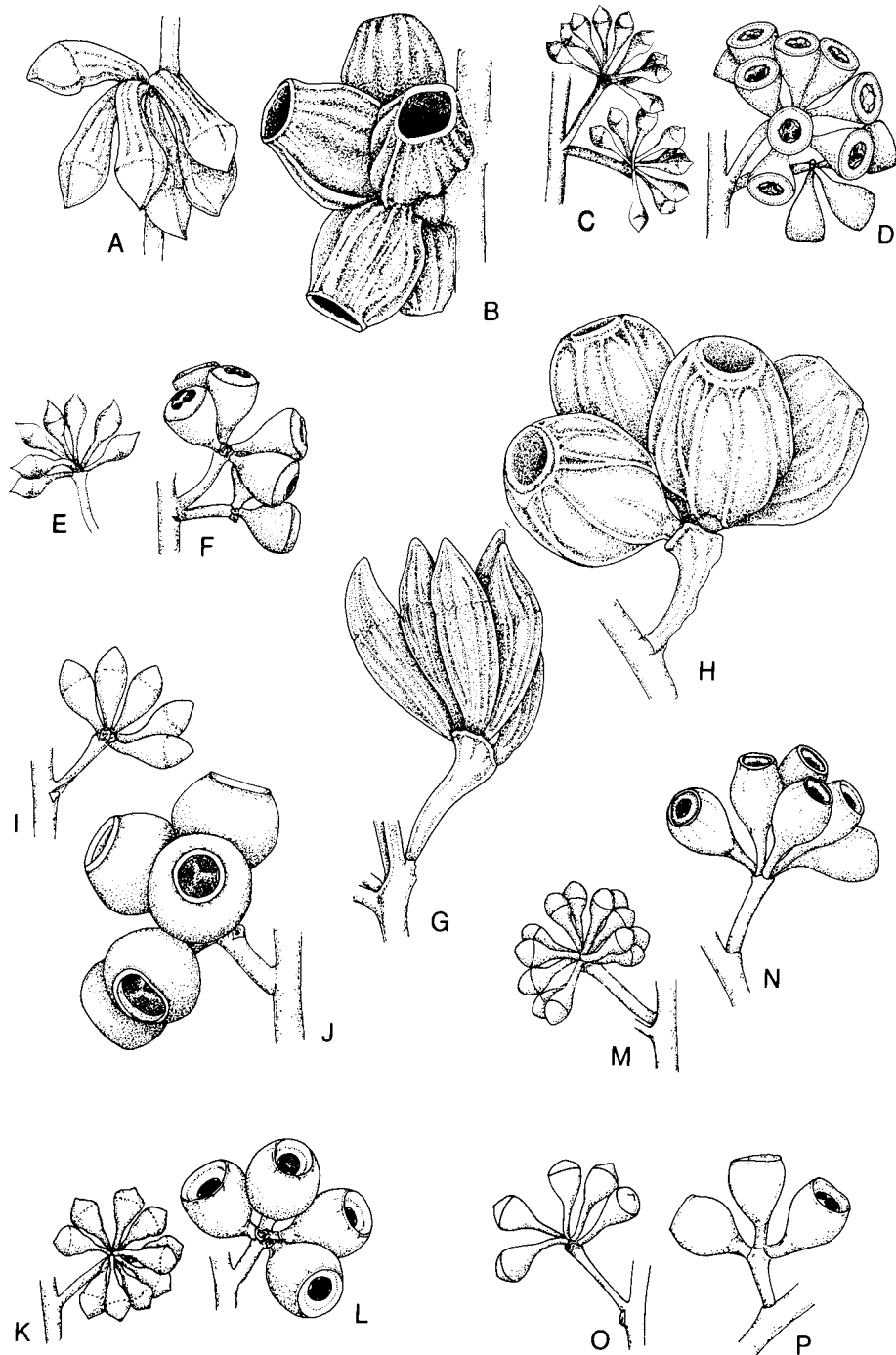


Figure 58. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. olsenii* (**A**, L.Pryor & J.Briggs 56, FRI; **B**, I.Brooker 4593, FRI). **C–D**, *E. regnans* (Traralgon, Vic., K.Eldridge, FRI). **E–F**, *E. fastigata* (**E**, Oxley Hwy, near Yarrowitch, N.S.W., R.Johnson & A.Nicholls, FRI; **F**, I.Brooker 6039, FRI). **G–H**, *E. planchoniana* (Washpool Forest, near Glen Innes, N.S.W., E.Larsen, FRI 12333, FRI). **I–J**, *E. sphaerocarpa* (**I**, I.Brooker 3785, FRI; **J**, I.Brooker 4812, FRI). **K–L**, *E. obliqua* (**K**, Linton, Vic., H.Williamson, FRI; **L**, G.Chippendale 1308, FRI). **M–N**, *E. delegatensis* subsp. *delegatensis* (**M**, P.Martensz 115, FRI; **N**, C.Beauglehole 35736, FRI). **O–P**, *E. delegatensis* subsp. *tasmaniensis* (**O**, J.Turnbull 113, FRI; **P**, J.Turnbull 125, FRI). Drawn by M.May.

Stems of seedlings glabrous; seedling leaves broadly lanceolate

140a. subsp. delegatensis

Stems of seedlings prominently warty; seedling leaves orbicular with a prominent short drip-tip

140b. subsp. tasmaniensis

140a. *Eucalyptus delegatensis* R.Baker subsp. *delegatensis*

E. obliqua var. *alpina* Maiden, *Proc. Assoc. Adv. Sci.* 9: 369 (1903). T: not clearly designated.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 161 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide Eucalypts* 1: 82 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 307 (1984).

Seedling stems glabrous; seedling leaves usually broadly lanceolate. Juvenile leaves ovate. Adult leaves: lamina 9–22 cm long, 1.3–4 cm wide; petiole 8–45 mm long. Fig. 58M–N.

Occurs in N.S.W., A.C.T. and Vic. from the Brindabella Ra., southwards to Macedon near Melbourne on steep slopes of ranges. Regions: HOWE, OTWY. Map 142.

A.C.T.: 4.4 km S of Bulls Head, *G.M.Chippendale* 703 (FRI, MEL, NSW, PERTH). Vic.: 14.5 km S of Harrietville, *L.A.S.Johnson* 7369 (FRI, MEL, NSW); head of Buffalo Ck, 20 Feb. 1963, *J.H.Willis* (MEL, NSW).

Characterised by the tall tree habit, fibrous bark on lower trunk, broadly lanceolate seedling leaves, shining lanceolate adult leaves and occurrence in sub-alpine areas.

140b. *Eucalyptus delegatensis* subsp. *tasmaniensis* Boland, *Austral. Forest Res.* 15: 177 (1985)

T: 31.7 km NW of Bothwell on Lakes Hwy, Tas., 5 Nov. 1974, *G.M.Chippendale* 1159 & *A.M.Gray*; holo: FRI; iso: HO, NSW.

E. risdonii var. *elata* Benth., *Fl. Austral.* 3: 203 (1867); *E. tasmanica* Blakely, *Key Eucalypts* 225 (1934). T: Lake St Clair, Tas., 1841, *R.Gunn* 1095; syn: K n.v., fide A.M.Gray, *Muelleria* 3: 197–198 (1976).

E. gigantea J.D.Hook., *London J. Bot.* 6: 479 (1847) p.p. and *Fl. Tasman.* 1: 136, t. 28 (1856) p.p. non Dehnh. (1832). T: W side Lake St Clair, Tas., 8 Jan. 1841, *R.Gunn* 1095; syn: K, NSW; Lake St Clair, Tas., 7 Jan. 1841, *R.Gunn* 1095; syn: BM, NSW; Black R., Circular Head, Tas., 10 Feb. 1838, *R.Gunn* 1104; syn: BM, K, NSW; Sassafras Valley, Tas., 7 Oct. 1840, *R.Gunn* 1106; syn: K, NSW; Arthurs Lake, Tas., 17 Jan. 1845, *R.Gunn* 1965; syn: NSW; Arthurs Lake, Tas., 17 Jan. 1845, *R.Gunn* 1966; syn: NSW.

Illustrations: D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 307 t. 9, 308 (1984) as *E. delegatensis*.

Seedling stems warty with conspicuous oil glands; seedling and juvenile leaves orbicular with a prominent short drip-tip. Adult leaves: lamina 5–17 cm long, 1.1–3.6 cm wide; petiole 10–40 mm long. Fig. 58 O–P.

Occurs only in Tas., mainly in the central subalpine areas and on Maria Is., on plateau edges. Region: TASM. Map 143.

Tas.: Bronte, *N.T.Burbidge* 3411 (CANB, HO); between Tunnack & Levendale, *M.I.H.Brooker* 5759 (AD, FRI, HO, MEL, NSW).

Differs from subsp. *delegatensis* in the glandular-warty seedling stems and the orbicular juvenile leaves.

141. *Eucalyptus oreades* R.Baker, *Proc. Linn. Soc. New South Wales* 24: 596 (1900)

E. altior (Deane & Maiden) Maiden, *Crit. Revis. Eucalyptus* 6: 272 (1922) *nom. illeg.*; *E. virgata* var. *altior* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 26: 124 (1901) based on *E. oreades* R.Baker. T: Lawson, N.S.W., 9 Aug. 1899, *H.G.Smith* & *R.T.Baker s.n.*; syn: FRI, NSW; Mt Victoria, N.S.W., *R.H.Cambage s.n.*; syn: n.v.; road to Jenolan Caves, N.S.W., *R.H.Cambage s.n.*; syn: n.v.

E. luehmanniana var. *altior* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 22: 713 (1897). T: Mt Wilson, N.S.W., Apr. 1896, *J.H.Maiden*; holo: NSW.

Illustrations: S.Kelly *et al.*, *Eucalypts* 2: t. 168 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 85 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 315 (1984).

Tree to 40 m. Bark fibrous, grey to 3 m from base, then smooth and white, grey or yellow above. Juvenile leaves ovate, dull, grey-green. Adult leaves lanceolate, acuminate, thick;

lamina 11–17 cm long, 1.5–2.3 cm wide, shining, green; lateral veins just visible, at 15°–20°; intramarginal vein up to 1 mm from margin; petiole flattened, 15–22 mm long. Umbels 7-flowered; peduncle flattened, 9–25 mm long; pedicels absent or up to 2 mm long. Buds clavate or broadly fusiform, curved; operculum conical or hemispherical, 3–4 mm long, 4–5 mm wide; hypanthium obconical, 3–4 mm long, 4–5 mm wide. Fruits pyriform, hemispherical, ovoid or subglobular, 6–10 mm long and wide; disc level or descending; valves 4 or 5, level or just included. Seeds black. *Blue Mountains Ash*, *White Ash*. Fig. 59A–B.

Occurs in Qld and N.S.W. in several disjunct areas, in the McPherson Ra., near Port Macquarie, in the Gibraltar Ra., and in the Blue Mts. Grows usually in open forest, often on cliff tops or rock outcrops with associated eucalypts. Regions: MCPH, NEPN. Map 144.

Qld: Springbrook, *T.J.McDonald* 327 (BRI, FRI). N.S.W.: Kings Tableland, *M.I.H.Brooker* 4691 (BRI, FRI, MEL, NSW); Mt Banda Banda, *R.Coveny* 6021 (NSW); Dandahra Tableland, 7 Apr. 1954, *R.J.Turner* (NSW).

Characterised as a tall tree, with mostly smooth, white, grey or yellow bark but with grey, fibrous basal bark shed in long strips, shining leaves with acute venation, 7-flowered umbels and usually curved buds.

142. *Eucalyptus luehmanniana* F.Muell., *Fragm.* 11: 38 (1878)

T: Bulli, N.S.W., *W.Kirton s.n.*; holo: MEL; iso: K, NSW.

Illustrations: N.Hall, *Forest Tree Ser.* No. 32 (1972); S.Kelly *et al.*, *Eucalypts* 1: t. 165 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 86 (1983).

Mallee to 6 m. Bark smooth, white throughout. Juvenile leaves oblong or elliptic, shining, green. Adult leaves lanceolate, acuminate or mucronate, leathery; lamina 15–18 cm long, 2–4 cm wide, shining green; lateral veins just visible, at 20°–40°; intramarginal vein up to 2 mm from margin; petiole flattened, 15–25 mm long. Umbels 7–11-flowered; peduncle flattened, broad, 10–25 mm long; pedicels flattened, 4–8 mm long. Buds fusiform, sometimes glaucous; operculum conical, ribbed, 4–6 mm long and wide; hypanthium conical, ribbed, 5–7 mm long, 4–6 mm wide. Fruits hemispherical, ribbed, 10–13 mm long, 7–10 mm wide; disc flat or convex; valves 5, included. Seeds black. *Yellow-top Mallee Ash*. Fig. 59C–D.

Occurs in south-eastern N.S.W., in a small area from Kariong southwards to near Nowra; grows in sandstone areas in scrubby vegetation. Regions: NEPN, HOWE. Map 145.

N.S.W.: Tumbledown Dick Hill, *G.M.Chippendale* 1010 (BRI, FRI, MEL, NSW); 15.1 km SW of Nowra, *R.Coveny* 4031 (NSW); Kariong Trig., Aug. 1916, *A.Murphy* (NSW).

Distinguished from *E. oreades* by the mallee habit, smooth bark and relatively large hemispherical, ribbed fruits.

143. *Eucalyptus pauciflora* Sieber ex Sprengel, *Syst. Veg.* 4(2): 195 (1827)

T: New Holland, 1823, *F.W.Sieber* 470; iso: BM, G, MEL, W.

E. coriacea Cunn. ex Schauer in W.G.Walpers, *Repert. Bot. Syst.* 2: 925 (1843). T: Goulburn Plains, N.S.W., Apr. 1824, *A.Cunningham* 35; iso: BM, K.

E. phlebophylla F.Muell. ex Miq., *Ned. Kruidd. Arch.* 4: 140 (1856). T: Mt Aberdeen, Buffalo Ra., Vic., Feb. 1853, *F.Mueller* syn: K; Tas., *C.Stuart*; syn: n.v.

E. submultiplinervis Miq., *op. cit.* 138. T: Tas., *C. Stuart* 10, 13, 14, 15; all n.v.

Tree or mallee. Bark smooth, white to light grey or sometimes brown-red, shedding in irregular patches or strips, giving a mottled appearance, sometimes with 'scribbles'. Adult leaves lanceolate to broadly lanceolate or narrowly ovate; lateral veins distinct, usually almost parallel with midrib. Umbels 7–15-flowered; peduncle flattened or angular. Buds clavate or ovoid, sometimes angular; operculum hemispherical or conical; hypanthium obconical. Fruits hemispherical, subglobular, pyriform or obconical, rarely angled or ribbed; valves 3 or 4, level or included. Seeds black.

Occurs widely from near the Qld–N.S.W. border southwards through N.S.W. and Vic. to near Mt Gambier in S.A., and in Tas. Grows usually on mountains and tablelands. Distinguished by the smooth bark, often with ‘scribbles’, by the thick glossy leaves with almost parallel veins, and by the thick-rimmed fruits. There are three subspecies.

1 Buds not glaucous

143a. subsp. pauciflora

1: Buds glaucous

2 Buds angular

143c. subsp. debeuzevillei

2: Buds not angular

143b. subsp. niphophila

143a. *Eucalyptus pauciflora* Sieber ex Sprengel subsp. pauciflora

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 168 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 90 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 323 (1984).

Tree to 20 m. Bark white to grey-white with insect ‘scribbles’. Juvenile leaves ovate, oblique, apiculate, dull. Adult leaves lanceolate to broadly lanceolate, acute to acuminate, thick, blue-green; lamina 7–16 cm long, 1.2–3.2 cm wide, shining, green or blue-green; lateral veins almost parallel with midrib or up to 20°; intramarginal vein distinct, up to 3 mm from margin; petiole channelled or angular, 10–20 mm long. Umbels 7–15-flowered; peduncle terete or flattened, 3–16 mm long; pedicels absent or to 3 mm long. Buds clavate, sometimes warty or glaucous; operculum hemispherical or conical, 2–4 mm long, 3–5 mm wide; hypanthium obconical, 4–6 mm long, 3–5 mm wide. Fruits hemispherical, pyriform or obconical, 6–10 mm long, 5–9 mm wide. *Snow Gum*. Figs 26, 59E–F.

Occurs in Qld, N.S.W., A.C.T., Vic. and Tas., on the highest and coldest mountains and tablelands from just N of the Qld–N.S.W. border to near Mt Gambier and Tas. Grows in woodland and forest, often in pure stands but also associated with other eucalypts. Regions: MCPH, NEPN, HOWE, OTWY, TASM. Map 146.

Qld: Wallangarra, Apr. 1914, *J.L.Boorman* (NSW). N.S.W.: 2.7 km N of Bombala, *G.M.Chippendale* 918 (BRI, FRI, MEL, NSW). Vic.: 11.3 km from Digby towards Dartmoor, *M.I.H.Brooker* 3810 (FRI, MEL, PERTH). S.A.: 25 km SE of Mt Gambier, *I.B.Wilson* 913b (AD, FRI). Tas.: 12 km N of Derwent Bridge, *N.T.Burbidge* 3410 (CANB, HO).

Distinguished from the other subspecies by the non-glaucous buds.

143b. *Eucalyptus pauciflora* subsp. niphophila (Maiden & Blakely) L.Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 379 (1973)

E. niphophila Maiden & Blakely, *Crit. Revis. Eucalyptus* 8: 34 (1929); *E. pauciflora* var. *alba* Ewart, *Fl. Victoria* 837 (1930). T: Pretty Point, Mt Kosciusko, N.S.W., Jan. 1899, *J.H.Maiden* & *W.Forsyth s.n.*; holo: NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 59 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 182 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 91 (1983).

Straggly small tree or shrub to 6 m, but sometimes only to 1 m. Juvenile leaves ovate, dull, blue green. Adult leaves broadly lanceolate to narrowly ovate, uncinata, thick; lamina 5–8 cm long, 1.2–2 cm wide, green to blue-green; intramarginal vein up to 1 mm from margin; petiole channelled, 10–20 mm long. Umbels usually 7–11-flowered; peduncle terete or angular, 6–10 mm long; pedicels absent or to 3 mm long. Buds clavate, glaucous; operculum hemispherical, 2–3 mm long, 4–6 mm wide; hypanthium obconical, sometimes angular, 6–8 mm long, 4–6 mm wide. Fruits hemispherical or subglobular, glaucous, 5–10 mm long, 6–9 mm wide; disc level; valves 3, included. *Snow Gum*. Figs 14, 59G–H.

Occurs in N.S.W. and Vic., to the altitudinal limit of tree growth in south-eastern Australia, on high plateaus or rounded mountain tops, mostly in pure stands. Region: HOWE. Map 147.

N.S.W.: Mt Morgan, *M.I.H.Brooker* 5497 (AD, FRI); 3.6 km SSW of Guthega, *R.Coveny* 5415 (AD, BRI, FRI, MEL, NSW, PERTH). Vic.: Mt Useful, *F.Mueller* (MEL); Mt Speculation, 2 Jan. 1945, *J.H.Willis* (MEL).

Distinguished by its shrubby or straggly habit, the glaucous buds and fruits, and its high altitudinal occurrence.

143c. *Eucalyptus pauciflora* subsp. *debeuzevillei* (Maiden) L.Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 379 (1973)

E. debeuzevillei Maiden, *J. & Proc. Roy. Soc. New South Wales* 54: 68 (1920). T: Jounama Peaks, N.S.W., Dec. 1919, W.A.W. *de Beuzeville s.n.*; holo: NSW; iso: BM, K.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 125 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 181 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 92 (1983).

Many-stemmed shrub or a crooked tree, mostly to 9 m, but sometimes to 18 m. Juvenile leaves lanceolate to broadly lanceolate, dull, blue-green. Adult leaves lanceolate, uncinat, thick; lamina 7.5–15 cm long, 1.3–4.5 cm wide, green; intramarginal vein up to 1 mm from margin; petiole flattened or channelled, 13–18 mm long. Umbels 7–11-flowered; peduncle flattened, 6–13 mm long; pedicels absent. Buds ovoid, angular or 3-ribbed, glaucous; operculum conical, triangular, 3–4 mm long, 4–5 mm wide; hypanthium obconical, angular, 6–7 mm long, 4–5 mm wide. Fruits hemispherical or subglobular, glaucous, 10–15 mm long, 7–11 mm wide; disc level; valves 3 or 4, level. *Jounama Snow Gum*. Fig. 59 I–J.

Occurs in a small area in the Brindabella Ra., A.C.T., at Jounama Peaks between Kiandra and Tumut Ponds, N.S.W., and near Falls Creek, Vic., usually on steep slopes, plateaus and ridges. Region: HOWE. Map 148.

A.C.T.: Mt Ginini, *L.G.Adams* 2043 (CANB, NSW). N.S.W.: 4.8 km S of Cabramurra, *B.G.Briggs* 2556 (NSW); Jounama Ra., *M.I.H.Brooker* 3985 (FRI, NSW). Vic.: Falls Creek Village, *S.J.Forbes* 821 (FRI).

Has larger, more angular buds and fruits than the other subspecies of *E. pauciflora*.

144. *Eucalyptus gregsoniana* L.Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 380 (1973)

E. pauciflora var. *nana* Blakely, *Key Eucalypts* 339 (1934). T: Clarence to Wolgan, N.S.W., Nov. 1906, *J.H.Maiden*; lecto: NSW, *fide* L.A.S.Johnson & D.Blaxell, *op. cit.* 380; isolecto: FRI.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 167 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 179 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 93 (1983).

Mallee to 5 m. Bark smooth, white to light grey throughout. Juvenile leaves lanceolate, blue-green. Adult leaves lanceolate, acuminate, symmetrical or slightly oblique, thick; lamina 7–11 cm long, 1.5–2.5 cm wide, grey-green; lateral veins distinct, almost parallel to midrib; intramarginal vein up to 1 mm from margin; petiole thick, flattened or channelled, 8–12 mm long. Umbels 7–11-flowered; peduncle absent, or terete, up to 10 mm long; pedicels absent or up to 2 mm long. Buds clavate; operculum hemispherical or conical, 2–3 mm long, c. 4 mm wide; hypanthium obconical, 5–6 mm long, c. 4 mm wide. Fruits truncate-pyriform, sometimes wrinkled, 6–8 mm long and wide; disc level or convex; valves 3, just included. Seeds black. *Mallee Snow Gum*. Fig. 59K–L.

Occurs in N.S.W. on and to the W of the Blue Mts, in the Budawang Ra. and S of Braidwood, on mountain tops and tablelands, in mallee and heathland vegetation. Regions: NEPN, HOWE. Map 149.

N.S.W.: 15 km N of Mongarlowe, *D.F.Blaxell* 525 (BRI, FRI, NSW); 10.1 km from Bell towards Lithgow, *M.I.H.Brooker* 3738 (BRI, FRI, MEL, NSW); 50 km SSW of Braidwood, *R.Coveny* 5973 (AD, BRI, CANB, MEL, NSW).

Resembles *E. pauciflora* but is distinguished especially by the mallee habit and shorter petioles.

Ser. 33 Psathyroxyla

Eucalyptus ser. **Psathyroxyla** Blakely, *Key Eucalypts* 52, 217 (1934).

Type: *E. haemastoma* Smith, lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 503 (1988).

Trees or mallees. Bark smooth throughout and with insect ‘scribbles’, or fibrous on trunk and larger branches or throughout, sometimes fibrous only at base. Juvenile leaves alternate, petiolate, often falcate, often oblique, the first concolorous, later ones discolorous. Adult leaves alternate, petiolate, falcate, concolorous. Conflorescences axillary, simple, 7–many-flowered umbels. Buds clavate. Fruits pyriform, ±globular, hemispherical, obconical or campanulate; disc usually moderately broad to broad, usually level or convex, rarely included, vertical in *E. stenostoma*; valves 3–5, usually 4, usually level or convex, rarely just exerted. Seeds pyramidal, black, brown-black or red-brown. *Ashes, Scribbly Gums.*

A series of 11 species in eastern parts of Qld, N.S.W., Vic. and Tas., and on Kangaroo Is., S.A., differing from series *Eucalyptus* in having juvenile leaves concolorous, upper ones discolorous, and seeds usually dark- or red-brown.

145. Eucalyptus andrewsii Maiden, *Proc. Linn. Soc. New South Wales* 2nd ser., 29: 472 (1904)

T: Tingha, N.S.W., 16 Oct. 1903, *R.H.Cambage s.n.*; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 1: 195, 205 (1905).

E. haemastoma var. *inophloia* C.White, *Queensland Agric. J.* 2nd ser., 14: 70, t. 3 (1920). T: ranges near Toowoomba, Qld, *C.T.White; n.v.*

Tree to 45 m. Bark fibrous, grey to brown-grey on trunk and larger branches or sometimes throughout. Juvenile leaves ovate to broadly lanceolate, dull, blue-green. Adult leaves lanceolate, often falcate, acuminate, oblique; lamina green or blue-green; lateral veins just visible; intramarginal vein 1–2 mm from margin; petiole channelled. Umbels 11–15-flowered; peduncle angular or flattened. Operculum conical or hemispherical; hypanthium obconical. Fruits hemispherical, pyriform, campanulate or obconical; disc flat or slightly convex; valves 4 or 5, level or just included. Seeds brown-black.

Occurs disjunctly from coastal ranges of central Qld to N of Newcastle, N.S.W. Differs from *E. considiniana* chiefly in the smaller buds and fruits. There are two subspecies.

Fruits hemispherical

145a. subsp. andrewsii

Fruits obconical, rarely campanulate

145b. subsp. campanulata

145a. Eucalyptus andrewsii Maiden subsp. **andrewsii**

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 140 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 188 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 121 (1983).

Tree to 45 m, sometimes only to 20 m. Lamina of adult leaves 10–16 cm long, 2–3 cm wide; lateral at 20°–35°; petiole 14–20 mm long. Peduncle 10–20 mm long; pedicels 5–8 mm long. Operculum 1–2 mm long, 3–4 mm wide; hypanthium 2–3 mm long, 3–4 mm wide. Fruits hemispherical, 4–6 mm long, 5–6 mm wide. *New England Blackbutt.* Fig. 59M–N.

Occurs in scattered disjunct areas from near Eungella, W of Mackay, Qld, to the New England area, N.S.W. Grows on undulating or hilly plateaus and ranges, in open forest or tall open forest. Regions: BURD, DWSN, MCPH. Map 150.

Qld: Mt Maroon, *L.S.Smith 12143* (BRI); Fletcher, *C.T.White 9392* (BRI, NSW). N.S.W.: 28.8 km from Guyra towards Tingha, *M.I.H.Brooker 3927* (FRI, NSW); 23.7 km NNW of Armidale, *G.M.Chippendale 1252* (AD, BRI, FRI, MEL, NSW); 2.3 km N of Torrington, *R.Coveny 5193* (AD, BRI, FRI, MEL, NSW).

Distinguished by the hemispherical fruits c. 5–6 mm long and wide. Branchlets, adult leaves and buds are slightly glaucous.

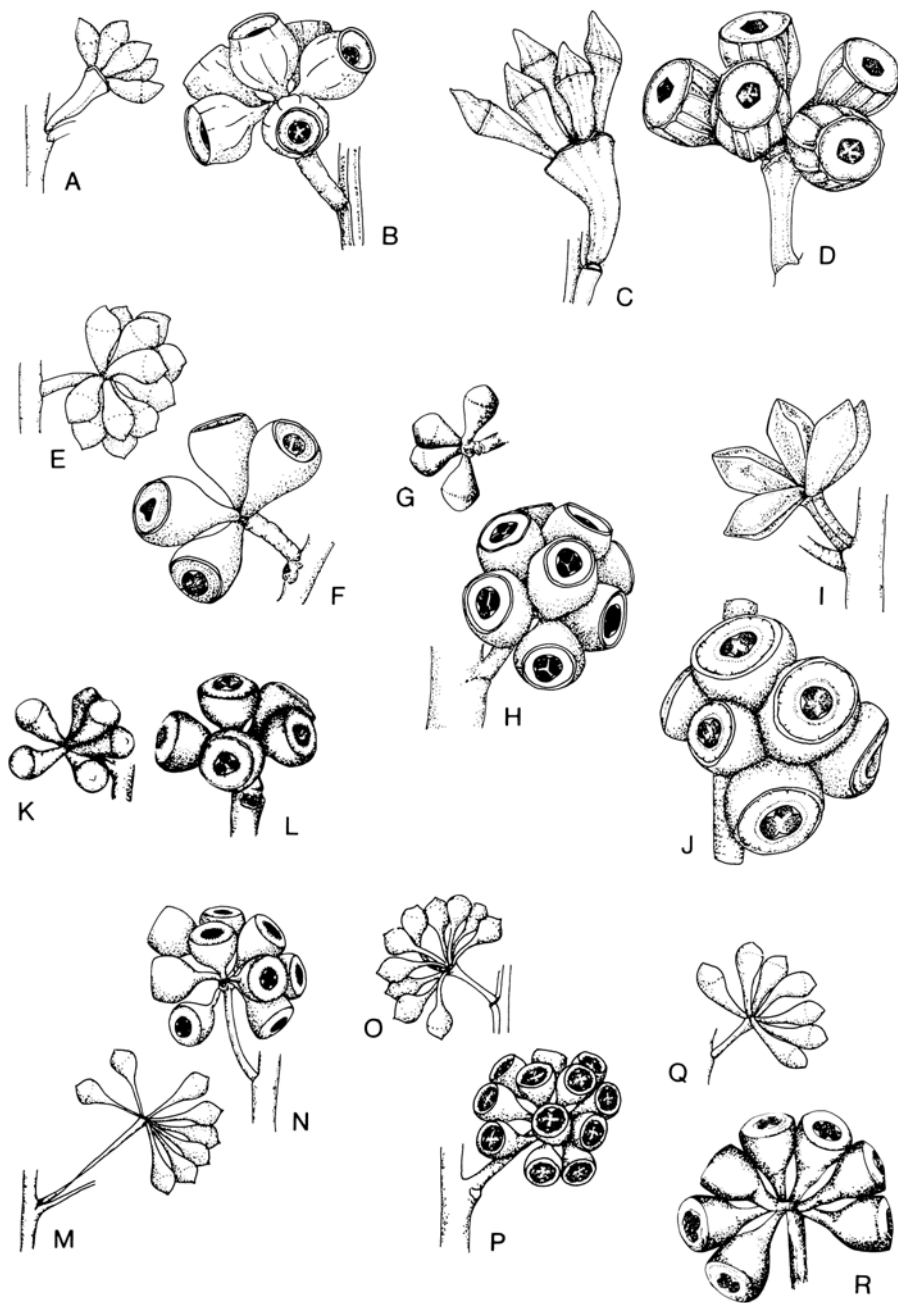


Figure 59. *Eucalyptus* buds and fruits, all $\times 1$. **A–B.** *E. oreades* (**A**, Newnes State Forest, N.S.W., F.Bailey, FRI 11713, FRI; **B**, D.Kleinig DK84, FRI). **C–D.** *E. luehmanniana* (**C**, I.Brooker 3049, FRI; **D**, J.Briggs 181, FRI). **E–F.** *E. pauciflora* subsp. *pauciflora* (**E**, Tumbarumba, N.S.W., W. de Beuzeville, FRI; **F**, I.Brooker 3060, FRI). **G–H.** *E. pauciflora* subsp. *niphophila* (**G**, The Perisher, Mt Kosciusko, N.S.W., A.Costin, FRI; **H**, I.Brooker 5501, FRI). **I–J.** *E. pauciflora* subsp. *debeuzevillei* (**I**, D.Kleinig 571, FRI; **J**, Falls Ck, L.Langley, FRI). **K–L.** *E. gregsoniana* (**K**, Clarence to Wolgan, N.S.W., J.Maiden, FRI; **L**, Clarence to Newnes Junction, N.S.W., W.Blakely, FRI). **M–N.** *E. andrewsii* subsp. *andrewsii* (**M**, I.Brooker 5274, FRI; **N**, I.Brooker 3926, FRI). **O–P.** *E. andrewsii* subsp. *campanulata* (**O**, 9.6 km E of Blackwater, Qld, J.Williams, FRI 13534, FRI; **P**, I.Brooker 6064, FRI). **Q–R.** *E. considiniana* (**Q**, Blue Mtns, N.S.W., J.Maiden, FRI; **R**, Boyne State Forest, 6.4 km N of Batemans Bay, N.S.W., L.Walker, FRI). Drawn by M.May.

145b. *Eucalyptus andrewsii* subsp. *campanulata* (R.Baker & H.G.Smith) L.Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 381 (1973)

E. campanulata R.Baker & H.G.Smith, *J. & Proc. Roy. Soc. New South Wales* 45: 288, t. 13 (1912). T: Tenterfield, N.S.W., Dec. 1909, *C.F.Laseron s.n.*; holotype: Museum of Applied Arts and Sciences, Sydney; iso: NSW.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 213 (1970); S.Kelly *et al.*, *Eucalypts* 1: t. 179 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 122 (1983).

Tree to 25 m. Lamina of adult leaves 9–18 cm long, 1–2.5 cm wide; lateral distinct, at 20°–30°; petiole 14–20 mm long. Peduncle 10–15 mm long; pedicels 4–6 mm long. Operculum apiculate, 1–2 mm long, c. 3 mm wide; hypanthium 2–3 mm long, c. 3 mm wide. Fruits obconical or campanulate, 5–6 mm long, c. 5 mm wide. *New England Blackbutt, New England Ash.* Fig. 59 O–P.

Occurs from south-eastern Qld through the New England district to Mt Royal State Forest, N.S.W., on tablelands and coastal escarpments, in open forest and tall open forest. Regions: DWSN, MCPH, NEPN. Map 151.

Qld: Mt Maroon, *S.L.Everist 7113* (BRI, CANB); Pechey, *C.T.White 3599* (BRI). N.S.W.: 38.6 km NW of Dungog, *R.Story 7339* (AD, CANB, NSW, PERTH); 46.7 km E of Aberdeen, *R.Story 7546* (BRI, CANB, NSW).

Distinguished from subsp. *andrewsii* by the obconical or campanulate fruits.

146. *Eucalyptus consideniana* Maiden, *Proc. Linn. Soc. New South Wales* 2nd ser., 29: 475 (1904)

T: near Springwood, N.S.W., 7 Apr. 1888, *J.H.Maiden & H.Deane s.n.*; syn: NSW; Pigeon House Mtn, near Milton, N.S.W., Dec. 1899, *R.H.Cambage s.n.*; syn: NSW; same locality, 31 Dec. 1902, *R.H.Cambage s.n.*; syn: MEL, NSW; Burrill, Ulladulla, N.S.W., Dec. 1899, *R.H.Cambage s.n.*; syn: NSW; same locality, 30 Dec. 1902, *R.H.Cambage s.n.*; syn: MEL, NSW; Wingello, N.S.W., Nov. 1899, *J.L.Boorman s.n.*; syn: NSW; same locality, 20 Dec. 1900, *J.L.Boorman s.n.*; syn: K, L, NSW; top of mountain E of Burragarang, N.S.W., 11 Nov. 1901, *R.H.Cambage 1022*; syn: NSW.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 163 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 87 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 317 (1984).

Tree to 30 m. Bark fibrous throughout, grey. Juvenile leaves ovate, blue-green. Adult leaves lanceolate, acuminate, often oblique; lamina 8–14 cm long, 1–2.5 cm wide, green; lateral veins distinct, at 15°–25°; intramarginal vein up to 3 mm from margin; petiole flattened or channelled, 12–16 mm long. Umbels 11–15-flowered; peduncle angular or flattened, 5–14 mm long; pedicels 4–6 mm long. Operculum hemispherical, apiculate, 1–2 mm long, 3–4 mm wide; hypanthium campanulate, 3–5 mm long, 3–4 mm wide. Fruits obconical or pyriform, 5–10 mm long, 6–8 mm wide; disc level or convex; valves usually 4, level or slightly exserted. Seeds brown-black. *Yertchuk.* Fig. 59Q–R.

Occurs from the Sydney area, N.S.W., to near Melbourne, Vic., in coastal and adjoining tableland areas, usually on poorly drained sites in open forest. Regions: NEPN, HOWE. Map 152.

N.S.W.: 2.7 km from Nowra towards Illaroo, *R.Coveny 3959* (FRI, NSW); 8 km E of Nerriga, *R.Pullen 2227* (BRI, CANB, NSW). Vic.: 41 km from Buchan towards Orbost, *M.I.H.Brooker 4954* (AD, BRI, FRI, NSW); near Darriman, 14 Aug. 1944, *J.H.Willis* (MEL).

Distinguished by grey, fibrous bark throughout, acutely angled leaf venation, clavate buds, and obconical or pyriform fruits.

Closely related to *E. sieberi*, which has dull juvenile leaves and smooth upper bark, and to *E. andrewsii* which has smaller buds and fruits.

147. *Eucalyptus remota* Blakely, *Key Eucalypts* 197 (1934)

T: near Mt Taylor, Kangaroo Is., S.A., June 1907, *W.Gill s.n.*; holo: NSW; iso: FRI.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 128 (1974); L.Costermans, *Native Trees & Shrubs S.E. Australia* 375 (1981); S.Kelly *et al.*, *Eucalypts* 2: t. 167 (1983).

Mallee to 4 m. Bark smooth, white or grey, often with a small amount of subfibrous bark at base. Juvenile leaves ovate to ovate-lanceolate, grey-green. Adult leaves lanceolate, acuminate, oblique, thick; lamina 7.5–15 cm long, 1.9–3.2 cm wide, dark green; lateral veins usually visible, at 15°–30°; intramarginal vein up to 2 mm from margin; petiole channelled, 14–17 mm long. Umbels up to 20-flowered; peduncle flat or angular, 6–18 mm long; pedicels to 4 mm long. Operculum hemispherical, apiculate, 1–2 mm long, 3–5 mm wide; hypanthium obconical or campanulate, 5–6 mm long, 3–5 mm wide. Fruits hemispherical or subglobose, 5–8 mm long and wide; disc \pm level; valves 3–5, almost level. Seeds brown-black. *Kangaroo Island Mallee Ash*. Fig. 60A–B.

Occurs on the central elevated plateau of Kangaroo Is., S.A., from Mt Taylor to Flinders Chase Conservation Park, in mallee scrub. Region: EYRE. Map 153.

S.A.: 6.6 km N of Karatta, *G.M.Chippendale* 1366 (AD, BRI, FRI, MEL, NSW); 12 km E of Cape Borda, *R.Schodde* 541 (AD, CANB).

Distinct in being a mallee with mostly smooth bark, thick, dark green leaves, and usually hemispherical fruits.

148. *Eucalyptus sieberi* L.Johnson, *Contr. New South Wales Natl Herb.* 3: 125 (1962)

T: Blackheath, N.S.W., Apr. 1899, *J.H.Maiden*; holo: NSW.

E. sieberiana F.Muell., *Eucalyptographia Decades* 2: 9th plate (1879), *nom. illeg.* based on *E. virgata* Sieber ex Sprengel *p.p.*

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 162 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 88 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 319 (1984).

Tree usually to 35 m, sometimes to 45 m. Bark fibrous, hard, furrowed, dark grey to black on trunk and on bases of larger branches, then smooth and white above. Juvenile leaves ovate, grey- or blue-green. Adult leaves lanceolate, acuminate; lamina 9–15 cm long, 1.2–2.8 cm wide, shining, green; lateral veins prominent, at 15°–30°; intramarginal vein up to 3 mm from margin; petiole channelled, 13–18 mm long. Umbels 7–15-flowered; peduncle angular or flattened, 8–16 mm long; pedicels 1–4 mm long. Operculum hemispherical, apiculate, 1–2 mm long, 3–4 mm wide; hypanthium obconical, 2–4 mm long, 3–4 mm wide. Fruits obconical or pyriform, 8–12 mm long, 7–9 mm wide; disc level, just descending or slightly convex; valves 3, just included or level. Seeds brown-black. *Silvertop Ash*. Fig. 60C–D.

Occurs from near Wyong, N.S.W., southwards through A.C.T. to eastern Vic. and north-eastern Tas., on the coast and nearby ranges, often in pure stands in open forest or tall open forest. Regions: NEPN, HOWE, TASM. Map 154.

N.S.W.: Wentworth Falls Lookout, *G.M.Chippendale* 1207 (BRI, FRI, MEL, NSW); 24.8 km NNE of Robertson, *R.Coveny* 847 (AD, BRI, FRI, MEL, NSW); Little Forest, c. 8 km from Milton, *C.R.Dunlop* 148 (CBG, FRI, NT). Vic.: Mt Beenak, *R.Melville* 3921 (MEL). Tas.: S of St Marys, *N.T.Burbidge* 3119 (CANB, HO).

Distinguished by rough bark on trunk and base of largest branches, smooth, white bark above, acute leaf venation and obconical or pyriform fruits with broad disc. Differs from *E. consideniana* especially in the 3-valved fruits. One of the main species used for woodchips in N.S.W.; also used for structural engineering, fencing, sleepers, flooring and plywood.

149. *Eucalyptus multicaulis* Blakely, *J. & Proc. Roy. Soc. New South Wales* 61: 172 (1927)

T: Kariong trig., N.S.W., Sept. 1925, W.F.Blakely, *D.W.C.Shireess* & *H.Bott s.n.*; holo: NSW; iso: FRI. (Note: *H.Bott* not on label in NSW; only *W.F.Blakely* on label at FRI)

Illustrations: N.Hall, *Forest Tree Ser.* No. 31 (1972); S.Kelly *et al.*, *Eucalypts* 2: t. 166 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 89 (1983).

Mallee to 6 m. Bark smooth throughout, white, grey or grey-brown. Juvenile leaves ovate, slightly glaucous. Adult leaves lanceolate, acuminate, oblique, thick; lamina 7.5–10 cm long, 0.7–1 cm wide, dull, green; lateral veins faint, at c. 15°; intramarginal vein up to 3 mm from margin; petiole flattened or channelled, 10–18 mm long. Umbels 7–15-flowered; peduncle flattened, 10–15 mm long; pedicels 4–6 mm long. Operculum hemispherical, apiculate, 1–2 mm long, 3–5 mm wide; hypanthium obconical, 3–4 mm long, 3–5 mm wide. Fruits pyriform, 7–9 mm long, 5–7 mm wide; disc level or convex; valves 4, included. Seeds brown-black. *Whipstick Mallee Ash*. Fig. 60E–F.

Occurs in N.S.W. on sandstone ridges from the Blue Mts to S of Sydney, with smaller disjunct occurrences near Jervis Bay and in the Budawang Ra. Regions: NEPN, HOWE. Map 155.

N.S.W.: Genowlan Mtn, *E.F.Constable* 5045 (FRI, NSW); 39 km SW of Jervis Bay, *R.Coveny* 3750 (NSW); The Castle, Budawang Ra., *I.R.Telford* (CBG, FRI).

Distinguished by mallee habit, smooth stems, and pyriform fruits. Leaves much narrower than those of the related mallee species *E. remota*.

150. *Eucalyptus signata* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 85 (1859)

E. micrantha var. *signata* (F.Muell.) Blakely, *Key Eucalypts* 219 (1934); *E.racemosa* var. *signata* (F.Muell.) R.D.Johnston & Marryatt, *Comm. For. Timber Bur. Leaflet* 92: 20 (1965). T: Brisbane R., Qld, *F.Mueller*; holo: MEL; iso: K.

Illustrations: N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 3: 470 (1976); S.Kelly *et al.*, *Eucalypts* 2: t. 193 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 125 (1983).

Tree to 25 m. Bark smooth throughout, white or yellow-white, with insect 'scribbles'. Juvenile leaves ovate, oblique, blue-green. Adult leaves lanceolate, acuminate, lamina 7–14 cm long, 2–3 cm wide, dull, green; lateral veins clearly visible, at 25°–35°; intramarginal vein up to 2 mm from margin; petiole channelled or flattened, 12–20 mm long. Umbels 7–11-flowered; peduncle flattened or angular, 5–12 mm long; pedicels 2–6 mm long. Operculum conical, 1–2 mm long, 3–4 mm wide; hypanthium obconical or hemispherical, 3–4 mm long and wide. Fruits hemispherical, 4–6 mm long, 5–7 mm wide; disc level or convex; valves 4, level or included. Seeds red-brown. *Scribbly Gum*. Fig. 60G–N.

Occurs in Qld and N.S.W., from near Tin Can Bay, including some islands, southwards to just N of Newcastle, in coastal, sandy, flat areas, in open forest. Regions: DWSN, MCPH, NEPN. Map 156.

Qld: Margate, *S.T.Blake* 18462 (BRI); Sunnybank, *C.E.Hubbard* 3457 (BRI). N.S.W.: 6.9 km SE of Eungai, *R.D.Johnston* & *G.M.Chippendale* 488 (FRI, MEL, NSW, PERTH); Hat Head, 19 Jan. 1954, *E.F.Constable* (NSW).

Distinguished by the smooth, white or yellow-white bark with insect 'scribbles', and the conical operculum. Usually a taller tree than *E. sclerophylla*.

151. *Eucalyptus sclerophylla* (Blakely) L.Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 381 (1973)

E. haemastoma var. *sclerophylla* Blakely, *Key Eucalypts* 218 (1934). T: Mt Victoria, N.S.W., Apr. 1899, *J.H.Maiden*; holo: NSW; iso: FRI.

E. haemastoma var. *capitata* Maiden, *Crit. Revis. Eucalyptus* 1: 319 (1909). T: Mt Victoria, N.S.W., 1 Apr. 1889, *J.H.Maiden*; holo: NSW; iso: FRI.

Tree to 20 m. Bark smooth throughout, white, grey or white-yellow, with insect 'scribbles'. Juvenile leaves elliptic to ovate, subglaucous. Adult leaves lanceolate, acuminate, thick; lamina 5–16 cm long, 2–4 cm wide, shining, green; lateral veins clearly visible, at 15°–30°; intramarginal vein up to 2 mm from margin; petiole flattened or channelled, 12–17 mm long. Umbels 7–15-flowered; peduncle angular, 8–12 mm long; pedicels 4–5 mm long.

Operculum hemispherical, 1–2 mm long, 2–4 mm wide; hypanthium hemispherical, 3–4 mm long, 2–4 mm wide. Fruits hemispherical or subpyriform, 4–6 mm long, 4–5 mm wide; disc level or convex; valves 4, level or included. Seeds red-brown. *Hard-leaved Scribbly Gum*. Fig. 60 I–J.

Occurs in the Blue Mts and S of Sydney to about Jervis Bay, N.S.W., in sandy soils, in open forest. Regions: NEPN, HOWE. Map 157.

N.S.W.: Yanderra, *M.I.H.Brooker* 4699 (BRI, FRI, NSW); 2.4 km E of Blackheath, *R.D.Johnston & G.M.Chippendale* 695 (BRI, FRI, MEL, NSW); 18.5 km NW of Mittagong, *R.Coveny* 6068 (FRI, NSW).

Distinguished by smooth bark with insect ‘scribbles’, hemispherical operculum, and hemispherical or subpyriform fruits 4–6 mm long. Leaves thicker than those of related species.

152. *Eucalyptus haemastoma* Smith, *Trans. Linn. Soc. London* 3: 286 (1797)

T: Port Jackson, N.S.W., 1794, *J.White s.n.*; holo: LINN; iso: G.

Illustrations: N.Hall, *Forest Tree Ser.* No. 12 (1970); S.Kelly *et al.*, *Eucalypts* 1: t. 180 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 123 (1983).

Tree to 15 m. Bark smooth throughout, white, grey or yellow-white, with insect ‘scribbles’. Juvenile leaves broadly lanceolate or ovate. Adult leaves lanceolate or broadly lanceolate, acuminate, oblique, thick; lamina 12–15 cm long, 1.5–3 cm wide, shining, green; lateral veins at 25°–35°; intramarginal vein up to 3 mm from margin; petiole channelled, 10–20 mm long. Umbels 7–15-flowered; peduncle thick, angular or flattened, 12–25 mm long; pedicels 6–8 mm long. Operculum hemispherical or conical, 2–3 mm long, 4–5 mm wide; hypanthium hemispherical, 4–5 mm long and wide. Fruits subglobular, pyriform or obconical, 6–9 mm long, 6–11 mm wide; disc conspicuous, often red, usually flat, sometimes convex; valves 4, level or included. Seeds red-brown. *Scribbly Gum*. Fig. 60K–L.

Occurs along the central coast and adjacent tablelands, from Fassifern to near Jervis Bay, N.S.W., in open forest, in flat or gently sloping sandy soil. Regions: NEPN, HOWE. Map 158.

N.S.W.: Mt Colah, *M.I.H.Brooker* 2829 (BRI, FRI, MEL); Mona Vale, *M.I.H.Brooker* 3310 (BRI, FRI, NSW); Frenchs Forest, 27 July 1946, *L.A.S.Johnson* (NSW).

Distinguished by smooth bark with insect ‘scribbles’, and relatively large subglobular or pyriform fruits with broad, conspicuous, often red disc. Has longer pedicels than related species.

153. *Eucalyptus racemosa* Cav., *Icon.* 4: 24 (1797)

T: Botany Bay, N.S.W., 1793, *L.Née s.n.*; holo: MA.

E. micrantha DC., *Prodr.* 3: 217 (1828). T: Australia, 1823, *F.W.Sieber* 497; holo: G; iso: G, W.

Illustrations: N.C.W.Beadle *et al.*, *Fl. Sydney Region* 3rd edn, 328 (1982); S.Kelly *et al.*, *Eucalypts* 2: t. 192 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 126 (1983).

Tree to 15 m. Bark smooth throughout, white or yellow-white, with insect ‘scribbles’. Juvenile leaves narrowly lanceolate. Adult leaves narrowly lanceolate to lanceolate, acuminate, oblique, thin; lamina 7–14 cm long, 1–1.5 cm wide, green; lateral veins just visible, at 15°–30°; intramarginal vein 1–2 mm from margin; petiole flattened or channelled, 10–15 mm long. Umbels 7–15-flowered; peduncle angular, 7–12 mm long; pedicels 4–6 mm long. Operculum conical, 1–2 mm long, 2–3 mm wide; hypanthium obconical, 2–3 mm long and wide. Fruits hemispherical, subpyriform or subglobular, 4–5 mm long, 6–7 mm wide; disc brown, usually convex, sometimes level; valves 4, level or included. Seeds red-brown. *Scribbly Gum*, *Snappy Gum*. Fig. 60M–N.

Occurs in N.S.W. on ranges to the E of the Great Divide from the Hunter R. to near Jervis Bay and W to near Bathurst, sometimes in pure stands, in dry sclerophyll forest. Region: NEPN. Map 159.

N.S.W.: Pokolbin State Forest, *M.I.H.Brooker* 4629 (BRI, FRI, MEL, NSW); 10.4 km NNE of Lake Munmorah Post Office, *R.Coveny* 6050 (BRI, CANB, MEL, NSW); Terrey Hills, 26 Apr. 1954, *L.A.S.Johnson* (BRI, NSW).

Distinguished by smooth bark with insect 'scribbles', and hemispherical, subpyriform or subglobular fruits 4–5 mm long. Differs from *E. rossii* mainly in the conical operculum, and mostly occurs nearer the coast.

154. *Eucalyptus rossii* R.Baker & H.G.Smith, *Res. Eucalypts* 70 (1902)

T: Cow Flat, Bathurst, N.S.W., Mar. 1901, *R.T.Baker s.n.*; iso: NSW.

Illustrations: S.Kelly *et al.*, *Eucalypts* 2: t. 192 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 127 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 331 (1984).

Tree commonly to 15 m, sometimes to 25 m. Bark smooth throughout, white, grey or yellow-white, with insect 'scribbles'. Juvenile leaves broadly lanceolate or lanceolate. Adult leaves lanceolate or narrowly lanceolate, acuminate, oblique, thin; lamina 7–15 cm long, 0.8–1.3 cm wide, grey-green; lateral veins just visible, at 25°–35°; intramarginal vein up to 1 mm from margin; petiole flattened, 10–20 mm long. Umbels 9–15-flowered; peduncle terete, 7–10 mm long; pedicels 2–5 mm long. Operculum hemispherical, sometimes apiculate, 1–2 mm long, 2–3 mm wide; hypanthium obconical or hemispherical, 2–3 mm long and wide. Fruits subglobular or hemispherical, 4–5 mm long, 5–6 mm wide; disc level or convex; valves 4, ±level. Seeds red-brown. *Scribbly Gum*. Figs 10, 60 O–P.

Occurs from near Tenterfield southwards to near Cooma, N.S.W., on slopes and tablelands, in open forest or woodland. Regions: MCPH, DARL, NEPN, HOWE. Map 160.

N.S.W.: 27.4 km NE of Tenterfield, *R.D.Johnston* & *G.M.Chippendale* 640 (BRI, FRI, MEL, NSW); 4.8 km ENE of Glen Davis, 25 Sept. 1964, *E.F.Constable* (FRI, NSW); between Cooma and Berridale, 22 Jan. 1951, *L.A.S.Johnson* (NSW); 4.8 km N of Queanbeyan, *R.Pullen* 2095 (AD, BRI, CANB, MEL, NSW).

Distinguished by the smooth whitish or grey bark with insect 'scribbles', hemispherical operculum and usually subglobular fruits.

155. *Eucalyptus stenostoma* L.Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 285 (1972)

T: near head of Tuross R., N.S.W., 7 July 1965, *D.J.Hynd* NSW 119425; holo: NSW; iso: FRI.

Illustrations: D.A.Kleinig & M.I.H.Brooker, *Forest Tree Ser.* No. 189 (1975); S.Kelly *et al.*, *Eucalypts* 2: t. 180 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 94 (1983).

Tree to 25 m, often leaning; stems glaucous. Bark fibrous, fissured, dark grey to black to 4 m, then smooth above, white or yellow-white, with insect 'scribbles'. Juvenile leaves broadly lanceolate, blue-green. Adult leaves lanceolate, acuminate; lamina 13–19 cm long, 1.5–3 cm wide, green; lateral veins clearly visible, at 10°–15°; intramarginal vein up to 3 mm from margin; petiole terete, 25–35 mm long. Umbels more than 20-flowered; peduncle flattened, 16–28 mm long, often recurved in fruit; pedicels slender, 6–10 mm long. Buds glaucous; operculum hemispherical or conical, 1–2 mm long, 2–3 mm wide; hypanthium obconical, 3–4 mm long, 2–3 mm wide. Fruits globular, 9–10 mm long and wide, with narrow orifice, usually glaucous; disc vertical, descending; valves 3–5, included. Seeds black. *Jillaga Ash*. Fig. 60Q–R.

Occurs in a very restricted area of dissected escarpment W of Bodalla, N.S.W., mostly in pure stands, in sclerophyll forest, on slopes near ridge tops. Region: HOWE. Map 161.

N.S.W.: 30 km W of Bodalla, *D.A.Kleinig* 120 (BRI, FRI, MEL, NSW); Tuross R., *I.Olsen* 2394 (BRI, CANB, MEL, NSW).

Distinguished by many-flowered umbels, and globular fruits with narrow orifice; of restricted occurrence.

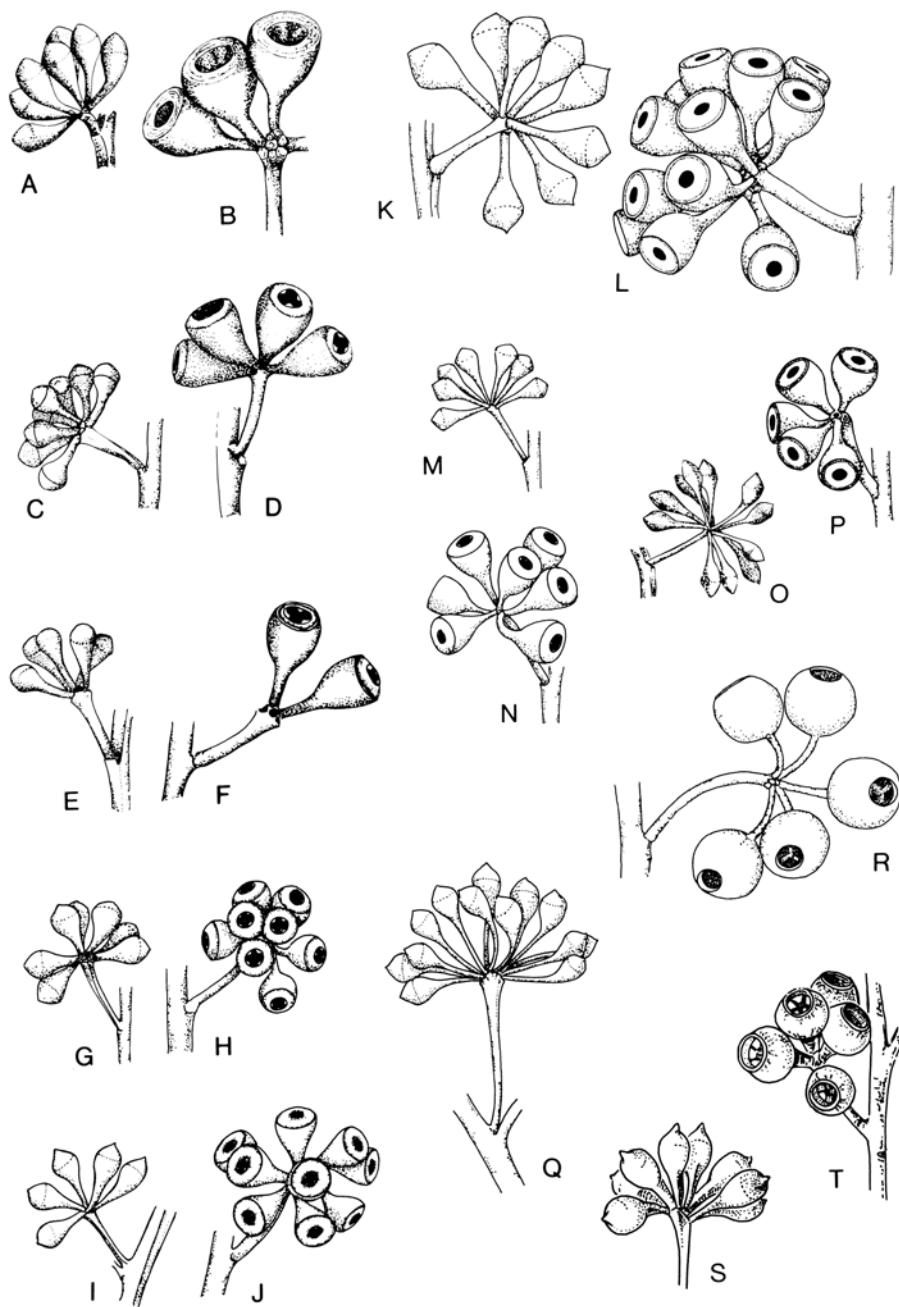


Figure 60. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. remota* (Kangaroo Is., S.A., R.Crocker, NSW 58858, NSW). **C–D**, *E. sieberi* (National Park, N.S.W., J.Camfield, NSW). **E–F**, *E. multicaulis* (**E**, 1.2 km SW of Island Mtn, N.S.W., A.Rodd, NSW; **F**, Kariong trig., N.S.W., W.Blakely, NSW). **G–H**, *E. signata* (**G**, I.Brooker 4716, FRI; **H**, C.Cossalter 171, FRI). **I–J**, *E. sclerophylla* (**I**, G.Chippendale 880 & M.Beeston, FRI; **J**, 10.1 km from Nerriga towards Nowra, C.Dunlop, FRI). **K–L**, *E. haemastoma* (I.Brooker 2829, FRI). **M–N**, *E. racemosa* (N.Hall H77/12, FRI). **O–P**, *E. rossii* (**O**, Mt Ainslie, A.C.T., H.Willings, FRI; **P**, Cotter River, A.C.T., A.Eilert, FRI 12187, FRI). **Q–R**, *E. stenostoma* (D.Kleinig 120, FRI). **S–T**, *E. fraxinoides* (**S**, G.Moran 6, FRI; **T**, D.Boland 1564, FRI). **S**, **T** drawn by M.Risby. Others drawn by M.May.

Ser. 34 Fraxinales

Eucalyptus ser. **Fraxinales** Blakely, *Key Eucalypts* 47, 196 (1934).

Type: *E. fraxinoides* Deane & Maiden

Trees or mallees. Bark smooth throughout, or with some basal fibrous bark, sometimes with insect 'scribbles'. Juvenile leaves alternate, petiolate, concolorous, sometimes discolorous. Adult leaves alternate, petiolate, often falcate, concolorous or rarely slightly discolorous. Conflorences axillary, simple, 3–11-flowered umbels. Buds usually clavate, sometimes cylindrical or turbinate. Fruits globular, subglobular, or ±urceolate, rarely campanulate, hemispherical obconical or cylindrical; disc usually broad, less commonly narrow, usually descending, rarely level or convex; valves usually 3 or 4, sometimes 5, usually included, sometimes ±level. Seeds pyramidal, brown, black or red-brown. *Ashes*.

A series of 11 species mostly in eastern N.S.W., with 2 species extending to south-eastern Qld and 2 species also in Vic. Characterised by having usually all concolorous leaves and brown pyramidal seeds.

156. *Eucalyptus fraxinoides* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 23: 412 & t. 19 (1898)

E. virgata var. *fraxinoides* (Deane & Maiden) Maiden, *Forest Fl. New South Wales* 3: 87 (1907). T: Tantawangalo Mtn near Cathcart, N.S.W., Dec. 1896, *H. Deane s.n.*; syn: NSW; Tantawangalo Mtn, N.S.W., 23 June 1889, *W. Bäuerlen s.n.*; syn: NSW; Tantawangalo Mtn, N.S.W., 1895, *J.H. Maiden*; syn: BM.

Illustrations: S.Kelly *et al.*, *Eucalypts* 2: t. 169 (1983); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 95 (1983); D.J. Boland *et al.*, *Forest Trees Australia* 4th edn, 327 (1984).

Tree to 40 m. Bark fibrous, compact, dark grey up to 10 m, smooth and white above, usually with insect 'scribbles'. Juvenile leaves ovate to broadly lanceolate, light grey or blue-green, concolorous. Adult leaves narrowly lanceolate to lanceolate, falcate, acuminate or uncinat, usually oblique; lamina 8–16 cm long, 1–2 cm wide, green, concolorous; lateral veins faint, at 15°–30°; intramarginal vein 1–2 mm from margin; petiole flattened or channelled, 10–15 mm long. Umbels 7–11-flowered; peduncle angular or flattened, 5–18 mm long; pedicels 1–6 mm long. Buds clavate; operculum conical or hemispherical, apiculate, often warty, 1–2 mm long, 3–4 mm wide; hypanthium hemispherical or obconical, 3–4 mm long and wide. Fruits urceolate or subglobular, 7–11 mm long, 6–11 mm wide; disc moderately broad, descending; valves 4 or 5, included. Seeds black. *White Mountain Ash*. Fig. 60S–T.

Occurs on the central and southern tablelands and escarpment N.S.W. and in the Howe Ra., Vic., usually on cool, moist slopes or mountain tops, often in pure stands in wet sclerophyll forest. Regions: NEPN, HOWE. Map 162.

N.S.W.: 8 km ENE of Hoskinstown, *L.G. Adams 2020* (CANB, MEL); South Tallaganda State Forest, *M.I.H. Brooker 3279* (AD, BRI, FRI, MEL, NSW); 1.6 km NNE of Badja Ck bridge, *G.M. Chippendale 832* (FRI, NSW); Pikes Saddle, Big Badja Hill, *R. Coveny 5756* (AD, BRI, MEL, NSW, PERTH). Vic.: Howe Ra., 19 Nov. 1970, *G. Beach* (MEL, NSW).

Distinguished from other taxa in series *Fraxinales* by dark grey, fibrous bark up to 10 m, and smooth, white bark above with insect 'scribbles', and black seeds. Similar to *E. dendromorpha* which has a somewhat pointed operculum. Has been used for flooring, joinery and general construction, but of low durability.

157. *Eucalyptus triflora* (Maiden) Blakely, *Key Eucalypts* 201 (1934)

E. virgata var. *triflora* Maiden, *Forest Fl. New South Wales* 3: 87 (1907); *E. fraxinoides* var. *triflora* (Maiden) Maiden, *Crit. Revis. Eucalyptus* 4: 301 (1919). T: Pigeon House Mtn near Milton, N.S.W., Dec. 1899, *R.H. Cambage s.n.*; holotype: N.S.W.

Illustrations: N.Hall & M.I.H. Brooker, *Forest Tree Ser.* No. 113 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 170 (1983); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 96 (1983).

Tree to 15 m. Bark smooth throughout, grey or white, sometimes mottled with yellow or orange-yellow, usually with insect 'scribbles'. Juvenile leaves broadly lanceolate, shining, green, slightly discolorous. Adult leaves lanceolate, falcate, acuminate, oblique, thick; lamina 7.5–13 cm long, 1.3–2 cm wide, shining, green, concolorous; lateral veins faint, at 15°–25°; intramarginal vein 1–2 mm from margin; petiole thick, flattened or channelled, 8–15 mm long. Umbels 3-flowered, rarely 7-flowered; peduncle flattened, 3–6 mm long; pedicels absent. Buds cylindrical-clavate, angled due to crowding; operculum hemispherical or conical, 2–3 mm long, 3–5 mm wide; hypanthium cylindrical or hemispherical, 3–4 mm long, 3–5 mm wide, warty. Fruits usually subglobular or suburceolate, sometimes hemispherical, 7–10 mm long, 7–9 mm wide; disc narrow to moderately broad, level or descending; valves 4 or 5, included. Seeds brown. *Pigeon House Ash*. Fig. 61A–B.

Occurs in a restricted area around Pigeon House Mtn and the northern Budawang Ra. area, N.S.W., usually between boulders on sandstone outcrops on elevated areas, as scattered individuals in heathland or in small groups in open forest. Region: HOWE. Map 163.

N.S.W.: 2.7 km E of Endrick R., *M.I.H. Brooker* 3420 (AD, BRI, FRI, MEL, NSW); Pigeon House Mtn, *M.I.H. Brooker* 5412 (FRI); near Camp Rock, Sassafras, *L.A.S. Johnson* 88 (CANB, FRI, NSW).

Recognised by the smooth bark, leathery leaves, usually 3-flowered umbels, and sessile buds and fruits. A rare and restricted taxon.

158. *Eucalyptus paliformis* L.Johnson & Blaxell, *Contr. New South Wales Natl. Herb.* 4: 382 (1973)

T: SE of Wadbilliga trig., Upper Tuross R., N.S.W., 25 Apr. 1971, *L.A.S. Johnson* & *D.F. Blaxell* 490; holo: N.S.W.; iso: FRI, PERTH.

Illustrations: D.J. Boland & M.I.H. Brooker, *Forest Tree Ser.* No. 195 (1977); S. Kelly *et al.*, *Eucalypts* 2: t. 178 (1983); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 105 (1983).

Tree to 12 m. Bark smooth, green, grey, white, red or yellow, with some older trees having up to 2 m of dark grey fibrous bark at base. Juvenile leaves lanceolate, shining, green, discolorous. Adult leaves lanceolate or narrowly lanceolate, falcate, uncinat, slightly crenulate, oblique, thick; lamina 8.5–10 cm long, 1.2–1.5 cm wide, shining, green, concolorous; lateral veins faint, at 15°–30°; intramarginal vein prominent, up to 1 mm from margin; petiole flattened, 5–10 mm long. Umbels 7-flowered; peduncle terete or flattened, 5–8 mm long; pedicels 2–3 mm long. Buds clavate; operculum conical, 1–3 mm long, 2–3 mm wide; hypanthium obconical, 3–4 mm long, 2–3 mm wide. Fruits subglobular, 5–6 mm long, 6–7 mm wide; disc narrow to moderately broad, descending; valves 3, included. Seeds brown. *Wadbilliga Ash*. Fig. 61C–D.

Occurs in Wadbilliga Natl Park, N.S.W.; grows in pure stands in shallow sandy soil on a ridge of the southern tablelands escarpment. Region: HOWE. Map 164.

N.S.W.: 2.4 km SE of Wadbilliga trig., *M.I.H. Brooker* 3299 (BRI, FRI, MEL, NSW); 1.6 km SE of Wadbilliga trig., *M.T. Roberts* 32 (AD, FRI, MEL, NSW).

Distinguished by slightly crenulate leaves, ±subglobular 3-valved fruits and restricted occurrence. A rare taxon.

159. *Eucalyptus dendromorpha* (Blakely) L.Johnson & Blaxell, *Contr. New South Wales Natl. Herb.* 4: 286 (1972)

E. obtusiflora var. *dendromorpha* Blakely, *Austral. Naturalist* 10: 258 (1941). T: West Albion Park, near Macquarie Pass, N.S.W., June 1901, *R.H. Cambage s.n.*; holo: NSW.

Illustrations: D.J. Boland & D.A. Kleinig, *Forest Tree Ser.* No. 216 (1978); S. Kelly *et al.*, *Eucalypts* 2: t. 171 (1983); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 97 (1983).

Tree to 30 m, more usually to 15 m. Bark rough, compact, scaly or flaky, grey-brown to 5 m, then smooth above, grey, white or sometimes green, with insect 'scribbles'. Juvenile leaves broadly lanceolate, falcate, oblique, green, discolorous. Adult leaves lanceolate, falcate, acuminate or uncinat, oblique; lamina 8–11 cm long, 1.5–2 cm wide, green, concolorous;

lateral veins faint, at 20°–30°; intramarginal vein up to 1 mm from margin; petiole flattened, 10–13 mm long. Umbels mostly 7-flowered, sometimes more; peduncle flattened or angular, 5–10 mm long; pedicels thick, 2–4 mm long. Buds clavate, usually warty; operculum conical, 1–3 mm long, 3–4 mm wide; hypanthium cylindrical-conical, 3–4 mm long and wide. Fruits subglobose or suburceolate, 8–11 mm long and wide; disc broad, descending; valves 4, included. Seeds brown. *Budawang Ash*. Fig. 61E–F.

Occurs in the Blue Mts and the Budawang Ra., N.S.W. Grows in sandstone soils on rocky outcrops in tall forest. Regions: NEPN, HOWE. Map 165.

N.S.W.: N of Mt Budawang, *M.I.H. Brooker* 5399 (BRI, FRI, MEL, NSW); Sugarloaf Mtn, 26.6 km SE of Braidwood, *G.M. Chippendale* 827 (FRI, NSW); Blackheath, Jan. 1905, *J.H. Maiden* (NSW).

Distinguished by the rough bark on the lower trunk, the pointed conical operculum, and the sessile fruits. Considered a relict species.

160. *Eucalyptus obtusiflora* DC., *Prodr.* 3: 220 (1828)

T: Port Jackson, N.S.W., 1823, *F.W. Sieber* 473; holo: G; iso: BM, G, K, NSW, W.

Illustrations: N.Hall, *Forest Tree Ser.* No. 38 (1972); S.Kelly *et al.*, *Eucalypts* 1: t. 166 (1983); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 98 (1983).

Mallee to 4 m. Bark smooth throughout, white or grey-green. Juvenile leaves ovate to broadly lanceolate, shining, green, slightly discolorous. Adult leaves lanceolate to broadly lanceolate, uncinata, thick; lamina 6–10 cm long, 1.5–2.5 cm wide, shining, green, concolorous; lateral veins just visible or prominent, at 15°–25°; intramarginal vein 1–2 mm from margin; petiole thick, channelled, 8–15 mm long. Umbels usually 7-flowered; peduncle thick, angular or flattened, 7–16 mm long; pedicels thick, 1–5 mm long. Buds clavate; operculum hemispherical, sometimes apiculate, warty, 2–3 mm long, 5–7 mm wide; hypanthium cylindrical or subpyriform, 5–6 mm long, 5–7 mm wide. Fruits suburceolate or subglobose, 10–13 mm long, 8–11 mm wide; disc moderately broad, descending; valves 4, included. Seeds brown. *Port Jackson Mallee*. Fig. 61G–H.

Occurs in central coastal and nearby tablelands from northern Sydney to Jervis Bay, N.S.W.; grows in sandstone in small pure stands or in mallee communities. Regions: NEPN, HOWE. Map 166.

N.S.W.: Royal Natl Park, *M.I.H. Brooker* 3047 (BRI, FRI, NSW); La Perouse, Sydney, 4 Dec. 1897, *J.H. Camfield* (NSW); 1 km from W Hyams Beach, *G.M. Chippendale* 883 & *M.J. Beeston* (AD, BRI, FRI, MEL, NSW).

Distinguished by the mallee habit, thick shining leaves, clavate buds and suburceolate or subglobose fruits that are larger than in related species.

161. *Eucalyptus stricta* Sieber ex Sprengel, *Syst. Veg.* 4(2): 195 (1827)

E. virgata var. *stricta* (Sieber ex Sprengel) Maiden, *Forest. Fl. New South Wales* 3: 86 (1907). T: Blue Mts or Port Jackson, N.S.W., *F.W. Sieber* 472; holo: G; iso: BM, FI, G, K, L, MEL, NSW, W.

E. ambigua DC., *Prodr.* 3: 219 (1828). T: ‘Nova-Hollandia’, *J.J.H. de Labillardière*; n.v.

E. stricta var. *subcampanulata* Blakely, *Key Eucalypts* 202 (1934). T: Newnes Railway, Blue Mts, N.S.W., Dec. 1928, *G.J. Rodger s.n.*; holo: NSW; iso: FRI.

Illustrations: N.Hall, *Forest Tree Ser.* No. 33 (1972); S.Kelly *et al.*, *Eucalypts* 1: t. 167 (1983); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 100 (1983).

Mallee to 5 m. Bark smooth throughout, white or grey. Juvenile leaves lanceolate, thick, green, concolorous. Adult leaves narrowly lanceolate to lanceolate, acuminate, oblique, thick; lamina 6–10 cm long, 0.6–1 cm wide, green, concolorous; lateral veins faint, at 15°–25°; intramarginal vein 1–2 mm from margin; petiole thick, channelled, 5–10 mm long. Umbels 7-flowered, sometimes more; peduncle flattened or angular, 7–13 mm long; pedicels 1–3 mm long. Buds clavate; operculum hemispherical or conical, 2–3 mm long, 3–4 mm wide; hypanthium subpyriform, 4–5 mm long, 3–4 mm wide. Fruits suburceolate or subglobose,

7–10 mm long, 6–8 mm wide; disc narrow to moderately broad, descending; valves 4, included. Seeds brown. *Blue Mountains Mallee*. Fig. 61 I–J.

Occurs from the Blue Mts and central coast southwards to the Budawang Ra. area, N.S.W., in heathland and shrubland on plateaus and ridge tops. Regions: NEPN, HOWE. Map 167.

N.S.W.: Nerriga, *J.L.Boorman* 4 (NSW); Kings Tableland, *M.I.H.Brooker* 4693 (AD, BRI, FRI, MEL, NSW); Dr George Mtn, *R.Coveny* 7307 (AD, BRI, FRI, MEL, NSW, PERTH).

A smooth-barked mallee; leaves narrower than in *E. obtusiflora* and *E. burgessiana*.

162. *Eucalyptus burgessiana* L.Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 286 (1972)

T: c. 1 km N of Great Western Hwy, Faulconbridge, N.S.W., 11 Mar. 1953, *L.A.S.Johnson & C.Burgess* NSW 132522; holo: NSW; iso: FRI, MEL.

Illustrations: D.Kleinig & D.Boland, *Forest Tree Ser.* No. 221 (1983); S.Kelly *et al.*, *Eucalypts* 2: t. 173 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 99 (1983).

Mallee to 7 m. Bark smooth, grey throughout, the new bark tan to orange. Juvenile leaves broadly lanceolate, dark green, concolorous. Adult leaves lanceolate, uncinata, thick; lamina 8–17 cm long, 1.5–2.5 cm wide, dark green, concolorous; lateral veins just visible, at 30°–40°; intramarginal vein very faint, c. 1 mm from margin; petiole flattened, 12–24 mm long. Umbels 7–11-flowered; peduncle flattened, 7–15 mm long, 3–5 mm wide; pedicels 2–5 mm long. Buds clavate; operculum conical, 2–4 mm long, 3–4 mm wide; hypanthium subpyriform or obconical, 5–6 mm long, 3–4 mm wide. Fruits subglobular or suburceolate, 8–12 mm long and wide; disc moderately broad, descending; valves 4, included. Seeds brown. *Faulconbridge Mallee Ash*. Fig. 61K–L.

Occurs between Springwood and Faulconbridge in the Blue Mts, N.S.W., in sandy soil in dry sclerophyll forest. Region: NEPN. Map 168.

N.S.W.: Faulconbridge, *G.M.Chippendale* 1198 & *M.J.Brennan* (AD, BRI, FRI, MEL, NSW, PERTH); 4.8 km NW of Springwood, *R.Coveny* 3599 (AD, BRI, FRI, MEL, NSW).

A smooth-barked mallee with thick leaves, distinctly flattened peduncle and moderately large buds and fruits. A very restricted taxon in some danger from urban expansion, though occurring in the Blue Mountains Natl Park.

163. *Eucalyptus apiculata* R.Baker & H.G.Smith, *Research Eucalypts* 198 (1902)

T: Berrima, N.S.W., 10 May 1899, *J.J.Fletcher s.n.*; syn: K, NSW; Mittagong, N.S.W., 29 July 1901, *J.J.Hook* 108; syn: K.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 114 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 174 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 101 (1983).

Mallee to 6 m. Bark smooth throughout, white, grey or grey-green. Juvenile leaves lanceolate, shining, green, concolorous. Adult leaves narrowly lanceolate, uncinata or apiculate, thick; lamina 5–10 cm long, 0.5–0.7 cm wide, shining, green, concolorous; lateral veins and intramarginal vein indistinct; petiole thick, flat or channelled, 3–5 mm long. Umbels 3–7-flowered; peduncle thick, terete, 5–10 mm long; pedicels 4–5 mm long. Buds clavate; operculum hemispherical, apiculate, warty, 2–3 mm long, 3–4 mm wide; hypanthium subpyriform, 4–5 mm long, 3–4 mm wide. Fruits subglobular or urceolate, 6–9 mm long, 6–8 mm wide; disc narrow, descending; valves 4, included. Seeds brown. *Narrow-leaved Mountain Mallee*. Fig. 61M–N.

Occurs from the Blue Mts area southwards to Berrima, N.S.W., on rocky plateaus in stunted forest and shrubland. Region: NEPN. Map 169.

N.S.W.: Berrima Colliery, *G.M.Chippendale* 1002 (BRI, FRI, MEL); 14.5 km N of Clarence, *R.Coveny* 3587 (NSW); 1.5 km S of Kandos Weir, *M.D.Crisp* 1277 (AD, CBG, FRI).

Closely related to *E. stricta* but has narrower and more erect leaves. A rare and restricted taxon.

164. *Eucalyptus cunninghamii* Sweet, *Hort. Brit.* 2nd edn, 209 (1830)

Based on *E. microphylla* Cunn. in B.Field, *Geogr. Mem. New South Wales* 350 (1825) *nom. illeg. non Willd. ex Link* (1822). T: Blue Mts, N.S.W., Oct. 1822, A.Cunningham 32; holo: BM, see L.A.S.Johnson, *Fl. Australia* 19: 508 (1988).

E. rupicola L.Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 287 (1972). T: Pulpit Rock, 3.2 km N of Blackheath, N.S.W., 16 Apr. 1953, L.A.S.Johnson NSW 26906; holo: NSW; iso: FRI, MEL.

Illustrations: D.Kleinig & M.I.H.Brooker, *Forest Tree Ser.* No. 169 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 172 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 102 (1983).

Mallee to 2 m. Bark smooth throughout, grey, with insect 'scribbles'. Juvenile leaves linear-lanceolate, shining, green, discolorous, glandular. Adult leaves narrowly lanceolate, acuminate or uncinat, thick; lamina 4–10 cm long, 0.3–0.8 cm wide, shining, green, slightly discolorous; lateral and intramarginal veins indistinct; petiole channelled, 4–8 mm long. Umbels 7-flowered; peduncle terete, 3–8 mm long; pedicels 2–3 mm long. Buds clavate; operculum conical, warty 1–2 mm long, 3–4 mm wide; hypanthium obconical, 3–4 mm long and wide. Fruits subglobose or suburceolate, 5–7 mm long and wide; disc moderately broad, descending; valves usually 3, included. Seeds brown. *Cliff Mallee Ash*. Fig. 61 O–P.

Occurs in restricted areas on cliff edges of the Blue Mts, N.S.W., as an understorey in dry sclerophyll forest. Region: NEPN. Map 170.

N.S.W.: Kings Tableland, *R.Coveny* 3596 (FRI, MEL, NSW, PERTH); Sublime Point, *D.A.Kleinig* 67 (AD, FRI, MEL, NSW).

Similar to *E. apiculata* but with discolorous juvenile leaves, shorter pedicels and slightly smaller buds and fruits; young leaves have a typical pink-grey or blue-grey appearance. A very restricted and rare taxon.

165. *Eucalyptus approximans* Maiden, *J. & Proc. Roy. Soc. New South Wales* 53: 65 (1919)

T: Barren Mtn, N.S.W., 1901, *H.Deane s.n.*; holo: NSW.

Mallee to 4 m. Bark smooth throughout, white or grey. Juvenile leaves lanceolate, shining, green, discolorous. Adult leaves lanceolate or narrowly lanceolate, sometimes falcate, acuminate or uncinat, slightly oblique, thick; lamina shining, green, concolorous; lateral veins faint, at 15°–20°; intramarginal vein up to 1 mm from margin; petiole channelled, 4–10 mm long. Umbels 3- or 7-flowered; peduncle flattened or angular, 3–7 mm long. Buds clavate; operculum hemispherical, warty; hypanthium obconical. Fruits cylindrical or campanulate; disc broad, level or descending; valves 3 or 4, included. Seeds brown.

Occurs in several disjunct areas from Mt Norman and the McPherson Ra., Qld, to the New England Tableland, N.S.W. A spindly mallee forming large clumps, distinguished from related species by the cylindrical or campanulate fruits. There are two subspecies.

Umbels 7-flowered; fruits cylindrical

165a. subsp. *approximans*

Umbels usually 3-flowered; fruits campanulate

165b. subsp. *codonocarpa*

165a. *Eucalyptus approximans* Maiden subsp. *approximans*

Illustrations: S.Kelly *et al.*, *Eucalypts* 2: t. 175 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 103 (1983).

Lamina 8–10 mm long, 0.6–0.9 cm wide. Umbels 7-flowered; pedicels 1–4 mm long. Operculum 1–2 mm long, 2–3 mm wide; hypanthium 3–4 mm long, 2–3 mm wide. Fruits cylindrical, 6–8 mm long, 6–7 mm wide. *Barren Mountain Mallee*. Fig. 61Q–R.

Occurs from the McPherson Ra., Qld, to Barren Mtn in the New England district, N.S.W., usually among granite outcrops in small pure stands. Region: MCPH. Map 171.

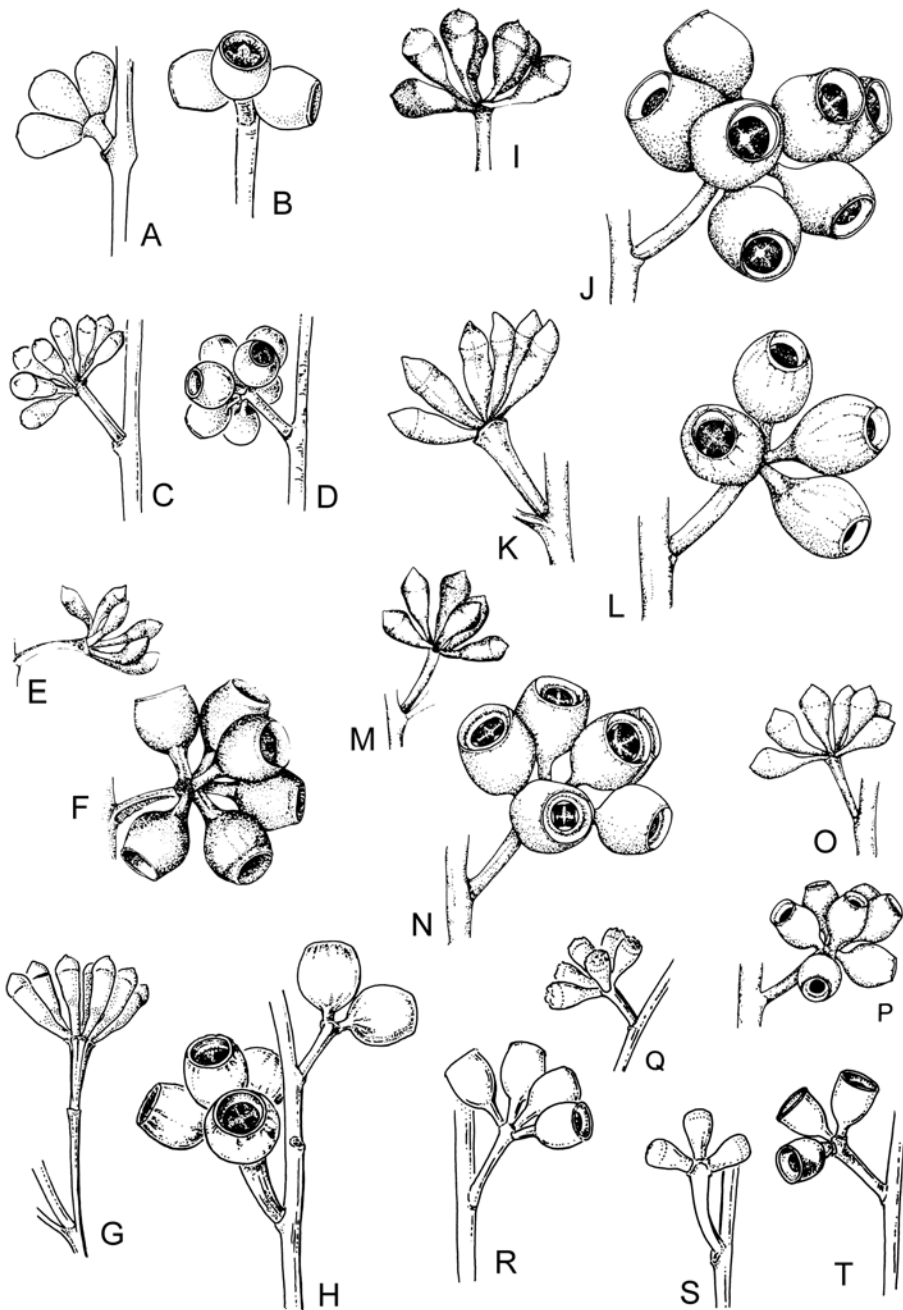


Figure 61. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. triflora* (C.Dunlop 199, FRI). **C–D**, *E. paliformis* (J.Briggs 332, FRI). **E–F**, *E. dendromorpha* (Fitzroy Falls, N.S.W., L.Langley, FRI). **G–H**, *E. obtusiflora* (**G**, Jervis Bay, A.C.T., R.Johnston, FRI). **I–J**, *E. stricta* (**I**, Newnes State Forest, N.S.W., F.Bailey, FRI; **J**, J.Briggs 194, FRI). **K–L**, *E. burgessiana* (**K**, D.Boland 1540, FRI; **L**, J.Briggs 187, FRI). **M–N**, *E. apiculata* (**M**, Berrima Rd, Mittagong, N.S.W., D.Shireess, NSW 27194, NSW; **N**, J.Briggs 205, FRI). **O–P**, *E. cunninghamii* (**O**, J.Briggs 199, FRI; **P**, D.Kleinig 66, FRI). **Q–R**, *E. approximans* subsp. *approximans* (**Q**, cult., Melba, A.C.T., L.Craven, FRI; **R**, J.Briggs 2 & L.Pryor, FRI). **S–T**, *E. approximans* subsp. *codonocarpa* (**S**, R.W.Jessop & M.Gray 3416, FRI; **T**, J.Briggs 15, FRI). **E**, **F** drawn by C.Stahl. **I** drawn by J.Collins. **J–P** drawn by M.May. Others drawn by M.Risby.

N.S.W.: Barren Mtn, Nov. 1913 J.L.Boorman (FRI, MEL, NSW); Barren Mtn, I.R.Telford 1189 (FRI, MEL, NSW).

A rare taxon, of disjunct occurrence.

165b. *Eucalyptus approximans* subsp. *codonocarpa* (Blakely & McKie) L.Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 453 (1973)

E. codonocarpa Blakely & McKie, *Proc. Linn. Soc. New South Wales* 55: 589 (1930). T: Pheasant Mtn, 3.2 km NE of Backwater, N.S.W., 30 Oct. 1929, E.N.McKie, T.Youman & W.F.Blakely s.n.; holo: NSW; iso: BRI, K, L, MEL.

Illustrations: S.Kelly *et al.*, *Eucalypts* 2: t. 176 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 104 (1983).

Lamina 7–11 cm long, 0.9–1.8 cm wide. Umbels 3-flowered; pedicels absent or up to 4 mm long. Operculum 1–2 mm long, 2–4 mm wide; hypanthium 3–4 mm long, 2–4 mm wide. Fruits campanulate, 6–8 mm long, 7–8 mm wide. *Bell-fruited Mallee Ash*. Fig. 61S–T.

Occurs in Qld and N.S.W. on the McPherson Ra. with disjunct occurrences near Wallangarra, and near Backwater, usually in small pure stands among granite outcrops. Region: MCPH. Map 172.

Qld: Mt Maroon, S.L.Everist 7179 (BRI, CANB). N.S.W.: Pheasant Mtn, D.McGillivray & R.Coveny 3607 (BRI, FRI, MEL, NSW, PERTH).

Differs from subsp. *approximans* in the 3-flowered umbels and campanulate fruits. A rare taxon, of disjunct occurrence.

166. *Eucalyptus kybeanensis* Maiden & Cabbage, J. & *Proc. Roy. Soc. New South Wales* 48: 417 (1915)

T: near Kydra trig. stn, 25.8 km E of Nimitybelle [Nimmitabel], N.S.W., 4 Nov. 1908, R.H.Cabbage s.n.; holo: NSW; iso: FRI, K.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 95 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 177 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 106 (1983).

Mallee to 4 m, or rarely a tree to 18 m. Bark smooth throughout, white, grey or grey-green. Juvenile leaves lanceolate, shining, green, slightly discoloured. Adult leaves lanceolate, erect, falcate, uncinat, thick; lamina 5–9 cm long, 0.6–1.3 cm wide, green, concolorous; lateral veins faint, at 20°–30°; intramarginal vein faint, c. 1 mm from margin; petiole thick, 3–5 mm long. Umbels 3–11-flowered; peduncle angular or terete, 1–5 mm long; pedicels absent. Buds broadly clavate or turbinate, warty; operculum low hemispherical, usually apiculate, 1–2 mm long, 3–4 mm wide; hypanthium subpyriform or hemispherical, 3–4 mm long and wide. Fruits hemispherical or obconical, 4–5 mm long, 5–8 mm wide; disc broad level, convex or just below rim; valves 4 or 5, level or just included. Seeds red-brown. *Kybean Mallee Ash*. Fig. 62A–B.

Occurs from the Munyang Ra., N.S.W., southwards and westwards to Mt Useful, Vic. Grows on exposed high altitude mountains and plateaus mostly in small pure stands. Region: HOWE. Map 173.

N.S.W.: Wadbilliga trig., D.F.Blaxell 489 (FRI, NSW). Vic.: Brumby Point, Nunniong Plateau, 13 Nov. 1964, J.H.Willis (AD, FRI, MEL, NSW).

Distinguished by the sessile buds and fruits, and occurrence at high altitudes in south-eastern N.S.W. and Vic. Fruit smaller than in *E. approximans*.

Ser. 35 Longitudinales

Eucalyptus ser. **Longitudinales** Blakely, *Key Eucalypts* 49, 203 (1934).

Type: *E. stellulata* Sieber ex DC., lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 500 (1988).

E. subser. *Cylindriformes* Blakely, *op. cit.* 49, 206. T: *E. stellulata* Sieber ex DC., lecto, *fide* G.M.Chippendale, *loc. cit.*

Mallees or small trees. Bark smooth, sometimes with retained compact bark at base. Juvenile leaves alternate or opposite, sessile or rarely petiolate, green. Adult leaves alternate, petiolate, uncinata, green, concolorous; lateral veins at 10°–15°. Conflorescences axillary, simple, 7–many-flowered umbels. Buds sessile, fusiform. Fruits globular or subglobular, sessile; disc narrow to moderately broad, level or descending; valves 3, included or nearly level. Seeds ±pyramidal, red-brown.

A series of 3 species in N.S.W. and Vic., recognised by the smooth bark, concolorous leaves, sessile buds and small sessile fruits.

167. *Eucalyptus mitchelliana* Cambage, J. & Proc. Roy. Soc. New South Wales 52: addendum slip to 457 t. 38 (?1919)

E. mitchellii Cambage, *op. cit.* 457 (1916) *nom. illeg.* non Ettingsh. (1861). T: Mt Buffalo, Vic., Jan. 1913, *R.H.Cambage* 3786; holo: NSW; iso: MEL.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 90 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 183 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 107 (1983).

Tree to 15 m. Bark white to grey. Juvenile leaves alternate, petiolate, lanceolate, dark green, discolorous. Adult leaves lanceolate to narrowly lanceolate, moderately thick; lamina 7.5–13 cm long, 0.7–1.3 cm wide; intramarginal vein c. 1 mm from margin; petiole ±terete, 10–15 mm long. Umbels 7–11-flowered; peduncle terete, 1–5 mm long. Operculum conical, acute, 3–4 mm long and wide; hypanthium obconical, 4–5 mm long, 3–4 mm wide. Fruits subglobular, 5–7 mm long and wide; disc broad; valves level or just included. *Mt Buffalo Sallee*. Fig. 62C–D.

Occurs on the Mt Buffalo plateau, Vic., on the edges of slopes among granite outcrops in open eucalypt forest. Region: HOWE. Map 174.

Vic.: Near Mt Buffalo Chalet, *N.Hall* 2 (AD, FRI, MEL, NSW, PERTH); E of Mt Buffalo Chalet, *T.B.Muir* 656 (AD, CANB, NSW, PERTH).

Distinguished by the narrow leaves, sessile fusiform buds and subglobular fruits. A rare species, occupying less than 100 hectares, in Mt Buffalo Natl Park. Has high potential as an ornamental for alpine areas.

168. *Eucalyptus stellulata* Sieber ex DC., Prodr. 3: 217 (1828)

T: Port Jackson to the Blue Mts, N.S.W., 1823, *F.W.Sieber* 478; holo: G; iso: BM, FI, K, L, MEL, NSW, W.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 199 (1970); S.Kelly *et al.*, *Eucalypts* 1: t. 169 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 108 (1983).

Tree to 15 m. Bark dark grey, grey-black or olive green. Juvenile leaves opposite, sessile but becoming shortly petiolate, orbicular to ovate, green, discolorous. Adult leaves elliptic to broadly lanceolate, thick; lamina 5–9 cm long, 1.3–2.3 cm wide, shining; lateral veins conspicuous with 3 main veins; intramarginal vein 1–3 mm from margin; petiole terete or flattened, 4–9 mm long. Umbels 7–23-flowered; peduncle terete, 1–5 mm long. Operculum conical, acute, 3–4 mm long, 2–3 mm wide; hypanthium obconical, 2–3 mm long and wide. Fruits globular, 3–5 mm long and wide; disc level; valves included. *Black Sallee*. Fig. 62E–F.

Occurs from near Wallangarra, N.S.W., southwards to near Melbourne, Vic., usually on small flat areas among mountains and tablelands in open woodland. Regions: MCPH, NEPN, HOWE. Map 175.

N.S.W.: Jenolan Caves, Nov. 1899, *W.F.Blakely* (NSW); 22.5 km E of Armidale, *M.I.H.Brooker* 3908 (FRI, NSW); 21.7 km ESE of Michelago, *G.M.Chippendale* 733 (FRI, MEL, NSW, PERTH). Vic.: Mt Useful, 5 May 1974, *J.H.Willis* (MEL); Bennison Plains, 90 km N of Traralgon, 14 Mar. 1966, *J.H.Willis* (MEL, NSW).

Differs from *E. mitchelliana* in the tree habit, smooth, olive green, dark grey or grey-black bark (the old compact bark persistent at base), small leaves with three veins almost parallel to the margin, shorter buds and smaller fruits.

Leaves broader than in *E. mitchelliana* and *E. moorei*.

169. *Eucalyptus moorei* Maiden & Cabbage, *Proc. Linn. Soc. New South Wales* 2nd ser., 30: 191 (1905)

Based on *E. stellulata* var. *angustifolia* Benth., *Fl. Austral.* 3: 201 (1867). T: Blackheath, N.S.W., Jan. 1905, *J.H.Maiden*; lecto, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 4: 218 (1919): NSW.

[*E. microphylla* auct. non Cunn.: G.Bentham, *Fl. Austral.* 3: 201 (1867)]

Tree or mallee to 8 m. Bark white or grey. Juvenile leaves at first opposite, becoming alternate, sessile, becoming petiolate, lanceolate, concolorous. Adult leaves narrowly lanceolate or lanceolate, thick; lamina 4–7 cm long; intramarginal vein indistinct, or c. 1 mm from margin; petiole terete or flattened, 2–5 mm long. Umbels 7–15-flowered; peduncle terete, 1–3 mm long. Operculum conical, 2–3 mm long, 1–3 mm wide; hypanthium obconical, 2–3 mm long, 1–3 mm wide. Fruits subglobular, 3–4 mm long and wide; disc descending; valves included.

Occurs in the Gibraltar Ra., Blue Mts and southern tablelands, N.S.W., in sandy soil in heathland. Differs from *E. stellulata* in the mallee habit, conical operculum and descending disc. There are two varieties.

Adult leaves 5–10 mm wide

169a. var. *moorei*

Adult leaves 12–17 mm wide

169b. var. *latiuscula*

169a. *Eucalyptus moorei* Maiden & Cabbage var. *moorei*

Illustrations: N.Hall, *Forest Tree Ser.* No. 34 (1972); S.Kelly *et al.*, *Eucalypts* 1: t. 170 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 109 (1983).

Mallee or small tree, to 12 m. Lamina of adult leaves 5–10 mm wide. Fruits crowded. *Narrow-leaved Sallee*. Fig. 62G–H.

Occurs in N.S.W., in the Gibraltar Ra. of New England, the Blue Mts and southern tablelands in disjunct areas, particularly the Budawang Ra., usually forming thickets on exposed sandstone plateaus. Regions: MCPH, NEPN, HOWE. Map 176.

N.S.W.: Minna Ha Ha Falls, *M.I.H.Brooker* 3015 (FRI, NSW); 2.4 km SE of Wadbilliga Trig., *M.I.H.Brooker* 3300 (AD, FRI, MEL, NSW); Gibraltar Ra., 29 May 1974, *J.B.Williams* (NSW).

169b. *Eucalyptus moorei* var. *latiuscula* Blakely, *Key Eucalypts* 207 (1934)

T: Tuross R., 16 miles [25.8 km] E of Nimitybelle [Nimmitabel], N.S.W., 4 Nov. 1908, *R.H.Cabbage* 1981; holo: NSW; iso: FRI.

Illustrations: S.Kelly *et al.*, *Eucalypts* 2: t. 184 (1983).

Mallee to 4 m. Lamina of adult leaves 12–17 mm wide. Fruits usually forming globular clusters. Fig. 62 I–J.

Occurs in the Wentworth Falls area, the Tinderry Mtns, and the Tuross R. headwaters, in sandy soil in heathland. Regions: NEPN, HOWE. Map 177.

N.S.W.: 2 km SE of Wadbilliga Trig., *M.I.H.Brooker* 6943 (FRI); Wentworth Falls, 21 July 1957, *L.A.S.Johnson* (NSW).

Ser. 36 Piperitales

Eucalyptus ser. **Piperitales**, Blakely, *Key Eucalypts* 50, 208 (1934).

Type: *E. piperita* Smith

Trees. Bark fibrous, grey on trunk and larger branches, smooth and white or grey above. Juvenile leaves alternate, petiolate, ovate, falcate, concolorous. Adult leaves alternate, petiolate, falcate, acuminate, oblique, green or blue-green, dull, concolorous. Conflorences axillary, simple, 7–15-flowered umbels. Buds fusiform; operculum conical; hypanthium obconical. Fruits ovoid or urceolate; disc descending; valves 3 or 4, included. Seeds pyramidal, red-brown.

A series of one species in N.S.W., recognised by the peppermint scent of the oil and the pedicellate ovoid to urceolate fruits.

170. *Eucalyptus piperita* Smith in J.White, *White's Voy.* 226 (1790)

T: Port Jackson, N.S.W., *J.White s.n.*; holotype: LINN; iso: BM,

Metrosideros aromatica Salisb., *Prodr.* 351 (1796); *E. aromatica* (Salisb.) Domin, *Biblioth. Bot.* 89: 461 (1928). T: Port Jackson, N.S.W., *D.Burton*; *n.v.*

E. piperita var. *laxiflora* Benth., *Fl. Austral.* 3: 207 (1867). T: Manly Beach, N.S.W., *W.Woolfs s.n.*; syn: K, MEL; Twofold Bay, N.S.W., *F.Mueller*; syn: MEL; Camden, N.S.W., *J.Backhouse s.n.*; syn: *n.v.*; Macleay R., N.S.W., *H.Beckler*; syn: *n.v.*; Clarence R., N.S.W., *H.Beckler s.n.*; syn: MEL.

E. bottii Blakely, *J. & Proc. Roy. Soc. New South Wales* 61: 163 (1927), *fide* L.Pryor & L.A.S.Johnson, *Class. Eucalypts* 61 (1971). T: between Stanwell Park and Otford, N.S.W., *W.F.Blakely s.n.*; holotype: NSW (sheet labelled Type by Blakely).

Tree to 20–30 m. Adult leaves lanceolate; lateral veins just visible, at 15°–25°; intramarginal vein 1–3 mm from margin. Fruits ovoid or urceolate; disc broad.

Occurs in the central coast and nearby tablelands, N.S.W., in dry sclerophyll forest. There are two subspecies.

Capsules ovoid

170a. subsp. piperita

Capsules urceolate

170b. subsp. urceolaris

170a. *Eucalyptus piperita* Smith subsp. *piperita*

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 215 (1970); S.Kelly *et al.*, *Eucalypts* 2: t. 190 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 120 (1983).

Tree to 20 m. Adult leaves: lamina 10–16 cm long, 1–3 cm wide; petiole slightly flattened, 12–20 mm long. Peduncle flattened, dilated, or quadrangular, 5–18 mm long; pedicel quadrangular or terete, 2–6 mm long. Operculum conical, 3–6 mm long, c. 3 mm wide; hypanthium obconical, 3–6 mm long, c. 3 mm wide. Fruits ovoid, 6–7 mm long, 6–8 mm wide. *Sydney Peppermint*. Fig. 62K–L.

Occurs in N.S.W. in the Blue Mts, tablelands and coastal areas from near Dungog southwards to near Batemans Bay, often on the sides of valleys in dry sclerophyll forest. Regions: NEPN, HOWE. Map 178.

N.S.W.: 22 km N of Batemans Bay, *M.I.H.Brooker* 6228 (FRI); Sublime Point, Blue Mts, *G.M.Chippendale* 1211 & *M.J.Brennan* (AD, BRI, FRI, MEL, NSW, PERTH); Genowlan Mtn, *E.F.Constable* 5040 (FRI, NSW); 12.9 km S of Dungog, *R.Story* 7359 (BRI, NSW).

Distinguished by fibrous bark on trunk and larger branches, peppermint-scented leaves and ovoid fruits.

170b. *Eucalyptus piperita* subsp. *urceolaris* (Maiden & Blakely) L.Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 381 (1973)

E. urceolaris Maiden & Blakely in J.H.Maiden, *Crit. Revis. Eucalyptus* 8: 10, t. 45 fig. 6 (1929). T: Wingello, N.S.W., Sept. 1899, *J.L.Boorman* NSW. 132541; holo: NSW.

Illustrations: S.Kelly *et al.*, *Eucalypts* 2: t. 189 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 120 (1983).

Tree to 30 m. Adult leaves: lamina 6–18 cm long, 1.5–3 cm wide; petiole slightly flattened, 14–18 mm long. Peduncle quadrangular, 8–15 mm long; pedicels quadrangular, 3–5 mm long. Operculum conical, 2–4 mm long, 2–3 mm wide; hypanthium obconical, 2–4 mm long, 2–3 mm wide. Fruits urceolate, 7–9 mm long, 6–7 mm wide. *Sydney Peppermint*. Fig. 62M–N.

Occurs south of Sydney from about Wingello to the Clyde R. and Shoalhaven R., N.S.W., in dry sclerophyll forest. Regions: NEPN, HOWE. Map 179.

N.S.W.: 35.4 km N of Batemans Bay, *M.I.H.Brooker* 3289 (BRI, FRI, MEL, NSW); Sassafras, *M.Gray* 3538 (CANB, NSW); Mittagong, Jan. 1926, *D.W.C.Shireess* (NSW).

Distinguished from subsp. *piperita* in the urceolate fruits, but the two subspecies intergrade.

Ser. 37 Radiatae

Eucalyptus* ser. *Radiatae Chippendale, *Fl. Australia* 19: 504 (1988).

Type: *E. radiata* Sieber ex DC.

E. ser. Piperitales Blakely, *Key Eucalypts* 50, 208 (1934) *p.p.* not as to type.

Trees, shrubs or mallees. Bark fibrous on lower part of trunk, or up to larger branches, or throughout, or smooth throughout. Juvenile leaves opposite, sessile, sometimes becoming shortly petiolate, usually at least slightly discolourous. Adult leaves alternate, petiolate, concolorous, aromatic with a peppermint-type scent. Conflourescences axillary, simple, 3–40-flowered umbels. Buds clavate. Fruits hemispherical, subglobular, ±pyriform, conical or obconical; disc usually moderately broad, ±level, descending, convex or ascending; valves 3–5, usually ±level, less commonly included. Seeds ±pyramidal, red-brown. *Peppermints*.

A series of 10 species in eastern N.S.W., Vic., south-eastern S.A. and Tas. Trees or mallees with fibrous or smooth bark, concolorous peppermint-scented leaves and simple axillary conflourescences of clavate buds. The seedling stem has many raised oil glands.

P.Y.Ladiges *et al.*, Cladistic relationships and biogeographic patterns in the peppermint group of *Eucalyptus* (informal subseries *Amygdalininae*, subgenus *Monocalyptus*) and the description of a new species, *E. willisii*, *Austral. J. Bot.* 31: 565–584 (1983).

171. *Eucalyptus radiata* Sieber ex DC., *Prodr.* 3: 218 (1828)

T: New South Wales, 1823, *F.W.Sieber* 475 [cited in error as *Sieber* 425]; holo: G; iso: F, G, K, L, MEL, W.

E. australiana R.Baker & H.G.Smith, *J. Roy. Soc. New South Wales* 49: 514 (1916); *E. radiata* var. *australiana* (R.Baker & H.G.Smith) Blakely, *Key Eucalypts* 211 (1934). T: ?Nerrigundah, N.S.W., 1913, *W.F.Farrell s.n.*; *n.v.*

E. phellandra R.Baker & H.G.Smith, *Res. Eucalyptus* 2nd edn, 280 (1920). T: Moss Vale, N.S.W., 22 Nov. 1917, *C.J.Clulee s.n.*; syn: NSW; Monga, N.S.W., July 1898, *W.Bäuerlen s.n.*; syn: NSW.

E. radiata var. *subplatyphylla* Blakely & Mckie, *Key Eucalypts* 212 (1934). T: Aberfoyle Road, Guyra, N.S.W., Dec. 1932, *E.N.McKie s.n.*; syn: NSW; 6 miles [c. 10 km] S of Guyra, N.S.W., *collector unknown*; syn: *n.v.*; Butterleaf State Forest, N.S.W., *collector unknown*; syn: *n.v.*; Hanging Rock, Nundle, N.S.W., June 1906, *J.H.Maiden s.n.*; syn: NSW; Hanging Rock via Nundle, N.S.W., Feb. 1915, *A.Julius*

s.n.; syn: NSW.

E. radiata var. *subexserta* Blakely, *Key Eucalypts* 211 (1934). T: Jenolan Caves, N.S.W., 18 July 1899, *W.F. Blakely s.n.*; syn: NSW; Jenolan Caves, N.S.W., Nov. 1928, *J.C. Wibur s.n.*; syn: NSW.

Tree 10–50 m. Bark fibrous, grey-brown throughout, or with smaller branches becoming smooth. Juvenile leaves narrowly to broadly lanceolate. Adult leaves linear to lanceolate; lateral veins at 20°–40°; intramarginal vein 1–2 mm from margin. Umbels 7–23-flowered; peduncle terete. Operculum hemispherical to conical; hypanthium obconical. Fruits hemispherical, subglobular or subpyriform; disc broad, \pm level, occasionally descending; valves 3 or 4. Fig. 4.

Occurs in N.S.W., A.C.T. and Vic., in open forest and tall open forest. Differs from *E. dives* especially in the narrower, thin leaves. There are two subspecies.

Adult leaves narrowly lanceolate, green

171a. subsp. radiata

Adult leaves narrowly to broadly lanceolate, grey-green or subglaucous

171b. subsp. robertsonii

171a. *Eucalyptus radiata* Sieber ex DC. subsp. radiata

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 175 (1983); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 115 (1983); D.J. Boland *et al.*, *Forest Trees Australia* 4th edn, 343 (1984).

Tree to 30 m, often 10–15 m. Juvenile leaves green. Adult leaves narrowly lanceolate to almost linear, acuminate, thin; lamina 7–15 cm long, 0.7–1.5 cm wide, green; petiole terete, 5–15 mm long. Peduncle 2–8 mm long; pedicels 1–5 mm long. Operculum 1–2 mm long, 2–3 mm wide; hypanthium 2–3 mm long and wide. Fruits hemispherical or subglobular, 3–7 mm long, 4–7 mm wide; disc level; valves \pm level. *Narrow-leaved Peppermint*. Fig. 62 O–P.

Occurs throughout eastern N.S.W., A.C.T. and Vic. from the northern tablelands southwards including some near-coastal areas, usually in open forest. Regions: MCPH, NEPN, HOWE, OTWY. Map 180.

N.S.W.: 1.6 km N of Woodford, *R.H. Cambage* 4004 (NSW); Mt Coricudgy, *R. Coveny* 972 (FRI, NSW); 4 km S of Taralga, *R.T. Eakin* 59 (AD, FRI, MEL, NSW). Vic.: 4.8 km NNE of Yarram, *G.M. Chippendale* 986 & *M.J. Beeston* (AD, FRI, MEL); Strathbogie, Nov. 1902, *H.B. Williams* (MEL).

Has been used in commercial oil distillation. The wood is useful in general construction.

171b. *Eucalyptus radiata* subsp. robertsonii (Blakely) L. Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 380 (1973)

E. robertsonii Blakely, *J. Roy. Soc. New South Wales* 61: 167 (1927). T: Talbingo Mtn, N.S.W., Sept. 1924, *C.C. Robertson* & *W.A.W. de Beuzeville s.n.* [cited by Blakely as '*A.W. Howitt, C.C. Robertson & W.A.W. de Beuzeville*']; holo: NSW; iso: K.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 173 (1983); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 116 (1983); D.J. Boland *et al.*, *Forest Trees Australia* 4th edn, 345 (1984).

Tree to 50 m. Juvenile leaves grey-green or blue-grey. Adult leaves lanceolate to narrowly lanceolate, acuminate, thin; lamina 7.5–13 cm long, 0.8–1.5 cm wide, grey-green or subglaucous; petiole terete, 5–12 mm long. Peduncle 5–8 mm long; pedicels 1–3 mm long. Operculum 1–2 mm long, 1–3 mm wide; hypanthium 2–3 mm long, 1–3 mm wide. Fruits subglobular or subpyriform, 4–5 mm long and wide; disc level; valves level or included. *Narrow-leaved Peppermint*. Fig. 62Q–R.

Occurs on the central and southern tablelands, N.S.W. and A.C.T. through Gippsland, Vic., on slopes in mountain areas, in open forest to tall open forest. Regions: NEPN, HOWE. Map 181.

N.S.W.: 19.3 km E of Tumut, *M.I.H. Brooker* 2968 (FRI, NSW); 1.5 km NE of Mullion Ck, *R. Coveny* 4166 (AD, BRI, FRI, MEL, NSW). Vic.: 8.5 km N of Orbost, *M.I.H. Brooker* 4417 (FRI, MEL, NSW); 4.4 km NNE of Yarram, *G.M. Chippendale* 988 & *M.J. Beeston* (BRI, FRI, MEL).

A taller tree than subsp. *radiata*, with ±glaucous juvenile and adult leaves. Although the wood has a high shrinkage rate, it has been used in some constructions. The species has been planted for shade in New Zealand.

172. *Eucalyptus elata* Dehnh., *Cat. Plant. Hort. Camaldulensis* 1: 26 (1829)

T: Hortus Camaldulensis, Italy (cultivated), *F. Dehnhardt s.n.*; *n.v.*

E. andreaana Naudin, *Rev. Hort.* 346 (1890). T: cultivated specimen from gardens in France; *n.v.*

E. lindleyana var. *stenophylla* Blakely, *Key Eucalypts* 209 (1934). T: Nullica, near Eden, N.S.W., 12 Oct. 1932, W.A.W. de Beuzeville *s.n.*; iso: FRI, K.

[*E. lindleyana* auct. non DC.: W.F. Blakely, *Key Eucalypts* 209 (1934)]

Illustrations: S. Kelly *et al.*, *Eucalypts* 1: t. 172 (1983); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 117 (1983); D.J. Boland *et al.*, *Forest Trees Australia* 4th edn, 349 (1984).

Tree to 30 m. Bark fibrous to c. 10 m, compact, dark grey, with longitudinal fissures, then smooth, grey or white above. Juvenile leaves lanceolate, amplexicaul, green. Adult leaves narrowly lanceolate, acuminate, thin; lamina 10–14 cm long, 0.7–1.3 cm wide, green; lateral veins faint, at 15°–25°; intramarginal vein up to 1 mm from margin; petiole terete, 10–15 mm long. Umbels up to 40-flowered; peduncle angular, 5–10 mm long; pedicels 2–5 mm long. Operculum hemispherical or conical, c. 1 mm long, 1–2 mm wide; hypanthium obconical or subpyriform, 2–3 mm long and wide. Fruits subglobular, 4–6 mm long and wide; disc broad, descending or level; valves 3 or 4, included. *River Peppermint*. Fig. 63K–L.

Occurs in central coastal and tableland areas of N.S.W. southwards through east Gippsland and adjacent north-eastern Vic. Grows usually along watercourses, but also in undulating country, sometimes on rocky ridges and screes in open forest and tall open forest. Regions: NEPN, HOWE. Map 182.

N.S.W.: Werriberri Ck, The Oaks, W.A.W. de Beuzeville 129 (FRI, NSW); 15.5 km from Braidwood towards Araluen, P. Martensz 942 (BRI, FRI, NSW); Brown Mtn, E of Nimmitabel, R. Pullen 4035 (BRI, CANB, NSW). Vic.: Genoa, J.P. Baker 137 (FRI, MEL, NSW); 3.2 km N of Nungatta homestead, R. Filson 11088 (MEL, NSW).

Distinguished by hard fibrous bark to c. 10 m on trunk, peppermint-scented, narrowly lanceolate adult leaves, many-flowered umbels and crowded fruits. The wood is suitable for joinery and interior finish. The species is used as street trees or in large gardens. The leaves have been used for oil distillation. Differs from *E. radiata*, *E. amygdalina* and *E. nitida* in having rough bark on only half the trunk, and from *E. dives* and *E. willisii* in the narrower leaves.

173. *Eucalyptus dives* Schauer in W.G. Walpers, *Repert. Bot. Syst.* 2: 926 (1843)

T: N of Bathurst, N.S.W., Dec. 1822, A. Cunningham 181; iso: BM, K, MEL.

E. amygdalina var. *latifolia* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 20: 609 (1896). T: not designated; *n.v.*

Illustrations: S. Kelly *et al.*, *Eucalypts* 1: t. 176 (1983); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 118 (1983); D.J. Boland *et al.*, *Forest Trees Australia* 4th edn, 351 (1984).

Tree to 25 m. Bark fibrous, grey-brown on trunk and larger branches, then smooth and grey above. Juvenile leaves ovate, rarely connate, usually glaucous. Adult leaves broadly lanceolate, acuminate, thick; lamina 7–15 cm long, 1.6–3.3 cm wide, shining, green; lateral veins usually conspicuous, at 15°–30°; intramarginal vein up to 2 mm from margin; petiole terete, 10–16 mm long. Umbels with 11–15 or more flowers; peduncle terete or angular, 5–13 mm long; pedicels 2–5 mm long. Operculum hemispherical, apiculate or conical, 2–3 mm long and wide; hypanthium obconical or subpyriform, 3–4 mm long, 2–3 mm wide. Fruits hemispherical, obconical or subpyriform, 5–7 mm long, 4–7 mm wide; disc broad, level, convex or ascending; valves 3 or 4, level. *Broad-leaved Peppermint*. Fig. 62S–T.

Occurs widely on the central and southern tablelands, N.S.W. and A.C.T., and in southern Vic., in open forest and woodland. Regions: MCPH, NEPN, HOWE, OTWY. Map 183.

N.S.W.: Bowning, W.A.W. *de Beuzeville* 495 (FRI, NSW); 26.2 km from Walcha towards Ingalba, R.W. *Jessup* 3362 (CANB, NSW); 14.5 km SW of Tarago, G.P. *Smith* 26 (BRI, CBG, FRI, MEL, NSW, NT). Vic.: 9 km S of Wooriyallock, G.M. *Chippendale* 977 & M.J. *Beeston* (BRI, FRI, MEL); Mt Granya, 3 June 1962, J.H. *Willis* (MEL).

Distinguished from related species by the thick, broad juvenile and adult leaves with a strong peppermint scent. Buds slightly longer than those of *E. radiata*. The wood has been used for local construction, but is not greatly durable; the leaves have been used, and still are in some areas, for oil distillation.

174. *Eucalyptus willisii* Ladiges, Humphries & Brooker, *Aust. J. Bot.* 31: 583 (1983)

T: Mt Oberon car park, Wilsons Promontory, Vic., 27 Nov. 1982, M.I.H. *Brooker* 7792 & P.Y. *Ladiges*; holotype: MEL; isotype: FRI, NSW.

Tree or mallee to 15 m. Bark usually fibrous, grey-brown at base of trunk, smooth above. Juvenile leaves broadly lanceolate, cordate, green. Adult leaves lanceolate to narrowly lanceolate, uncinately, \pm thick, dull, light green; lateral veins quite visible, at 15°–20°; intramarginal vein up to 2 mm from margin; petiole terete, 8–16 mm long. Umbels with 11 or more flowers; peduncle terete, 6–10 mm long; pedicels 2–5 mm long. Operculum hemispherical, 1–2 mm long, 2–3 mm wide; hypanthium obconical, 3–4 mm long, 2–3 mm wide. Fruits hemispherical or obconical, disc \pm broad, level; valves 3 or 4, \pm level.

Occurs in south-eastern S.A. and southern Vic., in open forest or woodland. Differs from *E. dives* mainly in having rough bark only at base of trunk, and in the narrower leaves. There are 2 subspecies.

M.R. *Newnham et al.*, Origin of the Grampians Shining Peppermint—a new subspecies of *Eucalyptus willisii* Ladiges, Humphries & Brooker, *Austral. J. Bot.* 34: 331–348 (1980).

Fruits 4–5 mm long; juvenile leaves not falcate or twisting

174a. subsp. *willisii*

Fruits 6–7 mm long; juvenile leaves falcate and twisting by 8th node

174b. subsp. *falciformis*

174a. *Eucalyptus willisii* Ladiges, Humphries & Brooker subsp. ***willisii***

[*E. vitrea* auct. non R. Baker: A.J. *Ewart*, *Fl. Victoria* 617 (1930)]

[*E. nitida* auct. non J.D. Hook.: J.H. *Willis*, *Handb. Pl. Victoria* 2: 415, 416 (1972)]

Juvenile leaves broadly lanceolate, cordate. Adult leaves: lamina 11–14 cm long, 1.5–2 cm wide. Fruits 4–5 mm long, 4–6 mm wide. Fig. 62U–V.

Occurs in several disjunct areas, from Penola Forest near Mt Gambier, S.A., to Gippsland, Vic. Regions: OTWY, HOWE. Map 184.

S.A.: 3 km NE of Wandilo railway siding, I.B. *Wilson* 989 (CANB, FRI, NSW). Vic.: Mt Oberon, 14 Jan. 1967, J.H. *Willis* (MEL); 8 km SE of Rosedale, 2 Feb. 1972, J.H. *Willis* (MEL, NSW).

Distinguished by fibrous, grey-brown bark at least at trunk base, lanceolate to narrowly lanceolate adult leaves with acute lateral veins and fruits 4–5 mm long.

174b. *Eucalyptus willisii* subsp. ***falciformis*** Newnham, Ladiges & Whiffin, *Austral. J. Bot.* 34: 348 (1986)

T: intersection Taylor Road & Burrong Shortcut, W of Mt Victory, The Grampians, Vic., 12 July 1985, M. *Newnham* 64; holotype: MEL; isotype: FRI, NSW.

Juvenile leaves sessile to 10th node, becoming petiolate, cordate to tapering, falcate and twisting by 8th node. Adult leaves: lamina 8.5–18 cm long, 0.9–3 cm wide. Fruits 6–7 mm long, 5–6 mm wide. Fig. 62W–X.

Restricted to The Grampians, Vic. Region: OTWY. Map 185.

Distinguished by falcate and twisting juvenile leaves by 8th node, and fruits 6–7 mm long.

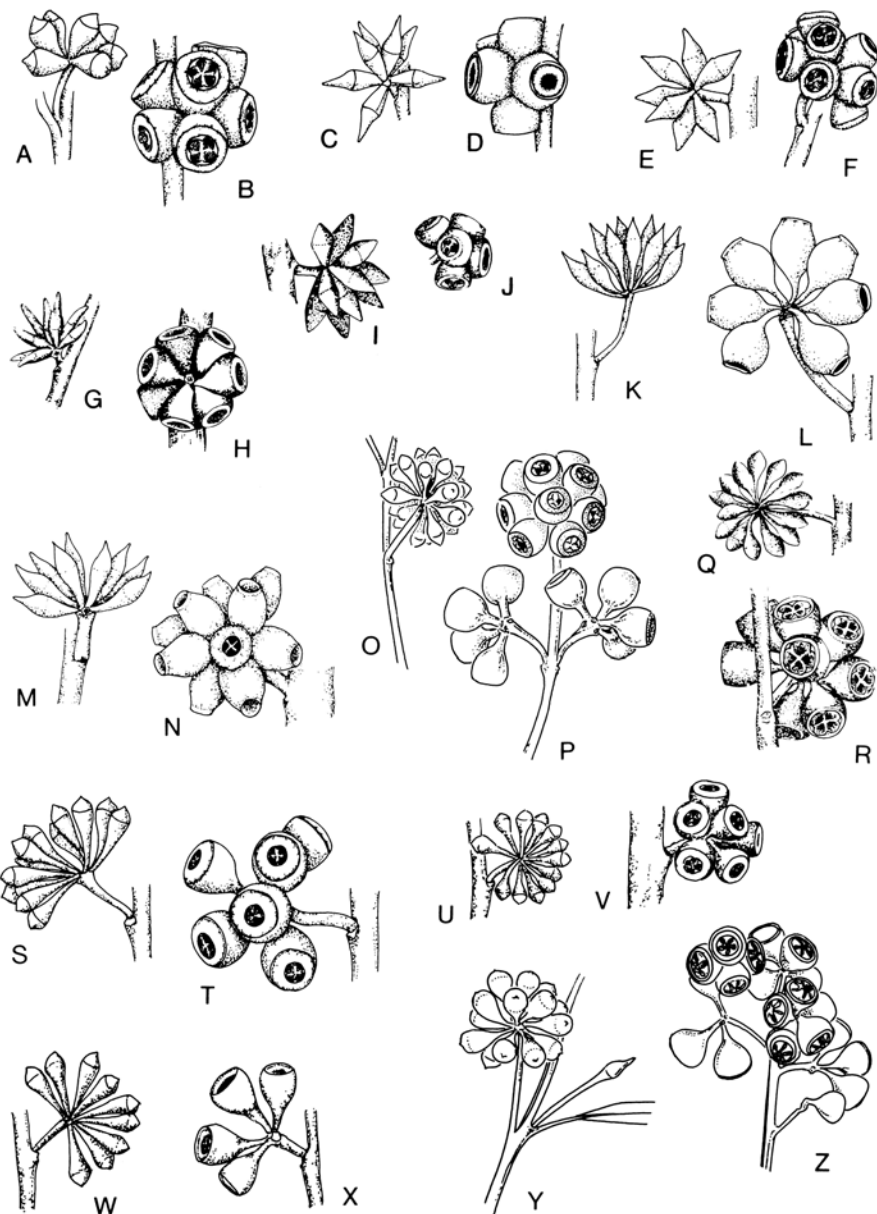


Figure 62. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. kybeanensis* (**A**, Kybeyan Mtn, collector unknown, FRI 11704, FRI). **C–D**, *E. mitchelliana* (**C**, J.Briggs 57, FRI; **D**, I.Brooker 4365, FRI). **E–F**, *E. stellulata* (**E**, I.Brooker 2990, FRI; **F**, D.Kleinig 223, FRI). **G–H**, *E. moorei* var. *moorei* (Tinderry, N.S.W., L.Pryor, GAUBA). **I–J**, *E. moorei* var. *latiuscula* (**I**, Wentworth Falls, N.S.W., J.Camfield, NSW; **J**, head of Tuross R., N.S.W., R.Cambage, FRI). **K–L**, *E. piperita* subsp. *piperita* (**K**, Manly, N.S.W., C.Carter, FRI 11634, FRI; **L**, Bensville, N.S.W., R.Johnston & H.Vos, FRI 13478, FRI). **M–N**, *E. piperita* subsp. *urceolaris* (80 km NE of Braidwood, N.S.W., T.Greaves, FRI). **O–P**, *E. radiata* subsp. *radiata* (**O**, Oberon – Jenolan Caves Rd, R.Johnston & H.Vos, FRI; **P**, I.Brooker 4384, FRI). **Q–R**, *E. radiata* subsp. *robertsonii* (Mullion Ck, near Orange, N.S.W., W.Blakely, FRI). **S–T**, *E. dives* (J.Briggs 435, FRI). **U–V**, *E. willisii* subsp. *willisii* (I.Brooker & P.Ladiges 7792, FRI). **W–X**, *E. willisii* subsp. *falciformis* (M.Newnham 64, FRI). **Y–Z**, *E. amygdalina* (**Y**, Coal Mines, Tas., C.Dunlop, FRI; **Z**, 16.1 km from Bothwell towards Great Lake, Tas., FRI). **O**, **P**, **Y**, **Z** drawn by M.Risby. Others drawn by M.May.

175. *Eucalyptus amygdalina* Labill., *Nov. Holl. Pl. Spec.* 2: 14, t. 154 (1806)

T: Van Diemens Land, [Tas.], 1792, *J. de Labillardière s.n.*; holo: FI; iso: BM, L, W.

E. salicifolia Cav., *Icon Pl.* 4: 24 (1787). T: not cited.

E. glandulosa Desf., *Cat. Pl. Paris.* 3rd edn, 284, 408 (1829). T: cultivated in Paris, France; holo: FI.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 174 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 113 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 339 (1984).

Tree, usually 15–30 m, occasionally a mallee to 10 m. Bark finely fibrous, grey-brown on trunk and larger branches, then smooth, salmon pink or white to grey above. Juvenile leaves lanceolate, green to subglaucous. Adult leaves narrowly lanceolate to linear, falcate, acuminate or uncinata, thin; lamina 7–12 cm long, 0.5–1.3 cm wide, dull, green; lateral veins faint, at 15°–25°; intramarginal vein up to 1 mm from margin; petiole flattened or angular, 7–10 mm long. Umbels with 11–15 or more flowers; peduncle terete or angular, 4–10 mm long; pedicels 1–3 mm long. Operculum hemispherical, sometimes apiculate, 1–2 mm long, 2–3 mm wide; hypanthium subpyriform, 2–3 mm long and wide. Fruits hemispherical or obconical, 4–7 mm long, 5–7 mm wide; disc broad, \pm level, sometimes ascending; valves 4, level. *Black Peppermint*. Fig. 62Y–Z.

Occurs widely in Tas., in open forest in undulating country, on hills and mountain slopes. Region: TASM. Map 186.

Tas.: 16 km NW of Ouse, *N.T.Burbidge 3313* (CANB, HO); 19.3 km NW of Bothwell, *G.M.Chippendale 1157* & *A.M.Gray* (FRI, HO, MEL, NSW); Risdon, 18 Jan. 1949, *L.A.S.Johnson* (HO, NSW).

Distinguished by thin, grey-brown, fibrous bark on trunk and larger branches, narrowly adult leaves with acute lateral venation, hemispherical operculum and thick pedicels. Most closely related to *E. pulchella* which has smooth bark.

176. *Eucalyptus pulchella* Desf., *Cat. Hort. Paris.* 284, 408 (1829)

T: New Holland, [Tas.], 1792, *J. de Labillardière s.n.*; holo: FI.

E. linearis Dehnh., *Cat. Pl. Horti Camaldulensis* 2nd edn, 6, 20 (1832); *E. amygdalina* var. *angustifolia* F. Muell. ex L. Bailey, *Stand. Cycl. Hort.* 3rd edn, 1: 1157 (1947). T: described from trees cultivated near Naples, Italy, the seed being from trees on Mt Wellington, Tas.; *n.v.*

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 171 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 112 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 327 (1984).

Tree to 21 m. Bark smooth throughout, yellow to white and grey. Juvenile leaves linear, green. Adult leaves linear, acuminate or uncinata, thin; lamina 5–10 cm long, 0.2–0.7 cm wide, green; lateral veins faint, at 10°–20°; intramarginal vein up to 1 mm from margin; petiole \pm terete, 4–7 mm long. Umbels with 15 or more flowers; peduncle angular or flattened, 3–8 mm long; pedicels 1–3 mm long. Operculum hemispherical, 1–2 mm long, 2–3 mm wide; hypanthium obconical, 2–3 mm long and wide. Fruits subglobose or subpyriform, 5–6 mm long, 5–7 mm wide; disc broad, level or descending; valves 4, \pm level. *White Peppermint*. Figs 25, 63A–B.

Occurs in central and south-eastern Tas., in hilly areas in open forest. Region: TASM. Map 187.

Tas.: 0.8 km on Ridgeway road from Mt Wellington, *G.M.Chippendale 1172* (AD, FRI, HO, MEL, NSW); Mt Nelson, Oct. 1946, *W.M.Curtis* (HO); near Longley, 3 Jan. 1965, *L.A.S.Johnson* (HO, NSW).

Distinguished by the smooth bark and linear leaves. Extensively cultivated and highly suitable as a street tree. The wood is currently used for woodchips.

177. *Eucalyptus tenuiramis* Miq., *Ned. Kruidk. Arch.* 4: 128 (1856)

T: ?vicinity of Southport, Tas., *C.Stuart 11*; holo: U photo seen; iso: MEL.

E. tasmanica Blakely, *Key Eucalypts* 214, 215 (1934) *p.p.* not as to type; description only, *fide* A.M.Gray, *Muelleria* 3: 197 (1976).

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 178 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 111 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 335 (1984).

Tree to 25 m. Bark smooth throughout, white to grey or somewhat yellow. Juvenile leaves broadly ovate to suborbicular, connate, glaucous. Adult leaves broadly lanceolate to elliptic-lanceolate, acuminate or uncinata, usually thin; lamina 5.5–13 cm long, 0.9–2.5 cm wide, grey-green or glaucous; lateral veins just visible to faint, at 15°–25°; intramarginal vein 1–2 mm from margin; petiole terete or angular, 7–12 mm long. Umbels with 11–15 or more flowers; peduncle terete, 6–15 mm long; pedicels usually 1–5 mm long. Operculum hemispherical, sometimes apiculate, glaucous, 1–2 mm long, 3–4 mm wide; hypanthium obconical, glaucous, 2–4 mm long, 3–4 mm wide. Fruits subpyriform, obconical or hemispherical, glaucous, 6–11 mm long and wide; disc broad, level or descending; valves usually 4, \pm level. *Silver Peppermint*. Fig. 63C–D.

Occurs in eastern and southern Tas. and on Flinders Is., Tas., on lowlands and hills, in open forest and in pure stands. Region: TASM. Map 188.

Tas.: Acton Road to South Arm, *M.I.H.Brooker* 2877 (FRI, MEL, NSW); Eaglehawk Neck, *N.T.Burbidge* 3223 (CANB, HO); 2.7 km E of expressway towards Mt Wellington, *G.M.Chippendale* 1167 & *A.M.Gray* (FRI, HO, MEL, NSW).

Distinguished by smooth bark, connate, glaucous juvenile leaves, and glaucous buds, fruits and branchlets. Currently used as woodchips, and has been cultivated in New Zealand as windbreaks in cold, exposed areas.

178. *Eucalyptus risdonii* J.D.Hook., *London J. Bot.* 6: 477 bis (1847)

T: Risdon on the Derwent, Tas., 27 Nov. 1840, *R.Gunn* 1072; holo: K; iso: BM.

Illustrations: N.Hall & A.M.Gray, *Forest Tree Ser.* No. 151 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 187 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 110 (1983).

Shrub, mallee or tree to 8 m. Bark smooth, grey to cream-white, sometimes with grey-pink patches. Juvenile leaves orbicular, ovate or broadly lanceolate, becoming connate, glaucous, often persisting on mature trees. Adult leaves not often seen, lanceolate, acuminate, firm; lamina 6.5–10 cm long, 1.5–2 cm wide, subglaucous or green; lateral veins faint, at 15°–25°; intramarginal vein up to 2 mm from margin; petiole terete, 6–15 mm long. Umbels 7–15-flowered; peduncle terete, 5–25 mm long; pedicels absent or to 3 mm long. Operculum hemispherical to flattened-hemispherical, glaucous, 1–2 mm long, 2–3 mm wide; hypanthium obconical or subpyriform, glaucous, 3–5 mm long, 2–3 mm wide. Fruits hemispherical or subglobular, glaucous, 7–10 mm long, 7–9 mm wide; disc narrow, level or descending; valves usually 4, level or included. *Risdon Peppermint*. Fig. 63E–F.

Occurs in a very restricted area near Hobart, Tas., mostly N of the Derwent R. between Risdon and Cambridge. Grows in almost pure stands, in open shrubland on hill slopes. Region: TASM. Map 189.

Tas.: N of Shag Bay, *M.I.H.Brooker* 2926 (FRI, MEL, NSW); Risdon, *N.T.Burbidge* 3176 (CANB, HO); Geilston Bay Point, *G.M.Chippendale* 1176 & *A.M.Gray* (FRI, HO, NSW).

Closely related to *E. tenuiramis* but distinguished by shrub or small tree habit, and smaller fruits with a narrower disc. Juvenile leaves more persistent than in *E. tenuiramis*. An endangered taxon, mostly surviving on private land, though also in small reserves, but with the threat of urban development. Hybridises with *E. amygdalina*, see B.M.Potts & J.B.Reid, Analysis of a hybrid swarm between *Eucalyptus risdonii* Hook.f. and *E. amygdalina* Labill; *Austral. J. Bot.* 53: 543–562 (1985).

179. *Eucalyptus nitida* J.D.Hook., *Fl. Tasman.* 1: 137, t. 29 (1856)

E. amygdalina var. *nitida* (J.D.Hook.) Benth., *Fl. Austral.* 3: 203 (1867); *E. australiana* var. *nitida* (J.D.Hook.) Ewart, *Fl. Victoria* 833 (1931). T: ?Circular Head, Tas., 21 Jan. 1837, *R.Gunn* 808; holo: K; iso: BM, NSW.

E. simmondsii Maiden, *Crit. Revis. Eucalyptus* 6: 344 (1922). T: Smithton, Tas., 27 May 1921,

J.H.Simmonds; holo: NSW.

Illustrations: D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 340 (1984).

Tree or mallee to 40 m. Bark fibrous, grey up to 3/4 of trunk, then smooth above, yellow-green to white or grey. Juvenile leaves ovate to broadly lanceolate, grey-green. Adult leaves lanceolate to narrowly lanceolate, acuminate or uncinata, usually thick; lamina 6.5–13 cm long, 0.8–1.7 cm wide, green; lateral veins faint, at 15°–25°; intramarginal vein 1–2 mm from margin; petiole terete or angular, 7–12 mm long. Umbels with 11 or more flowers; peduncle terete or angular, 2–8 mm long; pedicels absent or to 4 mm long. Operculum hemispherical or conical, 1–2 mm long, 2–3 mm wide; hypanthium subpyriform, 2–4 mm long, 2–3 mm wide. Fruits hemispherical or conical, 4–8 mm long, 5–9 mm wide; disc broad, level or ascending; valves 3–5, \pm level. *Smithton Peppermint*. Fig. 63G–H.

Occurs in northern, western and southern Tas., and also on some Bass Strait islands. Grows from sea level flats to hills and plateaus, in various types of forest. Region: TASM. Map 190.

Tas.: 19.8 km WNW of Maydena, *G.M.Chippendale 1181* & *A.M.Gray* (AD, BRI, FRI, HO, MEL, NSW); 1.6 km S of Marrawah, *A.M.Gray 161* (FRI, HO); Tasman Arch, *A.M.Gray 204* (FRI, HO).

Distinguished by fibrous bark on trunk up to three-quarters of height, broad peppermint-scented leaves and crowded buds and fruits. In some areas shows a clinal change to *E. coccifera*, see M.J.Shaw *et al.*, Variation within and between *Eucalyptus nitida* Hook.f. and *E. coccifera* Hook.f., *Austral. J. Bot.* 32: 641–654 (1984).

180. *Eucalyptus coccifera* J.D.Hook., *London J. Bot.* 6: 477 (1847)

T: Western Mts, Tas., *R.W.Lawrence 299*; syn: K; Mt Wellington, Tas., *R.Gunn 1076*; syn: K, NSW; Mt Wellington, Tas., *R.Gunn 1279*; syn: K.

E. daphnoides Miq., *Ned. Kruidk. Arch.* 4: 133 (1856). T: Van Diemens Land, [Tas.], *C. Stuart 9*; n.v.

E. coccifera var. *parviflora* Benth., *Fl. Austral.* 3: 204 (1867). T: Mt Fatigue, Tas., *R.Gunn*; holo: K.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 197 (1970); S.Kelly *et al.*, *Eucalypts* 1: t. 177 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 119 (1983).

Shrub or tree to 10 m. Bark smooth throughout, white-grey, or yellow or pink when fresh. Juvenile leaves broadly elliptic or orbicular, apiculate, subglaucous. Adult leaves elliptic or lanceolate, markedly uncinata, thick; lamina 5–10 cm long, 1–2 cm wide, grey-green; lateral veins faint, at 15°–30°; intramarginal vein distinct, up to 1 mm from margin; petiole terete or channelled, 10–15 mm long. Umbels 3-flowered, sometimes up to 9-flowered; peduncle terete to angular, 5–10 mm long; pedicels absent or to 4 mm long. Operculum flattened-hemispherical, glaucous, warty, 1–2 mm long, 3–5 mm wide; hypanthium obconical, glaucous, 4–5 mm long, 3–5 mm wide. Fruits hemispherical or obconical, often 2-ribbed, glaucous, 7–11 mm long, 10–13 mm wide; disc broad, level; valves 3 or 4, level. *Tasmanian Snow Gum*. Fig. 63 I–J.

Occurs in the central plateau area, Tas., on exposed mountain tops and rocky sites, in alpine woodland. Region: TASM. Map 191.

Tas.: Lake Margaret, *S.T.Blake 18414* (CANB, HO); 67 km N of Bothwell, *A.M.Gray 199* (AD, FRI, HO, NSW); Cradle Mt, 29 Jan. 1949, *L.A.S.Johnson* (HO, NSW).

Distinguished by smooth bark, prominently uncinata leaves, glaucous, warty flattened buds usually in 3s, and glaucous fruits.

Ser. 38 Myrtiformes

Eucalyptus ser. **Myrtiformes** Blakely, *Key Eucalypts* 53, 220 (1934).

Type: *E. deglupta* Blume, lecto, *vide* G.M.Chippendale, *Fl. Australia* 19: 502 (1988)

Trees. Bark (in Australian taxa) subfibrous, grey-brown on trunk and usually on larger branches, then smooth, white or grey above. Juvenile leaves opposite or subopposite, petiolate, discolorous. Adult leaves alternate, sometimes opposite, petiolate, strongly discolorous. Conflorences terminal, compound; umbels usually 3–7-flowered. Buds ovoid or subpyriform. Fruits hemispherical or campanulate, thin-walled; disc very small; valves very small, 3 or 4 or not visible. Seeds \pm elliptic, brown.

A series of 3 species; 1 in central-eastern Qld, 1 in north-eastern W.A. and north-western N.T.; 1 in the Philippines, Indonesia and Papua New Guinea. Trees with subfibrous bark on trunk and usually on larger branches, and smooth above, strongly discolorous leaves, compound terminal conflorences and small, pedicellate thin-walled fruits. The calyx lobes fall separately.

181. Eucalyptus raveretiana F.Muell., *Fragm.* 10: 99 (1877)

T: near Rockhampton, Qld, *P.O'Shanesy s.n.*; holo: MEL; iso: K.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 219 (1970); S.Kelly *et al.*, *Eucalypts* 2: t. 196 (1983).

Tree to 30 m, more commonly to 21 m. Juvenile leaves broadly ovate to suborbicular. Adult leaves alternate, lanceolate, acuminate or uncinat; lamina 7–13 cm long, 1.2–2.5 cm wide, grey-green to green; lateral veins just visible, at 40°–60°; intramarginal vein up to 1 mm from margin; petiole terete, 17–25 mm long. Peduncle terete, 5–8 mm long; pedicels 3–5 mm long. Buds ovoid; operculum conical, 2–3 mm long, 1–2 mm wide; hypanthium hemispherical, c. 1 mm long, 1–2 mm wide. Fruits hemispherical, c. 2 mm long and wide; disc rudimentary, ascending; valves exserted. *Black Ironbox*. Fig. 63M–N.

Occurs from S of Townsville to S of Rockhampton, Qld, on river flats, slopes or ridges, in open woodland. Regions: BURD, DWSN. Map 192.

Qld: Rockhampton, 1881, *F.J.Byerley* (BRI, MEL, NSW); 3.2 km NW of Wycarbah, *N.H.Speck* 2006 (BRI, CANB, MEL, NSW, PERTH); Groper Ck, *R.Wyatt* (BRI).

A tree with subfibrous bark, strongly discolorous leaves, terminal compound conflorence and extremely small fruits with exserted valves.

182. Eucalyptus brachyandra F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 97 (1859)

T: Upper Victoria R., N.T., Dec. 1855, *F.Mueller*; holo: MEL; iso: K.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 190 (1975); S.Kelly *et al.*, *Eucalypts* 2: t. 197 (1983).

Tree, sometimes shrubby, to 10 m, commonly to 7 m, deciduous. Juvenile leaves not seen. Adult leaves alternate or sometimes opposite, ovate, retuse, apiculate or obtuse; lamina 5–8 cm long, 2.5–3.5 cm wide, green; lateral veins visible, at 50°–60°; intramarginal vein 1–2 mm from margin; petiole terete, 12–25 mm long. Peduncle terete, 5–10 mm long; pedicels 1–2 mm long. Buds subpyriform; operculum hemispherical or conical, 1–2 mm long, 2–3 mm wide; hypanthium campanulate, 2–3 mm long and wide. Fruits campanulate, 2–3 mm long and wide; disc narrow, descending; valves included, rarely visible. *Tropical Red Box*. Fig. 63 O–P.

Occurs in the Kimberley, W.A., and north-western N.T. Grows on rocky ridges and escarpment edges, associated with other small trees and shrubs. Regions: KIMB, ARNM. Map 193.

W.A.: Garimbu Ck, Prince Regent R. Nature Reserve, *K.F.Kenneally* 2088 (CANB). N.T.: McCallum Ck, *W.Bateman* (FRI, NSW, NT); Port Keats, *C.S.Robinson* (CANB, DNA, FRI, NT).

Differ from *E. raveretiana* mainly in the slightly broader leaves, shorter pedicels and larger fruits with included valves.

Ser. 39 Howittianae

Eucalyptus Ser. **Howittianae** Chippendale, *Fl. Australia* 19: 498 (1988).

Type: *E. howittiana* F.Muell.

Trees. Bark subfibrous, compact, grey or grey-brown throughout. Juvenile leaves subopposite, petiolate, broadly lanceolate to suborbicular, discolorous. Adult leaves alternate, petiolate, discolorous. Conflorescences terminal or axillary, compound; umbels 7–11-flowered. Buds fusiform, sessile. Fruits subglobular; disc narrow, descending; valves 3, included. Seeds round or elliptic, yellow-brown.

A series of one species in north-eastern Qld. Trees with subfibrous bark throughout, discolorous leaves, terminal or axillary compound conflorescences and small sessile buds and fruits. Calyx lobes fall separately.

183. *Eucalyptus howittiana* F.Muell., *S. Sci. Rec.* 2: 171 (1882)

T: Lake Lucy near Rockingham Bay, Qld, 21 June 1866, *J.Dallachy s.n.*; holo: MEL; iso: BRI, K.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 147 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 130 (1983).

Tree to 30 m. Adult leaves lanceolate to broadly lanceolate, acuminate; lamina 7–11 cm long, 2–3 cm wide; lateral veins faint, at 60°–70°; intramarginal vein up to 1 mm from margin; petiole channelled, 12–20 mm long. Peduncle angular, 2–6 mm long. Operculum conical, 3–4 mm long, c. 2 mm wide; hypanthium cylindrical or obconical, c. 3 mm long, 2 mm wide. Fruits 2–3 mm long and wide. *Howitt's Box*. Fig. 63Q–R.

Occurs between Cairns and Townsville, Qld, up to 160 km inland, usually on slopes in hilly country, occasionally dominant in tall open forest. Regions: CYRK, BURD. Map 194.

Qld: Bluewater Ck, *B.Hyland* 5285 (BRI, CANB, FRI, NSW); 10 km NE of Valley of Lagoons, L.A.S.Johnson, *L.D.Pryor* & *D.F.Blaxell* 513 (CANB, FRI, MEL, NSW); 30.5 km W of Greenvale Stn, *R.A.Perry* 4654 (BRI, CANB, K, MEL, NSW, PERTH).

A tall tree with subfibrous bark throughout, discolorous leaves, usually large terminal conflorescence and small buds and fruits.

Ser. 40 Ochroxylon

Eucalyptus ser. **Ochroxylon** Blakely, *Key Eucalypts* 41, 172 (1934).

Type: *E. guilfoylei* Maiden

Trees. Bark fibrous, compact, brown or grey-brown on trunk and most branches. Juvenile leaves alternate, petiolate, elliptic to ovate, green, discolorous. Adult leaves alternate, petiolate, green, discolorous. Conflorescences terminal and axillary, compound; umbels 7-flowered. Buds clavate. Fruits pyriform or subglobular; disc narrow, level or descending; valves 3 or 4, level or included. Seeds round or elliptic, flat, red-brown.

A series of one species in south-western W.A. Trees with fibrous bark throughout, discolorous leaves, terminal or axillary compound conflorescences and large sessile or shortly pedicellate buds and fruits. The wood is yellow.

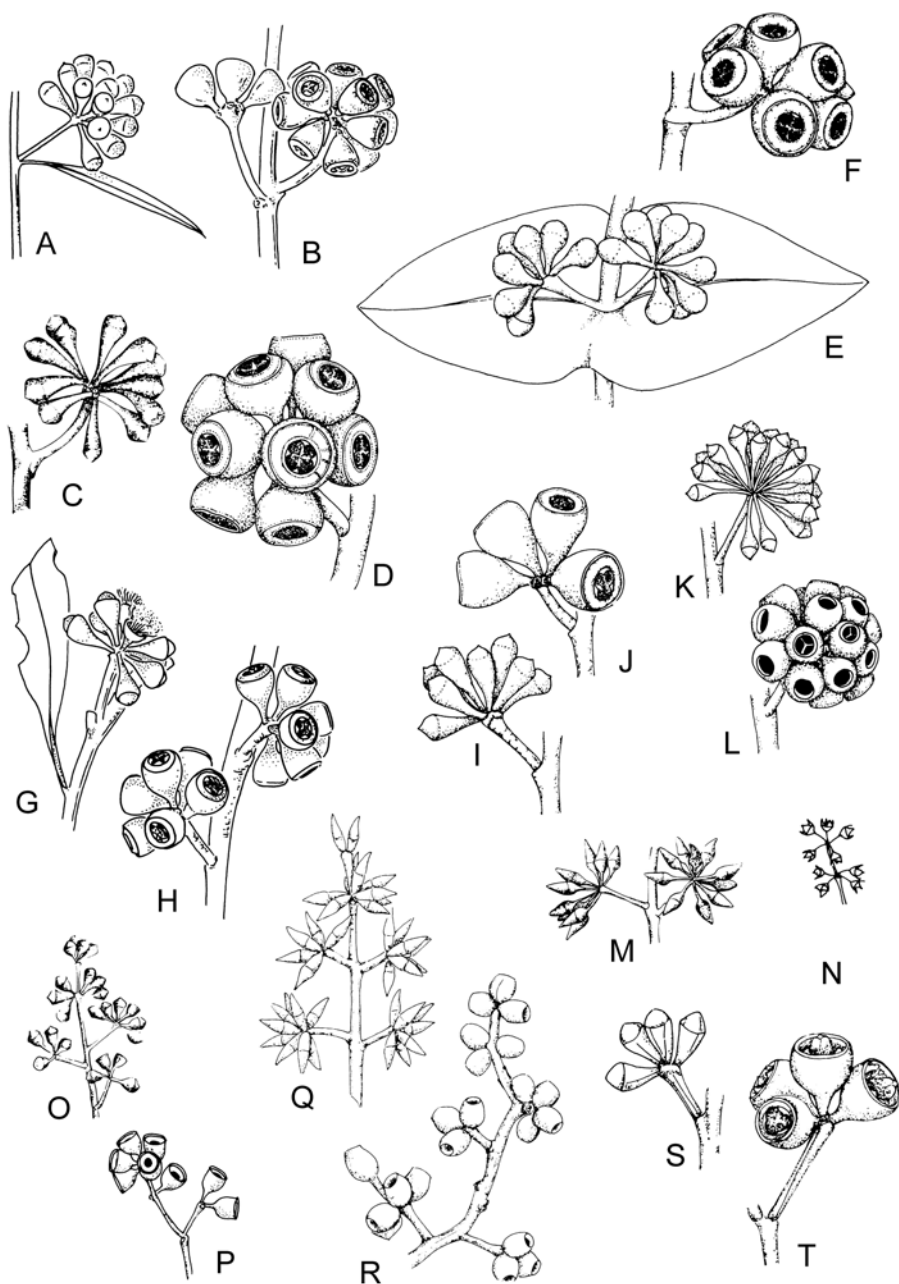


Figure 63. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. pulchella* (E.Carroll 2504, FRI). **C–D**, *E. tenuiramis* (**C**, N slopes of approach to Mt Wellington, Tas., L.Langley, FRI; **D**, I.Brooker 5755, FRI). **E–F**, *E. risdonii* (G.Chippendale 1176, FRI). **G–H**, *E. nitida* (**G**, A.Gray 1175/204, FRI; **H**, I.Brooker 5879, FRI). **I–J**, *E. coccifera* (A.Gray 194, FRI). **K–L**, *E. elata* (**K**, I.Brooker 4971, FRI; **L**, J.Briggs 201, FRI). **M–N**, *E. raveretiana* (**M**, Neerkool Ck, Qld, E.Bowman, FRI; **N**, J.Briggs 383, FRI). **O–P**, *E. brachyandra* (**O**, McCallum Ck, N.T., W.Bateman, FRI; **P**, M.Lazarides 8515, FRI). **Q–R**, *E. howittiana* (**Q**, I.Brooker 3389, FRI; **R**, D.Kleinig 331, FRI). **S–T**, *E. guilfoylei* (**S**, Valley of Giants, Walpole, W.A., E.Holm, FRI; **T**, I.Brooker 4426, FRI). **A, B, G, H**, drawn by M.Risby. Others drawn by M.May.

184. *Eucalyptus guilfoylei* Maiden, J. W. Austral. Nat. Hist. Soc. 3: 180 (1911)

T: Denmark, W.A., March 1905, *A. Murphy s.n.*; holo: NSW.

Illustrations: C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 159 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 148 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 355 (1984).

Tree to 35 m. Adult leaves lanceolate to broadly lanceolate, acuminate; lamina 9.5–13 cm long, 1.7–3.5 cm wide; lateral veins just visible, at 65°–70°; intramarginal vein almost confluent with margin; petiole channelled, 10–20 mm long. Peduncle flattened, 10–21 mm long; pedicels absent or to 3 mm long. Operculum hemispherical, 2–3 mm long, 4–5 mm wide; hypanthium cylindrical or obconical, ridged, 4–6 mm long, 4–5 mm wide. Fruits 7–10 mm long and wide. *Yellow Tingle*. Fig. 63S–T.

Occurs in a restricted area near Nornalup Inlet, Deep R. and Frankland R., W.A. Grows on slopes and ridges, in tall open forest, usually as scattered trees. Region: LUWN. Map 195.

W.A.: Mt Frankland, *M.I.H.Brooker* 3579 (BRI, FRI, MEL, PERTH); Frankland R., Jan. 1929, *C.A.Gardner* (MEL, PERTH).

Distinguished by fibrous bark on trunk and branches, discolorous leaves, compound conflorescence and pyriform fruits. Resembles *E. jacksonii* in habit but differs especially in the compound conflorescence and round or elliptic seeds. The wood has been used for sleepers, poles, bridges, flooring and general building. Flowers in Dec. and Jan. producing pollen and nectar for honey production.

Ser. 41 Inclusae***Eucalyptus* ser. *Inclusae* (Benth.) Chippendale, *Fl. Australia* 19: 499 (1988).**

E. subser. *Inclusae* Benth., *Fl. Austral.* 5: 197, 246 (1867); *E.* subser. *Inclusae* Blakely, *Key Eucalypts* 19, 94 (1934) *nom. illeg. p.p.*

Type: *E. diversicolor* F.Muell., lecto, *fide* G.M.Chippendale, *loc. cit.*

Trees. Bark smooth throughout, orange-yellow, bronze or white, often in varying patterns. Juvenile leaves alternate, petiolate, broadly ovate or orbicular, green, discolorous. Adult leaves alternate, petiolate, green, discolorous. Conflorescences axillary, simple, 7-flowered umbels. Buds clavate. Fruits usually ovoid or subglobular; disc broad, descending; valves 3, prominent, included or level. Seeds round or elliptic, flat, grey-brown.

A series of 1 species in south-western W.A. Tall trees with smooth bark throughout, discolorous leaves, simple axillary 7-flowered umbels and pedicellate fruits.

185. *Eucalyptus diversicolor* F.Muell., *Fragm.* 3: 131 (1863)

T: ?Wilson Inlet, W.A., *A.Oldfield* 788; holo: MEL; iso: CGE, E, K.

Illustrations: C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 10 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 25 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 359 (1984).

Tree to almost 90 m. Adult leaves broadly lanceolate, acuminate; lamina 9–12 cm long, 2–3.2 cm wide; lateral veins conspicuous, at 35°–50°; intramarginal vein up to 1 mm from margin; petiole channelled, 10–20 mm long. Peduncle flattened or angular, 18–28 mm long; pedicels 3–6 mm long. Operculum conical, 5–7 mm long and wide; hypanthium cylindrical to obconical, 7–8 mm long, 5–7 mm wide. Fruits 8–12 mm long, 7–10 mm wide. *Karri*. Figs 18, 64A–B.

Occurs in a narrow stretch from near Margaret River to Denmark, W.A., on hilly country, in tall open forest. Region: LUWN. Map 196.

W.A.: near Manjimup, *S.T.Blake* 18030 (BRI, CANB, K, PERTH); Karri Bank, Porongurup Ra., *M.I.H.Brooker* 2331 (PERTH); Denmark, *C.A.Gardner* 1655 (FRI, PERTH).

A very tall tree with smooth bark usually in coloured patches, discoloured leaves, 7-flowered umbels, and fruits which are ovoid or subglobular. One of Australia's tallest trees, having been recorded at 87 m. An important timber species in W.A., with heavy, strong, tough and durable wood which has been used in building and flooring. Longer lengths of wood can be obtained from *Karri* than from other hardwood species. Flowers in Dec. and Jan., sometimes until Apr., producing pollen and nectar for honey production.

Ser. 42 Transversae

Eucalyptus ser. **Transversae** Blakely, *Key Eucalypts* 19, 94 (1934).

Type: *E. saligna* Smith, lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 506 (1988)

E. subser. *Leptocarpae* Blakely, *op. cit.* 19, 95. T: *E. saligna* Smith, lecto, *fide* G.M.Chippendale, *loc. cit.*

Trees. Bark smooth throughout, often with up to 4 m of flaky bark at base, or subfibrous throughout. Juvenile leaves alternate, petiolate, green, discoloured. Adult leaves alternate, petiolate, long-acuminate, green, discoloured; petiole channelled. Conflorescences axillary, simple; umbels usually 7–11-flowered, up to 15-flowered in one taxon. Buds subcylindrical, clavate, ovoid, rostrate or \pm fusiform. Fruits cylindrical, campanulate, or \pm pyriform; disc usually descending, sometimes \pm level; valves 3–5, usually exserted, sometimes included. Seeds cuboid or \pm flat, brown.

A series of 5 species in eastern parts of Qld, N.S.W. and Vic. Tall trees with smooth or subfibrous bark, strongly discoloured leaves and simple axillary umbels.

186. Eucalyptus deanei Maiden, *Proc. Linn. Soc. New South Wales* 2nd ser., 29: 471 (1904)

E. saligna var. *parviflora* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 242: 486 (1888). T: The Valley, Springwood, N.S.W., Apr. 1888, *H. Deane*; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 3: 65 (1915).

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 28 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 128 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 361 (1984).

Tree to 65 m. Bark smooth, white and blue-grey throughout, or sometimes with a small amount of old flaky or scaly bark at base. Juvenile leaves ovate to suborbicular. Adult leaves lanceolate to broadly lanceolate; lamina 8–12.5 cm long, 1.7–3.5 cm wide; lateral veins faint, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole 15–20 mm long. Umbels 7–11-flowered; peduncle angular or flattened, 7–14 mm long; pedicels angular, 1–5 mm long. Buds clavate; operculum hemispherical, apiculate, 1–3 mm long, 3–4 mm wide; hypanthium obconical or campanulate, 3–4 mm long and wide. Fruits cylindrical or campanulate, 4–6 mm long and wide; disc level or descending; valves 3 or 4, level or exserted, often curved outwards. *Deane's Gum*. Fig. 64C–D.

Occurs in two disjunct areas, one from near Emu Vale, Qld, southwards into N.S.W. along the New England escarpment, the other from near Singleton southwards to the Picton area, N.S.W. Grows on ridges, slopes, valleys and coastal lowlands, in open forest and tall open forest. Regions: MCPH, NEPN. Map 197.

Qld: Thulimbah, *S.T.Blake 20183* (BRI, FRI). N.S.W.: Lacys Ck, Warragamba, *M.I.H.Brooker 4680* (AD, BRI, FRI, MEL); 30.6 km NE of Glen Innes, *L.A.S.Johnson & D.J.McGillivray 2390* (BRI, FRI, NSW); near Mt Warrawalong, *R.Story 6689* (BRI, CANB, K, NSW).

A tall, smooth-barked tree with discoloured leaves, 7–11-flowered umbels, clavate buds, and hemispherical operculum. Differs from *E. grandis* and *E. saligna* in having ovate to orbicular juvenile leaves, more distinct pedicels and exserted or level valves. The wood has been used for flooring, panelling and general construction.

187. *Eucalyptus grandis* W.Hill ex Maiden, *Cat. Timbers Queensland (London Exhib.)* 25 (1862)

T: N.S.W., *W.Hill 74*; holo: ?K.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 26 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 129 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 363 (1984).

Tree to 55 m. Bark smooth, white, grey-white or blue-grey, with some rough flaky bark at base up to 4 m. Juvenile leaves ovate. Adult leaves lanceolate; lamina 10–16 cm long, 2–3 cm wide; lateral veins conspicuous, at 40°–55°; intramarginal vein up to 1 mm from margin; petiole 15–20 mm long. Umbels 7–11-flowered; peduncle flattened, 8–18 mm long; pedicels angular, absent or to 3 mm long. Buds ovoid or broadly fusiform; operculum conical or slightly rostrate, 3–4 mm long, 4–5 mm wide; hypanthium obconical or campanulate, 3–4 mm long, 4–5 mm wide. Fruits subpyriform, 5–8 mm long, 4–7 mm wide; disc narrow, level or descending; valves 4 or 5, exserted, incurved. *Flooded Gum, Rose Gum*. Fig. 64E–F.

Occurs in Qld and N.S.W. in several disjunct areas: in the Atherton area, W of Townsville, W of Mackay, and with the main area from near Bundaberg southwards to near Port Stephens. Grows usually on lower slopes and flats of valleys, in tall open forest, often on the fringes of or in rainforest. Regions: CYRK, BURD, DWSN, MCPH, NEPN. Map 198.

Qld: Atherton to Herberton, *A.K.Irvine 603* (BRI, FRI, NSW); Somerset Dam, *R.J.Henderson 135* (BRI, CANB). N.S.W.: 4.8 km NW of Krambach, *R.Coveny 6024* (BRI, FRI, MEL, NSW, PERTH); 11.9 km E of Bulahdelah, *R.D.Johnston & G.M.Chippendale 477* (FRI, NSW, PERTH).

Distinguished from *E. deanei* and *E. saligna* mainly by the exserted, incurved fruiting valves. An important timber tree, the wood being resistant to borers; used for boat building, flooring, plywood, panelling and general construction.

188. *Eucalyptus saligna* Smith, *Trans. Linn. Soc. London* 3: 285 (1797)

T: Port Jackson, N.S.W., 1794, *J.White s.n.*; holo: LINN; iso: BM, G.

E. saligna var. *protrusa* Blakely & McKie in W.F.Blakely, *Key Eucalypts* 96 (1934). T: Diehard State Forest, Glen Innes district, N.S.W., 9 June 1932, *E.N.McKie s.n.*; holo: NSW.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 27 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 130 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 365 (1984).

Tree to 55 m. Bark smooth, white or blue-grey, with rough, brown-grey, flaky bark at base up to 4 m. Juvenile leaves ovate to broadly lanceolate. Adult leaves lanceolate; lamina 9–17 cm long, 2–3 cm wide; lateral veins visible, at 35°–55°; intramarginal vein up to 1 mm from margin; petiole 15–25 mm long. Umbels 7–11-flowered; peduncle flattened, 4–18 mm long; pedicels absent or angular, to 3 mm long. Buds fusiform or ±ovoid; operculum conical, 3–4 mm long and wide; hypanthium hemispherical, cylindrical or campanulate, 2–3 mm long, 3–4 mm wide. Fruits cylindrical, campanulate or subpyriform, 5–8 mm long, 4–7 mm wide; disc narrow, descending; valves 3 or 4, exserted, curved outwards. *Sydney Blue Gum*. Fig. 64G–H.

Occurs in eastern Qld W of Mackay on the Kroombit and Blackdown Tablelands, in the Carnarvon Gorge area and from near Maryborough southwards to about Batemans Bay, N.S.W. Grows on tablelands and slopes, in open forest and tall open forest. Regions: BURD, DWSN, MCPH, NEPN, HOWE. Map 199.

Qld: 64.4 km SSW of Gladstone, *R.A.Epp* (BRI); 32 km SE of Blackwater, *R.J.Henderson 854* (BRI, CANB, MEL, NSW). N.S.W.: Gloucester R., *E.F.Constable 6014* (NSW); 19.3 km NW of Newcastle, *R.Story 7246* (AD, CANB, MEL, NSW, PERTH).

Distinguished by the exserted, outcurved fruiting valves. The wood has been used for flooring, panelling and general construction.

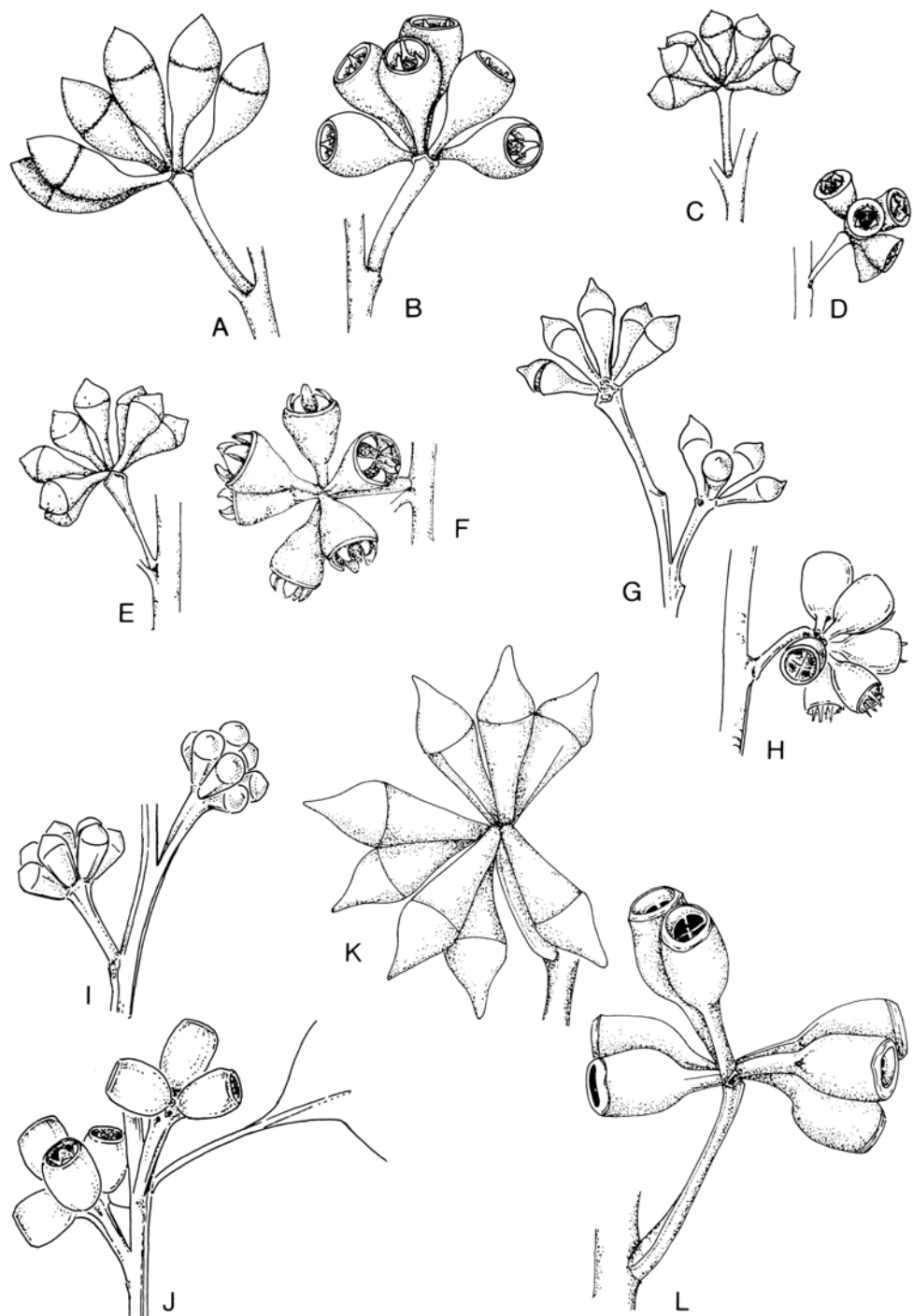


Figure 64. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. diversicolor* (**A**, Pemberton, W.A., C.Hamilton, FRI; **B**, B.Rockel W.A. 2, FRI). **C–D**, *E. deanei* (**C**, I.Brooker 3949, FRI; **D**, Oakdale, N.S.W., L.Langley, FRI). **E–F**, *E. grandis* (**E**, I.Brooker 3734, FRI; **F**, I.Brooker 6590, FRI). **G–H**, *E. saligna* (I.Brooker 6065, FRI). **I–J**, *E. botryoides* (**I**, Malua Beach, N.S.W., C.Dunlop, FRI; **J**, G.Chippendale 983, FRI). **K–L**, *E. robusta* (G.Smith 58, FRI). **G–L** drawn by M.Risby. Others drawn by M.May.

189. *Eucalyptus botryoides* Smith, *Trans. Linn. Soc. London* 3: 286 (1797)

T: Port Jackson, N.S.W., 1794, *J.White s.n.*; holo: LINN; iso: BM, G.

E. platypodos Cav., *Icon.* 4: 23, t. 341 (1797). T: Port Jackson, N.S.W., 1794, *J.White*; holo: LINN.

E. botryoides var. *platycarpa* Blakely, *Key Eucalypts* 97 (1934). T: Newport, N.S.W., July 1905, *J.H.Maiden & R.H.Cambage s.n.*; holo: NSW.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 29 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 131 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 367 (1984).

Tree to 40 m. Bark fibrous or flaky-fibrous, brown to grey-brown, on trunk and larger branches, then smooth, white or grey-white on smaller branches. Juvenile leaves ovate. Adult leaves broadly lanceolate; lamina 10–16 cm long, 2.5–4 cm wide; lateral veins usually visible, at 40°–60°; intramarginal vein up to 2 mm from margin; petiole 20–30 mm long. Umbels 7–11-flowered; peduncle broadly flattened, 7–15 mm long; pedicels usually absent, sometimes up to 3 mm long. Buds subcylindrical, clavate or ovoid; operculum conical or hemispherical, 3–5 mm long, 4–5 mm wide; hypanthium cylindrical or obconical, often ribbed, 4–6 mm long, 4–5 mm wide. Fruits cylindrical, 7–12 mm long, 5–9 mm wide; disc moderately broad, descending; valves 3 or 4, level or included. *Bangalay, Southern Mahogany*. Fig. 64 I–J.

Occurs from near Gosford, N.S.W., southwards to near Metung, Vic., on coastal sandy flats, in open forest. Regions: NEPN, HOWE. Map 200.

N.S.W.: Bundeena, *M.I.H.Brooker* 3048 (BRI, FRI, NSW); Narooma, *G.M.Chippendale* 900 & *M.J.Brennan* (BRI, FRI, MEL, NSW). Vic.: Lake King, *F.Mueller* (BM, K, NSW).

Differ from *E. saligna* in having fibrous bark to the lower branches, and usually sessile, more robust buds and fruits, the fruits being cylindrical. The wood is durable and used in general construction.

190. *Eucalyptus robusta* Smith, *Spec. Bot. New Holland* 39 (1795)

T: Port Jackson, N.S.W., 1793, *J.White s.n.*; holo: LINN; ISO: BM, G.

E. multiflora Poirét, *Lamarck's Encycl. Suppl.* 2: 594 (1812). T: 'elles font toutes deux originaires de la Nouvelle-Hollande'.

E. robusta var. *bivalvis* (Blakely) Blakely, *Key Eucalypts* 2nd edn, 101 (1955) as *bivalva*; *E. multiflora* var. *bivalvis* Blakely, *Key Eucalyptus* 98 (1934). T: Coffs Harbour, N.S.W., 28 July 1931, *W.A.W. de Beuzeville* 256; holo: NSW; iso: BRI, FRI.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 30 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 132 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 369 (1984).

Tree to 30 m. Bark rough throughout, soft, spongy, subfibrous, red-brown. Juvenile leaves ovate. Adult leaves broadly lanceolate; lamina 10–16 cm long, 2.7–4.5 cm wide; lateral veins fine, at 50°–60°; intramarginal vein up to 2 mm from margin; petiole 20–35 mm long. Umbels 9–15-flowered; peduncle broadly flattened, 13–30 mm long; pedicels angular, 1–9 mm long, sometimes absent. Buds rostrate or ±fusiform; operculum conical, rostrate, 10–12 mm long, 6–8 mm wide; hypanthium obconical, 6–7 mm long, 6–8 mm wide. Fruits cylindrical, sometimes slightly constricted in the middle, 10–18 mm long, 6–11 mm wide; disc broad, descending; valves 3 or 4, usually included and joined across the orifice, sometimes level or slightly exserted. *Swamp Mahogany*. Fig. 64K–L.

Occurs from the Bowenia State Forest, N of Rockhampton, Qld, and some off-shore islands, southwards to Moruya, N.S.W. Grows in swampy areas, near lagoons and estuaries, and sometimes on slopes, often in pure stands in open forest. Regions: DWSN, MCPH, NEPN, HOWE. Map 201.

Qld: 14 km SSE of Bundaberg, *R.J.Henderson* 1320 (BRI, NSW); Bribie Is., *P.Sharpe* 122 (BRI). N.S.W.: 4.8 km N of Evans Head, *R.Coveny* 5109 (AD, BRI, MEL, NSW); Fivedock, July 1884, *H.Deane* (NSW).

Similar to *E. botryoides* but has larger buds and fruits and prefers wetter habitats. The valve apices usually cohere after dehiscence. The wood has been used in wharf construction, as it

is durable and resistant to marine borers.

Ser. 43 Annulares

Eucalyptus ser. **Annulares** (Blakely) Chippendale, *Fl. Australia* 19: 495 (1988).

E. subser. *Annulares* Blakely, *Key Eucalypts* 20, 98 (1934).

Type: *E. resinifera* Smith, lecto, *fide* G.M.Chippendale, *loc. cit.*

Trees. Bark fibrous throughout, red-brown, brown or grey. Juvenile leaves alternate, petiolate, green, discolorous. Adult leaves alternate, petiolate, long acuminate, green, discolorous. Conflorences axillary, simple; umbels usually 7–11-flowered. Buds rostrate, fusiform or ovoid. Fruits hemispherical to obconical; disc broad, usually level, sometimes ascending or descending; valves 3 or 4, exserted. Seeds cubical, subpyramidal or flattened, brown.

A series of 3 species in eastern Qld and N.S.W. Trees with fibrous bark, discolorous leaves, simple 7–11-flowered umbels and brown seeds.

191. *Eucalyptus peltita* F.Muell., *Fragm.* 4: 159 (1864)

E. resinifera var. *peltita* (F.Muell.) Bailey, *Syn. Queensland Fl.* 179 (1883). T: Rockingham Bay, Qld, 1864, *J.Dallachy s.n.*; holo: MEL; iso: K.

E. spectabilis F.Muell., *Fragm.* 5: 45 (1865); *E. resinifera* var. *spectabilis* (F.Muell.) Bailey, *Syn. Queensland Fl.* 179 (1883). T: Rockingham Bay, Qld, 1864, *J.Dallachy s.n.*; holo: MEL; ISO: K.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 32 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 133 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 371 (1984).

Tree to 40 m. Juvenile leaves ovate. Adult leaves lanceolate to broadly lanceolate; lamina 10–15 cm long, 2–4 cm wide; lateral veins faint, at 45°–60°; intramarginal vein up to 2 mm from margin; petiole channelled, 15–25 mm long. Umbels usually 7-flowered, occasionally 3-flowered; peduncle broadly flattened, 10–25 mm long; pedicels thick, angular, 1–9 mm long, rarely absent. Buds fusiform; operculum conical, rostrate, or hemispherical, 10–12 mm long, 6–10 mm wide; hypanthium obconical, 6–8 mm long, 6–10 mm wide. Fruits hemispherical or obconical, 7–14 mm long, 7–17 mm wide; disc prominent, level. *Large-fruited Red Mahogany*. Fig. 65A–B.

Occurs in two main, widely disjunct areas, with several isolated occurrences between. The northern main area is from Cape York Peninsula to just N of Townsville, Qld, with a small occurrence at Bribie Is. Southern areas are at Mt Banda Banda, N.S.W., then from N of Newcastle southwards to Tathra, N.S.W. Grows mainly on gentle slopes, but occasionally on steep slopes, in open forest. Regions: CYRK, BURD, MCPH, NEPN, HOWE. Map 202.

Qld: McIlwraith Ra., *B.Hyland* 7659 (BRI, DNA, FRI, NSW, PERTH); Hopevale Mission, *L.Pedley* 2609 (BRI, CANB, K). N.S.W.: 39.8 km NNE of Batemans Bay, *G.M.Chippendale* 890 & *M.J.Beeston* (BRI, FRI, MEL, NSW); Pokolbin, *R.Story* 7374 (CANB, NSW).

A tree with fibrous, red-brown bark throughout, discolorous leaves, broad peduncles, and strongly exserted valves. Buds and fruits larger than in *E. notabilis* and *E. resinifera*.

192. *Eucalyptus notabilis* Maiden, *J. Roy. Soc. New South Wales* 54: 169 (1920)

T: Glenbrook, (Lapstone Hill to Springwood), N.S.W., Nov. 1904, *J.H.Maiden* & *R.H.Cambage s.n.*; holo: NSW.

Illustrations: N.Hall, *Forest Tree Ser.* No. 27 (1972); S.Kelly *et al.*, *Eucalypts* 2: t. 40 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 134 (1983).

Tree to 30 m. Juvenile leaves broadly lanceolate to ovate. Adult leaves lanceolate, often falcate; lamina 10–15 cm long, 1.7–2.5 cm wide; lateral veins just visible, at 55°–60°; intramarginal vein up to 1 mm from margin; petiole channelled or flattened, 15–25 mm long. Umbels 7–11-flowered; peduncle flattened, 6–12 mm long; pedicels absent or to 5 mm

long. Buds ovoid or broadly fusiform; operculum conical or hemispherical, 5–7 mm long, 5–6 mm wide; hypanthium hemispherical or obconical, 4–5 mm long, c. 5 mm wide. Fruits hemispherical or obconical, sometimes ribbed, 6–8 mm long, 6–10 mm wide; disc level or ascending. *Blue Mountains Mahogany*. Fig. 65C–D.

Occurs in several disjunct areas from the Lamington Plateau to the Gibraltar Ra., Qld, and in the Blue Mts, N.S.W. Grows on plateaus, ridges and slopes, in dry sclerophyll forest. Regions: MCPH, NEPN. Map 203.

Qld: Lamington Natl Park, *C.T.White 11451* (BRI, NSW). N.S.W.: Gibraltar Ra., Sept. 1949, *F.M.Bailey* (NSW); Springwood, *G.M.Chippendale 1197* & *M.J.Brennan* (AD, BRI, FRI, MEL, NSW, PERTH); 4.8 km from Lower Portland, *J.Pickard 851* (FRI, NSW).

193. *Eucalyptus resinifera* Smith in J.White, *John White's Voyage* 231 (1790)

T: Port Jackson, N.S.W., *J.White s.n.*; iso: BM.

E. hemilampra F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 85 (1859); *E. resinifera* var. *hemilampra* (F.Muell.) Domin, *Biblioth. Bot.* 89: 468 (1928). T: upper Brisbane R., Qld, collector unknown; holo: MEL; iso: K.

E. resinifera var. *grandiflora* Benth., *Fl. Austral.* 3: 246 (1867). T: Manly Beach, N.S.W., W.Woolls; isosyn: MEL; locality uncertain, *W.Caley*; syn: *n.v.*

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 31 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 135 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 373 (1984).

Tree to 45 m. Juvenile leaves ovate to broadly lanceolate. Adult leaves broadly lanceolate; lamina 10–17 cm long, 1.8–3.5 cm wide; lateral veins faint to distinct, at 45°–60°; intramarginal vein up to 1 mm from margin; petiole channelled, 15–30 mm long. Umbels 7–11-flowered; peduncle flattened, 10–22 mm long; pedicels angular, 3–10 mm long. Buds rostrate; operculum conical or rostrate, 10–12 mm long, 5–7 mm wide; hypanthium hemispherical, 4–5 mm long, 5–7 mm wide. Fruits hemispherical or obconical, 6–11 mm long, 7–10 mm wide; disc level or convex. *Red Mahogany*. Fig. 65E–F.

Occurs in several disjunct areas in Qld, near Coen, on the Atherton Tableland, and near Eungella, then from near Gympie southwards to S of Nowra, N.S.W. Grows on flats, in valleys and on gentle slopes, in open forest and tall open forest. Regions: CYRK, BURD, DWSN, MCPH, NEPN, HOWE. Map 204.

Qld: Brisbane, 30 May 1969, *C.R.Dunlop* (CBG, FRI, NSW); Lankelly Ck Road, *G.C.Stocker 830* (BRI, FRI); 12.8 km NE of Coen, *J.W.Turnbull 384* (FRI). N.S.W.: 5.9 km ENE of Karuah Bridge, *G.M.Chippendale 1294* & *M.J.Brennan* (BRI, FRI, MEL, NSW).

Distinguished by the long, narrow operculum; peduncle and pedicels usually longer than in *E. pellita* and *E. resinifera*. The wood has been used for flooring, panelling, bridge decking and for general construction.

Ser. 44 *Lepidotae-fimbriatae*

***Eucalyptus* ser. *Lepidotae-fimbriatae* Maiden, *Crit. Revis. Eucalyptus* 7: 152 (1925).**

Type: *E. canaliculata* Maiden, lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 500 (1988).

E. subser. *Pauciflorae* Blakely, *Key Eucalypts* 21, 102 (1934). T: not designated.

E. subser. *Pelliculares* Blakely, *op. cit.* 20, 99. T: not designated.

Trees, sometimes a mallee in *E. cosmophylla*. Bark usually smooth with a matt surface, cream to orange, weathering to grey or grey-brown (grey gums), or blue-grey to white in *E. cosmophylla*, and subfibrous to the larger branches in *E. longifolia*. Juvenile leaves alternate, petiolate, green, discolorous. Adult leaves alternate, petiolate, sometimes falcate, acuminate, green and discolorous or grey-green and concolorous. Conflorescences axillary, simple, occasionally apparently terminal; umbels 3- or 7-flowered, rarely to 15-flowered. Buds ovoid, clavate, cylindrical, rostrate or broadly fusiform. Fruits hemispherical, obconical or slightly campanulate or cylindrical; disc broad or narrow, level, ascending or broad and descending;

valves usually 3 or 4, sometimes 4 or 5, mostly exserted, sometimes level or included. Seeds subpyramidal, smooth or toothed on margin, brown or black.

A series of 8 species mostly in eastern Qld and N.S.W., with one species in southern S.A. Trees or mallees usually with smooth matt bark, discolorous leaves, 3- or 7-flowered umbels and brown or black seeds.

194. *Eucalyptus major* (Maiden) Blakely, *Key Eucalypts* 100 (1934)

E. propinqua var. *major* Maiden, *Crit. Revis. Eucalypts* 6: 504, t. 241 (1923). T: Norman Ck near Brisbane, Qld, May 1917, *C.T.White s.n.*; holotype: NSW; isotype: BRI.

Illustrations: S.Kelly *et al.*, *Eucalypts* 2: t. 42 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 136 (1983).

Tree to 20 m. Bark grey gum type. Juvenile leaves ovate to broadly lanceolate. Adult leaves lanceolate; lamina 8–16 cm long, 1.2–2.7 cm wide, discolorous; lateral veins faint, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole channelled, 17–25 mm long. Umbels 7-flowered; peduncle flattened, 5–12 mm long; pedicels absent or to 4 mm long. Buds ovoid or fusiform; operculum conical or rostrate, 4–5 mm long and wide; hypanthium hemispherical or obconical, 3–5 mm long, 4–5 mm wide. Fruits hemispherical or obconical, often ribbed, 4–7 mm long, 6–8 mm wide; disc moderately broad, level or ascending; valves 3 or 4, strongly exserted. Seeds brown. *Grey Gum*. Fig. 65G–H.

Occurs in south-eastern Qld, in coastal areas and nearby hills and plateaus, in tall open forest. Regions: DWSN, MCPH. Map 205.

Qld: Indooroopilly, *M.I.H.Brooker 4913* (AD, BRI, FRI, MEL, NSW); 6.4 km ESE of Ipswich, *L.Pedley 1990* (BRI, FRI); Carnarvon Ra., *C.T.White 9471* (BRI, NSW).

A tree with matt, smooth, cream to orange or grey bark in patches, discolorous leaves, sessile or very shortly pedicellate buds and fruits, and strongly exserted fruiting valves. Differs from *E. propinqua* in the larger buds and fruits and from *E. punctata* in having usually sessile buds. Blakely's description of *E. major* refers to *E. punctata*.

195. *Eucalyptus propinqua* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 10: 541 (1896)

T: Dungog–Stroud Road, N.S.W., 10 Feb. 1893, *A.Rudder s.n.*; ?holotype: NSW.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 33 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 136 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 375 (1984).

Tree to 40 m. Bark grey gum type. Juvenile leaves lanceolate to broadly lanceolate. Adult leaves lanceolate, sometimes falcate; lamina 8–14 cm long, 1.2–2.7 cm wide; lateral veins just visible, at 45°–55°; intramarginal vein up to 1 mm from margin; petiole channelled, 10–15 mm long. Umbels 7–15-flowered; peduncle flattened, 5–15 mm long; pedicels angular, 2–5 mm long. Buds ovoid or clavate; operculum hemispherical or conical, 2–3 mm long, 3–4 mm wide; hypanthium hemispherical, 2–3 mm long, 3–4 mm wide. Fruits hemispherical or obconical, 2–5 mm long, 3–6 mm wide; disc moderately broad, level or ascending; valves 3 or 4, exserted. Seeds brown. *Grey Gum*. Figs 9, 65 I–J.

Occurs in small isolated areas on the Blackdown Tableland and the Expedition Ra., Qld, then from near Maryborough southwards to about Wyong, N.S.W. Grows usually on low hills and ridges of coastal or subcoastal areas, in tall open forest. Regions: DWSN, MCPH, NEPN. Map 206.

Qld: near turn-off to Rainbow Falls, Blackdown Tableland, *M.I.H.Brooker 4811* (AD, BRI, FRI, MEL, NSW); Tamaree, July 1917, *E.H.F.Swain* (BRI). N.S.W.: 14.6 km NE of Dungog, *G.M.Chippendale 1043* & *M.J.Brennan* (AD, BRI, FRI, MEL, NSW); 6.4 km NW of Kramback, *R.Coveny 6022* (NSW).

Differs from all related species in the smaller buds and fruits. The wood has been used in heavy engineering projects and for poles and sleepers; it is very hard and durable, with good resistance to borers.

196. *Eucalyptus punctata* DC., *Prodr.* 3: 217 (1828)

E. tereticornis var. *brachycorys* Benth., *Fl. Austral.* 3: 242 (1867). T: New Holland, *F.W.Sieber* 623; holo: G; iso: G, NSW.

E. punctata var. *didyma* R.Baker & H.G.Smith, *Research Eucalyptus* 127 (1902). T: Rylstone, N.S.W., June 1897, *R.T.Baker*; lecto: NSW, *fide* L.A.S.Johnson & K.D.Hill, *Fl. Australia* 19: 509 (1988).

E. shiressii Maiden & Blakely in J.H.Maiden, *Crit. Revis. Eucalyptus* 6: 512 (1923). T: 16 mile post, Galston Road, Hornsby, N.S.W., Feb. 1922, *W.F.Blakely* & *D.W.C.Shiress s.n.*; holo: NSW.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 34 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 137 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 377 (1984).

Tree to 35 m. Bark grey gum type. Juvenile leaves narrowly lanceolate to lanceolate. Adult leaves lanceolate, slightly falcate; lamina 8–15 cm long, 1.6–3 cm wide, shining above; lateral veins just visible, at 45°–55°; intramarginal vein up to 1 mm from margin; petiole channelled or flattened, 15–26 mm long. Umbels 7-flowered; peduncle flattened or angular, 5–20 mm long; pedicels angular, 2–9 mm long. Buds ovoid to ±cylindrical; operculum conical, hemispherical or slightly rostrate, 5–6 mm long, 4–6 mm wide; hypanthium obconical or hemispherical, 4–5 mm long, 4–6 mm wide. Fruits hemispherical or cylindrical, 5–12 mm long, 5–10 mm wide; disc moderately broad, level or ascending; valves 3 or 4, exserted. Seeds black. *Grey Gum*. Fig. 65K–L.

Occurs in central-eastern N.S.W., in coastal areas and on adjacent ranges, in open forest. Regions: NEPN, MCPH. Map 207.

N.S.W.: Gungal–Glenburnie, *M.I.H.Brooker* 3096 (BRI, FRI, NSW); Maroota, *W.A.W. de Beuzeville* 28 (FRI, NSW); Castle Cove, Sydney, *M.Gray* 5379 (CANB, NSW).

Has larger buds and fruits than *E. propinqua* and narrower fruits than *E. canaliculata*. The wood is hard, heavy, strong and durable, and has been used for poles, sleepers and heavy constructions.

197. *Eucalyptus canaliculata* Maiden, *J. Roy. Soc. New South Wales* 54: 171 (1920)

Based on *E. punctata* var. *grandiflora* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 26: 133 (1901). T: 7 miles [c. 11 km] from Dungog on the Booral Road, N.S.W., Sept. 1920, *A.Rudder s.n.*; lecto, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 3: 195 (1917): NSW.

Illustrations: S.Kelly *et al.*, *Eucalypts* 2: t. 44 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 138 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 377 (1984).

Tree to 30 m. Bark grey gum type. Juvenile leaves broadly lanceolate. Adult leaves lanceolate; lamina 8–15 cm long, 1.6–3 cm wide, discolorous; lateral veins just visible, at 45°–60°; intramarginal vein up to 1 mm from margin; petiole channelled, 15–28 mm long. Umbels 7-flowered; peduncle flattened, 10–18 mm long; pedicels 4–7 mm long. Buds ovoid or broadly fusiform, 2-ribbed or angular; operculum conical, 4–6 mm long, 5–6 mm wide; hypanthium hemispherical or obconical, 3–5 mm long, 5–6 mm wide. Fruits hemispherical or obconical, ribbed, 8–12 mm long, 12–15 mm wide; disc broad, level or ascending; valves 3 or 4, exserted. Seeds black. *Large-fruited Grey Gum*. Fig. 65M–N.

Occurs from the Gloucester area southwards to Pokolbin, N.S.W., in coastal ranges on low hills and ridges, in open forest. Regions: MCPH, NEPN. Map 208.

N.S.W.: 35.4 km S of Bulahdelah, *R.D.Johnston* 185 (FRI, NSW); 16 km NNE of Ravensworth, *R.Story* 7143 (BRI, CANB, MEL, NSW); 16 km NW of Dungog, *R.Story* 7307 (CANB, NSW).

Fruits broader than in other grey gums.

198. *Eucalyptus biturbinata* L.Johnson & K.Hill, *Fl. Australia* 19: 507 (1988).

T: Kyogle road, 3 miles [c. 5 km] N of Cawongla, N.S.W., 14 Jan. 1966, *R.D.Johnston* 149 & *A.Nichols*; holo: NSW; iso: FRI.

E. punctata var. *didyma* R.Baker & H.G.Smith, *Res. Eucalyptus* 127 (1902) *p.p.* not as to lecto.

Illustrations: S.Kelly *et al.*, *Eucalypts* 2: t. 45 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 139 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 377 (1984).

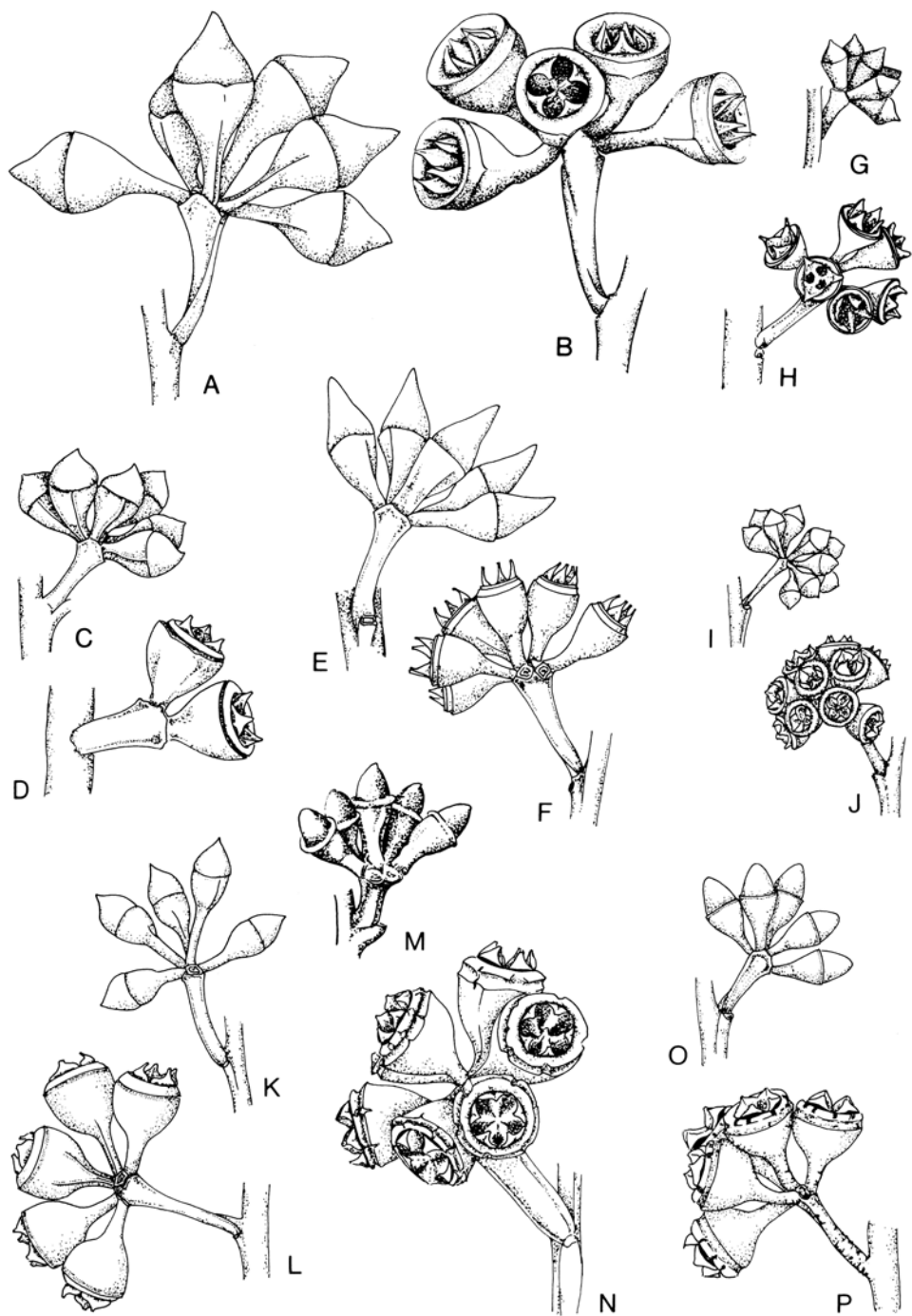


Figure 65. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. pellita* (**A**, I.Brooker 3038, FRI; **B**, Black Mtn Rd, NE of Mareeba, Qld, L.Johnson, NSW). **C–D**, *E. notabilis* (D.Kleinig DK134, FRI). **E–F**, *E. resinifera* (**E**, I.Brooker 4123, FRI; **F**, I.Brooker 4838, FRI). **G–H**, *E. major* (**G**, Norman Ck, near Brisbane, Qld, C.White, FRI; **H**, P.Martensz 1041, FRI). **I–J**, *E. propinqua* (R.Johnston 214, FRI). **K–L**, *E. punctata* (9.3 km S of Ginghi towards Rylestone, N.S.W., J.Banks, FRI). **M–N**, *E. canaliculata* (**M**, Fosterton, Dungog, N.S.W., W. de Beuzeville, FRI; **N**, I.Brooker 6119, FRI). **O–P**, *E. biturbinata* (**O**, R.Johnston 205, FRI; **P**, R.Johnston 112, FRI). Drawn by M.May.

Tree to 30 m. Bark grey gum type. Juvenile leaves broadly lanceolate. Adult leaves lanceolate; lamina 8–12 cm long, 1.8–2.4 cm wide, discolorous; lateral veins just visible, at 45°–60°; intramarginal vein up to 1 mm from margin; petiole channelled, 15–25 mm long. Umbels 7-flowered; peduncle flattened, 10–20 mm long; pedicels thick, 4–6 mm long. Buds ovoid or clavate; operculum conical or hemispherical, angular, 5–7 mm long, 6–8 mm wide; hypanthium hemispherical, 4–6 mm long, 6–8 mm wide. Fruits hemispherical, 7–9 mm long, 6–9 mm wide; disc broad, level, convex or ascending; valves 3 or 4, exserted. Seeds black. *Grey Gum*. Fig. 65 O–P.

Occurs in south-eastern Qld and north-eastern N.S.W., on hills and ridges in open forest. Region: MCPH. Map 209.

Qld: 4.8 km S of Jimna, *R.D.Johnston 314b* (FRI). N.S.W.: 4.8 km N of Rookhurst, *R.D.Johnston 117* (BRI, FRI, NSW); 4.8 km N of Cawongla, *R.D.Johnston 149* (FRI, NSW).

Operculum broader and more wrinkled than in related species, often wider than hypanthium.

199. *Eucalyptus longirostrata* (Blakely) L.Johnson & K.Hill, *Fl. Australia* 19: 509 (1988)

E. punctata var. *longirostrata* Blakely, *Key Eucalypts* 101 (1934). T: Acacia Creek, Qld, June 1905, *W.Dunn s.n.*; syn: NSW; Benarkin, Qld, June 1917, *Forest Inspector Twine s.n.*; lecto: NSW, *fide* L.Johnson & K.Hill, *loc. cit.*

Illustrations: S.Kelly *et al.*, *Eucalypts* 2: t. 43 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 139 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 377 (1984).

Tree to 30 m. Bark grey gum type. Juvenile leaves broadly lanceolate. Adult leaves lanceolate; lamina 10–14 cm long, 1.8–2.6 cm wide, discolorous; lateral veins faint, at 50°–60°; intramarginal vein almost confluent with margin; petiole channelled, 15–25 mm long. Umbels 7-flowered; peduncles flattened, 8–16 mm long; pedicels 6–8 mm long. Buds rostrate; operculum rostrate, 8–14 mm long, 5–8 mm wide; hypanthium hemispherical or obconical, 3–6 mm long, 5–8 mm wide. Fruits hemispherical or ±campanulate, 7–12 mm long, 8–12 mm wide; disc narrow, ascending; valves 3 or 4, exserted. Seeds black. *Grey Gum*. Fig. 66A–B.

Occurs widely in Qld from the Blackdown Tableland southwards to near Toowoomba, on hills and ridges in open forest. Regions: DWSN, MCPH. Map 210.

Qld: 12.9 km SE of Kingaroy, *R.D.Johnston 239* (BRI, FRI); Sedgley Park, Mar. 1964, *L.S.Smith* (BRI); 29 km S of Cracow, *N.H.Speck 1931* (AD, BRI, CANB, NSW, NT).

Differs from related species especially by the long, rostrate, pedicellate buds.

200. *Eucalyptus longifolia* Link, *Enum. Hort. Berol.* 2: 29 (1822)

T: probably from Port Jackson, N.S.W., *collector unknown*, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 2: 295 (1914); *holo: n.v.*; *iso: n.v.*

E. woollsii F.Muell., *Fragm.* 2: 50 (1860). T: Smithfield, N.S.W., *W.Woolls s.n.*; *holo: MEL*.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 35 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 140 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 381 (1984).

Tree to 35 m. Bark subfibrous, ridged and cracked, grey on trunk and larger branches, then smooth, light brown or grey-green above. Juvenile leaves ovate to broadly lanceolate. Adult leaves lanceolate or narrowly lanceolate, falcate; lamina 11–24 cm long, 1.2–2.5 cm wide; lateral veins just visible, at 35°–50°; intramarginal vein up to 1 mm from margin; petiole channelled, 15–30 mm long. Umbels 3-flowered; peduncle terete or angular, often recurved, 11–34 mm long; pedicels 4–20 mm long. Buds fusiform; operculum conical, 8–11 mm long, 6–12 mm wide; hypanthium obconical, 6–9 mm long, 6–12 mm wide. Fruits cylindrical or subcampanulate, 10–17 mm long, 9–16 mm wide; disc broad, descending; valves usually 4, ±level. Seeds black. *Woollybutt*. Fig. 66C–D.

Occurs from about Newcastle southwards to Eden, N.S.W. Grows in coastal and near-coastal areas in valleys, and adjacent hills in heavy soil as scattered trees, in open forest and tall open forest. Regions: NEPN, HOWE. Map 211.

N.S.W.: Jigamy Ck, 9.7 km N of Eden, 11 June 1960, *E.F. Constable* (K, NSW); Wyee, *R. Coveny* 6056 (FRI, NSW); Sussex Inlet, *M. Gray* 5483 (CANB, NSW).

Differs from related species in the grey, subfibrous bark on trunk and larger branches, the concolorous leaves and the 3-flowered pendulous umbels with long peduncles and pedicels. The wood is hard and durable, and has been used for railway sleepers and general construction.

201. *Eucalyptus cosmophylla* F.Muell., *Trans. & Proc. Victorian Inst. Advancem. Sci.* 32 (1855)

T: Lofty Ranges, S.A., 2 Mar. 1848 & Nov. 1848, *F. Mueller*; syn: MEL; Bugle Ranges, S.A., 28 Apr. 1848 & July 1851, *F. Mueller*; syn: MEL.

E. cosmophylla f. *leprosula* F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 134 (1856); *E. cosmophylla* var. *leprosula* (F.Muell. ex Miq.) F.Muell. ex Maiden, *Crit. Revis. Eucalyptus* 3: 17 (1917). T: none cited.

E. cosmophylla var. *rostrigera* F.Muell. ex Maiden, *Crit. Revis. Eucalyptus* 3: 17 (1917). T: Mt Barker Ra., S.A., *F. Mueller*; holotype: MEL.

Illustrations: N.Hall & M.I.H. Brooker, *Forest Tree Ser.* No. 126 (1974); S.Kelly *et al.*, *Eucalypts* 1: t. 36 (1983); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 141 (1983).

Mallee to 2 m or tree to 10 m. Bark smooth, matt, white or blue-grey throughout, though often with accumulated old grey-brown bark at base. Juvenile leaves ovate. Adult leaves lanceolate to broadly lanceolate, leathery; lamina 7.5–15 cm long, 2–3.8 cm wide, concolorous; lateral veins just visible, at 40°–60°; intramarginal vein conspicuous, up to 3 mm from margin; petiole thick, flattened, 15–25 mm long. Umbels 3-flowered; peduncle thick, flattened or angular, 2–8 mm long; pedicels absent. Buds ovoid, shortly rostrate or fusiform; operculum conical, hemispherical or shortly rostrate, 6–10 mm long, 9–14 mm wide; hypanthium hemispherical or obconical, 7–14 mm long, 9–14 mm wide. Fruits hemispherical or shortly cylindrical, finely 2-ribbed, 15–20 mm long, 12–18 mm wide; disc broad, descending; valves 4 or 5, ±level. Seeds black. *Cup Gum*. Fig. 66E–F.

Occurs from the Mt Lofty Ranges to the Fleurieu Peninsula and on Kangaroo Is., S.A.; grows in open shrubland, as an understorey in low open forest, and in heathland near the sea. Region: EYRE. Map 212.

S.A.: 1.6 km SW of Crafrers, *M.I.H. Brooker* 3120 (FRI, NSW); 11 km NW of Karatta, Kangaroo Is., *G.M. Chippendale* 1367 & *M.J. Brennan* (AD, BRI, FRI, NSW); Mt Bold, *K. Czornij* 544 (AD).

Differs from *E. longifolia* in being a mallee or small tree with smooth bark, leathery leaves, and sessile buds and fruits. A small tree suitable for street planting.

Ser. 45 Cornutae

Eucalyptus* ser. *Cornutae Blakely, *Key Eucalyptus* 22, 106 (1934).

E. subser. *Cornutae* Benth., *Fl. Austral.* 3: 195, 233 (1867); *E.* subser. *Sessiles* Blakely, *Key Eucalypts* 22 (1934) *p.p.* as to type. T: *E. cornuta* Labill.

E. ser. *Lehmannianae* D.Carr & S.Carr, *Austral. J. Bot.* 28: 524 (1980) *p.p.* T: *E. lehmannii* (Schauer) Benth.

Trees, shrubs or mallees. Bark usually smooth, deciduous in flakes, but fibrous in several taxa at least on the trunk and larger branches. Adult leaves alternate, petiolate, usually green, concolorous. Conflorescences axillary, simple, 3–many-flowered umbels; peduncles mostly flattened, sometimes angular; pedicels usually absent. Buds clavate, conical, cylindrical or horn-shaped. Fruits campanulate, hemispherical, subglobular or cylindrical, sometimes aggregated into globular masses; disc broad or obscure, usually exserted,

occasionally level; valves 3 or 4, often held together at least initially by the persistent base of the style. Seeds \pm flat, grey-brown.

A series of 8 species in south-western W.A. Trees or mallees with smooth or fibrous bark, concolorous leaves, sessile or shortly pedicellate buds and fruits with exserted valves usually remaining \pm joined at the apices.

D.J. & S.G.M.Carr, The *Lehmannianae* : a natural group of Western Australian Eucalypts, *Austral. J. Bot.* 28: 523–550 (1980).

202. *Eucalyptus gomphocephala* DC., *Prodr.* 3: 220 (1828)

T: Geographe Bay, [W.A.], May 1801, *J.Leschenault*; holo: G; iso: K.

E. gomphocephala var. *rhodoxylon* Blakely & Steedman, *Contr. New South Wales Natl Herb.* 1: 36 (1939). T: Guildford district, W.A., Nov. 1937, *H.Steedman s.n.*; holo: NSW.

Illustrations: C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 13 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 47 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 385 (1984).

Tree to 40 m. Bark subfibrous throughout, finely fissured, grey. Juvenile leaves alternate, petiolate, ovate, often cordate, green, discolorous. Adult leaves lanceolate, acuminate; lamina 9–16 cm long, 1.6–2.5 cm wide; lateral veins faint, at 30°–45°; intramarginal vein up to 1 mm from margin; petiole flattened or channelled, 15–20 mm long. Umbels 7-flowered; peduncle 13–27 mm long; pedicels absent or up to 4 mm long. Buds clavate; operculum hemispherical, 8–10 mm long, 9–13 mm wide; hypanthium obconical or campanulate, often ribbed, 7–9 mm long, 7–8 mm wide. Fruits campanulate or cylindrical, often faintly ribbed, 13–22 mm long, 13–17 mm wide; disc broad, level, convex or ascending; valves 4, level or slightly exserted. *Tuart.* Fig. 66G–H.

Occurs in a restricted area from about Perth to near Busselton, with an isolated occurrence near Jurien Bay, W.A. Grows in limestone areas on the coastal plain, on flat country and undulating country, in woodland and open forest. Region: LUWN. Map 213.

W.A.: Ludlow, Nov. 1923, *C.A.Gardner* (PERTH); NE of Cervantes, *A.S.George 11780* (FRI, PERTH); Fremantle, 6 Mar. 1918, *F.M.C.Schock* (FRI, PERTH).

A large tree with grey flaky-fibrous bark, 7-flowered umbels, usually sessile buds and large, campanulate or cylindrical fruits. The hemispherical operculum clearly wider than the hypanthium is distinctive. The wood is very hard, strong and durable and has been used for railway carriage construction, bridge supports and wheelwright work.

203. *Eucalyptus cornuta* Labill., *Voy. Rech. Pérouse* 1: 402, t. 17 (1800)

T: Observatory Is., [W.A.], 13 Dec. 1792, *J. de Labillardière*; holo: FI; iso: BM, G, K, LE, LINN, MEL.

E. macrocera Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 22(2): 20 (1849). T: W.A., *J.Drummond* 4: 67; holo: L; iso: BM, CGE, K.

Illustrations: C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 202 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 43 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 387 (1984).

Tree to 25 m, sometimes a mallee to 10 m. Bark rough, hard, deeply furrowed, dark grey or black on trunk and larger branches, then smooth, grey or grey-brown above. Juvenile leaves alternate, petiolate, orbicular to ovate, green, discolorous. Adult leaves lanceolate to broadly lanceolate, acuminate; lamina 8–14 cm long, 1–2.7 cm wide, shining; lateral veins conspicuous, at 30°–40°; intramarginal vein up to 2 mm from margin; petiole flattened or channelled, 5–15 mm long. Umbels usually 11–15-flowered; peduncle 17–30 mm long. Buds horn-shaped or narrowly cylindrical, often shortly pedicellate; operculum horn-shaped, 17–30 mm long, 5–10 mm wide; hypanthium hemispherical, faintly ribbed, 4–8 mm long, 5–10 mm wide. Fruits hemispherical or campanulate, crowded, 7–14 mm long, 6–13 mm wide; disc obscure; valves 3, exserted. *Yate.* Fig. 66 I–J.

Occurs in a coastal belt from the Busselton area to Duke of Orleans Bay, W.A., including some islands. Grows in moist valleys and on coastal hills, as scattered trees in open forest, often by granite outcrops. Regions: LUWN, ESPR. Map 214.

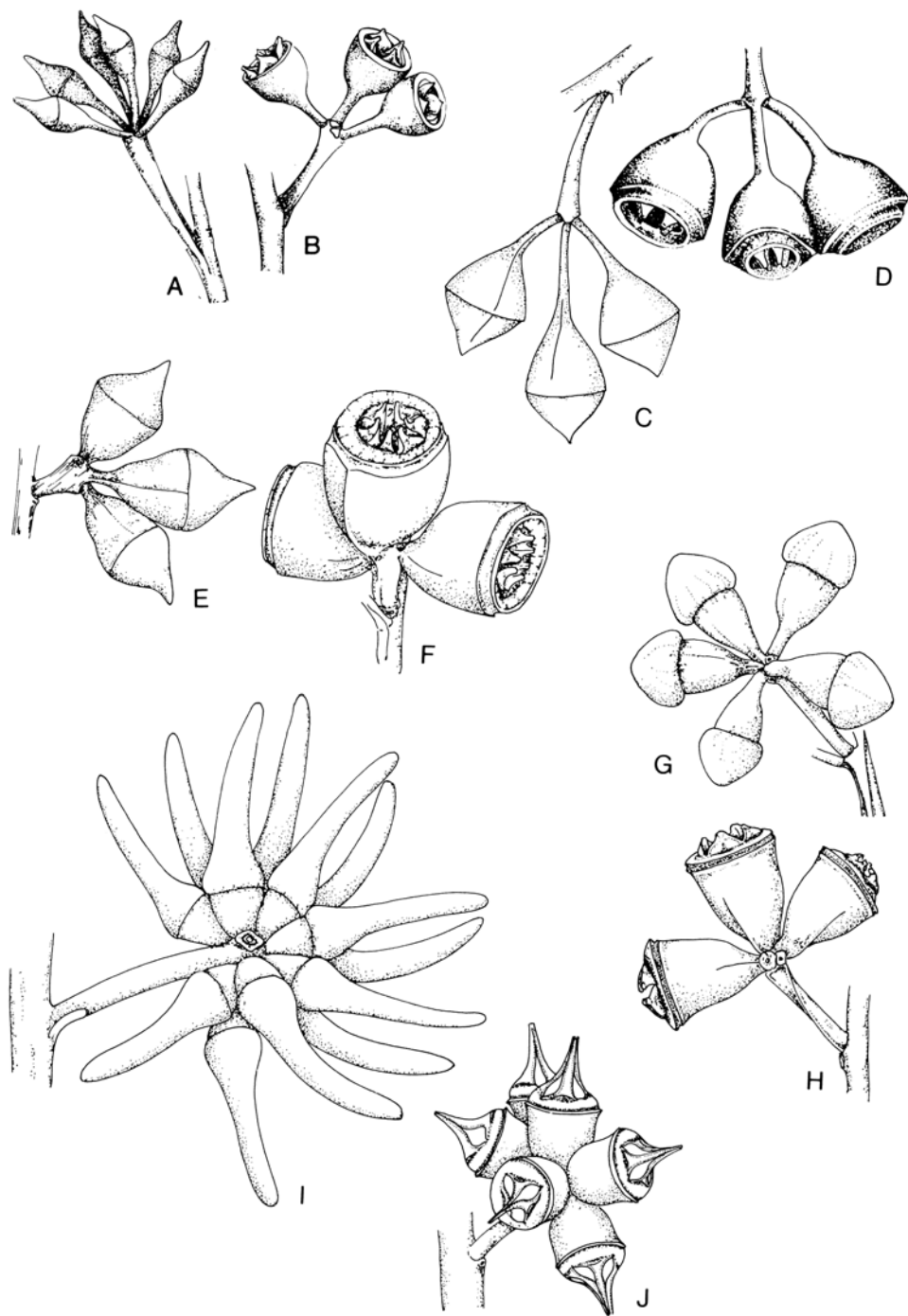


Figure 66. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. longirostrata* (Benarkin, Qld, M.Irvine, FRI). **C–D**, *E. longifolia* (**C**, I.Brooker 6131, FRI; **D**, Batemans Bay, N.S.W., D.Nicholson, FRI). **E–F**, *E. cosmophylla* (**E**, Bridgewater, S.A., P.Snowdon, FRI; **F**, I.Brooker 5940, FRI). **G–H**, *E. gomphocephala* (**G**, 57.6 km N of Bunbury, W.A., M.Phillips, FRI; **H**, C.Cossalter 1571, FRI). **I–J**, *E. cornuta* (**I**, I.Brooker 5652, FRI; **J**, B.Rockel W.A.3, FRI). **A** drawn by C.Stahl. Others drawn by M.May.

W.A.: Cape Le Grand, *K.M.Allan* 828 (FRI, PERTH); Cape Freycinet, *M.I.H.Brooker* 3575 (FRI, PERTH); near Ross Peak, Nov. 1934, *C.A.Gardner* (PERTH).

May be recognised as a hard, rough-barked tree with 11–15-flowered umbels, long smooth horn-shaped buds and shortly pedicellate campanulate or hemispherical fruits with strongly exerted valves. The wood is one of the hardest and strongest in the world, though now limited in availability. Pollen and nectar available on flowers from Dec.–Feb., producing excellent honey.

204. *Eucalyptus talyuberlup* D.Carr & S.Carr, *Austral. J. Bot.* 28: 543 (1980)

T: Stirling Range Drive, Stirling Ra. Natl Park, W.A., 10 Aug. 1974, *D.J.Carr & S.G.M.Carr* 1974; holo: PERTH.

Illustration: D.J.Carr & S.G.M.Carr, *op. cit.* t. 36; S.Kelly *et al.*, *Eucalypts* 1: t. 279 (1983).

Tree or shrub to 3 m. Bark smooth throughout, grey to white. Juvenile leaves not seen. Adult leaves elliptic to lanceolate, apiculate; lamina 5.5–9.5 cm long, 0.8–1.8 cm wide; lateral veins faint, at 30°–45°; intramarginal vein up to 1 mm from margin; petiole flattened, 8–15 mm long. Umbels 7–13-flowered; peduncle 20–30 mm long. Buds narrowly and acutely conical, swollen at base; operculum acutely conical or horn-shaped, 26–43 mm long, 10–12 mm wide; hypanthium obconical, 8–10 mm long, 10–11 mm wide. Fruits campanulate, sometimes several-ribbed, 12–15 mm long, 15–18 mm wide; disc obscure; valves 3 or 4, prominently exerted. Fig. 68C–D.

Occurs in the Stirling Ra.–Kalgan R. area, W.A., usually on lower slopes and hills in dense shrubland. Regions: LUWN, ESPR. Map 215.

W.A.: 4.2 km W of Chester Pass, *M.I.H.Brooker* 3584 (FRI); Bluff Knoll, Stirling Ra., *M.I.H.Brooker* 7662 (FRI).

Differs from *E. cornuta* in the small habit, smooth bark, sessile buds, larger operculum and hypanthium, and larger fruits.

205. *Eucalyptus burdettiana* Blakely & Steedman, *Contr. New South Wales Natl Herb.* 1: 35 (1939)

T: East Mt Barren, W.A., Jan. 1938, *H.Steedman* NSW 58883; holo: NSW; iso: MEL.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 44 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 242 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 47 (1983).

Mallee or shrub to 3.5 m. Bark smooth throughout, green-brown to light brown. Juvenile leaves not seen. Adult leaves lanceolate, acuminate; lamina 6–9 cm long, 1–2.5 cm wide, shining; lateral veins usually faint, at 25°–30°; intramarginal vein visible clearly, up to 2 mm from margin; petiole thick, flattened, 8–12 mm long. Umbels 7–11-flowered; peduncle 20–35 mm long, often recurved. Buds cylindrical; operculum cylindrical, expanded at base, warty, 38–42 mm long, 13–16 mm wide; hypanthium obconical, 10–12 mm long, 13–16 mm wide. Fruits campanulate or subglobose, 20–25 mm long and wide; disc broad, convex, overlying the valves; valves 3, exerted. *Burdett's Gum*. Fig. 67A–B.

Occurs on ridges of the Barrens, Fitzgerald R. Natl Park, W.A., on quartzite rocks of the seaward face, in shrubland. Region: ESPR. Map 216.

W.A.: East Mt Barren, *G.M.Chippendale* 420 (AD, BRI, FRI, MEL, NSW, PERTH).

Similar to *E. megacornuta*, but distinguished by mallee habit and smaller buds and fruits. Readily distinguished from *E. cornuta* by the smooth bark and larger buds with warty operculum.

206. *Eucalyptus megacornuta* C.Gardner, *Proc. Roy. Soc. W. Australia* 27: 184 (1942)

T: Ravensthorpe Ra., W.A., 9 Nov. 1935, *C.A.Gardner s.n.*; holo: PERTH; iso: FRI.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 45, 46 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 103 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 44 (1983).

Tree to 12 m. Bark smooth throughout, grey-brown to grey-red. Juvenile leaves ovate. Adult leaves elliptic to lanceolate, acuminate; lamina 6–8.5 cm long, 1.3–2 cm wide; lateral veins faint, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole terete or channelled, 5–10 mm long. Umbels 7-flowered; peduncle 25–40 mm long, erect at first but becoming recurved. Buds cylindrical; operculum cylindrical, swollen at base, very warty, 45–50 mm long, 20–23 mm wide; hypanthium campanulate, ribbed, 15–20 mm long, 20–23 mm wide. Fruits campanulate, 1-ribbed, 20–40 mm long, 25–35 mm wide; disc broad, striate, convex, overlying the valves; valves 3, exserted. *Warty Yate*. Fig. 67C–D.

Occurs on a few hillsides in the Ravensthorpe Ra., W.A., on lateritic rock outcrops in woodland. Region: ESPR. Map 217.

W.A.: 10 km E of Ravensthorpe, *G.M.Chippendale* 204 (FRI, MEL, PERTH); Ravensthorpe Ra., *C.A.Gardner* 13659 (PERTH).

Distinguished by tree habit, pendulous buds, markedly warty operculum and slightly ribbed hypanthium. Buds and fruits larger than those of *E. burdettiana* and peduncle usually longer.

207. *Eucalyptus newbeyi* D.Carr & S.Carr, *Austral. J. Bot.* 28: 541 (1980)

T: junction of Susetta R. and Fitzgerald R., W.A., 119°27'E, 34°S, 13 July 1970, *A.S.George* 10002; holo: PERTH.

Illustrations: D.J.Carr & S.G.M.Carr, *op. cit.* fig. 35; S.Kelly *et al.*, *Eucalypts* 1: t. 274 (1983).

Tree to 8 m. Bark smooth throughout, grey to pink-grey. Juvenile leaves not seen. Adult leaves elliptic or lanceolate, acuminate; lamina 4.5–8.5 cm long, 1–1.4 cm wide; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole flattened, 5–8 mm long. Umbels 3–7-flowered, sometimes to 9-flowered; peduncle recurved, 35–40 mm long, 12–17 mm wide. Buds acutely long-conical; operculum long-conical or horn-shaped, expanded at base, 25–45 mm long, 7–17 mm wide; hypanthium campanulate, 7–15 mm long, 5–17 mm wide. Fruits campanulate, grooved when aged, 20–25 mm long, 20–27 mm wide; disc obscure; valves 3 or 4, prominently exserted. Fig. 69A–B.

Occurs in the south-western W.A. at the Pallinup R. and at the Fitzgerald R., on steep spongolite slopes and cliffs forming river banks in shrubland. Region: ESPR. Map 218.

W.A.: N side of Beaufort Inlet, *M.I.H.Brooker* 7164 (FRI); Millers Point Road, Pallinup R., *D.J.Carr & S.G.M.Carr* 2256 (FRI).

Very similar to *E. megacornuta* but with smooth operculum.

208. *Eucalyptus conferruminata* D.Carr & S.Carr, *Austral. J. Bot.* 28: 535 (1980)

T: Middle Mt Barren, W.A., 16 July 1970, *A.S.George* 10097; holo: PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 47 (1973) as *E. lehmannii*; S.Kelly *et al.*, *Eucalypts* 1: t. 45 (1983).

Tree to 8 m. Bark smooth throughout, grey-brown to grey. Juvenile leaves stellate hairy. Adult leaves elliptic to lanceolate, apiculate; lamina 4.5–8 cm long, 1.1–2.2 cm wide; lateral veins at 20°–30°; intramarginal vein up to 2 mm from margin; petiole flattened, 5–8 mm long. Umbels 19–35-flowered; peduncle flattened, recurved, 25–40 mm long. Buds horn-shaped, expanded at base; operculum horn-shaped, 30–35 mm long, 8–13 mm wide; hypanthia fused. Fruits fused into a globular head which is 2–5 cm long, 4–7 cm wide; disc narrow, ascending; valves 3, strongly exserted. *Bald Island Marlock*. Fig. 68E–F.

Occurs at several disjunct localities in W.A., from Two Peoples Bay E to Cape Arid, including Bald Is., Middle Is., North Twin Peak Is. and Goose Is. Grows on hills and slopes. Region: ESPR. Map 219.

W.A.: N of Mt Le Grand, *M.I.H.Brooker* 3623 (FRI); Two Peoples Bay, *N.T.Burbidge* 8133 (CANB, PERTH).

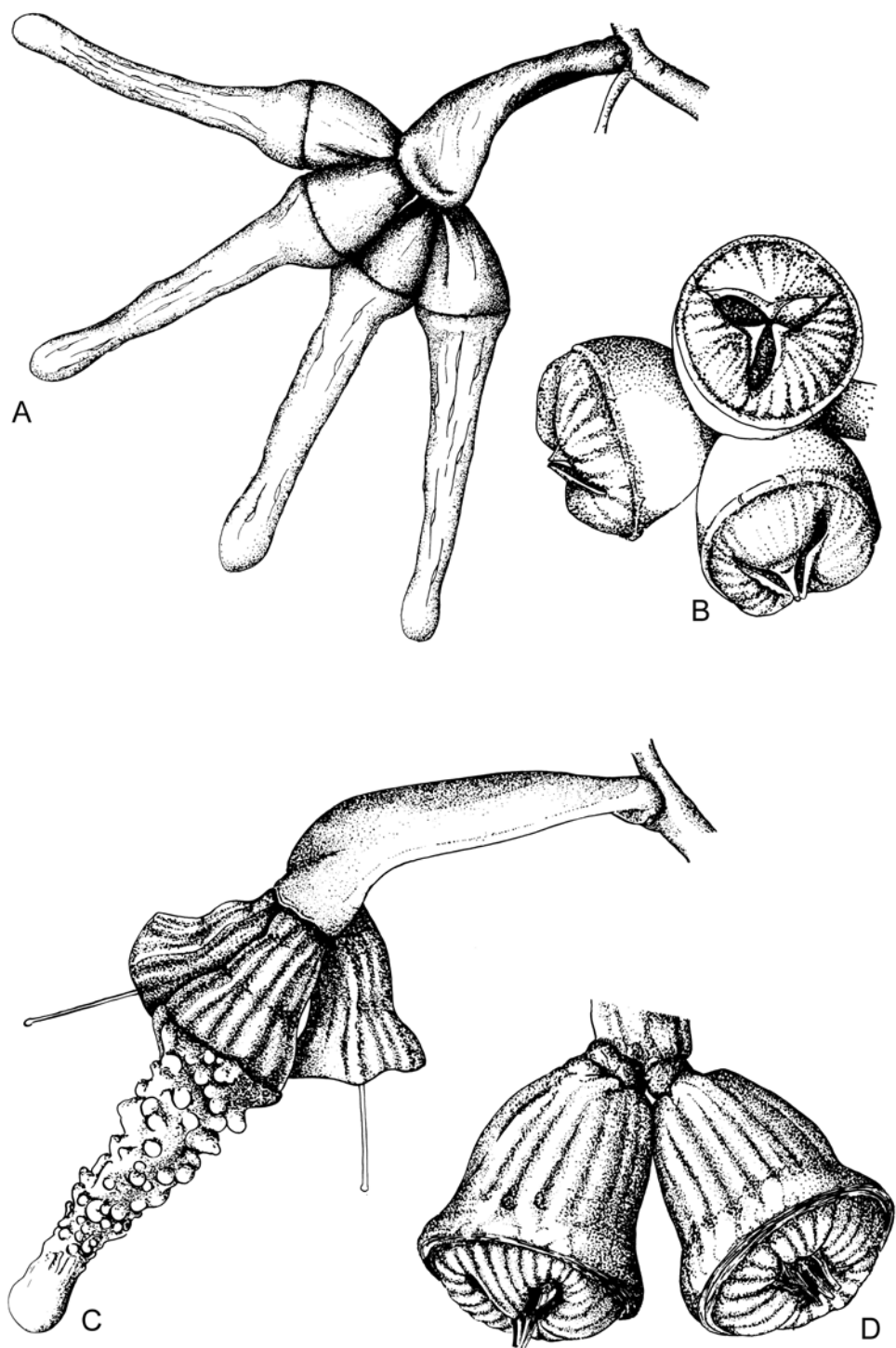


Figure 67. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. burdettiana* (A, G.Chippendale 420, FRI; B, Mt Barren, W.A., H.Steedman, NSW). **C–D**, *E. megacornuta* (C, Ravensthorpe Ra., W.A., C.Gardner & A.Miles, FRI; D, G.Chippendale 204, FRI). Drawn by M.May.

Closely related to *E. lehmannii*, but a small, smooth-barked tree with larger buds and fruits. This and *E. lehmannii* are the only species with fused hypanthia. Widely cultivated as an ornamental tree.

209. *Eucalyptus lehmannii* (Schauer) Benth., *Fl. Austral.* 3: 233 (1867)

Symphomyrtus lehmannii Schauer in J.G.C. Lehmann, *Pl. Preiss.* 1: 127 (1844). T: Cape Riche, W.A., 19 Nov. 1840, *L. Preiss* 227; lecto: LD n.v., *fide* D.J. Carr & S.G.M. Carr, *Austral. J. Bot.* 28: 531 (1980); isolecto: G, MEL.

Illustrations: G.M. Chippendale, *Eucalypts W. Austral. Goldfields* 46 (1973); C.A. Gardner (ed. T.E. Aplin), *Eucalypts W. Australia* 235 (1979); S. Kelly *et al.*, *Eucalypts* 1: t. 45 (1983), as *E. conferruminata*.

Mallee to 3 m. Bark smooth, grey, grey-brown or grey-red, often with accumulated older bark at base of trunk. Juvenile leaves alternate, ovate or orbicular, stellate hairy. Adult leaves elliptic to lanceolate, apiculate; lamina 5–7 cm long, 1–2 cm wide; lateral veins at 25°–35°; intramarginal vein up to 2 mm from margin; petiole flattened or angular, 5–10 mm long. Umbels 7–22-flowered; peduncle 35–45 mm long, at first erect, but recurved at maturity. Buds horn-shaped; operculum acutely conical, 25–35 mm long, 4–7 mm wide; hypanthia fused. Fruits aggregated into a globular, woody head 3.5–4.5 cm diam.; disc obscure; valves 3 or 4, exserted. *Bushy Yate*. Fig. 68A–B.

Occurs from near Albany E to the Cape Arid area and inland to Ongerup, W.A.; an old record (*J. Staer*, Feb. 1911) from Eucla has not been recently confirmed. Grows on rocky hills, and steep upper slopes in gravelly soil in shrubland. Regions: LUWN, ESPR. Map 220.

W.A.: Fitzgerald Inlet, *M.I.H. Brooker* 2701 (FRI, MEL, PERTH); Stirling Ra., 17 Apr. 1970, *A.J. Milesi* (PERTH); 3 km NE of Howick Hill, *A.E. Orchard* 1104 (AD, PERTH).

Distinguished by the mallee habit, large umbels, fused hypanthia and slender operculum. Useful for cultivation in salt-spray areas.

Ser. 46 Micromembranae

***Eucalyptus* ser. *Micromembranae* Maiden, *Crit. Revis. Eucalyptus* 7: 118 (1925).**

Type: *E. occidentalis* Endl., lecto, *fide* G.M. Chippendale, *Fl. Australia* 19: 501 (1988).

E. subser. *Pedicellateae* Blakely, *Key Eucalypts* 23, 108 (1934). T: *E. astringens* Maiden, lecto, *fide* G.M. Chippendale, *op. cit.* 503.

Usually small trees or mallees. Bark smooth throughout or fibrous, flaky on at least the lower trunk and rarely also on lower branches. Juvenile leaves alternate, petiolate. Adult leaves alternate, petiolate, usually shining, green, concolorous. Conflorences axillary, simple; umbels usually 7-flowered, rarely to 15-flowered or more. Buds cylindrical or horn-shaped; operculum clearly much longer than hypanthium. Stamens yellow-green to cream. Fruits campanulate, cylindrical, ±pyriform, or hemispherical; disc narrow, ±level, descending or convex; valves usually 4, exserted. Seeds irregularly crescent-shaped, reticulate, grey-brown or black.

A series of 6 species in south-western W.A. Trees or mallees with fibrous or smooth bark, concolorous leaves, pedicellate buds and a ±cylindrical or horn-shaped operculum.

210. *Eucalyptus occidentalis* Endl., *Enum. Pl. Huegel* 49 (1837)

T: Fremantle, W.A., *K. Hügel s.n.*; holo: W; iso: K. The locality appears incorrect, since the species does not occur at or near Fremantle.

E. agnata Domin, *Repert. Spec. Nov. Regni Veg.* 12: 389 (1913). T: Slab Hut Creek to Cranbrook, W.A., 1910, *A. Dorrien Smith* 7087; holo: PR; iso: K.

E. occidentalis var. *?stenantha* Diels ex Maiden, *Crit. Revis. Eucalyptus* 4: 147 (1920). T: Lake Cowan, W.A., 1 Nov. 1901, *L. Diels* 5245; n.v.

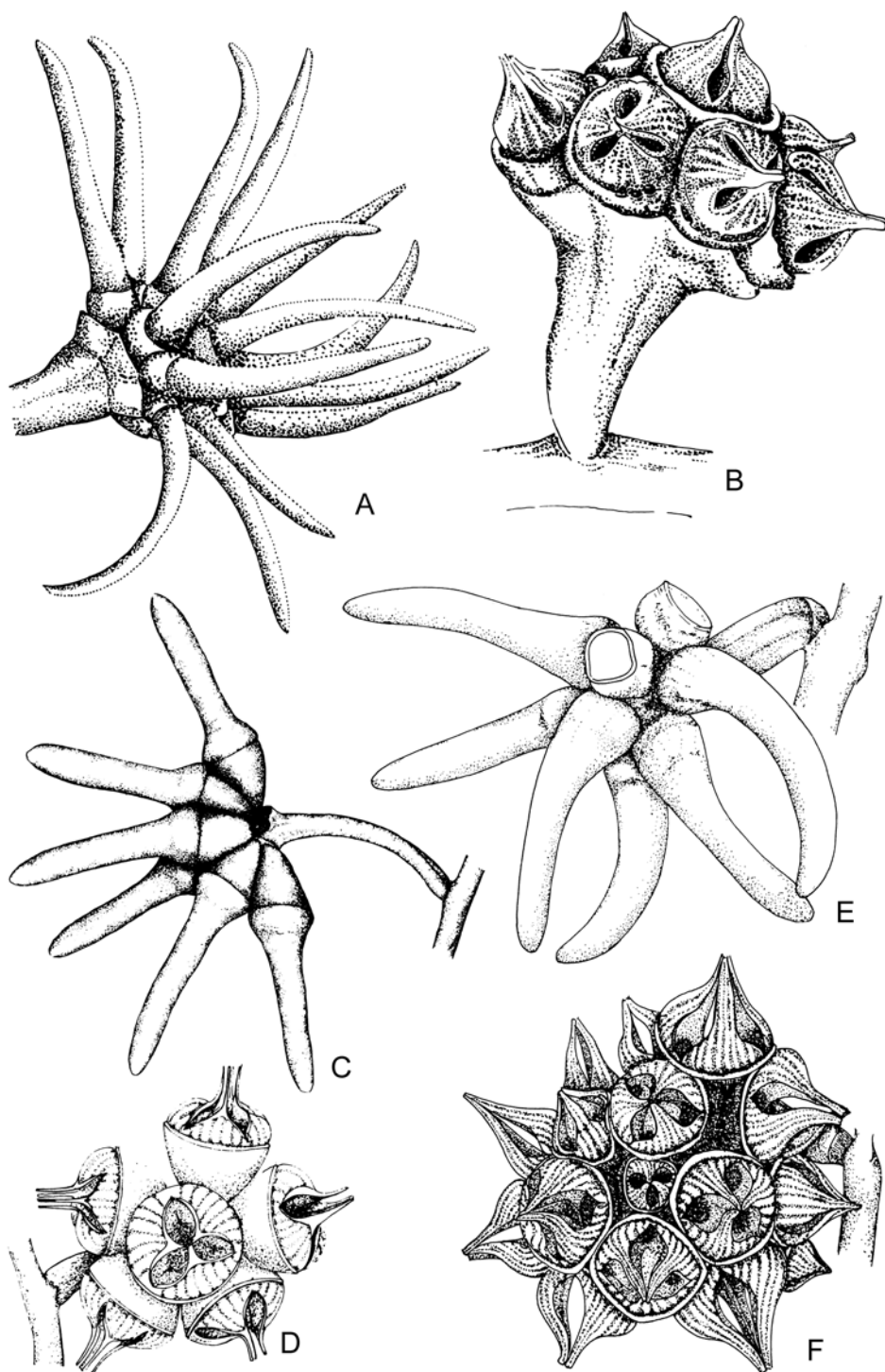


Figure 68. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. lehmannii* (**A**, A.George 1903, PERTH; **B**, cult., Waite Arboretum, S.A., N.Hall & D.Symon, FRI). **C–D**, *E. talyuberlup* (**C**, G.Chippendale 433, FRI; **D**, I.Brooker 7182, FRI). **E–F**, *E. conferruminata* (I.Brooker 3623, fRI). **B** drawn by C.Stahl. Others drawn by M.May.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 48, 49 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 34 (1979); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 389 (1984).

Tree to 20 m. Bark rough, flaky, fibrous on trunk and lower parts of main branches, then smooth, grey above. Juvenile leaves ovate, green, discolorous. Adult leaves lanceolate, uncinately; lamina 7–16 cm long, 1.2–2.5 cm wide; lateral veins conspicuous, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole terete, channelled or flattened, 8–15 mm long. Peduncle flattened, usually recurved, up to 2.5 cm long; pedicels thick, 3–6 mm long. Operculum cylindrical-conical or horn-shaped, expanded at base, 10–15 mm long, 5–6 mm wide; hypanthium campanulate, 5–10 mm long, 5–6 mm wide. Fruits campanulate, faintly striated, 8–15 mm long, 7–11 mm wide; disc narrow, obscured by a prominent staminal ring, descending; valves 4, curved outwards. *Flat-topped Yate, Swamp Yate*. Fig. 69C–D.

Occurs widely in south-western W.A., from about Wagin and Katanning E to Esperance and Israelite Bay. Grows usually on alluvial flats subject to flooding. Regions: BENC, LUWN, ESPR. Map 221.

W.A.: Wagin, C.A.Gardner 1911 (NSW, PERTH); 25 km W of Chester Pass, P.G.Wilson 4219 (FRI, PERTH); 22 km N of Shoal Cape, P.G.Wilson 7821 (FRI, MEL, PERTH).

Characteristically a tree with dark rough bark on trunk and lower branches, shining leaves, recurved peduncles, horn-shaped buds and campanulate fruits. Differs from *E. astringens* mainly in the rough bark and in tolerating fire. Fruits of inland populations may be almost cylindrical. Tolerant of moderately saline soils, a useful shade tree, and has been cultivated in California, Israel, Hawaii, Sri Lanka, and Algiers. Also a useful honey plant.

211. *Eucalyptus astringens* (Maiden) Maiden, *Crit. Revis. Eucalyptus* 7: 55 (1924)

E. occidentalis var. *astringens* Maiden, *J. W. Austral. Nat. Hist. Soc.* 3: 186 (1911). T: Broomehill, W.A., Dec. 1909, J.H.Maiden; holo: NSW; iso: K.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 50 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 34 (1979); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 391 (1984).

Tree to 24 m, usually below 15 m, sometimes a mallee. Bark smooth throughout, light brown to grey, usually with small patches of curly exfoliating bark. Juvenile leaves ovate, green or grey-green, concolorous. Adult leaves lanceolate, acuminate; lamina 7–11 cm long, 1.2–2 cm wide; lateral veins just visible, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 10–20 mm long. Peduncle flattened, becoming recurved, 15–30 mm long; pedicels 5–8 mm long. Operculum cylindrical, constricted in middle, expanded slightly at base, 8–18 mm long, 5–7 mm wide; hypanthium campanulate or hemispherical, 6–8 mm long, 5–7 mm wide. Fruits campanulate, faintly striated, 8–12 mm long, 6–10 mm wide; disc narrow, ±level; valves usually 4, curved outwards. *Brown Mallet*. Fig. 69E–F.

Occurs from NW of York S to Mt Barker, then E to near Kondinin, Lake Grace and Ravensthorpe, W.A. Grows usually on hills and flats with lateritic soil, in woodland and open forest. Regions: BENC, LUWN, ESPR. Map 222.

W.A.: Boyagin Fauna Sanctuary, N.T.Burbidge 8079 (CANB, PERTH); Lort R., 75 km W of Esperance, G.M.Chippendale 195 (FRI, MEL, PERTH); 4.7 km W of Needilup, G.M.Chippendale 424 (AD, FRI, MEL, PERTH).

Closely related to *E. occidentalis* but has smooth bark with small exfoliating curly flakes, and is killed by fire, regenerating from seed. The wood is hard, strong and durable and has been used for tool handles, farm and mining construction and fuel. The bark has a high tannin content and has been used commercially.

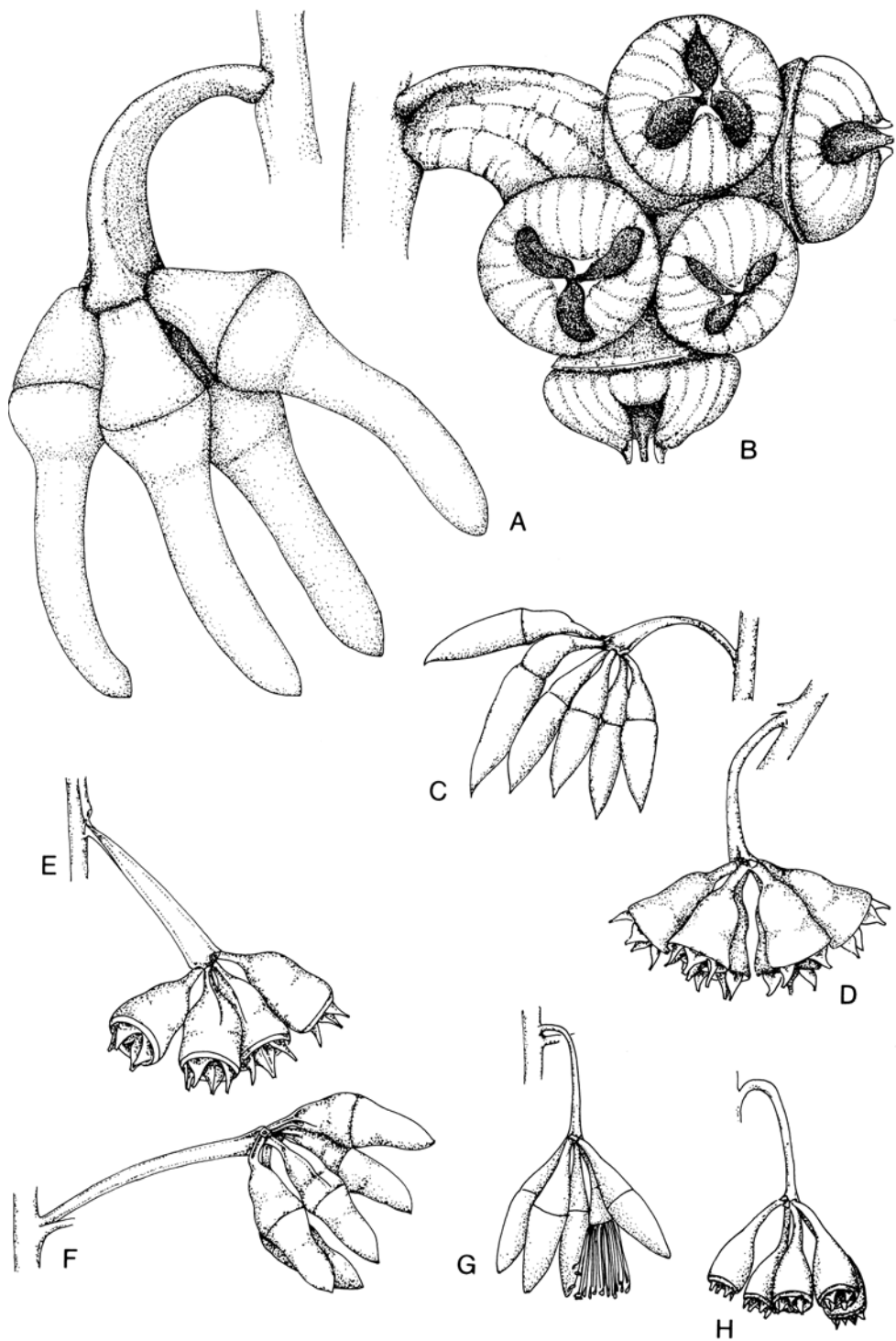


Figure 69. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. newbeyi* (I.Brooker 7164, FRI). **C–D**, *E. occidentalis* (**C**, P.Wilson 5665, FRI; **D**, D.Boland 220, FRI). **E–F**, *E. astringens* (**E**, G.Chippendale 417, FRI; **F**, C.Gardener 1223, FRI). **G–H**, *E. sargentii* (J.Baker 135, FRI). Drawn by M.May.

212. *Eucalyptus sargentii* Maiden, *Crit. Revis. Eucalyptus* 7: 58 (1924)

T: Meare Lake, W.A., Sept. 1910, *O.H.Sargent* 707; holo: NSW; iso: FRI.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 51, 52 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 237 (1979); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 393 (1984).

Tree to 11 m. Bark rough, flaky, grey-brown on lower trunk, then smooth, red-brown to grey above. Juvenile leaves lanceolate, grey-green, concolorous. Adult leaves narrowly lanceolate, acuminate; lamina 6–9 cm long, 0.5–1.1 cm wide; lateral veins faint, at 20°–30°; intramarginal vein up to 1 mm from margin; petiole terete, 8–12 mm long. Peduncle angular, slender, 7–24 mm long; pedicels 3–5 mm long. Operculum horn-shaped, 11–13 mm long, 4–5 mm wide; hypanthium cylindrical, 3–5 mm long, 4–5 mm wide. Fruits cylindrical or subpyriform, 7–9 mm long, 4–7 mm wide; disc narrow, level; valves 3 or 4. *Salt River Gum*. Fig. 69G–H.

Occurs from Lake Meares to Cunderdin, Wyola Siding and Hines Hill, W.A. Grows in low-lying, poorly drained areas in open woodland. Region: BENC. Map 223.

W.A.: 9.3 km NE of Hines Hill, *J.P.Baker* 135 (AD, BRI, FRI, MEL, NSW, PERTH); 8 km W of Tammin, *M.I.H.Brooker* 2437 (FRI, NSW, PERTH); 4.3 km E of Cunderdin, *G.M.Chippendale* 77 (AD, BRI, FRI, MEL, NSW, PERTH).

Differs from *E. occidentalis* and *E. astringens* mainly in having narrow adult leaves and smaller buds and fruits, and also from *E. astringens* in having rough bark on the lower trunk. Important as a salt tolerant tree, useful in many salt-affected arid areas as a cultivated species.

213. *Eucalyptus stowardii* Maiden, *J. Roy. Soc. New South Wales* 51: 457 (1917)

T: Kwelkan, a few miles N of Kellerberrin, W.A., Apr.–May 1917, *F.Stoward* 150; holo: NSW.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 53 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 191 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 53 (1983).

Tree or mallee to 8 m. Bark smooth throughout, yellow-brown to grey or grey-pink. Juvenile leaves broadly lanceolate to ovate, green, concolorous. Adult leaves lanceolate, acuminate; lamina 8–11.5 cm long, 1.5–3 cm wide; lateral veins just visible or faint, at 20°–30°; intramarginal vein up to 2 mm from margin; petiole terete, 20–30 mm long. Peduncle terete, 15–25 mm long; pedicels slender, 4–6 mm long. Operculum conical, up to 12-ribbed, 20–25 mm long, 8–10 mm wide; hypanthium obconical, ribbed, 8–15 mm long, 8–10 mm wide. Fruits cylindrical or subpyriform, ribbed, 12–15 mm long, 10–15 mm wide; disc broad, convex; valves 4. *Fluted Horn Mallee*. Fig. 70A–B.

Occurs from the Wubin area S and SE to Dowerin, Wyalkatchem and Kellerberrin, W.A. Grows usually in granitic soil in open shrubland. Region: BENC. Map 224.

W.A.: 16 km W of Carnamah, *K.M.Allan* 710 (BRI, FRI, NSW, PERTH); Pithara, *G.M.Chippendale* 247 (FRI, NSW, PERTH); c. 340 km from Perth on road to Paynes Find, *H.Demarz* 2386 (FRI, PERTH).

The ribbed buds and fruits are characteristic. Highly suitable for street planting. Usually a smaller plant than the preceding species.

214. *Eucalyptus macrandra* F.Muell. ex Benth., *Fl. Austral.* 3: 235 (1867)

E. occidentalis var. *macrandra* (F.Muell. ex Benth.) Maiden, *J. W. Austral. Nat. Hist. Soc.* 3: 187 (1911). T: Stirling Ra., W.A., *G.Maxwell*; syn: K, MEL, NSW; Salt R., W.A., *G.Maxwell*; syn: K, MEL, NSW; Phillips Ra., W.A., *G.Maxwell*; syn: n.v.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 54 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 211 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 54 (1983).

Mallee to 3 m, occasionally a tree to 6 m. Bark smooth throughout, light brown to grey. Juvenile leaves lanceolate to broadly lanceolate, green, concolorous. Adult leaves lanceolate; lamina 7.5–10 cm long, 1–3 cm wide; lateral veins just visible, at c. 40°; intramarginal vein up to 2 mm from margin; petiole terete, 15–20 mm long. Umbels to 15-flowered; peduncle

flattened, 15–30 mm long; pedicels slender, 2–6 mm long. Operculum narrowly conical or horn-shaped, 18–30 mm long, 3–4 mm wide; hypanthium cylindrical, 4–5 mm long and wide. Fruits cylindrical or hemispherical, 6–9 mm long, 6–7 mm wide; disc narrow, level or slightly ascending; valves convex. *Long-flowered Marlock*. Figs 27, 70C–D.

Occurs from the Stirling Ra. to the Hamersley R., W.A., in depressions and on stream banks, often forming thickets. Region: ESPR. Map 225.

W.A.: Hamersley R., *M.I.H.Brooker* 2747 (FRI, PERTH); Pallinup R., *H.Demarz* 2208 (FRI, PERTH); Beaufort Inlet, *K.Newbey* 762 (PERTH).

The many-flowered umbels and long narrow smooth operculum are diagnostic. In the dehiscent fruit the valves often remain fused at tips. Most useful as a street tree or for windbreaks.

215. *Eucalyptus annulata* Benth., *Fl. Austral.* 3: 234 (1867)

T: Salt R., W.A., *G.Maxwell*; holo: K; iso: MEL.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 55, 56 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 50 (1983).

Mallee or tree to 8 m. Bark smooth throughout, yellow-brown or yellow-green to grey or grey-brown. Juvenile leaves narrowly to broadly lanceolate, green, concolorous. Adult leaves narrowly lanceolate, uncinat, sometimes slightly falcate; lamina 6.5–10 cm long, 1–1.5 cm wide; lateral veins faint, at c. 30°; intramarginal vein up to 1 mm from margin; petiole terete, 10–20 mm long. Peduncle flattened, 5–10 mm long; pedicels absent. Operculum cylindrical-conical, 10–15 mm long, 4–5 mm wide; hypanthium hemispherical, 3–5 mm long, 4–5 mm wide. Fruits hemispherical, 6–7 mm long, 10–12 mm wide; disc narrow, slightly ascending; valves 3 or 4, broad at base, spreading at maturity. *Open-fruited Mallee*. Fig. 70E–F.

Occurs widely from the Stirling Ra. to N of Esperance, W.A., often forming thickets, in clayey soil. Region: ESPR. Map 226.

W.A.: 13.7 km NW of Ravensthorpe, *G.M.Chippendale* 219 (FRI, MEL, NSW, PERTH); 3.2 km N of Salmon Gums, *M.I.H.Brooker* 2496a (FRI, NSW, PERTH); 12 km NNW of Ongerup, *M.D.Tindale* 3897 (FRI, NSW, PERTH).

Differs from other species of the series in the sessile buds and robust fruiting valves that spread at dehiscence. Useful as a street tree or windbreaks, and has a long flowering period, Oct. to Mar., when excellent honey can be produced.

Ser. 47 *Elongatae*

Eucalyptus* ser. *Elongatae Blakely, *Key Eucalypts* 28, 127 (1934).

Type: *E. erythronema* Turcz., lecto, *vide* G.M.Chippendale, *Fl. Australia* 19: 498 (1988).

E. subser. *Pedicellatae* Blakely, *Key Eucalypts* 23 (1934) *p.p.*

E. ser. *Cornutae* subser. *Sessiles* Blakely, *Key Eucalypts* 22 (1934) *p.p.* not as to type.

Mallees or small trees. Bark smooth throughout. Juvenile leaves alternate, petiolate, concolorous. Adult leaves alternate, petiolate, concolorous. Conflorences axillary, simple, 3–7-flowered umbels. Buds ovoid, horn-shaped, cylindrical, conical, ±pyramidal, or ±fusiform. Fruits obconical, turbinate, pyriform, cylindrical, hemispherical, urceolate or obpyramidal; disc often obscure; valves 3–5, usually exserted, sometimes included or level. Seeds ovoid to orbicular, elliptic, or crescent-shaped, brown, reticulate.

A series of 9 species in south-western W.A. Mallees or small trees with smooth bark throughout, concolorous leaves, simple 3–7-flowered umbels, an obscure fruiting disc and brown seeds.

216. *Eucalyptus nutans* F.Muell., *Fragm.* 3: 152 (1863)

E. platypus var. *nutans* (F.Muell.) Benth., *Fl. Austral.* 3: 235 (1867). T: Bremer Bay, W.A., Dec. 1862, G.Maxwell; holo: MEL; iso: K.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 56 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 49 (1983).

Mallee to 2.5 m. Bark light brown to grey. Juvenile leaves lanceolate to broadly lanceolate. Adult leaves lanceolate to broadly lanceolate, acuminate to uncinata; lamina 5–6.5 cm long, 1.5–2.5 cm wide, shining, green; lateral veins just visible, at 30°–40°; intramarginal vein faint, up to 2 mm from margin; petiole terete, 10–20 mm long. Umbels 7-flowered; peduncle broadly flattened, 10–20 mm long, 7–10 mm wide, usually recurved; pedicels absent or to 4 mm long. Buds ovoid; operculum conical, obtuse, 5–7 mm long, 5–6 mm wide, narrower at base than hypanthium; hypanthium hemispherical, 5–10 mm long, 6–7 mm wide. Fruits obconical or turbinate, 2-ribbed, 8–12 mm long, 8–10 mm wide; disc narrow, obscure; valves 3–5, ±level, just included or just exerted. *Red-flowered Moort.* Fig. 70G–H.

Occurs in south-western W.A., near the coast from Bremer Bay to the Ravensthorpe area, usually on hilly and rocky country, in thickets. Region: ESPR. Map 227.

W.A.: Eyre Ra., A.S.George 7260 (PERTH); Kundip, R.D.Royce 4144 (PERTH); 8 km E of Ravensthorpe, P.G.Wilson 5534 (FRI, PERTH).

A small mallee with short leaves, a bluntly conical red operculum which is distinctly narrower than hypanthium, and fruits with 2 keel-like ribs. Stamens usually reddish pink.

217. *Eucalyptus platypus* Hook., *Icon. Pl.* t. 849 (1851)

T: near King George Sound, W.A., J.Drummond 183; holo: K; iso: BM, FI, LE, MEL, NSW, PERTH, W.

E. obcordata Turcz., *Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersburg* 10: 337 (1852). T: near King George Sound, W.A., J.Drummond 183; holo: LE; iso: BM, FI, K, MEL, NSW, PERTH, W.

Tree or mallee to 9 m. Bark brown-pink to grey. Juvenile leaves ovate. Adult leaves usually orbicular, sometimes obovate, often retuse, undulate, or lanceolate to spatulate, olive green; lateral veins faint, at 25°–35°; intramarginal vein up to 3 mm from margin; petiole terete, up to 10 mm long. Umbels 7-flowered; peduncle flattened, recurved, up to 40 mm long; pedicels 3–4 mm long. Buds horn-shaped; operculum cylindrical or horn-shaped; hypanthium turbinate, several-ribbed. Fruits turbinate or subpyriform, several-ribbed; disc obscure; valves 3–5, exerted, very fragile.

Occurs in southern W.A., near the coast from Albany to Esperance and inland to Gnowangerup, usually in thickets in clayey soil. Differs from *E. nutans* in the larger habit, broader leaves and longer operculum. There are 2 varieties.

Adult leaves orbicular or obovate

217a. var. *platypus*

Adult leaves lanceolate to spatulate

217b. var. *heterophylla*

217a. *Eucalyptus platypus* Hook. var. *platypus*

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 58, 59 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 244 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 48 (1983).

Tree or shrub without lignotuber. Adult leaves orbicular or obovate, often retuse; lamina 4–6.5 cm long, 2–3.5 cm wide. Peduncle 15–40 mm long, 10 mm wide. Operculum 10–15 mm long, 4–7 mm wide; hypanthium 6–10 mm long, 7–8 mm wide. Fruits 12–15 mm long, 10–14 mm wide. *Moort.* Fig. 70 I–J.

Occurs from the Gnowangerup area to near Esperance, W.A., usually in pure stands. Region: ESPR. Map 228.

W.A.: 20.9 km S of Ravensthorpe, A.S.George 7586 (PERTH); near Young R., A.E.Orchard 4437 (AD, PERTH); Fitzgerald R., M.D.Tindale 3864 (NSW, PERTH).

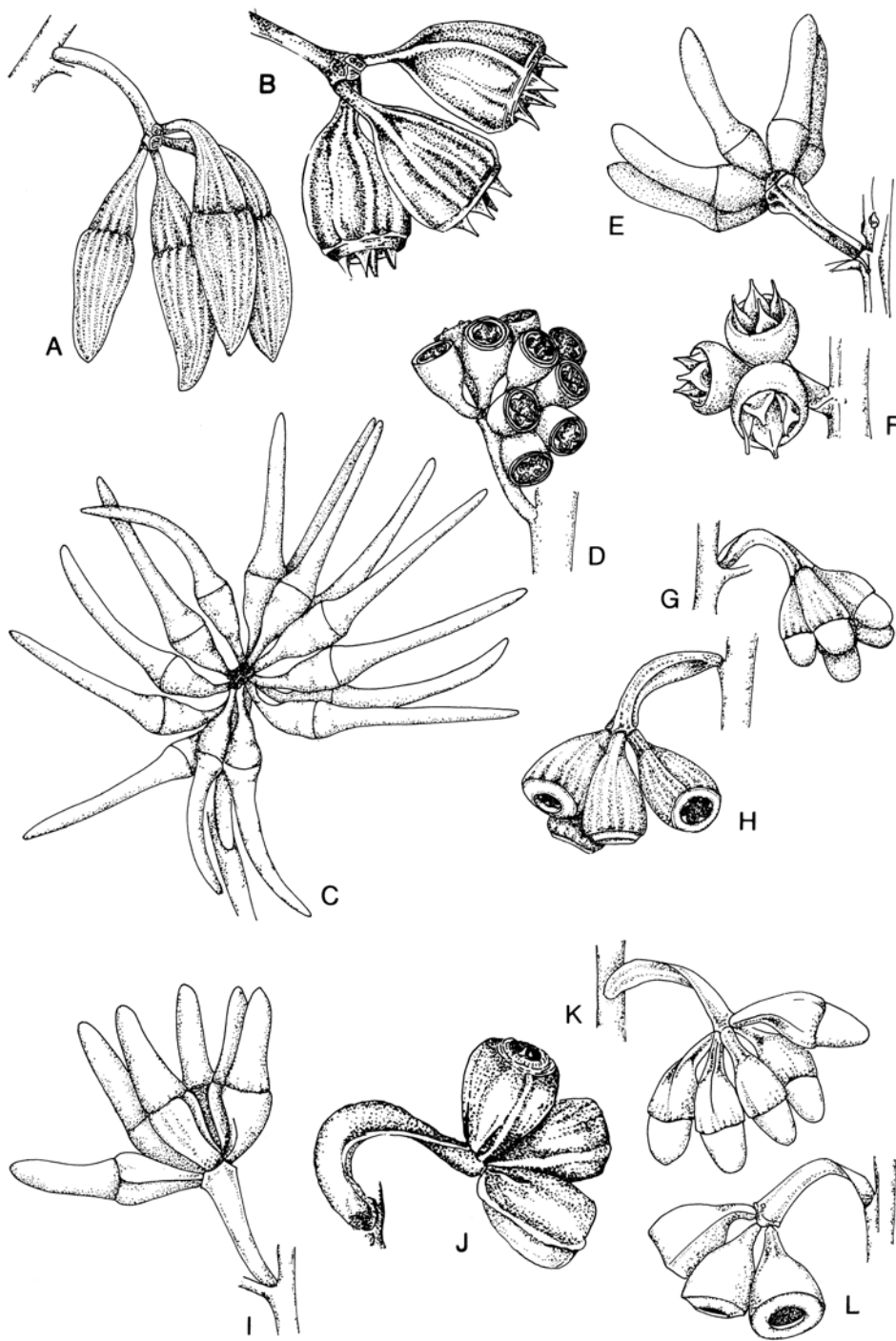


Figure 70. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. stowardii* (**A**, G.Chippendale 247, FRI; **B**, R.Royce 2124, FRI). **C–D**, *E. macrandra* (H.Demarz D2208, FRI). **E–F**, *E. annulata* (**E**, J.Beard 8173, FRI; **F**, P.Wilson 8008, FRI). **G–H**, *E. nutans* (**G**, S.Paull 83, FRI; **H**, G.Chippendale 415, FRI). **I–J**, *E. platypus* var. *platypus* (**I**, G.Chippendale 813, FRI; **J**, Ravenhorpe district, W.A., C.Gardner, FRI). **K–L**, *E. platypus* var. *heterophylla* (J.Briggs 103 & L.Pryor, FRI). Drawn by M.May.

A small tree with brown-pink to grey smooth bark, orbicular adult leaves, horn-shaped, usually sessile buds, and recurved peduncles. A useful small tree for street planting and windbreaks.

217b. *Eucalyptus platypus* var. *heterophylla* Blakely, *Key Eucalypts* 107 (1934)

T: near Ongerup, W.A., 30 May 1917, *F.Stoward s.n.*; holo: NSW.

Illustration: S.Kelly *et al.*, *Eucalypts* 2: t. 48 (1983).

Tree ? with lignotuber. Adult leaves lanceolate to spatulate; lamina 4.5–8.5 cm long, 1–1.5 cm wide. Peduncle 12–22 mm long, 4–6 mm wide. Operculum 8–18 mm long, 5–6 mm wide; hypanthium 5–8 mm long, 6–7 mm wide. Fruits 7–10 mm long and wide. Fig. 70K–L.

Occurs mainly in the area between Hopetoun, Kundip and the Hamersley R., W.A., and at the Pallinup R. and on some islands of the Recherche Archipelago, in depressions of clay soil. Region: ESPR. Map 229.

W.A.: Middle Is., *M.C.Ellis* 9292 (PERTH); Hopetoun, *C.A.Gardner* 14044 (PERTH).

Differs from var. *platypus* mainly in the lanceolate to spatulate adult leaves, and smaller fruits.

218. *Eucalyptus spathulata* Hook., *Icon. Pl.* 7: t. 611 (1844)

T: Swan R., W.A., *J.Drummond Suppl. n.* 20; holo: K.

Tree or mallee to 12 m. Bark smooth, red-brown to grey. Juvenile leaves narrowly lanceolate. Adult leaves linear-lanceolate or narrowly elliptic, often uncinata, glandular; lamina 5–6 cm long, up to 1 cm wide; lateral veins and intramarginal vein obscure; petiole 2–5 mm long. Umbels 3–7-flowered. Peduncle 5–15 mm long. Buds ovoid to cylindrical; operculum cylindrical-conical, 5–10 mm long, 3–4 mm wide, usually slightly narrower than hypanthium; hypanthium hemispherical, up to 8 mm long, c. 4 mm wide. Fruits hemispherical to pyriform; disc obscure; valves 3–5, narrow, exserted.

Occurs from Wongan Hills S and E to N of Esperance, W.A., in low lying areas and in gravelly loam, often in thickets. Differs from related species especially in the narrow leaves. There are 2 subspecies.

Adult leaves linear-lanceolate, 2–5 mm wide

218a. subsp. *spathulata*

Adult leaves narrowly elliptic, 5–10 mm wide

218b. subsp. *grandiflora*

218a. *Eucalyptus spathulata* Hook. subsp. *spathulata*

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 59, 60 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 51 (1983).

Tree or mallee to 12 m. Adult leaves linear-lanceolate, \pm uncinate; lamina 5–6 cm long, 0.2–0.5 cm wide, grey-green. Peduncle slightly flattened, 5–10 mm long; pedicels 3–4 mm long. Fruits hemispherical, 6–10 mm long, 5–9 mm wide. *Swamp Mallet*. Fig. 71A–B.

Occurs mainly from near Wongan Hills to the Ravensthorpe area, W.A., in low-lying areas including near seasonal lakes and depressions. Region: BENC, LUWN, ESPR, LEON. Map 230.

W.A.: Lucy Rock, 4.8 km N of Holt Rock, *K.M.Allan* 802 (FRI, MEL, PERTH); Dumbleyung, *C.A.Gardner* 515 (NSW, PERTH); Elverdton, *A.S.George* 7579 (PERTH).

Distinguished by narrow, grey-green leaves up to 5 mm wide, cylindrical or ovoid buds, and small hemispherical fruits with exserted valves. Useful as a small tree for street planting, highway screening and windbreaks.

218b. *Eucalyptus spathulata* subsp. *grandiflora* (Benth.) L.Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 453 (1973)

E. spathulata var. *grandiflora* Benth., *Fl. Austral.* 3: 236 (1867). T: Phillips Ra., W.A., *G.Maxwell*; holo: K; iso: FRI, NSW.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 61 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 49 (1983).

Tree or mallee to 4.5 m. Adult leaves narrowly elliptic, acuminate or uncinat; lamina 5–6 cm long, 0.5–1 cm wide, green or grey-green. Peduncle dilated, 10–15 mm long; pedicels 2–6 mm long. Fruits pyriform, 1- or 2-ribbed, 9–12 mm long, 5–9 mm wide. Fig. 71C–D.

Occurs mainly from near Pingrup and Ongerup to the Ravensthorpe area and also in the Grass Patch and Truslove area, W.A. Grows usually in thickets, in red sandy or gravelly loam. Region: ESPR. Map 231.

W.A.: 20.9 km NE of Lake Grace, *M.I.H.Brooker* 2271 (FRI, NSW, PERTH); 17.4 km S of Ravensthorpe, *G.M.Chippendale* 212 (FRI, MEL, NSW, PERTH); Gairdner R., *K.Newbey* 130 (PERTH).

Distinguished by narrowly elliptic leaves up to 10 mm wide, and pyriform fruits with 1 or 2 ribs.

219. *Eucalyptus steedmanii* C.Gardner, *Proc. Roy. Soc. W. Australia* 19: 87 (1933)

T: Forrestania, S of Southern Cross, W.A., Feb. 1928, *H.Steedman s.n.*; holo: PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 62 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 9 (1983).

Small tree to 12 m. Bark red-brown. Juvenile leaves broadly lanceolate or ovate. Adult leaves narrowly elliptic or lanceolate, apiculate; lamina 4.5–6.5 cm long, 0.8–1.3 cm wide, green; lateral veins inconspicuous, at 25°–35°; intramarginal vein up to 2 mm from margin; petiole flattened, 2–6 mm long. Umbels 3-flowered; peduncle angular, 20–30 mm long; pedicels angular, 8–20 mm long. Buds ovoid or pyramidal, 4-winged; operculum pyramidal, 10–15 mm long, 5–8 mm wide; hypanthium turbinate, 10–18 mm long, 8–12 mm wide. Fruits turbinate, 4-winged, 10–18 mm long, 10–15 mm wide; disc narrow, descending; valves 4, exserted. *Steedman's Gum*. Fig. 71E–F.

Occurs in a very restricted area SW of Lake Cronin, W.A., in dense stands on flat or slightly undulating land in woodland. Region: ESPR. Map 232.

W.A.: 8.3 km S of Hyden–Norseman road, SW of [Forrestania] crossroads, *M.I.H.Brooker* 6731 (FRI); Forrestania, Nov. 1929, *L.J.H.Teakle* (PERTH).

Recognised by the long-pedicellate 4-winged buds in 3-flowered umbels, and turbinate, winged fruits. Thought to be extinct for some time after its discovery in 1928, but rediscovered in 1978.

220. *Eucalyptus eremophila* (Diels) Maiden, *J. Roy. Soc. New South Wales* 54: 71 (1920)

E. occidentalis var. *eremophila* Diels in L.Diels & E.Pritzel, *Bot. Jahrb. Syst.* 35: 442 (1904). T: Boorabbin, W.A., Nov. 1901, *E.Pritzel* 917; syn: BM, E, G, K, W; near Coolgardie, W.A., *L.Diels* 5237; syn: *n.v.*; Gilmores, W.A., *L.Diels* 5264; syn: *n.v.*

E. eremophila var. *grandiflora* (Maiden) Maiden, *Crit. Revis. Eucalyptus* 7: 22 (1923); *E. occidentalis* var. *grandiflora* Maiden, *Crit. Revis. Eucalyptus* 4: 149, t. 150 (1–2) (1919). T: Kurrawang, W.A., *J.B.Cleland s.n.*; *n.v.*

E. eremophila var. *pteroarpa* Blakely & Steedman, *Contr. New South Wales Natl Herb.* 1: 36 (1939); *E. eremophila* subsp. *pteroarpa* (Blakely & Steedman) L.Johnson & Blaxell, *Contr. New South Wales Natl Herb* 4: 454 (1973). T: near Hatters Hill, W.A., Jan. 1938, *H.Steedman s.n.*; holo: NSW.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 63, 64(1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 195 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 52 (1983).

Shrub to 4.5 m. Bark light brown or yellow-brown to grey-white. Juvenile leaves narrowly lanceolate. Adult leaves narrowly lanceolate to elliptic-lanceolate, acuminate or uncinat;

lamina 6–8 cm long, 1–1.7 cm wide, green, glandular; lateral veins obscure, at 20°–30°; intramarginal vein faint, up to 2 mm from margin; petiole slightly flattened, 5–10 mm long. Umbels 7-flowered; peduncle slightly flattened, 15–25 mm long; pedicels 4–10 mm long. Buds horn-shaped; operculum horn-shaped, 10–25 mm long, 3–5 mm wide; hypanthium hemispherical, 5–8 mm long, 4–6 mm wide. Fruits subpyriform or cylindrical, 8–10 mm long, 7–9 mm wide; disc obscure; valves 3 or 4, fragile, exserted. Fig. 71G–H.

Occurs widely in the Goldfields and central agricultural region, south-western W.A., on flat and slightly undulating plains, in thickets and shrubland. Regions: BENC, LEON, ESPR. Map 233.

W.A.: 0.6 km N of Grass Patch, *J.P.Baker* 70 (BRI, FRI, NSW, PERTH); Harrismith, *M.I.H.Brooker* 2260 (FRI, MEL, PERTH); 10.9 km E of Dumbleyung, *H.Demarz* 1532 (PERTH).

A non-lignotuberosus shrub with smooth horn-like buds in which the operculum is slightly narrower than the hypanthium. Has been planted as highway screening in California, and is an excellent windbreak species. The flowers provide abundant nectar and pollen for honey production.

221. *Eucalyptus cylindriflora* Maiden & Blakely, *J. Roy. Soc. New South Wales* 59: 180 (1925)

T: Bendering, W.A., 5 Feb. 1923, *C.A.Gardner* 1909; holo: NSW; iso: PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 65 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 73 (1983).

Mallee to 4.5 m. Bark light brown to white or grey. Juvenile leaves not seen. Adult leaves linear-lanceolate to narrowly lanceolate, sometimes falcate, uncinata; lamina 5–7 cm long, 0.5–0.9 cm wide, shining, green; lateral veins faint, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole slightly flattened, 5–8 mm long. Umbels 7-flowered; peduncle terete or slightly flattened, 10–15 mm long; pedicels quadrangular, 4–9 mm long. Buds ±fusiform; operculum conical, obtuse, 5–6 mm long, 4–6 mm wide; hypanthium hemispherical or obconical, 4–5 mm long, 4–6 mm wide. Fruits cylindrical or hemispherical, 6–10 mm long, 6–8 mm wide; disc prominent, grey, obliquely descending; valves 3 or 4, fragile, exserted or included. *White Mallee*. Fig. 71 I–J.

Occurs from Bendering to Lake Grace, extending E towards Balladonia. Grows on sandplain in mallee shrubland. Regions: BENC, LEON, ESPR. Map 234.

W.A.: 2.7 km NNW of Salmon Gums, *G.M.Chippendale* 177 (FRI, MEL, NSW, PERTH); Bendering, *C.A.Gardner* 9479 (PERTH); 4.8 km NW of Ongerup, *K.Newbey* 3094 (FRI, K, PERTH).

A mallee with smooth, light brown to grey or white bark, bluntly conical operculum much shorter than those of *E. eremophila*.

222. *Eucalyptus erythronema* Turcz., *Bull. Cl. Phys.-Math. Acad. Sci. Saint-Petersbourg* 10: 337 (1852)

T: Swan R. Colony, W.A., *J.Drummond* 5: 37; iso: CGE, E, FI, G, K, MEL, NSW, W.

E. conoidea Benth., *Fl. Austral.* 3: 227 (1867). T: Swan R. Colony, W.A., *J.Drummond* 5: 37; holo: K; iso: CGE, E, FI, G, K, MEL, NSW, W.

Mallee or small tree to 6 m. Bark white, grey, red or pink-brown, usually powdered. Juvenile leaves lanceolate. Adult leaves narrowly lanceolate, uncinata; lamina 6–8 cm long, 0.8–1.5 cm wide, shining, green, glandular; lateral veins faint, at 20°–35°; intramarginal vein up to 1 mm from margin; petiole slightly flattened, 6–9 mm long. Peduncle terete or angular, usually recurved, 15–20 mm long; pedicels often quadrangular, 10–18 mm long. Buds conical or ±fusiform; operculum conical, 10–15 mm long, 7–10 mm wide; hypanthium obconical, 6–7 mm long, 8–9 mm wide. Fruits obconical or turbinate, striate, 7–12 mm long, 10–15 mm wide; disc broad, level or obliquely descending; valves 4 or 5, just exserted.

Occurs from near Wongan Hills to near Corrigin and eastwards to Southern Cross, W.A., on flat areas in shrubland and open woodland. The striate fruits and usually deep red stamens distinguish it from related species. There are 2 varieties.

Umbels usually 7-flowered; buds and fruits without expanded rim

222a. var. erythronema

Umbels usually 3-flowered; buds and fruits with prominently expanded rim

222b. var. marginata

222a. *Eucalyptus erythronema* Turcz. var. *erythronema*

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 66 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 47 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 89 (1983).

Umbels 7-flowered. Buds smooth; basal rim of operculum not expanded. *Red-flowered Mallee*. Figs 11, 71K–L.

Occurs from N of Watheroo to near Kondinin, W.A., often in stony or gravelly soils, in flat areas of open shrubland and woodland. Regions: BENC, ESPR. Map 235.

W.A.: 3.2 km E of Noongar, *N.T.Burbidge* 4926 (CANB, PERTH); Yerbillon, *C.A.Gardner* 10326 (FRI, PERTH); 5.6 km N of Burracoppin, *B.R.Maslin* 3963 (PERTH).

Newly exposed bark is almost white, changing to deep red in autumn. Has been used successfully as a street tree at Kalgoorlie, W.A. and is an attractive ornamental, with red buds and stamens, rarely cream.

222b. *Eucalyptus erythronema* var. *marginata* (Benth.) Domin, *Repert. Spec. Nov. Regni Veg.* 12: 389 (1913)

E. conoidea var. *marginata* Benth., *Fl. Austral.* 3: 227 (1867). T: Swan R. Colony, W.A., *J.Drummond* 3: 56; holo: K.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 67 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 47 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 90 (1983).

Umbels 3-flowered. Buds with expanded basal rim of operculum. Fruits winged by expanded horizontal rim. Fig. 71M–N.

Occurs mainly between Wubin and Wongan Hills, W.A., on flat areas often in stony or gravelly soil, in open shrubland and woodland. Region: BENC. Map 236.

W.A.: 2.3 km S of Wubin, *G.M.Chippendale* 61 (AD, BRI, CANB, FRI, NSW); 3.2 km S of Pithara, *B.R.Maslin* 1661 (BRI, PERTH); 19.3 km E of Ballidu, *R.D.Royce* 2148 (PERTH).

Differs from var. *erythronema* in the 3-flowered umbels, expanded operculum based and fruits with a horizontally expanded calycine rim.

223. *Eucalyptus dielsii* C.Gardner, *J. Roy. Soc. W. Australia* 12: 67 (1927)

T: Salmon Gums, W.A., 13 Jan. 1925, *C.A.Gardner* 1051a per *W.T.Brown*; holo: PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 68 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 119 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 92 (1983).

Mallee or small tree to 4.5 m. Bark brown-grey or brown-green. Juvenile leaves not seen. Adult leaves narrowly lanceolate, uncinat; lamina 6–9 cm long, 1–1.5 cm wide, bright green, glandular; lateral veins faint, at 20°–30°; intramarginal vein up to 1 mm from margin; petiole angular, 12–20 mm long. Umbels 7-flowered; peduncle angular, recurved, 13–25 mm long; pedicels quadrangular, 5–12 mm long. Buds ovoid to cylindrical-conical; operculum conical, obtuse, 7–10 mm long, 5–8 mm wide; hypanthium hemispherical, 5–6 mm long, 5–8 mm wide. Fruits hemispherical, 7–11 mm long, 9–11 mm wide; rim broad, vertical at first, becoming expanded horizontally; disc broad, level or ascending; valves 4 or 5, just exserted. *Cap-fruited Mallee*. Fig. 72A–B.

Occurs between Lake King, Ravensthorpe and Salmon Gums, W.A., in clayey soil in shrubland. Region: ESPR. Map 237.

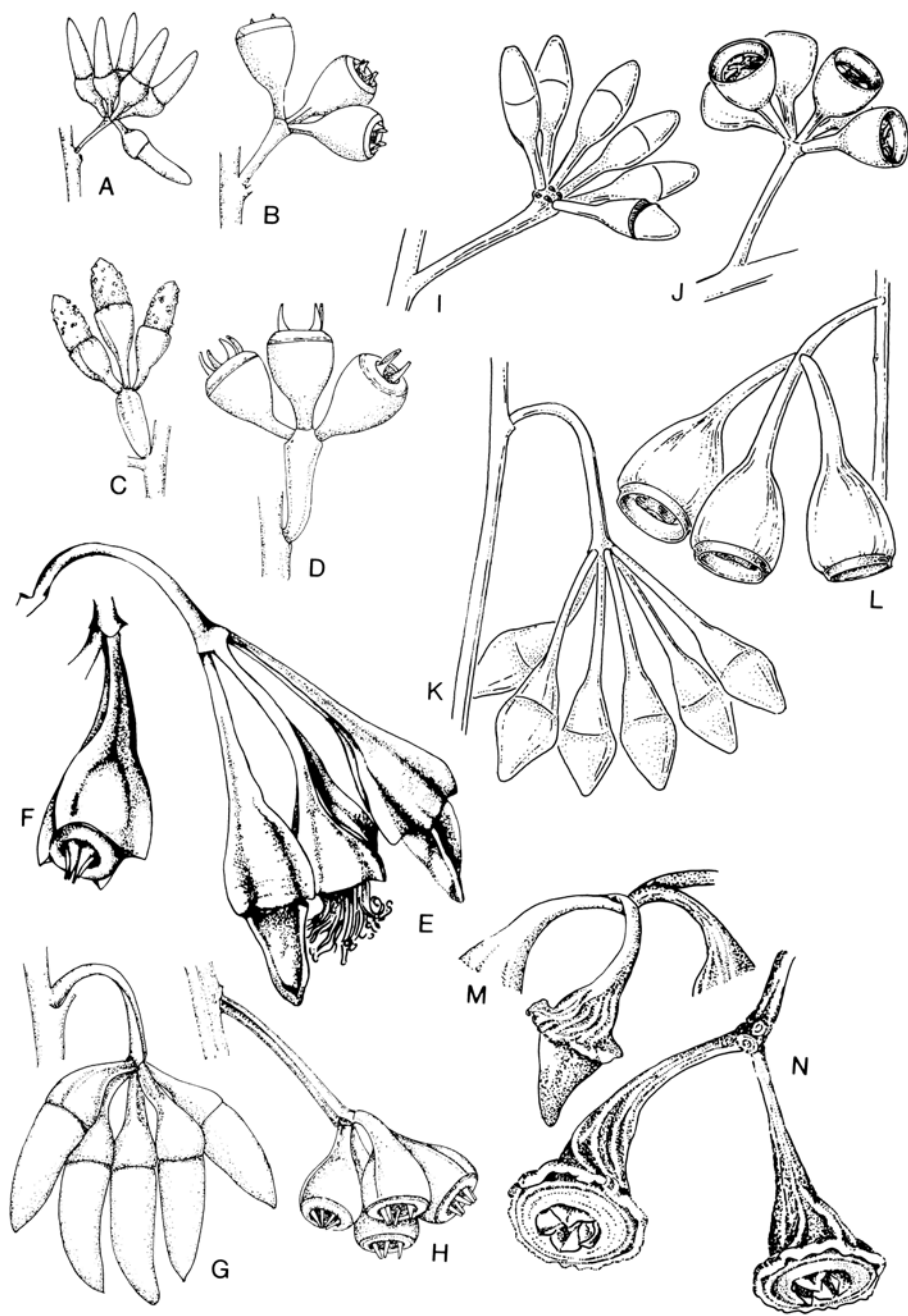


Figure 71. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. spathulata* subsp. *spathulata* (**A**, Ongerup, E of Gnowangerup, W.A., J.Willis, FRI; **B**, J.Beard 8175, FRI). **C–D**, *E. spathulata* subsp. *grandiflora* (G.Chippendale 212, FRI). **E–F**, *E. steedmanii* (cult., Haileybury College grounds, Hampton, Vic., J.Willis, FRI). **G–H**, *E. eremophila* (R.Chinnock 3297, FRI). **I–J**, *E. cylindriflora* (**I**, I.Brooker 2496, FRI; **J**, M.Crisp 5519, FRI). **K–L**, *E. erythronema* var. *erythronema* (**K**, D.Blaxell 75/116 & I.Brooker, FRI; **L**, C.Gardner 7641, FRI). **M–N**, *E. erythronema* var. *marginata* (cult., Kalgoorlie Forestry Arboretum, W.A., C.Davies, FRI). **E**, **F** drawn by C.Stahl. **I–L** drawn by M.Risby, Others drawn by M.May.

W.A.: 48.3 km NE of Condingup, *J.S.Beard* 6365 (NSW, PERTH); 48.3 km S of Lake King, *M.I.H.Brooker* 2288 (FRI, PERTH); 4.8 km N of Salmon Gums, *C.A.Gardner* 11165 (FRI, PERTH).

Distinguished by the bright green leaves, ovoid or cylindrical-conical buds, bluntly conical operculum and hemispherical fruits with an expanded wing-like rim. Petiole longer than in *E. erythronema*, buds smaller.

224. *Eucalyptus cerasiformis* Brooker & Blaxell, *Nuytsia* 2: 226 (1978)

T: 164 km (by road) E of Hyden towards Norseman, W.A., 3 Oct. 1975, *D.F.Blaxell* W75/51; holotype: NSW; iso: FRI.

Illustrations: M.I.H.Brooker & D.F.Blaxell, *op. cit.* 227; S.Kelly *et al.*, *Eucalypts* 1: t. 256 (1983).

Mallee to 3 m. Bark grey to brown. Juvenile leaves lanceolate. Adult leaves narrowly lanceolate, uncinately; lamina 6–8 cm long, 0.5–1.2 cm wide, yellow-green, glandular; lateral veins faint, at 25°–30°; intramarginal vein up to 1 mm from margin; petiole terete, 10–12 mm long. Umbels 7-flowered; peduncle terete, recurved, 20–30 mm long; pedicels 10–12 mm long. Buds constricted in middle; operculum conical, 3–5 mm long, 4–5 mm wide; hypanthium urceolate, 6–7 mm long, 4–5 mm wide. Fruits from slightly urceolate to cylindrical or hemispherical, 12–15 mm long, 7–10 mm wide; disc obliquely descending; valves 4, included. Fig. 72C–D.

Occurs in a very restricted area between Hyden and Norseman, just N of the Johnston Lakes, W.A. Grows in red loamy soil in low open forest. Region: ESPR. Map 238.

W.A.: 164 km E of Hyden, *M.I.H.Brooker* 4991 (AD, FRI); 318 mile post between Hyden & Norseman, *A.Kessell* 545 (FRI, PERTH).

Differs from *E. dielsii* in the smaller buds and fruits, urceolate hypanthium and fruits, and the absence of an expanded rim in the fruits.

Ser. 48 *Levispermae*

Eucalyptus ser. *Levispermae* Maiden, *Crit. Revis. Eucalyptus* 7: 144 (1925).

Type: *E. redunca* Schauer

E. ser. Subcornutae Blakely, *Key Eucalypts* 24, 111 (1934). T: *E. redunca* Schauer, lectotype, *vide* G.M.Chippendale, *Fl. Australia* 19: 505 (1988).

Trees or mallees. Bark smooth throughout. Juvenile leaves alternate, petiolate, but not seen in several taxa. Adult leaves alternate, petiolate, concolorous. Conflourescences axillary, simple, 7–15-flowered umbels; peduncle flattened. Buds cylindrical, horn-shaped or fusiform; operculum conical or horn-shaped. Fruits cylindrical, hemispherical, subpyriform or slightly campanulate; disc narrow, usually descending; valves 3 or 4, level, included or exserted. Seeds subspherical, almost smooth, white-grey-brown.

A series of 5 species in south-western W.A. Trees or mallees with smooth bark, concolorous leaves, simple 7–15-flowered umbels, a flattened peduncle and white, grey or brown seeds.

225. *Eucalyptus wandoo* Blakely, *Key Eucalypts* 112 (1934)

Based on *E. redunca* var. *elata* Benth., *Fl. Austral.* 3: 253 (1867). T: Kalgan R., W.A., *A.Oldfield*; *n.v.*

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 69, 70 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 60 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 395 (1984).

Tree to 25 m. Bark white or cream, often with yellow-brown flakes. Juvenile leaves ovate to broadly lanceolate, concolorous, hairy in inland occurrences. Adult leaves lanceolate to narrowly lanceolate, acuminate; lamina 8–12 cm long, 1–2 cm wide, dull, green to grey-green; lateral veins faint, at 35°–50°; intramarginal vein up to 3 mm from margin; petiole terete or angular, 12–16 mm long. Umbels 11–15-flowered; peduncle flattened, 10–20 mm long; pedicels 1–5 mm long. Buds horn-shaped; operculum 6–10 mm long, 3–5 mm

wide; hypanthium cylindrical to campanulate, 4–5 mm long, 3–5 mm wide. Fruits cylindrical to pyriform, 6–10 mm long, 3–8 mm wide; disc descending vertically; valves level or slightly exserted. *Wandoo*. Fig. 72E–F.

Widespread in south-western W.A. from near Three Springs S to the Kalgan R. and extending inland to near Karalee. Grows in valleys, on ridges, plateaus and plains; often dominant in woodland and open forest. Regions: BENC, LUWN, LEON, ESPR. Map 239.

W.A.: 21.7 km N of Kellerberrin, *M.I.H. Brooker* 2691 (FRI, PERTH); Boyagin Fauna Sanctuary, *N.T. Burbidge* 8088 (CANB, MEL, NSW, PERTH); 9.2 km N of Three Springs, *G.M. Chippendale* 38 (AD, BRI, FRI, MEL, PERTH); 40 km W of Southern Cross, *P.G. Wilson* 4114 (PERTH).

A characteristic tree of the agricultural areas of W.A., with mostly smooth white bark, 11–15-flowered umbels, horn-shaped buds and cylindrical or pyriform fruits. Staminal filaments cream. An important timber species; the wood is very strong and durable and has been used for sleepers, poles, flooring and heavy construction. Fire-tolerant, regenerating by epicormic shoots. Young trees sometimes have mostly flaky bark.

226. *Eucalyptus redunca* Schauer in J.G.C. Lehmann, *Pl. Preiss.* 1: 127 (1844)

T: between King George Sound and York, W.A., Oct., *L. Preiss* 234; syn: *n.v.*; same locality, Feb., *L. Preiss* 245; syn: *n.v.*; same locality, Mar., *L. Preiss* 247; syn: *n.v.*; Konkoberup near Cape Riche, W.A., Nov., *L. Preiss* 232; syn: *n.v.*

E. redunca var. *melanophloia* Benth., *Fl. Austral.* 3: 253 (1867). T: Murchison and South Hutt Rivers, W.A., *A. Oldfield*; *n.v.*

E. redunca var. *subangusta* Blakely, *Key Eucalypts* 111 (1934). T: Cunderdin, W.A., Jan. 1903 & Nov. 1907, *W.V. Fitzgerald s.n.*; syn: NSW; near Knutsford, W.A., 9 Dec. 1891, *R. Helms*; syn: NSW.

Illustrations: G.M. Chippendale, *Eucalypts W. Austral. Goldfields* 71 (1973); S. Kelly *et al.*, *Eucalypts* 1: t. 57 (1983).

Mallee to 4.5 m. Bark light brown to grey or grey-brown. Juvenile leaves lanceolate, concolorous. Adult leaves narrowly lanceolate to lanceolate, sometimes falcate, apiculate; lamina 5.5–8 cm long, 0.6–2.5 cm wide, dull, green; lateral veins faint, at 40°–50°; intramarginal vein faint, up to 3 mm from margin; petiole terete, 6–15 mm long. Umbels 11–15-flowered; peduncle 10–15 mm long; pedicels 2–3 mm long. Buds cylindrical or horn-shaped; operculum 10–15 mm long, 3–4 mm wide; hypanthium cylindrical or obconical, 3–5 mm long, 3–4 mm wide. Fruits subpyriform or cylindrical, 6–10 mm long, 5–6 mm wide; disc obliquely descending; valves exserted. *Black Marlock*. Fig. 72G–H.

Widespread in the agricultural areas and Goldfields, southern W.A., on flats and hills, in sandy soil in shrubland and open woodland. Regions: BENC, LUWN, ESPR. Map 240.

W.A.: 27.4 km SE of Wickiepin, *M.I.H. Brooker* 2257a (FRI, NSW, PERTH); 15.1 km N of Bruce Rock, *G.M. Chippendale* 256 (FRI, PERTH); Rabbit Proof Fence, E of Lake King, *R.A. Saffrey* 336 (FRI, PERTH); 20 km W of Bremer Bay, *P.G. Wilson* 4344 (PERTH).

Staminal filaments lemon or cream. Morphologically resembles *E. wandoo*, but always a mallee and usually has a longer operculum. Also very similar to *E. gardneri* which is a tree with distinctly blue leaves. Typical *E. redunca* occurs near the S coast. Inland populations, represented by the varietal names above, may with further study be shown to be worthy of recognition as subspecies or species.

227. *Eucalyptus xanthonema* Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 20(1): 163 (1847)

E. redunca var. *angustifolia* Benth., *Fl. Austral.* 3: 253 (1867). T: Swan R. Colony, W.A., *J. Drummond* 67; iso: BM, CGE, E, FI, G, K, PERTH.

Illustrations: G.M. Chippendale, *Eucalypts W. Austral. Goldfields* 72 (1973); S. Kelly *et al.*, *Eucalypts* 2: t. 51 (1983).

Mallee or small tree to 3.5 m. Bark grey. Juvenile leaves not seen. Adult leaves linear-lanceolate, sometimes more or less falcate, acuminate to uncinatate; lamina 4–6 cm long,

0.5–0.7 cm wide, green; lateral veins faint, at 35°–45°; intramarginal vein almost confluent with or up to 1 mm from margin; petiole terete, 4–10 mm long. Umbels 7-flowered; peduncle 5–10 mm long; pedicels absent or to 1 mm long. Buds horn-shaped; operculum 4–6 mm long, 3–4 mm wide; hypanthium obconical, 4–5 mm long, 3–4 mm wide. Fruits hemispherical, 4–5 mm long and wide; disc narrow, descending; valves 3, exserted, fragile. Fig. 72 I–J.

Occurs between the Young R. and S of Norseman, W.A., in low mallee shrubland on plains and gentle slopes. Region: ESPR. Map 241.

W.A.: source of Young R., *C.A.Gardner* 12178 (PERTH); Ravensthorpe area, Nov. 1944, *C.A.Gardner* (FRI, PERTH).

Very similar to *E. redunca* but distinguished by the consistently narrow leaves, usually smaller umbels, very short pedicels and smaller fruits. Staminal filaments pale yellow.

228. *Eucalyptus gardneri* Maiden, *Crit. Revis. Eucalyptus* 7: 53 (1924)

T: near Bendering, W.A., 6 Feb. 1922, *C.A.Gardner* 1239; holo: NSW.

E. redunca var. *oxymitra* Maiden, *Crit. Revis. Eucalyptus* 4: 98 (1918). T: Broad Arrow, W.A., July 1899, *R.Helms* 102; holo: NSW; iso: CANB, K, MEL, PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 73 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 59 (1983).

Tree to 9 m. Bark light brown to grey. Juvenile leaves not seen. Adult leaves lanceolate, uncinat; lamina 7–9 cm long, 0.8–2 cm wide, blue-green; lateral veins faint, at 40°–50°; intramarginal vein faint, up to 2 mm from margin; petiole terete, 10–15 mm long. Umbels 7–11-flowered; peduncle 10–15 mm long; pedicels 2–3 mm long. Buds narrowly horn-shaped; operculum 10–15 mm long, 3–4 mm wide, uncinat; hypanthium obconical, 4–5 mm long, 3–4 mm wide. Fruits pyriform or cylindrical, 7–8 mm long, 5–6 mm wide; disc descending; valves \pm level. *Blue Mallet*. Fig. 72K–L.

Widespread in the southern agricultural regions, south-western W.A. Grows often in thickets but also in woodland on gravelly or sandy loam plains. Regions: BENC, ESPR, LEON. Map 242.

W.A.: Pingrup, *W.E.Blackall* 3070 (PERTH); 14.5 km S of Wickepin, *M.I.H.Brooker* 2254 (FRI, PERTH); Wagin, *C.A.Gardner* 1908 (FRI, NSW, PERTH).

Similar to *E. redunca*, but a tree with brownish bark and distinctly bluish leaves. Killed by fire and regenerates from seed. Staminal filaments pale yellow. The variant represented by *E. redunca* var. *oxymitra* may prove a distinct taxon.

229. *Eucalyptus desmondensis* Maiden & Blakely, *J. & Proc. Roy. Soc. New South Wales* 59: 183 (1925)

T: Desmond, W.A., 18 May 1924, *C.A.Gardner* 2183; holo: NSW; iso: PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 73 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 177 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 63 (1983).

Mallee, slender, willowy, to 4.5 m. Bark powdery white. Juvenile leaves not seen. Adult leaves lanceolate to elliptic, acuminate; lamina 7.5–10 cm long, 1.5–2.5 cm wide, grey-green; lateral veins faint to just visible, at 40°–45°; intramarginal vein up to 3 mm from margin; petiole slightly flattened, 10–20 mm long. Umbels 11–15-flowered; peduncle flattened, pruinose, 9–15 mm long; pedicels absent or to 1 mm long. Buds \pm fusiform; operculum conical, 5–8 mm long, 5–6 mm wide; hypanthium hemispherical or campanulate, 4–6 mm long, 5–6 mm wide. Fruits hemispherical or campanulate, 7–10 mm long, 7–8 mm wide; disc descending; valves 3 or 4, usually included, sometimes level or just exserted. *Desmond Mallee*. Fig. 72M–N.

Restricted to Mt Desmond in the Ravensthorpe Ra., W.A., growing on lateritic slopes in low shrubland. Region: ESPR. Map 243.

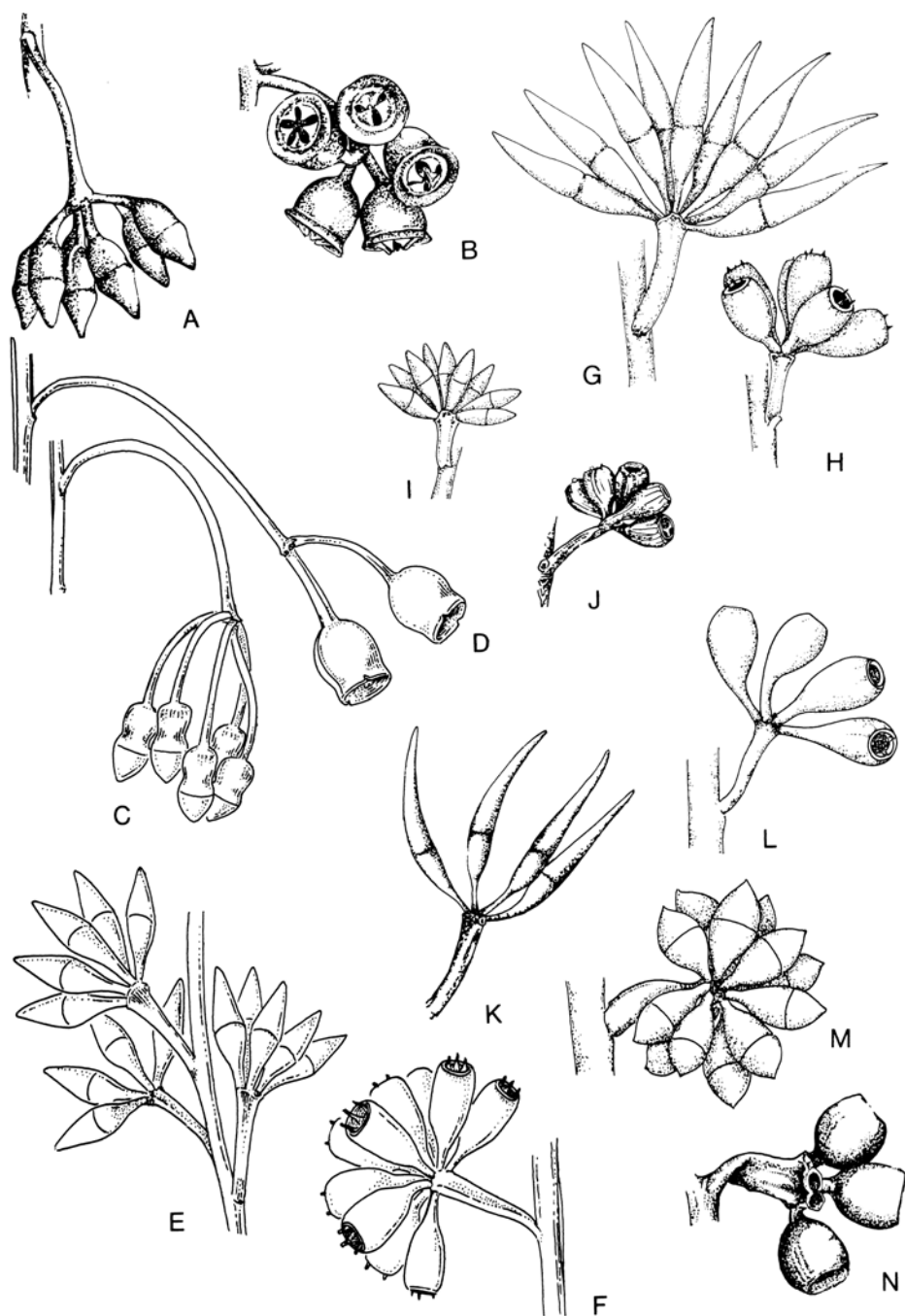


Figure 72. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. dielsii* (cult., Waite Arboretum, S.A., N.Hall & D.Symon, FRI). **C–D**, *E. cerasiformis* (**C**, L.Allan 33, FRI; **D**, I.Brooker 4990, FRI). **E–F**, *E. wandoo* (**E**, I.Brooker 2429, FRI; **F**, G.Chippendale 209, FRI). **G–H**, *E. redunca* (**G**, I.Brooker 2637, FRI; **H**, I.Brooker 6447, FRI). **I–J**, *E. xanthonea* (**I**, J.Briggs 270, FRI; **J**, Fitzgerald R., W.A., C.Gardner & A.Miles, PERTH). **K–L**, *E. gardneri* (**K**, C.Gardner 1908, FRI; **L**, B.Rockel A52, FRI). **M–N**, *E. desmondensis* (**M**, Mt Desmond copper mine, 9.6 km S of Ravensthorpe, W.A., J.Willis, FRI; **N**, L.Johnson W222, NSW 53196, FRI). **A, B** drawn by C.Stahl. **C–F**, drawn by M.Risby. Others drawn by M.May.

W.A.: 9.3 km S of Ravensthorpe, *G.M.Chippendale* 205 (FRI, MEL, NSW, PERTH); Desmond, *C.A.Gardner* 2935 (FRI, PERTH).

Distinguished by slender, willowy habit, powdery white bark and peduncles, and usually bronze-red ±fusiform buds. Staminal filaments lemon to yellow.

Ser. 49 *Accedentes*

Eucalyptus* ser. *Accedentes Chippendale, *Fl. Australia* 19: 495 (1988).

Type: *E. accedens* W.Fitzg.

Trees or mallees. Bark smooth throughout, sometimes exfoliating in flakes. Juvenile leaves alternate, petiolate, concolorous or slightly discolorous. Adult leaves alternate, petiolate, thick or coriaceous, concolorous. Conflorescences axillary, simple 7–11-flowered umbels; peduncle flattened. Buds ovoid or obovoid to clavate or cylindrical-conical. Fruits cylindrical, hemispherical, obconical or subpyriform; disc level to descending; valves 3–5, just included to exserted. Seeds orbicular or elliptic, reticulate, grey-brown.

A series of 5 species in W.A., south-western N.T. and northern S.A. Trees or mallees with smooth bark, concolorous leaves, simple 7–11-flowered umbels, a flattened peduncle, hemispherical to conical operculum, and grey-brown seeds.

230. *Eucalyptus laeliae* Podger & Chippendale, *J. Roy. Soc. W. Australia* 51: 65 (1969)

T: 2.9 km SE of North Dandalup on Whittakers Mill road, W.A., 13 Oct. 1966, *L.McGann* s.n.; holo: FRI; iso: CANB, MEL, NSW, PERTH.

Illustrations: F.D.Podger & G.M.Chippendale, *op. cit.* 66, 67; N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 72 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 53 (1983).

Tree to 20 m. Bark white, powdery, or pale yellow when fresh. Juvenile leaves broadly lanceolate, green to grey-green, slightly discolorous. Adult leaves lanceolate, falcate, acuminate, thick; lamina 10–16 cm long, 1–2 cm wide, green to grey-green; lateral veins faint, at 40°–55°; intramarginal vein confluent with or less than 1 mm from margin; petiole terete, 10–16 mm long. Peduncle dilated, 10–15 mm long; pedicels 1–3 mm long. Buds ovoid to clavate; operculum hemispherical to conical, 2–3 mm long, 3–5 mm wide; hypanthium hemispherical or obconical, 4–5 mm long, 3–5 mm wide. Fruits hemispherical to cylindrical, 5–7 mm long, 4–6 mm wide; disc narrow, descending; valves 3, rarely 4, exserted. *Darling Range Ghost Gum*. Fig. 73A–B.

Occurs in several disjunct populations in the Darling Ra. from about Perth to near Collie, W.A. Grows usually on drainage lines near exposed granite on flats and hills in open forest. Region: LUWN. Map 244.

W.A.: Dirk Brook, *G.M.Chippendale* 74 (AD, BRI, FRI, MEL, NSW, PERTH); 12 km E of Harvey, *P.G.Wilson* 6358 (FRI, K, MEL, NSW, PERTH).

Distinguished by tree habit, smooth white bark, lanceolate, falcate leaves, and small buds and fruits.

231. *Eucalyptus accedens* W.Fitzg., *J. W. Austral. Nat. Hist. Soc.* 1: 21 (1904)

T: near Pingelly, W.A., Nov. 1903, *W.V.Fitzgerald* s.n.; holo: NSW; iso: E, PERTH.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 82 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 62 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 399 (1984).

Tree to 25 m. Bark white or pale pink, covered with a talc-like powder, the older bark shedding in small, brown flakes. Juvenile leaves ovate to orbicular, cordate, grey-blue or glaucous, concolorous. Adult leaves broadly lanceolate to lanceolate, acuminate, thick; lamina 8–12.5 cm long, 1.4–2 cm wide, dull, blue-green or grey-green; lateral veins faint, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole terete, 15–22 mm long. Peduncle 7–14 mm long; pedicels 2–6 mm long. Buds ovoid to clavate; operculum

hemispherical or conical, 4–5 mm long, 4–6 mm wide; hypanthium hemispherical or cylindrical, 4–6 mm long and wide. Fruits cylindrical or subpyriform, 9–10 mm long, 6–9 mm wide; disc broad, descending; valves 3 or 4, just exserted to just included. *Powderbark*. Figs 6, 73C–D.

Occurs between Three Springs and Narrogin, W.A., especially on the E side of the Darling Ra., usually on lateritic hill tops in open forest. Regions: BENC, LUWN. Map 245.

W.A.: Boyagin Fauna Sanctuary, *N.T.Burbidge* 8080 (CANB, MEL, NSW, PERTH); Mt Peron, *C.A.Gardner* 9412 (FRI, PERTH); 10 km N of Three Springs, *M.D.Tindale* 1294 (K, NSW, PERTH).

Resembles *E. wandoo* but distinguished by the powdery pink-white bark with flakes of exfoliating brown bark, dull blue-green or grey-green leaves and ovoid to clavate buds. Differ from *E. laeliae* in the larger buds and fruits. The wood is very heavy, strong and tough, but is restricted in use because of limited availability and its hardness.

232. *Eucalyptus trivalvis* Blakely, *Proc. Roy. Soc. S. Australia* 60: 155 (1936)

T: S of Queen Victoria Spring, W.A., Sept. 1891, *R.Helms* 28; holo: NSW; iso: AD.

Illustrations: J.Turner & M.I.H.Brooker, *Forest Tree Ser.* No. 209 (1978); S.Kelly *et al.*, *Eucalypts* 2: t. 60 (1983).

Mallee to 6 m. Bark grey or pink-grey. Juvenile leaves broadly lanceolate to lanceolate, green, concolorous. Adult leaves lanceolate, broadly lanceolate or ovate, acuminate, thick; lamina 6–11 cm long, 1.5–3 cm wide, grey to glaucous or sometimes green; lateral veins faint, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole terete, 10–20 mm long. Peduncle 5–15 mm long; pedicels absent or to 3 mm long. Buds ovoid to cylindrical; operculum conical, 3–4 mm long, 4–5 mm wide; hypanthium cylindrical, 4–5 mm long and wide. Fruits cylindrical, 6–10 mm long, 4–6 mm wide; disc broad, level to descending vertically; valves 3, level or exserted. Fig. 73E–F.

Widespread in arid W.A. from the Hamersley Ra. to Sandstone and E to the Great Victoria Desert and eastern ranges; common on the ranges of southern N.T., rare in north-western S.A.; grows on ranges, plains and dunes as scattered mallees and in open shrubland. Regions: PILB, LEON, GBSN, VICD, MACD. Map 246.

W.A.: 82 km S of Sandstone, *M.I.H.Brooker* 2422 (FRI, PERTH). N.T.: S of Lake Neale, *P.K.Latz* 2419 (FRI, MEL, NSW, NT). S.A.: 80 km SW of Everard Ranges, *G.C.Cornwall* 225 (AD).

Distinguished by mallee habit, usually grey or glaucous leaves, sessile or almost sessile cylindrical buds and fruits.

233. *Eucalyptus pilbarensis* Brooker & Edgecombe, *Nuytsia* 5: 376 (1986)

T: W of Hamersley Gorge, W.A., 8 July 1983, *M.I.H.Brooker* 8236 & *W.B.Edgecombe*; holo: PERTH; iso: FRI, K, MEL, NSW.

Illustrations: M.I.H.Brooker & W.B.Edgecombe, *op. cit.* 378, 379 (1986).

Mallee to 4 m. Bark pink-grey, white-grey or grey. Juvenile leaves ovate, dull, green, concolorous or slightly discolorous. Adult leaves narrowly lanceolate to lanceolate, sometimes falcate, uncinata; lamina 6–12 cm long, 1–2 cm wide, shining, green; lateral veins clearly visible, at 35°–45°; intramarginal vein up to 1.5 mm from margin; petiole terete, 10–20 mm long. Peduncle 5–12 mm long; pedicels absent or to 3 mm long. Buds obovoid to clavate; operculum hemispherical to conical, 3–5 mm long, 4–6 mm wide; hypanthium obconical to subcylindrical, 6–10 mm long, 4–5 mm wide. Fruits cylindrical to obconical, 8–15 mm long, 7–9 mm wide; disc broad, steeply descending; valves 3–5, included. Fig. 73G–H.

Occurs near Hamersley Gorge, at Mt Nameless, near Mt Brockman and near Roy Hill, north-western W.A., in small populations on slopes and plateaus. Region: PILB. Map 247.

W.A.: 87 km N of Shepherds roadhouse towards Roy Hill, *M.I.H.Brooker* 4556 (FRI, PERTH); Mt Nameless, *M.I.H.Brooker* 8315 & *W.B.Edgecombe* (FRI, NSW, PERTH).

Buds and fruits larger than those of *E. trivalvis*, and leaves shining green.

234. *Eucalyptus prominens* Brooker, *Nuytsia* 2: 115 (1976)

T: Shothole Canyon, W.A., 22°04'S, 114°01'E, 6 Sept. 1970, *K.M.Allan* 462; holo: PERTH; iso: FRI, NSW, NT.

Illustrations: M.I.H.Brooker, *op. cit.* 116; N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 204 (1977); S.Kelly *et al.*, *Eucalypts* 2: t. 61 (1983).

Mallee or small tree to 3 m. Bark grey or grey-brown, sometimes with 0.5 m of fibrous grey bark at base. Juvenile leaves lanceolate, green, concolorous. Adult leaves narrowly lanceolate to lanceolate, coriaceous; lamina 6–13 cm long, 0.7–2 cm wide, light green to grey-green; lateral veins faint, at 30°–40°; intramarginal vein almost confluent with or up to 1 mm from margin; petiole terete or flattened, 5–8 mm long. Peduncle 4–15 mm long; pedicels absent or to 4 mm long. Buds clavate; operculum hemispherical, 3–4 mm long, 5–6 mm wide; hypanthium obconical, 4–5 mm long, 5–6 mm wide. Fruits obconical, 6–12 mm long, 8–13 mm wide; disc narrow, obliquely descending; valves 4 or 5, exserted. Fig. 73 I–J.

Occurs on the Cape Ra. and adjacent areas, north-western W.A., on slopes and plateaus in tall open shrubland. Region: MRCH. Map 248.

W.A.: Shothole Canyon, *K.M.Allan* 465 (AD, CANB, FRI, NSW, PERTH); 5 km W of Giralalia Homestead, *M.I.H.Brooker* 4569 (FRI, NSW, NT, PERTH).

The obconical fruits with prominent exserted valves are diagnostic.

Ser. 50 Obliquae

***Eucalyptus* ser. *Obliquae* Blakely, *Key Eucalypts* 21, 103 (1934).**

Type: *E. grossa* F.Muell. ex Benth., lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 502 (1988).

E. subser. *Cylindraceae* Blakely, *Key Eucalypts* 22, 105 (1934). T: *E. grossa* F.Muell. ex Benth., lecto, *fide* G.M.Chippendale, *loc. cit.*

Small trees or mallees. Bark smooth with flaky rough bark at base, or rough on all but young stems. Juvenile leaves alternate or opposite, petiolate, concolorous. Adult leaves alternate or opposite, petiolate, acuminate, thick, concolorous; petiole terete. Conflorescences axillary, simple, 7-flowered; umbels; peduncle thick, flattened; pedicels absent. Buds cylindrical to ovoid; operculum conical to hemispherical. Fruits cylindrical or campanulate; disc broad, descending vertically; valves 3 or 4, included or exserted. Seeds irregularly crescent-shaped, reticulate, grey-brown or red-brown.

A series of 3 species in southern W.A. Small trees or mallees with smooth or rough bark, thick concolorous leaves, simple 7-flowered umbels, a flattened peduncle and sessile buds and fruits.

235. *Eucalyptus grossa* F.Muell. ex Benth., *Fl. Austral.* 3: 232 (1867)

T: Phillips R., W.A., *G.Maxwell*; holo: K; iso: MEL, NSW.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 75 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 175 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 42 (1983).

Mallee to 3 m, rarely a straggly tree to 6 m. Bark rough, grey, longitudinally fissured on all but the young branchlets. Juvenile leaves opposite, elliptic. Adult leaves opposite, subopposite or sometimes alternate, broadly lanceolate to ovate; lamina 9–13 cm long, 2.5–5 cm wide, shining, green; lateral veins conspicuous, at 35°–40°; intramarginal vein up to 5 mm from margin; petiole 17–25 mm long. Peduncle 15–25 mm long, often recurved. Operculum 10–15 mm long, 8–13 mm wide; hypanthium cylindrical, sometimes angular when crowded, 13–20 mm long, 8–13 mm wide. Fruits cylindrical, 15–18 mm long, 10–14 mm wide; valves included. *Coarse-leaved Mallee*. Fig. 73K–L.

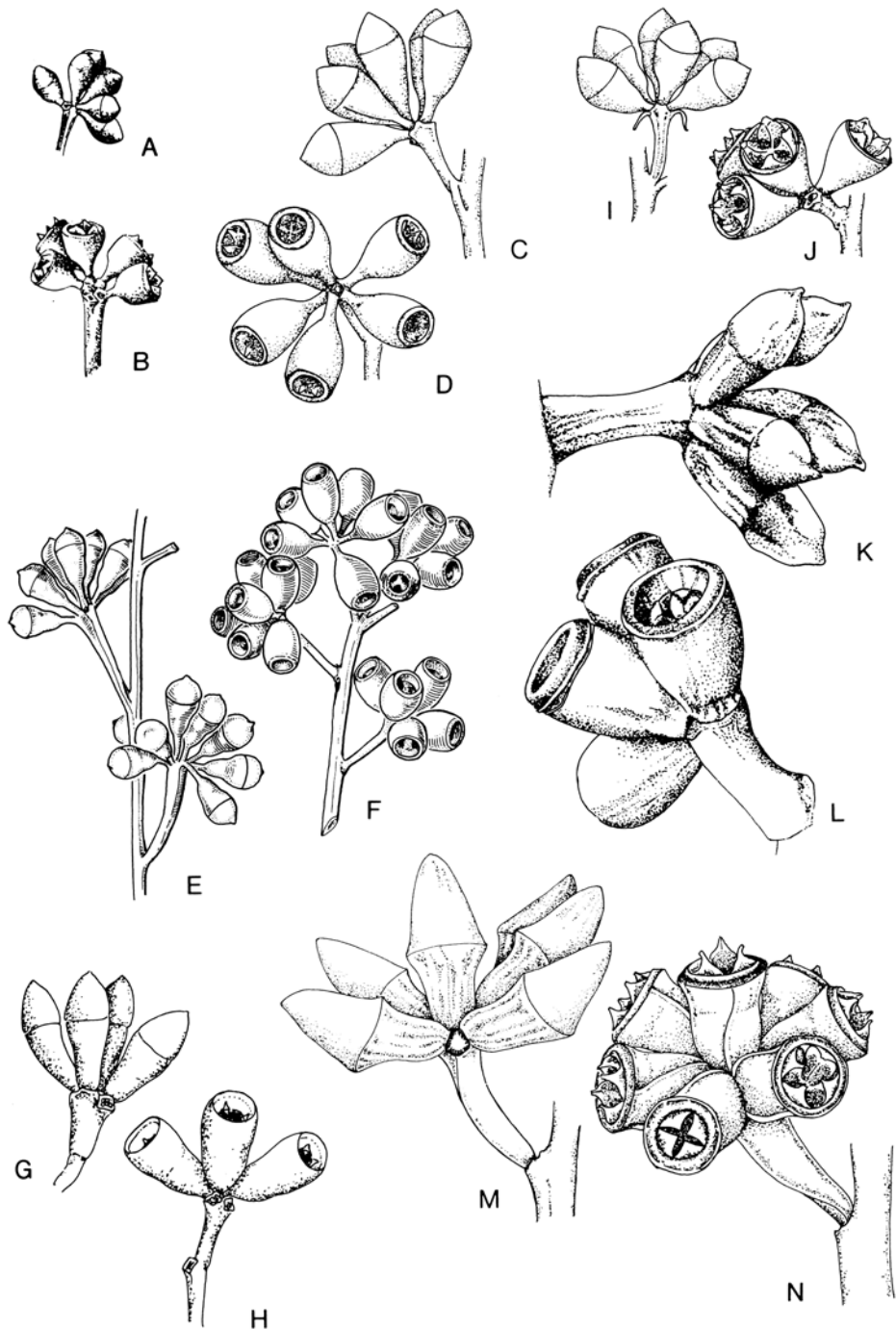


Figure 73. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. laeliae* (2.9 km SE of North Dandalup, W.A., L.McGann, FRI). **C–D**, *E. accedens* (**C**, I.Brooker 2360, FRI; **D**, M.Crisp 6665, FRI). **E–F**, *E. trivalvis* (**E**, I.Brooker 2406, FRI; **F**, P.Latz 2331, FRI). **G–H**, *E. pilbarensis* (I.Brooker 8236, FRI). **I–J**, *E. prominens* (A.George 10352, FRI). **K–L**, *E. grossa* (**K**, near Red Lake, W.A., C.Davies, FRI; **L**, cult., Narrandera, N.S.W., E.Johnston, NSW 58882, NSW). **M–N**, *E. stricklandii* (**M**, Higginsville, W.A., J.Ives, FRI; **N**, J.Baker 83, FRI). **E**, **F** drawn by M.Risby. **K**, **L** drawn by C.Stahl. Others drawn by M.May.

Occurs from near Newdegate to S and E of Norseman, W.A., often associated with granitic rocks, in thickets on flat and slightly undulating ground. Region: ESPR. Map 249.

W.A.: 47.3 km SW of Norseman, *G.M.Chippendale* 170 (FRI, MEL, NSW, PERTH); Salmon Gums, *C.A.Gardner* 2228 (FRI, NSW, PERTH).

Distinguished by straggly mallee habit, rough bark, broad thick shining leaves, and sessile, often pendulous buds and fruits. Stamens lemon-yellow.

236. *Eucalyptus stricklandii* Maiden, *J. W. Austral. Nat. Hist. Soc.* 3: 175 (1911)

T: Hampton Plains Estate, Coolgardie, W.A., Dec. 1900, *E.Lidgely s.n.*; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 2: 216 (1912); isolecto: K.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 76, 77 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 189 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 40 (1983).

Tree to 11 m. Bark smooth, red-brown to grey, with flaky grey-black rough bark at base. Juvenile leaves alternate, elliptic to ovate. Adult leaves alternate, lanceolate; lamina 10–13 cm long, 2–3 cm wide, shining, green; lateral veins distinct, at 30°–40°; intramarginal vein up to 2 mm from margin; petiole 20–35 mm long. Peduncle glaucous, 10–20 mm long. Operculum glaucous, 10–15 mm long, 7–10 mm wide; hypanthium glaucous, campanulate, 8–10 mm long, 7–10 mm wide. Fruits campanulate, faintly several-ribbed, 13–15 mm long, 10–13 mm wide; valves exserted. *Strickland's Gum*. Fig. 73M–N.

Occurs between Coolgardie and Norseman, W.A., on ridges, rocky hills and sometimes near creeks in open woodland. Regions: LEON, ESPR. Map 250.

W.A. 56.7 km SE of Coolgardie, *J.P.Baker* 83 (FRI, NSW, PERTH); 4.8 km S of Higginsville, *N.T.Burbidge* 2654 (BRI, CANB).

Distinguished from *E. grossa* by tree habit, smooth bark except for 1 m or so at base, glaucous buds, yellow or green-yellow stamens and campanulate fruits. Most useful as a shade, ornamental or street tree, particularly in inland areas.

237. *Eucalyptus carnei* C.Gardner, *J. & Proc. Roy. Soc. W. Australia* 14: 82 (1928)

T: near Sandstone, W.A., 19 July 1927, *C.A.Gardner s.n.*; holo: PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 78 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 224 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 46 (1983).

Tree to 6 m. usually stunted. Bark smooth brown to grey, with rough dark bark at base only. Juvenile leaves alternate, elliptic to lanceolate. Adult leaves alternate, lanceolate, sometimes falcate; lamina 8.5–12 cm long, 1.6–2.5 cm wide, grey-green or yellow-green; lateral veins faint, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole 20–25 mm long. Peduncles glaucous, dilated, 8–12 mm long. Operculum 4–5 mm long, 5–7 mm wide; hypanthium cylindrical, faintly 2-ribbed, 5–7 mm long and wide. Fruits cylindrical, faintly 2-ribbed, 6–10 mm long, 6–9 mm wide; valves exserted. *Carne's Blackbutt*. Fig. 74A–B.

Occurs from near Sandstone and Meekatharra S to near Menzies, W.A. Grows on hillsides and loamy flats as scattered trees in open shrubland. Region: LEON. Map 251.

W.A.: 16 km E of Sandstone, *M.I.H.Brooker* 2414 (FRI, NSW, PERTH); Granite Peak Road, *N.H.Speck* 793 (AD, BRI, CANB, NSW, PERTH).

Closely related to *E. stricklandii* but a more stunted tree with smaller buds and fruits.

Ser. 51 Contortae

Eucalyptus ser. **Contortae** Blakely, *Key Eucalypts* 66, 274 (1934).

Type: *E. salubris* F.Muell.

Trees or mallees; trunks often spirally fluted. Bark smooth throughout, or fibrous on stems in *E. effusa*. Juvenile leaves alternate, petiolate, concolorous. Adult leaves alternate, petiolate, concolorous; petiole terete. Conflorescences axillary, simple; umbels usually 7-flowered, 3-flowered in *E. diptera*; peduncle flattened, absent in *E. diptera*. Buds ovoid or conical. Fruits obconical or hemispherical; disc narrow to moderately broad, often convex, level or descending; valves 3 or 4, exserted. Seeds irregularly D-shaped, cubical or orbicular, red-brown or yellow-brown, pitted. *Gimlets*.

A series of 4 species in southern W.A. Trees or mallees often with spirally fluted trunks, concolorous leaves, simple 7- or 3-flowered umbels, ovoid or conical buds, exserted valves and red-brown or yellow-brown seeds.

238. Eucalyptus salubris F.Muell., *Fragm.* 10: 54 (1876)

T: between Queen Victoria Spring and Ularing, W.A., 9 Oct. 1875, *J.Young*; holo: MEL; iso: K.

Tree to 15 m, occasionally to 24 m; trunk strongly spirally fluted. Bark smooth, shining, red-brown or copper-coloured. Juvenile leaves lanceolate, green. Adult leaves narrowly lanceolate, acute to acuminate; lamina 4.5–10.5 cm long, 0.5–1.3 cm wide; lateral veins faint, at 25°–35°; intramarginal vein up to 1 mm from margin; petiole 8–15 mm long. Peduncle 4–13 mm long; pedicels absent or up to 5 mm long. Buds ovoid; operculum conical, rounded at apex, 4–6 mm long, 4–5 mm wide; hypanthium hemispherical, 6–8 mm long, 4–5 mm wide. Fruits hemispherical 3–6 mm long, 5–8 mm wide; disc usually convex, narrow, descending.

Widespread in south-western W.A. except coastal and wetter forest areas. There are 2 varieties.

Buds and fruits shortly pedicellate; branchlets and peduncles not glaucous

238a. var. salubris

Buds and fruits sessile; branchlets and peduncles glaucous

238b. var. glauca

238a. Eucalyptus salubris F.Muell. var. **salubris**

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 79, 80 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 27 (1979); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 401 (1984).

Adult leaves shining, green, glandular. Peduncle green; pedicels 1–5 mm long. Buds shining. Fruits shortly pedicellate. *Gimlet*. Figs 17, 74C–D.

Occurs from the Yuna area south-eastwards to Ravensthorpe and E to the edge of the Great Victoria Desert. Grows in sandy loam to clayey soils, often in pure stands but also associated with other eucalypts of the semi-arid zone. Regions: BENC, LEON, ESPR. Map 252.

W.A.: 345 mile post, Hyden–Norseman road, *K.M.Allan* 777 (AD, FRI, PERTH); 32.8 km S of Kalgoorlie, *J.P.Baker* 8 (AD, BRI, FRI, MEL, NSW, PERTH); Carrabin, *R.Coveny* 8348 (FRI, NSW); 4.8 km E of Boulder, *R.D.Royce* 5217 (PERTH).

Recognised by the shining, copper-coloured smooth bark, spirally fluted trunk, small shining leaves, small ovoid buds and hemispherical fruits with exserted valves. The wood is dense and strong, and has been useful in mining areas of W.A. for firewood, poles and posts. Has been used as a street tree.

238b. *Eucalyptus salubris* var. *glauca* Maiden, *Crit. Revis. Eucalyptus* 4: 158 (1919)

T: 70 miles [c. 112 km] N of Kurrawang, W.A., Sept. 1909, *J.H.Maiden*; holo: NSW; iso: FRI.

Adult leaves glaucous. Peduncle glaucous; pedicels absent. Buds glaucous. Fruits sessile. Fig. 74E–F.

Occurs in the eastern Goldfields, W.A., in flat or gently undulating, often loamy, areas of open woodland. Regions: LEON, ESPR. 253.

W.A.: between Norseman & Fraser Ra., *M.I.H.Brooker* 2485 (FRI, NSW, PERTH); Hampton Hill Stn Homestead, *R.Coveny* 8425 & *B.Habersley* (FRI, NSW).

Differs from *E. salubris* var. *salubris* in the glaucous leaves and buds, and from *E. campaspe* in the smaller buds and fruits.

239. *Eucalyptus campaspe* S.Moore, *J. Linn. Soc., Bot.* 34: 193 (1899)

T: Gibraltar, W.A., Oct. 1895, *S.Moore* 90; holo: BM; iso: K, MEL, NSW.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 81 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 27 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 39 (1983).

Tree to 11 m; trunk slightly spirally fluted. Bark smooth, light copper-brown to dark red-brown. Juvenile leaves broadly lanceolate, grey-green. Adult leaves lanceolate, acute or acuminate; lamina 8–11.5 cm long, 1–2 cm wide, glaucous, grey to grey-green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole 10–15 mm long. Peduncle 5–10 mm long; pedicels 2–4 mm long. Buds ovoid to conical, glaucous; operculum hemispherical to conical, 5–8 mm long and wide; hypanthium hemispherical, 6–8 mm long, 5–8 mm wide. Fruits hemispherical, glaucous, 6–9 mm long, 8–10 mm wide; disc moderately broad, level or convex. *Silver-topped Gimlet*. Fig. 74G–H.

Occurs around Kalgoorlie, W.A., on loamy flats and low hills in open woodland. Region: LEON. Map 254.

W.A.: 4.8 km N of Widgiemooltha, *M.I.H.Brooker* 2233 (FRI, PERTH); 6.9 km ENE of Coolgardie, *G.M.Chippendale* 371 (AD, BRI, FRI, MEL, NSW, PERTH); 16 km W of Randells, *R.D.Royce* 5233 (PERTH).

Distinguished by slightly fluted trunk, smooth copper-brown to dark red-brown bark, and glaucous leaves, buds and fruits. Fruits larger than those of *E. salubris*. Suitable for cultivation in windbreaks and as a street tree.

240. *Eucalyptus diptera* C.R.P.Andrews, *J. W. Austral. Nat. Hist. Soc.* 1: 42 (1904)

T: Esperance, W.A., Oct. 1903, *C.Andrews s.n.*; holo: PERTH; iso: NSW.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 82, 83 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 240 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 68 (1983).

Tree or mallee to 8 m; trunk spirally fluted. Bark copper-brown or red-brown, shining. Juvenile leaves lanceolate, green. Adult leaves narrowly lanceolate, uncinat; lamina 6–9 cm long, 0.8–1.5 cm wide, shining, green; lateral veins faint, at 30°–45°; intramarginal vein less than 1 mm from margin; petiole 6–12 mm long. Peduncle absent; pedicels absent. Buds conical; operculum conical, slightly laterally compressed, 6–7 mm long, 6–9 mm wide; hypanthium hemispherical, 2-winged, 4–8 mm long, 8–10 mm wide. Fruits hemispherical, 2-winged, 7–10 mm long, 10–15 mm wide; disc narrow, obliquely descending. *Two-winged Gimlet*. Fig. 74 I–J.

Occurs between Circle Valley and Norseman and towards the Fraser Ra., W.A. Grows in sandy or clayey loam, sometimes in subsaline areas, in thickets and shrubland. Regions: LEON, ESPR. Map 255.

W.A.: 11.3 km N of Pine Hill Rock, *M.I.H.Brooker* 4534 (AD, FRI, MEL, NSW, PERTH); Salmon Gums, *C.A.Gardner* 1726 (FRI, NSW, PERTH); 3.2 km from Kondinin, Dec. 1975, *R.Smith* (FRI).

Distinguished especially by sessile 2-winged buds and fruits.

241. *Eucalyptus effusa* Brooker, *Nuytsia* 2: 108 (1976)

T: 112 km E of Norseman, W.A., 32°02'S, 122°57'E, 12 Mar. 1967, *G.M.Chippendale* 157; holo: FRI; iso: MEL, NSW, PERTH.

Illustrations: M.I.H.Brooker, *op. cit.* 109; S.Kelly *et al.*, *Eucalypts* 2: t. 58 (1983).

Mallee to 4 m; trunk not fluted. Bark fibrous, grey on stems, smooth, grey or pink-grey on smaller branches. Juvenile leaves ovate-lanceolate, green. Adult leaves narrowly lanceolate, uncinat, thick; lamina 5–10 cm long, 0.6–1.5 cm wide, green; lateral veins faint, at 25°–35°; intramarginal vein confluent or almost so with margin; petiole 7–10 mm long. Peduncle 3–10 mm long; pedicels 1–3 mm long. Buds ovoid; operculum conical, 3–5 mm long, 3–4 mm wide; hypanthium hemispherical or obconical, 3 mm long, 3–4 mm wide. Fruits hemispherical or obconical, 5–7 mm long, 5–6 mm wide; disc narrow, descending. Fig. 74K–L.

Occurs between the Fraser Ra. and Balladonia, and with a disjunct occurrence about 140 km NE of Paynes Find, W.A. Grows in small stands of tall shrubland in low hilly and stony country. Regions: LEON, ESPR. Map 256.

W.A.: 128.8 km E of Norseman, *W.E.Blackall* 1144 (PERTH); 141.9 km NE of Paynes Find, *J.D.Briggs* 133 (FRI); 117.5 km E of Norseman, *M.I.H.Brooker* 3646 (AD, FRI, NSW, PERTH).

Distinguished by mallee habit, rough-barked stems, small leaves, 7-flowered umbels and conical operculum.

Ser. 52 *Kruseanae****Eucalyptus* ser. *Kruseanae* Chippendale, *Fl. Australia* 19: 500 (1988).**

Type: *E. kruseana* F.Muell.

Mallees. Bark smooth throughout, grey-brown, deciduous in flakes, new bark yellow-brown. Juvenile leaves usually opposite, sometimes subopposite or alternate, petiolate, glaucous, concolorous. Adult leaves usually opposite, sometimes subopposite or alternate, sessile or petiolate, glaucous, concolorous. Conflorescences axillary, simple, 7-flowered umbels. Buds ovoid to conical, glaucous; operculum conical; hypanthium obconical. Fruits cylindrical to obconical, glaucous; disc narrow, descending vertically; valves 3 or 4, included or occasionally exserted. Seeds crescent-shaped, reticulate, brown or red-brown.

A series of 2 species in southern W.A. Mallees with smooth bark, usually opposite glaucous leaves, simple 7-flowered umbels, glaucous buds and fruits.

242. *Eucalyptus kruseana* F.Muell., *Austral. J. Pharm.* 10: 233 (1895)

T: near Fraser Ra., 160 km N of Israelite Bay, W.A., 1895, *J.D.Batt s.n.*; holo: MEL; iso: K.

E. morrisonii Maiden, *J. W. Austral. Nat. Hist. Soc.* 3: 44 (1910). T: 50–150 miles [c. 80–240 km] E of Kalgoorlie, W.A., May 1909, *H.Deane s.n.*; holo: NSW; iso: FRI, K, MEL.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 83, 84 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 208 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 122 (1983).

Mallee to 2.5 m. Juvenile leaves opposite, orbicular, often persistent on mature plant. Adult leaves opposite, sessile, orbicular, cordate; lamina 1.5–2 cm long and wide; lateral veins faint, at 60°–70°; intramarginal vein up to 1 mm from margin. Peduncle terete or flattened, 3–10 mm long; pedicels 3–6 mm long. Operculum 4–6 mm long, 4–5 mm wide; hypanthium 3–4 mm long, 4–5 mm wide. Fruits 6–7 mm long and wide; valves included or exserted. *Bookleaf Mallee*. Figs 28, 74M–N.

Occurs E and SE of Kalgoorlie, W.A., usually associated with granite outcrops in flat and slightly undulating country. Regions: LEON, ESPR. Map 257.

W.A.: 48.3 km E of Binyarinyinna Rock, *M.I.H.Brooker* 3654 (BRI, FRI, MEL, PERTH); 11.3 km E of Karonie, *G.M.Chippendale* 130 (AD, BRI, FRI, MEL, NSW, PERTH).

Distinguished by mallee habit and glaucous, crowded, sessile, orbicular leaves and yellow stamens. Leaves much smaller than those of *E. brachyphylla*. An attractive shrub or small tree highly suitable for cultivation in drier areas.

243. *Eucalyptus brachyphylla* C.Gardner, *J. & Proc. Roy. Soc. W. Australia* 27: 186 (1942)

T: near Lake Cowan, W.A., July 1940, *G.E.Brockway s.n.*; holo: PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 85 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 208 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 123 (1983).

Mallee to 3.5 m. Juvenile leaves subopposite or alternate, broadly ovate. Adult leaves alternate, subopposite or opposite, petiolate, broadly ovate or suborbicular, apiculate; lamina 3–4 cm long, 2–3 cm wide; lateral veins at 35°–55°; intramarginal vein up to 2 mm from margin; petiole terete, 1–4 mm long. Peduncle slightly flattened, glaucous, 6–10 mm long; pedicels glaucous, 3–4 mm long. Operculum 3–4 mm long and wide; hypanthium 4–5 mm long, 3–4 mm wide. Fruits 4–6 mm long and wide, often glaucous; valves usually included. Fig. 74 O–P.

Occurs from near Lake Cowan to around Karonie, W.A., usually associated with granite outcrops in flat and slightly undulating country. Region: LEON. Map 258.

W.A.: 4.5 km N of Karonie, *G.M.Chippendale* 131 (AD, BRI, FRI, MEL, NSW, PERTH); Binyarinyinna Rock, 10 Aug. 1959, *R.J.Donovan* (FRI, PERTH).

Distinguished from *E. kruseana* by the usually broadly ovate, petiolate leaves which may be opposite, subopposite or alternate. Considered by L.Pryor & L.A.S.Johnson, *A Classification of the Eucalypts* 61 (1971), to be a hybrid between *E. kruseana* and *E. ovularis*.

Ser. 53 *Loxophlebae*

Eucalyptus* ser. *Loxophlebae Chippendale, *Fl. Australia* 19: 500 (1988).

Type: *E. loxophleba* Benth.

Trees or mallees. Bark fibrous on trunk, then smooth above, or smooth throughout. Juvenile leaves alternate, petiolate, ovate, sometimes cordate, grey-green or glaucous, concolorous. Adult leaves alternate, petiolate, uncinat, shining, concolorous. Conflorences axillary, simple, 7–11-flowered umbels. Buds clavate; operculum hemispherical to almost conical. Fruits obconical; disc broad, descending vertically; valves 3 or 4, included. Seeds crescent-shaped, reticulate, red-brown.

A series of 1 species in south-western W.A. Trees or mallees with smooth or fibrous bark, shining concolorous leaves with prominent veins at a very narrow angle with midrib and obconical fruits.

244. *Eucalyptus loxophleba* Benth., *Fl. Austral.* 3: 252 (1867)

T: Darling Ra., W.A., *A.Collie*; syn: K; Swan R., W.A., *J.Drummond* 82; syn: BM, CGE, G, K, MEL, NSW, W; York district, W.A., *L.Preiss* 246 (and 248?); syn: n.v.; Murchison R., near Champion Bay, W.A., *A.Oldfield*; syn: K, MEL.

E. loxophleba var. *fruticosa* Benth., *loc. cit.* 252. T: Murchison R., W.A., *A.Oldfield*; syn: MEL; Salt R., W.A., *G.Maxwell*; syn: MEL.

Tree or mallee to 15 m. Adult leaves narrowly lanceolate to lanceolate; lamina 7.5–15 cm long, 1–2.5 cm wide; lateral veins prominent, at 15°–20°; intramarginal vein up to 3 mm from margin; petiole terete or angular, 8–15 mm long. Peduncle flattened, angular or terete. Operculum 2–3 mm long, 3–5 mm wide; hypanthium obconical, 3–10 mm long, 3–6 mm wide. Fruits 5–10 mm long, 4–9 mm wide.

Occurs through most of south-western W.A. except the wetter forest areas. There are 2 subspecies.

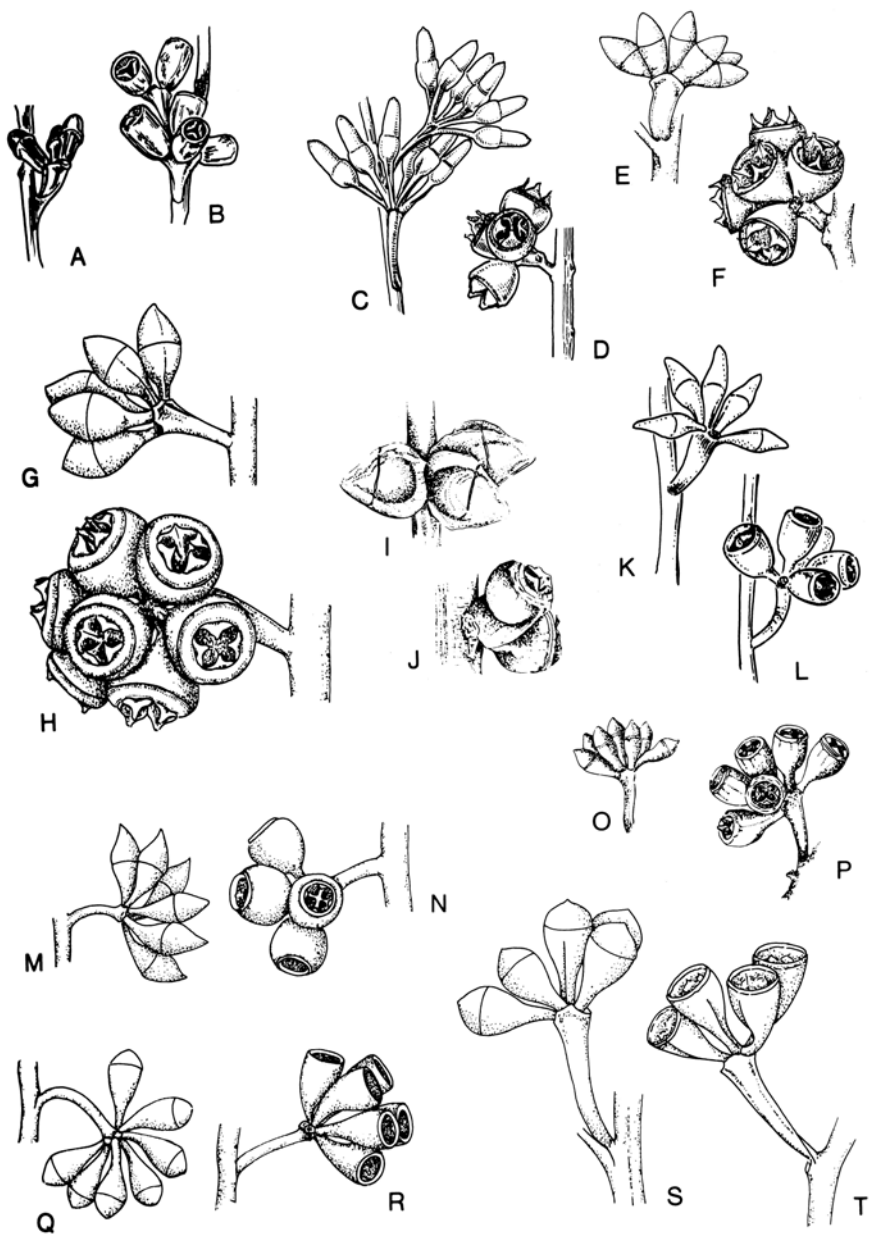


Figure 74. *Eucalyptus* buds and fruits, all $\times 1$, unless otherwise stated. **A–B**, *E. carnei* $\times 0.75$ (**A**, G.Chippendale 366, FRI; **B**, J.Baker 95, FRI). **C–D**, *E. salubris* var. *salubris* (**C**, R.Kuchel 1757, FRI; **D**, J.Baker 8, FRI). **E–F**, *E. salubris* var. *glauca* (I.Brooker 2485, FRI). **G–H**, *E. campaspe* (**G**, near Coolgardie on Kalgoorlie Rd, W.A., M.Phillips, FRI; **H**, J.Baker 124, FRI). **I–J**, *E. diptera* (Salmon Gums, W.A., C.Gardner, NSW 58881, NSW). **K–L**, *E. effusa* (**K**, G.Chippendale 157, FRI; **L**, 83.2 km W of Balladonia, W.A., J.Willis, FRI). **M–N**, *E. kruseana* (**M**, Woomera Bowling Club, N.Hall, FRI; **N**, L.Pryor 118, FRI). **O–P**, *E. brachyphylla* (**O**, near Lake Cowan, W.A., G.Brockway, PERTH; **P**, Binyarinyinna Rock, W.A., R.Donovan, PERTH). **Q–R**, *E. loxophleba* subsp. *loxophleba* (**Q**, G.Chippendale 13, FRI; **R**, D.Boland J245, FRI). **S–T**, *E. loxophleba* subsp. *gratae* (**S**, 19.2 km E of Newdegate, W.A., M.Phillips, FRI; **T**, J.Beard 8157, FRI). **A–D**, **K**, **L** drawn by M.Risby. **I**, **J**, **O**, **P** drawn by J.Collins. Others drawn by M.May.

Bark rough on trunks; buds and fruits not glaucous

244a. subsp. *loxophleba*

Bark smooth on trunks; buds and fruits often glaucous

244b. subsp. *gratiae*

244a. *E. loxophleba* Benth. subsp. *loxophleba*

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 85 (1970); G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 86, 87 (1973); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 403 (1984).

Bark rough, grey-brown to dark grey on trunk. Adult leaves: lamina 1–2 cm wide, green. Peduncle terete to angular, 5–20 mm long; pedicels 1–4 mm long. Operculum c. 2 mm long, 3–4 mm wide; hypanthium 3–5 mm long, 3–4 mm wide. Fruits 5–8 mm long, 4–6 mm wide. *York Gum*. Fig. 74Q–R.

Widespread in the Goldfields and agricultural areas, south-western W.A.; grows in loam, rocky loam and clay-loam, in woodland and tall shrubland on plains and low hills. Regions: MRCH, BENC, LEON, LUWN, ESPR. Map 259.

W.A.: 20.9 km N of Westonia, *M.I.H.Brooker* 2426 (BRI, FRI, PERTH); 11.3 km SE of Moora, *G.M.Chippendale* 13 (AD, BRI, CANB, FRI, MEL, PERTH); 32 km N of Murchison R., *A.S.George* 7896 (K, MEL, PERTH); near Bullabulling, *F.G.Smith* 1655 (PERTH); 13.3 km NW of Wongan Hills, *M.D.Tindale* 2795 (FRI, NSW, PERTH).

A characteristic tree of the W.A. wheatbelt. Distinguished by usually rough bark, green shining leaves with very acute, somewhat irregular venation, and non-glaucous buds and fruits. The wood was once used by wheelwrights but is not available in commercial sizes now. A medium honey can be produced from the flowers, mainly Sept.–Dec.

244b. *E. loxophleba* subsp. *gratiae* Brooker, *Nuytsia* 1: 248–250 (1972)

T: 0.5 mile (0.8 km) W of Burngup, W.A., 31°01'S, 118°41'E, 3 Nov. 1969, *M.I.H.Brooker* 2273; holo: PERTH.

Illustrations: M.I.H.Brooker, *op. cit.* 249; S.Kelly *et al.*, *Eucalypts* 2: t. 54 (1983).

Bark smooth throughout, red-brown to grey, shining. Adult leaves: lamina 1.3–2.5 cm wide, bright green. Peduncle flattened, 12–20 mm long; pedicels 2–5 mm long. Operculum 2–3 mm long, 3–5 mm wide; hypanthium 7–10 mm long, 4–6 mm wide. Fruits 7–10 mm long, 6–9 mm wide. Fig. 74S–T.

Occurs between Dumbleyung and Lake Grace, W.A., on plains in shrubland and woodland. Regions: BENC, ESPR. Map 260.

W.A.: 16 km W of Lake Grace, *M.I.H.Brooker* 2269 (FRI, NSW, PERTH); 25 km W of Lake King, *G.M.Chippendale* 224 (FRI, PERTH).

Distinguished from subsp. *loxophleba* by the smooth bark, glaucous branchlets, thick leaves, and often glaucous larger buds and fruits.

Ser. 54 *Decurvae*

Eucalyptus* ser. *Decurvae* Blakely, *Key Eucalypts* 28, 126 (1934) *p.p.

Type: *E. decurva* F.Muell.

Mallees or small trees to 4.5 m. Bark smooth throughout, white, creamy or grey, often deciduous in flakes. Juvenile leaves opposite, sessile, green or glaucous, concolorous. Adult leaves alternate or opposite, petiolate, concolorous; intramarginal vein up to 1 mm from margin; petiole flattened. Conflorescences axillary, simple, 7-flowered umbels; peduncle terete, becoming recurved. Buds clavate or cylindrical-rostrate. Fruits globular; disc broad, descending vertically or obliquely; valves 3 or 4, included. Seeds elliptic, reticulate, grey-black.

A series of 2 species in southern W.A. Mallees or small trees with smooth pale bark, concolorous leaves, simple 7-flowered umbels, included valves and grey-black seeds. In bud, the operculum and hypanthium are cream.

245. *Eucalyptus doratoxylon* F.Muell., *Fragm.* 2: 55 (1860)

T: Kojoneerup, W.A., *G.Maxwell*; holo: MEL.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 87 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 121 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 86 (1983).

Juvenile leaves narrowly lanceolate, green. Adult leaves opposite, narrowly lanceolate, uncinat; lamina 6–7.5 cm long, 0.8–1 cm wide, green; lateral veins at 35°–40°; petiole 5–8 mm long. Peduncle 8–10 mm long; pedicels slender, terete, 3–5 mm long. Buds cylindrical-rostrate; operculum conical, rostrate, 4–5 mm long, c. 3 mm wide; hypanthium cylindrical, 3–4 mm long, c. 3 mm wide. Fruits 6–8 mm long and wide. *Spearwood Mallee*. Fig. 75A–B.

Occurs in coastal and near-coastal areas from the Stirling Ra. and near Albany eastwards to Mt Ragged and Israelite Bay, W.A. Grows in protected rocky areas in heathland or open forest. Regions: LUWN, ESPR. Map 261.

W.A.: S of Mt Ragged, *K.M.Allan* 752 (AD, FRI, PERTH); Trio Peak, Stirling Ra., *M.I.H.Brooker* 4429 (AD, FRI, MEL, PERTH); 56.3 km E of Esperance, *G.M.Chippendale* 187 (AD, FRI, MEL, NSW, PERTH).

Distinguished by opposite leaves, cylindrical-rostrate buds and globular fruits up to 8 mm long. Differs from *E. decurva* in the narrower leaves, shorter petiole and peduncle and longer, rostrate operculum.

246. *Eucalyptus decurva* F.Muell., *Fragm.* 3: 130 (1863)

T: E of Porongurup Ra., W.A., *G.Maxwell*; holo: MEL; iso: K, NSW.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 89 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 87 (1983).

Juvenile leaves ovate, ±cordate, glaucous. Adult leaves alternate, lanceolate, sometimes falcate, uncinat or acuminate; lamina 6.5–8 cm long, 1.5–2.5 cm wide, grey-green; lateral veins faint, at 45°–60°; petiole 10–18 mm long. Peduncle 15–20 mm long; pedicels quadrangular, 4–8 mm long. Buds clavate; operculum hemispherical-conical, 2–3 mm long, 4–5 mm wide; hypanthium cylindrical, 4–5 mm long and wide. Fruits 8–10 mm long and wide. *Slender Mallee*. Fig. 75C–D.

Occurs in coastal and near-coastal areas from about the Stirling Ra. eastwards beyond Esperance, with several isolated disjunct occurrences SE of Perth, W.A. Grows in lateritic sandy and clayey soils in hilly and undulating country. Regions: LUWN, ESPR. Map 262.

W.A.: 3.4 km N of Hopetoun, *G.M.Chippendale* 216 (FRI, MEL, NSW, PERTH); Kalgan Plains, Oct. 1951, *C.A.Gardner* (FRI, PERTH); 11.3 km NNE of Cheyne Beach, *M.D.Tindale* 323 (K, NSW, PERTH).

Distinguished by glaucous branchlets, hemispherical-conical operculum which is shorter than the hypanthium, and globular fruits up to 10 mm long. Leaves larger and peduncle longer than in *E. doratoxylon*.

Ser. 55 Micrantherae

Eucalyptus* ser. *Micrantherae Benth., *Fl. Austral.* 3: 192, 217 (1867).

T: *E. micranthera* F.Muell.

E. ser. Eremophilae Blakely, *Key Eucalypts* 64, 266 (1934). T: not designated.

Mallees or trees. Bark smooth throughout, or fibrous on lower trunk, or rough throughout. Juvenile leaves usually alternate, but decussate in *E. goniantha* subsp. *semiglobosa*, petiolate,

concolorous. Adult leaves alternate, usually petiolate, concolorous. Conflorescences axillary, simple, 7–15-flowered umbels. Buds conical, fusiform, ovoid, clavate, globular or rostrate. Fruits hemispherical, subglobular, ovoid, or turbinate subpyriform; disc descending, ascending or convex; valves 3–5, exserted. Seeds elliptic, reticulate, red-grey-brown.

A series of 9 species in southern W.A. and southern S.A. Mallees or small trees with smooth or rough bark, concolorous leaves, simple 3–15-flowered umbels, exserted valves and red-grey-brown seeds.

247. *Eucalyptus balladoniensis* Brooker, *Nuytsia* 2: 103 (1976)

T: 80 km by road S of Zanthus, W.A., 31°37'S, 123°53'E, 13 Feb. 1970, *M.I.H. Brooker* 2471; holo: PERTH.

Illustrations: *M.I.H. Brooker, op. cit.* 104; *S. Kelly et al., Eucalypts* 2: t. 249 (1983).

Mallee to 4 m. Bark fibrous, grey to dark grey on lower stems, smooth and grey-brown or pink-grey above. Juvenile leaves narrowly lanceolate, green. Adult leaves lanceolate, acuminate; lamina 7–13 cm long, 1–2.5 cm wide, grey-green; lateral veins just visible, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole flattened or quadrangular, 10–22 mm long. Umbels 7-flowered; peduncle flattened or terete, 10–20 mm long; pedicels angular, 4–8 mm long. Buds globular; operculum rostrate, 13–15 mm long, 9–12 mm wide; hypanthium hemispherical, 7–8 mm long, 9–12 mm wide. Fruits hemispherical, 10–12 mm long, 9–12 mm wide; disc broad, descending; valves 4. Fig. 75E–F.

Occurs N and NW of Balladonia, W.A., on plains and gentle slopes in open shrubland. Regions: LEON, ESPR. Map 263.

W.A.: between 12 & 13 mile posts W of Balladonia, *M.I.H. Brooker* 3653 (FRI, NSW, PERTH); W of Balladonia, *M.I.H. Brooker* 4536 (FRI, NSW, PERTH).

Distinguished by mallee habit, fibrous bark on lower stems, thick lanceolate leaves, 7-flowered umbels with ±rostrate buds, and hemispherical fruits.

248. *Eucalyptus goniantha* Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 20(1): 163 (1847)

E. incrassata var. *goniantha* (Turcz.) Maiden, *Crit. Revis. Eucalyptus* 1: 96, 103 (1904). T: King George Sound, W.A., *J. Drummond* 71; holo: LE; iso: BM, E, FI, FRI, G, K, NSW, PERTH, W.

Mallee or tree to 3.5 m. Bark smooth throughout, grey to pale brown. Juvenile leaves ovate, green. Adult leaves lanceolate to broadly lanceolate; lateral veins clearly visible, at 35°–40°; intramarginal vein up to 3 mm from margin; petiole angular or slightly flattened, 15–25 mm long. Umbels 7-flowered; peduncle flattened, recurved. Buds conical or ovoid; operculum narrower than hypanthium; hypanthium obconical or hemispherical. Fruits ribbed; disc broad; valves 4 or 5.

Occurs in S coastal heathlands from near Albany to Balladonia, W.A. Differs from *E. balladoniensis* in the smooth bark and ribbed fruits. Buds usually cream. There are 2 subspecies.

Operculum conical

248a. subsp. *goniantha*

Operculum hemispherical

248b. subsp. *semiglobosa*

248a. *Eucalyptus goniantha* Turcz. subsp. *goniantha*

E. kessellii Maiden & Blakely, *J. & Proc. Roy. Soc. New South Wales* 59: 187 (1925). T: Salmon Gums, W.A., *W.P. Brown per C.A. Gardner* 994a; holo: NSW; iso: PERTH.

Illustrations: *C.A. Gardner* (ed. *T.E. Aplin*), *Eucalypts W. Australia* 181 (1979); *S. Kelly et al., Eucalypts* 1: t. 79 (1983).

Adult leaves acuminate; lamina 6–12 cm long, 2–3 cm wide, dark green. Peduncle 10–15 mm long; pedicels absent or up to 4 mm long, thick. Buds conical; operculum conical, smooth or striate, 7–10 mm long, 5–12 mm wide; hypanthium ribbed, 5–10 mm long, 6–13

mm wide. Fruits hemispherical or subpyriform, 10–15 mm long, 12–16 mm wide. *Jerdacuttup Mallee*. Fig. 75G–H.

Occurs from Two Peoples Bay to Balladonia, W.A., often in sandy heathland. Region: ESPR. Map 264.

W.A.: 20.9 km SW of Mt Ridley, *M.I.H.Brooker* 2758 (FRI, MEL, PERTH); 6.4 km N of Mt Bland, *M.D.Tindale* 3854a (NSW, PERTH); 80 km E of Ravensthorpe, *P.G.Wilson* 8062 (FRI, K, PERTH).

248b. *Eucalyptus goniantha* subsp. *semiglobosa* Brooker, *Nuytsia* 2: 110 (1976)

T: between Mt Le Grand and Frenchmans Peak, W.A., 33°59'S, 122°08'E, 22 Apr. 1972, *M.I.H.Brooker* 3613; holo: FRI; iso: AD, BRI, NSW, PERTH.

Illustrations: *M.I.H.Brooker, op. cit.* 111; *S.Kelly et al., Eucalypts* 2: t. 70 (1983).

Adult leaves uncinat; lamina 8–12 cm long, 2–4 cm wide, dark green. Peduncle 15–25 mm long; pedicels thick, 5–8 mm long. Buds ovoid; operculum hemispherical, wrinkled, 5–6 mm long, 7–8 mm wide; hypanthium striate, c. 5 mm long, 7–8 mm wide. Fruits hemispherical to subglobular, 7–12 mm long, 11–15 mm wide. Fig. 75 I–J.

Occurs between Mt Le Grand and Frenchman Peak, W.A., along creeks in granitic hills in dense shrubland. Region: ESPR. Map 265.

W.A.: Coronet Ck, *M.I.H.Brooker* 3615 (FRI, PERTH); Boyatup Hill, *R.Pullen* 10085 (FRI).

Differs from subsp. *goniantha* mainly in the rounded operculum and more globular fruits.

249. *Eucalyptus falcata* Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 20(1): 163 (1847)

T: Swan R. Colony, W.A., July 1847, *J.Drummond* 70; holo: KW; iso: CGE, FI, G, K, MEL, NSW, PERTH.

E. falcata var. *ecostata* Maiden, *J. W. Austral. Nat. Hist. Soc.* 3: 173 (1911). T: Hopetoun, W.A., Nov. 1909, *J.H.Maiden*; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 2: 184 (1912); iso: G, K, L.

E. dorrienii Domin, *Repert. Spec. Nov. Regni Veg.* 12: 388 (1913). T: Cranbrook to Warrunup, W.A., 1910, *A.Dorrien-Smith* 7087; holo: PR; iso: K.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 92 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 179 (1979); *S.Kelly et al., Eucalypts* 1: t. 88 (1983).

Tree to 9 m or mallee to 3.5 m. Bark smooth throughout, grey or grey-brown. Juvenile leaves broadly lanceolate, grey-green. Adult leaves lanceolate, sometimes falcate, uncinat; lamina 8–9.5 cm long, 1.5–2 cm wide, grey-green; lateral veins faint, at 35°–40°; intramarginal vein up to 1 mm from margin; petiole quadrangular, 15–20 mm long. Umbels 7–15-flowered peduncle ±quadrangular, 6–12 mm long; pedicels quadrangular, 6–8 mm long. Buds conical; operculum conical, smooth or striate, 8–10 mm long, 4–5 mm wide; hypanthium hemispherical, usually ribbed, rarely smooth, 4–6 mm long, 5–6 mm wide. Fruits hemispherical or subglobular, ribbed or smooth, 5–8 mm long, 7–10 mm wide; disc narrow to moderately broad, ascending, collar-like; valves 3–5. *Silver Mallet*. Fig. 75K–L.

Occurs from Narrogin to Wagin, S to the coast and E to Lake Grace and Esperance, W.A., with outliers near Badgingarra. Varies from a tree in hilly areas inland to a mallee in undulating sandy areas near the coast. Regions: BENC, LUWN, ESPR. Map 266.

W.A.: 1.1 km N of Hopetoun, *G.M.Chippendale* 214 (FRI, MEL, NSW, PERTH); Harrismith, *C.A.Gardner* 2116 (NSW, PERTH); 32.2 km W of Bremer Bay, *P.G.Wilson* 4342 (AD, BRI, FRI, PERTH); 25 km NW of Kondinin, *D.F. Blaxell* 18 (N.S.W.).

Buds cream. Distinguished from *E. goniantha* by the narrower leaves, long, conical operculum and smaller fruits. Buds and fruits less prominently ribbed than in *E. ornata*.

250. *Eucalyptus ornata* Crisp, *Nuytsia* 5: 311 (1985)

T: 9 km NE of Kondinin, W.A., 25 Sept. 1983, *J.Taylor* 2244 & *P.Ollerenshaw*; holo: CBG; iso: CBG, K, MEL, NSW, PERTH.

Illustration: *M.D.Crisp, op. cit.* 312.

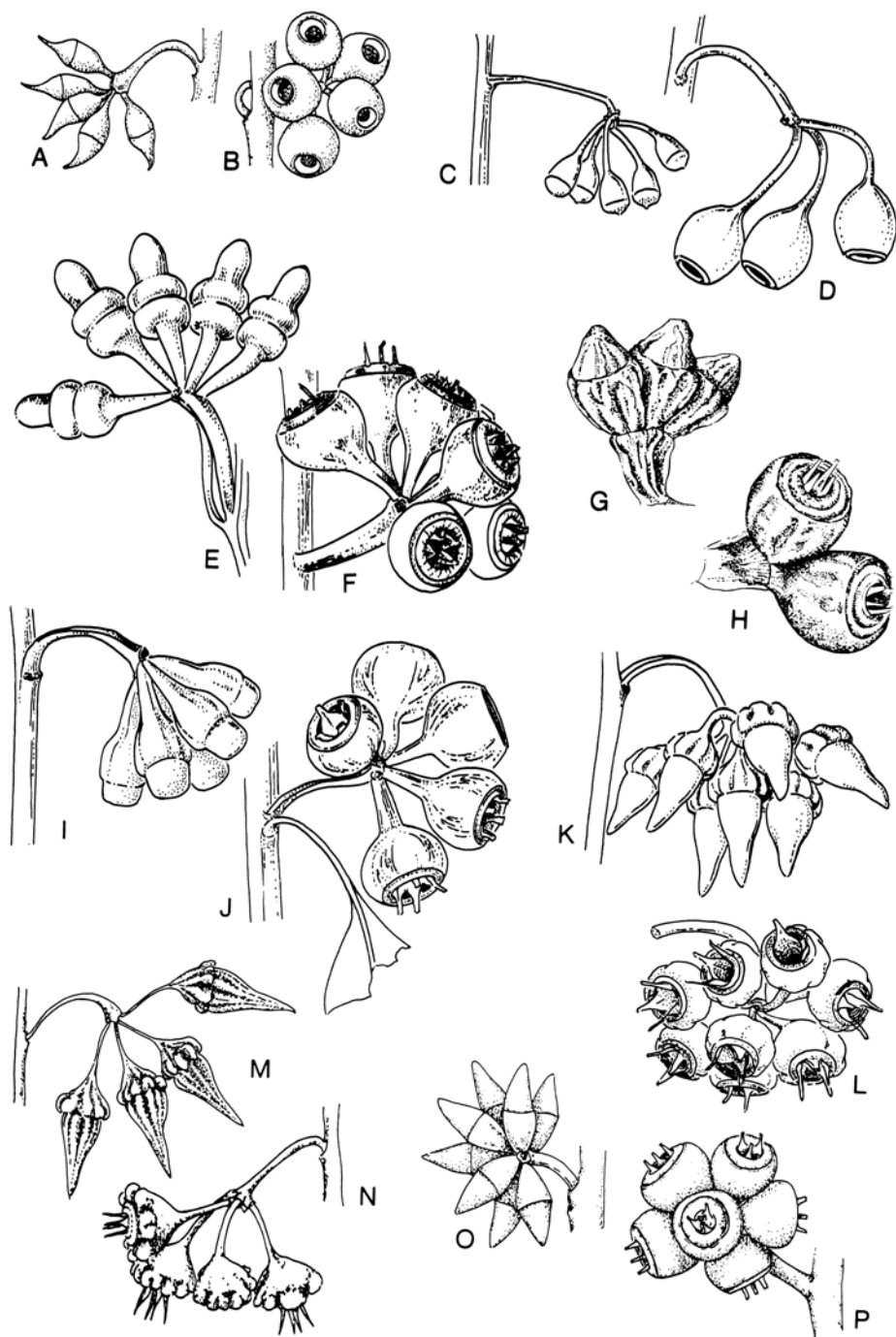


Figure 75. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. doratoxylon* (G.Chippendale 187, FRI). **C–D**, *E. decurva* (C, I.Brooker 2319, FRI; D, G.Chippendale 430, FRI). **E–F**, *E. balladoniensis* (I.Brooker 6441, FRI). **G–H**, *E. goniantha* subsp. *goniantha* (W.A., C.Davies, FRI 12041, FRI). **I–J**, *E. goniantha* subsp. *semiglobosa* (I.Brooker 3613, FRI). **K–L**, *E. falcata* (I.Brooker 2265, FRI). **M–N**, *E. ornata* (J.Briggs & L.Silvester 1666, FRI). **O–P**, *E. decipiens* (O, G.Keighery 2292, FRI; P, I.Brooker 2735a, FRI). **C–F**, **I–L** drawn by M.Risby. **G–H** drawn by C.Stahl. Others drawn by M.May.

Tree to 10 m. Bark smooth throughout, grey to white. Juvenile leaves ovate or elliptic, dull, grey-green. Adult leaves lanceolate to broadly lanceolate, falcate, acuminate; lamina 5–15 cm long, 1–2.2 cm wide, shining, green; lateral veins faint, at 25°–35°; intramarginal vein up to 1 mm from long margin; petiole ±quadrangular, 10–20 mm long. Umbels 7–11-flowered; peduncle flattened, recurved, 12–17 mm long; pedicels angular, 7–15 mm long. Buds ovoid-rostrate, prominently 7–9-ribbed; operculum conical, rostrate, 10–14 mm long, 8–10 mm wide; hypanthium hemispherical, 5–6 mm long, 9–10 mm wide. Fruits turbinate, 7–9-ribbed, 6–11 mm long, 9–13 mm wide; disc broad, ascending, collar-like; valves 3 or 4. Fig. 75M–N.

Occurs from NE of Kondinin to S of Hyden, W.A., on low hills in woodland. Region: ESPR. Map 267.

W.A.: c. 9 km NE of Kondinin, *M.I.H.Brooker* 8364 (FRI); 9 km NE of Kondinin, *M.D.Crisp* 5522 (CBG, FRI, NSW, PERTH).

Distinguished from *E. falcata* by the prominently ribbed buds and fruits, the latter more turbinate. Considered to be an endangered species.

251. *Eucalyptus decipiens* Endl., *Enum. Pl. Huegel* 49 (1837)

T: King George Sound, W.A., *K.Hügel s.n.*; holotype: W.

E. concolor Schauer in J.G.C.Lehmann, *Pl. Preiss.* 1: 129 (1844). T: near Fremantle, W.A., Dec. 1838, *L.Preiss* 225; syn: *n.v.*; interior, south-western W.A., *L.Preiss* 243; syn: *n.v.*

E. decipiens var. *angustifolia* Schauer in J.G.C.Lehmann, *Pl. Preiss.* 1: 130 (1840). T: Cape Riche, W.A., Nov. 1840, *L.Preiss* 241; iso: G.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 93, 94 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 183 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 199 (1983).

Tree to 9 m, spreading, twisted, gnarled, or mallee to 4.5 m. Bark fibrous throughout or smooth in eastern forms, grey. Juvenile leaves orbicular or obcordate, grey. Adult leaves lanceolate to broadly lanceolate, uncinata; lamina 6–10 cm long, 1.5–3 cm wide, grey-green; lateral veins faint, at 40°–50°; intramarginal vein up to 2 mm from margin; petiole ±flattened, 7–15 mm long. Umbels 7–15-flowered; peduncle terete, 5–10 mm long; pedicels absent. Buds fusiform; operculum conical, 5–8 mm long, 3–5 mm wide; hypanthium obconical, 4–5 mm long, 3–5 mm wide. Fruits hemispherical or subglobular, 4–6 mm long, 5–6 mm wide; disc broad, level or obliquely descending; valves 3–5. *Redheart*. Fig. 75 O–P.

Widespread S of Perth, in near-coastal and agricultural areas, south-western W.A. Grows in sandy soil on the W coast, elsewhere in clayey or stony soil, often subject to wet conditions in winter on plains and in hilly areas. Regions: LEON, LUWN, ESPR. Map 268.

W.A.: 3.2 km N of West Mt Barren, *M.I.H.Brooker* 2735a (FRI, MEL, PERTH); Tolls Pass, Stirling Ra., *C.A.Gardner* 1931 (FRI, NSW, PERTH); S of Porongurup Ra., *A.S.George* 6229 (NSW, PERTH).

Distinguished by the sessile, fusiform buds and the subglobular, sessile often densely clustered fruits. The fibrous bark of western (typical) populations is also characteristic.

252. *Eucalyptus micranthera* F.Muell. ex Benth., *Fl. Austral.* 3: 218 (1867)

T: Israelite Bay to Eyres Relief, W.A., *G.Maxwell*; holotype: K; iso: MEL.

Illustration: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 95 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 173 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 235 (1983).

Mallee to 3.5 m. Bark smooth throughout, grey to light brown. Juvenile leaves elliptical to lanceolate, grey-green. Adult leaves lanceolate, uncinata; lamina 8–11 cm long, 1–2 cm wide, pale green, glandular; lateral veins faint, at 30°–40°; intramarginal vein up to 2 mm from margin; petiole flattened or quadrangular, 10–20 mm long. Umbels 7–11-flowered; peduncle terete, sometimes flattened, 5–10 mm long; pedicels absent or to 2 mm long. Buds ±ovoid; operculum conical or hemispherical, 4–5 mm long, 4–6 mm wide; hypanthium cylindrical,

4–5 mm long, 4–6 mm wide. Fruits hemispherical or subglobular, 1-ribbed, 8–10 mm long and wide; disc narrow, descending; valves 3 or 4. Fig. 76A–B.

Occurs in W.A. near the S coast from the Gairdner R. to Israelite Bay, with an outlier near Cocklebidy. Grows in sandy soil on flat or slightly undulating country in low open shrubland. Region: ESPR. Map 269.

W.A.: 16 km NE of Gibson, *M.I.H.Brooker* 2755 (FRI, MEL, PERTH); 172 km E of Esperance towards Balladonia, *M.I.H.Brooker* 4488 (AD, BRI, FRI, MEL, NSW); 18.2 km N of Esperance, *G.M.Chippendale* 190 (FRI, MEL, NSW, PERTH).

Distinguished from related taxa by the larger fruits. Operculum shorter than in *E. decipiens* and disc narrower.

253. *Eucalyptus angustissima* F.Muell., *Fragm.* 4: 25 (1863)

T: between Point Malcolm and Point Dover, W.A., *G.Maxwell*; holo: MEL; iso: K, NSW.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 95, 96 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 71 (1983).

Mallee to 3 m. Bark smooth throughout, grey-brown. Juvenile leaves not seen. Adult leaves linear, uncinata; lamina 5–7.5 cm long, 0.2–0.4 cm wide, green; lateral veins and intramarginal vein inconspicuous; petiole absent or to 2 mm long. Umbels 3–7-flowered; peduncle slightly flattened, 3–4 mm long; pedicels absent or to 2 mm long. Buds ovoid; operculum conical, 3–4 mm long and wide; hypanthium hemispherical, 2–3 mm long, 4–5 mm wide. Fruits hemispherical, 3–6 mm long, 5–8 mm wide; disc broad, convex; valves 3. *Narrow-leaved Mallee*. Fig. 76C–D.

Scattered along the S coast of W.A. from Pingrup E to near Israelite Bay, in sand in shrubland, sometimes near salt lakes. Region: ESPR. Map 270.

W.A.: between Lake King & Ravensthorpe, *M.I.H.Brooker* 3601 (BRI, FRI, MEL, PERTH); near Israelite Bay, *A.S.George* 7453 (FRI, K, MEL, PERTH).

Distinguished especially by the very narrow leaves. Operculum narrower than hypanthium.

254. *Eucalyptus halophila* D.Carr & S.Carr, *Nuytsia* 3: 173 (1980)

T: 12.5 km NNW of Dalyup, W.A., 131°32'E, 4°37'S, 25 Feb. 1966, *A.S.George* 7661 & *S.G.M.Carr*; holo: PERTH; iso: FRI.

Illustrations: D.J.Carr & S.G.M.Carr, *op. cit.* 174, 176, 177; S.Kelly *et al.*, *Eucalypts* 1: t. 267 (1983).

Mallee to 2 m. Bark smooth throughout or with persistent loose strips, pale grey or brown. Juvenile leaves linear to narrowly obovate, green. Adult leaves elliptic to lanceolate, slightly falcate, uncinata; lamina 5–7 cm long, 0.6–0.9 cm wide, green; lateral veins faint, at 15°–20°; intramarginal vein up to 2 mm from margin, giving impression of being 3-veined; petiole terete or flattened, 5–7 mm long. Umbels 3–7-flowered; peduncle terete or quadrangular, 5–10 mm long; pedicels slender, 2–5 mm long. Buds clavate; operculum conical or hemispherical, 2–3 mm long, 3–4 mm wide; hypanthium obconical or urceolate, 4–6 mm long and wide. Fruits ovoid, 5–8 mm long, 7–8 mm wide; disc broad, descending; valves 4. Fig. 76E–F.

Occurs in the catchment area of the Dalyup R., southern W.A., usually near the margins of salt lakes in shrubland. Region: ESPR. Map 271.

W.A.: 11.2 km E of Truslove, *M.I.H.Brooker* 7081 (FRI); 12.5 km NNW of Dalyup, *A.S.George* 7662 (FRI).

Differs from *E. angustissima* in the longer petiole, usually broader leaves, longer pedicels, a longer hypanthium and ovoid fruits. Outer stamens usually with abortive anthers.

255. *Eucalyptus cneorifolia* DC., *Prodr.* 3: 220 (1828)

T: New Holland [S.A.], 1821, *collector unknown*; *holo*: G.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 130 (1974); S.Kelly *et al.*, *Eucalypts* 1: t. 224 (1983).

Mallee to 5 m, or tree to 9 m. Bark fibrous, grey-brown to grey to 1–3 m, smooth and white-grey or yellow-grey above. Juvenile leaves narrowly lanceolate, uncinata, green. Adult leaves linear to narrowly lanceolate, uncinata; lamina 5–10 cm long, 0.3–1 cm wide, dull, grey-green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole flattened, 2–10 mm long. Umbels 7–11-flowered; peduncle terete, 2–8 mm long; pedicels absent or to 2 mm long. Buds ovoid to fusiform; operculum conical, 4–6 mm long, 3–5 mm wide; hypanthium hemispherical, 2–4 mm long, 3–5 mm wide. Fruits hemispherical, 5–6 mm long, 5–8 mm wide; disc broad, level or obliquely descending; valves 3 or 4. *Kangaroo Island Narrow-leaved Mallee.* Fig. 76G–H.

Occurs on the eastern end of Kangaroo Is. and on the adjacent mainland in the Waitpinga area, S.A. Grows in low open woodland and shrubland in gently undulating country. Region: EYRE. Map 272.

S.A.: 3.3 km SW of Kingscote, *G.M.Chippendale 1353* (AD, BRI, FRI, MEL, NSW); Talloringi, Waitpinga, *D.Hunt 3002* (AD).

Distinguished from *E. angustissima* and *E. halophila* in the rough bark up to about half stem height, grey-green leaves, and larger operculum that is as wide as the hypanthium. *Eucalyptus* oil extracted from this species on Kangaroo Is.

Ser. 56 Squamosae***Eucalyptus* ser. *Squamosae* Chippendale, *Fl. Australia* 19: 505 (1988).**

Type: *E. squamosa* Deane & Maiden

Small trees, sometimes straggly. Bark tessellated or smooth throughout. Adult leaves alternate, petiolate, falcate, acuminate, grey-green, concolorous. Conflorescences axillary, simple, 7–13-flowered umbels, usually in pairs; peduncle terete; pedicels slender. Buds ovoid; operculum conical, sometimes rostrate; hypanthium hemispherical. Fruits hemispherical; disc level or convex; valves 3 or 4, exserted, often spreading. Seeds elliptic or orbicular, reticulate, grey-brown.

A series of 2 species, 1 in north-eastern Qld and 1 in central-eastern N.S.W. Small trees with tessellated or smooth bark, grey-green concolorous leaves, simple 7–13-flowered umbels of ovoid buds and hemispherical fruits with exserted valves often recurved.

256. *Eucalyptus squamosa* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 22: 561 & t. 19 (1898)

E. tereticornis var. *squamosa* (Deane & Maiden) Maiden, *Bull. Herb. Boissier* ser. 2, 2: 574 (1902). T: National Park, N.S.W., 6 Jan. 1891, *J.H.Maiden*; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 2: 237 (1912).

Illustrations: N.Hall, *Forest Tree Ser.* No. 35 (1972); S.Kelly *et al.*, *Eucalypts* 1: t. 225 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 143 (1983).

Tree to 12 m. Bark flaky, tessellated throughout, grey to red-brown. Juvenile leaves opposite becoming alternate, broadly lanceolate to ovate, concolorous, petiolate. Adult leaves lanceolate, grey-green; lamina 7.5–12 cm long, 1–1.5 cm wide; lateral veins just visible, at 45°–55°; intramarginal vein confluent with margin; petiole terete, 11–17 mm long. Umbels 7–13-flowered; peduncle 7–10 mm long; pedicels 2–3 mm long. Operculum often uncinata, 3–5 mm long and wide; hypanthium 3–4 mm long, 3–5 mm wide. Fruits 5–6 mm long, 6–8 mm wide; disc broad, level; valves usually 3. *Scaly Bark.* Fig. 76 I–J.

Occurs in the Sydney area, N.S.W., from near the coast to the lower Blue Mtns, on sandstone plateaus in low sclerophyll forest. Region: NEPN. Map 273.

N.S.W.: Hawkins Lookout, 24 km NNE of Windsor, *R.Coveny* 750 (FRI, NSW); Cheltenham, June 1946, *L.A.S.Johnson* (NSW).

Distinguished by flaky, tessellated bark, grey-green leaves, usually paired umbels and often uncinat operculum.

257. *Eucalyptus pachycalyx* Maiden & Blakely, *Crit. Revis. Eucalyptus* 8: 15 (1929)

T: Atherton, Qld, Dec. 1915, *H.W.Mocatta* 13; holotype: NSW; isotype: BRI.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 64 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 242 (1983).

Tree to 10 m, often crooked. Bark smooth, shining throughout, white or mottled pink-grey. Juvenile leaves not seen. Adult leaves narrowly lanceolate or lanceolate, thick; lamina 10–15 cm long, 1.3–2 cm wide; lateral veins faint, at 35°–50°; intramarginal vein up to 1 mm from margin; petiole terete, 13–20 mm long. Umbels 7–11-flowered; peduncle 6–15 mm long; pedicels 2–5 mm long. Operculum 5–7 mm long, 4–5 mm wide; hypanthium 3–4 mm long, 4–5 mm wide. Fruits 5–6 mm long, 7–8 mm wide; disc narrow to moderately broad; valves 3 or 4. *Shiny-barked Gum*. Fig. 76K–L.

Restricted to the northern Atherton Tableland area, Qld, on hilly slopes near granite outcrops, in open eucalypt forest. Region: CYRK. Map 274.

Qld: 19.3 km S of Cardwell Ck, *M.I.H.Brooker* 3383 (BRI, FRI, NSW); Stannary Hills, *G.C.Stocker* 970 (BRI, CANB, FRI, NSW).

Distinguished from *E. squamosa* mainly by the smooth, shining bark and longer operculum.

Ser. 57 Bakerianae

***Eucalyptus* ser. *Bakerianae* Chippendale, *Fl. Australia* 19: 496 (1988).**

Type: *E. bakeri* Maiden

Mallees or small trees. Bark fibrous, grey or grey-brown on part or all of trunk, occasionally also on lower branches, then smooth, white, yellow, blue-green or grey above. Juvenile leaves alternate, sessile or petiolate, green, concolorous. Adult leaves alternate, petiolate, uncinat, shining, concolorous. Conflorences axillary, simple, 7–13-flowered umbels. Buds ovoid or cylindrical; operculum conical; hypanthium obconical. Fruits hemispherical; disc moderately broad, level, ascending or descending; valves usually 3, exserted, each apparently split into three, with the remains of the style between two lobes. Seeds orbicular or elliptic, reticulate, grey-brown.

A series of 3 species in W.A., south-western N.T., north-western S.A., eastern Qld and eastern N.S.W. Mallees or small trees with fibrous bark, shining concolorous leaves, simple 7–13-flowered umbels, and fruits with 3 exserted split valves.

258. *Eucalyptus jutsonii* Maiden, *J. & Proc. Roy. Soc. New South Wales* 53: 61 (1919)

T: Comet Vale, W.A., Dec. 1916, *J.T.Jutson* 216; holotype: NSW; isotype: FRI, MEL.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 96, 97 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 231 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 236 (1983).

Mallee to 8 m high. Bark fibrous to 3 m, smooth and grey above. Juvenile leaves sessile or almost so, linear. Adult leaves linear; lamina 9–12 cm long, 0.3–0.6 cm wide, bright green; lateral veins obscure, at c. 30°; intramarginal vein not usually visible; petiole terete, 2–5 mm long. Umbels 7-flowered; peduncle flattened, 3–5 mm long; pedicels absent or to 2 mm long. Buds ovoid; operculum 3–5 mm long, 4–5 mm wide; hypanthium 3–5 mm long and wide.

Fruits 4–5 mm long, 6–7 mm wide; disc level or obliquely descending. *Jutson's Mallee*. Fig. 76M–N.

Occurs near Comet Vale and Cundeelee, W.A., in sand or sandy loam, on plains and gently sloping country in open shrubland. Region: LEON. Map 275.

W.A.: NW of Cundeelee, *M.I.H.Brooker* 2621 (PERTH); 0.6 km N of Comet Vale, *G.M.Chippendale* 129 (AD, BRI, FRI, MEL, NSW, PERTH).

Distinguished by mallee habit, fibrous bark on stems, linear leaves, ovoid buds, and hemispherical fruits, the valves with 3 small apical teeth.

259. *Eucalyptus mannensis* Boomsma, *Trans. Roy. Soc. S. Australia* 88: 115 (1964)

T: 33 km N of Angas Downs Homestead, N.T., 15 Oct. 1957, *G.M.Chippendale* 3986 & *L.A.S.Johnson*; holotype: AD; isotype: BRI, CANB, K, MEL, NSW, NT, PERTH.

Illustrations: J.Turner & M.I.H.Brooker, *Forest Tree Ser.* No. 205 (1978); A.S.Mitchell, *Eucalypts Central Australia* 16 (1980); S.Kelly *et al.*, *Eucalypts* 2: t. 237 (1983).

Mallee to 10 m high. Bark fibrous, grey on stems and sometimes on lower branches, then smooth, grey-white, above. Juvenile leaves petiolate, narrowly lanceolate to lanceolate. Adult leaves narrowly lanceolate; lamina 6.5–14 cm long, 1–2 cm wide, yellow-green to green, shining; lateral veins just visible, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole terete, 8–15 mm long. Umbels usually 7-flowered; peduncle terete, 3–6 mm long; pedicels 1–3 mm long. Buds ovoid; operculum 3–4 mm long, 3–6 mm wide; hypanthium 3–4 mm long, 3–6 mm wide. Fruits 5–8 mm long and wide; disc level or ascending. Fig. 76 O–P.

Widespread in the central Australian ranges of W.A., N.T. and S.A., with disjunct occurrences westwards in the Great Victoria Desert, the Wiluna area, the Shark Bay area and the northern wheatbelt of W.A. Grows on plains and dunes in tall open shrubland. The distribution appears disjunct, but as much of the area is remote, further collecting may show it to be more continuous. Regions: MRCH, BENC, LEON, MACD, VICD. Map 276.

W.A.: 6 km N of Wannoo, *M.I.H.Brooker* 5008 (AD, FRI, MEL); 160 km W of Giles, *A.S.George* 8222b (PERTH). N.T.: 40.2 km S of George Gill Ra., *G.M.Chippendale* 6327 (AD, MEL, NSW, NT, PERTH). S.A.: 54.7 km NE of Cheesemans Peak road junction, *D.E.Symon* 2625 (AD, ADW, PERTH).

Distinguished by mallee habit, rough bark on trunk, shining yellow-green to green narrow leaves, shortly pedicellate buds and fruits, and fruiting valves with three teeth. Leaves broader than in *E. jutsonii* and *E. bakeri*; fruits slightly longer than in *E. jutsonii*.

260. *Eucalyptus bakeri* Maiden, *J. & Proc. Roy. Soc. New South Wales* 47: 87 (1913)

T: Ticketty Well, N.S.W., July 1911, *E.H.F.Swain s.n.*; holotype: NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 145 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 239 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 144 (1983).

Mallee to 6 m or tree to 12 m. Bark fibrous, grey-brown on trunk, and smooth, white, yellow or blue-green above. Juvenile leaves petiolate, linear or narrowly lanceolate. Adult leaves narrowly lanceolate; lamina 7.5–9 cm long, 0.7–1 cm wide, green or yellow-green; lateral veins faint, at 35°–45°; intramarginal vein almost confluent with margin; petiole terete, 2–10 mm long. Umbels 7–13-flowered; peduncle terete, 5–15 mm long; pedicels 1–3 mm long. Buds cylindrical or narrowly ovoid; operculum 4–6 mm long, 2–3 mm wide; hypanthium 2–3 mm long and wide. Fruits 3–4 mm long, 4–5 mm wide; disc level or slightly ascending. *Baker's Mallee*. Fig. 76Q–R.

Occurs N of Tambo, Qld, and between Millmerran, Qld, and Warialda, N.S.W. Grows usually on gently sloping areas, often in lateritic soil, in dense shrubland. Regions: BURD, DWSN, MCPH. Map 277.

Qld: 9.2 km SW of Thanes Ck, *G.M.Chippendale* 1070 (AD, BRI, FRI, MEL); 4 km S of Inglewood, *L.A.S.Johnson* 7214 (AD, BRI, FRI, MEL, NSW, PERTH). N.S.W.: Warialda, Oct. 1912, *W.A.W. de Beuzeville* (NSW).

Distinguished by fibrous bark on at least part of the trunk, narrow leaves, usually cylindrical buds and exserted fruiting valves with three teeth. Has larger umbels and smaller fruit than the 2 preceding species.

Ser. 58 Brockwayanae

Eucalyptus ser. **Brockwayanae** Chippendale, *Fl. Australia* 19: 496 (1988).

Type: *E. brockwayi* C.Gardner

Trees. Bark smooth throughout, white or grey to red-brown or salmon pink, shedding in flakes. Juvenile leaves crowded, alternate or almost opposite, sessile, elliptic, pale green, concolorous. Adult leaves alternate, petiolate, uncinata, shining, bright green, concolorous. Conflorences axillary, simple; umbels 7–15-flowered. Buds ±ovoid or subcylindrical; operculum hemispherical to conical; hypanthium urceolate to cylindrical, wider than operculum. Fruits globular, narrowing to a short neck; disc broad, descending vertically; valves 3, included. Seeds elliptic, faintly reticulate, brown or grey-brown.

A series of 1 species in W.A. Trees with smooth bark, shining bright green concolorous leaves, simple 7–15-flowered umbels and globular fruits narrowing to a short neck. The seedling leaves are opposite and setose with simple, unicellular hairs.

M.I.H.Brooker, Seedling morphology and classification in the *Bisectae* group of Eucalypts, *Austral. J. Bot.* 18: 67–75 (1970).

261. *Eucalyptus brockwayi* C.Gardner, *J. & Proc. Roy. Soc. W. Australia* 27: 185 (1942)

T: W of Norseman, W.A., 15 Dec. 1940, *G.E.Brockway & C.A.Gardner* 5598; holo: PERTH; iso: PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 98 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 71 (1979); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 407 (1984).

Tree to 25 m. Adult leaves narrowly lanceolate; lamina 8–12.5 cm long, 0.7–1.5 cm wide; lateral veins faint, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole 15–20 mm long. Peduncles angular, 4–12 mm long; pedicels 1–2 mm long. Operculum 3–4 mm long, c. 3 mm wide; hypanthium 4–6 mm long, 3–4 mm wide. Fruits 5–6 mm long, 4–6 mm wide. *Dundas Mahogany*. Fig. 76S–T.

Occurs around Norseman, W.A., in scattered small stands on low rocky hills and gentle slopes in woodland and open forest. Region: ESPR. Map 278.

W.A.: 10.9 km NW of Norseman, *G.M.Chippendale* 156 (AD, BRI, CANB, FRI, MEL, NSW, PERTH); 10 km N of Norseman, *P.G.Wilson* 7755 (PERTH).

Distinguished by tall tree habit, smooth white or grey to salmon pink bark, operculum shorter and narrower than hypanthium, and globular fruits with a short neck. The wood is hard and has been used as firewood and in mining construction, and also for axe handles. The species has been cultivated in inland Australian towns, and has been introduced successfully into northern Africa and Cyprus.

Ser. 59 Microcorythae

Eucalyptus ser. **Microcorythae** Blakely, *Key Eucalypts* 24, 112 (1934).

Type: *E. cladocalyx* F.Muell., lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 501 (1988).

Trees. Bark smooth throughout, grey-white, yellow or blue-grey. Juvenile leaves alternate, petiolate, orbicular, dark green, strongly discolorous. Adult leaves alternate, petiolate, acuminate, shining, dark green, strongly discolorous. Conflorences axillary, simple; umbels 7–11-flowered. Buds cylindrical or urceolate; operculum hemispherical, apiculate, usually wider than hypanthium; hypanthium cylindrical, faintly ribbed. Fruits ovoid or

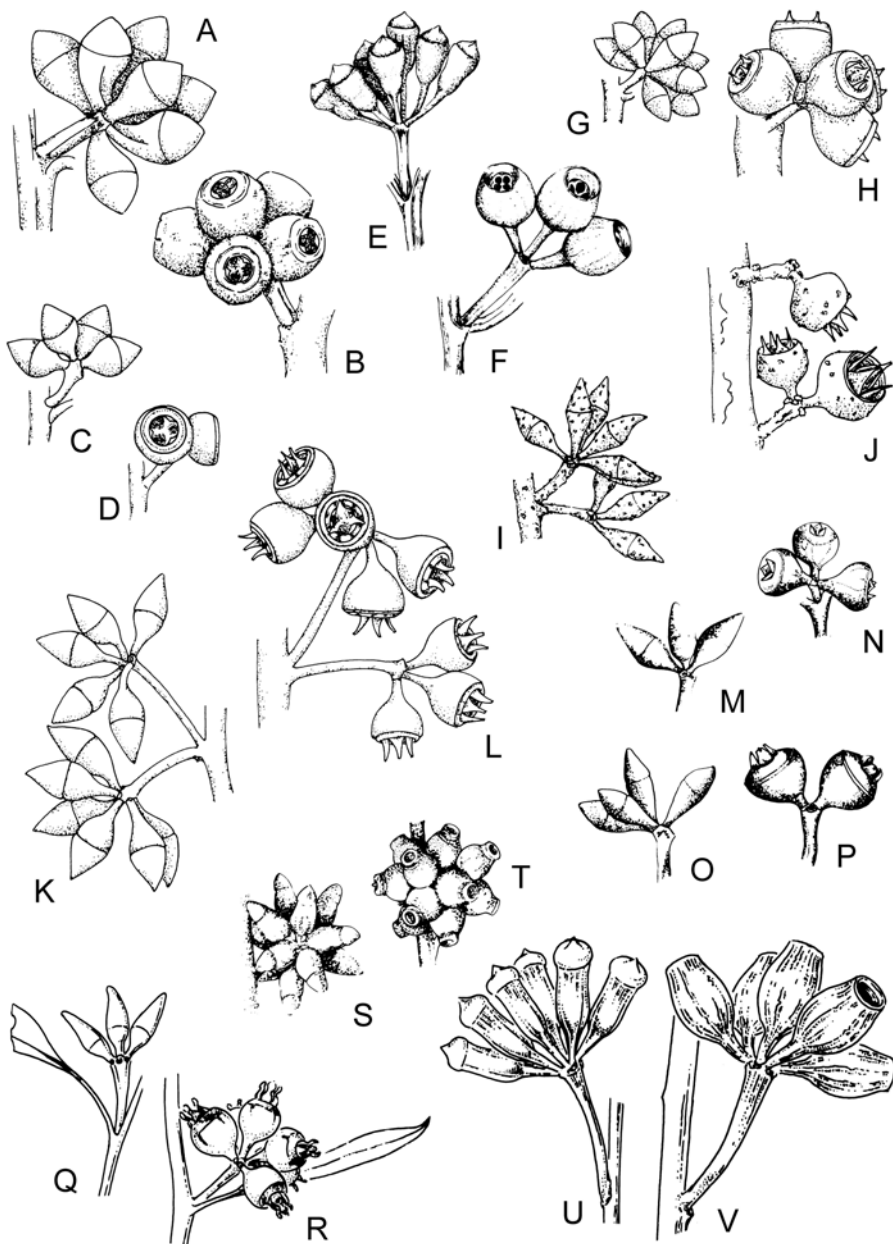


Figure 76. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. micranthera* (**A**, I.Brooker 4488, FRI; **B**, I.Brooker 4439, FRI). **C–D**, *E. angustissima* (**A**.George 16021, FRI). **E–F**, *E. halophila* (**A**.George 7662, FRI). **G–H**, *E. cneorifolia* (**G**, D.Hunt 2883, FRI; **H**, J.Briggs 414, FRI). **I–J**, *E. squamosa* (**I**, 12.5 km from Park HQ, Glenbrook, N.S.W., D.Boland, FRI; **J**, Blue Mtns Natl Park, 12.2 km from Ranger Stn, Glenbrook, N.S.W., N.Hall, FRI). **K–L**, *E. pachycalyx* (I.Brooker 3383, FRI). **M–N**, *E. jutsonii* (**M**, E of Wiladdi Soak, NE of Bardoc, W.A., J.Frank, PERTH; **N**, C.Gardner 7966, PERTH). **O–P**, *E. mannensis* (**O**, W.Bateman 14004, FRI; **P**, Ayres Rock track, 57.6 km SW of Alice Springs, N.T., C.Carter & W.Bateman, FRI). **Q–R**, *E. bakeri* (**Q**, Jericho, Qld, J.Boorman, FRI; **R**, A.Gillison 2613, FRI). **S–T**, *E. brockwayi* (Kalgoorlie, W.A., P.Barrett, FRI). **U–V**, *E. cladocalyx* (**U**, D.Kleinig 48, FRI; **V**, G.Chippendale 1374, FRI). **Q**, **R**, **U**, **V** drawn by M.Risby. Others drawn by M.May.

urceolate, ribbed; disc broad, descending; valves 3 or 4, included. Seeds elliptic, faintly reticulate, grey-brown.

A series of 1 species in southern S.A. Trees with smooth bark, strongly discoloured leaves, simple 7–11-flowered umbels of cylindrical or urceolate buds and ovoid or urceolate ribbed fruits.

262. *Eucalyptus cladocalyx* F.Muell., *Linnaea* 25: 388 (1853)

E. corynocalyx F.Muell., *Fragm.* 2: 43 (1860), *nom. illeg.* based on same types as *E. cladocalyx*. T: Marble Ra., S.A., Feb. 1852, *C. Wilhelmi s.n.*; holo: MEL; iso: K.

E. langii Maiden & Blakely, *Crit. Revis. Eucalyptus* 8: 72 (1929). T: cultivated at Litanga Stn, Lismore, Vic., Apr. 1921, *P.R.H. St John s.n.*; holo: NSW.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 61 (1983); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 145 (1983); D.J. Boland *et al.*, *Forest Trees Australia* 4th edn 405 (1984).

Tree to 35 m. Adult leaves lanceolate; lamina 11–15 cm long, 2–2.5 cm wide; lateral veins clearly visible, at 40°–50°; intramarginal vein 1–2 mm from margin; petiole quadrangular, 12–21 mm long. Peduncle terete, 10–17 mm long; pedicels 2–7 mm long. Operculum 3–4 mm long, c. 5 mm wide; hypanthium 7–8 mm long, 4–5 mm wide. Fruits 9–16 mm long, 6–10 mm wide. *Sugar Gum*. Fig. 76U–V.

Occurs in several disjunct areas in the southern Flinders Ra., the eastern side of Eyre Peninsula and on Kangaroo Is. Grows on flats and low hills in open forest. Region: EYRE. Map 279.

S.A.: 22.7 km SW of Kingscote, *G.M. Chippendale 1361* (AD, FRI, NSW); 8 km WNW of Mt Remarkable, *A.E. Orchard 3248* (AD, FRI); 12.9 km NW of Port Lincoln, 12 Oct. 1950, *D.J.E. Whibley* (AD).

Distinguished by tree habit, smooth, pale bark, strongly discoloured leaves and usually ovoid, ribbed fruits. Extensively cultivated in Australia and overseas for poles, posts and heavy construction, as well as for windbreaks and shelter belts.

Ser. 60 Subulatae

Eucalyptus* ser. *Subulatae Blakely, *Key Eucalypts* 64, 267 (1934).

Type: *E. oleosa* F.Muell. ex Miq., lecto, *fide* G.M. Chippendale, *Fl. Australia* 19: 506 (1988).

Mallees or trees. Bark smooth throughout or rough, fibrous or flaky on trunk and smooth above. Juvenile leaves opposite, subopposite, alternate, or spirally arranged, sessile or shortly petiolate, concolorous. Adult leaves alternate, petiolate, concolorous. Conflorences simple, axillary, 7–13-flowered umbels. Buds ovoid, cylindrical, clavate, suburceolate, conical, rostrate or fusiform. Fruits ±globular, obconical, cylindrical, ovoid, urceolate to suburceolate or hemispherical; disc broad, descending vertically; valves 3 or 4, sometimes 5, subulate, fragile, usually exerted. Seeds elliptic, shallowly reticulate, grey-brown.

A series of 14 species in south-western and southern W.A., south-western N.T., western and southern S.A., south-western N.S.W. and north-western Vic. Mallees or trees with smooth or rough bark, concolorous leaves, simple 7–13-flowered umbels and fruits with exerted fragile valves.

M.I.H. Brooker, Seedling morphology and classification in the *Bisectae* group of *Eucalypts*, *Austral. J. Bot.* 18: 67–75 (1970).

263. *Eucalyptus longicornis* (F.Muell.) F.Muell. ex Maiden, *J. & Proc. Roy. Soc. New South Wales* 52: 504 (1919)

E. oleosa var. *longicornis* F.Muell., *Fragm.* 11: 14 (1878). T: Upper Swan R., W.A., 1877, *F. Mueller*; holo: MEL; iso: NSW.

E. grasbyi Maiden & Blakely, *Crit. Revis. Eucalyptus* 8: 40 (1929). T: Lake Barlee, W.A., Sept. 1919,

F. Fraser s.n.; holo: NSW; iso: FRI, K, PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 100 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 53 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 226 (1983).

Tree to 30 m. Bark rough, flaky or fibrous, grey on trunk and lower branches, smooth, red-grey or grey-brown above. Juvenile leaves apparently in 3s or spirally arranged, sessile, elliptic, grey-green, decurrent. Adult leaves narrowly lanceolate, uncinata or acuminate; lamina 7–12 cm long, 0.5–1.2 cm wide, deep green, shining, glandular; lateral veins faint, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole terete or slightly flattened, 8–12 mm long. Umbels 7–13-flowered; peduncle terete, 8–12 mm long; pedicels 4–6 mm long. Buds conical; operculum conical, 5–8 mm long, 4–5 mm wide; hypanthium cylindrical or hemispherical, 3–5 mm long, 4–5 mm wide. Fruits subglobose, 6–8 mm long and wide; valves 3. *Red Morrel*. Fig. 77A–B.

Widespread in inland south-western W.A., usually in loam or clay-loam in open forest or woodland. Regions: BENC, LUWN, LEON, ESPR. Map 280.

W.A.: 48.3 km S of Menzies, *M.I.H.Brooker* 2037 (PERTH); 146 km S of Norseman, *G.M.Chippendale* 165 (FRI, MEL, NSW, PERTH); Southern Cross, *C.A.Gardner* 1751 (NSW, PERTH); Bullabulling, *C.A.Gardner* 9277 (FRI, PERTH).

Differs from related species in the tall tree habit with rough bark to the lower branches, deep green shining leaves and long conical operculum. The seedling leaves are linear, heath-like and crowded. There is a good honey flow in flowering time, Nov.–Mar. Has been grown successfully in Cyprus and Kenya, and is useful for street planting and for arid zone forestry.

264. *Eucalyptus oleosa* F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 127 (1856)

T: Murray Scrub, Vic., *H.Behr s.n.*; lecto: U, *fide* M.I.H.Brooker, *Brunonia* 2: 153 (1979), by exclusion; isolecto: MEL. Note: other syntype cited by Mueller, 'Marble Range, Wilhelmi' is *E. foecunda* Schauer, see M.I.H.Brooker, *loc. cit.*

E. oleosa var. *angustifolia* Maiden, *Crit. Revis. Eucalyptus* 4: 278 (1919). T: near Gawler Town, S.A., Jan. 1849, *H.Behr s.n.*; syn: MEL, NSW, U; above Salts Creek, S.A., *collector unknown*; syn: *n.v.*

E. oleosa var. *obtusa* C.Gardner, *J. & Proc. Roy. Soc. W. Australia* 34: 77 (1950). T: Montana Hill, Coolgardie, W.A., 29 Sept. 1922, *C.A.Gardner* 1839; holo: PERTH; iso: NSW.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 101, 102 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 56 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 227 (1983).

Usually a mallee, sometimes a tree, to 12 m. Bark rough, fibrous or flaky on lower trunk, smooth, grey or grey-brown above. Juvenile leaves spirally arranged or in 3s, sessile, narrowly elliptic, green, decurrent. Adult leaves narrowly lanceolate, uncinata; lamina 7–10 cm long, 0.8–1.5 cm wide, shining, green, glandular; lateral veins faint, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole terete, 8–18 mm long. Umbels usually 7–11-flowered, sometimes more; peduncle slightly flattened, 7–12 mm long; pedicels 1–5 mm long. Buds ovoid or cylindrical; operculum conical-cylindrical, obtuse, 3–4 mm long and wide; hypanthium cylindrical or hemispherical, 2–3 mm long, 3–4 mm wide. Fruits subglobose, 4–6 mm long and wide; valves 3. *Giant Mallee, Red Mallee*. Fig. 77C–D.

Widespread in southern W.A. except the desert, extending E through southern S.A. to south-western N.S.W. and north-western Vic. Grows mostly in flat sandy areas, usually in shrubland. Regions: BENC, LEON, ESPR, VICD, NULL, EYRE, TRNS, RIVR, OTWY. Map 281.

W.A.: 16.6 km E of Karonie, *M.I.H.Brooker* 2462 (FRI, PERTH). S.A.: 16 km NE of Foul Bay, *A.E.Orchard* 2838 (AD, FRI). N.S.W.: Balranald, 10 Oct. 1947, *E.F.Constable* (NSW). Vic.: 22.5 km E of Ouyen, *T.B.Muir* 1154 (MEL).

Differs from related species in the smaller buds and fruits, and from *E. kochii* also in the shorter operculum. A useful species for pollen and honey, mainly summer to autumn, but varies locally.

265. *Eucalyptus kochii* Maiden & Blakely, *Crit. Revis. Eucalyptus* 8: 41 (1929)

T: 96 km E of Watheroo Rabbit Fence, W.A., Sept. 1905, *M.Koch 1608*; syn: NSW; Watheroo Rabbit Fence, W.A., Sept. 1905, *M.Koch 1990*; syn: FRI, NSW, PERTH; Watheroo Rabbit Fence, W.A., Sept. 1905, *M.Koch 1990A*; syn: NSW.

E. oleosa var. *kochii* C.Gardner, *J. Roy. Soc. W. Australia* 34: 78 (1950). T: Rabbit Proof Fence, 25 miles [c. 40 km] E of Dalwallinu, C.A.Gardner 8519, 8519a, 8524; syn: PERTH, *n.v.*

Mallee to 5 m or tree to 12 m. Bark rough, fibrous, twisted or latticed, dark grey on lower trunk, smooth, red-brown or grey-brown above. Juvenile leaves alternate, shortly petiolate, linear to narrowly lanceolate, glaucous. Adult leaves almost linear to narrowly lanceolate, uncinat; lamina 6.5–10 cm long, 0.5–1.2 cm wide, dull to slightly shining, green, usually glandular; lateral veins faint, at 40°–45°; intramarginal vein up to 1 mm from margin; petiole terete, 6–12 mm long. Umbels 7–11-flowered; peduncle terete, 6–8 mm long; pedicels 2–3 mm long. Buds cylindrical to fusiform; operculum conical, 4–5 mm long, c. 3 mm wide; hypanthium obconical or cylindrical, 4–5 mm long, c. 3 mm wide. Fruits subovoid or suburceolate, 6–7 mm long, 5–6 mm wide; valves 3 or 4. Fig. 77E–F.

Occurs from near Kondut northwards to near Pindar, W.A., in sandy soil in open woodland and shrubland. Regions: BENC, LEON. Map 282.

W.A.: 17.7 km E of Pithara, *M.I.H.Brooker 3693* (BRI, FRI, MEL); 16.3 km E of Pindar, *G.M.Chippendale 51* (AD, BRI, FRI, NSW, PERTH).

Has longer buds than *E. oleosa* and *E. plenissima*.

266. *Eucalyptus plenissima* (C.Gardner) Brooker, *Austral. Forest Res.* 7: 65 (1976)

E. oleosa var. *plenissima* C.Gardner, *J. & Proc. Roy. Soc. W. Australia* 34: 79 (1950). T: between Beacon and Wialki, W.A., 16 Jan. 1946, *C.A.Gardner 8532*; holo: PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 103 (1973); M.I.H.Brooker, *op. cit.* 66; S.Kelly *et al.*, *Eucalypts* 1: t. 228 (1983).

Mallee, or occasionally a tree, to 12 m. Bark rough, flaky, dark grey on lower trunks, smooth, grey-brown above, deciduous in ribbons. Juvenile leaves alternate, sessile, lanceolate to broadly lanceolate, grey-green, glandular. Adult leaves linear to narrowly lanceolate, uncinat; lamina 8–12 cm long, 0.6–1 cm wide, dull to slightly shining, green, glandular; lateral veins faint, at 35°–45°; intramarginal vein faint, almost confluent with margin; petiole terete, 8–12 mm long. Umbels 7–11-flowered; peduncle terete, 5–8 mm long; pedicels 1–3 mm long. Buds clavate; operculum hemispherical, 2–3 mm long, 3–5 mm wide; hypanthium obconical, 4–6 mm long, 3–4 mm wide. Fruits subovoid, sometimes cylindrical, 5–10 mm long, 5–7 mm wide; valves 3. *Oil Mallee*. Fig. 77G–H.

Occurs in W.A. from W of Sandstone southwards to Hines Hill and E to near the Die Hardy Ra. and Mt Gibson. Grows on sandy loam plains in mallee shrubland. Regions: BENC, LEON. Map 283.

W.A.: 20.9 km N of Bencubbin, *M.I.H.Brooker 4543* (FRI, NSW, PERTH); 0.8 km N of Kalannie, *C.A.Gardner 8534* (FRI, PERTH).

Operculum much shorter than hypanthium; pedicels very short.

267. *Eucalyptus horistes* L.Johnson & K.Hill, *Fl. Australia* 19: 509 (1988).

T: 15.9 km N of Binu on Highway 1, W.A., 27°54'S, 114°42'E, 27 Oct. 1983, *K.Hill 389*, *L.Johnson*, *D.Blaxell* & *I.Brooker*; holo: NSW; iso: AD, FRI, MEL, PERTH.

E. oleosa var. *borealis* C.Gardner, *J. & Proc. Roy. Soc. W. Australia* 34: 77 (1950). T: 6–8 miles [c. 10–13 km] E of Canna, W.A., Jan. 1944, *E.M.Watson* & *C.A.Gardner s.n.*; holo: PERTH; iso: FRI.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 106 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 247 (1983).

Mallee or tree to 12 m. Bark rough, fibrous, fissured, grey on lower trunk, smooth, grey-brown above. Juvenile leaves opposite, becoming alternate, sessile, lanceolate or elliptic,

grey-green, decurrent. Adult leaves narrowly lanceolate, uncinata; lamina 6–9.5 cm long, 0.6–2 cm wide, grey-green, glandular; lateral veins faint, at 40°–50°; intramarginal vein almost confluent with or up to 1 mm from margin; petiole terete, 8–15 mm long. Umbels 7–11-flowered, sometimes more; peduncle terete, 5–12 mm long; pedicels 3–6 mm long. Buds fusiform; operculum conical or rostrate, 5–10 mm long, c. 4 mm wide; hypanthium obconical, 4–6 mm long, c. 4 mm wide. Fruits urceolate or subglobular, 5–8 mm long, 5–7 mm wide; valves 3. Fig. 77 I–J.

Scattered in the northern agricultural and goldfields regions, south-western W.A. Grows on plains in lateritic and sandy loam in mallee shrubland. Regions: BENC, LEON. Map 284.

W.A.: 0.8 km E of Canna siding, *M.I.H. Brooker* 3687 (FRI, MEL, PERTH); 4.8 km SE of Canna, *G.M. Chippendale* 54 (BRI, FRI, PERTH).

Differs from related species in the operculum being relatively long and often slightly constricted.

268. *Eucalyptus peeneri* (Blakely) Pryor & L. Johnson ex Boomsma, *J. Adelaide Bot. Gard.* 1: 368 (1979)

E. oleosa var. *peeneri* Blakely, *Key Eucalypts* 270 (1934). T: Barton, S.A., 19 Sept. 1920, *E.H. Ising* 1372; lecto: NSW, *fide* C.D. Boomsma, *loc. cit.*; isolecto: AD, FRI.

Illustrations: C.D. Boomsma, *op. cit.* 369; S. Kelly *et al.*, *Eucalypts* 2: t. 246 (1983).

Mallee to 3 m. Bark rough, grey at least on stems. Juvenile leaves not seen. Adult leaves elliptic to lanceolate, uncinata; lamina 5–7 cm long, 0.8–1 cm wide, dull, grey-green, glandular; lateral veins faint, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole terete, 10–12 mm long. Umbels 7–11-flowered; peduncle terete, 7–9 mm long; pedicels 1–3 mm long. Buds conical, obtuse; operculum conical, 5–6 mm long, 3–4 mm wide; hypanthium hemispherical to subglobular, 3–4 mm long and wide. Fruits subglobular, 7–8 mm long, 6–7 mm wide; valves usually 3, sometimes 4. *Peeneri*, *Water Mallee*. Fig. 77K–L.

Sparsely scattered in the eastern Great Victoria Desert, including Barton, Ooldea, NE of Maralinga and S of Lake Meramangye, S.A., in open shrubland. Regions: VICD, EYRE. Map 285.

S.A.: 33.6 km W of Emu, *N. Forde* 482 (AD); 15 km W of Barton, *F.A. Mowling* 73 (AD).

Distinguished from *E. horistes* by the dull grey-green leaves and shorter buds, and from *E. eremicola* especially by the larger fruits.

269. *Eucalyptus eremicola* Boomsma, *S. Austral. Naturalist* 50: 28 (1975)

T: 125 km E of Serpentine Lake, S.A., 28°30'S, 130°22'E, 28 June 1967, *J. Johnson s.n.*; *holo*: AD.

Illustrations: C.D. Boomsma, *op. cit.* 29; S. Kelly *et al.*, *Eucalypts* 2: t. 248 (1983).

Mallee to 3 m or rarely a tree to 5 m. Bark rough, flaky, brown to 1 m, smooth white above. Juvenile leaves not seen. Adult leaves narrowly lanceolate, uncinata; lamina 6–8 cm long, 0.7–1.2 cm wide, green, slightly shining, glandular; lateral veins faint, at 35°–50°; intramarginal vein up to 1 mm from margin; petiole terete, 10–13 mm long. Umbels 11-flowered; peduncle terete or angular, 5–10 mm long; pedicels 2–3 mm long. Buds conical; operculum conical, 4–5 mm long, 3–4 mm wide; hypanthium hemispherical, 2–3 mm long, 3–4 mm wide. Fruits hemispherical or subglobular, 5–6 mm long and wide; valves 3. Fig. 77M–N.

Occurs around Emu, N of Maralinga, and near Nawa, S.A., usually in swales of sandy arid areas in shrubland. Region: VICD. Map 286.

S.A.: 35 km W of Emu, *T.R.N. Lothian* 3925 (AD, FRI).

Distinguished by rough bark, narrow slightly shining green leaves, and acute operculum. Fruits smaller than in *E. peeneri*.

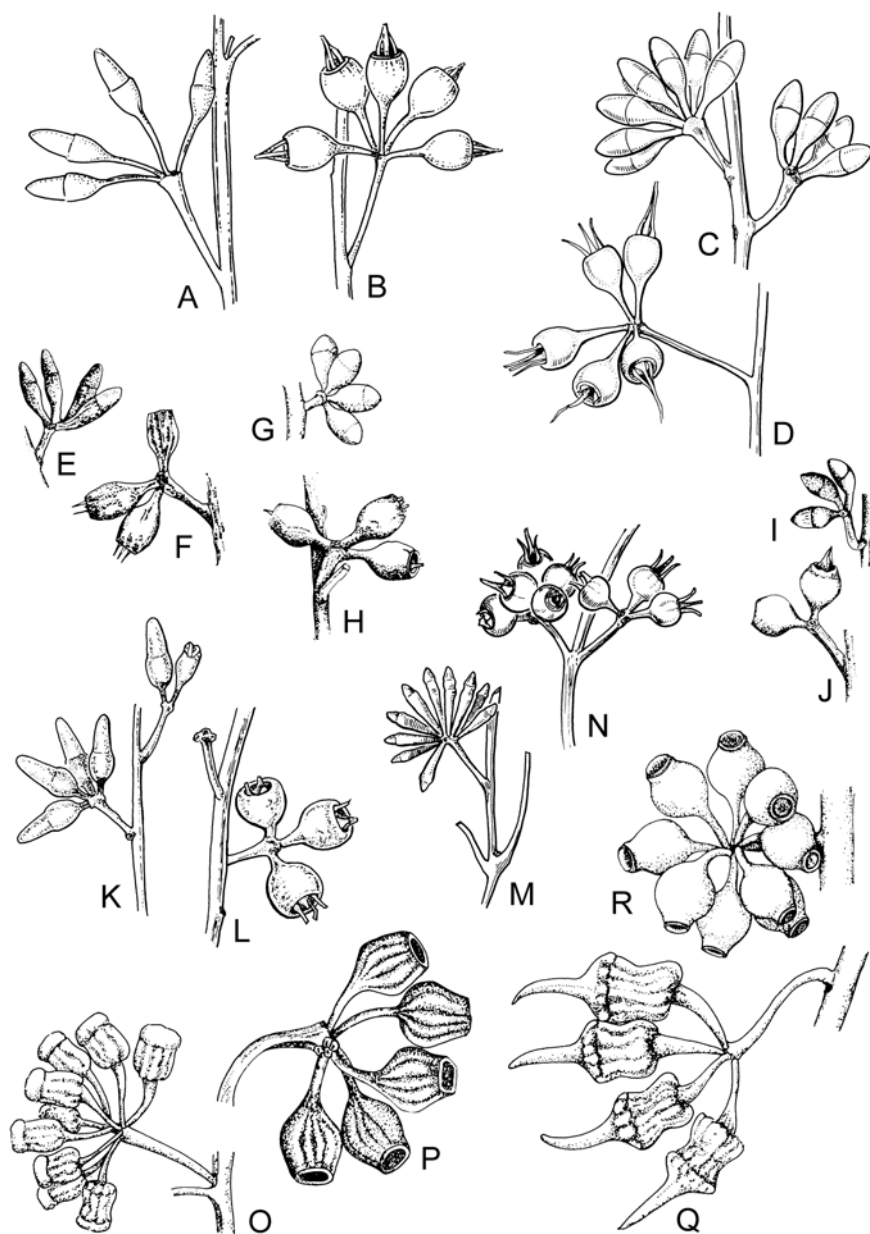


Figure 77. *Eucalyptus* buds and fruits, all $\times 1$, unless otherwise stated. **A–B**, *E. longicornis* (G.Chippendale 165, FRI). **C–D**, *E. oleosa* (1.6 km S of Mannum, S.A., W.Gill, FRI). **E–F**, *E. kochii* (**E**, rabbit-proof fence, 40 km E of Dalwallinu, W.A., C.Gardner, PERTH; **F**, Watheroo rabbit-proof fence, W.A., M.Koch, FRI). **G–H**, *E. plenissima* (**G**, C.Gardner 10211, FRI; **H**, Westonia, W.A., C.Gardner, FRI). **I–J**, *E. horistes* (9.6 km E of Canna siding, W.A., E.Watson, FRI). **K–L**, *E. peeneri* (**K**, after *J. Adelaide Bot. Gard.* 1: fig. 5 (1979); **L**, Barton, S.A., E.Ising, FRI). **M–N**, *E. eremicola* $\times 0.25$ (**M**, after *S. Austral. Naturalist* 50: 29 (1975); **N**, T.Loethian 5696, FRI). **O–P**, *E. cooperiana* (**O**, R.Kuchel 1612, FRI; **P**, 48 km from Esperance, W.A., A.George & S.Carr, FRI). **Q–R**, *E. flocktoniae* (**Q**, 8 km S of Lake King, W.A., M.Phillips, FRI; **R**, G.Chippendale 381, FRI). **A–D**, **K–N** drawn by M.Risby. **E–F** drawn by C.Stahl. **G–J** drawn by J.Collins. Others drawn by M.May.

270. *Eucalyptus cooperiana* F.Muell., *Fragm.* 11: 83 (1880)

T: south-western Australia, *G.Maxwell s.n.*; holo: MEL; iso: NSW.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 107 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 199 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 250 (1983).

Mallee to 3 m. Bark smooth throughout, grey or white to pink-white. Juvenile leaves subopposite or spirally arranged, shortly petiolate, elliptic to suborbicular, green, glandular. Adult leaves elliptic to lanceolate, uncinata; lamina 7–11 cm long, 1.2–3 cm wide, shining, green, glandular; lateral veins just visible, at 40°–50°; intramarginal vein up to 3 mm from margin; petiole angular, 18–30 mm long. Umbels 7–11-flowered; peduncle flattened or angular, recurved, 12–15 mm long; pedicels 6–8 mm long. Buds suburceolate; operculum hemispherical, 2–3 mm long, 4–5 mm wide; hypanthium suburceolate or cylindrical, faintly ribbed, 4–5 mm long, c. 4 mm wide. Fruits urceolate, faintly ribbed, 7–8 mm long, 6–7 mm wide; valves 4, included. *Many-flowered Mallee*. Fig. 77 O–P.

Occurs from Esperance to Twilight Cove, southern W.A., in near-coastal white or grey sand in low heathland. Regions: ESPR, NULL. Map 287.

W.A.: 47.8 km E of Esperance, *M.I.H.Brooker* 2507 (FRI, MEL, NSW, PERTH); 111 km E of Esperance, *G.M.Chippendale* 403 (AD, BRI, FRI, NSW, PERTH).

Distinguished especially by the pendulous umbels, shining leaves, and the operculum much shorter than the hypanthium. Buds and fruits smaller than in *E. flocktoniae*. Possibly should be placed in a separate series.

271. *Eucalyptus flocktoniae* (Maiden) Maiden, *J. & Proc. Roy. Soc. New South Wales* 49: 316 (1916)

E. oleosa var. *flocktoniae* Maiden, *J. W. Austral. Nat. Hist. Soc.* 3: 172 (1911) as *flocktoni*. T: Desmond, W.A., Nov. 1909, *J.H.Maiden*; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 2: 215 (1912); isolecto: K.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 109 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 231 (1983).

Tree, sometimes a mallee, to 12 m. Bark smooth throughout, grey to light brown or red-brown. Juvenile leaves opposite, sessile, decurrent, elliptic to broadly lanceolate, glaucous. Adult leaves lanceolate, uncinata; lamina 8–11 cm long, 1–2 cm wide, dark green, shining, glandular; lateral veins usually faint, at 35°–50°; intramarginal vein up to 2 mm from margin; petiole terete, 15–20 mm long. Umbels 7–11-flowered; peduncle quadrangular, recurved, 10–15 mm long; pedicels quadrangular, 4–10 mm long. Buds urceolate or conical; operculum hemispherical, rostrate, 9–11 mm long, 5–6 mm wide at base; hypanthium urceolate to cylindrical, 5–6 mm long and wide. Fruits urceolate, pendulous, 8–10 mm long, 6–8 mm wide; valves 4, sometimes 5. *Merrit*. Fig. 77Q–R.

Widespread in south-western W.A. except the wetter areas, and on Eyre Peninsula, S.A., with 1 record from Yorke Peninsula. Grows usually on sandy loam plains in open woodland and forest. Regions: BENC, LUWN, LEON, ESPR, EYRE. Map 288.

W.A.: 8 km E of Widgiemooltha, *M.I.H.Brooker* 2234 (FRI, PERTH); 165.4 km SSE of Southern Cross, *G.M.Chippendale* 347 (FRI, MEL, NSW, PERTH); 8 km W of Jerdacuttup R., *M.D.Tindale* 3806 (NSW, PERTH). S.A.: 3.2 km NW of Cummins, *M.I.H.Brooker* 3866 (AD, FRI, MEL, NSW).

Distinguished by tree habit, smooth bark, dark green shining leaves, pendulous umbels, rostrate operculum slightly wider than hypanthium, and urceolate fruits with exerted valves. Differs from *E. cooperiana* in the larger buds and fruits and the rostrate operculum. Produces abundant pollen and nectar for honey production from spring to summer. Cultivated successfully in arid areas within Australia, and also in California, Cyprus and northern Africa.

272. *Eucalyptus transcontinentalis* Maiden, J. & Proc. Roy. Soc. New South Wales 53: 58 (1919)

E. oleosa var. *glauca* Maiden, J. W. Austral. Nat. Hist. Soc. 3: 171, 172 (1911). T: Kalgoorlie, W.A., Sept. 1909, J.H.Maiden; lecto: NSW, fide J.H.Maiden, Crit. Revis. *Eucalyptus* 2: 183 (1912).

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 104, 105 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 54 (1979); S.Kelly et al., *Eucalypts* 1: t. 229 (1983).

Tree to 25 m, occasionally a mallee to 6 m. Bark smooth throughout, white or grey to grey-red, with an accumulation of decortivating, subfibrous bark sometimes at base of older trees. Juvenile leaves alternate, petiolate or opposite, sessile, decurrent, ovate, blue-green. Adult leaves lanceolate to narrowly lanceolate, acuminate; lamina 7–15 cm long, 1–2.2 cm wide, blue-grey or grey-green, dull, glandular; lateral veins faint, at 30°–40°; intramarginal vein up to 2 mm from margin; petiole terete, 15–25 mm long. Umbels 7-flowered; peduncle terete or angled, 7–13 mm long; pedicels 4–7 mm long. Buds glaucous; operculum hemispherical at base, narrowly rostrate, 8–13 mm long, 5–6 mm wide; hypanthium ±cylindrical or suburceolate, 4–5 mm long, 5–6 mm wide. Fruits subglobular to urceolate, 6–11 mm long and wide, usually glaucous; valves usually 3, but up to 5. *Redwood*. Fig. 78A–B.

Widespread in the agricultural and goldfields regions, south-western W.A., usually in red sandy loam on flat country, with the mallee form on low hills, in open forest and woodland. Regions: BENC, LUWN, LEON, ESPR. Map 289.

W.A.: 30.5 km E of Pithara, K.M.Allan 711 (BRI, FRI, PERTH); 17.4 km E of Hyden, D.F.Blaxell W 7521 (NSW, PERTH); 2.2 km S of Wubin, G.M.Chippendale 60 (FRI, MEL, PERTH); 37 km SE of Kalgoorlie, R.Coveny 8416 (NSW, PERTH).

Distinguished usually by tree habit, smooth grey bark, dull, blue-green leaves, glaucous buds and fruits, the narrowly rostrate buds with the operculum just wider than the hypanthium. Produces abundant nectar and pollen for honey production in spring to summer. Planted successfully in deserts in California and Colorado, U.S.A., as well as in Australian arid areas.

273. *Eucalyptus socialis* F.Muell. ex Miq., Ned. Kruidk. Arch. 4: 132 (1856)

E. turbinata Behr & F.Muell. ex Miq., Ned. Kruidk. Arch. 4: 137 (1856). T: Salts Creek, S.A., H.Behr; holotype: U.

Illustrations: M.I.H.Brooker & N.Hall, *Forest Tree Ser.* No. 40 (1972); L.Costermans, *Native Trees & Shrubs S.E. Australia* 376 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 147 (1983).

Usually a mallee to 9 m, sometimes a tree to 12 m. Bark smooth throughout, pale grey. Juvenile leaves alternate, sessile to shortly petiolate, elliptic to ovate, dull, green. Adult leaves lanceolate, uncinately; lamina 6–9 cm long, 1.2–2 cm wide, dull grey-green; lateral veins faint, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole terete, 10–20 mm long. Umbels 7–13-flowered; peduncle slightly flattened, 8–20 mm long; pedicels 2–8 mm long. Buds fusiform; operculum conical, rostrate, 5–8 mm long, 4–5 mm wide; hypanthium hemispherical, 4–5 mm long and wide. Fruits globular, 5–8 mm long and wide; valves 3 or 4. *Red Mallee* Fig. 78C–D.

Occurs widely in southern N.T., throughout S.A. except the north-east, through inland N.S.W. and north-western Vic.; scattered in the Great Sandy and Gibson Deserts, W.A. Grows usually on plains in sandy soil in shrubland. Regions: SNDY, GBSN, MACD, VICD, TRNS, EYRE, COOP, WRGO, DARL, RIVR. Map 290.

S.A.: 1.6 km N of Mallala, G.M.Chippendale 1346 (AD, BRI, FRI); 16 km ENE of Minnipa, N.N.Donner 2508 (AD, FRI). N.S.W.: Tabbira, R.T.Eakin 101 (FRI, NSW). Vic.: 48 km SW of Mildura, I.P.George 5 (MEL).

Differs from *E. transcontinentalis* in the usually mallee habit, non-glaucous buds and fruits, and from *E. oleosa* especially in the rostrate buds. The occurrences in arid W.A. could be an undescribed species.

274. *Eucalyptus gillii* Maiden, *Crit. Revis. Eucalyptus* 2: 177 (1912)

T: Umberatana, Flinders Ra., S.A., May 1907, *W.Gill s.n.*; holo: NSW; iso: K, MEL.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 135 (1974); L.Costermans, *Native Trees & Shrubs S.E. Australia* 376 (1981); S.Kelly *et al.*, *Eucalypts* 1: t. 230 (1983).

Mallee, shrub or occasionally a tree to 7.5 m. Bark smooth, grey throughout, or sometimes with flaky, fibrous, rough bark on lower trunk. Juvenile leaves opposite, sessile, cordate or broadly ovate, glaucous. Adult leaves usually on only the higher branches of mature plants, lanceolate, acute; lamina 6–8 cm long, 1.2–2 cm wide, slightly glaucous; lateral veins faint, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole terete, 2–5 mm long. Umbels 7–11-flowered; peduncle terete, 6–15 mm long; pedicels 1–4 mm long. Buds glaucous; operculum rostrate, 5–8 mm long, 4–5 mm wide; hypanthium cylindrical, 3–4 mm long, 4–5 mm wide. Fruits globular, glaucous, 5–7 mm long and wide; valves 3. *Curly Mallee*. Fig. 78E–F.

Occurs in the Flinders Ra., S.A. and in the Barrier Ra., N.S.W., on plains and low hills, often in pure stands but also in open shrubland. Region: TRNS. Map 291.

S.A.: 35 km S of Paralana, *R.H.Kuchel* 965 (AD, FRI). N.S.W.: Fowlers Gap, N of Broken Hill, *S.Jacobs* 2264 (AD, BRI, FRI, NSW).

Distinguished from *E. socialis* in the persistent glaucous juvenile leaves, glaucous buds and fruits, and globular fruits.

275. *Eucalyptus yumbarrana* Boomsma, *J. Adelaide Bot. Gard.* 1: 366 (1979)

T: Yumbarra Conservation Park, S.A., 31°45'S, 133°35'E, 17 June 1977, *T.Dennis s.n.*; holo: AD; iso: AD, FRI.

Mallee or tree to 5 m. Bark rough, flaky, grey on lower trunks, smooth, grey to bronze above. Juvenile leaves opposite, sessile, ovate or broadly lanceolate, green, decurrent. Adult leaves lanceolate or broadly lanceolate, uncinata; lamina 10–12 cm long, 2–2.4 cm wide, dull, green; lateral veins faint, at 30°–50°; intramarginal vein up to 2 mm from margin; petiole angular or terete, 25–28 mm long. Umbels usually 7-flowered; peduncle flattened or quadrangular, 4–11 mm long; pedicels 3–5 mm long. Buds obtusely conical; operculum rostrate, 6–11 mm long, 5–7 mm wide; hypanthium suburceolate, 4–6 mm long, 5–7 mm wide. Fruits subglobular or suburceolate, 9–11 mm long, 8–9 mm wide; valves 3 or 4.

Scattered in arid areas from Lake Wyola to Yumbarra, S.A., often in swales of sand dunes in open shrubland. Differs from related species in the longer petiole and broader leaves. There are 2 subspecies.

Buds not glaucous or striate

275a. subsp. *yumbarrana*

Buds glaucous and striate or ribbed

275b. subsp. *striata*

275a. *Eucalyptus yumbarrana* Boomsma subsp. *yumbarrana*

Illustrations: C.D.Boomsma, *J. Adelaide Bot. Gard.* 1: 367 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 280 (1983).

Buds smooth, not glaucous. Fruits smooth, not glaucous. Fig. 78G–H.

Occurs from N of Cook eastwards to the Gawler Ra., S.A. Region: EYRE. Map 292.

S.A.: c. 14 km W of Cheesman Junction, *W.R.Barker* 3014 (AD, FRI); Yumbarra Conservation Park, *D.Keane* 62 (AD, FRI).

Distinct in being usually a mallee with broad green leaves, long petioles, smooth buds, and smooth subglobular fruits with fragile exerted valves.

275b. *Eucalyptus yumbarrana* subsp. *striata* Boomsma, *J. Adelaide Bot. Gard.* 2: 298 (1980)

T: 50 km SW of Lake Wyola, S.A., 16 Aug. 1979, *T.Dennis* 182; holo: AD.

Illustrations: C.D.Boomsma, *op. cit.* 297; S.Kelly *et al.*, *Eucalypts* 1: t. 280 (1983).

Buds strongly glaucous; operculum faintly striate to ribbed; hypanthium faintly striate. Fruits striate, glaucous. Fig. 78 I–J.

Occurs S of Lake Wyola, S.A., though not yet much collected. Grows in deep, red-brown loamy sand of swales, in open shrubland. Region: VICD. Map 293.

S.A.: c. 130 km N of Cook on track to Vokes Corner, *J.Z.Weber* 6343 (AD, FRI).

Distinguished by mallee habit, strongly glaucous, conical, rostrate buds which are striate or ribbed, and glaucous, striate subglobular fruits.

276. *Eucalyptus yalatensis* Boomsma, *S. Austral. Naturalist* 50: 29 (1975)

T: 17 km SSE of Yalata, S.A., 31°38'S, 131°58'E, 27 July 1969, *B.Copley* 2624; holo: AD.

Illustrations: C.D.Boomsma, *op. cit.* 30; J.Doran & M.I.H.Brooker, *Forest Tree Ser.* No. 218 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 241 (1983).

Mallee to 6 m, sometimes a tree. Bark rough, fibrous or flaky, grey on trunk and larger branches, smooth, shining, grey or orange-grey above. Juvenile leaves subopposite or alternate, shortly petiolate, ovate or broadly lanceolate, green. Adult leaves lanceolate, uncinat; lamina 6–11 cm long, 1–2 cm wide, grey-green, dull, glandular; lateral veins faint, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole terete or slightly flattened, 8–12 mm long. Umbels 7–11-flowered; peduncle terete or quadrangular, 4–8 mm long; pedicels 2–3 mm long. Buds fusiform; operculum conical or rostrate, 4–6 mm long, 3–4 mm wide; hypanthium obconical or hemispherical, 2–3 mm long, 3–4 mm wide. Fruits hemispherical or obconical, 4–5 mm long, 5–6 mm wide; valves 3 or 4. Fig. 78K–L.

Occurs in coastal and near-coastal areas of the Great Australian Bight from near Point Dover, W.A., eastwards to the Hincks Flora and Fauna Reserve, S.A., in sandy soil in open shrubland. Regions: NULL, EYRE. Map 294.

W.A.: Point Dover, *P.G.Wilson* 5933 (FRI); 15 km E of Cocklebiddy, *B.Lay* 941 (AD, FRI). S.A.: Streaky Bay, *T.Dennis* 90 (AD, FRI).

Distinguished by densely spreading mallee habit, grey-green leaves, fusiform buds and hemispherical or obconical fruits with fragile, exserted valves.

Differs from *E. socialis* in the smaller, non-rostrate buds and the smaller fruits and from *E. yumbarrana* in the much shorter petiole.

Ser. 61 *Salmonophloiae****Eucalyptus* ser. *Salmonophloiae* Chippendale, *Fl. Australia* 19: 505 (1988).**

Type: *E. salmonophloia* F.Muell.

Trees. Bark smooth throughout, salmon-coloured or pink-brown to grey or grey-brown. Juvenile leaves alternate, petiolate, elliptic to lanceolate, concolorous. Adult leaves alternate, petiolate, lanceolate, falcate, concolorous. Conflorences simple, axillary, 7–11-flowered umbels. Buds ovoid or clavate. Fruits hemispherical; disc narrow, descending vertically; valves 3 or 4, exserted, slender. Seeds usually elliptic, reticulate, grey-brown.

A series of 1 species in low rainfall areas of south-western W.A. Tall smooth-barked trees with shining concolorous leaves, simple umbels and small fruits with exserted valves.

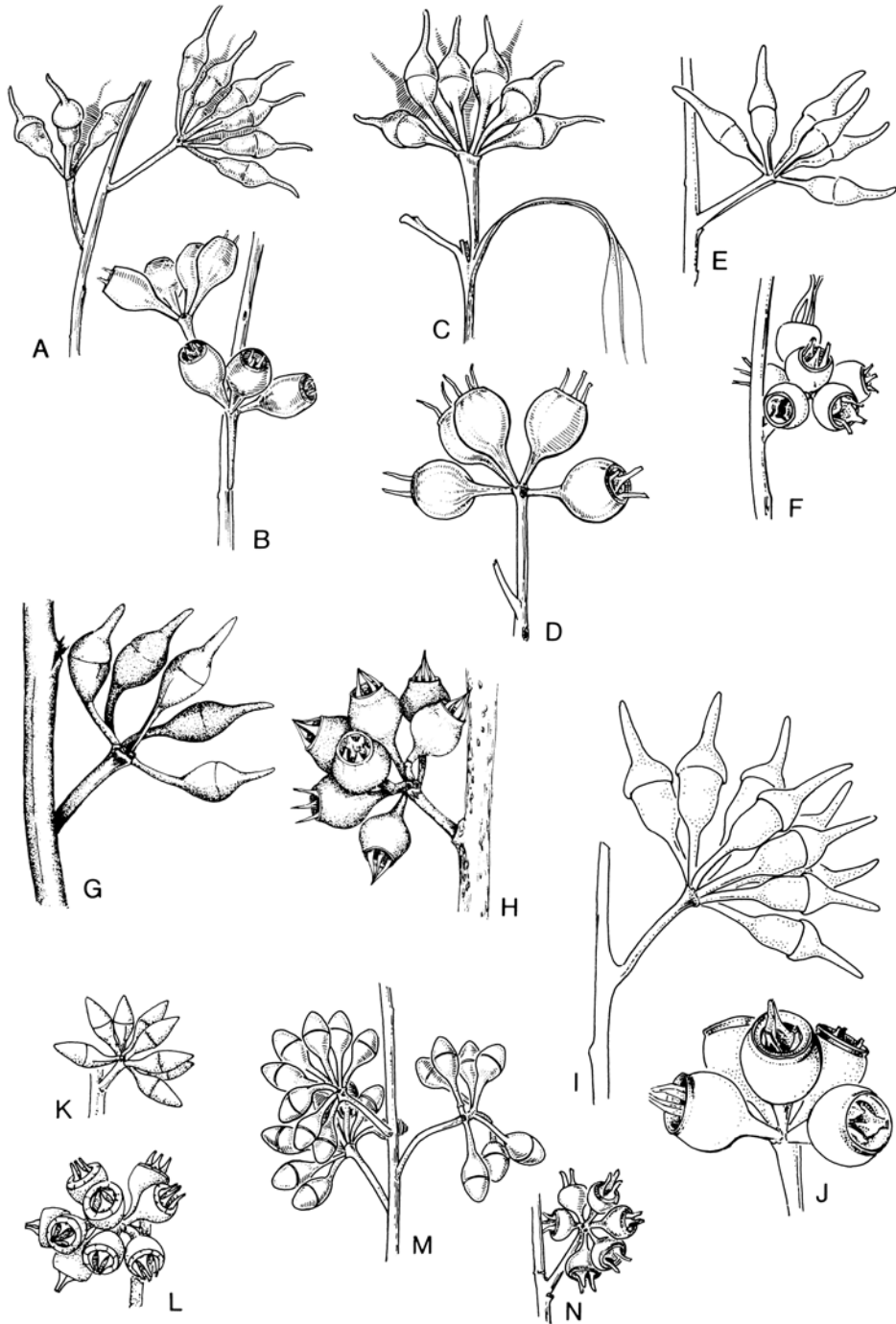


Figure 78. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. transcontinentalis* (Kalgoorlie, W.A., J.Maiden, FRI). **C–D**, *E. socialis* (**C**, C.Boomsma 13, FRI; **D**, R.Eakin 103, FRI). **E–F**, *E. gillii* (**E**, D.Blaxell 1210, FRI; **F**, M.Crisp 668, FRI). **G–H**, *E. yumbarrana* subsp. *yumbarrana* (**G**, M.Jacobs 173, FRI; **H**, C.Carter & W.Bateman 21, FRI). **I–J**, *E. yumbarrana* subsp. *striata* (D.Symon 12277, FRI). **K–L**, *E. yalatensis* (T.Dennis 90, FRI). **M–N**, *E. salmonophloia* (**M**, G.Chippendale 277, FRI; **N**, J.Baker 5, FRI). **A, B, G, H, K, L** drawn by M.May. Others drawn by M.Risby.

277. *Eucalyptus salmonophloia* F.Muell., *Fragm.* 11: 11 (1878)

T: a number of syntypes, including: Upper Swan R., W.A., Nov. 1877, *F.Mueller*; syn: MEL; iso: NSW; near York, W.A., Nov. 1877, *F.Mueller*; syn: MEL; beyond York, Nov. 1877, *F.Mueller*; syn: MEL.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 110–112 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 19 (1979); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 411 (1984).

Tree to 24 m. Adult leaves uncinat; lamina 6–12 cm long, 0.6–1.5 cm wide, shining, green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 10–15 mm long. Peduncle slender, terete or angled, 5–10 mm long; pedicels slender, 2–5 mm long. Operculum hemispherical, sometimes apiculate, or ±conical, 3–4 mm long and wide; hypanthium hemispherical or obconical, 2–3 mm long, 3–4 mm wide. Fruits 3–5 mm long, 4–5 mm wide. *Salmon Gum.* Figs 16, 78M–N.

Occurs throughout the wheatbelt and goldfields areas of south-western W.A., on plains and low hills, in red clay loam and clay, often dominant in open forest and woodland. Regions: BENC, LEON, ESPR. Map 295.

W.A.: 39.4 km S of Norseman, *J.P.Baker* 63 (BRI, FRI, MEL, NSW, PERTH); 16.6 km E of Karonie, *M.I.H.Brooker* 2461 (AD, FRI, MEL, NSW, PERTH); 3.2 km E of Coolgardie, *G.M.Chippendale* 372 (BRI, FRI, MEL, NSW, PERTH); near Wagin, *C.A.Gardner* 512 (PERTH).

A tall tree with salmon-coloured to grey or grey-brown bark, shining green leaves, ovoid or clavate buds and small fruits with slender exerted valves. Bark changes colour with the seasons (see G.M.Chippendale *op. cit.* 111). The wood has been used as railway sleepers, firewood and mining timber. The tree is remarkable for its occurrence in areas of annual rainfalls only 250–500 mm, and has been cultivated in Australia, Cyprus, Ghana, India, Israel and South Africa. A choice honey is produced during flowering from Dec. to Mar.

Ser. 62 *Curviptera****Eucalyptus* ser. *Curviptera* Maiden, *Crit. Revis. Eucalyptus* 7: 117 (1925).**

Type: *E. burracoppinensis* Maiden, lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 497 (1988).

E. ser. Kochioides Maiden, *op. cit.* 114. T: *E. macrocarpa* Hook., lecto, *fide* G.M.Chippendale, *op. cit.* 499.

E. ser. Leptopodae Blakely, *Key Eucalypts* 66, 271 (1934), except *E. salmonophloia* F.Muell. T: *E. leptopoda* Benth.

E. ser. Xylocarpae Blakely, *Key Eucalypts* 67, 68 (1934). T: *E. pyriformis* Turcz.

Mallees, sometimes small trees. Bark smooth throughout, often decorticating in longitudinally curling strips, or rough, fibrous on lower trunk or to lower branches. Juvenile leaves alternate, petiolate, sometimes opposite and sessile, concolorous or slightly discolorous. Adult leaves alternate, petiolate, sometimes opposite, and sessile, concolorous. Conflorescences axillary, simple, 1–11-flowered umbels. Buds clavate, ovoid, rostrate, conical, globular, subglobular, turbinate or pyriform. Fruits hemispherical or subglobular, sometimes obconical, turbinate, urceolate to suburceolate, or campanulate; disc broad, ascending or convex, sometimes concave and descending, occasionally flat; valves 3–7, exerted, sometimes included. Seeds irregularly crescent-shaped, orbicular, cubical, ±pyramidal, elliptic or ovoid, reticulate.

A series of 21 species in W.A., central and south-western N.T., western S.A. and western Qld. Usually mallees, with smooth or rough bark, concolorous leaves, simple 1–11-flowered umbels, a broad descending disc, and red-brown seeds.

278. *Eucalyptus leptopoda* Benth., *Fl. Austral.* 3: 238 (1867)

T: south-western W.A., *J.Drummond* 5: suppl. 33; lecto: K, *fide* M.D.Crisp, *Nuytsia* 4: 133 (1982); isolecto: BM, E, FI, LE, MEL, NSW, PERTH, W.

E. angustifolia Turcz., *Bull. Cl. Phys.-Math. Acad. Sci. Saint-Petersburg* 10: 337 (1852) *nom. illeg.* non Desf. ex Link (1822). T: W.A., *J.Drummond* 5: suppl. 33; holo: KW; iso: BM, E, FI, K, LE, MEL, NSW, PERTH, W.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 113 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 239 (1983).

Mallee to 3.5 m, sometimes to 6 m. Bark smooth throughout, light grey to brown-grey. Juvenile leaves alternate, petiolate, elliptic to lanceolate, grey-green. Adult leaves alternate, erect, linear-lanceolate, uncinata, glandular; lamina 7–12 cm long, 0.6–1 cm wide, grey-green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 4–10 mm long. Umbels 7–11-flowered; peduncle slender, 8–15 mm long; pedicels slender, 5–10 mm long. Buds conical; operculum conical, 5–9 mm long, 4–7 mm wide; hypanthium shallowly hemispherical, 2–4 mm long and wide. Fruits subglobular, 4–7 mm long, 6–10 mm wide; disc flat to convex; valves 3 or 4, exserted. Seeds cubical to pyramidal, grey-brown. *Tammin Mallee*. Fig. 79A–B.

Occurs widely in the eastern Goldfields and central agricultural areas of south-western W.A. Grows in sandy soil on flat country. Regions: MRCH, BENC, LEON, ESPR, VICD. Map 296.

W.A.: 6.1 km SW of Merredin, *G.M.Chippendale* 82 (FRI, MEL, NSW, PERTH); 10 km N of Bungulla turn-off, Great Eastern Hwy, *M.D.Tindale* 3716 (NSW, PERTH); 4 km S of Neale Junction, *A.S.George* 11970 (CANB, PERTH); 43.5 km SE of Coolgardie, *J.W.Green* 1282 (PERTH).

Distinguished by diffuse mallee habit, erect grey-green leaves, white or cream conical buds with the operculum longer than hypanthium, and subglobular fruits with slender valves. Has smaller buds and fruits than *E. beardiana* and *E. synandra*.

279. *Eucalyptus beardiana* Brooker & Blaxell, *Nuytsia* 2: 220 (1978)

T: NW of Coburn Homestead, S of Shark Bay, W.A., 8 Oct. 1975, *D.F.Blaxell* W75/105; holo: NSW; iso: FRI, PERTH.

Illustrations: M.I.H.Brooker & D.F.Blaxell, *op. cit.* 221; S.Kelly *et al.*, *Eucalypts* 1: t. 251 (1983).

Mallee to 4 m. Bark smooth throughout, grey. Juvenile leaves alternate, petiolate, broadly lanceolate, green. Adult leaves alternate, lanceolate, uncinata; lamina 6–15 cm long, 0.8–1.5 cm wide, green; lateral veins faint, at 45°–55°; intramarginal vein faint, up to 1 mm from margin; petiole terete, 10–20 mm long. Umbels 11-flowered; peduncle terete, recurved, 12–30 mm long; pedicels 8–20 mm long. Buds rostrate; operculum rostrate, 12–20 mm long, 6–8 mm wide; hypanthium hemispherical, 5–7 mm long, 6–8 mm wide. Fruits hemispherical to suburceolate, 12–14 mm long, 10–12 mm wide; disc flat, pale, descending; valves 4, exserted. Seeds cubical to pyramidal or subpyramidal, grey-brown. Fig. 79C–D.

Occurs in several populations S of Shark Bay, and in an outlier in the northern Leeuwin Region, W.A., in heathland and shrubland on sand dunes and sand ridges. Region: MRCH. Map 297.

W.A.: 24.1 km W of Coburn Stn, *J.S.Beard* 7391 (FRI, PERTH); 71 km S of Wannoo, *M.I.H.Brooker* 5024 (AD, FRI, MEL, NSW, PERTH); 158 km N of Gingin, 28 June 1978, *L.D.Pryor* (FRI).

Distinguished from *E. leptopoda* and *E. synandra* in the larger fruits and in the filaments sometimes united in their lower half, but less so than in *E. synandra*.

280. *Eucalyptus synandra* Crisp, *Nuytsia* 4: 129 (1982)

T: ±5 km S of Jingymia, W.A., 30°31'S, 117°25'E, 2 Jan. 1981, *A.S.George* 16203; holo: PERTH; iso: CBG, FRI, K, NSW, PERTH.

Illustrations: M.D.Crisp, *op. cit.* 130; S.Kelly *et al.*, *Eucalypts* 1: t. 278 (1983).

Mallee to 6 m. Bark smooth throughout, white to grey. Juvenile leaves alternate, petiolate, linear to narrowly lanceolate, dull, green. Adult leaves alternate, linear to narrowly elliptic, uncinat; lamina 4–20 cm long, 0.4–1.5 cm wide, grey-green; lateral veins faint, at 30°–50°; intramarginal vein faint, up to 2 mm from margin; petiole terete, 3–15 mm long. Umbels 7-flowered; peduncle terete, recurved, 9–18 mm long; pedicels filiform, 7–15 mm long. Buds ovoid to conical; operculum conical to rostrate, 10–20 mm long, 5–7 mm wide; hypanthium hemispherical, 2–3 mm long, 5–7 mm wide. Staminal filaments united. Fruits hemispherical to subglobular, 6–9 mm long, 8–12 mm wide; disc very broad, steeply convex; valves 4 or 5, exserted. Seeds irregularly compressed ovoid, pale brown. Figs 29, 79E–F.

Occurs in several scattered areas from near Morawa eastwards to near Queen Victoria Spring, W.A., in lateritic and sandy soil, in tall shrubland. Regions: BENC, LEON, VICD. Map 298.

W.A.: 29 km N of Cundeelee, *M.I.H.Brooker 2612* (FRI, MEL, PERTH); Mt Gibson, July 1952, *C.A.Gardner* (FRI, PERTH).

Distinguished especially in having the staminal filaments united at least in the lower half. In western populations the outer filaments are often almost free but in those near Queen Victoria Spring all are united for $\frac{3}{4}$ their length. Has larger buds than *E. leptopoda*.

281. *Eucalyptus oxymitra* Blakely, *Trans. & Proc. Roy. Soc. S. Australia* 61: 155 (1936)

T: Missionary Plain by Pine Point, N.T., 1894, *R.Tate s.n.*; syn: AD, NSW; near junction of Palmer & Walker Rivers, N.T., 1894, *R.Tate s.n.*; *n.v.*

Illustrations: J.Turner & M.I.H.Brooker, *Forest Tree Ser.* No. 206 (1978); J.P.Jessop (ed.), *Fl. Central Australia* t. 298 (1981); S.Kelly *et al.*, *Eucalypts* 1: t. 238 (1983).

Mallee to 4 m. Bark smooth throughout, grey to cream, sometimes with accumulated bark forming a rough base. Juvenile leaves alternate, petiolate, ovate-lanceolate, green. Adult leaves alternate, ovate to broadly lanceolate, acuminate or uncinat; lamina 7–13 cm long, 3–4.5 cm wide, grey-green, dull; lateral veins faint, at 30°–45°; intramarginal vein up to 2 mm from margin; petiole terete, 10–20 mm long. Umbels 7-flowered; peduncle slightly flattened, dilating upwards, 10–13 mm long; pedicels 0.5 mm long. Buds globular-conical, glaucous; operculum hemispherical-conical, rostrate, 7–10 mm long, 8–13 mm wide; hypanthium hemispherical, 4–5 mm long, 7–12 mm wide. Fruits hemispherical or subglobular, sometimes slightly ribbed, 12–20 mm long, 10–15 mm wide; disc ascending, convex; valves 3–5, exserted. Seeds irregularly crescent-shaped, sometimes with a wing-like margin, grey-brown. *Sharp-capped Mallee*. Fig. 79G–H.

Occurs in central Australian ranges of far eastern W.A., south-western N.T. and north-western S.A. Grows in undulating sand and on sand dunes, in open shrubland. Regions: MACD, VICD. Map 299.

W.A.: Walter James Ra., *A.S.George 8307* (FRI, PERTH). N.T.: 110 km WNW of Mt Olga, *B.G.Briggs 3531* (NSW, NT); 22.9 km N of Angas Downs, *G.M.Chippendale 3985* (AD, BRI, NSW, NT). S.A.: 11 km W of Cheeseman Junction, *W.R.Barker 3015* (FRI).

Distinguished by mallee habit, smooth bark usually with a rough base, thick, ovate to broadly lanceolate leaves, glaucous globular-conical buds and large woody fruits with sharp, exserted woody valves. Has smoother bark and larger buds and fruits than *E. ewartiana*.

282. *Eucalyptus ewartiana* Maiden, *J. & Proc. Roy. Soc. New South Wales* 53: 111 (1919)

T: Pindar, W.A., Oct. 1909, *J.H.Maiden*; holo: NSW; iso: BM, FRI, MEL.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 113, 114 (1973); J.P.Jessop (ed.), *Fl. Central Australia* t. 299 (1981); S.Kelly *et al.*, *Eucalypts* 1: t. 237 (1983).

Mallee to 6 m. Bark at first smooth, red-brown, later deciduous in longitudinally curling flakes. Juvenile leaves alternate, petiolate, ovate, green. Adult leaves alternate, lanceolate to ovate-lanceolate, uncinat; lamina 5–9 cm long, 1.5–3 cm wide, dull, grey- or yellow-green,

glandular; lateral veins distinct, at 30°–40°; intramarginal vein up to 2 mm from margin; petiole terete, 10–20 mm long. Umbels 7-flowered; peduncle terete or slightly flattened, 10–20 mm long; pedicels quadrangular, 3–6 mm long. Buds globular or ovoid; operculum hemispherical, 5–6 mm long, 4–8 mm wide; hypanthium shallowly hemispherical, 2–3 mm long, 5–7 mm wide. Fruits subglobular, 5–10 mm long, 6–12 mm wide; disc steeply ascending, convex; valves 3 or 4, exserted. Seeds irregularly crescent-shaped, grey-brown. *Ewart's Mallee*. Fig. 79 I–J.

Occurs from the upper south-west, W.A., E to the Goldfields, often associated with granitic outcrops. Some older records give N.T. localities, but these are all *E. oxymitra*. Regions: BENC, LEON, VICD. Map 300.

W.A.: 136.8 km N of Bullfinch, *M.I.H. Brooker* 2452 (FRI, MEL, NSW, PERTH); 7.2 km W of Westonia, *G.M. Chippendale* 266 (FRI, NSW).

Differs from *E. oxymitra* in the longitudinally curling red-brown bark and smaller buds and fruits, and from *E. orbifolia* and *E. websteriana* in the larger lanceolate to ovate-lanceolate, dull, grey- or yellow-green leaves.

283. *Eucalyptus orbifolia* F. Muell., *Fragm.* 5: 50 (1865)

T: 30°47'S, 119°25'E, [NW of Koolyanobbing Ra.], W.A., *C. Harper s.n.*; holotype: n.v.; iso: K.

Illustrations: G.M. Chippendale, *Eucalypts W. Austral. Goldfields* 115 (1973); C.A. Gardner (ed. T.E. Aplin), *Eucalypts W. Australia* 77 (1979); J.P. Jessop (ed.), *Fl. Central Australia* t. 300 (1981).

Mallee, occasionally a tree, to 6 m. Bark at first smooth, red-brown, later deciduous in longitudinally curling flakes. Juvenile leaves opposite, petiolate, suborbicular, grey-green. Adult leaves alternate, sometimes opposite, suborbicular, retuse or emarginate; lamina 2.5–3.8 cm long, 2.5–4.3 cm wide, grey-green; lateral veins faint, at 40°–45°; intramarginal vein up to 3 mm from margin; petiole terete, 10–20 mm long, pruinose. Umbels 7-flowered, glaucous; peduncle terete, 10–25 mm long; pedicels 4–7 mm long. Buds globular to ovoid, sometimes shortly umbonate; operculum conical or hemispherical-conical, 7–13 mm long, 6–8 mm wide; hypanthium hemispherical, 3–5 mm long, 6–8 mm wide. Fruits hemispherical or campanulate, 6–11 mm long, 12–18 mm wide, pruinose; disc ascending; valves 3 or 4, exserted. Seeds irregularly crescent-shaped, grey-brown. *Round-leaved Mallee*. Fig. 79K–L.

Occurs in 2 disjunct areas, 1 the eastern Goldfields, W.A., the other south-western N.T. and far north-western S.A. Grows on and near granitic outcrops. Regions: LEON, ESPR, MACD. Map 301.

W.A.: 88.5 km NE of Kalgoorlie, *M.I.H. Brooker* 2581 (FRI, PERTH). N.T.: W of Mt Hermannsburg, *M.I.H. Brooker* 5114 (BRI, FRI, MEL, NSW, NT). S.A.: Mt Woodroffe, 17 Apr. 1950, *J.B. Cleland* (BRI).

Distinguished from *E. ewartiana* especially by the thick, grey-green suborbicular leaves which are retuse or emarginate.

284. *Eucalyptus websteriana* Maiden, *J. & Proc. Roy. Soc. New South Wales* 49: 313 (1916)

T: near Coolgardie, W.A., 1898, 1899 and 1900, *L.C. Webster* [published as C.L. Webster] *s.n.*; syn: NSW.

Illustrations: G.M. Chippendale, *Eucalypts W. Austral. Goldfields* 116, 117 (1973); J.P. Jessop (ed.), *Fl. Central Australia* t. 301 (1981); S. Kelly *et al.*, *Eucalypts* 1: t. 235 (1983).

Mallee to 6 m, dense, compact, sometimes straggly. Bark at first smooth, red-brown, later deciduous in longitudinally curling flakes. Juvenile leaves opposite, becoming alternate, petiolate, orbicular, subglaucous. Adult leaves usually alternate, sometimes opposite, obovate, retuse; lamina 2–4 cm long, 1.5–2.5 cm wide, dull, grey-green; lateral veins faint, at 40°–45°; intramarginal vein up to 2 mm from margin; petiole terete, 6–15 mm long. Umbels 7-flowered; peduncle terete, 10–15 mm long; pedicels angular, 6–8 mm long. Buds globular or broadly ovoid, glaucous; operculum hemispherical-conical, 3–4 mm long, 4–6 mm wide; hypanthium shallowly hemispherical, 2–3 mm long, 3–5 mm wide. Fruits shallowly

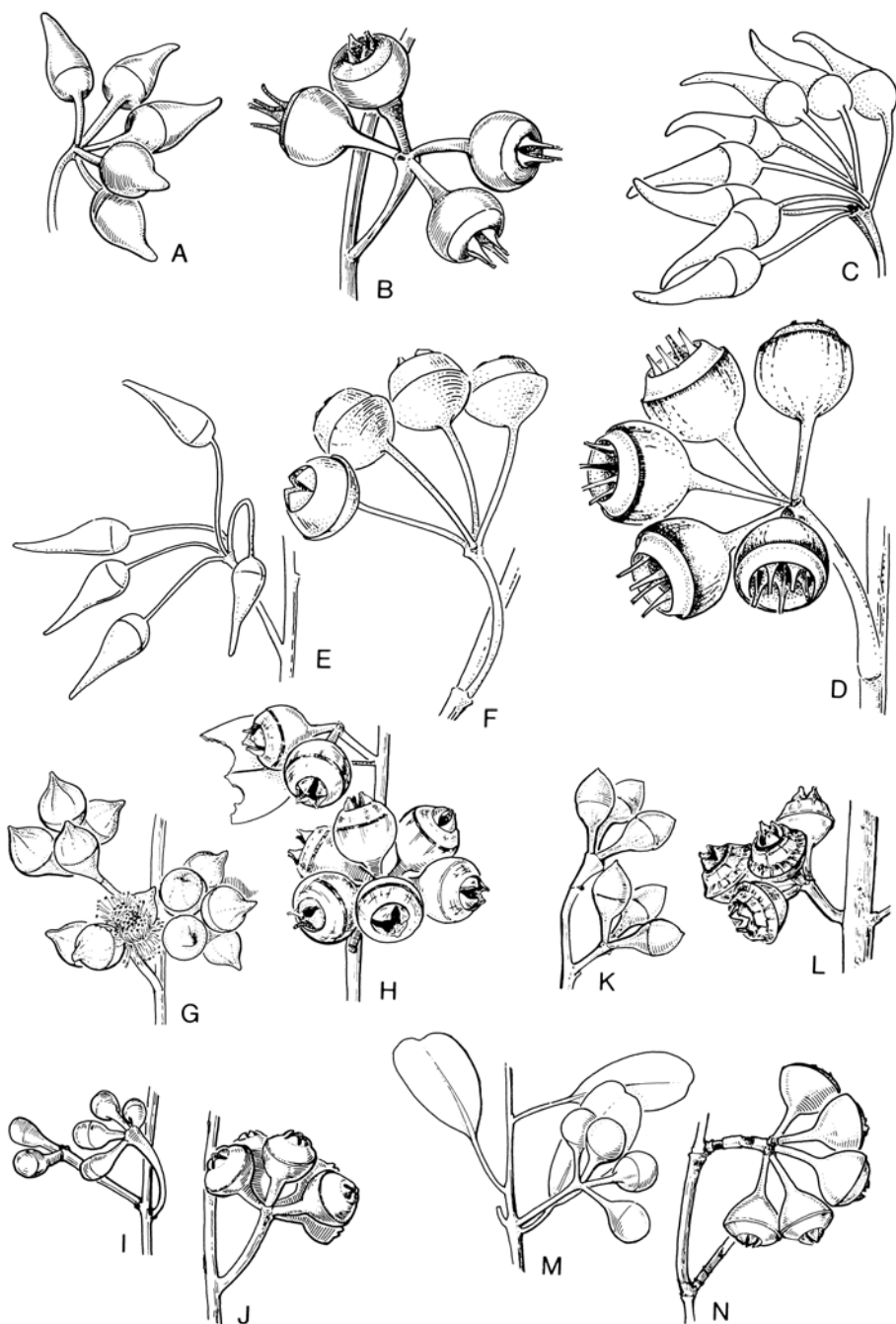


Figure 79. *Eucalyptus* buds and fruits, all $\times 1$, unless otherwise stated. **A–B**, *E. leptopoda* (A, M.Blackwell 51, FRI; B, 88 km from Southern Cross towards Coolgardie, W.A., M.Phillips, FRI). **C–D**, *E. beardiana* (C, J.Beard 7391, FRI; D, I.Brooker 5024, FRI). **E–F**, *E. synandra* (Mt Gibson, W.A. C.Gardner, FRI). **G–H**, *E. oxymitra* $\times 0.25$ (G, I.Brooker 5110, FRI; H, C.Dunlop 1994, FRI). **I–J**, *E. ewartiana* $\times 0.25$ (P.G.Wilson 8798, FRI). **K–L**, *E. orbifolia* $\times 0.5$ (cult., Austral. Nat. Bot. Gard., Canberra, A.C.T., M.Hall, FRI). **M–N**, *E. websteriana* (M, 8 km from Norseman towards Coolgardie, W.A., M.Phillips, FRI; N, 8 km from Norseman towards Coolgardie, M.Phillips, FRI). Drawn by M.Risby.

hemispherical, 5–8 mm long, 8–12 mm wide, glaucous; disc ascending, convex; valves 4, exserted. Seeds irregularly crescent-shaped, red-brown. *Webster's Mallee*. Figs 31, 79M–N.

Occurs from near Mt Churchman to the Coolgardie–Norseman area and Karonie, W.A., exclusively in shallow granitic soil near granite outcrops. Regions: LEON, ESPR. Map 302.

W.A.: Kambalda, *M.I.H.Brooker* 4537 (AD, FRI, NSW, NT, PERTH); 12.7 km S of Coolgardie, *G.M.Chippendale* 137 (AD, BRI, CANB, FRI, NSW, PERTH).

Distinguished mainly by the obovate leaves. Has smaller buds than *E. orbifolia*.

285. *Eucalyptus crucis* Maiden, *Crit. Revis. Eucalyptus* 6: 514 (1923)

T: Southern Cross, W.A., Apr. 1922, *H.Steedman s.n.*; holotype: NSW.

Mallee to 15 m, spreading or erect. Bark at first smooth, red-brown, later deciduous in longitudinally curling flakes. Juvenile leaves opposite, sessile, orbicular or suborbicular, grey-green. Intermediate leaves opposite or subopposite, petiolate or almost sessile, ovate, grey-green. Adult leaves alternate, lanceolate to narrowly lanceolate, or sometimes not present. Umbels 7-flowered; peduncle and pedicels slender. Buds ovoid, glaucous; operculum conical; hypanthium hemispherical. Fruits hemispherical, glaucous; disc flat or slightly ascending; valves 4, strongly exserted. Seeds irregularly cuboid, brown.

Occurs in inland south-western W.A., in shallow granitic soil associated with granite outcrops. Distinguished by the small sessile juvenile leaves that persist as the canopy; they are conspicuously mucronate and have minute black oil dots. There are 2 subspecies.

Leaves of canopy orbicular or ovate, sessile or petiolate; mallee to 6 m

285a. subsp. *crucis*

Leaves of canopy lanceolate or narrowly lanceolate, petiolate; mallee to 15 m

285b. subsp. *lanceolata*

285a. *Eucalyptus crucis* Maiden subsp. *crucis*

Illustrations: *G.M.Chippendale, Eucalypts W. Austral. Goldfields* 118 (1973); *S.Kelly et al., Eucalypts* 1: t. 234 (1983).

Mallee to 6 m, spreading. Juvenile or intermediate leaves comprise the canopy, 3.5–5 cm long, 3–4.3 cm wide. Adult leaves not developing. Peduncle terete, glaucous, 8–15 mm long; pedicels terete, 4–7 mm long. Operculum 5–6 mm long, 5–8 mm wide; hypanthium 4–5 mm long, 5–8 mm wide. Fruits 10–12 mm long, 12–18 mm wide. *Silver Mallee*. Fig. 80A–B.

Occurs from near Kellerberrin E to the Coolgardie area, W.A., near granite outcrops. Regions: BENC, LEON. Map 303.

W.A.: Yorkrakine Rock, *M.I.H.Brooker* 1793 (PERTH); Yorkrakine Rock, *G.M.Chippendale* 91 (FRI, NSW, MEL, PERTH).

A spreading, low mallee with a canopy of usually sessile, orbicular or ovate juvenile and intermediate leaves.

285b. *Eucalyptus crucis* subsp. *lanceolata* Brooker & Hopper, *Nuytsia* 4: 120 (1982)

T: Chiddarcoop Rock, W.A., 24 Aug. 1979, *M.I.H.Brooker* 6484; holotype: FRI; isotype: NSW, PERTH.

Illustrations: *M.I.H.Brooker & S.D.Hopper, op. cit.* t. 7 & 8; *S.Kelly et al., Eucalypts* 1: t. 257 (1983).

Mallee to 15 m, erect. Adult leaves: lamina 5–10 cm long, 0.8–2 cm wide; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 5–15 mm long. Peduncle terete, 8–18 mm long; pedicels terete, 3–7 mm long. Operculum 5–6 mm long, 4–5 mm wide; hypanthium 4–5 mm long and wide. Fruits 7–16 mm long, 10–15 mm wide. Fig. 80C–D.

Occurs N of Kellerberrin in the area around Nungarin and Mukinbudin, W.A., in shallow soil around granite outcrops. Region: BENC. Map 304.

W.A.: Dajoing Rock, *M.D.Crisp 6545* (FRI); Jouerdine Hill, *S.D.Hopper 1022* (FRI).

Differs from subsp. *crucis* in canopy of lanceolate or narrowly lanceolate adult leaves.

286. *Eucalyptus caesia* Benth., *Fl. Austral.* 3: 227 (1867)

T: W.A., *J.Drummond 5: suppl. 36*; holo: K: iso: BM, CGE, FI, G, MEL, W.

Mallee to 10 m. Bark at first smooth, red-brown, later deciduous in longitudinally curling flakes. Juvenile leaves alternate, petiolate, orbicular or cordate, shining, green. Adult leaves alternate, lanceolate, sometimes falcate, grey-green; petiole glaucous. Umbels 3-flowered, pendulous. Buds clavate, glaucous; operculum conical; hypanthium obconical or campanulate. Fruits urceolate or campanulate, glaucous, striate; disc descending; valves 5 or 6, included. Seeds irregularly crescent-shaped, grey-black.

Occurs in scattered localities in inland south-western W.A. on or around granite outcrops. A distinctive species with large, urceolate or campanulate glaucous fruits. There are 2 subspecies.

Fruits usually urceolate; buds up to 30 mm long

286a. subsp. *caesia*

Fruits usually campanulate; buds up to 40 mm long

286b. subsp. *magna*

286a. *Eucalyptus caesia* Benth. subsp. *caesia*

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 119, 120 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 37 (1983).

Mallee to 10 m. Adult leaves: lamina 7–12 cm long, 1.2–2.5 cm wide, acute or acuminate; lateral veins faint, at 30°–40°; intramarginal vein faint, almost confluent with margin; petiole 1–4 cm long. Peduncle terete, 20–30 mm long; pedicels 10–30 mm long. Operculum 8–10 mm long, 10–12 mm wide; hypanthium 8–12 mm long, 10–12 mm wide. Fruits urceolate, 20–30 mm long, 18–25 mm wide. *Gungurru*. Figs 30, 80E–F.

Occurs in scattered localities between Wongan Hills, Boyagin and E beyond Bonnie Rock, south-western W.A., on or around granitic rocks. Regions: BENC, LUWN. Map 305.

W.A.: Boyagin Rock, *M.I.H.Brooker 1858* (FRI, NSW, PERTH); Mt Caroline, *J.W.Green 1355* (FRI, PERTH).

Distinguished from related species by the large glaucous buds and fruits. Usually a smaller and less pendulous plant than subsp. *magna*. Has been cultivated in many parts of Australia and in California; its red filaments and large glaucous buds and fruits are most attractive.

The common name *Gungurru*, discussed by S.D.Hopper *et al.*, *Nuytsia* 5 : 179 (1984), is well established for this taxon.

S.D.Hopper & M.A.Burgman, Cladistic and phenetic analyses of phylogenetic relationships among populations of *Eucalyptus caesia*, *Austral. J. Bot.* 31: 35–49 (1983).

286b. *Eucalyptus caesia* subsp. *magna* Brooker & Hopper, *Nuytsia* 4: 117 (1982)

T: Chutawalakin Hill, W.A., 24 Aug. 1979, *M.I.H.Brooker 6488*; holo: FRI; iso: PERTH.

Illustrations: M.I.H.Brooker & S.D.Hopper, *op. cit.* 115, 118; S.Kelly *et al.*, *Eucalypts* 1: t. 254 (1983).

Mallee to 10 m. Adult leaves: lamina 15–24 cm long, 2.5–5 cm wide, acuminate; lateral veins faint, at 35°–45°; intramarginal vein almost confluent with margin; petiole 2–6 cm long. Peduncle terete, pendulous, 30–45 mm long; pedicels 10–33 mm long. Operculum 16–22 mm long, 20–25 mm wide; hypanthium obconical, 10–20 mm long, 20–25 mm wide. Fruits campanulate, 25–37 mm long, 25–40 mm wide. *Silver Princess*. Figs 5, 80G–H.

Occurs near Westonia, Warralakin and Kununoppin, W.A., on a few granite outcrops. Region: BENC. Map 306.

W.A.: Chiddarcooping Rock, *M.I.H.Brooker 6485* (FRI); Chutawalakin Hill, *G.Moran 12* (FRI).

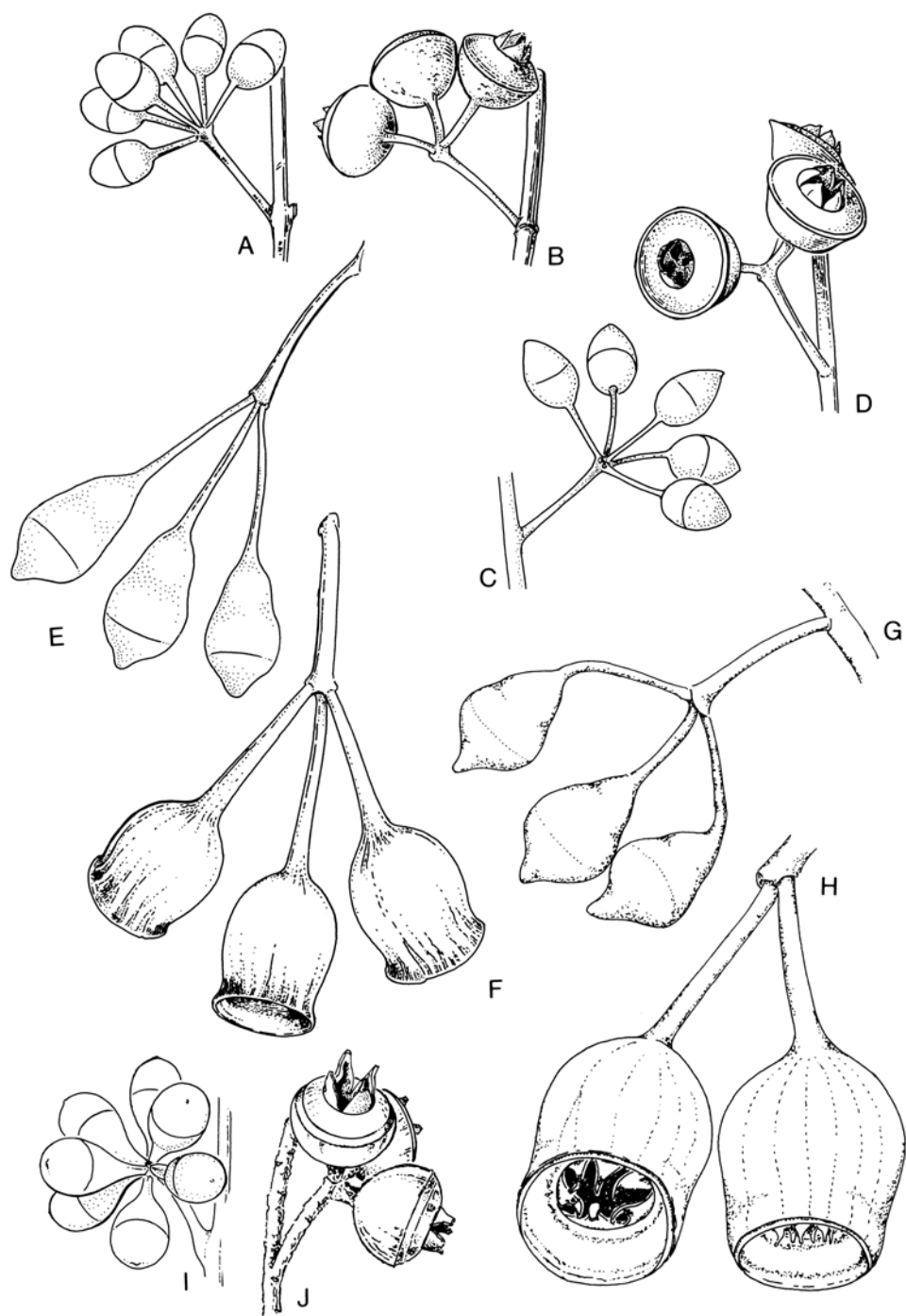


Figure 80. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. crucis* subsp. *crucis* (J.Briggs 87 & L.Pryor, FRI). **C–D**, *E. crucis* subsp. *lanceolata* (**C**, S.Hopper 1128, FRI; **D**, M.Crisp 6545, FRI). **E–F**, *E. caesia* subsp. *caesia* (**E**, cult., University of California, U.S.A., E.McClintock, FRI; **F**, G.Chippendale 333, FRI). **G–H**, *E. caesia* subsp. *magna* (**G**, S.Hopper 1038, FRI; **H**, I.Brooker 6488, FRI). **I–J**, *E. laneopolei* (I.Brooker 2552, FRI). **G**, **H** drawn by M.May. Others drawn by M.Risby.

A more robust plant than subsp. *caesia*, with pendulous branchlets and larger, glaucous, campanulate fruits. Cultivated as an ornamental, with attractive red flowers and grey buds and fruits.

287. *Eucalyptus lanepoolei* Maiden, J. & Proc. Roy. Soc. New South Wales 53: 107 (1919)

T: Beenup, W.A., 23 July 1919, *C.E.Lane-Poole 465*; holo: NSW; iso: BM, K.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 75 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 236 (1983).

Tree to 12 m. Bark smooth, white or pink-yellow, but often with deciduous red-brown flakes adhering on much of trunk. Juvenile leaves not seen. Adult leaves alternate, lanceolate, falcate, uncinata; lamina 7.5–13 cm long, 1–1.5 cm wide, green to grey-green; lateral veins faint, at 35°–45°; intramarginal vein almost confluent with margin; petiole terete, 8–10 mm long. Umbels 3–7-flowered; peduncle terete, 10–18 mm long; pedicels 4–5 mm long. Buds ovoid; operculum hemispherical, often shortly pointed, 3–5 mm long, 5–8 mm wide; hypanthium hemispherical, 4–8 mm long, 5–8 mm wide. Fruits shallowly hemispherical, 8–10 mm long, 11–14 mm wide; disc convex; valves 4 or 5, strongly exserted. Seeds orbicular to elliptic, red-grey-brown. *Salmonbark Wandoo*. Fig. 80 I–J.

Occurs from Perth to Pinjarra with several disjunct occurrences near Jurien, W.A., usually on gentle slopes in open forest. Region: LUWN. Map 307.

W.A.: 7.2 km W of [Brand] Hwy towards Jurien Bay, *M.I.H.Brooker 2552* (FRI, MEL, NSW, PERTH); Cervantes Rd, *H.Demarz 2160* (FRI, PERTH); Keysbrook, *R.D.Royce 4320* (PERTH); Armadale, *C.A.Gardner 250* (PERTH); Pinjarra, 10 Oct. 1948, *Mr. Auchterloch* (MEL).

Distinguished by small tree habit, smooth bark, often with persistent exfoliating patches, 3–7-flowered umbels, ovoid buds and shallowly hemispherical fruits. Pedicels and operculum shorter than in *E. drummondii*.

288. *Eucalyptus drummondii* Benth., *Fl. Austral.* 3: 237 (1867)

E. oldfieldii var. *drummondii* (Benth.) Maiden, *Crit. Revis. Eucalyptus* 2: 223 (1912). T: between Swan R. and King George Sound, W.A., *J.Drummond 2: 86*; lecto: K; isolecto: BM, CGE, E, NSW, W, *vide* J.H.Maiden, *Crit. Revis. Eucalyptus* 2: 224 (1912).

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 121 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 251 (1983).

Small tree to 8 m, or mallee to 3 m. Bark smooth, powdery, white or grey, deciduous in small dark flakes. Juvenile leaves alternate, shortly petiolate, elliptic, grey-green. Adult leaves alternate, elliptic to lanceolate, abruptly acuminate; lamina 5–8 cm long, 1.5–2 cm wide, dull, grey-green, glandular; lateral veins faint, at 50°–60°; intramarginal vein faint, almost confluent with margin; petiole terete, 15–20 mm long. Umbels 7-flowered; peduncle terete, 15–35 mm long; pedicels 6–12 mm long. Buds ovoid-conical, glaucous; operculum conical, 7–12 mm long, 6–10 mm wide; hypanthium hemispherical or obconical, 4–5 mm long, 6–8 mm wide. Fruits subglobular, 8–12 mm long, 10–15 mm wide; disc convex; valves 4, exserted. Seeds suborbicular to elliptic, brown. Fig. 81A–B.

Occurs from near Mary Springs southwards to near Pingelly and eastwards to Yorkrakine Rock, W.A., in hilly country in lateritic soil, sometimes over granite. Regions: BENC, LUWN. Map 308.

W.A.: 67 mile post [c. 107 km NNE of Perth], Great Northern Hwy, *K.M.Allan 719* (FRI, NSW, PERTH); 15 km NW of Mary Springs, *P.G.Wilson 6744* (FRI, PERTH); 12.9 km W of Woodanilling, *K.Newbey 2772* (PERTH); Mt Lesueur, *C.A.Gardner 15999* (PERTH).

Distinguished by white or grey powdery bark, glaucous ovoid-conical buds and subglobular fruits.

289. *Eucalyptus rameliana* F.Muell., *Fragm.* 10: 84 (1876)

T: near Alfred and Marie Range, W.A., June 1876, *E.Giles*; holo: MEL.

Illustrations: J.P.Jessop (ed.), *Fl. Central Australia* t. 304 (1981); S.Kelly *et al.*, *Eucalypts* 2: t. 255 (1983).

Mallee. Bark not known. Juvenile leaves not seen. Adult leaves alternate, petiolate, ovate-lanceolate, acuminate, thick; lamina up to 9 cm long, 3 cm wide, dull, green; venation not seen. Umbels 1-flowered; peduncle terete, 10–15 mm long; pedicel 10–15 mm long. Buds ovoid or subglobular; operculum hemispherical, rostrate; hypanthium hemispherical. Fruits not seen. Fig. 81C.

Known only from the type. Region: GBSN. Map 309.

The above description is based on that in J.P.Jessop, *loc. cit.*, which was compiled from W.F.Blakely, *Key Eucalypts* 275 (1934) and S.Kelly, *loc. cit.*

290. *Eucalyptus macrocarpa* Hook., *Icon. Pl.* 5: t. 405, 406, 407 (1842)

T: Swan R. Colony, W.A., *J.Drummond* 13; holo: K.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 122 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 233 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 243 (1983).

Mallee to 5 m, spreading or sprawling. Bark smooth throughout, grey. Juvenile leaves opposite, sessile or almost so, broadly elliptic to suborbicular, grey-green or glaucous. Adult leaves opposite, sessile, broadly ovate to elliptic-ovate, apiculate; lamina 8–12 cm long, 5–8 cm wide, glaucous; lateral veins faint, at 45°–55°; intramarginal vein up to 2 mm from margin. Umbels 1-flowered; peduncle terete, thick, glaucous, 6–10 mm long; pedicels absent. Buds ovoid; operculum conical-hemispherical, 25–35 mm long, 25–40 mm wide; hypanthium hemispherical or obconical, 15–25 mm long, 25–40 mm wide. Fruits shallowly hemispherical or turbinate, 30–50 mm long, 50–90 mm wide; disc ascending; valves 4–7, exserted. Seeds orbicular or irregularly pyramidal, ribbed on ventral surface, narrowly winged, brown. *Mottlecah*. Fig. 81D–E.

Occurs from near Eneabba S to Cataby and SE to Kulin, W.A. Grows in sand in undulating heathland. Regions: BENC, LUWN. Map 310.

W.A.: 4.8 km W of Calingiri, *M.I.H.Brooker* 2544 (FRI, MEL, PERTH); 77.2 km NNW of Gingin, *T.E.Aplin & R.Coveny* 3120 (FRI, PERTH); 0.8 km N of Piawaning, *G.M.Chippendale* 11 (FRI, PERTH); 1.6 km E of Quairading, *K.Newbey* 1630 (PERTH).

Distinguished by diffuse mallee habit, thick silvery sessile leaves, and very large solitary buds and fruits. Stamens red, rarely pink or cream. An attractive ornamental, and cultivated in California, U.S.A.

291. *Eucalyptus rhodantha* Blakely & Steedman in W.F.Blakely, E.N.McKie & H.S.Steedman, *Proc. Linn. Soc. New South Wales* 63: 68 (1938)

T: near Gunyidi, Victoria Plains, W.A., Dec. 1934, *H.Steedman s.n.*; holo: NSW.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 125 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 215 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 244 (1983).

Mallee to 3 m, spreading. Bark smooth throughout, grey-brown. Juvenile leaves opposite, sessile, ovate to orbicular, grey-green. Adult leaves opposite, sessile, orbicular, cordate, acuminate; lamina 6–8 cm long and wide, glaucous; lateral veins just visible, at 50°–65°; intramarginal vein up to 5 mm from margin. Umbels usually 1-flowered, rarely 3-flowered; peduncle terete, thick, glaucous, 10–20 mm long; pedicels glaucous, 5–20 mm long. Buds ovoid to turbinate, glaucous; operculum conical, slightly striate, 20–30 mm long, 20–40 mm wide; hypanthium hemispherical or turbinate, faintly 2-ribbed and striate, 10–25 mm long, 20–40 mm wide. Fruits hemispherical or turbinate, 20–30 mm long, 35–55 mm wide, 2-ribbed; disc flat to convex; valves 4 or 5, exserted up to 10 mm. Seeds orbicular or irregularly pyramidal, narrowly winged, ribbed on ventral side, brown. *Rose Mallee*. Fig. 81F–G.

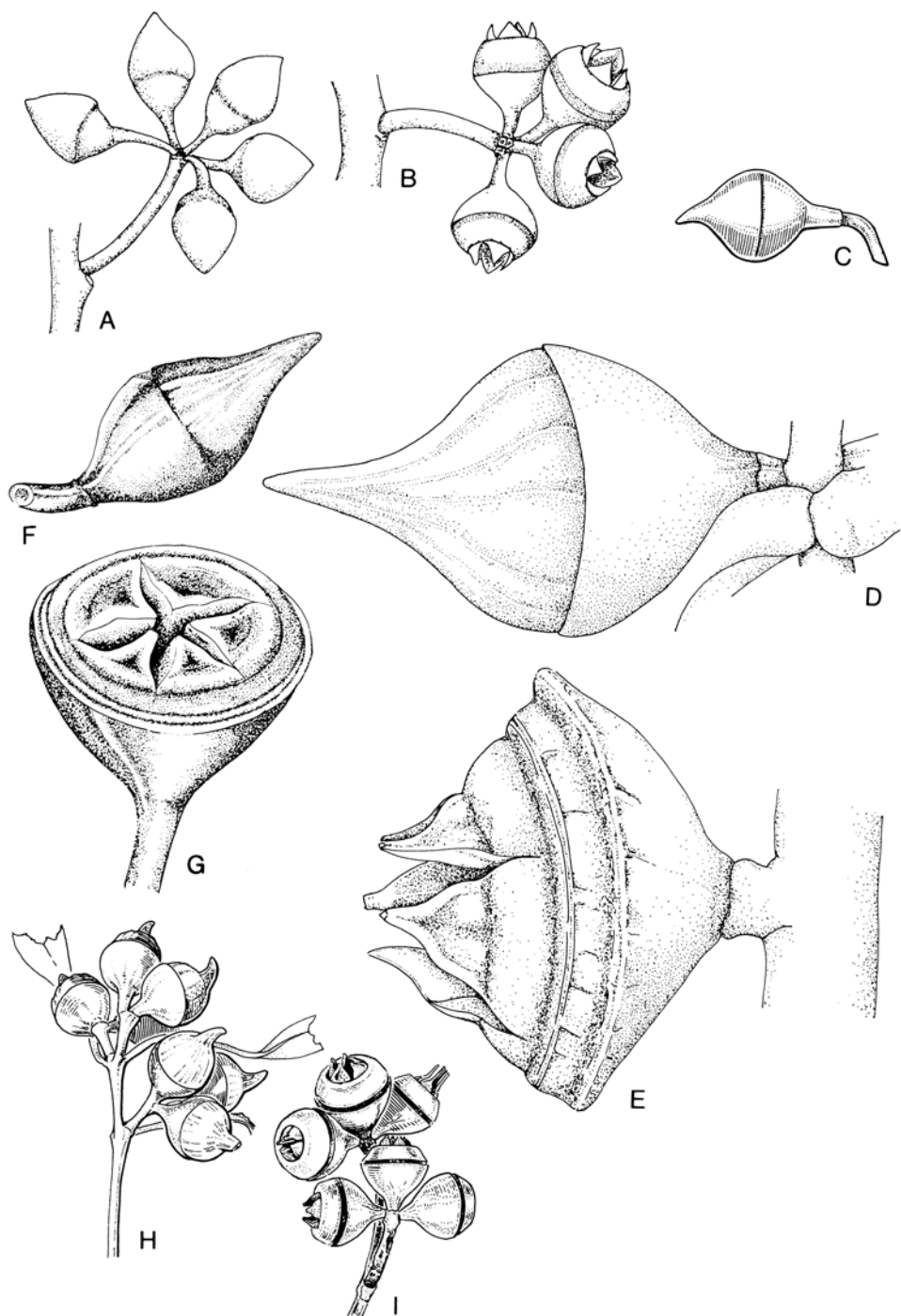


Figure 81. *Eucalyptus* buds and fruits, all $\times 1$, unless otherwise stated. **A–B**, *E. drummondii* (**A**, G.Chippendale 15, FRI; **B**, G.Chippendale 27, FRI). **C**, *E. rameliana* (after *Crit. Revis. Eucalyptus* 2: t. 76 (1912), beyond Alfred and Marie Ra., W.A., E.Giles, MEL). **D–E**, *E. macrocarpa* (**D**, R.Coveny 3120, FRI; **E**, G.Chippendale 135, FRI). **F–G**, *E. rhodantha* (G.Chippendale 33, FRI). **H–I**, *E. oldfieldii* $\times 0.5$ (**H**, E.Larsen S7102, FRI; **I**, I.Brooker 5707, FRI). **C**, **H**, **I** drawn by M.Risby. Others drawn by M.May.

Occurs from SW of Three Springs to N of Bolgart, W.A., often in small pure communities in flat and gently undulating country. Regions: BENC, LUWN. Map 311.

W.A.: 15.8 km SW of Three Springs, *K.M.Allan* 649 (FRI, NSW, PERTH); 4.4 km E of turn-off, 13.4 km S of Gunyidi siding, *G.M.Chippendale* 33 (FRI, MEL, NSW, PERTH).

Distinguished from *E. macrocarpa* by the long peduncle and pedicels and slightly smaller buds and fruits. The red filaments and silvery leaves make this a desirable shrub in gardens, particularly in drier areas.

292. *Eucalyptus oldfieldii* F.Muell., *Fragm.* 2: 37 (1860)

T: Murchison R., W.A., *A.Oldfield*; syn: K, MEL, U, W.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 126 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 197 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 253 (1983).

Mallee to 6 m or tree. Bark smooth throughout, grey-brown. Juvenile leaves alternate, petiolate, lanceolate-ovate, pale green. Adults leaves alternate, lanceolate to broadly lanceolate, acuminate; lamina 7–10 cm long, 1.2–2.5 cm wide, dull, grey-green; lateral veins clearly visible, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole terete, 15–20 mm long. Umbels 3-flowered; peduncle terete, thick, 6–12 mm long; pedicels absent or to 2 mm long. Buds globular to ovoid; operculum hemispherical, shortly rostrate, 6–10 mm long, 9–12 mm wide; hypanthium hemispherical, 5–8 mm long, 9–12 mm wide. Fruits subglobular, obconical or hemispherical, 10–12 mm long, 12–18 mm wide, usually sessile; disc ascending; valves 4, exserted. Seeds irregularly crescent-shaped or orbicular, brown. Fig. 81H–I.

Occurs in south-western W.A., extending from near Wannoo SE to the Goldfields, in undulating sandy heathland. Regions: MRCH, BENC, LEON. Map 312.

W.A.: 46.7 km N of Northampton, *K.M.Allan* 672 (FRI, MEL); Kalbarri Natl Park, *M.I.H.Brooker* 5005 (AD, FRI, MEL, NSW); 9.7 km N of Bungulla, *M.D.Tindale* 3712 (NSW, PERTH).

Distinguished by mallee habit, thick leaves, 3-flowered umbels with smooth sessile or subsessile buds, and subglobular, obconical or hemispherical fruits with robust, exserted valves.

293. *Eucalyptus burracoppinensis* Maiden & Blakely, *J. & Proc. Roy. Soc. New South Wales* 59: 178 (1925)

T: Burracoppin, W.A., 1908, *J.B.Cleland s.n.*; syn: NSW; Burracoppin, W.A., 2 July 1917, *F.M.C.Schock s.n.*; syn: MEL, NSW; halfway between Booraan siding and Burracoppin, W.A., *F.M.C.Schock* 205; syn: NSW, PERTH; Merredin, W.A., Jan. 1924, *M.Koch* 3020; syn: K, NSW; Carrabin, Weston Rd, W.A., 7 Oct. 1922, *C.A.Gardner* 1852 [cited as 1825]; syn: NSW, PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 128 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 117 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 249 (1983).

Mallee to 6 m, diffuse. Bark smooth, grey, except lower trunk where rough, persistent. Juvenile leaves alternate, petiolate, lanceolate, green. Adult leaves alternate, lanceolate, acuminate; lamina 8–11 cm long, 1.5–2 cm wide, light green; lateral veins faint, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole terete, 15–20 mm long. Umbels 3-flowered; peduncle flattened, 10–25 mm long; pedicels thick, 6–12 mm long. Buds subglobular or pyriform; operculum hemispherical, umbonate, thick, ribbed, 12–20 mm long and wide; hypanthium turbinate, ribbed, 5–10 mm long, 12–18 mm wide. Fruits turbinate, slightly ribbed, 12–20 mm long, 15–25 mm wide; disc often concave, steeply ascending; valves 4 or 5, exserted. Seeds irregularly crescent-shaped, narrowly winged, slightly ridged on ventral surface, brown. *Burracoppin Mallee*. Fig. 82A–B.

Occurs in the central wheatbelt, W.A., from E of Pithara S almost to Bendering in open heathland, often in thickets, in sandy and gravelly soil on flat and slightly undulating areas. Regions: BENC, ESPR. Map 313.

W.A.: 8.9 km S of Yorkrakine, *G.M.Chippendale* 73 (FRI, NSW, PERTH); 2.7 km W of Merredin, *M.D.Tindale* 3830 (FRI, NSW, PERTH).

Distinguished from *E. oldfieldii* by the pedunculate ribbed buds and broadly turbinate woody fruits with almost vertical disc.

294. *Eucalyptus pyriformis* Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 22(2): 22 (1849)

T: Swan R. Colony, W.A., *J.Drummond* 4: 69; holo: KW; iso: BM, K, MEL.

E. pruinosa Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 22(2): 23 (1849), *nom. illeg. non* Schauer (1843); *E. macrocalyx* Turcz., *Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersburg* 10: 339 (1852) based on *E. pruinosa* Turcz. T: Swan R. Colony, W.A., *J.Drummond* 4: 70; iso: K.

E. erythrocalyx Oldfield & F.Muell. ex F.Muell., *Fragm.* 2: 32 (1860). T: between Port Gregory & Murchison R., W.A., *A.Oldfield*; holo: n.v.; iso: K.

E. pyriformis var. *elongata* Maiden, *Crit. Revis. Eucalyptus* 2: 235 (1912). T: between Lawlers & Doyles Well, W.A., June 1901, *W.V.Fitzgerald s.n.*; holo: NSW; iso: K.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 129, 130 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 31 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 245 (1983).

Mallee to 4.5 m. Bark smooth, grey to light brown. Juvenile leaves alternate, petiolate, ovate-lanceolate, sometimes orbicular, green. Adult leaves alternate, lanceolate to ovate-lanceolate, acuminate; lamina 6–8 cm long, 1.5–2.5 cm wide, light green; lateral veins faint, at 40°–50°; intramarginal vein faint, up to 1 mm from margin; petiole flattened, 12–25 mm long. Umbels 3-flowered; peduncle terete, thick, pendulous, 20–65 mm long; pedicels very thick, 8–35 mm long. Buds pyriform; operculum hemispherical, umbonate, markedly ridged, 20–40 mm long, 25–38 mm wide; hypanthium obconical or obpyramidal, ridged, 20–30 mm long, 25–38 mm wide. Fruits broadly turbinate, strongly ribbed, 25–38 mm long, 30–65 mm wide; disc steeply ascending; valves 4–6, level or exserted. Seeds irregularly pyramidal, narrowly winged, ridged on ventral surface, dark brown. *Dowerin Rose, Pear-fruited Mallee*. Figs 32, 82C–D.

Occurs from near the Murchison R. southwards to Goomalling and Cowcowing, W.A., in flat and gently undulating heathland in sandy soil. Region: BENC. Map 314.

W.A.: 4.8 km W of Dowerin, *M.I.H.Brooker* 1822 (FRI, NSW, PERTH); 6.4 km E of Manmanning, *J.W.Green* 814 (FRI, PERTH).

Distinguished by diffuse mallee habit, smooth bark, lanceolate to ovate-lanceolate leaves, thick pedicels and peduncle and large pendulous ridged buds and fruits. Cultivated in Australia, New Zealand and California, U.S.A. The filaments may be red, pink, yellow or creamy.

295. *Eucalyptus youngiana* F.Muell., *Fragm.* 10: 5 (1876)

E. pyriformis subsp. *youngiana* (F.Muell.) Boomsma, *Trans. Roy. Soc. S. Australia* 93: 161 (1969). T: Queen Victoria Spring, W.A., 1875, *J.Young s.n.*; syn: MEL; 'Fowlers Bay' [actually at Ooldea], S.A., Mar. 1875, *Police Trooper Richards*; syn: MEL.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 131 (1973); J.P.Jessop (ed.), *Fl. Central Australia* t. 305 (1981); S.Kelly *et al.*, *Eucalypts* 1: t. 246 (1983).

Tree or mallee to 11 m. Bark rough, dark grey on trunk and lower branches, smooth, grey above. Juvenile leaves not seen. Adult leaves alternate, lanceolate, sometimes falcate, acuminate, lamina 10–15 cm long, 2–3.5 cm wide, pale green; lateral veins faint, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole terete, 20–30 mm long. Umbels 3-flowered; peduncle terete, thick, recurved, 10–20 mm long; pedicels absent or thick, to 8 mm long. Buds subglobose; operculum hemispherical or sometimes conical, strongly ribbed, 25–40 mm long and wide; hypanthium hemispherical to turbinate, strongly ribbed, 20–25 mm long, 25–35 mm wide. Fruits turbinate or hemispherical, strongly ribbed, 25–38 mm long, 35–70 mm wide; disc concave, ascending; valves 4–6, exserted. Seeds irregularly crescent-shaped, narrowly winged, ridged on ventral surface, brown or dark brown. *Large-fruited Mallee, Ooldea Mallee*. Fig. 82E–F.

Occurs from c. 160 km N of Kalgoorlie, W.A., eastwards through the Great Victoria Desert to Bulgunnia Stn, S.A.; grows in red sand and sandy loam on flat country, often associated with *Spinifex* (*Triodia* spp.). Regions: LEON, VICD. Map 315.

W.A.: 41.2 km N of Menzies, *G.M.Chippendale* 282 (FRI, NSW, PERTH). S.A.: 3 km NW of Emu, *G.Brooks* 19 (AD, FRI).

Distinguished by the taller habit, rough bark, shorter peduncle and pedicels and more coarsely ribbed buds and fruits. Staminal filaments red or pale yellow.

296. *Eucalyptus pachyphylla* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 98 (1859)

T: Hooker Ck, [N.T.], Feb. 1856, *F.Mueller*; holo: MEL; iso: K.

Illustrations: J.Turner & M.I.H.Brooker, *Forest Tree Ser.* No. 207 (1978); J.P.Jessop (ed.), *Fl. Central Australia* t. 306 (1981); S.Kelly *et al.*, *Eucalypts* 1: t. 247 (1983).

Mallee to 4 m. Bark smooth, grey to pink-grey, deciduous in long strips. Juvenile leaves alternate, petiolate, broadly lanceolate, green. Adult leaves alternate, ovate to broadly lanceolate, acuminate; lamina 9–16 cm long, 3–4 cm wide, grey-green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 15–25 mm long. Umbels 3-flowered; peduncle terete, 5–10 mm long; pedicels 3–6 mm long. Buds globular or subglobular; operculum hemispherical, rostrate, ribbed, 15–20 mm long, 14–17 mm wide; hypanthium hemispherical or obconical, ribbed, 6–7 mm long, 14–17 mm wide. Fruits hemispherical, strongly ribbed, 15–17 mm long, 20–30 mm wide; disc concave, ascending steeply; valves 4 or 5, exserted. Seeds irregularly crescent-shaped, narrowly winged, ribbed on ventral side, red-grey-brown. *Red-bud Mallee*. Fig. 82G–H.

Occurs in the north-eastern Gibson and Tanami Deserts, W.A., through central and southern N.T. and just into Qld; grows on sand plains, sand dunes and rocky slopes in open shrubland. Regions: TNMI, GBSN, BKLY, MACD, GGNA. Map 316.

W.A.: Pollock Hills, *A.S.George* 9057 (PERTH). N.T.: 35.4 km E of Jervois Mine, *G.M.Chippendale* 1129 (BRI, NSW, NT). Qld: Glenormiston Stn, 27 Jan. 1935, *A.C.Boyle* (BRI).

Distinguished by mallee habit, thick ovate to broadly lanceolate leaves, strongly ribbed long-rostrate buds which are usually red, and woody ribbed fruits that are smaller than *E. youngiana* and *E. kingsmillii*. An attractive shrub worthy of cultivation. Staminal filaments creamy yellow or red-pink.

297. *Eucalyptus kingsmillii* (Maiden) Maiden & Blakely, *Crit. Revis. Eucalyptus* 8: 43 (1929)

E. pyriformis var. *kingsmillii* Maiden, *J. & Proc. Roy. Soc. New South Wales* 52: 508 (1919). T: near Mt Keith, 160 miles [c. 260 km] N of Leonora, W.A., July 1918, *W.Kingsmill s.n.*; holo: NSW; iso: FRI, K.

Illustrations: C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 163 (1979); J.P.Jessop (ed.), *Fl. Central Australia* t. 307 (1981); S.Kelly *et al.*, *Eucalypts* 1: t. 250 (1983).

Mallee, usually to 3 m, but up to 6 m. Bark rough, grey on trunk, and smooth, green-brown on upper trunks and branches. Juvenile leaves not seen. Adult leaves alternate, narrowly to broadly lanceolate, acuminate; lamina 7–13 cm long, 1.5–3 cm wide, dull, grey-green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 10–15 mm long. Umbels 3-flowered; peduncle terete, pendulous, 10–30 mm long; pedicels 10–20 mm long. Buds globular to subpyriform; operculum hemispherical or conical, rostrate, ribbed, 15–30 mm long, 18–35 mm wide; hypanthium hemispherical, ribbed, 10–12 mm long, 18–35 mm wide. Fruits hemispherical, 8-ribbed, 14–18 mm long, 20–30 mm wide; disc concave, steeply ascending; valves 4 or 5, exserted. Seeds irregularly pyramidal, narrowly winged, ridged on ventral side, red-grey-brown. *Kingsmill's Mallee*. Fig. 82 I–J.

Occurs from the Hamersley Ra., W.A., SW to Mt Keith and eastwards into S.A., in red and brown sand on plains. Regions: PILB, LEON, GBSN, VICD. Map 317.

W.A.: 17.7 km E of Meekatharra, *M.I.H.Brooker* 2003 (FRI, PERTH); 38.6 km SW of Warburton Mission, *A.S.George* 8721 (FRI, PERTH). S.A.: Serpentine Lakes, *N.N.Donner* 3950 (AD, FRI).

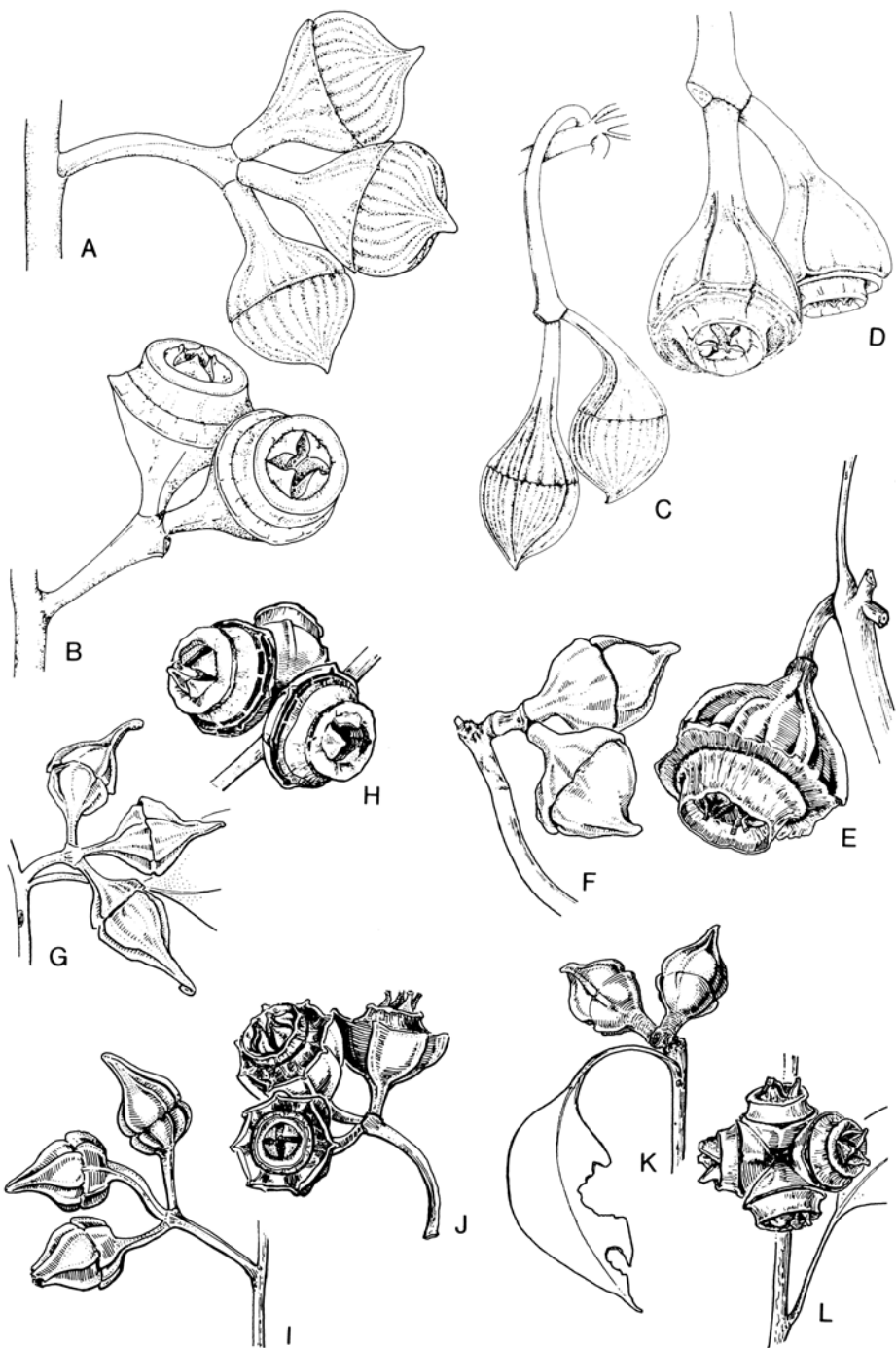


Figure 82. *Eucalyptus* buds and fruits, all $\times 1$, unless otherwise stated. **A–B**, *E. burracoppinensis* (**A**, C.Gardner 10329, FRI; **B**, L.Pryor 84, FRI). **C–D**, *E. pyriformis* $\times 0.5$ (J.Briggs 243, FRI). **E–F**, *E. youngiana* $\times 0.5$ (Ooldea, S.A., H.Deane, FRI). **G–H**, *E. pachyphylla* (**G**, 326.4 km N of Alice Springs, N.T., W.Bateman & C.Carter, FRI; **H**, J.Maconochie 111, FRI). **I–J**, *E. kingsmillii* (**I**, I.Brooker 4549, FRI; **J**, J.Baker 108, FRI). **K–L**, *E. sessilis* (**K**, I.Brooker 5080, FRI; **L**, D.Boland 1254, FRI). **A–D** drawn by M.May. Others drawn by M.Risby.

Differs from *E. pachyphylla* in the longer peduncle and pedicels and the larger buds. Staminal filaments cream.

298. *Eucalyptus sessilis* (Maiden) Blakely, *Key Eucalypts* 276 (1934)

E. pachyphylla var. *sessilis* Maiden, *Crit. Revis. Eucalyptus* 5: 14 (1922). T: Glen of Palms [Palm Valley], N.T., 1872, *E. Giles*; holo: MEL; iso: NSW.

Illustrations: J. Turner & M.I.H. Brooker, *Forest Tree Ser.* No. 208 (1978); J.P. Jessop (ed.), *Fl. Central Australia* t. 308 (1981); S. Kelly *et al.*, *Eucalypts* 1: t. 248 (1983).

Mallee to 4 m. Bark smooth, grey-brown, deciduous in strips which accumulate at base. Juvenile leaves alternate, petiolate, ovate, green. Adult leaves alternate, ovate-lanceolate to broadly lanceolate, acuminate; lamina 8–19 cm long, 2–4.5 cm wide, dull, grey-green; lateral veins faint, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole terete or flattened, 12–30 mm long. Umbels 7-flowered; peduncle terete, thick, 3–6 mm long; pedicels absent or very short. Buds ovoid; operculum conical or hemispherical, rostrate, ribbed, 10–12 mm long, 8–12 mm wide; hypanthium hemispherical, 9–10 mm long, 8–12 mm wide. Fruits subglobular or hemispherical, ribbed, 14–21 mm long, 16–20 mm wide; disc ascending steeply; valves 4 or 5, exserted. Seeds irregularly crescent-shaped or subpyramidal, narrowly winged, ridged on ventral surface, red-grey-brown. Fig. 82K–L.

Occurs in southern N.T., extending to the Walter James Ra., W.A. Grows on slopes of quartzite and sandstone, and sometimes on stony plains in open shrubland. Region: MACD. Map 318.

W.A.: Walter James Ra., *J.R. Maconochie 1390* (FRI). N.T.: James Ra., *M.I.H. Brooker 5085* (BRI, FRI, MEL, NT); Standley Chasm, *G.M. Chippendale 4004* & *L.A.S. Johnson* (AD, BRI, CANB, MEL, NSW, NT, PERTH).

Distinguished from related species by the sessile buds in 7-flowered umbels. Staminal filaments cream.

Ser. 63 *Heterostemon*

***Eucalyptus* ser. *Heterostemon* Benth., *Fl. Austral.* 3: 190, 209 (1867).**

Type: *E. gracilis* F. Muell., lecto, *fide* G.M. Chippendale, *Fl. Australia* 19: 498 (1988).

E. ser. Porantherae F. Muell., *Syst. Census Austral. Pl.* 57, 533 (1882) *p.p.*, not as to lecto.

E. subsect. Graciles Maiden, *Crit. Revis. Eucalyptus* 6: 525, 533 (1923) *p.p.*; as to type. T: *E. gracilis* F. Muell.

E. ser. Aridae Blakely, *Key Eucalypts* 63, 264 (1934). T: *E. gracilis* F. Muell.

Mallees or trees. Bark smooth, grey throughout, or with rough, fibrous or flaky, dark grey bark on lower trunk or at base. Juvenile leaves alternate, petiolate, dull, grey-green or glaucous, concolorous. Adult leaves alternate, petiolate, shining, green, or dull, grey-green, often with conspicuous black oil glands, concolorous. Conflorences axillary, simple, usually 7-flowered umbels. Buds pyriform, clavate, oblong, ovoid or suburceolate. Outer stamens sterile. Fruits ovoid, urceolate, suburceolate or cylindrical; disc broad, descending steeply; valves 3 or 4, occasionally 5, included. Seeds elliptic, reticulate, red-brown.

A series of 5 species in southern W.A., southern S.A., south-western N.S.W. and north-western Vic. Characterised especially by the smooth or sometimes rough bark, concolorous leaves, simple 7-flowered umbels, red-brown seeds and the sterile outer stamens.

M.I.H. Brooker, New species and subspecies of the informal '*Eucalyptus* series *Calycogonae*' Pryor & Johnson (*Eucalyptus* series *Aridae* Blakely—Myrtaceae), *Nuytsia* 5: 357–371 (1986).

299. *Eucalyptus gracilis* F.Muell., *Trans. & Proc. Victorian Inst. Advancem. Sci.* 35 (1855)

E. calycogona var. *gracilis* (F.Muell.) Maiden, *Crit. Revis. Eucalyptus* 1: 79 (1803). T: Murray Scrub, S.A., Dec. 1848, *F.Mueller s.n.*; lecto: MEL, *fide* J.H.Willis, *Muelleria* 1: 166 (1967); isoleccto: G, K, NSW.

E. gracilis var. *breviflora* Benth., *Fl. Austral.* 3: 211 (1867). T: Darling and Murray Desert, S.A., *F.Mueller s.n.*; holo: K.

E. gracilis var. *erecta* Blakely, *Key Eucalypts* 266 (1934). T: Memory Cove, Port Lincoln, S.A., Jan. 1907, *J.H.Maiden*; holo: NSW; iso: AD, BM, K, PERTH.

E. gracilis var. *viminea* Blakely, *Key Eucalypts* 266 (1934). T: near Griffith, N.S.W., Aug. 1928, *W.F.Blakely & D.W.C.Shiress s.n.*; holo: NSW.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 133 (1973); L.Costermans, *Native Trees & Shrubs S.E. Australia* 376 (1981); S.Kelly *et al.*, *Eucalypts* 1: t. 223 (1983).

Tree or mallee to 18 m. Bark rough, flaky, grey at base of trunk up to 2 m, then smooth, grey or red-brown above. Juvenile leaves linear to lanceolate, green to grey-green. Adult leaves narrowly lanceolate, uncinat; lamina 5–8 cm long, 0.8–1.5 cm wide, shining, green; lateral veins faint, at 25°–30°; intramarginal vein up to 2 mm from margin; petiole terete, 7–14 mm long. Peduncle quadrangular, 5–10 mm long; pedicels terete, 2–5 mm long. Buds clavate; operculum saucer-shaped or hemispherical, 1–2 mm long, 3–4 mm wide; hypanthium obconical, 3–4 mm long, 4–5 mm wide. Fruits ovoid or suburceolate, 4–7 mm long, 3–5 mm wide; valves 3 or 4. *Snap-and-rattle, Red Mallee, Yorrell.* Fig. 83A–B.

Widespread in southern W.A. except towards the W coast, in southern S.A., south-western N.S.W. and north-western Vic. Usually grows on flat areas of sandy soil in tall shrubland, open woodland and forest. Regions: BENC, LEON, ESPR, VICD, NULL, TRNS, EYRE, DARL, RIVR. Map 319.

W.A.: 54.7 km from Caiguna towards Balladonia, *M.E.Phillips* 270 (CBG, NSW, PERTH); 34 km W of Balladonia, *P.G.Wilson* 6023 (BRI, FRI, PERTH). S.A.: Spring Dam, S of Yunta, *M.I.H.Brooker* 2805 (FRI, NSW). N.S.W.: 11.3 km N of Balranald, *C.W.E.Moore* 6071 (CANB, NSW). Vic.: 33.8 km N of Linga, *R.Filson* 7350 (MEL).

Distinguished by the rough, flaky bark on the lower trunk, shining green leaves, non-angular buds with short hemispherical operculum and thin-rimmed fruits. A useful arid zone species for firewood and erosion control.

300. *Eucalyptus yilgarnensis* (Maiden) Brooker, *Nuytsia* 5: 366 (1986)

E. gracilis var. *yilgarnensis* Maiden, *J. & Proc. Roy. Soc. New South Wales* 52: 489 (191). T: Yilgarn and Coolgardie Goldfields, W.A., May 1901, *E.Pritzel* 332; holo: NSW; iso: BM, G, K, W.

Illustrations: J.H.Maiden, *Crit. Revis. Eucalyptus* 1: t. 12 figs h, i, k, l (1903); M.I.H. Brooker, *op. cit.* 367–369.

Tree or mallee to 6 m. Bark rough, fibrous or flaky, dark grey on lower trunk, then smooth, bronze or grey above, rarely smooth throughout. Juvenile leaves broadly lanceolate or ovate, dull, grey-green. Adult leaves narrowly lanceolate, uncinat; lamina 5–9 cm long, 0.7–1.5 cm wide, shining, green; lateral veins faint, at 20°–30°; intramarginal vein up to 2 mm from margin; petiole terete, 7–12 mm long. Peduncle slender, quadrangular, 6–14 mm long; pedicels terete, 2–8 mm long. Buds oblong, ovoid, pyriform or clavate; operculum shallowly conical or hemispherical, apiculate, 1–2 mm long, 2–3 mm wide; hypanthium cylindrical to suburceolate, 2–4 mm long, 2–3 mm wide. Fruits ovoid to suburceolate, 4–5 mm long, 3–4 mm wide; valves usually 4. Fig. 83C–D.

Occurs from Koorda E to Zanthus, extending S to Lake Varley and Kumarl, W.A., in sandy soil in low open woodland. Regions: BENC, ESPR, LEON. Map 320.

W.A.: 92 km E of Hyden, *D.F.Blaxell* W75/31 (FRI, NSW); 14.8 km SE of Coolgardie, *G.M.Chippendale* 139 (FRI, MEL, NSW PERTH); 14.5 km W of Karalee, *R.Filson* 8940 (AD, MEL, PERTH).

Juvenile leaves broader, buds and fruits usually smaller than those of *E. gracilis* and pedicels longer.

301. *Eucalyptus calycogona* Turcz., Bull. Cl. Phys.-Math. Acad. Sci. Saint-Petersburg 10: 338 (1852)

T: Swan R. Colony, W.A., 1849, *J.Drummond* 5: 184; holo: KW; iso: BM, FI, K, MEL, PERTH, W.

E. calycogona var. *spaffordii* Blakely, *Key Eucalypts* 265 (1934). T: Yeelanna, S.A., June 1917, *W.J.Spafford s.n.* [given as Stafford by Blakely]; syn: NSW.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 134, 135 (1973); L.Costermans, *Native Trees & Shrubs S.E. Australia* 375 (1981); S.Kelly *et al.*, *Eucalypts* 1: t. 221 (1983).

Mallee, sometimes a small tree, to 8 m. Bark smooth, grey throughout, often with ribbons or flakes of shedding bark on lower trunk. Juvenile leaves narrowly lanceolate to ovate, grey-green. Adult leaves narrowly lanceolate to lanceolate, uncinata; lamina 6–10 cm long, 1–2 cm wide, shining, green; lateral veins faint, at 25°–35°; intramarginal vein up to 3 mm from margin; petiole terete, 8–15 mm long. Peduncle slightly flattened, 5–10 mm long; pedicels quadrangular, 2–5 mm long. Buds oblong or suburceolate, 4-angled; operculum conical or pyramidal, sometimes umbonate, 4–5 mm long and wide; hypanthium obpyramidal, 5–10 mm long, 4–5 mm wide. Fruits oblong or suburceolate, 4-angled, 5–15 mm long, 5–8 mm wide; valves 3 or 4. *Gooseberry Mallee*. Fig. 83E–F.

Widespread in southern W.A. from about Wongan Hills E to Zanthus and S to the south coast, and from Cummins, S.A., to near Koraleigh, south-western N.S.W. and near Kerang, north-western Vic. Grows in sandy loam or gravelly soil usually on flat or slightly undulating areas in open forest and woodland. Regions: BENC, LEON, ESPR, EYRE, TRNS, RIVR. Map 321.

W.A.: 24.1 km NW of Merredin, *M.I.H.Brooker* 1815 (FRI, PERTH); 1.5 km S of Kumarl, *G.M.Chippendale* 389 (BRI, FRI, MEL, NSW, PERTH). S.A.: 13.1 km N of Mallala, *G.M.Chippendale* 1350 & *M.J. Brennan* (AD, BRI, FRI, MEL, NSW.). N.S.W.: 2 km from Koraleigh towards Tooleybuc, *J.D.Turner* 542 (FRI). Vic.: 8–9.7 km W of Nyah West, *C.W.E.Moore* 3647 (CANB, MEL, NSW).

Distinguished by the smooth bark and 4-angled buds and fruits. Resembles *E. celastroides* which has non-angular fruit.

302. *Eucalyptus celastroides* Turcz., Bull. Cl. Phys.-Math. Acad. Sci. Saint-Petersburg 10: 338 (1852)

E. calycogona var. *celastroides* (Turcz.) Maiden, *Crit. Revis. Eucalyptus* 1: 79 (1903). T: Swan R. Colony, W.A., 1849, *J.Drummond* 5: 34; holo: KW; iso: BM, K, NSW, PERTH, W.

Mallee, rarely a tree to 5 m. Bark rough, fibrous or flaky, grey on lower trunk, then smooth, grey or grey-brown above, or smooth, grey throughout. Juvenile leaves ovate, grey-green or glaucous. Adult leaves lanceolate or narrowly lanceolate. Buds clavate; operculum conical or hemispherical-apiculate. Fruits urceolate; valves usually 4.

Occurs in south-western W.A. extending E to the W edge of the Nullarbor Plain. Differs from *E. calycogona* mainly in the non-angular hypanthium. There are 2 subspecies.

Adult leaves grey-green or glaucous

302a. subsp. *celastroides*

Adult leaves shining, green

302b. subsp. *virella*

302a. *Eucalyptus celastroides* Turcz. subsp. *celastroides*

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 135, 136 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 234 (1983).

Bark rough, fibrous, dark grey on lower trunk, then smooth, grey or grey-brown above. Adult leaves lanceolate, uncinata; lamina 6–11 cm long, 1–1.5 cm wide, grey-green or glaucous; lateral veins faint, at 20°–30°; intramarginal vein up to 2 mm from margin; petiole terete, 10–18 mm long. Peduncle quadrangular, 7–10 mm long; pedicels terete, 2–5 mm long. Buds usually glaucous; operculum 2–3 mm long, 3–4 mm wide; hypanthium cylindrical or obconical, sometimes slightly angled or ribbed, 5–6 mm long, 3–4 mm wide. Fruits usually glaucous, 6–8 mm long, 4–6 mm wide. *Mirret*. Fig. 83G–H.

Occurs in the eastern Goldfields, W.A., in sandy loam and clayey soil on flat or slightly undulating country in open forest and woodland. Regions: LEON, ESPR. Map 322.

W.A.: 80 km N of Coolgardie, *J.S.Beard* 6246 (NSW, PERTH); 53.1 km E of Karonie, *M.I.H.Brooker* 2464 (FRI, MEL, NSW, PERTH); Kalgoorlie, Sept. 1909, *J.H.Maiden* (FRI, NSW, PERTH).

Distinguished by fibrous, dark grey bark on lower trunk, grey-green or glaucous leaves, and usually glaucous buds and fruits.

302b. *Eucalyptus celastroides* subsp. *virella* Brooker, *Nuytsia* 5: 359 (1986)

T: 13.2 km NE of Calingiri on Wongan Hills road, W.A., 28 Aug. 1983, *M.I.H.Brooker* 8283; holo: PERTH; iso: AD, BRI, FRI, K, MEL, NSW.

Illustrations: *M.I.H.Brooker, op. cit.* 360–362.

Bark smooth, grey throughout, or rough, grey, flaky on lower trunk. Adult leaves narrowly lanceolate, uncinata; lamina 5–9 cm long, 0.6–1 cm wide, shining, bright green; lateral veins faint, at 20°–30°; intramarginal vein up to 1 mm from margin; petiole terete, 5–10 mm long. Peduncle slender, terete to quadrangular, 7–9 mm long; pedicels terete to quadrangular, 2–5 mm long. Operculum 2–3 mm long, 3–4 mm wide; hypanthium cylindrical, obconical or suburceolate, 4–5 mm long, 3–4 mm wide. Fruits 6–8 mm long, 4–5 mm wide. Fig. 83 I–J.

Occurs from Walkaway to Ongerup and E to Southern Cross and almost to Esperance, W.A., in sandy soil, usually on flat country. Regions: BENC, ESPR. Map 323.

W.A.: 13.2 km SW of Three Springs, *M.I.H.Brooker* 2369 (FRI, MEL, PERTH); 17.2 km S of Burakin, *G.M.Chippendale* 66 (AD, FRI, MEL, PERTH); 3.2 km NW of Ongerup, *K.Newbey* 117 (PERTH).

Differs from subsp. *celastroides* in the non-glaucous branchlets, leaves, buds and fruits and shorter peduncle. Intermediate forms occur where the subspecies overlap in distribution.

303. *Eucalyptus brevipes* Brooker, *Nuytsia* 5: 365 (1986)

T: c. 0.2 km S of Cunderin Hill, W.A., 20 July 1983, *M.I.H.Brooker* 8242; holo: PERTH; iso: AD, FRI, K, MEL, NSW.

Illustrations: *M.I.H.Brooker, op. cit.* 363–365 (1986).

Mallee to 5 m. Bark rough, hard to 1 m at base of trunk, then smooth, grey or salmon pink above. Juvenile leaves linear to narrowly lanceolate, dull, green. Adult leaves linear, uncinata; lamina 7–10 cm long, 0.6–0.8 cm wide, shining, green; lateral veins faint, at 15°–20°; intramarginal vein up to 1 mm from margin; petiole terete or slightly flattened, 6–9 mm long. Peduncle terete or angular, 3–5 mm long; pedicels angular, 3–4 mm long. Buds clavate; operculum conical, sometimes apiculate, 2–3 mm long, 3–4 mm wide; hypanthium obconical, sometimes ribbed, 2–4 mm long, 3–4 mm wide. Fruits cylindrical, 5–7 mm long, 5–6 mm wide; valves 4. Fig. 83K–L.

Occurs in a restricted area NE of Mukinbudin, W.A., in sand or sandy loam in low open woodland. Region: BENC. Map 324.

W.A.: Echo Valley road, S of Yanneymooning Hill, *M.I.H.Brooker* 7970 (FRI, MEL, NSW, PERTH).

Differs from other species of the series mainly in its short peduncle.

Ser. 64 Porantherae

***Eucalyptus* ser. *Porantherae* Benth., *Fl. Austral.* 3: 191, 213 (1867).**

Type: *E. uncinata* Turcz., lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 503 (1988).

E. ser. Normales Benth., *op. cit.* 191, 213. T: not designated.

E. sect. Terminales Maiden, *Crit. Revis. Eucalyptus* 6: 530 (1924) *p.p.* T: not designated.

E. ser. Fruticosa Blakely, *Key Eucalypts* 53, 221 (1934). T: not designated.

[*E. ser. Foecundae* Pryor & Johnson, *Class. Eucalypts* 47 (1971), *nom. inval.* T: *E. foecunda* Schauer]

Mallees, sometimes trees. Bark smooth throughout or rough to 4–5 m. Juvenile leaves opposite or decussate, usually sessile, grey-green or glaucous. Adult leaves alternate, petiolate, shining or dull, green, concolorous, uncinat, often with prominent oil glands. Conflorences axillary, simple, 7–15-flowered umbels. Buds fusiform, ovoid-conical or clavate. Fruits hemispherical, subglobular, cylindrical, ovoid or obconical; disc broad, descending, rarely level, grey or white; valves 3 or 4, usually exserted, rarely just included. Seeds elliptic, reticulate, with shallow longitudinal grooves on dorsal side, red-brown or brown.

A series of 7 species in western and southern W.A., southern S.A., south-western N.S.W. and north-western Vic., characterised especially by the smooth or sometimes rough bark, concolorous leaves, simple 7–15-flowered umbels and the grey or white disc of the fruit.

M.I.H.Brooker, Seedling morphology and classification in the *Bisectae* group of Eucalypts, *Austral. J. Bot.* 18: 67–75 (1970); M.I.H.Brooker, A Revision of the Informal Series *Foecundae* Pryor and Johnson of the Genus *Eucalyptus* L'Hérit. and Notes on Variation in the Genus, *Brunonia* 2: 125–170 (1979).

304. *Eucalyptus rigidula* Maiden, *Crit. Revis. Eucalyptus* 7: 403 (1928)

E. angusta Maiden, *Crit. Revis. Eucalyptus* 6: 265 (1924), *nom. illeg. non Velen.* (1885). T: Comet Vale, W.A., Sept. 1909, *J.H.Maiden s.n.*; *holo:* NSW; *iso:* FRI, K.

E. uncinata var. *rostrata* Benth., *Fl. Austral.* 3: 216 (1867) *p.p.* T: mouth of Murchison R., W.A., *A.Oldfield*; *syn:* G, K, MEL, W; Yakinu, Murchison, W.A., *A.Oldfield*; *syn:* K; estuary of Murchison R., W.A., *A.Oldfield*; *syn:* K.

E. uncinata var. *?major* Benth., *Fl. Austral.* 3: 216 (1867). T: Murchison, W.A., *A.Oldfield*; *n.v.*

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 137 (1973); M.I.H.Brooker, *Brunonia* 2: 141–144 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 198 (1983).

Mallee to 5 m. Bark smooth, brown to grey-brown, often with ribbons of shedding bark accumulated at base of stems. Juvenile leaves decussate or opposite, narrowly lanceolate to lanceolate, green, discolorous. Adult leaves narrowly lanceolate, thick; lamina 7–11 cm long, 0.8–1.8 cm wide, green; lateral veins faint, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole terete or flattened, 10–15 mm long. Umbels 7–11-flowered; peduncle slightly flattened or angular, 7–12 mm long; pedicels angular or quadrangular, 2–4 mm long. Buds fusiform; operculum conical, 5–6 mm long and wide; hypanthium obconical, 4–5 mm long, 5–6 mm wide. Fruits hemispherical, subglobular or ovoid, 6–8 mm long, 5–6 mm wide; valves exserted. *Stiff-leaved Mallee.* Fig. 83M–N.

Widespread in south-western W.A. from the lower Murchison R. to Grass Patch and inland to the edge of the Great Victoria Desert. Grows usually in yellow sand, sometimes in gravelly soil, in heathland and shrubland. Regions: BENC, LEON, ESPR, NULL. Map 325.

W.A.: 8 km N of Calingiri, *M.I.H.Brooker* 2545 (BRI, FRI, MEL, NSW, PERTH); 5.8 km W of Bodallin, *G.M.Chippendale* 99 (AD, FRI, MEL, NSW, PERTH); 35.4 km NE of Laverton, *A.S.George* 2827 (FRI, PERTH).

Distinguished from related species especially by the larger buds and fruits.

305. *Eucalyptus foecunda* Schauer in J.G.C.Lehmann, *Pl. Preiss.* 1: 130 (1844)

T: Fremantle, W.A., Aug. 1839, *L.Preiss* 231; *iso:* G, NSW, W.

E. oleosa F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 127 (1856) *p.p.* not as to lectotype. T: Marble Ra., S.A., *C.Wilhelmi*; *syn:* MEL, U; Murray Scrub, S.A., *H.Behr s.n.*; *isosyn:* MEL, U.

E. leptophylla F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 123 (1856). T: Murray Scrub, S.A., *H.Behr s.n.*; *holo:* U.

E. uncinata var. *rostrata* Benth., *Fl. Austral.* 3: 216 (1867) *p.p.* T: Phillips Ra., W.A., *G.Maxwell*; *syn:* K.

E. desertorum Naudin, *Descr. Emploi Eucalyptus introd. Europe* 56 (1891). T: cultivated Villa Thuret, Antibes, France, 1889, *M.Naudin s.n.*; *syn:* P (3 specimens).

E. leptophylla var. *densa* Blakely, *Key Eucalypts* 222 (1934). T: Nymagee, N.S.W., Oct. 1903,

J.L.Boorman s.n.; holotype: NSW; isotype: BM, FRI, K.

E. leptophylla var. *leptorhyncha* Blakely, *Key Eucalypts* 222 (1934). T: S of Fremantle, W.A., 9 Mar. 1920, *T.W.C.Schock s.n.*; holotype: NSW; isotype: FRI.

E. leptophylla var. *floribunda* Blakely, *Trans. & Proc. Roy. Soc. S. Australia* 60: 155 (1936). T: Mt Churchman, 50 miles [80 km] NW of Knutsford, W.A., 10 Dec. 1891, *R.Helms s.n.*; holotype: NSW; isotype: AD, FRI, K.

[*E. uncinata* auctt. non Turcz.: C.Moore & E.Betche, *Handbook Fl. New South Wales* 200 (1893); A.J.Ewart, *Fl. Victoria* 841 (1930); N.T.Burbidge, *Trans. & Proc. Roy. Soc. S. Australia* 71: 153 (1947)]

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 138–139 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 191 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 181 (1983).

Mallee to 5 m, occasionally a tree to 8 m. Bark smooth, grey to brown, often with an accumulation of shedding bark at base of trunk. Juvenile leaves opposite, lanceolate, green. Adult leaves narrowly lanceolate to lanceolate, moderately thick; lamina 4–8 cm long, 0.4–1 cm wide, shining, green; lateral veins faint, at 45°–50°; intramarginal vein almost confluent with or up to 1 mm from margin; petiole terete, 5–10 mm long. Umbels 7–13-flowered; peduncle quadrangular, 6–8 mm long; pedicels terete, 2–4 mm long. Buds fusiform; operculum conical, 3–4 mm long and wide; hypanthium obconical, 3–4 mm long and wide. Fruits hemispherical or subglobular, 3–6 mm long and wide; valves exserted. Fig. 83 O–P.

Widespread across southern Australia from Shark Bay, W.A., through S.A. to western N.S.W. and Vic., but absent from the Nullarbor Plain. Grows in sandy or gravelly soil, sometimes near salt lakes, in heathland and shrubland. Regions: MRCH, BENC, LUWN, LEON, ESRP, NULL, VICD, EYRE, TRNS, DARL, RIVR. Map 326.

W.A.: 14.6 km E of Pithara, *G.M.Chippendale* 64 (AD, BRI, CANB, FRI, MEL, NSW, PERTH); Harris Smith, *C.A.Gardner* 2106 (FRI, NSW PERTH). S.A.: Athelstone, *M.I.H.Brooker* 3321 (FRI, NSW, PERTH). N.S.W.: 3–5 km along Griffith road, S of Rankin Springs, *R.T.Eakin* 107 (BRI, FRI, NSW). Vic.: Mt Arapiles, *A.C.Beauglehole* 30911 (FRI, MEL).

Distinguished by mallee habit, smooth bark, narrowly lanceolate to lanceolate shining adult leaves and pedicellate buds and fruits. Differs from *E. fruticosa* in the narrower leaves, slightly longer petiole and longer pedicels, and from *E. uncinata* in the non-connate juvenile leaves and pedicellate buds. Pollen and nectar are abundant for honey production from Dec. to Mar. The species is treated here in its broad sense, but further study may result in it being divided into several taxa.

306. *Eucalyptus fruticosa* Brooker, *Brunonia* 2: 129 (1979)

T: 103 miles [c. 160 km] S of Exmouth, W.A., 25 Apr. 1974, *M.I.H.Brooker* 4578a; holotype: FRI; isotype: AD, NSW, PERTH.

Illustrations: M.I.H.Brooker, *loc. cit.*; S.Kelly *et al.*, *Eucalypts* 1: t. 264 (1983).

Shrub to 3 m, straggling. Bark smooth throughout, grey or yellow-grey or some rough at base. Juvenile leaves decussate, sessile or shortly petiolate, elliptic to ovate, glaucous, slightly discolorous. Intermediate leaves alternate, petiolate, oblong to lanceolate; lamina 4.5–9 cm long, 1–1.8 cm wide, yellow-green; lateral veins faint, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole terete, 4–6 mm long. Adult leaves not formed, the mature canopy comprising lower juvenile leaves and upper intermediate leaves. Umbels 7-flowered; peduncle quadrangular, 5–10 mm long; pedicels terete to quadrangular, 1–2 mm long. Buds fusiform; operculum conical or slightly rostrate, 3–4 mm long and wide; hypanthium obconical, 4–5 mm long, 3–4 mm wide. Fruits subglobular, 4–5 mm long, 5–6 mm wide; valves exserted. Fig. 83 Q–R.

Occurs in the Scrubby Ra. area S of Exmouth Gulf, and S of Shark Bay, on sandy plains and low sandhills in open shrubland. Region: MRCH. Map 327.

W.A.: 20 km N of Warroora turn-off on Coral Bay Rd, *M.I.H.Brooker* 5696 (FRI, PERTH); 0.6 km W of Denham road on Useless Loop road, *M.I.H.Brooker* 5704 (FRI, PERTH).

A mallee of straggly shrubby habit, with a canopy of juvenile and intermediate leaves and buds with an acute operculum. The juvenile leaves have numerous oil glands. Petiole and pedicels shorter than those of *E. foecunda*.

307. *Eucalyptus formanii* C.Gardner, *J. & Proc. Roy. Soc. W. Australia* 27: 186 (1942)

T: Die Hardy Ra., near Mt Jackson, W.A., July 1940, *F.G.Forman & R.S.Matheson s.n.*; holo: PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 139, 140 (1973); M.I.H.Brooker, *Brunonia* 2: 137–139 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 238 (1983).

Tree, occasionally a mallee, to 11 m. Bark rough, flaky, grey to 5 m, then smooth, grey to grey-brown above. Juvenile leaves crowded, appearing to be in clusters of three, linear, grey, concolorous. Adult leaves linear, thick; lamina 5–9 cm long, 0.2–0.4 cm wide, pale green; lateral veins obscure, at c. 50°; intramarginal vein obscure but almost confluent with margin; petiole terete, 2–5 mm long. Umbels 7–11-flowered; peduncle quadrangular, 5–8 mm long; pedicels terete, 3–4 mm long. Buds fusiform; operculum conical, 3–4 mm long, c. 3 mm wide; hypanthium obconical, 2–3 mm long, c. 3 mm wide. Fruits hemispherical or subcylindrical, 3–4 mm long, 3–5 mm wide; valves exserted. Fig. 83S–T.

Occurs in a restricted area around the Die Hardy Ra., W.A. Grows in lateritic or rocky sand, in low woodland and scrubland. Region: LEON. Map 328.

W.A.: 123.9 km N of Bullfinch, *M.I.H.Brooker* 2451 (FRI, MEL, NSW PERTH); 0.3 km S of Die Hardy Ra., *G.M.Chippendale* 357 (AD, FRI, MEL, NSW, PERTH); 25.7 km N of Mt Jackson, *H.Demarz* 1678 (FRI, PERTH).

A tree or tall mallee with rough bark on most of the trunk and linear, markedly glandular leaves. The juvenile leaves are undulate.

308. *Eucalyptus uncinata* Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 22(2): 23 (1849)

T: Swan R. Colony, W.A., 1845, *J.Drummond* 3: 66; holo: KW; iso: BM, FI, G, K, LE, MEL, NSW.

E. uncinata var. *latifolia* Benth., *Fl. Austral.* 3: 216 (1867). T: Swan R. Colony, W.A., 1848, *J.Drummond* 4: 76; holo: K; iso: BM, CGE, FI, LE, NSW, PERTH.

E. dumosa var. *puncticulata* Benth., *Fl. Austral.* 3: 230 (1867); *E. puncticulata* (Benth.) Blakely, *Key Eucalypts* 114 (1934). T: Gordon R., W.A., *A.Oldfield*; syn: K; Mt Barren Ranges, W.A., *G.Maxwell*; syn: *n.v.*

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 141 (1973); M.I.H.Brooker, *Brunonia* 2: 132–136 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 183 (1983).

Mallee to 4 m. Bark smooth throughout, grey to light brown, sometimes rough. Juvenile leaves decussate, ovate, connate, glaucous, discolorous. Adult leaves lanceolate, thick; lamina 5–10 cm long, 1–2 cm wide, yellow-green; lateral veins faint, at 40°–45°; intramarginal vein up to 2 mm from margin; petiole thick, terete or flattened, 8–15 mm long. Umbels 7–13-flowered, or sometimes more; peduncle flattened, 5–10 mm long; pedicels absent. Buds ovoid, obtuse; operculum conical, obtuse, 2–5 mm long, 3–4 mm wide; hypanthium cylindrical, 4–5 mm long, 3–4 mm wide, several-ribbed due to clustering of buds. Fruits ovoid or cylindrical, 5–6 mm long, 4–6 mm wide; valves included. *Hook-leaved Mallee*. Fig. 83U–V.

Occurs in coastal and near-coastal areas from the Walpole–Nornalup Natl Park eastwards to Israelite Bay, W.A., mostly in open shrubland. Regions: LUWN, ESPR. Map 329.

W.A.: Fitzgerald Inlet, *M.I.H.Brooker* 2695 (FRI, MEL, PERTH); 5 km NW of Esperance, *G.M.Chippendale* 413 (FRI, MEL, NSW, PERTH); East Mt Barren, *P.G.Wilson* 5482 (FRI, PERTH).

Distinguished by sessile buds and fruits and connate seedling and juvenile leaves. NE of Esperance the species is tree-like and rough-barked.

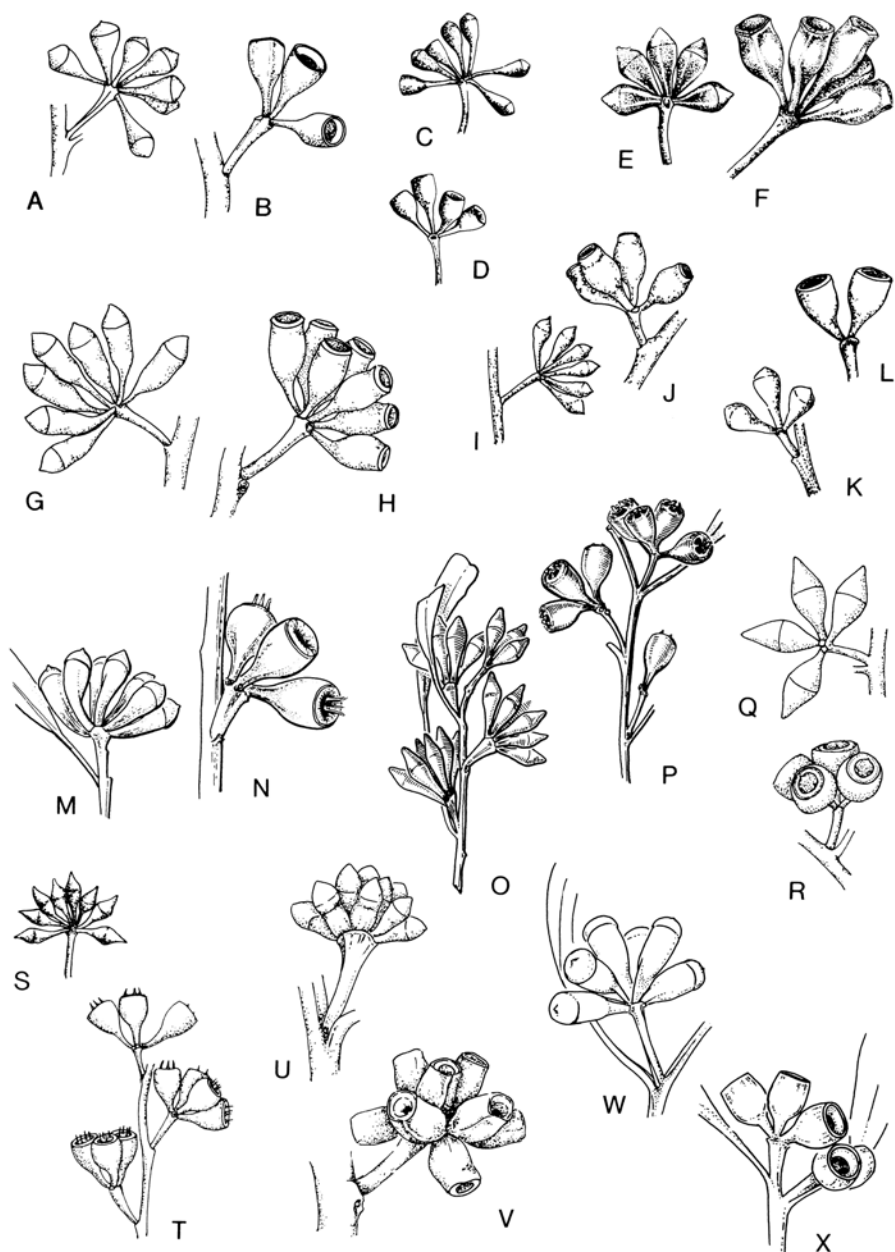


Figure 83. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. gracilis* (I.Brooker 743, FRI). **C–D**, *E. yilgarnensis* (L.Diels 2843, PERTH). **E–F**, *E. calycogona* (**E**, Wanbi Research Centre, S.A., I.Brooker, GAUBA; **F**, cult., Wail, Vic., A.Thornley, FRI). **G–H**, *E. celastroides* subsp. *celastroides* (**G**, 3.2 km from Coolgardie towards Southern Cross, W.A., M.Phillips, FRI; **H**, G.Chippendale 147, FRI). **I–J**, *E. celastroides* subsp. *virella* (0.8 km S of Tammin, W.A., collector unknown, FRI). **K–L**, *E. brevipes* (I.Brooker 8242, FRI). **M–N**, *E. rigidula* (I.Brooker 4996, FRI). **O–P**, *E. foecunda* (**O**, K.Allan 790, FRI; **P**, 14.4 km from Rankin Springs towards West Wyalong, N.S.W., M.Phillips, FRI). **Q–R**, *E. fruticosa* (I.Brooker 5696, FRI). **S–T**, *E. formanii* (**S**, Pigeon Rocks, near Mt Jackson, W.A., F.Foreman, FRI; **T**, G.Chippendale 359, FRI). **U–V**, *E. uncinata* (**U**, G.Chippendale 185, FRI; **V**, I.Brooker 2309, FRI). **W–X**, *E. discreta* (**W**, I.Brooker 5642, FRI; **X**, L.Pryor & J.Briggs 184, FRI). **F** drawn by C.Stahl. **M–P** drawn by M.Risby. Others drawn by M.May.

309. *Eucalyptus discreta* Brooker, *Brunonia* 2: 148 (1979)

T: 98 miles (c. 158 km) E of Esperance on the Fisheries road towards Balladonia, W.A., 9 Apr. 1974, *M.I.H. Brooker* 4484; holo: FRI; iso: AD, MEL, PERTH.

Illustrations: *M.I.H. Brooker, loc. cit.*; *S. Kelly et al., Eucalypts* 1: t. 260 (1983).

Shrub or mallee to 3 m. Bark smooth throughout, grey-brown or bronze. Juvenile leaves decussate, linear-oblong, green, concolorous. Adult leaves linear-lanceolate to lanceolate, thick, lamina 6–8 cm long, 0.6–1 cm wide, green to yellow-green; lateral veins faint, at 20°–30°; intramarginal vein up to 1 mm from margin; petiole terete, 6–10 mm long. Umbels 7-flowered; peduncle slightly flattened, 5–8 mm long; pedicels quadrangular, 1–2 mm long. Buds clavate; operculum saucer-shaped or depressed hemispherical, 1–2 mm long, 3–4 mm wide; hypanthium obconical or subcylindrical, 3–4 mm long and wide. Fruits ovoid, 5–7 mm long, 5–6 mm wide; valves included. Fig. 83W–X.

Occurs from E of Esperance to Israelite Bay and in the Mt Ragged area, W.A., in open shrubland on sandplains. Region: ESPR. Map 330.

W.A.: 20.9 km N of Fisheries road towards Mt Ragged, *K.M. Allan* 852 (FRI, PERTH); 16 km SW of Mt Ragged, *J.S. Beard* 6399 (NSW, PERTH).

Closely related to *E. uncinata* but distinguished by the pedicellate buds and fruits, usually depressed-hemispherical operculum and juvenile leaves which are not connate. The short operculum distinguishes it from *E. foecunda*.

310. *Eucalyptus albida* Maiden & Blakely, *J. & Proc. Roy. Soc. New South Wales* 59: 175 (1925)

T: Harrismith, W.A., 6 Mar. 1924, *C.A. Gardner* 2113; holo: NSW; iso: MEL, PERTH.

Illustrations: *G.M. Chippendale, Eucalypts W. Austral. Goldfields* 142, 143 (1973); *C.A. Gardner* (ed. *T.E. Aplin*), *Eucalypts W. Australia* 206 (1979); *S. Kelly et al., Eucalypts* 1: t. 182 (1983).

Mallee to 3 m. Bark smooth throughout, white or grey-brown. Juvenile leaves decussate, ovate, cordate, glaucous, concolorous. Adult leaves lanceolate or narrowly lanceolate, thin; lamina 4–7 cm long, 0.5–1.5 cm wide, shining, green; lateral veins faint, at 40°–50°; intramarginal vein almost confluent with margin; petiole terete, 10–13 mm long. Umbels 7–11-flowered; peduncle terete, 7–10 mm long; pedicels terete, 3–6 mm long. Buds fusiform, obtuse; operculum conical, obtuse, 3–4 mm long and wide; hypanthium hemispherical or obconical, 3–4 mm long and wide. Fruits hemispherical or obconical, 4–5 mm long and wide; valves \pm level. *White-leaved Mallee*. Figs 15, 84A–B.

Occurs from near Tammin SE to the Hamersley R. area, W.A., on plains in yellow sand in open heathland and shrubland. Regions: BENC, ESPR. Map 331.

W.A.: 11.3 km S of Wickepin, *M.I.H. Brooker* 2249 (AD, FRI, MEL, NSW, PERTH); 8.4 km S of Tammin, *G.M. Chippendale* 78 (AD, FRI, MEL, NSW, PERTH).

Distinguished by the often persistent glaucous juvenile leaves as coppice on mature mallees, the bluntly fusiform buds and hemispherical or obconical fruits. A useful ornamental with persistent grey juvenile leaves which are attractive in floral arrangements.

Ser. 65 *Rufispermae*

***Eucalyptus* ser. *Rufispermae* Maiden, *Crit. Revis. Eucalyptus* 7: 152 (1925).**

Type: *E. woodwardii* Maiden

E. ser. Dumosae Blakely, *Key Eucalypts* 25, 113 (1934) *p.p.* T: *E. dumosa* Cunn. ex Schauer

E. subser. Striatae Blakely, *op. cit.* 26, 117. T: not designated.

Trees or mallees. Bark smooth throughout but often deciduous in long strips, sometimes rough at base, rarely fibrous to the larger branches (*E. striaticalyx*). Juvenile leaves alternate, petiolate, sometimes glaucous or grey-green, concolorous or slightly discolorous. Adult leaves

alternate, petiolate, concolorous. Conflorescences axillary, simple; umbels 7-flowered, sometimes 3–7- or 7–11-flowered. Buds subglobular, \pm cylindrical, obovoid, conical, obconical, clavate, turbinate, pyriform, ovoid or fusiform. Fruits campanulate, cylindrical or subcylindrical, hemispherical, ovoid, obconical or pyriform; disc moderately broad, usually descending, but level in *E. striatocalyx*; valves usually 4 or 5, sometimes 3 or 6, included, level or exserted. Seeds irregularly elliptic, reticulate, red-brown, often shining.

A series of 16 species in south-western and southern W.A., southern S.A., western N.S.W. and north-western Vic. Characterised especially by the usually smooth bark, concolorous leaves, simple umbels and shining red seeds.

311. *Eucalyptus woodwardii* Maiden, *J. W. Austral. Nat. Hist. Soc.* 3: 42 (1910)

T: 120 miles [c. 193 km] E of Kalgoorlie, W.A., May 1909, *H.Deane s.n.*; holo: NSW; iso: FRI, K, MEL, PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 144 (1974); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 43 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 38 (1983).

Tree to 15 m, sometimes straggly. Bark smooth, grey or pink-white, sometimes scaly at base of trunk. Juvenile leaves oblong or broadly lanceolate, grey-green. Adult leaves lanceolate, acuminate, thick; lamina 10–15 cm long, 2–4 cm wide, grey-green; lateral veins faint, at 35°–45°; intramarginal vein up to 4 mm from margin; petiole terete, 20–23 mm long. Umbels 7-flowered; peduncle terete, 8–25 mm long; pedicels 5–8 mm long. Buds subglobular, rostrate, glaucous; operculum hemispherical, rostrate, striate, 8–10 mm long and wide; hypanthium hemispherical or obconical, 8–10 mm long wide. Fruits campanulate, striate, 12–15 mm long and wide, glaucous; valves 4 or 5, included or almost level. *Lemon-flowered Gum*. Fig. 84C–D.

Occurs in a restricted area S of Queen Victoria Spring, E of Kalgoorlie, W.A., in sandy soil in woodland, sometimes with a spinifex (*Triodia*) understorey. Region: LEON. Map 332.

W.A.: 57.4 km E of Karonie, *M.I.H. Brooker* 2466 (FRI, MEL, NSW, PERTH); c. 96 km S of Queen Victoria Spring, 27 Sept. 1891, *R.Helms* (K, MEL, NSW).

Within the series the large buds and fruits and the lemon-yellow stamens are distinctive. An attractive tree, successfully cultivated in arid areas, sometimes as a street tree. Has been crossed with *E. torquata* to give the variable hybrid *Torwood*.

312. *Eucalyptus georgei* Brooker & Blaxell, *Nuytsia* 2: 224 (1978)

T: 159 km E of Hyden along track to Norseman, W.A., 32°15'S, 120°23'E, 3 Oct. 1975, *D.Blaxell* W75/45; holo: NSW; iso: FRI, PERTH.

Illustrations: M.I.H.Brooker & D.F.Blaxell, *op. cit.* 225; S.Kelly *et al.*, *Eucalypts* 1: t. 265 (1983).

Mallee to 3 m. Bark smooth throughout, white or grey. Juvenile leaves ovate to lanceolate, glaucous. Adult leaves broadly lanceolate, acuminate, thick; lamina 9–15 cm long, 2–6 cm wide, grey- or yellow-green; lateral veins faint, at 25°–40°; intramarginal vein up to 1 mm from margin; petiole terete, glaucous, 20–30 mm long. Umbels 7-flowered; peduncle thick, terete or angular, glaucous, 15–30 mm long; pedicels 4–6 mm long. Buds subcylindrical, obovoid or pyriform, glaucous; operculum hemispherical, apiculate, 3–5 mm long, 5–7 mm wide; hypanthium obconical, 7–8 mm long, 5–7 mm wide. Fruits campanulate or cylindrical, glaucous, 12–15 mm long, 9–11 mm wide; valves 4 or 5, slightly exserted. *Hyden Blue Gum*. Fig. 84E–F.

Occurs between Hyden and Norseman, W.A., usually in small pure stands in sandy and lateritic soil on small rises, surrounded by open forest. Region: ESPR. Map 333.

W.A.: Mt Holland, *A.Kessell* 408 (FRI, PERTH); junction of Bremer Range road and Hyden track, *A.Kessell* 947 (FRI, PERTH).

A mallee with smaller buds and fruits than *E. woodwardii* and white stamens, but larger leaves, buds and fruits than *E. sheathiana*.

313. *Eucalyptus sheathiana* Maiden, J. & Proc. Roy. Soc. New South Wales 49: 312 (1916)

T: cultivated Kings Park, Perth, W.A., Dec. 1910, *J. Sheath s.n.*; holotype: NSW.

Illustrations: G.M. Chippendale, *Eucalypts W. Austral. Goldfields* 145 (1973); C.A. Gardner (ed. T.E. Aplin), *Eucalypts W. Australia* 115 (1979); S. Kelly *et al.*, *Eucalypts* 2: t. 52 (1983).

Tree to 15 m, sometimes a mallee to 4.5 m. Bark smooth, grey to brown, often prickly to touch. Juvenile leaves not seen. Adult leaves lanceolate, sometimes falcate, uncinate, thick; lamina 7–10 cm long, 1.5–2.5 cm wide, grey-green or dull green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 15–25 mm long. Umbels 7-flowered; peduncle slightly flattened, 10–20 mm long; pedicels 3–8 mm long. Buds subglobose to conical, glaucous; operculum hemispherical, shortly apiculate, or conical, 3–5 mm long and wide; hypanthium campanulate, 4–5 mm long, 3–5 mm wide. Fruits cylindrical, often glaucous, 7–8 mm long, 6–7 mm wide; valves 4, slightly included to slightly exserted. *Ribbon-barked Gum*. Fig. 84G–H.

Occurs from Wyalkatchem S to Nyabing and E to Hyden and Zanthus, W.A., in sandy or lateritic soil on flat areas in shrubland, often seen as remnants at the edges of fields. Regions: BENC, LEON, ESPR. Map 334.

W.A.: 1.6 km E of Kellerberrin, *M.I.H. Brooker* 2436 (FRI, PERTH); 3.2 km S of Yorkrakine, *G.M. Chippendale* 335 (FRI, MEL, NSW, PERTH); Carrabin, *C.A. Gardner* 11828 (FRI, PERTH).

Distinguished from *E. georgei* by the smaller buds and fruits on peduncles up to 20 mm long. Bark in this species, *E. georgei* and *E. woodwardii* often peels in long strips.

Several collections at NSW from near Perth may not be from natural populations.

314. *Eucalyptus cyanophylla* Brooker, Trans. Roy. Soc. S. Australia 101: 15 (1977)

T: c. 3 km NE of Berri, S.A., 34°15'S, 140°37'E, 5 Aug. 1972, *B. Copley* 3799; holotype: FRI; isotype: AD.

Illustrations: M.I.H. Brooker, *op. cit.* 16, 17; S. Kelly *et al.*, *Eucalypts* 1: t. 258 (1983); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 152 (1983).

Mallee to 6 m. Bark smooth, grey-brown, with some fibrous bark at base. Juvenile leaves ovate, dark green. Adult leaves broadly lanceolate, acuminate, thick; lamina 10–16 cm long, 2–3 cm wide, blue-grey to glaucous; lateral veins faint, at 30°–45°; intramarginal vein up to 1 mm from margin; petiole terete or angular, 15–22 mm long. Umbels 7-flowered; peduncle thick, slightly flattened, 5–12 mm long; pedicels 1–2 mm long. Buds cylindrical-conical; operculum hemispherical to conical, ribbed, 4–7 mm long, 5–8 mm wide; hypanthium cylindrical or obconical, wrinkled or ribbed, 6–7 mm long, 5–8 mm wide. Fruits hemispherical or obconical, wrinkled or ribbed, 7–10 mm long, 7–9 mm wide; valves 4 or 5, level. *Blue-leaved Mallee*. Fig. 84 I–J.

Occurs in south-eastern S.A., far south-western N.S.W. and north-western Vic., in sandy soil in open shrubland. Regions: TRNS, RIVR. Map 335.

S.A.: c. NW corner Berri Irrigation Area, *D.E. Symon* 3789 (CANB, K, NSW). N.S.W.: 57 km N of Wentworth towards Broken Hill, *J.D. Briggs* 326b (FRI). Vic.: 8 km E of Taplan, 29 Aug. 1955, *J.H. Willis* (MEL).

Distinguished by mallee habit, blue-grey to glaucous leaves and ribbed buds and fruits. Leaves and buds larger than those of *E. dumosa*.

315. *Eucalyptus dumosa* Cunn. ex Oxley, J. Two Exped. Int. New South Wales 63 (1820); Schauer in W.G. Walpers, Repert. Bot. Syst. 2: 925 (1843) (expanded description)

E. incrassata var. *dumosa* (Cunn. ex Oxley) Maiden, *Crit. Revis. Eucalyptus* 1: 96 (1904). T: Euryalean Scrub, between 33° and 34°S, and 146° and 147°E, N.S.W., 23 May 1817, *A. Cunningham* 206; isotype: BM, E, K.

E. lamprocarpa F. Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 129 (1856). T: not designated; *n.v.*

E. muelleri Miq., *op. cit.* 130. T: 'Madam Pepper-wealth ad fl. Murray', *F. Mueller*; *n.v.*

Illustrations: L.Costermans, *Native Trees & Shrubs S.E. Australia* 377 (1981); S.Kelly *et al.*, *Eucalypts* 1: t. 71 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 151 (1983).

Mallee to 8 m, or rarely a tree to 13 m. Bark smooth, white or yellow-white with c. 1 m of rough flaky bark at base. Juvenile leaves ovate, grey-green. Adult leaves lanceolate, uncinete, thick; lamina 7–10 cm long, 1–2 cm wide, dull, yellow-green to grey-green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 10–15 mm long. Umbels 7-flowered; peduncle slightly flattened or angular, 10–16 mm long; pedicels 1–3 mm long. Buds cylindrical; operculum conical or slightly rostrate, striate, 2–4 mm long, 4–5 mm wide; hypanthium cylindrical or suburceolate, 3–5 mm long, 4–5 mm wide. Fruits campanulate or cylindrical, often striate, 7–10 mm long, 5–7 mm wide; valves usually 4, level or slightly exserted. *White Mallee, Congoo Mallee.* Fig. 84K–L.

Occurs from eastern Eyre Peninsula through south-eastern S.A., through most of western N.S.W. and in north-western Vic. Grows in sandy loam and red earth on sandplains and dunefields, in shrubland. Regions: EYRE, TRNS, DARL, RIVR, NEPN, OTWY. Map 336.

S.A.: 54.6 km N of Overland Corner, *D.E.Symon* 3737 (AD, ADW). N.S.W.: 6.6 km SW of Yalgogrin, *G.M.Chippendale* 945 & *M.J.Beeston* (AD, BRI, FRI, MEL); 38.6 km N of Griffith, *R.T.Eakin* 102 (FRI, NSW). Vic.: between Ouyen & Piangil, *M.I.H.Brooker* 4909 (AD, FRI, NSW).

Distinguished by dull yellow-green to grey-green leaves, striate buds and campanulate or cylindrical fruits. Leaves and buds smaller than those of *E. cyanophylla*. The lignotubers ('mallee roots') have been used as firewood, and the stems are sometimes thick enough to be used as fence posts.

316. *Eucalyptus dongarraensis* Maiden & Blakely, *J. & Proc. Roy. Soc. New South Wales* 59: 184 (1925)

T: Dongara, W.A., Oct. 1909, *J.H.Maiden*; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 7: 402 (1927); isolecto: FRI, K, MEL, PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 146, 147 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 218 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 65 (1983).

Mallee or tree to 8 m. Bark smooth, grey throughout, sometimes up to 1 m of accumulated shedding bark at base. Juvenile leaves ovate, grey-green. Adult leaves narrowly to broadly lanceolate, sometimes falcate, acuminate or uncinete, thick; lamina 8–12 cm long, 1.5–3 cm wide, dull, green, glandular; lateral veins just visible, at 25°–35°; intramarginal vein up to 1 mm from margin; petiole terete or quadrangular, 15–20 mm long. Umbels usually 7-flowered, sometimes up to 11-flowered; peduncle slightly flattened, 8–15 mm long; pedicels 3–6 mm long. Buds turbinate or pyriform; operculum hemispherical, striate, 2–4 mm long, 4–6 mm wide; hypanthium turbinate, 5–6 mm long, 4–6 mm wide. Fruits pyriform or obconical, smooth, wrinkled or striate, 7–10 mm long and wide; valves 4 or 5, included or just exserted. *Dongara Mallee.* Fig. 84M–N.

Occurs from Gnarlloo Stn S to the Wubin area, including Dorre and Bernier Islands, W.A. Grows in sand or sandy loam in shrubland and woodland. Regions: MRCH, BENC. Map 337.

W.A.: between Hamelin & Coburn Stn, *J.S.Beard* 7054 (FRI, PERTH); 11.3 km N of Watheroo, *G.M.Chippendale* 32 (AD, BRI, FRI, MEL, NSW, PERTH); 11 km S of Wubin, *P.G.Wilson* 6487 (PERTH).

Pedicels and hypanthium usually longer than those of *E. dumosa*.

317. *Eucalyptus calcareana* Boomsma, *J. Adelaide Bot. Gard.* 1: 361 (1979)

T: 43 km along Eyre Hwy W of Nundroo, S.A., 31°29'S, 131°53'E, 11 Mar. 1977, *G.C.Cornwall* 290; holotype: AD; iso: FRI.

Illustrations: C.D.Boomsma, *op. cit.* 362; S.Kelly *et al.*, *Eucalypts* 1: t. 255 (1983).

Mallee or tree to 10 m. Bark smooth throughout, grey to pink-white. Juvenile leaves ovate to ovate-lanceolate. Adult leaves lanceolate, falcate, uncinete; lamina 9–12 cm long, 1.4–2

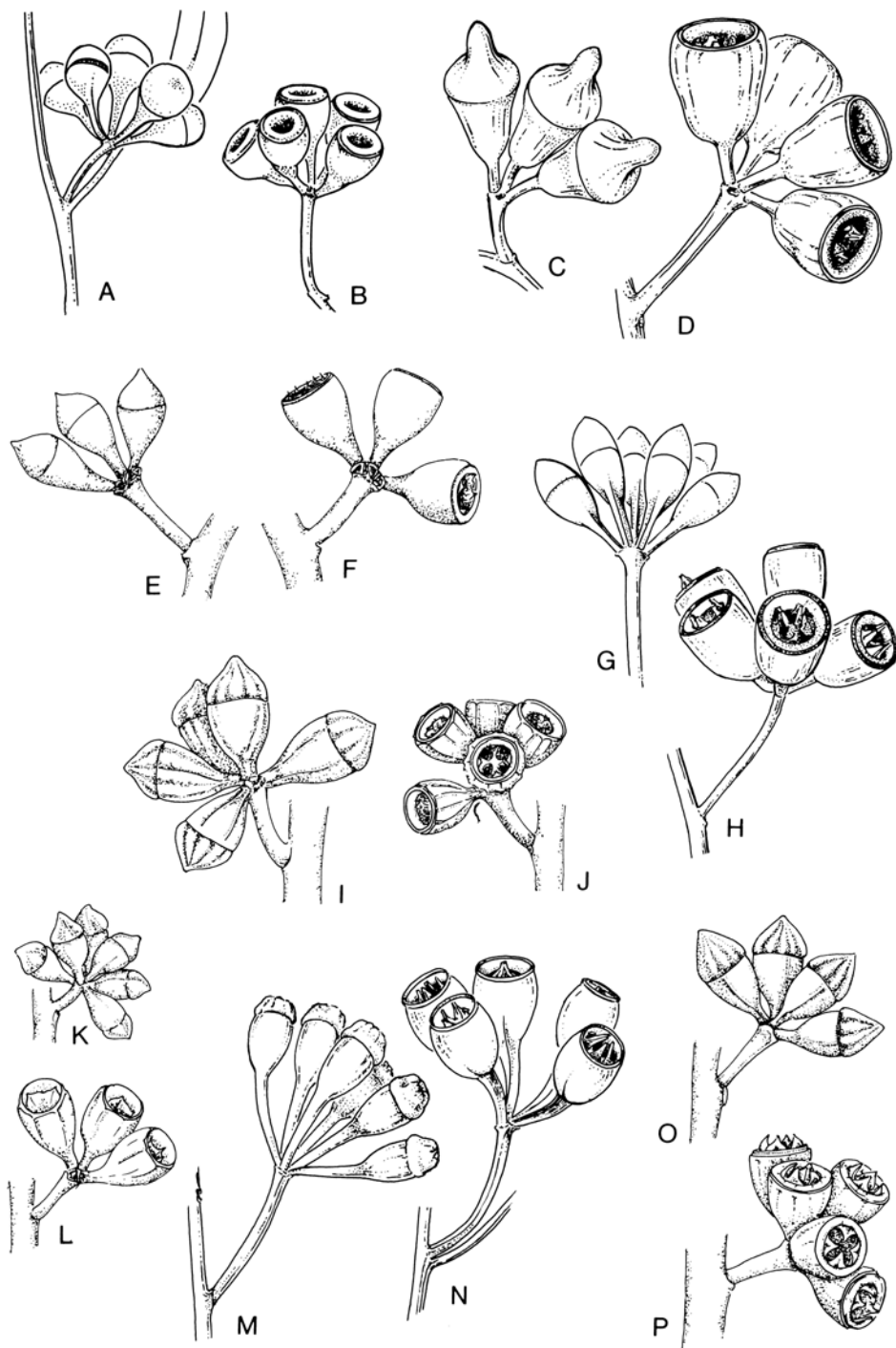


Figure 84. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. albida* (A.George 10598, FRI). **C–D**, *E. woodwardii* (L.Pryor & J.Briggs 157, FRI). **E–F**, *E. georgei* (M.Crisp 5556, FRI). **G–H**, *E. sheathiana* (**G**, I.Brooker 4977, FRI; **H**, I.Brooker 5664, FRI). **I–J**, *E. cyanophylla* (**I**, I.Brooker 5384, FRI; **J**, I.Brooker 4905, FRI). **K–L**, *E. dumosa* (**K**, I.Brooker 122, FRI; **L**, J.Briggs 368, FRI) **M–N**, *E. dongarraensis* (**M**, G.Chippendale 243, FRI; **N**, I.Brooker 5708, FRI). **O–P**, *E. calcareana* (G.Cornwall 291, FRI). Drawn by M.May.

cm wide, grey-green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete or quadrangular, 12–22 mm long. Umbels 7–11-flowered; peduncle angular, dilated upwards, 7–10 mm long; pedicels 2–3 mm long. Buds obconical; operculum hemispherical to obtusely conical, striate, 4–6 mm long and wide; hypanthium obconical, striate, 3–5 mm long, 4–6 mm wide. Fruits obconical or pyriform, striate, 5–7 mm long, 5–8 mm wide; valves usually 4, sometimes 6, level or slightly exserted. Fig. 84 O–P.

Occurs on the S edge of the Nullarbor Plain from near Madura Pass, W.A., eastwards to near Wudinna, S.A. Grows on lower slopes of sheltered depressions, sometimes on low crests in open shrubland. Regions: NULL, EYRE. Map 338.

W.A.: 4 km W of S.A.–W.A. border, *T.Dennis* 129 (AD, FRI). S.A.: Wudinna, 31 Aug. 1935, *E.H.Ising* (AD); 38 km E of Nundroo, *T.R.N.Lothian* 5727 (AD, BRI, FRI).

May be distinguished from *E. pileata* and *E. fraseri* especially by the grey-green leaves, and from *E. conglobata* by the pedicellate buds.

318. *Eucalyptus pileata* Blakely, *Key Eucalypts* 120 (1934)

T: Desmond, near Ravensthorpe, W.A., Nov. 1909, *J.H.Maiden*; holotype: NSW; isotype: BM, FRI, K, PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 147, 148 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 167 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 74 (1983).

Mallee, mostly to 3.5 m, occasionally to 6 m. Bark smooth throughout, light grey to light brown. Juvenile leaves ovate to lanceolate, green. Adult leaves lanceolate, uncinately, thick; lamina 6–10 cm long, 1–2 cm wide, shining, green, noticeably glandular; lateral veins just visible, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole quadrangular, 10–20 mm long. Umbels 7-flowered; peduncle slightly flattened or angular, 7–17 mm long; pedicels 3–5 mm long. Buds turbinate; operculum hemispherical, ribbed, 3–5 mm long, 4–8 mm wide; hypanthium turbinate, smooth but slightly striate when dry, 4–6 mm long, 5–6 mm wide. Fruits hemispherical, smooth to striate, 6–8 mm long and wide; valves 4, level or just exserted. *Capped Mallee*. Fig. 85A–B.

Widespread from W of Nugadong across southern W.A. to near Twilight Cove. Grows in sand and sandy loam in shrubland. Regions: BENC, ESPR, LEON, NULL. Map 339.

W.A.: Burngup, *M.I.H.Brooker* 2274 (FRI, MEL, NSW, PERTH); Boorabbin, *G.M.Chippendale* 108 (AD, FRI, MEL, NSW, PERTH).

Operculum usually shining-red before anthesis. Differs from *E. calcareana* especially in its greener leaves, from *E. conglobata* in its pedicellate buds. Peduncle and pedicels usually longer than those of *E. fraseri*.

319. *Eucalyptus conglobata* (R.Br. ex Benth.) Maiden, *Crit. Revis. Eucalyptus* 6: 273 (1922)

E. dumosa var. *conglobata* R.Br. ex Benth., *Fl. Austral.* 3: 230 (1867); *E. incrassata* var. *conglobata* (R.Br. ex Benth.) Maiden, *Crit. Revis. Eucalyptus* 1: 96, 100 (1904). T: Port Lincoln, S.A., *C.Wilhelmi* s.n.; syn; K, NSW; south coast, [S.A.], 1802, *R.Brown*; syn: BM, E, K, NSW.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 149, 150 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 69 (1983).

Mallee to 5 m. Bark smooth throughout, light grey. Juvenile leaves broadly lanceolate, green. Adult leaves lanceolate, apiculate or uncinately, thick; lamina 6–8 cm long, 1–2 cm wide, green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete or angular, 15–20 mm long. Umbels usually 7-flowered; peduncle terete, flattened or angular, 4–9 mm long; pedicels absent. Buds cylindrical-conical; operculum conical, striate, 3–5 mm long, 5–7 mm wide; hypanthium hemispherical, slightly striate, 2-ribbed, 4–5 mm long, 5–7 mm wide. Fruits hemispherical to subcylindrical, 5–8 mm long, 7–10 mm wide; valves 3–5, level or just exserted. *Port Lincoln Mallee*. Fig. 85C–D.

Occurs widely in south-western W.A. from Harrismith to the S coast and E to Twilight Cove, and in S.A. from W of Penong to Murray Bridge. Grows in sandy loam in tall shrubland. Regions: BENC, ESPR, EYRE, RIVR. Map 340.

W.A. Fitzgerald Inlet, *M.I.H.Brooker* 2702 (FRI, PERTH); 91.7 km E of Esperance, *M.I.H.Brooker* 4479 (AD, FRI, MEL, NSW). S.A.: 12.5 km S of Victor Harbor, *G.M.Chippendale* 1343 (AD, BRI, FRI, MEL); 2 km W of Memory Cove, *P.G.Wilson* 2710 (AD).

Distinguished by mallee habit, smooth bark, sessile buds and fruits, and operculum and hypanthium of about equal length.

320. *Eucalyptus fraseri* (Brooker) Brooker, *Austral. Forest Res.* 7: 65 (1976)

E. conglobata subsp. *fraseri* Brooker, *Nuytsia* 1: 251 (1972). T: 14 miles [c. 23 km] W of Balladonia, W.A., 14 Feb. 1970, *M.I.H.Brooker* 2472; holo: PERTH; iso: AD, BRI, FRI, MEL, NSW, PERTH.

Illustrations: M.I.H.Brooker, *op. cit.* 252; S.Kelly *et al.*, *Eucalypts* 2: t. 59 (1983).

Tree to 20 m. Bark smooth, white to white-grey, sometimes with up to 1 m of rough, dark, basal bark. Juvenile leaves not seen. Adult leaves lanceolate, acuminate, sometimes uncinat, thick; lamina 8–14 cm long, 1.5–3 cm wide, shining, green; lateral veins faint, at 20°–30°; intramarginal vein up to 1 mm from margin; petiole terete or quadrangular, 8–10 mm long. Umbels 7-flowered; peduncle angular or flattened, 2–10 mm long; pedicels 1–3 mm long. Buds ±fusiform; operculum conical, ribbed, 5–7 mm long, 4–7 mm wide; hypanthium obconical, striate, 4–5 mm long, 4–6 mm wide. Fruits obconical or hemispherical, striate, 8–11 mm long, 6–9 mm wide; valves 3–5, included. Fig. 85E–F.

Occurs from between Norseman and Scaddan eastwards to Balladonia, W.A., on exposed plains and low dunes in sand over limestone in open shrubland. Regions: LEON, ESPR, NULL. Map 341.

W.A.: 14.5 km N of Tower Hill corner towards Balladonia, *M.I.H.Brooker* 4532 (AD, BRI, FRI, NSW); 108.5 km E of Norseman, *G.M.Chippendale* 158 (FRI, PERTH).

Distinguished by tree habit, white or pale grey bark and shortly pedicellate buds and fruits.

321. *Eucalyptus anceps* (R.Br. ex Maiden) Blakely, *Key Eucalypts* 118 (1934)

E. conglobata ?var. *anceps* R.Br. ex Maiden, *Crit. Revis. Eucalyptus* 6: 275 (1924). T: Kangaroo Is., [S.A.], Mar. 1802, *R.Brown*; holo: BM; iso: E, K, MEL, NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 1: 101 (1904).

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 151 (1973); L.Costermans, *Native Trees & Shrubs S.E. Australia* 377 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 153 (1983).

Mallee to 6 m. Bark smooth throughout, grey-brown to yellow-brown. Juvenile leaves elliptic to ovate, light green. Adult leaves lanceolate, acuminate, thick; lamina 5–12 cm long, 1–2.5 cm wide, shining, green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete or quadrangular, 10–19 mm long. Umbels 7-flowered; peduncle slightly flattened, 5–12 mm long; pedicels to 2 mm long or obscure. Buds cylindrical; operculum conical, faintly striate, 3–4 mm long, 4–5 mm wide; hypanthium cylindrical or hemispherical, faintly striate, 4–5 mm long and wide. Fruits cylindrical, 5–10 mm long, 5–7 mm wide; valves 3 or 4, level. *Kangaroo Island Mallee*. Fig. 85G–H.

Widespread from Williams and the Stirling Ra., W.A., E to south-eastern S.A. Grows in sandy loam and on clayey flats in open shrubland. Regions: BENC, LUWN, ESPR, NULL, EYRE, TRNS, RIVR, OTWY. Map 342.

W.A.: 12.9 km E of Hamersley R. crossing, *M.I.H.Brooker* 2322 (PERTH); Nyabing, *C.A.Gardner* 10312 (FRI, PERTH). S.A.: 13.6 km SW of Strathalbyn, *G.M.Chippendale* 1338 & *M.J.Brennan* (AD, BRI, FRI, MEL, NSW); 3 km N of Bute, *B.Copley* 3787 (AD, FRI).

Similar to *E. conglobata*, differing mainly in the cylindrical fruits. Distinguished from *E. fraseri* especially by the mallee habit and smaller usually sessile buds and fruits.

322. *Eucalyptus kondininensis* Maiden & Blakely, *J. & Proc. Roy. Soc. New South Wales* 59: 189 (1925)

T: Kondinin, W.A., 30 Oct. 1922, *C.A.Gardner* 1843; syn: MEL, NSW, PERTH; Kondinin, W.A., 9 July 1923, *C.A.Gardner* 1966; syn: FRI, K, NSW, PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 152 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 246 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 67 (1983).

Tree to 15 m. Bark rough, fibrous, black to 4 m, then smooth, grey to light brown above. Juvenile leaves ovate to oblong, slightly glaucous. Adults leaves narrowly lanceolate, uncinete, thick; lamina 8–12 cm long, 0.8–1.5 cm wide, shining, green; lateral veins faint, at 30°–35°; intramarginal vein up to 1 mm from margin; petiole terete to quadrangular, 10–20 mm long. Umbels 7-flowered; peduncle flattened or angular, 5–10 mm long; pedicels absent. Buds cylindrical to ovoid; operculum conical, striate or ribbed, sometimes slightly rostrate, 4–5 mm long, 3–4 mm wide; hypanthium hemispherical or obconical, 4–5 mm long, 3–4 mm wide. Fruits ±cylindrical or hemispherical, smooth when fresh, wrinkled or striate when dry, 5–6 mm long and wide; valves 3 or 4, just exserted. *Kondinin Blackbutt*. Fig. 85 I–J.

Occurs from SE of Quairading to Kondinin, Newdegate, Lake Grace and Pingrup, W.A. Grows often in pure stands, usually in loamy soil in open woodland near salt lakes. Regions: BENC, ESPR. Map 343.

W.A.: 1.6 km E of Buniche, *M.I.H.Brooker* 2278 (FRI, NSW, PERTH); 2.4 km E of Newdegate, *G.M.Chippendale* 226 (AD, FRI, MEL, NSW); Pingrup, *G.M.Chippendale* 10310 (FRI, PERTH).

Distinguished by the tree habit, rough black bark to ±4 m with smooth bark above, and sessile buds and fruits with slightly exserted valves. A good shade tree, with potential as an arid zone plantation species.

323. *Eucalyptus striaticalyx* W.Fitzg., *J. W. Austral. Nat. Hist. Soc.* 1: 20 (1904)

T: Milly Soak, W.A., Sept. 1903, *W.V.Fitzgerald s.n.*; holo: PERTH; iso: E. NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 83 (1973); J.P.Jessop (ed.), *Fl. Central Australia* 247 (1981); S.Kelly *et al.*, *Eucalypts* 2: t. 66 (1983).

Tree or mallee to 12 m. Bark rough, subfibrous, longitudinally fissured, dark grey, persistent to small branches. Juvenile leaves broadly lanceolate to ovate, green. Adult leaves narrowly to broadly lanceolate, acuminate, thick; lamina 9–15 cm long, 1.8–3.2 cm wide, grey-green; lateral veins just visible, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole terete, 15–30 mm long. Umbels 7–11-flowered; peduncle terete or angular, 10–15 mm long; pedicels 2–5 mm long. Buds cylindrical or conical-cylindrical; operculum hemispherical, rostrate, striate or ribbed, 4–7 mm long, 5–7 mm wide; hypanthium cylindrical, 5–7 mm long and wide. Fruits cylindrical, hemispherical or subovoid, 7–12 mm long, 6–8 mm wide; valves 4 or 5, level or slightly exserted. *Cue York Gum*, *Kopi Gum*. Fig. 85K–L.

Occurs in inland W.A. from S of Roy Hill, southern Pilbara to near Wubin and the eastern Goldfields as far S as Gibson Soak and in S.A. from the Great Victoria Desert to Cockaleechie, Eyre Peninsula. Grows in sand, sandy loam and calcareous sand in low shrubland, often in drainage lines. Regions: PILB, MRCH, BENC, LEON, ESPR, VICD, NULL, EYRE. Map 344.

W.A.: near Lake Austin, *M.I.H.Brooker* 2407 (NSW, PERTH); c. 39 km NE of Wubin, *A.S.George* 1677 (PERTH). S.A.: 27 km N of Watson, *M.I.H.Brooker* 5607 (AD, FRI); Maralinga, *B.Copley* 2691 (AD, FRI).

Distinguished from *E. kondininensis* mainly by the pedicellate buds, from *E. clelandii* by the non-glaucous buds and fruits.

324. *Eucalyptus clelandii* (Maiden) Maiden, *Crit. Revis. Eucalyptus* 2: 189 (1912)

E. goniantha var. *clelandii* Maiden, *Proc. W. Austral. Nat. Hist. Soc.* 3: 176 (1911). T: Goongarrie, W.A., Sept. 1909, *J.H.Maiden*; NSW: lecto, *fide* J.H.Maiden, *op. cit.* 190; isolecto: K, L, PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 154, 155 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 226 (1979); J.P.Jessop (ed.), *Fl. Central Australia* 247 (1981).

Tree to 12 m; branchlets glaucous. Bark rough, dark, flaky-fibrous to 1.5 m, then smooth, grey to light brown above. Juvenile leaves broadly ovate, glaucous. Adult leaves narrowly lanceolate, uncinata, thick; lamina 8–12 cm long, 1–1.5 cm wide, dull, grey-green; lateral veins faint, at 30°–35°; intramarginal vein almost confluent with margin; petiole terete, 10–20 mm long. Umbels 7-flowered; peduncle slightly flattened, glaucous, 7–20 mm long; pedicels glaucous, 2–4 mm long. Buds ovoid, glaucous; operculum conical, or hemispherical and shortly pointed, ribbed, 5–6 mm long and wide; hypanthium hemispherical, smooth or 2-ribbed, 4–6 mm long, 5–6 mm wide. Fruits cylindrical or hemispherical, smooth or striate, glaucous, 5–8 mm long and wide; valves 4, just exserted. *Cleland's Blackbutt*. Fig. 85M–N.

Occurs from E of Cue S to near Lake Biddy, W.A. Grows in sandy loam, on rocky slopes and on flat areas, mostly in open woodland. Regions: BENC, LEON, ESPR. Map 345.

W.A.: 3.2 km E of Lake Biddy, *M.I.H.Brooker* 2282 (MEL, NSW, PERTH); 28.3 km SW of Kalgoorlie, *G.M.Chippendale* 116 (AD, FRI, MEL, NSW, PERTH); 25.8 km W of Kalgoorlie, *N.H.Speck* 902 (CANB, NSW, PERTH).

Similar to *E. striatocalyx* but has glaucous branchlets, buds and fruits. Buds and fruits smaller than those of *E. lesouefii* and *E. pterocarpa*.

325. *Eucalyptus lesouefii* Maiden, *Crit. Revis. Eucalyptus* 2: 187 (1912)

T: Kalgoorlie, W.A., Sept. 1909, *J.H.Maiden*; holo: NSW; iso: BM, BRI, K, MEL, PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 155, 156 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 187 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 78 (1983).

Tree to 18 m, commonly to 12 m; branchlets glaucous. Bark rough, dark, flaky to 2 m, then smooth, brown-grey above. Juvenile leaves lanceolate, glaucous. Adult leaves lanceolate, sometimes falcate, acuminate, thick; lamina 10–12 cm long, 1.5–2 cm wide, dull, green, glandular; lateral veins just visible, at 25°–30°; intramarginal vein usually almost confluent with margin; petiole terete, 15–20 mm long. Umbels 7-flowered; peduncle slightly flattened or angular, glaucous, 10–12 mm long; pedicels glaucous, 2–6 mm long. Buds broadly fusiform, glaucous; operculum conical, ribbed, 10–15 mm long, 10–12 mm wide; hypanthium obconical, ribbed, 6–7 mm long, 7–9 mm wide. Fruits hemispherical, ribbed, glaucous, 8–10 mm long and wide; valves 3 or 4, exserted. *Goldfields Blackbutt*. Fig. 85 O–P.

Occurs mainly in the eastern Goldfields, W.A., extending NW beyond Diemals. Grows in sandy or powdery loam, sometimes in alluvial areas, usually on flat country in open and closed woodland. Region: LEON. Map 346.

W.A.: 15.3 km S of Kalgoorlie, *J.P.Baker* 51 (AD, BRI, FRI, MEL, NSW, PERTH); 464 mile post between Norseman & Esperance [c. 12 km S of Norseman], *M.I.H.Brooker* 2488 (NSW, PERTH); 7.7 km N of Kalgoorlie, *G.M.Chippendale* 276 (FRI, NSW, PERTH).

Distinguished by the deeply ribbed, glaucous buds and fruits, larger than those of *E. clelandii* and *E. striatocalyx*.

326. *Eucalyptus pterocarpa* C.Gardner ex P.Lang, *Fl. Australia* 19: 510 (1988)

T: 8.7 km W on road 10.9 km NW of Norseman, W.A., 12 Mar. 1967, *G.M.Chippendale* 154; holo: FRI; iso: AD, PERTH.

Tree to 14 m. Bark smooth throughout, white to grey or grey-brown. Juvenile leaves not known. Adult leaves lanceolate, acuminate, thick; lamina 9.5–14.5 cm long, 1.2–2.8 cm wide, shining, yellow-green; lateral veins faint to just visible, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 15–20 mm long. Umbels 3–5- or rarely 7-flowered; peduncle flattened, 10–13 mm long; pedicels 5–10 mm long. Buds broadly fusiform, rostrate, deeply

ribbed or winged; operculum conical, rostrate, 7–12 mm long and wide; hypanthium obconical, 6–8 mm long, 7–12 mm wide. Fruits obconical to hemispherical, corrugated, 12–15 mm long, 13–16 mm wide; valves 3–5, just included to just exserted. Figs 34, 85Q–R.

Occurs in a restricted area W and NW of Norseman, W.A., on flat areas in clay, sandy loam or sand in forest. Region: ESPR. Map 347.

W.A.: 16 km NW of Norseman, Oct. 1942, *G.E.Brockway* (FRI, PERTH); 16 km W of Norseman, 20 July 1963, *C.A.Gardner* (PERTH).

Differs from *E. lesouefii* in having smooth bark throughout, shining yellow-green leaves, 3–5- or rarely 7-flowered umbels and corrugated non-glaucous buds and fruits.

Ser. 66 *Torquatae*

Eucalyptus* ser. *Torquatae Chippendale, *Fl. Australia* 19: 506 (1988).

Type: *E. torquata* Luehm.

Trees or mallees. Bark usually rough on lower trunk, sometimes to larger branches, with several taxa smooth throughout. Juvenile leaves alternate, petiolate, concolorous or slightly discolorous. Adult leaves alternate, petiolate, concolorous. Conflorences axillary, simple; umbels 3- or 7-flowered, sometimes to 11-flowered. Buds usually ovoid or clavate, occasionally cylindrical or subcylindrical. Fruits hemispherical, obconical, ovoid, subpyriform, campanulate or subcylindrical; disc broad or narrow, descending or level; valves 3–5, usually exserted or level, but deeply included in *E. deflexa*. Seeds irregularly elliptic, strongly reticulate, dark brown or grey-brown.

A series of 9 species in southern W.A. and western and southern S.A., characterised especially by the usually rough bark, concolorous leaves, simple umbels, fruits with descending or level disc and exserted valves, and brown seeds.

327. *Eucalyptus melanoxylon* Maiden, *Crit. Revis. Eucalyptus* 6: 351 (1922)

T: Westonia, W.A., 1 June 1921 & 15 Feb. 1922, *W.M.Cusack* 62 & 62K (published as *J.M.Cusack*); syn: NSW; isosyn: PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 157 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 88 (1983).

Tree to 24 m. Bark rough, fibrous, grey to 6 m or to larger branches, then smooth, white or grey above. Juvenile leaves lanceolate. Adult leaves narrowly lanceolate, sometimes falcate, uncinat; lamina 8–13 cm long, 0.7–1 cm wide, shining, green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 10–15 mm long. Umbels 7–11-flowered; peduncle quadrangular, 10–20 mm long; pedicels 2–5 mm long. Buds ovoid; operculum hemispherical to bluntly conical, 3–4 mm long and wide; hypanthium hemispherical, 3–4 mm long and wide. Fruits hemispherical or obconical, 4–5 mm long and wide; disc slightly convex, descending, narrow; valves 3, exserted, pointed outwards. *Black Morrel*. Fig. 85S–T.

Occurs in southern W.A. from Bullabulling through the eastern Goldfields and S almost to the coast, with outliers on the S edge of the Nullarbor Plain as far E as Mundrabilla. Grows in flat areas and slight clay-loam depressions in open and closed forest. Regions: BENC, LEON, ESPR, NULL. Map 348.

W.A.: Westonia, *M.I.H.Brooker* 2434 (FRI, MEL, NSW, PERTH); 165.4 km S of Southern Cross, *G.M.Chippendale* 349 (AD, FRI, MEL, NSW); Westonia, *C.A.Gardner* 1264 (PERTH); Kumarl, Apr. 1969, *B.A.Rockel* (FRI); 7 km N of Balladonia, *M.I.H.Brooker* 6437 (FRI).

Distinguished by tall tree habit, rough dark bark to larger branches, narrow leaves, ovoid buds, and fruit valves exserted and curved outwards. An arid zone tree worthy of trials in drier areas.



Figure 85. *Eucalyptus* buds and fruits, all $\times 1$, unless otherwise stated. **A–B**, *E. pileata* (C.Gardner 8001, FRI). **C–D**, *E. conglobata* (C. N.Gemmel 370, FRI; **D**, L.Pryor 193, FRI). **E–F**, *E. fraseri* (I.Brooker 2472, FRI). **G–H**, *E. anceps* (Murray Bridge, S.A., J.Maiden, FRI). **I–J**, *E. kondininensis* (G.Chippendale 226, FRI). **K–L**, *E. striaticalyx* (**K**, I.Brooker 2403, FRI; **L**, Milly Soak, Cue, W.A., J.Maiden, FRI). **M–N**, *E. clelandii* $\times 0.75$ (**M**, R.Kuchel 1271, FRI; **N**, I.Brooker 2410, FRI). **O–P**, *E. lesouefii* (**O**, C.Gardner 11154, FRI; **P**, 24 km S of Kalgoorlie, W.A., E.Larsen, FRI). **Q–R**, *E. pterocarpa* (**Q**, cult., Banool St., Woomera, S.A., N.Hall, FRI; **R**, J.Baker 49, FRI). **S–T**, *E. melanoxylon* (L.Pryor 86, FRI). **U–V**, *E. comitae-vallis* (**U**, B.Lay 899, FRI; **V**, I.Brooker 3659, FRI). **G**, **H** drawn by C.Stahl. **K–N**, **U**, **V** drawn by M.Risby. Others drawn by M.May.

328. *Eucalyptus comitae-vallis* Maiden, *Crit. Revis. Eucalyptus* 6: 431 (1923)

T: Comet Vale, W.A., Nov. 1917, *J.T.Jutson* 239; holo: NSW; iso: FRI.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 163 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 111 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 65 (1983).

Mallee to 6 m. Bark rough, flaky to 1.5 m, then smooth, silvery or grey-brown above. Juvenile leaves ovate. Adult leaves lanceolate, sometimes falcate, often uncinata; lamina 5.5–8.5 cm long, 0.9–1.5 cm wide, pale green or yellow-green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 10–15 mm long. Umbels 7-flowered; peduncle terete, 10–15 mm long; pedicels 4–7 mm long. Buds subcylindrical or cylindrical-conical; operculum conical or hemispherical, apiculate, 2–3 mm long, 3–5 mm wide; hypanthium hemispherical or campanulate, 4–5 mm long and wide. Fruits subcylindrical, 5–7 mm long and wide; valves 3 or 4, level or exserted. *Comet Vale Mallee*. Fig. 85U–V.

Occurs between Menzies and Norseman and to the east and north, W.A. Grows in sandy soil in open shrubland. Regions: LEON, ESPR, VICD. Map 349.

W.A.: 32.2 km E of Karonie, *M.I.H.Brooker* 2557 (FRI, K, PERTH); 96.6 km NE of Kalgoorlie, *M.I.H.Brooker* 2579 (FRI, PERTH);

Distinguished by rough flaky basal bark, clavate or subcylindrical buds which are not constricted, and hemispherical or subcylindrical fruits with valves which are level or just exserted.

329. *Eucalyptus brachycalyx* Blakely, *Key Eucalypts* 119 (1934)

T: Murat and Denial Bays, S.A., Sept. 1907, *R.S.Rogers*; holo: NSW; iso: AD, BM, FRI, MEL.

E. incrassata var. *protrusa* J.Black, *Fl. S. Australia* 3: 421 (1926); *E. brachycalyx* var. *protrusa* (J.Black) H.Eichler, *Suppl. J.M.Black's Fl. S. Australia 2nd edn* 240 (1965). T: Ooldea and eastwards, S.A., collector not stated; *n.v.*

E. brachycalyx var. *chindoo* Blakely, *Key Eucalypts* 119 (1934). T: Minnipa, S.A., May 1916, *W.J.Spafford*; holo: NSW; iso: AD.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 132 (1974); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 156 (1983).

Mallee or tree to 8 m. Bark in tree form rough, flaky-fibrous, grey to yellow-brown up to lower branches; in mallee form, bark smooth, grey to pink-brown. Juvenile leaves elliptic to ovate. Adult leaves narrowly lanceolate, uncinata; lamina 5–9 cm long, 0.6–1.3 cm wide, shining, green; lateral veins faint, at 30°–40°; intramarginal vein almost confluent with margin; petiole quadrangular, 10–15 mm long. Umbels 7–11-flowered; peduncle slightly flattened, 6–13 mm long; pedicels 2–5 mm long. Buds ovoid; operculum hemispherical or bluntly conical, striate or ribbed, 3–5 mm long, 3–4 mm wide; hypanthium hemispherical, 4–5 mm long, 4–5 mm wide. Fruits hemispherical to obconical, 4–8 mm long, 5–8 mm wide; disc narrow, level or descending; valves 3 or 4, level or exserted. *Gilja*. Fig. 86A–B.

Occurs in southern S.A. predominantly on Yorke and Eyre Peninsulas, and extending almost to Madura, W.A. Grows on flats and gently undulating areas, usually in shrubland. Regions: NULL, VICD, EYRE, TRNS, RIVR. Map 350.

W.A.: 32 km SE of Madura, *H.Martin* 993a (NSW). S.A.: Hundred of Wittunga, *B.Copley* 1221 (AD, NSW); 1 km N of Bute, *B.Copley* 3909 (AD, FRI); Mt Aleck, *R.H.Kuchel* 1044 (AD).

Distinguished by thick narrow leaves, ovoid buds with the operculum often noticeably narrower than the hypanthium, and small fruits with fragile exserted valves.

330. *Eucalyptus rugosa* R.Br. ex Blakely, *Key Eucalypts* 120 (1934)

T: Fowlers Bay, [S.A.], Jan. 1802, *R. Brown*; holo: K; iso: FRI.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 127 (1974); L.Costermans, *Native Trees & Shrubs S.E. Australia* 378 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 155 (1983).

Mallee to 9 m. Bark smooth throughout, creamy grey to grey. Juvenile leaves elliptic to ovate. Adult leaves lanceolate, acuminate; lamina 6–10 cm long, 1.2–2 cm wide, grey-green; lateral veins faint, at 25°–35°; intramarginal vein up to 1 mm from margin; petiole terete, 6–15 mm long. Umbels 7-flowered; peduncle flattened, dilating upwards, 10–18 mm long; pedicels absent or to 5 mm long. Buds clavate; operculum hemispherical, sometimes apiculate, usually ribbed, 3–5 mm long, 4–5 mm wide; hypanthium hemispherical, ribbed, 4–6 mm long, 5–7 mm wide. Fruits hemispherical or obconical, 8–15 mm long, 6–10 mm wide, wrinkled, ribbed or angled; disc descending, moderately broad, valves 3 or 4, exserted. *Kingscote Mallee*. Fig. 86C–D.

Occurs from near Mt Ragged, W.A., eastwards along and near the coast to the Murray R. area, S.A. Grows on flat and gently sloping land, usually in calcareous coastal sand. Regions: ESPR, NULL, EYRE, RIVR. Map 351.

W.A.: 27 km S of Caiguna, *R.Parsons* 195 (AD); Point Dover, *P.G.Wilson* 7708 (PERTH). S.A.: Waitpinga, *C.D.Boomsma* 120 (AD, FRI); 1.3 km N of Seal Bay, *G.M.Chippendale* 1371 (AD, BRI, FRI, MEL, NSW).

Distinguished from *E. brachycalyx* by the broader, grey-green leaves and ribbed buds and fruits.

331. *Eucalyptus griffithsii* Maiden, *J. W. Austral. Nat. Hist. Soc.* 3: 177 (1911)

T: Kalgoorlie, W.A., Sept. 1909, *J.H.Maiden*; holo: NSW; iso: K, PERTH.

E. griffithsii var. *angustiuscula* Blakely, *Key Eucalypts* 105 (1934). T: Kalgoorlie, W.A., June 1933, *A.Meebold s.n.*; holo: NSW.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 166 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 204 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 41 (1983).

Tree or mallee to 6 m. Bark smooth, red-brown to white or grey, with up to 0.6 m of flaky or scaly basal bark. Juvenile leaves lanceolate. Adult leaves lanceolate, acuminate or uncinat; lamina 10–13 cm long, 1–2.5 cm wide, shining, pale green or grey-green; lateral veins faint, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole terete, 12–20 mm long. Umbels 3-flowered; peduncle angular, 10–14 mm long; pedicels 5–9 mm long. Buds clavate; operculum hemispherical, flat-topped, corrugated, 3–5 mm long, 8–12 mm wide; hypanthium campanulate, 2-ribbed, 6–10 mm long, 8–12 mm wide. Fruits campanulate, 2-ribbed, 8–14 mm long, 9–15 mm wide; disc shallowly descending, moderately broad; valves 4, strongly exserted. *Griffiths Grey Gum*. Fig. 86E–F.

Occurs in the eastern Goldfields, W.A., particularly between Kalgoorlie and Norseman, in loamy and gravelly soil, on flat saline areas and sometimes on rocky slopes. Regions: BENC, LEON, ESPR. Map 352.

W.A.: 6.4 km N of Widgiemooltha, *M.I.H.Brooker* 2225 (PERTH); 35 km W of Curtin, *G.M.Chippendale* 136 (FRI, MEL, NSW, PERTH); near Kalgoorlie, *N.H.Speck* 896 (AD, CANB, NSW, PERTH).

Distinguished by the rough, scaly or flaky basal bark, thick leaves, flat-topped clavate buds in 3s, and campanulate, 2-ribbed fruits.

332. *Eucalyptus concinna* Maiden & Blakely, *Crit. Revis. Eucalyptus* 8: 49 (1929)

T: Camp 49, Great Victoria Desert, W.A., 12 Sept. 1891, *R.Helms*; holo: NSW; iso: K, PERTH.

E. ochrophylla Maiden & Blakely in *J.H.Maiden, Crit. Revis. Eucalyptus* 8: 50 (1929). T: Immana, near Ooldea, S.A., 29 Aug. 1922, *J.B.Cleland* 67; syn: NSW; Ooldea, S.A., 27 Aug. 1922, *J.B.Cleland* 71; syn: NSW; Ooldea, S.A., Aug. 1922, *J.B.Cleland* 72; syn: NSW; Ooldea Soak, S.A., 27 Aug. 1922, *J.B.Cleland* 68; syn: AD, NSW; E of Ooldea, S.A., June 1909, *H.Deane s.n.*; syn: NSW; Barton, S.A., 23 Aug. 1922, *J.B.Cleland* 66; syn: NSW; 70 miles [c. 112 km] SW of Camp 17, Elder Exploring Expedition, 17 July 1891, *R.Ramsay*; syn: MEL, NSW; Comet Vale, W.A., Sept. 1909, *J.H.Maiden*; syn: NSW.

E. meeboldii Blakely, *Key Eucalypts* 121 (1934). T: 7 miles [c. 11 km] W of Kalgoorlie, W.A., June 1933, *A.Meebold*; holo: NSW; iso: MEL, PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 164 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 69 (1983).

Tree or mallee to 9 m. Bark smooth throughout, grey or brown-grey, sometimes up to 3 m of rough, flaky, basal bark. Juvenile leaves lanceolate. Adult leaves narrowly lanceolate, acuminate; lamina 6–10 cm long, 1–2 cm wide, shining, pale green; lateral veins faint, at 25°–35°; intramarginal vein up to 1 mm from margin; petiole terete, 10–15 mm long. Umbels 3–7-flowered; peduncle slightly flattened, 5–10 mm long; pedicels 4–6 mm long. Buds clavate; operculum hemispherical, flat-topped or apiculate, slightly corrugated or sometimes smooth, 2–4 mm long, 5–6 mm wide; hypanthium hemispherical, often 2-ribbed, 5–6 mm long, 4–5 mm wide. Fruits subpyriform, hemispherical or subcampanulate, 6–10 mm long and wide; disc obliquely descending; valves 4, just exerted. *Victoria Desert Mallee*. Fig. 86G–H.

Widespread in inland southern W.A. including the Great Victoria Desert, extending E almost to Moonaree, S.A. Grows in sand and sandy loam, sometimes on sandhills and near salt lakes, in open woodland and shrubland. Regions: BENC, LEON, ESPR, VICD, NULL, EYRE. Map 353.

W.A.: 30.6 km S of Menzies, *M.I.H. Brooker* 2454 (FRI, MEL, NSW, PERTH); 9.7 km SW of Kalgoorlie, *G.M. Chippendale* 370 (AD, FRI, MEL, NSW). S.A.: Emu, *N.N. Donner* 3881b (AD, FRI); 1.6 km W of Emu, *N. Forde* 573 (AD, CANB, MEL, NSW).

Differs from *E. griffithsii* and *E. corrugata* in the 3–7-flowered umbels and smaller buds and fruits, the operculum only faintly ribbed.

333. *Eucalyptus corrugata* Luehm., *Victorian Naturalist* 13: 168 (1897)

T: Golden Valley, W.A., 1888, *W.A. Sayer*; holo: MEL; iso: K, NSW.

Illustrations: *G.M. Chippendale*, *Eucalypts W. Austral. Goldfields* 167, 168 (1973); *C.A. Gardner* (ed. *T.E. Aplin*), *Eucalypts W. Australia* 185 (1979); *S. Kelly et al.*, *Eucalypts* 1: t. 76 (1983).

Tree or mallee to 15 m. Bark smooth, grey-brown to creamy white, with up to 2 m of rough, grey-brown to yellow-brown, scaly basal bark. Juvenile leaves ovate. Adult leaves narrowly lanceolate to lanceolate, sometimes falcate, acuminate or uncinata; lamina 9–13 cm long, 1.5–2.5 cm wide, shining, light green; lateral veins faint, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole terete, 15–20 mm long. Umbels 3-flowered; peduncle terete or slightly flattened, glaucous, 8–12 mm long; pedicels glaucous, 4–6 mm long. Buds clavate; operculum hemispherical, flat-topped, corrugated, 4–6 mm long, 10–15 mm wide; hypanthium obconical, corrugated, 6–9 mm long, 10–15 mm wide. Fruits hemispherical or obconical, corrugated, 8–12 mm long, 10–15 mm wide; disc descending; valves 4 or 5, exerted strongly. *Rough-fruited Mallee*. Fig. 86 I–J.

Occurs between Westonia, Southern Cross and Mt Jackson, extending E to Balladonia, W.A. Grows in rocky and clayey loam, in open woodland and shrubland. Regions: BENC, LEON. Map 354.

W.A.: 3.1 km W of Westonia, *G.M. Chippendale* 265 (AD, BRI, FRI, NSW, PERTH); Koolyanobbing, *H. Demarz* 1670 (PERTH); 15 km SW of Londonderry, *R.H. Kuchel* 1764 (AD); Fraser Rd, Mar. 1963, *A. Pofflewell* (PERTH).

Distinguished by the coarsely corrugated buds and fruits in 3s. Pedicels usually shorter than in *E. griffithsii*.

334. *Eucalyptus torquata* Luehm., *Victorian Naturalist* 13: 147 (1897)

T: near Coolgardie, W.A., *W.A. Macpherson*; holo: MEL; iso: K.

Illustrations: *G.M. Chippendale*, *Eucalypts W. Austral. Goldfields* 169, 170 (1973); *C.A. Gardner* (ed. *T.E. Aplin*), *Eucalypts W. Australia* 41 (1979); *S. Kelly et al.*, *Eucalypts* 1: t. 80 (1983).

Tree to 11 m. Bark to 4 m rough, dark grey, slightly fissured, then smooth, grey-brown above. Juvenile leaves lanceolate. Adult leaves lanceolate, sometimes falcate, acuminate or uncinata; lamina 9–12 cm long, 1.5–2 cm wide, dull, grey-green; lateral veins faint, at 35°–40°; intramarginal vein up to 2 mm from margin; petiole terete, 15–20 mm long. Umbels 7-flowered; peduncle slender, terete, recurved, 15–32 mm long; pedicels 13–20 mm long.

Buds cylindrical; operculum rostrate, corrugated at base, 10–15 mm long, 8–10 mm wide; hypanthium cylindrical, smooth or striate, swollen and corrugated at base, 8–10 mm long, 6–8 mm wide. Fruits subcylindrical or ovoid, striate, 12–15 mm long, with a swollen corrugated base 8–12 mm wide; disc descending steeply, broad; valves 4, ±level. *Coral Gum*. Fig. 86K–L.

Occurs from Bullabulling to the Kalgoorlie area and southwards to Norseman, W.A., in shallow rocky soil on low hills in low open forest and woodland. Regions: LEON, ESPR. Map 355.

W.A.: 6.4 km N of Widgiemooltha, *M.I.H. Brooker* 2222 (FRI, NSW, PERTH); 33.8 km W of Kalgoorlie, *R.Filson* 8848 (AD, MEL, PERTH).

Distinguished by the rough bark on main trunk, the corrugated swollen base to the hypanthium, operculum and fruits, and the rostrate operculum. Buds and stamens usually pink or red. A good honey plant, and an attractive small tree which has been cultivated in many parts of Australia and in California and Arizona, U.S.A.

335. *Eucalyptus deflexa* Brooker, *Nuytsia* 2: 106 (1976)

T: 35 km E of Lake King towards Daniell, W.A., 33°05'S, 120°02'E, 11 Nov. 1966, *P.G.Wilson* 5745; holotype: PERTH; iso: FRI.

Illustrations: *M.I.H. Brooker, op. cit.* 107; *N.Hall & M.I.H. Brooker, Forest Tree Ser. No. 201* (1977); *S.Kelly et al., Eucalypts* 2: t. 64 (1983).

Mallee to 3 m. Bark smooth throughout, grey. Juvenile leaves lanceolate. Adult leaves lanceolate, sometimes falcate, acuminate or uncinat; lamina 5–10 cm long, 0.5–1 cm wide, shining, yellow-green; lateral veins faint, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole terete, 5–10 mm long. Umbels 3–7-flowered; peduncle terete, recurved, 20–30 mm long; pedicels 10–20 mm long. Buds cylindrical to ovoid; operculum hemispherical, sometimes apiculate, 2–3 mm long, 4–6 mm wide; hypanthium cylindrical or ovoid, 6–8 mm long, 4–6 mm wide. Fruits ovoid, smooth or slightly striate, 9–12 mm long, 6–9 mm wide; disc broad, steeply descending; valves 3–5, deeply included. Fig. 86M–N.

Occurs N of Ravensthorpe and E and NE of Lake King, W.A., in shrubland in sandy or gravelly soil on flat areas and slight rises. Region: ESPR. Map 356.

W.A.: 121 km E of Hyden towards Norseman, *M.I.H. Brooker* 4985 (AD, FRI, MEL, PERTH); 27 km E of Lake King, *P.G.Wilson* 6965 (FRI, PERTH).

Distinguished by small mallee habit, small thick yellow-green leaves, long deflexed peduncles and pedicels, cream or pinkish buds and filaments, and ovoid, often slightly striate fruits.

Ser. 67 Merrickianae

Eucalyptus* ser. *Merrickianae Chippendale, *Fl. Australia* 19: 501 (1988).

Type: *E. merrickiae* Maiden & Blakely

Mallees. Bark smooth throughout, grey or grey brown except *E. merrickiae* which has flaky, rough basal bark. Juvenile leaves not seen for all taxa. Adult leaves alternate, petiolate, usually shining, concolorous. Conflorences axillary, simple; umbels 3- or 7–11-flowered. Buds cylindrical, cylindrical-conical, or obovoid. Fruits subcylindrical, cylindrical, hemispherical, campanulate or ovoid; disc broad, descending; valves 4 or 5, included. Seeds irregularly elliptic or rounded, reticulate, often with a wing-like margin, brown or grey.

A series of 4 species in southern W.A., characterised by the usually smooth bark, concolorous leaves, simple umbels, fruits with descending disc and included valves, and brown or grey seeds.

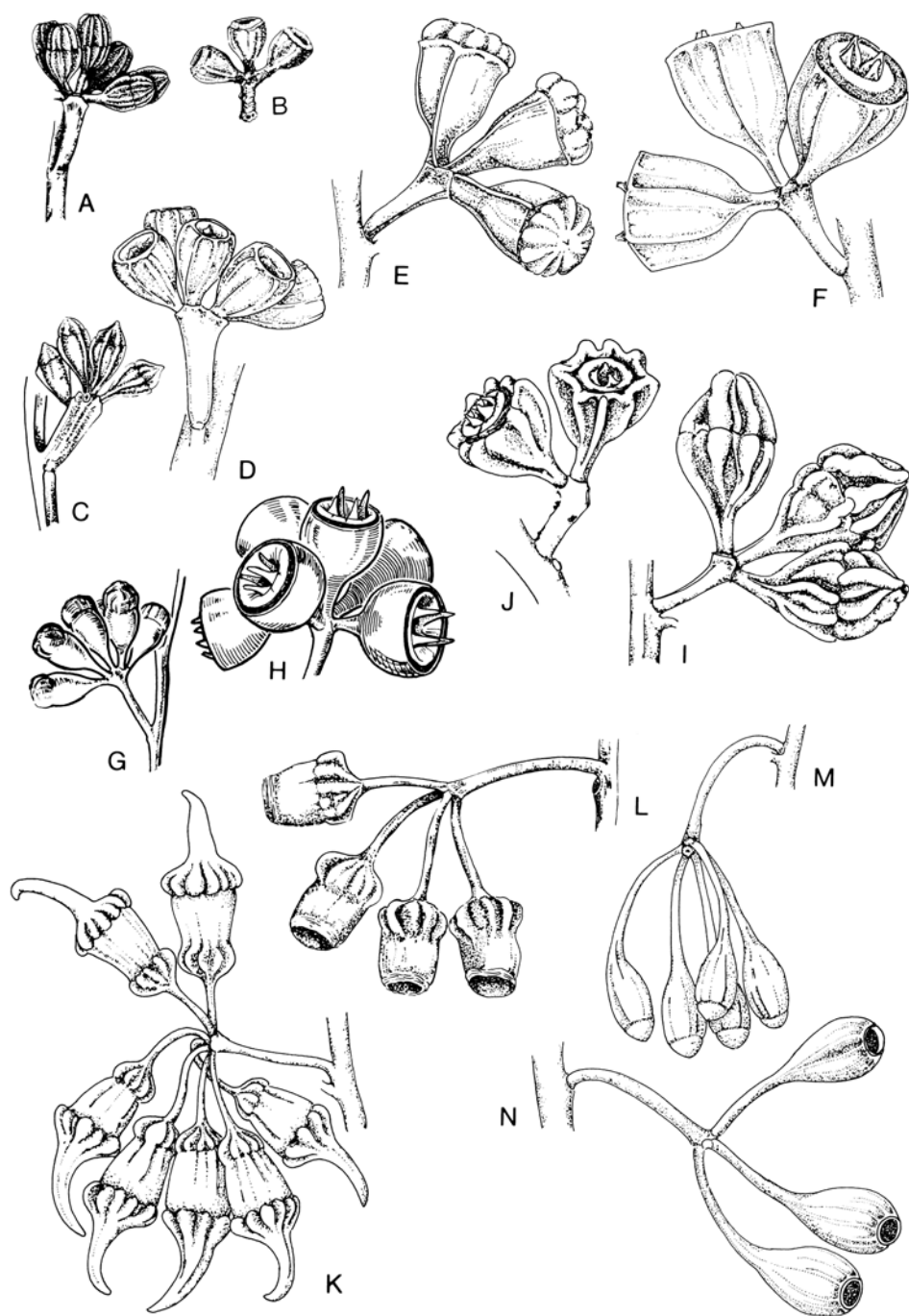


Figure 86. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. brachycalyx* (Murat & Denial Bays, S.A., R.Rogers, NSW 47540, NSW). **C–D**, *E. rugosa* (**C**, Fowlers Bay, S.A., R.Rogers, FRI; **D**, J.Banks 1098, FRI). **E–F**, *E. griffithsii* (C.Gardner 9269, FRI). **G–H**, *E. concinna* (**G**, T.Dennis 115, FRI; **H**, T.Dennis 93, FRI). **I–J**, *E. corrugata* (D.Boland J260, FRI). **K–L**, *E. torquata* (**K**, R.Kuchel 1773, FRI; **L**, Widgiemooltha, W.A., C.Gardner, FRI). **M–N**, *E. deflexa* (H.Demarz D130, FRI). **A**, **B** drawn by J.Collins. **G**, **H** drawn by M.Risby. Others drawn by M.May.

336. *Eucalyptus leptocalyx* Blakely, *Key Eucalypts* 118 (1934)

T: 9 mile Tank from Hopetoun, W.A., Sept. 1909, *J.H.Maiden*; syn: FRI, K, NSW, PERTH; Grass Patch, W.A., 23 May 1924, *C.A.Gardner* 2221; syn: NSW.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 161 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 165 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 62 (1983).

Mallee to 3.5 m. Juvenile leaves broadly ovate. Adult leaves lanceolate, acuminate or uncinatate, thick; lamina 6–10 cm long, 1.5–2.5 cm wide, shining, green; lateral veins faint, at 30°–40°; intramarginal vein up to 2 mm from margin; petiole terete or slightly flattened, 20–30 mm long. Umbels 7–11-flowered; peduncle slightly flattened, 8–12 mm long; pedicels quadrangular, 3–5 mm long. Buds cylindrical or obovoid; operculum hemispherical or conical, 3–4 mm long, 3–5 mm wide; hypanthium cylindrical, 5–6 mm long, 3–5 mm wide. Fruits ovoid, sometimes subcylindrical, 8–10 mm long, 6–8 mm wide; valves 4. *Hopetoun Mallee*. Fig. 87A–B.

Occurs mainly from near the Gairdner R. eastwards to Israelite Bay, and inland to S of Norseman, W.A., in stony and gravelly sand, sometimes in clayey soil in shrubland. Regions: BENC, LEON, ESPR. Map 357.

W.A.: 6.4 km S of Norseman, *M.I.H.Brooker* 3603 (BRI, FRI, MEL, PERTH); 24.8 km SSE of Ravensthorpe, *G.M.Chippendale* 418 (AD, FRI, MEL, NSW, PERTH); 9.7 km S of Salmon Gums, *R.D.Royce* 4056 (NSW, PERTH).

Distinguished by mallee habit, thick shining lanceolate leaves, cylindrical or obovoid buds, the operculum much shorter than the hypanthium, and ovoid or subcylindrical fruits.

337. *Eucalyptus scyphocalyx* (F.Muell. ex Benth.) Maiden & Blakely, *Crit. Revis. Eucalyptus* 8: 45 (1929)

E. dumosa var. *scyphocalyx* F.Muell. ex Benth., *Fl. Austral.* 3: 230 (1867). T: Eyres Relief Camp, W.A., *G.Maxwell*; holo: K.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 159 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 125, figs A–D (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 57 (1983) as *E. merrickiae*.

Mallee to 4 m. Juvenile leaves not seen. Adult leaves lanceolate, acuminate, thick; lamina 8–11 cm long, 1.5–2.7 cm wide, green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 15–30 mm long. Umbels 7–11-flowered; peduncle quadrangular, 8–15 mm long; pedicels quadrangular, 4–6 mm long. Buds cylindrical or cylindrical-conical; operculum depressed conical, 3–4 mm long, 5–6 mm wide; hypanthium cylindrical, 5–7 mm long, 5–6 mm wide. Fruits ovoid or cupular, 8–10 mm long, 7–9 mm wide; valves 4. Fig. 87C–D.

Occurs from about Newdegate to E of Zanthus, W.A., on sand plains. Regions: LEON, ESPR. Map 358.

W.A.: 33.8 km E of Lake King, *M.I.H.Brooker* 3594 (FRI); 29 km E of Ravensthorpe, *M.I.H.Brooker* 6695 (FRI); 16 km E of Newdegate, *R.D.Royce* 4187 (PERTH).

Very close to *E. leptocalyx* and usually distinguished by the quadrangular peduncle and slightly broader buds. Differs from the following 2 species in the larger umbels.

338. *Eucalyptus platycorys* Maiden & Blakely, *Crit. Revis. Eucalyptus* 8: 42 (1929)

T: Boorabbin, W.A., 16 Jan. 1906, *A.Morrison*; holo: NSW; iso: K, PERTH.

E. helmsii Maiden & Blakely, *Crit. Revis. Eucalyptus* 8: 47 (1929). T: near Camp 59, Victoria Desert, W.A., 23 Sept. 1891, *R.Helms* 14; holo: NSW; iso: AD, FRI.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 160 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 250 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 68 (1983).

Mallee, occasionally a tree, to 4.5 m. Juvenile leaves not seen. Adult leaves narrowly lanceolate, uncinatate, thick; lamina 6–8 cm long, 1–1.5 cm wide, shining, pale green; lateral veins just visible, at 30°–35°; intramarginal vein up to 2 mm from margin; petiole channelled,

15–20 mm long. Umbels 3-flowered; peduncle quadrangular, 4–8 mm long; pedicels quadrangular, 3–6 mm long. Buds cylindrical-conical, smooth when fresh, distinctly striate when dry; operculum hemispherical with a conical point, 4–9 mm long, 8–10 mm wide; hypanthium cylindrical or campanulate, 5–9 mm long, 7–8 mm wide, usually slightly narrower than the operculum. Fruits cylindrical or campanulate, 6–10 mm long, 7–10 mm wide, smooth or striate; valves 4 or 5. *Boorabbin Mallee*. Fig. 87E–F.

Occurs widely from Boorabbin to Ravensthorpe and eastwards to the Fraser Ra., W.A. Grows in sandy soil including near salty areas in open shrubland. Regions: BENC, LEON, ESPR. Map 359.

W.A.: 20 km NW of Hyden, *D.F.Blaxell* 71 (NSW, PERTH); 2.4 km E of Boorabbin, *G.M.Chippendale* 110 (FRI, MEL, NSW, PERTH); Yerbillon, *C.A.Gardner* 10332 (FRI, NSW, PERTH).

Distinguished by 3-flowered umbels, operculum slightly wider than hypanthium, buds smooth when fresh, striate when dry, and cylindrical or campanulate fruits.

339. *Eucalyptus merrickiae* Maiden & Blakely, J. & Proc. Roy. Soc. New South Wales 59: 192 (1925)

T: Grass Patch, W.A., 23 May 1924, *C.A.Gardner* 2218; holo: NSW; iso: FRI, PERTH.

Illustrations: *G.M.Chippendale, Eucalypts W. Austral. Goldfields* 158 (1973); *C.A.Gardner* (ed. T.E.Aplin), *Eucalypts W. Australia* 125, figs E–K (1979).

Mallee to 3 m. Basal bark rough, flaky. Juvenile leaves not seen. Adult leaves linear to very narrowly lanceolate, uncinata, firm; lamina 5–7 cm long, 0.5–1 cm wide, green or yellow-green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 4–7 mm long. Umbels 3-flowered; peduncle terete or quadrangular, 2–5 mm long; pedicels terete, 1–3 mm long. Buds cylindrical-conical; operculum hemispherical, apiculate to conical, 3–4 mm long, 5–6 mm wide; hypanthium cylindrical, 5–7 mm long, 5–6 mm wide. Fruits cylindrical, 6–9 mm long, 7–8 mm wide; valves 4. *Goblet Mallee*. Fig. 87G–H.

Occurs between Circle Valley, Grass Patch and East Dowak, W.A., often near salt lakes. Region: ESPR. Map 360.

W.A.: 4.3 km E of Truslove, *M.I.H.Brooker* 7075 (FRI, NSW, PERTH); Circle Valley, *C.A.Gardner* 11167 (FRI, PERTH).

Differs from *E. platycorys* mainly in the rough basal bark, narrower leaves, shorter peduncle and pedicels and narrower buds.

Ser. 68 Tetrapterae

***Eucalyptus* ser. *Tetrapterae* Blakely, Key *Eucalypts* 15, 73 (1934).**

Type: *E. tetraptera* Turcz.

E. ser. Quadricostatae Blakely, *op. cit.* 67, 274. T: *E. forrestiana* Diels.

E. ser. Anisomelae Blakely, *op. cit.* 27, 125 p.p. T: not designated.

E. subser. Macrocarpae Blakely, *op. cit.* 28, 125. T: *E. pimpiniana* Maiden.

Usually mallees, sometimes small trees. Bark smooth, grey to light brown throughout, sometimes rough at base. Juvenile leaves alternate but not seen for all taxa, petiolate, concolorous. Adult leaves alternate, petiolate, thick, concolorous. Conflorescences axillary, simple; umbels 1-, 3–7- or 7–11-flowered. Buds cylindrical, ovoid, conical, urceolate, pyriform, turbinate, to quadrangular, sometimes rostrate and/or winged. Fruits hemispherical, cylindrical, campanulate, urceolate, turbinate, ovoid, pyriform or quadrangular and winged; disc broad, descending; valves 3 or 4, included. Seeds pyramidal or sometimes elliptic or crescent-shaped, reticulate, narrowly winged, brown to black.

A series of 7 species in southern W.A., southern S.A., south-western N.S.W. and north-western Vic. Characterised especially by usually smooth bark, thick concolorous leaves, simple umbels sometimes 1-flowered, large fruits and black or brown seeds.

340. *Eucalyptus pimpiniana* Maiden, *Crit. Revis. Eucalyptus* 2: 211 (1912)

T: E of Ooldea, N of Fowlers Bay, S.A., June 1909, *H.Deane s.n.*; holo: NSW; iso: K.

E. isingiana Maiden, *Crit. Revis. Eucalyptus* 6: 353 (1922). T: 407 miles [c. 650 km] from Port Augusta, near Ooldea, S.A., 5 Sept. 1920, *E.H.Ising 1480*; holo: NSW.

Illustrations: C.D.Boomsma, *Native Trees S. Australia* 161 (1972); J.P.Jessop (ed.), *Fl. Central Australia* 248 (1981); S.Kelly *et al.*, *Eucalypts* 1: t. 85 (1983).

Mallee to 2 m. Juvenile leaves ovate to broadly lanceolate, grey-green, thick. Adult leaves ovate or broadly lanceolate, acuminate; lamina 7–11 cm long, 2.5–4 cm wide, yellow-green or grey-green; lateral veins faint, at 30°–50°; intramarginal vein faint, up to 1 mm from margin; petiole terete, 15–20 mm long. Umbels 7–11-flowered; peduncle terete or angular, thick, reflexed, 10–20 mm long; pedicels 5–13 mm long. Buds cylindrical, rostrate, smooth; operculum conical, rostrate, 10–15 mm long, 7–10 mm wide; hypanthium cylindrical or obconical, 12–15 mm long, 7–10 mm wide. Fruits pyriform or cylindrical, smooth, rugose or striate, 15–20 mm long, 10–14 mm wide; valves 3 or 4. *Pimpin Mallee*. Fig. 87 I–J.

Occurs as scattered populations in the area including Ooldea, Immarna, Maralinga and Cook, S.A. Grows in shrubland on sand dunes and plains. Region: VICD. Map 361.

S.A.: Immarna, Aug. 1922, *J.B.Cleland* (AD, FRI, NSW); 4.8 km S of Maralinga, *N.Forde 627* (AD, CANB, K, MEL, NSW).

Distinguished by small mallee habit, thick yellow-green or grey-green leaves, reflexed peduncle and smooth buds and pyriform fruits.

341. *Eucalyptus incrassata* Labill., *Nov. Holl. Pl. Spec.* 2: 12, t. 150 (1806)

T: south coast, Australia, *J.J.H. de Labillardière s.n.*; holo: FI; iso: BM, G, LINN, MEL.

E. costata F.Muell. & Behr ex F.Muell., *Trans. Victorian Inst. Advancem. Sci.* 33 (1855); *E. incrassata* var. *costata* (F.Muell. & Behr ex F.Muell.) N.Burb., *Trans. Roy. Soc. S. Australia* 71: 150 (1947); *E. incrassata* subsp. *costata* (F.Muell. & Behr ex F.Muell.) F.Johnstone & Hallam, *Proc. Roy. Soc. Victoria* 91: 204 (1980). T: Murray Desert, S.A., 1854, *F.Mueller*; syn: MEL; other syns: *n.v.*

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 170, 171 (1973); L.Costermans, *Native Trees & Shrubs S.E. Australia* 377 (1981); S.Kelly *et al.*, *Eucalypts* 1: t. 67 (1983).

Mallee to 4.5 m, usually dense. Juvenile leaves ovate, green. Adult leaves lanceolate, acuminate to uncinata; lamina 6–9 cm long, 1.4–2.5 cm wide, shining, green; lateral veins faint, at 35°–45°; intramarginal vein faint, up to 2 mm from margin; petiole terete, 10–20 mm long. Umbels 3–7-flowered; peduncle flattened, dilating upwards, 13–20 mm long; pedicels 3–5 mm long. Buds cylindrical, smooth or striate; operculum hemispherical, rostrate, smooth, 7–10 mm long, 6–8 mm wide; hypanthium campanulate, slightly striate, 8–10 mm long, 6–8 mm wide. Fruits cylindrical, urceolate, campanulate or ovoid, smooth or striate, 10–15 mm long and wide; valves 3 or 4. *Lerp Mallee*. Fig. 87K–L.

Widespread in southern W.A. except near the W coast, and from Murat Bay, S.A., to south-western N.S.W. and north-eastern Vic. Grows in sandy soil, in shrubland often in exposed windy positions. Regions: BENC, LEON, ESPR, NULL, EYRE, TRNS, RIVR, OTWY. Map 362.

W.A.: 20.9 km S of Scaddan, *J.P.Baker 72* (FRI, MEL, NSW, PERTH); Lake Lefroy, *M.I.H.Brooker 2239* (FRI, NSW, PERTH). S.A.: 51.5 km N of Overland Corner, *D.E.Symon 3631* (ADW, K, NSW). N.S.W.: 19.3 km E of Turlee, *B.G.Briggs 2794* (NSW). Vic.: Dimboola, *F.M.Reader 23* (MEL).

Distinguished by dense mallee habit, thick shining leaves, flat, dilated peduncle, hemispherical, rostrate operculum and smooth or striate fruits. Produces good pollen and nectar for honey production.

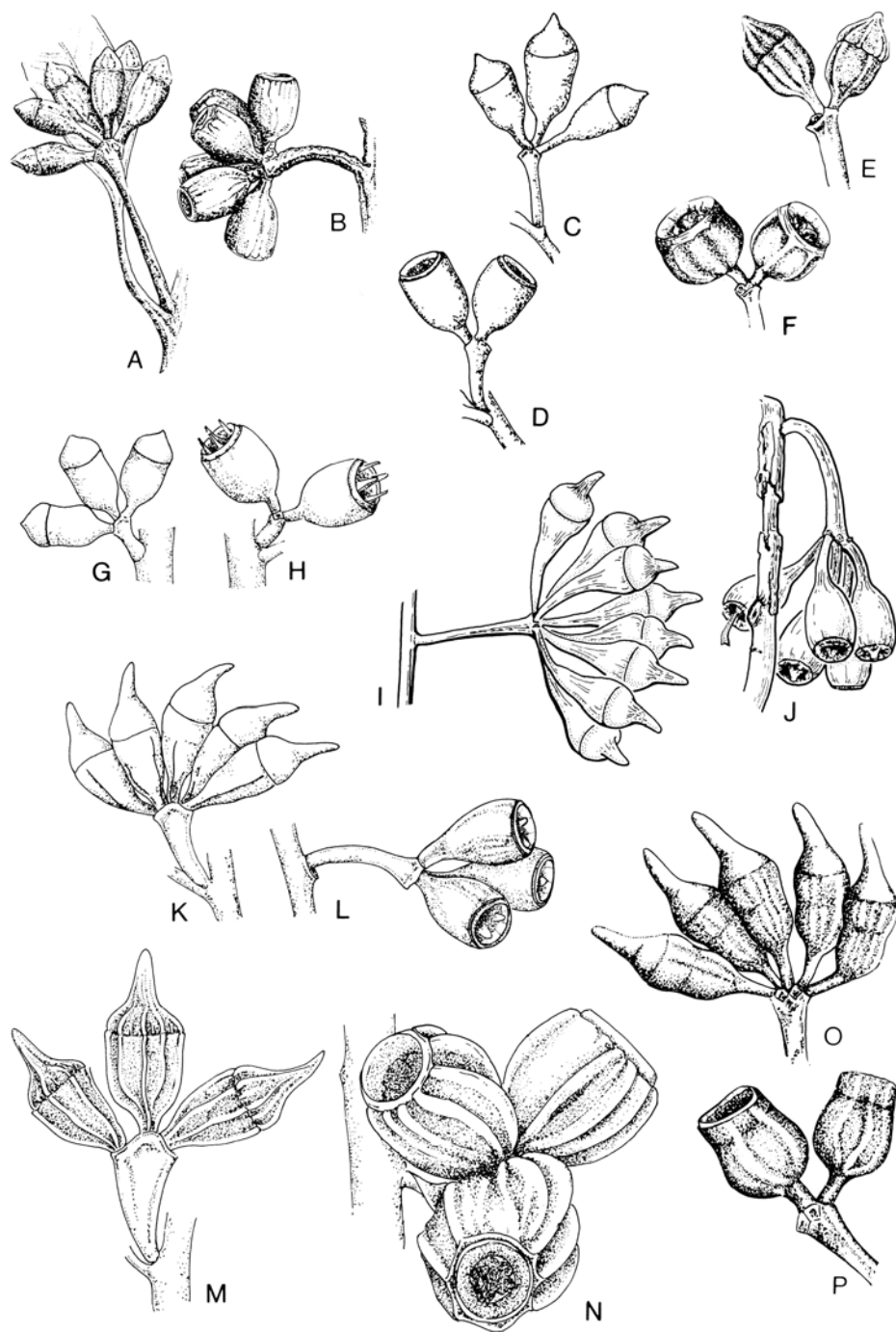


Figure 87. *Eucalyptus* buds and fruits, all $\times 1$, unless otherwise stated. **A–B**, *E. leptocalyx* (C.Gardner 2221, NSW). **C–D**, *E. scyphocalyx* (M.Burgman & S.McKee MAB1806, FRI). **E–F**, *E. platycorys* (G.Chippendale 110, FRI). **G–H**, *E. merrickiae* (C.Gardner 11167, FRI). **I–J**, *E. pimpiniana* $\times 0.5$ (**I**, R.Chinnock 2710, FRI; **J**, I.Brooker 5604, FRI). **K–L**, *E. incrassata* (J.Baker 72, FRI). **M–N**, *E. angulosa* (I.Brooker 3874, FRI). **O–P**, *E. ceratocorys* (G.Chippendale 126, FRI). **A, B** drawn by J.Collins. **I, J** drawn by M.Risby. Others drawn by M.May.

342. *Eucalyptus angulosa* Schauer in W.C. Walpers, *Repert. Bot. Syst.* 2: 925 (1843)

E. incrassata var. *angulosa* (Schauer) Benth., *Fl. Austral.* 3: 231 (1867). T: Australia, collector unknown; n.v.

E. cuspidata Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 22(2): 21 (1849). T: Swan R. Colony, W.A., *J.Drummond* 4: 75; iso: BM, CGE, FI, K, PERTH, W.

Illustrations: G.M. Chippendale, *Eucalypts W. Austral. Goldfields* 172, 173 (1973); S. Kelly *et al.*, *Eucalypts* 1: t. 83 (1983).

Mallee to 4.5 m. Juvenile leaves lanceolate, light green. Adult leaves lanceolate to broadly lanceolate, sometimes elliptic, uncinata; lamina 6–10 cm long, 2–3 cm wide, green; lateral veins faint, at 40°–50°; intramarginal vein up to 3 mm from margin; petiole terete, 12–20 mm long. Umbels 3–7-flowered; peduncle flattened, erect, striate, 15–25 mm long; pedicels 2–4 mm long. Buds ovoid, conical; operculum conical, striate or ribbed, 5–10 mm long, 6–8 mm wide; hypanthium obconical, ribbed, 7–10 mm long, 6–8 mm wide. Fruits cylindrical or hemispherical, ribbed, 10–20 mm long, 10–15 mm wide; valves 3 or 4. *Ridge-fruited Mallee*. Fig. 87M–N.

Occurs primarily in coastal areas from Two Peoples Bay to Twilight Cove, southern W.A. and from James to Encounter Bay, S.A. Usually grows in coastal sand in low shrubland. Regions: ESPR, NULL, EYRE, RIVR, OTWY. Map 363.

W.A.: 48.3 km S of Ravensthorpe, *M.I.H. Brooker* 2301 (FRI, PERTH); Rotary Lookout, Esperance, *G.M. Chippendale* 183 (FRI, MEL, PERTH). S.A.: 2.5 km W of Waitpinga, *G.M. Chippendale* 1342 & *M.J. Brennan* (AD, BRI, FRI, MEL); 4.8 km W of Victor Harbor, *R. Schodde* 625 (AD, CANB).

Differs from *E. incrassata* in the larger, more strongly striate or ribbed buds and fruits. Usually of lower habit and with shorter buds than *E. ceratocorys*.

343. *Eucalyptus ceratocorys* (Blakely) L. Johnson & K. Hill, *Fl. Australia* 19: 508 (1988)

E. angulosa var. *ceratocorys* Blakely, *Key Eucalypts* 124 (1934). T: Comet Vale, W.A., Dec. 1916, *T. Jutson* 116A; lecto: NSW, *vide* L.A.S. Johnson & K.D. Hill, *loc. cit.*

Illustration: S. Kelly *et al.*, *Eucalypts* 1: t. 185 (1983).

Mallee to 12 m. Juvenile leaves not seen. Adult leaves lanceolate, acuminate or uncinata; lamina 8.5–12 cm long, 1.5–2.4 cm wide, green; lateral veins faint, at 25°–35°; intramarginal vein up to 1 mm from margin; petiole terete, 15–20 mm long. Umbels 7-flowered; peduncle terete or angled, usually erect, 14–35 mm long; pedicels 4–7 mm long. Buds urceolate, conical, rostrate, striate; operculum rostrate, 15–20 mm long, 8–10 mm wide; hypanthium urceolate, 10–15 mm long, 8–10 mm wide. Fruits urceolate, ribbed, 15–18 mm long, 12–14 mm wide; valves 3 or 4. Fig. 87 O–P.

Restricted to an area near Comet Vale, W.A., in sand in shrubland. Region: LEON. Map 364.

W.A.: Sand Queen Mine, *G.M. Chippendale* 126 (FRI, MEL, PERTH); Comet Vale, *C.A. Gardner* 7968 (FRI, PERTH).

Closely related to *E. angulosa* but a taller plant with a much longer operculum.

344. *Eucalyptus tetraptera* Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 22(2): 22 (1849)

T: Swan R. to King George Sound, W.A., *J.Drummond* 4: 71 (wrongly cited as '17'); holo: LE; iso: BM, CGE, FI, G, K, PERTH.

E. acutangula Turcz., *Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg* 10: 338 (1852). T: Swan R. to Cape Riche, W.A., *J.Drummond* 189; holo: KW; iso: BM, CGE, FI, G, MEL.

Illustrations: G.M. Chippendale, *Eucalypts W. Austral. Goldfields* 175 (1973); C.A. Gardner (ed. T.E. Aplin), *Eucalypts W. Australia* 38 (1979); S. Kelly *et al.*, *Eucalypts* 1: t. 8 (1983).

Mallee to 2 m, occasionally to 3 m. Juvenile leaves broadly elliptic, green. Adult leaves broadly lanceolate or elliptic, apiculate; lamina 13–18 cm long, 4–7 cm wide, bright green; lateral veins visible, at 50°–60°; intramarginal vein up to 4 mm from margin; petiole

flattened, 20–40 mm long. Umbels 1-flowered; peduncle broadly flattened, twisted, recurved, 5–15 mm long; pedicels absent. Buds quadrangular with four fleshy wings; operculum conical or pyramidal, 12–20 mm long, 15–18 mm wide; hypanthium quadrangular, winged, 30–35 mm long and wide. Fruits quadrangular, winged, 40–50 mm long, 35–50 mm wide; valves 4. Figs 33, 88A–B.

Occurs from just E of the Stirling Ra. eastwards to near Israelite Bay, W.A., in sand in heathland. Region: ESPR. Map 365.

W.A.: 13.4 km N of Esperance, *G.M.Chippendale* 189 (FRI, MEL, NSW, PERTH); 12.9 km S of Ravensthorpe, *J.W.Green* 1215 (PERTH).

A very distinctive plant of open habit, large thick leaves with prominent midvein, and large solitary square winged buds and fruits on broad recurved peduncles.

345. *Eucalyptus stoatei* C.Gardner, *Proc. Roy. Soc. W. Australia* 22: 126 (1936)

E. forrestiana subsp. *stoatei* (C.Gardner) C.J.Robinson, *Nuytsia* 5: 197 (1985). T: Bandalup Ck near Kundip, W.A., June 1935, *K.F.Dureau & J.E.Harrison*; holo: PERTH; iso: K, NSW.

Illustrations: *G.M.Chippendale*, *Eucalypts W. Austral. Goldfields* 173, 174 (1973); *C.A.Gardner* (ed. T.E.Aplin), *Eucalypts W. Australia* 23 (1979); *S.Kelly et al.*, *Eucalypts* 1: t. 84 (1983).

Tree to 6 m, slender. Juvenile leaves ovate, green. Adult leaves oblong or elliptic to ovate or broadly lanceolate, apiculate; lamina 6–8 cm long, 2–3 cm wide, shining, dark green; lateral veins faint, at 45°–50°; intramarginal vein faint, up to 2 mm from margin; petiole quadrangular, 13–16 mm long. Umbels 1-flowered; peduncle flattened, dilated, recurved, 20–30 mm long; pedicels 2–10 mm long. Buds pyriform or turbinate; operculum conical, smooth or shallowly ribbed, 5–10 mm long, 8–10 mm wide; hypanthium pyriform, ribbed, 20–30 mm long, 15–20 mm wide. Fruits pyriform or turbinate, strongly ribbed, 25–35 mm long, 25–30 mm wide; valves 3. *Scarlet Pear Gum*. Fig. 88C–D.

Restricted to a small area E of Kundip near the Jerdacuttup R., W.A. Grows in gravelly sand and sandy loam on flat and slightly sloping country in heathland. Region: ESPR. Map 366.

W.A.: 19.5 km E of Jerdacuttup R., *G.M.Chippendale* 218 (FRI, MEL, NSW, PERTH); 25.8 km E of Kundip, 17 Dec. 1940, *G.E.Brockway* (PERTH).

Distinguished by the small, slender, tree habit, the thick leaves and the large pendulous usually pyriform, ribbed buds and fruits. Buds red, staminal filaments yellow. An unusual small shrub for coast or inland planting. Although variable, as discussed by Robinson, *loc. cit.*, the 6–10-ribbed buds adequately distinguish this from *E. forrestiana*.

S.D.Hopper & G.F.Moran, Bird pollination and the mating system of *Eucalyptus stoatei*, *Austral. J. Bot.* 29: 625–638 (1981).

346. *Eucalyptus forrestiana* Diels in *L.Diels & E.Pritzel, Bot. Jahrb. Syst.* 35: 439, fig. 50 (1904)

T: c. 50 km N of Esperance, W.A., Nov. 1901, *L.Diels* 5332; *n.v.*

Tree or shrub to 5 m. Juvenile leaves ovate, green. Adult leaves lanceolate, apiculate; lamina 6–9 cm long, 1.2–2 cm wide, shining, deep green, glandular; lateral veins visible, at 30°–50°; intramarginal vein up to 2 mm from margin; petiole flattened, 10–20 mm long. Umbels 1-flowered, rarely 3-flowered; peduncle flattened at top, recurved, 30–50 mm long; pedicels absent. Buds pyriform, quadrangular, 4-winged; operculum conical, pyramidal or rostrate; hypanthium obpyramidal or obovate, quadrangular, 4-winged. Fruits pyriform, quadrangular, 4-winged, 30–50 mm long, 15–35 mm wide; valves 3 or 4. *Fuchsia Gum*.

Occurs in W.A., often in thickets in sandy loam and clayey soil. Differs from *E. stoatei* especially in the 4-winged buds and fruits.

There are 2 subspecies. Both subspecies have been cultivated in many parts of Australia and also in California, U.S.A. The red fruits on drooping stalks are a feature.

Operculum low-conical or pyramidal

346a. subsp. *forrestiana*

Operculum narrowly rostrate

346b. subsp. *dolichorhyncha*

346a. *Eucalyptus forrestiana* Diels subsp. *forrestiana*

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 178 (1973); M.I.H.Brooker, *J. & Proc. Roy. Soc. W. Australia* 56: 74 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 252 (1983).

Operculum low-conical or pyramidal, 5–10 mm long, 12–15 mm wide; hypanthium 30–40 mm long, 12–15 mm wide. Fig. 88E–F.

Occurs in W.A., in a small area between Salmon Gums and Esperance, and NE of Munglinup to near Mt Heywood, in shrubland. Region: ESPR. Map 367.

W.A.: 20.9 km SW of Mt Ridley, *M.I.H.Brooker* 2760 (FRI, MEL, PERTH); 37 km NNE of Munglinup, *N.N.Donner* 3032 (AD, PERTH).

Distinguished by small tree or mallee habit, solitary quadrangular, 4-winged buds and fruits, and short-conical or pyramidal operculum.

346b. *Eucalyptus forrestiana* subsp. *dolichorhyncha* Brooker, *J. & Proc. Roy. Soc. W. Australia* 56: 74 (1974)

T: Grass Patch, W.A., 16 Mar. 1957, *J.W.Green* 1252; holo: PERTH.

Illustrations: M.I.H.Brooker, *op. cit.* 74; C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 69 (1979); S.Kelly *et al.*, *Eucalypts* 1: t. 242 (1983).

Operculum narrowly rostrate, 12–22 mm long, 7–14 mm wide; hypanthium 13–35 mm long, 7–17 mm wide. Fig. 88G–H.

Occurs in the area between Salmon Gums and Gibson, W.A. Region: ESPR. Map 368.

W.A.: 22 km S of Salmon Gums, *M.I.H.Brooker* 2501 (FRI, MEL, NSW, PERTH); 30.1 km S of Salmon Gums, *G.M.Chippendale* 180 (FRI, NSW, PERTH).

Differs from subsp. *forrestiana* in the rostrate operculum.

Ser. 69 Dundasianae

***Eucalyptus* ser. *Dundasianae* Chippendale, *Fl. Australia* 19: 497 (1988).**

Type: *E. dundasii* Maiden

Trees. Bark rough, grey or black, tessellated to 6 m, then smooth, red-brown to grey above. Juvenile leaves alternate, petiolate, ovate, concolorous. Adult leaves alternate, petiolate, lanceolate, sometimes falcate, uncinata, shining, green, concolorous. Conflorences axillary, simple, 7-flowered umbels. Buds cylindrical; operculum hemispherical, shortly rostrate. Fruits cylindrical, 2-ribbed, sometimes further striate; disc broad, descending vertically; valves 3, deeply included. Seeds elliptic to crescent-shaped, reticulate, brown.

A series of 1 species in southern W.A., characterised by tree habit, rough dark bark, shining concolorous leaves, simple umbels, cylindrical fruits with vertically descending disc and deeply included valves, and brown seeds.

347. *Eucalyptus dundasii* Maiden, *J. & Proc. Roy. Soc. New South Wales* 49: 309 (1916)

T: Dundas, W.A., 1901, *L.Diels* 5454; holo: NSW.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 182, 183 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 66 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 415 (1984).

Tree to 21 m. Adult leaves: lamina 8–12 cm long, 1–1.5 cm wide; lateral veins faint, at 40°–60°; intramarginal vein almost confluent with margin; petiole terete, 12–15 mm long. Peduncle angular, 5–20 mm long; pedicels absent or to 2 mm long. Operculum 3–4 mm

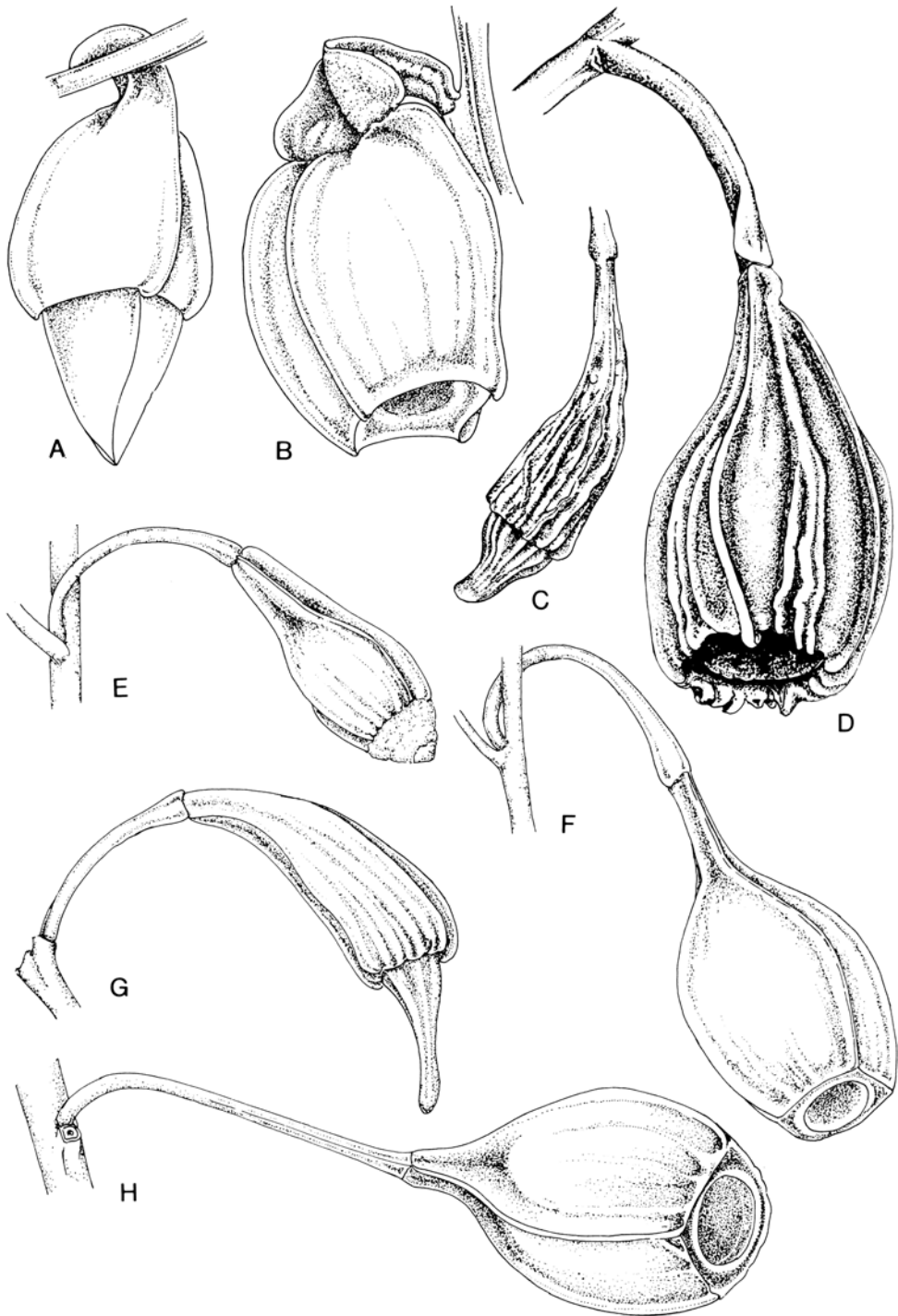


Figure 88. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. tetraptera* (L.Pryor & J.Briggs 160, FRI). **C–D**, *E. stoatei* (**C**, cult., Wail, Vic., collector unknown, FRI; **D**, 27.2 km E of Kundip, W.A., C.Gardner & G.Brockway, FRI). **E–F**, *E. forrestiana* subsp. *forrestiana* (**E**, cult., Broken Hill, N.S.W., R.Gould, FRI; **F**, L.Pryor 111, FRI). **G–H**, *E. forrestiana* subsp. *dolichorhyncha* (22.4 km N of Gibson, W.A., M.Phillips, FRI). Drawn by M.May.

long, 2–3 mm wide; hypanthium cylindrical, sometimes slightly constricted in middle, 5–6 mm long, 2–3 mm wide. Fruits 6–10 mm long, 4–5 mm wide. *Dundas Blackbutt*. Fig. 89A–B.

Occurs from near Lake Barlee southwards to Salmon Gums and the Fraser Ra., W.A. Grows usually in sandy and gravelly alluvial soil, in pure stands in open forest and woodland. Regions: LEON, ESPR. Map 369.

W.A.: 70.8 km S of Widgiemooltha, *K.M.Allan* 735 (BRI, FRI, PERTH); 15.6 km SE of Norseman, *J.P.Baker* 48 (BRI, FRI, NSW, PERTH).

Distinguished by tree habit, tessellated bark on lower trunk, buds and fruits sessile or almost so, shortly rostrate buds and cylindrical fruits. The timber has been used in the mining industry, as the wood is hard and durable.

Ser. 70 Ovulares

Eucalyptus ser. **Ovulares** Brooker, *Brunonia* 4: 3 (1981).

Type: *E. ovularis* Maiden & Blakely

Mallees or trees. Bark smooth throughout, or with rough basal bark. Juvenile leaves decussate, petiolate, light green or grey-green, slightly discolorous. Adult leaves alternate, petiolate, concolorous; venation faint; lamina usually noticeably glandular. Conflorences axillary, simple, 7–15-flowered umbels. Buds urceolate, ovoid, obconical, cylindrical, clavate or subpyriform. Fruits ovoid, obconical, suburceolate, cylindrical or subglobular; disc moderately broad, descending vertically; valves 3 or sometimes 4, included, level or slightly exerted. Seeds elliptic to ovoid, reticulate, brown.

A closely-knit series of 6 species of south-western W.A., characterised especially by the reniform cotyledons, concolorous leaves, simple umbels, inflexed staminal filaments, ovules in 4 vertical rows and shallowly reticulate dull seeds.

M.I.H.Brooker, A new series *Ovulares*, of the genus *Eucalyptus* based on the subseries *Ovularinae* Pryor & Johnson, *Brunonia* 4: 1–26 (1981).

348. *Eucalyptus ovularis* Maiden & Blakely, *J. & Proc. Roy. Soc. New South Wales* 59: 194 (1925)

T: Salmon Gums, W.A., 24 May 1924, *C.A.Gardner* 2227; holo: NSW; iso: FRI, PERTH.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 179 (1973); M.I.H.Brooker, *Brunonia* 4: 7–9, figs 4–7 (1981); S.Kelly *et al.*, *Eucalypts* 2: t. 72 (1983).

Mallee or tree to 9 m. Bark rough, flaky to 1.5 m, then smooth, grey or red-brown above. Juvenile leaves lanceolate. Adult leaves narrowly lanceolate, uncinat; lamina 6–10 cm long, 0.5–1.3 cm wide, shining, dark green; lateral veins at 25°–35°; intramarginal vein up to 1 mm from margin; petiole terete, 10–15 mm long. Umbels 11–15-flowered; peduncle angular, 7–12 mm long; pedicels 3–5 mm long. Buds ovoid; operculum conical or hemispherical, 1–2 mm long, 2–3 mm wide; hypanthium ovoid or suburceolate, 3–5 mm long, 2–3 mm wide. Fruits ovoid or suburceolate, 4–6 mm long, 3–4 mm wide; valves 3. *Small-fruited Mallee*. Fig. 89C–D.

Occurs from S of Coolgardie to Grass Patch, W.A., in yellow sand over limestone in shrubland on flats or hills. Regions: LEON, ESPR. Map 370.

W.A.: Salmon Gums, *C.A.Gardner* 11166 (FRI, PERTH); Grass Patch, *S.G.M.Carr* 627 (PERTH).

Hypanthium characteristically broadest at base; fruits often slightly urceolate.

349. *Eucalyptus myriadena* Brooker, *Brunonia* 4: 9 (1981)

T: Hyden, W.A., 4 Oct. 1975, *M.I.H.Brooker* 4992; holo: PERTH; iso: FRI.

Illustrations: M.I.H.Brooker, *op. cit.* 7, 10, 11, figs 4, 8–10; S.Kelly *et al.*, *Eucalypts* 1: t. 273 (1983).

Mallee or tree to 10 m. Bark rough, flaky, dark grey to 2 m, then smooth, pink-brown to grey above. Juvenile leaves lanceolate to ovate. Adult leaves narrowly lanceolate, uncinata; lamina 5–10 cm long, 0.7–1 cm wide, shining, green; lateral veins at 40°–50°; intramarginal vein up to 1 mm from margin; petiole terete, 8–10 mm long. Umbels 11–15-flowered; peduncle terete or quadrangular, 6–10 mm long; pedicels 2–3 mm long. Buds cylindrical to obconical; operculum shortly conical or hemispherical and shortly pointed, 2–3 mm long and wide; hypanthium obconical or suburceolate, 3–4 mm long, 2–3 mm wide. Fruits cylindrical to obconical, 4–5 mm long, c. 3 mm wide; valves 3. Fig. 89E–F.

Occurs in inland south-western W.A. between Wongan Hills and Ravensthorpe. Grows in sandy soil on flats, hills and near salt lakes. Regions: BENC, LEON, ESPR. Map 371.

W.A.: 9.7 km E of Ravensthorpe, *M.I.H.Brooker* 2293 (FRI, MEL, NSW, PERTH); 2.9 km W of Lake Grace, *G.M.Chippendale* 229 (FRI, MEL, NSW, PERTH); 8 km N of Bruce Rock, *R.D.Royce* 3981 (PERTH).

Differs from *E. ovularis* mainly in having the hypanthium in bud not swollen towards base and the fruits not urceolate.

350. *Eucalyptus cylindrocarpa* Blakely, *Key Eucalypts* 116 (1934)

T: Kurrawang, W.A., 2 Sept. 1926, *J.B.Cleland* 10; lecto: NSW, *fide* M.I.H.Brooker, *Brunonia* 4: 12 (1981).

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 180, 181 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 113 (1979); M.I.H.Brooker, *op. cit.* 7, 13, 14, figs. 4, 11–13.

Mallee, occasionally a tree, to 10 m. Bark smooth, red-brown or pink to grey, often with a very small amount of basal flaky or fibrous bark. Juvenile leaves lanceolate to broadly lanceolate. Adult leaves narrowly lanceolate, sometimes falcate, uncinata; lamina 8–10 cm long, 0.8–1.2 cm wide, shining, green; lateral veins at 25°–35°; intramarginal vein up to 1 mm from margin; petiole terete, 10–15 mm long. Umbels 7–11-flowered; peduncle terete, 10–15 mm long; pedicels 3–5 mm long. Buds cylindrical; operculum conical, 3–5 mm long, 3–4 mm wide; hypanthium cylindrical, 4–6 mm long, 3–4 mm wide. Fruits cylindrical to ovoid, 6–8 mm long, 4–6 mm wide, the peduncle often recurved; valves 3, sometimes 4. *Woodline Mallee*. Fig. 89G–H.

Occurs from W of Kellerberrin eastwards to the Zanthus area, W.A., in sand and sandy loam in shrubland and woodland. Regions: BENC, LEON, ESPR. Map 372.

W.A.: 8 km S of Zanthus, *M.I.H.Brooker* 2467 (FRI, PERTH); 3.2 km S of Widgiemooltha, *H.Demarz* 1646 (NSW, PERTH); near Norseman, *C.A.Gardner* 16349 (PERTH).

Has larger buds and fruits than *E. ovularis*, *E. myriadena* and *E. oraria*, with the operculum slightly rostrate.

351. *Eucalyptus oraria* L.Johnson, *Contr. New South Wales Natl Herb.* 3: 103 (1962)

T: c. 5 miles [c. 8 km] N of Dongara, W.A., 10 Dec. 1960, *L.A.S.Johnson* W33; holo: NSW.

E. baudiniana D.Carr & S.Carr, *Trans. Roy. Soc. Victoria* 88: 12 (1976). T: Bungabandi Ck road, 36 miles [c. 58 km] from junction with North West Coastal Hwy, W.A., 27°S, 115°22'E, 25 June 1969, *D.J. & S.G.M.Carr* 972; holo: PERTH; iso: CANB.

E. tamala D.Carr & S.Carr, *loc. cit.* T: Tamala Stn road, 26 miles [c. 42 km] from junction with Denham road, W.A., 26°35'S, 113°55'E, 27 June 1969, *D.J. & S.G.M.Carr* 1003; holo: PERTH; iso: CANB.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 181 (1973); M.I.H.Brooker, *Brunonia* 4: 7, 19, figs 4, 17, 18 (1981); S.Kelly *et al.*, *Eucalypts* 2: t. 55 (1983).

Mallee to 4 m. Bark smooth throughout, grey-brown. Juvenile leaves broadly lanceolate to ovate. Adult leaves narrowly lanceolate to lanceolate, uncinata; lamina 6–9 cm long, 1–1.5

cm wide, shining, green; lateral veins at 30°–50°; intramarginal vein up to 2 mm from margin; petiole terete, 7–10 mm long. Umbels 7–11-flowered; peduncle quadrangular, 10–15 mm long; pedicels 2–4 mm long. Buds clavate to subpyriform; operculum hemispherical or shallowly conical, 1–2 mm long, 3–4 mm wide; hypanthium obconical, 3–5 mm long, 3–4 mm wide. Fruits obconical, barrel-shaped or ovoid, 5–8 mm long, 4–5 mm wide; valves 3, sometimes 4. *Ooragmandee*. Fig. 89 I–J.

Occurs in coastal areas from near Dongara northwards to Shark Bay, W.A., including Bernier and Dorre Is. Grows in near coastal sandy soil, often associated with limestone, in open shrubland. Regions: MRCH, BENC, LUWN. Map 373.

W.A.: 37 km SW of Denham turn-off on Tamala road, *M.I.H. Brooker 5018* (AD, FRI, MEL, NSW, PERTH); Bernier Is., *R.D. Royce 5982* (PERTH).

Distinguished from the preceding 3 species by the clavate to subpyriform buds, and obconical to barrel-shaped fruits.

352. *Eucalyptus brachycorys* Blakely, *Key Eucalypts* 119 (1934)

T: Cowcowing and Watheroo Rabbit Fence, W.A., Sept. 1904, *M. Koch 990*; lecto: NSW, *vide* M.I.H. Brooker, *Brunonia* 4: 19 (1981); isolecto: MEL, PERTH.

Illustrations: M.I.H. Brooker, *Nuytsia* 1: 294, 295 (1974); M.I.H. Brooker, *Brunonia* 4: 7, 20, 21, figs 4, 19–21 (1981); S. Kelly *et al.*, *Eucalypts* 2: t. 63 (1983).

Mallee to 5 m. Bark rough, flaky, grey to 2 m, then smooth, grey-brown above. Juvenile leaves ovate. Adult leaves narrowly lanceolate to lanceolate, uncinat; lamina 7–9 cm long, 1–1.5 cm wide, shining, bright green; lateral veins at 25°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 10–13 mm long. Umbels 7-flowered; peduncle terete, 10–14 mm long; pedicels 3–5 mm long. Buds obconical to ovoid, constricted at junction of operculum and hypanthium; operculum hemispherical with a short point, 2–3 mm long, 3–4 mm wide; hypanthium cylindrical or pyriform, 4–5 mm long, 3–4 mm wide. Fruits ovoid, 5–7 mm long, 5–6 mm wide; valves 3, sometimes 4. Fig. 89K–L.

Occurs widely from near Geraldton south-east to E of Hyden, W.A., in sand and occasionally clay in shrubland. Regions: BENC, ESPR. Map 374.

W.A.: 93 km E of Hyden, *M.I.H. Brooker 1970* (FRI, PERTH); 13 km N of Marchagee, *G.M. Chippendale 35* (BRI, FRI, MEL, NSW, PERTH).

Differs from the preceding species in the rough basal bark and the buds with a constriction between the operculum and hypanthium.

353. *Eucalyptus cyclostoma* Brooker, *Brunonia* 4: 21 (1981)

T: 14 miles [c. 23 km] W of Balladonia towards Norseman, W.A., 14 Feb. 1970, *M.I.H. Brooker 2475*; holo: PERTH; iso: FRI.

Illustrations: M.I.H. Brooker, *op. cit.* 7, 22, 23, figs 4, 22–24; S. Kelly *et al.*, *Eucalypts* 1: t. 259 (1983).

Mallee to 2.5 m. Bark smooth throughout, pink-grey to grey, often powdery. Juvenile leaves not seen. Adult leaves lanceolate, occasionally narrowly lanceolate, uncinat; lamina 7–10 cm long, 1–1.5 cm wide, more or less shining, blue-green; lateral veins at 30°–40°; intramarginal vein up to 2 mm from margin; petiole terete, 10–15 mm long. Umbels 7–11-flowered; peduncle terete, 10–15 mm long; pedicels 5–8 mm long. Buds urceolate, constricted between operculum and hypanthium; operculum hemispherical with a distinct point, 4–5 mm long, 5–6 mm wide; hypanthium hemispherical or cylindrical, 5–6 mm long and wide. Fruits subglobose, 8–10 mm long and wide; valves 3, sometimes 4. Fig. 89M–N.

Occurs from NW of Balladonia to E of Zanthus, W.A., on sandy limestone plains and between ridges in shrubland. Regions: LEON, NULL, ESPR. Map 375.

W.A.: 41.7 km S of Zanthus, *M.I.H. Brooker 2469* (FRI, PERTH); 42 km from Balladonia Motel towards Norseman, *M.D. Crisp 5648* (CBG, FRI, NSW, PERTH).

Distinguished from *E. brachycorys* by the smooth bark, dull leaves and larger buds and fruits, the latter with a prominent black rim. Also resembles *E. platycorys*.

Ser. 71 Subexsertae

Eucalyptus ser. **Subexsertae** Blakely, *Key Eucalypts* 31, 137 (1934).

Type: *E. alba* Reinw. ex Blume, lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 506 (1988).

E. subser. Argophloiae Blakely, *Key Eucalypts* 31, 137 (1934), plus ser. *Argyrophyllae* Blakely, *op. cit.* 38, 163 (1934) p.p.

Trees, sometimes at least partly deciduous, rarely a mallee in *E. herbertiana*. Bark smooth. Juvenile leaves opposite, subopposite or alternate, usually petiolate but sessile in *E. apodophylla*, sometimes glaucous, concolorous or discolorous. Adult leaves alternate, sometimes subopposite or opposite, petiolate, sometimes sessile, concolorous, sometimes discolorous. Conflourescences axillary, simple, 3–11-flowered umbels. Buds ovoid, globular or subglobular, turbinate, clavate, or fusiform. Fruits hemispherical, subglobular, ovoid, obconical, turbinate or cylindrical; disc broad or narrow, convex, level or descending; valves 3–5, exserted or level. Seeds round to elliptic, reticulate, grey-black, yellow-brown or brown.

A series of 15 species in north-western and northern W.A., northern and central N.T., and central and eastern Qld. Characterised by deciduous tree habit, smooth bark, concolorous or discolorous leaves, simple umbels, level or descending disc and grey-black to yellowish or brown seeds.

354. *Eucalyptus alba* Reinw. ex Blume, *Bijdr. Fl. Ned. Ind.* 17: 1101 (1826–1827)

E. leucadendron Reinw. ex Vriese, *Pl. Ind. Bat. Orient.* 63 (1856), non Cunn. ex Maiden (1904). T: Timor, K.G.K.Reinwardt 1342; holo: L; iso: W.

E. alba var. *australasica* Blakely & Jacobs ex Blakely, *Key Eucalypts* 137 (1934). T: 22 miles [c. 35 km] S of Darwin, N.T., 10 July 1933, M.R.Jacobs 48; lecto: NSW, *fide* S.T.Blake, *Austral. J. Bot.* 1: 276 (1953); isolecto: BRI, FRI.

Illustrations: S.T.Blake, *op. cit.* t. 24–26; S.Kelly *et al.*, *Eucalypts* 1: t. 105 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn 419 (1984).

Tree to 20 m, more or less deciduous. Bark pink-red to white or cream. Juvenile leaves alternate, ovate to suborbicular, green, discolorous. Adult leaves alternate, narrowly to broadly lanceolate or ovate, acuminate, thin; lamina 7–21 cm long, 2–5 cm wide, green, concolorous; lateral veins conspicuous, at 30°–60°; intramarginal vein up to 2 mm from margin; petiole flattened or angular, 10–33 mm long. Umbels 7-flowered; peduncle terete or angular, 4–14 mm long; pedicels absent or angular, to 7 mm long. Buds globular to ovoid; operculum hemispherical, apiculate, or low conical, 3–5 mm long, 4–7 mm wide; hypanthium hemispherical, 3–5 mm long, 4–7 mm wide. Fruits hemispherical to obconical, 4–7 mm long, 5–8 mm wide; disc moderately broad, level or convex; valves 3 or 4, exserted. *White Gum*. Figs 12, 89 O–P.

Widespread in the Kimberley, W.A., across northern N.T. and in Qld from Cape York to Rockhampton including coastal islands, with outliers S of the Gulf of Carpentaria. Grows on flats and undulating country, often near the coast and near watercourses, in heavy soil in woodland and open forest. Also in Timor and New Guinea. Regions: KIMB, ARNM, BKLY, CARP, CYRK, BURD, DWSN. Map 376.

W.A.: 9.7 km NE of Kalumburu Mission, *N.H.Speck* 4901 (BRI, CANB, FRI, NT, PERTH). N.T.: 46.7 km NW of Katherine, *C.R.Dunlop* 1863 (FRI, NT); South Bay, Bickerton Bay, *R.L.Specht* 575a (AD, BRI, CANB, K, MEL, NSW, PERTH). Qld: Fitzroy Vale, *S.T.Blake* 19944 (BRI, CANB, FRI); 2.3 km from Cape York towards Bamaga, *M.I.H.Brooker* 4103 (BRI, FRI, MEL).

Characterised by smooth bark, lanceolate or ovate leaves, ovoid or globular buds and hemispherical to obconical fruits. One of few ±deciduous eucalypts. Differs from *E.*

platyphylla in the narrower leaves, from *E. tintinnans* in the larger fruits, and from *E. bigalerita* in the narrower, non-shining leaves.

355. *Eucalyptus platyphylla* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 93 (1859)

T: Upper Burdekin R., Qld, 14 Oct. 1856, *F.Mueller*; holo: MEL.

Illustrations: S.T.Blake, *Austral. J. Bot.* 1: t. 27 (1953); S.Kelly *et al.*, *Eucalypts* 2: t. 91 (1983).

Tree to 20 m, deciduous. Bark white, grey or tan, often powdery. Juvenile leaves alternate, broadly lanceolate to ovate, slightly discolourous. Adult leaves alternate, orbicular or rhomboid, rarely lanceolate, rounded or apiculate, thin, lamina 7–13 cm long, 5–9 cm wide, green, concolorous; lateral veins visible, at 45°–55°; intramarginal vein up to 2 mm from margin; petiole angular or terete, 30–40 mm long. Umbels 3–7-flowered; peduncle quadrangular, 3–7 mm long; pedicels absent or to 3 mm long. Buds ovoid; operculum hemispherical, sometimes apiculate, 3–5 mm long, 5–6 mm wide; hypanthium hemispherical to obconical, 3–5 mm long, 5–6 mm wide. Fruits hemispherical to turbinate, several-ribbed, 5–6 mm long, 7–9 mm wide; disc moderately broad, level or convex; valves 3 or 4, exserted. *Poplar Gum*. Fig. 89Q–R.

Widespread in eastern Qld, primarily from near Cape York to near Rockhampton. Grows mostly within 100 km of the coast on fertile flats which may be moist for long periods, and on ridges, usually in clayey soils. Regions: ARNM, CYRK, BURD, DWSN. Map 377.

Qld: 14.8 km SW of Yeppoon, *G.M.Chippendale 1121* & *M.J.Brennan* (BRI, FRI, NSW); Davies Ck, *B.Hyland 7723* (BRI, FRI, NSW, QRS); 4 km N of Banksia Homestead, *N.H.Speck 1739* (BRI, CANB, MEL, NSW, PERTH).

Differs from *E. alba* mainly in the broader leaves.

356. *Eucalyptus tintinnans* (Blakely & Jacobs) L.Johnson & K.Hill, *Fl. Australia* 19: 510 (1988)

E. platyphylla var. *tintinnans* Blakely & Jacobs in *W.F.Blakely, Key Eucalypts* 138 (1934). T: Outlier from plateau 10 miles [16 km] W of Pine Creek, N.T., 27 July 1933, *M.R.Jacobs* 89; lecto: NSW, *fide* L.Johnson & K.Hill, *loc. cit.*

Illustrations: S.T.Blake, *op. cit.* t. 28; S.Kelly *et al.*, *Eucalypts* 2: t. 92 (1953).

Tree to 9 m, straggly, usually deciduous. Bark salmon or khaki. Juvenile leaves not seen. Adult leaves usually alternate, sometimes opposite, triangular to broadly lanceolate, rounded, thin, lamina 6–12 cm long, 3.5–6 cm wide, pale green, concolorous; lateral veins clearly visible, at 35°–40°; intramarginal vein up to 2 mm from margin; petiole terete, 23–35 mm long. Umbels 3–7-flowered; peduncle quadrangular, 4–10 mm long; pedicels quadrangular, 2–5 mm long. Buds globular to ovoid; operculum hemispherical to conical, 3–4 mm long, 4–5 mm wide; hypanthium hemispherical, 2–3 mm long, 4–5 mm wide. Fruits hemispherical to turbinate, 3–4 mm long, 4–5 mm wide; disc convex or slightly descending; valves 3, level. *Ringed Gum*. Fig. 89S.

Occurs in hilly country from SE of Darwin to near Larrimah, N.T., in sandy soil. Region: ARNM. Map 378.

N.T.: 15.3 km S of Edith R. crossing, Stuart Hwy, *L.A.S.Johnson* & *G.M.Chippendale* 3895 (BRI, NSW, NT); between Katherine & Katherine Gorge, *D.E.Symon* 5111 (CANB, K, NSW, NT).

Characterised by straggly habit, smooth salmon or khaki bark, and triangular to broadly lanceolate leaves which are usually deciduous. Has smaller fruits than related species.

357. *Eucalyptus bigalerita* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 96 (1859)

T: W of Mataranka, near junction of King R., Dry R. and Darrinyan Ck, N.T., 3–5 July 1856, *F.Mueller*; holo: MEL; iso: K.

E. pastoralis *S.Moore*, *J. Bot.* 40: 27 (1902). T: Adelaide R., N.T., July 1886, *T.S.Lea s.n.*; holo: BM; iso: NSW.

Illustrations: C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 157 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 93 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 421 (1984).

Tree to 15 m. Bark white or cream to salmon-coloured. Juvenile leaves alternate, ovate to suborbicular, sometimes cordate, dull, grey-green, concolorous. Adult leaves alternate, ovate or triangular, shortly apiculate, thick; lamina 6–15 cm long, 6–13 cm wide, shining, green, concolorous; lateral veins conspicuous, at 35°–45°; intramarginal vein up to 3 mm from margin, often with another further in; petiole terete or angular, 30–55 mm long. Umbels 7-flowered; peduncle thick, angular, 8–14 mm long; pedicels thick, angular, 1–3 mm long. Buds ovoid to subglobular; operculum hemispherical, sometimes apiculate, 4–6 mm long, 8–10 mm wide; hypanthium hemispherical, 5–8 mm long, 8–10 mm wide. Fruits hemispherical or turbinate, 5–9 mm long, 6–12 mm wide; disc broad, level or descending; valves 4, level or just exserted. *Northern Salmon Gum*. Fig. 89T–U.

Occurs in the Kimberley, W.A., and northern N.T., including coastal islands, with an apparent disjunction in central-northern N.T. Grows in alluvial soils, from sand to clay, often inundated during the wet season, in open forest and woodland. Regions: KIMB, ARNM, BKLY. Map 379.

W.A.: Beverley Springs Homestead, A.S.George 12214 (FRI, PERTH); 119 km NNW of Gibb River Stn, N.H.Speck 4951 (BRI, CANB, K, PERTH). N.T.: Daly R., SSE of mouth, S.T.Blake 16624 (BRI, FRI, NSW); 132.6 km N of Top Springs, L.A.S.Johnson & G.M.Chippendale 3875 (BRI, CANB, NSW, NT, PERTH).

Has narrower leaves than *E. alba* and *E. tintinnans*, and may be distinguished from *E. platyphylla* especially by the longer peduncle, and broader buds and fruits. Worthy of cultivation in tropical areas because of its attractive bark.

358. *Eucalyptus brevifolia* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 84 (1859)

T: Victoria R., N.T., May 1856, *F.Mueller*; syn: BRI, CANB, K, MEL.

E. pallidifolia F.Muell., *Fragm.* 3: 131 (1863). T: Upper Victoria R., N.T., 1856, *F.Mueller*; syn: BRI, CANB, MEL, NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 164 (1974); J.P.Jessop (ed.), *Fl. Central Australia* 248 (1981); S.Kelly *et al.*, *Eucalypts* 1: t. 104 (1983).

Tree to 12 m. Bark white, often with flakes of dark, shedding bark. Juvenile leaves opposite, ovate to rhombic, grey-green, concolorous. Adult leaves alternate, ovate-lanceolate to lanceolate, acute or shortly apiculate, thick; lamina 6–15 cm long, 1.5–3.5 cm wide, grey-green, concolorous; lateral veins faint, at 50°–65°; intramarginal vein almost confluent with or up to 1 mm from margin; petiole terete, 10–17 mm long. Umbels 7-flowered; peduncle terete, 3–6 mm long; pedicels absent or 1–2 mm long. Buds ovoid; operculum hemispherical to subconical, 4–5 mm long and wide; hypanthium hemispherical, 4–5 mm long and wide. Fruits hemispherical or subglobular, 5–8 mm long, 4–7 mm wide; disc broad, convex or flat; valves usually 3, just exserted. *Snappy Gum*. Fig. 89V–W.

Widespread in the Kimberley, W.A., and adjacent parts of N.T., extending into the north-western Tanami Desert. Grows on gravelly plains, plateaus, ridges and slopes in open tropical woodland. Regions: KIMB, TNMI. Map 380.

W.A.: 14.5 km W of Tableland Stn, M.Lazarides 5132 (AD, BRI, CANB, FRI, NSW); 3.2 km E of Denham R., R.A.Perry 2520 (AD, BRI, FRI). N.T.: 80 km SW of Willeroo Homestead, G.M.Chippendale 6839 (BRI, FRI, NT); 3.2 km SE of Tanami Ra., J.R.Maconochie 1020 (AD, CANB, FRI, NT).

Characterised by smooth bark usually with flakes of dark shedding bark in small indentations, ±ovate-lanceolate leaves, buds sessile or almost so and hemispherical or subglobular fruits with a broad, flat or convex disc.

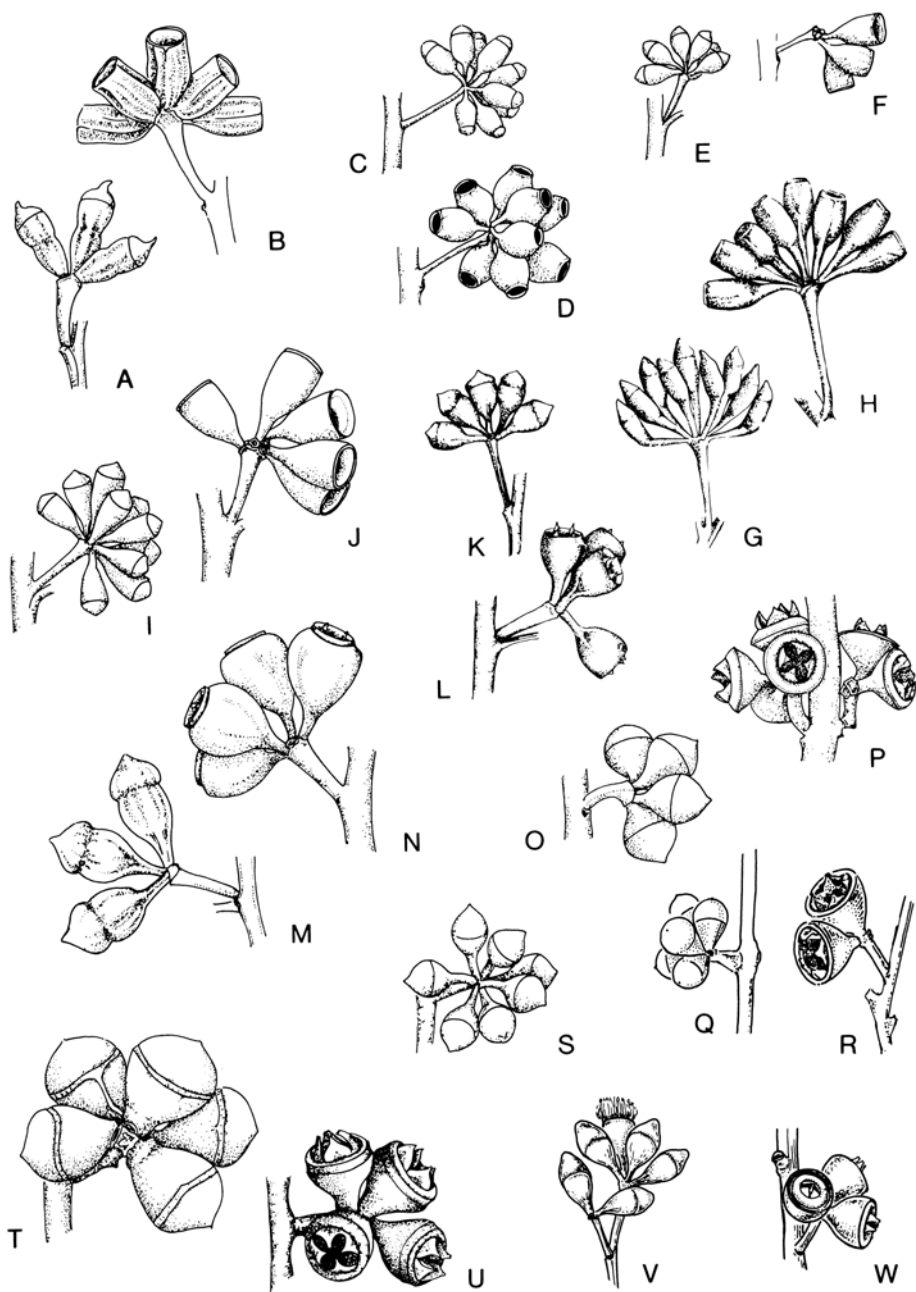


Figure 89. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. dundasii* (**A**, C.Gardner 2230, FRI; **B**, J.Baker 54, FRI). **C–D**, *E. ovularis* (**C**, C.Gardner 11162, FRI; **D**, C.Gardner 11166, FRI). **E–F**, *E. myriadena* (I.Brooker 4992, FRI). **G–H**, *E. cylindrocarpa* (C.Gardner 11164, NSW 58875, FRI). **I–J**, *E. oraria* (D.Blaxell W75/92 & I.Brooker, FRI). **K–L**, *E. brachycorys* (M.Koch 1041, FRI). **M–N**, *E. cyclostoma* (I.Brooker 2475, FRI). **O–P**, *E. alba* (J.Doran JD462, FRI). **Q–R**, *E. platyphylla* (**Q**, N.Speck 1739, FRI; **R**, 14.4 km NE of Yeppoon, Qld, C.Dunlop, FRI). **S**, *E. tintinnans* (I.Brooker 3129, FRI). **T–U**, *E. bigalerita* (**T**, Adelaide R., N.T., W.Bateman FRI; **U**, near Kununurra, W.A., C.Palzer & R.Fox, FRI). **V–W**, *E. brevifolia* (**V**, K.Kenneally 5634, FRI; **W**, J.Maconochie 1020, FRI). **G–H** drawn by C.Stahl. **Q, R, V, W** drawn by M.Risby. Others drawn by M.May.

359. *Eucalyptus leucophloia* Brooker, *Nuytsia* 2: 112 (1976)

T: near Rudall R., W.A., 22°37'S, 122°12'E, 22 May 1971, A.S.George 10782; holo: PERTH; iso: FRI, NSW.

Illustrations: M.I.H.Brooker, *op. cit.* 113; N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 203 (1977); S.Kelly *et al.*, *Eucalypts* 2: t. 89 (1983).

Tree to 10 m. Bark white, powdery, often black-spotted. Juvenile leaves subopposite, ovate to orbicular, subglaucous, concolorous. Adult leaves alternate, rarely opposite, narrowly lanceolate to lanceolate, shortly apiculate, thin; lamina 5–10 cm long, 1–2 cm wide, yellow-green or subglaucous, concolorous; lateral veins faint, at c. 40°; intramarginal vein almost confluent with margin; petiole slightly flattened or angular, 8–15 mm long. Umbels 7–11-flowered; peduncle slender, terete, 4–10 mm long; pedicels terete, 2–3 mm long. Buds ovoid to fusiform, glaucous; operculum hemispherical, sometimes apiculate, 2–3 mm long, 3–4 mm wide; hypanthium hemispherical, 2–3 mm long, 3–4 mm wide. Fruits hemispherical, 5–8 mm long, 4–6 mm wide; disc narrow, descending; valves 3, exserted. *Migum, Snappy Gum.* Fig. 90A–B.

Occurs in the Pilbara and adjacent parts of the Great Sandy Desert, W.A., with a broad disjunction to the north-central N.T. and north-western Qld. Grows on low stony hills, plateaus, slopes and stony sandplains in open woodland and as scattered individuals. Regions: PILB, SNDY, BKLY, MACD, CARP, GGNA. Map 381.

W.A.: Millstream Homestead, *M.I.H.Brooker* 2079 (FRI, NSW, PERTH); Mulga Downs, *N.T.Burbidge* 5993 (CANB, PERTH). N.T.: 61.2 km S of Tennant Creek, *J.Must* 475 (BRI, FRI, NT, PERTH); 12.9 km NW of Tennant Creek, *R.A.Perry* 575 (BRI, CANB, FRI, NT). Qld: 19.3 km from Mt Isa towards Camooweal, *L.Pedley* 2028 (BRI, FRI).

May be distinguished from the closely-related *E. brevifolia* mainly by the narrower, descending disc of the fruit.

360. *Eucalyptus confluens* W.Fitzg. ex Maiden, *J. & Proc. Roy. Soc. New South Wales* 49: 317 (1916)

T: summit of Mt Behn, W.A., May 1905, *W.V.Fitzgerald* 687; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 4: 177 (1919); isolecto: PERTH.

Illustrations: J.Turnbull & N.Hall, *Forest Tree Ser.* No. 103 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 85 (1983).

Tree to 10 m. Bark white or pink-white. Juvenile leaves not seen. Adult leaves alternate, narrowly lanceolate to lanceolate, acuminate, thick; lamina 10–15 cm long, 0.7–2 cm wide, shining, yellow-green, concolorous; lateral veins faint, at 25°–35°; intramarginal vein almost confluent with margin; petiole usually terete, 12–20 mm long. Umbels 3–7-flowered; peduncle terete, slender, 5–10 mm long; pedicels terete, 2–5 mm long. Buds ovoid to clavate; operculum conical, often obtuse, 3–4 mm long, 4–5 mm wide; hypanthium hemispherical, 4–5 mm long and wide. Fruits hemispherical to turbinate, 5–6 mm long and wide; disc level or convex; valves 3 or 4, slightly exserted. *Kimberley Gum.* Fig. 90C–D.

Occurs in the King Leopold Ranges area, W.A., and in the north-eastern Kimberley especially in the Denham River Stn area S of Wyndham. Grows on slopes and hilltops in sandy and rocky soil. Region: KIMB. Map 382.

W.A.: 5.3 km W of Inglis Gap, *M.I.H.Brooker* 4296 (BRI, FRI, NSW, PERTH); Carr Boyd Ra., *M.Lazarides* 6721 (BRI, CANB, K, NSW, NT, PERTH).

The shining leaves distinguish this from related species. May be distinguished from *E. leucophloia* by the smaller umbels, larger buds and fruits with a broad, level or convex disc. The terete peduncle, longer pedicels and shorter petiole also separate it from *E. hallii*.

361. *Eucalyptus hallii* Brooker, *Austral. Forest Res.* 7: 11 (1975)

T: 2 miles [c. 3 km] E of Goodwood railway stn on Woodgate road, Qld, 25°09'S, 152°27'E, 3 Sept. 1972, *M.I.H.Brooker* 3788; holo: FRI; iso: BRI, NSW, NT, PERTH.

Illustrations: *M.I.H.Brooker, op. cit.* 12; *N.Hall & M.I.H.Brooker, Forest Tree Ser.* No. 149 (1974); *S.Kelly et al., Eucalypts* 2: t. 78 (1983).

Tree to 17 m. Bark pink-grey to grey or dark grey. Juvenile leaves opposite or subopposite, lanceolate, grey to grey-green, discolorous. Adult leaves alternate, lanceolate, sometimes falcate, acuminate, thick; lamina 10–18 cm long, 1.5–3 cm wide, green or grey-green, concolorous; lateral veins faint, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole slightly flattened, 20–35 mm long. Umbels 7-flowered; peduncle angular, 5–10 mm long; pedicels absent or slightly flattened, to 3 mm long. Buds ovoid or clavate; operculum hemispherical to subconical, 2–4 mm long, 4–5 mm wide; hypanthium obconical, 4–5 mm long and wide. Fruits obconical, 5–8 mm long, 5–7 mm wide; disc broad, convex; valves 3, exserted. *Goodwood Gum*. Fig. 90E–F.

Occurs between Bundaberg and Maryborough, south-eastern Qld, in grey silt soil and white lateritic sand, usually on flat areas in open forest. Region: DWSN. Map 383.

Qld: 9.5 km E of Childers, *R.D.Johnston & G.M.Chippendale* 547 (BRI, FRI, MEL, NSW); 19.6 km NE of Childers, *G.M.Chippendale* 1137 & *M.J.Brennan* (AD, FRI, MEL, NSW, PERTH).

The grey or dark grey bark, dull leaves with longer petiole, angular peduncle and short pedicels distinguish this from *E. confluens*.

362. *Eucalyptus umbrawarrensis* Maiden, *Crit. Revis. Eucalyptus* 6: 257 (1922)

T: Umbrawarra, N.T., 5 July 1916, *H.I.Jensen* 412; holo: NSW; iso: FRI, BRI.

Illustrations: *J.H.Maiden, op. cit.* t. 228 fig. 2; *N.Hall & M.I.H.Brooker, Forest Tree Ser.* No. 65 (1973); *S.Kelly et al., Eucalypts* 2: t. 243 (1983).

Tree to 18 m. Bark white, sometimes blue-white or pink-white. Juvenile leaves subopposite, broadly ovate, green, slightly discolorous. Adult leaves alternate, narrowly lanceolate to lanceolate, acuminate, thin; lamina 6–10 cm long, 1–1.6 cm wide, shining, green, concolorous; lateral veins faint, at 30°–45°; intramarginal vein almost confluent with margin; petiole terete, 8–12 mm long. Umbels 7-flowered; peduncle terete, 5–10 mm long; pedicels terete, 2–3 mm long. Buds ovoid or turbinate; operculum usually conical, 2–3 mm long, c. 3 mm wide; hypanthium obconical, c. 3 mm long and wide. Fruits hemispherical to ovoid, 3–4 mm long and wide; disc descending; valves 3 or 4, level or slightly exserted. *Umbrawarra Gum*. Fig. 90G–H.

Occurs mainly in the area between Pine Creek and Daly Waters, N.T., on ridges, hills and tablelands in open woodland, sometimes in pure stands. Regions: KIMB, ARNM, BKLY. Map 384.

N.T.: 19.3 km NE of Willeroo, *N.Byrnes* 1924 (DNA, FRI, NT); 66 km SW of Katherine, *R.A.Perry* 1999 (BRI, CANB, FRI, NSW, NT).

Characterised by smooth bark, shining leaves, small buds, and fruits with a narrow descending disc.

363. *Eucalyptus rupestris* Brooker & Done, *Nuytsia* 5: 385 (1986)

T: Prince Regent R. Reserve, W.A., 30 Aug. 1974, *A.S.George* 12839; holo: PERTH; iso: FRI.

Illustration: *M.I.H.Brooker & C.Done, op. cit.* 386–387 (1986).

Tree to 5 m. Bark powdery, orange-white, sometimes black-spotted. Juvenile leaves decussate, petiolate, orbicular, concolorous. Adult leaves alternate, petiolate; elliptic to broadly lanceolate, apiculate, thin, lamina 5–7 cm long, 1–2 cm wide, dull light green, concolorous; lateral veins faint, at 35°–50°; intramarginal vein up to 1 mm from margin; petiole terete, 9–20 mm long. Umbels 7–9-flowered; peduncle terete, 2–4 mm long; pedicels absent or terete, to 2 mm long. Mature buds not seen, but immature buds clavate to ovoid;

operculum shorter than hypanthium. Fruits cylindrical, sometimes slightly contracted to form a short neck, 3–5 mm long, 3–4 mm wide; disc steeply descending; valves 3 or 4, level or slightly exserted. Fig. 90 I–J.

Occurs from the Prince Regent R. to the Drysdale R. and S to the Caroline Ra., north-western Kimberley, W.A., in sand among sandstone outcrops. Region: KIMB. Map 385.

W.A.: 49 km W of new Mt Elizabeth Stn, *M.I.H.Brooker* 7763 (FRI, NSW, PERTH); Euro Gorge, Drysdale R. Natl Park, *K.F.Kenneally* 4399 (CANB, PERTH).

Differs from *E. umbrawarrensensis* in dull light green, elliptic to broadly lanceolate leaves, and small cylindrical fruits which are sometimes contracted to a neck.

364. *Eucalyptus mooreana* W.Fitzg. ex Maiden, *J. & Proc. Roy. Soc. New South Wales* 47: 221 (1914)

T: summit of Mt Rason, W.A., Sept. 1905, *W.V.Fitzgerald* 1472; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 5: 101 (1920); isolecto: BM, K, PERTH.

Illustrations: J.H.Maiden, *op. cit.* t. 179 fig. 1; C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 135 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 127 (1983).

Tree to 9 m, crooked. Bark smooth, white. Juvenile leaves opposite, ovate, cordate or broadly lanceolate, perfoliate, undulate, glaucous, concolorous. Adult leaves opposite, broadly lanceolate or cordate, sessile or perfoliate, thick; lamina 9–16 cm long, 6–10 cm wide, glaucous, concolorous; lateral veins conspicuous, at 40°–60°; intramarginal vein up to 4 mm from margin with a second vein further in. Umbels 7-flowered; peduncle thick, terete, 10–15 mm long; pedicels absent. Buds turbinate to fusiform, glaucous; operculum conical, 5–10 mm long and wide; hypanthium obconical, 5–7 mm long and wide. Fruits hemispherical to turbinate, 6–10 mm long and wide; disc convex or level; valves 3 or 4, exserted. *Moore's Gum*. Fig. 90K–L.

Restricted to the western Kimberley, W.A., in the King Leopold Ra. area, among quartzite rocks on slopes. Region: KIMB. Map 386.

W.A.: King Leopold Ra., *M.I.H.Brooker* 7757 (FRI); Mt Bell, *J.R.Maconochie* 224 (FRI, NT).

Recognised by the crooked tree habit, smooth white bark, sessile buds and fruits, and leaves which are glaucous, opposite, sessile and cordate.

365. *Eucalyptus houseana* W.Fitzg. ex Maiden, *J. & Proc. Roy. Soc. New South Wales* 49: 318 (1916)

T: Isdell R., near Mt Barnett Homestead, W.A., May 1905, *W.V.Fitzgerald* 1014; holo: NSW; iso: PERTH.

Illustrations: J.Turnbull & N.Hall, *Forest Tree Ser.* No. 104 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 155 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 125 (1983).

Tree to 24 m. Bark white to light grey, often with fragments of deciduous flakes adhering. Juvenile leaves opposite, suborbicular to ovate, slightly discolorous. Adult leaves subopposite or alternate, lanceolate, acute, moderately thick; lamina 10–15 cm long, 1.5–3.2 cm wide, pale green, concolorous or very slightly discolorous; lateral veins just visible, at 35°–50°; intramarginal vein up to 1 mm from margin; petiole terete, 12–20 mm long. Umbels 3–7-flowered; peduncle quadrangular, 3–6 mm long; pedicels absent. Buds ovoid to subglobular, subglaucous; operculum hemispherical, 2–3 mm long, 3–4 mm wide; hypanthium hemispherical, 2–3 mm long, 3–4 mm wide. Fruits hemispherical to obconical, 2–4 mm long, 3–5 mm wide; disc convex or slightly descending; valves 3 or 4, level or slightly exserted. *Kimberley White Gum*. Fig. 90M–N.

Occurs in the western Kimberley, W.A., along river flats in swampy alluvial soil, in open forest and woodland, often dominant. Region: KIMB. Map 387.

W.A.: King Leopold Ra., *M.I.H.Brooker* 4291 (FRI, NSW, NT); Upper Charnley R., *C.A.Gardner* 1081 (PERTH); Bell Ck, King Leopold Ra., *L.A.S.Johnson* 2033 (K, NSW, PERTH).

Distinguished from *E. mooreana* by the petiolate leaves, short angular peduncle and smaller buds and fruits, and from *E. apodophylla* by the longer petiole, concolorous leaves and narrower buds and fruits.

366. *Eucalyptus apodophylla* Blakely & Jacobs ex Blakely, *Key Eucalypts* 165 (1934)

T: Pine Creek, N.T., 6 Nov. 1915, *H.I.Jensen & G.F.Hill 345*; holo: NSW; iso: FRI.

Illustrations: S.T.Blake, *Austral. J. Bot.* 1: t. 2 fig. 3, t. 3 fig. 1 (1953); N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 165 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 126 (1983).

Tree to 18 m, usually deciduous. Bark white, more or less powdery, often with flakes of deciduous bark adhering. Juvenile leaves opposite, ovate to broadly lanceolate, grey-green, discolorous. Leaves on mature trees opposite, oblong to ovate, apiculate, cordate to amplexicaul, thick; lamina 8–17 cm long, 4–8 cm wide, grey-green, discolorous; lateral veins visible, at 50°–70°; intramarginal vein up to 4 mm from margin; petiole absent or angular, to 7 mm long. Umbel 3–7-flowered; peduncle quadrangular, 5–13 mm long; pedicels terete, to 3 mm long, or absent. Buds subglobular to ovoid, glaucous, 2–4-ribbed; operculum hemispherical, sometimes apiculate, 2–3 mm long, 4–5 mm wide; hypanthium hemispherical or obconical, 3–5 mm long, 4–5 mm wide. Fruits hemispherical to obconical, sometimes 1- or 2-ribbed, often glaucous, 4–5 mm long, 5–7 mm wide; disc convex; valves 3 or 4, just exserted. *Whitebark*. Fig. 90 O–P.

Occurs in the Kimberley, W.A., and north-western N.T., often in pure stands on flats near watercourses in grassland and very open woodland. Regions: KIMB, ARNM. Map 388.

W.A.: Phillips Ra., *J.S.Beard 6976* (DNA, NSW, PERTH); Beverley Springs Homestead, *A.S.George 12215* (PERTH). N.T.: 25.8 km NE of Tipperary Homestead, *M.Lazarides 6686* (AD, BRI, CANB, K, MEL, NSW, PERTH); 260 km S of Darwin, Stuart Hwy, *R.E.Winkworth 1431* (BRI, CANB, FRI, NT).

Differ from related species especially in the discolorous leaves with short petiole.

367. *Eucalyptus herbertiana* Maiden, *Crit. Revis. Eucalyptus* 6: 429 (1923)

T: Donkins Hill near Mitchell R., W.A., 7 July 1921, *C.A.Gardner 1471*; holo: NSW; iso: FRI, PERTH.

Illustrations: J.H.Maiden, *op. cit.* t. 238 fig. 2; N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 163 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 76 (1983).

Tree or mallee to 8 m. Bark cream-yellow or white. Juvenile leaves subopposite or alternate, broadly lanceolate, green, discolorous. Adult leaves alternate, narrowly to broadly lanceolate, sometimes falcate, acuminate, thick; lamina 10–18 cm long, usually 1–2 cm wide, occasionally to 3.5 cm wide, green or grey-green, concolorous; lateral veins visible to faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole angular, 12–20 mm long. Umbels 7-flowered; peduncle thick, terete, 5–12 mm long; pedicels absent or up to 2 mm long. Buds ovoid; operculum hemispherical to conical, 3–4 mm long and wide; hypanthium obconical, angular, 3–4 mm long and wide. Fruits hemispherical or turbinate, sometimes 2-ribbed, 4–6 mm long, 5–6 mm wide; disc convex; valves 4, prominently exserted. *Kalumburu Gum*. Fig. 90Q–R.

Occurs in 3 disjunct areas, in the north Kimberley, W.A., northern N.T. and far north-western Qld. Grows on rocky slopes, edges of escarpments and adjacent drainage lines, in open woodland. Regions: KIMB, ARNM, CARP. Map 389.

W.A.: near Solea Falls, Drysdale R., 13 Aug. 1975, *A.S.George 13777* (CANB, PERTH); 1.6 km NW of Kalumburu Mission, *N.H.Speck 4907* (AD, BRI, CANB, FRI, K, MEL, NSW, NT, PERTH). N.T.: Katherine Gorge, *M.I.H.Brooker 3145* (BRI, FRI); E of Eva Valley Stn, *M.I.H.Brooker 4173* (FRI, NT). Qld: 64 km E of Wollgorang, *D.E.Symon 5039* (ADW, BRI, NT).

Distinguished by mallee or small tree habit, usually cream-yellow bark, thick peduncle, sessile or shortly pedicellate buds and prominently exserted valves on hemispherical or turbinate fruits.

368. *Eucalyptus cupularis* C.Gardner, J. & Proc. Roy. Soc. W. Australia 47: 60 (1964)

T: Halls Creek, W.A., 11 May 1951, *C.A.Gardner 10217*; holo: PERTH; iso: BRI, PERTH.

Illustrations: J.Turnbull & N.Hall, *Forest Tree Ser.* No. 102 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 252 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 77 (1983).

Tree to 10 m. Bark green to grey, white-powdery. Juvenile leaves not seen. Adult leaves alternate, narrowly to broadly lanceolate, acuminate, thick; lamina 10–18 cm long, 0.7–3.8 cm wide, green or grey-green, concolorous; lateral veins just visible, at 40°–45°; intramarginal vein almost confluent with or up to 2 mm from margin; petiole slightly flattened or angular, 15–50 mm long. Umbels 7-flowered; peduncle thick, angular, 10–15 mm long; pedicels absent. Buds ovoid to fusiform, faintly ribbed, glaucous; operculum conical, 4–7 mm long, 5–8 mm wide; hypanthium obconical, faintly ribbed, 5–7 mm long, 5–8 mm wide. Fruits hemispherical, cylindrical or obconical, faintly ribbed, 6–9 mm long, 6–8 mm wide; disc level or convex; valves 4 or 5, exserted. *Halls Creek White Gum*. Fig. 90S–T.

Occurs near Halls Creek in the south-eastern Kimberley, W.A., and in the north-western Tanami Desert, N.T. Found in open woodland in sandy soil, along flat drainage lines and near the base of rocky slopes. Regions: KIMB, TNMI. Map 390.

W.A.: 6–8 km from New Halls Creek Rd towards Halls Creek, *L.A.S.Johnson 2064* (FRI, NSW, PERTH). N.T.: Coomarie Spring, 32 km N of Tanami, *G.M.Chippendale 5626* (NT).

Differs from *E. herbertiana* in the white-powdery bark and larger buds and fruits.

Ser. 72 Exsertae***Eucalyptus* ser. *Exsertae* Blakely, *Key Eucalypts* 29, 128 (1934).**

Type: *E. exserta* F. Muell.

E. subser. *Exsertae* Benth., *Fl. Austral.* 3: 195, 236 (1867). T: *E. exserta* F. Muell.

Usually trees, sometimes mallees. Bark smooth throughout, sometimes rough on trunk or extending to larger branches, then smooth above. Juvenile leaves alternate, petiolate, usually slightly to clearly discolorous or sometimes concolorous. Adult leaves alternate, petiolate, concolorous; lateral veins usually distinctly visible. Conflorescences axillary, simple; umbels usually 7-flowered, sometimes 7–11-flowered, less frequently 3–7-flowered, or 7–many-flowered. Buds conical to ±rostrate, fusiform, cylindrical or subcylindrical, ±ovoid, obovoid, subglobular or ±conical. Fruits usually hemispherical to subglobular, sometimes ovoid, obconical, cylindrical or ±campanulate; disc usually ascending, sometimes convex, level or descending; valves 3–6, usually exserted. Seeds cuneate or cubical, toothed around edges, reticulate except *E. camaldulensis* which is smooth with reticulate inner coat.

A series of 17 species throughout mainland Australia except central-southern and south-eastern W.A. and south-western S.A. Characterised by usually smooth bark, concolorous leaves with distinct veins, simple umbels, fruits with exserted valves, and cubical or cuneate seeds.

369. *Eucalyptus seeana* Maiden, *Proc. Linn. Soc. New South Wales* 29: 469 (1904)

T: a few miles from Grafton on the Glen Innes road, N.S.W., Nov. 1903, *J.H.Maiden & J.L.Boorman s.n.*; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 4: 30 (1917); isolecto: K.

E. tereticornis var. *linearis* R.Baker & H.G.Smith, *Res. on Eucalypts* 74 (1902). T: Woodburn, Richmond R., N.S.W., 14 Aug. 1900, *collector unknown*; n.v.

Illustrations: N.Hall, *Forest Tree Ser.* No. 20 (1971); S.Kelly *et al.*, *Eucalypts* 2: t. 86 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 158 (1983).

Tree to 40 m. Bark smooth throughout, white or grey to grey-brown. Juvenile leaves broadly lanceolate, green, discolorous. Adult leaves narrowly lanceolate, acuminate, thin; lamina 10–18 cm long, 1–2 cm wide, green; lateral veins visible, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole slightly flattened, 10–20 mm long. Umbels 7–11-flowered;

peduncle quadrangular, 5–13 mm long; pedicels 2–5 mm long. Buds subcylindrical; operculum cylindrical or horn-shaped, 6–8 mm long, 3–4 mm wide; hypanthium hemispherical, 2–3 mm long, 3–4 mm wide. Fruits hemispherical, 4–5 mm long, 4–7 mm wide; disc broad, convex; valves 3 or 4, incurved. Seeds red-brown. *Narrow-leaved Red Gum*. Fig. 90U–V.

Occurs from just N of Brisbane, Qld, southwards to near Port Macquarie, N.S.W. Grows mainly in coastal districts in poorly drained soils, often as scattered individuals in forest. Region: MCPH. Map 391.

Qld: Margate, *S.T.Blake 18464* (BRI, FRI); 10 km NW of Stanthorpe, *L.Pedley 7428a* (BRI). N.S.W.: 0.5 km N of Lake Cathie turnoff from highway, *M.Brennan & G.M.Chippendale 1066* (BRI, FRI, MEL, NSW); 20.9 km SE of Grafton, *R.D.Johnston & G.M.Chippendale 506* (BRI, FRI, MEL, NSW).

Distinguished by smooth bark, narrowly lanceolate leaves, and subcylindrical buds with the operculum much longer and just narrower than the hypanthium. The trees produce abundant pollen and nectar, and the honey is pleasantly aromatic.

370. *Eucalyptus bancroftii* (Maiden) Maiden, *Crit. Revis. Eucalyptus* 4: 14 (1917)

E. tereticornis var. *bancroftii* Maiden, *Forest Fl. New South Wales* 2: 9 (1904). T: Honeysuckle Flat, c. 9 miles [c. 15 km] S of Port Macquarie, N.S.W., July 1895, *J.H.Maiden*; lecto: NSW, *vide J.H.Maiden, Crit. Revis. Eucalyptus* 4: 14 (1917).

E. tereticornis var. *brevifolia* Benth., *Fl. Austral.* 3: 242 (1867). T: New England, N.S.W., *C.Stuart s.n.*; holotype: K.

E. seeana var. *constricta* Blakely, *Key Eucalypts* 134 (1934). T: Burpengary, Qld, Dec. 1903, *T.L.Bancroft s.n.*; holotype: NSW; isotype: B.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 99 (1970); S.Kelly *et al.*, *Eucalypts* 1: t. 101 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 159 (1983).

Tree to 30 m. Bark smooth throughout, pink or orange to grey-brown. Juvenile leaves ovate, green, discolorous. Adult leaves lanceolate to broadly lanceolate, acute, thick; lamina 7.5–20 cm long, 1.5–4 cm wide, green; lateral veins at 30°–60°; intramarginal vein up to 2 mm from margin; petiole terete or channelled, 12–25 mm long. Umbels 7-flowered; peduncle angular, 5–20 mm long; pedicels 2–5 mm long. Buds cylindrical; operculum cylindrical, 7–12 mm long, 4–5 mm wide; hypanthium hemispherical, 3–4 mm long, 4–6 mm wide. Fruits hemispherical to subglobular, often angular or ribbed, 5–9 mm long and wide; disc broad, convex; valves 3 or 4. Seeds red-brown. *Orange Gum*, *Bancroft's Red Gum*. Fig. 90W–X.

Occurs from near Noonooroo, southeastern Qld, S to Maitland, N.S.W., predominantly in coastal areas but extending to adjacent tablelands. Grows in flat and gently sloping country, sometimes in drainage channels, and on rock outcrops on tablelands, often as scattered trees in open forest, sometimes dominant in small areas. Regions: DWSN, MCPH, NEPN. Map 392.

Qld: Bald Mt near Wallangarra, *S.T.Blake 4475* (BRI); 20.9 km SW of Tin Can Bay, *R.D.Johnston & G.M.Chippendale 537* (AD, BRI, FRI, MEL, NSW). N.S.W.: 27 km N of Dirty Ck, *M.I.H.Brooker 4722* (BRI, FRI, MEL, NSW); 12.9 km NW of Port Macquarie, *R.D.Johnston & G.M.Chippendale 486* (BRI, FRI, MEL, NSW, PERTH).

Differs from *E. seeana* in the often orange new bark, broader leaves and 7-flowered umbels, operculum slightly narrower than hypanthium and hemispherical to subglobular fruits, and from *E. parramattensis* in the larger buds and fruits.

371. *Eucalyptus parramattensis* C.Hall, *Proc. Linn. Soc. New South Wales* 37: 568 (1913)

T: near Public School, Fairfield, N.S.W., 3 May 1913, *C.Hall s.n.*; lecto: NSW, *vide J.H.Maiden, Crit. Revis. Eucalyptus* 4: 38 (1917).

E. parramattensis var. *sphaerocalyx* Blakely, *Key Eucalypts* 133 (1934). T: Duck River, N.S.W., *W.Woolls s.n.*; holotype: NSW.

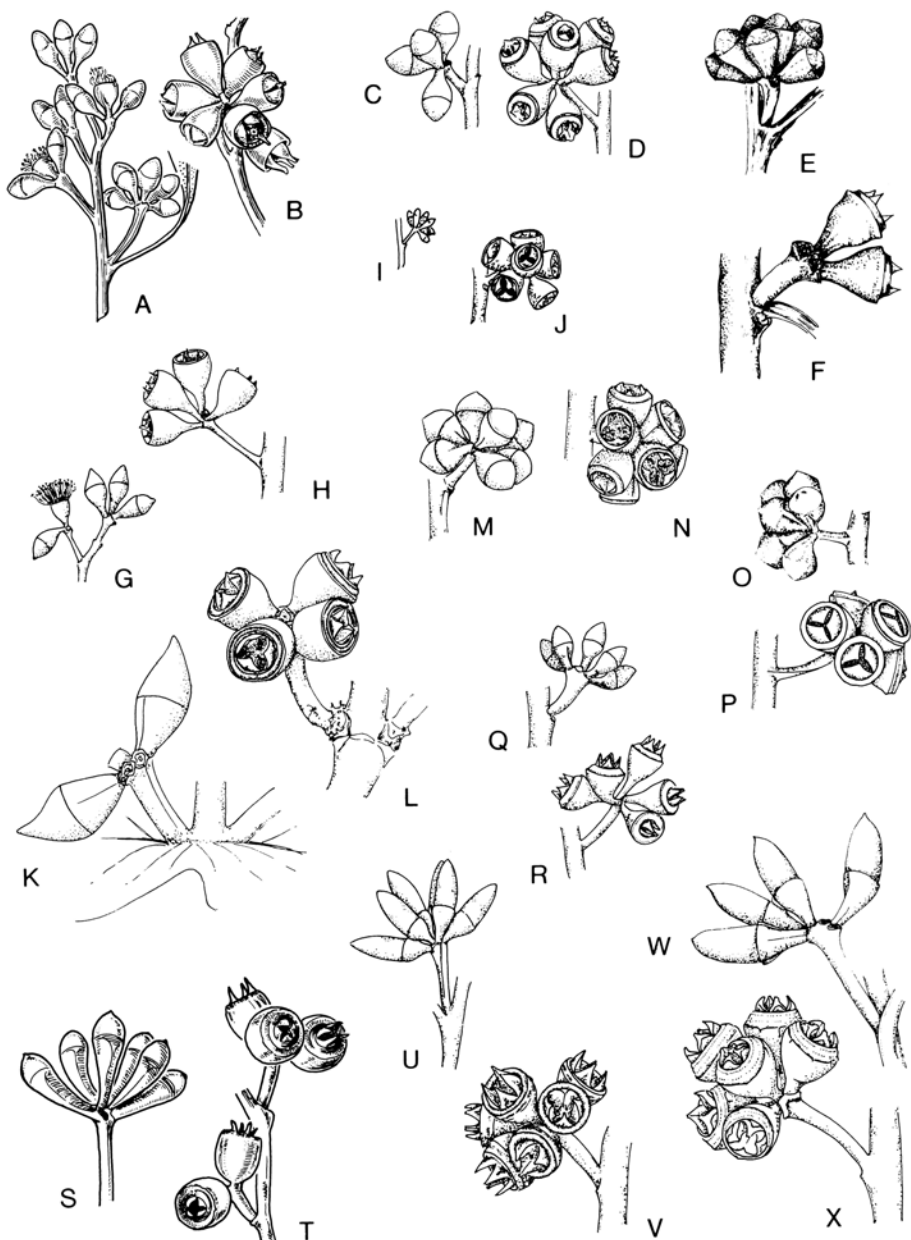


Figure 90. *Eucalyptus* buds and fruits, all $\times 1$, unless otherwise stated. **A–B**, *E. leucophloia* $\times 1.5$ (**A**, C.Dunlop 1844, FRI; **B**, 35 km SE of Cloncurry, Qld, W.McReaddie, FRI). **C–D**, *E. confluens* (**C**, I.Brooker 4296, FRI; **D**, J.Turnbull 325, FRI). **E–F**, *E. hallii* (R.Johnston & G.Chippendale 547, FRI). **G–H**, *E. umbrawarrensii* (**G**, I.Brooker 4190, FRI; **H**, D.Boland 1291, FRI). **I–J**, *E. rupestris* (**I**, immature buds $\times 0.5$, I.Brooker 7763, FRI; **J**, A.George 14073, FRI). **K–L**, *E. mooreana* (**K**, summit of Mt Rason, W.A., W.Fitzgerald, FRI; **L**, J.Maconochie 224, FRI). **M–N**, *E. houseana* (**M**, K.Kenneally 2062, FRI; **N**, J.Banks 1458, FRI). **O–P**, *E. apodophylla* (**O**, M.Jacobs 62, FRI; **P**, J.Banks 1537, FRI). **Q–R**, *E. herbertiana* (**Q**, I.Brooker 3145, FRI; **R**, N.Byrnes 2696, FRI). **S–T**, *E. cupularis* (4.8 km along Old Halls Creek Rd, W.A., F.Lullfitz, FRI). **U–V**, *E. seeana* (G.Chippendale 1066, FRI). **W–X**, *E. bancroftii* (**W**, R.Johnston & G.Chippendale 486, FRI; **X**, G.Chippendale 504, FRI). **A**, **B**, **S**, **T** drawn by M.Risby. Others drawn by M.May.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 112 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 99, 100 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 160 (1983).

Tree to 18 m. Bark smooth throughout, grey to white. Juvenile leaves narrowly lanceolate to lanceolate, green, slightly discoloured. Adult leaves narrowly lanceolate to lanceolate, acuminate, thin; lamina 7.5–15 cm long, 1–2 cm wide, green; lateral veins faint, at 45°–60°; intramarginal vein up to 1 mm from margin; petiole terete, 10–20 mm long. Umbels 7-flowered; peduncle terete, 5–10 mm long; pedicels 2–8 mm long. Buds ovoid, conical or subglobose; operculum conical or hemispherical, 4–5 mm long and wide; hypanthium hemispherical, 2–3 mm long, 3–5 mm wide. Fruits hemispherical, 3–5 mm long, 5–8 mm wide; disc narrow to moderately broad, level or slightly ascending and then descending; valves 3 or 4. Seeds red-brown. *Parramatta Red Gum*, *Drooping Red Gum*. Fig. 91A–B.

Occurs from near Kandos to Douglas Park, N.S.W., on flat and gently sloping country in woodland. Regions: NEPN, MCPH. Map 393.

N.S.W.: 59.6 km from Windsor towards Singleton, M.I.H.Brooker 3717 (AD, BRI, FRI, MEL, NSW); 0.3 km W of Kanwal, R.D.Johnston & G.M.Chippendale 447 (BRI, FRI, MEL, NSW); 11.3 km N of Ulan, 15 Aug. 1950, L.A.S.Johnson (NSW).

Distinguished by smooth bark, narrowly lanceolate to lanceolate leaves, 7-flowered umbels, and hemispherical fruits slightly wider than long. Differs from related species mainly in having smaller buds. The var. *sphaerocalyx* has a short rounded operculum and occurs near Putty, Parramatta and Liverpool, W of Sydney.

372. *Eucalyptus amplifolia* Naudin, *Descr. Emploi. Eucalyptus introd. Europe* 28 (1891)

T: cultivated Du bois de Boulogne, Algeria, C.Naudin s.n.; syn: P; cultivated Cannes, France, C.Naudin s.n.; syn: P; cultivated Jardin du Riou, Cannes, France, 14 Sept. 1880, C.Naudin s.n.; syn: P; cultivated Jardin du Riou, Cannes, France, 21 Oct. 1882, C.Naudin s.n.; syn: P; Garden of M.Ricasola, Florence, Italy, collector unknown s.n.; syn: P.

E. amplifolia var. *sessiliflora* Blakely, *Key Eucalypts* 131 (1934). T: Acacia Ck, McPherson Ra., N.S.W., Dec. 1904, W.Dunn s.n.; holotype: NSW.

Illustrations: N.Hall, *Forest Tree Ser.* No. 19 (1971); S.Kelly *et al.*, *Eucalypts* 2: t. 81, 82 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 162 (1983).

Tree to 30 m. Bark smooth throughout, white, grey, blue-grey or green-grey. Juvenile leaves broadly lanceolate to orbicular, green, concolorous. Adult leaves lanceolate to broadly lanceolate, acuminate, firm; lamina 10–20 cm long, 1.5–3 cm wide, green; lateral veins at 35°–45°; intramarginal vein up to 2 mm from margin; petiole terete or channelled, 14–24 mm long. Umbels 7–15-flowered; peduncle flattened or angular, 7–15 mm long; pedicels absent or terete, to 8 mm long. Buds conical; operculum conical, 7–9 mm long, c. 4 mm wide; hypanthium hemispherical, 2–3 mm long, c. 4 mm wide. Fruits hemispherical or ovoid, 3–5 mm long, 3–6 mm wide; disc broad, ascending; valves 3–5, strongly exerted. Seeds brown-black. *Cabbage Gum*. Fig. 91C–D.

Occurs from near Legume southwards to Pambula, N.S.W., usually in depressions and on river flats in heavy soil in open woodland and forest. Regions: MCPH, NEPN, HOWE. Map 394.

N.S.W.: 3.2 km W of Coneac, D.F.Blaxell 1 (NSW); 1.6 km S of Wyong, R.D.Johnston & G.M.Chippendale 445 (BRI, FRI, NSW); Liston, 11 Nov. 1954, L.A.S.Johnson (BRI, NSW); Upper Williams R., 1934, J.W.Vickery (NSW).

Has larger leaves than *E. parramattensis* with more divergent lateral veins, larger umbels and longer buds. Differs from *E. tereticornis* mainly in the shorter operculum and smaller fruits. The name var. *sessiliflora* was applied to a variant with sessile buds from the Casino–Tenterfield–Armidale area.

373. *Eucalyptus tereticornis* Smith, *Spec. Bot. New Holland* 1: 41 (1795)

T: Port Jackson, N.S.W., 1793, *J. White s.n.*; holo: LINN; iso: BM.

E. umbellata (Gaertner) Domin, *Biblioth. Bot.* 89: 467 (1928) *nom. illeg.* non Desf. (1814); *Leptospermum umbellatum* Gaertner, *Fruct. Sem. Pl.* 1: 174 & t. xxxv (1788). T: Bay of Inlets, [Qld], 29 May 1770, *J. Banks & D. Solander*; holo: BM.

E. populifolia Desf., *Cat. Pl. Hort. Parisiensis* 3rd edn, 284, 408 (1829). T: none cited.

E. subulata Cunn. ex Schauer in W.G. Walpers, *Repert. Bot. Syst.* 2: 924 (1843). T: Moreton Bay, Qld, Sept. 1827, *A. Cunningham* 150; holo: *n.v.*; iso: BM, K, MEL.

E. insignis Naudin, *Descr. Emploi Eucalyptus introd. Europe* 30 (1891). T: cultivated, Villa Thuret, France, 26 June, 1886, *C. Naudin s.n.*; syn: P; cultivated at Villa Thuret, France, 17 Aug. 1887, *C. Naudin s.n.*; syn: P.

E. umbellata var. *pruiniflora* Blakely, *Key Eucalypts* 130 (1934); *E. tereticornis* var. *pruiniflora* (Blakely) Cameron, *Victorian Naturalist* 63: 43 (1946). T: 'Head Wharf, Lower Latrobe River, Raymond Island, Lake King, Glengarry, near Munro', Vic., *H. Hopkins*; all *n.v.*

Illustrations: S. Kelly *et al.*, *Eucalypts* 1: t. 95 (1983); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 163 (1983); D.J. Boland *et al.*, *Forest Trees Australia* 4th edn, 423 (1984).

Tree to 50 m. Bark smooth throughout, white, grey or grey-blue. Juvenile leaves ovate, dull, green to blue-green, slightly discolorous. Adult leaves narrowly lanceolate to lanceolate, acuminate, thick; lamina 10–20 cm long, 1–2.7 cm wide, shining, green; lateral veins at 40°–50°; intramarginal vein up to 2 mm from margin; petiole terete or channelled, 13–24 mm long. Umbels 7–11-flowered; peduncle terete or angular, 7–25 mm long; pedicels 3–10 mm long. Buds conical; operculum conical, 8–13 mm long, 4–6 mm wide; hypanthium hemispherical, 2–3 mm long, 4–6 mm wide. Fruits subglobular or ovoid, 5–7 mm long, 4–8 mm wide; disc broad, steeply ascending; valves 4 or 5, strongly exserted. Seeds brown-black. *Forest Red Gum*. Fig. 91E–F.

Occurs widely in eastern Qld, N.S.W. and Vic. Grows in open forest and as scattered trees, on alluvial flats. Regions: CYRK, BURD, DWSN, MCPH, NEPN, HOWE. Map 395.

Qld: The Gap, *S.T. Blake* 23093 (BRI, CANB, NSW); 24.1 km S of Warwick, *S.L. Everist* 1281 (BRI). N.S.W.: Trial Bay, Aug. 1909, *J.L. Boorman* (NSW); 22.9 km N of Taree, *G.P. Smith* 3 (BRI, CANB, CBG, FRI, HO, K, MEL, NSW, PERTH). Vic.: 16.1 km E of Stratford, *H.I. Aston* 459 (MEL).

Has longer operculum and longer fruits than *E. amplifolia* and *E. blakelyi*. Distinguished by tall tree habit, smooth bark, conical buds, and fruits with steeply ascending disc and strongly exserted valves. Has been used for heavy construction, railway sleepers, piles, poles and posts; the wood is hard, strong and durable. The trees are a major source of pollen and a useful source of nectar, and the honey has a pleasant caramel or toffee flavour.

374. *Eucalyptus chloroclada* (Blakely) L. Johnson & K. Hill, *Fl. Australia* 19: 508 (1988)

E. dealbata var. *chloroclada* Blakely, *Key Eucalypts* 339 (1934). T: Baradine, N.S.W., 29 June 1923, *J.A. Fletcher* 31A; lecto: NSW, *vide* L. Johnson & K. Hill, *loc. cit.*

Illustrations: S. Kelly *et al.*, *Eucalypts* 2: t. 84 (1983); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 166 (1983).

Tree or sometimes a mallee, to 15 m. Bark smooth throughout, cream, grey, white or cream-orange. Juvenile leaves orbicular to ovate, pale green, slightly discolorous. Adult leaves lanceolate, acute or acuminate, thin; lamina 6–15 cm long, 2–3 cm wide, dull or shining, green; lateral veins at 30°–45°; intramarginal vein up to 2 mm from margin; petiole terete or channelled, 10–22 mm long. Umbels 7-flowered; peduncle usually quadrangular, 6–10 mm long; pedicels 1–3 mm long. Buds conical; operculum conical, 4–7 mm long, 3–5 mm wide; hypanthium hemispherical or obconical, 4–7 mm long, 3–5 mm wide. Fruits hemispherical, 4–6 mm long and wide; disc broad, level or ascending; valves 4. Seeds brown-black. *Baradine Gum*, *Red Gum*. Fig. 91G–H.

Occurs widely in south-eastern Qld and on the northern tablelands, N.S.W., west of the Divide, mostly on sandy plains and hills in woodland. Regions: DWSN, WRGO, MCPH, DARL, NEPN. Map 396.

Qld: Mt Playfair Stn, *L.G.Adams 1353* (AD, BRI, CANB, K, MEL); 0.2 km W of Burri Burri, *R.D.Johnston & G.M.Chippendale 580* (BRI, FRI, NSW). N.S.W.: Baan Baa, Oct. 1914, *J.L.Boorman* (NSW); 1 km W of Premer dump, *M.I.H.Brooker 5183* (FRI, NSW).

Differs from *E. tereticornis* and *E. blakelyi* in having the operculum and hypanthium of c. equal length, and from *E. glaucina* and *E. dealbata* in the non-glaucous buds.

375. *Eucalyptus blakelyi* Maiden, *Crit. Revis. Eucalyptus* 4: 43 (1917)

T: Pilliga scrub, 10–15 miles [16–24 km] from Coonabarabran towards Rocky Glen, N.S.W., 11 Aug. 1911, *H.I.Jensen 129*; holotype: NSW.

E. blakelyi var. *irrorata* Blakely, *Key Eucalypts* 131 (1934). T: numerous syntypes cited, e.g. Tambaroora, N.S.W., 1 Aug. 1911, *R.H.Cambage 1786*; syn: NSW.

E. blakelyi var. *parvifructa* Blakely, *Key Eucalypts* 132 (1934). T: Wollongawah near Tumut, N.S.W., 15 Apr. 1932, *W.A.W. de Beuzeville s.n.*; holotype: NSW; isotype: FRI.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 96 & 2: 83 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 165 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 425 (1984).

Tree to 25 m. Bark smooth throughout, white or grey with grey-blue, pink or cream-yellow patches. Juvenile leaves ovate to suborbicular, grey-green, concolorous. Adult leaves lanceolate to narrowly lanceolate, acuminate, moderately thick lamina 9–16 cm long, 1–2 cm wide, green; lateral veins at 35°–50°; intramarginal vein up to 2 mm from margin; petiole ±terete, 15–22 mm long. Umbels 7–11-flowered; peduncle terete or angular, 7–19 mm long; pedicels 1–10 mm long. Buds conical, sometimes glaucous; operculum conical, 5–8 mm long, 3–5 mm wide; hypanthium hemispherical, 3–4 mm long, 3–5 mm wide. Fruits ovoid, subglobular or hemispherical, 4–7 mm long, 4–8 mm wide; disc broad, ascending; valves 3 or 4. Seeds brown-black. *Blakely's Red Gum*. Fig. 91 I–J.

Widespread in the eastern half of N.S.W. except on the coast, extending just into south-eastern Qld and north-eastern Vic., with an outlier near Pumphouse Springs, Qld. Grows in woodland and open forest. Regions: DWSN, MCPH, NEPN, HOWE, OTWY. Map 397.

Qld: near Ballandean, *L.Pedley 7421* (BRI, FRI, NSW). N.S.W.: 32.2 km from Inverell towards Yetman, *M.I.H.Brooker 3936* (FRI, NSW); 3.5 km NW of Murrurundi, *M.J.Brennan & G.M.Chippendale 1231* (AD, FRI, MEL, NSW). Vic.: 14.5 km NW of Wangaratta, 15 Mar. 1946, *J.D.Sherwood* (MEL).

Has narrower leaves than *E. chloroclada* and *E. glaucina* and much greener leaves than *E. dealbata*. Distinguished by smooth bark, conical buds, and ovoid, subglobular or hemispherical fruits with broad, ascending discs and exerted valves. The wood is hard, strong and durable and has been used mainly in fencing.

376. *Eucalyptus glaucina* (Blakely) L.Johnson, *Contr. New South Wales Natl Herb.* 3: 104 (1962)

E. tereticornis var. *glaucina* (Blakely) Cameron, *Victorian Naturalist* 63: 43 (1946); *E. umbellata* var. *glaucina* Blakely, *Key Eucalypts* 130 (1934) *p.p.* as to type. T: Williams R., N.S.W., Aug. 1906, *J.L.Boorman s.n.*; holotype: NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 111 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 80 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 164 (1983).

Tree, often to 18 m, sometimes to 30 m. Bark smooth throughout, white or grey. Juvenile leaves ovate, pale green or glaucous, slightly discolorous. Adult leaves lanceolate to broadly lanceolate, acuminate, moderately thick; lamina 12–18 cm long, 2–3 cm wide, dull, green; lateral veins at 40°–50°; intramarginal vein up to 3 mm from margin; petiole flattened, 15–20 mm long. Umbels 7-flowered; peduncle angular or flattened, 12–20 mm long; pedicels 2–5 mm long. Buds conical, glaucous; operculum conical, 6–10 mm long, 5–6 mm wide; hypanthium hemispherical or obconical, 2–4 mm long, 5–6 mm wide. Fruits hemispherical or ovoid, 7–10 mm long, 7–10 mm wide; disc broad, ascending; valves 3–5. Seeds brown-black. *Slaty Red Gum*. Fig. 91K–L.

Occurs in the Casino area and from Gloucester to Taree, N.S.W. Grows mostly on gentle slopes near drainage lines in alluvial and clayey soils, in open forest. Regions: MCPH, NEPN. Map 398.

N.S.W.: Paterson R., *M.J.Brennan & G.M.Chippendale 1039* (AD, BRI, FRI, MEL, NSW); Taree, Oct. 1904, *E.H.F.Swain* (NSW).

Distinguished from *E. tereticornis* and *E. chloroclada* by the glaucous buds, and from *E. blakelyi* and *E. dealbata* by the larger fruits.

377. *Eucalyptus dealbata* Cunn. ex Schauer in W.G.Walpers, *Repert. Bot. Syst.* 2: 924 (1843)

E. viminalis var. *dealbata* (Cunn. ex Schauer) C.Moore & E.Betche, *Handb. Fl. New South Wales* 202 (1893); *E. tereticornis* var. *dealbata* (Cunn. ex Schauer) Deane & Maiden, *Proc. Linn. Soc. New South Wales* 24: 466 (1899); *E. umbellata* var. *dealbata* (Cunn. ex Schauer) Domin, *Biblioth. Bot.* 89: 447 (1928). T: Wellington Valley, N.S.W., Nov. 1825, *A.Cunningham 71*; holo: n.v.; iso: K, MEL.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 97 (1970); N.C.W.Beadle *et al.*, *Fl. Sydney Region* 3rd edn, 323 (1982); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 167 (1983).

Tree to 15 m. Bark smooth throughout, grey or white. Juvenile leaves broadly ovate, usually glaucous, slightly discolorous. Adult leaves lanceolate, acuminate, moderately thick; lamina 7.5–11.5 cm long, 1.3–3.5 cm wide, grey-green or glaucous; lateral veins at 35°–50°; intramarginal vein up to 2 mm from margin; petiole terete or slightly flattened, 10–20 mm long. Umbels 7–11-flowered; peduncle angular, 7–12 mm long; pedicels 2–6 mm long. Buds ovoid to conical, glaucous; operculum conical, 5–6 mm long, 3–4 mm wide; hypanthium hemispherical or obconical, 2–4 mm long, 3–4 mm wide. Fruits hemispherical, 4–7 mm long, 5–7 mm wide; disc broad, ascending; valves 3 or 4. Seeds brown-black. *Tumbledown Gum*. Fig. 91M–N.

Occurs from the Emerald district, Qld, southwards through the western slopes and tablelands of N.S.W. to the Chiltern area, Vic. Grows on ridges, hills and plains in open woodland. Regions: DWSN, WRGO, MCPH, NEPN, DARL, RIVR, HOWE. Map 399.

Qld: 35 km E of Texas, *M.I.H.Brooker 3945* (BRI, FRI); Ballandean, *C.T.White 9413* (BRI, NSW). N.S.W.: Warrumbungle State Forest, 5 May 1968, *N.Hall* (FRI, NSW); Mt Hope, *D.Walker 1324* (CANB, FRI, NSW). Vic.: Chiltern, Apr. 1911, *J.Staer* (NSW).

Distinguished by small, often irregular, tree habit, smooth bark, grey-green or glaucous adult leaves, glaucous conical or ovoid buds and the broad ascending disc of the fruit. The trees are a major source of pollen and the honey has a pleasant flavour.

378. *Eucalyptus dwyeri* Maiden & Blakely, *J. & Proc. Roy. Soc. New South Wales* 59: 160 (1915)

T: Gungah, N.S.W., Sept. 1904, *J.L.Boorman s.n.*; syn: NSW (2 sheets), MEL.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 121 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 98 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 169 (1983).

Mallee or small tree to 6 m. Bark smooth throughout, cream, white or grey. Juvenile leaves narrowly lanceolate to lanceolate, pale green, slightly discolorous. Adult leaves narrowly lanceolate to lanceolate, acuminate, thin; lamina 10–15 cm long, 1.2–2.5 cm wide, dull, green or grey-green; lateral veins at 35°–45°; intramarginal vein up to 1 mm from margin; petiole terete or slightly flattened, 15–25 mm long. Umbels 7-flowered; peduncle angular, 6–15 mm long; pedicels 1–3 mm long. Buds conical or fusiform; operculum conical, 3–5 mm long and wide; hypanthium obconical, 2–3 mm long, 3–5 mm wide. Fruits hemispherical, cylindrical or subcampanulate, 4–7 mm long and wide; disc narrow, level or ascending; valves 3 or 4, level or exserted. Seeds brown-black. *Dwyer's Mallee Gum*. Fig. 91 O–P.

Widespread W of the Divide in central N.S.W. and in north-eastern Vic., with an outlier W of Wheatvale, Qld, mostly from the Narrabri area southwards to near Beechworth. Grows usually on small stony ridges in well drained sandy soils. Regions: MCPH, DARL, NEPN, RIVR, HOWE. Map 400.

N.S.W.: 8.7 km from Sandy Hollow towards Gungal, *M.I.H.Brooker 5163* (AD, FRI, NSW); Goonoo Goonoo State Forest, near Dubbo, *M.Gray 5501* (CANB, NSW); 10 km E of Narrabri, *L.A.S.Johnson 7855* (NSW). Vic.: 4.5 km N of Beechworth, *M.I.H.Brooker 7419* (FRI).

Similar to *E. dealbata* but not glaucous and has a shorter operculum.

379. *Eucalyptus flindersii* Boomsma, *J. Adelaide Bot. Gard.* 2: 293 (1980)

T: Mt Hack, S.A., 10 Sept. 1969, *R.Callen 38*; holotype: AD.

Illustrations: C.D.Boomsma, *op. cit.* 294 fig. 1; S.Kelly *et al.*, *Eucalypts* 1: t. 263 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 168 (1983).

Mallee or small tree to 5 m. Bark smooth throughout, grey. Juvenile leaves broadly ovate, green, slightly discolorous. Adult leaves narrowly lanceolate to lanceolate, acuminate, thick; lamina 8–15 cm long, 1–2 cm wide, dull, grey-green or yellow-green; lateral veins at 30°–45°; intramarginal vein up to 2 mm from margin; petiole slightly flattened, 15–20 mm long. Umbels 3–7-flowered; peduncle terete, 5–9 mm long; pedicels absent or to 3 mm long. Buds ovoid; operculum conical or hemispherical, 5–6 mm long and wide; hypanthium hemispherical, 3–4 mm long, 5–6 mm wide. Fruits hemispherical, obconical or ovoid, 5–8 mm long, 6–9 mm wide; disc broad, level or ascending; valves 3 or 4. Seeds brown-black. Fig. 91Q–R.

Occurs mainly in the Flinders Ra. with an occurrence also at Pualco Gorge, S.A., on slopes and among rocks, in open woodland. Region: TRNS. Map 401.

S.A.: 40 km NNE of Hawker, *R.H.Kuchel 2411* (AD, FRI); Tanderra Saddle, St Mary Peak, *D.E.Symon 6781* (AD, CANB, NSW); near Mt Hayward, *D.E.Symon 7311* (AD, CANB, NSW).

Distinguished by mallee or rarely tree habit, narrowly lanceolate to lanceolate adult leaves, sessile or shortly pedicellate, ovoid buds, and hemispherical, obconical or ovoid fruits.

380. *Eucalyptus camaldulensis* Dehnh., *Cat. Pl. Hort. Camaldulensis* 2nd edn, 6, 20 (1832)

T: cultivated at Camalduli, Naples, Italy, *F.Dehnhardt*; holotype: W.

E. rostrata Schldl., *Linnaea* 20: 655 (1847), *nom. illeg.* non Cav. (1797); *E. longirostris* F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 125 (1856). T: 'On the banks of brooks and rivers', collector unknown; *n.v.*

E. rostrata var. *acuminata* (Hook.) Maiden, *Crit. Revis. Eucalyptus* 4: 67 (1917); *E. camaldulensis* var. *acuminata* (Hook.) Blakely, *Key Eucalypts* 135 (1934); *E. acuminata* Hook. in T.L.Mitchell, *J. Exped. Trop. Australia* 390 (1848). T: Mooni Ck or R., [Qld], 20 Nov. 1846, *T.L.Mitchell 435*; iso: CGE, NSW.

E. rostrata var. *brevirostris* (F.Muell. ex Miq.) Maiden, *Bull. Herb. Boissier* Ser. 2, 2: 581 (1902); *E. camaldulensis* var. *brevirostris* (F.Muell. ex Miq.) Blakely, *Key Eucalypts* 135 (1934); *E. longirostris* f. *brevirostris* F.Muell. ex Miq., *loc. cit.* T: Glenelg R., Vic., *F.Mueller*; iso: K.

E. rostrata var. *borealis* R.Baker & H.G.Smith, *Research Eucalypts* 75 (1902). T: Nyngan, N.S.W., Nov. 1899, *W.Bäuerlen s.n.*; *n.v.*

E. tereticornis var. *rostrata* Ewart, *Handb. Forest Trees Victorian Forester* 301, t. 147 (1915). T: not designated; *n.v.*

E. camaldulensis var. *obtusata* Blakely, *Key Eucalypts* 135 (1934). T: Nannine, W.A., Sept. 1910, *W.V.Fitzgerald s.n.*; syn: NSW; Balkara, W.A., 29 Sept. 1905, *A.Morrison*; syn: NSW; Strelly R., W.A., 1900, *J.B.Cleland*; syn: NSW; Alice Springs, N.T., 13 Jan. 1927, *J.B.Cleland*; syn: NSW; Daly Waters, N.T., July 1922, *C.E.F.Allen*; syn: NSW; Powell Ck, N.T., Aug. 1922, *C.E.F.Allen*; syn: NSW; Finke R., N.T., 1880, *H.Kempe*; syn: MEL, NSW; Mt Lyndhurst, S.A., Nov. 1899, *M.Koch s.n.*; syn: NSW; Kuitpo, S.A., 16 Mar. 1923, *J.B.Cleland*; syn: K; Sandy Ck, 14 miles [c. 23 km] N of Gilgunnia, N.S.W., 7 June 1900, *R.H.Cambage 1012*; syn: NSW.

E. camaldulensis var. *pendula* Blakely & Jacobs in W.F.Blakely, *Key Eucalypts* 135 (1934). T: No. 4 bore, between Birdum & Daly Waters, N.T., 4 Aug. 1933, *M.R.Jacobs 136*; holotype: NSW; iso: FRI.

E. camaldulensis var. *subcinerea* Blakely, *Key Eucalypts* 135 (1934). T: Silverton, N.S.W., 22 Apr. 1921, *R.H.Cambage 4343*; syn: NSW; Charleville, Qld, 25 Sept. 1911, *E.B.Atkins*; syn: NSW.

Illustrations: C.D.Boomsma, *Native Trees S. Australia* 89 (1972); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 228 (1979); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 427 (1984).

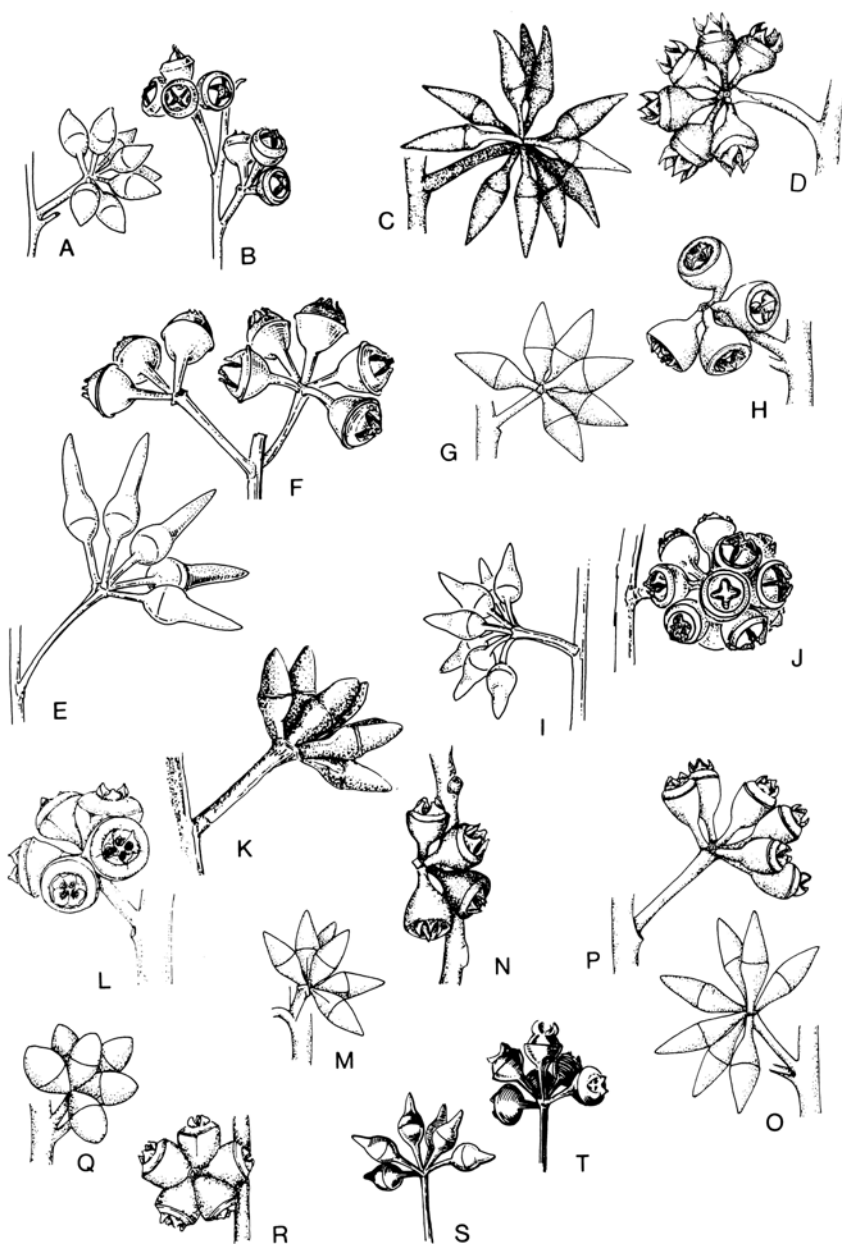


Figure 91. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. parramattensis* (G.Chippendale 447 & R.Johnston, FRI). **C–D**, *E. amplifolia* (**C**, Barbers Ck, N.S.W., J.Maiden, NSW; **D**, C.Morre 3387, NSW). **E–F**, *E. tereticornis* (**E**, B.Hyland 5079, FRI; **F**, N.Michael 2113, FRI). **G–H**, *E. chloroclada* (**G**, K.Wilson 2490, FRI; **H**, 8 km E of Warialda, N.S.W., A.Nicholls, FRI). **I–J**, *E. blakelyi* (**I**, Wagga Wagga, N.S.W., M.Phillips, FRI; **J**, R.Eakin 142, FRI). **K–L**, *E. glauca* (**K**, I.Brooker 4641, NSW; **L**, R.Story 7446, NSW). **M–N**, *E. dealbata* (**M**, K.Wilson 2438, FRI; **N**, Parkes district, N.S.W., R.Whiting, FRI). **O–P**, *E. dwyeri* (**O**, G.Chippendale 933, FRI; **P**, I.Brooker 3095, FRI). **Q–R**, *E. flindersii* (**Q**, 6.4km S of Hawker South, S.A., N.Burbidge, FRI; **R**, Wilpena Pound, S.A., N.Burbidge, FRI). **S–T**, *E. camaldulensis* (**S**, G.Chippendale 1391 & M.Brennan, FRI; **T**, D.Boland 1269, FRI). **K**, **L** drawn by J.Collins. **A**, **B**, **E**, **F**, **I**, **J**, **S**, **T** drawn by M.Risby. Others drawn by M.May.

Tree commonly to 20 m, occasionally to 45 m. Bark smooth throughout, white, grey, brown or red. Juvenile leaves ovate to broadly lanceolate, green, grey-green or blue-green, slightly discolorous. Adult leaves lanceolate to narrowly lanceolate, acuminate, moderately thick; lamina 8–30 cm long, 0.7–2 cm wide, green or grey-green; lateral veins at 40°–50°; intramarginal vein up to 2 mm from margin; petiole terete or channelled, 12–15 mm long. Umbels 7–11-flowered; peduncle slender, terete or quadrangular, 6–15 mm long; pedicels slender, 5–12 mm long. Buds globular-rostrate or ovoid-conical; operculum hemispherical, rostrate or conical, obtuse, 4–6 mm long, 3–6 mm wide; hypanthium hemispherical, 2–3 mm long, 3–6 mm wide. Fruits hemispherical or ovoid, 5–8 mm long and wide; disc broad, ascending; valves 3–5. Seeds yellow. *River Red Gum*. Fig. 91S–T.

Occurs in most of the Australian mainland except southern W.A., south-western S.A., and the eastern coastal areas of Qld, N.S.W. and Vic. Grows along and near watercourses, sometimes extending to hills or ranges, usually in open forest and woodland. Regions: all except LUWN, ESPR, NULL, GBSN, TASM. Map 402.

W.A.: Wiluna, *C.A.Gardner 19065* (PERTH). N.T.: Elkedra Stn, *P.K.Latz 6950* (FRI, NT). S.A.: Penola, *P.G.Wilson 1259* (AD). Qld: creek crossing W of Irvinebank, *M.I.H.Brooker 3362* (BRI, DNA, FRI, NSW). N.S.W.: 38.6 km S of Forbes, *R.T.Eakin 75* (FRI, NSW). Vic.: c. Euroa, 27 Nov. 1965, *E.R.Rotherham* (MEL).

Usually a tall tree with smooth, white, grey, brown or red bark, globular-rostrate or ovoid-conical buds on slender pedicels, and hemispherical or ovoid fruits with a broad ascending disc. The most widespread species in the genus, consequently exhibiting great variation, with some authorities preferring to recognise several taxa. The wood is hard and durable and has been used for many purposes, including railway sleepers, flooring, fencing, plywood, veneer, turnery and firewood. The trees are good producers of pollen and nectar for honey, and the honey is first grade.

381. *Eucalyptus rudis* Endl. in S.L.Endlicher et al., *Enum. Pl. Huegel* 49 (1837)

T: King George Sound, W.A., 1833, *C. von Hügel s.n.*; holo: W.

E. brachypoda Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 22(2): 21 (1849). T: Swan R. Colony, W.A., July 1847, *J.Drummond 4*: 73; iso: BM, CGE, K, LE, MEL.

Illustrations: G.M.Chippendale, *Eucalypts W. Austral. Goldfields* 185 (1973); S.Kelly et al., *Eucalypts* 1: t. 103 (1983); D.J.Boland et al., *Forest Trees Australia* 4th edn, 431 (1984).

Tree to 20 m. Bark rough, fibrous, grey on trunk and larger branches, then smooth and grey above. Juvenile leaves ovate or orbicular, dull, grey-green, slightly discolorous to concolorous. Adult leaves lanceolate, acuminate, moderately thick; lamina 9–14 cm long, 1.3–3 cm wide, green; lateral veins at 40°–50°; intramarginal vein up to 2 mm from margin; petiole quadrangular or terete, 15–30 mm long. Umbels 7-flowered; peduncle terete or quadrangular, 6–15 mm long; pedicels 4–8 mm long. Buds ovoid to fusiform; operculum conical, 6–8 mm long and wide; hypanthium obconical, 3–4 mm long, 6–8 mm wide. Fruits hemispherical, obconical or campanulate, 4–6 mm long, 6–9 mm wide; disc broad, usually level, sometimes slightly convex or descending; valves 4. Seeds brown. *Flooded Gum*. Fig. 92A–B.

Occurs throughout the wetter parts of south-western W.A. from Geraldton to King George Sound, mainly on river flats, along watercourses and onto damp slopes in open forest and woodland. Regions: BENC, LUWN, ESPR. Map 403.

W.A.: 19.3 km W of Moora, *G.M.Chippendale 19* (AD, FRI, MEL, PERTH); Swan R., Perth, May 1960, *A.S.George* (PERTH); Lake Clifton, *S.Paust 971* (PERTH); Ebbano-Yandanooka, *S.T.Blake 18068* (BRI, CANB, PERTH); Greenmount, 26 Oct. 1917, *F.M.C.Schock* (PERTH).

Distinguished from *E. camaldulensis* by rough fibrous bark on trunk and larger branches, larger buds and usually hemispherical fruits with disc level or slightly ascending or descending. Shows a clinal change to *E. camaldulensis* between the Moore and Murchison Rivers. A useful source of pollen, and the honey produced is a light amber colour.

382. *Eucalyptus brassiana* S.T.Blake, *Austrobaileya* 1: 1 (1977)

T: Cooktown, Qld, 28 Jan. 1958, *S.T.Blake 20194*; holo: BRI; iso: CANB, FRI, NSW.

Illustrations: S.T.Blake, *op. cit.* 3; J.Turnbull & M.I.H.Brooker, *Forest Tree Ser.* No. 213 (1978); S.Kelly *et al.*, *Eucalypts* 2: t. 74 (1983).

Tree to 20 m. Bark rough, thick, hard, dark grey to c. 2 m, then smooth and grey, cream-yellow or blue-grey above. Juvenile leaves lanceolate, green, slightly discolourous. Adult leaves lanceolate to narrowly lanceolate, acuminate, thin; lamina 12–18 cm long, 1.5–2.5 cm wide, green; lateral veins at 30°–50°; intramarginal vein up to 2 mm from margin; petiole channelled or slightly flattened, 12–22 mm long. Umbels 3–7-flowered; peduncle slightly angular, 10–20 mm long; pedicels 5–10 mm long. Buds conical; operculum conical, 7–10 mm long, 5–7 mm wide; hypanthium hemispherical, 3–4 mm long, 5–7 mm wide. Fruits ovoid to subglobular, 6–14 mm long, 6–12 mm wide; disc very broad, ascending steeply; valves 4 or 5, strongly exserted. Seeds brown-black. *Cape York Red Gum*. Fig. 92C–D.

Occurs in the north-eastern Cape York Peninsula, Qld, as far S as Helenvale; grows on seasonally flooded flats and depressions, well-drained rocky slopes and some slightly undulating plains, in woodland and open forest in poor soils. Also occurs in south-western Papua New Guinea. Region: CYRK. Map 404.

Qld: Little Laura R., *N.Byrnes 3421* (BRI); Flinders Is., *J.R.Clarkson 2257* (BRI); 33.8 km N of Laura, *B.Hyland 5173* (BRI, FRI, NSW).

Distinguished by having rough bark to c. 2 m, a conical operculum much longer than the hypanthium, and ovoid or subglobular fruits with a steeply ascending disc.

383. *Eucalyptus exserta* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 85 (1859)

T: Burnett R., Qld, *F.Mueller*; holo: MEL; iso: K.

E. insulana Bailey, *Queensland Agric. J.* 17: 103 (1906). T: Middle Percy Is., Qld, Dec. 1905, *H.Tryon s.n.*; iso: K, MEL, NSW.

E. exserta var. *parvula* Blakely, *Key Eucalypts* 129 (1934). T: Brian Pastures, Gayndah, Qld, July 1903, *S.A.Lindeman s.n.*; syn: NSW; Maryborough West, Qld, 26 Oct. 1918, *P.J.McGrath s.n.*; syn: NSW; Duaringa, Qld, Mar. 1909, *J.H.Maiden*; syn: NSW.

Illustrations: S.Kelly *et al.*, *Eucalypts* 2: t. 75 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 171 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 433 (1984).

Tree to 25 m. Bark rough, fibrous, hard, with longitudinal fissures on trunk and larger branches, then smooth and grey above. Juvenile leaves linear, green, concolorous. Adult leaves narrowly lanceolate to lanceolate, acute or acuminate, thin; lamina 8–18 cm long, 0.7–1.7 cm wide, slightly shining, green; lateral veins at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete or slightly flattened, 10–20 mm long. Umbels 7-flowered; peduncle thick, angular, 4–20 mm long; pedicels absent or angular, to 5 mm long. Buds ovoid or fusiform; operculum conical, 5–9 mm long, 4–6 mm wide; hypanthium obconical, 2–3 mm long, 4–6 mm wide. Fruits ovoid or subglobular, 5–8 mm long, 4–9 mm wide; disc broad, steeply ascending; valves usually 4, strongly exserted. Seeds brown-black. *Queensland Peppermint*. Fig. 92E–F.

Occurs widely in the eastern half of Qld from near Cooktown southwards to near Inverell, N.S.W. Grows in open forest and woodland on some alluvial coastal areas and on low hills. Regions: CYRK, BURD, THOM, DWSN, WRGO, MCPH. Map 405.

Qld: Moogerah Ra., *N.Michael 2364* (BRI, FRI); 9.7 km W of Dawson R., *N.H.Speck 1896* (BRI, CANB, K, NSW, PERTH); Mt Cooroora, *C.T.White 1894* (BRI, NSW). N.S.W.: Pindari Dam, 24 km NE of Bakkulla, June 1970, *B.Lane* (NSW).

Similar to *E. brassiana* but has shorter pedicels and slightly smaller buds and fruits. The wood is hard and durable, though somewhat brittle, and has been used in house frames and in general construction and fencing. The linear juvenile leaves of regrowth are distinctive.

384. *Eucalyptus morrisii* R.Baker, *Proc. Linn. Soc. New South Wales* 25: 312 (1900)

T: Girilambone area, N.S.W., Dec. 1899, *W.Bäuerlen s.n.*; syn: NSW; Coolabah area, N.S.W., 1899, *W.Bäuerlen s.n.*; syn: *n.v.*; isosyn: K.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 178 (1975); G.M.Cunningham *et al.*, *Plants W. New South Wales* 528 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 172 (1983).

Mallee or straggly tree to 10 m. Bark rough, fibrous on base of trunk, or extending over all the trunk and branches. Juvenile leaves linear, green, slightly discolorous. Adult leaves lanceolate to narrowly lanceolate, acuminate, moderately thick; lamina 8–12 cm long, 1.2–2 cm wide, grey-green; lateral veins at 25°–35°; intramarginal vein up to 2 mm from margin; petiole slightly flattened, 10–20 mm long. Umbels usually 3-flowered, rarely to 7-flowered; peduncle thick, quadrangular, 5–10 mm long; pedicels absent or to 3 mm long. Buds ovoid; operculum conical, 5–7 mm long, 5–6 mm wide; hypanthium obconical, 2–4 mm long, 5–6 mm wide. Fruits ovoid or subglobular, 7–9 mm long, 6–9 mm wide; disc broad, steeply ascending; valves 4–6. Seeds brown-black. *Grey Mallee*. Fig. 92G–H.

Occurs in west-central N.S.W. between Bourke, Nyngan and Cobar, usually on stony rises in shallow soil in low open mallee communities. Regions: DARL, RIVR. Map 406.

N.S.W.: Mt Drysdale, *N.T.Burbidge 6601* (CANB, NSW); Gunderbooka Ra., *E.F.Constable 4545* (FRI, K, NSW).

Differs from *E. brassiana* and *E. exserta* in being a mallee or straggly tree with 3-flowered or rarely 7-flowered umbels.

385. *Eucalyptus gillenii* Ewart & L.Kerr, *Trans. Roy. Soc. Victoria* 39: 7 (1926)

T: Mt Gillen, N.T., July 1924, *A.J.Ewart s.n.*; holo: MEL.

E. incurva Boomsma, *S. Austral. Naturalist* 50: 31 (1975). T: Mt Lindsay, S.A., 27°03'S, 129°52'E, 26 June 1967, *J.Johnson s.n.*; holo: AD; iso: FRI.

Illustrations: J.Turner & M.I.H.Brooker, *Forest Tree Ser.* No. 220 (1979); C.D.Boomsma, *op. cit.* 32; S.Kelly *et al.*, *Eucalypts* 2: t. 79 (1983).

Mallee to 3 m or tree to 6 m. Bark smooth throughout, white, grey or pale brown. Juvenile leaves narrowly to broadly lanceolate, grey-green, concolorous. Adult leaves lanceolate, sometimes falcate, acute to acuminate, thick; lamina 10–15 cm long, 1.2–2.5 cm wide, green; lateral veins at 40°–45°; intramarginal vein up to 1 mm from margin; petiole flattened or angular, 15–30 mm long. Umbels 7-flowered, occasionally 3-flowered, single or paired; peduncle thick, terete, 5–10 mm long; pedicels absent or to 4 mm long. Buds ovoid to obovoid or ±conical; operculum conical, 4–8 mm long, 3–6 mm wide; hypanthium hemispherical, 3–4 mm long, 3–6 mm wide. Fruits subglobular to ovoid, 6–15 mm long, 6–12 mm wide; disc broad, steeply ascending; valves 3–5, strongly exserted. Seeds brown-black. Fig. 92 I–J.

Occurs from the Dean Ra., W.A., to the White Ra. E of Alice Springs, N.T., and S to Mt Lindsay, far north-western S.A. Grows on hills among quartzite and sandstone outcrops, in shrubland and open woodland. Map 407.

W.A.: Dean Ra., *R.Carolin 6092* (NSW). N.T.: Mt Sonder, *G.M.Chippendale 4838* (AD, NSW, NT). S.A.: Mt Lindsay, *D.E.Symon 2552* (AD).

Differs from *E. morrisii* especially in having smooth bark, regularly 7-flowered umbels and often larger fruit. Also resembles *E. flindersii* which has grey-green or yellow-green leaves and usually smaller fruit with a ±level disc. *E. incurva* differs mainly in seedling leaves and oil content, but until this group is fully revised, it is included under *E. gillenii*.

Ser. 73 Pumilae

Eucalyptus ser. **Pumilae** Chippendale, *Fl. Australia* 19: 503 (1988).

Type: *E. pumila* Cabbage

Mallees. Bark smooth throughout. Juvenile leaves alternate, petiolate, ovate, green, discolorous. Adult leaves alternate, petiolate, lanceolate, sometimes falcate, acuminate, green, concolorous. Conflourescences axillary, simple; umbels 7-flowered. Buds fusiform. Fruits hemispherical; disc broad, ascending; valves 3 or 4, exserted. Seeds irregular, longitudinally pitted, brown-black.

A series of 1 species in central-eastern N.S.W., characterised by the mallee habit, smooth bark, concolorous leaves, simple umbels and longitudinally pitted brown-black seeds.

386. *Eucalyptus pumila* Cabbage, *J. & Proc. Roy. Soc. New South Wales* 52: 453 (1919)

T: Pokolbin, N.S.W., 24 Apr. 1906, *R.H.Cabbage s.n.*; syn: CANB, FRI, NSW.

Illustrations: D.A.Kleinig & M.I.H.Brooker, *Forest Tree Ser.* No. 210 (1978); S.Kelly *et al.*, *Eucalypts* 2: t. 41 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 161 (1983).

Mallee to 6 m. Bark red-bronze to grey-white or grey-blue. Adult leaves: lamina 6–12 cm long, 1.5–2.5 cm wide; lateral veins just visible, at 40°–45°; intramarginal vein up to 1 mm from margin; petiole channelled or terete, 12–15 mm long. Peduncle slightly flattened or quadrangular, 10–12 mm long; pedicels quadrangular, 2–3 mm long. Operculum conical, 5–7 mm long, 4–6 mm wide; hypanthium obconical, sometimes ribbed, 2–4 mm long, 4–6 mm wide. Fruits 6–7 mm long, 8–9 mm wide. *Pokolbin Mallee.* Fig. 92K–L.

Restricted to the northern end of the Broken Back Ra. near Pokolbin, N.S.W., on a steep, sandy hill among rock outcrops, usually in pure stands. Region: NEPN. Map 408.

N.S.W.: Broken Back Ra., *M.I.H.Brooker 5154* (FRI, MEL, NSW); near Pokolbin, 8 May 1960, *L.A.S.Johnson* (BRI, FRI, K, MEL, NSW).

Distinguished among red gums and grey gums especially by mallee habit.

Ser. 74 Michaelianae

Eucalyptus ser. **Michaelianae** Chippendale, *Fl. Australia* 19: 501 (1988).

Type: *E. michaeliana* Blakely

Trees. Bark smooth throughout. Juvenile leaves alternate, petiolate, lanceolate to broadly lanceolate, green, strongly discolorous. Adult leaves alternate, petiolate, lanceolate, acuminate, dull, green, almost concolorous. Conflourescences axillary, compound; umbels 3–7-flowered. Buds ovoid to obovoid. Fruits hemispherical to subglobose; disc narrow, level or ascending; valves 3 or 4, level or included. Seeds somewhat cubical, reticulate, brown.

A series of 1 species in south-eastern Qld and eastern N.S.W., distinguished especially by the compound conflourescences and strongly discolorous juvenile leaves.

387. *Eucalyptus michaeliana* Blakely in W.F.Blakely, E.N.McKie & H.Steedman, *Proc. Linn. Soc. New South Wales* 63: 67 (1938).

T: Hillgrove and Enmore, N.S.W., Mar. 1907, *J.F.Campbell s.n.*; holo: NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 166 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 131 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 173 (1983).

Tree to 30 m. Bark white, yellow, grey or red, in blotches. Adult leaves: lamina 15–20 cm long, 2–3 cm wide; lateral veins just visible, at 50°–60°; intramarginal vein up to 1 mm from margin; petiole slightly flattened or terete, 17–30 mm long. Peduncle flattened, 5–10 mm long; pedicels 2–5 mm long. Operculum conical to hemispherical, 1–2 mm long, 2–3 mm

wide; hypanthium hemispherical, 2–3 mm long and wide. Fruits 4–5 mm long and wide. *Hillgrove Gum*. Fig. 92M–N.

Occurs in Qld and N.S.W., in 3 disjunct areas: at Mt Ballow, McPherson Ra., in the Hillgrove area and near Wyong, on ridges and valley slopes as scattered trees in more or less wet sclerophyll forest. Regions: MCPH, NEPN. Map 409.

Qld: Mt Ballow, 19 July 1937, *N.Michael* (FRI, NSW). N.S.W.: 9 km from Hillgrove on Long Point road, 12 May 1960, *G.M.Chippendale 1261* & *M.J.Brennan* (BRI, FRI, MEL, NSW); Mogo Ck, 11.3 km SW of Bucketty, *L.A.S.Johnson* (BRI, CANB, K, MEL, NSW).

Ser. 75 *Foveolatae*

Eucalyptus* ser. *Foveolatae Maiden, *Crit. Revis. Eucalyptus* 7: 144 (1925).

Type: *E. aggregata* Deane & Maiden, lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 498 (1988).

E. subser. Semidecorticatae Blakely, *Key Eucalypts* 32, 139 (1934). T: *E. ovata* Labill., lecto, *fide* G.M.Chippendale, *op. cit.* 505.

Usually trees, occasionally mallee-like. Bark smooth throughout, usually with accumulated decorticate bark at base, or rough, fibrous on trunk only or extending to smaller branches. Juvenile leaves alternate, petiolate or sometimes sessile in *E. rodwayi*, discoloured or slightly discoloured. Adult leaves alternate, petiolate, sometimes undulate, shining, green, concolorous except *E. brookeriana*. Conflourescences axillary, simple; umbels usually 7-flowered, sometimes 7–11-flowered. Buds usually ±fusiform, or ovoid to obovoid. Fruits usually obconical to hemispherical, sometimes cylindrical; disc broad or narrow, level or convex, rarely descending; valves usually 3 or 4, rarely 5, exserted or rarely ±level. Seeds irregularly-shaped, ±flat, shallowly reticulate, lacunose or almost smooth, brown-grey.

A series of 7 species in southern S.A., south-eastern Qld, eastern N.S.W., Vic. and Tas., characterised mainly by the usually concolorous leaves, simple umbels, level or convex disc and usually exserted valves. For discussion of this series and ser. *Microcarpae* see P.Y.Ladiges *et al.*, Seedling characters and phylogenetic relationships in the informal series *Ovatae* of *Eucalyptus*, subgenus *Symphyomyrtus*, *Austral. J. Bot.* 32: 1–13 (1984).

388. *Eucalyptus yarraensis* Maiden & Cambage in J.H.Maiden, *Crit. Revis. Eucalyptus* 6: 17 (1922)

T: Yarra R. near Healesville, Vic., 11 Jan. 1921, *R.H.Cambage 4340*; holo: NSW; iso: MEL.

Illustrations: L.Costermans, *Native Trees & Shrubs S.E. Australia* 353 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 176 (1983).

Tree to 20 m. Bark rough, fibrous on trunk and usually extending throughout, brown or grey-brown. Juvenile leaves broadly ovate, green, slightly discoloured. Adult leaves elliptic to broadly lanceolate, undulate, acute; lamina 6–10 cm long, 2.5–3 cm wide, green; lateral veins just visible, at 20°–35°; intramarginal vein up to 2 mm from margin; petiole terete, 15–20 mm long. Umbels 7-flowered; peduncle terete or quadrangular, 5–8 mm long; pedicels 2–4 mm long. Buds ovoid; operculum conical, 2–3 mm long and wide; hypanthium obconical, c. 2 mm long, 2–3 mm wide. Fruits obconical to hemispherical, 4–5 mm long and wide; disc narrow, level; valves 3 or 4, slightly exserted. *Yarra Gum*. Fig. 92 O–P.

Occurs from E of Ararat to the Yarra R. valley near Healesville, Vic., in alluvial soil often over clay, in valleys and nearby slopes in open woodland, now mostly cleared for pastoral use. Regions: OTWY, HOWE. Map 410.

Vic.: 1.6 km E of Yarra Glen, *M.I.H.Brooker 4368* (AD, FRI, MEL, NSW); 16 km E of Ararat, *D.Simmons 304* (FRI); Sutherlands Ck, 16 Sept. 1911, *P.R.H.St John* (FRI, MEL).

Distinguished from *E. ovata* by the rough fibrous bark and smaller buds and fruits.

389. *Eucalyptus ovata* Labill., *Nov. Holl. Pl.* 2: 13, t. 153 (1806)

E. gunnii var. *ovata* (Labill.) Deane & Maiden, *Proc. Linn. Soc. New South Wales* ser. 2, 26: 136 (1901), *nom. illeg.* T: Van Diemens Land, [Tas.] (wrongly given by Labillardière as 'Van Leuwin'), *J.Labillardière*; *n.v.*

E. stuartiana F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 131 (1856) *p.p.* T: Tasmania, *C.Stuart*; *n.v.*

E. muelleri Naudin, *Rev. Hort.* 406 (1885). T: not designated.

E. paludosa R.Baker, *Proc. Linn. Soc. New South Wales* 23: 167 (1898); *E. stuartiana* var. *longifolia* Benth., *Fl. Austral.* 3: 244 (1867). T: locality unknown, *W.Woolfs s.n.*; *syn: n.v.*; Twofold Bay, N.S.W., *F.Mueller*; *syn: K*; Twofold Bay, N.S.W., *A.Oldfield s.n.*; *syn: K*.

E. gunnii var. *acervula* (Labill.) Deane & Maiden, *Proc. Linn. Soc. New South Wales* ser. 2, 26: 136 (1901). T: near Plenty Ra., Vic., *F.Mueller*; *n.v.*

E. ovata var. *grandiflora* Maiden, *Crit. Revis. Eucalyptus* 3: 146 (1916). T: Glencoe, 15 miles [c. 24 km] from Mt Gambier, S.A., Jan. 1904, *W.Gill s.n.*; *holo: NSW*.

[*E. acervula* *auct. non* Sieber ex DC.: J.D.Hook., *Fl. Tasmaniae* 135 (1856)]

Illustrations: L.Costermans, *Native Trees & Shrubs S.E. Australia* 352 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 175 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 439 (1984).

Tree to 30 m. Bark smooth throughout, white, grey or pink-grey, often with accumulated decorticate bark forming a rough trunk base. Juvenile leaves elliptic to ovate, dull, green, discolorous. Adult leaves broadly lanceolate, undulate, acuminate; lamina 8–15 cm long, 1.7–3 cm wide, shining, green; lateral veins distinct, at 25°–40°; intramarginal vein up to 2 mm from margin; petiole terete, 17–25 mm long. Umbels 7-flowered; peduncle terete or angular, 3–14 mm long; pedicels 1–4 mm long, sometimes absent. Buds fusiform; operculum conical to slightly rostrate, 3–5 mm long, 4–5 mm wide; hypanthium obconical, 3–4 mm long, 4–5 mm wide. Fruits obconical, 5–7 mm long, 4–7 mm wide; disc broad, \pm level; valves 3 or 4, level or slightly exserted. *Swamp Gum*. Fig. 92Q–R.

Occurs S of Adelaide and near Mt Gambier, S.A., through much of southern Vic., in south-eastern N.S.W. and in Tas. including King Is. Grows in sand and clay, mostly on poorly drained tablelands or plains and nearby hills in open forest and woodland. Regions: EYRE, OTWY, NEPN, HOWE, TASM. Map 411.

S.A.: 20 km SE of Mt Gambier, *I.B.Wilson* 795 (AD, CANB). N.S.W.: 12.1 km E of Captains Flat, *G.M.Chippendale* 712 (FRI, MEL, NSW, PERTH). Vic.: Ringwood, 10 May 1922, *P.F.Morris* (MEL). Tas.: near Ellendale, *N.T.Burbidge* 3305 (CANB, HO, K).

Distinguished from *E. yarraensis* by the smooth bark, and from *E. camphora* by the narrower undulate adult leaves. The trees produce fair supplies of pollen, and the honey is a clear amber colour.

P.Y.Ladiges *et al.*, Pattern of geographic variation, based on seedling morphology, in *Eucalyptus ovata* Labill. and *E. brookerana* A.M.Gray and comparison with some other *Eucalyptus* species, *Austral. J. Bot.* 29: 593–603 (1981).

390. *Eucalyptus camphora* R.Baker, *Proc. Linn. Soc. New South Wales* 24: 298 (1899)

E. ovata var. *camphora* (R.Baker) Maiden, *Crit. Revis. Eucalyptus* 3: 148 (1917). T: Ganguddy Ck, Rylstone, N.S.W., 1895, *R.T.Baker s.n.*; *syn: n.v.*; Nanango, N.S.W., 1897, *R.T.Baker s.n.*; *syn: n.v.*; Haydens Bog, Delegate, N.S.W., *W.Bäuerlen s.n.*; *syn: n.v.*

E. ovata var. *aquatica* Blakely, *Key Eucalypts* 140 (1934). T: Wingello, N.S.W., Nov. 1903, *A.Murphy*; *holo: NSW*.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 56 (1973); L.Costermans, *Native Trees & Shrubs S.E. Australia* 352 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 174 (1983).

Tree to 22 m. Bark smooth throughout, though often with accumulated decorticate bark at trunk base, grey to brown-grey to almost black. Juvenile leaves ovate, emarginate, green, slightly discolorous. Adult leaves ovate or broadly lanceolate, sometimes emarginate; lamina 6–13 cm long, 3.8–5 cm wide, shining, green; lateral veins distinct, at 35°–40°; intramarginal vein up to 2 mm from margin; petiole terete, 25–40 mm long. Umbels 7-flowered; peduncle

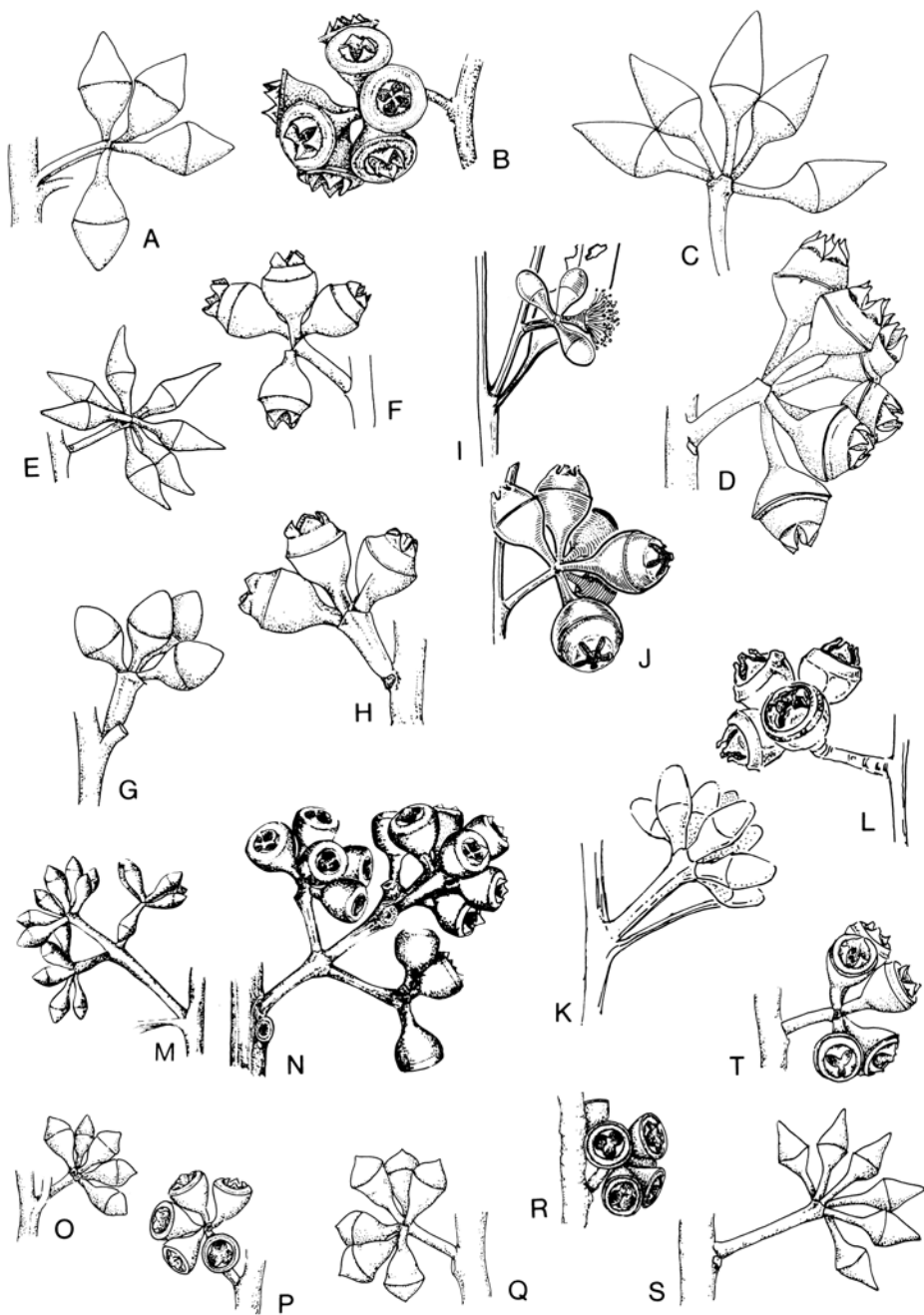


Figure 92. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. rudis* (**A**, Northam, W.A., C.Gardner, FRI; **B**, G.Chippendale 4, FRI). **C–D**, *E. brassiana* (**C**, S.Blake 20194, FRI; **D**, J.Turnbull 398, FRI). **E–F**, *E. exserta* (**E**, C.White 12453, FRI; **F**, C.Cossalter CTFT636, FRI). **G–H**, *E. morrisii* (I.Brooker 6185, FRI). **I–J**, *E. gillienii* (**I**, C.Dunlop 2299, FRI; **J**, I.Brooker 5117, FRI). **K–L**, *E. pumila* (3.2 km WNW of Pokolbin, N.S.W., L.Johnson, FRI). **M–N**, *E. michaeliana* (N of St Albans, N.S.W., R.Johnston & A.Nicholls, FRI). **O–P**, *E. yarraensis* (I.Brooker 6979, FRI). **Q–R**, *E. ovata* (**Q**, J.Turner 193, FRI; **R**, R.Eakin 13, FRI). **S–T**, *E. camphora* (**S**, G.Chippendale 823, FRI; **T**, G.Chippendale 824, FRI). **I–L** drawn by M.Risby. Others drawn by M.May.

terete, 10–18 mm long; pedicels 2–5 mm long. Buds fusiform; operculum conical or slightly rostrate, 4–5 mm long, 3–5 mm wide; hypanthium obconical, 2–3 mm long, 3–5 mm wide. Fruits obconical, 4–6 mm long and wide; disc narrow, level or slightly ascending; valves 3 or 4, level or slightly exserted. *Mountain Swamp Gum*. Fig. 92S–T.

Occurs from near Wallangarra, Qld, to near Glen Innes, N.S.W., then from the Rylstone district to Megalong Valley, and from the southern tablelands of N.S.W. to southern Vic. Grows in valleys and marshes of mountain regions in forest. Regions: MCPH, NEPN, HOWE, OTWY. Map 412.

Qld: Girraween Natl Park, *N.Byrnes* 4094 (BRI, FRI). N.S.W.: 7.2 km N of Goodradigbee R., *G.M.Chippendale* 824 (BRI, FRI, MEL, NSW); Coxs Ck, N of Rylstone, *D.Simmons* 267 (FRI). Vic.: Wulgulmerang Ck, *D.F.Blaxell* 1321 (FRI, MEL).

Distinguished from *E. ovata* by the broader leaves with long petiole.

391. *Eucalyptus brookeriana* A.M.Gray, *Austral. For. Res.* 9: 111 (1979)

T: c. 1 km N of Little Swanport, Tas., 42°11'S, 147°53'E, 16 Feb. 1977, *A.M.Gray* 225; holo: HO *n.v.*; iso: CANB, FRI, NSW.

Illustrations: A.M.Gray, *loc. cit.*; M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 178 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 441 (1984).

Tree to 40 m. Bark rough, fibrous, grey to 6 m, sometimes tessellated, then smooth above and orange-red, olive-green or cream. Juvenile leaves broadly ovate to orbicular, strongly crenulate, slightly shining, bright green, slightly discolorous. Adult leaves ovate or broadly lanceolate to lanceolate, usually crenulate, often undulate, acute; lamina 6.5–14 cm long, 1.5–3 cm wide, green; lateral veins faint, at 25°–45°; intramarginal vein up to 5 mm from margin; petiole terete, 10–30 mm long. Umbels usually 7-flowered, sometimes more; peduncle angular, 5–12 mm long; pedicels 1–5 mm long. Buds fusiform to almost obovoid; operculum conical, or almost rostrate, 3–5 mm long and wide; hypanthium obconical, 2–4 mm long, 3–5 mm wide. Fruits obconical or almost hemispherical, 5–8 mm long, 5–7 mm wide; disc narrow, level or ascending; valves 3 or 4, level or exserted. Fig. 93A–B.

Occurs in Vic. in the Otway Ranges, between Daylesford and Woodend, and E of Melbourne, and scattered in Tas. including King Is. Grows on slopes, ridge tops and in alluvial areas near watercourses, in tall open forest and sometimes near or in rainforest. Regions: OTWY, HOWE, TASM. Map 413.

Vic.: 12 km SW of Benwerrin, *J.D.Turner* 290 & *J.C.Doran* (FRI). Tas.: 3.5 km NW of Kellevie, *A.M.Gray* 156 (FRI, NSW); Tower Hill Road, *A.M.Gray* 227 (CANB, FRI, HO, NSW).

Distinguished by fibrous bark on trunk, usually crenulate, undulate leaves, fusiform to almost obovoid buds and obconical or almost hemispherical fruits. The adult leaves are discolorous in eastern Tas. and concolorous elsewhere. Closely related to *E. barberi* which is a mallee or small tree with larger fruits.

392. *Eucalyptus barberi* L.Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 288 (1972)

T: 7.2 km N of Cranbrook, Tas., 3 Jan. 1965, *L.A.S.Johnson* & *L.D.Pryor* NSW 132523; holo: NSW; iso: FRI, MEL.

Illustrations: A.M.Gray, *Forest Tree Ser.* No. 152 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 95 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 177 (1983).

Mallee to 5 m, or tree to 10 m. Bark smooth throughout, grey-white, or sometimes with fibrous bark to c. 1 m at base. Juvenile leaves elliptic to elliptic-lanceolate, subcrenulate, green, discolorous. Adult leaves lanceolate, sometimes falcate, subcrenulate, acute or acuminate; lamina 7.5–13 cm long, 1.2–2.5 cm wide, green; lateral veins faint, at 45°–50°; intramarginal vein distinct, up to 1 mm from margin; petiole terete or slightly flattened, 15–20 mm long. Umbels 7-flowered; peduncle slightly flattened, 7–15 mm long; pedicels 5–10 mm long. Buds fusiform to obovoid; operculum conical, hemispherical or slightly

rostrate, 3–4 mm long, 5–6 mm wide; hypanthium obconical or cylindrical, 4–5 mm long, 5–6 mm wide. Fruits obconical to cylindrical, 6–9 mm long, 6–8 mm wide; disc moderately broad, level, slightly ascending or slightly descending; valves 3–5, level, slightly exserted or slightly included. Fig. 93C–D.

Occurs in Tas. near the central east coast on low hills and sloping ground in open, dry sclerophyll forest. Region: TASM. Map 414.

Tas.: 7.9 km NE of Cranbrook, *G.M.Chippendale 1154* & *A.M.Gray* (FRI, HO); 20.9 km S of Bicheno, Jan. 1970, *W.Jackson* (HO).

Distinguished from *E. brookeriana* by the mallee or small tree habit, usually smooth bark, and longer pedicels.

393. *Eucalyptus aggregata* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 24: 614 (1900)

T: Wallerawang, N.S.W., Nov. 1899, *J.H.Maiden*; lecto: N.S.W., *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 3: 100 (1915); isolecto: K.

E. rydalensis R.Baker & H.G.Smith, *Res. Eucalypts* 2nd edn, 48 (1920). T: Rydal, N.S.W., Oct. 1909, ?*C.Laseron*; n.v.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 109 (1970); L.Costermans, *Native Trees & Shrubs S.E. Australia* 353 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 179 (1983).

Tree to 18 m. Bark rough, fibrous, hard throughout, grey. Juvenile leaves elliptic to ovate or broadly lanceolate, green, slightly discolorous. Adult leaves lanceolate to narrowly lanceolate, acuminate; lamina 5–12 cm long, 1–2 cm wide, green; lateral veins faint, at 15°–40°; intramarginal vein up to 3 mm from margin; petiole terete, 4–10 mm long. Umbels 7-flowered; peduncle terete, 3–4 mm long; pedicels absent or to 2 mm long. Buds ovoid to fusiform; operculum conical, 2–3 mm long and wide; hypanthium obconical, c. 2 mm long, 2–3 mm wide. Fruits obconical, 2–3 mm long, 3–5 mm wide; disc narrow, level; valves 3 or 4, exserted or level. *Black Gum*. Fig. 93E–F.

Occurs in N.S.W. and Vic., with a disjunct occurrence near Woodend. Usually grows on flats and valleys near watercourses in open woodland. Regions: NEPN, HOWE, OTWY. Map 415.

N.S.W.: Capertee, 1 Jan. 1900, *J.L.Boorman* (BM, K, NSW); Manar Ck, Kings Hwy, *G.M.Chippendale 837* (FRI, NSW); Berrima, Sept. 1901, *J.H.Maiden* (NSW). Vic.: 1.6 km S of Woodend, *E.F.Constable 5271* (FRI, MEL, NSW).

Closely related to the Tasmanian species *E. rodwayi*, differing mainly in the consistently 7-flowered umbels on shorter peduncles and the slightly larger fruits.

394. *Eucalyptus rodwayi* R.Baker & H.G.Smith, *Pap. Proc. Roy. Soc. Tasmania* 191 (1912); *Res. Eucalypts Tasmania* 53 (1912).

T: Interlaken, Tas., 28 May 1912, *L.G.Irby NSW 54113*; lecto: NSW, *fide* L.A.S.Johnson, *Contr. New South Wales Natl Herb.* 3: 105 (1962).

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 51 (1972); S.Kelly *et al.*, *Eucalypts* 2: t. 96 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 180 (1983).

Tree to 25 m. Bark rough, compact, fibrous, grey on trunk and larger branches, then smooth and white on smaller branches. Juvenile leaves sometimes sessile, lanceolate to broadly lanceolate, green, slightly discolorous. Adult leaves lanceolate, acuminate; lamina 5–12 cm long, 1–1.5 cm wide, green; lateral veins faint, at 15°–30°; intramarginal vein up to 1 mm from margin; petiole terete, 7–14 mm long. Umbels 7–11-flowered; peduncle terete, 5–8 mm long; pedicels 1–3 mm long. Buds ovoid; operculum conical, 2–3 mm long, 3–4 mm wide; hypanthium obconical, 2–4 mm long, 3–4 mm wide. Fruits obconical to hemispherical, 3–4 mm long, 4–6 mm wide; disc narrow, level; valves 3 or 4, level or slightly exserted. *Swamp Peppermint*. Fig. 93G–H.

Occurs in Tas. on the central plateau and eastwards to the coast, in swampy areas in valleys. Region: TASM. Map 416.

Tas.: Waddamana, Dec. 1949, *H.N.Barber* (HO); 12.9 km E of Scottsdale, *N.T.Burbidge* 3054 (CANB, HO, K); 16 km WSW of Buckland, *G.M.Chippendale* 1150 & *A.M.Gray* (FRI, HO, MEL, NSW).

Has larger umbels and a longer peduncle than *E. aggregata*.

Ser. 76 Microcarpae

Eucalyptus ser. **Microcarpae** Blakely, *Key Eucalypts* 32, 141 (1934).

Type: *E. scoparia* Maiden; lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 501 (1988).

Trees. Bark usually smooth throughout but sometimes with accumulated decortivating bark at trunk base, or rough, fibrous throughout. Juvenile leaves usually alternate but sometimes opposite or subopposite, sessile or petiolate, concolorous or slightly discolorous. Adult leaves usually alternate, rarely subopposite, petiolate, sometimes shortly so, concolorous. Conflourescences axillary, simple, 7-flowered umbels. Buds ovoid or obovoid, fusiform or rarely clavate. Fruits hemispherical, subglobular, obconical or ovoid; disc narrow to broad, usually ascending, sometimes level; valves 3 or 4, exserted or sometimes level. Seeds irregularly-shaped, ±flat, shallowly reticulate, lacunose or almost smooth, brown-grey.

A series of 6 species in south-eastern Qld, eastern N.S.W. and eastern and southern Vic., characterised by the smooth or rough bark, concolorous leaves, simple umbels, ascending or level disc and level or exserted valves.

395. *Eucalyptus aromaphloia* Pryor & J.H.Willis, *Victorian Naturalist* 71: 125 (1954)

T: 113 mile post, Great Western Hwy (between Buangor and Mt Langi-Ghiran), Vic., 20 Aug. 1954, *L.D.Pryor & J.H.Willis*; holotype: MEL; isotype: BRI, K, NSW.

E. corticosa L.Johnson, *Contr. New South Wales Nat. Herb.* 3: 108 (1962). T: c. 3 miles [c. 5 km] E of Currant Mtn Gap, c. 8 miles (c. 13 km) E of Olinda, N.S.W., 9 Apr. 1955, *L.A.S.Johnson* NSW 54076; holotype: NSW; isotype: K.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 113 (1970); L.Costermans, *Native Trees & Shrubs S.E. Australia* 354 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 181 (1983).

Tree to 22 m. Bark rough, fibrous throughout, grey. Juvenile leaves alternate or opposite, sessile or almost so, elliptic, ovate or broadly lanceolate, green or slightly glaucous, slightly discolorous. Adult leaves alternate, narrowly lanceolate to lanceolate, acuminate; lamina 7.5–14 cm long, 1–2.5 cm wide, dull, blue-green to green; lateral veins clearly visible, at 20°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 8–17 mm long. Peduncle terete or quadrangular, 4–6 mm long; pedicels 1–3 mm long. Buds ovoid or ±fusiform; operculum conical, shortly apiculate, 2–4 mm long, 3–4 mm wide; hypanthium hemispherical to obconical, c. 3 mm long, 3–4 mm wide. Fruits hemispherical to subglobular, 4–7 mm long, 4–6 mm wide; disc ascending; valves exserted. *Scent Bark*. Fig. 93 I–J.

Occurs throughout southern Vic. and in several disjunct occurrences in N.S.W.: E of Rylstone and in the Budawang Ra. Grows in flat or slightly undulating areas of open forest. Map 417.

N.S.W.: 1.8 km N of Benns Ck, *M.I.H.Brooker* 6803 (FRI); Wog Wog Ck, Budawang Ra., *C.R.Dunlop* 134 (CBG); 4.8 km E of Currant Mtn Gap, 31 Aug. 1951, *L.A.S.Johnson* (FRI, NSW). Vic.: 3.7 km SE of Pomonal, *G.M.Chippendale* 1304 & *M.J.Brennan* (AD, BRI, FRI, MEL, NSW); between Creswick & Daylesford, 29 Oct. 1967, *N.Hall* (FRI, MEL, NSW).

Distinguished by fibrous bark throughout, green to blue-green adult leaves, ovoid to ±fusiform buds and hemispherical to subglobular fruits. Young bark aromatic when crushed.

J.Chappill *et al.*, *Eucalyptus aromaphloia* Pryor & Willis —a redefinition of geographical and morphological boundaries, *Austral. J. Bot.* 34: 395–412 (1986).

396. *Eucalyptus parvifolia* Cabbage, *Proc. Linn. Soc. New South Wales* 34: 336, t. 28, 29 (1909)

T: E of Nimmitybelle [Nimmitabel], N.S.W., 9 Feb. 1908, *R.H.Cabbage* 1924; syn: CANB, FRI, NSW; Kybeyan R., N.S.W., 5 Nov. 1908, *R.H.Cabbage* 2019; syn: CANB, FRI, NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 91 (1973); L.Costermans, *Native Trees & Shrubs S.E. Australia* 359 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 191 (1983).

Tree to 9 m. Bark smooth throughout, dull, grey, grey-green or sometimes pink. Juvenile leaves opposite, sessile, elliptic, green, slightly discolorous or concolorous, often persisting on mature trees. Adult leaves subopposite, lanceolate, acute; lamina 5–7 cm long, 0.6–1 cm wide, green; lateral veins faint, at 15°–20°; intramarginal vein up to 1 mm from margin; petiole more or less flattened, 2–6 mm long. Umbels 7-flowered; peduncle terete, thick, 4–7 mm long; pedicels absent. Buds ovoid; operculum conical, 1–2 mm long, 2–3 mm wide; hypanthium hemispherical, 2–3 mm long and wide. Fruits hemispherical to obconical, 3–4 mm long and wide; disc slightly ascending; valves 3 or 4, level. *Kybean Gum*. Fig. 93K–L.

Restricted to the southern tablelands escarpment E of Cooma, N.S.W., on flat and gently sloping areas, usually in small pure stands and in woodland. Region: HOWE. Map 418.

N.S.W.: 16.9 km SSE of Countegany Stn, *G.M.Chippendale* 833 (AD, BRI, FRI, MEL, NSW); Upper Tuross R., *H.Streimann* 182 (BRI, CBG, MEL, NSW).

Distinguished by small tree habit, smooth bark, narrow shortly petiolate lanceolate adult leaves, small elliptic juvenile leaves often in crown, small sessile ovoid buds, sessile obconical to hemispherical fruits and restricted distribution.

397. *Eucalyptus acaciiformis* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 24: 454 (1899)

T: Yarrowitch, N.S.W., 1897, *J.H.Maiden*; lecto: NSW *n.v.*, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 3: 43 (1914); isolecto: MEL.

Illustrations: N.Hall, *Forest Tree Ser.* No. 14 (1971); S.Kelly *et al.*, *Eucalypts* 2: t. 97 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 183 (1983).

Tree to 20 m. Bark rough, fibrous throughout, grey-brown. Juvenile leaves alternate, petiolate, elliptic, grey-green, concolorous. Adult leaves alternate, lanceolate, acuminate; lamina 5–10 cm long, 1–1.5 cm wide, green; lateral veins just visible, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole slightly flattened or terete, 6–18 mm long. Peduncle terete, 2–5 mm long; pedicels 1–3 mm long. Buds ovoid to obovoid or ±fusiform; operculum conical or hemispherical, 1–2 mm long, 2–3 mm wide; hypanthium hemispherical, 2–3 mm long and wide. Fruits hemispherical, 3–4 mm long, 4–5 mm wide; disc level; valves 3 or 4, level or exserted, *Wattle-leaved Peppermint*. Fig. 93M–N.

Occurs on higher areas of the northern tablelands, N.S.W., in shallow soils on slopes and ridges, mostly in mixed woodland. Region: MCPH. Map 419.

N.S.W.: Jeogla, *M.I.H.Brooker* 3911 (BRI, FRI, NSW); 44.7 km SE of Walcha, *R.D.Johnston & G.M.Chippendale* 661 (AD, BRI, FRI, MEL, NSW).

Similar to *E. nicholii* but has elliptic juvenile leaves, broader greener adult leaves and a shorter peduncle.

398. *Eucalyptus nicholii* Maiden & Blakely, *Crit. Revis. Eucalyptus* 8: 52 (1929)

E. acaciiformis var. *linearis* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 24: 455 (1899). T: 16–17 miles [c. 28 km] E of Walcha, N.S.W., Nov. 1897, *J.H.Maiden*; lecto: NSW *n.v.*, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 3: 43 (1914); isolecto: BM, K, MEL.

Illustrations: N.Hall, *Forest Tree Ser.* No. 1 (1970); S.Kelly *et al.*, *Eucalypts* 1: t. 109 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 182 (1983).

Tree to 15 m. Bark rough, fibrous throughout, yellow-brown to grey-brown. Juvenile leaves alternate, crowded, shortly petiolate, linear, grey-green, concolorous. Adult leaves alternate, narrowly lanceolate acuminate; lamina 6–13 cm long, 0.5–1 cm wide, slightly blue-green to

grey-green; lateral veins faint, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole terete, 7–12 mm long. Peduncle terete, 5–7 mm long; pedicels 2–3 mm long. Buds ovoid or ±fusiform; operculum conical, 1–3 mm long, c. 2 mm wide; hypanthium hemispherical to subglobular, 2–3 mm long, c. 2 mm wide. Fruits hemispherical to obconical, 2–5 mm long, 3–4 mm wide; disc level; valves slightly exserted. *Narrow-leaved Peppermint*. Fig. 93 O–P.

Occurs on the New England Tableland between Jenners Ck and Walcha, N.S.W., on well-drained slopes and ridges in poor soils as scattered trees and in woodland. Region: MCPH. Map 420.

N.S.W.: 29.9 km SE of Walcha, *R.D.Johnston & G.M.Chippendale* 659 (FRI, MEL, NSW); 16 km N of Glen Innes, *L.A.S.Johnson & D.J.McGillivray* 2432 (BRI, FRI, NSW).

Distinguished by rough bark throughout, narrowly lanceolate, blue-green to grey-green adult leaves, and very small buds and fruits. Has been cultivated as an ornamental, street tree or shade tree, in Australia and in California, mainly because of its compact crown and resistance to frost.

399. *Eucalyptus mannifera* Mudie, *Trans. Roy. Med.-Bot. Soc. London* 1(3): 24 (1834)

T: Bathurst, N.S.W., Jan. 1825, *A.Cunningham* 91; holo: K; iso: BM.

Tree to 25 m. Bark smooth throughout, white, cream, grey, sometimes with patches of red, usually powdery. Juvenile leaves alternate, petiolate, concolorous or slightly discolorous. Adult leaves alternate, acuminate, dull, blue-green to grey-green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete or channelled. Peduncle terete. Buds usually ovoid, rarely clavate; operculum conical or hemispherical; hypanthium obconical or hemispherical. Fruits hemispherical, ovoid or subglobular; disc level, convex or ascending; valves slightly exserted.

Occurs in eastern N.S.W. and Vic., with 1 record in south-eastern Qld. Differs from the preceding species in the smooth bark, and from *E. scoparia* in the broader, blue-grey leaves. There are 5 subspecies which intergrade where they meet.

1 Adult leaves usually 20 mm or more wide

2 Peduncle 5–10 mm long; juvenile leaves orbicular or ovate to broadly lanceolate

399b. subsp. elliptica

2: Peduncle 5–6 mm long; juvenile leaves linear to lanceolate

399a. subsp. mannifera

1: Adult leaves up to 20 mm wide

3 Buds often glaucous

399d. subsp. praecox

3: Buds not glaucous

4 Juvenile leaves glaucous; hypanthium hemispherical; disc ascending

399c. subsp. maculosa

4: Juvenile leaves pale green; hypanthium obconical; disc level or convex

399e. subsp. gullickii

399a. *Eucalyptus mannifera* Mudie subsp. **mannifera**

Illustrations: N.C.W.Beadle *et al.*, *Fl. Sydney Region* 3rd edn, 324 (1982); S.Kelly *et al.*, *Eucalypts* 1: t. 117 (1983).

Tree to 20 m. Juvenile leaves linear to lanceolate, blue-green to glaucous, slightly discolorous. Adult leaves lanceolate; lamina 10–18 cm long, 1.5–3 cm wide, dull, blue-green; petiole 10–22 mm long. Peduncle 5–6 mm long; pedicels 1–3 mm long. Buds ovoid or rarely clavate; operculum hemispherical to conical, 2–3 mm long, 2–4 mm wide; hypanthium obconical to hemispherical, c. 2 mm long, 2–4 mm wide. Fruits hemispherical to ovoid, 5–7 mm long, 4–6 mm wide; disc convex. *Mottled Gum*. Fig. 93Q–R.

Occurs from N of Murrurundi, N.S.W., southwards to the Dargo area, Vic., in hilly and tableland areas in open forest. Regions: NEPN, HOWE. Map 421.

N.S.W.: Warung State Forest, *R.Coveny 1197* (NSW); 16 km E of Bathurst, 3 Sept. 1951, *L.A.S.Johnson* (NSW). Vic.: 9.3 km from Gelantipy towards Wulgulmerang, *M.I.H.Brooker 4962* (AD, BRI, FRI, MEL, NSW); Macedon, Mar. 1905, *P.R.H.St John* (K, MEL).

Distinguished from subsp. *elliptica* by the narrow juvenile leaves and shorter peduncle, and from subsp. *praecox* in the usually broader adult leaves and the non-glaucous buds.

399b. *Eucalyptus mannifera* subsp. *elliptica* (Blakely & McKie) L.Johnson, *Contr. New South Wales Natl Herb.* 3: 108 (1962)

E. mannifera var. *elliptica* Blakely & McKie in W.F.Blakely, *Key Eucalypts* 148 (1934). T: Mt Lindsay Stn, Nandewar Mts, N.S.W., 4 Nov. 1909, *R.H.Cambage s.n.*; holo: NSW; iso: CANB.

Illustrations: N.C.W.Beadle, *Students Fl. N.E. New South Wales* 3: 469 (1976); S.Kelly *et al.*, *Eucalypts* 2: t. 102 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 186 (1983).

Tree to 20 m. Juvenile leaves orbicular or ovate to broadly lanceolate, subglaucous, concolorous. Adult leaves lanceolate; lamina 15–25 cm long, 1.5–3 cm wide, green; petiole 15–27 mm long. Peduncle 5–10 mm long; pedicels 1–3 mm long. Buds glaucous; operculum hemispherical to conical, 2–4 mm long, 3–4 mm wide; hypanthium hemispherical, 2–3 mm long, 3–4 mm wide. Fruits hemispherical to subglobular, 5–7 mm long and wide; disc convex or ascending. *Brittle Gum*. Fig. 93S–T.

Occurs from Thulimbah, Qld, southwards through the northern tablelands of N.S.W., on hills and tablelands in open forest and woodland. Region: MCPH. Map 422.

Qld: Thulimbah, *S.T.Blake 20406* (CANB, FRI). N.S.W.: Mt Kaputar, *M.I.H.Brooker 4757* (AD, BRI, FRI, MEL, NSW); 24.1 km N of Bendemeer, 6 Sept. 1949, *L.A.S.Johnson* (NSW).

Closest to subsp. *praecox* but has broader adult leaves.

399c. *Eucalyptus mannifera* subsp. *maculosa* (R.Baker) L.Johnson, *Contr. New South Wales Natl Herb.* 3: 107 (1962)

E. gunnii var. *maculosa* (R.Baker) Maiden, *Proc. Linn. Soc. New South Wales* 26: 561, 562, 581 (1902); *E. maculosa* R.Baker, *Proc. Linn. Soc. New South Wales* 24: 598 (1900). T: Charleys Forest, Monga, N.S.W., Sept. 1898, *W.Bauerlen s.n.*; lecto: NSW 54074, *fide* L.A.S.Johnson, *loc. cit.*

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 111 (1970); S.Kelly *et al.*, *Eucalypts* 1: t. 111 (1983).

Tree to 18 m. Juvenile leaves elliptic to narrowly lanceolate, blue-green to glaucous, slightly discoloured. Adult leaves lanceolate; lamina 6–15 cm long, 0.8–2 cm wide, dull, grey-green; petiole 10–15 mm long. Peduncle 5–10 mm long; pedicels 2–5 mm long. Buds not glaucous; operculum hemispherical to conical, 2–3 mm long, 3–5 mm wide; hypanthium hemispherical, 2–3 mm long, 3–5 mm wide. Fruits hemispherical to subglobular, 5–6 mm long, 4–5 mm wide; disc ascending. *Brittle Gum*. Fig. 93U–V.

Widespread in Vic. E of Ballarat and in eastern N.S.W. from E of Murrundi southwards. Grows on mountain slopes, tablelands and undulating ground in dry sclerophyll forest and open woodland. Regions: NEPN, HOWE, OTWY. Map 423.

N.S.W.: Umeralla R., SE of Cooma, *R.H.Cambage 1873* (NSW); 20 km from Braidwood towards Nowra, *G.M.Chippendale 851* & *M.J.Beeston* (AD, FRI, HO, MEL, NSW). Vic.: Gobur, 13 Sept. 1935, *R.A.Black* (MEL); Timbertop, 15 Dec. 1954, *R.J.Grose* (MEL).

Adult leaves usually narrower than in subsp. *mannifera* and juvenile leaves broader, but the 2 subspecies sometimes scarcely distinguishable. Planted extensively in cooler areas of Australia as a street tree and ornamental, because of its fine foliage and colourful trunk.

399d. *Eucalyptus mannifera* subsp. *praecox* (Maiden) L.Johnson, *Contr. New South Wales Natl Herb.* 3: 107 (1962)

E. praecox Maiden, *J. & Proc. Roy. Soc. New South Wales* 48: 423 (1915). T: Capertee, N.S.W., Mar. 1901, *J.H.Maiden* & *J.L.Boorman s.n.*; holo: NSW; iso: BM.

E. lactea R.Baker, *Proc. Linn. Soc. New South Wales* 25: 691 (1901). T: Ilford, N.S.W., before 1900,

R.T.Baker NSW 54075; lecto: NSW, *fide* L.A.S.Johnson, *loc. cit.*

Illustrations: S.Kelly *et al.*, *Eucalypts* 2: t. 104 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 185 (1983).

Tree to 10 m. Juvenile leaves orbicular, slightly glaucous, slightly discolorous. Adult leaves lanceolate to narrowly lanceolate; lamina 8–14 cm long, 1–2 cm wide, pale green; petiole 10–15 mm long. Peduncle 5–8 mm long, pedicels 1–3 mm long. Buds often glaucous; operculum hemispherical, 2–3 mm long; 3–4 mm wide; hypanthium hemispherical, 2–3 mm long, 3–4 mm wide. Fruits ovoid to subglobular, 5–6 mm long and wide; disc ascending. *Brittle Gum*. Fig. 93W–X.

Occurs in the Upper Cudgegong R.–Capertee area, N.S.W., in sandy soil, usually on sloping ground in woodland and open forest. Region: NEPN. Map 424.

N.S.W.: 1.4 km W of Sweetridges, *M.I.H.Brooker* 5214 (AD, FRI, NSW); 2.4 km N of Cullen Bullen, 29 Jan. 1953, *L.A.S.Johnson* (NSW).

Distinguished from subsp. *mannifera* by the narrower adult leaves and often glaucous buds.

399e. *Eucalyptus mannifera* subsp. *gullickii* (R.Baker & H.G.Smith) L.Johnson, *Contr. New South Wales Natl Herb.* 3: 108 (1962)

E. gullickii R.Baker & H.G.Smith, *Res. Eucalypts* 2nd edn, 128 (1920). T: Lawson, N.S.W., Aug. 1919, *C.F.Laseron*; holo: NSW. Note: the lectotypification by L.A.S.Johnson, *op. cit.* 107, was superfluous since it was clearly indicated by Baker & Smith.

Illustrations: N.Hall, *Forest Tree Ser.* No. 36 (1972); S.Kelly *et al.*, *Eucalypts* 2: t. 103 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 186 (1983).

Tree to 18 m. Juvenile leaves elliptic to broadly lanceolate, pale green, concolorous. Adult leaves lanceolate, sometimes falcate; lamina 10–14 cm long, 1.3–1.8 cm wide, green; petiole 6–15 mm long. Peduncle 5–8 mm long; pedicels 1–4 mm long. Buds not glaucous; operculum conical or hemispherical, apiculate, 2–3 mm long, 3–4 mm wide; hypanthium obconical, 2–3 mm long, 3–4 mm wide. Fruits hemispherical, subglobular or obconical, 5–6 mm long and wide; disc level or convex. *Mountain Spotted Gum*. Fig. 93Y–Z.

Occurs from the Blue Mts southwards to near Araluen, N.S.W., on hills, plateaus and flat areas as scattered trees, in sandy poorly drained soil in open forest. Regions: NEPN, HOWE. Map 425.

N.S.W.: 6.4 km SSE of Sassafras, *D.F.Blaxell* 75 (NSW); Clarence railway stn, *G.M.Chippendale* 1222 & *M.J.Brennan* (AD, BRI, FRI, MEL, NSW).

Differs from other subspecies in the apiculate operculum and usually shorter pedicels.

400. *Eucalyptus scoparia* Maiden, *Proc. Linn. Soc. New South Wales* 29: 777 (1905)

T: near Wallangarra, Qld, July 1904, *J.L.Boorman s.n.*; holo: NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 141 (1974); S.Kelly *et al.*, *Eucalypts* 1: t. 110 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 187 (1983).

Tree to 15 m. Bark smooth, powdery throughout, white to pale grey. Juvenile leaves opposite to subopposite, petiolate, narrowly elliptic, green, slightly discolorous. Adult leaves alternate, narrowly lanceolate to linear-lanceolate, acuminate; lamina 10–15 cm long, 0.6–1 cm wide, shining, green; lateral veins faint, at 12°–15°; intramarginal vein up to 1 mm from margin; petiole terete, 8–12 mm long. Peduncle slightly flattened or terete, 4–8 mm long; pedicels terete, 2–4 mm long. Buds ovoid; operculum conical, slightly rostrate, c. 3 mm long, 3–4 mm wide; hypanthium cylindrical, 2–3 mm long, 3–4 mm wide. Fruits ovoid, 4–5 mm long and wide; disc ascending; valves usually 3, level or slightly exserted. *Wallangarra White Gum*. Fig. 93AA–BB.

Restricted to Mt Norman and Castle Rock, Qld, on granite outcrops and slopes often as scattered trees in open forest and woodland. Region: MCPH. Map 426.



Figure 93. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. brookeriana* (**A**, I.Brooker 5764, FRI; **B**, J.Turner 225 & D.Kleinig, FRI). **C–D**, *E. barberi* (near Lake Leake, Tas., H.Barber, FRI). **E–F**, *E. aggregata* (G.Chippendale 837, FRI). **G–H**, *E. rodwayi* (R.Cambage 4101, NSW). **I–J**, *E. aromaphloia* (**I**, Killara railway stn, Vic., P.Carolan, FRI; **J**, Great Western to Armstrong (Stawell & Ararat), Vic., L.Johnson, FRI). **K–L**, *E. parvifolia* (J.Briggs 18, FRI). **M–N**, *E. acaciiformis* (I.Brooker 6070, FRI). **O–P**, *E. nicholii* (cult., near Australian War Memorial, Canberra A.C.T., L.Langley, FRI). **Q–R**, *E. mannifera* subsp. *mannifera* (Hanging Rock, Nundle, N.S.W., J.Maiden & J.Boorman, NSW). **S–T**, *E. mannifera* subsp. *elliptica* (Rose Valley Ck, near Bendemeer, N.S.W., C.Burgess, FRI). **U–V**, *E. mannifera* subsp. *maculosa* (cult., Hopetoun Circuit, Yarralumla, A.C.T., R.Johnston & M.Hall, FRI). **W–X**, *E. mannifera* subsp. *praecox* (M.Crisp 2215 & I.Telford, FRI). **Y–Z**, *E. mannifera* subsp. *gullickii* (Frederica Falls, Lawson, N.S.W., R.Baker, NSW). **AA–BB**, *E. scoparia* (**AA**, Wallangarra, Qld, R.Hassey, FRI; **BB**, A.Gray 26, FRI). Drawn by M.May.

Qld: Mt Norman, *G.M.Chippendale* 1280 & *M.J.Brennan* (AD, BRI, FRI, MEL, NSW); Racecourse Ck, *L.S.Smith* 753 (BRI, K, NSW).

Distinguished from *E. mannifera* by the smooth powdery bark, narrow shining leaves and the usually rostrate operculum.

Ser. 77 *Viminales*

Eucalyptus* ser. *Viminales Blakely, *Key Eucalypts* 37, 160 (1934)

Type: *E. viminalis* Labill.

E. ser. Globulares Blakely, *op. cit.* 33, 144. T: *E. globulus* Labill.

E. ser. Semiunicolores Blakely, *op. cit.* 37, 158 (1934). T: *E. johnstonii* Maiden.

E. ser. Argyrophyllae Blakely, *op. cit.* 38 (1934). T: *E. viminalis* Labill.

Trees, sometimes mallees or dwarf shrubs. Bark smooth throughout, sometimes with exfoliating bark at base, or rough throughout or on at least part of trunk. Juvenile leaves opposite, sessile, sometimes subopposite or alternate, and sometimes petiolate, often amplexicaul, sometimes crenulate, sometimes glaucous, usually discolorous, rarely concolorous. Adult leaves alternate or rarely opposite or subopposite, petiolate or rarely sessile, concolorous, rarely discolorous. Conflorescences axillary, simple; umbels 3- or 7-flowered, sometimes 7–11- or more flowered, rarely 1-flowered. Buds ovoid, obovoid, obconical, clavate, turbinate, subpyriform, fusiform, cylindrical or subglobular. Fruits hemispherical, subglobular, ovoid, conical, obconical, cylindrical, ±campanulate or ±urceolate; disc broad or narrow, level, ascending or descending; valves usually 3 or 4, rarely 5, included, level or exserted. Seeds irregular, sometimes ±cubical, often lacunose on dorsal side, reticulate, grey, brown or black.

A series of 43 species in central-southern and south-eastern S.A., south-eastern Qld, eastern N.S.W., Vic. and Tas. Somewhat heterogeneous, characterised by sessile seedling leaves, markedly different juvenile and adult leaves, smooth or rough bark, simple umbels and fruit with ±robust usually exserted valves.

401. *Eucalyptus neglecta* Maiden, *Victorian Naturalist* 21: 114 (1904)

T: Upper Livingstone Ck, 20 miles [c. 32 km] upstream from Omeo, Vic., 1882, *A.W.Howitt s.n.*; iso: MEL.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 88 (1973); L.Costermans, *Native Trees & Shrubs S.E. Australia* 358 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 188 (1983).

Tree to 6 m. Bark rough, fibrous, grey on trunk, then smooth and green or green-grey above. Juvenile leaves opposite, sessile, broadly elliptic to suborbicular, grey-green, glaucous on midribs, discolorous. Adult leaves alternate, lanceolate, acute, thin; lamina 7.5–15 cm long, 2.5–3.8 cm wide, green, concolorous; lateral veins faint, at 35°–45°; intramarginal vein up to 3 mm from margin; petiole flattened, 12–20 mm long. Umbels 7–15-flowered; peduncle thick, quadrangular, 2–5 mm long; pedicels absent. Buds ovoid or subglobular; operculum hemispherical or conical, c. 2 mm long, 3–4 mm wide; hypanthium hemispherical, glaucous, 2–3 mm long, 3–4 mm wide. Fruits hemispherical to slightly obconical, 5–6 mm long, 4–5 mm wide; disc narrow, level or slightly descending; valves 3 or 4, level or just exserted. *Omeo Gum*. Fig. 94A–B.

Occurs mainly as disjunct occurrences between Omeo, Bright and slightly southwards, Vic., usually as an understorey along creeks at high altitudes. Region: HOWE. Map 427.

Vic.: 45 km S of Porepunkah, *N.Hall* 39 (FRI, MEL, NSW, PERTH); Spring Ck near Cobungra, *L.A.S.Johnson* 7389, *B.G.Briggs & E.Edgar* (AD, FRI, MEL, NSW, PERTH).

Distinguished by small tree habit, rough bark on trunk, intramarginal vein up to 3 mm from margin, short peduncle, and sessile buds and sessile fruits with a pale disc. Cultivated in Canberra, and could be useful as a hedge or windbreak.

402. *Eucalyptus kitsoniana* Maiden, *Crit. Revis. Eucalyptus* 3: 164 (1917)

E. kitsonii Luehm. ex Maiden, *Victorian Naturalist* 21: 112 (1904) *nom. illeg.* non Deane (1902). T: Powlett Plains, Vic., 3 Feb. 1903, *A.E.Kitson s.n.*; holotype: NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 78 (1973); L.Costermans, *Native Trees & Shrubs S.E. Australia* 358 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 189 (1983).

Mallee to 9 m. Bark smooth throughout, white to grey, sometimes with accumulated decorticate bark at trunk base. Juvenile leaves opposite, sessile, ovate to suborbicular, emarginate, often mucronate, green, discolorous. Adult leaves alternate, lanceolate to broadly lanceolate, sometimes falcate, acuminate; lamina 12–18 cm long, c. 2.5 cm wide, green, concolorous; lateral veins at 25°–35°; intramarginal vein up to 2 mm from margin; petiole flattened, 10–15 mm long. Umbels 7-flowered; peduncle flattened, 7–25 mm long; pedicels absent. Buds ovoid to fusiform; operculum conical, 3–4 mm long, 5–7 mm wide; hypanthium hemispherical, 3–4 mm long, 5–7 mm wide. Fruits hemispherical to cylindrical, ±wrinkled, 7–8 mm long and wide; disc moderately broad, level to slightly ascending; valves 3 or 4, ±level. *Gippsland Mallee*. Fig. 94C–D.

Occurs from near Portland eastwards to near Yarram, Vic., inland and on coastal plains and flats near watercourses, often in small pure stands. Regions: HOWE, OTWY. Map 428.

Vic.: 5.6 km N of Mt Richmond, *H.I.Aston* 742 (MEL); 1.8 km SW of Nine Mile Ck towards Welshpool, *G.M.Chippendale* 989 & *M.J.Beeston* (AD, FRI, MEL).

Differs from *E. neglecta* in the smooth bark, longer peduncle and larger buds and fruits.

403. *Eucalyptus sturgissiana* L.Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 289 (1972)

T: 29 km SW of Nowra, N.S.W., 11 Aug. 1970, *L.A.S.Johnson & D.F.Blaxell s.n.*; holotype: NSW; isotype: FRI, NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 115 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 114 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 190 (1983).

Mallee to 5 m. Bark smooth throughout, grey to grey-brown or pink. Juvenile leaves opposite, sessile, connate, elliptic to orbicular or ovate, glaucous, discolorous. Adult leaves alternate or subopposite, lanceolate to narrowly lanceolate, acuminate; lamina 7.5–12 cm long, 0.7–1.5 cm wide, light green or grey-green, concolorous; lateral veins faint, at 25°–40°; intramarginal vein up to 1 mm from margin; petiole flattened, 2–7 mm long. Umbels 7-flowered; peduncle flattened, 5–10 mm long; pedicels absent or extremely short. Buds fusiform, often glaucous; operculum conical or hemispherical, apiculate, 2–3 mm long, 3–4 mm wide; hypanthium obconical, 3–4 mm long and wide. Fruits hemispherical to cylindrical, 4–6 mm long and wide; disc narrow, slightly convex, then descending; valves 3 or 4, level. *Ettrema Mallee*. Fig. 94E–F.

Restricted to an area SW of Nowra, N.S.W. Grows in small pure stands, usually on flat sandy areas on sandstone plateaus. Region: HOWE. Map 429.

N.S.W.: Turpentine Ra., *E.F.Constable* 1997 (AD, BRI, NSW, NT); Ettrema Plateau, 15 Mar. 1969, *L.A.S.Johnson* (NSW).

Distinguished by mallee habit, smooth bark, thick leaves, flat petiole, usually sessile buds and fruits, and restricted occurrence. Leaves narrower than in *E. neglecta* and *E. kitsoniana*.

404. *Eucalyptus crenulata* Blakely & Beuzev., *Contr. New South Wales Natl Herb.* 1: 37 (1939)

T: Acheron Valley, near Buxton, Vic., 17 Sept. 1938, *E.E.Pownall s.n.*; holotype: NSW; isotype: MEL.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 87 (1973); L.Costermans, *Native Trees & Shrubs S.E. Australia* 359 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 192 (1983).

Tree to 12 m. Bark rough, compact, grey on at least half the trunk, then smooth and grey to grey-brown above. Juvenile leaves opposite, sessile, amplexicaul, ovate, cordate, crenulate,

glaucous, discolorous. Adult leaves opposite, broadly ovate, crenulate, apiculate; lamina 3.5–6.5 cm long, 3–5.5 cm wide, glaucous, discolorous; lateral veins at 55°–65°; intramarginal vein 3–4 mm from margin; petiole absent or terete, to 6 mm long. Umbels 7–11-flowered; peduncle terete, 5–8 mm long; pedicels 2–4 mm long. Buds ovoid, rostrate, glaucous; operculum hemispherical, apiculate or rostrate, 2–4 mm long, 3–4 mm wide; hypanthium hemispherical to obconical, 3–4 mm long and wide. Fruits cylindrical, 3–4 mm long, 4–6 mm wide, glaucous at first; disc narrow, descending; valves 3 or 4, included. *Silver Gum*, *Buxton Gum*. Figs 35, 94G–H.

Restricted to the valley of the Acheron R., Vic., on flat and very gently sloping areas near watercourses, often swampy, usually in more or less pure stands in woodland. Region: HOWE. Map 430.

Vic.: 2.9 km SSW of Steavenson R., *G.M.Chippendale* 970 & *M.J.Beeston* (BRI, CANB, FRI, MEL); 2.4 km NW of Yering railway stn, 11 Oct. 1949, *J.H.Willis* (MEL, NSW).

Distinguished especially by the crenulate, glaucous, sessile or shortly petiolate leaves and by tree habit, rough bark on at least half of trunk, and small ovoid, rostrate buds. A restricted and possibly endangered species, useful for planting in cold regions, particularly in areas of poor drainage.

405. *Eucalyptus dunnii* Maiden, *Proc. Linn. Soc. New South Wales* 30: 336 (1905)

T: Acacia Ck, Macpherson Ra., N.S.W., 8 May 1905, *W.Dunn* 88; holo: NSW; iso: BM, K.

Illustrations: S.Kelly *et al.*, *Eucalypts* 2: t. 100 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 193 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 443 (1984).

Tree to 50 m. Bark rough, flaky or fibrous, grey to 4 m, then smooth and white to grey above. Juvenile leaves opposite to subopposite, sessile to shortly petiolate, ovate to suborbicular, cordate, crenulate, discolorous. Adult leaves alternate, lanceolate to narrowly lanceolate, acuminate; lamina 13–20 cm long, 1.3–2.5 cm wide, green, concolorous; lateral veins clearly visible, at 30°–45°; intramarginal vein up to 1 mm from margin; petiole terete or channelled, 22–40 mm long. Umbels 7-flowered; peduncle flattened, 7–16 mm long; pedicels angular, 1–5 mm long. Buds ovoid; operculum conical or hemispherical, apiculate, 3–4 mm long and wide; hypanthium hemispherical, 2–3 mm long, 3–4 mm wide. Fruits obconical or hemispherical, 4–5 mm long, 5–8 mm wide; disc broad, level or ascending; valves 3 or 4, exserted. *Dunn's White Gum*. Fig. 94 I–J.

Occurs in several restricted areas from E of Warwick, Qld, to W of Coffs Harbour, N.S.W. Grows in basaltic soil on lower slopes, valleys and ridges, in tall open forest near rainforest. Region: MCPH. Map 431.

Qld: Lamington Natl Park, *C.R.Dunlop* 383 (CANB, CBG, FRI). N.S.W.: 19.3 km SW of Urbenville, *R.D.Johnston* & *G.M.Chippendale* 590 (BRI, FRI, MEL, NSW).

Distinguished by tall habit, rough base of trunk with otherwise smooth bark, long flattened peduncle, and obconical or hemispherical fruits with exserted valves. Juvenile leaves grey-green above. An important forest tree, though not abundant, useful in light construction work.

406. *Eucalyptus angophoroides* R.Baker, *Proc. Linn. Soc. New South Wales* 25: 676 (1901)

T: Colombo, N.S.W., *W.Bäuerlen s.n.*; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 5: 185 (1921).

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 122 (1973); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 194 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 445 (1984).

Tree to 40 m. Bark rough, flaky or fibrous, grey to grey-brown on trunk and larger branches or throughout, sometimes smooth above. Juvenile leaves opposite to subopposite, sessile to shortly petiolate, broadly ovate to suborbicular, amplexicaul, cordate, crenulate, discolorous. Adult leaves alternate, lanceolate to narrowly lanceolate, acuminate; lamina 11–20 cm long, 1.8–2.5 cm wide, green, discolorous; lateral veins faint or visible, at 35°–45°;

intramarginal vein up to 2 mm from margin; petiole terete, 15–27 mm long. Umbels 7-flowered; peduncle slightly flattened, 5–10 mm long; pedicels 1–6 mm long. Buds ovoid; operculum conical or hemispherical, apiculate, 4–5 mm long, 5–6 mm wide; hypanthium hemispherical, 3–4 mm long, 5–6 mm wide. Fruits obconical or hemispherical, 4–5 mm long, 6–7 mm wide; disc moderately broad, level or slightly ascending; valves usually 4, exserted. *Apple-topped Box*. Fig. 94K–L.

Occurs in south-eastern N.S.W. and Vic., in valleys and on hill slopes, mainly in alluvial soil, often near swamp edges, in open forest. Regions: NEPN, HOWE. Map 432.

N.S.W.: 9.7 km E of Araluen, *L.G.Adams 2024* (CANB, K, NSW); 3.9 km N of Moruya, *M.I.H.Brooker 6651* (FRI). Vic.: Traralgon South, *M.I.H.Brooker 5133* (AD, BRI, FRI, NSW).

Distinguished from *E. dunnii* by the rough bark on trunk and larger branches and the discoloured leaves. Juvenile leaves dark green above.

407. *Eucalyptus bridgesiana* R.Baker, *Proc. Linn. Soc. New South Wales* 23: 164 (1898)

T: Gippsland, Vic., *A.W.Howitt 101–104*, 18; syn: MEL; Colombo, N.S.W., *W.Bäuerlen s.n.*; syn: *n.v.*; Albury, N.S.W., 21 June 1897, *Dr Andrews*; syn: NSW; Gerogery, N.S.W., *J.Manns*; syn: *n.v.*; Rylstone, N.S.W., *R.T.Baker*; syn: *n.v.*; Bathurst, N.S.W., *W.Woolls*; syn: *n.v.*

E. stuartiana F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 131 (1856) *p.p.* T: Tasmania, *C.Stuart*; *n.v.*

E. bridgesiana var. *amblycorys* (Blakely) Cameron, *Victorian Naturalist* 63: 41 (1946); *E. stuartiana* var. *amblycorys* Blakely, *Key Eucalypts* 145 (1934). T: Tumut, N.S.W., Jan. 1897, *E.Betche s.n.*; *holo*: NSW.

[*E. stuartiana* auct. non F.Muell. ex Miq.: A.K.Cameron, *Victorian Naturalist* 62: 47–50 (1945)]

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 117 (1970); L.Costermans, *Native Trees & Shrubs S.E. Australia* 355 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 195 (1983).

Tree to 22 m. Bark rough, fibrous, flaky, tessellated throughout, grey to grey-brown. Juvenile leaves opposite to subopposite, sessile to shortly petiolate, orbicular to broadly ovate, amplexicaul, crenulate, glaucous, concolorous. Adult leaves alternate, lanceolate or narrowly lanceolate, acuminate; lamina 12–20 cm long, 1.5–2.5 cm wide, dark green, concolorous; lateral veins distinct, at 25°–40°; intramarginal vein up to 2 mm from margin; petiole flattened or terete, 15–30 mm long. Umbels 7-flowered; peduncle terete or angular, 7–15 mm long; pedicels 2–5 mm long. Buds ovoid, often apiculate; operculum conical, 3–4 mm long, 3–5 mm wide; hypanthium hemispherical, 2–3 mm long, 3–5 mm wide. Fruits hemispherical, 5–7 mm long, 4–7 mm wide; disc moderately broad, ascending; valves 3 or 4, exserted. *Apple Box*. Fig. 94M–N.

Widespread from near Stanthorpe, Qld, southwards through the tablelands of N.S.W. to southern Vic. Grows in clayey soil in open woodland and forest, mostly on gentle slopes. Regions: MCPH, NEPN, HOWE, RIVR, OTWY. Map 433.

Qld: Bald Mtn, near Wallangarra, *S.T.Blake 4539* (BRI). N.S.W.: 18 km NW of Binalong, *G.M.Chippendale 959* & *M.J.Brennan* (BRI, FRI, MEL); Yarrowyck, *L.A.S.Johnson 21* (NSW). Vic.: Old Rosedale Rd, *M.I.H.Brooker 4391* (FRI).

Differs from *E. dunnii* in having rough bark throughout and a more obtuse operculum, and from *E. angophoroides* in the concolorous adult leaves. A useful shade tree in parks, and its regular profuse flowering makes it a good honey tree.

408. *Eucalyptus malacoxylon* Blakely, *Key Eucalypts* 145 (1934)

E. stuartiana var. *grossa* Maiden, *Crit. Revis. Eucalyptus* 3: 69 (1917). T: Hanging Rock, near Nundle, N.S.W., June 1906, *J.H.Maiden* & *J.L.Boorman s.n.*; syn: FRI, K, NSW; Hanging Rock, near Nundle, N.S.W., June 1904, *J.L.Boorman s.n.*; syn: BM, NSW.

Illustrations: N.Hall, *Forest Tree Ser.* No. 21 (1971); N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 3: 461 (1976) as *E. bridgesiana* subsp. *malacoxylon* *nom. inval.*; M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 196 (1983) as *E. bridgesiana* subsp. *malacoxylon* *nom. inval.*

Tree to 15 m. Bark rough, fibrous, flaky, ±tessellated throughout, grey. Juvenile leaves subopposite to alternate, petiolate, broadly ovate, subcordate, glaucous, slightly discoloured.

Adult leaves alternate, lanceolate to narrowly lanceolate, acuminate; lamina 15–25 cm long, 2.5–4 cm wide, green, concolorous; lateral veins at 30°–40°; intramarginal vein up to 2 mm from margin; petiole channelled, 20–32 mm long. Umbels 7-flowered; peduncle slightly flattened, 7–13 mm long; pedicels 1–3 mm long. Buds fusiform, glaucous; operculum conical, 3–4 mm long, c. 5 mm wide; hypanthium obconical, c. 3 mm long, 4–5 mm wide. Fruits obconical to hemispherical, glaucous, 6–8 mm long and wide; disc narrow, level or slightly ascending; valves 3 or 4, exserted. *Moonbi Apple Box*. Fig. 74 O–P.

Occurs from N of Bendemeer southwards to Nundle, N.S.W., usually on granite hills and ranges on sloping ground in open woodland. Region: MCPH. Map 434.

N.S.W.: 7.6 km NE of Bendemeer, *G.M.Chippendale* 1254 & *M.J.Brennan* (AD, FRI, MEL, NSW); Moonbi Ra., 6 Sept. 1949, *L.A.S.Johnson* (NSW).

Differs from *E. bridgesiana* and *E. goniocalyx* in the glaucous buds and fruits on stouter pedicels. Also resembles *E. banksii* which has non-glaucous buds and fruits on a short peduncle.

409. *Eucalyptus banksii* Maiden, *Proc. Linn. Soc. New South Wales* 29: 774 (1905)

T: Wallangarra, N.S.W., 2 Aug. 1904, *J.L.Boorman* s.n.; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 3: 79 (1915).

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 142 (1974); N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 3: 459 (1976); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 199 (1983).

Tree to 30 m. Bark rough, fibrous, ±tessellated throughout, grey-brown. Juvenile leaves opposite, sessile, broadly ovate, cordate, glaucous, discolorous. Adult leaves alternate, lanceolate, acuminate; lamina 12–20 cm long, 2–3 cm wide, grey-green, concolorous; lateral veins faint, at 20°–40°; intramarginal vein up to 3 mm from margin; petiole terete, 20–30 mm long. Umbels 7-flowered; peduncle flattened, 5–10 mm long; pedicels absent. Buds ovoid, angular; operculum hemispherical, 2–3 mm long, 3–5 mm wide; hypanthium hemispherical, 2–3 mm long, 3–5 mm wide. Fruits hemispherical, sometimes 2-ribbed, 4–6 mm long, 5–7 mm wide; disc narrow, convex; valves 3 or 4, exserted. *Tenterfield Woollybutt*. Fig. 94Q–R.

Occurs from near Cunningham Gap and the McPherson Ra., Qld, southwards to near Armidale, N.S.W., mostly in granitic soils on hilly and sloping country in open forest and woodland. Region: MCPH. Map 435.

Qld: Mt Castle, *C.T.White* 10354 (BRI). N.S.W.: 16 km N of Glen Innes, *L.A.S.Johnson* & *D.M.McGillivray* 2441 (BRI, FRI, NSW).

Distinguished by rough ±tessellated bark throughout, thick leaves, sessile ovoid non-glaucous buds on a short peduncle and hemispherical fruits.

410. *Eucalyptus goniocalyx* F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 134 (1856)

T: Buffalo Ra., Vic., 1853, *F.Mueller*; holo: MEL; iso: K, NSW.

E. elaeophora F.Muell., *Fragm.* 4: 52 (1864). T: Macalister R., Vic., Jan. 1863, *F.Mueller*; holo: MEL; iso: NSW.

E. cambagei Deane & Maiden, *Proc. Linn. Soc. New South Wales* 25: 106 (1900). T: Hassans Walls, N.S.W., 8 Apr. 1900, *J.H.Maiden*; syn: BM, NSW; Mt Bulaway, N.S.W., Oct. 1899, *W.Forsyth*; syn: NSW.

E. cordieri var. *brachypoma* Blakely, *Key Eucalypts* 147 (1934). T: Mt McDonald, near Cowra, N.S.W., May 1900, *R.H.Cambage* s.n.; holo: NSW.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 119 (1970); C.D.Boomsma, *Native Trees S. Australia* 121 (1972); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 197 (1983).

Tree to 15 m, often straggly. Bark rough, fibrous throughout, grey-brown. Juvenile leaves opposite, sessile, orbicular, light green, slightly discolorous. Adult leaves alternate, lanceolate, acuminate; lamina 10–22 cm long, 1.3–3 cm wide, slightly shining, green, concolorous; lateral veins faint, at 15°–35°; intramarginal vein up to 2 mm from margin;

petiole terete, 20–30 mm long. Umbels 7-flowered; peduncle flattened, 5–15 mm long; pedicels absent. Buds ovoid, angular; operculum conical, 3–5 mm long, 3–6 mm wide; hypanthium obconical, often angular, 4–6 mm long, 3–6 mm wide. Fruits cylindrical, 6–10 mm long, 6–8 mm wide; disc narrow, descending; valves 3 or 4, level or included. *Long-leaved Box*. Fig. 94S–T.

Occurs from the Flinders Ra. to the Mt Lofty Ra., S.A., and with a disjunction through southern and central Vic. and eastern N.S.W. Grows in poor soils on tablelands, plains and ridges in open dry sclerophyll forest and open woodland. Regions: TRNS, EYRE, RIVR, OTWY, HOWE, NEPN, MCPH. Map 436.

S.A.: Mt Remarkable, *M.I.H.Brooker* 3890 (AD, FRI, MEL, NSW). N.S.W.: Hill End, *R.H.Cambage* 2778 (NSW); 18.4 km N of Glen Innes, *G.P.Smith* 17 (BRI, FRI, K). Vic.: 1.6 km from Healesville towards Eildon, *M.I.H.Brooker* 4369 (AD, FRI, MEL, NSW); Mt Zero, 27 July 1950, *J.H.Willis* (MEL).

Distinguished from *E. banksii* by the larger buds and slightly shining leaves and from *E. nortonii* by the non-glaucous buds and fruits and green leaves.

411. *Eucalyptus nortonii* (Blakely) L.Johnson, *Contr. New South Wales Natl Herb.* 3: 112 (1962)

E. cordieri var. *nortonii* Blakely, *Key Eucalypts* 147 (1934). T: Woolomin, N.S.W., May 1927, *E.A.Norton*; lecto: NSW, *ide* L.A.S.Johnson, *loc. cit.*

E. goniocalyx var. *pallens* Benth., *Fl. Austral.* 3: 230 (1867); *E. cambagei* var. *pallens* (Benth.) Deane & Maiden, *Proc. Linn. Soc. New South Wales* 25: 107 (1900). T: Snowy R., 10 Feb. 1854, *F.Mueller*; holo: K; iso: MEL.

[*E. cordieri* auct. non Trabut: W.F.Blakely, *Key Eucalypts* 147 (1934), *ide* L.A.S.Johnson, *loc. cit.*]

Illustrations: N.Hall, *Forest Tree Ser.* No. 22 (1971); N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 460 (1976); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 198 (1983).

Tree to 18 m. Bark rough, fibrous throughout, grey or grey-brown. Juvenile leaves opposite, sessile, orbicular, cordate, sometimes emarginate, sometimes crenulate, dull, grey or glaucous, concolorous. Adult leaves alternate, lanceolate to narrowly lanceolate, acute or acuminate; lamina 15–25 cm long, 1.8–3 cm wide, grey-green to glaucous, concolorous; lateral veins distinct, at 20°–40°; intramarginal vein up to 2 mm from margin; petiole terete, 20–30 mm long. Umbels 7-flowered; peduncle thick, angular or flattened, 4–10 mm long; pedicels absent. Buds cylindrical, glaucous; operculum conical, 3–5 mm long, 5–6 mm wide; hypanthium cylindrical, 5–7 mm long, 5–6 mm wide. Fruits cylindrical, glaucous, 7–10 mm long, 6–9 mm wide; disc narrow, level or just descending; valves 3 or 4, level or just exserted. *Mealy Bundy*. Fig. 94U–V.

Occurs from near the Warrumbungle Ranges, N.S.W., southwards through tableland and foothill areas and westwards through Vic., with scattered occurrences to N of Coleraine. Usually grows in stony and poor soil on undulating country in open woodland or forest. Regions: MCPH, NEPN, HOWE, OTWY. Map 437.

N.S.W.: 11.3 km ESE of Michelago, *G.M.Chippendale* 730 (FRI, MEL, NSW, PERTH); 1.6 km E of Queanbeyan, *R.Pullen* 3884 (CANB, MEL, NSW). Vic.: Chiltern, 2 Nov. 1928, *L.Frost* (NSW); Ballantynes Hills, 16 Jan. 1948, *J.H.Willis* (MEL).

Similar to *E. goniocalyx* but has glaucous branchlets, grey-green to glaucous leaves, and glaucous buds and fruits.

412. *Eucalyptus cypellocarpa* L.Johnson, *Contr. New South Wales Natl Herb.* 3: 114 (1962)

T: Sawmill to Wynnes Rocks, Mt Wilson, N.S.W., 23 Sept. 1949, *L.A.S.Johnson s.n.*; holo: NSW.

E. goniocalyx var. *acuminata* Benth., *Fl. Austral.* 3: 230 (1867). T: Gippsland, Vic., *F.Mueller*; holo: K; iso: MEL.

E. goniocalyx var. *parviflora* Blakely & McKie, *Proc. Linn. Soc. New South Wales* 63: 66 (1938). T: 2 miles [c. 3 km] from Hanging Rock, N.S.W., 28 Oct. 1930, *E.N.Mckie s.n.*; lecto: NSW, *ide* L.A.S.Johnson, *loc. cit.*; isolecto: FRI, MEL.

[*E. goniocalyx* auct. non F.Muell. ex Miq.: W.F.Blakely, *Key Eucalypts* 157 (1934), fide L.A.S.Johnson, loc. cit.]

Illustrations: L.Costermans, *Native Trees & Shrubs S.E. Australia* 356 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 200 (1983); D.J.Boland et al., *Forest Trees Australia* 4th edn, 447 (1984).

Tree to 65 m. Bark usually smooth throughout, yellow-white or grey, sometimes rough on trunk and larger branches. Juvenile leaves opposite, sessile, broadly lanceolate to ovate, shining, green, discolorous. Adult leaves alternate, lanceolate to narrowly lanceolate, sometimes falcate, acuminate; lamina 11–20 cm long, 1–2.5 cm wide, green, concolorous; lateral veins distinct, at 30°–45°; intramarginal vein up to 2 mm from margin; petiole slightly flattened, 15–25 mm long. Umbels 7-flowered; peduncle flattened, 8–22 mm long; pedicels to 5 mm long, rarely absent. Buds ovoid, angular; operculum conical, 3–4 mm long, 2–4 mm wide; hypanthium cylindrical, 7–8 mm long, 4–5 mm wide. Fruits cylindrical or ovoid, often ribbed, 5–10 mm long, 6–9 mm wide; disc moderately broad, steeply descending; valves usually 3, level or just included. *Mountain Grey Gum*. Fig. 95A–B.

Occurs widely from the northern tablelands, N.S.W., southwards through the coastal side of the southern tablelands then westwards to The Grampians, Vic. Grows mainly on mountains and hills in tall open forest. Regions: MCPH, NEPN, HOWE, OTWY. Map 438.

N.S.W.: Mt Kaputar, *B.G.Briggs* 4304 (NSW); 5 km SE of Mt Werong, *J.Campbell & J.Pickard* 1611 (FRI, NSW). Vic.: Anglesea, 4 Dec. 1966, *L.F.Costermans* (MEL); 2.4 km NW of Halls Gap, *N.Hall* 2a (FRI).

Distinguished by tall habit, usually smooth bark throughout, long slightly flattened peduncle, and usually angular or ribbed buds and fruits on short pedicels. Northerly populations usually have rough bark on trunk and sometimes on larger branches. The wood is hard, heavy, moderately strong and durable, and is used for general construction, bridges, fences, marine craft and for pulp.

413. *Eucalyptus nitens* (Deane & Maiden) Maiden, *Crit. Revis. Eucalyptus* 2: 272 (1913)

E. goniocalyx var. *nitens* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 24: 463 (1899). T: Delegate R., N.S.W., May 1889, *W.Bäuerlen* s.n.; lecto: NSW, fide J.H.Maiden, loc. cit.

Illustrations: L.Costermans, *Native Trees & Shrubs S.E. Australia* 356 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 201 (1983); D.J.Boland et al., *Forest Trees Australia* 4th edn, 451 (1984); *Fl. Australia* 1: facing p. 113 (1981).

Tree to 70 m, occasionally to 90 m. Bark smooth throughout, yellow-white or grey, or sometimes rough, flaky, grey to black at base of trunk. Juvenile leaves opposite, sessile, broadly lanceolate to ovate, amplexicaul, glaucous, discolorous. Adult leaves alternate, lanceolate to narrowly lanceolate, acuminate; lamina 13–24 cm long, 1.5–2.5 cm wide, shining, green, concolorous; lateral veins distinct, at 20°–45°; intramarginal vein up to 3 mm from margin; petiole terete or channelled, 15–22 mm long. Umbels 7-flowered; peduncle slightly flattened, 6–15 mm long; pedicels absent. Buds ovoid to cylindrical, angular or ribbed; operculum conical, 2–3 mm long, 3–4 mm wide; hypanthium cylindrical or angular, 3–4 mm long and wide. Fruits cylindrical or ovoid, often slightly ribbed, shining, 4–7 mm long, 4–6 mm wide; disc narrow, descending; valves 3 or 4, level or slightly exserted. *Shining Gum*. Fig. 95C–D.

Occurs in N.S.W. and Vic. in several disjunct areas: the Dorrigo area and Barrington Tops, from Tallaganda State Forest to the central highlands of Vic. Grows in loamy soils on slopes and mountain tops in tall open forest, often in pure stands. Regions: MCPH, HOWE. Map 439.

N.S.W.: Glenbog State Forest, *D.F.Blaxell* 461 (NSW); 1.6 km NNE of Badja Ck, *G.M.Chippendale* 829 (AD, FRI, MEL, NSW). Vic.: Mt St Leonard, 26 Oct. 1964, *J.H.Willis* (MEL).

Closely related to *E. cypellocarpa* but has shining leaves and smaller buds and fruits. Leaves of typical trees at Bondi State Forest, N.S.W., and Errinundra Plateau, Vic., have glandular margins. The wood is used for general construction, flooring, panelling, furniture and for pulp.

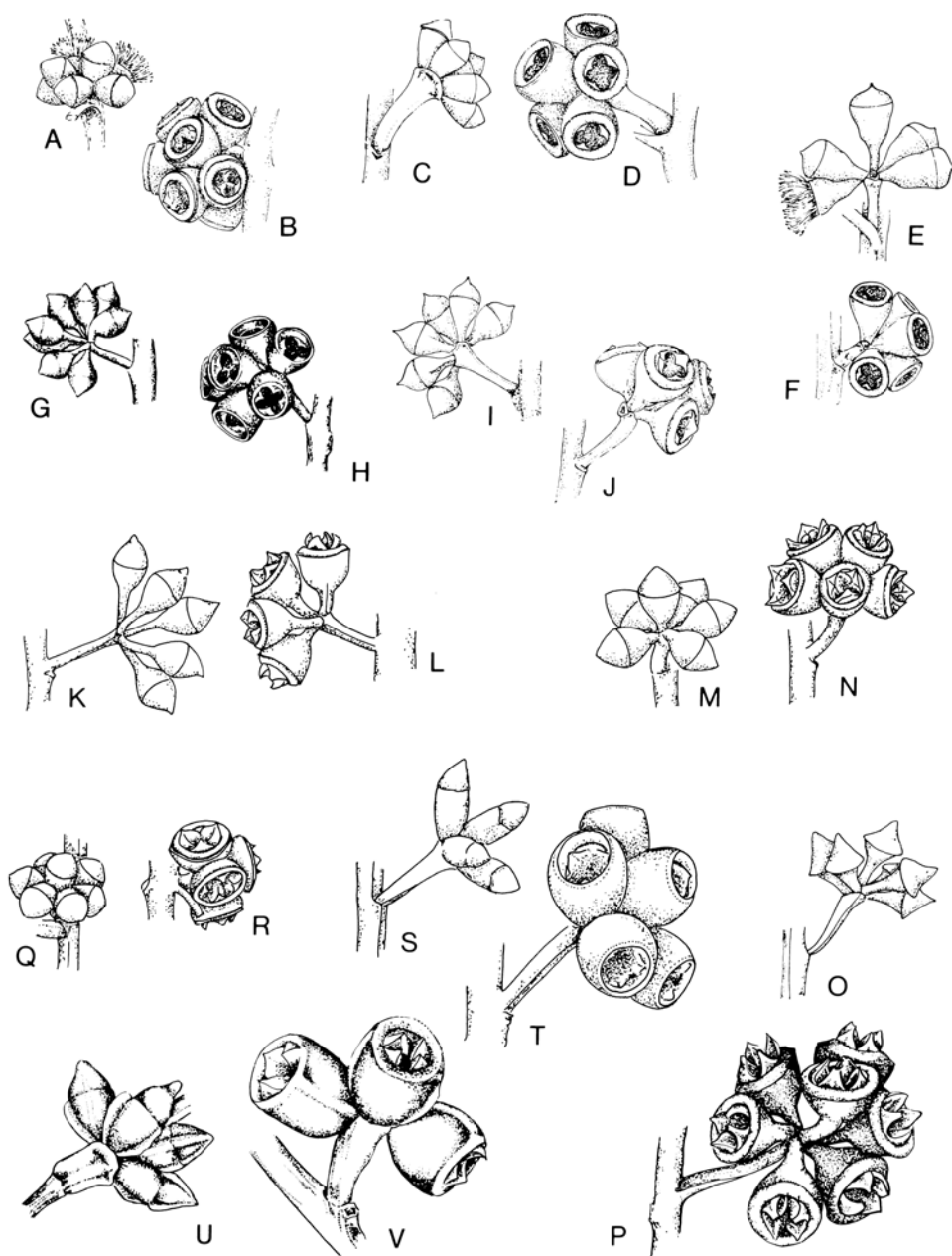


Figure 94. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. neglecta* (**A**, Spring Ck, Cobungra, Vic., H. Williamson, FRI; **B**, J. Briggs 103, FRI) **C–D**, *E. kitsoniana* (J. Briggs 95, FRI). **E–F**, *E. sturgissiana* (**E**, I. Brooker 4005, FRI, **F**, along Yarramunmun Fire Trail, N of Tianjara Falls, N.S.W., C. Borroughs, FRI). **G–H**, *E. crenulata* (Healesville Forest Office, Vic., L. Langley, FRI). **I–J**, *E. dunnii* (**I**, J. Doran 29, FRI; **J**, J. Doran 24, FRI). **K–L**, *E. angophoroides* (**K**, Mogo State Forest, N.S.W., District Forester, FRI; **L**, N. Hall 4, FRI). **M–N**, *E. bridgesiana* (Uriarra Crossing, Murrumbidgee R., A.C.T., C. Dunlop, FRI). **O–P**, *E. malacoxylon* (**O**, J. Banks 705, FRI; **P**, 22.4 km NE of Bendemeer, N.S.W., G. Battarbee, NSW 30907, FRI). **Q–R**, *E. banksii* (**Q**, New England Hwy, 14.4 km N of Armidale, E. McKie, FRI; **R**, G. Chippendale 1262, FRI). **S–T**, *E. goniocalyx* (I. Brooker 4369, FRI). **U–V**, *E. nortonii* (Woolomin, N.S.W., E. Norton, NSW 54073, NSW). Drawn by M. May.

414. *Eucalyptus quadrangulata* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 24: 451 (1899)

T: Hill Top, N.S.W., Jan. 1896, *J.H.Maiden*; holo: NSW.

Illustrations: N.Hall, *Forest Tree Ser.* No. 9 (1970); N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 460 (1976); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 206 (1983).

Tree to 45 m. Bark rough, fibrous throughout, often tessellated, grey-brown. Juvenile leaves opposite, sessile, amplexicaul, lanceolate to broadly lanceolate, green, discolorous. Adult leaves alternate, narrowly lanceolate, acuminate; lamina 12–20 cm long, 1–2 cm wide, slightly shining, green, concolorous; lateral veins faint, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole slightly flattened, 12–20 mm long. Umbels 7-flowered; peduncle slightly flattened, 8–12 mm long; pedicels absent or to 2 mm long. Buds ovoid or fusiform; operculum conical, 2–3 mm long, 3–4 mm wide; hypanthium hemispherical or obconical, 3–4 mm long and wide. Fruits obconical to campanulate, 5–7 mm long, 4–6 mm wide; disc narrow, level; valves 3 or 4, exserted. *White-topped Box*. Fig. 95E–F.

Occurs near Cunningham Gap, Qld, and in N.S.W. between Dorrigo and Scone and from near Camden to Milton. Grows on slopes and edges of tablelands in heavy soils in forest including wet sclerophyll forest. Regions: MCPH, NEPN, HOWE. Map 440.

Qld: 32.2 km ESE of Warwick, *L.S.Smith 11480* (BRI). N.S.W.: Copeland State Forest, *M.I.H.Brooker 4644* (AD, BRI, MEL, NSW); 8 km SSE of Dorrigo, *R.D.Johnston & G.M.Chippendale 489* (BRI, FRI, NSW).

Distinguished especially by the adult leaves with glandular often irregularly sinuate margins, and the small sessile or very shortly pedicellate buds and fruits. The wood is hard and durable, and has been used for sleepers, poles and in heavy engineering construction.

415. *Eucalyptus globulus* Labill., *Voy. Rech. Pérouse* 1: 153, t. 13 (1800)

T: probably Recherche Bay, [Tas.], Dec. 1792, *J.J.H. de Labillardière*; holo: FI; iso: BM, G, K, L, W.

Trees, usually to 45 m, sometimes to 70 m. Bark usually smooth, white to cream, yellow or grey, but accumulated grey-brown, undecorticated bark at the trunk base. Juvenile leaves opposite, sessile, amplexicaul, ovate, grey-green to glaucous, discolorous. Adult leaves lanceolate to narrowly lanceolate, sometimes falcate, acuminate, green, concolorous. Umbels 1-, 3- or 7-flowered; peduncles flattened or terete; pedicels present or absent. Buds turbinate to obconical, warty glaucous; operculum flattened hemispherical, shortly umbonate; hypanthium obconical, ribbed or ±smooth. Fruits obconical to hemispherical or subglobose, glaucous or not; disc broad, level to ascending; valves 3–5, level or exserted.

Occurs in several disjunct areas in north-eastern N.S.W., extending to south-eastern N.S.W., eastern Vic. and Tas. Distinguished by the warty, glaucous buds and fruits, solitary or in 3s or 7s. There are 4 subspecies that are sometimes treated as species.

- | | |
|-------------------------------|------------------------------------|
| 1 Umbels 1-flowered | 415a. subsp. globulus |
| 1: Umbels 3- or 7-flowered | |
| 2 Umbels 7-flowered | 415d. subsp. maidenii |
| 2: Umbels 3-flowered | |
| 3 Buds and fruits pedicellate | 415c. subsp. pseudoglobulus |
| 3: Buds and fruits sessile | 415b. subsp. bicostata |

415a. *Eucalyptus globulus* Labill. subsp. globulus

E. gigantea Desf., *Cat. Pl. Hort. Paris*. 2nd edn, 6, 20 (1832). T: cultivated in Paris, France; *n.v.*

Illustrations: L.Costermans, *Native Trees & Shrubs S.E. Australia* 357 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 205 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 459 (1984); *Fl. Australia* 1: ix (1981).

Trees to 70 m. Adult leaves: lamina 12–25 cm long, 1.7–3 cm wide, acuminate, thick; lateral veins conspicuous, at 30°–45°; intramarginal vein up to 2 mm from margin; petiole channelled or flattened, 20–30 mm long. Umbels 1-flowered; peduncle absent or to 4 mm long; pedicels absent or very short. Operculum 7–15 mm long, 14–17 mm wide; hypanthium 10–12 mm long, 14–17 mm wide. Fruits 10–21 mm long, 14–24 mm wide; valves 4 or 5. *Tasmanian Blue Gum*. Fig. 95G–H.

Occurs at Cape Otway and Wilsons Promontory, Vic., and widely in Tas. including Flinders and King Islands. Grows mainly on undulating country and in loamy soil in moist valleys, in woodland, forest and open forest. Regions: HOWE, OTWY, TASM. Map 441.

Vic.: Mt Munro, 11 Apr. 1954, *J.H. Willis* (MEL); Neerim South, 14 Mar. 1973, *J.H. Willis* (MEL). Tas.: 0.8 km N of St Helens, *N.T. Burbidge* 3117 (CANB, HO, K); 2.4 km from Ridgeway Rd on Mt Wellington road, *A.M. Gray* & *G.M. Chippendale* 1175 (FRI, HO, NSW).

Distinguished by tall tree habit, smooth bark, long leaves, and large solitary glaucous buds and fruits. The wood is moderately durable and is used for general construction, poles, piles and railway sleepers. The trees are useful honey sources. The floral emblem of Tas.

415b. *Eucalyptus globulus* subsp. *bicostata* (Maiden, Blakely & J.Simm.) Kirkpatr., *Bot. J. Linn. Soc.* 69: 101 (1975)

E. globulus var. *bicostata* (Maiden, Blakely & J.Simm.) Ewart, *Fl. Victoria* 804 (1931); *E. bicostata* Maiden, Blakely & J.Simm. in J.Simmonds, *Trees Shelter & Timber New Zealand, Eucalypt* 133, t. 48 (1929). T: Mundaroo State Forest, Tumbarumba, N.S.W., July 1921, *W.A.W. de Beuzeville*; holotype: NSW.

Illustrations: L.Costermans, *Native Trees & Shrubs S.E. Australia* 357 (1981); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 204 (1983); D.J. Boland *et al.*, *Forest Trees Australia* 4th edn, 457 (1984).

Tree to 45 m. Adult leaves: lamina 14–25 cm long, 2–3 cm wide, acuminate, thick; lateral veins conspicuous, at 30°–45°; intramarginal vein up to 2 mm from margin; petiole terete or channelled, 30–50 mm long. Umbels 3-flowered; peduncle 1–3 mm long; pedicels absent or central bud shortly pedicellate. Operculum 6–8 mm long, 12–14 mm wide; hypanthium 7–9 mm long, 12–14 mm wide. Fruits 2-ribbed, glaucous, 8–17 mm long, 10–20 mm wide; valves 3 or 4. *Eurabbie, Southern Blue Gum*. Fig. 95 I–J.

Occurs in several disjunct populations in eastern N.S.W.: Carrai State Forest, Nullo Mtn area, Jenolan Caves, and from the southern tablelands westwards to the Pyrenees Ra., Vic., and on West Sister Is., Tas. Grows in mountainous country in loamy soil in open forest and tall open forest. Regions: MCPH, NEPN, HOWE, OTWY, TASM. Map 442.

N.S.W.: Nullo Mtn, *M.I.H. Brooker* 5218 (AD, FRI, NSW); 56.3 km WNW of Kempsey, *D.J. McGillivray* & *R. Coveny* 404 (BRI, FRI, K, NSW). Vic.: between Seaview & Trida, *M.I.H. Brooker* 4378 (AD, FRI); Kalimna Gully, 15 Aug. 1944, *J.H. Willis* (MEL). Tas.: West Sister Is., *J.S. Whinray* 109 (FRI).

Distinguished from other subspecies in having sessile buds and fruits in 3s. The wood is moderately durable and has been used in general construction. Widely planted as an ornamental in parks and streets.

415c. *Eucalyptus globulus* subsp. *pseudoglobulus* (Naudin ex Maiden) Kirkpatr., *J. Linn. Soc., Bot.* 69: 101 (1975)

E. pseudoglobulus Naudin ex Maiden, *Crit. Revis. Eucalyptus* 8: 28 (1929). T: Metung, Vic., 23 Aug. 1909, *J.L. King s.n.*; lectotype: NSW, *vide* J.B. Kirkpatrick, *loc. cit.*

E. globulus var. *stjohnii* R. Baker, *Victorian Naturalist* 30: 127 (1913); *E. stjohnii* (R. Baker) R. Baker, *Hardwoods Australia* 218 (1919). T: Lerderderg R., Vic., 5 Nov. 1903, *P.R.H. St John*; *n.v.*

Illustrations: N. Hall & M.I.H. Brooker, *Forest Tree Ser.* No. 77 (1973); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 203 (1983); D.J. Boland *et al.*, *Forest Trees Australia* 4th edn, 455 (1984).

Tree to 45 m. Adult leaves: lamina 13–25 cm long, 1.5–3 cm wide, acuminate, thick; lateral veins clearly visible, at 30°–40°; intramarginal vein up to 2 mm from margin; petiole channelled or terete, 15–35 mm long. Umbels 3-flowered; peduncle 6–10 mm long; pedicels 1–5 mm long. Operculum 5–6 mm long, 8–9 mm wide; hypanthium 7–8 mm long, 8–9 mm

wide. Fruits sometimes glaucous, 7–11 mm long, 9–16 mm wide; valves 3 or 4. *Victorian Eurabbie*. Fig. 95K–L.

Occurs from Nadgee R., N.S.W., westwards to Bacchus Marsh and Phillip Is., Vic., on slopes of valleys and hills in alluvial soil, in open forest and tall open forest. Regions: OTWY, HOWE. Map 443.

N.S.W.: Nadgee R., *E.F.Constable* 7403 (FRI, MEL, NSW). Vic.: Lerderderg R., *G.M.Chippendale* 1301 & *M.J.Brennan* (AD, BRI, FRI, MEL, NSW); You Yangs, 25 Sept. 1930, *P.R.H.St John* (MEL).

Distinguished by the pedicellate glaucous buds & fruits in 3s on a broad, flattened peduncle. Occurs at lower altitudes than subsp. *maidenii*.

415d. *Eucalyptus globulus* subsp. *maidenii* (F.Muell.) Kirkpatr., *J. Linn. Soc., Bot.* 69: 101 (1974)

E. maidenii F.Muell., *Proc. Linn. Soc. New South Wales* ser. 2, 4: 1020 (1890). T: Colombo, N.S.W., June 1887, *W.Bäuerlen s.n.*; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 2: 265 (1913); isolecto: MEL.

Illustrations: L.Costermans, *Native Trees & Shrubs S.E. Australia* 357 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 202 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 453 (1984).

Tree to 45 m. Adult leaves: lamina 12–28 cm long, 1.2–2.5 cm wide, acuminate, thick; lateral veins at 20°–40°; intramarginal vein up to 2 mm from margin; petiole channelled or terete, 15–35 mm long. Umbels 7-flowered; peduncle 8–25 mm long; pedicels absent or to 8 mm long and stout. Operculum 3–4 mm long, 5–7 mm wide; hypanthium 5–7 mm long and wide. Fruits 5–11 mm long, 6–10 mm wide; valves 3 or 4. *Maiden's Gum*. Fig. 95M–N.

Occurs from Wingello, N.S.W., southwards to near Orbost, Vic., in loam and sandy loam in mountain valleys, slopes and ridges, in open forest and tall open forest. Regions: NEPN, HOWE. Map 444.

N.S.W.: NW of Bimmie Hill, Nullina, *M.I.H.Brooker* 5427 (FRI, NSW); near Araluen, Jan. 1888, *H.Deane* (NSW). Vic.: between Genoa & N.S.W. border, *A.C.Beauglehole* 33682 (FRI, MEL).

Distinguished from other subspecies by the long peduncle and 7-flowered umbels, the smaller, less glaucous and rugose buds and fruits. The wood is strong and durable and has been used in general construction.

416. *Eucalyptus vernicosa* J.D.Hook., *London J. Bot.* 6: 478 bis (1847)

T: Mt Fatigue, Tas., 4 Apr. 1842, *R.Gunn* 1113; holo: K.

Illustrations: N.Hall & A.M.Gray, *Forest Tree Ser.* No. 67 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 115 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 207 (1983).

Dwarf shrub to 1 m, or mallee to 3.5 m. Bark smooth throughout, grey. Juvenile leaves opposite, sessile, elliptic to ovate, crenulate, mucronate, shining, green, slightly discoloured. Adult leaves opposite, elliptic to ovate, mucronate; lamina 1.5–2.5 cm long, 1–1.5 cm wide, shining, green, concolorous; lateral veins faint, at 45°–50°; intramarginal vein up to 1 mm from margin; petiole channelled, 5–8 mm long. Umbels 3-flowered; peduncle absent or terete to 2 mm long; pedicels absent. Buds ovoid; operculum conical, 3–5 mm long, 3–6 mm wide; hypanthium campanulate, 3–5 mm long, 3–6 mm wide. Fruits hemispherical to campanulate, ribbed, 5–8 mm long, 5–9 mm wide; disc broad, descending; valves 3 or 4, level or just exserted. *Varnished Gum*. Fig. 95 O–P.

Occurs in western Tas. in mountainous areas, on steep exposed slopes and plateaus in alpine humus soil or peats, in low shrub communities. Region: TASM. Map 445.

Tas.: 49.7 km SW of Maydena, *A.M.Gray & G.M.Chippendale* 1184 (FRI, HO, NSW); Hartz Mtn, May 1947, *D.Stoane* (HO).

Very distinctive in being a low spreading shrub with very small thick mucronate shining leaves and small sessile buds and fruits. Usually only 1 of the 3 buds in the umbel matures.

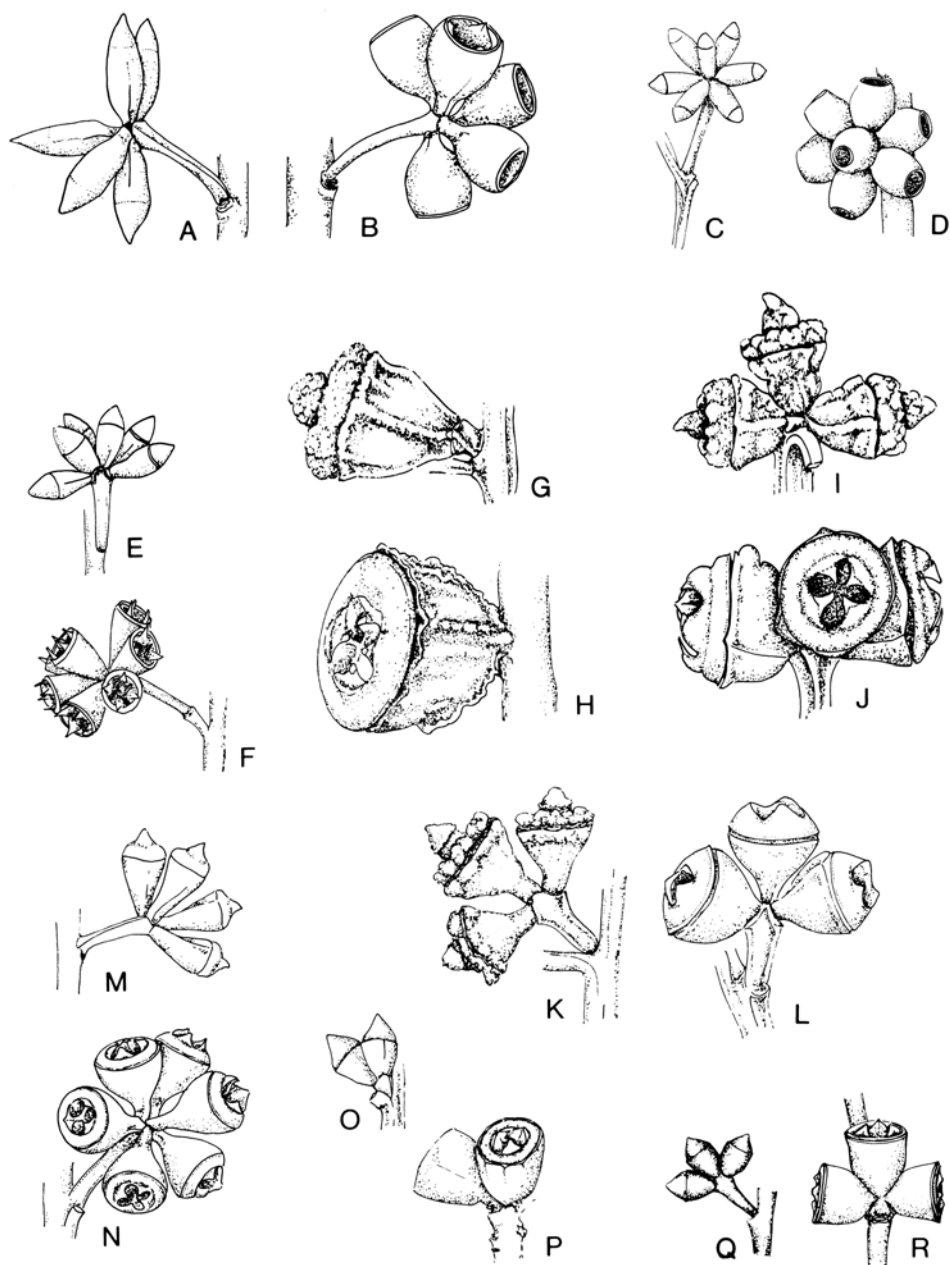


Figure 95. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. cypellocarpa* (N.Hall 28, FRI). **C–D**, *E. nitens* (C, Bondi State Forest, Bombala, N.S.W., A.Johnson, FRI; D, D.Kleinig 81, FRI). **E–F**, *E. quadrangulata* (E, N of Mittagong, N.S.W., N.Hall, FRI; F, R.Johnston & G.Chippendale 489, FRI). **G–H**, *E. globulus* subsp. *globulus* (G, Sandy Bay, Hobart, Tas., C.Dunlop, FRI; H, J.Turner 218 & D.Kleinig, FRI). **I–J**, *E. globulus* subsp. *bicostata* (I, D.Young 373, FRI; J, D.McGillivray & R.Coveny 404, FRI). **K–L**, *E. globulus* subsp. *pseudoglobulus* (K, A.Beauglehole 33448, FRI; L, A.Beauglehole 33589, FRI). **M–N**, *E. globulus* subsp. *maidenii* (M, Towamba, 32 km W of Eden, N.S.W., B.Pigott, FRI; N, I.Brooker 5423, FRI). **O–P**, *E. vernicosa* (O, L.Pryor & J.Briggs 20, FRI; P, A.Gray 10, FRI). **Q–R**, *E. subcrenulata* (Q, Mt Field, Tas., L.Pryor, GAUBA; R, J.Turner 202, FRI). Drawn by M.May.

417. *Eucalyptus subcrenulata* Maiden & Blakely, *Crit. Revis. Eucalyptus* 8: 59 (1929)

T: Mt Field East, Tas., Mar. 1906, *J.H.Maiden*; holo: NSW; iso: K.

Illustrations: N.Hall & A.M.Gray, *Forest Tree Ser.* No. 68 (1973); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 208 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 463 (1984).

Tree to 18 m. Bark smooth throughout, grey to white or yellow-green. Juvenile leaves opposite, sessile or shortly petiolate, elliptic or ovate to orbicular, crenulate, green, slightly discoloured. Adult leaves alternate, lanceolate to broadly lanceolate, subcrenulate, acuminate; lamina 6–10 cm long, 1.5–2.5 cm wide, shining, green, concolorous; lateral veins at 25°–35°; intramarginal vein up to 2 mm from margin; petiole terete, 15–25 mm long. Umbels 3-flowered; peduncle terete, 2–6 mm long; pedicels absent or to 2 mm long. Buds ovoid, slightly wrinkled; operculum hemispherical to conical, 3–4 mm long, 4–5 mm wide; hypanthium campanulate, 3–4 mm long, 4–5 mm wide. Fruits hemispherical to campanulate, sessile, sometimes 2-ribbed, 5–8 mm long and wide; disc narrow to moderately broad, descending; valves 3 or 4, level or exserted. *Tasmanian Alpine Yellow Gum*. Fig. 95Q–R.

Occurs in western and central Tas., in montane areas on exposed ridges, plateaus and slopes in humus or yellow podsolic soil, in subalpine woodland. Region: TASM. Map 446.

Tas.: between Lake Fenton & Lake Dobson, *N.T.Burbidge* 3284 (CANB, HO, K); Cradle Mtn, 29 Jan. 1949, *L.A.S.Johnson* (HO, K, NSW).

Distinguished by small tree habit, smooth bark, thick shining green subcrenulate leaves, 3-flowered umbels, short thick peduncle and pedicels absent or very short.

418. *Eucalyptus johnstonii* Maiden, *Crit. Revis. Eucalyptus* 6: 280 (1922)

E. muelleri T.B.Moore, *Proc. Roy. Soc. Tasmania* for 1886; 207 (1887), *nom. illeg.* non Miq. (1856). T: dividing range between the Huon and Derwent watersheds, Tas., *collector unknown*; *n.v.*

Illustrations: N.Hall & A.M.Gray, *Forest Tree Ser.* No. 69 (1973); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 209 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 465 (1984).

Tree to 40 m. Bark smooth throughout, orange-red or yellow-green to grey or yellow-bronze. Juvenile leaves opposite, elliptic, sessile, becoming alternate, petiolate, orbicular, shining, dark green, slightly discoloured or concolorous. Adult leaves alternate, lanceolate to broadly lanceolate, subcrenulate, acuminate; lamina 8–12 cm long, 2–3 cm wide, shining, dark green, concolorous; lateral veins at 25°–30°; intramarginal vein up to 4 mm from margin; petiole terete, 15–30 mm long. Umbels 3-flowered; peduncle flattened or angular, 3–9 mm long; pedicels absent or to 2 mm long. Buds ovoid, slightly wrinkled; operculum low-hemispherical, shortly umbonate, 4–6 mm long, 6–9 mm wide; hypanthium obconical, angular or 2-ribbed, 5–6 mm long, 6–9 mm wide. Fruits obconical to hemispherical, wrinkled, 2- or 3-ribbed, 7–8 mm long, 9–13 mm wide; disc broad, level or slightly ascending; valves 3 or 4, exserted. *Tasmanian Yellow Gum*. Fig. 96A–B.

Occurs in south-eastern Tas., on mountains and plateaus in mountain podsolic soils, in tall forest and tall open forest. Region: TASM. Map 447.

Tas.: 18 km SSW of Bushy Park, *A.M.Gray & G.M.Chippendale* 1191 (AD, FRI, HO, MEL, NSW); near Cape Raoul, June 1939, *P.Unwin* (HO).

Closely related to *E. subcrenulata* but is taller and has broader buds and fruits. The wood is of moderately high density and has been used in joinery and cabinet making.

419. *Eucalyptus imlayensis* Crisp & Brooker, *Telopea* 2: 41 (1980)

T: Mt Imlay, N.S.W., 37°11'S, 149°E, 16 May 1978, *M.D.Crisp* 4021, *I.R.Telford & S.I.Parker*; holo: CBG; iso: FRI.

Illustrations: M.D.Crisp & M.I.H.Brooker, *op. cit.* 44, 46, t. 2, 3; S.Kelly *et al.*, *Eucalypts* 1: t. 268 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 210 (1983).

Mallee to 7 m. Bark smooth throughout, green to orange-brown and grey. Juvenile leaves opposite, sessile, elliptic to ovate, slightly crenulate, prominently glandular, shining, dark

green. Adult leaves alternate, lanceolate, often falcate, acuminate; lamina 10–15 cm long, 1.5–2 cm wide, green, concolorous; lateral veins faint, at 30°–35°; intramarginal vein up to 2 mm from margin; petiole flattened, 10–15 mm long. Umbels 3-flowered; peduncle angular or slightly flattened, 3–5 mm long; pedicels absent or central bud shortly pedicellate. Buds ovoid or subcylindrical; operculum conical, 3–4 mm long, 3–5 mm wide; hypanthium obconical to slightly urceolate, 3–4 mm long, 3–5 mm wide. Fruits hemispherical to subglobular, 5–7 mm long, 6–8 mm wide; disc broad, ascending; valves 3 or 4, exserted. Fig. 96C–D.

Restricted to one small population near the summit of Mt Imlay, SW of Eden, N.S.W., on a steep quartzite outcrop in open forest. Region: HOWE. Map 448.

N.S.W.: Mt Imlay, *D.J.Boland 1915* (FRI); Mt Imlay, *M.D.Crisp 3502* & *I.R.Telford* (CBG, FRI).

Distinguished from closely-related species mainly by mallee habit and smooth bark. Stems of juvenile plants are quadrangular. The population is within Mt Imlay Natl Park.

420. *Eucalyptus macarthurii* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 24: 448 (1899)

T: from N.S.W., *W.Macarthur 142*; syn: K, NSW; Berrima, N.S.W., 1864, *Miss Atkinson s.n.*; syn: NSW; Camden, N.S.W., *W.Woolfs*; syn: *n.v.*

E. diversifolia Woolfs, *Contr. Fl. Australia* 235 (1867), *nom. illeg.* non Bonpl. (1813). T: not designated.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 136 (1984); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 211 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 467 (1984).

Tree to 40 m. Bark rough, fibrous, grey-brown on trunk and larger branches, then smooth and grey on smaller branches. Juvenile leaves opposite, sessile, broadly lanceolate to ovate or suborbicular, amplexicaul, dull, green, slightly discolorous. Adult leaves alternate, narrowly lanceolate, sometimes falcate, acuminate; lamina 8.5–19 cm long, 0.8–1.6 cm wide, green, concolorous; lateral veins faint, at 20°–40°; intramarginal vein up to 1 mm from margin; petiole slightly flattened, 8–12 mm long. Umbels 7-flowered; peduncle terete or quadrangular, 2–9 mm long; pedicels absent or to 3 mm long. Buds ovoid or fusiform; operculum conical, 2–3 mm long and wide; hypanthium obconical, 2–3 mm long and wide. Fruits hemispherical, obconical or subcampanulate, 3–5 mm long, 3–6 mm wide; disc broad, ascending; valves 3 or 4, slightly exserted. *Camden Woollybutt*. Fig. 96E–F.

Occurs from near the Boyd R. in the Blue Mtns, southwards to Paddys R., N of Marulan, N.S.W., on flats and near watercourses in clay-loam and alluvial soil in open forest. Region: NEPN. Map 449.

N.S.W.: Paddys R., [Hume Hwy], *M.I.H.Brooker 4702* (AD, BRI, FRI, MEL, NSW, PERTH); 3.7 km NE of Moss Vale, *G.M.Chippendale 1000* & *R.Godenzi* (BRI, FRI, MEL, NSW).

Distinguished by tall tree habit, rough bark on trunk and larger branches, and small, sessile or shortly pedicellate buds and fruits in 7-flowered umbels.

421. *Eucalyptus smithii* R.Baker, *Proc. Linn. Soc. New South Wales* 24: 292 (1899)

E. viminalis var. *pedicellaris* F.Muell. ex Deane & Maiden, *Proc. Linn. Soc. New South Wales* 26: 141 (1901). T: Sugar Loaf Mtn, N.S.W., Aug. 1898, *W.Bäuerlen s.n.*; lecto: NSW, *vide* J.H.Maiden, *Crit. Revis. Eucalyptus* 2: 77 (1910); isolecto: K, MEL.

Illustrations: L.Costermans, *Native Trees & Shrubs S.E. Australia* 360 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 212 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 469 (1984).

Tree to 45 m. Bark rough, fibrous, grey or brown on most of trunk, then smooth and white or cream above. Juvenile leaves opposite, sessile, lanceolate, amplexicaul, green, discolorous, stems sometimes glaucous. Adult leaves alternate, narrowly lanceolate, acuminate; lamina 10–18 cm long, 0.7–1.5 cm wide, green, concolorous; lateral veins faint or distinct, at 20°–40°; intramarginal vein up to 1 mm from margin; petiole slightly flattened or terete, 7–20 mm long. Umbels 7-flowered; peduncles angular or flattened, 5–12 mm long; pedicels

2–6 mm long. Buds ovoid, clavate or fusiform; operculum conical, 2–4 mm long, 3–4 mm wide; hypanthium obconical, 2–3 mm long, 3–4 mm wide. Fruits ovoid or subglobular, 6–7 mm long, 3–4 mm wide; disc broad, ascending; valves 3 or 4, exserted. *Gully Gum*. Fig. 96G–H.

Occurs on the coastal side of the southern tablelands, N.S.W., and eastern Vic., on lower slopes, near watercourses and swamps and sometimes on scarps and ridges, in clay-loam and sandy loam in tall open forest. Regions: NEPN, HOWE. Map 450.

N.S.W.: 2.1 km E of Endrick R., *M.I.H. Brooker 3419* (AD, FRI, MEL, NSW); 3.2–4.8 km N of Narooma, *N. Hall 6* (BRI, FRI, NSW). Vic.: near Mt Skene, May 1973, *E. Chester* (MEL).

Distinguished from *E. macarthurii* in having smooth bark on the upper trunk and branches and pedicellate fruits, and from *E. viminalis* especially in the 7-flowered umbels.

The wood is hard and moderately durable, and has been used in general construction. The foliage has been used in oil distillation.

422. *Eucalyptus viminalis* Labill., *Nov. Holl. Pl.* 2: 12, t. 151 (1806)

T: Van Diemens Land [probably Recherche Bay, Tas.], 1793, *J.J.H. de Labillardière s.n.*; holo: FI; iso: L.

Tree to 50 m. Bark smooth throughout, grey, white or yellow-white, or rough, fibrous on lower or whole trunk, or rough to larger branches. Juvenile leaves opposite, sessile, lanceolate, cordate or amplexicaul, green, slightly discolorous. Adult leaves alternate, lanceolate or narrowly lanceolate, acuminate, green, concolorous. Umbels 3- or 7-flowered; pedicels absent or very short. Buds ovoid; operculum conical or hemispherical, apiculate; hypanthium hemispherical or campanulate. Fruits hemispherical to subglobular; disc broad, ascending; valves 3 or 4, exserted.

Occurs in south-eastern S.A., and from south-eastern Qld to Vic. and Tas. There are 2 subspecies.

Umbels 3-flowered; bark smooth throughout or sometimes rough at base

422a. subsp. *viminalis*

Umbels 7-flowered; bark rough on trunk and often on larger branches

422b. subsp. *cygnetensis*

422a. *Eucalyptus viminalis* Labill. subsp. *viminalis*

E. angustifolia Desf. ex Link, *Enum. Pl. Hort. Berolinensis* 2: 30 (1822). T: *n.v.*

E. viminalis var. *rhynchocorys* F. Muell. ex Maiden, *Forest Fl. New South Wales* 7: 131 (1820). T: Snowy R., Vic., *F. Mueller*; holo: MEL; iso: K, NSW.

[*E. pilularis* auct. non Smith: A.P. de Candolle, *Prodr.* 3: 218 (1828)]

Illustrations: L. Costermans, *Native Trees & Shrubs S.E. Australia* 360 (1981); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 213 (1983); D.J. Boland *et al.*, *Forest Trees Australia* 4th edn, 471 (1984).

Bark smooth throughout, white or yellow-white, or rough with undecorticated bark at base or on most of trunk. Adult leaves: lamina 12–20 cm long, 0.8–2 cm wide; lateral veins distinct, at 30°–50°; intramarginal vein up to 1 mm from margin; petiole terete or slightly flattened, 10–25 mm long. Umbels 3-flowered; peduncle angular or flattened, 4–8 mm long. Operculum 3–4 mm long, 3–5 mm wide; hypanthium 2–3 mm long, 3–5 mm wide. Fruits 5–8 mm long, 5–9 mm wide. *Manna Gum*. Fig. 96 I–J.

Occurs widely in the wetter parts of south eastern Australia from the Adelaide area, S.A., through Vic. and N.S.W. to south-eastern Qld, and throughout Tas. including King and Flinders Islands. Grows in varied situations from the coastal flats in Tas., valleys of mountainous and hilly country to tablelands, usually in tall open forest. Regions: EYRE, RIVR, OTWY, MCPH, NEPN, HOWE, TASM. Map 451.

S.A.: Marsh Swamp area, *I.B. Wilson 826* (AD, CANB). Qld: Pozieres, *L. Pedley 7407* (BRI, NSW). N.S.W.: Mittagong, Apr. 1929, *W.F. Blakely* (NSW). Vic.: Lakes Entrance, 15 Mar. 1930, *T.S. Hart* (MEL). Tas.: 9.7 km N of Wilmot, *N.T. Burbidge 3505* (CANB, HO, K).

Distinguished by smooth bark often with persistent old bark at base, long narrow leaves, 3-flowered umbels, and sessile or shortly pedicellate fruits with broad, ascending disc. An important forest tree in south-eastern Australia; the wood has been used for building frames, flooring, panelling, joinery and pulp. The trees produce good nectar and pollen for honey production.

422b. *Eucalyptus viminalis* subsp. *cygnetensis* Boomsma, *J. Adelaide Bot. Gard.* 2: 295 (1980)

T: Cygnet R., Kangaroo Is., S.A., 10 Dec. 1979, *R.C.Hagerstrom & C.D.Boomsma 510*; holotype: AD.

[*E. huberiana* auct. non Naudin: W.F.Blakely, *Key Eucalypts* 163 (1934); *E. viminalis* var. *huberiana* (Naudin) N.Burb., *Trans. & Proc. Roy. Soc. S. Australia* 71: 147 (1947) *p.p.* not as to basionym]

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 133 (1974); C.D.Boomsma, *op. cit.* 294; M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 214 (1983).

Bark rough, thick, fibrous on trunk and larger branches, grey-brown, then smooth and grey-white above. Adult leaves: lamina 12–18 cm long, 1.9–2.5 cm wide; lateral veins just visible, at 30°–40°; intramarginal vein up to 2 mm from margin; petiole terete or slightly flattened, 10–15 mm long. Umbels 7-flowered; peduncle terete, 5–13 mm long. Operculum 4–5 mm long, 3–4 mm wide; hypanthium 2–3 mm long, 3–4 mm wide. Fruits 4–6 mm long, 5–8 mm wide. *Rough-barked Manna Gum*. Fig. 96K–L.

Occurs in the southern Eyre Peninsula and Kangaroo Is., S.A., E to the southern Grampians, Vic. Grows on flat and gently undulating country in podsols, alluvial and volcanic soils, in open forest and open woodland. Regions: EYRE, RIVR, OTWY. Map 452.

S.A.: Myponga, *M.I.H.Brooker 5943* (AD, FRI, NSW); 8.8 km SW of Victor Harbor, *G.M.Chippendale 1344* & *M.J.Brennan* (AD, BRI, FRI, K, MEL, NSW, PERTH). Vic.: 5.1 km SW of Digby, *G.M.Chippendale 1314* & *M.J.Brennan* (AD, BRI, FRI, MEL, NSW, K).

Differs from subsp. *viminalis* in having rough bark on the trunk and larger branches and 7-flowered umbels.

423. *Eucalyptus pryoriana* L.Johnson, *Contr. New South Wales Natl Herb.* 3: 115 (1962)

E. viminalis var. *racemosa* F.Muell. ex Blakely, *Key Eucalypts* 162 (1934). T: Port Phillip, Vic., Feb. 1880, ?*F.Mueller*; lecto: NSW, *fide* L.A.S.Johnson, *loc. cit.*

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 89 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 122 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 215 (1983).

Tree to 15 m. Bark rough, fibrous, thick, dark grey-brown on trunk and larger branches, then smooth, white-grey or pink above. Juvenile leaves opposite, sessile, lanceolate, sometimes amplexicaul, green, discolorous. Adult leaves alternate, narrowly lanceolate, acuminate; lamina 10–18 cm long, 0.8–2 cm wide, green, concolorous; lateral veins faint, at 30°–40°; intramarginal vein up to 2 mm from margin; petiole slightly flattened, 8–15 mm long. Umbels 3-flowered; peduncle slightly flattened, 5–10 mm long; pedicels absent or to 2 mm long. Buds ovoid; operculum conical, 2–5 mm long, 3–5 mm wide; hypanthium hemispherical or campanulate, 2–4 mm long, 3–5 mm wide. Fruits hemispherical, 5–7 mm long, 6–8 mm wide; disc narrow, convex or ascending; valves 3 or 4, level or slightly exserted. *Gippsland Manna Gum*. Fig. 96M–N.

Occurs in southern coastal Vic., in gently undulating country in sandy and podsolic soil in open, dry sclerophyll forest. Regions: HOWE, OTWY. Map 453.

Vic.: Paynesville, *M.J.Brennan* & *G.M.Chippendale 990* (AD, BRI, FRI, MEL); 6.4 km N of Bass, *D.V.Young 300* (FRI, MEL).

Closely related to *E. viminalis* subsp. *viminalis*; distinguished by rough bark on trunk and larger branches.

424. *Eucalyptus wilcoxii* Boland & Kleinig, *Brunonia* 6: 241 (1983)

T: Mother Woila Mtn, Deua Natl Park, N.S.W., 26 Mar. 1982, *D.J.Boland J1714*; holo: FRI; iso: NSW, K.

Illustration: D.J.Boland & D.A.Kleinig, *op. cit.* 243, 246, 247 (1983).

Mallee or tree to 10 m. Bark smooth throughout, olive green-yellow. Juvenile leaves alternate, petiolate, narrowly elliptic to elliptic, blue-green, slightly discolorous to concolorous. Adult leaves alternate, narrowly lanceolate, usually falcate, acuminate; lamina 7–13 cm long, 0.8–1.6 cm wide, blue-green, concolorous; lateral veins faint, at 25°–35°; intramarginal vein up to 1 mm from margin; petiole slightly flattened or terete, 6–13 mm long. Umbels 3-flowered; peduncle angular, 2–5 mm long; pedicels 1–5 mm long. Buds pyriform or cylindrical, rostrate, green or glaucous when dried; operculum conical, 2–3 mm long, c. 3 mm wide; hypanthium obconical or urceolate, c. 5 mm long, c. 4 mm wide. Fruits cylindrical, hemispherical or campanulate, 4–6 mm long, 5–7 mm wide; disc narrow, slightly descending; valves 3–5, usually 4, slightly exserted. Fig. 96 O–P.

Restricted to 2 small populations, in Deua and Wadbilliga Natl Parks on the southern tablelands escarpment E of Cooma, N.S.W., in skeletal soils on scree slopes. Region: HOWE. Map 454.

N.S.W.: Mother Woila Mtn, *D.J.Boland J1872* (FRI, NSW); Mother Woila Mtn, *I.Olsen 2056* (NSW).

Distinguished by small tree or mallee habit, smooth olive green-yellow bark throughout, narrowly lanceolate leaves with prominent oil glands, 3-flowered umbels, pyriform or cylindrical, rostrate buds and shortly pedicellate, hemispherical, cylindrical or campanulate fruits and restricted distribution. The populations lie within Deua and Wadbilliga Natl Parks.

425. *Eucalyptus badjensis* Beuzev. & Welch, *J. & Proc. Roy. Soc. New South Wales* 58: 177 (1924)

T: 3 miles [c. 5 km] S of Big Badja Mtn, N.S.W., Jan. 1924, *W.A.W. de Beuzeville s.n.*; holo: NSW.

Illustrations: D.Boland & N.Hall, *Forest Tree Ser.* No. 188 (1975); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 216 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 475 (1984).

Tree to 45 m. Bark rough, compact, hard, grey-brown on lower trunk, then smooth and white-green to light brown-grey above. Juvenile leaves opposite, sessile, sometimes amplexicaul, lanceolate, green, slightly discolorous. Adult leaves alternate, narrowly lanceolate, acuminate; lamina 8.5–20 cm long, 0.7–1.5 cm wide, dull, green, concolorous; lateral veins faint, at 25°–40°; intramarginal vein up to 1 mm from margin; petiole terete or slightly flattened, 6–12 mm long. Umbels 3-flowered; peduncle angular, 2–5 mm long; pedicels absent or rarely to 1 mm long. Buds ovoid, sometimes slightly angular; operculum conical, 1–2 mm long, 2–3 mm wide; hypanthium cylindrical to obconical, 2–3 mm long and wide. Fruits obconical or campanulate, with flared rim, 3–5 mm long, 3–6 mm wide; disc moderately broad, convex or ascending; valves 3 or 4, exserted. *Big Badja Gum*. Fig. 96Q–R.

Occurs in discrete stands on the eastern edge of the southern tablelands, from Big Badja Mtn to Mt Darragh, N.S.W., on tableland slopes, hillsides and plateaus in fertile and stony soils in tall open forest. Region: HOWE. Map 455.

N.S.W.: 1 km W of Mt Darragh, *M.I.H.Brooker 5050* (AD, BRI, FRI, NSW, NT); 1.4 km at 193° from Dampier trig., *M.D.Crisp 2384* (AD, CBG, NSW).

Distinguished from *E. wilcoxii* by the compact rough bark on lower trunk, and from *E. baeuerlenii* by the narrower leaves, smaller buds, and fruits with flared rims. In habit resembles *E. elata*, but that species has larger umbels with long-pedicellate rounded buds and fruits.

426. *Eucalyptus baeuerlenii* F.Muell., *Victorian Naturalist* 7: 76 (1890)

E. viminalis var. *baeuerlenii* (F.Muell.) Deane & Maiden, *Proc. Linn. Soc. New South Wales* 26: 142 (1901). T: Sugar Loaf Mtn towards sources of the Clyde R., N.S.W., 1890, *W.Bäuerlen s.n.*; holo: MEL; iso: K.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 92 (1973); N.C.W.Beadle *et al.*, *Fl. Sydney Region* 3rd edn, 316 (1982); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 217 (1983).

Mallee to 9 m, or occasionally tree to 18 m. Bark smooth throughout, red to grey-red, cream-green or brown. Juvenile leaves opposite, sessile, broadly lanceolate, green, discolorous. Adult leaves alternate, lanceolate, often falcate, acuminate, thin; lamina 9–15 cm long, 1–2.5 cm wide, green, concolorous; lateral veins faint, at 25°–35°; intramarginal vein up to 1 mm from margin; petiole terete or channelled, 7–17 mm long. Umbels 3-flowered; peduncle slightly angular or flattened, 1–5 mm long; pedicels absent. Buds subpyriform, often rostrate, sometimes warty; operculum conical to rostrate, 3–4 mm long, 4–6 mm wide; hypanthium cylindrical to obconical, 4–5 mm long, 4–6 mm wide. Fruits campanulate, often 1-ribbed, with flared rim, 6–9 mm long, 6–10 mm wide; disc narrow to moderately broad, level to slightly ascending; valves 3 or 4, exserted. Fig. 96S–T.

Occurs in N.S.W., disjunctly in the Blue Mtns and on the southern tablelands escarpment on the Budawang Ra. and near Mother Woila Mtn, in skeletal soils on plateaus and steep upper mountain slopes in open forest. Regions: NEPN, HOWE. Map 456.

N.S.W.: Sugarloaf Mtn, *G.M.Chippendale* 825 (AD, BRI, FRI, MEL, NSW); National Pass, Wentworth Falls, *R.Coveny* 4777 & *Miss Bowden* (BRI, FRI, MEL, NSW).

Distinguished by usually mallee habit, smooth bark, thin leaves, 3-flowered umbels, sessile warty buds with usually rostrate operculum and sessile, campanulate fruits. A rare species but conserved in several national parks.

427. *Eucalyptus benthamii* Maiden & Cambage, *J. & Proc. Roy. Soc. New South Wales* 48: 418 (1915)

T: Nepean R. near Cobbitty, N.S.W., June 1913, *J.H.Maiden & R.H.Cambage s.n.*; holo: NSW; iso: BM.

Tree to 40 m. Bark smooth throughout, cream, white or grey, or with c. 1 m of undecorticated bark at trunk base. Juvenile leaves opposite, sessile, elliptic, ovate or broadly lanceolate, glaucous, discolorous. Adult leaves alternate, lanceolate, acuminate, green or grey-green, dull, thin, concolorous; lateral veins distinct, at 20°–40°; intramarginal vein up to 1 mm from margin; petiole slightly flattened or terete. Umbels 7-flowered; pedicels absent or very short. Buds ovoid or clavate. Fruits campanulate, obconical or hemispherical; disc narrow, level or slightly ascending; valves 3 or 4, slightly exserted.

Occurs in the Dorrigo area, and along the Nepean R., N.S.W. Distinguished from related species by the 7-flowered umbels. Buds and fruits smaller than in *E. dalrympleana*. There are two varieties.

Operculum hemispherical to almost conical; buds sessile or shortly pedicellate (Nepean R. area)

427a. var. *benthamii*

Operculum conical; buds shortly pedicellate (Dorrigo area)

427b. var. *dorrigoensis*

427a. *Eucalyptus benthamii* Maiden & Cambage var. *benthamii*

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 57 (1973); N.C.W.Beadle *et al.*, *Fl. Sydney Region* 3rd edn, 324 (1982); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 218 (1983).

Juvenile leaves elliptic to ovate. Adult leaves: lamina 8–13 cm long, 1.5–2 cm wide, green; petiole 10–20 mm long. Peduncle terete, 5–6 mm long; pedicels absent or 1–2 mm long. Buds sometimes glaucous; operculum hemispherical to almost conical, 1–2 mm long, 2–3 mm wide; hypanthium hemispherical to obconical, 2–3 mm long and wide. Fruits campanulate, 4–5 mm long and wide. *Nepean River Gum*. Fig. 96U–V.

Occurs in the Camden area on flats and levee banks of the Nepean R., N.S.W., in alluvial soil. The area is largely cleared for agricultural and pastoral use, so the present limited populations are remnants of woodlands or forests. Region: NEPN. Map 457.

N.S.W.: The Oaks, W.A.W. *de Beuzeville* 125 (FRI, NSW); Nepean R. crossing, Camden, M.I.H. *Brooker* 3273 (AD, BRI, FRI, MEL, NSW).

Distinguished by smooth bark, thin green leaves, hemispherical or almost obconical operculum and campanulate fruits.

427b. *Eucalyptus benthamii* var. *dorrigoensis* Blakely, *Key Eucalypts* 162 (1934)

T: Wild Cattle Ck. and Megan, Dorrigo, N.S.W., Jan. & Sept. 1931, W.A.W. *de Beuzeville*; syn: FRI, NSW (4 sheets); Dorrigo, N.S.W., Mar. 1920, D.C. *Kennedy*; syn: NSW (several sheets).

Illustrations: N.C.W. *Beadle*, *Stud. Fl. N.E. New South Wales* 3: 469 (1976); M.I.H. *Brooker* & D.A. *Kleinig*, *Field Guide to Eucalypts* 1: 219 (1983).

Juvenile leaves ovate to broadly lanceolate. Adult leaves: lamina 8–16 cm long, 1.5–3 cm wide, green or grey-green; petiole 14–22 mm long. Peduncle angular, 4–6 mm long; pedicels 1–2 mm long. Buds not glaucous; operculum conical, 1–2 mm long, 2–3 mm wide; hypanthium obconical or hemispherical, 2–3 mm long and wide. Fruits obconical to hemispherical, 4–5 mm long and wide. *Dorrigo White Gum*. Fig. 96W–X.

Occurs near Dorrigo, N.S.W., in deep soils on the tablelands and valleys, in tall forest. Region: MCPH. Map 458.

N.S.W.: c. 2 km up Moonbar road, M.I.H. *Brooker* 6079 (FRI, NSW); 5 km NE of Dorrigo, R.D. *Johnston* & G.M. *Chippendale* 493 (BRI, FRI, MEL, NSW).

Distinguished from var. *benthamii* in the conical, slightly more acute operculum and the usually more distinct pedicels.

428. *Eucalyptus kartzoffiana* L. Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4: 455 (1973)

T: c. 4 miles [6.5 km] N of Araluen (on Braidwood road), N.S.W., 5 Jan. 1968, L.A.S. *Johnson* NSW 132571; holo: NSW; iso: FRI.

Illustrations: E.G. *Cole* & N. *Hall*, *Forest Tree Ser.* No. 186 (1975); L. *Costermans*, *Native Trees & Shrubs S.E. Australia* 362 (1981); M.I.H. *Brooker* & D.A. *Kleinig*, *Field Guide to Eucalypts* 1: 220 (1983).

Tree to 30 m. Bark rough, scaly, light grey-brown on trunk to 4 m, then smooth and white to grey above. Juvenile leaves opposite, sessile, ovate, cordate, glaucous, discolourous. Adult leaves alternate, narrowly lanceolate to lanceolate, acuminate; lamina 8–20 cm long, 1–2 cm wide, dull, green or blue-green, concolorous; lateral veins faint, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole flattened, 17–30 mm long. Umbels 3-flowered; peduncle flattened, broadened upwards, 3–5 mm long; pedicels absent. Buds cylindrical, glaucous; operculum conical, c. 2 mm long, 3–4 mm wide; hypanthium cylindrical, 3–5 mm long, 3–4 mm wide. Fruits campanulate, glaucous, 5–7 mm long and wide; rim flared; disc narrow, slightly ascending; valves 3 or 4, exserted. *Araluen Gum*. Fig. 96Y–Z.

Occurs between Majors Creek and the Araluen Valley, N.S.W., on dry, steep valley slopes in granitic soil in sclerophyll forest. Region: HOWE. Map 459.

N.S.W.: Moodong Ck, 20.9 km S of Majors Creek, L.G. *Adams* 2003 (AD, BRI, CANB, FRI, NSW); 2.4 km NW of Araluen Ck, M.I.H. *Brooker* 3292 (AD, BRI, FRI, MEL, NSW).

Distinguished by variably rough bark on at least part of trunk, glaucous branchlets, 3-flowered umbels, sessile often glaucous buds, short flattened peduncle, and campanulate fruits.

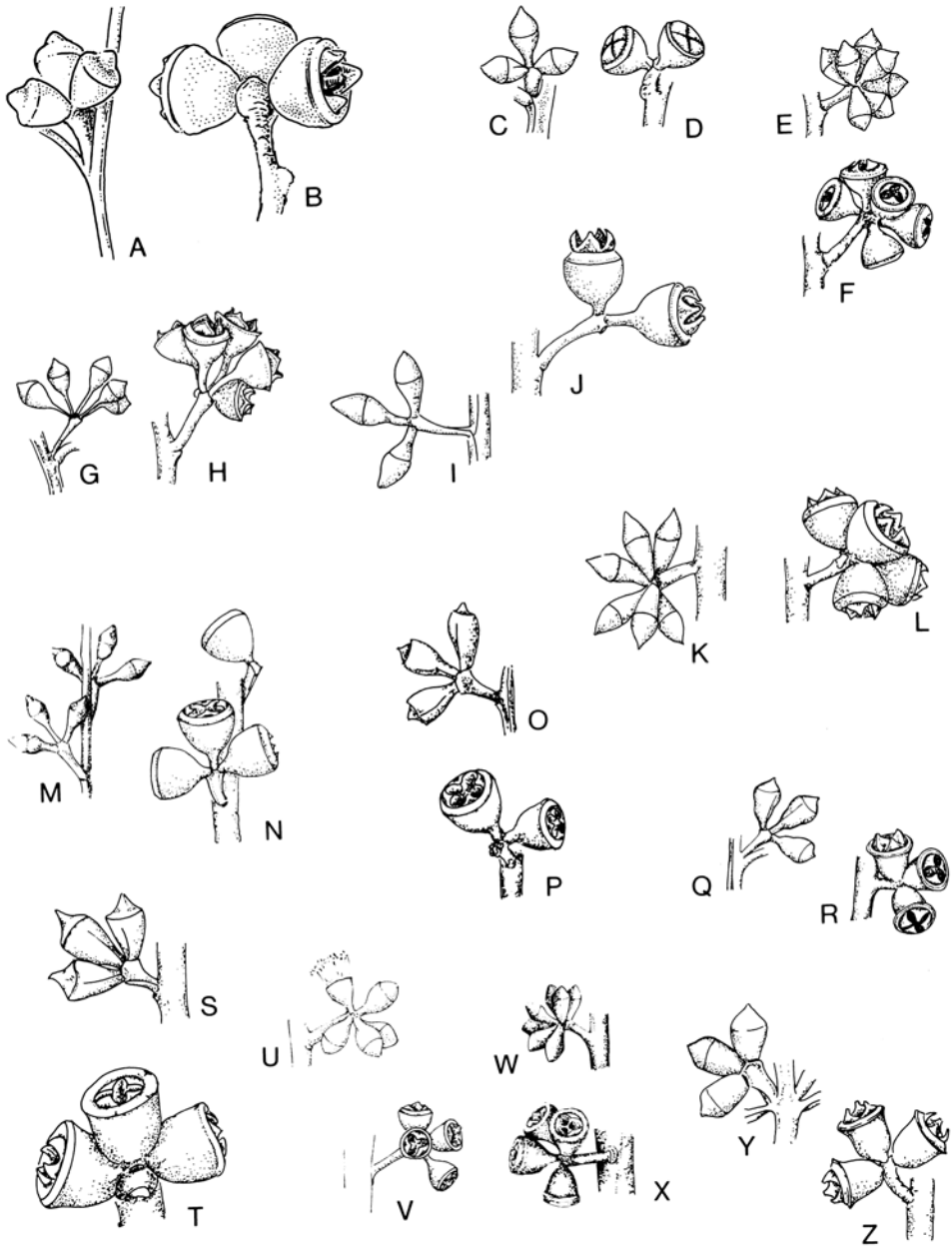


Figure 96. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. johnstonii* (G.Chippendale 1191 & A.Gray, FRI) **C–D**, *E. imlayensis* (I.Brooker 6018, FRI). **E–F**, *E. macarthurii* (E, D.Kleinig 270, FRI; F, D.Kleinig 277, FRI). **G–H**, *E. smithii* (I, I.Brooker 5986, FRI). **I–J**, *E. viminalis* subsp. *viminalis* (N.Brown 426, FRI). **K–L**, *E. viminalis* subsp. *cygnetensis* (**K**, D.Young 286, FRI; **L**, J.Briggs 416, FRI). **M–N**, *E. pryoriana* (**M**, between Rosedale & Longford, Vic., K.Eldridge, FRI; **N**, I.Brooker 5457, FRI). **O–P**, *E. wilcoxii* (D.Boland 1889, FRI). **Q–R**, *E. badjensis* (**Q**, I.Brooker 5050, FRI; **R**, I.Brooker 5436, FRI). **S–T**, *E. bauerlenii* (G.Chippendale 826, FRI). **U–V**, *E. benthamii* var. *benthamii* (**U**, I.Brooker 3009, FRI; **V**, J.Briggs 431, FRI). **W–X**, *E. benthamii* var. *dorrigoensis* (W. de Beuzeville 313, FRI). **Y–Z**, *E. kartzoffiana* (**Y**, P.Martensz 939, FRI; **Z**, I.Brooker 3292, FRI). **M** drawn by C.Stahl. **A, B** drawn by M.Risby. Others drawn by M.May.

429. *Eucalyptus dalrympleana* Maiden, *Forest Fl. New South Wales* 7: 137 (1920)

T: Peppercorn Plain, Yarrangobilly, N.S.W., Jan. 1920, W.A.W. de Beuzeville 1, 2, 3; holo: NSW.

Tree to 40 m. Bark smooth throughout, blotched white and grey to yellow-white, and sometimes pink, green to olive, and often with c. 1 m of accumulated undecorticated bark at trunk base. Juvenile leaves opposite, sessile, amplexicaul, orbicular to ovate, light green to subglaucous, concolorous. Adult leaves alternate, narrowly lanceolate to lanceolate, acuminate, sometimes undulate, green, often shining, concolorous; lateral veins conspicuous, at 30°–45°; intramarginal vein up to 1 mm from margin; petiole terete, 15–27 mm long. Umbels 3- or 7-flowered; peduncle angular or slightly flattened; pedicels absent or 1–4 mm long. Buds ovoid; operculum conical or sometimes almost hemispherical; hypanthium hemispherical to obconical. Fruits hemispherical, ovoid or campanulate; disc moderately broad, ascending, convex or sometimes \pm level; valves 3 or 4, exserted.

Occurs on the tablelands of N.S.W., extending to Vic. and eastern Tas. Most closely related to *E. rubida* but is a larger tree with greener juvenile leaves. There are 2 subspecies.

Umbels 3-flowered

429a. subsp. *dalrympleana*

Umbels 7-flowered

429b. subsp. *heptantha*

429a. *Eucalyptus dalrympleana* Maiden subsp. *dalrympleana*

Illustrations: L.Costermans, *Native Trees & Shrubs S.E. Australia* 361 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 221 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 477 (1984).

Adult leaves: lamina 10–20 cm long, 1.5–2.5 cm wide. Umbels 3-flowered; peduncle 3–8 mm long. Operculum 2–4 mm long, 3–5 mm wide; hypanthium 3–4 mm long, 3–5 mm wide. Fruits 5–8 mm long, 5–9 mm wide. *Mountain Gum*. Fig. 97A–B.

Occurs from the central tablelands of N.S.W. southwards through the southern tablelands including the Australian Alps, westwards to The Grampians, Vic., and in eastern Tas. Grows in sandy to clay soils on upper slopes in mountain forest. Regions: NEPN, HOWE, OTWY, TASM. Map 460.

N.S.W.: 12.9 km E of Michelago, M.I.H.Brooker 2982 (BRI, FRI); 14.5 km W of Wombeyan Caves, R.T.Eakin 63 (FRI, MEL, NSW). Vic.: Gobur, 23 Sept. 1935, R.A.Black (MEL); S of Macallister R., 2 Apr. 1956, F.M.Reader (MEL). Tas.: 25 km NW of Bothwell, G.M.Chippendale 1158 & A.M.Gray (FRI, HO, NSW).

Distinguished by tall tree habit, smooth bark, shining undulate leaves, and 3-flowered umbels.

429b. *Eucalyptus dalrympleana* subsp. *heptantha* L.Johnson, *Contr. New South Wales Natl Herb.* 3: 110 (1962)

T: Wandsworth to Moredun Ck, N.S.W., 23 May 1957, L.A.S.Johnson NSW 41849; holo: NSW; iso: FRI, K.

Illustrations: N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 3: 468 (1976); S.Kelly *et al.*, *Eucalypts* 2: t. 107 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 222 (1983).

Tree to 30 m. Adult leaves: lamina 10–22 cm long, 1.5–3 cm wide. Umbels 7-flowered; peduncle 4–7 mm long. Operculum 2–4 mm long, 3–4 mm wide; hypanthium 2–3 mm long, 3–4 mm wide. Fruits 5–7 mm long and wide. *Mountain Gum*. Fig. 97C–D.

Occurs on the northern tablelands, N.S.W., in sandy and stony soil on high ridges and slopes in woodland and forest. Region: MCPH. Map 461.

N.S.W.: 2.3 km N of Torrington, R.Coveny 5194 (AD, BRI, FRI, MEL, NSW, PERTH); Ben Lomond, Dec. 1899, J.H.Maiden (NSW).

Distinguished by the 7-flowered umbels. Resembles *E. benthamii* var. *dorrigensis* but has larger fruits.

430. *Eucalyptus rubida* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 24: 456 (1899)

E. gunnii var. *rubida* (Deane & Maiden) Maiden, *Proc. Linn. Soc. New South Wales* 26: 561, 562, 577 (1902). T: Jindabyne, N.S.W., Jan. 1898, *J.H.Maiden*; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 3: 123 (1916).

Illustrations: C.D.Boomsma, *Native Trees S. Australia* 169 (1972); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 223 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 479 (1984).

Tree to 40 m. Bark smooth throughout, white or red to red-brown, often with horizontal, dark, insect scars. Juvenile leaves opposite, sessile, orbicular, amplexicaul, glaucous, concolorous. Adult leaves alternate, lanceolate to narrowly lanceolate, acuminate; lamina 9–15 cm long, 0.8–2.4 cm wide, glaucous or dull, green, concolorous; lateral vein distinct, at 30°–40°; intramarginal vein to 2 mm from margin; petiole terete, 13–25 mm long. Umbels 3-flowered; peduncle slightly angular or flattened, 3–8 mm long; pedicels absent or to 3 mm long. Buds ovoid, often glaucous; operculum conical, 2–3 mm long, 4–5 mm wide; hypanthium hemispherical, 2–4 mm long, 4–5 mm wide. Fruits hemispherical to subglobose, often glaucous, 4–6 mm long, 5–7 mm wide; disc broad, ascending; valves 3 or 4, exserted. *Candlebark*. Fig. 97E–F.

Occurs widely from the northern tablelands of N.S.W. southwards to eastern Vic. including lower hills of the Australian Alps, and on the plateau area of eastern Tas., with outliers in the Mt Lofty Ra. and several nearby places, S.A. Grows on tablelands, hills and slopes in shallow soils in woodland and open forest. Regions: MCPH, NEPN, HOWE, OTWY, EYRE, TASM. Map 462.

S.A.: Stirling West, 11 Oct. 1965, *E.H.Ising* (AD, FRI). N.S.W.: 8 km NE of Michelago, *G.M.Chippendale* 721 (FRI, MEL, NSW, PERTH); Moredun Ck, *L.A.S.Johnson* & *D.J.McGillivray* 2445 (NSW). Vic.: 27.4 km from Wodonga towards Bogong, *M.I.H.Brooker* 4357 (AD, FRI, MEL, NSW). Tas.: 2.9 km W of Karanja, *G.M.Chippendale* 1180 & *A.M.Gray* (BRI, FRI, HO, MEL, NSW).

Recognised by tall tree habit, smooth white bark but often with red to red-brown old patches and with horizontal insect scars on the lower trunk, 3-flowered umbels and sessile or shortly pedicellate buds. Differs from *E. dalrympleana* mainly in bark colour and glaucous juvenile leaves. The wood is tough but not durable and is useful for fencing. The trees produce nectar for honey production.

431. *Eucalyptus chapmaniana* Cameron, *Victorian Naturalist* 64: 52 (1947)

T: State Electricity Commission private road to Pretty Valley, 2–3 miles [c. 3–5 km] above Bogong, Vic., 2 Mar. 1947, *A.K.Cameron s.n.*; holotype: MEL; isotype: BRI, K.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 86 (1973); L.Costermans, *Native Trees & Shrubs S.E. Australia* 362 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 224 (1983).

Tree to 30 m. Bark rough, fibrous, brown-grey, longitudinally fissured on at least half the trunk, then smooth and white-grey above. Juvenile leaves opposite, sessile, orbicular, glaucous, slightly discolorous. Adult leaves alternate, lanceolate, sometimes falcate, acute; lamina 18–30 cm long, 2.5–4 cm wide, dull, grey-green, concolorous; lateral veins distinct, at 25°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 18–35 mm long. Umbels 3-flowered; peduncle angular or flattened, 6–8 mm long; pedicels 2–4 mm long. Buds clavate or fusiform, glaucous; operculum conical, 3–5 mm long and wide; hypanthium obconical, 3–4 mm long, 3–5 mm wide. Fruits ovoid, glaucous, 8–12 mm long, 8–10 mm wide; disc broad, ascending; valves 3 or 4, exserted. *Bogong Gum*. Fig. 97G–H.

Occurs from Khancoban State Forest, N.S.W., to the Upper Kiewa and Mt Bogong areas, Vic., on mountain slopes in podsolic soil in wet sclerophyll forest. Region: HOWE. Map 463.

N.S.W.: 5.1 km from Cabramurra towards Khancoban, *M.I.H.Brooker* 5826 (FRI). Vic.: 3.2 km S of Bogong, *N.Hall* 72/42 (BRI, FRI, MEL, NSW, PERTH); 12.1 km S of Harrietville, 13 Feb. 1966, *J.H.Willis* (K, MEL).

Distinguished by rough bark on at least part of trunk, long leaves, 3-flowered glaucous umbels and relatively large fruits with a prominent ascending disc.

432. *Eucalyptus glaucescens* Maiden & Blakely, *Crit. Revis. Eucalyptus* 8: 56 (1929)

T: Tingiringi [Tingaringy] Mtn, Vic., 20 June 1887, *W.Bauerlen s.n.*; holotype: NSW.

E. gunnii var. *glauca* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 24: 464 (1899) *p.p.* T: Mt. Baw Baw, Vic., *F.Mueller*; syn: MEL, NSW; Nimbo Stn, head of Queanbeyan R., N.S.W., *H.Deane*; syn: MEL.

[*E. gunnii* auct. non J.D.Hook.: A.J.Ewart, *Fl. Victoria* 811 (1931)]

Illustrations: N.Hall, *Forest Tree Ser.* No. 8 (1970); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 225 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 481 (1984).

Tree to 45 m, or mallee to 12 m. Bark rough, fibrous, dark grey on lower trunk of larger trees, then smooth and green-grey above, or more or less smooth throughout on smaller trees and mallees. Juvenile leaves opposite, sessile, orbicular, amplexicaul, emarginate, slightly glaucous, concolorous. Adult leaves alternate, lanceolate, acute; lamina 6–13 cm long, 1.2–2 cm wide, dull, green or grey-green, concolorous; lateral veins just visible, at 35°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 15–25 mm long. Umbels 3-flowered; peduncle terete, 2–6 mm long; pedicels absent or obscured. Buds cylindrical, glaucous or shiny; operculum conical or slightly rostrate, 2–3 mm long, 3–4 mm wide; hypanthium cylindrical, 3–4 mm long and wide. Fruits cylindrical to slightly ovoid, often glaucous, 6–12 mm long, 6–10 mm wide; disc narrow, level or convex to descending; valves 3 or 4, just included. *Tingiringi Gum*. Fig. 97 I–J.

Occurs in south-eastern N.S.W. and A.C.T., in the Tidbinbilla and Tinderry Ranges, and in high mountains southwards including Mt Tingaringy, Mt Baw Baw and Mt Erica, Vic., often in skeletal or peaty soils on steep, rocky mountain areas, in woodland or forest. Region: HOWE. Map 464.

N.S.W.: Tinderry Ra., *A.R.Crawford & R.Coveny 5450* (AD, BRI, FRI, MEL, NSW, PERTH). Vic.: Mt Stradbroke, 23 Feb. 1962, *J.H.Willis* (MEL).

Distinguished from related species especially by the larger, cylindrical glaucous fruits.

433. *Eucalyptus gunnii* J.D.Hook., *London J. Bot.* 3: 499 (1844)

E. gunnii var. *montana* J.D.Hook., *Bot. Mag.* 127: t. 7808 (1901) *nom. illeg. p.p.* not as to description. T: Lake Arthur, Tas., 18 Feb. 1843, *R.Gunn 1080*; syn: BM, HO, K; Lake Arthur, Tas., 18 Feb. 1843, *R.Gunn 1082*; syn: K; Lake Arthur, Tas., 18 Feb. 1843, *R.Gunn 1084*; syn: BM, CGE, HO, K, NSW.

E. whittingehamei Landsborough, *Trans. Proc. Bot. Soc. Edinburgh* 20: 516 (1896). T: from seed from Australia, sown 1845; possible holotype: cultivated at Whittingeham, Scotland, 12 Mar. 1888, *A.J.Gray*; K.

E. divaricata McAulay & Brett ex Brett, *Proc. Roy. Soc. Tasmania for 1937*: 94 (1938). T: not designated.

Illustrations: W.M.Curtis, *Stud. Fl. Tasmania* 1: 212 (1956); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 227 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 483 (1984).

Tree to 25 m. Bark smooth throughout, white, grey or grey-green, or sometimes c. 1 m of persistent or undecorticated, flaky bark at trunk base. Juvenile leaves opposite, sessile, ovate to orbicular, amplexicaul, crenulate, emarginate, grey-green, slightly discolourous. Adult leaves alternate, elliptic or ovate to broadly lanceolate, acuminate or apiculate; lamina 5–8 cm long, 1.2–3 cm wide, grey-green, concolorous; lateral veins faint, at 30°–45°; intramarginal vein up to 1 mm from margin; petiole terete, 11–20 mm long. Umbels 3-flowered; peduncle slightly angular, 5–9 mm long; pedicels absent or 1–2 mm long. Buds clavate to subcylindrical, usually glaucous; operculum hemispherical, slightly umbonate, 2–3 mm long, 3–5 mm wide; hypanthium obconical, 4–5 mm long, 3–5 mm wide. Fruits cylindrical or suburceolate, usually glaucous, 6–9 mm long, 4–7 mm wide; disc broad, level or slightly descending; valves 3 or 4, included. *Cider Gum*. Fig. 97K–L.

Occurs on the central plateau and near Hobart, Tas., on poorly drained flats, valleys and plateaus, in alpine humus soil among rocks, in woodlands and open woodland. Region: TASM. Map 465.

Tas.: 6.4 km S of Moina, *N.T.Burbidge* 3539 (CANB, HO, K); 6.3 km SE of Miena, *A.M.Gray & G.M.Chippendale* 1161 (FRI, HO).

Distinguished from *E. glaucescens* by the slightly discoloured juvenile leaves, usually longer peduncle, hemispherical operculum and usually smaller, less glaucous fruits. Has been grown outside in Britain. For discussion of intergradation with *E. archeri*, see B.M.Potts & J.B.Reid, Variation in the *Eucalyptus gunnii-archeri* complex. I. Variation in the adult phenotype, *Austral. J. Bot.* 33: 337–359 (1985).

434. *Eucalyptus archeri* Maiden & Blakely, *Crit. Revis. Eucalyptus* 8: 58 (1929)

T: Western Mts, Tas., Jan. 1848, *W.H.Archer*; holo: NSW; iso: FRI.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 54 (1972); S.Kelly *et al.*, *Eucalypts* 2: t. 117 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 228 (1983).

Mallee or straggly tree to 9 m. Bark usually smooth throughout, white, grey or grey-green, sometimes accumulated decorticate bark at trunk base. Juvenile leaves opposite, sessile, ovate, rounded, sometimes apiculate, grey-green, concolorous. Adult leaves alternate, lanceolate, acuminate, thick; lamina 5–8 cm long, 1–2 cm wide, grey-green, concolorous; lateral veins faint, at 40°–50°; intramarginal vein up to 2 mm from margin; petiole terete, 10–15 mm long. Umbels 3-flowered; peduncle flattened, thick, 1–4 mm long; pedicels absent. Buds obovoid; operculum hemispherical, slightly apiculate, 2–3 mm long, 4–5 mm wide; hypanthium hemispherical to obconical, 3–4 mm long, 4–5 mm wide. Fruits hemispherical or subcampanulate, slightly wrinkled, 6–8 mm long and wide; disc moderately broad, descending; valves 3 or 4, level or included. *Alpine Cider Gum*. Fig. 97M–N.

Occurs on the central plateau just N of the Great Lake and in the Ben Lomond Natl Park, Tas., in shallow soil among rock outcrops on plateaus and mountain tops as scattered specimens and in very open woodland. Region: TASM. Map 466.

Tas.: 4.8 km N of Breona, *G.M.Chippendale* 1164 & *A.M.Gray* (AD, FRI, HO, MEL, NSW); Mt Maurice, Aug. 1963, *W.Jackson* (HO).

Very similar to *E. gunnii* but of a more straggly habit, with thick lanceolate leaves, a short thick peduncle and slightly wrinkled fruits.

435. *Eucalyptus saxatilis* Kirkpatr. & Brooker, *Austral. Forest Res.* 7: 209 (1977)

T: Little R. Gorge, Vic., 37°05'S, 148°18'E, 18 Sept. 1975, *M.I.H.Brooker* 4967; holo: FRI; iso: AD, BRI, K, MEL, NSW, PERTH.

Illustrations: M.I.H.Brooker, *op. cit.* 210, 212; D.J.Boland & M.I.H.Brooker, *Forest Tree Ser.* No. 212 (1978); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 226 (1983).

Mallee or small tree to 10 m. Bark smooth throughout, yellow-orange to grey or grey-green, often accumulated decorticate bark at trunk base. Juvenile leaves opposite, sessile, ovate to orbicular, sometimes emarginate, subglaucous, discoloured. Adult leaves alternate, lanceolate, often falcate, acuminate; lamina 10–15 cm long, 1–2 cm wide, dull, blue-grey or subglaucous, concolorous; lateral veins faint, at 20°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 10–20 mm long. Umbels 3-flowered; peduncle terete, thick, glaucous, 3–5 mm long; pedicels absent. Buds turbinate, glaucous; operculum low-hemispherical, rostrate, 2–4 mm long, 5–7 mm wide; hypanthium obconical or urceolate, c. 5 mm long, 5–7 mm wide. Fruits campanulate, glaucous, 6–12 mm long, 8–14 mm wide; disc broad, ascending, occasionally level; valves 3–5, exserted. *Suggan Buggan Mallee*. Fig. 97O–P.

Restricted to mountains near Suggan Buggan at Stradbroke Chasm, Mt Wheeler and Little R. Gorge, Vic., in clefts in rocks on cliff faces and tops, in shallow soil in mallee communities. Region: HOWE. Map 467.

Vic.: Little R. Gorge, *M.I.H.Brooker 5064* (B, FRI); Stradbroke Chasm, 20 Apr. 1957, *J.H.Willis* (MEL, NSW).

Distinguished from related species mainly by the mallee habit, smooth bark and sessile campanulate fruits.

436. *Eucalyptus morrisbyi* Brett, *Proc. Roy. Soc. Tasmania* for 1938: 129 (1939)

T: 'junction of the South Arm and Clifton Beach roads', Tas., *collector not designated*; syn: HO.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 52 (1972); S.Kelly *et al.*, *Eucalypts* 2: t. 108 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 229 (1983).

Tree to 15 m. Bark smooth throughout, light brown, white-grey or pink-grey, or sometimes rough, scaly at trunk base. Juvenile leaves opposite, sessile, orbicular, crenulate, amplexicaul, glaucous, slightly discolorous. Adult leaves alternate, lanceolate, often undulate, acuminate, thin; lamina 5–10 cm long, 1.2–2.3 cm wide, grey-green to glaucous, concolorous; lateral veins faint, at 35°–50°; intramarginal vein up to 1 mm from margin; petiole terete, 12–20 mm long. Umbels 3-flowered; peduncle slightly flattened or angular, 7–10 mm long; pedicels 1–4 mm long. Buds turbinate, glaucous; operculum hemispherical, rostrate, 3–4 mm long, 4–7 mm wide; hypanthium obconical, 4–5 mm long, 4–7 mm wide. Fruits cylindrical, glaucous, 7–9 mm long, 5–6 mm wide; disc moderately broad, descending; valves 4 or 5, included. *Morrisby's Gum*. Fig. 97Q–R.

Restricted to Geilston Bay and near Cremorne, Tas., in sandy soils on gentle slopes near sea level, often in pure stands and in dry sclerophyll forest. Region: TASM. Map 468.

Tas.: 0.2 km on road to Cremorne from South Arm Rd, *G.M.Chippendale 1179* & *A.M.Gray* (AD, FRI, HO, MEL, NSW); Port Davey track, Oct. 1959, *D.Martin* (HO).

Distinguished by tree habit, thin grey-green to glaucous leaves, glaucous turbinate buds and cylindrical glaucous fruits. Grows at lower altitudes and has more pendulous foliage than related Tas. species.

437. *Eucalyptus urnigera* J.D.Hook., *London J. Bot.* 6: 477 bis (1847)

T: Mt Wellington, Tas., *R.Gunn 1074*; syn: BM, K, NSW; Mt Wellington, Tas., *R.Gunn 1282*; syn: K; Lake Echo, Tas., *R.Gunn 1231*; syn: K.

E. urnigera var. *elongata* Rodway, *Tasmanian Fl.* 58 (1903). T: not designated.

Illustrations: N.Hall & A.M.Gray, *Forest Tree Ser.* No. 66 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 110 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 230 (1983).

Tree to 12 m. Bark smooth throughout, white-grey, grey-yellow or yellow-brown. Juvenile leaves opposite, sessile, orbicular, crenulate, amplexicaul, often emarginate, shining, green, slightly discolorous. Adult leaves alternate, broadly lanceolate or lanceolate, acute, thick; lamina 5–9 cm long, 1.3–2.5 cm wide, green or slightly glaucous, concolorous; lateral veins faint, at 45°–50°; intramarginal vein up to 2 mm from margin; petiole terete, 13–25 mm long. Umbels 3-flowered; peduncle angular, 8–20 mm long, recurved in the fruiting stage; pedicels 2–7 mm long. Buds urceolate, often glaucous; operculum flattened-hemispherical, slightly rostrate, 2–4 mm long, 5–6 mm wide; hypanthium urceolate, 6–8 mm long, 5–6 mm wide. Fruits urceolate, often glaucous, 10–16 mm long, 8–10 mm wide; disc broad, descending; valves 3 or 4, included. *Urn Gum*. Fig. 97S–T.

Occurs on mountains and plateaus in south-eastern Tas., including Mt Wellington and Mt Field Natl Park at high altitudes in open montane and subalpine woodland, often dominant. Region: TASM. Map 469.

Tas.: Lake Fenton, *N.T.Burbridge 3281* (CANB, HO); Snug Plains, *A.M.Gray 23* (FRI, HO, MEL).

Easily distinguished by the long urceolate hypanthium and fruits.

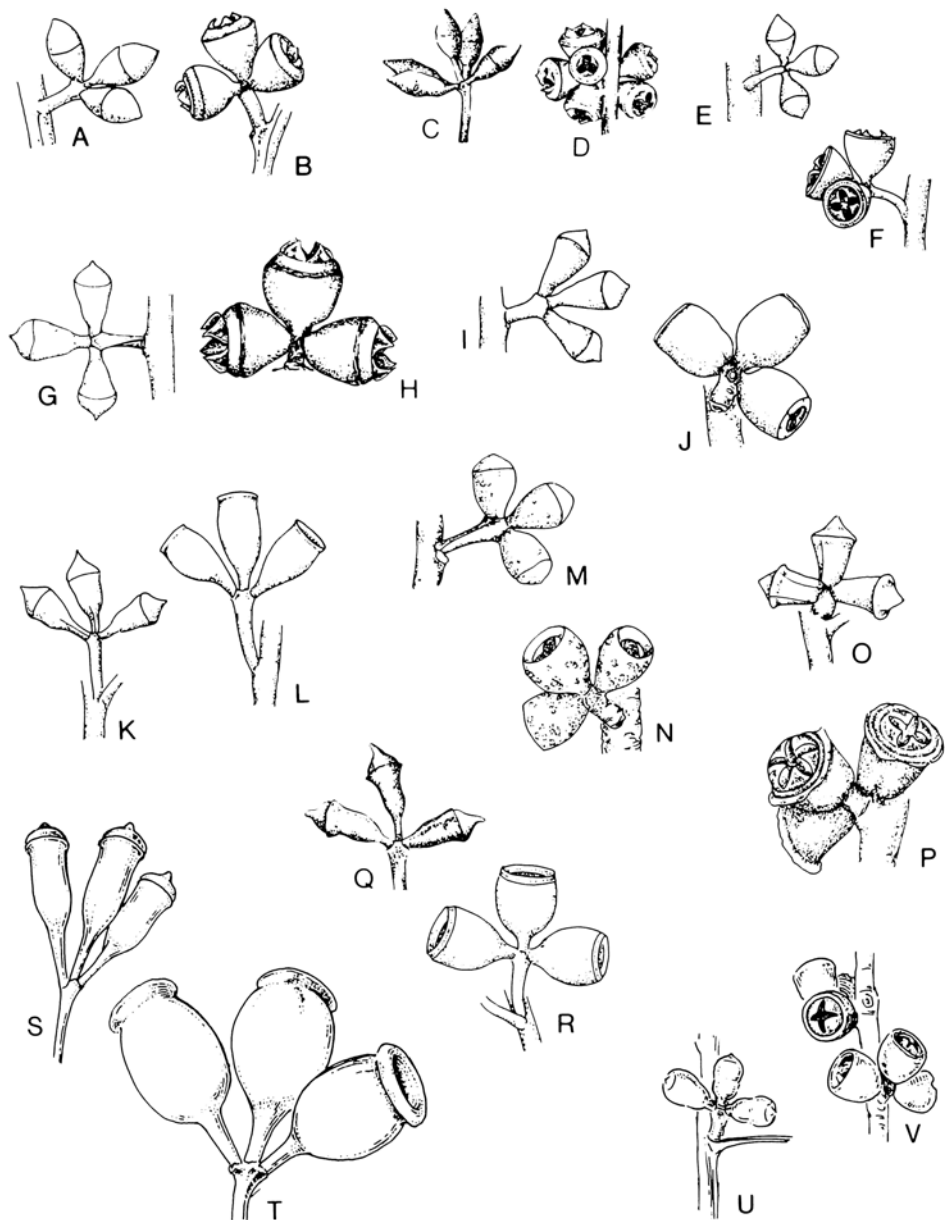


Figure 97. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. dalrympleana* subsp. *dalrympleana* (**A**, I.Brooker 2982, FRI; **B**, J.Doran 535, FRI). **C–D**, *E. dalrympleana* subsp. *heptantha* (**C**, Waring State Forest, N.S.W., W. de Beuzeville, FRI; **D**, 27.2 km E of Walcha, N.S.W., J.Maiden, NSW 89460, NSW). **E–F**, *E. rubida* (**E**, M.Connell 23, FRI; **F**, M.Connell 180, FRI). **G–H**, *E. chapmaniana* (**G**, I.Brooker 4362, FRI; **H**, upper Kiewa Valley, Vic., N.Hall, FRI). **I–J**, *E. glaucescens* (**I**, I.Brooker 4362, FRI; **J**, I.Brooker 2984, FRI). **K–L**, *E. gunnii* (**K**, G.Chippendale 1161, FRI; **L**, A.Gray 29, FRI). **M–N**, *E. archeri* (**M**, Projection Bluff, 7.7 km N of Breona, Tas., J.Turnbull, FRI; **N**, I.Brooker 5743, FRI). **O–P**, *E. saxatilis* (L.Pryor & J.Briggs 216, FRI). **Q–R**, *E. morrisbyi* (**Q**, near junction of South Arm and Clifton Beach Roads, S of Hobart, Tas., L.Langley, FRI; **R**, junction of Cremorne and South Arm Roads, Tas., A.Gray, FRI). **S–T**, *E. urnigera* (**S**, Mt Wellington, Tas., M.Phillips, FRI; **T**, 7.3 km from Ferntree towards Mt. Wellington, A.Gray, FRI). **U–V**, *E. perriniana* (**U**, I.Brooker 5473, FRI; **V**, J.Briggs 209, FRI). **S–V** drawn by M.Risby. Others drawn by M.May.

438. *Eucalyptus perriniana* F.Muell. ex Rodway, *Pap. & Proc. Roy. Soc. Tasmania* for 1893: 181 (1893)

T: Hamilton District, Tas., *Mr. Dicker, Superintendent Hedberg*; n.v.

[*E. gunnii* var. *montana* J.D.Hook., *Bot. Mag.* 127: t. 7808, figs 1, 2 (1901) as to description but not as to type]

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 123 (1973); L.Costermans, *Native Trees & Shrubs S.E. Australia* 363 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 231 (1983).

Mallee to 6 m or straggly tree to 9 m. Bark smooth throughout, bronze, white-green or grey, or often a short stocking of persistent bark at trunk base. Juvenile leaves opposite, sessile, connate, orbicular, glaucous, slightly discolorous, often persisting on mature plants. Adult leaves alternate or subopposite, lanceolate, acuminate; lamina 8–13 cm long, 1.2–2.5 cm wide, dull, grey-green or blue-green, concolorous; lateral veins faint, at 25°–45°; intramarginal vein up to 2 mm from margin; petiole terete or flattened, 10–15 mm long. Umbels 3-flowered; peduncle terete, glaucous, 2–5 mm long; pedicels absent or to 2 mm long. Buds ovoid, glaucous; operculum hemispherical to conical, 2–3 mm long, 3–4 mm wide; hypanthium obconical, 3–4 mm long and wide. Fruits hemispherical, glaucous, sessile, 5–7 mm long and wide; disc narrow, level or descending; valves 3–5, ±level. *Spinning Gum*. Fig. 97U–V.

Occurs in N.S.W., A.C.T. and Vic., in high montane areas from the Tinderry Ra. to the Dargo High Plains and in central and eastern Tas., in subalpine woodland on plateaus and slopes. Regions: HOWE, TASM. Map 470.

A.C.T.: Coronet Peak, *M.I.H.Brooker 5038* (BRI, FRI, MEL, NSW). Vic.: Dargo High Plains, 28 Jan. 1946, *J.H.Willis* (MEL). Tas.: Hungry Flats, *G.M.Chippendale 1178* & *A.M.Gray* (AD, FRI, HO, MEL, NSW).

Distinguished by straggly mallee or small tree habit, sessile connate glaucous juvenile leaves often persisting in adult plants, 3-flowered umbels, glaucous buds and fruits. Most closely related to the 2 following species but has a shorter peduncle. A useful ornamental shrub, the silvery leaves being used in floral arrangements. Common name refers to detached but persistent juvenile leaf pairs spinning in the wind. See R.J.E.Wiltshire & J.B.Reid, Genetic variation in the Spinning Gum, *Eucalyptus perriniana* F.Muell. ex Rodway, *Austral. J. Bot.* 35: 35–47 (1987).

439. *Eucalyptus cordata* Labill., *Nov. Holl. Pl.* 2: 13, t. 152 (1806)

T: Van Diemens Land [Recherche Bay, Tas.], *J.J.H. de Labillardière s.n.*; holo: FI; iso: BM, G, L, MEL.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 53 (1972); S.Kelly *et al.*, *Eucalypts* 2: t. 111 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 232 (1983).

Shrub to 3 m, or tree to 21 m. Bark smooth throughout, white, grey, green or yellow-green and purple. Juvenile leaves opposite, sessile, amplexicaul, orbicular or cordate, crenulate, glaucous, slightly discolorous, usually persisting on mature trees. Adult leaves usually only in upper parts of large trees, alternate, lanceolate, acute; lamina 7.5–13 cm long, 2–3.8 cm wide, dull, grey-green or glaucous, concolorous; lateral veins faint, at 40°–45°; intramarginal vein very faint, up to 2 mm from margin; petiole flattened, 15–20 mm long. Umbels 3-flowered; peduncle flattened, glaucous, 5–8 mm long; pedicels absent. Buds obovoid or turbinate, glaucous; operculum low-hemispherical, slightly rostrate, 4–5 mm long, 8–10 mm wide; hypanthium obconical or campanulate, 6–7 mm long, 8–10 mm wide. Fruits subglobose or cylindrical, glaucous, smooth or 2-ribbed, 10–13 mm long and wide; disc narrow, descending; valves 3 or 4, included or level. *Silver Gum*. Fig. 98A–B.

Occurs in small areas of south-eastern Tas., in marshy and damp areas of mountains in podsolic soils in wet sclerophyll forest. Region: TASM. Map 471.

Tas.: 3.2 km from Uxbridge towards Moogara, *G.M.Chippendale 1192* & *A.M.Gray* (BRI, FRI, HO, MEL, NSW); Chimney Pot Hill, Nov. 1923, *L.Rodway* (HO).

Has larger buds and fruits than *E. perriniana* and *E. pulverulenta*, and is usually a larger, more erect tree.

440. *Eucalyptus pulverulenta* Sims, *Bot. Mag.* 46: t. 2087 (1819)

T: cultivated Northampton Nursery, England, *Messrs. Barr & Brookes*; *n.v.*

E. cordata Lodd., *Bot. Cab.* 4: t. 328 (1819); *nom. illeg.* non Labill. (1806). T: Van Diemens Land [Tas.]; *n.v.*

E. pulviger Cunn. in B.Field, *Geogr. Mem. New South Wales* 350 (1825). T: near Cox's R., N.S.W., Oct. 1822, A.Cunningham 57; holo: K; iso: BM.

Illustrations: N.Hall, *Forest Tree Ser.* No. 28 (1972); L.Costermans, *Native Trees & Shrubs S.E. Australia* 363 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 233 (1983).

Tree to 9 m, or straggly mallee to 5 m. Bark smooth throughout, bronze to grey. Juvenile leaves opposite, sessile, amplexicaul, orbicular to ovate, glaucous, concolorous, usually persisting on mature plants. Adult leaves rarely seen, alternate, lanceolate or oblong, apiculate; lamina 5–10 cm long, 1.2–1.9 cm wide, glaucous, concolorous; lateral veins faint, at 20°–35°; intramarginal vein up to 1 mm from margin; petiole terete, 10–18 mm long. Umbels 3-flowered; peduncle terete, 5–8 mm long; pedicels absent. Buds ovoid, glaucous; operculum conical, 2–3 mm long, 5–6 mm wide; hypanthium obconical, 5–6 mm long and wide. Fruits cylindrical to hemispherical, glaucous, 5–9 mm long, 6–10 mm wide; disc narrow, level; valves 3 or 4, level or slightly exserted. *Silver-leaved Mountain Gum*. Fig. 98C–D.

Occurs in two disjunct occurrences, one SW of the Blue Mts and one E of Bredbo, N.S.W., in shallow soils on mountain slopes. Regions: NEPN, HOWE. Map 472.

N.S.W.: 22.5 km SE of Bredbo, *M.J.Brennan* 1 (AD, BRI, FRI, MEL); 2.1 km W of Little Hartley, 31 Mar. 1971, *N.Hall* (FRI, MEL, NSW).

Distinguished from *E. perriniana* and *E. cordata* by the straggly habit, and from *E. perriniana* by the longer peduncle and larger fruits. A restricted species which is cultivated as an unusual silvery-leaved tree or shrub. Extensively grown in California for the ornamental young leaves.

441. *Eucalyptus nova-anglica* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 24: 616 (1900)

E. cinerea var. *nova-anglica* (Deane & Maiden) Maiden, *Crit. Revis. Eucalyptus* 3: 9 (1914). T: Moona Plains, Walcha, N.S.W., Sept. 1898, *A.R.Crawford s.n.*; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 3: 22 (1914).

Illustrations: N.Hall, *Forest Tree Ser.* No. 2 (1970); N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 3: 461 (1976); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 234 (1983).

Tree to 24 m. Bark rough, fibrous, grey on trunk and larger branches, then smooth and grey or light brown above. Juvenile leaves opposite, sessile, amplexicaul, orbicular to cordate, glaucous, slightly discolorous. Adult leaves alternate, narrowly lanceolate to lanceolate, acuminate; lamina 7.5–15 cm long, 0.7–1 cm wide, green or subglaucous, concolorous; lateral veins clearly visible at 35°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 15–25 mm long. Umbels 7-flowered; peduncle terete or quadrangular, 7–10 mm long; pedicels 2–4 mm long. Buds ovoid, glaucous; operculum conical, 2–3 mm long, c. 4 mm wide; hypanthium obconical, 2–3 mm long, c. 4 mm wide. Fruits hemispherical to conical, sometimes glaucous, 4–5 mm long and wide; disc moderately broad, convex or ascending; valves 3 or 4, exserted. *New England Peppermint*. Fig. 98E–F.

Occurs from near Stanthorpe, Qld, southwards through the New England region, N.S.W., in poorly drained tableland areas, lower slopes and valleys, sometimes on flats, in heavy soils in woodland. Region: MCPH. Map 473.

Qld: Applethorpe, *S.L.Everist* 1327 & *L.J.Webb* (BRI, CANB, K). N.S.W.: 4.6 km NE of Deepwater, *G.M.Chippendale* 1279 & *M.J.Brennan* (BRI, FRI, MEL, NSW); Glen Innes, Apr. 1885, *H.Deane* (NSW).

Distinguished by rough bark on trunk and larger branches, narrow green or subglaucous leaves, long-pedicellate 7-flowered umbels, glaucous buds, and usually glaucous fruits with an ascending or convex disc. Closely related to the following 2 species.

442. *Eucalyptus cinerea* F.Muell. ex Benth., *Fl. Austral.* 3: 239 (1867)

T: Lachlan R. near Bathurst, N.S.W., *A.Cunningham* 39; syn: K; Lake George, N.S.W., *herb. F.Mueller* (?W.Woolls); syn: n.v.

E. pulverulenta var. *lanceolata* Howitt, *Rep. 7th Meeting Austral. Assoc. Advancem. Sci.* 7: 518 (1898); *E. stuartiana* var. *cordata* R.Baker & H.G.Smith, *Res. Eucalypts* 105 (1902) *nom. illeg.* T: between Pilot Ra. & Beechworth, Vic., *F.Mueller*; syn: n.v.; near Ovens R., Vic., *C.Falk* 4; syn: MEL; Ovens district, Vic., *D.Ingle*; syn: n.v.

[*E. pulverulenta* auct. non Sims: *F.Mueller, Fragm.* 2: 70 (1860)]

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 145 (1970); L.Costermans, *Native Trees & Shrubs S.E. Australia* 363 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 235 (1983).

Tree to 16 m. Bark rough, fibrous, red-brown on trunk and larger branches, then smooth and brown-red or grey above, or sometimes rough throughout. Juvenile leaves opposite, sessile or shortly petiolate, amplexicaul, orbicular to cordate, glaucous, slightly discolorous. Intermediate leaves opposite, sessile or shortly petiolate, sometimes amplexicaul, ±cordate or broadly ovate, glaucous or almost green. Juvenile or intermediate leaves usually persist on adult trees. Adult leaves alternate, broadly lanceolate, acuminate, thick; lamina 7.5–11.5 cm long, 1.5–2.5 cm wide, glaucous, concolorous; lateral veins faint, at 30°–45°; intramarginal vein up to 2 mm from margin; petiole flattened, 5–11 mm long. Umbels 3-flowered; peduncle terete, 2–6 mm long; pedicels absent. Buds fusiform, glaucous; operculum conical, 2–3 mm long, 4–5 mm wide; hypanthium obconical, 3–4 mm long, 4–5 mm wide. Fruits obconical to hemispherical, 5–8 mm long, 5–9 mm wide; disc broad, level or ascending; valves 3–5, slightly exserted. *Argyle Apple*. Fig. 98G–H.

Occurs from N of Bathurst, N.S.W., to the southern tablelands near Canberra, A.C.T., with a disjunction in the Beechworth area, Vic. Grows in clay and clay-loam soils on flats, near watercourses and undulating country in woodland. Regions: NEPN, HOWE. Map 474.

N.S.W.: 13.7 km W of Gundaroo, *L.G.Adams* 1897 (CANB, NSW); 4.8 km W of Berrima, *R.Dawson & R.Coveny* 3626 (AD, BRI, FRI, MEL, NSW, PERTH). Vic.: 7 km N of Beechworth, *M.I.H.Brooker* 7418 (FRI).

Distinguished from *E. nova-anglica* and *E. cephalocarpa* by the longer petiole and slightly more acute operculum. Peduncle shorter than in *E. nova-anglica*. Cultivated as an ornamental, and as a street tree.

443. *Eucalyptus cephalocarpa* Blakely, *Key Eucalypts* 164 (1934)

E. cinerea var. *multiflora* Maiden, *Crit. Revis. Eucalyptus* 3: 7 (1914). T: Dandenong Mts, Vic., June 1901, *J.H.Maiden*; lecto: NSW, *fide* W.F.Blakely, *loc. cit.*

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 58 (1973); L.Costermans, *Native Trees & Shrubs S.E. Australia* 363 (1981) as *E. cinerea* subsp. *cephalocarpa*; M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 236 (1983).

Tree to 24 m, but sometimes only to 8 m. Bark rough, fibrous throughout, grey or grey-brown, longitudinally fissured. Juvenile leaves opposite, sessile, amplexicaul, orbicular to ovate, grey-green or glaucous, slightly discolorous. Adult leaves alternate, lanceolate, acuminate; lamina 12.5–20 cm long, 1.6–2.5 cm wide, grey-green, concolorous; lateral veins faint, at 15°–20°; intramarginal vein 1–2 mm from margin; petiole terete or slightly flattened, 10–15 mm long. Umbels 7–11-flowered; peduncle slightly angular, 5–18 mm long; pedicels absent or 1–2 mm long. Buds fusiform, often glaucous; operculum conical, 2–3 mm long, 3–5 mm wide; hypanthium obconical, c. 3 mm long, 3–5 mm wide. Fruits obconical, sometimes slightly glaucous, 5–7 mm long, 5–6 mm wide; disc broad, ascending; valves 3 or 4, exserted or nearly level. *Mealy Stringybark*. Fig. 98 I–J.

Occurs in the Eden–Cape Howe area, N.S.W., and the Gippsland region and westwards, Vic., on coastal flats or more inland foothills in sandy and loam soils, in woodland and forest. Regions: OTWY, HOWE. Map 475.

N.S.W.: Eden to Cape Howe, Jan. 1902, *J.S.Allan* (NSW). Vic.: 9 km S of Woori Yallock, *G.M.Chippendale* 975 & *M.J.Brennan* (AD, BRI, FRI, MEL); 4 km S of Narrabarbera, *M.D.Crisp* 4028 (FRI); Ringwood, June 1914, *P.R.H.St John* (MEL); 9.7 km SSE of Rosedale, 2 Feb. 1972, *J.H.Willis* (MEL, NSW).

Differs from *E. nova-anglica* in the longer petiole, very shortly pedicellate buds and larger fruits, and from *E. cinerea* in the longer petiole and leaves.

Ser. 78 Striolatae

Eucalyptus ser. **Striolatae** Maiden, *Crit. Revis. Eucalyptus* 7: 121 (1925).

Type: *E. patellaris* F.Muell., lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 505 (1988).

E. subser. *Megaphyllae* Blakely, *Key Eucalypts* 57, 238 (1934) *p.p.*

E. subser. *Boreales* Blakely, *op. cit.* 57, 240.

E. subser. *Protrusae* Blakely, *op. cit.* 58, 242, *p.p.*

E. subser. *Subplatyphyllae* Blakely, *op. cit.* 56, *p.p.*

Trees, rarely mallees. Bark rough, fibrous throughout, less frequently rough on trunk and larger branches, rarely smooth throughout (forms of *E. microtheca*). Juvenile leaves alternate, rarely opposite, subopposite or decussate, petiolate, concolorous or slightly discolorous, but not all species seen. Adult leaves alternate, rarely opposite, usually petiolate but sessile in *E. pruinosa*, concolorous. Conflorescences terminal, sometimes axillary, paniculate; umbels 3–11-flowered. Buds ovoid, obovoid, clavate, pyriform, conical, cylindrical, turbinate, rostrate or fusiform. Fruits campanulate, urceolate, ovoid, obconical, turbinate, cylindrical, subcylindrical, subglobose or hemispherical; disc descending, level or ascending; valves 3–5, exserted, sometimes level or included. Seeds suborbicular to elliptic, shallowly reticulate, grey, brown or black, yellow-brown in *E. microtheca* (not seen in *E. fitzgeraldii* and *E. cyanoclada*).

A series of 14 species in northern Australia with one species also widespread in arid and semi-arid areas of mainland Australia except Vic. Characterised mainly by rough bark, concolorous leaves and usually terminal panicle confluences.

444. *Eucalyptus leptophleba* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 86 (1859)

E. drepanophylla var. *leptophleba* (F.Muell.) Luehm. ex Burt-Davey in L.H.Bailey, *Cycl. Amer. Hort.* 553 (1900). T: Gilbert R., Qld, 1857, *F.Mueller*; holo: MEL; iso: K.

E. stoneana Bailey, *Queensland Agric. J.* 23: 259 (1909). T: Stannary Hills, Qld, Sept. 1909, *T.L.Bancroft s.n.*; holo: BRI; iso: K, NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 97 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 208 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 491 (1984).

Tree, usually to 14 m, sometimes to 28 m. Bark rough throughout, fibrous, compact, more or less tessellated, grey or brown-grey. Juvenile leaves alternate, ovate, grey-green, slightly discolorous. Adult leaves broadly to narrowly lanceolate, acute; lamina 11–24 cm long, 1.2–3 cm wide, blue-green or grey-green; lateral veins visible, at 35°–50°; intramarginal vein up to 1 mm from margin; petiole terete, 20–30 mm long. Confluence axillary and terminal. Umbels 7–11-flowered; peduncle terete or angular, 4–20 mm long; pedicels 2–8 mm long. Buds clavate to ovoid; operculum hemispherical, apiculate or conical, 3–5 mm long, 4–7 mm wide; hypanthium obconical or campanulate, 4–6 mm long, 4–7 mm wide. Fruits ovoid or subcampanulate, 6–11 mm long, 5–10 mm wide; disc broad, descending; valves 4 or 5, level, included or slightly exserted. *Molloy Red Box*. Fig. 98K–L.

Occurs in central and eastern Cape York Peninsula as far S as Ravenswood, Qld, in sandy and loamy soil in open forest, open woodland and woodland in river valleys, on undulating country. Regions: CARP, CYRK, BURD. Map 476.

Qld: Kuranda Ra., *M.I.H.Brooker* 3338 (BRI, DNA, FRI, NSW); Kalpowar, *L.Pedley* 2644 (BRI, FRI, NSW); near Lynd Stn, *N.H.Speck* 4669 (AD, BRI, CANB, MEL, NSW, PERTH).

Distinguished by rough bark throughout, terminal or axillary panicles, and ovoid to campanulate fruits. The wood is hard and very durable and has been used for railway sleepers, posts and heavy construction.

445. *Eucalyptus patellaris* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 84 (1859)

T: upper part of Roper R., N.T., 3 July 1856, *F.Mueller*; holo: K.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 47 (1972); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 151 (1979); S.Kelly *et al.*, *Eucalypts* 2: t. 209 (1983).

Tree usually to 10 m, sometimes to 18 m. Bark rough throughout, fibrous, compact, grey, somewhat furrowed or more or less tessellated. Juvenile leaves alternate, ovate or broadly lanceolate, grey-green, concolorous. Adult leaves lanceolate, slightly falcate, acuminate; lamina 12–25 cm long, 1.7–3 cm wide, grey-green; lateral veins faint, at 35°–50°; intramarginal vein up to 1 mm from margin; petiole terete, 10–16 mm long. Umbels 7-flowered; peduncle terete or slightly flattened, 20–25 mm long; pedicels 4–8 mm long. Buds fusiform; operculum conical, 6–8 mm long and wide; hypanthium obconical, 5–8 mm long and wide. Fruits cylindrical or campanulate, sometimes 3- or 4-ribbed, 5–10 mm long, 6–10 mm wide; disc broad, descending; valves 4 or 5, \pm level or clearly exserted. *Weeping Box*. Fig. 98M–O.

Occurs disjunctly in 3 widely separated areas: between Millstream and Carnarvon, including Barrow Is., and in the E Kimberley, W.A., extending to much of northern N.T., with an isolated occurrence near the tip of Cape York Peninsula, Qld. Grows in sandy and loamy soil on gentle slopes and river flats in open forest and open woodland. Regions: KIMB, PILB, MRCH, BARK, CYRK. Map 477.

W.A.: near Mt Hollister, *M.I.H.Brooker* 4573 (BRI, FRI, NT); Cape Ra., *A.S.George* 2461 (PERTH). N.T.: 45 km S of Larrimah, *C.R.Dunlop* 1857 (NT); 51.5 km N of Pine Creek, *M.Lazarides* 7632 (CANB, NSW, NT) Qld: 29 km from Bamaga towards Cape York, *M.I.H.Brooker* 4100 (AD, BRI, FRI, NSW).

Usually a smaller tree than *E. leptophleba* and the fruits have a broader disc. Buds and fruits larger than in the next 3 species.

446. *Eucalyptus oligantha* Schauer in W.G.Walpers, *Repert. Bot. Syst.* 2: 926 (1843)

T: Copeland Is., N.T., 12 Apr. 1818, *A.Cunningham* 250; iso: BM, FRI, K, NSW.

E. hillii Maiden, *J. & Proc. Roy. Soc. New South Wales* 53: 63 (1919). T: Bathurst Is., N.T., 6 Nov. 1916, *G.F.Hill* 468; holo: NSW; iso: BRI, FRI, K, MEL.

E. hillii var. *alleniana* Blakely & Jacobs in W.F.Blakely, *Key Eucalypts* 239 (1934). T: 6 miles [c. 10 km] S of Batchelor Farm, N.T., 12 July 1935, *M.R.Jacobs* 58; holo: NSW; iso: BRI, FRI.

Illustrations: S.T.Blake, *Austral. J. Bot.* 1: t. 32, 33 (1953); N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 48 (1972); S.Kelly *et al.*, *Eucalypts* 2: t. 210 (1983).

Tree to 15 m. Bark rough, fibrous throughout, grey or grey-white. Juvenile leaves alternate, ovate, concolorous. Adult leaves broadly ovate or suborbicular; lamina 10–15 cm long, 7.5–13 cm wide, green; lateral veins visible, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole terete, 25–70 mm long. Umbels 3–7-flowered; peduncle terete, 5–10 mm long; pedicels 5–8 mm long. Buds obovoid; operculum conical or hemispherical, apiculate, 3–4 mm long, 4–5 mm wide; hypanthium cylindrical to ovoid, c. 4 mm long, 4–5 mm wide. Fruits subcampanulate, subcylindrical or ovoid, 7–9 mm long, 6–8 mm wide; disc narrow, descending; valves usually 4, level or slightly exserted. *Broad-leaved Box*. Fig 98P–Q.

Occurs in the Kimberley between Wyndham and Derby, W.A., and apparently with disjunctions in north-western and north-eastern N.T. including a number of islands. Grows

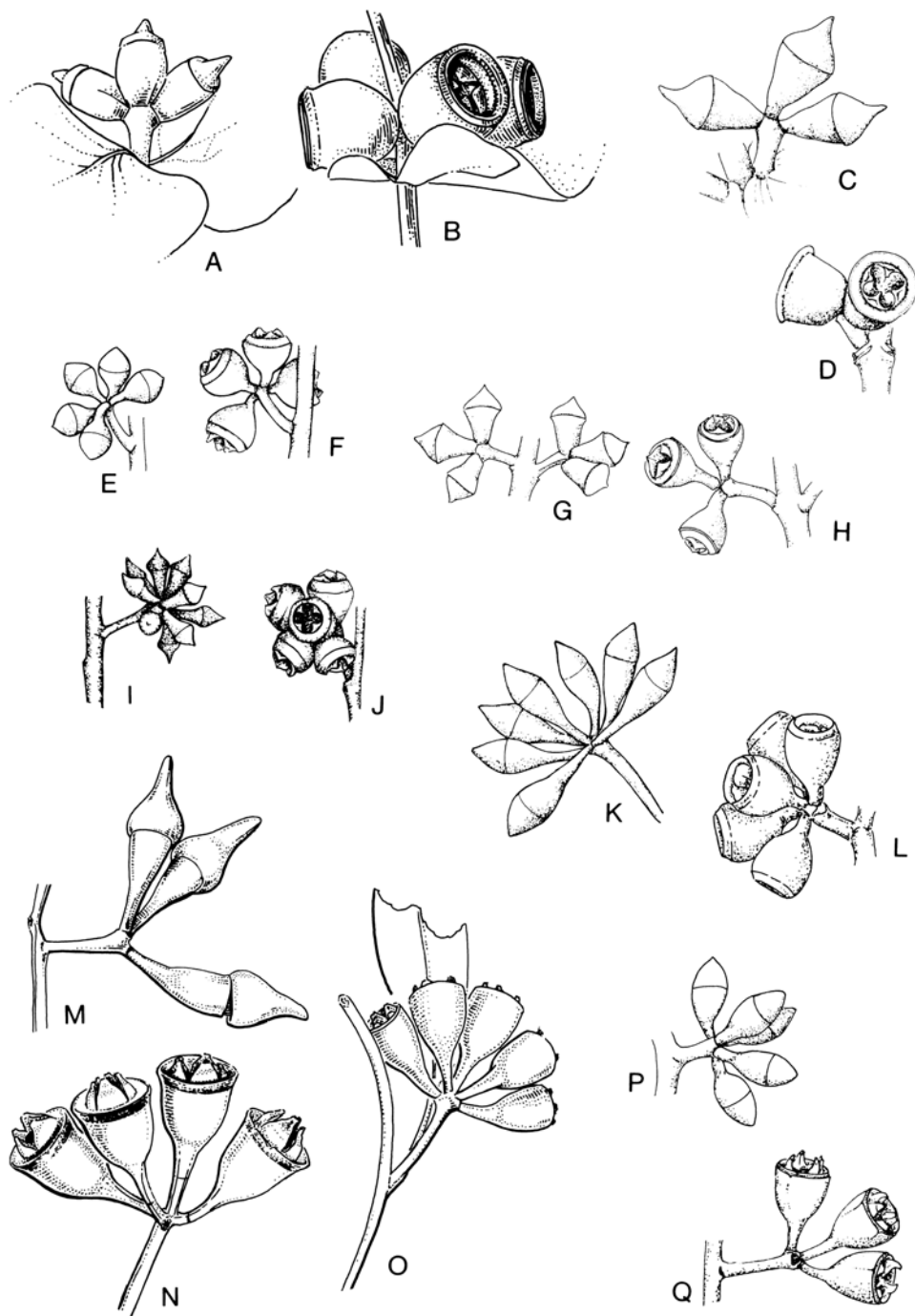


Figure 98. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. cordata* (I.Brooker 2882a, FRI). **C–D**, *E. pulverulenta* (C, I.Brooker 3741, FRI; D, J.Briggs 125, FRI). **E–F**, *E. nova-anglica* (E, Guyra, N.S.W., E.McKie, FRI; F, I.Brooker 3920, FRI). **G–H**, *E. cinerea* (G, J.Briggs 38, FRI; H, C.Moore 1273, FRI). **I–J**, *E. cephalocarpa* (Upper Yarra district, Vic., J.Blackburne, NSW). **K–L**, *E. leptophleba* (K, J.Turner 475, FRI; L, I.Brooker 4072, FRI). **M–O**, *E. patellaris* (M, P.Latz 86, FRI; N, 22.4 km from Katherine, N.T., W.McReaddie, FRI; O, D.Young 102, FRI). **P–Q**, *E. oligantha* (P, I.Brooker 5334, FRI; Q, I.Brooker 3158, FRI). **A, B, M–O** drawn by M.Risby. Others M.May.

on flats and gentle slopes, often along watercourses, in shallow loams and podsols in open forest and woodland. Regions: KIMB, ARNM. Map 478.

W.A.: near Gibb R. Homestead, *L.A.S.Johnson* 2090 (FRI, NSW, PERTH). N.T.: 32 km NNE of Tipperary Homestead, *M.Lazarides* 6659 (AD, CANB, NSW, NT, PERTH); 51.5 km SE of Adelaide River town, *R.A.Perry* 3207 (BRI, CANB, NT).

Has much broader leaves and a narrower disc than *E. patellaris* and a shorter peduncle than *E. koolpinensis* and *E. fitzgeraldii*.

447. *Eucalyptus koolpinensis* Brooker & Dunlop, *Austral. Forest Res.* 8: 214 (1978)

T: Koolpin Creek Gorge road, N.T., 29 Sept. 1976, *M.I.H.Brooker* 5348; holo: FRI; iso: DNA, K, NSW.

Illustrations: M.I.H.Brooker & C.R.Dunlop, *op. cit.* 215; S.Kelly *et al.*, *Eucalypts* 1: t. 271 (1983).

Tree to 8 m. Bark rough, fibrous throughout, irregularly tessellated, grey-brown below to bleached white above. Juvenile leaves opposite, subopposite or becoming alternate, ovate or orbicular, glaucous, concolorous. Mature canopy usually of juvenile or intermediate leaves. Adult leaves not usually seen. Leaves on mature trees orbicular to broadly ovate, 6–10 cm long and wide, glaucous to grey-green; lateral veins distinct, at c. 50°; intramarginal vein up to 4 mm from margin; petiole terete, 15–25 mm long. Umbels glaucous, 7-flowered; peduncle terete, 10–15 mm long; pedicels 5–8 mm long. Buds cylindrical, conical; operculum conical or rostrate, 3–4 mm long, 4–5 mm wide; hypanthium obconical, subcampanulate or cylindrical, c. 4 mm long, 4–5 mm wide. Fruits campanulate to urceolate, faintly glaucous, 5–7 mm long, 7–8 mm wide; disc broad, level or descending; valves 4 or 5, level or exserted. Fig. 99A–B.

Restricted to 2 localities between the South Alligator R. and Koolpin Gorge, N.T., in almost pure stands on clay flats and shallow soil on sandstone. Region: ARNM. Map 479.

N.T.: near Koolpin Pool towards South Alligator R., *M.I.H.Brooker* 5349 (BRI, DNA, FRI, NSW, NT); near Koolpin Gorge on Koolpin Gorge Rd, *C.R.Dunlop* 4568 (AD, BRI, CANB, DNA, FRI, K, MEL, NSW, NT, PERTH).

Differs from *E. oligantha* and *E. patellaris* especially in the glaucous buds and fruits. Intermediate or juvenile leaves persist as the mature crown.

448. *Eucalyptus fitzgeraldii* Blakely, *Key Eucalypts* 239 (1934)

T: between Tabletop Mtn and Artesian Ra., near Charnley R., W.A., Aug. 1905, *W.V.Fitzgerald* 1353; holo: NSW; iso: BRI, FRI, K, PERTH.

Illustrations: J.H.Maiden, *Crit. Revis. Eucalyptus* 2: t. 64, figs 4a, 4b (1912); S.Kelly *et al.*, *Eucalypts* 2: t. 211 (1983).

Tree to 12 m. Bark rough, flaky throughout, grey, shedding in papery flakes. Juvenile leaves not seen. Adult leaves ovate or orbicular, retuse or emarginate; lamina to 10 cm long and 12 cm wide, shining when fresh, dull grey-green when dry; lateral veins irregular; petiole terete, to 40 mm long. Umbels 7-flowered; peduncle terete, 10–15 mm long; pedicels c. 5 mm long. Buds obovate to turbinate; operculum conical to hemispherical, 3–4 mm long, 5–6 mm wide; hypanthium obconical to campanulate, 5–6 mm long and wide. Fruits campanulate to urceolate, 7–8 mm long and wide; disc narrow, descending; valves not seen. *Paper-barked* Box. Fig. 99C.

Known only from type locality between Tabletop Mtn and the Artesian Ra., among large sandstone rocks in mountainous areas. Region: KIMB. Map 480.

Description compiled after W.F.Blakely, *Key Eucalypts* 239 (1934) as only one collection other than the type is known; some additional description added, *fide* S.Kelly *et al.*, *Eucalypts* 2: t. 211 (1983).

W.A.: SW flank of Look Out Hill, N of Beverley Springs, W.A.K.Hill 971, *L.A.S.Johnson* & *D.Benson* (NSW).

Distinguished from *E. koolpinensis* by the flaky papery bark, the large ovate or orbicular, retuse or emarginate leaves on long petiole, and the shorter pedicels.

449. *Eucalyptus argillacea* W.Fitzg. in J.H.Maiden, *Crit. Revis. Eucalyptus* 4: 132 (1919)

T: Mt House, W.A., May 1905, *W.V.Fitzgerald* 962; holo: NSW; iso: BRI, E, FRI.

E. leucophylla Domin, *Biblioth. Bot.* 89: 464 (1928). T: near Cloncurry, Qld, Feb. 1910, *K.Domin* 7192; holo: PR.

E. tropica Cambage ex Maiden, *Crit. Revis. Eucalyptus* 8: 6 (1929). T: near Corella R., 30 miles [48 km] N of Cloncurry on road to Granada, Qld, 30 Aug. 1913, *R.H.Cambage* 4163; holo: NSW; iso: BRI, K.

Illustrations: J.Turnbull & N.Hall, *Forest Tree Ser.* No. 105 (1973); J.P.Jessop (ed.), *Fl. Central Australia* 250 (1981).

Tree to 14 m, though usually to 10 m, sometimes mallee-like. Bark rough, fibrous throughout, grey. Juvenile leaves not seen. Adult leaves narrowly to broadly lanceolate, acute; lamina 8–14 cm long, 0.7–3.5 cm wide, light green or grey-green; lateral veins at 40°–55°; intramarginal vein up to 1 mm from margin; petiole terete, 5–13 mm long. Umbels 3–7-flowered; peduncle terete, 5–10 mm long; pedicels 3–5 mm long. Buds turbinate or pyriform, glaucous; operculum conical, 2–3 mm long, 3–4 mm wide; hypanthium obconical or campanulate, 2–4 mm long, 3–4 mm wide. Fruits turbinate or obconical, 5–8 mm long, 4–6 mm wide; disc narrow, level; valves 3 or 4, level or exserted. Fig. 99D–E.

Occurs in the N Kimberley, W.A., across northern N.T., with outliers in the Tanami Desert and northern Qld. Grows on plains and drainage areas, mostly in heavy soil but sometimes in sandy soil, in dry open woodland. Regions: KIMB, ARNM, BKLY, MACD, CARP, CYRK, BURD, GGNA, THOM. Map 481.

W.A.: 32 km SE of Kimberley Research Stn, *R.A.Perry* 2937 (AD, BRI, CANB, FRI, K, NSW, NT). N.T.: 1.6 km NW of Montejinnie Stn, *G.M.Chippendale* 2171 (BRI, CANB, NSW, NT); 3.2 km S of Renner Springs, *R.E.Winkworth* 1051 (AD, BRI, CANB, FRI, K, NSW, NT). Qld: between Jeannie R. and Howick R., *B.Hyland* 6283 (BRI, FRI, NSW); 16 km W of Gregory Downs, *L.Pedley* 2056 (BRI, CANB, K).

Distinguished by rough bark throughout, light green or grey-green leaves, paniculate conflorescence, small glaucous buds and striate or wrinkled fruits.

450. *Eucalyptus chlorophylla* Brooker & Done, *Nuytsia* 5: 389 (1986)

T: c. 15 km SE of Kununurra on Katherine road, W.A., 25 Oct. 1982, *M.I.H.Brooker* 7736; holo: PERTH; iso: DNA, FRI, NSW.

Illustration: M.I.H.Brooker & C.Done, *op. cit.* 388, 389.

Tree to 5 m. Bark fibrous throughout, white to yellow-grey. Juvenile leaves opposite, lanceolate to broadly lanceolate. Adult leaves narrowly lanceolate, sometimes falcate, acuminate or uncinat; lamina 16–18 cm long, 1.5–2 cm wide, shining, green; lateral veins faint or just visible, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole terete, 10–15 mm long. Umbels 7-flowered; peduncle quadrangular, 5–10 mm long; pedicels 3–5 mm long. Mature buds not seen, but immature buds fusiform; operculum conical, slightly longer than hypanthium; hypanthium obconical. Fruits obconical or campanulate, 5–8 mm long, 4–5 mm wide; disc broad, level and just included or obliquely descending; valves 3–5, exserted. Fig. 99F–G.

Occurs near Kununurra, W.A., in sandy and lateritic soil in seasonally moist depressions. Region: KIMB. Map 482.

W.A.: c. 15 km SE of Kununurra, *C.Done* 658 (BRI, FRI, NSW, PERTH).

Differs from *E. argillacea* in the narrower bright green adult leaves and the non-glaucous buds and fruits. The distribution of this newly described species may be wider than indicated and may extend from the Erskine Ra., W.A., to N.T.

451. *Eucalyptus normantonensis* Maiden & Cambage, J. & Proc. Roy. Soc. New South Wales 52: 489 (1919)

T: Normanton, Qld, Aug. 1913, *R.H.Cambage* 3930; holo: NSW; iso: BRI.

E. largiflorens var. *xanthophylla* (Blakely) Cameron, *Victorian Naturalist* 63: 42 (1946); *E. bicolor* var. *xanthophylla* Blakely, *Key Eucalypts* 232 (1934). T: Camooweal, Qld, 26 June 1922, *S.A.White* s.n.; syn: n.v.; Barrow Ck, N.T., 3 May 1922, *S.A.White* 244; syn: NSW; isosyn: AD.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 160 (1974); A.S.Mitchell, *Eucalypts Central Australia* 18 (1980); J.P.Jessop (ed.), *Fl. Central Australia* 250 (1981).

Usually a mallee to 5 m, sometimes a small tree to 8 m. Bark rough, subtessellated, grey on trunk, smooth and grey or brown on upper stems and branches. Juvenile leaves alternate or subopposite, narrowly lanceolate, green, concolorous. Adult leaves narrowly lanceolate, acuminate; lamina 8–12 cm long, 0.6–2 cm wide, shining, green; lateral veins faint, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole terete or slightly flattened, 8–14 mm long. Umbels 7-flowered; peduncle quadrangular or terete, 10–15 mm long; pedicels 2–6 mm long. Buds clavate; operculum hemispherical or slightly apiculate, 1–2 mm long, 2–3 mm wide; hypanthium obconical, 2–3 mm long and wide. Fruits cylindrical to subglobular, 3–4 mm long and wide; disc narrow, descending; valves 3 or 4, included. Fig. 99H–I.

Occurs from the Pollock Hills, north-eastern Gibson Desert, W.A., through central N.T. and much of northern Qld. Grows in shallow sand and gravel on flats, gently undulating areas and drainage lines in low open woodland. Regions: GBSN, TNMI, MACD, GGNA, CARP, CYRK, BURD, THOM, DWSN. Map 483.

W.A.: Pollock Hills, *A.S.George* 9058 (PERTH). N.T.: near Redbank Gorge, *G.M.Chippendale* 4884 (AD, BRI, CANB, MEL, NSW, NT); Elkedra Stn, *P.K.Latz* 6956 (FRI, NT). Qld: Normanton, *S.T.Blake* 12477 (BRI, FRI); 8 km S of Dunrobin Homestead, *L.Pedley* 1734 (BRI, CANB).

Differs from related species in the small buds and fruits.

452. *Eucalyptus tectifica* F.Muell., J. Proc. Linn. Soc., Bot. 3: 92 (1859)

T: Macarthur R., N.T., 5 Aug. 1856, *F.Mueller*; holo: K.

E. spenceriana Maiden in A.J.Ewart & O.B.Davies, *Fl. N. Terr.* 307 (1917). T: Burrundie, N.T., 5 Nov. 1915, *H.I.Jensen* 346; holo: NSW; iso: BM, BRI.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 120 (1973); C.A.Gardner (ed. T.E.Aplin), *Eucalypts W. Australia* 50 (1979); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 493 (1984).

Tree to 15 m. Bark rough, fibrous throughout, compact, subtessellated, grey. Juvenile leaves alternate, lanceolate to broadly lanceolate, grey-green, concolorous. Adult leaves lanceolate or narrowly lanceolate, acute; lamina 9–16 cm long, 1–2 cm wide, green or grey-green; lateral veins faint, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole channelled or terete, 10–25 mm long. Umbels 7-flowered; peduncle terete, 5–13 mm long; pedicels 3–7 mm long. Buds pyriform or obovoid, rostrate; operculum rostrate, 2–3 mm long, c. 3 mm wide; hypanthium subpyriform, 2–3 mm long, c. 3 mm wide. Fruits subovoid to hemispherical, thin-walled, 4–7 mm long, 4–6 mm wide; disc broad, steeply descending; valves 3 or 4, included to just exserted. *Darwin Box*. Fig. 99J–K.

Occurs in the Kimberley, W.A., across northern N.T. and around the Gulf of Carpentaria, Qld, on flats and slopes in a range of soils, mostly in open woodland. Regions: KIMB, ARNM, BKLY, CARP. Map 484.

W.A.: 19.3 km SW of Beagle Bay, *M.Lazarides* 6555 (AD, BRI, CANB, MEL, NSW, PERTH); Karunjie Stn, *R.A.Perry* 3153 (BRI, CANB, NSW, NT, PERTH). N.T.: 34.1 km NW of Katherine, *G.M.Chippendale* 7533 (BRI, CANB, NSW, NT); Tortilla Flats, *M.Parker* 497 (FRI, NT). Qld: 7 km N of Normanton, *G.R.Brown* 86 (BRI).

Distinct in being a tree partly or wholly deciduous in dry season, with rough bark throughout, terminal conflorescence, non-glaucous pyriform or obovoid rostrate buds, and very thin-walled fruits.

453. *Eucalyptus distans* Brooker in Boland & Kleinig, *Austral. Forest Res.* 10: 95 (1980)

T: 11 km W of Katherine Gorge, N.T., 14°24'S, 132°24'E, 2 Apr. 1977, *C.R.Dunlop 4178*; holo: FRI; iso: BRI, DNA, FRI, K, NSW, NT.

Illustrations: M.I.H.Brooker *et al.*, *op. cit.* 96–98; S.Kelly *et al.*, *Eucalypts* 1: t. 261 (1983).

Tree to 10 m. Bark rough, fibrous throughout, grey. Juvenile leaves alternate, narrowly lanceolate, green, concolorous. Adult leaves lanceolate, obtuse or apiculate; lamina 9–13 cm long, 1–2 cm wide, blue-green; lateral veins faint, at 35°–50°; intramarginal vein up to 1 mm from margin; petiole terete, 10–17 mm long. Umbels 7-flowered; peduncle terete, 4–9 mm long; pedicels 1–3 mm long. Buds cylindrical to ovoid; operculum hemispherical, apiculate, 1–3 mm long, 3–4 mm wide; hypanthium cylindrical or hemispherical, 3–4 mm long and wide. Fruits obconical, 2–4 mm long, 3–5 mm wide; disc narrow, level; valves 3 or 4, exserted. Fig. 99L–M.

Occurs between Katherine and Katherine Gorge, N.T., on low stony ridges. Region: ARNM. Map 485.

N.T.: 15 km from Katherine towards Katherine Gorge, *M.I.H.Brooker 5336* (FRI).

Distinguished by rough bark throughout, small obconical fruits with strongly exserted valves and restricted occurrence.

454. *Eucalyptus microneura* Maiden & Blakely, *J. & Proc. Roy. Soc. New South Wales* 59: 168 (1925)

T: Gilbert R., Qld., Feb. 1922, *C.T.White 1385*; holo: NSW; iso: BRI.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 98 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 213 (1983).

Tree to 18 m. Bark rough, fibrous throughout, brown-grey. Juvenile leaves not seen. Adult leaves lanceolate to broadly lanceolate, acute; lamina 7.5–15 cm long, 1.8–2.5 cm wide, dull, subglaucous; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete or angular, 12–22 mm long. Umbels glaucous, 7-flowered; peduncle terete, 7–13 mm long; pedicels 2–4 mm long. Buds ovoid; operculum conical, 4–5 mm long, 3–4 mm wide; hypanthium suburceolate or obconical, 2–3 mm long, 3–4 mm wide. Fruits turbinate or obconical, 5–8 mm long, 4–6 mm wide, glaucous or subglaucous; disc narrow, level; valves 4, exserted. *Gilbert River Box.* Fig. 99N–O.

Occurs on Cape York Peninsula and S to near Rainscourt Stn, Qld, on river flats and rarely on low hills and ridges, in clayey and sandy soil, in open forest and woodland. Regions: CARP, CYRK, BURD. Map 486.

Qld: 3.9 km W of McMillan Ck, *A.K.Irvine 451* (BRI, FRI); Rainscourt Stn, *R.A.Perry 4486* (AD, BRI, CANB, FRI, MEL, NSW, NT).

Distinguished from related species especially in having the operculum distinctly longer than the hypanthium.

455. *Eucalyptus microtheca* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 87 (1859)

T: Victoria R., N.T., Dec. 1855, *F.Mueller*; holo: MEL; iso: BM, CANB, NSW.

E. raveretiana var. *jerichoensis* Domin, *Biblioth. Bot.* 89: 464 (1928). T: Jericho, Qld, Mar. 1910, *K.Domin 9183*; holo: PR.

E. coolabah Blakely & Jacobs in W.F.Blakely, *Key Eucalypts* 245–246 (1934). T: Bourke, N.S.W., *J.L.Boorman s.n.*; syn: *n.v.*; Bogan R. near Coolabah, N.S.W., 26 Mar. 1904, *J.H.Maiden & J.L.Boorman s.n.*; syn: K; Bourke, N.S.W., *O.C.McDougall s.n.*; syn: *n.v.*

E. coolabah var. *arida* Blakely, *Key Eucalypts* 246 (1934). T: Coopers Ck, S.A., Nov. 1919, *H.Basedow 17*; syn: K, NSW, PERTH; Ooraminra, N.T., Jan. 1927, *J.B.Cleland s.n.*; syn: NSW.

E. coolabah var. *rhodoclada* Blakely, *Key Eucalypts* 246 (1934). T: Milly Soak, near Cue, W.A., Sept. 1903, *W.V.Fitzgerald s.n.*; holo: NSW; iso: BM, FRI, K, NSW, PERTH.

Illustrations: C.D.Boomsma, *Native Trees S. Australia* 143 (1972); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 238 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 495 (1984).

Tree to 20 m. Bark varies from smooth and white or grey throughout to rough, fibrous, grey to grey-black on trunk and often on larger branches. Juvenile leaves alternate, lanceolate to broadly lanceolate, green to grey-green or glaucous, slightly discolorous. Adult leaves lanceolate or narrowly lanceolate, acute; lamina 8–17 cm long, 0.8–2.5 cm wide, dull, green or grey-green; lateral veins clearly visible, at 35°–60°; intramarginal vein up to 1 mm from margin; petiole terete, 8–17 mm long. Umbels 7-flowered; peduncle terete, 3–9 mm long; pedicels 1–4 mm long. Buds usually ovoid, occasionally fusiform, often glaucous; operculum hemispherical, apiculate, or conical, 1–2 mm long, 2–3 mm wide; hypanthium obconical, c. 2 mm long, 2–3 mm wide. Fruits hemispherical or obconical, 1–5 mm long, 3–7 mm wide; disc very narrow, ascending, or absent; valves 3 or 4, strongly exserted. *Coolibah*. Fig. 100A–B.

Occurs over most of the arid and semi-arid areas of mainland Australia N of 33°S latitude, on seasonally flooded, heavy grey and brown soil, such as margins of swamps, lagoons and watercourses, in open woodland. Regions: all except LUWN, ESPR, EYRE, RIVR, OTWY, NEPN, HOWE, TASM. Map 487.

W.A.: 32.2 km S of Nicholson Stn, *R.A.Perry* 2433 (AD, BRI, CANB, NSW, PERTH). N.T.: 55.5 km SE of Elliott, *G.M.Chippendale* 3853 (BRI, CANB, NSW, NT). S.A.: 30 km E of Cordillo Downs, *N.N.Donner* 5346 (BRI). Qld: Charleville, *S.T.Blake* 5346 (BRI). N.S.W.: 64.4 km W of Moree, 8 Oct. 1969, *N.Hall & W.Bateman* (FRI).

Distinguished by rough or smooth bark, terminal panicles of 7-flowered umbels, small buds and fruits, the fruits being hemispherical or obconical with strongly exserted valves and an obscure ascending disc. After *E. camaldulensis* the most widely distributed species. The wood has been used for firewood and fencing. The species is immortalised in the poem 'Waltzing Matilda' by A.B. (Banjo) Paterson and as the tree carved with the word 'Dig' by the explorer Robert O'Hara Burke.

456. *Eucalyptus cyanoclada* Blakely, *Key Eucalypts* 242 (1934)

T: Newcastle Waters, N.T., Aug. 1922, *C.E.F.Allen* 636; holo: NSW; iso: BRI.

Illustrations: S.T.Blake, *Austral. J. Bot.* 1: t. 35 (1953); S.Kelly *et al.*, *Eucalypts* 2: t. 214 (1983).

Tree to 7 m. Bark rough, fibrous throughout, grey. Juvenile leaves not seen. Adult leaves lanceolate, sometimes falcate, acute; lamina 7–16 cm long, 1.5–3 cm wide, grey-green or subglaucous; lateral veins clearly visible, at 50°–60°; intramarginal vein up to 2 mm from margin; petiole terete, 5–10 mm long. Umbels 7-flowered; peduncle terete, 5–10 mm long; pedicels 1–3 mm long. Buds obovoid to pyriform; operculum saucer-shaped to almost hemispherical, 1–2 mm long, 3–4 mm wide; hypanthium ovoid to obconical, 2–3 mm long, 3–4 mm wide. Fruits subcampanulate or suburceolate, 3–5 mm long, 2–4 mm wide; disc very narrow, level; valves 3 or 4, included. Fig. 100C–D.

Occurs from N of Tea Tree Well to near Maranboy, N.T., in clay soil on plains, as scattered trees and in open woodland. Regions: TNMI, MACD, BKLY. Map 488.

N.T.: 16 km NE of Tea Tree Well, *N.Forde* 11 (AD, CANB, FRI); 19 km S of Elliott, *L.A.S.Johnson* 2012 (NSW); Alexandria Homestead, *R.Swinbourne* 750 (BRI, CANB, FRI).

Differs from *E. microtheca* especially in the included valves of the fruits, also in the broader buds and level disc.

457. *Eucalyptus pruinosa* Schauer in W.G.Walpers, *Repert. Bot Syst.* 2: 926 (1843)

T: Sweers, Bentinck or Allen Is., [Qld], Nov. 1802, *F.Bauer & R.Brown s.n.*; iso: E, K.

E. spodophylla F.Muell., *Fragm.* 2: 71 (1860). T: none cited; *n.v.*

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 50 (1972); J.P.Jessop (ed.), *Fl. Central Australia* 253 (1981); S.Kelly *et al.*, *Eucalypts* 1: t. 206 (1983).

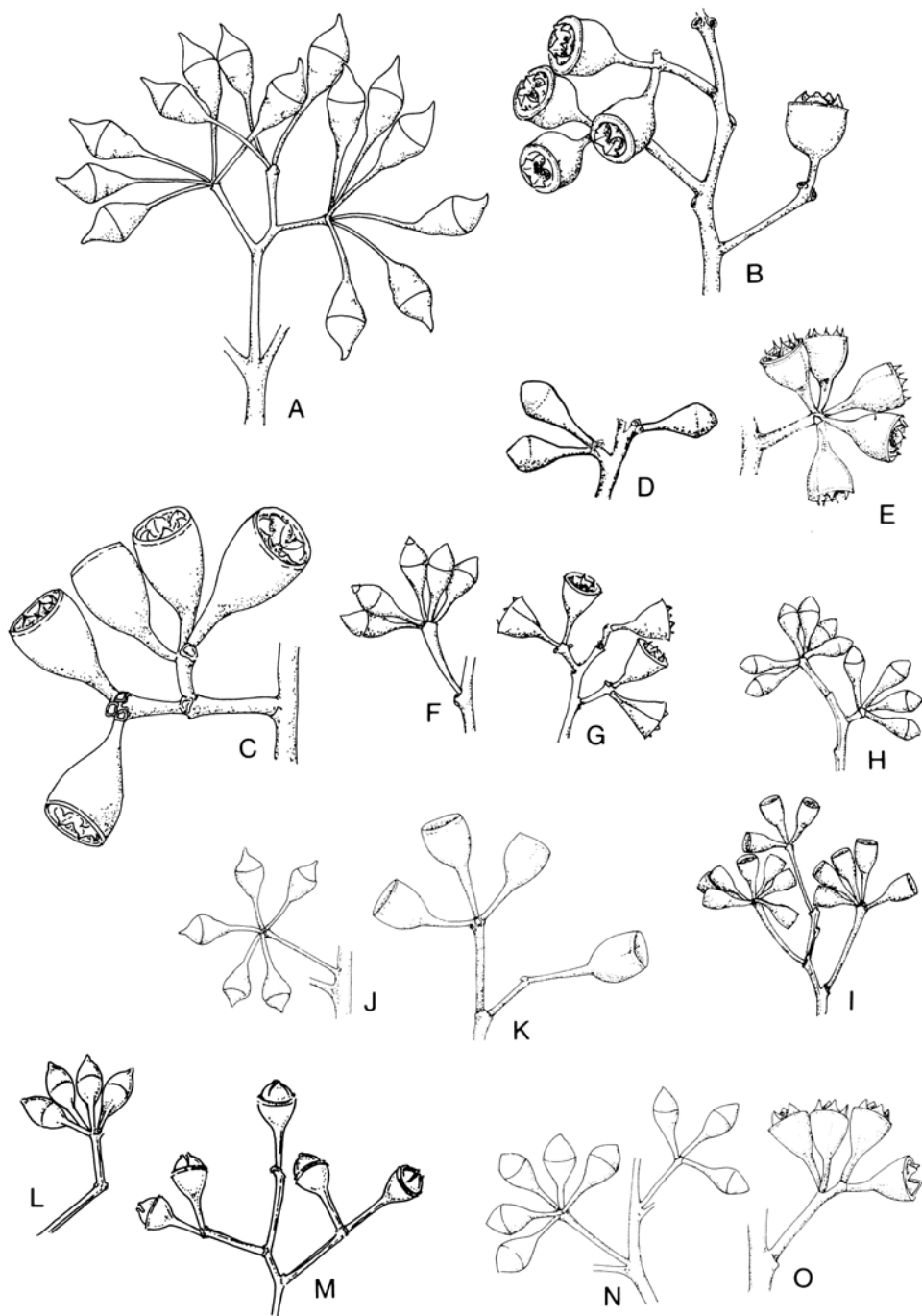


Figure 99. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. koolpinensis* (**A**, C.Dunlop 4568, FRI; **B**, I.Brooker 5349, FRI). **C**, *E. fitzgeraldii* (K.Hill 971, FRI). **D–E**, *E. argillacea* (**D**, 12.8 km S of Mt Isa, Qld, R.Perry, FRI; **E**, Elder Ck, E of Cloncurry, Qld, W.McReddie, FRI). **F–G**, *E. chlorophylla* (**F**, P.Latz 57, NSW; **G**, K.Hill 927, FRI). **H–I**, *E. normantonensis* (**H**, D.Kleinig 227, FRI; **I**, B.Hyland 5073, FRI). **J–K**, *E. tectifera* (**J**, C.Dunlop 4595, FRI; **K**, P.Martensz & R.Schodde 523, FRI). **L–M**, *E. distans* (I.Brooker 6216, FRI). **N–O**, *E. microneura* (**N**, A.Irvine 454, FRI; **O**, C.Cossalter 831, FRI). **D**, **E**, **L**, **M** drawn by M.Risby. Others drawn by M.May.

Tree to 10 m, but often a mallee to 3 m or more. Bark rough, flaky throughout, light brown to grey. Juvenile leaves opposite, ovate or broadly lanceolate, glaucous, concolorous. Adult leaves broadly ovate to elliptic-ovate, cordate, apiculate; lamina 5–13 cm long, 2.5–9 cm wide, grey-green to pruinose; lateral veins at 50°–60°; intramarginal vein double, one confluent with margin, the other up to 3 mm from margin; petiole absent. Umbels 7-flowered; peduncle slightly flattened to terete, 12–25 mm long; pedicels 5–10 mm long. Buds fusiform to pyriform, pruinose; operculum conical, sometimes slightly rostrate, 4–6 mm long, 3–6 mm wide; hypanthium obconical, 4–7 mm long, 3–6 mm wide. Fruits cylindrical to almost obconical, 7–10 mm long, 6–8 mm wide, glaucous when young; disc narrow, descending; valves 3–5, just exserted. *Silver Box*. Fig. 100E–F.

Occurs widely in northern Australia from Derby, W.A., through N.T. to Qld, but absent from most of Cape York Peninsula. Grows mostly on sandplains but on some ridges and low hills, in gravelly sand and clay in open woodland. Regions: KIMB, ARNM, TNMI, BKLY, CARP, CYRK, GGNA, THOM, BURD. Map 489.

W.A.: Ord R., *W.V.Fitzgerald 1616* (NSW, PERTH). N.T.: 16 km N of Hooker Creek Stn, *G.M.Chippendale 2208* (CANB, NT); 37 km W of West Baines R., *J.R.Maconochie 314* (FRI, NT). Qld: 22.5 km W of Gregory Downs Homestead, *L.Pedley 2057* (BRI, FRI); 59.6 km NW of Croydon, *N.H.Speck 4762* (CANB, MEL, NT, PERTH).

A distinctive small tree or mallee, with rough light brown to grey flaky bark, opposite sessile grey-green to pruinose leaves, terminal panicles and cylindrical to almost obconical fruits.

Ser. 79 *Buxuales*

Eucalyptus* ser. *Buxuales Blakely, *Key Eucalypts* 55, 230 (1934).

Type: *E. brownii* Maiden & Cambage, lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 496 (1988).

E. subser. *Subangustae* Blakely, *op. cit.* 56, 231: T: not designated.

E. subser. *Subplatyphyllae* Blakely, *loc. cit.* T: *E. brownii* Maiden & Cambage, lecto, *fide* G.M.Chippendale, *loc. cit.*

E. subser. *Protrusae* Blakely, *op. cit.* 58 *p.p.*

Trees, or one taxon a mallee (*E. behriana*). Bark usually rough, fibrous on trunk and larger branches, but rough on lower trunk only in *E. behriana*, smooth above. Juvenile leaves alternate, petiolate, discolorous. Adult leaves alternate, petiolate, usually concolorous; petiole terete. Conflorences axillary or terminal, paniculate; umbels 3–11-flowered, rarely to 15-flowered. Buds ovoid or clavate. Fruits ovoid, pyriform, hemispherical or obconical, rarely subcampanulate; disc narrow, descending; valves 3 or 4, level or included. Seeds suborbicular to elliptic, shallowly reticulate, grey, brown or black.

A series of 5 species in S.A., Qld, N.S.W. and Vic., characterised usually by tree habit, rough bark, concolorous leaves, axillary or terminal paniculate conflorences and fruits with a descending disc.

458. *Eucalyptus largeana* Blakely & Beuzev. ex Blakely, *Key Eucalypts* 232 (1934)

T: Avon State Forest, Craven, N.S.W., 25 June 1931, *W.A.W. de Beuzeville & R.Large s.n.*; *holo*: NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 191 (1975); N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 463 (1976); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 239 (1983).

Tree to 40 m. Bark rough, fibrous, finely tessellated on trunk and larger branches, grey or often somewhat bleached, then smooth and white or light grey above. Juvenile leaves lanceolate to broadly lanceolate, dark green, discolorous. Adult leaves narrowly lanceolate, acuminate; lamina 12–18 cm long, 1–2 cm wide, dull, dark green; lateral veins faint or just visible, at 35°–40°; intramarginal vein up to 1 mm from margin; petiole 12–18 mm long. Conflorence terminal or axillary; umbels 7-flowered; peduncle terete, 10–15 mm long; pedicels 2–4 mm long. Buds ovoid; operculum conical, 1–2 mm long, 2–3 mm wide; hypanthium obconical, 2–3 mm long and wide. Fruits ovoid to pyriform, 3–4 mm long, 2–3 mm wide; valves 3 or 4, included. *Craven Grey Box*. Fig. 100G–H.

Occurs from the upper Macleay and Manning Rivers to the upper Hunter R. valley, N.S.W., on slopes and ridges often in grey and brown podsolic soil in wet sclerophyll forest. Regions: MCPH, NEPN. Map 490.

N.S.W.: 7 km from Stroud towards Berrico, *M.I.H. Brooker* 4635 (AD, BRI, FRI, MEL, NSW); 19.3 km W of Gloucester, *N. Hall* 59 (AD, BRI, FRI, MEL, NSW, PERTH).

Distinguished by rough bark on trunk and largest branches, dark green narrowly lanceolate adult leaves, panicle inflorescence and small buds and fruits.

459. *Eucalyptus populnea* F. Muell., *J. Proc. Linn. Soc., Bot.* 3: 93 (1859)

E. populifolia Hook. in T.L. Mitchell, *J. Exped. Trop. Australia* 204 (1848), non Desf. (1829) T: near Mt Owen, Maranoa R., Qld, *T.L. Mitchell*; n.v.

E. populifolia Hook., *Icon. Pl.* t. 879 (1851), non Desf. T: Wide Bay district, [presumably collected inland from Wide Bay, as this taxon does not occur near the coast in that area], Qld, *J.T. Bidwill* 76; holo: K.

Illustrations: N. Hall *et al.*, *Forest Trees Australia* 3rd edn, 239 (1970); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts*: 240 (1983); D.J. Boland *et al.*, *Forest Trees Australia* 4th edn, 497 (1984).

Tree to 20 m. Bark rough, fibrous, grey to brown or often bleached on trunk and larger branches, then smooth and brown to grey-brown above. Juvenile leaves ovate to orbicular, shining, green, slightly discoloured. Adult leaves ovate, broadly lanceolate or rhombic, acute; lamina 5–10 cm long, 2–7.5 cm wide, shining, green; lateral veins distinct, at 25°–40°; intramarginal vein up to 1 mm from margin; petiole 15–20 mm long. Inflorescence terminal; umbels 7–15-flowered; peduncle terete or angular, 5–10 mm long; pedicels 1–3 mm long. Buds clavate; operculum hemispherical, 1–2 mm long, 2–3 mm wide; hypanthium obconical, 2–3 mm long and wide. Fruits obconical to hemispherical, 2–4 mm long and wide; valves usually 4, level or included. *Bimble Box*, *Poplar Box*. Fig. 100 I–J.

Occurs widely in eastern and southern Qld and inland N.S.W. Grows on plains and gentle slopes, often in areas of seasonal inundation, in open woodland. Regions: BURD, DWSN, WRGO, MCPH, DARL, RIVR, NEPN. Map 491.

Qld: 4 km N of Leyburn, *S.L. Everist* 2200 (BRI); near Monto, *L. Pedley* 2880 (BRI, FRI). N.S.W.: 1.9 km W of Peak Hill, *R.T. Eakin* 78 (FRI, MEL, NSW); between Leeton & Griffith, *K. Wells* 11 (CANB, NSW).

Distinguished from related species especially by the shining, broadly lanceolate or rhombic leaves. The wood is hard, strong and durable, and has been used as fencing or firewood. Trees are excellent for shade and shelter in pastoral areas.

460. *Eucalyptus brownii* Maiden & Cambage, *J. & Proc. Roy. Soc. New South Wales* 47: 215 (1913)

T: Reid R., near Townsville, Qld, Sept. 1912, *N. Daley s.n.*; syn: NSW; Reid R., near Townsville, Qld, Dec. 1912, *N. Daley*; syn: BM, NSW (several).

E. bicolor var. *parviflora* F. Muell. ex Benth., *Fl. Austral.* 3: 215 (1867). T: Burdekin R., Qld, 1857, *F. Mueller*; holo: K; iso: NSW.

Illustrations: N. Hall & M.I.H. Brooker, *Forest Tree Ser.* No. 180 (1975); S. Kelly *et al.*, *Eucalypts* 2: t. 206 (1983).

Tree to 16 m. Bark rough, fibrous, finely tessellated, grey to grey-brown on trunk and larger branches, then smooth and grey above. Juvenile leaves lanceolate, green, slightly discoloured. Adult leaves narrowly lanceolate to lanceolate, acute; lamina 8–15 cm long, 0.7–2 cm wide, shining, green; lateral veins at 15°–30°; intramarginal vein up to 1 mm from margin; petiole 10–15 mm long. Inflorescence terminal panicles or axillary umbels; umbels 7–11-flowered; peduncle terete, 3–6 mm long; pedicels 1–2 mm long. Buds ovoid; operculum hemispherical or bluntly conical, 1–2 mm long, c. 2 mm wide; hypanthium obconical or hemispherical, c. 2 mm long and wide. Fruits obconical or subcampanulate, 3–4 mm long, 2–3 mm wide; valves usually 4, just included. *Brown's Box*, *Reid River Box*. Fig. 100K–L.

Occurs widely in Qld, from near Mt Carbine southwards to between Rockhampton and Tambo, on plains and gentle slopes in clayey and sandy loam soils in woodland, sometimes dominating. Regions: CYRK, BURD, DWSN, THOM. Map 492.

Qld: Pentland, *S.T.Blake* 9916 (BRI, FRI); 51 km E of Hughenden, *M.I.H.Brooker* 4145 (FRI, MEL, NSW, NT); Mt Carbine, *B.Hyland* 3437 (BRI, CANB).

Differs from *E. populnea* in the narrower leaves, from *E. largiflorens* in the shining leaves and from *E. largeana* in the short peduncle.

461. *Eucalyptus largiflorens* F.Muell., *Trans. & Proc. Victorian Inst. Advancem. Sci.* 1: 34 (1855)

T: Murray R. above Moorundie, S.A., 1 Feb. 1851, *F.Mueller*; lecto: MEL 10392, *fide* J.H.Willis, *Muelleria* 1: 166–167 (1967); isolecto: K.

?*E. bicolor* Cunn. ex Mitch., *J. Exped. Trop. Australia* 390 (1848). T: subtropical Australia, 20 Nov. 1846, *T.L.Mitchell* 439; holo: K; iso: CGE, PERTH.

Illustrations: L.Costermans, *Native Trees & Shrubs S.E. Australia* 364 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 241 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 499 (1984).

Tree to 20 m. Bark rough, fibrous, dark grey on trunk and larger branches, then smooth and white above. Juvenile leaves linear to narrowly lanceolate, blue-green, slightly discoloured. Adult leaves narrowly lanceolate to lanceolate, acute; lamina 9–18 cm long, 0.9–1.8 cm wide, dull, green or grey-green; lateral veins faint, at 25°–40°; intramarginal vein up to 1 mm from margin; petiole 8–15 mm long. Conflorescence usually terminal; umbels 7–11-flowered; peduncle terete or angular, 3–11 mm long; pedicels 1–5 mm long. Buds ovoid; operculum hemispherical, apiculate to conical, c. 2 mm long, c. 3 mm wide; hypanthium ovoid to obconical, 2–3 mm long, c. 3 mm wide. Fruits hemispherical or ovoid, 3–6 mm long, 3–5 mm wide; valves 3 or 4, level or included. *Black Box*. Fig. 100M–N.

Widely scattered in eastern S.A., north-western Vic. and throughout inland N.S.W. with outliers in eastern Qld. Grows usually in seasonally flooded areas such as depressions in plains, river flats and lake beds, in heavy clay soil, rarely somewhat sandy soil, in woodland and open woodland. Regions: EYRE, TRNS, RIVR, OTWY, COOP, WRGO, DARL, NEPN, MCPH, DWSN. Map 493.

S.A.: 1 km E of Sanderston, *R.Schodde* 739 (AD, CANB). Qld: Teebah, *S.L.Everist* 6083 (BRI). N.S.W.: 23 km N of Collarenebri, *P.Martensz* 1123 (FRI, NSW). Vic.: Lake Hattah, Sept. 1941, J.H.Willis (MEL).

Distinguished by the dull green or grey-green adult leaves. The narrow juvenile leaves are also distinctive. The wood is heavy, hard and durable, but subject to borers, and has been used for poles, posts and railway sleepers.

462. *Eucalyptus behriana* F.Muell., *Trans. & Proc. Victorian Inst. Advancem. Sci.* 1: 34 (1855)

T: near Bacchus Marsh, Vic., Jan. 1853, *F.Mueller*; lecto: MEL 10388, *fide* J.H.Willis, *Muelleria* 1: 165 (1967); isolecto: K, MEL, NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 60 (1973); L.Costermans, *Native Trees & Shrubs S.E. Australia* 378 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 242 (1983).

Mallee to 7 m. Bark rough, fibrous, dark brown to brown-black on lower trunk, then smooth and grey-green above. Juvenile leaves ovate, blue-green or subglaucous, slightly discoloured. Adult leaves broadly lanceolate to ovate, acute; lamina 7.5–13 cm long, 1.5–5 cm wide, shining, green; lateral veins conspicuous, at 20°–40°; intramarginal vein up to 4 mm from margin; petiole 12–20 mm long. Conflorescence terminal; umbels 3–7-flowered; peduncle terete, 5–10 mm long; pedicels 1–3 mm long. Buds ovoid; operculum hemispherical, c. 2 mm long, 2–3 mm wide; hypanthium obovoid to obconical, c. 3 mm long, 2–3 mm wide. Fruits ovoid or subpyriform, 5–6 mm long, c. 4 mm wide; valves usually 4, included. *Bull Mallee*. Fig. 100 O–P.

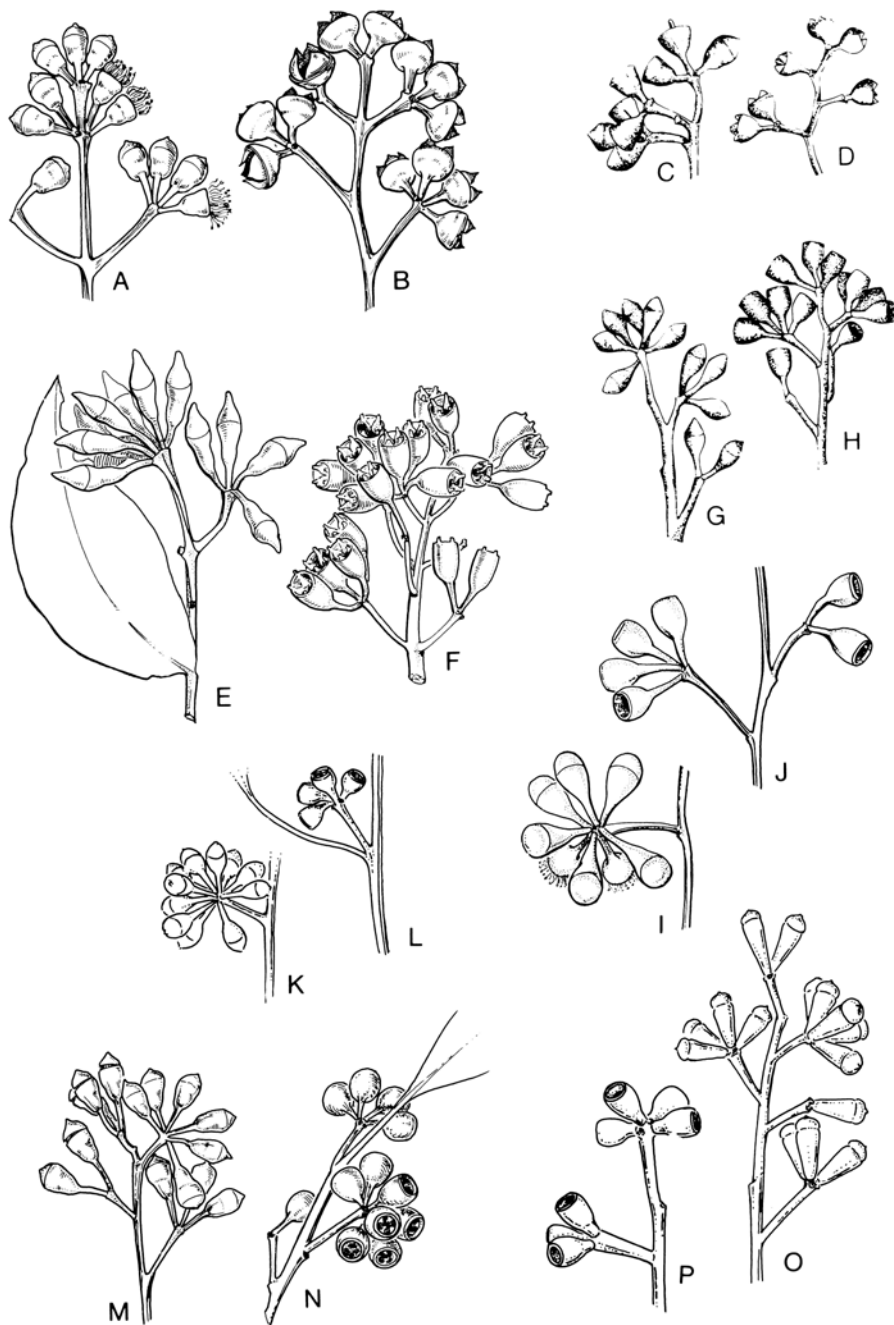


Figure 100. *Eucalyptus* buds and fruits, all $\times 1$, unless otherwise stated. **A–B**, *E. microtheca* $\times 1.5$ (**A**, D.Nelson 2178, FRI; **B**, J.Must 647, FRI). **C–D**, *E. cyanoclada* (**C**, R.Perry 223, CANB; **D**, R.Swinbourne 750, NT). **E–F**, *E. pruinosa* (**E**, 19.2 km W of Inverway, N.T., E.Larsen, FRI; **F**, I.Brooker 4205, FRI). **G–H**, *E. largeana* (Avon State Forest, Craven, N.S.W., W. de Beuzeville & R.Large, FRI). **I–J**, *E. populnea* (**I**, G.Cole 172, FRI; **J**, K.Wells & A.Gillison 82, FRI). **K–L**, *E. brownii* (**K**, I.Brooker 4150, FRI; **L**, J.Banks 145, FRI). **M–N**, *E. largiflorens* (**M**, D.Kleinig 148, FRI; **N**, P.Martensz 1122, FRI). **O–P**, *E. behriana* (**O**, 13.6 km S of West Wyalong, N.Hall, FRI; **P**, J.Briggs 158, FRI). **C**, **D**, **G**, **H** drawn by M.May. Others drawn by M.Risby.

Occurs in small disjunct populations in N.S.W., Vic. and S.A., including southern Eyre Peninsula, at Wirrabara, and near Wyalong. Grows in sandy and sandy loam soil on flat and gently sloping areas in tall shrubland. Regions: EYRE, RIVR, OTWY. Map 494.

S.A.: Nuriootpa, 8 Jan 1912, *J.M.Black* (AD). Qld: 1.4 km SE of Inglewood, *G.M.Chippendale* 1295 & *M.J.Brennan* (AD, BRI, FRI, MEL, NSW). N.S.W.: 8 km W of West Wyalong, 7 May 1955, *L.A.S.Johnson* (NSW). Vic.: 8 km N of Huntly, 20 Dec. 1959, *J.H.Willis* (MEL).

The intramarginal vein widely-spaced from the margin is a characteristic feature. The mallee habit, grey-green smooth upper bark and shining green broadly lanceolate to ovate leaves are also distinctive.

Ser. 80 Rummeryanae

Eucalyptus* ser. *Rummeryanae Chippendale, *Fl. Australia* 19: 504 (1988).

Type: *E. rummeryi* Maiden

Trees. Bark rough, fibrous throughout, finely tessellated, grey to grey-brown, sometimes bleached, nearly smooth on smaller branches. Juvenile leaves alternate, petiolate, ovate or broadly lanceolate, green, discolorous. Adult leaves alternate, petiolate, lanceolate, acuminate, dull, green, discolorous. Conflouescences terminal or axillary, paniculate; umbels 7-flowered. Buds ovoid or fusiform. Fruits obconical, subpyriform or hemispherical; disc narrow, descending; valves usually 4, level or slightly exserted. Seeds suborbicular to elliptic, shallowly reticulate, grey-brown-black.

A series of 1 species in north-eastern N.S.W., characterised by rough bark, discolorous leaves and paniculate conflouescences of 7-flowered umbels.

463. *Eucalyptus rummeryi* Maiden, *Crit. Revis. Eucalyptus* 6: 427 (1923)

T: Busbys Flat, near Casino, N.S.W., Oct. 1921, *G.E.Rummery s.n.*; holo: NSW; iso: BRI, K, MEL.

Illustrations: J.H.Maiden, *op. cit.* t. 238, fig. 1; N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 168 (1974); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 237 (1983).

Tree to 40 m. Adult leaves: lamina 8–15 cm long, 1–2.5 cm wide; lateral veins faint, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole channelled, 10–17 mm long. Peduncle angular, 6–12 mm long; pedicels 2–3 mm long. Operculum conical, 2–4 mm long, 2–3 mm wide; hypanthium usually obconical, 2–4 mm long, 2–3 mm wide. Fruits 3–4 mm long and wide. *Brown Box*. Fig. 101A–B.

Occurs from near Mallanganee southwards to near Carrai State Forest, N.S.W., on slopes and ridges in fertile, often basaltic soil in wet sclerophyll forest. Region: MCPH. Map 495.

N.S.W.: Kangaroo Creek State Forest, *M.I.H.Brooker* 4710 (AD, BRI, FRI, NSW); Pickapeni State Forest, 8 June 1957, *L.A.S.Johnson* (NSW).

Distinguished especially by fibrous bark on trunk and larger branches and discolorous leaves. The wood is strong and durable, and has been used for poles, railway sleepers and in some heavy constructions.

Ser. 81 Cambageanae

Eucalyptus* ser. *Cambageanae Chippendale, *Fl. Australia* 19: 496 (1988)

Type: *E. cambageana* Maiden

Trees. Bark rough, fibrous, dark grey to black, sometimes ±tessellated on lower trunk but often extending to almost all the trunk, abruptly changing to smooth, white or grey above. Juvenile leaves alternate, petiolate, ovate, green, concolorous. Adult leaves alternate, petiolate, lanceolate to narrowly lanceolate, acuminate or uncinat, green, concolorous.

Conflorescences terminal, paniculate; umbels 7-flowered. Buds clavate or ovoid. Fruits obconical or subpyriform, faintly ribbed; disc narrow, level or descending; valves 4 or 5, included. Seeds suborbicular, elliptic, ±flat or tending to cubical, shallowly reticulate, grey-brown-black.

A series of 1 species in central-eastern Qld., characterised by rough bark, concolorous leaves, terminal paniculate conflorescences of 7-flowered umbels and fruits with a white disc.

464. *Eucalyptus cambageana* Maiden, J. & Proc. Roy. Soc. New South Wales 47: 91 (1913)

T: Mirtna Stn, S of Charters Towers, Qld, Jan. 1912 & Dec. 1912, Z.Clark; syn: NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 109 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 207 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 501 (1984).

Tree to 35 m. Adult leaves: lamina 9.5–17 cm long, 1.1–2 cm wide; lateral veins clearly visible, at 30°–40°; intramarginal vein up to 2 mm from margin; petiole terete, 10–20 mm long. Peduncle terete or angular, 4–11 mm long; pedicels thick, angular, 2–6 mm long. Operculum hemispherical to conical, 2–3 mm long, 3–4 mm wide; hypanthium obovoid to obconical, 2–3 mm long, 3–4 mm wide. Fruits 4–7 mm long, 3–5 mm wide; disc white. *Coowarra Box.* Fig. 101C–D.

Occurs from near the coast inland to Charleville, Charters Towers and Jericho, Qld, in clay and loam soils on flat and undulating country in woodland and tall woodland. Regions: BURD, DWSN, WRGO. Map 496.

Qld: 14.5 km W of Biloela, M.I.H.Brooker 3764 (BRI, FRI, MEL, NSW); 5 km SW of Gogango, P.Martensz 946 (FRI, NSW, NT); 11.3 km E of Jericho, L.S.Smith & S.L.Everist 993 (BRI, CANB, MEL).

Distinguished by rough bark on lower trunk or almost all of the trunk, with an abrupt change to smooth bark above, lanceolate to narrowly lanceolate leaves, paniculate conflorescence and obconical or subpyriform fruits with a white disc, the last character distinguishing this from the following species.

Ser. 82 *Paniculatae*

***Eucalyptus* ser. *Paniculatae* Blakely, Key *Eucalypts* 39, 167 (1934).**

Type: *E. intertexta* R.Baker, lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 503 (1988).

Trees, rarely mallees. Bark rough, fibrous, grey or red-brown on part or all of trunk, smooth above. Juvenile leaves alternate, petiolate, ovate to broadly lanceolate, blue-green or grey-green, slightly discolourous to concolorous. Adult leaves alternate, petiolate, acute or acuminate, green, grey-green or dull green, concolorous. Conflorescences usually terminal, paniculate, or some axillary, simple; umbels 7-flowered. Buds clavate. Fruits hemispherical, subglobular, ovoid or ±pyriform; disc moderately broad, level or descending; valves 3–5, level or included. Seeds suborbicular to elliptic, tending flat or cubical, shallowly reticulate, grey-brown-black.

A series of 2 species in W.A., N.T., S.A., Qld and N.S.W., characterised by rough bark, concolorous leaves, and terminal paniculate as well as axillary simple conflorescences.

465. *Eucalyptus intertexta* R.Baker, Proc. Linn. Soc. New South Wales 25: 308 (1900)

T: Dubbo to Darling R., N.S.W., W.Bäuerlen *s.n.*; syn: *n.v.*; Nymagee, Condobolin, N.S.W., July 1899, R.H.Cambage *s.n.*; syn: *n.v.*; Mt Hope, N.S.W., R.H.Cambage *s.n.*; Cobar, N.S.W., R.H.Cambage *s.n.*; syn: *n.v.*; Drysdale, N.S.W., July 1899, R.H.Cambage *s.n.*; syn: NSW; Bobadah, 30 miles [48 km] E of Nymagee, N.S.W., R.H.Cambage *s.n.*; syn: NSW; Bobadah, 30 miles [48 km] E of Nymagee, N.S.W., R.H.Cambage *s.n.*; syn: *n.v.*; Nyngan, N.S.W., 7 Dec. 1899, collector unknown; syn: *n.v.*

E. intertexta var. *fruticosa* Blakely & Jacobs in W.F.Blakely, Key *Eucalypts* 168 (1934). T: White Range Goldfield, N.T., Aug. 1933, M.R.Jacobs 178; syn: NSW; White Ra. creek beds, N.T., Aug. 1933,

M.R.Jacobs 179; syn: BRI, NSW.

E. intertexta var. *diminuta* Blakely, *Key Eucalypts* 169 (1934). T: Mt Cooper, Cavanagh Ra., W.A., 31 July 1891, *R.Helms s.n.*; holo: NSW.

Illustrations: N.Hall, *Forest Tree Ser.* No. 37 (1972); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 243 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 503 (1984).

Tree to 30 m. Bark rough on lower trunk, then smooth and white, grey or brown above, often in patches. Adult leaves narrowly to broadly lanceolate, acute to acuminate; lamina 7–14 cm long, 1–2 cm wide, green, grey-green or dull green; lateral veins clearly visible, at 25°–35°; intramarginal vein up to 1 mm from margin; petiole terete, 5–15 mm long. Peduncle angular, 5–16 mm long; pedicels angular, 3–9 mm long. Operculum conical, 2–4 mm long, 3–4 mm wide; hypanthium obconical to obovoid, c. 4 mm long, 3–4 mm wide. Fruits hemispherical to ovoid, 4–9 mm long, 4–7 mm wide; disc descending; valves 4 or 5, level or included. *Gum-barked Coolibah*. Fig. 101E–F.

Occurs widely in central deserts of W.A., N.T. and S.A., extending to other parts of eastern S.A., western N.S.W. and southern Qld. Grows in sandy and well-drained soil, mostly on flat areas in woodland and open woodland. Regions: SNDY, LEON, GBSN, MACD, SIMP, TRNS, COOP, WRGO, DARL, RIVR. Map 497.

W.A.: 124 km SW of Warburton, *A.S.George* 2909 (PERTH). N.T.: 1.6 km W of Arltunga, *N.Ford* 67 (AD, BRI, CANB, NSW, NT, PERTH). S.A.: Paralana Springs, *J.Carrick* 2004 (AD, FRI). Qld: 35.4 km NW of Dirranbandi, *S.L.Everist* 4297 (BRI). N.S.W.: 30.6 km N of Byrock, 30 May 1951, *E.F.Constable* (NSW).

Distinguished by rough bark mostly on lower trunk only, green, grey-green or dull green leaves, and paniculate conflorescence but simple umbels often present. Buds and fruits smaller than in *E. orgadophila*. The wood is moderately durable, suitable for firewood or light constructions.

466. *Eucalyptus orgadophila* Maiden & Blakely, *Crit. Revis. Eucalyptus* 7: 462 (1928)

T: Cooranga North, Qld, 21 Apr. 1925, *C.T.White* 2484 [incorrectly published as 2482]; holo: NSW; iso: BRI, CANB, FRI, K, L.

E. intertexta var. *magna* Blakely, *Key Eucalypts* 168 (1934). T: Springsure, Qld, June 1913, *J.L.Boorman s.n.*; syn: NSW; Roma, Qld, 2 Sept. 1910, *R.H.Simmonds*; syn: NSW; Gowrie, Qld, 26 Oct. 1911, *W.F.Gray*; syn: NSW; Bindango, Qld, 7 July 1922, *H.C.Quodling*; syn: BRI, NSW.

Illustrations: N.Hall, *Forest Tree Ser.* No. 17 (1971); S.Kelly *et al.*, *Eucalypts* 1: t. 208 (1983).

Tree to 15 m. Bark rough on most of trunk, then smooth and grey-white above. Adult leaves narrowly to broadly lanceolate, acute to acuminate; lamina 5–12 cm long, 1.2–2.5 cm wide, grey-green or dull green; lateral veins faint, at 25°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 12–15 mm long. Peduncle quadrangular, 7–13 mm long; pedicels terete, 1–4 mm long. Operculum hemispherical, sometimes apiculate, 3–5 mm long, 4–5 mm wide; hypanthium hemispherical, 4–5 mm long and wide. Fruits subglobose to subpyriform, 5–8 mm long, 4–6 mm wide; disc descending; valves 3–5, included. *Mountain Coolibah*, *Gum-topped Box*. Fig. 101G–H.

Occurs from just S of Cape York Peninsula, Qld, to near the N.S.W. border, in well-drained soil on ridges and hills, often in pure stands, and in woodland. Regions: BURD, DWSN, MCPH, WRGO. Map 498.

Qld: SE of Surat, *S.T.Blake* 21285 (AD, BRI, CANB, NSW, PERTH); 43.8 km N of Wandoan, *M.I.H.Brooker* 4793 (BRI, FRI, NSW); near Amby, *L.S.Smith* 6300 (BRI).

Buds and fruits usually larger than in *E. intertexta*, and bark paler in colour.

Ser. 83 Lucasianae

Eucalyptus ser. **Lucasianae** Chippendale, *Fl. Australia* 19: 500 (1988).

Type: *E. lucasii* Blakely

Trees or mallees. Bark usually smooth throughout, occasionally rough at base. Juvenile leaves not seen. Adult leaves alternate, petiolate, lanceolate, acute, concolorous. Conflorences terminal, paniculate, sometimes with axillary umbels; umbels 7-flowered. Buds clavate. Fruits ovoid; disc narrow, descending; valves 4 or 5, included. Seeds suborbicular to elliptic, shallowly reticulate, grey-brown-black.

A series of 1 species in central-southern W.A., characterised by smooth bark, concolorous leaves and mostly terminal paniculate conflorences or with a few axillary simple ones.

467. Eucalyptus lucasii Blakely, *Key Eucalypts* 226 (1934)

T: Lake Barlee, W.A., Sept. 1919, *C.Fitzgerald-Fraser per W.C.Grasby s.n.*; holo: NSW; iso: PERTH.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 74 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 202 (1983).

Tree to 12 m, or mallee to 8 m. Bark usually smooth throughout, copper-brown to white or grey, but occasionally with rough bark to c. 0.3 m. Adult leaves: lamina 6–11.5 cm long, 1.3–2 cm wide, grey-green or subglaucous; lateral veins faint, at 25°–40°; intramarginal vein up to 2 mm from margin; petiole terete, 20–30 mm long. Peduncle terete, 5–8 mm long; pedicels 2–4 mm long. Operculum hemispherical, 1–2 mm long, 2–3 mm wide; hypanthium obovoid, 3–4 mm long, c. 3 mm wide. Fruits 5–8 mm long, 4–5 mm wide. *Barlee Box*. Fig. 101 I–J.

Occurs widely in the eastern Goldfields, W.A., in sandy soil on plains in shrubland and open shrubland. Region: LEON. Map 499.

W.A.: Wiluna Research Stn, *M.I.H.Brooker 2015* (FRI, PERTH); Niagara, *A.S.George 2731* (PERTH); 64.4 km S of Wiluna, *N.H.Speck 1456* (AD, CANB, MEL, NSW, NT, PERTH).

Distinguished by small tree or mallee habit, usually smooth bark throughout, usually terminal panicles, grey-green or subglaucous leaves on long petioles and terete peduncle, 5–8 mm long.

Ser. 84 Porantheroideae

Eucalyptus ser. **Porantheroideae** (Maiden) Chippendale, *Fl. Australia* 19: 503 (1988).

E. sect. Porantheroideae Maiden, *Crit. Revis. Eucalyptus* 6: 529 (1924). T: *E. ochrophloia* F.Muell., lecto, *fide* G.M.Chippendale, *loc. cit.*

E. ser. Subbuxales Blakely, *op. cit.* 54 *p.p.*, not as to lectotype; *E. ser. Buxales* subser. *Subangustae* Blakely, *op. cit.* 56 *p.p.*, not as to lectotype.

Trees or mallees. Bark rough, fibrous on at least part of trunk, occasionally to larger branches, or smooth throughout. Juvenile leaves alternate, petiolate, concolorous or slightly discolorous; not seen in *E. petraea*. Adult leaves alternate, petiolate, concolorous. Conflorences terminal, paniculate, or axillary, simple; umbels 7-flowered. Buds cylindrical, clavate, conical, obconical or ovoid. Fruits cylindrical to ovoid, obconical, obovoid, hemispherical, pyriform or suburceolate; disc broad, descending; valves 3–5, included. Seeds suborbicular, ovoid or elliptic, shallowly reticulate, grey, brown or black.

A series of 4 species in W.A., N.T., S.A., Qld and N.S.W., characterised by the usually rough bark, concolorous leaves, terminal paniculate and axillary simple conflorences and fruits with a broad descending disc.

468. *Eucalyptus thozetiana* F.Muell. ex R.Baker, *Proc. Linn. Soc. New South Wales* 31: 305 (1906)

T: Tandawanna, Qld, 24 Oct. 1903, *C.W.Chapman s.n.*; syn: NSW; Newinga, Qld, 1 June 1906, *C.W.Chapman s.n.*; syn: NSW; Goondiwindi, Qld, *C.W.Chapman s.n.*; syn: *n.v.*; Cometville & Emerald, Qld, 1879, *P.A.O'Shanesey s.n.*; syn: MEL; Expedition Ra., Qld, 1878, *A.Thozet s.n.*; syn: MEL.

E. gracilis var. *thozetii* Bailey, *Queensland Fl.* 2: 615 (1900). T: Expedition Ranges, Qld, *E.Bowman & P.O'Shanesey*; *n.v.*

Illustrations: A.S.Mitchell, *Eucalypts Central Australia* 30 (1980); J.P.Jessop (ed.), *Fl. Central Australia* 252 (1981); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 507 (1984).

Tree to 25 m. Bark smooth throughout, white to grey, sometimes pink-grey; exfoliating flakes often retained in small curls. Juvenile leaves linear, green, concolorous. Adult leaves narrowly lanceolate, acuminate; lamina 6–15 cm long, 0.5–1.1 cm wide, green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 5–10 mm long. Peduncle terete or angular, 5–14 mm long; pedicels 2–6 mm long. Buds ovoid to clavate, somewhat quadrangular; operculum conical, 1–2 mm long, 2–3 mm wide; hypanthium suburceolate, 2–3 mm long and wide. Fruits cylindrical to ovoid, 3–6 mm long, 3–4 mm wide; valves 3 or 4. *Yapunya*, *Thozet's Box*. Fig. 101K–L.

Occurs in Qld from Charters Towers southwards almost to the N.S.W. border, with a small isolated disjunct population NE of Alice Springs, N.T. Grows mainly in sandy soil on plains, small hills and ridges, in woodland and open forest. Regions: BURD, DWSN, WRGO, MCPH, MACD. Map 500.

N.T.: 7 km E of The Garden Homestead, *M.I.H.Brooker* 5122 (BRI, FRI, NSW, NT). Qld: 88.5 km W of Biloela, *M.I.H.Brooker* 3765 (BRI, FRI, MEL, NSW); 27.8 km WSW of Moura, *G.M.Chippendale* 1095 & *M.J.Brennan* (AD, BRI, MEL, NSW, PERTH).

Distinguished by the linear juvenile leaves, smooth bark with older shedding bark often retained in small curly fragments, narrowly lanceolate adult leaves, terminal panicles or axillary umbels and ovoid to clavate buds. The wood is hard, heavy and durable, and has been used for poles, posts and general construction.

469. *Eucalyptus ochrophloia* F.Muell., *Fragm.* 11: 36 (1878)

T: Warrego R., Qld, *F.Mueller*; syn: K; Paroo R., N.S.W., *collector unknown*; syn: *n.v.*

Illustrations: N.Hall, *Forest Tree Ser.* No. 25 (1971); J.P.Jessop (ed.), *Fl. Central Australia* 252 (1981); G.M.Cunningham *et al.*, *Pl. W. New South Wales* 522 (1981).

Tree to 20 m, though usually less than 15 m. Bark rough, fibrous to 4 m, abruptly changing to smooth and red or bronze above. Juvenile leaves narrowly lanceolate to lanceolate, green, slightly discoloured. Adult leaves narrowly lanceolate, acuminate to uncinata; lamina 12.5–18 cm long, 1–1.5 cm wide, green; lateral veins faint, at 25°–35°; intramarginal vein up to 2 mm from margin; petiole terete, 10–20 mm long. Peduncle terete, 5–12 mm long; pedicels 5–6 mm long. Buds cylindrical to conical; operculum conical, 5–6 mm long and wide; hypanthium cylindrical or suburceolate, 6–7 mm long, 5–6 mm wide. Fruits cylindrical to suburceolate, 2–4-ribbed, 10–15 mm long, 6–8 mm wide; valves 3 or 4. *Yapunya*. Fig. 101M–N.

Occurs in south-western Qld and far north-western N.S.W., in open woodland and forest in drainage channels and depressions near rivers in silty soil and cracking clay. Regions: COOP, WRGO, DARL. Map 501.

Qld: Thylungra, *S.L.Everist* 7474 (BRI, MEL, NSW); 59.6 km from Bulloo Downs towards Thargomindah, *C.H.Gittins* 1921 (BRI). N.S.W.: Paroo R., Wanaaring, *L.A.S.Johnson* 140 (NSW).

Differs from *E. thozetiana* in having rough dark bark to 4 m, abruptly changing to smooth and red or bronze bark, a shorter petiole, and larger buds and fruits. The wood is very heavy, hard, and durable, but difficult to work.

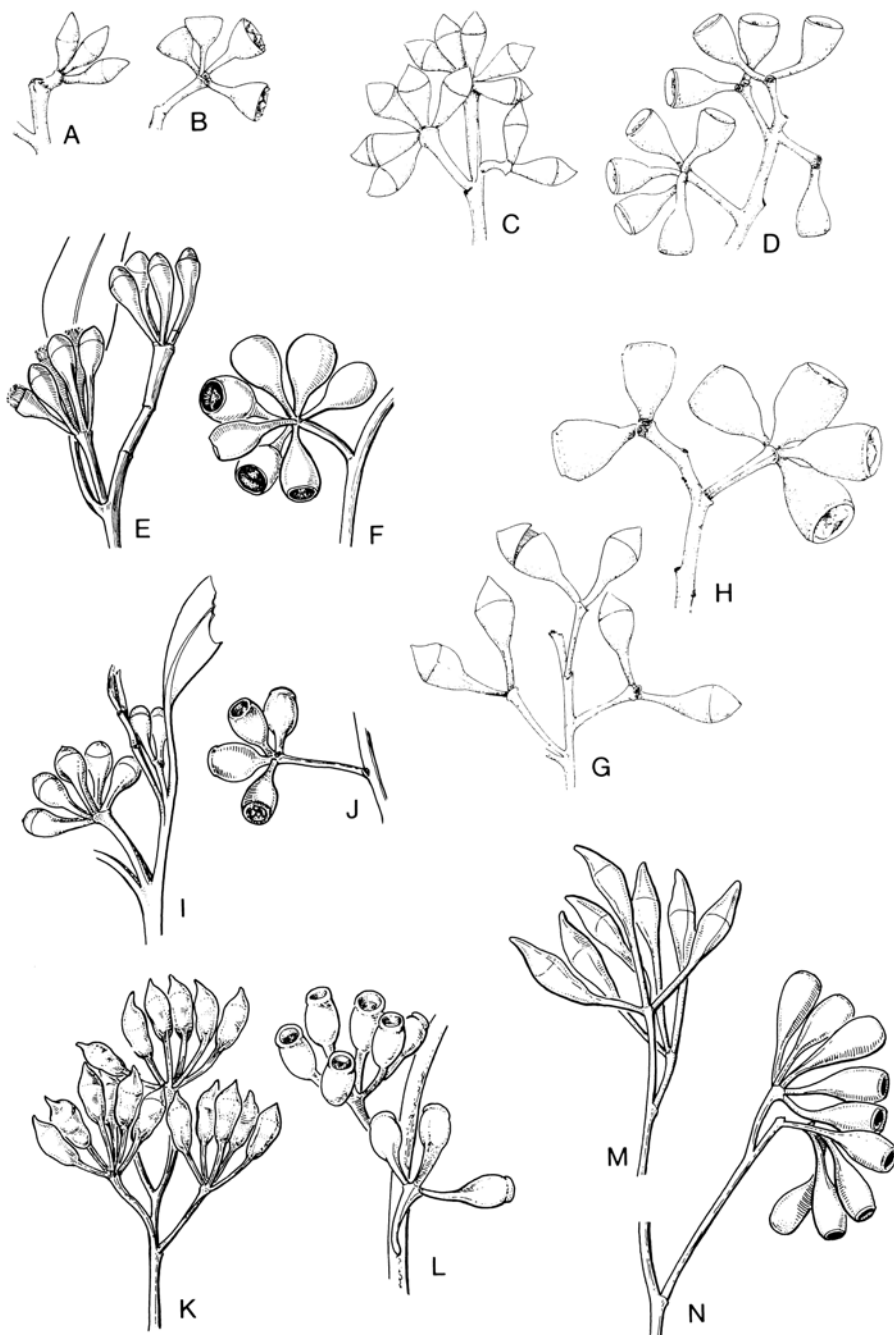


Figure 101. *Eucalyptus* buds and fruits, all $\times 1$, unless otherwise stated. **A–B**, *E. rummeryi* (**A**, Casino, N.S.W., G.Rummery, FRI; **B**, I.Brooker 4710, FRI). **C–D**, *E. cambageana* (D.Boland 1050, FRI). **E–F**, *E. intertexta* $\times 1.25$ (**E**, I.Brooker 1694, FRI; **F**, I.Brooker 1695, FRI). **G–H**, *E. orgadophila* (**G**, I.Brooker 4826, FRI; **H**, B.Hyland 6151, FRI). **I–J**, *E. lucasii* (**I**, B.Lay 917a, FRI; **J**, 88 km E of Meekatharra, W.A., E.Larsen, FRI). **K–L**, *E. thoetiana* (**K**, I.Brooker 1394, FRI; **L**, G.Chippendale 1095 & M.Brennan, FRI). **M–N**, *E. ochrophloia* $\times 0.75$ (**M**, S.Everist 7474, FRI; **N**, 212.8 km W of Charleville towards Quilpie, Qld, R.Edmonds, FRI). **A–D**, **G**, **H**, drawn by M.May. Others drawn by M.Risby.

470. *Eucalyptus lansdowneana* F.Muell. & J.Brown in J.E.Brown, *Forest Fl. S. Australia* 9: t. 31 (1891)

T: Pandura Run, S.A., 1889, *T.L.Browne s.n.*; holo: AD; iso: AD, NSW.

Mallee to 6 m or small tree to 9 m. Bark rough, fibrous, grey or grey-brown on trunk and larger branches, then smooth and white-grey above. Juvenile leaves broadly lanceolate to lanceolate, slightly discoloured, green. Adult leaves lanceolate to broadly lanceolate, acute; petiole terete, 10–20 mm long. Pedicels absent or to 3 mm long. Fruits ovoid to suburceolate, subcylindrical or pyriform; valves 3 or 4.

Occurs in south-eastern S.A., in several isolated areas. Differs from related species in the sessile flowers and usually coloured staminal filaments. There are 2 subspecies.

Flowers crimson; leaves light yellow-green to grey-green

470a. subsp. *lansdowneana*

Flowers white, cream, mauve or purple; leaves dull, green to dark green

470b. subsp. *albopurpurea*

470a. *Eucalyptus lansdowneana* F.Muell. & J.Brown subsp. ***lansdowneana***

Illustrations: C.D.Boomsma, *S. Austral. Naturalist* 48: 54 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 200 (1983).

Adult leaves lanceolate; lamina 8–14 cm long, 1.5–2.5 cm wide, grey-green to yellow-green; lateral veins distinct, at 25°–40°; intramarginal vein up to 3 mm from margin. Peduncle angular or flattened, 6–13 mm long. Buds usually cylindrical; operculum hemispherical, c. 3 mm long, 4–5 mm wide; hypanthium obconical to urceolate, 6–7 mm long, 4–5 mm wide. Fruits ovoid to suburceolate, several-ribbed, 7–10 mm long and wide. *Crimson Mallee*. Fig. 102A–B.

Occurs on Eyre Peninsula chiefly in the Gawler Ranges, S.A., on granitic ridges in small pure groups or with other mallees and shrubs. Region: EYRE. Map 502.

S.A.: 30.4 km from Chilpuddie Tank towards Yardea Stn, *M.I.H.Brooker* 5591 (AD, FRI); 16 km S of Yardea Homestead, *D.E.Symon* 8158 (AD, FRI, NSW).

A mallee or small tree habit, rough bark on trunk and larger branches, and sessile or shortly pedicellate buds and fruits. The crimson filaments are distinctive. An attractive, diffuse shrub in cultivation.

470b. *Eucalyptus lansdowneana* subsp. ***albopurpurea*** Boomsma, *S. Austral. Naturalist* 48: 55 (1974)

T: 4 km E of Kellidie Bay, S.A., 34°40'S, 135°30'E, 2 July 1973, *R.A.Dorward s.n.*; holo: AD; iso: AD, CANB.

E. behriana var. *purpurascens* F.Muell. ex Benth., *Fl. Austral.* 3: 214 (1867); *E. hemiphloia* var. *purpurascens* (F.Muell. ex Benth.) Maiden, *Trans. & Proc. Roy. Soc. S. Australia* 26: 12 (1902); *E. odorata* var. *purpurascens* (F.Muell. ex Benth.) Maiden, *Trans. & Proc. Roy. Soc. S. Australia* 32: 283 (1908). T: Lake Wangary, S.A., *C.Wilhelmi s.n.*; iso: MEL.

E. lansdowneana var. *leucantha* Blakely, *Key Eucalypts* 224 (1934). T: between Kirton Point & Port Lincoln, S.A., Jan. 1907, *J.H.Maiden*; holo: NSW.

Illustrations: C.D.Boomsma, *op. cit.* 54; L.Costermans, *Native Trees & Shrubs S.E. Australia* 379 (1981); S.Kelly *et al.*, *Eucalypts* 1: t. 185 (1969).

Adult leaves broadly lanceolate to lanceolate; lamina 7–11 cm long, 1.2–2.2 cm wide, dull, green to dark green; lateral veins distinct, at 20°–35°; intramarginal vein up to 2 mm from margin. Peduncle angular or slightly flattened, 10–15 mm long. Buds ovoid to cylindrical; operculum hemispherical, 2–3 mm long, c. 4 mm wide; hypanthium obconical to obovoid, 4–5 mm long, c. 4 mm wide. Fruits subcylindrical or pyriform, without ribs, 6–9 mm long, 5–6 mm wide. *Port Lincoln Mallee*. Fig. 102C–D.

Occurs on Eyre Peninsula and southern parts of Kangaroo Is., S.A., in limestone soil in shrubland. Region: EYRE. Map 503.

S.A.: between Proper Bay & Sleaford Bay, *M.I.H.Brooker* 3872 (AD, FRI, MEL, NSW); 1 km NE of Eleanor Stn, *G.M.Chippendale* 1363 (AD, BRI, FRI, NT).

Differs from subsp. *lansdowneana* in the slightly smaller buds and fruits and in leaf and filament colour. An attractive shrub in cultivation, usually with mauve flowers.

471. *Eucalyptus petraea* D.Carr & S.Carr, *Nuytsia* 4: 279 (1983)

T: Gnarlbin Rock, W.A., 28 Nov. 1980 [incorrectly published as 29 Nov.], *D.J.Carr & S.G.M.Carr 2373*; holo: FRI.

Illustrations: D.J.Carr & S.G.M.Carr, *op. cit.* 283, 285–288, 290.

Tree or mallee to 14 m. Bark rough, fibrous, dark grey on trunk for 3–10 m, then smooth, grey to pink-grey above, deciduous in long ribbons. Juvenile leaves not seen. Adult leaves lanceolate, acute to acuminate; lamina 7–12 cm long, 2–2.5 cm wide, shining, dark green; lateral veins usually distinct, at 30°–40°; intramarginal vein up to 2 mm from margin; petiole terete, 15–25 mm long. Peduncle angular, 13–18 mm long; pedicels 3–7 mm long. Buds obconical; operculum conical, 2–4 mm long, 4–5 mm wide; hypanthium obconical, 3–5 mm long, 4–5 mm wide. Fruits obconical to obovoid or hemispherical, 5–8 mm long, 6–7 mm wide; valves 4 or 5. Fig. 102E–F.

Occurs between Merredin and Karonie, W.A., in isolated populations associated with granitic outcrops in woodland. Regions: BENC, LEON. Map 504.

W.A.: 4.1 km N of Karonie on track to Cardunia Rocks, *D.Blaxell 1746* (FRI, NSW); Moorine Rock, *M.I.H.Brooker 5671* (AD, FRI, MEL, NSW, PERTH).

Resembles *E. lucasii* but has rough bark for 3–10 m, thick, shining, dark green lanceolate leaves, and longer peduncles.

Ser. 85 Dawsonianae

***Eucalyptus* ser. Dawsonianae** Chippendale, *Fl. Australia* 19: 497 (1988).

Type: *E. dawsonii* R.Baker

Trees. Bark smooth throughout, grey, white or yellow, shedding in strips or plates. Juvenile leaves alternate, petiolate, orbicular to broadly ovate, grey-green, concolorous. Adult leaves alternate, petiolate, lanceolate, apiculate or acute, green or grey-green, concolorous. Conflorences terminal, paniculate; umbels 7-flowered. Buds obovoid, clavate or fusiform, glaucous. Fruits obconical; disc narrow, descending; valves 3 or 4, level or included. Seeds suborbicular to elliptic, shallowly reticulate, grey-brown.

A series of 1 species in central eastern N.S.W., characterised by the smooth bark, dull concolorous leaves, terminal paniculate conflorences, and glaucous buds and fruits.

472. *Eucalyptus dawsonii* R.Baker, *Proc. Linn. Soc. New South Wales* 24: 295 (1899)

T: Bylong, 32 miles [c. 51 km] from Rylstone, N.S.W., 18 Oct. 1898, *R.T.Baker s.n.*; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 5: 57 (1920); isolecto: K, MEL.

Illustrations: N.Hall, *Forest Tree Ser.* No. 26 (1971); N.C.W.Beadle *et al.*, *Fl. Sydney Region* 3rd edn, 326 (1982); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 262 (1983).

Tree to 28 m. Adult leaves: lamina 10–15 cm long, 1.5–2.5 cm wide; lateral veins at 35°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 15–23 mm long. Peduncle terete, 6–10 mm long; pedicels 2–4 mm long. Buds glaucous; operculum conical, c. 2 mm long and wide; hypanthium obconical, 2–3 mm long, c. 2 mm wide. Fruits glaucous, 3–6 mm long, 2–4 mm wide. *Slaty Gum*. Fig. 102G–H.

Occurs mainly in the Upper Hunter Valley centred on Denman–Scone, N.S.W., in alluvial and loamy soil on mainly flat areas of tall woodland. Region: NEPN. Map 505.

N.S.W.: 3.5 km from Hollydeen towards Denman, *M.I.H.Brooker 4658* (AD, FRI, MEL); Jerrys Plains, 3 Sept. 1938, *E.C.Chapman* (NSW).

Distinct in smooth bark, dull green or grey-green leaves, glaucous buds and obconical glaucous fruits.

Ser. 86 Moluccanae

Eucalyptus ser. **Moluccanae** Chippendale, *Fl. Australia* 19: 501 (1988).

Type: *E. moluccana* Roxb.

E. subser. *Subangustae* Blakely, *op. cit.* 56, 231, p.p.; *E.* subser. *Subplatyphyllae* Blakely, *op. cit.* 56, 233, p.p.

Trees. Bark rough, fibrous on half to all of trunk, sometimes extending to larger branches, then smooth above. Juvenile leaves alternate, petiolate, usually concolorous but slightly discolorous in *E. moluccana*. Adult leaves alternate, petiolate, concolorous. Conflorences terminal, paniculate, often also with some axillary, simple umbels; umbels 7-flowered, 7–9-flowered in *E. microcarpa*. Buds ovoid, cylindrical or fusiform. Fruits cylindrical or ovoid to suburceolate or subglobose; disc usually broad, but narrow in *E. pilligaensis*, descending; valves usually 4, included, but sometimes level in *E. microcarpa*. Seeds suborbicular to elliptic, shallowly reticulate, grey-brown-black. *Grey Boxes*.

A series of 4 species in S.A., Qld, N.S.W. and Vic., characterised by rough bark, concolorous leaves, mostly paniculate terminal conflorences, and fruits with a descending disc and included or level valves.

473. *Eucalyptus albens* Benth., *Fl. Austral.* 3: 219 (1867)

E. hemiphloia var. *albens* (Benth.) Maiden, *Forest Fl. New South Wales* 1: 131 (1904). T: Macquarie R., N.S.W., Aug. 1817, *A. Cunningham* 198; syn: BM, K; New England, N.S.W., *C. Stuart s.n.*; syn: K, MEL; between Alford's and the Range, N.S.W., 17 June 1843, *L. Leichhardt s.n.*; syn: MEL; between Ten Mile Ck & Broken R., Vic., *F. Mueller*; syn: K, MEL.

E. albens var. *elongata* Blakely, *Key Eucalypts* 237 (1934). T: Mt Topper State Forest, N.S.W., Oct. 1923, *L.B. Peacocke s.n.*; holotype: NSW.

Illustrations: L. Costermans, *Native Trees & Shrubs S.E. Australia* 365 (1981); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 247 (1983); D.J. Boland *et al.*, *Forest Trees Australia* 4th edn, 513 (1984).

Tree to 25 m. Bark rough, fibrous, light grey or somewhat bleached on trunk, then smooth and white above. Juvenile leaves ovate to suborbicular, sometimes cordate, 9–15 cm long, 6–11.5 cm wide, grey-green to blue-green. Adult leaves broadly lanceolate to lanceolate, acuminate; lamina 10–16 cm long, 1.7–3 cm wide, glaucous or grey-green; lateral veins prominent, at 20°–30°; intramarginal vein up to 2 mm from margin; petiole terete to slightly flattened, 15–22 mm long. Peduncle quadrangular, glaucous, 10–15 mm long; pedicels absent or 1–5 mm long. Buds cylindrical, glaucous; operculum conical, 4–8 mm long, 4–7 mm wide; hypanthium cylindrical, 4–8 mm long, 4–7 mm wide. Fruits cylindrical to suburceolate, glaucous, often ribbed, 6–15 mm long, 5–10 mm wide. *White Box*. Fig. 102 I–J.

Occurs widely in eastern N.S.W. and Vic., extending to south-eastern Qld and with outliers in the Flinders Ra. and near Melrose, S.A. Grows on gentle slopes, plains and valleys in a wide range of soils in woodland. Regions: MCPH, NEPN, HOWE, RIVR, TRNS, OTWY. Map 506.

S.A.: Melrose, *B. Copley* 3775 (AD). Qld: Yamsion, *C.T. White* 9138 (BRI). N.S.W.: 8 km from Coolah towards Cassilis, *M.I.H. Brooker* 5169 (AD, FRI, NSW); 12.9 km SW of Warren, *J. Pickard* 1098 (NSW). Vic.: 16 km NNE of Heathcote, *H.I. Aston* 957 (MEL).

Recognised within the series by the rough-barked trunk, smooth white branches, large juvenile leaves, grey-green or glaucous leaves and glaucous buds and fruits. The wood is heavy, hard, strong and durable, and has been used for heavy construction, railway sleepers,

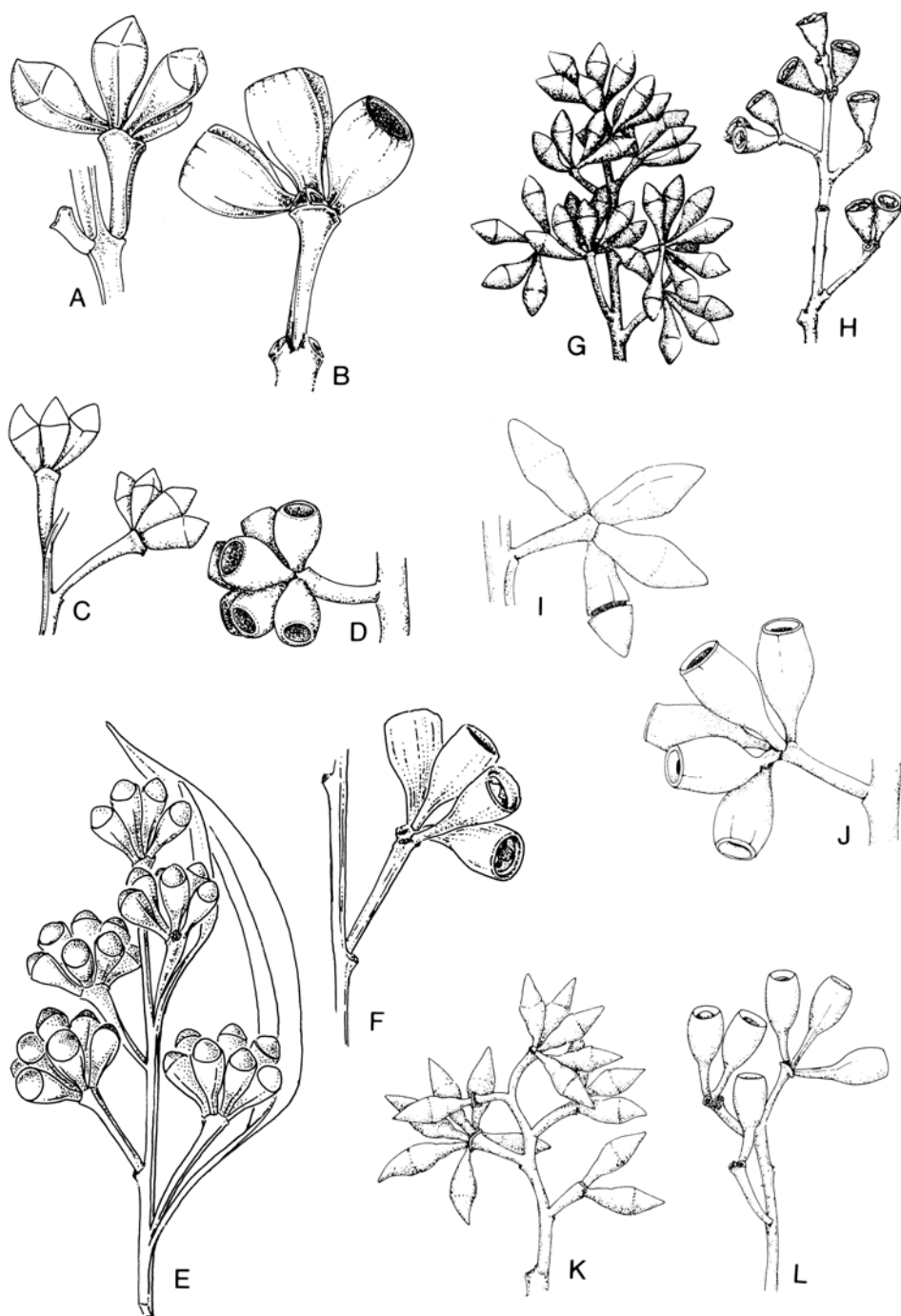


Figure 102. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. lansdowneana* subsp. *lansdowneana* (**A**, T.Dennis 49, FRI; **B**, I.Brooker 5591, FRI). **C–D**, *E. lansdowneana* subsp. *alboburpurea* (**C**, I.Brooker 3857, FRI; **D**, I.Brooker 3873, FRI). **E–F**, *E. petraea* (L.Pryor & J.Briggs 90, FRI). **G–H**, *E. dawsonii* (C.Luther 2087, FRI). **I–J**, *E. albens* (**I**, Hume Hay, Wagga Wagga, N.S.W., H.Elliott, FRI; **J**, 22.4 km N of Cowra, N.S.W., N.Hall, FRI). **K–L**, *E. moluccana* (**K**, I.Brooker 3960, FRI; **L**, Nowra, N.S.W., W. de Beuzeville, FRI). **E**, **F** drawn by M.Risby. Others drawn by M.May.

poles and fencing. An important source of choice honey, though the pollen is suspected of causing losses in bees.

474. *Eucalyptus moluccana* Roxb., *Fl. Ind.* 2nd edn, 2: 2 (1832)

T: cultivated in Amboyna, Indonesia, *C.Smith s.n.*; ?holo or iso: BM, *fide* L.A.S.Johnson, *Contr. New South Wales Natl Herb.* 3: 115–116 (1962).

E. hemiphloia F.Muell. ex Benth., *Fl. Austral.* 3: 216 (1867). T: Moreton Bay, Qld, *F.Mueller*; syn: MEL; Parramatta, N.S.W., *W.Woolfs s.n.*; syn: MEL. Note: localities for S.A., given by Benthham, are not this taxon, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 2: 15 (1910).

Illustrations: N.C.W.Beadle *et al.*, *Fl. Sydney Region* 3rd edn, 337 & t. 4 (1982); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 244 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 509 (1984).

Tree to 30 m. Bark rough, fibrous, grey on half trunk or sometimes more, then smooth, sometimes shining, grey or white above and deciduous in hanging ribbons. Juvenile leaves ovate, sometimes suborbicular, green. Adult leaves broadly lanceolate to lanceolate, acuminate; lamina 8.5–14 cm long, 2–3.3 cm wide, shining, green; lateral veins at 25°–40°; intramarginal vein up to 1 mm from margin; petiole terete to slightly flattened, 15–25 mm long. Peduncle terete or angular, 5–13 mm long; pedicels 1–7 mm long. Buds fusiform; operculum conical, 3–5 mm long, 3–4 mm wide, hypanthium obconical, 3–4 mm long and wide. Fruits ovoid to suburceolate, often ribbed, 5–9 mm long, 4–6 mm wide. *Grey Box*. Fig. 102K–L.

Occurs from south-eastern Qld south to Jervis Bay, N.S.W., with a few records N to the Atherton Tableland. Grows in coastal and nearby tableland areas in clay soil on plains and gently sloping country, in open forest and woodland. Regions: CYRK, BURD, DWSN, MCPH, NEPN. Map 507.

Qld: 10.7 km S of Bajool, *G.M.Chippendale 1125 & M.J.Brennan* (BRI, FRI, MEL, NSW, PERTH); 11.1 km SE of Toorilla Homestead, *N.H.Speck 1737* (AD, BRI, CANB, MEL, NSW, PERTH). N.S.W.: 18.4 km SE of Murrurundi, *G.M.Chippendale 1229 & M.J.Brennan* (BRI, FRI, MEL); Yerranderie, *A.L.Mitchell 120* (NSW).

Usually a larger tree than related species, with less rough bark on trunk and broader leaves. The wood is very hard, strong, durable and termite-resistant and has been used for heavy construction, poles, posts and railway sleepers.

475. *Eucalyptus microcarpa* (Maiden) Maiden, *Crit. Revis. Eucalyptus* 6: 438 (1923)

E. hemiphloia var. *microcarpa* Maiden, *Forest Fl. New South Wales* 1: 131 (1904). T: Gulgong, N.S.W., Apr. 1904, *J.H.Maiden & J.L.Boorman s.n.*; holo: NSW.

E. woollsiana R.Baker, *Proc. Linn. Soc. New South Wales* 25: 684 (1900) *p.p.* T: Girilambone to Condobolin, N.S.W., Sept. 1900, *W.Bäuerlen s.n.*; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 5: 223 (1921), where he states the type is shown by R.T.Baker, *op. cit.* t. 43.

Illustrations: L.Costermans, *Native Trees & Shrubs S.E. Australia* 365 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 245 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 511 (1984).

Tree to 25 m. Bark rough, fibrous on trunk and larger branches, grey, tessellated, then smooth and white above. Juvenile leaves ovate, green. Adult leaves lanceolate, acuminate; lamina 8–15 cm long, 1–2 cm wide, green; lateral veins faint or clearly visible, at 20°–30°; intramarginal vein up to 1 mm from margin; petiole terete, 10–15 mm long. Peduncle angular, 3–10 mm long; pedicels 1–5 mm long, occasionally absent. Buds fusiform; operculum conical, 2–3 mm long, 2–4 mm wide; hypanthium obconical, 3–4 mm long, 2–4 mm wide. Fruits ovoid to cylindrical, not ribbed, 3–7 mm long, 3–5 mm wide. *Grey Box*. Fig. 103A–B.

Occurs from south-eastern Qld through central N.S.W. to northern Vic.; and in the southern Flinders Ra. and Mt Lofty Ra., S.A. Grows in alluvial and clay soil on plains and gentle slopes in woodland. Regions: DWSN, MCPH, NEPN, DARL, RIVR, TRNS, OTWY, HOWE. Map 508.

S.A.: 10 km WSW of Melrose, *E.N.S.Jackson* 304 (AD). Qld: 56.3 km SE of Texas, *S.L.Everist* 7156 (BRI, CANB). N.S.W.: Murga, May 1885, *H.Deane* (NSW); 6 km S of Caragabal, *K.Wells* 52 (CANB, NSW). Vic.: Bacchus Marsh, 24 Mar. 1911, *P.R.H.St John* (MEL).

Differs from *E. albens* in the greener leaves, from *E. moluccana* in the narrower leaves and from *E. pilligaensis* in the longer petiole and pedicels and larger buds and fruits. The wood is hard, strong and durable, and has been used for fencing and railway sleepers. The trees are useful as a source of honey but production varies with the area, as the species is widespread.

476. *Eucalyptus pilligaensis* Maiden, J. & Proc. Roy. Soc. New South Wales 54: 163 (1920)

E. odorata var. *woollsiana* Maiden, *Crit. Revis. Eucalyptus* 2: 32 (1910). T: Narrabri, N.S.W., Nov. 1899, *J.H.Maiden*; holo: NSW.

Illustrations: N.Hall, *Forest Tree Ser.* No. 24 (1971); N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 3: 463 (1976); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 246 (1983).

Tree to 25 m. Bark rough, fibrous on trunk and larger branches, grey, then smooth and white-grey above. Juvenile leaves linear, green. Adult leaves linear to narrowly lanceolate, acute; lamina 7.5–13 cm long, 0.7–1.3 cm wide, shining, green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 7–10 mm long. Peduncle terete, 7–13 mm long; pedicels 5–8 mm long. Buds ovoid to fusiform; operculum conical, 1–2 mm long, c. 2 mm wide; hypanthium obovoid, 1–2 mm long, c. 2 mm wide. Fruits subglobular to ovoid, not ribbed, 2–4 mm long, 3–4 mm wide. *Narrow-leaved Box*, *Pilliga Box*. Fig. 103C–D.

Occurs from the Darling Downs area, Qld, southwards through the western slopes of N.S.W. Grows in alluvial and clay soil on plains and gentle slopes in open forest. Regions: DWSN, WRGO, MCPH, DARL, RIVR, NEPN, HOWE. Map 509.

Qld: 11.3 km W of Kogan, *S.L.Everist* 3443 (BRI, CANB). N.S.W.: SW of Baradine, 4 May 1968, *N.Hall* (FRI, NSW); 28 km NNW of Tooraweenah, *K.Wells* 24 (CANB, NSW).

Has narrower leaves and smaller buds and fruits than the preceding species. A first-grade honey is produced from this species.

Ser. 87 Subbuxaeales

***Eucalyptus* ser. *Subbuxaeales* Blakely, *Key Eucalypts* 54, 223 (1934).**

Type: *E. odorata* Behr, lecto, *fide* G.M.Chippendale, *Fl. Australia* 19: 505 (1988)

E. subser. *Subplatyphyllae* Blakely, *op. cit.* 56 p.p. min. (*E. bosistoana* only).

Trees or mallees. Bark rough, fibrous on lower or all trunk, rarely extending to larger branches, or smooth throughout. Juvenile leaves alternate, petiolate, usually slightly discolorous, sometimes concolorous; not seen in *E. sparsa*. Adult leaves alternate, petiolate, concolorous. Conflourescences usually axillary, sometimes terminal, usually simple, rarely paniculate; umbels 7–11-flowered. Buds ovoid, obovoid, clavate, subglobular or fusiform. Fruits hemispherical, subglobular, ovoid, cylindrical or pyriform; disc narrow to wide, usually descending, rarely level; valves 3–7, included or level, rarely just exerted. Seeds ovate to elliptic or cubical, shallowly reticulate, grey-brown-black.

A series of 8 species in W.A., N.T., S.A., Qld, N.S.W. and Vic., distinguished by fibrous or sometimes smooth bark, concolorous leaves, usually simple conflourescences, and fruits with a descending disc and 3–7 included or slightly exerted valves.

477. *Eucalyptus argophloia* Blakely, *Key Eucalypts* 256 (1934)

T: c. 12 miles [19.3 km] N of Chinchilla, Qld, May 1933, *R.C.Beasley*; syn: NSW; isosyn: BRI, FRI, K; 6–7 miles [9.7–11.3 km] N of Chinchilla, Qld, Apr. 1933, *R.C.Beasley*; isosyn: K.

Illustrations: N.Hall, *Forest Tree Ser.* No. 18 (1971); S.Kelly *et al.*, *Eucalypts* 2: t. 225 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 515 (1984).

Tree to 40 m. Bark smooth throughout, usually white but seasonally brown, yellow to pink-grey, with c. 1 m of decorticating bark at base of trunk. Juvenile leaves linear to narrowly lanceolate, grey-green, slightly discolourous. Adult leaves narrowly lanceolate, acute to acuminate; lamina 8.5–13 cm long, 0.8–1.3 cm wide, green; lateral veins just visible, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 7–12 mm long. Conflorescence axillary, sometimes terminal, simple; umbels 7-flowered; peduncle quadrangular, 4–8 mm long; pedicels 1–5 mm long. Buds ovoid to subglobular; operculum hemispherical, 1–2 mm long, 3–4 mm wide; hypanthium hemispherical, 2–3 mm long, 3–4 mm wide. Fruit hemispherical, 3–5 mm long, 4–7 mm wide; disc moderately broad, ±level; valves 4–6, slightly included to slightly exserted. *Queensland White Gum*. Fig. 103E–F.

Occurs in a restricted area between Chinchilla and Burra Burri, Qld, in loam and clay on plains in woodland and open forest. Region: MCPH. Map 510.

Qld: NNE of Burncluith, *M.I.H.Brooker* 4772 (AD, BRI, FRI); NE of Chinchilla, *L.A.S.Johnson* 7207 & *B.G.Briggs* (BRI, FRI, NSW).

Distinct in smooth white bark, narrow leaves, ovoid to subglobular buds and hemispherical fruits with 4–6 valves.

An endangered species of a few scattered stands needing conservation for its potential value in amenity and wood production. The wood is hard, strong and durable, and has been used for fencing and general construction.

478. *Eucalyptus bosistoana* F.Muell., *Austral. J. Pharm.* 10: 293 (1895)

T: between Nicholson R. & Tambo R., Vic., *C.L.Schlipalius*; lecto: MEL 10389, *fide* J.H.Willis, *Muelleria* 1: 165–166 (1967).

Illustrations: N.C.W.Beadle *et al.*, *Fl. Sydney Region* 3rd edn, 339 (1982); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 248 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 517 (1984).

Tree to 60 m. Bark rough, finely fibrous, grey on lower trunk or sometimes higher, or sometimes ±smooth, grey-white throughout. Juvenile leaves ovate to orbicular, green, discolourous. Adult leaves lanceolate to narrowly lanceolate, sometimes falcate, acuminate; lamina 10–20 cm long, 0.7–2 cm wide, green; lateral veins clearly visible, at 25°–45°; intramarginal vein up to 3 mm from margin; petiole terete, 10–17 mm long. Conflorescence usually axillary, simple, sometimes terminal, paniculate; umbels 7-flowered; peduncle terete to quadrangular, 7–10 mm long; pedicels 3–10 mm long. Buds ovoid or clavate; operculum conical to hemispherical, 3–5 mm long and wide; hypanthium hemispherical, c. 4 mm long, 3–5 mm wide. Fruits hemispherical to ovoid, 4–7 mm long and wide; disc moderately broad, descending; valves 5–7, level or included. *Bosisto's Box*, *Coast Grey Box*. Fig. 103G–H.

Occurs in south-eastern N.S.W. and eastern Vic., mainly in coastal areas in loamy soil near watercourses and on tablelands in tall open forest. Regions: NEPN, HOWE. Map 511.

N.S.W.: 0.8 km from Bringelly towards Luddenham, *M.I.H.Brooker* 5142 (AD, FRI, NSW); Bungonia Lookdown, *C.W.E.Moore* 2591 (CANB, NSW). Vic.: Genoa, 1887, *W.Bäuerlen* (MEL, NSW).

Differs from *E. argophloia* in the finely fibrous or smooth white bark, longer conical operculum and longer fruit. The wood is hard, strong and durable though sometimes susceptible to borers, and has been used for heavy construction, poles, railway sleepers and fences.

479. *Eucalyptus porosa* F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 132 (1856)

E. calcicultrix var. *porosa* Blakely, *Key Eucalypts* 224 (1934). T: Flinders Ra., S.A., *F.Mueller*; n.v.

E. odorata var. *calcultrix* F.Muell. ex Miq., *op. cit.* 129; *E. calcicultrix* (F.Muell. ex Miq.) F.Muell. ex Blakely, *Key Eucalypts* 224 (1934). T: near Adelaide, S.A., *F.Mueller*; iso: AD, MEL, NSW.

Illustrations: C.D.Boomsma, *Native Trees S. Australia* 163 (1972); N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 134 (1974); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 249 (1983).

Mallee to 5 m or tree to 12 m. Bark rough, fibrous, grey-brown on trunk or lower stems of mallees, sometimes extending to larger branches of trees, then smooth and grey-white above. Juvenile leaves elliptic to ovate, dark green, slightly discolorous. Adult leaves lanceolate, uncinete; lamina 6–12 cm long, 1–2 cm wide, shining, green; lateral veins clearly visible, at 15°–40°; intramarginal vein up to 3 mm from margin; petiole terete, 10–15 mm long. Conflouescence axillary, simple; umbels 7-flowered; peduncle quadrangular, 2–10 mm long; pedicels 2–4 mm long. Buds clavate to obovoid; operculum hemispherical to conical, 2–4 mm long, 3–4 mm wide; hypanthium obovoid, 2–4 mm long, c. 4 mm wide. Fruits ovoid to pyriform, 5–8 mm long, 5–6 mm wide; disc moderately broad, descending; valves 4 or 5, included. *Mallee Box*. Fig. 103 I–J.

Occurs widely in south-eastern S.A., south-western N.S.W. and north-western Vic. Grows mainly in shallow calcareous soil in gently undulating areas in woodland. Regions: EYRE, TRNS, RIVR, OTWY. Map 512.

S.A.: 15 km SW of Kimba, *M.I.H.Brooker* 5590 (AD, FRI); 5 km E of Yardea, *A.E.Orchard* 2334 (AD). N.S.W.: Broken Hill, 20 July 1920, *A.Morris* (NSW). Vic.: 9.7 km S of Ouyen, Nov. 1954, *J.Rowan* (MEL).

Distinguished by mallee or small tree habit, fibrous bark mainly on lower trunk, small, thick, shining leaves with clearly visible venation and the intramarginal vein up to 3 mm from margin, and 4 or 5 fruiting valves. The wood is moderately durable, useful for small fences and firewood. There is useful pollen every few years and the honey is good.

480. *Eucalyptus sparsa* Boomsma, *J. Adelaide Bot. Gard.* 1: 363 (1979)

T: Betty Ck Gorge, Everard Ra., S.A., 26°57'S, 132°39'E, 4 Oct. 1974, *C.D.Boomsma* 57; holo: AD.

Illustrations: C.D.Boomsma, *op. cit.* 365; S.Kelly *et al.*, *Eucalypts* 1: t. 277 (1983).

Mallee, sometimes a tree, to 6 m. Bark rough, fibrous, grey or grey-brown on lower trunk, then smooth, grey above. Juvenile leaves not seen. Adult leaves lanceolate to broadly lanceolate or ovate, acute; lamina 5–12 cm long, 1.5–3.5 cm wide, shining, green; lateral veins prominent, at 25°–40°; intramarginal vein up to 4 mm from margin; petiole terete, 15–25 mm long. Conflouescence terminal, paniculate, sometimes axillary, simple; umbels 7-flowered; peduncle terete, 6–11 mm long; pedicels 2–3 mm long. Buds ovoid to clavate; operculum hemispherical to conical, 2–3 mm long, 3–4 mm wide; hypanthium obovoid, 3–4 mm long and wide. Fruits hemispherical to subglobular, 4–5 mm long, 4–6 mm wide; disc broad, descending; valves 4–6, level or included. Fig. 103K–L.

Occurs in the vicinity of the Blackstone, Petermann, Tomkinson and Musgrave Ranges, W.A., N.T. and S.A., mostly in well-drained soil on plains and slopes. Region: MACD. Map 513.

W.A.: Blackstone Ra., 8 Jan. 1973, *D.E.Symon* 8432 (FRI, NSW). N.T.: 16 km N of Mulga Park Homestead, *N.Forde* 875 (NT). S.A.: Everard Ra., 13 Apr. 1950, *J.B.Cleland* (AD).

Differs from related taxa in the long petiole and leaves with the intramarginal vein up to 4 mm from margin.

481. *Eucalyptus odorata* Behr in D.F.L. von Schlechtendal, *Linnaea* 20: 657 (1847)

T: Aldenhoven Estate, S.A., *H.Behr s.n.*; holo: HAL *n.v.*, *fide* C.D.Boomsma, *Trans. Roy. Soc. S. Australia* 93: 159 (1969).

Tree or mallee to 15 m. Bark rough, fibrous, grey on most of trunk, then smooth and grey-brown above. Juvenile leaves elliptic to ovate, green, slightly discolourous. Adult leaves narrowly lanceolate or lanceolate, acute or acuminate, green; lateral veins faint, at 20°–30°; intramarginal vein up to 1 mm from margin. Conflorescence axillary, simple; umbels 7–11-flowered; peduncle quadrangular. Buds fusiform to clavate. Fruits cylindrical to ovoid; disc broad, descending; valves 4 or 5, included.

Occurs in south-eastern S.A. and western Vic. Differs from related taxa mainly in the cylindrical fruits. There are 2 varieties.

Adult leaves lanceolate, 9–18 mm wide

481a. var. *odorata*

Adult leaves narrowly lanceolate, 5–10 mm wide

481b. var. *angustifolia*

481a. *Eucalyptus odorata* Behr var. ***odorata***

E. cajuputea F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 126 (1856). T: Flinders Ra., S.A., Oct. 1851, *F.Mueller*; iso: MEL, NSW.

E. odorata var. *erythrandra* F.Muell. ex Miq., *op. cit.* 129. T: Port Lincoln, S.A., *F.Mueller*; *n.v.*

E. fruticetorum F.Muell. ex Miq., *op. cit.* 131. T: Murray R., Vic., *F.Mueller*; *n.v.*

E. odorata var. *refracta* Blakely, *Key Eucalypts* 226 (1934). T: near Beaumont, S.A., 21 May 1911, *J.B.Cleland*; holo: NSW.

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 225 (1970); C.D.Boomsma, *Native Trees S. Australia* 149 (1972); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 250 (1983).

Adult leaves lanceolate; lamina 6–10 cm long, 0.9–1.8 cm wide; petiole terete, 7–15 mm long. Peduncle 5–9 mm long; pedicels 2–3 mm long. Operculum conical, 2–3 mm long, 3–4 mm wide; hypanthium obovoid, 3–4 mm long and wide. Fruits 4–7 mm long, 4–6 mm wide. *Peppermint Box*. Fig. 103M–N.

Occurs in south-eastern S.A. and western Vic. Grows in red-brown loamy soil on plains and low hills in open woodland. Regions: EYRE, TRNS, RIVR, OTWY. Map 514.

S.A.: NE of Bibliando Stn, *M.D.Crisp* 757 (CBG, NSW); Folland Park, *D.N.Kraehenbuehl* 540 (AD, FRI). Vic.: Mt Arapiles, *A.C.Beaglehole* 29814 (FRI).

Distinguished by usually tree habit, though more a mallee in drier areas, rough bark on at least half of trunk, lanceolate leaves and small buds and fruits. The wood is moderately durable, useful for fencing and firewood.

481b. *Eucalyptus odorata* var. ***angustifolia*** Blakely, *Key Eucalypts* 226 (1934)

T: Port Lincoln to Coffins Bay, S.A., Jan. 1907, *J.H.Maiden*; holo: NSW.

Illustrations: S.Kelly *et al.*, *Eucalypts* 1: t. 188 (1983).

Usually a mallee to 8 m. Adult leaves narrowly lanceolate; lamina 6.5–9.5 cm long, 0.5–1 cm wide; petiole terete or slightly flattened, 7–12 mm long. Peduncle 7–12 mm long; pedicels 2–5 mm long. Operculum conical, 3–4 mm long and wide; hypanthium obconical to obovoid, 4–5 mm long, 3–4 mm wide. Fruits 4–7 mm long, 5–6 mm wide. *Seaside Mallee*. Fig. 103 O–P.

Occurs in south-eastern S.A., mainly from the Flinders Ra. to Eyre Peninsula, often in loamy soil on flats in mallee scrub. Regions: EYRE, TRNS. Map 515.

S.A.: Currency Ck, *D.Hunt* 2803 (AD, BRI, FRI, MEL); Wilpena Pound Homestead, *T.R.N.Lothian* 1488 (AD).

Leaves narrower than in var. *odorata*, peduncle longer, buds shorter. A poorly-defined taxon needing further study.

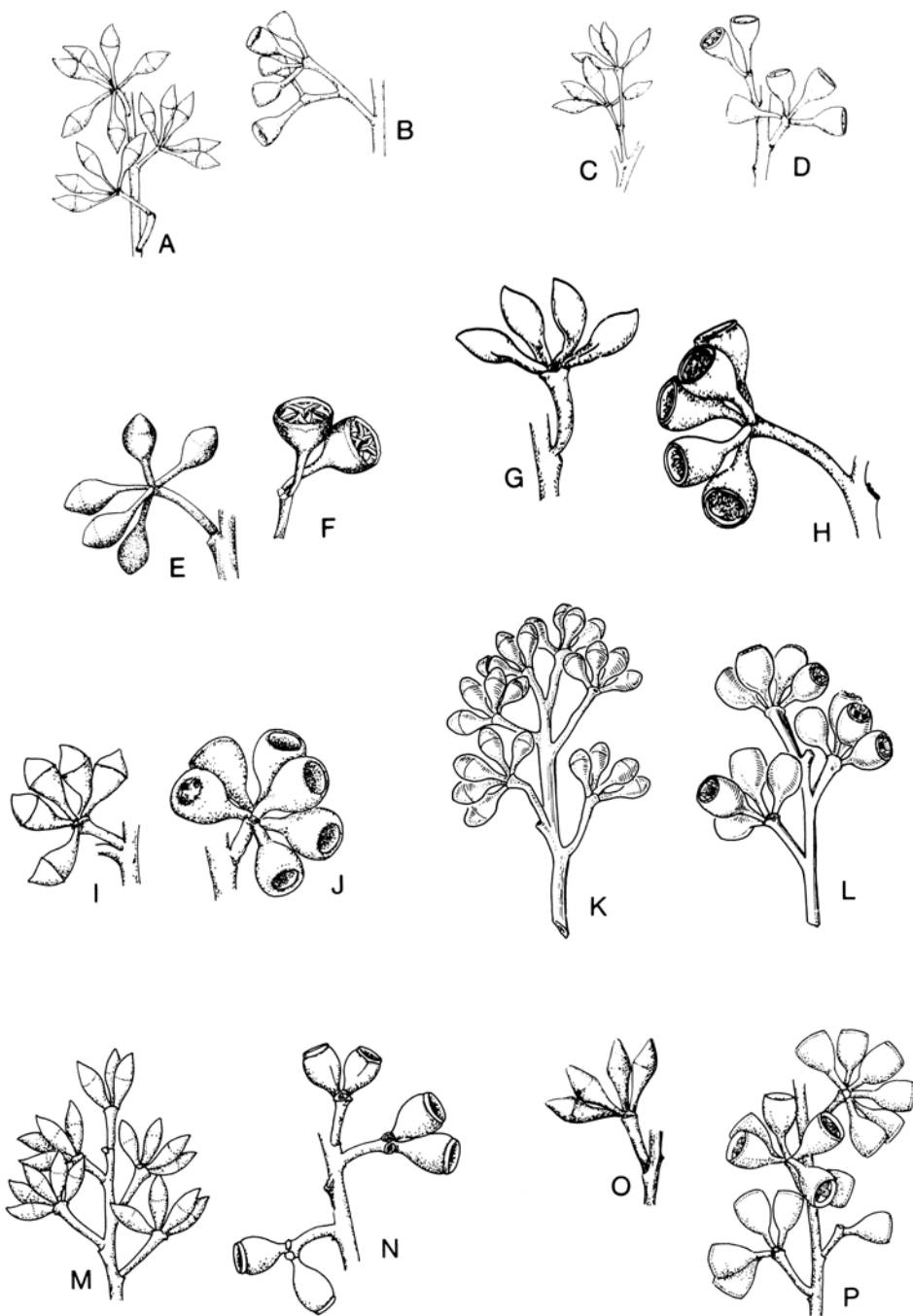


Figure 103. *Eucalyptus* buds and fruits, all $\times 1$, unless otherwise stated. **A–B**, *E. microcarpa* (Eumungeri Rd near Narromine, N.S.W., M.Hall, FRI). **C–D**, *E. pilligaensis* (I.Brooker 1475, FRI). **E–F**, *E. argophloia* (19.2 km N of Chinchilla, Qld, R.Beasley, FRI). **G–H**, *E. bosistoana* (M.Crisp 6441, FRI). **I–J**, *E. porosa* (**I**, W.Cain 4, FRI; **J**, J.Briggs 326, FRI). **K–L**, *E. sparsa* $\times 0.75$ (**K**, Bettys Ck Gorge, S.A., C.Boomsma, AD; **L**, C.Dunlop 2016, FRI). **M–N**, *E. odorata* var. *odorata* (T.Smith 1709, FRI). **O–P**, *E. odorata* var. *angustifolia* (**O**, Cleve, Eyre Peninsula, S.A., M.Phillips, FRI; **P**, G.Chippendale 808, FRI). **K**, **L** drawn by M.Risby. Others drawn by M.May.

482. *Eucalyptus polybractea* R.Baker, *Proc. Linn. Soc. New South Wales* 25: 692 (1901)

T: West Wyalong, N.S.W., Dec. 1900, *R.H.Cambage s.n.*; holo: NSW; iso: K.

[*E. fruticetorum* auct. non F.Muell. ex Miq.: W.F.Blakely, *Key Eucalypts* 228 (1934)]

Illustrations: N.Hall, *Forest Tree Ser.* No. 5 (1970); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 251 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 519 (1984).

Mallee to 10 m. Bark rough, fibrous on lower stems, then smooth and grey to pink-grey above. Juvenile leaves linear to lanceolate, slightly glaucous, concolorous. Adult leaves narrowly lanceolate, acuminate; lamina 6–11 cm long, 0.4–1.1 cm wide, blue-green to grey-green; lateral veins faint, at 20°–30°; intramarginal vein up to 1 mm from margin; petiole terete, 6–12 mm long. Conflourescence axillary, simple; umbels 7–11-flowered; peduncle terete or quadrangular, 4–10 mm long; pedicels 1–4 mm long. Buds clavate or fusiform; operculum hemispherical to conical, 2–3 mm long, 3–4 mm wide; hypanthium obovoid or obconical, 3–4 mm long and wide. Fruits ovoid to hemispherical, 3–5 mm long and wide; disc broad, descending; valves 3–5, included. *Blue-leaved Mallee*. Fig. 104A–B.

Occurs in the area near Wyalong, N.S.W., and disjunctly in the Bendigo area, Vic. Grows in loam, sand and shale soil on gently undulating country in low mallee shrubland. Regions: RIVR, OTWY, HOWE. Map 516.

N.S.W.: 6.5 km S of West Wyalong, *M.I.H.Brooker 6146* (FRI). Vic.: 1.2 km N of Inglewood, *G.M.Chippendale 1296* & *M.J.Brennan* (BRI, FRI, MEL).

Differs from *E. odorata* in the blue-grey leaves and smaller fruit, from *E. froggattii* in the non-angular fruit, and from *E. viridis* in the blue-grey leaves. Has been used in commercial distillation of oil.

483. *Eucalyptus froggattii* Blakely, *Key Eucalypts* 225 (1934)

T: Kamarooka, near Bendigo, Vic., *A.W.Howitt s.n.*; holo:

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 80 (1973); L.Costermans, *Native Trees & Shrubs S.E. Australia* 379 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 252 (1983).

Mallee to 6 m or tree to 9 m. Bark rough, fibrous, grey to grey-brown on stems or trunk, then smooth and green-brown above. Juvenile leaves elliptic to lanceolate, green, slightly discolorous. Adult leaves lanceolate, acute; lamina 7.5–12 cm long, 1.2–2 cm wide, shining, green; lateral veins faint, at 15°–25°; intramarginal vein prominent, up to 3 mm from margin; petiole slightly flattened, 7–12 mm long. Conflourescence usually terminal panicles, sometimes axillary, simple; umbels 7–11-flowered; peduncle flattened, 7–15 mm long; pedicels 4–6 mm long. Buds quadrangular, clavate to ovoid; operculum pyramidal, 4–5 mm long, 4–6 mm wide; hypanthium ovoid to obpyramidal, 5–7 mm long, 4–5 mm wide. Fruits ovoid to cylindrical, quadrangular, 6–8 mm long, 5–8 mm wide; disc broad, descending; valves 4 or 5, included. *Kamarooka Mallee*. Fig. 104C–D.

Occurs between Horsham and Kamarooka, Vic., in clay soil on gently undulating plains, usually only seen in remnants of woodland or shrubland in farmlands. Region: OTWY. Map 517.

Vic.: near Wedderburn, *M.I.H.Brooker 3796* (AD, BRI, FRI, MEL, PERTH); 4.8 km S of Kamarooka, 30 Aug. 1958, *L.A.S.Johnson* (NSW).

Distinguished especially by the quadrangular buds and fruits. A very restricted species, much reduced by farming.

484. *Eucalyptus viridis* R.Baker, *Proc. Linn. Soc. New South Wales* 25: 316 (1900)

T: Girilambone, N.S.W., 16 Jan. 1900, *W.Bäuerlen*; syn: K, MEL; 7 miles [11.3 km] from Coolabah on Wilga Downs Road, N.S.W., *W.Bäuerlen s.n.*; syn: *n.v.*

E. acacioides Cunn. ex Maiden, *Crit. Revis. Eucalyptus* 2: 45 (1914) *nom. illeg.* T: Lachlan R., N.S.W., 23 May 1817, *A.Cunningham 203*; holo: NSW; iso: K.

E. viridis var. *ovata* Blakely, *Key Eucalypts* 229 (1934). T: Mt Boppy, Cobar, N.S.W., Aug. 1903,

J.L.Boorman; syn: NSW; Cobar, May 1918, *J.L.Boorman*; syn: NSW.

Illustrations: N.Hall, *Forest Tree Ser.* No. 6 (1970); L.Costermans, *Native Trees & Shrubs S.E. Australia* 379 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 253 (1983).

Mallee to 10 m. Bark rough, fibrous, dark grey on lower stems, then smooth and grey to pink-grey above. Juvenile leaves linear, the petioles difficult to distinguish from leaf base, green, concolorous. Adult leaves linear to narrowly lanceolate, uncinat; lamina 6–10 cm long, 0.4–0.8 cm wide, slightly shining, dark green; lateral veins faint, at 15°–25°; intramarginal vein up to 1 mm from margin; petiole terete or slightly flattened, 5–10 mm long. Conflorance usually axillary, simple, rarely terminal, paniculate; umbels 7-flowered; peduncle quadrangular, 5–8 mm long; pedicels 2–4 mm long. Buds fusiform; operculum conical, 2–3 mm long and wide; hypanthium obconical, 2–3 mm long and wide. Fruits hemispherical to subglobular, 2–4 mm long, 3–4 mm wide; disc narrow, descending; valves 4, included. *Green Mallee*. Fig. 104E–F.

Occurs disjunctly in the Flinders Ra., S.A., and from near Inglewood, Qld, southwards through the lower western slopes of the Great Dividing Ra. and nearby plains of N.S.W. and in the Bendigo area, Vic. Grows in sand and loam on plains and gently undulating land, often in pure stands and in tall shrubland. Regions: TRNS, MCPH, DARL, NEPN, RIVR, OTWY, HOWE. Map 518.

S.A.: Moockra Tower, *C.D.Boomsma* 4176 (AD, FRI). Qld: 41.8 km N of Talwood, *T.J.McDonald* 475 (BRI, FRI, MEL). N.S.W.: Dubbo, Nov. 1903, *J.L.Boorman* (NSW); Yalgogrin, 30 July 1955, *E.F.Constable* (NSW). Vic.: Whipstick Scrub, *E.F.Constable* 5251 (FRI, MEL, NSW).

Distinguished from related species mainly by the narrow dark-green leaves which have copious oil dots, and small fruits. The leaves have been used for distillation of oil.

Ser. 88 *Siderophloiae*

Eucalyptus* ser. *Siderophloiae Blakely, *Key Eucalypts* 59, 246 (1934), except subser. *Submelliodorae* and *E. pruinosa*.

Type: *E. siderophloia* Benth.

Trees. Bark very hard, deeply furrowed, persistent throughout or on trunk and larger branches. Juvenile leaves usually alternate, petiolate, but opposite and sessile in *E. melanophloia* and *E. shirleyi*, concolorous or discolorous. Adult leaves usually alternate, petiolate, but opposite in *E. melanophloia* and *E. shirleyi*, and sessile in *E. shirleyi* and sometimes *E. melanophloia*, concolorous; petiole terete. Conflorances terminal or axillary, paniculate, sometimes also with axillary, simple umbels; umbels 7–11-flowered. Buds fusiform, clavate or ovoid to subglobular. Fruits hemispherical, ovoid, obconical, pyriform, subcylindrical, subglobular or urceolate; disc descending to ascending; valves 3–5, included to exserted. Seeds suborbicular to elliptic, shallowly reticulate, grey-brown. *Ironbarks*.

A series of 12 species in W.A., N.T., Qld and N.S.W., characterised by the hard, furrowed bark, concolorous leaves and terminal and axillary mostly paniculate conflorances of 7–11-flowered umbels.

485. *Eucalyptus decorticans* (Bailey) Maiden, *Crit. Revis. Eucalyptus* 5: 231 (1921)

E. siderophloia f. *decorticans* Bailey, *Queensland Agric. J.* 26: 127 (1911). T: Eidsvold, Qld, *T.L.Bancroft* s.n.; holotype: BRI; iso: FRI, K.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 110 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 220 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 527 (1984).

Tree to 40 m. Bark rough on trunk and larger branches, grey to black, then smooth and white above. Juvenile leaves lanceolate, green, discolorous. Adult leaves narrowly lanceolate, acuminate; lamina 8.5–12 cm long, 1–1.5 cm wide, green to grey-green; lateral veins very faint, at 40°–50°; intramarginal vein confluent with or up to 1 mm from margin; petiole 12–20 mm long. Conflorance axillary and terminal panicles, also axillary umbels; umbels

7-flowered; peduncle angular to slightly flattened, 5–18 mm long; pedicels 2–6 mm long. Buds clavate or fusiform; operculum conical, 3–4 mm long, 3–5 mm wide; hypanthium obconical, 3–4 mm long, 3–5 mm wide. Fruits ovoid to subcylindrical or almost hemispherical, occasionally faintly ribbed, 4–7 mm long and wide; disc narrow, convex, level or descending; valves 3 or 4, just included to just exserted. *Gum-top Ironbark*. Fig. 104G–H.

Occurs in south-eastern Qld, in stony clay soil on hills and sloping country in open forest. Regions: DWSN, THOM, MCPH. Map 519.

Qld: 29.6 km W of Mt Perry, *G.M.Chippendale 564* & *R.D.Johnston* (AD, BRI, FRI, MEL, PERTH); 8 km SW of Cloyna, *L.A.S.Johnson 7082* (BRI, NSW).

Distinguished by the smooth white bark above the grey to black ironbark of the trunk and larger branches, the narrowly lanceolate leaves and the clavate or fusiform buds.

486. *Eucalyptus fibrosa* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 87 (1859)

T: near Brisbane R., Qld, *F.Mueller*; holo: MEL; iso: K.

Tree to 35 m. Bark rough throughout, grey-black to black. Juvenile leaves orbicular to ovate. Adult leaves narrowly to broadly lanceolate, acuminate; lateral veins just visible, at 35°–45°; intramarginal vein up to 1 mm from margin. Conflorescence terminal, paniculate, with some axillary umbels; umbels 7–11-flowered. Buds fusiform; operculum conical; hypanthium obconical. Fruits obconical, pyriform or hemispherical; disc narrow, level to ascending; valves 4 or 5, ±level or exserted.

Differs from *E. decorticans*, *E. siderophloia* and *E. drepanophylla* in the larger buds.

Occurs in south-eastern Qld and eastern N.S.W. There are 2 subspecies.

Leaves, buds and fruits not glaucous

486a. subsp. *fibrosa*

Leaves, buds and fruits glaucous

486b. subsp. *nubila*

486a. *Eucalyptus fibrosa* F.Muell. subsp. *fibrosa*

E. siderophloia var. (?) *rostrata* Benth., *Fl. Austral.* 3: 220 (1867). T: Port Jackson, N.S.W., *R.Brown*; syn: FRI, K; Port Jackson, N.S.W., *G.Caley s.n.*; syn: *n.v.*; Maitland, N.S.W., *J.Backhouse s.n.*; syn: K.

E. bowmanii F.Muell. ex Benth., *Fl. Austral.* 3: 219 (1867). T: Qld, *E.M.Bowman s.n.*; holo: K; iso: M.

Illustrations: D.A.Kleinig & M.I.H.Brooker, *Forest Tree Ser.* No. 198 (1977); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 254 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 523 (1984).

Juvenile leaves green, slightly discoloured. Adult leaves lanceolate to broadly lanceolate; lamina 14–18 cm long, 3–5 cm wide, green; petiole 15–27 mm long. Peduncle terete to flattened, 6–20 mm long; pedicels 2–7 mm long, the angles continuing as ribs on hypanthium. Operculum 6–10 mm long, 4–5 mm wide; hypanthium 4–6 mm long, 4–5 mm wide. Fruits obconical to pyriform, 6–10 mm long, 5–9 mm wide. *Broad-leaved Ironbark*. Fig. 104 I–J.

Occurs from N of Rockhampton, Qld, south to near Bodalla, N.S.W. Grows in sand, sandy loam or clay-loam on plains and slopes in open forest. Regions: DWSN, MCPH, NEPN, DARL, HOWE. Map 520.

Qld: 5.7 km N of Tamborine, *M.I.H.Brooker 2820* (FRI); near Hutton Ck, N of Injune, *N.H.Speck 1948* (AD, BRI, CANB, MEL, PERTH). N.S.W.: Menangle, Jan. 1929, *W.F.Blakely* (NSW); Liverpool, *M.I.H.Brooker 4704* (FRI, NSW).

Leaves much wider than in related species. The wood is very hard, strong and durable, and has been used for heavy construction, railway sleepers and poles.

486b. *Eucalyptus fibrosa* subsp. *nubila* (Maiden & Blakely) L.Johnson, *Contr. New South Wales Natl Herb.* 3: 119 (1962)

E. nubila Maiden & Blakely in J.H.Maiden, *Crit. Revis. Eucalyptus* 8: 38 (1929), based on *E. siderophloia* var. *glauca* Deane & Maiden; *E. siderophloia* var. *glauca* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 24: 461 (1899). T: Dubbo district, N.S.W., Nov. 1897, *J.V. de Coque & J.L.Boorman*; syn: FRI, NSW; Dubbo district, N.S.W., Nov. 1892, *H.Deane*; syn: *n.v.*

Illustrations: D.A.Kleinig & M.I.H.Brooker, *Forest Tree Ser.* No. 199 (1977); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 254 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 523, 525 (1984).

Juvenile leaves glaucous, concolorous. Adult leaves lanceolate; lamina 11–18 cm long, 1.5–2.5 cm wide, glaucous; petiole 18–30 mm long. Peduncle terete to flattened, 8–18 mm long; pedicels 1–5 mm long. Operculum 6–12 mm long, 4–5 mm wide; hypanthium 3–7 mm long, 4–5 mm wide. Fruits obconical to almost hemispherical, sometimes ribbed, glaucous, 5–8 mm long, 5–7 mm wide. *Blue-leaved Ironbark*. Fig. 104K–L.

Occurs disjunctly from near Mt Moffat Stn, Qld, south to near Yetman, then in the area including Dubbo, Gilgandra and Muswellbrook, N.S.W. Grows in sand, loam, sandy loam and clay-loam on plains and slopes in open forest. Regions: DWSN, MCPH, NEPN. Map 521.

Qld: Ballon Forestry Settlement, *G.M.Chippendale* 581 & *R.D.Johnston* (AD, BRI, FRI, MEL, PERTH); 40.2 km SSE of Chinchilla, *T.J.McDonald* 447 (BRI, FRI). N.S.W.: Minore, Feb. 1899, *J.L.Boorman* (NSW); Wongoni, 16 Aug. 1950, *L.A.S.Johnson* (NSW).

Distinguished by the glaucous leaves, buds and fruits. The wood is very hard, strong and durable, useful for general construction, railway sleepers and poles. The trees are a major source of nectar for honey production.

487. *Eucalyptus siderophloia* Benth., *Fl. Austral.* 3: 220 (1867)

T: Moreton Bay, Qld, Sept. 1829, *A.Cunningham* 51; lecto: K, *vide* L.A.S.Johnson, *Contr. New South Wales Natl Herb.* 3: 117 (1962); isolecto: BM, FRI, NSW, W.

E. decepta Blakely, *Key Eucalypts* 249 (1934). T: Ramornie, N.S.W., July 1922, *W.F.Blakely & D.W.C.Shireess*; lecto: NSW 54108, *vide* L.A.S.Johnson, *loc. cit.*

Illustrations: N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 3: 473 (1976); N.C.W.Beadle *et al.*, *Fl. Sydney Region* 3rd edn, 317 (1982); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 255 (1983).

Tree to 45 m. Bark rough on trunk and at least larger branches, sometimes smooth above, grey to grey-black. Juvenile leaves ovate to broadly lanceolate, green, discolorous. Adult leaves lanceolate to broadly lanceolate, acuminate; lamina 8–15 cm long, 1–2 cm wide, dull, green or grey-green; lateral veins just visible, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole 10–17 mm long. Conflorescence terminal, paniculate; umbels 7-flowered; peduncle quadrangular, 6–12 mm long; pedicels 2–4 mm long. Buds fusiform; operculum conical, sometimes rostrate, 3–4 mm long and wide; hypanthium obconical, 2–4 mm long, 3–4 mm wide. Fruits obconical, 6–8 mm long, 5–7 mm wide; disc narrow, descending; valves usually 4, exserted. *Northern Grey Ironbark*. Fig. 104M–N.

Occurs from near Maryborough and inland to Springsure, Qld, south to near Sydney, N.S.W. Grows in clay-loam and clay, mainly on coastal plains and foothills in dry sclerophyll forest. Regions: BURD, DWSN, MCPH, NEPN. Map 522.

Qld: 12.6 km W of Ipswich, *G.P.Smith* 10 (AD, BRI, CBG, FRI, HO, NT); Sunnybank, *C.T.White* 986 (BRI, NSW). N.S.W.: Four Mile Ck, Beresfield, 29 Nov. 1954, *L.A.S.Johnson* (NSW); Camira Ck, near Whiporie, 18 Aug. 1955, *R.J.Turner* (NSW).

Closely related to the following species but differs mainly in the longer peduncle, more tapered operculum and obconical fruits.

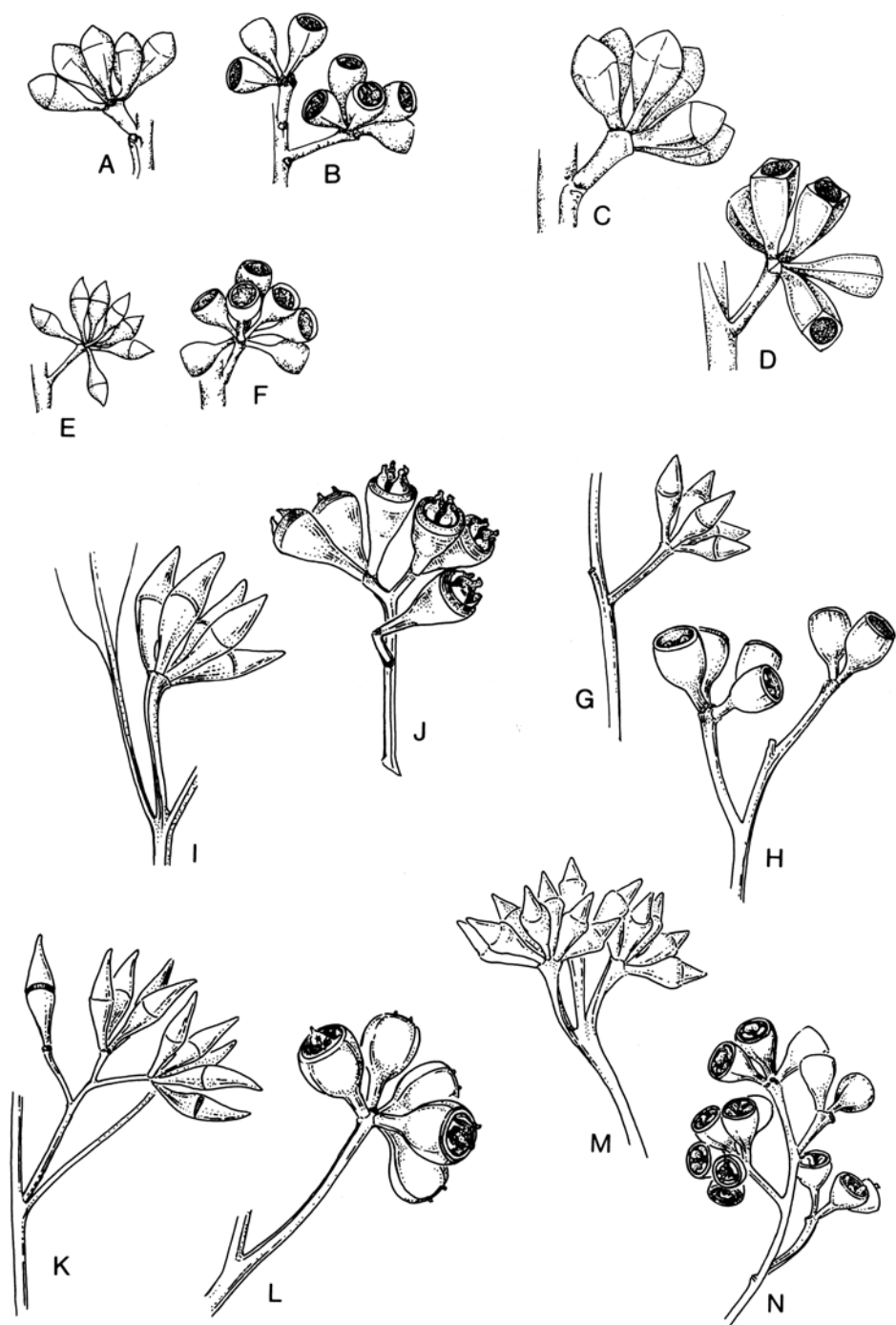


Figure 104. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. polybractea* (J.Briggs 375, FRI). **C–D**, *E. froggattii* (**C**, I.Brooker 3796, FRI; **D**, J.Briggs 155, FRI). **E–F**, *E. viridis* (M.Crisp 4444, FRI). **G–H**, *E. decorticans* (I.Brooker 3762a, FRI). **I–J**, *E. fibrosa* subsp. *fibrosa* (**I**, I.Brooker 4623, FRI; **J**, I.Brooker 4841, FRI). **K–L**, *E. fibrosa* subsp. *nubile* (**K**, S.Everist 3441, FRI; **L**, I.Brooker 5153, FRI). **M–N**, *E. siderophloia* (**M**, I.Brooker 6120, FRI; **N**, I.Brooker 4721, FRI). **A–F** drawn by M.May. Others drawn by M.Risby.

488. *Eucalyptus drepanophylla* F.Muell. ex Benth., *Fl. Austral.* 3: 221 (1867)

T: Edgecombe Bay, Port Denison, Qld, *J.Dallachy s.n.*; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 5: 262, 290 (1921); isolecoto: BRI, K, MEL.

E. racemosa var. *macrocarpa* (Domin) Blakely, *Key Eucalypts* 249 (1934); *E. crebra* var. *macrocarpa* Domin, *Biblioth. Bot.* 89: 465 (1928). T: Castle Hill, Townsville, Qld, Feb. 1910, *K.Domin 7195*; holo: PR.

Illustration: S.Kelly *et al.*, *Eucalypts* 2: t. 224 (1983).

Tree to 30 m. Bark rough on trunk and larger branches or throughout, dark grey to black. Juvenile leaves elliptic to ovate, light green, concolorous. Adult leaves lanceolate to narrowly lanceolate, acuminate; lamina 10–15 cm long, 1.4–2.5 cm wide, green or grey-green; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole 10–20 mm long. Conflorescence terminal and axillary, paniculate; umbels 7-flowered; peduncle terete, rarely quadrangular, 4–7 mm long; pedicels 3–6 mm long. Buds obovoid or obconical; operculum hemispherical–conical, c. 3 mm long, c. 4 mm wide; hypanthium obconical, 3–4 mm long, c. 4 mm wide. Fruits hemispherical to subcylindrical, 4–6 mm long, 5–6 mm wide; disc narrow, descending; valves usually 4, level to exserted. *Queensland Grey Ironbark*. Fig. 105A–B.

Occurs widely in Qld, from Cape York Peninsula to S of Brisbane, in sandy and clay-loam soil on rocky slopes in tall open forest. Regions: CYRK, BURD, DWSN, MCPH. Map 523.

Qld: between Kuranda & Clohesy R., *M.I.H.Brooker 3344* (AD, BRI, DNA, FRI); 10 km S of Isla Gorge, *L.A.S.Johnson 7173* (BRI, NSW); 3.2 km E of Watsonville, *G.C.Stocker 943* (BRI, FRI).

Differs from *E. siderophloia* in the rounded operculum and hemispherical slightly smaller fruits. A valuable tree for nectar, producing excellent honey.

489. *Eucalyptus crebra* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 87 (1859)

T: Burdekin, Qld, 10 Nov. 1856, *F.Mueller*; holo: MEL.

Metrosideros salicifolia Sol. ex Gaertner, *Fruct. Sem. Pl.* 1: 171 & t. 34 (left-hand part) (1788), non *E. salicifolia* Cav. T: Thirsty Sound, [Qld], 1770, *J.Banks & D.Solander*; n.v.

Illustrations: N.C.W.Beadle *et al.*, *Fl. Sydney Region* 3rd edn, 318 (1982); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 256 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 529, 531 (1984).

Tree to 30 m. Bark rough throughout, dark grey to black. Juvenile leaves linear to narrowly lanceolate, green or grey-green, slightly discolorous. Adult leaves narrowly lanceolate to lanceolate, acuminate; lamina 6.5–15 cm long, 1–1.7 cm wide, dull, green or grey-green; lateral veins faint, at 30°–45°; intramarginal vein up to 1 mm from margin; petiole 10–15 mm long. Conflorescence terminal, paniculate; umbels 7–11-flowered; peduncle terete to quadrangular, 4–12 mm long; pedicels 1–6 mm long, with angles sometimes continuous as ribs on hypanthium. Buds clavate or fusiform; operculum conical to hemispherical, 2–3 mm long, c. 3 mm wide; hypanthium hemispherical to obovoid, 2–3 mm long, c. 3 mm wide. Fruits hemispherical or ovoid, 4–7 mm long, 4–6 mm wide; disc narrow, level or descending; valves 3 or 4, ±level to included. *Narrow-leaved Ironbark*. Fig. 105C–D.

Occurs widely from central Cape York Peninsula, Qld, south to near Yerranderie, S of Sydney, N.S.W. Grows in sand, sandy loam and clay-loam on plains and low plateaus, in woodland and open woodland. Regions: CYRK, BURD, DWSN, MCPH, NEPN. Map 524.

Qld: 15.4 km E of Emerald, *G.M.Chippendale 1109* & *M.J.Brennan* (BRI, FRI, MEL, PERTH); near Many Peaks, *L.Pedley 2878* (BRI, FRI). N.S.W.: 3.1 km NE of Baradine, *M.I.H.Brooker 5193* (AD, FRI, NSW); Branxton, Nov. 1904, *J.L.Boorman* (NSW).

Distinguished by the dark ironbark throughout, narrow dull green or grey-green leaves and small buds and fruits. Closely related to the following 3 species. The wood is hard, strong, extremely durable, and has been used for poles, railway sleepers and heavy engineering construction. The trees are a major source of pollen, though erratic in nectar production; honey produced from this species is excellent.

490. *Eucalyptus cullenii* Cambage, *J. & Proc. Roy. Soc. New South Wales* 54: 48, t. 1 (1920)

T: Alma-den, Qld, 20 Aug. 1913, *R.H.Cambage* 3905; holo: NSW; iso: FRI.

E. cullenii var. *trivalvis* Blakely, *Key Eucalypts* 248 (1934). T: Chillagoe, Qld, 2 Oct. 1901, *E.Doran s.n.*; holo: NSW; iso: FRI.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 99 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 221 (1983).

Tree to 18 m. Bark rough throughout, grey, brown-grey or brown-red, very deeply and widely furrowed. Juvenile leaves not seen. Adult leaves narrowly lanceolate, acuminate; lamina 10–13 cm long, 0.7–1.5 cm wide, green; lateral veins faint, at 40°–55°; intramarginal vein up to 1 mm from margin; petiole 9–15 mm long. Conflorescence terminal, paniculate; umbels 7-flowered; peduncle terete, 10–18 mm long; pedicels 4–6 mm long. Buds ovoid to subglobose; operculum hemispherical, shortly rostrate, 2–4 mm long, 3–5 mm wide; hypanthium hemispherical, 2–3 mm long, 3–4 mm wide. Fruits hemispherical or subglobose, 2–4 mm long, 4–5 mm wide; disc broad, ascending; valves 3 or 4, exserted. *Cullen's Ironbark*. Fig. 105E–F.

Occurs on northern and eastern Cape York Peninsula, Qld, in red podsols and shallow stony soils on undulating and hilly country in woodland. Regions: CYRK, BURD. Map 525.

Qld: St George Ck, *M.I.H.Brooker* 3413 (BRI, FRI); 26 km ESE of Coen, *L.A.S.Johnson* 7797 (NSW); 38.6 km WNW of Mt Carbine, *L.Pedley* 2604 (BRI, FRI, MEL).

Differs from related species especially in the shortly rostrate operculum and relatively narrow leaves.

491. *Eucalyptus whitei* Maiden & Blakely, *J. & Proc. Roy. Soc. New South Wales* 59: 172 (1925)

T: Berricania, Qld, Sept. 1920, *J.S.Swanson s.n.*; lecto: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 7: 401 (1927); isolecto: BRI.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 148 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 223 (1983).

Tree to 17 m. Bark rough throughout, brown-grey to dark grey, deeply fissured. Juvenile leaves broadly lanceolate to ovate, light green, slightly discolorous. Adult leaves narrowly lanceolate, sometimes falcate, acute; lamina 7.5–13 cm long, 1–2 cm wide, glaucous; lateral veins faint, at 40°–50°; intramarginal vein up to 1 mm from margin; petiole 6–10 mm long. Conflorescence axillary and terminal panicles, and some axillary umbels; umbels 7-flowered; peduncle terete, 10–18 mm long; pedicels 2–5 mm long. Buds fusiform, sometimes glaucous; operculum conical, 2–4 mm long, c. 3 mm wide; hypanthium obconical, 3–4 mm long, c. 3 mm wide. Fruits ovoid, sometimes glaucous, 5–8 mm long, 4–5 mm wide; disc narrow, steeply descending; valves 4 or 5, included. *White's Ironbark*. Fig. 105G–H.

Occurs from southern Cape York Peninsula south to Yalleroi and Ooline, Qld, in sand, sandy loam and sandy podsols on plains and gently undulating land in woodland and open forest. Regions: CYRK, BURD, DWSN, THOM. Map 526.

Qld: between Herberton & Watsonville, *M.I.H.Brooker* 3353 (BRI, FRI); 27.4 km SW of Forsayth town, *R.A.Perry* 3868 (AD, BRI, CANB, MEL, NT, PERTH).

Differs from related species in the glaucous leaves, buds and fruits with included valves. Leaves narrower than *E. melanophloia*, *E. shirleyi* and *E. fibrosa*.

492. *Eucalyptus staigeriana* F.Muell. ex Bailey, *Syn. Queensland Fl.* 176 (1883)

T: Cooktown, Palmer R., Qld, *P.A.Sellheim s.n.*; holo: BRI; iso: NSW.

E. crebra var. *citrata* F.Muell., *Eucalyptographia* 5: t. 3 (1880). T: Palmer R., Qld, *F.M.Bailey s.n.*; holo: BRI; iso: MEL, NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 100 (1973); S.Kelly *et al.*, *Eucalypts* 1: t. 203 (1983).

Tree to 21 m. Bark rough throughout, dark grey to black, deeply fissured. Juvenile leaves ovate to elliptic, green, concolorous. Adult leaves lanceolate, to elliptic, obtuse, apiculate; lamina 4–10 cm long, 1.2–2 cm wide, green; lateral veins faint, at 40°–45°; intramarginal vein up to 1 mm from margin; petiole 8–14 mm long. Conflouescence axillary and terminal, paniculate; umbels 7–11-flowered; peduncle terete, 8–13 mm long; pedicels 3–7 mm long. Buds fusiform; operculum conical, 2–3 mm long, 3–4 mm wide; hypanthium obconical, 3–4 mm long and wide. Fruits ovoid to pyriform, 5–6 mm long, 4–5 mm wide; disc narrow, descending; valves 3 or 4, \pm level. *Lemon-scented Ironbark*. Fig. 105 I–J.

Occurs along the eastern side of Cape York Peninsula, Qld, in sandy or shallow soil on undulating or hilly country in woodland or open forest. Region: CYRK. Map 527.

Qld: 2.9 km N of Whites Ck, *M.I.H. Brooker* 3414 (AD, BRI, FRI, MEL); SE of Maitland Downs, *B. Hyland* 5898 (BRI, CANB, FRI).

Distinguished from all other ironbarks by the strongly lemon- or citronella-scented leaves.

493. *Eucalyptus jensenii* Maiden, *Crit. Revis. Eucalyptus* 6: 255 (1922)

T: Wandi, N.T., Apr. 1916, *H.I. Jensen* 372; holo: NSW; iso: BM, BRI, K, L.

E. perplexa Maiden & Blakely in J.H. Maiden, *Crit. Revis. Eucalyptus* 8: 3 (1929). T: between Erskine Ra. & Mt Marriion, W.A., Aug. 1906, *W.V. Fitzgerald s.n.*; lecto: NSW, *fide* S.T. Blake, *Austral. J. Bot.* 1: 301 (1953); iso: K.

Illustrations: N. Hall & M.I.H. Brooker, *Forest Tree Ser.* No. 49 (1972); S. Kelly *et al.*, *Eucalypts* 2: t. 244 (1983).

Tree to 12 m. Bark rough throughout, grey to black, coarsely furrowed. Juvenile leaves broadly lanceolate to ovate, green, concolorous. Adult leaves lanceolate to broadly lanceolate, apiculate; lamina 5–10 cm long, 1.5–3.8 cm wide, grey-green; lateral veins faint, at 30°–45°; intramarginal vein almost confluent with or up to 1 mm from margin; petiole 5–10 mm long. Conflouescence terminal, paniculate, and axillary umbels; umbels 7-flowered; peduncle terete to slightly flattened, 4–7 mm long; pedicels 2–4 mm long. Buds ovoid to ovoid-conical, often glaucous; operculum hemispherical to conical, c. 2 mm long, 2–4 mm wide; hypanthium ovoid, 3–4 mm long, 2–4 mm wide. Fruits hemispherical, ovoid or subglobular, often glaucous, 3–5 mm long, 4–5 mm wide; disc narrow, descending; valves 3 or 4, just included to just exserted. *Wandi Ironbark*. Fig. 105K–L.

Occurs in the Kimberley, W.A., and northern N.T. including Groote Is., in sandy and lateritic soil on gentle slopes and tablelands, less frequently on flats or near swamps, in open forest and woodland. Regions: KIMB, ARNM. Map 528.

W.A.: 37 km NW of Blina Stn, *M. Lazarides* 3128 (AD, BRI, CANB, FRI, MEL, NT, PERTH); 45.1 km N of Gibb River Stn, *N.H. Speck* 4979 (CANB, NT, PERTH). N.T.: between Mary R. & Coirwong Ck, *S.T. Blake* 17096 (BRI, NSW); 16 km NNE of Mainoru Stn, *J. Must* 992 (CANB, DNA, FRI, NT).

The only ironbark of the series in W.A. and N.T.

494. *Eucalyptus quadricostata* Brooker, *Austrobaileya* 2: 148 (1985)

T: 2.4 km W of Oakvale Homestead on Wanda Vale road, Qld, 28 July 1976, *M.I.H. Brooker* 5305; holo: FRI; iso: BRI, K, NSW.

Illustrations: D.J. Boland *et al.*, *Forest Trees Australia* 4th edn, 524 (1984); M.I.H. Brooker, *op. cit.* 150, 151 (1985).

Tree to 6 m. Bark rough throughout, grey-black, furrowed. Juvenile leaves ovate, dull, grey-green, concolorous. Adult leaves lanceolate, acuminate; lamina 11–15 cm long, 1.5–2.2 cm wide, dull, green; lateral veins just visible, at 30°–40°; intramarginal vein 1–2 mm from margin; petiole 13–27 mm long. Conflouescence terminal, paniculate, with some axillary umbels; umbels 7-flowered; peduncle slightly flattened, 12–20 mm long; pedicels 5–6 mm long. Buds clavate; operculum pyramidal, 4–6 mm long, 5–6 mm wide; hypanthium quadrangular, 6–7 mm long, 5–6 mm wide. Fruits ovoid, quadrangular, 10–14 mm long, 8–10 mm wide; disc narrow, descending; valves 4, level or slightly exserted. Fig. 106A–B.

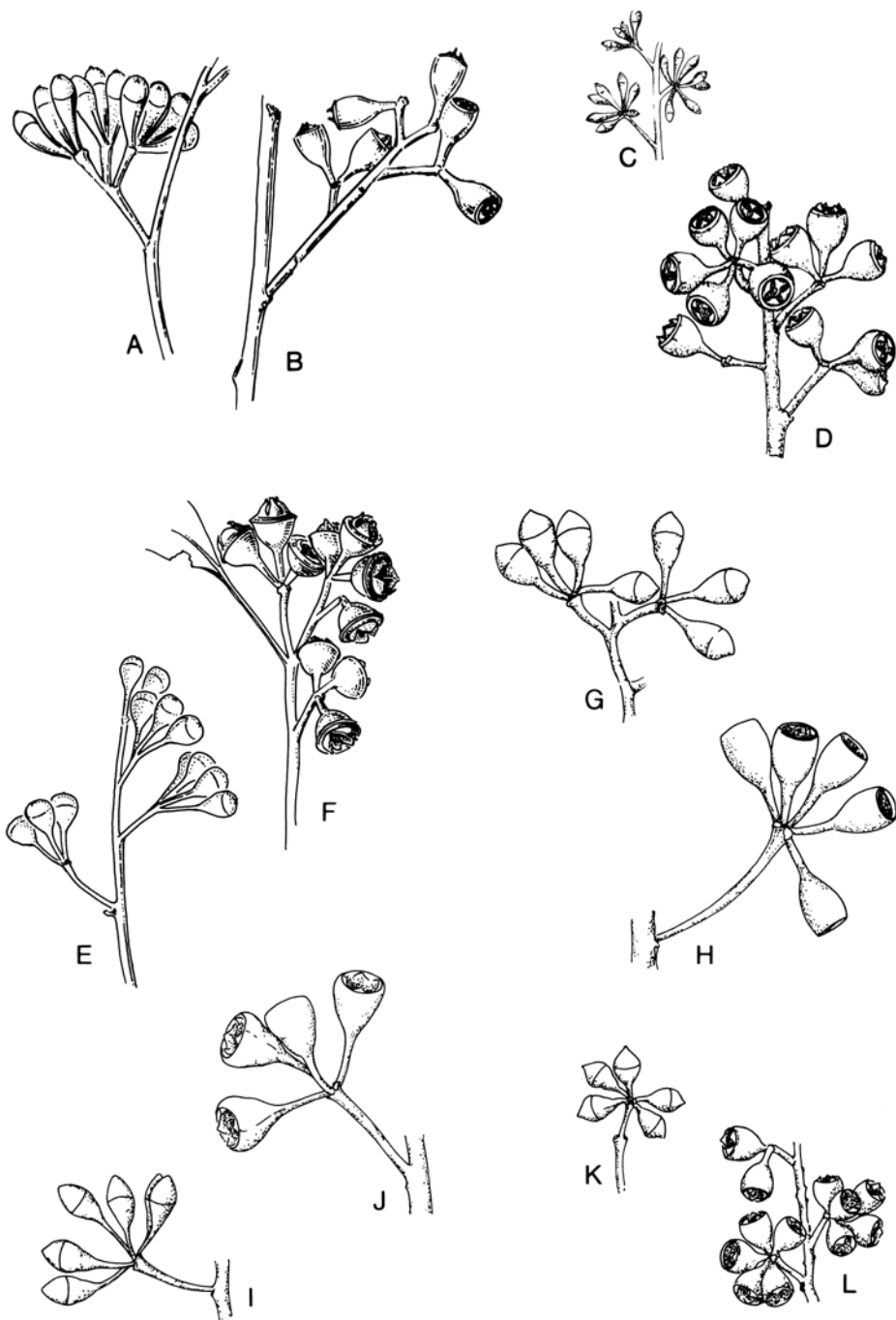


Figure 105. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. drepanophylla* (**A**, I.Brooker 5293, FRI; **B**, D.Kleinig 252, FRI). **C–D**, *E. crebra* (**C**, cult., Waite Arboretum, S.A., N.Hall & D.Symon, FRI; **D**, G.Smith 15, FRI). **E–F**, *E. cullenii* (**E**, I.Brooker 3368, FRI; **F**, I.Brooker 4071, FRI). **G–H**, *E. whitei* (**G**, I.Brooker 3353, FRI; **H**, I.Brooker 4142, FRI). **I–J**, *E. staigeriana* (**I**, B.Hyland 7929, FRI; **J**, I.Brooker 4015, FRI). **K–L**, *E. jensenii* (**K**, C.Gardner 9954, FRI; **L**, I.Brooker 3130, FRI). **A**, **B**, **E**, **F** drawn by M.Risby. Others drawn by M.May.

Restricted to an area near Pentland, Qld, in shallow soil on plains, slopes and low hills in open woodland. Region: BURD. Map 529.

Qld: 9 km N of Pentland, *D.F.Blaxell 1547* & *J.Armstrong* (FRI, NSW); 6.4 km NW of Cornelia Stn, *M.Lazarides 4580* (BRI, CANB, MEL).

The large 4-ribbed buds and fruits are diagnostic.

495. *Eucalyptus melanophloia* F.Muell., *J. Proc. Linn. Soc., Bot.* 3: 93 (1859)

T: subtropical Australia [Qld], 5 Mar. 1846, *T.L.Mitchell 485*; syn: K; Moreton Bay, [Qld], 1854, *C.Moore 66*; syn: K.

Illustrations: L.Costermans, *Native Trees & Shrubs S.E. Australia* 371 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 257 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 533 (1984).

Tree to 25 m. Bark rough throughout, dark grey to black, deeply furrowed. Juvenile leaves opposite, ovate to orbicular, often cordate, glaucous, concolorous. Adult leaves opposite, ovate to broadly lanceolate, apiculate; lamina 5–9 cm long, 2–3 cm wide, glaucous; lateral veins faint, at 40°–55°; intramarginal vein up to 2 mm from margin; petiole very short or absent. Conflorescence terminal, sometimes axillary, paniculate; umbels 7-flowered; peduncle terete or quadrangular, 4–16 mm long; pedicels 1–7 mm long. Buds fusiform, glaucous; operculum conical, 3–4 mm long, 3–5 mm wide; hypanthium obconical, 4–6 mm long, 3–5 mm wide. Fruits hemispherical, ovoid or urceolate, 3–8 mm long and wide, glaucous; disc broad, steeply descending; valves 3 or 4, level or slightly exserted. *Silver-leaved Ironbark*. Fig. 106C–D.

Occurs widely in eastern Qld south of Cape York Peninsula and in northern N.S.W. as far S as Narromine. Grows in a wide range of soils on plains and tablelands in woodland and open woodland. Regions: CYRK, BURD, DWSN, WRGO, MCPH, DARL, NEPN. Map 530.

Qld: 1.6 km SW of Mirtina Stn, *L.G.Adams 1157* (BRI, CANB, MEL, NT); 2.6 km N of Guluguba, *M.I.H.Brooker 4792* (AD, BRI, FRI, MEL); Ravenshoe, *I.B.Staples 2157* (BRI). N.S.W.: Ashford, Jan. 1906, *W.S.Campbell* (NSW).

Distinguished by the dark ironbark throughout, opposite broad glaucous leaves, and glaucous buds and fruits. The wood is heavy, hard and durable, and has been used for general construction and fencing. As a honey species it is variable in nectar production according to area, but is important for pollen, and the honey is aromatic.

496. *Eucalyptus shirleyi* Maiden, *Crit. Revis. Eucalyptus* 6: 425 (1923)

T: Stannary Hills, Qld, Dec. 1908, *T.L.Bancroft 180*; holo: NSW; iso: BRI.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 96 (1973); S.Kelly *et al.*, *Eucalypts* 2: t. 128 (1983).

Tree to 15 m. Bark rough throughout, dark grey to black, deeply fissured. Juvenile leaves opposite, ovate to orbicular, cordate to amplexicaul, glaucous, concolorous or slightly discolorous. Foliage on adult trees usually intermediate leaves, opposite, orbicular to broadly lanceolate, cordate or amplexicaul; lamina 5–9 cm long, 2.5–8 cm wide, glaucous; lateral veins just visible, at 45°–65°; intramarginal vein up to 3 mm from margin; petiole absent. Conflorescence terminal and axillary, paniculate; umbels 7-flowered; peduncles flattened, 10–20 mm long; pedicels 4–8 mm long. Buds ovoid to fusiform, glaucous; operculum conical, 3–4 mm long, 5–6 mm wide; hypanthium obconical, 4–6 mm long, 5–6 mm wide. Fruits ovoid to subcylindrical, usually ribbed, 7–12 mm long, 6–10 mm wide, glaucous; disc broad, steeply descending; valves 4, included. *Shirley's Silver-leaved Ironbark*. Fig. 106E–F.

Occurs from Stannary Hills S to near Pentland, Qld, in a wide range of soils on slopes, ridges and flats in woodland and dry sclerophyll forest. Regions: CYRK, BURD, CARP. Map 531.

Qld: 1.7 km E of Boorkoora railway stn, *M.I.H.Brooker 3380* (BRI, DNA, FRI, MEL); near Lynd Stn, *N.H.Speck 4673* (BRI, CANB, K, MEL, NT, PERTH).

Closely related to *E. melanophloia* but may be recognised by the broader adult leaves and larger fruits with included valves.

Ser. 89 *Heterophloiae*

Eucalyptus ser. **Heterophloiae** Blakely, *Key Eucalypts* 63, 262 (1934), excluding *E. dawsonii*.

Type: *E. polyanthemos* Schauer, lecto, *fide* G.M. Chippendale, *Fl. Australia* 19: 498 (1988)

Usually trees, but a mallee in *E. lucens*. Bark usually fibrous, flaky or subtessellated on at least part of trunk, often extending to larger branches, or smooth throughout. Juvenile leaves alternate, petiolate, usually concolorous, but sometimes slightly discolorous. Adult leaves alternate, petiolate, usually concolorous, but sometimes discolorous in *E. rudderi*. Conflorences usually terminal, paniculate, but sometimes also with axillary umbels; umbels 7-flowered. Buds ovoid or clavate to fusiform. Fruits hemispherical, pyriform, obovoid or obconical; disc descending; valves 3 or 4, included. Seeds suborbicular to elliptic, somewhat flat to cubical, shallowly reticulate, grey-brown.

A series of 6 species in N.T., S.A., Qld, N.S.W. & Vic., characterised by the usually rough bark, usually concolorous leaves, terminal paniculate conflorences or sometimes axillary and simple, and fruits with included valves. The outer stamens lack anthers.

497. *Eucalyptus rudderi* Maiden, *Proc. Linn. Soc. New South Wales* 29: 779 (1904)

T: Cundletown, near Taree, N.S.W., July 1885, *A.Rudder s.n.*; lecto: NSW, *fide* N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 193 (1977).

Illustrations: N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 3: 463 (1976); N.Hall & M.I.H.Brooker, *loc. cit.*; M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 258 (1983).

Tree to 40 m. Bark subtessellated on trunk and larger branches, light grey, then smooth, grey to grey-brown above. Juvenile leaves lanceolate to ovate, green, discolorous. Adult leaves narrowly to broadly lanceolate, acuminate; lamina 6–14 cm long, 1–3 cm wide, green; lateral veins clearly visible, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole terete, 15–24 mm long. Conflorence terminal, paniculate; peduncle terete, 5–8 mm long; pedicels absent or to 4 mm long. Buds clavate or ovoid; operculum conical or hemispherical, 1–2 mm long, 2–3 mm wide; hypanthium hemispherical to subglobular, 2–3 mm long and wide. Fruits hemispherical to obconical, 3–5 mm long, 2–4 mm wide; disc narrow. *Rudder's Box*. Fig. 106G–H.

Occurs from near Taree to near Warragamba, N.S.W., in shallow soil on steep slopes in forest. Regions: MCPH, NEPN. Map 532.

N.S.W.: Lacey Ck, Warragamba, *M.I.H.Brooker* 4679 (AD, BRI, FRI, MEL); Kiwarra State Forest, 18 Apr. 1963, *I.P.Burgess* (NSW).

Distinguished by rough bark on trunk and larger branches, terminal panicles, small clavate or ovoid buds and small hemispherical to obconical fruits. Has greener leaves and slightly smaller fruits than the following 3 species. The wood is heavy, hard and durable, and has been used for railway sleepers and fencing.

498. *Eucalyptus conica* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 24: 612 (1900)

E. baueriana var. *conica* (Deane & Maiden) Maiden, *Proc. Linn. Soc. New South Wales* 27: 216, 217 (1902). T: W of the Dividing Range, [?N.S.W.]; collector unknown; syn: NSW (several).

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 243 (1970); N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 3: 462 (1976); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 259 (1983).

Tree to 21 m. Bark fibrous on trunk and larger branches, grey to grey-brown, then smooth, white above. Juvenile leaves ovate, light green, slightly discolorous. Adult leaves lanceolate

to narrowly lanceolate, acuminate; lamina 7–12 cm long, 0.8–2.5 cm wide, dull, grey-green; lateral veins faint, at 25°–40°; intramarginal vein up to 2 mm from margin; petiole terete, 10–20 mm long. Conflorescence terminal, paniculate, and axillary umbels; peduncle terete or quadrangular, 4–10 mm long; pedicels 2–4 mm long. Buds clavate to fusiform; operculum conical, 1–2 mm long, c. 3 mm wide; hypanthium obconical, 2–4 mm long, c. 3 mm wide. Fruits obconical, 5–7 mm long, 3–5 mm wide; disc narrow. *Fuzzy Box*. Fig. 106 I–J.

Occurs from the Carnarvon Ra. area, Qld, through the western slopes and plains of N.S.W. as far S as Cowra and Grenfell. Grows in heavy alluvial soil and sandy loam, on gentle slopes and plains in open woodland. Regions: DWSN, WRGO, MCPH, NEPN, RIVR. Map 533.

Qld: 3.2 km from Warrong towards Mt Moffat, *M.I.H. Brooker* 4865 (AD, BRI, FRI); 0.3 km E of Burra Burra, *G.M. Chippendale* 575 & *R.D. Johnston* (BRI, FRI, MEL). N.S.W.: Murrumbidgee, Oct. 1893, *R.T. Baker* (NSW); Tingha, *R.H. Cambage* 993 (CANB, FRI, NSW).

Differs from *E. rudderi* in the obconical fruits, from *E. baueriana* in the narrower leaves and non-glaucous buds and fruits, and from *E. polyanthemus* in the narrower lanceolate leaves.

499. *Eucalyptus baueriana* Schauer in W.G. Walpers, *Repert. Bot. Syst.* 2: 924 (1843)

T: Georges R., N.S.W., *R. Brown* & *F. Bauer s.n.*; holo: W; iso: BM, FRI, K, MEL, NSW.

E. fletcheri R. Baker, *Proc. Linn. Soc. New South Wales* 25: 682 (1901). T: South Ck, St Marys, N.S.W., 17 Nov. 1900, *R.T. Baker s.n.*; lecto: NSW, *vide* J.H. Maiden, *Crit. Revis. Eucalyptus*: 2: 122 (1911); isolecoto: BRI, K, MEL, NSW.

Illustrations: N. Hall, *Forest Tree Ser.* No. 39 (1972); L. Costermans, *Native Trees & Shrubs S.E. Australia* 368 (1981); M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 260 (1983).

Tree to 20 m. Bark fibrous, flaky, light grey on trunk and larger branches, then smooth, grey to white above. Juvenile leaves suborbicular, emarginate, dull, grey-green, concolorous. Juvenile or ovate intermediate leaves often persist on mature trees. Adult leaves ovate to broadly lanceolate, acuminate; lamina 6–10 cm long, 3–5 cm wide, glaucous or green; lateral veins clearly visible, at 30°–40°; intramarginal vein up to 4 mm from margin; petiole terete, 20–25 mm long. Conflorescence terminal, paniculate; peduncle terete, 5–10 mm long; pedicels 2–4 mm long. Buds clavate or fusiform, glaucous; operculum conical, 1–2 mm long, 2–3 mm wide, usually narrower than hypanthium; hypanthium ovoid to obconical, 3–4 mm long, c. 3 mm wide. Fruits obconical, 5–7 mm long, 4–6 mm wide; disc broad. *Blue Box*. Fig. 106K–L.

Occurs in several disjunct areas: near Stanthorpe, Qld, in the Glen Innes–Armidale area, N.S.W., from just N of Sydney, N.S.W., to near Metung, Vic., and the Werribee–Bacchus Marsh area, Vic. Grows in loam and clay-loam on flats, including near watercourses, in woodland. Regions: MCPH, NEPN, HOWE, OTWY. Map 534.

Qld: 4.8 km from Stanthorpe, Mar. 1904, *A. Murphy* (BRI, NSW). N.S.W.: 11 km NNW of Narooma, *R. Coveny* 6184 (CANB, NSW); Enmore, 29 km E of Uralla, *R.H. Cambage* 3776 (BRI, CANB, NSW). Vic.: Metung, *M.I.H. Brooker* 4396 (AD, BRI, FRI, MEL); near Bacchus Marsh, May 1965, *P. Carolan* (MEL).

Distinguished by the ovate to broadly lanceolate leaves with intramarginal vein up to 4 mm from margin.

500. *Eucalyptus polyanthemus* Schauer in W.G. Walpers, *Repert. Bot. Syst.* 2: 924 (1843)

T: N from Bathurst, N.S.W., 1822, *A. Cunningham* 136; holo: n.v.; iso: BM, K.

E. ovalifolia R. Baker, *Proc. Linn. Soc. New South Wales* 25: 680 (1901) p.p. T: Bathurst, N.S.W., 15 Feb. 1901, *R.T. Baker s.n.*; syn: MEL; Rylstone, N.S.W., Oct. 1898, *R.T. Baker s.n.*; syn (various dates, pre-1900): BM, BRI, K, MEL, NSW; Camboon, N.S.W., 10 Oct. 1893, *R.T. Baker s.n.*; syn: BRI, K, MEL; Hargraves, N.S.W., *A.A. Suttor*; syn: n.v.; Gerogery, N.S.W., *L. Mann s.n.*; syn: n.v.

E. ovalifolia var. *lanceolata* R. Baker & H.G. Smith, *Res. Eucalypts* 124 (1902). T: Camboon, N.S.W., *R.T. Baker s.n.*; syn: n.v.; Rylstone, N.S.W., *R.T. Baker s.n.*; syn: n.v.; Hargraves, N.S.W., *A.A. Suttor*; syn: n.v.; Wellington, N.S.W., *collector unknown*; syn: n.v.

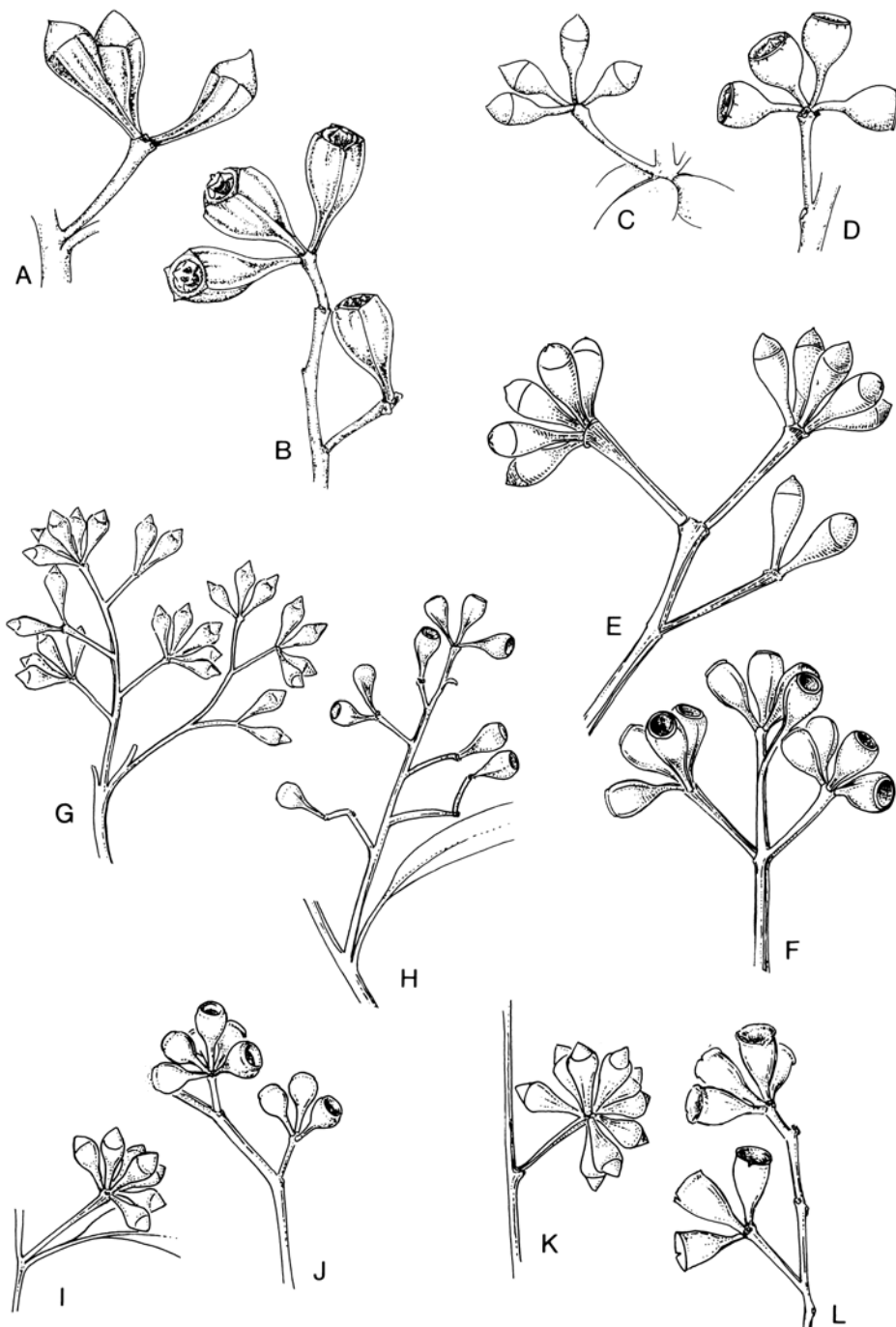


Figure 106. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. quadricostata* (I.Brooker 5305, FRI). **C–D**, *E. melanophloia* (**C**, Narrabri, N.S.W., G.Burrow, FRI; **D**, D.Kleinig 174, FRI). **E–F**, *E. shirleyi* (**E**, I.Brooker 3382, FRI; **F**, I.Brooker 4148, FRI). **G–H**, *E. rudderi* (**G**, Kiwarra State Forest, N.S.W., J.Doran, FRI; **H**, I.Brooker 4648, FRI). **I–J**, *E. conica* (**I**, I.Brooker 6625, FRI; **J**, 20.8 km S of Leyburn Qld, R.Edmonds, FRI). **K–L**, *E. baueriana* (**K**, Georges R., N.S.W., R.Brown & F.Bauer, FRI; **L**, I.Brooker 4396, FRI). **A–D** drawn by M.May. Others drawn by M.Risby.

Illustrations: L.Costermans, *Native Trees & Shrubs S.E. Australia* 368 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 261 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 537 (1984).

Tree to 25 m. Bark fibrous, grey-brown on trunk and larger branches, or almost smooth throughout, grey, cream or pink. Juvenile leaves orbicular, emarginate, dull, grey-green, concolorous. Adult leaves ovate to broadly lanceolate, apiculate; lamina 5.5–9 cm long, 1.5–3.5 cm wide, grey or glaucous; lateral veins clearly visible, at 20°–40°; intramarginal vein up to 4 mm from margin; petiole terete or flattened, 15–25 mm long. Conflourescence terminal, paniculate; peduncle terete, 5–10 mm long; pedicels 2–5 mm long. Buds clavate to fusiform, glaucous; operculum conical, 1–2 mm long, c. 2 mm wide; hypanthium obovoid to obconical, c. 3 mm long and wide. Fruits obconical to pyriform, often glaucous, 4–7 mm long, 3–6 mm wide; disc broad. *Red Box*. Fig. 107A–B.

Occurs on the central and southern tablelands, N.S.W., and in central and eastern Vic., in stony and gravelly soil on slight slopes and foothills in woodland. Regions: MCPH, NEPN, HOWE, OTWY. Map 535.

N.S.W.: Tumut, *R.H.Cambage* 877 (CANB, FRI, NSW); Mullion Ra., 22.5 km NNE of Orange, *R.Coveny* 4164 (AD, BRI, FRI, MEL, NSW, PERTH). Vic.: 29 km NE of Bendigo, *E.F.Constable* 5252 (FRI, MEL, NSW); 16 km E of Bruthen, *T.B.Muir* 2167 (MEL).

Distinguished by the grey or glaucous leaves, that are narrower than in *E. baueriana*. Also resembles *E. dawsonii* which has all stamens fertile and smooth bark. The wood is hard, strong and durable, and has been used for fencing, firewood and railway sleepers.

501. *Eucalyptus fasciculosa* F.Muell., *Trans. Victorian Inst. Advancem. Sci.* 1: 34 (1855)

T: Bugle Ra., S.A., Aug. 1850, *F.Mueller*; lecto: MEL 10340, *fide* J.H.Willis, *Muelleria* 1: 166 (1967).

Illustrations: N.Hall *et al.*, *Forest Trees Australia* 3rd edn, 263 (1970); C.D.Boomsma, *Native Trees S. Australia* 109 (1972); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 263 (1983).

Tree to 15 m. Bark flaky on a variable amount of trunk, brown to grey, then smooth, grey-yellow to white-grey above. Juvenile leaves ovate, green, concolorous. Adult leaves lanceolate to broadly lanceolate, acute, oblique; lamina 8–13 cm long, 1.5–3.5 cm wide, dull, or sometimes almost shining, green; lateral veins faint or just visible, at 40°–50°; intramarginal vein 1–2 mm from margin; petiole terete, 15–20 mm long. Conflourescence terminal, paniculate; peduncle quadrangular, 5–10 mm long; pedicels 1–4 mm long. Buds clavate to fusiform; operculum conical, 2–3 mm long, c. 3 mm wide; hypanthium obovoid, 3–4 mm long and wide. Fruits obconical to obovoid, 6–9 mm long, 5–6 mm wide; disc narrow. *Pink Gum*. Fig. 107C–D.

Occurs on Kangaroo Is. and from near Adelaide, S.A., east to W of Dergholm, Vic. Grows in coastal sand and poor podsols on plains, ridges and slopes, in woodland and open forest. Regions: EYRE, OTWY. Map 536.

S.A.: 12.4 km SE of Padthaway, *G.M.Chippendale* 1325 & *M.J.Brennan* (AD, FRI, MEL); Culburra, *B.Copley* 1985 (AD, FRI); McLaren Vale, *E.N.S.Jackson* 504 (AD, FRI). Vic.: W of Dergholm, 20 Mar. 1947, *G.G.Shephard* (AD, FRI).

The only species in its area of distribution with terminal panicles. Has longer fruits than related species. Operculum shorter and narrower than the hypanthium. The wood is hard and durable, useful for posts, poles and firewood. Honey production varies according to district.

502. *Eucalyptus lucens* Brooker & Dunlop, *Austral. Forest Res.* 8: 209 (1978)

T: Mt Sonder, N.T., 23°35'S, 132°33'E, 1 Jan. 1973, *C.R.Dunlop* 3008; holotype: FRI; isotype: AD, BRI, CANB, DNA, NSW, NT.

Illustrations: M.I.H.Brooker & C.R.Dunlop, *op. cit.* 210; J.P.Jessop (ed.), *Fl. Central Australia* 253 (1981).

Mallee to 3 m. Bark usually smooth, grey, but often some rough at trunk bases. Juvenile leaves lanceolate, green, concolorous. Adult leaves lanceolate, sometimes falcate, acuminate

or uncinat; lamina 8–12 cm long, 1–1.5 cm wide, shining, green; lateral veins faint, at 30°–35°; intramarginal vein up to 1 mm from margin; petiole terete, 10–15 mm long. Conflouescence terminal and axillary, paniculate, but with some simple umbels; peduncle terete, 5–10 mm long; pedicels 2–4 mm long. Buds ovoid to fusiform; operculum conical, often narrower than hypanthium, 2–3 mm long, 3–4 mm wide; hypanthium pyriform, 2–3 mm long, 3–4 mm wide. Fruits obconical, 4–6 mm long and wide; disc broad. Fig. 107E–F.

Occurs on the ranges W of Alice Springs, N.T., in shallow soil on slopes of sandstone and quartzite hills in open shrubland. Region: MACD. Map 537.

N.T.: Mt Sonder, *C.R.Dunlop 2515* (AD, BRI, CANB); Mt Hermannsburg, *P.K.Latz 3123* (FRI, NT).

The only species of the series in N.T. Distinguished by the mallee habit, smooth bark but a little rough at the base, shining green lanceolate leaves and buds with conical operculum narrower than hypanthium.

Ser. 90 *Rhodoxyla*

Eucalyptus ser. **Rhodoxyla** (Blakely) Chippendale, *Fl. Australia* 19: 504 (1988).

E. subser. Rhodoxyla Blakely, *Key Eucalypts* 61, 258 (1934) except *E. sideroxylon*. *T: E. paniculata* Smith, lecto, *fide* G.M.Chippendale, *loc. cit.*

Trees. Bark hard, grey to black, furrowed, usually throughout, but sometimes only on trunk and larger branches. Juvenile leaves alternate, petiolate or rarely sessile, concolorous or discolorous. Adult leaves alternate, petiolate, concolorous or discolorous; petiole terete. Conflouescences terminal, paniculate and also some axillary umbels; umbels 7-flowered. Buds fusiform, clavate, globular, ovoid or obovoid. Fruits obovoid, obconical, hemispherical, subglobular or subpyriform; disc level or descending, often obscured by the staminal ring; valves 3–5, usually included, rarely \pm level or slightly exserted. Seeds suborbicular, ovoid, elliptic or almost cubical, smooth or shallowly reticulate, grey-brown.

A series of 7 species in Qld and N.S.W., characterised by hard furrowed bark, concolorous or discolorous leaves and mostly terminal paniculate conflouescences of 7-flowered umbels.

503. *Eucalyptus melanoleuca* S.T.Blake, *Austrobaileya* 1: (1977)

T: 6–7 miles [c. 10–11 km] N of Yarraman, Qld, 31 July 1952, *S.T.Blake 18975*; holo: BRI; iso: CANB, FRI, NSW.

Illustration: S.Kelly *et al.*, *Eucalypts* 2: t. 228 (1983).

Tree to 30 m. Bark rough, black on trunk and larger branches, then smooth, white above. Juvenile leaves sessile or shortly petiolate, lanceolate, green, discolorous. Adult leaves lanceolate, often crenulate, acuminate, sometimes falcate; lamina 8–15 cm long, 1.5–2.5 cm wide, green, concolorous; lateral veins faint, at 40°–45°; intramarginal vein up to 1 mm from margin; petiole 12–23 mm long. Peduncle usually quadrangular, 3–13 mm long; pedicels quadrangular, 2–5 mm long. Buds obovoid to fusiform; operculum conical, slightly narrower than hypanthium, 2–4 mm long, 3–5 mm wide; hypanthium pyriform, 4–5 mm long, 3–5 mm wide. Fruits obovoid to hemispherical, 5–6 mm long, 4–5 mm wide; disc obscure, descending; valves 4, included. Seeds shallowly reticulate. Fig. 107G–H.

Occurs from the Blackdown Tableland S to near Yarraman, Qld, in sandy loam and clay-loam, in open forest and on the margin of rainforest. Regions: DWSN, MCPH. Map 538.

Qld: 5 km S of Nanango, *M.I.H.Brooker 5546* (AD, BRI, FRI, MEL, NSW); 40.2 km WSW of Duaringa, *C.H.Gittins 866* (BRI, NSW).

Distinguished by black ironbark on trunk and larger branches then smooth white bark above, lanceolate often crenulate leaves, obovoid to fusiform buds and obovoid to hemispherical fruits mostly in terminal panicles.

504. *Eucalyptus tetrapleura* L.Johnson, *Contr. New South Wales Natl Herb.* 3: 119 (1962)

T: Wells Crossing, 1 mile [c. 1.6 km] N of Halfway Ck, N.S.W., 6 June 1957, *L.A.S.Johnson & E.F.Constable NSW 54122*; holotype: NSW.

Illustrations: N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 170 (1974); S.Kelly *et al.*, *Eucalypts* 2: t. 227 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 264 (1983).

Tree to 30 m. Bark rough throughout, grey-brown to grey-black. Juvenile leaves lanceolate to ovate, green, concolorous. Adult leaves lanceolate, acuminate; lamina 12–20 cm long, 1.5–3 cm wide, green, concolorous; lateral veins just visible, at 40°–45°; intramarginal vein up to 1 mm from margin; petiole 20–30 mm long. Peduncle slightly flattened or angular, 15–30 mm long; pedicels angular, 8–12 mm long. Buds fusiform, 4-angled; operculum conical, often narrower than hypanthium, 6–7 mm long, 4–5 mm wide; hypanthium obconical, 6–7 mm long, 4–5 mm wide. Fruits obconical, 4-angled, 9–10 mm long, 6–8 mm wide; disc often obscure, descending; valves 4 or 5, included. Seeds suborbicular, ovoid or elliptic, grey brown. *Square-fruited Ironbark*. Fig. 107 I–J.

Occurs in the Casino–Grafton area, N.S.W., in poorly drained soil on slightly sloping ground between drainage lines in open forest. Region: MCPH. Map 539.

N.S.W.: 26.2 km NW of Corindi, *R.Coveny 4272 & J.Armstrong* (BRI, FRI, MEL, NSW); Girard State Forest, 22 Apr. 1955, *R.J.Turner* (NSW).

Distinguished by dark ironbark throughout, and 4-angled buds and fruits.

505. *Eucalyptus paniculata* Smith, *Trans. Linn. Soc. London* 3: 287 (1797)

T: Port Jackson, N.S.W., *D.Burton s.n.*; holotype: LINN; iso: BM.

E. fergusonii R.Baker, *J. & Proc. Roy. Soc. New South Wales* 51: 415 (1917). T: Bulahdelah, N.S.W., Oct. 1916, *L.C.Maxwell*; lectotype: NSW, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 5: 259 (1921).

E. nanglei R.Baker, *J. & Proc. Roy. Soc. New South Wales* 51: 418 (1917). T: Woy Woy, Lindfield, Nowra, Morisset, Stroud, Bulahdelah, N.S.W., *collectors unknown*; *n.v.*

Illustrations: L.Costermans, *Native Trees & Shrubs S.E. Australia* 371 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 265 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 539 (1984).

Tree to 50 m. Bark rough throughout, light grey. Juvenile leaves ovate to broadly lanceolate, green, discolorous. Adult leaves lanceolate, acuminate; lamina 9.5–15 cm long, 1.2–2.4 cm wide, green, discolorous; lateral veins clearly visible, at 35°–45°; intramarginal vein up to 1 mm from margin; petiole 13–22 mm long. Peduncle terete, quadrangular or flattened, 6–16 mm long; pedicels 4-angled, 2–10 mm long. Buds obovoid to fusiform; operculum conical, usually narrower than hypanthium, 3–4 mm long and wide; hypanthium obovoid to obconical, 4–5 mm long and wide. Fruits hemispherical, obconical, obovoid or subpyriform, 6–8 mm long, 5–8 mm wide; disc obscure, descending; valves 4 or 5, level or included. Seeds shallowly reticulate. *Grey Ironbark*. Fig. 107 K–L.

Occurs from near Coffs Harbour to near Bega, N.S.W., on ridges, hills and valleys of coastal areas, in sandy loam in open forest and tall open forest. Regions: MCPH, NEPN, HOWE. Map 540.

N.S.W.: Craven State Forest, 25 June 1931, *W.A.W. de Beuzeville* (BRI, NSW); 8.8 km N of Batemans Bay, *G.M.Chippendale 894 & M.J.Beeston* (AD, BRI, FRI, MEL, NSW); Otford, 1 July 1905, *J.H.Maiden* (NSW).

Differs from other ironbarks in the light grey ironbark, discolorous leaves, and usually 5-valved fruits.

506. *Eucalyptus beyeri* R.Baker, *J. & Proc. Roy. Soc. New South Wales* 51: 420 (1917)

E. paniculata var. *angustifolia* Benth., *Fl. Austral.* 3: 212 (1867). T: Parramatta, N.S.W., *W.Woolfs s.n.*; holotype: K; iso: NSW.

E. panda subsp. *illaquens* L.Johnson, *Contr. New South Wales Natl Herb.* 3: 120 (1962). T: 2 miles [c.

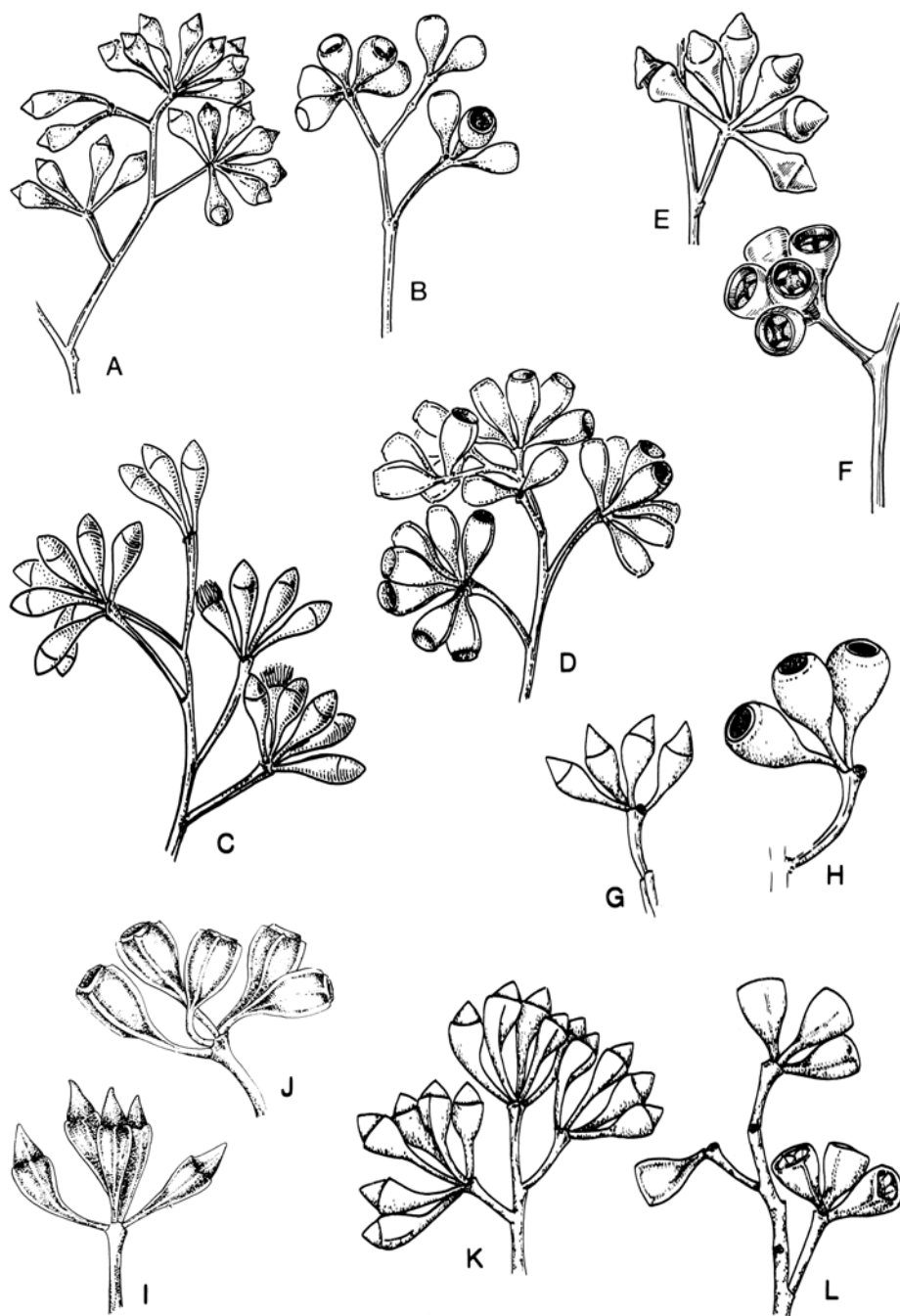


Figure 107. *Eucalyptus* buds and fruits, all $\times 1$, unless otherwise stated. **A–B**, *E. polyanthemos* (**A**, 6.4 km NE of Tarcutta, N.S.W., N.Hall, FRI; **B**, I.Brooker 5978, FRI). **C–D**, *E. fasciculosa* (**C**, P.Wilson 1381, FRI; **D**, Tea Tree Gully, S.A., R.Southcott, FRI). **E–F**, *E. lucens* $\times 0.75$ (**E**, I.Brooker 5082, FRI; **F**, P.Latz 6345, FRI). **G–H**, *E. melanoleuca* (I.Brooker 4820, FRI). **I–J**, *E. tetrapleura* (**I**, Bordens Bridge, Clarence R., N.S.W., R.Oxenford, NSW 54123, NSW; **J**, Wells Crossing, 1.6 km N of Halfway Ck, N.S.W., L.Johnson & E.Constable, NSW 54122, NSW). **K–L**, *E. paniculata* (**K**, J.Doran 188, FRI; **L**, D.Boland 1103, FRI). **A–D** drawn by M.Risby. Others drawn by M.May.

3.2 km] E of Munghorn, N.S.W., 22 Nov. 1952, *C.K.Ingram NSW 54103*; holo: NSW; iso: FRI, K.

Illustrations: D.A.Kleinig & M.I.H.Brooker, *Forest Tree Ser.* No. 215 (1978); N.C.W.Beadle *et al.*, *Fl. Sydney Region* 3rd edn, 318 (1982); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 266 (1983).

Tree to 25 m. Bark rough throughout, dark grey to black. Juvenile leaves narrowly lanceolate to lanceolate, green, slightly discolorous. Adult leaves narrowly lanceolate to lanceolate, acuminate or uncinata; lamina 6–12 cm long, 0.8–2 cm wide, green to grey-green, concolorous; lateral veins faint, at 45°–50°; intramarginal vein up to 1 mm from margin; petioles 12–20 mm long. Peduncle terete, 5–9 mm long; pedicels terete, 5–8 mm long. Buds fusiform or clavate; operculum conical, usually narrower than hypanthium, c. 2 mm long, 2–3 mm wide; hypanthium hemispherical to obovoid, 2–3 mm long, 2–4 mm wide. Fruits subglobular, hemispherical or obconical, 4–6 mm long, 3–6 mm wide; disc obscure, descending; valves 4, included. Seeds suborbicular, ovoid or elliptic, grey-brown. Fig. 108A–B.

Occurs from Goonoo State Forest through the Hunter R. valley and S to the Nowra area, N.S.W., in sandy soil on sandstone ridges and plateaus in woodland and forest. Region: NEPN. Map 541.

N.S.W.: 5 km W of Premer railway stn, *M.I.H.Brooker 5184* (AD, BRI, FRI, MEL, NSW); 14.5 km W of Princes Hwy on Nowra–Yalwal road, *L.A.S.Johnson, D.F.Blaxell & B.G.Briggs 3133* (BRI, FRI, NSW).

Distinguished by dark grey to black ironbark, narrowly lanceolate to lanceolate leaves, operculum narrower than hypanthium and subglobular, hemispherical or obconical fruits that are smaller than those of *E. paniculata*. Pedicels and petiole longer than in *E. panda*.

507. *Eucalyptus panda* S.T.Blake, *Proc. Roy. Soc. Queensland* 69: 87 (1958)

T: Barakula State Forest, Qld, 21 Oct. 1957, *S.R.Stevens s.n.*; holo: BRI; iso: BRI, CANB, K, L, NSW.

Illustrations: D.A.Kleinig & M.I.H.Brooker, *Forest Tree Ser.* No. 197 (1977); S.Kelly *et al.*, *Eucalypts* 2: t. 229 (1983).

Tree, often straggly, to 20 m. Bark rough throughout, grey. Juvenile leaves narrowly lanceolate, grey-green, concolorous. Adult leaves lanceolate to broadly lanceolate, apiculate or acuminate; lamina 5.5–10 cm long, 0.8–2.5 cm wide, dull, grey-green, concolorous; lateral veins faint, at 45°–50°; intramarginal vein up to 1 mm from margin; petiole 7–15 mm long. Peduncle terete, 4–7 mm long; pedicels terete, 2–4 mm long. Buds fusiform; operculum conical, often narrower than hypanthium, 2–4 mm long, 3–4 mm wide; hypanthium obconical, c. 4 mm long, 4–5 mm wide. Fruits hemispherical or obconical, 4–5 mm long, 5–6 mm wide; disc narrow, descending; valves 4 or 5, included to slightly exserted. Seeds smooth. *Tumbledown Ironbark*. Fig. 108C–D.

Occurs from the Carnarvon Ra. S to Inglewood State Forest, Qld, in sandy soil on plains and low ridges in woodland. Regions: DWSN, MCPH. Map 542.

Qld: 15.6 km from Tara towards Chinchilla, *M.I.H.Brooker 4768* (BRI, FRI, MEL, NSW); Inglewood State Forest, *L.A.S.Johnson 7221 & B.G.Briggs* (BRI, FRI, MEL, NSW, PERTH).

Closely related to *E. beyeri* but usually recognised by the shorter petiole and pedicels; also more straggly in habit and bark paler.

508. *Eucalyptus virens* Brooker & Bean, *Brunonia* 9: 223 (1986)

T: 14.8 km by road from 'Ogilby' (sic) Corner, NW of Injune, Qld, 29 Apr. 1975, *M.I.H.Brooker 4888 & D.A.Kleinig*; holo: FRI; iso: AD, BRI, MEL, NSW.

Illustrations: M.I.H.Brooker & A.R.Bean *op. cit.* 224–225.

Tree to 25 m. Bark rough, hard, shallowly furrowed, grey-black, on trunk and larger branches. Juvenile leaves petiolate, linear or falcate, green. Adult leaves narrowly lanceolate to falcate, acute or uncinata; lamina 6–10 cm long, 1–1.9 cm wide, shining, bright green, concolorous; lateral veins dense, fine, clearly visible at 40°–45°; intramarginal vein up to 1.5 mm from margin; petiole terete or channelled, 11–20 mm long. Conflouescence axillary,

simple, or terminal, apparently compound; peduncle terete to quadrangular, 5–12 mm long; pedicels 3–5 mm long, buds globular to rhomboidal, but fusiform when immature; operculum hemispherical, c. 2 mm long, c. 4 mm wide; hypanthium hemispherical, c. 3 mm long, c. 4 mm wide. Fruits hemispherical, obconical or campanulate, 3–5 mm long, 3–6 mm wide; disc narrow, descending; valves 4–6, included to slightly exserted. Seeds rounded, flattish, light brown, slightly reticulate.

Occurs in 3 small populations in southern Qld at Maranoa R., Tara and Inglewood in coarse sandy soil on flats or undulating to sloping country, sometimes among boulders in open forest. Map 564.

Qld: 16 km N of Ogilvie Corner, S of Moffatt homestead, Carnarvon Gorge Natl Park, *D.F.Blaxell* 1879 & *L.A.S.Johnson* (BRI, FRI, MEL, PERTH); 75.8 km N of Womblebank towards Carnarvon, *M.I.H.Brooker* 7885 (FRI); c. 8 km SE of Warrong Stn, NW of Injune, *P.N.Martensz* 962 (FRI).

Distinguished from related species by the shining green leaves and slightly smaller fruits.

509. *Eucalyptus caleyi* Maiden, *Proc. Linn. Soc. New South Wales* 30: 512 (1906)

T: Howell, N.S.W., Aug. 1905, *J.H.Maiden* & *J.L.Boorman*; holotype: NSW; isotype: G, L.

E. leucoxylon var. *pallens* Benth., *Fl. Austral.* 3: 210 (1867); *E. sideroxylon* var. *pallens* (Benth.) Rehder, *Cycl. Amer. Hort.* 2: 552 (1900). T: New England, N.S.W., *C.Stuart*; holotype: n.v.

E. coerulea R.Baker & H.G.Smith, *Res. Eucalypts* 2nd edn, 271 (1920). T: Murrumbidgee, N.S.W., 5 Oct. 1900, *R.T.Baker* s.n.; holotype: n.v.; isotype: NSW.

Illustrations: N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 3: 472 (1977); N.Hall & M.I.H.Brooker, *Forest Tree Ser.* No. 144 (1974); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 267 (1983).

Tree to 27 m. Bark rough throughout, dark grey to black. Juvenile leaves ovate to orbicular, sometimes emarginate, glaucous, concolorous. Adult leaves lanceolate to broadly lanceolate, acute to uncinately; lamina 5–10 cm long, 1.5–4 cm wide, glaucous, concolorous; lateral veins faint, at 30°–40°; intramarginal vein up to 1 mm from margin; petiole 14–23 mm long. Peduncle terete, 12–25 mm long; pedicels terete, 5–10 mm long. Buds clavate to fusiform, glaucous; operculum conical, usually narrower than hypanthium, 3–4 mm long, 4–5 mm wide; hypanthium obconical, 3–4 mm long, 4–5 mm wide. Fruits ovoid to subpyriform, glaucous, 6–10 mm long, 5–8 mm wide; disc narrow, descending; valves 3 or 4, included. Seeds smooth. *Caley's Ironbark*. Fig. 108E–F.

Occurs from the Millmerran area, Qld, S to Murrumbidgee, N.S.W., in shallow and lateritic soil, sometimes in podzols, on small rises, hills, ridges and broad undulating valleys, in dry sclerophyll open forest. Regions: MCPH, NEPN. Map 543.

Qld: 40 km E of Inglewood, *L.Pedley* 7426 (BRI, FRI). N.S.W.: 32 km NNW of Bendemeer, *L.A.S.Johnson* & *D.McGillivray* 2377 (FRI, NSW); 40.3 km NW of Uralla, *G.M.Chippendale* 1250 & *M.J.Brennan* (BRI, FRI, NSW).

Distinguished by the dark grey to black ironbark, thick, glaucous leaves, and glaucous buds and fruits on long pedicels and peduncles. Resembles *E. melanophloia* which can easily be distinguished by the opposite adult leaves.

Ser. 91 *Melliodorae*

Eucalyptus ser. *Melliodorae* Blakely, *Key Eucalypts* 62, 261 (1834)

Type: *E. melliodora* Cunn. ex Schauer

E. subser. *Leucoxyla* Blakely, *op. cit.* 62, 258. T: *E. leucoxylon* F.Muell.

Trees, sometimes mallees. Bark fibrous on lower trunk or to upper branches, or smooth on smallest branches, or hard, black, furrowed on trunk and at least on larger branches. Juvenile leaves alternate or opposite, petiolate or sessile, concolorous to discolorous. Adult leaves alternate, petiolate, concolorous. Conflorences axillary; umbels 3- or 7-flowered. Buds clavate, ovoid, sometimes rostrate, or fusiform. Fruits ovoid, hemispherical,

subglobular, campanulate or urceolate; disc narrow, descending, usually obscured by staminal ring; valves 4–6, included or rarely level. Seeds suborbicular, ovoid, elliptic or somewhat cubical, almost smooth or shallowly reticulate, grey-brown.

A series of 3 species in S.A., Qld, N.S.W. and Vic., characterised by fibrous or hard fissured bark, concolorous leaves and simple 3- or 7-flowered umbels. The staminophore is broad and prominent, and the outer stamens are sterile.

510. *Eucalyptus melliodora* Cunn. ex Schauer in W.G.Walpers, *Repert. Bot. Syst.* 2: 924 (1843)

T: Bathurst neighbourhood, N.S.W., Nov. 1825, *A.Cunningham* 57; holo: *n.v.*; iso: E, G, K, MEL, NSW.

E. patentiflora Miq., *Ned. Kruidk. Arch.* 4: 125 (1856). T: Melbourne, Vic., *F.Mueller*; syn *n.v.*; St Kilda, Vic., *F.Mueller*; syn: K.

E. caeruleascens Naudin, *Descr. Emploi Eucalyptus introd. Europe* 47 (1891). T: cultivated Bois du Boulogne, Algeria, 14 Feb. 1883, *C.Naudin s.n.*; fide J.H.Maiden, *Crit. Revis. Eucalyptus* 2: 136 (1912); holo: P.

E. forsythii Maiden, *Crit. Revis. Eucalyptus* 6: 115 (1922). T: Pilliga Scrub, Coonabarabran–Baradine road, N.S.W., Oct. 1899, *W.Forsyth s.n.*; holo: NSW.

E. melliodora var. *brachycarpa* Blakely, *Key Eucalypts* 262 (1934). T: Mt Ainslie, Canberra, A.C.T., collector unknown; syn: *n.v.*; Gulgong, N.S.W., Apr. 1901, *J.H.Maiden*; syn: NSW; same locality, *I.C.Boorman*; syn: NSW.

E. melliodora var. *elliptocarpa* Blakely, *loc. cit.* T: Urana, N.S.W., Aug. 1927, *J.W.Dwyer s.n.*; holo: NSW.

Illustrations: L.Costermans, *Native Trees & Shrubs S.E. Australia* 369 (1981); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 268 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 541 (1984).

Tree to 30 m. Bark fibrous on lower trunk only or up to larger branches, grey, yellow or red-brown, then smooth, white-yellow above. Juvenile leaves alternate, petiolate, ovate or elliptic, grey-green, concolorous. Adult leaves narrowly lanceolate to lanceolate, acuminate; lamina 6.5–14 cm long, 0.8–1.8 cm wide, green or grey-green; lateral veins clearly visible, at 20°–40°; intramarginal vein up to 2 mm from margin; petiole terete or slightly flattened, 10–15 mm long. Umbels 7-flowered; peduncle terete or quadrangular, 3–11 mm long; pedicels 2–9 mm long. Buds clavate to fusiform; operculum conical to rostrate, usually narrower than hypanthium, 2–3 mm long, c. 3 mm wide; hypanthium hemispherical, 3–4 mm long and wide. Fruits hemispherical, ovoid to subglobular, 4–7 mm long and wide; valves usually 5, level or included. *Yellow Box*. Figs 8, 108G–H.

Occurs widely in south-eastern Qld, eastern N.S.W. and Vic. except the north-west, particularly on the tablelands and inland. Grows on gentle slopes, low hills and, in drier areas, on flats near watercourses, in loamy and heavy alluvial soil, in woodland sometimes in open forest. Regions: DWSN, MCPH, NEPN, HOWE, OTWY. Map 544.

Qld: The Ranch, near Boonah, *N.Michael* 2281 (BRI, FRI). N.S.W.: Wollomombi Falls, *M.I.H.Brooker* 6067 (FRI, NSW); 12.5 km NW of Cootamundra, *G.M.Chippendale* 935 & *M.J.Beeston* (FRI, MEL, NSW). Vic.: 8 km from Stawell towards Halls Gap, *T.B.Muir* 1209 (MEL); The Domain, S. Melbourne, 19 Jan. 1943, *J.H.Willis* (MEL).

Distinguished by the fibrous, grey, yellow or red-brown bark persistent to variable heights on trees, intramarginal vein up to 2 mm from margin, 7-flowered umbels and prominent dark staminal ring, that persists and obscures the disc in fruit. A greatly favoured tree for honey production. The wood is hard, heavy, strong and extremely durable and has been used for heavy construction, railway sleepers, poles and firewood.

511. *Eucalyptus leucoxylo* F.Muell., *Trans. Victorian Inst. Advancem. Sci.* 1: 33–34 (1855)

T: Mt Lofty Ra., S.A., Nov. 1849, *F.Mueller*; lecto: MEL 1010317, fide D.J.Boland, *Austral. Forest Res.* 9: 65 (1979).

Tree or mallee. Bark rough, fibrous to 2 m, grey to dark grey, then smooth, white, grey, yellow and/or blue above. Juvenile leaves opposite, broadly lanceolate to ovate or orbicular, cordate, sometimes connate, green or glaucous, slightly discoloured. Adult leaves narrowly lanceolate to lanceolate, acuminate; lamina green to glaucous; intramarginal vein up to 3 mm from margin; petiole terete. Umbels 3-flowered; peduncle terete. Buds ovoid, sometimes rostrate, or fusiform; operculum conical to rostrate, usually narrower than hypanthium; hypanthium hemispherical. Fruits hemispherical, subglobular, ovoid or campanulate, sometimes ribbed; valves 4–6, included.

Occurs in south-eastern S.A., including Kangaroo Is., extending to south-western Vic., with a small isolated occurrence between Euston and Barham, N.S.W. Stamens white, pink or red. Differs from *E. melliodora* and *E. sideroxylon* subsp. *sideroxylon* in the 3-flowered umbels. There are 4 subspecies.

1 Buds and fruits glaucous 511c. subsp. *pruinosa*

1: Buds and fruits not glaucous

2 Buds ribbed 511d. subsp. *petiolaris*

2: Buds not ribbed

3 Fruits 7–14 mm long; peduncles 4–11 mm long 511a. subsp. *leucoxylon*

3: Fruits 11–18 mm long; peduncles 10–18 mm long 511b. subsp. *megalocarpa*

511a. *Eucalyptus leucoxylon* F.Muell. subsp. *leucoxylon*

E. leucoxylon var. *rugulosa* F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 127 (1856). T: Devils Country, S.A., Jan. 1851, *F.Mueller*; lecto: MEL 1010310, *fide* D.J.Boland, *Austral. Forest Res.* 9: 66 (1979).

E. leucoxylon var. *erythrostema* F.Muell. ex Miq., *loc. cit.* T: Encounter Bay, S.A., *C.Stuart & F.Mueller*; lecto: U 190556, *fide* D.J.Boland, *loc. cit.*

E. leucoxylon var. *angulata* Benth., *Fl. Austral.* 3: 210 (1867) *p.p.* T: Devils Country, S.A., *F.Mueller*; holo: *n.v.*, *fide* D.J.Boland, *loc. cit.*

Illustrations: D.J.Boland & M.I.H.Brooker, *Forest Tree Ser.* No. 187 (1975); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 269 (1983); S.Kelly *et al.*, *Eucalypts* 1: t. 212 (1983).

Tree to 16 m. Juvenile leaves sessile, ovate to broadly lanceolate, dull, green. Adult leaves: lamina 9–13 cm long, 1.3–2.5 cm wide, dull, green to blue-green; lateral veins just visible, at 20°–30°; petiole 10–20 mm long. Peduncle 4–11 mm long; pedicels 3–25 mm long. Buds ovoid to fusiform, rostrate, not ribbed; operculum 4–5 mm long, 5–6 mm wide; hypanthium 5–7 mm long, 6–7 mm wide. Fruits ovoid to subglobular, 7–14 mm long, 8–13 mm wide. *Yellow Gum, Blue Gum.* Figs 37, 108 I–J.

Occurs in Vic. and S.A. including Kangaroo Is. Grows in sand and sandy loam, on gently sloping country, low hills or valleys in woodland and open forest. Regions: EYRE, RIVR, OTWY. Map 545.

S.A.: 15 km W of Murray Bridge, *J.Carrick 3693* (AD, FRI); 3.5 km NW of Keith, *G.M.Chippendale 1333 & M.J.Brennan* (AD, BRI, FRI, MEL). Vic.: 16 km WSW of Bendigo, 16 June 1963, *W.Bateman* (MEL); 5.6 km NW of Kaniva, *R.Melville 890* (MEL).

Has rough bark up to 2 m, dull green to blue-green leaves, 3-flowered umbels and ovoid to subglobular fruits with a dark, caducous staminal ring. The wood is hard, strong and very durable, and has been used for structural engineering, railway sleepers, poles and fencing. Abundant nectar is produced, and honey from this species is of fine quality.

511b. *Eucalyptus leucoxylon* subsp. *megalocarpa* Boland, *Austral. Forest Res.* 9: 68 (1979)

T: Dingley Dell, Port MacDonnell, S.A., 1 May 1970, *D.J.Boland 158*; holo: FRI.

E. leucoxylon var. *macrocarpa* J.Brown, *Forest Fl. S. Australia* (1883). T: illustration accompanying original description; lecto, *fide* D.J.Boland, *loc. cit.*

Illustrations: M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 270 (1983); S.Kelly *et al.*, *Eucalypts* 1: t. 213 (1983).

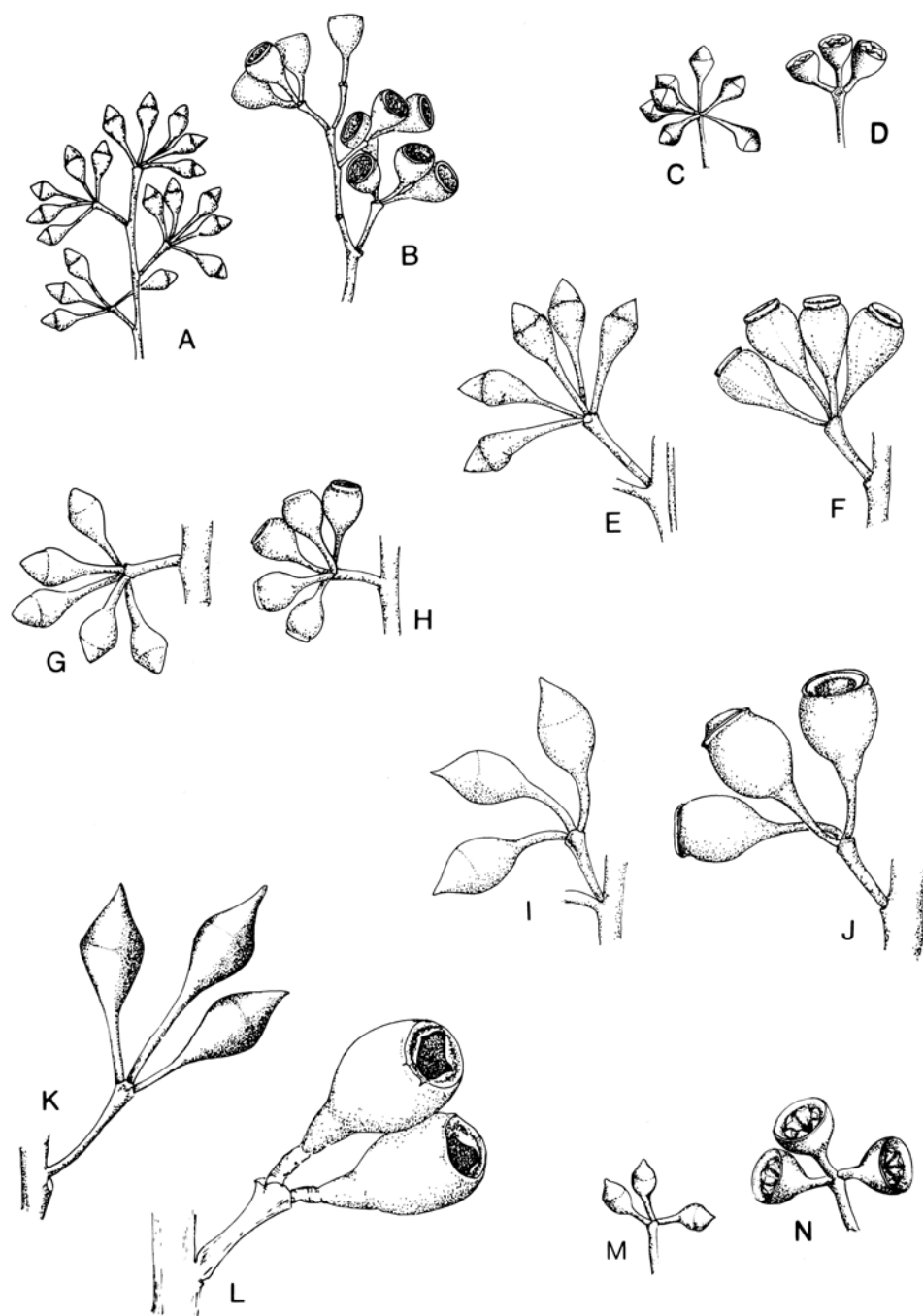


Figure 108. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. beyeri* (**A**, I.Brooker 4694, FRI; **B**, I.Brooker 4920, FRI). **C–D**, *E. panda* (Barakula State Forest, NNW of Chinchilla, Qld, S.Stevens, NSW). **E–F**, *E. caleyi* (**E**, Keira Gap, Bundarra, N.S.W., R.Vickery, FRI; **F**, R.Johnston & G.Chippendale 677, FRI). **G–H**, *E. melliodora* (**G**, I.Brooker 5167, FRI; **H**, G.Chippendale 1236, FRI). **I–J**, *E. leucoxylon* subsp. *leucoxylon* (**I**, N.Donner 114, FRI; **J**, D.Boland 34, FRI). **K–L**, *E. leucoxylon* subsp. *megalocarpa* (**K**, Kapunda Forest Reserve, S.A., W.Gill, NSW; **L**, I.Brooker 3812, FRI). **M–N**, *E. leucoxylon* subsp. *pruinosa* (64 km N of Adelaide, near Mt Crawford, S.A., W.Gill, FRI). Drawn by M.May.

Tree to 10 m. Juvenile leaves sessile, ovate to broadly lanceolate, green. Adult leaves: lamina 10–15 cm long, 2–2.5 cm wide, green; lateral veins clearly visible, at 20°–35°; petiole 15–23 mm long. Peduncle 10–18 mm long; pedicels 8–17 mm long. Buds ovoid, rostrate, smooth; operculum 5–8 mm long, c. 6 mm wide; hypanthium 6–9 mm long, 7–8 mm wide. Fruits ovoid to subglobular, 11–18 mm long, 10–16 mm wide. Fig. 108K–L.

Occurs in coastal south-eastern S.A. including Kangaroo Is., in calcareous soil. Regions: EYRE, OTWY. Map 546.

S.A.: Smith Rd, W of Port MacDonnell, *M.I.H. Brooker* 3812 (AD, FRI); 6.4 km E of Coomunga, *D.J.E. Whibley* 369 (AD).

Has longer peduncle and larger fruits than subsp. *leucoxydon* and subsp. *pruinosa*.

511c. *Eucalyptus leucoxydon* subsp. *pruinosa* (F.Muell. ex Miq.) Boland, *Austral. Forest Res.* 9: 68 (1979)

E. leucoxydon var. *pruinosa* F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 127 (1856). T: Salt Ck, S.A., Jan. 1849, *F. Mueller* or *H. Behr*; syn: MEL 1010320; Salt Ck, *F. Mueller* or *H. Behr*; syn: U 190557; *fide* D.J. Boland, *loc. cit.*

E. leucoxydon var. *pauperita* J. Brown, *Forest Fl. S. Australia* (1883). T: illustration accompanying original description, J.E. Brown, *loc. cit.*, *fide* D.J. Boland, *loc. cit.*

Illustrations: M.I.H. Brooker & D.A. Kleinig, *Field Guide to Eucalypts* 1: 270 (1983); S. Kelly *et al.*, *Eucalypts* 2: t. 232 (1983).

Mallee or tree to 15 m. Juvenile leaves sessile, sometimes connate, orbicular, cordate, glaucous. Adult leaves: lamina 9–14 cm long, 1.2–2.2 cm wide, grey-green or glaucous; lateral veins clearly visible, at 20°–30°; petiole 10–17 mm long. Peduncle 3–10 mm long; pedicels 2–8 mm long. Buds ovoid, rostrate, glaucous, smooth; operculum 2–4 mm long, 4–5 mm wide; hypanthium 4–5 mm long, 5–6 mm wide. Fruits hemispherical, glaucous, 5–12 mm long, 8–11 mm wide. Fig. 108M–N.

Occurs in south-eastern S.A., in Vic. except Gippsland, and between Euston and Barham, N.S.W., in clay and sandy soil in woodland. Regions: EYRE, OTWY, RIVR, HOWE. Map 547.

S.A.: 17.4 km NW of Padthaway, *G.M. Chippendale* 1328 & *M.J. Brennan* (AD, FRI); Freeling Cemetery, *D.N. Kraehenbuehl* 1517 (AD, FRI). N.S.W.: 1.6 km N of Barham, 4 May 1955, *L.A.S. Johnson* (NSW). Vic.: 3.2 km S of Heathcote, *D.J. Boland* 795 (FRI); Marong near Bendigo, Nov. 1921, *D.J. Paton* (MEL).

Distinguished from other subspecies by the glaucous juvenile leaves, buds and fruits.

511d. *Eucalyptus leucoxydon* subsp. *petiolaris* Boland, *Austral. Forest Res.* 9: 70 (1979)

T: Pillaworta Ck near Pillaworta Hill, S.A., 15 May 1971, *D.J. Boland* 690; holotype: FRI.

Illustrations: D.J. Boland, *op. cit.* 71; S. Kelly *et al.*, *Eucalypts* 1: t. 214 (1983).

Tree to 13 m. Juvenile leaves petiolate, broadly lanceolate to ovate, green. Adult leaves: lamina 8–13 cm long, 1.2–2 cm wide, green; lateral veins clearly visible, at 15°–30°; petiole 10–17 mm long. Peduncle 8–16 mm long; pedicels 10–17 mm long. Buds ovoid, rostrate to fusiform, ribbed; operculum 5–8 mm long, 4–7 mm wide; hypanthium 5–8 mm long and wide. Fruits hemispherical, sometimes campanulate, 12–15 mm long, 11–14 mm wide. Fig. 109A–B.

Occurs in 2 main populations, near Port Lincoln and Cleve, Eyre Peninsula, S.A., in lateritic and quartzitic soil, often over limestone. Region: EYRE. Map 548.

S.A.: Wanilla Forest Reserve, *C.D. Boomsma* 273 (AD, FRI); Marble Ra., *E.N.S. Jackson* 3740 (AD, FRI).

Distinguished from other subspecies by the petiolate juvenile leaves, ribbed buds and hemispherical or campanulate fruits with a broad disc extending over the valves.

512. *Eucalyptus sideroxylon* Cunn. ex Woolls, *Proc. Linn. Soc. New South Wales* 11: 859 (1887)

T: Lachlan R., N.S.W., 3 June 1817, *A. Cunningham* 205; holo: K; iso: BM.

Tree to 35 m. Bark hard, black, deeply furrowed throughout or on trunk and larger branches, smooth, white on upper branches. Juvenile leaves alternate, petiolate, linear to lanceolate or ovate, green or grey-green, slightly discolorous. Adult leaves lanceolate to narrowly lanceolate, acuminate or uncinata; lamina green, grey-green or blue-green; lateral veins just visible, at 25°–40°; intramarginal vein up to 2 mm from margin; petiole terete, 10–20 mm long. Peduncle quadrangular to terete; pedicels quadrangular. Buds ovoid, rostrate; operculum conical or rostrate; hypanthium ovoid to hemispherical. Fruits hemispherical, ovoid, subglobular or urceolate; valves 5 or 6, included. Fig. 3.

Occurs from south-eastern Qld through N.S.W. to Vic. Stamens white, cream, pink or red. Differs from *E. melliodora* and *E. leucoxylon* in the ironbark and from other ironbarks in the simple conflorescence. There are 2 subspecies.

H.W.Bramwells & T.Whiffin, Patterns of variation in *Eucalyptus sideroxylon* A.Cunn. ex Woolls. I Variation in adult morphology, *Austral. J. Bot.* 32: 263–281 (1984).

Umbels 7-flowered

512a. subsp. *sideroxylon*

Umbels 3-flowered

512b. subsp. *tricarpa*

512a. *Eucalyptus sideroxylon* Cunn. ex Woolls subsp. ***sideroxylon***

E. leucoxylon var. *pallens* Benth., *Fl. Austral.* 3: 210 (1867) p.p. T: New England, N.S.W., *C.Stuart s.n.*; holo: MEL, n.v. at K.

E. leucoxylon var. *minor* Benth., loc. cit.; *E. sideroxylon* var. *minor* (Benth.) Maiden, *Crit. Revis. Eucalyptus* 2: 54 (1910). T: Parramatta, N.S.W., *W.Woolls s.n.*; lecto: K, *fide* L.A.S.Johnson, *Contr. New South Wales Natl Herb.* 3: 122 (1962).

Illustrations: N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 3: 472 (1976); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 271 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 543 (1984).

Juvenile leaves lanceolate to linear. Adult leaves: lamina 7–14 cm long, 1.2–1.8 cm wide. Umbels 7-flowered; peduncle 7–20 mm long; pedicels 2–15 mm long. Operculum 3–5 mm long, 4–5 mm wide; hypanthium 4–6 mm long, 4–5 mm wide. Fruits ovoid, subglobular or urceolate, 5–11 mm long, 6–10 mm wide; valves 5. *Red Ironbark, Mugga*. Fig. 109C–D.

Occurs widely in south-eastern Qld and eastern N.S.W. and in northern Vic. Grows in shallow sand, gravel and clay mainly on hills or sloping country in woodland. Regions: MCPH, NEPN, DARL, RIVR, HOWE. Map 549.

Qld: Green Hill, *N.Michael* 2381 (BRI); Ballandean Stn, *L.S.Smith* 728 (BRI). N.S.W.: Peak Hill, 15 Jan. 1900, *R.H.Cabbage* (NSW); Bevendale, *R.T.Eakin* 21 & *G.P.Smith* (AD, BRI, CANB, FRI, K, MEL, NSW, NT, PERTH). Vic.: Panton Hills, 13 Feb. 1915, *P.R.H.St John* (MEL).

Distinguished by the black ironbark, simple conflorescence, 7-flowered umbels and ovoid, subglobular or urceolate fruits. The wood is hard, strong, extremely durable and has been used for heavy construction and railway sleepers. It has been cultivated as a street tree particularly in inland towns. The trees flower profusely and abundant honey may be produced.

512b. *Eucalyptus sideroxylon* subsp. ***tricarpa*** L.Johnson, *Contr. New South Wales Natl Herb.* 3: 122 (1962)

T: Tilba Tilba to Wallaga Lake, N.S.W., 20 Nov. 1950, *L.A.S.Johnson* NSW 54090; holo: NSW.

Illustrations: S.Kelly *et al.*, *Eucalypts* 2: t. 231 (1983); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 2: 272 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 543 figs 4, 5, 9, 14 (1984).

Juvenile leaves lanceolate to ovate. Adult leaves: lamina 9.5–22 cm long, 1–2 cm wide, green. Umbels 3-flowered; peduncle 5–18 mm long; pedicels 7–18 mm long. Operculum 2–5

mm long, 4–6 mm wide; hypanthium 4–5 mm long, 4–6 mm wide. Fruits ovoid, hemispherical or subglobular, 9–14 mm long and wide; valves 5 or 6. Fig. 109E–F.

Occurs from the far south coast of N.S.W. to south-eastern and central Vic., in gravelly and rocky soil on low hills and plateaus in open forest. Regions: OTWY, HOWE. Map 550.

N.S.W.: 23.8 km from Araluen towards Moruya, *M.I.H.Brooker 4943* (AD, BRI, FRI, MEL, NSW). Vic.: 8 km SW of Bendigo, 16 June 1963, *W.Bateman* (FRI, MEL).

Differs from subsp. *sideroxylon* in the 3-flowered umbels and from *E. leucoxylon* in the ironbark.

Ser. 92 *Alveolatae*

Eucalyptus ser. **Alveolatae** Maiden, *Crit. Revis. Eucalyptus* 7: 151 (1925)

Type: *E. microcorys* F.Muell.

E. ser. *Steatoxylon* Blakely, *Key Eucalypts* 42, 176 (1934). T: *E. microcorys* F.Muell.

Trees. Bark rough, softly fibrous throughout, brown to red-brown. Juvenile leaves alternate, petiolate, ovate, often crenulate, green, discolorous. Adult leaves alternate, petiolate, lanceolate, usually crenulate, acuminate, thin, green, discolorous. Conflorescences axillary, 7–9-flowered umbels. Buds clavate. Fruits obconical; disc moderately broad, steeply descending; valves 3 or 4, included to slightly exerted. Seeds elliptic, ±flat, finely reticulate to almost smooth, yellow-brown.

A series of 1 species in south-eastern Qld and north-eastern N.S.W., characterised by soft fibrous bark, discolorous leaves and simple 7–9-flowered umbels.

513. *Eucalyptus microcorys* F.Muell., *Fragm.* 2: 50 (1860)

T: Brisbane R., Qld, July 1855, *F.Mueller*; syn: K, MEL; Hastings R., N.S.W., *H.Beckler s.n.*; syn: K, MEL (several); Macleay R., N.S.W., *H.Beckler s.n.*; syn: *n.v.*

Illustrations: N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 3: 454 (1976); M.I.H.Brooker & D.A.Kleinig, *Field Guide to Eucalypts* 1: 273 (1983); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 549 (1984).

Tree to 60 m. Adult leaves: lamina 8–13 cm long, 1.5–2.5 cm wide; lateral veins just visible to clearly visible, at 45°–60°; intramarginal vein up to 1 mm from margin; petiole terete to channelled, 8–15 mm long. Peduncle flattened, 6–18 mm long; pedicels 2–7 mm long. Operculum hemispherical, often with crossed sutures, 1–2 mm long, 2–3 mm wide; hypanthium clavate, 3–5 mm long, 2–3 mm wide. Fruits 4–10 mm long, 3–6 mm wide. *Tallow-wood*. Fig. 109G–H.

Occurs in south-eastern Qld including Fraser Is., and north-eastern N.S.W., mostly in fertile soils on slopes, ridges and in valleys, mainly in tall open forest. Regions: MCPH, NEPN. Map 551.

Qld: Mt Coot-tha, *M.I.H.Brooker 3328* (BRI, DNA, FRI); Taylor Ra., near Brisbane, *C.E.Hubbard 3731* (BRI). N.S.W.: Ellenborough Falls, Oct. 1902, *J.H.Maiden* (NSW); 25 km N of Taree, *G.P.Smith 4* (BRI, FRI).

Distinct in softly fibrous bark throughout, thin discolorous usually crenulate leaves, clavate buds with the operculum marked with crossed sutures, and obconical fruits. The wood is very hard, strong and durable, and is used for heavy constructions, railway sleepers, flooring and decking. The trees provide useful pollen but little nectar, and small amounts of honey may be produced.

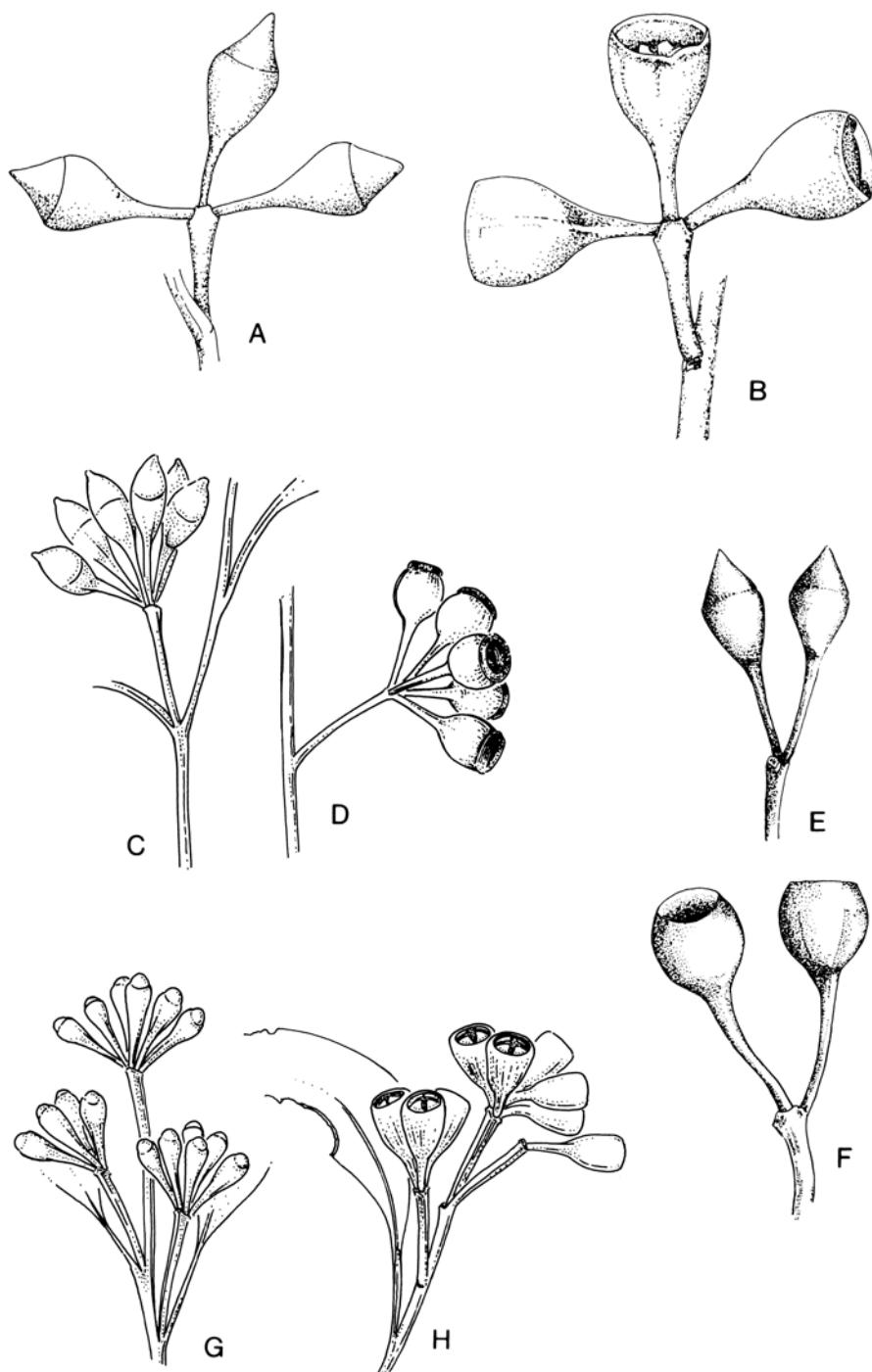


Figure 109. *Eucalyptus* buds and fruits, all $\times 1$. **A–B**, *E. leucoxydon* subsp. *petiolaris* (**A**, D.Kleinig 40, FRI; **B**, D.Boland 1522, FRI). **C–D**, *E. sideroxylon* subsp. *sideroxylon* (**C**, I.Brooker 6191, FRI; **D**, D.Walker 1325, FRI). **E–F**, *E. sideroxylon* subsp. *tricarpa* (**E**, Wagonga near Narooma, N.S.W., J.Allan, NSW 54089, NSW; **F**, Merimbula, N.S.W., P.Murphy, NSW 54092, NSW). **G–H**, *E. microcorys* (**G**, I.Brooker 6601, FRI; **H**, I.Brooker 6094, FRI). **A**, **B**, **E**, **F** drawn by M.May. Others drawn by M.Risby.

PRESUMED HYBRIDS

The following names published in *Eucalyptus* are believed to be hybrids. In most cases the putative parent species are given, with relevant references.

Eucalyptus adjuncta Maiden, *J. Proc. Roy. Soc. New South Wales* 54: 167 (1920).

T: about $\frac{3}{4}$ of a mile [c. 1 km] from Wyee railway station, near Morrisset, N.S.W., *collector unknown* [J.H.Maiden?]; *n.v.*

Reputed hybrid with *E. longifolia* as one parent, *fide* L.D.Pryor & L.A.S.Johnson, *Classif. Eucalypts* 57 (1971).

Eucalyptus aequans Blakely, *J. Proc. Roy. Soc. New South Wales* 61: 154 (1927).

T: Kings Tableland, Wentworth Falls, N.S.W., *D.W.C.Shiress & W.F.Blakely*; *n.v.*

Reputed hybrid between *E. ligustrina* and *E. moorei*, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus affinis Deane & Maiden, *Proc. Linn. Soc. New South Wales* 25: 104, t. v (1900).

T: western N.S.W., *collector unknown*; *n.v.*

Reputed hybrid between *E. albens* and *E. sideroxylon*, *fide* J.H.Maiden, *Proc. Linn. Soc. New South Wales* 30: 498 (1906).

Eucalyptus algeriensis Trabut, *Revue Hort. Alger.* 8: 146 (1904).

T: cultivated; *n.v.*

Reputed hybrid between *E. camaldulensis* and *E. rudis*, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus anomala Blakely, *J. Proc. Roy. Soc. New South Wales* 62: 209, t. XVIII (1928).

T: Bywater, near Brooklyn, Hawkesbury R., N.S.W.; on the southern side of Sugarloaf, about 5 miles [c. 8 km] N of Brooklyn, N.S.W.; about 1 mile [c. 1.5 km] E of Cowan railway station, N.S.W., *D.W.C.Shiress and W.F.Blakely*; all *n.v.*

Reputed hybrid between *E. racemosa* and *E. umbra*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 58.

Eucalyptus apodophylla var. *brachyphylla* Blakely & Jacobs in Blakely, *Key Eucalypts* 166 (1934).

T: Wandí, N.T., *H.I.Jensen* 375; *n.v.*

Reputed hybrid between *E. alba* and *E. apodophylla*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 58.

Eucalyptus auburnensis Maiden, *Crit. Revis. Eucalyptus* 6: 116 (1922).

T: Auburn Vale Station, near Inverell, N.S.W., 28 Oct. 1907, *Gordon Burrow*; *n.v.*

Reputed hybrid between *E. melliodora* and *E. melanophloia*, *fide* J.H.Maiden, *loc. cit.*

Eucalyptus barmedmanensis Maiden, *Crit. Revis. Eucalyptus* 6: 108 (1922).

T: Barmedman, N.S.W., 16 Sept. 1900, *R.H.Cambage*; *n.v.*

Reputed hybrid between *E. sideroxylon* subsp. *sideroxylon* and *E. woollsiana*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 59.

Eucalyptus beasleyi Blakely, *Key Eucalypts* 234 (1934).

T: on R.C.Beasley's property, about 4 miles [c. 6 km] N of Chinchilla, Qld, and on Branch Ck, Burncluith, about 12 miles [c. 19 km] N of Chinchilla, Qld, 10 July 1928 and 27 Mar. 1933, *R.C.Beasley* 20; *n.v.*

Reputed hybrid between *E. melanophloia* and *E. populnea*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 59.

Eucalyptus bennettiae D.Carr & S.Carr, *Austral. J. Bot.* 28: 541, fig. 34 (1980).

T: NW slope of Mt Desmond, 33°37'S, 127°07'E, W.A., 15 Aug. 1979, *D.J. & S.G.M.Carr* 2304f; *holo*: PERTH.

Reputed hybrid between *E. lehmannii* and *E. aff. occidentalis* (mallee form), M.I.H.Brooker, *pers. comm.*

Eucalyptus biangularis Simmonds in J.H.Maiden, *Crit. Revis. Eucalyptus* 7: 382 (1927).

T: cultivated at Invercargill, New Zealand, *J.H.Simmonds* 561; *n.v.*

Reputed hybrid between *E. urnigera* and *E. globulus*, *fide* J.H.Simmonds, *loc. cit.*

Eucalyptus bipileata Blakely, *Key Eucalypts* 253 (1934).

T: Gulgong, N.S.W., W.A.Wyndham; *n.v.*

Reputed hybrid between *E. crebra* and *E. melanophloia*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 60.

Eucalyptus blackburniana Maiden, *Crit. Revis. Eucalyptus* 6: 120 (1922).

T: Inglewood, Vic., *J. Blackburne* 14; *n.v.*

Reputed hybrid between *E. odorata* and *E. sideroxylon*, *fide* J.H.Maiden, *loc. cit.*, or between *E. viridis* and *E. sideroxylon*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 60, but with *E. sideroxylon* subsp. *tricarpa*, not subsp. *sideroxylon*.

Eucalyptus boormanii Deane & Maiden, *Proc. Linn. Soc. New South Wales* 26: 339, 341 (1901).

T: N.S.W., *collector unknown*; *n.v.*

Reputed hybrid between *E. fibrosa* subsp. *fibrosa* and *E. moluccana*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 60.

Eucalyptus botryoides var. *lynei* Blakely, *Key Eucalypts* 97 (1934).

T: Craven State Forest, between Craven & Gosford, N.S.W., *collector unknown*; *n.v.*

Reputed hybrid between *E. botryoides* and *E. robusta*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 61.

Eucalyptus bourlieri Trabut, *Revue Hort. Algér.* 5: 240 (1901).

T: not cited.

Reputed hybrid from *E. globulus*, *fide* L.C.Trabut, *loc. cit.*; L.D.Pryor & L.A.S.Johnson, *op. cit.* 61.

Eucalyptus brevirostris Blakely, *Key Eucalypts* 183 (1934).

T: Upper Yarra, Vic., Oct 1889, *C.Walter*; *n.v.*

Reputed hybrid between *E. macrorhyncha* subsp. *macrorhyncha* and *E. muelleriana*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 61.

Eucalyptus bucknellii Cambage, *Proc. Linn. Soc. New South Wales* 51: 325, t. XXII (1926).

T: about 20 miles [32km] N of Mungindi, N.S.W., *collector unknown*; *n.v.*

Reputed hybrid between *E. microtheca* and *E. populnea*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 62.

Eucalyptus calcicultrix var. *obscura* Blakely, *Key Eucalypts* 224 (1934).

T: Bundaleer Forest, S.A., Mar. 1897, *J.H.Maiden*; *n.v.*

Reputed hybrid between *E. albens* and *E. porosa* or *E. albens* and *E. odorata*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 62.

Eucalyptus californica Kinney, *Eucalyptus* 191 & fig. (1895).

T: not cited.

Reputed hybrid.

Eucalyptus callanii Blakely, *J. & Proc. Roy. Soc. New South Wales* 61: 160 (1927).

T: near the junction of the old Mittagong and Joadja roads, Bowral–Wombeyan Caves road, N.S.W., Apr. 1923, *W.H.Blakely & D.W.C.Shiress*; *n.v.*

Reputed hybrid between *E. globoidea* and *E. pauciflora* subsp. *pauciflora*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 62.

Eucalyptus calophylla var. *hawkeyi* Blakely, *Key Eucalypts* 85 (1934).

T: not cited.

Reputed hybrid between *E. calophylla* and *E. ficifolia*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 62.

Eucalyptus calophylla var. *rosea* Guilfoyle, *Austral. Pl.* 161 (1911).

T: W.A., *collector unknown*; *n.v.*

Probable hybrid.

Eucalyptus calophylla var. *rubra* Guilfoyle, *Austral. Pl.* 161 (1911).

T: W.A., *collector unknown*; *n.v.*

Probable hybrid.

Eucalyptus campanifructa Blakely, *Key Eucalypts* 228 (1934).

T: half a mile [c. 1 km] from Girilambone railway station, N.S.W., Aug. 1910, *J.H.Maiden & J.L.Boorman*; *n.v.*

Probable hybrid, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 63.

Eucalyptus carnabyi Blakely & Steedman ex Blakely, *Austral. Naturalist* 10: 259 (1941).

T: near Moora, W.A., Mar. 1937 & Apr. 1939, *I.Carnaby & H.Steedman*; *n.v.*

Reputed hybrid between *E. drummondii* and *E. macrocarpa*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 63.

Eucalyptus chisholmii Maiden & Blakely in *J.H.Maiden, Crit. Revis. Eucalyptus* 7: 61 (1924).

T: Marrangaroo, 102 miles [c. 160 km] W of Sydney, N.S.W., May 1922, *E.C.Chisholm* 265; *n.v.*

Reputed hybrid between *E. piperita* and *E. rossii*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 64.

Eucalyptus chrysantha Blakely & Steedman in *W.F.Blakely, E.N.McKie & H.Steedman, Proc. Linn. Soc. New South Wales* 63: 66 (1938)

E. sepulcralis var. *robusta* C.Gardner, J. & Proc. Roy. Soc. Western Australia 19: 89 (1933). T: Mount Bland, W.A., Nov. 1932, H.Steedman; holo: PERTH; iso: NSW.

Reputed hybrid between *E. preissiana* and *E. sepulcralis*, fide L.D.Pryor & L.A.S.Johnson, loc. cit. Several modern collections at PERTH from the Fitzgerald River Natl Park.

Eucalyptus congener Maiden & Blakely in J.H.Maiden, Crit. Revis. *Eucalyptus* 8: 36 (1929).

T: in the vicinity of Wingello township, N.S.W., J.L.Boorman & Murphy; n.v.

Reputed hybrid between *E. piperita* subsp. *urceolaris* and *E. sclerophylla*, fide L.D.Pryor & L.A.S.Johnson, op. cit. 65.

Eucalyptus cordieri Trabut, Bull. Stat. Rech. For. Nord Afr. 1: 149 (1917).

T: Trabut, loc. cit. fig. 4; lecto: fide L.A.S.Johnson, Contr. New South Wales Natl Herb. 3: 112 (1962).

Reputed hybrid between *E. globulus* and *E. goniantha*, fide L.A.S.Johnson, loc. cit.

Eucalyptus crawfordii Maiden & Blakely in J.H.Maiden, Crit. Revis. *Eucalyptus* 8: 54 (1929).

T: Moona Plains, Walcha, N.S.W., Jan. 1897, 1898, Dec. 1904, A.L.Crawford; n.v.

Reputed hybrid between *E. acaciiformis* and *E. saligna*, fide L.D.Pryor & L.A.S.Johnson, op. cit. 66.

Eucalyptus cultrifolia Naudin, Descr. Emploi *Eucalyptus* introd. Europe 64 (1891).

T: cultivated in Europe; n.v.

Probable hybrid.

Eucalyptus currabubula Blakely, Key *Eucalypts* 229 (1934).

T: Mount Terrible, near Currabubula, N.S.W., collector unknown; n.v.

Reputed hybrid between *E. albens* and *E. viridis*, fide L.D. Pryor & L.A.S.Johnson, op. cit. 66.

Eucalyptus dixonii F.Wakef. in J.H.Maiden, Crit. Rev. *Eucalyptus* 8: 20 (1929).

T: 3.5 miles [c. 5.5 km] E of Yambulla Mtn, N.S.W., June 1920, F.W.Wakefield; n.v.

Probable hybrid between *E. dives* and *E. radiata* subsp. *radiata*, fide L.D.Pryor & L.A.S.Johnson, op. cit. 68.

Eucalyptus dorisiana Blakely, Key *Eucalypts* 227 (1934).

T: Cobar, N.S.W., July 1903, J.L.Boorman; n.v.

Reputed hybrid between *E. intertexta* and *E. viridis*, fide L.D.Pryor & L.A.S.Johnson, op. cit. 68.

Eucalyptus ednaeana Blakely, Key *Eucalypts* 247 (1934).

T: Beelbangera Rd, Griffith Ra., Griffith, N.S.W., July 1928, D.W.C.Shireess & W.F.Blakely; n.v.

Reputed hybrid between *E. intertexta* and *E. sideroxylon*, fide L.D.Pryor & L.A.S.Johnson, op. cit. 68.

Eucalyptus erythrandra Blakely & Steedman in W.F.Blakely, E.N.McKie & H. Steedman, Proc. Linn. Soc. New South Wales 63: 65 (1938).

E. angulosa var. *robusta* C. Gardner, J. & Proc. Roy. Soc. Western Australia 19: 88 (1933). T: Kundip, near Ravensthorpe, W.A., Oct. 1930, H.Steedman; holo: PERTH; iso NSW.

Reputed hybrid between *E. incrassata* and *E. tetraptera*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 69.

Eucalyptus ficifolia var. *alba* Guilfoyle, *Austral. Pl.* 165 (1911).

T: W.A., collector unknown; *n.v.*

Probable hybrid.

Eucalyptus ficifolia var. *alba* Blakely, *Key Eucalypts* 86 (1934). *nom. illeg.* non Guilfoyle (1911).

T: not cited.

Reputed hybrid between *E. calophylla* and *E. ficifolia*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 70.

Eucalyptus ficifolia var. *carmina* Blakely, *Key Eucalypts* 85 (1934).

T: not cited.

Probable hybrid.

Eucalyptus ficifolia var. *guilfoylei* Bailey, *Proc. Roy. Soc. Queensland* 10: 18 (1894).

T: cultivated Melbourne Botanic Gardens ex W.R.Guilfoyle; *n.v.*

Reputed hybrid between *E. calophylla* and *E. ficifolia*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 70.

Eucalyptus ficifolia var. *rosea* Guilfoyle, *Austral. Pl.* 165 (1911).

T: W.A., collector unknown; *n.v.*

Probable hybrid.

Eucalyptus forthiana Blakely, *Contr. New South Wales Natl Herb.* 1: 37 (1939).

T: Lower Monkerai, N.S.W., 22 Mar. 1938, P.Forth & W.F.Blakely; *n.v.*

Reputed hybrid between *E. moluccana* and *E. siderophloia*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 70.

Eucalyptus gillii var. *petiolaris* Maiden, *J. & Proc. Roy. Soc. New South Wales* 53: 69 (1919).

T: Wirrabarra, S.A., W.Gill; *n.v.*

Reputed hybrid between *E. gillii* and *E. socialis*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 71.

Eucalyptus globoidea var. *largifructa* Blakely, *Key Eucalypts* 189 (1934).

T: Ingleburn, N.S.W., collector unknown; *n.v.*

Possible hybrid with *E. globoidea* as one parent, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 71.

Eucalyptus globulus var. *compacta* Maiden, *Crit. Revis. Eucalyptus* 8: 23 (1929).

T: Golden Gate Park, San Francisco, U.S.A., July 1921, A.Eastwood; *n.v.*

Reputed hybrid with *E. globulus* as one parent, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 71.

Eucalyptus gomphocornuta Trabut, *Revue Hort.* 2nd ser. 3: 326, fig. 128 (1903).

T: not cited.

Said to be a hybrid cultivated in Algeria, *fide* W.F.Blakely, *Key Eucalypts* 109 (1934); reputed parents *E. gomphocephala* and *E. cornuta*.

Eucalyptus grandis var. *grandiflora* Maiden, *J. & Proc. Roy. Soc. New South Wales* 52: 502 (1919).

T: Carinda, near Woolgoolga, N.S.W., Sept. 1905, *E.H.F.Swain*; *n.v.*

Reputed hybrid between *E. grandis* and *E. robusta*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 72.

Eucalyptus hybrida Maiden, *J. & Proc. Roy. Soc. New South Wales* 47: 85 (1913).

T: Concord, N.S.W., 1890, *W.Woolls*; *n.v.*; same locality, 10 Feb. 1901, *R.H.Cambage*; *n.v.*

Reputed hybrid between *E. moluccana* and *E. paniculata*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 73.

Eucalyptus insizwaensis Maiden, *Crit. Revis. Eucalyptus* 6: 82 (1924).

T: Insizwa Plantation, Mount Ayliff district, Cape Province, South Africa, *collector unknown*; *n.v.*

Reputed cultivated hybrid between *E. globulus* and *E. robusta*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 73.

Eucalyptus joyceae Blakely, *J. & Proc. Roy. Soc. New South Wales* 62: 201, t. XVII (1928).

T: about 1 mile [1.6 km] S of Kariong trig., Wondabyne, N.S.W., *D.W.C.Shireess & W.F.Blakely*; *n.v.*

Reputed hybrid between *E. haemastoma* and *E. piperita* subsp. *piperita*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 74.

Eucalyptus jugalis Naudin, *Descr. & Emploi Eucalyptus introd. Europe* 37 (1891).

T: cultivated in France; *n.v.*

Reputed cultivated hybrid probably from *E. leucoxylon*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 74.

Eucalyptus kalangadoensis Maiden & Blakely, *J. & Proc. Roy. Soc. New South Wales* 59: 165 (1925).

T: near Kalangadoo, S.A., *J.B.Cleland & J.A.Rolland*; *n.v.*

Reputed hybrid between *E. ovata* and *E. viminalis*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 74.

Eucalyptus kalganensis Maiden, *Crit. Revis. Eucalyptus* 6: 349 (1922).

T: Kalgan Plains, W.A., Apr.–May 1917, *F.Stoward* 117; *n.v.*

Reputed hybrid between *E. marginata* and *E. preissiana*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 74.

Eucalyptus kirtoniana F.Muell., *Eucalyptographia* Decades 1: 9th. Plate, *in obs.* (1879); Decades 7: 9th. Plate, *in obs.* (1880).

E. resinifera var. *kirtoniana* (F.Muell.) Deane & Maiden, *Proc. Linn. Soc. New South Wales* 26: 128 (1901). T: Illawarra district, N.S.W., *collector unknown*; *n.v.*

Reputed hybrid between *E. robusta* and *E. tereticornis*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 74.

Eucalyptus laevopinea var. *turbinata* Blakely & McKie ex Blakely, *Key Eucalyptus* 183 (1934).

T: Puddledock, c. 12 miles [c. 19 km] SE of Guyra, N.S.W., 4 Dec. 1932, *E.N.McKie*; holo: NSW; iso: FRI.

Probable hybrid.

Eucalyptus laseronii R.Baker, *Proc. Linn. Soc. New South Wales* 37: 585 (1913).

T: Black Mountain district, N.S.W., July 1907, *Laseron*; n.v.

Reputed hybrid between *E. caliginosa* and *E. stellulata*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 75.

Eucalyptus laseronii var. *doleiformis* Blakely & McKie ex Blakely, *Key Eucalypts* 193 (1934).

T: Near Guyra, N.S.W., *E.N.McKie* & *W.F.Blakely*; n.v.

Reputed hybrid from *E. stellulata*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 75.

Eucalyptus laseronii var. *maxima* Blakely & McKie ex Blakely, *Key Eucalypts* 193 (1934).

T: Rosehill, Black Mountain Rd, 6.5 miles [c. 10.5 km] SW of Guyra, N.S.W., June 1930, *E.N.McKie* & *T.Youman*; n.v.

Reputed hybrid from *E. stellulata*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 75.

Eucalyptus leptocarpa Blakely, *Key Eucalypts* 230 (1934).

T: Ticketty Well, N.S.W., July, 1917, *A.Julius*; n.v.

Reputed hybrid between *E. crebra* and *E. viridis*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 76.

Eucalyptus leucoxylon var. *pluriflora* F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 127 (1856).

T: Gawler, S.A., *collector unknown*; n.v.

Probable hybrid.

Eucalyptus longifolia var. *multiflora* Maiden, *Crit. Revis. Eucalyptus* 6: 432 (1923).

T: Erina Ck, Gosford, N.S.W., *collector unknown*; n.v.

Reputed hybrid between *E. longifolia* and *E. robusta*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 77.

Eucalyptus longifolia var. *turbinata* Blakely & Beuzev. ex W.F.Blakely, *Key Eucalypts* 102 (1934).

T: Victoria Ck, between Tilba Tilba and Narooma, N.S.W., Oct. 1932, *W.A.W. de Beuzeville*; n.v.

Reputed hybrid between *E. longifolia* and *E. tereticornis*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 77.

Eucalyptus maideni var. *williamsoni* Blakely, *Key Eucalypts* 157 (1934).

T: W side of Mallacoota Inlet, Vic., Jan. 1927, *H.B.Williamson*; n.v.

Reputed hybrid between *E. botryoides* and *E. globulus* subsp. *pseudoglobulus*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 78.

Eucalyptus marsdenii C.Hall, *Proc. Linn. Soc. New South Wales* 39: 485 (1914).

T: Toongabbie, N.S.W., *collector unknown*; n.v.

Probable hybrid.

Eucalyptus mcclatchiei Kinney, *Eucalyptus* 188 (1895).

T: not cited.

Probable hybrid between *E. globulus* and *E. ovata*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 78.

Eucalyptus mcintyrensis Maiden, *Crit. Revis. Eucalyptus* 6: 166 (1922).

T: Mt McIntyre, S.A., Apr. 1921, W.C.Gill; *n.v.*

Reputed hybrid between *E. camaldulensis* and *E. ovata*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 78.

Eucalyptus media Link, *Enum. Hort. Berol.* 2: 30 (1822).

T: not cited.

Probable hybrid.

Eucalyptus melanophloia var. *senta* Blakely, *Key Eucalypts* 253 (1934).

T: Botanic Gardens, Sydney, N.S.W., *collector unknown*; *n.v.*

Reputed hybrid from *E. melanophloia*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 78.

Eucalyptus melliodora var. *murrurundi* Blakely, *Key Eucalypts* 261 (1934).

T: Murrurundi, N.S.W., *collector unknown*; *n.v.*

Reputed hybrid between *E. albens* and *E. melliodora*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 79.

Eucalyptus microtheca var. *cymbaliformis* Blakely & M.Jacobs ex W.F.Blakely, *Key Eucalypts* 245 (1934).

T: Newcastle Waters, N.T., Aug 1933, C.E.F.Allen & M.R.Jacobs 141; *n.v.*

Probable hybrid between *E. cyanoclada* and *E. microtheca*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 78.

Eucalyptus montana (Deane & Maiden) Blakely, *Key Eucalypts* 207 (1934).

E. haemastoma var. *montana* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 26: 125 (1901). T: Mt. Victoria, N.S.W., Feb. 1901, J.H.Maiden; *n.v.*

Reputed hybrid between *E. moorei* and *E. sclerophylla*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 80.

Eucalyptus moorei var. *arborea* Blakely, *Key Eucalypts* 207 (1934).

T: Blackheath, N.S.W., Sept. 1932, W.F.Blakely; *n.v.*

Reputed hybrid between *E. moorei* and *E. piperita*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 80.

Eucalyptus mortoniana Kinney, *Eucalyptus* 193 & fig. (1855).

T: not cited.

Reputed hybrid from *E. globulus*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 80.

Eucalyptus mucronata Link, *Enum. Pl. Berolinensis* 2: 30 (1822).

T: not cited.

Probable hybrid.

Eucalyptus mundijongensis Maiden, *J. & Proc. Roy. Soc. New South Wales* 47: 223 (1914).

T: Jarrahdale, W.A., 1909, *J.B.Cleland*; *n.v.*

Reputed hybrid between *E. gomphocephala* and *E. wandoo*, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus murphyi Maiden & Blakely in J.H.Maiden, *Crit. Revis. Eucalyptus* 7: 465 (1928).

T: Wongoni, near Merrygoen, N.S.W., Jan. 1919 and Nov. 1921, A. & P.Murphy; *n.v.*

Reputed hybrid between *E. conica* and *E. fibrosa* subsp. *nubila*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 80.

Eucalyptus nepeanensis R.Baker & H.G.Smith, *Res. Eucalypts* 2nd edn, 167 (1920).

T: Cabramatta, N.S.W., *collector unknown*; syn: *n.v.*; St Marys, N.S.W., *collector unknown*; syn: *n.v.*

Probable hybrid.

Eucalyptus nervosa Hoffsgg., *Verz. Pfl.* 1: 134, 215 (1824).

T: not cited.

Probable hybrid.

Eucalyptus nowraensis Maiden, *Crit. Revis. Eucalyptus* 7: 68 (1924).

T: 4 miles [c. 6 km] E of Nowra, N.S.W., *A.J.Gallagher*; *n.v.*

Reputed hybrid between *E. gummifera* and *E. maculata*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 81.

Eucalyptus obliqua var. *discocarpa* Blakely, *Key Eucalypts* 194 (1934).

T: top of range near Sealer's Cove, Vic., 1905, 1906, *A.W.Howitt & J.L.King*; *n.v.*

Reputed hybrid probably between *E. muelleriana* and *E. obliqua*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 81.

Eucalyptus obliqua var. *microstoma* Blakely, *Key Eucalypts* 194 (1934).

T: Kilmore, Vic., May 1917 & Nov. 1919, *J.D.Dyer* 988, 1129; *n.v.*

Reputed hybrid from *E. obliqua*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 81.

Eucalyptus obliqua var. *pilula* Blakely, *Key Eucalypts* 194 (1934).

T: Daylesford, Vic., Sept. 1906, *J.Blackburne*; *n.v.*; Mt Toolewong, Vic., *D.W.C.Shiress*; *n.v.*

Reputed hybrid with *E. obliqua* as one parent, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 81.

Eucalyptus odorata var. *macrocarpa* Blakely, *Key Eucalypts* 226 (1934).

T: Port Lincoln, S.A., May 1923, *J.B.Cleland*; *n.v.*

Probable hybrid between *E. leucoxylon* and *E. odorata*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 82.

Eucalyptus oviformis Maiden & Blakely in J.H.Maiden, *Crit. Revis. Eucalyptus* 8: 32 (1929).

T: Metung, Vic., Aug. 1909, *J.L.King*; *n.v.*

Reputed hybrid between *E. globulus* subsp. *pseudoglobulus* and *E. tereticornis*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 83.

Eucalyptus oxypoma Blakely, *Key Eucalypts* 244 (1934).

T: near the 37 mile post, Deniliquin—Barham road, N.S.W., Dec. 1922, *W.C.Wentworth*; *n.v.*

Reputed hybrid between *E. camaldulensis* and *E. largiflorens*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 83.

Eucalyptus pachypoda F.Muell., *Fragm.* 7: 41 (1869).

T: cultivated, Melbourne Bot. Gard. from W.A. seed, *F.Mueller*; *n.v.*

Probable hybrid.

Eucalyptus paradoxa Maiden & Blakely in J.H.Maiden, *Crit. Revis. Eucalyptus* 8: 30 (1929).

T: Metung, Vic., *J.L.King*; near Metung, Vic., *A.W.Howitt*; *n.v.*

Reputed hybrid between *E. globulus* subsp. *pseudoglobulus* and *E. tereticornis*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 84.

Eucalyptus patentinervis R.Baker, *Proc. Linn. Soc. New South Wales* 24: 602 (1900).

T: Ballina, N.S.W., *W.Bäuerlen*; *n.v.*; Bungwall, N.S.W., *A.Rudder*; *n.v.*

Reputed hybrid between *E. robusta* and *E. tereticornis*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 84.

Eucalyptus pauciflora var. *cylindrocarpa* Blakely, *Key Eucalypts* 205 (1934).

T: 4 miles [c. 6.5 km] along the Guyra–Armidale road near the Urandangie turnoff, N.S.W., Aug. 1933, *E.N.McKie*; *n.v.*

Probable hybrid, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 84.

Eucalyptus pauciflora var. *densiflora* Blakely & McKie in W.F.Blakely, E.N.McKie & H.Steedman, *Proc. Linn. Soc. New South Wales* 63: 66 (1938).

T: T.F.Grills' paddock, 17 miles [c. 27 km] E of Guyra, N.S.W., 23 Dec. 1934, *E.N.McKie*; *n.v.*

Probable hybrid, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 84.

Eucalyptus pauciflora var. *rusticata* Blakely & McKie ex Blakely, *Key Eucalypts* 205 (1934).

T: near Oban, N.S.W., Oct. 1929, E.N.McKie, *Youman* & *W.F.Blakely*; *n.v.*

Probable hybrid, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus peacockeana Maiden, *Crit. Revis. Eucalyptus* 6: 113 (1922).

T: H.R.Hughes' property, Elsmore Stn, Elsmore, N.S.W., *L.B.Peacocke*; *n.v.*

Reputed hybrid between *E. crebra* and *E. melliodora*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 85.

Eucalyptus penrithensis Maiden, *J. & Proc. Roy. Soc. New South Wales* 47: 227 (1914).

T: 2 miles [c. 3 km] E of Penrith, N.S.W., Jan. 1900, *J.L.Boorman*; *n.v.*

Reputed hybrid between *E. eugenioides* and *E. sclerophylla*, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus petrophila Blakely, *Key Eucalypts* 199 (1934).

T: half a mile [c. 1 km] on the Medlow road, Blackheath, N.S.W., Jan. 1905, *J.H.Maiden* & *R.H.Cabbage*; *n.v.*

Reputed hybrid between *E. blaxlandii* and *E. sclerophylla*, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus piperita var. *orophila* Blakely, *Key Eucalypts* 339 (1934).

T: Katoomba, N.S.W., Nov. 1932, *W.F.Blakely*; *n.v.*

Reputed hybrid between *E. oreades* and *E. piperita*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 86.

Eucalyptus plurilocularis F.Muell., *Fragm.* 2: 70, *in obs.* (1860).

T: not cited.

Probable hybrid.

Eucalyptus populnea var. *obconica* (Blakely) Cameron, *Victorian Naturalist* 63: 42 (1946).

E. populifolia var. *obconica* Blakely, *Key Eucalypts* 243 (1934). T: near Chinchilla, Qld, July 1933, R.C.Beasley; *n.v.*

Reputed hybrid, probably between *E. microtheca* and *E. populnea*, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus pseudo-piperita Maiden & Blakely in J.H.Maiden, *Crit. Revis. Eucalyptus* 8: 8 (1929).

T: Taronga Park, N.S.W., A.S.Lesouf & D.W.C.Shiress; *n.v.*

Reputed hybrid between *E. capitellata* and *E. piperita* subsp. *piperita*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 87.

Eucalyptus purpurascens Link, *Enum. Pl. Berolinensis* 2: 31 (1822).

T: not cited.

Probable hybrid.

Eucalyptus pygmaea Blakely, *J. & Proc. Roy. Soc. New South Wales* 61: 149 (1927).

T: a little S of the 17 mile post between Hornsby and Galston, about 24 miles [c. 39 km] N by rail from Sydney, N.S.W., collector unknown; *n.v.*

Reputed hybrid between *E. camfieldii* and *E. haemastoma*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 87.

Eucalyptus radiodives R.Black, *Victorian Naturalist* 60: 175 (1944).

T: on eastern slopes of Buttercup Ck, Booroolite, Mansfield, Vic., 12 Jan. 1941, R.A.Black 352.006-(1); *n.v.*

Reputed hybrid between *E. radiata* and *E. dives*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 88.

Eucalyptus rameliana Trabut, *Assoc. Franc. Avanc. Sci. Marseille* for 1891(2): 463 (1892), *nom. illeg.* non F.Muell.

T: cultivated in Europe; *n.v.*

Reputed hybrid between *E. botryoides* and *E. rostrata*, *fide* L.C.Trabut, *loc. cit.*

Eucalyptus rariflora Bailey, *Queensland Agric. J.* 2nd ser. 1: 62, t. 8–11 (1914).

T: Eidsvold and Mundubbera, Qld, T.L.Bancroft; *n.v.*

Reputed hybrid between *E. crebra* and *E. populnea*, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus reticulata Link, *Enum. Pl. Berolinensis* 2: 29 (1822).

T: not cited.

Probable hybrid.

Eucalyptus rigescens Blakely, *Key Eucalypts* 207 (1934).

T: Blackheath, N.S.W., *collector unknown*; *n.v.*

Reputed hybrid between *E. moorei* and *E. stricta*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 89.

Eucalyptus rigida Hoffsgg., *Verz. Pfl.* 2: 114 (1826).

T: Australia, *collector unknown*; *n.v.*

Probable hybrid.

Eucalyptus rigida var. *luehmanniana* F.Muell., *Eucalyptographia* Decades 4: 6th Plate, *in obs.* (1879).

T: not cited.

Probable hybrid.

Eucalyptus rivularis Blakely, *Key Eucalypts* 253 (1934).

T: Charleville, about 20 miles [32 km] N of Mungindi, towards Thallon, Qld, *R.C.Beasley*; *n.v.*; Namoi R., near Narrabri, N.S.W.; *n.v.*

Reputed hybrid between *E. melanophloia* and *E. microtheca*, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus robsonae Blakely & McKie in W.F.Blakely, *Key Eucalypts* 236 (1934).

T: 2 miles [c. 3 km] S of Nundle, on the Crawney road, N.S.W., Oct. 1931 & Feb. 1933, *E.N.McKie*, *J.Faulkner* & *Miss Robson*; *n.v.*

Reputed hybrid between *E. albens* and *E. melliodora*, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus rubricaulis Desf., *Cat. Hort. Paris*. 3rd edn, 248, 408 (1829).

T: cultivated in Paris; *n.v.*

Probable hybrid.

Eucalyptus salicifolia var. *hypericifolia* (Benth.) Blakely, *Key Eucalypts* 210 (1934).

E. amygdalina var. *hypericifolia* Benth., *Fl. Austral.* 3: 203 (1867). T: Risdon Cove, Tas., *R.Brown*; *n.v.*

Reputed hybrid between *E. amygdalina* and *E. risdonii*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 90.

Eucalyptus stellaris Blakely, *Key Eucalypts* 192 (1934).

T: Blackheath, N.S.W., Jan. 1905, *J.H.Maiden* & *R.H.Cabbage*; *n.v.*

Reputed hybrid between *E. blaxlandii* and *E. moorei*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 92.

Eucalyptus stopfordii Maiden, *Crit. Revis. Eucalyptus* 6: 114 (1922).

T: near Inverell, N.S.W., *A.E.Stopford*; *n.v.*

Reputed hybrid between *E. melliodora* and *E. sideroxylon*, *fide* J.H.Maiden, *loc. cit.*

Eucalyptus stricta var. *pyrifera* Blakely, *Key Eucalypts* 202 (1934).

T: near 'The Mount', Kings Tableland, Wentworth Falls, N.S.W., *collector unknown*; *n.v.*

Reputed hybrid between *E. sieberi* and *E. stricta*, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus stricta var. *rigida* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 22: 71 (1898).

T: Berrima, N.S.W., *collector unknown*; *n.v.*; Blackheath, N.S.W., *collector unknown*; *n.v.*

Possible hybrid.

Eucalyptus studleyensis Maiden, *Crit. Revis. Eucalyptus* 6: 121 (1922).

E. rostrata var. *studleyensis* (Maiden) Ewart, *Fl. Victoria* 822 (1931). T: Studley Park, Kew, Vic., *A.D.Hardy*; *n.v.*

Reputed hybrid between *E. camaldulensis* and *E. ovata*, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus subviridis Maiden & Blakely in J.H.Maiden, *Crit. Revis. Eucalyptus* 8: 16 (1929).

T: near the Pound Yard at Marulan, and along Jounama Ck, half a mile [c. 1 km] from Marulan, N.S.W., Dec. 1921, *A. & P.Murphy*; *n.v.*

Reputed hybrid between *E. blakelyi* and *E. cinerea*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 93.

Eucalyptus taeniola R.Baker & H.G.Smith, *Res. Eucalypts of Tasmania* 60, t. 3 (1912); *Pap. Proc. Roy. Soc. Tasmania* for 1912: 198, t. 3 (?1913).

T: St Marys Pass, Tas., *L.G.Irby*; *n.v.*

Reputed hybrid between *E. amygdalina* and *E. sieberi*, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus taylori Maiden, *Crit. Revis. Eucalyptus* 7: 63 (1924).

T: Spring Ridge State Forest, Gunnedah district, N.S.W., *T.W.Taylor*; *n.v.*

Reputed hybrid between *E. conica* and *E. crebra*, *fide* J.H.Maiden, *loc. cit.*; L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus tenandrensis Maiden, *Crit. Revis. Eucalyptus* 6: 112 (1922).

T: State Forest No. 166, Tenandra, N.S.W., *Withers*; *n.v.*

Reputed hybrid between *E. crebra* and *E. melliodora*, *fide* J.H.Maiden, *loc. cit.*; L.D.Pryor & L.A.S.Johnson, *op. cit.* 93.

Eucalyptus tephrophloia Blakely, *Key Eucalypts* 198 (1934).

T: Mount Victoria, N.S.W., May 1932, *E.N.McKie & W.F.Blakely*; *n.v.*

Reputed hybrid between *E. sclerophylla* and *E. stricta*, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus tereticornis var. *latifolia* Benth., *Fl. Austral.* 3: 242 (1867).

E. umbellata var. *latifolia* (Benth.) Blakely, *Key Eucalypts* 130 (1934). T: Shoalwater Passage, [Qld], *R.Brown*; *n.v.*

Reputed hybrid between *E. platyphylla* and *E. tereticornis*, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus tinghaensis Blakely & McKie, *Proc. Linn. Soc. New South Wales* 55: 591 (1930).

T: on G.W.Browning's property, 6 miles [c. 10 km] from Tingha, N.S.W., 1 Nov. 1929, *E.N.McKie, T.Youman & W.F.Blakely*; *n.v.*

Reputed hybrid between *E. caliginosa* and *E. mckieana*, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus trabutii Vilmorin, *Revue Hort.* ser. 2, 3: 325 (1903).

T: not cited.

Reputed hybrid of cultivation, between *E. botryoides* and *E. camaldulensis*, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus umbellata var. *media* Blakely, *Key Eucalypts* 130 (1934).

E. tereticornis var. *media* (Blakely) Cameron, *Victorian Naturalist* 63: 43 (1946). T: Lindenow, Briagalong, Swan Reach, Tambo R., Bairnsdale, Vic., *H.Hopkins*; *n.v.*

Reputed hybrid between *E. camaldulensis* and *E. tereticornis*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 94.

Eucalyptus unialata R.Baker & H.G.Smith, *Pap. and Proc. Roy. Soc. Tasmania* for 1912: 176, Pl. I (?1913).

E. viminalis var. *macrocarpa* Rodway, *Tasmanian Fl.* 57 (1903). T: not cited.

Reputed hybrid between *E. globulus* and *E. viminalis*, *fide* L.Rodway, *loc. cit.*

Eucalyptus virgata Sieber ex DC., *Prodr.* 3: 217 (1828).

T: Australia, *F.W.Sieber* 467; lecto: *n.v.*; isolecto: NSW; *fide* L.A.S.Johnson, *Contr. New South Wales Natl Herb.* 3: 126 (1962).

Reputed hybrid between *E. luehmanniana* and *E. obtusiflora*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 95.

Eucalyptus viridis var. *latiuscula* Blakely, *Key Eucalypts* 229 (1934).

T: Brush Ck, Inglewood, Qld, *collector unknown*; *n.v.*

Reputed hybrid between *E. microcarpa* and *E. viridis*, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus vitrea R.Baker, *Proc. Linn. Soc. New South Wales* 25: 303, t. xv (1900).

T: Crookwell, N.S.W., *J.J.Hook*; *n.v.*; Moss Vale, N.S.W., *S.Farrell*; *n.v.*; mountains N of Marulan, N.S.W., *R.H.Cabbage*; *n.v.*; Bungendore, N.S.W., *W.Bäuerlen*; *n.v.*

Reputed hybrid between *E. pauciflora* subsp. *pauciflora* and *E. radiata* subsp. *radiata*, *fide* L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus vittelina Naudin, *Descr. Emploi Eucalyptus introd. Europe* 65 (1891).

T: cultivated in Europe; *n.v.*

Probable hybrid.

Eucalyptus wardii Blakely, *Proc. Roy. Soc. New South Wales* 62: 212, t. 19 (1928).

T: near the old Wool-wash, Spring Gully Ck, Hornsby, N.S.W., June 1928, *R.Fogarty*, *E.Stanton* & *W.F.Blakely*; *n.v.*

Reputed hybrid between *E. oblonga* and *E. pilularis*, *fide* L.D.Pryor & L.A.S.Johnson, *op. cit.* 96.

Eucalyptus westoni Maiden & Blakely, *Proc. Roy. Soc. New South Wales* 59: 170 (1925).

T: near Gungahlin, Yass–Queanbeyan road, A.C.T., *C.Weston*; *n.v.*

Reputed hybrid between *E. goniocalyx* and *E. mannifera* subsp. *maculosa*, fide L.D.Pryor & L.A.S.Johnson, *loc. cit.*

Eucalyptus yagobiei Maiden, *Crit. Revis. Eucalyptus* 6: 118, Pl. 219 (1922).

T: Gwydir R., N.S.W., W.M.Brennan; *n.v.*

Reputed hybrid between *E. microtheca* and *E. albens*, fide J.H.Maiden, *loc. cit.*

DOUBTFUL NAMES

Application of the following names published in *Eucalyptus* is uncertain, in most cases because the protologue is inadequate and the type has not been seen. For many names, no type was cited.

Eucalyptus albicans F.Muell., *Fragm.* 7: 42 (1869).

T: not cited.

Maiden, *Crit. Revis. Eucalyptus* 1: 12 (1909) stated 'doubtful sp.'. Seedlings only described, from unknown source.

Eucalyptus amygdalina var. *alpina* Rodway ex Maiden, *Report Ninth Meeting Austral. Assoc. Advance. Sci.* 359 (1903).

T: Ironstone Mt, and on other high situations, Tas., collector unknown; *n.v.*

Identity doubtful.

Eucalyptus androsaemifolia Hoffsgg., *Verz. Pfl.* 2: 113 (1826).

T: cultivated in Europe; *n.v.*

Identity doubtful.

Eucalyptus australiana var. *latifolia* R.Baker & H.G.Smith, *Res. Eucalypts* 2nd edn, 174 (1920).

T: Officer, Vic., collector unknown; *n.v.*; Moruya, N.S.W., collector unknown; *n.v.*

Identity doubtful.

Eucalyptus beauchampiana Elwes & A.Henry, *Trees Great Britain & Ireland* 6: 1615 (1912).

T: cultivated in Britain from seeds obtained from N.S.W.; *n.v.*

Identity doubtful.

Eucalyptus coccifera var. *parviflora* Benth., *Fl. Austral.* 3: 204 (1867).

T: Mt Fatigue, Tas., R.C.Gunn; *n.v.*

Possibly a minor variant of *E. coccifera*, fide L.D.Pryor & L.A.S.Johnson, *Classif. Eucalypts* 64 (1971).

Eucalyptus coccifera var. *viridifolia* Summerh., *Bot. Mag.* 160: t. 9511 (1938).

T: cultivated in Britain; *n.v.*

Identity doubtful.

Eucalyptus colossea F.Muell., *Fragm.* 7: 42 (1869).

T: not cited.

Description very brief and not adequate to clarify the taxon.

Eucalyptus connata Dum.-Cours., *Bot. Cult.* 2nd edn, 7: 280 (1814).

T: not cited.

Identity doubtful.

Eucalyptus corymbosa var. *terminalis* F.Muell. ex Bailey, *Queensland Woods* 44 (1886).

T: Queensland, collector unknown; n.v.

Identity doubtful.

Eucalyptus cotinifolia Colla, *Herb. Pedemontanum* 2: 423 (1834).

T: not cited.

Identity doubtful.

Eucalyptus dealbata var. *populnea* Blakely, *Key Eucalypts* 339 (1934).

T: Inglewood, Qld, Oct. 1922, C.J.Smith; n.v.

Needs further investigation, *fide* L.D.Pryor & L.A.S.Johnson, *Classif. Eucalypts* 67 (1971).

Eucalyptus discolor Desf., *Cat. Hort. Paris.* 3rd edn, 284, 408 (1829).

T: cultivated in France; n.v.

Possibly *E. pilularis*.

Eucalyptus elongata Link, *Enum. Hort. Berol.* 2: 30 (1822).

T: not cited.

Identity doubtful.

Eucalyptus erythronema var. *roei* Maiden, *Crit. Revis. Eucalyptus* 1: 110 (1909).

T: between Swan R. and King George Sound, W.A., J.S.Roe; n.v.; between Norseman and Esperance, W.A., 2 Nov. 1901, L. Diels 5831; n.v.

Identity doubtful.

Eucalyptus eugenioides var. *nana* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 23: 799, t. xxxiii (1899).

T: Kings Tableland, Wentworth Falls, N.S.W., collector unknown; n.v.

Identity doubtful.

Eucalyptus flexilis Regel, *Gartenfl.* 7: 284 (1858).

T: not cited.

Identity doubtful.

Eucalyptus glauca Hoffsgg., *Verz. Pfl.* 1: 134, 215 (1824).

T: cultivated in Europe; n.v.

Description inadequate.

Eucalyptus glauca DC., *Prodr.* 3: 221 (1829), *nom. illeg.* non Hoffsgg. (1824).

E. pulverulenta Link, *Emum. Hort. Berol.* 2: 31 (1822), *nom. illeg.* non Sims (1819).

T: 'in Nova-Hollandia.'; n.v.

Probably *E. globulus* subsp. *globulus*, but doubtful.

Eucalyptus glaucophylla Hoffsgg., *Verz. Pfl.* 2: 114 (1826)

T: cultivated in Europe; *n.v.*

Probably *E. calophylla*, *fide* Blakely, *Key Eucalypts* 321 (1934), but doubtful according to J.H.Maiden.

Eucalyptus globulus var. *compacta* H.M.Hall in L.H.Bailey, *Standard Cycl. Hort.* 2nd edn, 2: 1154 (1914)

T: cultivated in California, U.S.A.; *n.v.*

‘Said to have originated near Niles, Calif., from seed of the ordinary blue-gum (Calif. Nursery Co.)’, *fide* H.M.Hall, *loc. cit.*

Eucalyptus gracilipes Naudin, *Descr. Emploi Eucalyptus introd. Europe* 37 (1891).

T: cultivated in Europe; *n.v.*

Possibly is *E. leucoxylon*, *fide* W.F.Blakely, *Key Eucalyptus* 321 (1834).

Eucalyptus gunnii var. *elata* J.D.Hook., *Bot. Mag.* 127: subt. 7808 (1901) *nom. illeg.*

T: not cited.

Identity doubtful.

Eucalyptus gunnii var. *undulata* Rehder in L.H.Bailey, *Cycl. Amer. Hort.* 2: 555 (1900).

T: not cited.

Identity doubtful.

Eucalyptus hemiphloia var. *parviflora* Benth., *Fl. Austral.* 3: 217 (1867).

T: Mt. Elliott, Qld., *E.Fitzalan*; *n.v.*

Identity doubtful.

Eucalyptus huberiana Naudin, *Descr. Emploi Eucalyptus introd. Europe* 42 (1891).

E. viminalis var. *huberiana* (Naudin) N.Burb., *Trans. & Proc. Roy. Soc. S. Australia* 71: 147 (1947). T: cultivated in Europe; *n.v.*

Possibly *E. viminalis*.

Eucalyptus hypericifolia Dum.-Cours., *Bot. Cult.* 2nd edn, 7: 279 (1814).

T: not cited.

Possibly *E. risdonii*, *fide* W.F.Blakely, *Key Eucalypts* 322 (1934).

Eucalyptus inophloea Brogli, *Beitr. Anat. Myrtaceen* 20 (1867).

T: not cited.

Identity doubtful.

Eucalyptus leucoxylon var. *purpurea* H.M.Hall in L.H.Bailey, *Stand Cycl. Hort.* 2nd edn, 2: 1159 (1914).

T: not cited.

Probably a minor variant of *E. leucoxylon*.

Eucalyptus leucoxylon var. *rostellata* F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 127 (1856).

T: near Tammida [Tanunda], S.A., *H.Behr*; iso: MEL.

Difficult to place, see D.J.Boland, *Austral. Forest Res.* 9: 69 (1979).

Eucalyptus leucoxylon var. *rubra* Guilfoyle, *Austral. Pl.* 165 (1911).

T: from Vic. collector unknown; *n.v.*

Probably a minor colour variant of *E. leucoxylon*.

Eucalyptus lindleyana DC., *Prodr.* 3: 219 (1828).

E. longifolia Lindley, *Bot. Reg.* 11: t. 947 (1826), *nom. illeg.* non Link (1822). T: cultivated in England; *n.v.*

Possibly *E. elata*.

Eucalyptus macrorrhyncha f. *grandiflora* Maiden, *Forest Fl. New South Wales* 121 (1907).

T: Mt Vincent, N.S.W., *R.T.Baker*; *n.v.*; Rylstone, N.S.W., *R.T.Baker*; *n.v.*

Identity doubtful.

Eucalyptus mazeliiana Naudin, *Descr. Emploi Eucalyptus introd. Europe* 41 (1891).

T: cultivated in Europe; *n.v.*

Identity doubtful.

Eucalyptus microphylla Willd., *Enum. Hort. Berol.* 515 (1809).

T: cultivated in Berlin; *n.v.*

Possibly not *Eucalyptus*, *fide* W.F.Blakely, *Key Eucalypts* 325 (1934).

Eucalyptus myrtifolia Link, *Enum. Pl. Berol.* 2: 30 (1822).

T: not cited.

Description inadequate.

Eucalyptus myrtiformis Naudin, *Descr. Emploi Eucalyptus introd. Europe* 50 (1891).

T: cultivated in Europe; *n.v.*

Possibly *E. cneorifolia*, *fide* J.H.Maiden, *Crit. Revis. Eucalyptus* 128 (1911).

Eucalyptus occidentalis var. *californica* Kinney, *Eucalyptus* 92, *in obs.* (1895).

T: cultivated in California; *n.v.*

Identity doubtful.

Eucalyptus odorata var. *floribunda* Benth., *Fl. Austral.* 3: 216 (1867).

T: Yarra R., Vic., *F.Mueller*; *n.v.*

Identity doubtful.

Eucalyptus paniculata var. *conferta* Benth., *Fl. Austral.* 3: 212 (1867).

T: south-western W.A., *J.Drummond*, *3rd Coll., suppl. no. 9*; *n.v.*

Identity doubtful.

Eucalyptus perfoliata Desf., *Cat. Hort. Paris.* 3rd edn, 284, 408 (1829).

T: cultivated in France; *n.v.*

Possibly *E. globulus*, *fide* W.F.Blakely, *Key Eucalypts* 328 (1934).

Eucalyptus piperita var. *brachycorys* Benth., *Fl. Austral.* 3: 208 (1867).

T: Twofold Bay, N.S.W., collector unknown; n.v.

Identity doubtful.

Eucalyptus piperita var. *pauciflora* Sieber ex DC., *Prodr.* 3: 219 (1828).

T: Australia, F.W.Sieber 470; n.v.

Possibly *E. obtusiflora*, fide W.F.Blakely, *Key Eucalypts* 329 (1934).

Eucalyptus preissiana var. *glauca* Regel, *Gartenfl.* 6: 148 (1857).

T: cultivated in Europe; n.v.

Identity doubtful.

Eucalyptus pulverulenta var. *ovatifolia* Dehnh., *Cat. Hort. Camaldulensis* 2nd edn, 6, 20 (1832).

T: cultivated in Europe; n.v.

Identity doubtful.

Eucalyptus pyriformis var. *minor* Maiden, *Crit. Revis. Eucalyptus* 2: 235 (1912).

T: interior of South Australia, collector unknown; syn: MEL n.v.; Glen of Palms, MacDonnell Ra., N.T., *E.Giles*; n.v.; western Queensland, collector unknown; syn: MEL n.v.; Burracoppin, W.A., *J.B.Cleland*; n.v.

The S.A. and N.T. collections may be *E. pachyphylla*, fide S.T.Blake, *Austral. J. Bot.* 1: 311 (1953); the W.A. collection may be *E. burracoppinensis*.

Eucalyptus pyrophora var. or f. *compacta* Domin, *Biblioth. Bot.* 89: 470 (1928), *nom. illeg.*

T: Georgina R., Qld, Sept. 1919, *E.W.Bick*; n.v.

Identity doubtful.

Eucalyptus racemosa var. *longiflora* Blakely, *Key Eucalypts* 249 (1934).

T: Eidsvold, Qld, Mar. 1912, *T.L.Bancroft*; n.v.

Possibly *E. crebra*, fide L.D.Pryor & L.A.S.Johnson, *Classif. Eucalypts* 88 (1971).

Eucalyptus redunca var. *angustifolia* W.Fitzg., *J. Proc. Mueller Bot. Soc.* 1: 40 (1903).

T: Stirling Ra., W.A., collector unknown; n.v.

Identity doubtful.

Eucalyptus rhodophloia (Benth.) Blakely, *Key Eucalypts* 115: (1934).

E. dumosa var. *rhodophloia* Benth., *Fl. Austral.* 3: 231 (1867). T: 'Phillips Bluff, near Eyre's Relief', W.A., *G.Maxwell*; n.v.

Type material is a mixture, fide L.D.Pryor & L.A.S.Johnson, *Classif. Eucalypts* 89 (1971).

Eucalyptus risdonii var. *hypericifolia* Rodway, *Pap. Proc. Roy. Soc. Tasmania* for 1910: 368 (?1911).

T: not cited.

Identity doubtful.

Eucalyptus robusta var. *rostrata* (Cav.) Pers., *Syn. Pl.* 2: 32 (1806).

E. rostrata Cav., *Icon. Pl.* 4: 23, t. 342 (1797). T: Port Jackson, N.S.W., collector unknown; n.v.

Probably *E. camaldulensis*, *fide* L.D.Pryor & L.A.S.Johnson, *Classif. Eucalypts* 89 (1971).

Eucalyptus rostrata var. *borealis* R.Baker & H.G.Smith, *Res. Eucalyptus* 75 (1902).

T: Nyngan, N.S.W., 12 Dec. 1899, *collector unknown*; *n.v.*; near Broken Hill, N.S.W., 19 July 1898, *collector unknown*; *n.v.*

Identity doubtful.

Eucalyptus scabra Dum.-Cours., *Bot. Cult.* 2nd edn 7: 280 (1814).

E. piperita var. *eugenioides* Benth., *Fl. Austral.* 3: 208 (1867). T: cultivated in Europe; *n.v.*

Identity doubtful.

Eucalyptus stenophylla Link, *Enum. Hort. Berol.* 2: 30 (1822).

T: not cited.

Description inadequate.

Eucalyptus stuartiana var. *parviflora* Deane & Maiden, *Proc. Linn. Soc. New South Wales* 25: 109 (1900).

T: 'near Hassan's Walls, at Young', N.S.W., *collector unknown*; *n.v.*

Possibly *E. angophoroides*.

Eucalyptus terminalis var. *carnosa* Bailey, *Queensland Agric. J.* 15: 898, *in obs.* (1905).

T: Darling Downs, Qld, *collector unknown*; *n.v.*; Rockhampton, Qld, *Edgar*; *n.v.*; 74 miles (c. 120 km) from Rockhampton, Qld, *Pagan*; *n.v.*

Description very brief; possibly *Eucalyptus polycarpa*, *fide* S.T.Blake, *Austral. J. Bot.* 1: 237 (1953).

Eucalyptus triantha Link, *Enum. Hort. Berol.* 2: 30 (1822).

T: not cited.

Identity doubtful.

Eucalyptus tuberculata Parm. ex DC., *Prodr.* 3: 221 (1828).

T: Australia, *collector unknown*; *n.v.*

Insufficiently described.

Eucalyptus umbellata Dum.-Cours., *Bot. Cult.* 2nd edn, 7: 279 (1814).

T: cultivated in Europe; *n.v.*

Identity doubtful.

Eucalyptus uncinata var. *pedicellata* Hochr., *Candollea* 2: 463 (1925).

T: Boorabbin, W.A., 14 Feb. 1905, *B.P.G.Hochreutiner* 2922; *n.v.*

Identity doubtful.

Eucalyptus undulata Colla, *Herb. Pedemont.* 2: 423 (1834).

T: not cited.

Identity doubtful.

Eucalyptus verrucosa Colla, *Herb. Pedemont.* 2: 422, *in obs.* (1834).

T: not cited.

Identity doubtful.

Eucalyptus viminalis var. *microcarpa* F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 125 (1856).

T: Fifteen Mile Ck, Vic., *O.W.Sonder herb.*; iso: MEL.

Possibly *E. rubida*, see J.H.Maiden, *Crit. Revis. Eucalyptus* 3: 12 (1914).

2. ANGOPHORA

G.M.Chippendale

Angophora Cav., *Icon.* 4: 21, t. 338 (1797); from the Greek *angos* (a goblet, vessel) and *phorus* (carrier), a reference to the fruit resembling a goblet.

Type: *A. cordifolia* Cav. = *A. hispida* (Smith) Blaxell

Trees, occasionally shrubs, often with several-celled uniseriate hairs and bristle-glands. Bark rough, or smooth in *A. costata*. Adult leaves opposite, discolorous. Conflorescences terminal, determinate or indeterminate, thyrsoid or thyriform; umbels 3–7-flowered, pedunculate. Flowers bisexual. Hypanthium extending beyond ovary. Sepals 4 or 5. Petals 4 or 5, orbicular, free, keeled, creamy white. Stamens numerous in several whorls, free, versatile; filaments creamy yellow, rarely pink, glabrous; connective terminated by a gland; anthers bilobed, opening by longitudinal slits. Ovary inferior, 3- or rarely 4-locular; style simple; ovules hemianatropous. Fruit a woody capsule enclosed by hypanthium, longitudinally ribbed, dehiscent by terminal valves; disc descending or level. Seed 1 per locule, broadly elliptic, dark brown; ovulodes numerous.

A genus of 7 species endemic in eastern mainland Australia. Closely related to *Eucalyptus*, especially series *Terminaliptera*, but distinguished by the petals and the bristle-like emergent oil glands that are interspersed with several-celled white hairs.

G.Bentham, *Angophora*, *Fl. Austral.* 3: 183–184 (1866); P.Y.Ladiges, A Comparative Study of Trichomes in *Angophora* Cav. and *Eucalyptus* L'Hérit. - a Question of Homology, *Austral. J. Bot.* 32: 561–574 (1984); G.Leach, A revision of the genus *Angophora* (Myrtaceae), *Telopea* 2: 749–779 (1986).

- | | | |
|----|--|--------------------------|
| 1 | Leaves usually cordate to auriculate at base; petiole absent or to 4 mm long | |
| 2 | Fruits 15–25 mm long | 6. <i>A. hispida</i> |
| 2: | Fruits 7–13 mm long | |
| 3 | Leaves less than 2 cm wide | 5. <i>A. melanoxylon</i> |
| 3: | Leaves 2–5 cm wide | 7. <i>A. subvelutina</i> |
| 1: | Leaves attenuate or cuneate at base; petiole 3–21 mm long | |
| 4 | Bark smooth, pink to pink-grey throughout | 1. <i>A. costata</i> |
| 4: | Bark rough, grey to brown throughout | |
| 5 | Pedicels 15–25 mm long; fruits blackish | 3. <i>A. woodsiana</i> |
| 5: | Pedicels 4–14 mm long; fruits brown to grey | |
| 6 | Petiole 3–9 mm long; leaves usually 0.5–2 cm wide | 2. <i>A. bakeri</i> |
| 6: | Petiole 8–12 mm long; leaves 1.5–3 cm wide | 4. <i>A. floribunda</i> |

N.S.W.: Howes Mtn, Putty Rd, 14 Aug. 1970, *C.Burgess* (CBG); 1.6 km N of Gibbs Long Swamp, *L.A.S.Johnson NSW 127674* (NSW).

Distinguished by the broad adult leaves and strongly ribbed fruits.

1c. *Angophora costata* subsp. *leiocarpa* L.Johnson ex G.Leach, *Telopea* 2: 760 (1986)

T: near high school, S of Warialda, N.S.W., 25 Aug. 1976, *G.Leach* 423; holo: LTB n.v., *fide* G.Leach, *loc. cit.*; iso: NSW.

Tree to 25 m. Adult leaves: lamina 6.5–16 cm long, 0.7–3 cm wide; lateral veins at 70°–80°; petiole slightly flattened or terete, 8–18 mm long. Peduncle 15–32 mm long; pedicels 4–18 mm long. Fruits thinly woody, 8–14 mm long, 7.5–11.5 mm wide, glabrous, not or inconspicuously ribbed. Fig. 110D–E.

Occurs widely in N.S.W. and Qld, in sandy soil on sandstone hills in open forest. Regions: THOM, DWSN, MCPH, WRGO. Map 554.

Qld: 80 km NW of Rolleston, *M.D.Crisp* 3067 (CBG, FRI); 51.5 km W of Theodore township, *M.Lazarides* 6927 (CANB). N.S.W.: Biniguy, Aug. 1940, *W.A.W. de Beuzeville* (FRI).

Distinguished by the glabrous relatively thin-walled fruits without noticeable ribs.

2. *Angophora bakeri* C.Hall, *J. & Proc. Roy. Soc. New South Wales* 47: 103, t. iv (1913)

T: around Sydney, N.S.W.; t. iv in C.Hall, *loc. cit.*; lecto, *fide* G.Leach, *Telopea* 2: 762 (1986).

Tree to 18 m. Bark fibrous, grey throughout. Adult leaves petiolate, entire, narrowly elliptic to narrowly ovate, cuneate at base, glabrous or sparsely pubescent on lower surface; lateral veins fine, at 50°–70°; petiole terete or slightly flattened. Umbels 3- or 7-flowered; peduncle and pedicels terete. Sepals 5, up to 1 mm long. Petals up to 3 mm long, 2–4 mm wide. Staminal gland brown, distinct. Fruits ovoid or cylindrical, glabrous or sparsely to moderately pubescent, smooth or roughened with tuberculate bristle-gland bases, prominently ribbed or with ribs just visible, pale brown or grey.

Occurs in the McPherson and Nepean Regions, N.S.W., from Lismore S to Sydney. There are 3 subspecies.

- 1 Leaves thick, stiff, coriaceous; pedicels usually more than 10 mm long; fruits 10–14 mm long

2c. subsp. *crassifolia*

- 1: Leaves thin, flexible; pedicels usually less than 10 mm long; fruits 7–11 mm long

- 2 Tree usually less than 11 m high; leaves usually less than 10 mm wide

2a. subsp. *bakeri*

- 2: Tree up to 18 m high; leaves usually more than 10 mm wide

2b. subsp. *paludosa*

2a. *Angophora bakeri* C.Hall subsp. *bakeri*

A. lanceolata var. *angustifolia* A.Gray, *U.S. Expl. Exped., Phan.* 1: 556 (1854). T: 'Newington', N.S.W., collector unknown; holo: GH n.v., *fide* G.Leach, *Telopea* 2: 762 (1986).

Illustrations: C.Hall, *J. & Proc. Roy Soc. New South Wales* 47: 103, t. iv (1913).

Tree to 10 m. Adult leaves narrowly elliptic, acute; lamina 5–9.5 cm long, 0.5–1 cm wide, thin, usually glabrous, dark green above; petiole 3–7 mm long. Peduncle 7–18 mm long, glabrous or sparsely pubescent; pedicels 4–10 mm long, glabrous or sparsely pubescent. Filaments to 5 mm long. Fruits reflexed, 8–11 mm long, 8–12 mm wide, glabrous or sparsely pubescent; ribs just visible; disc ascending or level, just below rim, obscured by over-arching rim. *Narrow-leaved Apple*.

Occurs in the Nepean Region, N.S.W., from N of Newcastle southwards to near Wollongong, with a disjunct population near Yalwal. Grows in sandstone soil including ridges in woodland and dry sclerophyll forest. Region: NEPN. Map 555.

N.S.W.: Glenorie, 16 Feb. 1963, *C.Burgess* (CBG); Yalwal, *M.Gray* 5241 (CANB); Yarramundi, 10 Apr. 1963, *M.E.Phillips* (CBG, FRI).

Distinguished by the small tree habit, leaves usually less than 10 mm wide and fruits 8–11 mm long with ribs just visible.

2b. *Angophora bakeri* subsp. *paludosa* G.Leach, *Telopea* 2: 764 (1986)

T: 10 km S of Woodburn, N.S.W., 19 Aug. 1975, *G.Leach* 195; holo: LTB n.v., *fide* G.Leach, *loc. cit.*; iso: NSW.

Tree to 18 m. Adult leaves narrowly elliptic, acuminate; lamina 6.5–10 cm long, 0.7–2 cm wide, thin, glabrous, dark green above; petiole 4–8 mm long. Peduncle 8–20 mm long, pubescent with short white hairs; pedicels 6–9 mm long, pubescent. Filaments 4–5 mm long. Fruits 7–10 mm long, 7–11 mm wide, sparsely pubescent; ribs prominent; disc level or descending, just below rim or well sunken. Fig. 110F.

Occurs between Lismore and Grafton, N.S.W., in sandy alluvial soil, often inundated. Region: MCPH. Map 556.

N.S.W.: Orara R., 16 km S of Ramornie, *W.F.Blakely & D.W.C.Shireess* NSW 143451 (NSW); Iluka turnoff, Pacific Hwy, *G.Leach* 144 (CANB, NSW).

Distinguished by the tall tree habit and leaves mostly over 10 mm wide.

2c. *Angophora bakeri* subsp. *crassifolia* G.Leach, *Telopea* 2: 766 (1986)

T: past St Ives towards Terrey Hills on the Mona Vale road, N.S.W., 21 May 1975, *G.Leach* 122; holo: LTB n.v., *fide* G.Leach, *loc. cit.*; iso: BRI, CANB, MEL, NSW.

Tree to 10 m, shrubby. Adult leaves narrowly elliptic to narrowly ovate, acute; lamina 7.5–11 cm long, 0.8–1.5 cm wide, coriaceous, glabrous, dull, dark olive-green or grey-green above; petiole 6–9 mm long. Peduncle 15–25 mm long, pubescent with short white hairs and bristle-glands; pedicels 10–14 mm long, pubescent. Filaments up to 8 mm long. Fruits 10–14 mm long, 9–12 mm wide, pubescent; ribs just visible; disc level, just below rim, obscured by over-arching rim. Fig. 110G–H.

Occurs in the Sydney area, N.S.W., in sandstone soil in open forest. Region: NEPN. Map 557.

N.S.W.: 1.6 km E of St Ives Showground, *M.I.H.Brooker* 3312 (BRI, FRI, K, MEL, NSW); 7.2 km E of Gordon, 29 Dec. 1965, *C.Burgess* (CBG, FRI).

Distinguished by the small stunted tree habit, thick, rigid, usually olive-green leaves and fruits 10–14 mm long.

3. *Angophora woodsiana* Bailey, *Proc. Linn. Soc. New South Wales* 6: 143 (1882)

A. intermedia var. *woodsiana* (Bailey) Bailey, *Queensland Fl.* 2: 605 (1900); *A. lanceolata* var. *woodsiana* (Bailey) Maiden, *Forest Fl. New South Wales* 2: 16 (1804); *A. floribunda* var. *woodsiana* (Bailey) Domin, *Biblioth. Bot.* 89: 459 (1928). T: Eight Mile Plain, Qld, *F.M.Bailey s.n.*; holo: BRI; iso: NSW.

Illustrations: C.N.Debenham, *Austral. Pl.* 1: 21 (1961).

Tree to 20 m. Bark fibrous, grey to grey-brown throughout. Adult leaves petiolate, lanceolate to narrowly ovate, often falcate, acute to acuminate, attenuate at base; lamina entire, 9–15 cm long, 1.7–3 cm wide, glabrous, green above; lateral veins faint, at 60°–80°; petiole slightly flattened or terete, 10–17 mm long. Umbels 3- or 7-flowered; peduncle terete to quadrangular, 15–35 mm long, glabrous or pubescent with hairs and bristle-glands; pedicels terete, 15–25 mm long, pubescent. Hypanthium 4–10 mm long, 5–10 mm wide, pubescent. Sepals 5, 3 mm long. Petals 3–4 mm long, c. 4 mm wide. Filaments to 7 mm long; gland brown, distinct. Fruits ovoid or cylindrical, 11–15 mm long, 10–15 mm wide, glabrous or slightly pubescent, rarely rough with bristle-gland bases, prominently ribbed, black to grey. *Smudgee*. Fig. 110 I.

Occurs from Tin Can Bay, Qld, S to Coffs Harbour, N.S.W.; grows in gravelly and sandy soil on sandstone hillsides in dry sclerophyll forest. Region: MCPH. Map 558.

Qld: N of Brisbane–Beerburum, Feb. 1913, *S.Jennings* (FRI); N of Helidon, *L.A.S.Johnson 7074A & B.G.Briggs* (FRI, NSW). N.S.W.: 16 km N of Ramornie, *W.F.Blakely & D.W.C.Shireess* NSW 143494 (NSW); 1.6 km NW OF Busbys Flat, *L.A.S.Johnson & E.F.Constable* NSW 143493 (NSW).

Distinguished from *A. costata* by the rough bark, wide leaves on long petiole and strongly ribbed larger fruits. Pedicels much longer and fruits larger than those of *A. floribunda*. The trees are a good source of pollen, but not high in nectar, and honey produced is not first grade.

4. *Angophora floribunda* (Smith) Sweet, *Hort. Brit.* 2nd edn, 209 (1830)

Metrosideros floribunda Smith, *Trans. Linn. Soc. London* 3: 267 (1797); *Acmena floribunda* (Smith) DC., *Prodr.* 3: 262 (1828). T: Port Jackson, N.S.W., 1795, *J.White*; holo: LINN n.v., *fide* G.Leach, *Telopea* 2: 769 (1986).

Angophora intermedia DC., *Prodr.* 3: 222 (1828). T: New Holland, 1816, *A.B.Lambert s.n.*; holo: G-DC n.v., *fide* G.Leach, *loc. cit.*

Angophora ochrophylla R.Baker, *Proc. Soc. Linn. New South Wales* 38: 601 (1914). T: Myall Ck, near Bingara, N.S.W., Apr. 1911, *C.F.Laseron* NSW 167269; lecto: NSW, *fide* G.Leach, *op. cit.* 777.

Illustrations: L.Costermans, *Native Trees & Shrubs S.E. Australia* 234 (1981); D.J.Boland *et al.*, *Forest Trees Australia* 4th edn, 191 (1984).

Tree to 30 m, often gnarled. Bark fibrous, brown to grey throughout. Adult leaves petiolate, narrowly elliptic to narrowly ovate, usually falcate, acute to acuminate, attenuate at base; lamina entire, 8–12 cm long, 1.5–3 cm wide, dark green above, glabrous; lateral veins fine, at 55°–65°; petiole flattened or angular, 8–12 mm long. Umbels 3- or 7-flowered; peduncle terete to quadrangular, 10–25 mm long, glabrous or sparsely pubescent; pedicels terete, 4–10 mm long, glabrous or pubescent. Hypanthium 4–6 mm long, 6–7 mm wide, glabrous or rarely pubescent. Sepals 5, 10–15 mm long. Petals 2–4 mm long, c. 3 mm wide. Filaments 5–7 mm long; gland brown, distinct. Fruits globular to ovoid, rarely cylindrical, 7–10 mm long, 8–10 mm wide, pubescent, tuberculate, prominently ribbed. *Rough-barked Apple*. Fig. 111A–B.

Occurs from S of Rockhampton, Qld, to the New England area, N.S.W., and from S of Port Macquarie, N.S.W., to the Mallacoota area, Vic., with an outlier at Ravenshoe near Atherton, Qld. Grows in alluvial soil, sandy loam and sand in open forest and woodland on undulating country and on plains. Regions: CYRK, DWSN, MCPH, NEPN, HOWE. Map 559.

Qld: Kroombit Tableland, c. 60 km SW of Gladstone, *M.D.Crisp* 2782 (CBG, FRI); Western Ck near Milmerran, May 1939, *M.R.O.Millet* (FRI). N.S.W.: W of Moruya, 26 Jan. 1946, *N.T.Burbidge* (CANB); 3.8 km SW of Nundle, *G.M.Chippendale* 1235 & *M.J.Brennan* (AD, BRI, FRI, K, MEL, NSW). Vic.: Mallacoota, Jan. 1927, *H.B.Williamson* (FRI).

Distinguished by the usually gnarled tree habit, rough bark, and prominently ribbed fruits 7–10 mm long and 8–10 mm wide. The wood is hard, tough, strong and moderately durable, and has been used for palings and farm buildings.

5. *Angophora melanoxylon* R.Baker, *Proc. Linn. Soc. New South Wales* 25: 84, t. 2 (1900)

A. intermedia var. *melanoxylon* (R.Baker) Maiden & E.Betche, *Census New South Wales Pl.* 145 (1916). T: Coolabah, N.S.W., Feb. 1900, *W.Bäuerlen s.n.*; lecto: NSW, *fide* G.Leach, *Telopea* 2: 771 (1986).

Illustration: R.T.Baker, *loc. cit.*; G.M.Cunningham *et al.*, *Pl. Western New South Wales* 517 (1981).

Tree to 15 m, usually gnarled. Bark fibrous dark grey throughout. Leaves of mature tree petiolate, narrowly elliptic, acute to acuminate, rarely obtuse, attenuate and cordate to auriculate at base; lamina entire, 4–8 cm long, 0.7–1.7 cm wide, sparsely pubescent becoming glabrous, dull, blue-grey or grey-green above; lateral veins fine, at 60°–65°; petiole terete, 1–3 mm long. Umbels 7-flowered, rarely 3-flowered; peduncle terete, 6–23 mm long, pubescent; pedicels terete, 3–9 mm long, pubescent. Hypanthium 4–5 mm long, 5–6 mm wide, pubescent. Sepals 4 or 5, to 2 mm long. Petals c. 4 mm long, 3–4 mm wide. Filaments

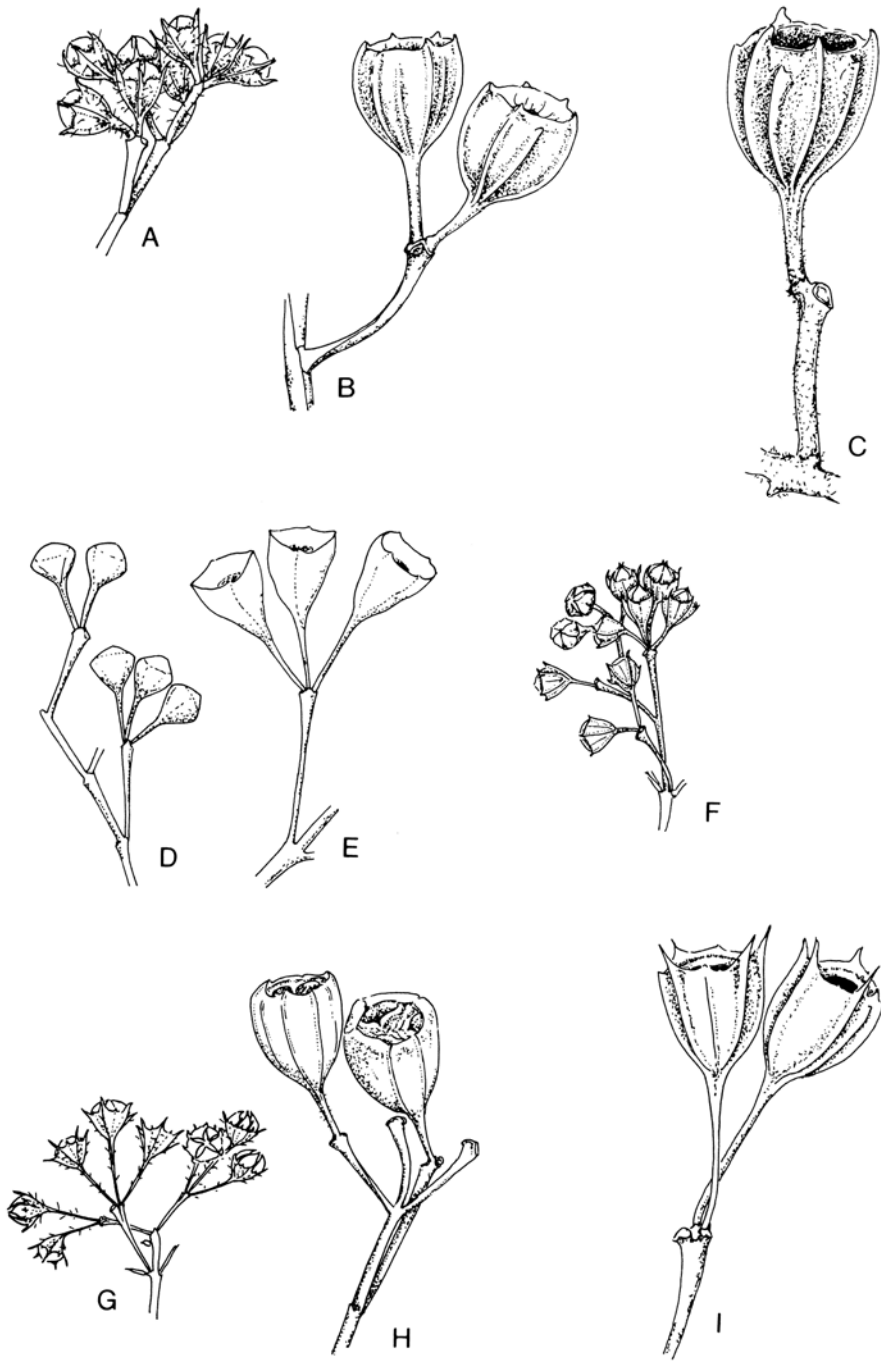


Figure 110. *Angophora* buds and fruits, all $\times 1$. **A–B**, *A. costata* subsp. *costata* (Georges R., Sydney, N.S.W., J.McLeod, NSW). **C**, *A. costata* subsp. *euryphylla* (1.6 km N of Gibbs Long Swamp, N.S.W., L.Johnson, NSW 127674, NSW). **D–E**, *A. costata* subsp. *leiocarpa* (N.Michael 2242, FRI). **F**, *A. bakeri* subsp. *paludosa* (Copmanhurst, N.S.W., H.Rupp, FRI). **G–H**, *A. bakeri* subsp. *crassifolia* (**G**, I.Brooker 3312, FRI; **H**, heights overlooking Coal and Candle Ck, N.S.W., D.Shireess, FRI). **I**, *A. woodsiana* (L.Johnson 7530 & M.Watson, FRI). Drawn by M.May.

to 9 mm long; gland brown, distinct. Fruits ovoid or cylindrical, 8–13 mm long, 7–11 mm wide, glabrous or rarely sparsely pubescent, prominently ribbed. *Coolabah Apple*. Fig. 111C–D.

Occurs in Qld and N.S.W., from Augathella S to Coolabah and E to St George and Narrabri; grows in sandy soil on granite and sandstone hills on sandplains. Regions: WRGO, DARL. Map 560.

Qld: S of Charleville, *M.I.H. Brooker 1403* (FRI); c. 35.4 km E of Cunnamulla, *N.Hall 73/8* (FRI). N.S.W.: 40 km SW of Cumborah, *J.Campbell & J.Pickard 1295* (FRI, NSW); Coolabah, *E.Larsen 21* (FRI).

Distinguished by the gnarled, small tree habit, rough bark throughout, crown of mixed petiolate and sessile cordate to auriculate leaves, and prominently ribbed fruits 8–13 mm long, 7–11 mm wide.

6. *Angophora hispida* (Smith) Blaxell, *Kew Bull.* 31: 272 (1976)

Metrosideros hispida Smith, *Trans. Linn. Soc. London* 3: 267 (1797). T: Port Jackson, N.S.W., 1795, *J.White s.n.*; holotype: LINN *n.v.*, *fide* G.Leach, *Telopea* 2: 773 (1986).

Angophora cordifolia Cav., *Icon.* 4: 21, t. 338 (1797); *Metrosideros cordifolia* (Cav.) Pers., *Syn. Pl.* 2: 25 (1806). T: ex Port Jackson, N.S.W., collector unknown; holotype: MA *n.v.*, *fide* G.Leach, *loc. cit.*

Metrosideros hirsuta Andrews, *Bot. Repos.* 4, t. 281 (1803). T: t. 281 in H.C.Andrews, *loc. cit.*; lectotype, *fide* G.Leach, *loc. cit.*

Metrosideros anomala Vent., *Jard. Malm.* 5, t. 5 (1803). T: t. 5 in E.P.Ventenat, *loc. cit.*; lectotype, *fide* G.Leach, *loc. cit.*

Eucalyptus hirsuta Link, *Enum. Hort. Berol.* 2: 31 (1822). T: destroyed at B.

Illustrations: A.J.Cavanilles, *loc. cit.*; H.C.Andrews, *loc. cit.*

Tree or shrub to 8 m. Bark rough, peeling in strips, grey to grey-brown throughout. Leaves of mature tree sessile or shortly petiolate, elliptic to ovate, obtuse, auriculate at base; lamina crenulate, undulate, 5–10 cm long, 2.5–4.5 cm wide, glabrous to pubescent and bristly, dull, grey-green to olive-green above; lateral veins at 60°–80°; petiole absent or terete, to 4 mm long. Umbels 3- or 7-flowered; peduncle terete, 17–70 mm long, pubescent; pedicels terete, 10–22 mm long, pubescent. Hypanthium 7–10 mm long, 8–13 mm wide, pubescent. Sepals 5, 2–4 mm long. Petals 5–8 mm long, 7–10 mm wide. Filaments 8–12 mm long; gland indistinct. Fruits campanulate to urceolate, 15–25 mm long, 13–20 mm wide, pubescent, tuberculate, prominently ribbed. *Dwarf Apple*. Fig. 111E–F.

Occurs between Gosford and southern parts of Sydney, N.S.W., in open woodland on sandstone areas. Region: NEPN. Map 561.

N.S.W.: Belrose, *R.Coveny 11053 & P.Hind* (FRI, NSW); Sylvania, Sept. 1963, *L.Langley* (FRI).

Distinguished by the often shrubby habit, rough bark in strips, and sessile or shortly petiolate, obtuse leaves with crenulate and undulate margins. Pedicels longer than those of *A. melanoxylon* and *A. subvelutina*.

7. *Angophora subvelutina* F.Muell., *Fragm.* 1: 31 (1858)

T: Burnett & Brisbane Rivers, [Qld], Dec. 1856, *F.Mueller*; lectotype: MEL, *fide* G.Leach, *Telopea* 2: 774 (1986).

Illustrations: J.H.Maiden, *Forest Fl. New South Wales* 8: t. 272 (1925); N.C.W.Beadle, *Stud. Fl. N.E. New South Wales* 3: 445 (1976).

Tree to 17 m, sometimes to 25 m. Bark fibrous, grey throughout. Leaves of mature tree petiolate, ovate to ovate-lanceolate or elliptic, acute to obtuse, cordate to auriculate; lamina entire or slightly crenate, 6–9 cm long, 2–5 cm wide, pubescent and becoming glabrous, dull, grey-green above; lateral veins fine at 60°–70°; petiole sometimes absent, or terete, to 3 mm long. Umbels 7-flowered; peduncle terete to quadrangular, 9–30 mm long, pubescent; pedicels terete quadrangular, 3–10 mm long, pubescent. Hypanthium 4–6 mm long, 4–7 mm wide, pubescent. Sepals 5, c. 1 mm long. Petals 3–4 mm long, c. 3 mm wide. Filaments up

to 8 mm long; gland brown, distinct. Fruits ovoid, 7–11 mm long and wide, glabrous or pubescent, smooth or tuberculate, prominently ribbed. *Broad-leaved Apple*. Fig. 111G–H.

Occurs from near Bundaberg, Qld, south mainly in coastal areas to near Taree, N.S.W., then apparently disjunctly around Sydney and near Araluen. Grows in alluvial soil and gravelly clay in open forest. Regions: DWSN, MCPH, NEPN, HOWE. Map 562.

Qld: Kolan R., 48 km N of Gin Gin, *J.C.G.Banks* 68 (FRI); Bunjuren, *N.Michael* 2080 (BRI). N.S.W.: Edinburgh Castle State Forest, *E.F.Constable* 6617 (FRI, NSW); Casino, *D.Walker* 1346 (CANB).

Distinguished by rough bark, leaves usually cordate, broad, and small fruits. A good source of pollen, but generally not a good source of honey.

PRESUMED HYBRIDS

Angophora clelandii Maiden, *J. Proc. Roy. Soc. New South Wales* 54: 175 (1920).

T: Kogarah, N.S.W., 9 Dec. 1947, *J.H.Camfield* NSW 143570; lecto: NSW, *fide* G.Leach, *op. cit.* 777.

Presumed hybrid between *A. hispida* and *A. bakeri* subsp. *bakeri*, *fide* G.Leach, *loc. cit.*

Angophora dichromophloia Blakely, *Contr. New South Wales Natl Herb.* 1: 34 (1939).

T: Junction Rd, Hornsby, N.S.W., 11 Nov. 1928, *W.F.Blakely*; holo: BRI.

Presumed hybrid between *A. costata* subsp. *costata* and *A. hispida*, *fide* G.Leach, *loc. cit.*

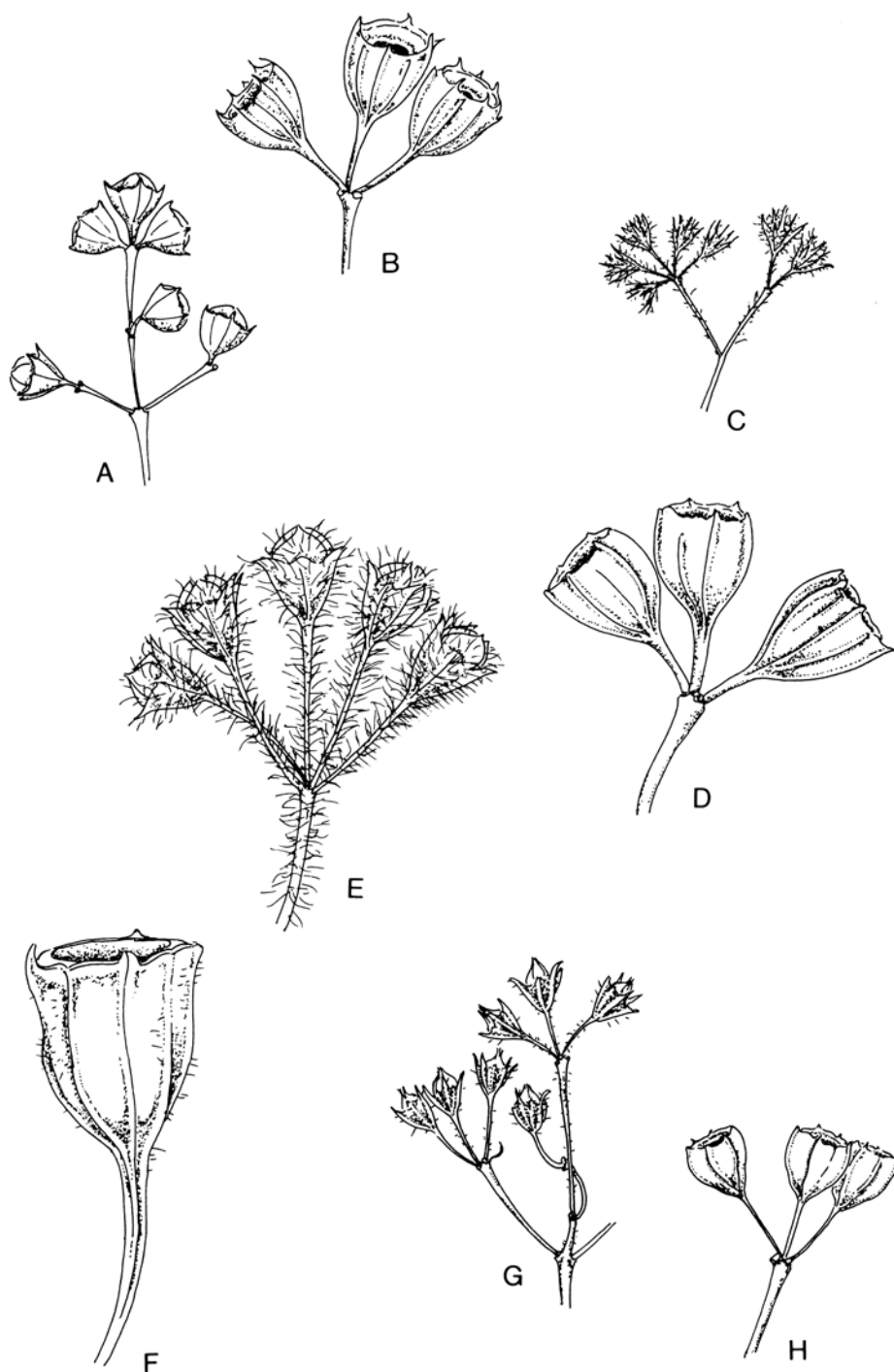
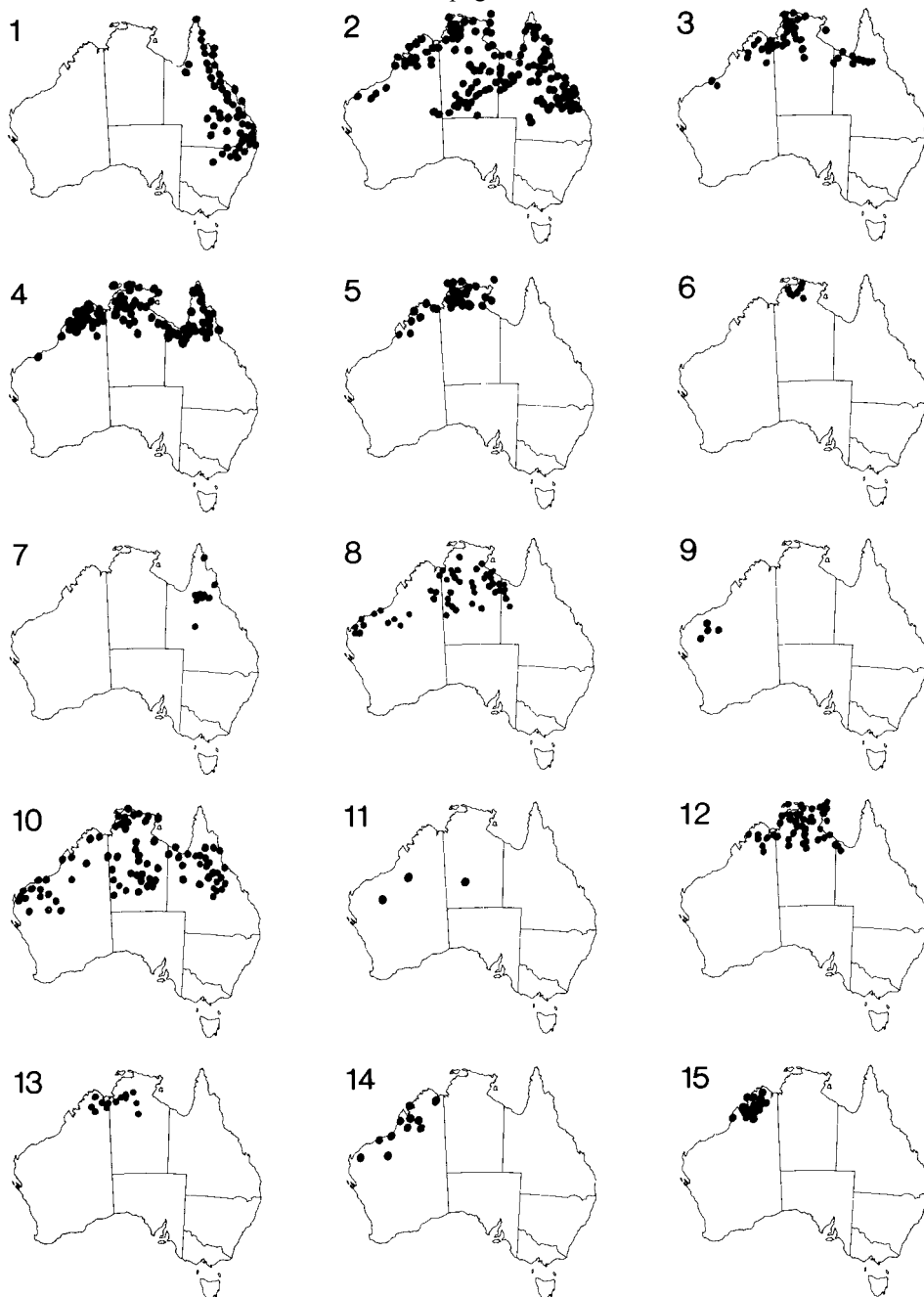


Figure 111. *Angophora* buds and fruits, all $\times 1$. **A–B**, *A. floribunda* (**A**, R.Pullen & J.Story 8717, FRI; **B**, near ‘Khyber Pass’, 35 km E of Rylstone, N.S.W., M.Phillips, FRI). **C–D**, *A. melanoxylon* (**C**, J.Campbell & J.Pickard 1295, FRI; **D**, E.Larsen 21, FRI). **E–F**, *A. hispida* (**E**, Narrabeen, N.S.W., H.Porter, FRI; **F**, N.Donner 1595, FRI). **G–H**, *A. subvelutina* (**G**, E.Constable 6617, FRI; **H**, N.Michael 2080, FRI). Drawn by M.May.

MAPS

Number in brackets refers to the page on which the taxon is described



1. *E. tessellaris* (67)

4. *E. confertiflora* (69)

7. *E. gilbertensis* (72)

10. *E. setosa* (73)

13. *E. abbreviata* (76)

2. *E. papuana* (68)

5. *E. clavigera* (71)

8. *E. aspera* (72)

11. *E. deserticola* (74)

14. *E. zygophylla* (76)

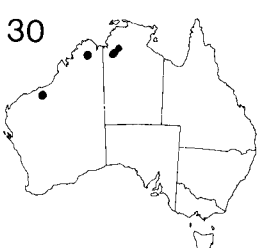
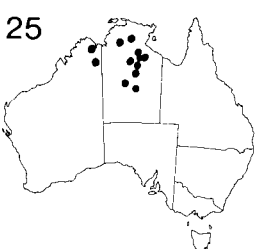
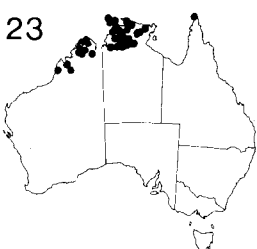
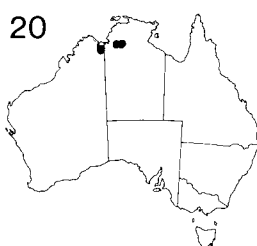
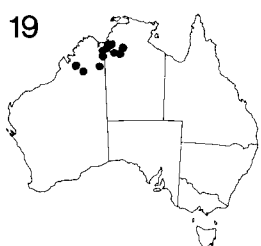
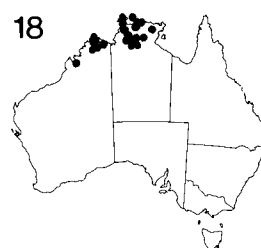
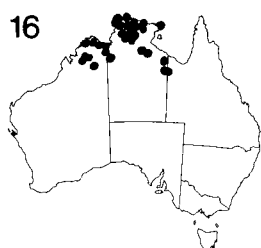
3. *E. grandifolia* (69)

6. *E. kombolgiensis* (71)

9. *E. ferriticola* (73)

12. *E. ferruginea* (74)

15. *E. lamprocalyx* (77)



16. *E. ptychocarpa* (77)

19. *E. pyrophora* (80)

22. *E. foelscheana* (82)

25. *E. ollaris* (84)

28. *E. urnularis* (85)

17. *E. collina* (79)

20. *E. pontis* (80)

23. *E. latifolia* (82)

26. *E. arnhemensis* (84)

29. *E. umbonata* (85)

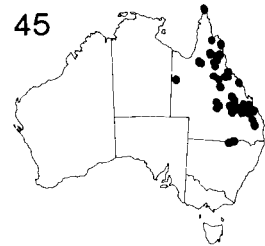
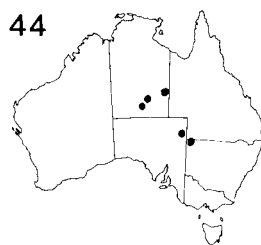
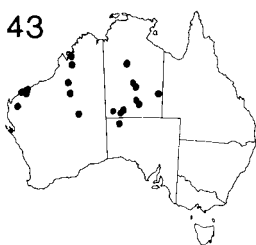
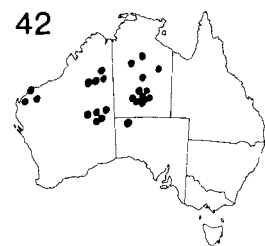
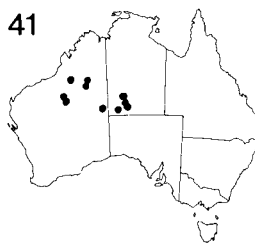
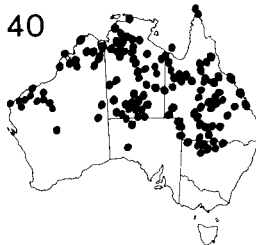
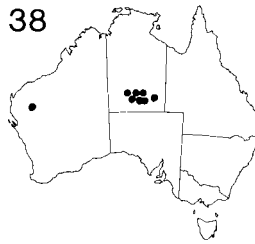
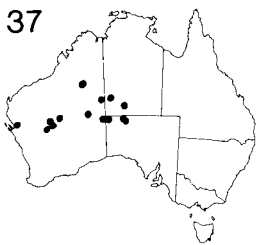
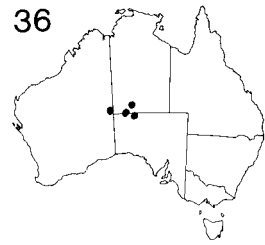
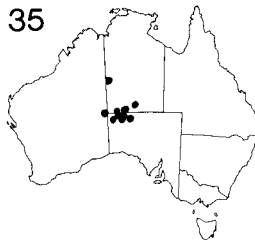
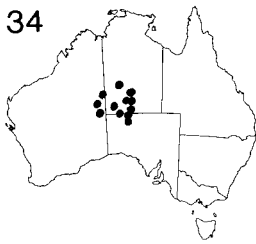
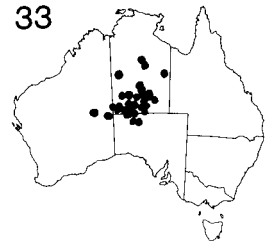
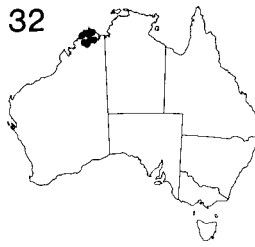
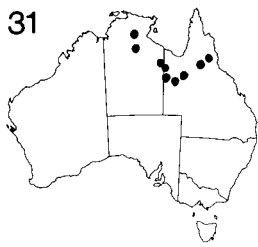
18. *E. bleeseri* (79)

21. *E. porrecta* (80)

24. *E. dichromophloia* (83)

27. *E. drysdalensis* (84)

30. *E. coniphloia* (85)



31. *E. capricornia* (86)

34. *E. symonii* (88)

37. *E. lenziana* (89)

40. *E. terminalis* (90)

43. *E. opaca* (93)

32. *E. arenaria* (86)

35. *E. australis* (88)

38. *E. fordeana* (90)

41. *E. chippendalei* (92)

44. *E. orientalis* (93)

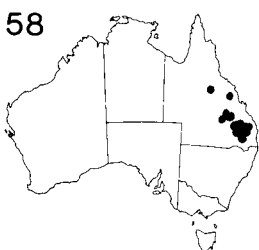
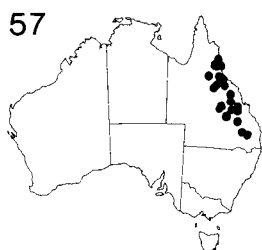
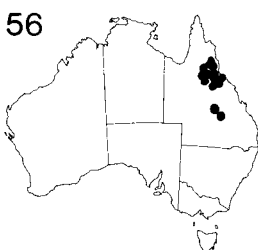
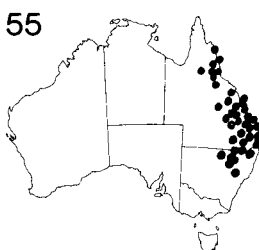
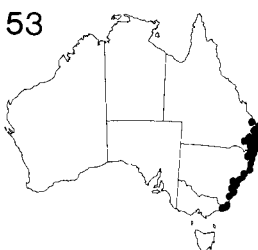
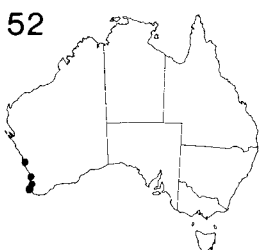
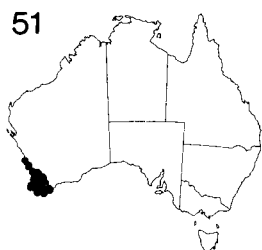
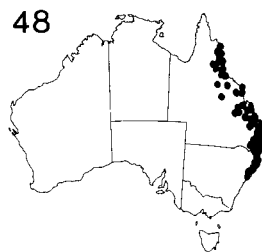
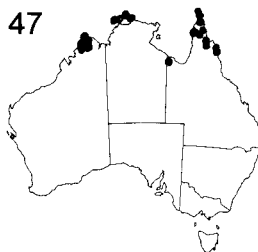
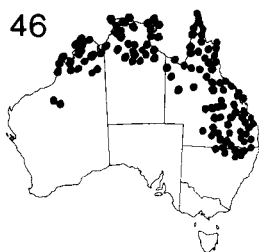
33. *E. eremaea* (88)

36. *E. connerensis* (89)

39. *E. nelsonii* (90)

42. *E. centralis* (92)

45. *E. erythrophloia* (94)



46. *E. polycarpa* (94)

49. *E. abergiana* (97)

52. *E. haematoxylon* (98)

55. *E. trachyphloia* (101)

58. *E. bloxsomei* (103)

47. *E. nesophila* (95)

50. *E. ficifolia* (97)

53. *E. gummiifera* (100)

56. *E. peltata* subsp.
peltata (102)

59. *E. watsoniana* (103)

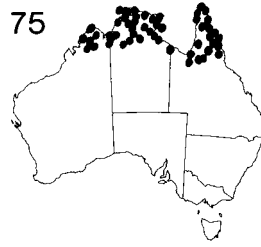
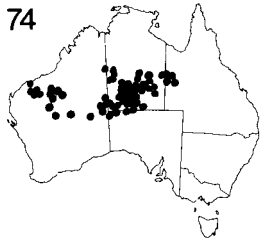
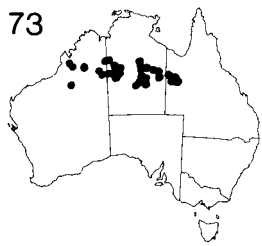
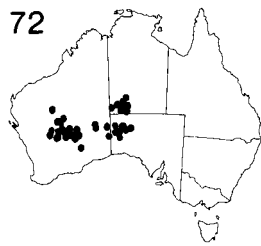
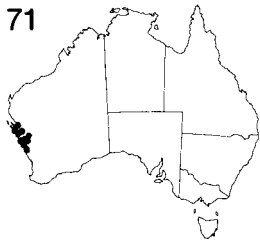
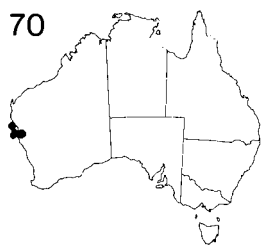
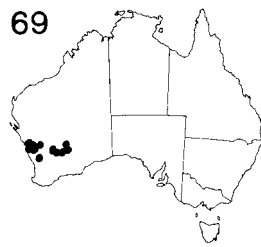
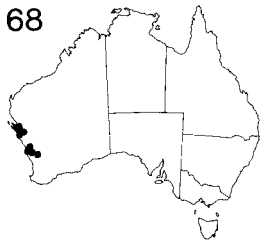
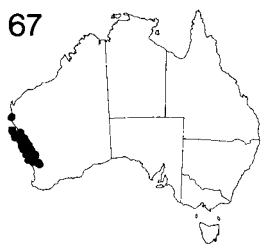
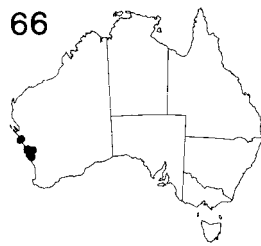
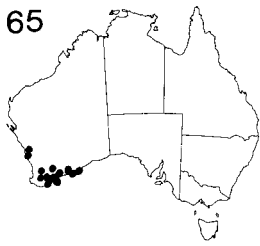
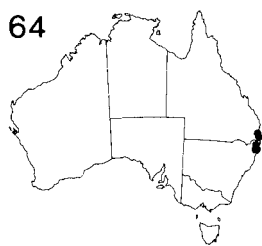
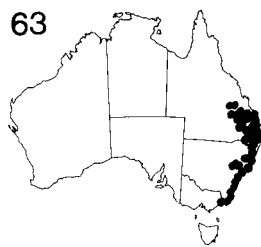
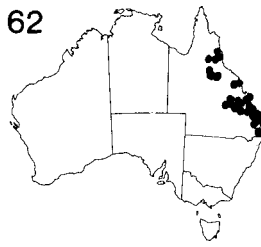
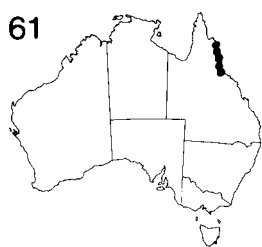
48. *E. intermedia* (95)

51. *E. calophylla* (97)

54. *E. jacobsoniana* (100)

57. *E. peltata* subsp.
leichhardtii (102)

60. *E. eximia* (105)



61. *E. torelliana* (105)

64. *E. henryi* (107)

67. *E. eudesmioides* (110)

70. *E. roycei* (112)

73. *E. odontocarpa* (113)

62. *E. citriodora* (106)

65. *E. tetragona* (109)

68. *E. gittinsii* (110)

71. *E. jucunda* (112)

74. *E. gamophylla* (115)

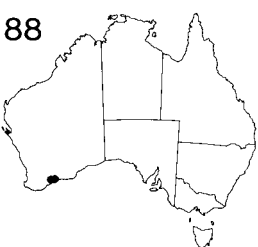
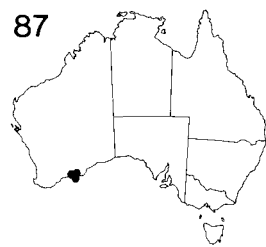
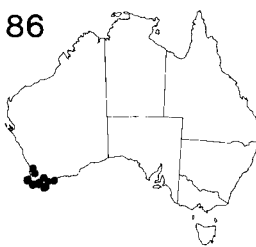
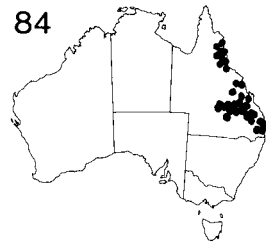
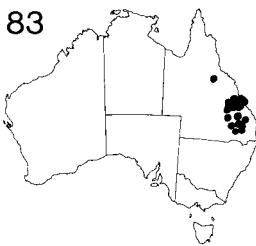
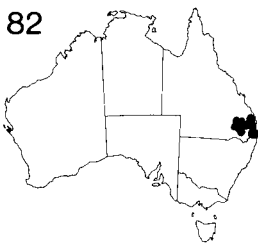
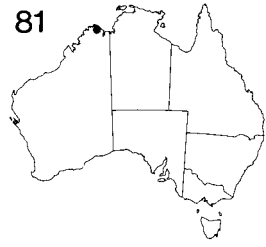
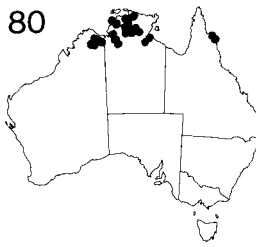
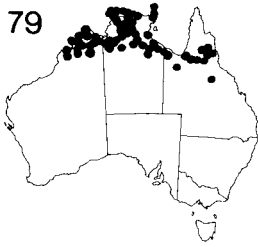
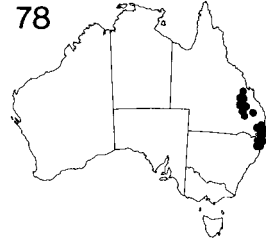
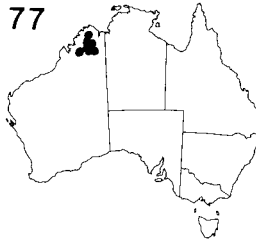
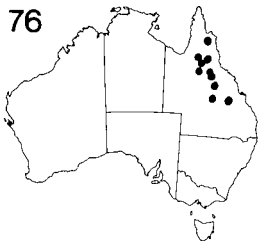
63. *E. maculata* (107)

66. *E. erythrocorys* (109)

69. *E. ebbanoensis* (111)

72. *E. gongylocarpa* (113)

75. *E. tetradonta* (116)



76. *E. similis* (116)

79. *E. miniata* (118)

82. *E. curtisii* (121)

85. *E. rubiginosa* (123)

88. *E. coronata* (126)

77. *E. lirata* (117)

80. *E. phoenicea* (120)

83. *E. tenuipes* (121)

86. *E. megacarpa* (125)

89. *E. preissiana* (126)

78. *E. baileyana* (117)

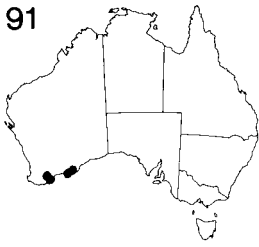
81. *E. ceracea* (120)

84. *E. cloeziana* (122)

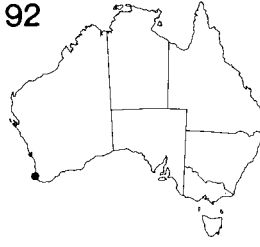
87. *E. aquilina* (125)

90. *E. acies* (126)

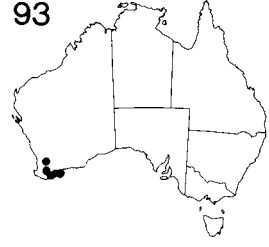
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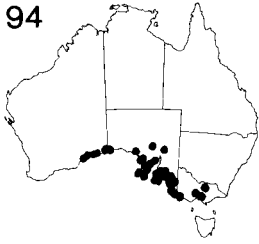
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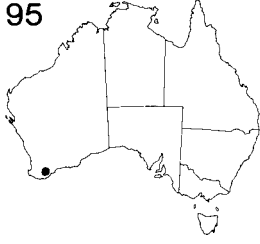
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94



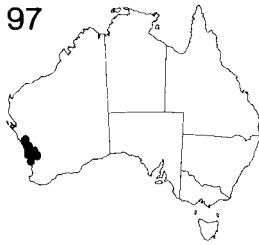
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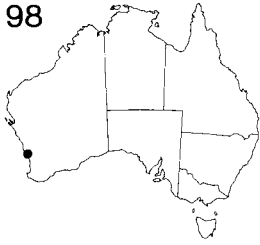
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97



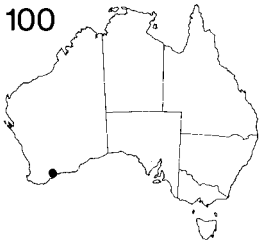
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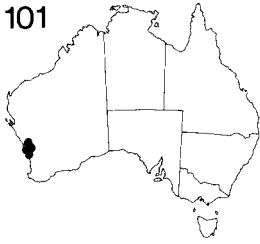
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100



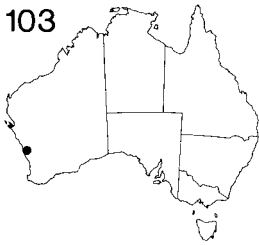
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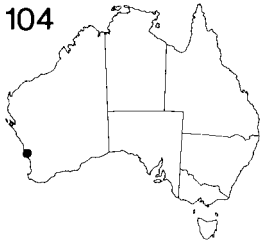
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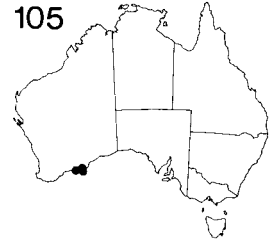
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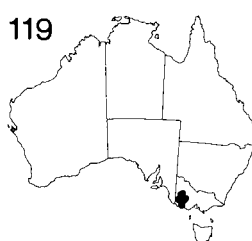
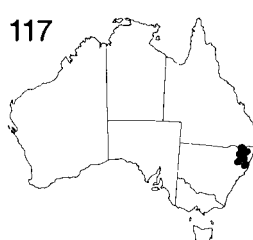
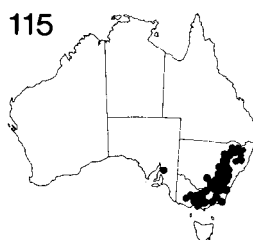
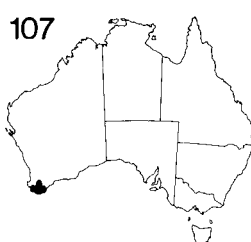
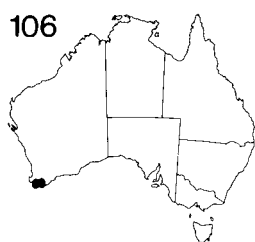


104



105

91. *E. ligulata* (128)94. *E. diversifolia* (129)97. *E. todtiana* (131)100. *E. sepulcralis* (134)103. *E. johnsoniana* (135)92. *E. calcicola* (128)95. *E. erectifolia* (130)98. *E. lateritica* (131)101. *E. pendens* (134)104. *E. suberea* (136)93. *E. pachyloma* (129)96. *E. patens* (131)99. *E. buprestium* (133)102. *E. exilis* (135)105. *E. insularis* (137)



106. *E. brevistylis* (137)

109. *E. staeri* (140)

112. *E. umbra* subsp.
carnea (142)

115. *E. macrorhyncha* subsp.
macrorhyncha (145)

118. *E. baxteri* (146)

107. *E. jacksonii* (138)

110. *E. acmenoides* (140)

113. *E. muelleriana* (142)

116. *E. macrorhyncha* subsp.
cannonii (145)

119. *E. alpina* (147)

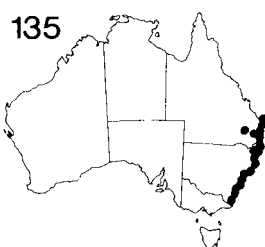
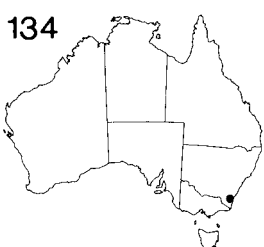
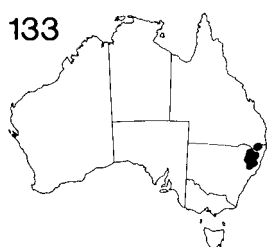
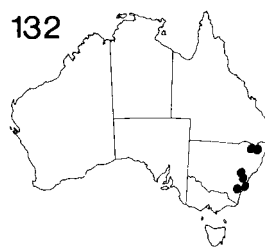
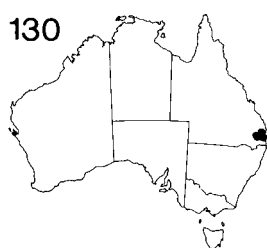
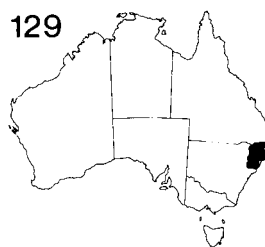
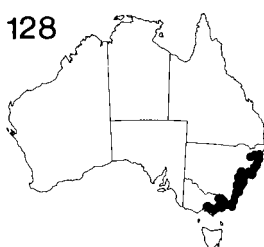
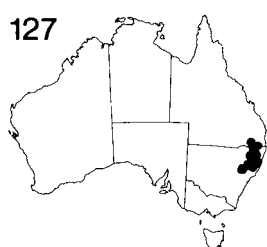
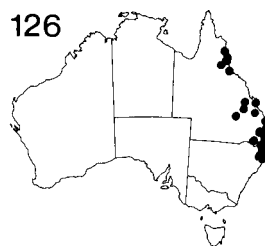
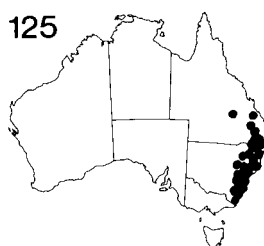
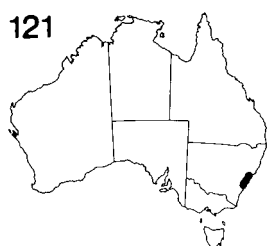
108. *E. marginata* (138)

111. *E. umbra* subsp.
umbra (141)

114. *E. laevopinea* (143)

117. *E. youmanii* (146)

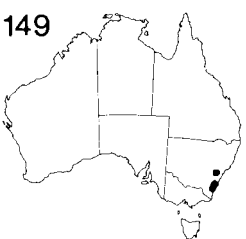
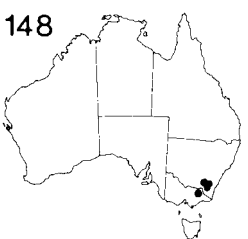
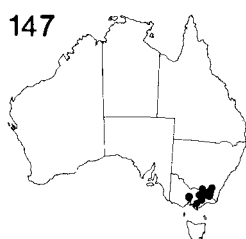
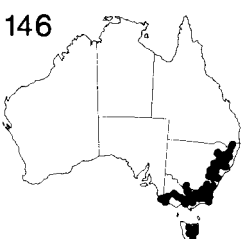
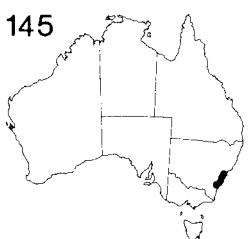
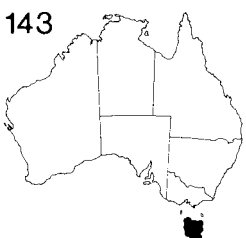
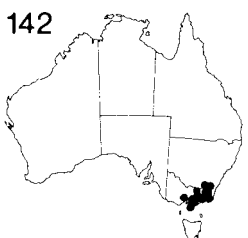
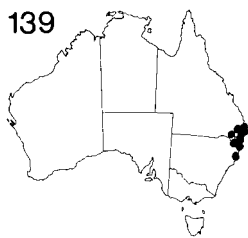
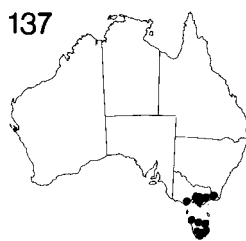
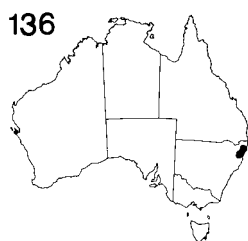
120. *E. blaxlandii* (147)



121. *E. camfieldii* (148)
 124. *E. tindaliae* (150)
 127. *E. caliginosa* (152)
 130. *E. conglomerata* (153)
 133. *E. mckieana* (154)

122. *E. capitellata* (148)
 125. *E. eugenioides* (151)
 128. *E. globoidea* (152)
 131. *E. oblonga* (154)
 134. *E. olsenii* (155)

123. *E. agglomerata* (150)
 126. *E. nigra* (151)
 129. *E. cameronii* (153)
 132. *E. ligustrina* (154)
 135. *E. pilularis* (156)



136. *E. pyrocarpa* (156)

139. *E. planchoniana* (159)

142. *E. delegatensis* subsp.
delegatensis (163)

145. *E. luehmanniana* (164)

148. *E. pauciflora* subsp.
debeuzevillei (166)

137. *E. regnans* (158)

140. *E. sphaerocarpa* (160)

143. *E. delegatensis* subsp.
tasmaniensis (163)

146. *E. pauciflora* subsp.
pauciflora (165)

149. *E. gregsoniana* (166)

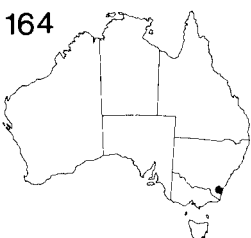
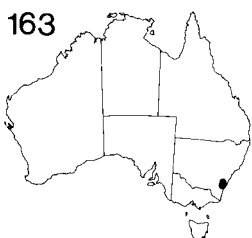
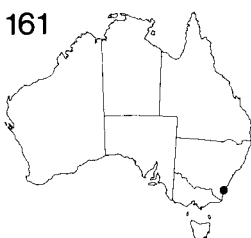
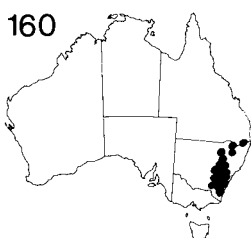
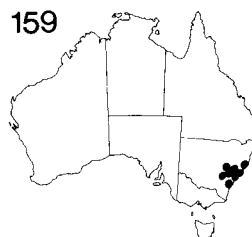
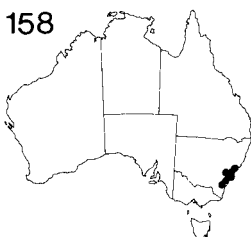
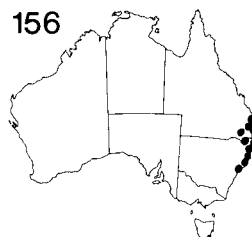
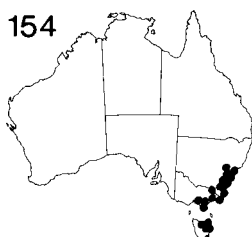
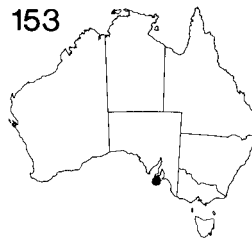
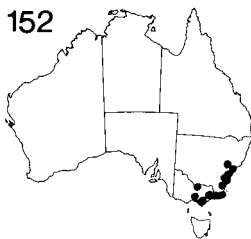
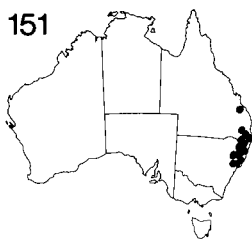
138. *E. fastigata* (159)

141. *E. obliqua* (160)

144. *E. oreades* (163)

147. *E. pauciflora* subsp.
niphophila (165)

150. *E. andrewsii* subsp.
andrewsii (167)



151. *E. andrewsii* subsp. *campanulata* (169)

154. *E. sieberi* (170)

157. *E. sclerophylla* (171)

160. *E. rossii* (173)

163. *E. triflora* (175)

152. *E. consideniana* (169)

155. *E. multicaulis* (170)

158. *E. haemastoma* (172)

161. *E. stenostoma* (173)

164. *E. paliformis* (176)

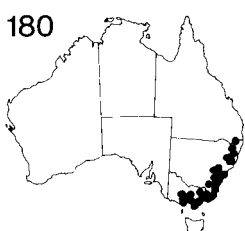
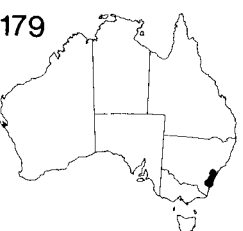
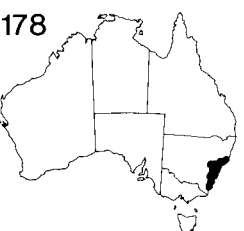
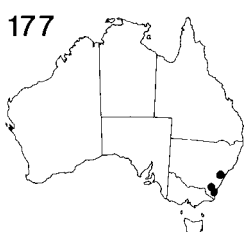
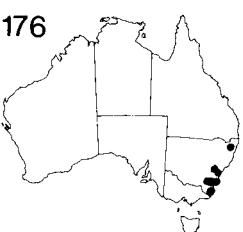
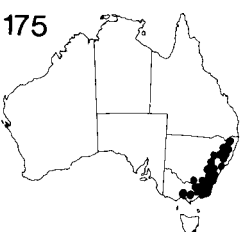
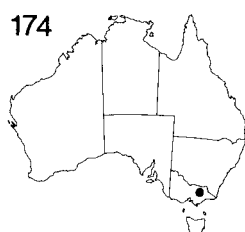
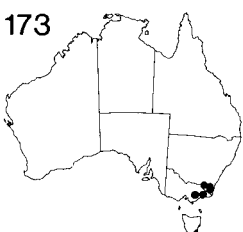
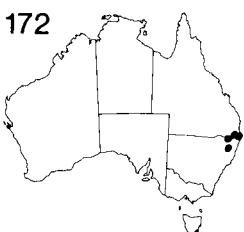
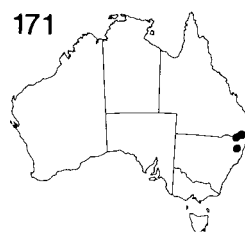
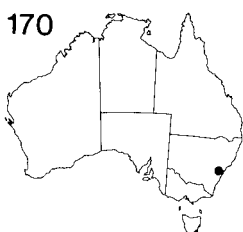
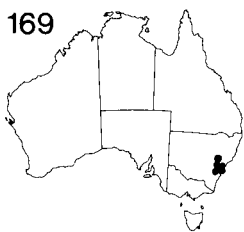
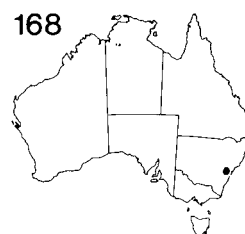
153. *E. remota* (170)

156. *E. signata* (171)

159. *E. racemosa* (172)

162. *E. fraxinoides* (175)

165. *E. dendromorpha* (176)



166. *E. obtusiflora* (177)

169. *E. apiculata* (178)

172. *E. approximans* subsp.
codonocarpa (181)

175. *E. stellulata* (182)

178. *E. piperita* subsp.
piperita (184)

167. *E. stricta* (177)

170. *E. cunninghamii* (179)

173. *E. kybeanensis* (181)

176. *E. moorei* var.
moorei (183)

179. *E. piperita* subsp.
urceolaris (185)

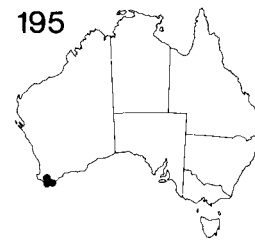
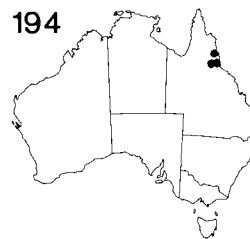
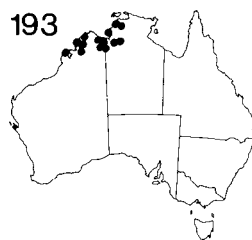
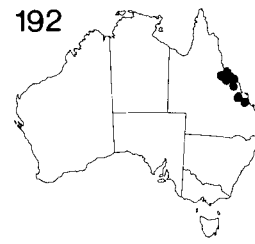
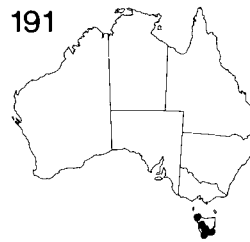
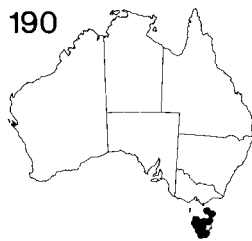
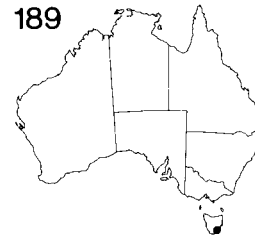
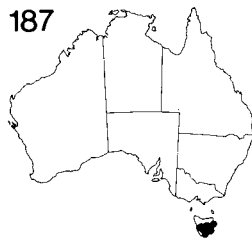
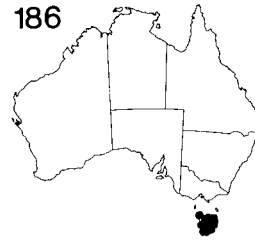
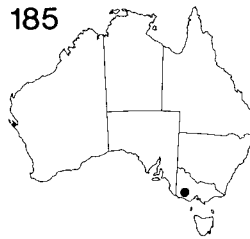
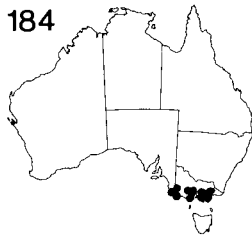
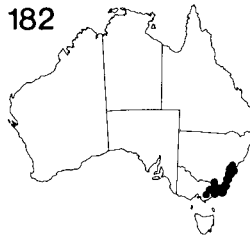
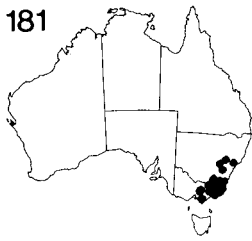
168. *E. burgettiana* (178)

171. *E. approximans* subsp.
approximans (179)

174. *E. mitchelliana* (182)

177. *E. moorei* var.
latiuscula (183)

180. *E. radiata* subsp.
radiata (186)



181. *E. radiata* subsp.
robertsonii (186)

184. *E. willisii* subsp.
willisii (188)

187. *E. pulchella* (190)

190. *E. nitida* (191)

193. *E. brachyandra* (193)

182. *E. elata* (187)

185. *E. willisii* subsp.
falciformis (188)

188. *E. tenuiramis* (190)

191. *E. coccifera* (192)

194. *E. howittiana* (194)

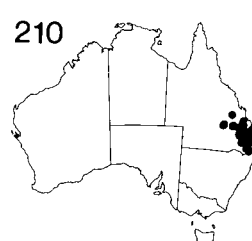
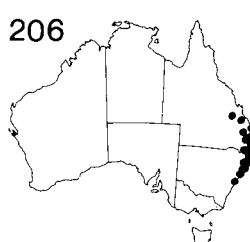
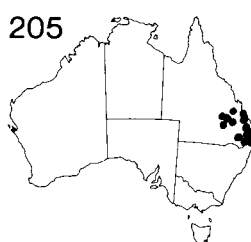
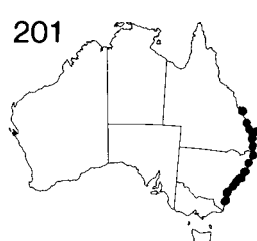
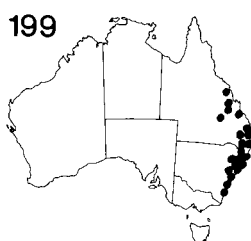
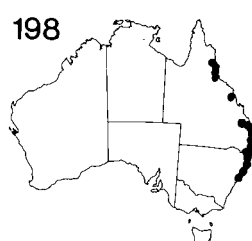
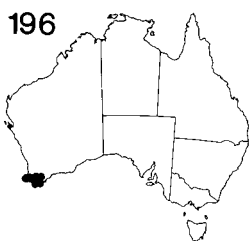
183. *E. dives* (187)

186. *E. amygdalina* (190)

189. *E. risdonii* (191)

192. *E. raveretiana* (193)

195. *E. guilfoylei* (196)



196. *E. diversicolor* (196)

199. *E. saligna* (198)

202. *E. pellita* (201)

205. *E. major* (203)

208. *E. canaliculata* (204)

197. *E. deanei* (197)

200. *E. botryoides* (200)

203. *E. notabilis* (201)

206. *E. propinqua* (203)

209. *E. biturbinata* (204)

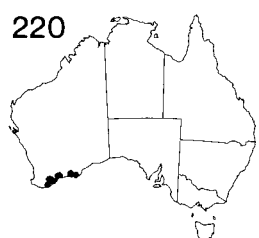
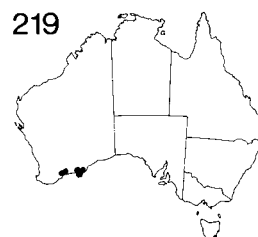
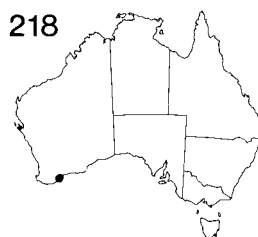
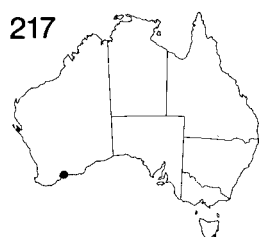
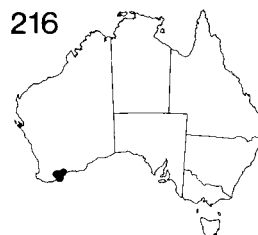
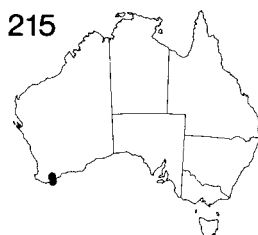
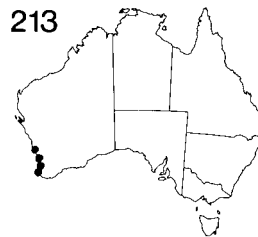
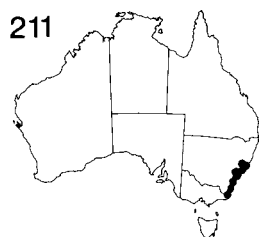
198. *E. grandis* (198)

201. *E. robusta* (200)

204. *E. resinifera* (202)

207. *E. punctata* (204)

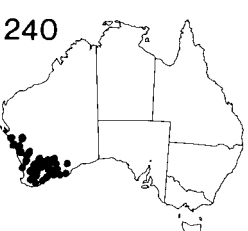
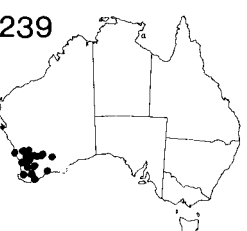
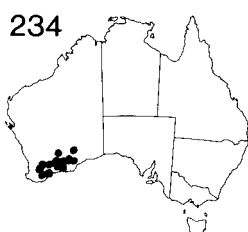
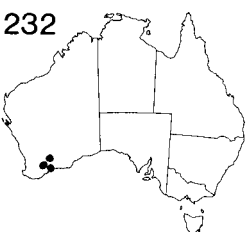
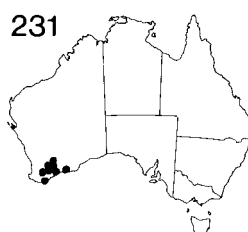
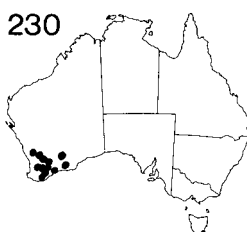
210. *E. longirostrata* (206)



211. *E. longifolia* (206)
 214. *E. cornuta* (208)
 217. *E. megacornuta* (210)
 220. *E. lehmannii* (213)
 223. *E. sargentii* (217)

212. *E. cosmophylla* (207)
 215. *E. talyuberlup* (210)
 218. *E. newbeyi* (211)
 221. *E. occidentalis* (213)
 224. *E. stowardii* (217)

213. *E. gomphocephala* (208)
 216. *E. burdettiana* (210)
 219. *E. conferruminata* (211)
 222. *E. astringens* (215)
 225. *E. macrandra* (217)



226. *E. annulata* (218)

227. *E. nutans* (219)

228. *E. platypus* var.
platypus (219)

229. *E. platypus* var.
heterophylla (221)

230. *E. spathulata* subsp.
spathulata (221)

231. *E. spathulata* subsp.
grandiflora (222)

232. *E. steedmanii* (222)

233. *E. eremophila* (222)

234. *E. cylindriflora* (223)

235. *E. erythronema* var.
erythronema (224)

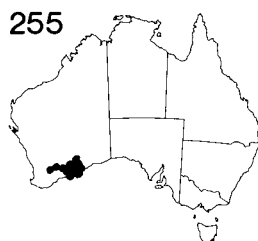
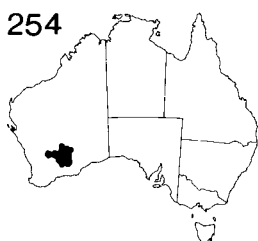
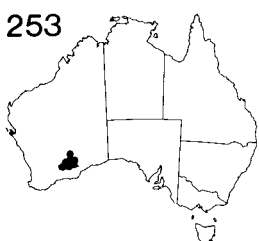
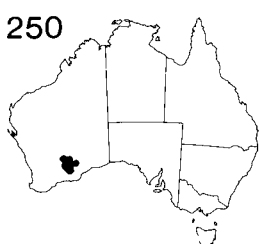
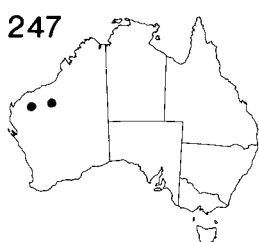
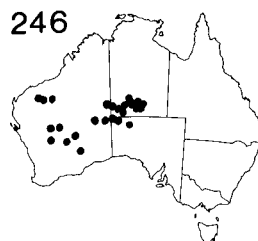
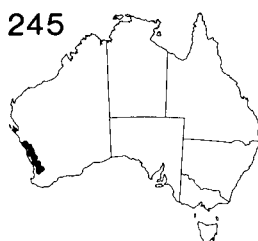
236. *E. erythronema* var.
marginata (224)

237. *E. dielsii* (224)

238. *E. cerasiformis* (226)

239. *E. wandoo* (226)

240. *E. redunca* (227)



241. *E. xanthonema* (227)

244. *E. laeliae* (230)

247. *E. pilbarensis* (231)

250. *E. stricklandii* (234)

253. *E. salubris* var.
glauca (236)

242. *E. gardneri* (228)

245. *E. accedens* (230)

248. *E. prominens* (232)

251. *E. carnei* (234)

254. *E. campaspe* (236)

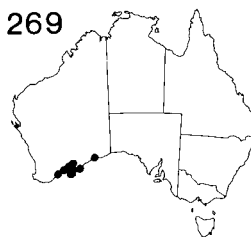
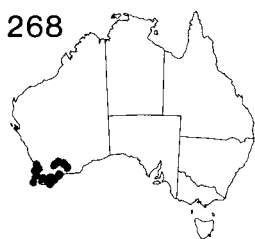
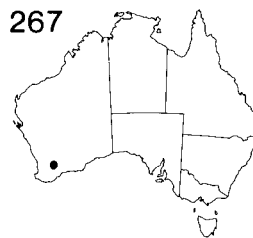
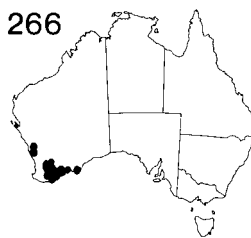
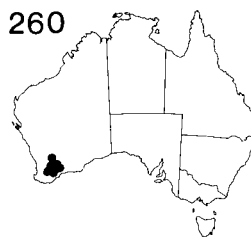
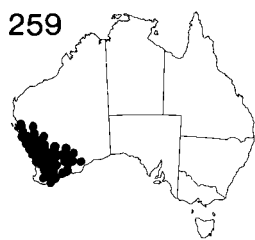
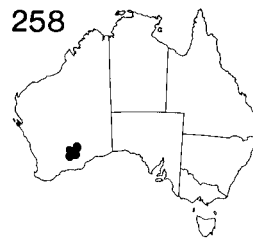
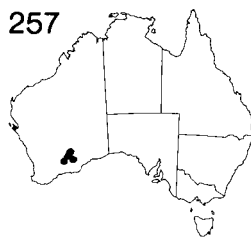
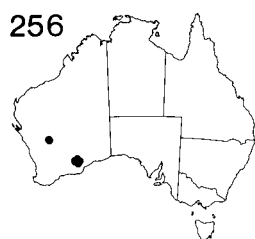
243. *E. desmondensis* (228)

246. *E. trivalvis* (231)

249. *E. grossa* (232)

252. *E. salubris* var.
salubris (235)

255. *E. diptera* (236)



256. *E. effusa* (237)

259. *E. loxophleba* subsp.
loxophleba (240)

262. *E. decurva* (241)

265. *E. goniantha* subsp.
semiglobosa (243)

268. *E. decipiens* (245)

257. *E. kruseana* (237)

260. *E. loxophleba* subsp.
gratae (240)

263. *E. balladoniensis* (241)

266. *E. falcata* (243)

269. *E. micranthera* (245)

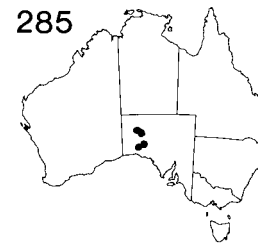
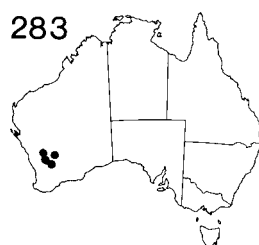
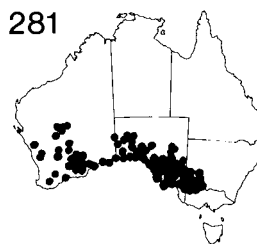
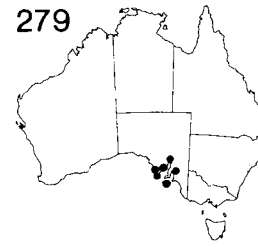
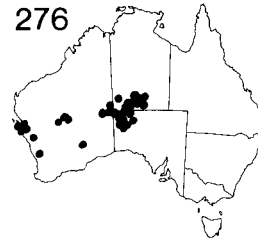
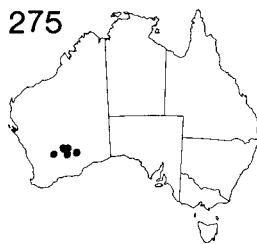
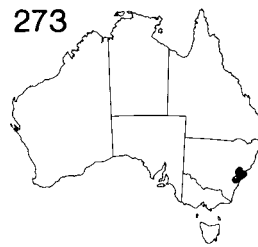
258. *E. brachyphylla* (238)

261. *E. doratoxylon* (241)

264. *E. goniantha* subsp.
goniantha (242)

267. *E. ornata* (243)

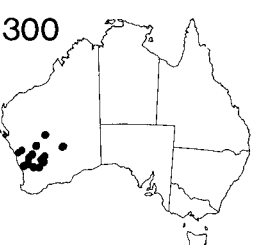
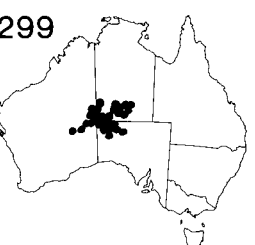
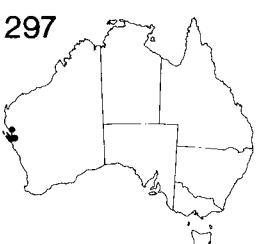
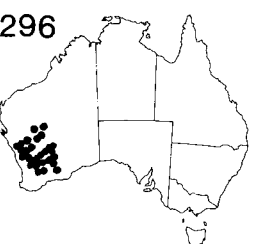
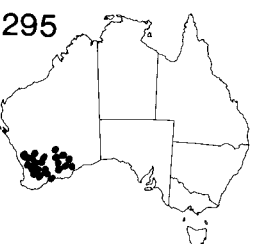
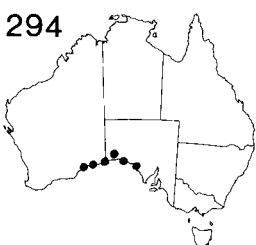
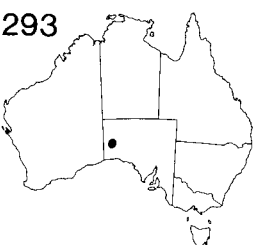
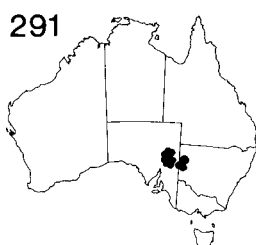
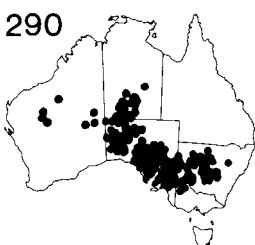
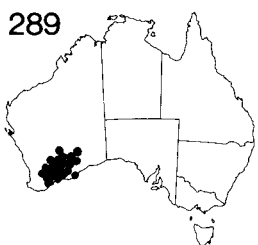
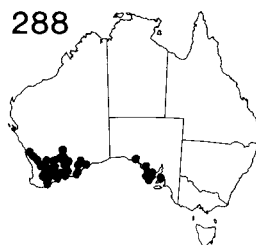
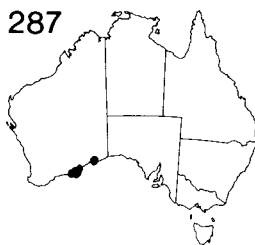
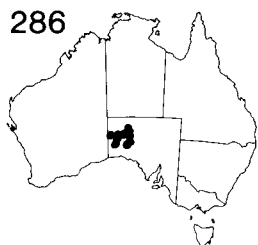
270. *E. angustissima* (246)



271. *E. halophila* (246)
 274. *E. pachycalyx* (248)
 277. *E. bakeri* (249)
 280. *E. longicornis* (252)
 283. *E. plenissima* (254)

272. *E. cneorifolia* (247)
 275. *E. jutsonii* (248)
 278. *E. brockwayi* (250)
 281. *E. oleosa* (253)
 284. *E. horistes* (254)

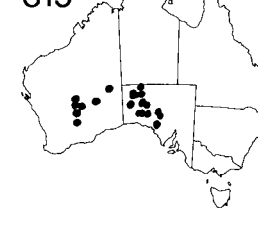
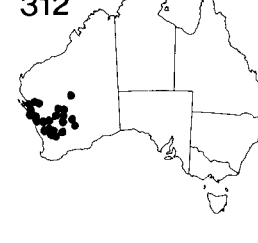
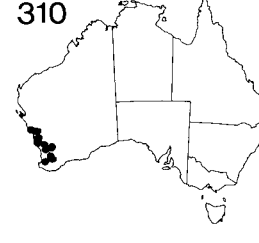
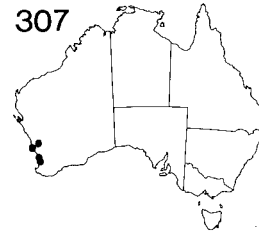
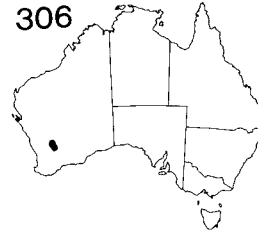
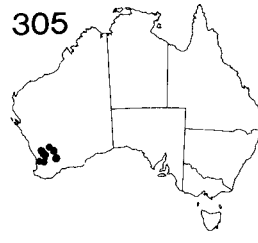
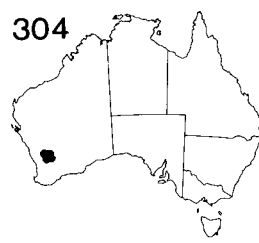
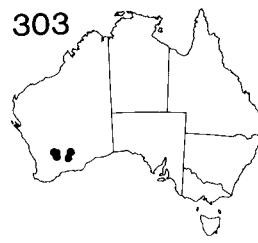
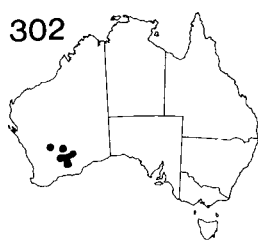
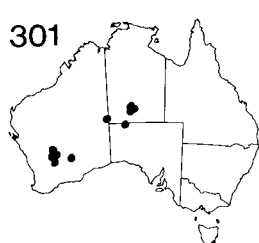
273. *E. squamosa* (247)
 276. *E. mannensis* (249)
 279. *E. cladocalyx* (252)
 282. *E. kochii* (254)
 285. *E. peeneri* (255)



286. *E. eremicola* (255)
 289. *E. transcontinentalis* (258)
 292. *E. yumbarrana* subsp.
 yumbarrana (259)
 295. *E. salmonophloia* (262)
 298. *E. synandra* (263)

287. *E. cooperiana* (257)
 290. *E. socialis* (258)
 293. *E. yumbarrana* subsp.
 striata (260)
 296. *E. leptopoda* (263)
 299. *E. oxymitra* (264)

288. *E. flocktoniae* (257)
 291. *E. gillii* (259)
 294. *E. yalatensis* (260)
 297. *E. beardiana* (263)
 300. *E. ewartiana* (264)



301. *E. orbifolia* (265)

302. *E. websteriana* (265)

303. *E. crucis* subsp.
crucis (267)

304. *E. crucis* subsp.
lanceolata (267)

305. *E. caesia* subsp.
caesia (268)

306. *E. caesia* subsp.
magna (268)

307. *E. lanepolei* (270)

308. *E. drummondii* (270)

309. *E. rameliana* (271)

310. *E. macrocarpa* (271)

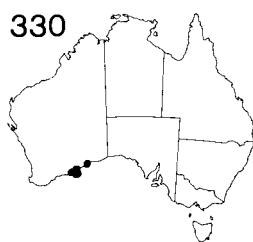
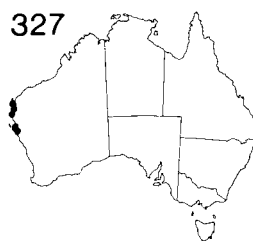
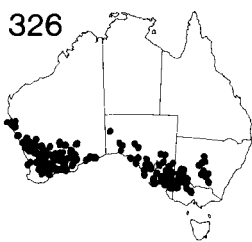
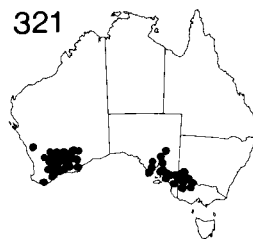
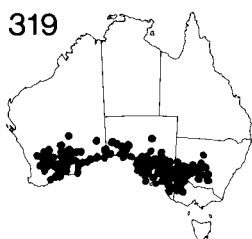
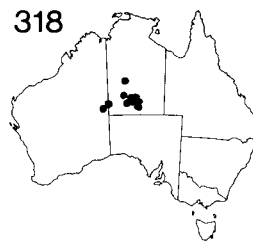
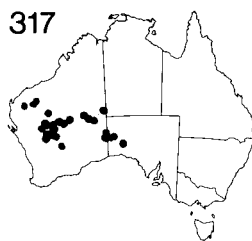
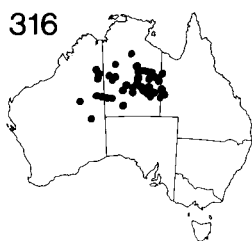
311. *E. rhodantha* (271)

312. *E. oldfieldii* (273)

313. *E. burracoppinensis* (273)

314. *E. pyriformis* (274)

315. *E. youngiana* (274)



316. *E. pachyphylla* (275)

319. *E. gracilis* (278)

322. *E. celastroides* subsp.
celastroides (279)

325. *E. rigidula* (281)

328. *E. formanii* (283)

317. *E. kingsmillii* (275)

320. *E. yilgarnensis* (278)

323. *E. celastroides* subsp.
virella (280)

326. *E. foecunda* (281)

329. *E. uncinata* (283)

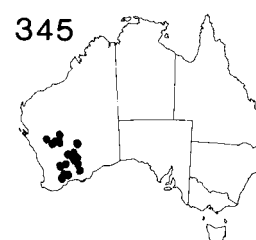
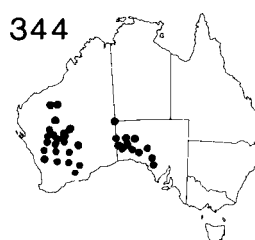
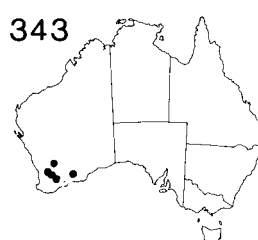
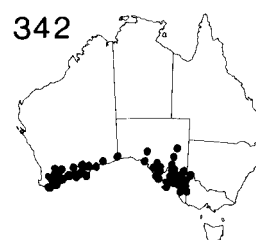
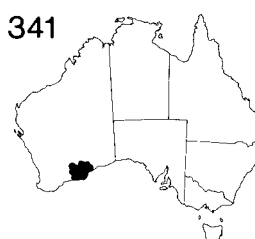
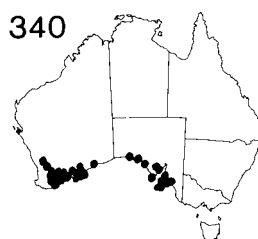
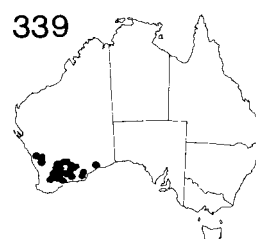
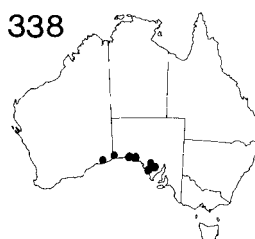
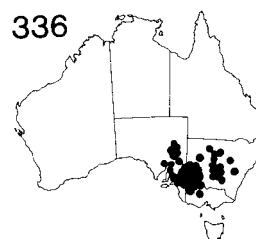
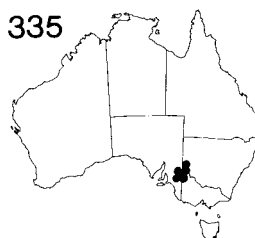
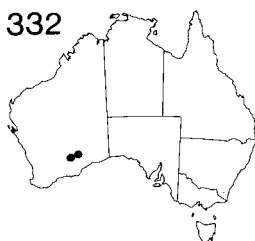
318. *E. sessilis* (277)

321. *E. calycogona* (279)

324. *E. brevipes* (280)

327. *E. fruticosa* (282)

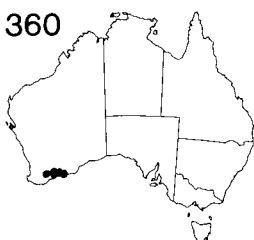
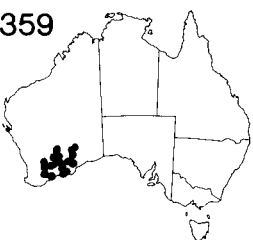
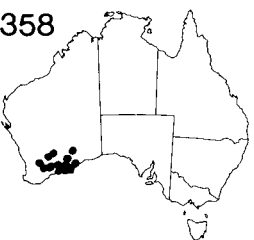
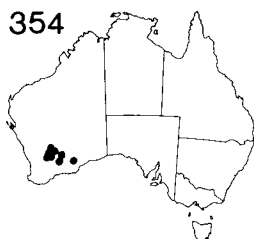
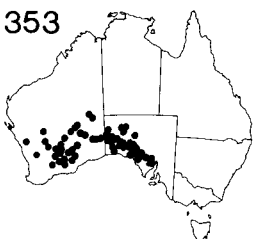
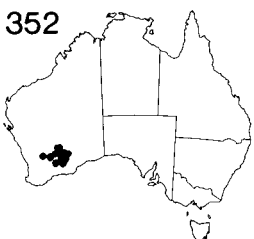
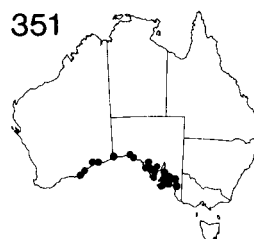
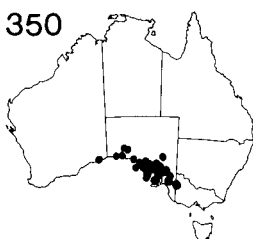
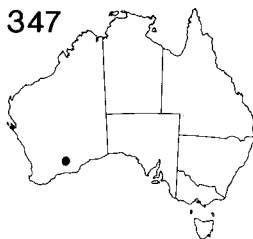
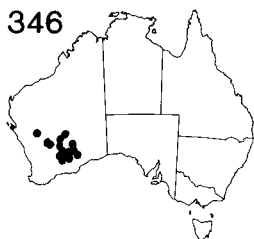
330. *E. discreta* (285)



331. *E. albida* (285)
 334. *E. sheathiana* (287)
 337. *E. dongarraensis* (288)
 340. *E. conglobata* (290)
 343. *E. kondininensis* (292)

332. *E. woodwardii* (286)
 335. *E. cyanophylla* (287)
 338. *E. calcareana* (288)
 341. *E. fraseri* (291)
 344. *E. striatocalyx* (292)

333. *E. georgei* (286)
 336. *E. dumosa* (287)
 339. *E. pileata* (290)
 342. *E. anceps* (291)
 345. *E. clelandii* (293)



346. *E. lesouefii* (293)

349. *E. comitae-vallis* (296)

352. *E. griffithsii* (297)

355. *E. torquata* (298)

358. *E. scyphocalyx* (301)

347. *E. pterocarpa* (293)

350. *E. brachycalyx* (296)

353. *E. concinna* (297)

356. *E. deflexa* (299)

359. *E. platycorys* (301)

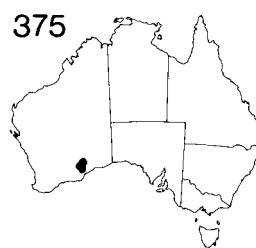
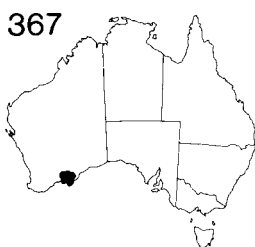
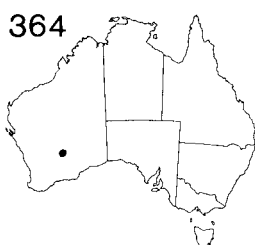
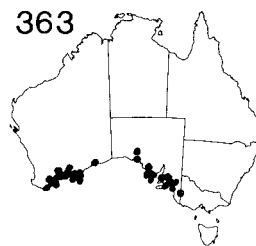
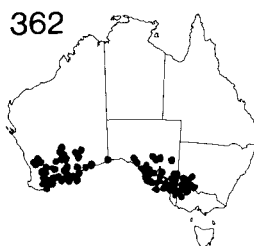
348. *E. melanoxydon* (294)

351. *E. rugosa* (296)

354. *E. corrugata* (298)

357. *E. leptocalyx* (301)

360. *E. merrickiae* (302)



361. *E. pimpiniana* (303)

364. *E. ceratocorys* (305)

367. *E. forrestiana* subsp.
forrestiana (307)

370. *E. ovularis* (309)

373. *E. oraria* (310)

362. *E. incrassata* (303)

365. *E. tetraptera* (305)

368. *E. forrestiana* subsp.
dolichorhyncha (307)

371. *E. myriadena* (310)

374. *E. brachycorys* (311)

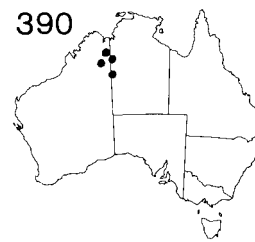
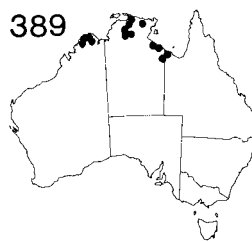
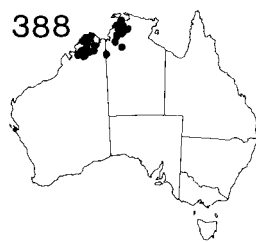
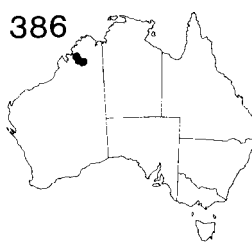
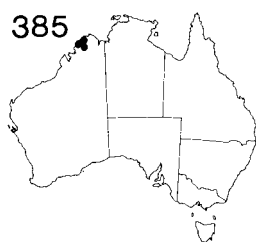
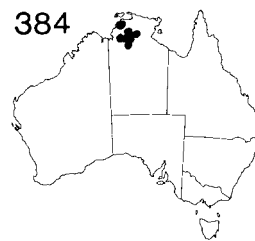
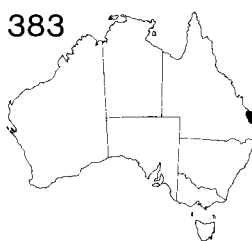
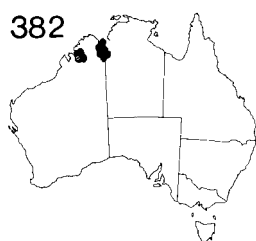
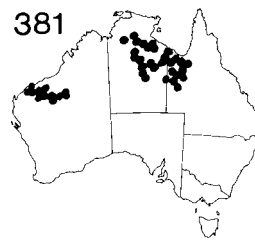
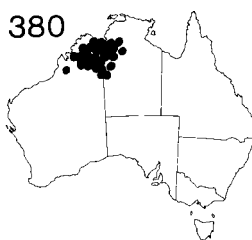
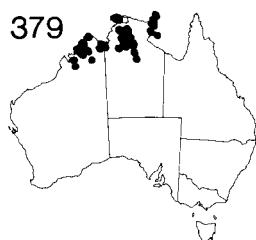
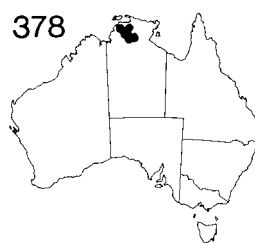
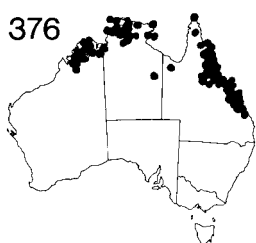
363. *E. angulosa* (305)

366. *E. stoatei* (306)

369. *E. dundasii* (307)

372. *E. cylindrocarpa* (310)

375. *E. cyclostoma* (311)



376. *E. alba* (312)

379. *E. bigalerita* (313)

382. *E. confluens* (316)

385. *E. rupestris* (317)

388. *E. apodophylla* (319)

377. *E. platyphylla* (313)

380. *E. brevifolia* (314)

383. *E. hallii* (317)

386. *E. mooreana* (318)

389. *E. herbertiana* (319)

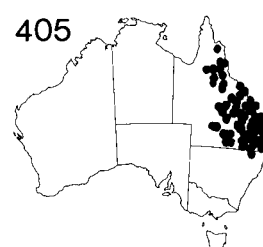
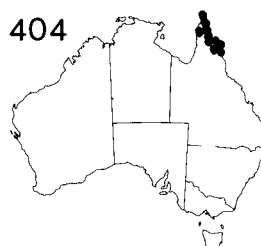
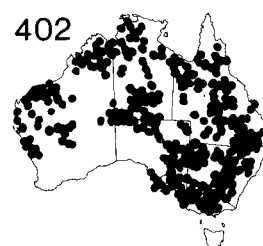
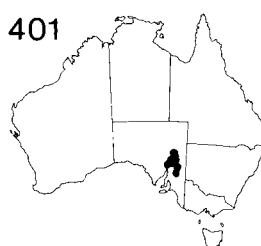
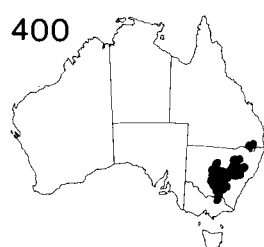
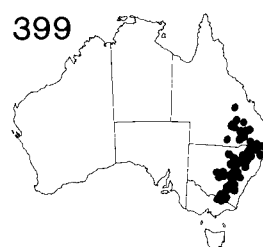
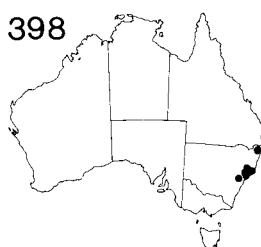
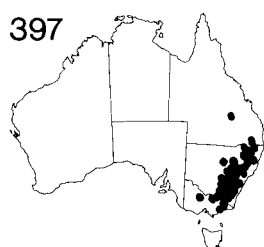
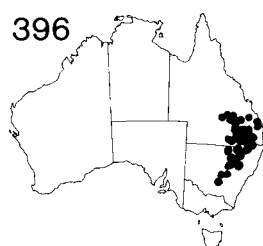
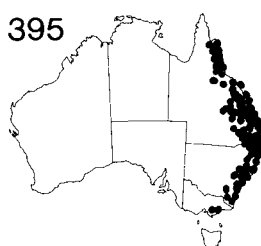
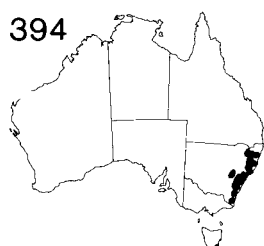
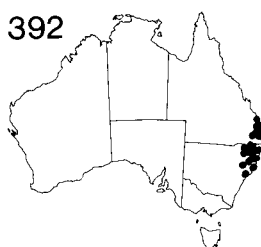
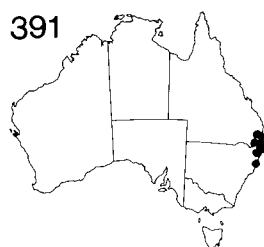
378. *E. tintinnans* (313)

381. *E. leucophloia* (316)

384. *E. umbrawarrensensis* (317)

387. *E. houseana* (318)

390. *E. cupularis* (320)



391. *E. seeana* (320)

394. *E. amplifolia* (323)

397. *E. blakelyi* (325)

400. *E. dwyeri* (326)

403. *E. rudis* (329)

392. *E. bancroftii* (321)

395. *E. tereticornis* (324)

398. *E. glaucina* (325)

401. *E. flindersii* (327)

404. *E. brassiana* (330)

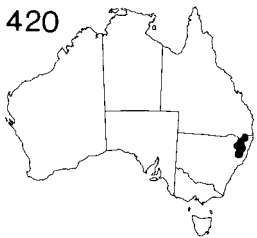
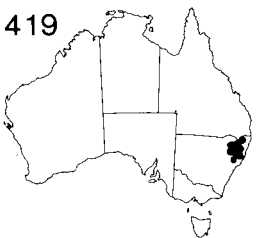
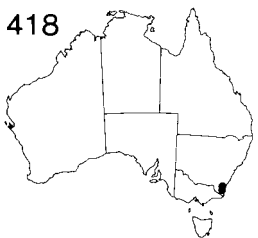
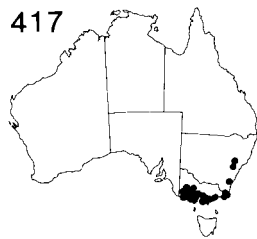
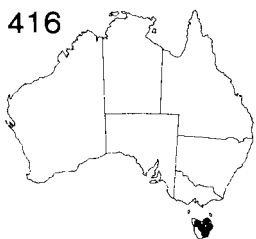
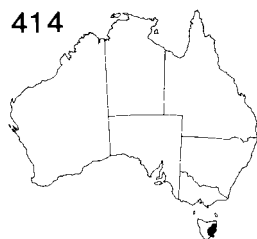
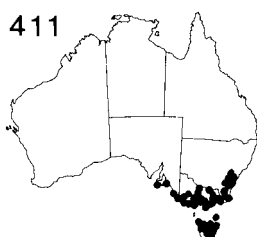
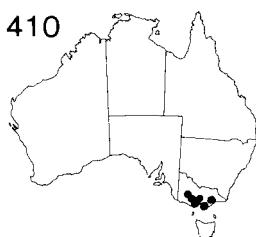
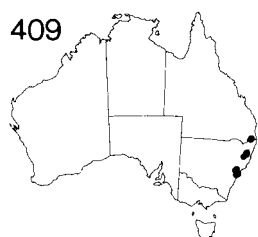
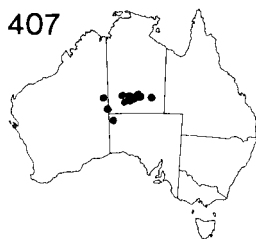
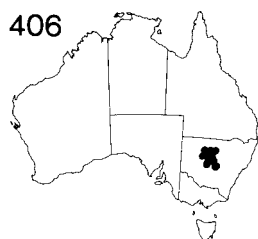
393. *E. parramattensis* (321)

396. *E. chloroclada* (324)

399. *E. dealbata* (326)

402. *E. camaldulensis* (327)

405. *E. exserta* (330)



406. *E. morrisii* (331)

409. *E. michaeliana* (332)

412. *E. camphora* (334)

415. *E. aggregata* (337)

418. *E. parvifolia* (339)

407. *E. gillennii* (331)

410. *E. yarraensis* (333)

413. *E. brookeriana* (336)

416. *E. rodwayi* (337)

419. *E. acaciiformis* (339)

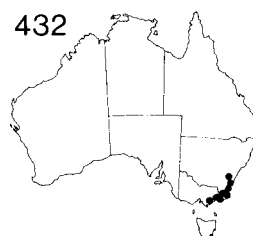
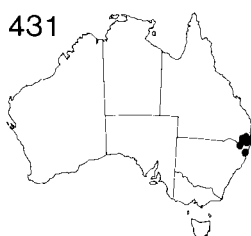
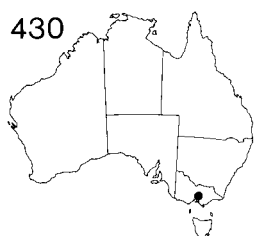
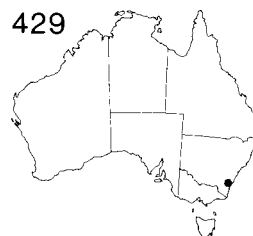
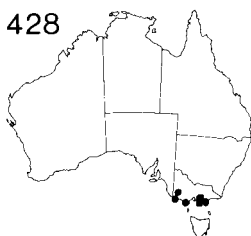
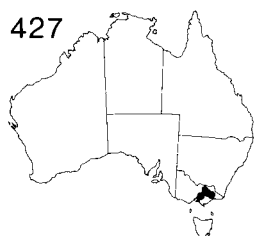
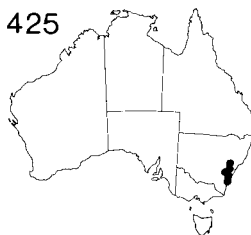
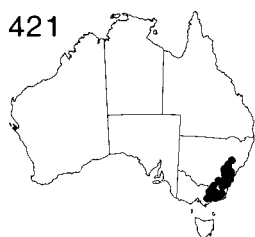
408. *E. pumila* (332)

411. *E. ovata* (334)

414. *E. barberi* (336)

417. *E. aromaphloia* (338)

420. *E. nicholii* (339)



421. *E. mannifera* subsp. *mannifera* (340)

424. *E. mannifera* subsp. *praecox* (341)

427. *E. neglecta* (344)

430. *E. crenulata* (345)

433. *E. bridgesiana* (347)

422. *E. mannifera* subsp. *elliptica* (341)

425. *E. mannifera* subsp. *gullickii* (342)

428. *E. kitsoniana* (345)

431. *E. dunnii* (346)

434. *E. malacoxylon* (347)

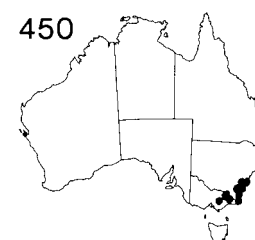
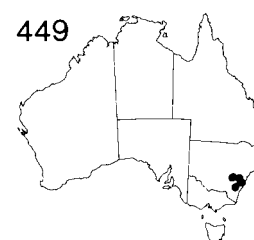
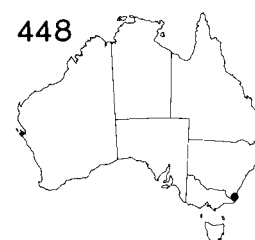
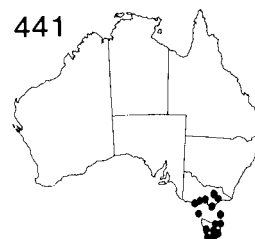
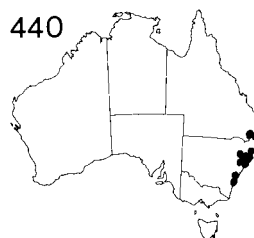
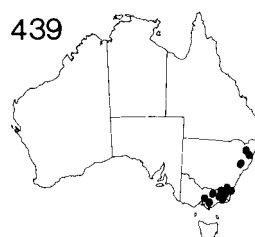
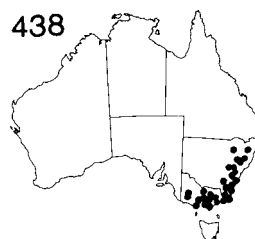
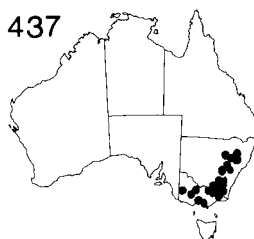
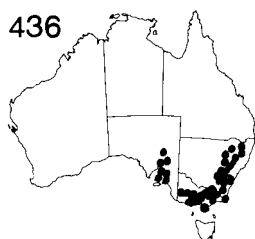
423. *E. mannifera* subsp. *maculosa* (341)

426. *E. scoparia* (342)

429. *E. sturgissiana* (345)

432. *E. angophoroides* (346)

435. *E. banksii* (348)



436. *E. goniocalyx* (348)

439. *E. nitens* (350)

442. *E. globulus* subsp.
bicostata (353)

445. *E. vernicosa* (354)

448. *E. imlayensis* (356)

437. *E. nortonii* (349)

440. *E. quadrangulata* (352)

443. *E. globulus* subsp.
pseudoglobulus (353)

446. *E. subcrenulata* (356)

449. *E. macarthurii* (357)

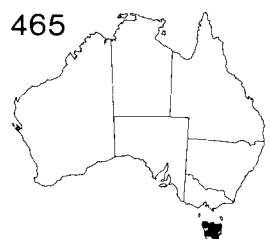
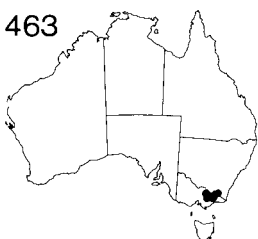
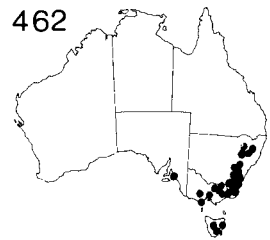
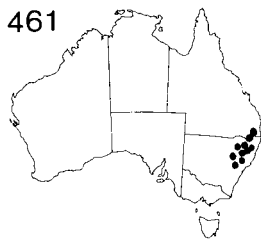
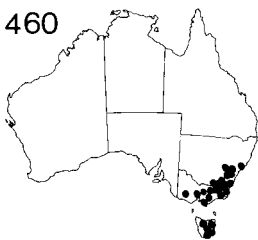
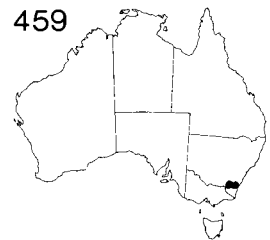
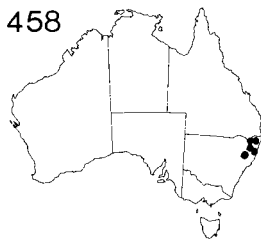
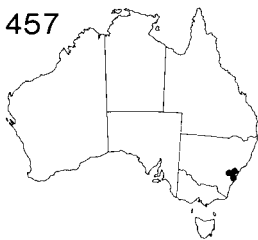
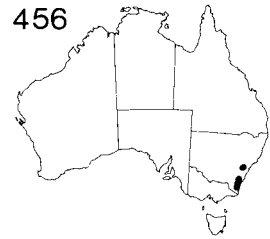
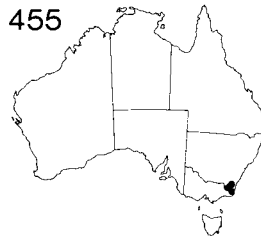
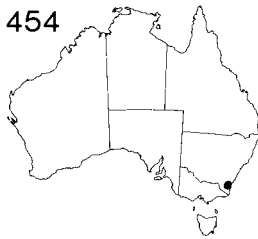
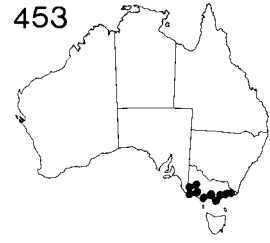
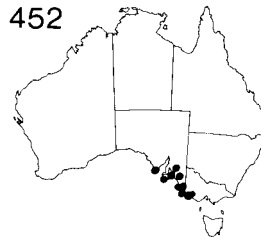
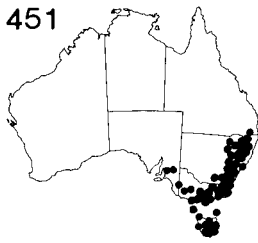
438. *E. cypellocarpa* (349)

441. *E. globulus* subsp.
globulus (352)

444. *E. globulus* subsp.
maidenii (354)

447. *E. johnstonii* (356)

450. *E. smithii* (357)



451. *E. viminalis* subsp.
viminalis (358)

454. *E. wilcoxii* (360)

457. *E. benthamii* var.
benthamii (361)

460. *E. dalrympleana* subsp.
dalrympleana (364)

463. *E. chapmaniana* (365)

452. *E. viminalis* subsp.
cygnetensis (359)

455. *E. badjensis* (360)

458. *E. benthamii* var.
dorrigoensis (362)

461. *E. dalrympleana* subsp.
heptantha (364)

464. *E. glaucescens* (366)

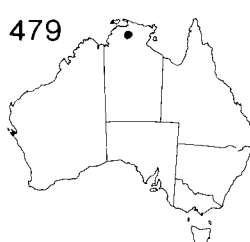
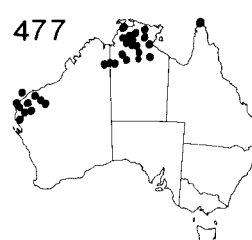
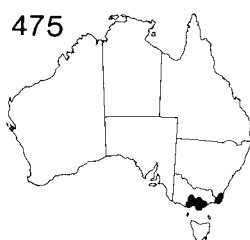
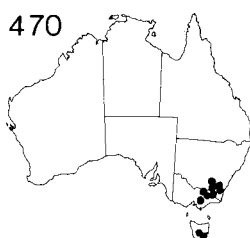
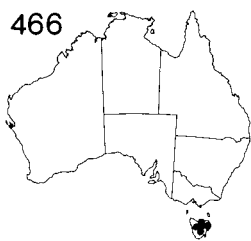
453. *E. pryoriana* (359)

456. *E. baeuerlenii* (361)

459. *E. kartzoffiana* (362)

462. *E. rubida* (365)

465. *E. gunnii* (366)



466. *E. archeri* (367)

469. *E. urnigera* (368)

472. *E. pulverulenta* (371)

475. *E. cephalocarpa* (372)

478. *E. oligantha* (374)

467. *E. saxatilis* (367)

470. *E. perriniana* (370)

473. *E. nova-anglica* (371)

476. *E. leptophleba* (373)

479. *E. koolpinensis* (376)

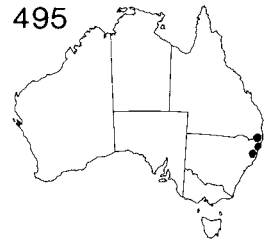
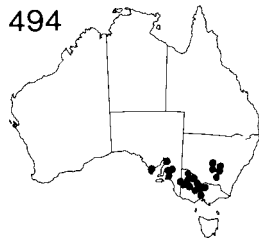
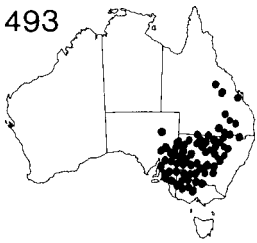
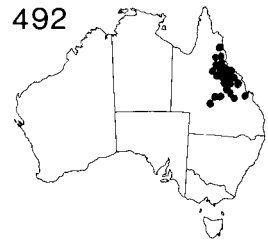
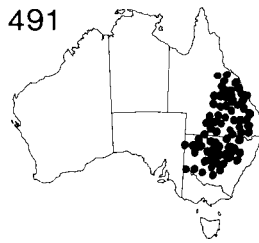
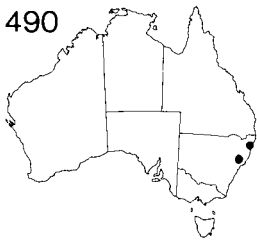
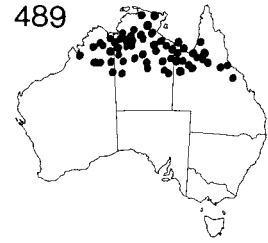
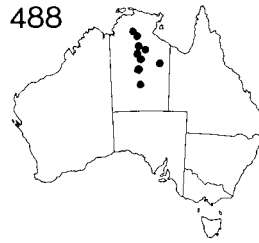
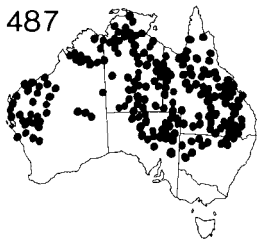
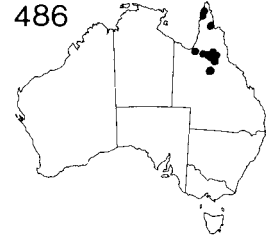
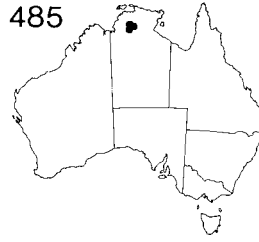
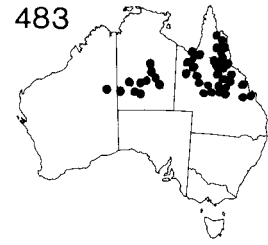
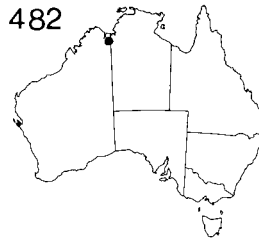
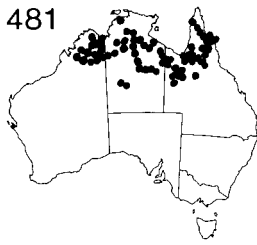
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471. *E. cordata* (370)

474. *E. cinerea* (372)

477. *E. patellaris* (374)

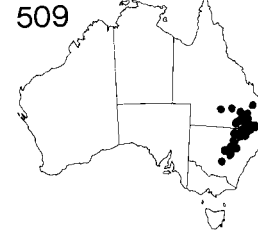
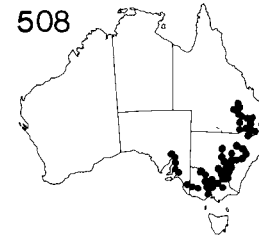
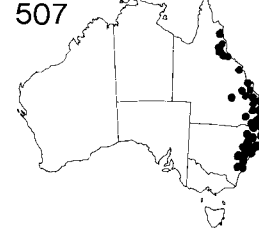
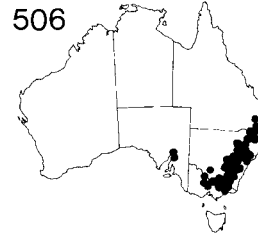
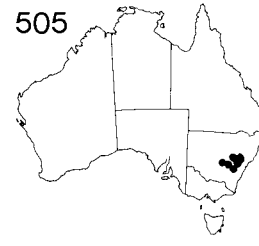
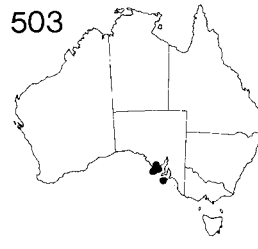
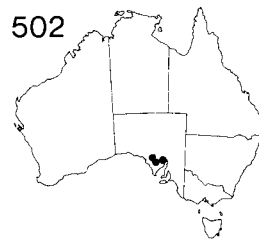
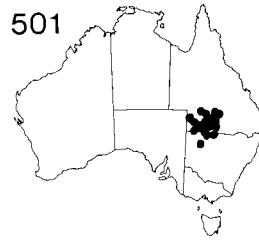
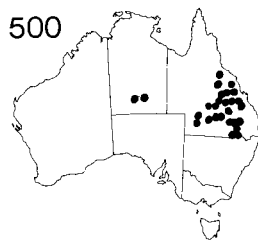
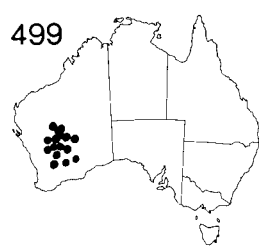
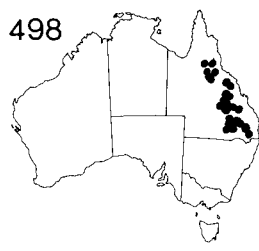
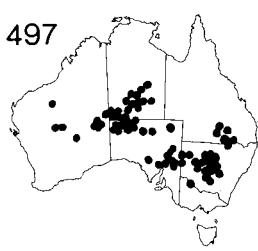
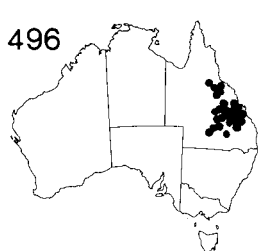
480. *E. fitzgeraldii* (376)



481. *E. argillacea* (377)
 484. *E. tectifera* (378)
 487. *E. microtheca* (379)
 490. *E. largeana* (382)
 493. *E. largiflorens* (384)

482. *E. chlorophylla* (377)
 485. *E. distans* (379)
 488. *E. cyanoclada* (380)
 491. *E. populnea* (383)
 494. *E. behriana* (384)

483. *E. normantonensis* (378)
 486. *E. microneura* (379)
 489. *E. pruinosa* (380)
 492. *E. brownii* (383)
 495. *E. rummeryi* (386)



496. *E. cambageana* (387)

499. *E. lucasii* (389)

502. *E. lansdowneana* subsp.
lansdowneana (392)

505. *E. dawsonii* (393)

508. *E. microcarpa* (396)

497. *E. intertexta* (387)

500. *E. thozetiana* (390)

503. *E. lansdowneana* subsp.
albopurpurea (392)

506. *E. albens* (394)

509. *E. pilligaensis* (397)

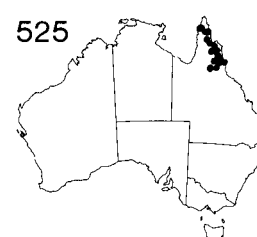
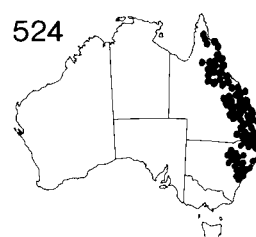
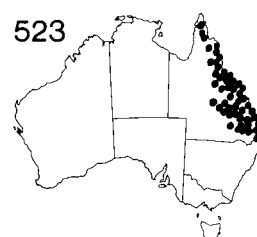
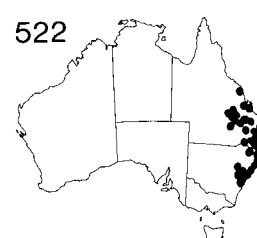
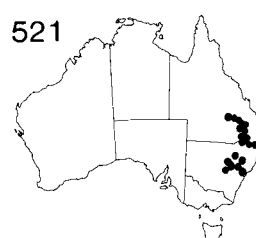
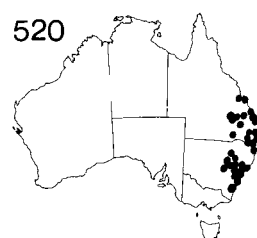
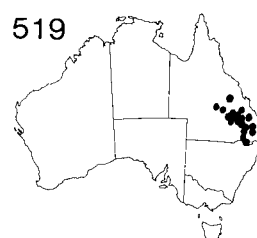
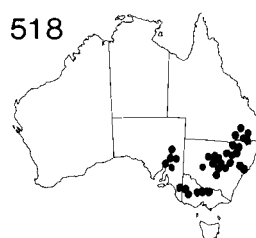
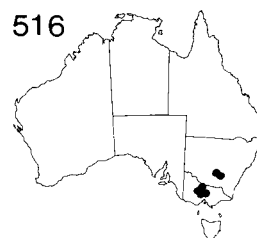
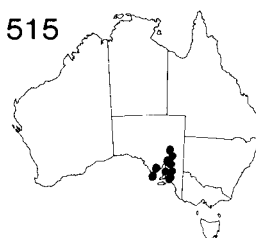
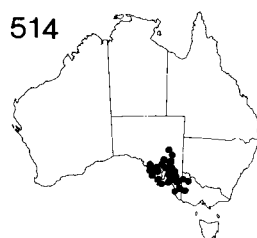
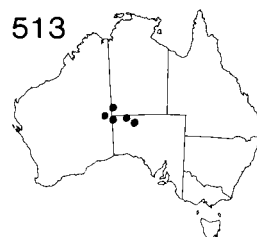
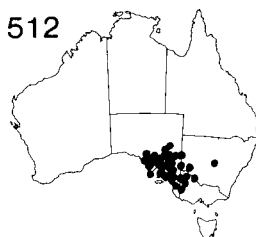
498. *E. orgadophila* (388)

501. *E. ochrophloia* (390)

504. *E. petraea* (393)

507. *E. moluccana* (396)

510. *E. argophloia* (398)



511. *E. bosistoana* (398)

514. *E. odorata* var.
odorata (400)

517. *E. froggattii* (402)

520. *E. fibrosa* subsp.
fibrosa (404)

523. *E. drepanophylla* (407)

512. *E. porosa* (399)

515. *E. odorata* var.
angustifolia (400)

518. *E. viridis* (402)

521. *E. fibrosa* subsp.
nubila (405)

524. *E. crebra* (407)

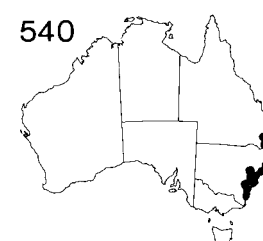
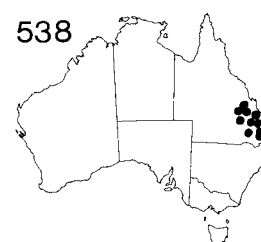
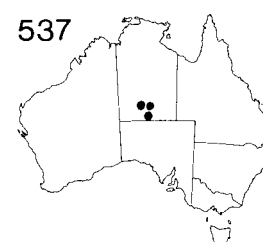
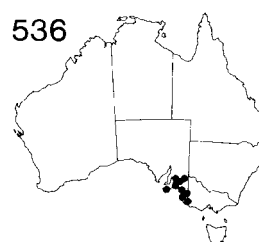
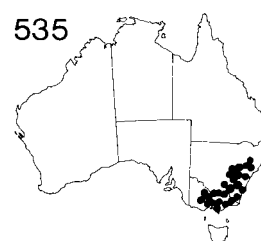
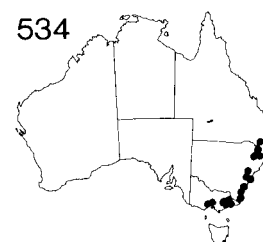
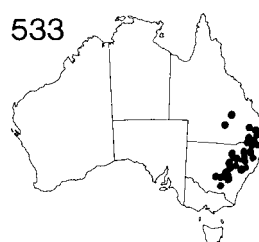
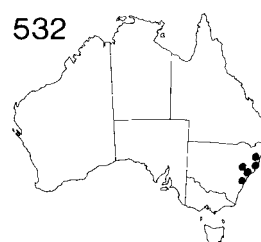
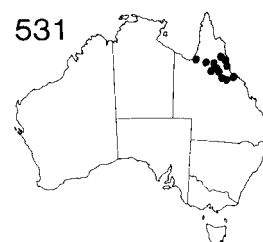
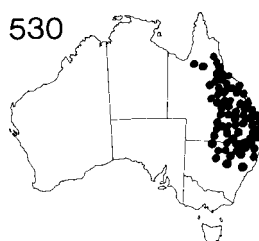
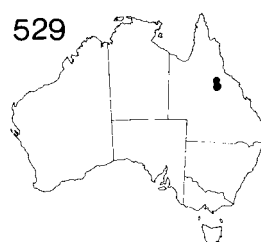
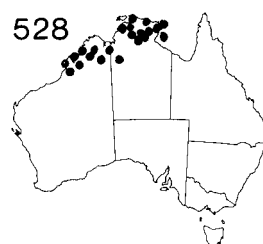
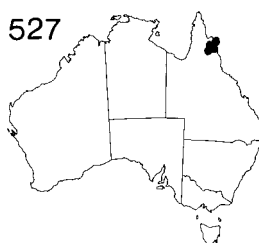
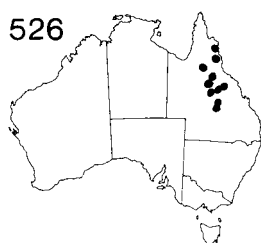
513. *E. sparsa* (399)

516. *E. polybractea* (402)

519. *E. decorticans* (403)

522. *E. siderophloia* (405)

525. *E. cullenii* (408)



526. *E. whitei* (408)

529. *E. quadricostata* (409)

532. *E. rudderi* (412)

535. *E. polyanthemos* (413)

538. *E. melanoleuca* (416)

527. *E. staigeriana* (408)

530. *E. melanophloia* (411)

533. *E. conica* (412)

536. *E. fasciculosa* (415)

539. *E. tetrapleura* (417)

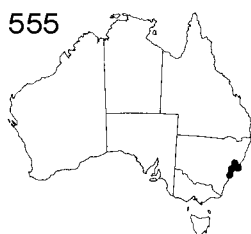
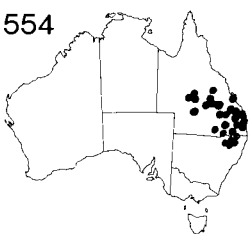
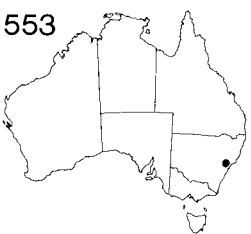
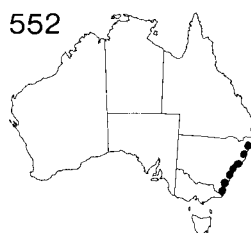
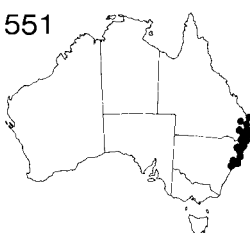
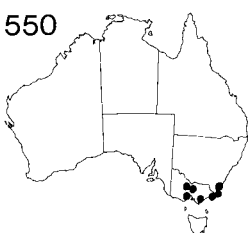
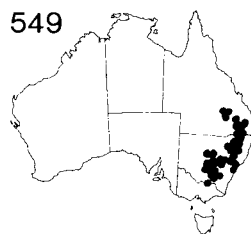
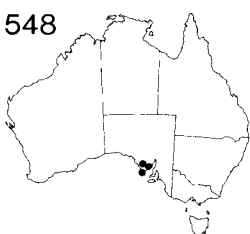
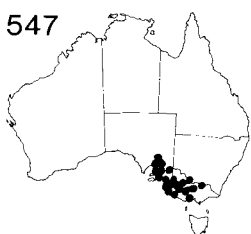
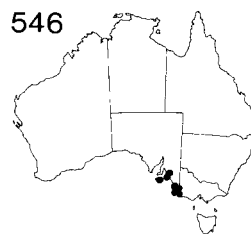
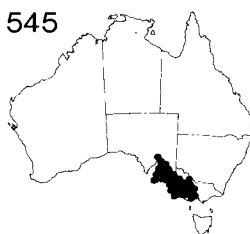
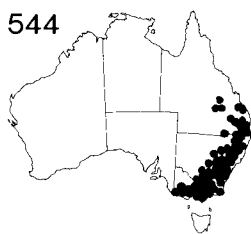
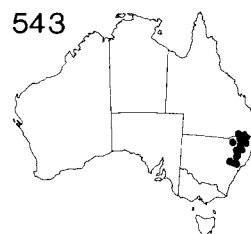
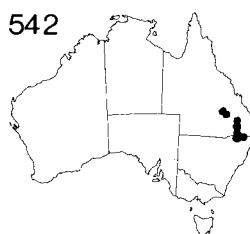
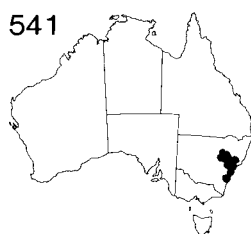
528. *E. jensenii* (409)

531. *E. shirleyi* (411)

534. *E. baueriana* (413)

537. *E. lucens* (415)

540. *E. paniculata* (417)



541. *E. beyeri* (417)

544. *E. melliodora* (421)

547. *E. leucoxylon* subsp.
pruinosa (424)

550. *E. sideroxylon* subsp.
tricarpa (425)

553. *Angophora costata*
subsp. *euryphylla* (449)

542. *E. panda* (419)

545. *E. leucoxylon* subsp.
leucoxylon (422)

548. *E. leucoxylon* subsp.
petiolaris (424)

551. *E. microcorys* (426)

554. *Angophora costata*
subsp. *leiocarpa* (450)

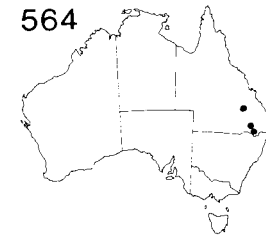
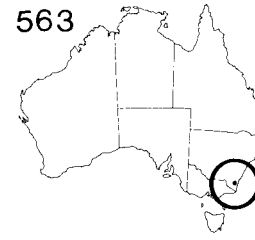
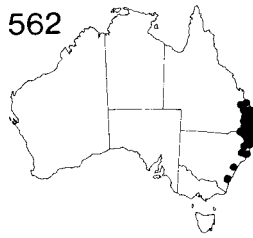
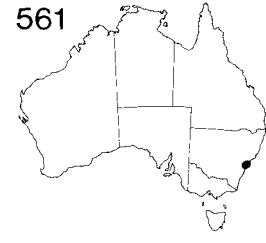
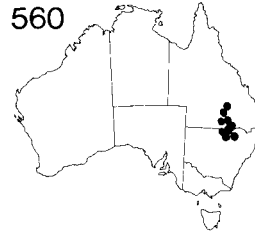
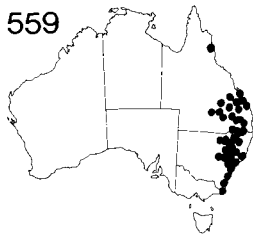
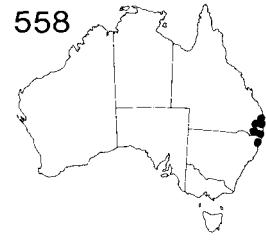
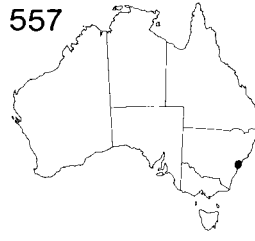
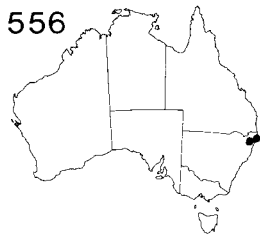
543. *E. caleyi* (420)

546. *E. leucoxylon* subsp.
megalocarpa (422)

549. *E. sideroxylon* subsp.
sideroxylon (425)

552. *Angophora costata* subsp.
costata (449)

555. *Angophora bakeri*
subsp. *bakeri* (450)



556. *Angophora bakeri*
subsp. *paludosa* (451)

559. *Angophora floribunda*
(452)

562. *Angophora*
subvelutina (454)

557. *Angophora bakeri*
subsp. *crassifolia* (451)

560. *Angophora*
melanoxylon (452)

563. *Eucalyptus deuaensis* (147)

558. *Angophora woodsiana* (451)

561. *Angophora hispida* (454)

564. *Eucalyptus virens* (419)

APPENDIX

New taxa, combinations and lectotypifications

New taxa, combinations and lectotypifications occurring in this Volume of the *Flora of Australia* are formally published below. All are in the genus *Eucalyptus*. Contributors are alphabetically arranged. For economy the entries are brief; the treatment of new taxa is more comprehensive in the main text. The date of publication of this Volume will be given in Volume 3.

EUCALYPTUS

D.J. & S.G.M.Carr

Eucalyptus deserticola D.Carr & S.Carr, nom. nov.

Eucalyptus desertorum D.Carr & S.Carr, *Eucalyptus* 1: 102 (1985), non *E. desertorum* Naudin (1891).

This name was foreshadowed in D.J. & S.G.M.Carr, *Eucalyptus* II: 311 (1987). It is formed from the Latin *desertum* (desert) with the suffix *-cola* (dweller).

EUCALYPTUS

G.M.Chippendale

For the series here described as new the names have been derived from the epithet of the type species. The numbers in brackets after the sentence giving the series content are those of the included species in the main text of this volume.

Selection of lectotypes has been based on an assessment of the species included in the protologue and here retained in the series. Where several species were equally appropriate, an early-named one has been selected as representing the original author's concept. For some of Maiden's names a lectotype has been chosen so as to maintain current usage of other series names.

Eucalyptus* ser. *Accedentes Chippendale, ser. nov.

Type: *E. accedens* W.Fitzg.

Arbores vel frutices 'mallees'. Cortex laevis, interdum parce laminata. Folia juvenilia alterna, petiolata, concolora vel parum discolora. Folia adulta alterna, petiolata, coriacea, concolora. Conflorescentiae axillares, simplices; umbelli 7–11 floribus; pedunculus applanatus. Alabastra ovoidea vel obovoidea ad clavata vel cylindrico-conica. Fructus cylindrici, hemisphaerici, obconici vel subpyriformes; discus deplanatus ad descendens; valvi 3–5, inclusi vel exserti. Semina orbicularia vel elliptica, reticulata, cinereo-brunnea.

A series of 5 species (230–234).

Eucalyptus* ser. *Annulares (Blakely) Chippendale, stat. nov.

E. subser. *Annulares* Blakely, *Key Eucalypts* 20, 98 (1934); lecto (here chosen): *E. resinifera* Smith

This species is typical of Blakely's concept of the taxon.

APPENDIX

Eucalyptus ser. **Bakerianae** Chippendale, ser. nov.

Type: *E. bakeri* Maiden

Frutices ‘mallees’ vel arbores parvae. Cortex in trunco fibrosa, cinerea vel cinereo-brunnea, supra laevis, alba, flava, olivacea vel cinerea. Folia juvenilia alterna, sessilia vel petiolata, viridia, concolora. Folia adulta alterna, petiolata, nitentia, concolora. Conflorescentiae axillares, simplices; umbelli 7–13 floribus. Alabastra ovoidea vel cylindrica. Fructus hemisphaerici; discus modice latus, deplanatus, ascendens vel descendens; valvi 3, exserti, 3-fissi. Semina orbicularia vel elliptica, reticulata, cinereo-brunnea.

A series of 3 species (258–260).

Eucalyptus ser. **Brockwayanae** Chippendale, ser. nov.

Type: *E. brockwayi* C.Gardner

Arbores. Cortex laevis, alba vel cinerea ad rufo-brunnea, squamosis decidua. Folia juvenilia conferta, alterna vel fere opposita, sessilia, elliptica, pallide viridia, concolora. Folia adulta alterna, petiolata, nitentia, viridia, concolora. Conflorescentiae axillares; umbelli simplices, 7–15 floribus. Alabastra ovoidea vel subcylindrica. Fructus globulares collo brevi; discus latus, verticaliter descendens; valvi 3, inclusi. Semina elliptica, leviter reticulata, brunnea vel cinereo-brunnea.

A series of 1 species (261).

Eucalyptus ser. **Buxuales** Blakely, *Key Eucalypts* 55, 230 (1934)

Lecto (here chosen): *E. brownii* Maiden & Cabbage

E. subser *Subplatyphyllae* Blakely, *op. cit.* 56, 233; lecto (here chosen): *E. brownii* Maiden & Cabbage

Of the species included by Blakely, *E. brownii* appears the appropriate lectotype. *E. behriana* is a mallee, *E. bicolor* is a doubtful name, and *E. largeana* was newly described in that work.

Eucalyptus ser. **Cabbageanae** Chippendale, ser. nov.

Type: *E. cabbageana* Maiden

Arbores. Cortex in trunco fibrosa, interdum tessellata, atro-cinerea, supra laevis, alba vel cinerea. Folia juvenilia alterna, petiolata, ovata, viridia, concolora. Folia adulta alterna, petiolata, lanceolata, viridia, concolora. Conflorescentiae terminales, paniculatae; umbelli 7 floribus. Alabastra clavata vel ovoidea. Fructus obconici vel subpyriformes, leviter costati; discus angustus, deplanatus vel descendens; valvi 4 vel 5, inclusi. Semina suborbicularia, elliptica vel ± cubica, leviter reticulata, cinereo-brunneo-atra.

A monotypic series (464).

Eucalyptus ser. **Cochleatae** Maiden, *Crit. Revis. Eucalyptus* 7: 169 (1925)

Lecto (here chosen): *E. buprestium* F.Muell.

By selecting this of the two names included by Maiden the usage of ser. *Diversiformes* is maintained.

Eucalyptus ser. *Corymbosae* Blakely, *Key Eucalypts* 15, 73 (1934)

Lecto (here chosen): *E. dichromophloia* F.Muell.

This species is chosen as lectotype from those listed in Blakely’s subser. *Eucorymbosae* as representative of his concept of the series.

Eucalyptus ser. **Curtisianae** Chippendale, ser. nov.

Type: *E. curtisii* Blakely & C.White

Arbores vel frutices ‘mallees’. Cortex omnino laevis. Folia juvenilia alterna, petiolata, lanceolata, viridia, discolora. Folia adulta subopposita vel alterna, petiolata, discolora. Conflorescentiae paniculatae corymbosae terminales; umbelli 3–7 floribus. Alabastra ovoidea ad clavata. Sepala et petala 4, libera, imbricata. Fructus hemisphaerici ad campanulati; discus latus, descendens; valvi 4 vel 5, inclusi. Semina conspicue elongata, flavo-brunnea.

A monotypic series (81).

Eucalyptus ser. **Curviptera** Maiden, *Crit. Revis. Eucalyptus* 7: 117 (1925)

Lecto (here chosen): *E. burracoppinensis* Maiden

Of the 2 species included by Maiden this appears to have been better known to him and therefore more representative of his series concept.

Eucalyptus ser. **Dawsonianae** Chippendale, ser. nov.

Type: *E. dawsonii* R.Baker

Arbores. Cortex laevis, cinerea, alba vel flava, laciniis vel squamis decorticans. Folia juvenilia alterna, petiolata, orbicularia ad late ovata, cinereo-viridia, concolora. Folia adulta alterna, petiolata, lanceolata, viridia vel cinereo-viridia, concolora. Conflorescentiae terminales, paniculatae; umbelli 7 floribus. Alabastra obovoidea, clavata vel fusiformia, glauca. Fructus obconici; discus angustus, descendens; valvi 3 vel 4, aequati vel inclusi. Semina suborbicularia ad elliptica, leviter reticulata, cinereo-brunnea.

A monotypic series (472).

Eucalyptus ser. **Diversiformes** Blakely, *Key Eucalypts* 40, 169 (1934)

Lecto (here chosen): *E. diversifolia* Bonpl.

Of the 4 species included by Blakely, *E. patens* and *E. todtiana* are now transferred to ser. *Neuroptera* Maiden. *E. diversifolia* is the more variable of the other two and is considered more representative of the diversity reflected in Blakely’s name.

Eucalyptus ser. **Dundasianae** Chippendale, ser. nov.

Type: *E. dundasii* Maiden

Arbores. Cortex in trunco aspera, tessellata, atra, supra laevis, rufo-brunnea ad cinerea. Folia juvenilia alterna, petiolata, ovata, concolora. Folia adulta alterna, petiolata, lanceolata, nitentia, concolora. Conflorescentiae axillares; umbelli simplices, 7 floribus. Alabastra cylindrica. Fructus cylindrici, bicostati; discus latus, verticaliter descendens; valvi 3, arcte inclusi. Semina elliptica ad lunata, reticulata, brunnea.

A monotypic series (347).

Eucalyptus ser. **Ebbanoenses** Chippendale, ser. nov.

Type: *E. ebbanoensis* Maiden

Frutices ‘mallees’. Cortex laevis. Folia juvenilia subopposita vel alterna, petiolata, ovata, concolora, primum stellato-hirsuta. Folia adulta alterna, interdum opposita, petiolata, concolora. Conflorescentiae axillares, simplices; umbelli 3 floribus. Alabastra pyriformia. Stamina fasciculis 4. Fructus hemisphaerici; discus applanatus vel parum convexus; valvi 3, exserti. Semina ovalia vel D-formia, non alata, atro-cinerea.

A monotypic series (68).

APPENDIX

Eucalyptus ser. **Elongatae** Blakely, *Key Eucalypts* 28, 167 (1934)

Lecto (here chosen): *E. erythronema* Turcz.

Of the 3 species included in this taxon by Blakely, *E. erythronema* is selected as lectotype as representative of his concept.

Eucalyptus ser. *Eudesmiae* Blakely, *Key Eucalypts* 13, 68 (1934)

Lecto (here chosen): *Eucalyptus tetragona* (R.Br.) F.Muell.

In publishing this name Blakely did not cite either *Eudesmia* R.Br. or *Eucalyptus* subser. *Eudesmiae* Benth., hence his taxon is regarded as new. Nonetheless it appears to derive from the earlier taxon, and the type of Brown's generic name is therefore selected as lectotype for this series.

Eucalyptus ser. **Foveolatae** Maiden, *Crit. Revis. Eucalyptus* 7: 144 (1925)

Lecto (here chosen): *E. aggregata* Deane & Maiden

This species is representative of Maiden's typical concept in having finely reticulate seeds (described by him as 'minutely pitted'). With its selection the name ser. *Viminales*, which contains species with similar seeds included by Maiden, can be maintained.

Eucalyptus ser. **Heterophloiae** Blakely, *Key Eucalypts* 63, 262 (1934)

Lecto (here chosen): *E. polyanthemus* Schauert

Of the species included by Blakely and still placed in the series, *E. polyanthemus* is selected as representative of his concept of the series.

Eucalyptus ser. **Heteroptera** Maiden, *Crit. Revis. Eucalyptus* 7: 115 (1925)

Lecto (here chosen): *E. tetragona* (R.Br.) F.Muell.

This species represents Maiden's principal concept of the series. *E. tetraptera* is, on other characters, distantly related.

Eucalyptus ser. **Heterostemones** Benth., *Fl. Austral.* 3: 190, 209 (1867)

Lecto (here chosen): *E. gracilis* F.Muell.

Of the species included by Bentham, *E. gracilis* is the only one retained in the series.

Eucalyptus subser. *Holocalyces* Blakely, *Key Eucalypts* 14, 71 (1934)

Lecto (here chosen): *E. baileyana* F.Muell.

E. baileyana agrees more completely with Blakely's diagnosis in having stellate-tomentose juvenile leaves.

Eucalyptus ser. **Howittianae** Chippendale, ser. nov.

Type: *E. howittiana* F.Muell.

Arbores. Cortex omnino subfibrosa, compacta, cinerea vel cinereo-brunnea. Folia juvenilia subopposita, petiolata, late lanceolata ad suborbicularia, discolora. Folia adulta alterna, petiolata, discolora. Conflorescentiae terminales vel axillares, compositae; umbelli 7–11 floribus. Alabastra fusiformia, sessilia. Fructus subglobulares; discus angustus, descendens; valvi 3, inclusi. Semina rotundata vel elliptica, flavo-brunnea.

A monotypic series (183).

Eucalyptus ser. **Inclusae** (Benth.) Chippendale, stat. nov.

E. subser. *Inclusae* Benth., *Fl. Austral.* 5: 197, 246 (1867); lecto (here chosen): *E. diversicolor* F.Muell.

E. subser. *Inclusae* Blakely, *Key Eucalypts* 19, 94 (1934), *nom. illeg.* non Benth. (1867); lecto (here chosen): *E. diversicolor* F.Muell.

This is the only species of those included by Bentham in subser. *Inclusae* to be retained in the series.

Eucalyptus ser. **Insulares** Chippendale, ser. nov.

Type: *E. insularis* Brooker

Frutices ‘mallees’. Cortex omnino laevis, glandulosa. Folia juvenilia alterna vel subopposita, petiolata, lanceolata. Folia adulta alterna, petiolata, concolora. Conflorescentiae axillares, simplices; umbelli multiflori. Alabastra clavata. Fructus ovoidei; discus latus, planus vel obliquus, verticaliter descendens; valvi 3, inclusi. Semina pyramidalia, ±elongata, costata, atro-brunnea.

A monotypic series (104).

Eucalyptus ser. **Jacobsianae** Chippendale, ser. nov.

Type: *E. jacobsiana* Blakely

Arbores. Cortex fibrosa vel subtessellata. Folia juvenilia opposita vel alterna, petiolata, setosa, discolora. Folia adulta alterna, petiolata, discolora. Conflorescentiae paniculae terminales, corymbosae. Alabastra obovoidea vel clavata; operculum depresso-hemisphaerico-conicum. Fructus urceolati, fragiles; discus latus, arcte descendens; valvi obscuri, alte inclusi. Semina plerumque elliptica, non alata, rufo-brunnea.

A monotypic series (54).

Eucalyptus ser. **Johnsonianae** Chippendale, ser. nov.

Type: *E. johnsoniana* Brooker & Blaxell

Frutices ‘mallees’. Cortex infera laminato-fibrosa, supera laevis. Folia juvenilia opposita, petiolata. Folia adulta alterna, petiolata, concolora. Conflorescentiae axillares, simplices; umbelli floribus 7. Alabastra clavata. Fructus hemisphaerici ad globulares; discus latus, descendens; valvi 3 vel 4, inclusi ad parum exserti. Semina pyramidalia, alata, brunnea.

A monotypic series (102).

Eucalyptus ser. **Jucundae** Chippendale, ser. nov.

Type: *E. jucunda* C.Gardner

Frutices ‘mallees’ vel arbores. Cortex laevis, interdum aspera vel squamosa ad basin trunci. Glandes oleosi in et medulla et cortice. Folia juvenilia non visa. Folia adulta opposita vel alterna, petiolata, concolora. Conflorescentiae ut videtur simplices, sed vere compositae, ex umbellis 3 simplicibus sessilibus 3-floratis constantes. Alabastra quadrangularia vel cylindrica. Fructus cupulares, ovoidei vel globulares; discus angustus; valvi 3 vel 4. Semina irregulariter pyramidalia, ala angusta hyalina, cinereo-nigra.

A series of 2 species (69, 70).

Eucalyptus ser. *Kochioides* Maiden, *op. cit.* 114.

Lecto (here chosen): *E. macrocarpa* Hook.

The seeds of this species represent Maiden’s concept most closely.

APPENDIX

Eucalyptus ser. **Kruseanae** Chippendale, ser. nov.

Type: *E. kruseana* F.Muell.

Frutices ‘mallees’. Cortex laevis, cinereo-brunnea, squamosis decidua. Folia juvenilia opposita, interdum alterna, petiolata, glauca, concolora. Folia adulta opposita, interdum alterna, sessilia vel petiolata, glauca, concolora. Conflorescentiae axillares, simplices; umbelli 7 floribus. Alabastra ovoidea ad conica, glauca. Fructus cylindrici ad obconici, glauci; discus angustus, verticaliter descendens; valvi 3 vel 4, inclusi vel raro exserti. Semina lunata, reticulata, brunnea vel rufo-brunnea.

A series of 2 species (242, 243).

Eucalyptus ser. **Lepidotae-fimbriatae** Maiden, *Crit. Revis. Eucalyptus* 7: 152 (1925)

Lecto (here chosen): *E. canaliculata* Maiden

This species is representative of Maiden’s concept of the series and its selection allows continued use of other established names, especially ser. *Viminalae*.

Eucalyptus ser. **Leptospermae** (Blakely) Chippendale, stat. nov.

E. subser. *Leptospermae* Blakely, *Key Eucalypts* 14, 70 (1934); lecto (here chosen): *E. tenuipes* (Maiden & Blakely) Blakely & C.White

Of the 2 species included by Blakely, *E. curtisii* is here moved to ser. *Curtisianae*, leaving *E. tenuipes* as the only remaining species in ser. *Leptospermae*.

Eucalyptus ser. **Longitudinales** Blakely, *Key Eucalypts* 49, 203 (1934)

Lecto (here chosen): *E. stellulata* Sieber ex DC.

E. subser. *Cylindriformes* Blakely, *op. cit.* 49, 206; lecto (here chosen): *E. stellulata* Sieber ex DC.

Blakely’s ser. *Longitudinales* is now restricted to the 3 species of his subser. *Cylindriformes*. *E. stellulata* is selected as lectotype of both names, as representative of his concept.

Eucalyptus ser. **Loxophlebae** Chippendale, ser. nov.

Type: *E. loxophleba* Benth.

Arbores vel frutices ‘mallees’. Cortex in trunco fibrosa, supra laevis, vel omnino laevis. Folia juvenilia alterna, petiolata, ovata, interdum cordata, cinereo-viridia vel glauca, concolora. Folia adulta alterna, petiolata, nitentia, concolora, venis lateralibus sub angulo 15°–20°. Conflorescentiae axillares, simplices; umbelli 7–11 floribus. Alabastra clavata. Fructus obconici; discus latus, verticaliter descendens; valvi 3 vel 4, inclusi. Semina lunata, reticulata, rufo-brunnea.

A series of 1 species (244).

Eucalyptus ser. **Lucasianae** Chippendale, ser. nov.

Type: *E. lucasii* Blakely

Arbores vel frutices ‘mallees’. Cortex laevis, interdum ad basin aspera. Folia adulta alterna, petiolata, lanceolata, concolora. Conflorescentiae terminales, paniculatae, interdum axillares, simplices; umbelli 7 floribus. Alabastra clavata. Fructus ovoidei; discus angustus, descendens; valvi 4 vel 5, inclusi. Semina suborbicularia ad elliptica, leviter reticulata, cinereo-brunneo-atra.

A monotypic series (467).

Eucalyptus ser. **Maculatae** (Blakely) Chippendale, stat. nov.

E. subser. *Maculatae* Blakely, *Key Eucalypts* 18, 93 (1934). T: *E. maculata* Hook.

Eucalyptus ser. **Meglanthae** (Blakely) Chippendale, stat. nov.

E. subser. *Meglanthae* Blakely, *Key Eucalypts* 39, 169 (1934). T: *E. cloeziana* F.Muell.

Eucalyptus ser. **Merrickianae** Chippendale, ser. nov.

Type: *E. merrickiae* Luehm.

Frutices ‘mallees’. Cortex laevis, cinerea vel cinereo-brunnea, interdum ad basin aspera. Folia adulta alterna, petiolata, nitentia, concolora. Conflorescentiae axillares; umbelli simplices, 3 vel 7–11 floribus. Alabastra cylindrica, anguste conica vel obovoidea. Fructus cylindrici, hemisphaerici, campanulati vel ovoidei; discus latus, descendens; valvi 4 vel 5, inclusi. Semina irregulariter elliptica vel rotundata, reticulata, saepe margine tenui, brunnea vel cinerea.

A series of 4 species (336–339).

Eucalyptus ser. **Michaelianae** Chippendale, ser. nov.

Type: *E. michaeliana* Blakely

Arbores. Cortex laevis. Folia juvenilia alterna, petiolata, lanceolata, viridia, arcte discolora. Folia adulta alterna, petiolata, lanceolata, sordide viridia, paene concolora. Conflorescentiae axillares, compositae; umbelli 3–7 floribus. Alabastra ovoidea ad obovoidea. Fructus hemisphaerici ad subglobulares; discus angustus, deplanatus vel ascendens; valvi 3 vel 4, aequati vel inclusi. Semina ± cubica, reticulata, brunnea.

A monotypic series (387).

Eucalyptus ser. **Microcarpae** Blakely, *Key Eucalypts* 32, 141 (1934)

Lecto (here chosen): *E. scoparia* Maiden

E. scoparia is representative of Blakely’s concept of the series, especially in its opposite juvenile leaves and pedicellate buds.

Eucalyptus ser. **Microcorythae** Blakely, *Key Eucalypts* 24, 112 (1934)

Lecto (here chosen): *E. cladocalyx* F.Muell.

This is the only currently-accepted species included by Blakely.

Eucalyptus ser. **Micromembranae** Maiden, *Crit. Revis. Eucalyptus* 7: 118 (1925)

Lecto (here chosen): *E. occidentalis* Endl.

Selection of this name allows continued usage of the established name ser. *Cornutae* for the other species included by Maiden.

Eucalyptus ser. **Moluccanae** Chippendale, ser. nov.

Type: *E. moluccana* Roxb.

Arbores. Cortex in trunco fibrosa, cinerea, supra laevis. Folia juvenilia alterna, petiolata, concolora vel parum discolora. Folia adulta alterna, petiolata, concolora. Conflorescentiae terminales, paniculatae, etiam saepe axillares, simplices; umbelli 7 floribus, interdum 7–9. Alabastra ovoidei, cylindrica vel fusiformia. Fructus cylindrici, ovoidei, suburceolati vel subglobulares; discus latus, interdum angustus, descendens; valvi 4, inclusi vel interdum aequati. Semina suborbicularia ad elliptica, leviter reticulata, cinereo-brunneo-atra.

A series of 4 species (473–476).

APPENDIX

Eucalyptus ser. **Myrtiformes** Blakely, *Key Eucalypts* 53, 220 (1934)

Lecto (here chosen): *E. deglupta* Blume

This species is selected as lectotype since it most completely agrees with Blakely's concept in respect of the characters known to him for his included species.

Eucalyptus ser. **Naviculares** Maiden, *Crit. Revis. Eucalyptus* 7: 109 (1925)

Lecto (here chosen): *E. eximia* Schauer

E. eximia is considered representative of Maiden's concept of the series. By selecting it the usage of ser. *Maculatae* is maintained. *E. trachyphloia*, the other species included by Maiden, is atypical and in this volume is placed in its own series.

Eucalyptus ser. **Obliquae** Blakely, *Key Eucalypts* 21, 103 (1934)

Lecto (here chosen): *E. grossa* F.Muell. ex Benth.

E. subser. *Cylindraceae* Blakely, *Key Eucalypts* 22, 105 (1934); lecto (here chosen): *E. grossa* F.Muell. ex Benth.

Of the 2 still-accepted species included by Blakely in subser. *Cylindraceae*, to which ser. *Obliquae* is now restricted, *E. grossa* represents his concept more closely especially in the included valves of the fruit.

Eucalyptus ser. **Occidentales** Blakely, *Key Eucalypts* 40, 171 (1974)

Lecto (here chosen): *E. marginata* Donn ex Smith

Of the 4 species included in the series by Blakely, only *E. marginata* is here retained, two having been transferred to other series, while *E. kalganensis* is a presumed hybrid.

Eucalyptus subser. *Ochrophloiae* Blakely, *Key Eucalypts* 18, 91 (1934)

Lecto (here chosen): *E. eximia* Schauer

Blakely included 5 species in subser. *Ochrophloiae*. One, *E. torelliana*, is here removed to its own series. Of the other 4, *E. eximia* is selected as lectotype in being representative of Blakely's concept.

Eucalyptus ser. **Odontocarpae** Chippendale, ser. nov.

Type: *E. odontocarpa* F.Muell.

Arbores vel frutices 'mallees'. Cortex laevis vel parce squamata. Folia juvenilia opposita, sessilia, connata. Folia adulta opposita vel alterna, plerumque petiolata, concolora. Conflorescentiae paniculatae, terminales vel axillares, interdum simplices; umbelli 3–7 floribus. Alabastra pyriformia, clavata, turbinata vel subglobularia. Stamina 4-fasciculata. Fructus ±globulares vel ±cylindrici; discus angustus; valvi 3 vel 4. Semina applanata vel patellaria, interdum anguste alata, atro-cinerea.

A series of 3 species (71–73).

Eucalyptus ser. **Olsenianae** Chippendale, ser. nov.

Type: *E. olsenii* L.Johnson & Blaxell

Arbores. Cortex laevis, crenea vel alba, ad basin trunci aspera. Folia juvenilia infera opposita, supra alterna, sessilia vel petiolata, stellato-pilosa, discolora. Folia adulta alterna, petiolata, nitenti-viridia, concolora. Conflorescentiae axillares, simplices; umbellae floribus 7. Alabastra clavata. Fructus sessiles, globulares vel doliiformes; discus latus, descendens; valvi 4 vel 5, alte inclusi. Semina D-formia, brunnea.

A monotypic series (132).

Eucalyptus ser. **Pachyphloiae** Blakely, *Key Eucalypts* 42, 177 (1934)

Lecto (here chosen): *E. capitellata* Smith

E. subser. *Congestae* Blakely, *op. cit.* 44, 185; lecto (here chosen): *E. capitellata* Smith

E. capitellata is chosen as lectotype, being representative of the several species included by Blakely in both taxa.

Eucalyptus ser. **Paniculatae** Blakely, *Key Eucalypts* 39, 167 (1934)

Lecto (here chosen): *E. intertexta* R.Baker

Of the species included in the series by Blakely, *E. intertexta* is the only one retained here.

Eucalyptus subser. *Pedicellatae* Blakely, *Key Eucalypts* 23, 108 (1934)

Lecto (here chosen): *E. astringens* Maiden

Five of the taxa included by Blakely as species are retained in the ser. *Micromembranae*, of which this name is a synonym. Of these, *E. astringens* is selected as lectotype as representing his concept, in particular as regards the smooth bark, deflexed umbels, and exerted valves of the fruit.

Eucalyptus ser. **Planchonianae** Chippendale, nom. nov.

E. subser. *Costatae* Blakely, *Key Eucalypts* 47, 198 (1934), *nom. illeg.* non Blakely, *op. cit.* 16, 84. T: *E. planchoniana* F.Muell.

Eucalyptus ser. **Porantherae** Benth., *Fl. Austral.* 191, 213 (1867)

Lecto (here chosen): *E. uncinata* Turcz.

Of the species included by Bentham, only *E. uncinata* is retained in the series.

Eucalyptus ser. **Porantheroideae** (Maiden) Chippendale, stat. nov.

E. sect. *Porantheroideae* Maiden, *Crit. Revis. Eucalyptus* 6: 529 (1924); lecto (here chosen): *E. ochrophloia* F.Muell.

Of the species retained in this series, *E. ochrophloia* is selected as representative of Maiden's concept of the taxon.

Eucalyptus ser. **Psathyroxyla** Blakely, *Key Eucalypts* 52, 217 (1934)

Lecto (here chosen): *E. haemastoma* Smith

Of the 3 taxa included by Blakely as species, *E. haemastoma* is selected as lectotype since it has several features highlighted in the protologue, in particular the smooth reddish disc of the fruit.

Eucalyptus ser. **Pseudostringybarks** Blakely, *Key Eucalypts* 41, 173 (1934)

Lecto (here chosen): *E. pilularis* Smith

Although not of Latin form the epithet is accepted in the spirit of Art. 23.2 of the *International Code*. Blakely included 3 species in the series; of these 2 have been transferred to other series.

Eucalyptus ser. **Pumilae** Chippendale, ser. nov.

Type: *E. pumila* Cabbage

Frutices 'mallees'. Cortex laevis. Folia juvenilia alterna, petiolata, ovata, viridia, concolora. Folia adulta alterna, petiolata, lanceolata, viridia, concolora. Conflorescentiae axillares;

APPENDIX

umbelli simplices, 7 floribus. Alabastra fusiformia. Fructus hemisphaerici; discus latus, ascendens; valvi 3 vel 4, exserti. Semina irregularia, longitudinaliter foveata, atro-brunnea.

A monotypic series (386).

Eucalyptus ser. **Radiatae** Chippendale, ser. nov.

Type: *E. radiata* Sieber ex DC.

Arbores vel frutices ‘mallees’. Cortex fibrosa vel laevis. Folia juvenilia opposita, sessilia, interdum breviter petiolata, plerumque parum discolora. Folia adulta alterna, petiolata, concolora, ‘peppermint’-odorata. Conflorescentiae axillares, simplices; umbelli 3–40 floribus. Alabastra clavata. Fructus hemisphaerici, subglobulares, pyriformes, conici vel obconici; discus modice latus, \pm deplanatus, descendens, convexus vel ascendens; valvi 3–5, plerumque deplanati, interdum inclusi. Semina \pm pyramidalia, rufo-brunnea.

A series of 10 species (171–180).

Eucalyptus ser. **Regnantes** Chippendale, ser. nov.

Type: *E. regnans* F.Muell.

Arbores excelsae. Cortex saltem in dimidio inferiore aspera, fibrosa, brunnea. Folia juvenilia alterna, petiolata, ovata ad late lanceolata, obliqua, viridia, discolora. Folia adulta alterna, petiolata, acuminata, falcata, saepe obliqua, viridia, concolora; venae laterales conspicuae, sub angulo 15°–30°; vena intramarginalis ad 4 mm ab margine posita. Conflorescentiae axillares, simplices; umbelli binati, 9–15 floribus. Alabastra clavata. Fructus obconici ad pyriformes; discus latus, deplanatus vel ascendens; valvi 3, deplanati vel parum exserti. Semina \pm pyramidalia, brunnea.

A series of 2 species (135, 136).

Eucalyptus ser. **Rhodoxyla** (Blakely) Chippendale, stat. nov.

E. subser. *Rhodoxyla* Blakely, *Key Eucalypts* 61, 258 (1934); lecto (here chosen): *E. paniculata* Smith

Of the species included by Blakely and retained in the series, *E. paniculata* is the earliest described and is representative of his concept of the series.

Eucalyptus ser. **Rubiginosae** Chippendale, ser. nov.

Type: *E. rubiginosa* Brooker

Arbores. Cortex omnino fibrosa, rufo-brunnea. Folia juvenilia alterna, petiolata, lanceolata, nitentia, viridia. Folia adulta alterna, petiolata, saepe falcata, discolora. Conflorescentiae terminales, paniculatae; umbelli 7 floribus, raro 9. Alabastra clavata. Fructus hemisphaerici; discus latus, deplanatus ad parum ascendens; valvi 4, exserti. Semina oblonga vel deltoidea ad ovoidea, nitentia, rufo-brunnea, ventraliter costata.

A monotypic series (84).

Eucalyptus ser. **Rummeryanae** Chippendale, ser. nov.

Type: *E. rummeryi* Maiden

Arbores. Cortex fibrosa, subtiliter tessellata, cinerea ad cinereo-brunnea. Folia juvenilia alterna, petiolata, ovata vel late lanceolata, viridia, discolora. Folia adulta alterna, petiolata, lanceolata, sordide viridia, discolora. Conflorescentiae terminales vel axillares, paniculatae; umbelli 7 floribus. Alabastra ovoidea vel fusiformia. Fructus obconici, subpyriformes vel hemisphaerici; discus angustus, descendens; valvi 4, aequatus vel parum exserti. Semina suborbicularia ad elliptica, vadosa reticulata, cinereo-brunneo-atra.

A monotypic series (463).

Eucalyptus ser. **Salmonophloieae** Chippendale, ser. nov.

Type: *E. salmonophloia* F.Muell.

Arbores. Cortex laevis, salmonacea ad cinereo-brunnea vel cinerea. Folia juvenilia alterna, petiolata, elliptica ad lanceolata, concolora. Folia adulta alterna, petiolata, lanceolata, nitentia, concolora. Conflorescentiae axillares; umbelli simplices, 7–11 floribus. Alabastra ovoidea vel clavata. Fructus hemisphaerici; discus angustus, verticaliter descendens; valvi 3 vel 4, graciles, exserti. Semina elliptica, reticulata, cinereo-brunnea.

A monotypic series (277).

Eucalyptus ser. **Scutelliformes** Maiden, *Crit. Revis. Eucalyptus* 7: 119 (1925)

Lecto (here chosen): *E. baileyana* F.Muell.

This species is representative of Maiden's concept of the series and maintains the usage of ser. *Decurvae* and ser. *Microcorythae*.

Eucalyptus ser. **Scutiformes** Maiden, *Crit. Revis. Eucalyptus* 7: 113 (1925)

Lecto (here chosen): *E. grandifolia* R.Br. ex Benth.

From the 5 species included by Maiden, this is selected as representative of his concept of the series.

Eucalyptus subser. *Semidecorticatae* Blakely, *Key Eucalypts* 32, 139 (1934).

Lecto (here chosen): *E. ovata* Labill.

Blakely included only 2 species with typically decorticating bark, *E. ovata* and *E. camphora*. The former agrees more closely with the series diagnosis in its soft timber.

Eucalyptus ser. **Squamosae** Chippendale, ser. nov.

Type: *E. squamosa* Deane & Maiden

Arbores, interdum effusae. Cortex tessellata vel laevis. Folia adulta alterna, petiolata, falcata, cinereo-viridia, concolora. Conflorescentiae axillares, simplices; umbelli 7–13 floribus, plerumque binati. Alabastra ovoidea. Fructus hemisphaerici; discus deplanatus vel convexus; valvi 3 vel 4, exserti, saepe patentes. Semina elliptica vel orbicularia, reticulata, cinereo-brunnea.

A series of 2 species (256, 257).

Eucalyptus ser. **Striolatae** Maiden, *Crit. Revis. Eucalyptus* 7: 121 (1925)

Lecto (here chosen): *E. patellaris* F.Muell.

This species is representative of Maiden's concept of his series, and all 3 species placed by him in a subgroup are included in the series in this volume. Lectotypification on any of several other species would prevent usage of several well-known series names.

Eucalyptus ser. **Subbuxaeales** Blakely, *Key Eucalypts* 54, 223 (1934)

Lecto (here chosen): *E. odorata* Behr ex Schldl.

Three of the species included by Blakely are retained in the series. *E. odorata* is considered a more typical 'box' than the others and therefore selected as lectotype.

Eucalyptus ser. *Subcornutae* Blakely, *Key Eucalypts* 24, 11 (1934)

Lecto (here chosen): *E. redunca* Schauer

Of the 4 species included in the series by Blakely, *E. redunca* is selected as lectotype being representative of his concept of the series. The name is a synonym of ser. *Levispermae*.

APPENDIX

Eucalyptus ser. **Subereae** Chippendale, ser. nov.

Type: *E. suberea* Brooker & Hopper

Frutices ‘mallees’. Cortex in dimidio trunci inferiore aspera, laminata vel suberosa. Folia juvenilia subopposita, petiolata, lanceolata, nitentia, viridia, parum discolora. Folia adulta alterna, petiolata, concolora. Conflorescentiae axillares, simplices; umbelli 12–20 floribus. Alabastra fusiformia ad clavata. Fructus subglobulares vel suburceolati; discus arcte descendens; valvi 3 vel 4, inclusi. Semina D-formia vel subpyramidalia, nitentia, brunnea, non vel parum costata.

A monotypic series (103).

Eucalyptus ser. **Subexsertae** Blakely, *Key Eucalypts* 31, 137 (1934)

Lecto (here chosen): *E. alba* Reinw. ex Blume

E. alba is representative of Blakely’s concept of the series.

Eucalyptus ser. **Subulatae** Blakely, *Key Eucalypts* 64, 267 (1934)

Lecto (here chosen): *E. oleosa* F.Muell. ex Miq.

Blakely included 14 species, some with varieties, of which 8 species are here accepted in the series. *E. oleosa* is selected as lectotype as representative of his concept of the series.

Eucalyptus ser. **Terminaliptera** Maiden, *Crit. Revis. Eucalyptus* 7: 105 (1925)

Lecto (here chosen): *E. setosa* Schauer

This species is representative of Maiden’s concept of the series.

Eucalyptus ser. **Tetodontae** Chippendale, ser. nov.

Type: *E. tetrodonta* F.Muell.

Arbores. Cortex ubique fibrosa. Glandes oleosi in cortice, medulla et petiolo. Folia juvenilia opposita vel alterna, petiolata, cinereo-viridia, concolora. Folia adulta opposita vel alterna, petiolata, concolora. Conflorescentiae axillares; umbellae simplices floribus 3. Alabastra ovoidea vel subpyriformia, quadrangularia; operculum hemisphaericum, 8-costatum; hypanthium 4-dentatum. Fructus cupulares vel campanulati, quadrangulares. Semina appanata ad patelliformia, interdum anguste alata, cinereo-nigra.

A monotypic series (74).

Eucalyptus ser. **Torellianae** Chippendale, ser. nov.

Type: *E. torelliana* F.Muell.

Arbores. Cortex in trunco infero fibrosa, subtessellata, cinerea vel nigra, supra laevis, schistaceo-viridis. Folia juvenilia alterna, petiolata, discolora, setosa. Folia adulta alterna, petiolata, discolora. Conflorescentiae paniculae terminales corymbosae; umbellae floribus 3 vel 7. Alabastra ovoidea. Fructus globulari-urceolati vel ovoidei; discus latus, descendens; valvi 3, alte inclusi. Semina elliptica, lateraliter carinata, rufo-brunnea.

A monotypic series (60).

Eucalyptus ser. **Torquatae** Chippendale, ser. nov.

Type: *E. torquata* Luehm.

Arbores vel frutices ‘mallees’. Cortex aspera, vel interdum laevis. Folia juvenilia alterna, petiolata, concolora vel parum discolora. Folia adulta alterna, petiolata, concolora. Conflorescentiae axillares; umbelli simplices, floribus 3 vel 7, raro 11. Alabastra ovoidea vel clavata, interdum cylindrica. Fructus hemisphaerici, obconici, ovoidei, subpyriformes vel

campanulati; discus latus vel angustus, descendens vel deplanatus; valvi 3–5, exserti vel aequati, interdum inclusi. Semina irregulariter, elliptica, reticulata, fusca vel cinereo-brunnea.

A series of 9 species (327–335).

Eucalyptus ser. Trachyphloiae Chippendale, ser. nov.

Type: *E. trachyphloia* F.Muell.

Arbores. Cortex laminata, tessellata. Folia juvenilia opposita, petiolata, setosa, discolora. Folia adulta alterna, petiolata, discolora. Conflorescentiae paniculae terminales corymbosae. Alabastra obovoidea vel pyriformia; operculum depresso-hemisphaericum, apiculatum. Fructus urceolati; discus latus, descendens; valvi 3 vel 4, alte inclusi. Semina suborbicularia ad elliptica, non alata, brunnea.

A monotypic series (55).

Eucalyptus ser. Transversae Blakely, *Key Eucalypts* 19, 94 (1934)

Lecto (here chosen): *E. saligna* Smith

E. subser. Leptocarpae Blakely, *op. cit.* 19, 95; lecto (here chosen): *E. saligna* Smith

Four taxa included in subser. *Leptocarpae* as species by Blakely are retained in the series, the other species and the other subseries of the *Transversae* now being recognised in other infrageneric taxa. *E. saligna* is considered representative of Blakely's concept of the series.

Eucalyptus ser. White-mahoganies Blakely, *Key Eucalypts* 42, 174 (1934)

Lecto (here chosen): *E. umbra* R.Baker

Of the 4 taxa included by Blakely in this series, *E. umbra* is the only one now accepted in it. The epithet is accepted in the spirit of Art. 23.2 of the *International Code of Botanical Nomenclature*.

EUCALYPTUS

L.A.S.Johnson & K.D.Hill

The following new species, names in new status and lectotypifications are published in advance of our projected revision of *Eucalyptus* and allied genera, to enable them to be treated in the *Flora of Australia*. This does not necessarily imply our endorsement of the circumscriptions of related taxa or of generic or infrageneric taxa in the present work.

Eucalyptus biturbinata L.Johnson & K.Hill, sp. nov.

T: Kyogle road, 3 miles [c. 5 km] N of Cawongla, N.S.W., 14 Jan. 1966, *R.D.Johnston 149 & A.Nichols*; holo: NSW; iso: FRI.

E. canaliculatae affinis, sed alabastris fructibusque minoribus, foliis adultis atque minoribus, foliis juvenilibus ovatis, pedunculo minus applanato et calyptra alabastris acuta vel parum rostrata distinguitur.

Restricted to sloping sites in dry sclerophyll forests on a variety of soils, associated with a wide range of forest species. Occurs on coastal ranges and the adjacent eastern fall of the tablelands, from Crows Nest and Ipswich, Qld, south to the Gloucester district, N.S.W. This species and *E. canaliculata* are sympatric in the Gloucester–Comboyne–Curricabark district, with a mosaic distribution of small populations of typical *E. biturbinata*, typical *E. canaliculata* and variable intergrading forms.

E. biturbinata is distinguished from *E. canaliculata* by the smaller buds, fruits and leaves, the ovate juvenile leaves, the less flattened peduncle and the acute to somewhat rostrate calyptra (operculum).

APPENDIX

The name *E. punctata* var. *didyma* has been applied to this taxon, but that name (see below) should correctly be typified on material belonging to *E. punctata*.

Named from the Latin, *bi* (two); *turbo*, *turbinis* (a spinning top); and *-atus* (provided with, pertaining to), referring to the distinctive bud shape, resembling two spinning tops joined by their broad apices.

***Eucalyptus ceratocorys* (Blakely) L.Johnson & K.Hill, stat. nov.**

E. angulosa var. *ceratocorys* Blakely, *Key Eucalypts* 124 (1934). T: Comet Vale, W.A., Dec. 1916, *J.T.Jutson 116A*; lecto (here chosen): NSW.

Although Blakely cited two localities, he annotated two specimens collected by Jutson from the above locality as types. The above is selected as lectotype, being more complete.

Distinguished by the mallee habit, medium-size juvenile leaves (to 6 cm long, 4 cm wide), large lanceolate adult leaves (to 10 cm long, 2.5 cm wide), long calyptra more than twice as long as wide, and large ribbed fruit (more than 10 mm diam.).

Sporadic and scattered in red sand, from Cowcowing to Bencubbin and E to the south-eastern Great Victoria Desert, W.A.

***Eucalyptus chloroclada* (Blakely) L.Johnson & K.Hill, stat. nov.**

E. dealbata var. *chloroclada* Blakely, *Key Eucalypts* 399 (1934). T: Baradine, N.S.W., June 1923, *J.A.Fletcher 31A*; lecto (here chosen): NSW.

Although not specified as the type in the protologue, the above specimen was annotated 'TYPE' by Blakely in preference to other Fletcher collections of the same date, and is hence designated as lectotype.

Distributed from Theodore, Qld, south to Quirindi and Gilgandra, N.S.W.

E. chloroclada has a patchy distribution throughout its range, and is restricted to level areas on deep sandy soils, often in association with *Callitris glaucophylla*. This contrasts with the occurrence of related species that have similar fruit shape; *E. dealbata* is found in shallow soils on ridges of basic rock and *E. dwyeri* is found in shallow soils on siliceous hills and ridges.

E. chloroclada is distinguished by the combination of short broad calyptra, non-glaucous or slightly pruinose buds, non-glaucous adult leaves, rounded glaucous juvenile leaves and a flat or slightly raised disc.

***Eucalyptus cunninghamii* Sweet, *Hort. Brit.* 2nd edn, 209 (1830)**

E. microphylla Cunn. in Field, *Geogr. Mem. New South Wales* 350 (1825); non Willd. ex Link, *Enum. Hort. Berol.* 225 (1822). T: Blue Mts, N.S.W., Oct. 1822, *A.Cunningham 32*; holotype: BM.

The habitat notes on this specimen correspond to those in Cunningham's journal and also those in the protologue of *E. microphylla* in Field's work ('Forming brushes upon the more elevated parts of the mountains'). This is also the type for *E. cunninghamii*, since Sweet was merely providing a new name, *E. microphylla* being preoccupied by Willdenow's name (which although valid remains a nomen dubium). The new name was also published by G.Don, *Gen. Syst.* 2: 821 (1832), but Sweet's publication has priority. This specimen also represents the taxon currently known as *E. rupicola* L.Johnson & Blaxell, which name must now fall into the synonymy of *E. cunninghamii*. Several other sheets in K labelled '*E. microphylla*' are not indisputably Cunningham 32, and bear mixed collections including *E. moorei*, *E. stricta* and *E. cunninghamii*.

Eucalyptus horistes L.Johnson & K.Hill, sp. nov.

T: 15.9 km N of Binu on Highway 1, W.A., 27°54'S, 114°42'E, 27 Oct. 1983, *K.Hill 389, L.Johnson, D.Blaxell & I.Brooker*; holotype: NSW; isotype: AD, FRI, MEL, PERTH.

Inter taxa affinia combinatione characterorum sequentium distinguitur: habitu pluricauli, cortice in trunco inferiore aspera persistenti, foliis adultis angustis lucidisque, pedicellis brevibus, calyptra conica hypanthio longiore.

Named from the Greek *horistes* (one who marks the boundaries), referring to the geographical position of this taxon at the northern limit of the South-western Botanical Province of W.A.

Distinguished from related taxa by the combination of the mallee habit, persistent rough bark on the lower trunk, narrow and glossy adult leaves, short pedicels, and the conical calyptra which is longer than the hypanthium.

The leaves of *E. horistes* are consistently broader and glossier than those of *E. kochii*, and the calyptra longer and more pointed than that of *E. plenissima*. The name *E. oleosa* var. *borealis* C.Gardner has been used for this taxon. Gardner's epithet is not raised to specific rank since the taxon is related to *E. kochii* and *E. plenissima* rather than *E. oleosa*, and the name *borealis* is meaningless in this context.

Locally frequent in lateritic or sandy country, from the Murchison R. to near Coorow, inland as far as Pindar, with a single record near Wiluna.

Eucalyptus longirostrata (Blakely) L.Johnson & K.Hill, stat. nov.

E. punctata var. *longirostrata* Blakely, *Key Eucalypts* 101 (1934). T: Benarkin, Qld, June 1917, *Forest Inspector Twine*; lectotype (here chosen): NSW.

One of a number of syntypes cited by Blakely (1934), but the only specimen in NSW annotated 'Type' by the author. The name was thus informally lectotypified by Blakely, and this treatment is formalised here.

Distinguished from related taxa by the elongate, rostrate calyptra and the elongate pedicel.

Restricted to the shallower soils usually on sloping sites in sandstone range country of central and southern Qld, from the Blackdown Tableland S through the Dawson, Expedition and Carnarvon Ranges to Barakula, Kingaroy and the Blackbutt Ra.

Eucalyptus punctata var. *didyma* R.Baker & H.G.Smith, *Res. Eucalyptus* 127 (1902)

T: Rylstone, N.S.W., June 1897, *R.T.Baker*; lectotype (here chosen): NSW.

Baker and Smith mentioned specific localities at two points in the protologue, viz. 'It has a wide geographical range—Blue Mountains, Rylstone, Barber's Creek, Lismore, Colo Vale, New South Wales.' (p. 127). 'Material was obtained from various localities in New South Wales—From Colo Vale, 4th July, 1900; from Rylstone, 3rd August, 1897; and from Barber's Creek, 12th July, 1898.' (material for oil analysis, p. 128).

Specimens matching the Rylstone and Lismore citations only are extant. Oil differences were a critical distinguishing feature cited in the protologue for this variety, and only the Rylstone material (of the above two localities) was analysed. It is hence selected as the lectotype of the variety. Maiden (*Crit. Revis. Eucalyptus* 3: 198, 1917) cited the Bäuerlen specimen from Lismore as the type, but, since this specimen does not match the above requirements of the protologue, it cannot be maintained as the type. With this typification, the varietal name falls into the synonymy of *E. punctata*. The Lismore material belongs to *E. biturbinata* (see above).

Eucalyptus tintinnans (Blakely & Jacobs) L.Johnson & K.Hill, stat. nov.

E. platyphylla var. *tintinnans* Blakely & Jacobs in Blakely, *Key Eucalypts* 138 (1934). T: outlier from plateau 10 miles [c. 16 km] W of Pine Creek, N.T., 22 July 1933, *M.R.Jacobs 89*; lectotype (here chosen): NSW.

APPENDIX

Blakely and Jacobs cited a number of syntypes in the protologue, as follows: ‘N.T.—’ ... between Stapleton and Birdum. ...”Dr. M.R.Jacobs.’ ““... Wandii.” Dr. H.I.Jensen, No. 376, April, 1916.’ ““...Umbrawarra.” Dr. H.I.Jensen, No. 404, July, 1916.’

Blake (*Austral. J. Bot.* 1: 276–278, 1953) discussed problems associated with the above syntypes and their incomplete correlation with the protologue. He then recorded that specimens held at NSW had been annotated by Blakely as follows: *Jacobs 89* — ‘Type’; *Jacobs 98*, *Jensen 404* and *Jensen 427*—all annotated ‘cotype’. Since these specimens were in his opinion at variance with the protologue, Blake then designated *Jacobs 77* as the lectotype.

We consider that Blakely intended *Jacobs 89* to represent the species according to his concept of what has since been clearly defined as a holotype (*International Code of Botanical Nomenclature* 7, 1983), and as such should be followed. Blakely and Jacobs prepared the description from the range of material then available, and individual specimens hence may not conform to it precisely (*Jacobs 89* is, however, well within the limits of variation covered). We therefore overturn Blake’s lectotypification and designate as lectotype the specimen annotated by Blakely, to accord with Blakely’s original intention.

This taxon is distinguished by the small roundish leaves and small fruit, and is characteristic of somewhat infertile, shallow soils on low rolling hills in the northern N.T.; for instance on the granite country N of Katherine. Blake (1953) included it in *E. alba*, but we consider that it forms sufficiently coherent populations over considerable areas to be recognised as a species. It is also ecologically separated from other related taxa in the *E. alba* group.

EUCALYPTUS

P.J.Lang

Eucalyptus pterocarpa C.Gardner ex P.Lang, sp. nov.

T: 5.4 miles (8.7 km) W on road 6.8 miles (10.9 km) NW of Norseman, W.A., 12 March 1967, *G.M.Chippendale 154*; holotype: FRI; isotype: AD, PERTH.

Eucalypto lesouefii Maiden seriei *Rufispermum* affinis a qua cortice trunci ubique laevi, foliis adultis nitidis flavidoviridibus non glaucis, ramulis inflorescentisque non glaucis, operculo 1.4–2.1-plo longiore quam latiore, fructus alatis latioribus, et inflorescentiis ex floribus 3, 5 vel raro 7 constantibus, differt.

Confined to a small area north-west of Norseman, southern W.A.

A distinctive taxon of ser. *Rufispermae*, despite its close relationship to *E. lesouefii*. The name, from the Greek *pter-* (winged) and *carpos* (fruit), was applied by Gardner to the first collection made in 1942 and refers to the ribs that form radial wings on the fruit.

SUPPLEMENTARY GLOSSARY

concolourus: of uniform colour; *of leaves*, having both surfaces the same colour..

conflorescence: a flower-bearing branch system in which the main axis does not end in a flower but the axes of the branches do.

discolorous: of different colours; *of leaves*, having the two surfaces different in colour.

mallee: a growth form in eucalypts in which several stems arise from a lignotuber.

ovulode: sterile structures on the placenta.

scribble: irregular lines on the bark of some eucalypts, being the old tunnels burrowed by moth larvae between bark layers and exposed when the outer layer falls.

staminophore: a band of tissue around the apex of the hypanthium in a eucalypt flower on which the stamens are inserted.

Abbreviations and Contractions

Literature

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*.

Herbaria

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
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
FRI	Australian National Herbarium, formerly special Eucalyptus collection, CSIRO Division of Forest Research, Canberra
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

States, Territories, nearby countries

Abbreviations of Australian States and Territories and nearby countries as used in statements of distribution and citation of collections.

A.C.T.	Australian Capital Territory
N.Caled.	New Caledonia
N.S.W.	New South Wales
N.T.	Northern Territory
N.Z.	New Zealand
P.N.G.	Papua New Guinea
Qld	Queensland
S.A.	South Australia
Tas.	Tasmania
Vic.	Victoria
W.A.	Western Australia

General abbreviations

alt.	altitude
app.	appendix
auct.	<i>auctoris</i> (of an author or authors)
c.	<i>circa</i> (about)

Abbreviations and Contractions

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
<i>in litt.</i>	<i>in litteris</i> (in correspondence)
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
Rd	Road
S	south
sect.	<i>sectio</i> /section
SEM	Scanning Electron Micrograph

Abbreviations and Contractions

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)
St	Street
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
trig.	trigonometric station
T.S.	transverse section
<i>typ. cons.</i>	<i>typus conservandus</i> (conserved type)
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 nomen invalidum; also, in localities, denotes a place name later than that originally cited or on the herbarium sheet
♀	female
♂	male

Botanical regions

Abbreviations of botanical regions cited in the notes on distribution are listed inside the back endpapers.

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INDEX

Accepted names are in roman, synonyms and doubtful names in *italic*.

Principal page references are in **bold**, figures in *italic*.

- Acmena floribunda* (Smith) DC. 452
 Albany Blackbutt 140
 Allspice 1
 Alpine Ash 161
 Alpine Cider Gum 367
 Alpine Yellow Gum, Tasmanian 356
 Angophora Cav. **448**
 bakeri C.Hall **450**
 subsp. *bakeri* **450**, 455, 493
 subsp. *crassifolia* G.Leach **451**, 453, 494
 subsp. *paludosa* G.Leach **451**, 453, 494
 clelandii Maiden 455
 cordifolia Cav. 448, 454
 costata (Gaertner) Britten xvi, **449**, 452
 subsp. *costata* **449**, 453, 455, 493
 subsp. *euryphylla* L.Johnson ex G.Leach **449**, 453, 493
 subsp. *leiocarpa* L.Johnson ex G.Leach **450**, 453, 493
 dichromophloia Blakely 455
 floribunda (Smith) Sweet **452**, 456, 494
 var. *woodsiana* (Bailey) Domin 451
 hispida (Smith) Blaxell 448, **454**, 455, 456, 494
 intermedia DC. 452
 var. *melanoxylon* (R.Baker) Maiden & Betche 452
 var. *woodsiana* (Bailey) Bailey 451
 lanceolata Cav. 449
 var. *angustifolia* A.Gray 450
 var. *hispida* Cunn. ex A.Gray 449
 var. *woodsiana* (Bailey) Maiden 451
 melanoxylon R.Baker **452**, 454, 456, 494
 ochrophylla R.Baker 452
 subvelutina F.Muell. **454**, 456, 494
 woodsiana Bailey **451**, 453, 494
 Apple Box 347
 Moonbi 348
 Apple Gum 71
 Apple Mallee 133
 Apple, Argyle 372
 Broad-leaved 455
 Coolabah 454
 Dwarf 454
 Narrow-leaved 450
 Smooth-barked 449
 Apple-topped Box 347
 Araluen Gum 362
 Argyle Apple 372
 Ash, Alpine 161
 Bell-fruited Mallee 181
 Blue Mountains 164
 Budawang 177
 Cliff Mallee 179
 Faulconbridge Mallee 178
 Jilliga 173
 Kangaroo Island Mallee 170
 Kybean Mallee 181
 Moreton Bay 68
 Mountain 158
 New England 169
 Pigeon House 176
 Silvertop 170
 Wadbilliga 176
 Whipstick Mallee 171
 White 164
 White Mountain 175
 Yellow-top Mallee 164
 Ashes 160, 167, 175
 Badgingarra Mallee 134
 Bailey's Stringybark 118
 Baker's Mallee 249
 Bald Island Marlock 211
 Bancroft's Red Gum 321
 Bangalay 200
 Baradine Gum 324
 Bark, Scalpy 247
 Scent 338
 Barlee Box 389
 Barrel, Brown 159
 Barren Mountain Mallee 179
 Bell-fruited Mallee 126
 Bell-fruited Mallee Ash 181
 Big Badja Gum 360
 Bimble Box 383
 Black Box 384
 Black Gum 337
 Black Ironbox 193
 Black Marlock 227
 Black Morrel 294
 Black Peppermint 190
 Black Sallee 182

INDEX

- Blackbutt 131, 156
 - Albany 140
 - Carne's 234
 - Cleland's 293
 - Dundas 309
 - Goldfields 293
 - Kondinin 292
 - Large-fruited 158
 - New England 167, 169
 - Stringybark 160
- Blakely's Red Gum 325
- Blaxland's Stringybark 148
- Bloodwood x, 92
 - Broome 76
 - Brown 101
 - Desert 72
 - Gilbert River 72
 - Gum-topped 83
 - Inland 92
 - Long-fruited 94
 - Mallee 88
 - Melville Island 95
 - Pink 95
 - Range 97
 - Red 94
 - Rough-leaved 74
 - Round-leaved 83
 - Rusty 76
 - Sandhill 92
 - Scraggy 76
 - Silver-leaved 79
 - Smooth-barked 82
 - Smooth-stemmed 79
 - Spring 77
 - Stringybarked 101
 - Twin-leaved 77
 - Variable-barked 83
 - Yellow 105
- Blue Box 413
- Blue Gum 422
 - Hyden 286
 - Southern 353
 - Sydney 198
 - Tasmanian 353
- Blue Mallee 115
- Blue Mallet 228
- Blue Mountains Ash 164
- Blue Mountains Mahogany 202
- Blue Mountains Mallee 178
- Blue-leaved Ironbark 405
- Blue-leaved Mallee 287, 402
- Blue-leaved Stringybark 150
- Bogong Gum 365
- Bookleaf Mallee 237
- Boorabbin Mallee 302
- Bosisto's Box 398
- Box x
 - Apple 347
 - Apple-topped 347
 - Barlee 389
 - Bimble 383
 - Black 384
 - Blue 413
 - Bosisto's 398
 - Broad-leaved 374
 - Brown 386
 - Brown's 383
 - Coast Grey 398
 - Coowarra 387
 - Craven Grey 382
 - Darwin 378
 - Fuzzy 413
 - Gilbert River 379
 - Grey 396
 - Gum-topped 388
 - Howitt's 194
 - Long-leaved 349
 - Mallee 399
 - Molloy Red 373
 - Moonbi Apple 348
 - Narrow-leaved 397
 - Paper-barked 376
 - Peppermint 400
 - Pilliga 397
 - Poplar 000383
 - Red 415
 - Reid River 383
 - Rudder's 412
 - Silver 382
 - Thozet's 390
 - Tropical Red 193
 - Weeping 374
 - White 394
 - White-topped 352
 - Yellow 421
- Boxes, Grey 394
- Brittle Gum 341
- Brittle Range Gum 72
- Broad-leaved Apple 455
- Broad-leaved Box 374
- Broad-leaved Carbeen 69
- Broad-leaved Ironbark 404
- Broad-leaved Peppermint 187
- Broad-leaved Stringybark 152

INDEX

Broad-leaved White Mahogany 141, 142
 Broome Bloodwood 76
 Brown Barrel 159
 Brown Bloodwood 101
 Brown Box 386
 Brown Mallet 215
 Brown Stringybark 146, 148
 Brown's Box 383
 Budawang Ash 177
 Bull Mallee 384
 Bullich 125
 Bundy, Mealy 349
 Burdett's Gum 210
 Burracoppin Mallee 273
 Bushy Yate 213
 Buxton Gum 346

 Cabbage Gum 68, 69, 71, 323
 Large-leaved 69
 Cadaga 105
 Caley's Ironbark 420
 Camden Woollybutt 357
 Camfield's Stringybark 148
 Candlebark 365
 Cannon's Stringybark 145
 Cap-fruited Mallee 224
 Cape York Red Gum 330
 Capped Mallee 290
 Carbeen 68
 Broad-leaved 69
 Carbeen Gum 69
 Carne's Blackbutt 234
 Cider Gum 366
 Alpine 367
 Cleland's Blackbutt 293
 Cliff Mallee Ash 179
 Cloves 1
 Coarse-leaved Mallee 232
 Coast Grey Box 398
 Comet Vale Mallee 296
 Congoo Mallee 288
 Coolabah Apple 454
 Coolibah 381
 Gum-barked 388
 Mountain 388
 Coowarra Box 387
 Coral Gum 299
 Craven Grey Box 382
 Crimson Mallee 392
 Crowned Mallee 126
 Cue York Gum 292
 Cullen's Ironbark 408

Cup Gum 207
 Curly Mallee 259

 Darling Range Ghost Gum 230
 Darwin Box 378
 Darwin Stringybark 116
 Darwin Woollybutt 118
 Deane's Gum 197
 Desert Bloodwood 72
 Desert Gum 68, 113
 Desmond Mallee 228
 Diehard Stringybark 153
 Dongara Mallee 288
 Dorrigo White Gum 362
 Dowerin Rose 274
 Drooping Red Gum 323
 Dundas Blackbutt 309
 Dundas Mahogany 250
 Dunn's White Gum 346
 Dwarf Apple 454
 Dwyer's Mallee Gum 326

 Ettrema Mallee 345
 Eucalyptus L'Hér. **1, 448, 495, 510**
 sect. *Bilobae* 4
 sect. *Bisectae* 4
 sect. *Graciles* 3
 sect. *Macrantherae* 3
 sect. *Micrantherae* 3
 sect. *Platytherae* 4
 sect. *Porantheroideae* Maiden 3, 503
 sect. *Renantherae* 3
 sect. *Renantheroideae* 3
 sect. *Reniformes* 4
 sect. *Terminales* Maiden 3, 280
 ser. *Accedentes* Chippendale 3, 4, **230, 495**
 ser. *Alveolatae* Maiden 3, 4, **426**
 ser. *Anisomelae* Blakely 302
 ser. *Annulares* (Blakely) Chippendale 3, 4, **201, 495**
 ser. *Argyrophyllae* Blakely 312, 344
 ser. *Aridae* Blakely 277
 ser. *Bakerianae* Chippendale 4, **248, 496**
 ser. *Brockwayanae* Chippendale 4, **250, 496**
 ser. *Buxaeales* Blakely 3, 4, **382, 496**
 subser. *Subangustae* Blakely 389
 ser. *Cambageanae* Chippendale 3, 4, **386, 496**
 ser. *Clavigerae* (Maiden) S.T.Blake 67
 ser. *Cochleatae* Maiden 3, 4, **133, 496**
 ser. *Contortae* Blakely 3, 4, **235**
 subser. *Sessiles* Blakely 218
 ser. *Cornutae* Blakely 3, 4, **207, 501**

INDEX

Eucalyptus continued

- ser. *Corymbosae* Blakely 73, 496
 - subser. *Tessellatae* Blakely 67
- ser. *Curtisianae* Chippendale 3, 4, **121, 497, 500**
- ser. *Curviptera* Maiden 3, 4, **262, 497**
- ser. *Dawsonianae* Chippendale 3, 4, **393, 497**
- ser. *Decurvae* Blakely 3, 4, **240, 505**
- ser. *Diversiformes* Blakely 3, 4, **123, 496, 497**
- ser. *Dumosae* Blakely 285
- ser. *Dundasianae* Chippendale 3, 4, **307, 497**
- ser. *Ebbanoenses* Chippendale 3, 4, **111, 497**
- ser. *Elongatae* Blakely 3, 4, **218, 498**
- ser. *Eremophilae* Blakely 241
- ser. *Eucalyptus* 3, 4, **160, 167**
- ser. *Eudesmiae* Blakely 109, 498
- ser. *Exsertae* Blakely 3, 4, **320**
- ser. *Foecundae* Pryor & Johnson 280
- ser. *Foveolatae* Maiden 3, 4, **333, 498**
- ser. *Fraxinales* Blakely 3, 4, **175**
- ser. *Fruticosae* Blakely 280
- ser. *Globulares* Blakely 344
- ser. *Heterophloiae* Blakely 3, 4, **412, 498**
- ser. *Heteroptera* Maiden 3, 4, **109, 498**
- ser. *Heterostemones* Benth. 3, 4, **271, 498**
- ser. *Howittianae* Chippendale 3, 4, **194, 498**
- ser. *Inclusae* (Benth.) Chippendale 3, 4, **196, 499**
- ser. *Insulares* Chippendale 3, 4, **136, 499**
- ser. *Jacobsianae* Chippendale 3, 4, **100, 499**
- ser. *Johnsonianae* Chippendale 3, 4, **135, 499**
- ser. *Jucundae* Chippendale 3, 4, **112, 499**
- ser. *Kochioides* Maiden 262, 499
- ser. *Kruseanae* Chippendale 3, 4, **237, 500**
- ser. *Lehmannianae* D.Carr & S.Carr 207
- ser. *Lepidotae-fimbriatae* Maiden 3, 4, **202, 500**
- ser. *Leptopodae* Blakely 262
- ser. *Leptospermae* (Blakely) Chippendale 3, 4, **121, 500**
- ser. *Levispermae* Maiden 3, 4, **226, 506**
- ser. *Longitudinales* Blakely 3, 4, **182, 500**
- ser. *Loxophlebae* Chippendale **238, 500**
- ser. *Lucasianae* Chippendale 3, 4, **389, 500**
- ser. *Maculatae* (Blakely) Chippendale 3, 4, **106, 500, 502**
- ser. *Meglanthae* (Blakely) Chippendale 3, 4, **122, 501**
- ser. *Meliiodorae* Blakely 3, 4, **420**
- ser. *Merrickianae* Chippendale 3, 4, **299, 501**
- ser. *Michaelianae* Chippendale 3, 4, **332, 501**
- ser. *Micrantherae* Benth. 3, 4, **241**
- ser. *Microcarpa* Blakely 3, 4, 333, **338, 501**
- ser. *Microcorythae* Blakely 3, 4, **250, 501, 505**
- ser. *Micromembranae* Maiden 3, 4, **213, 501, 503**

Eucalyptus continued

- ser. *Miniatae* Blakely 3, 4, **118**
- ser. *Moluccanae* Chippendale 3, 4, **394, 501**
- ser. *Muricatae* Maiden 133
- ser. *Myrtiformes* Blakely 3, 4, **193, 502**
- ser. *Naviculares* Maiden 3, 4, **102, 502**
- ser. *Neuroptera* Maiden 3, 4, **130, 497**
- ser. *Normales* Benth. 280
- ser. *Obliquae* Blakely 3, 4, **232, 502**
- ser. *Occidentales* Blakely 3, 4, **137, 502**
- ser. *Ochroxylon* Blakely 3, 4, **194**
- ser. *Odontocarpae* Chippendale 3, 4, **113, 502**
- ser. *Olsenianae* Chippendale 3, 4, **155, 502**
- ser. *Ovulares* Brooker 3, 4, **309**
- ser. *Pachyphloiae* Blakely 3, 4, **142, 503**
- ser. *Pachyspermae* Maiden 109
- ser. *Paniculatae* Blakely 3, 4, **387, 503**
- ser. *Piperitales* Blakely 3, 4, **184, 185**
- ser. *Planchonianae* Chippendale 3, 4, **159, 503**
- ser. *Porantherae* Benth. 3, 4, **280, 503**
- ser. *Porantherae* F.Muell. 277
- ser. *Porantheroideae* (Maiden) Chippendale 3, **389, 503**
- ser. *Psathyroxyla* Blakely 3, 4, **167, 503**
- ser. *Pseudostringybarks* Blakely 3, 4, **156, 503**
- ser. *Pumilae* Chippendale 3, 4, **332, 503**
- ser. *Pyramidales-D-shaped* Maiden 160
- ser. *Quadricostatae* Blakely 302
- ser. *Radiatae* Chippendale 3, 4, **185, 504**
- ser. *Regnantes* Chippendale 3, 4, **158, 504**
- ser. *Renantherae* Benth. 160
- ser. *Rhodoxyla* (Blakely) Chippendale 3, 4, **416, 504**
- ser. *Rubiginosae* Chippendale 3, 4, **123, 504**
- ser. *Rufispermae* Maiden 3, 4, **285, 510**
- ser. *Rummeryanae* Chippendale 3, 4, **386, 504**
- ser. *Salmonophloiae* Chippendale 4, **260, 505**
- ser. *Scutelliformes* Maiden 3, 4, **116, 505**
- ser. *Scutiformes* Maiden 3, 4, **67, 505**
- ser. *Semiunicolores* Blakely 344
- ser. *Siderophloiae* Blakely 3, 4, **403**
- ser. *Squamosae* Chippendale 4, **247, 505**
- ser. *Steatoxylon* Blakely 426
- ser. *Striolatae* Maiden 3, 4, **373, 505**
- ser. *Subbuxae* Blakely 3, 4, 389, **397, 505**
- ser. *Subcornutae* Blakely 226, 505
- ser. *Subereae* Chippendale 3, 4, **136, 506**
- ser. *Subexsertae* Blakely 3, 4, **312, 506**
- ser. *Subulatae* Blakely 4, **252, 506**
- ser. *Terminaliptera* Maiden 3, 4, **73, 448, 506**
- ser. *Tetrapterae* Blakely 3, 4, **302**
- ser. *Tetrodontae* Chippendale 3, 4, **115, 506**

INDEX

Eucalyptus continued

- ser. *Torellianae* Chippendale 3, 4, **105**, **506**
- ser. *Torquatae* Chippendale 3, 4, **294**, **506**
- ser. *Trachyphloiae* Chippendale 3, 4, **101**, **507**
- ser. *Transversae* Blakely 3, 4, **197**, **507**
- scr. *Viminales* Blakely 3, 4, **344**, 498, 500
- ser. *White-mahoganies* Blakely 3, **140**, 507
- ser. *Xylocarpae* Blakely 262
- subsect. *Graciles* Maiden 277
- subser. *Annulares* Blakely 201, 495
- subser. *Argophloiae* Blakely 312
- subser. *Boreales* Blakely 373
- subser. *Clavigerae* Maiden 67
- subser. *Congestae* Blakely 142, 503
- subser. *Cornutae* Benth. 207
- subser. *Corymbosae* Benth. 73
- subser. *Costatae* Blakely 159, 503
- subser. *Cylindraceae* Blakely 232, 503
- subser. *Cylindriformes* Blakely 182, 500
- subser. *Eucorymbosae* Blakely 496
- subser. *Eudesmiae* Benth. 109, 498
- subser. *Exsertae* Benth. 320
- subser. *Fasciculares* Blakely 109, 113, 115
- subser. *Holocalyces* Blakely 116, 498
- subser. *Inclusae* Benth. 196, 499
- subser. *Leptocarpae* Blakely 197, 507
- subser. *Leptospermae* Blakely 121, 500
- subser. *Leucoxylla* Blakely 420
- subser. *Macrocarpae* Blakely 302
- subser. *Maculatae* Blakely 106, 500
- subser. *Megaphyllae* Blakely 373
- subser. *Meglanthae* Blakely 122, 501
- subser. *Ochrophloiae* Blakely 102, 103, 105, 502
- subser. *Pauciflorae* Blakely 202
- subser. *Pedicellatae* Blakely 213, 218, 503
- subser. *Pelliculares* Blakely 202
- subser. *Protrusae* Blakely 373, 382
- subser. *Rhodoxylla* Blakely 416, 504
- subser. *Semidecorticatae* Blakely 333, 505
- subser. *Sessiles* Blakely 207
- subser. *Setosae* Blakely 67
- subser. *Striatae* Blakely 285
- subser. *Subangustae* Blakely 382, 394
- subser. *Submelliodorae* Blakely 403
- subser. *Subplatyphyllae* Blakely 373, 382, 394, 397, 496
- abbreviata Blakely & Jacobs **76**, 78, 457
- abergiana F.Muell. **97**, 99, 460
- acaciiformis Deane & Maiden **339**, 343, 431, 484
- var. *linearis* Deane & Maiden 339
- acacioides* Cunn. ex Maiden 402

Eucalyptus continued

- accedens* W.Fitzg. x, **230**, 233, 473, 495
- acervula* Sieber ex DC. 151
- acervula auct. non* Sieber ex DC. 334
- acies* Brooker **126**, 127, 462
- acmenoides* Schauer **140**, 141, 144, 464
- var. *carnea* (R.Baker) Maiden 142
- var. *tenuipes* Maiden & Blakely 121
- acuminata* Hook. 327
- acutangula* Turcz. 305
- adjuncta* Maiden 428
- aequans* Blakely 428
- affinis* Deane & Maiden 428
- agglomerata* Maiden 149, **150**, 465
- aggregata* Deane & Maiden 333, **337**, 338, 343, 484, 498
- agnata* Domin 213
- alba* Reinw. ex Blume xiv, **312**, 313, 314, 315, 428, 482, 501, 510
- var. *australasica* Blakely & Jacobs ex Blakely 312
- albens* Benth. **394**, 395, 397, 428, 430, 431, 435, 439, 442, 490
- var. *elongata* Blakely 394
- albicans* F.Muell. 442
- albida* Maiden & Blakely xiv, **285**, 289, 479
- algeriensis* Trabut 428
- alpina* Lindley xiii, 146, **147**, 149, 464
- altior* (Deane & Maiden) Maiden 163
- ambigua* DC. 177
- amplifolia* Naudin **323**, 324, 328, 483
- var. *sessiliflora* Blakely 323
- amygdalina* Labill. 187, 189, **190**, 191, 439, 440, 469
- var. *alpina* Rodway ex Maiden 442
- var. *angustifolia* F.Muell. ex L.Bailey 190
- var. *hypericifolia* Benth. 439
- var. *latifolia* Deane & Maiden 187
- var. *nitida* (J.D.Hook.) Benth. 191
- var. *regnans* F. Muell. 158
- anceps* (R.Br. ex Maiden) Blakely **291**, 295, 479
- andreana* Naudin 187
- andrewsii* Maiden **167**, 169
- subsp. *andrewsii* **167**, 168, 169, 466
- subsp. *campanulata* (R.Baker & H.G.Smith) L.Johnson & Blaxell 168, **169**, 467
- androsaemifolia* Hoffsgg. 442
- angophoroides* R.Baker **346**, 347, 351, 447, 485
- angulosa* Schauer 304, **305**, 481
- var. *ceratocorys* Blakely 305, 508
- var. *robusta* C.Gardner 431
- angusta* Maiden 281
- angustifolia* Desf. ex Link. 358

INDEX

Eucalyptus continued

- angustifolia* Turcz. 263
angustissima F.Muell. 246, 247, 251, 474
annulata Benth. 218, 220, 472
anomala Blakely 428
apiculata R.Baker & H.G.Smith 178, 179, 180, 468
apodophylla Blakely & Jacobs ex Blakely 312, 319, 322, 428, 482
 var. *brachyphylla* Blakely & Jacobs 428
approximans Maiden 179, 181
 subsp. *approximans* 179, 180, 181, 468
 subsp. *codonocarpa* (Blakely & McKie) L.Johnson & Blaxell 180, 181, 468
aquilina Brooker 125, 126, 127, 462
archeri Maiden & Blakely 367, 369, 488
arenaria Blakely 86, 87, 459
argillacea W.Fitzg. 377, 381, 489
argophloia Blakely 398, 401, 490
arnhemensis D.Carr & S.Carr 84, 85, 87, 458
aromaphloia Pryor & J.H.Willis 338, 343, 484
aromatica (Salisb.) Domin 184
aspera F.Muell. 72, 73, 75, 457
astringens (Maiden) Maiden 213, 215, 216, 217, 471, 503
auburnensis Maiden 428
aurantiaca F.Muell. 118
australiana R.Baker & H.G.Smith 185
 var. *latifolia* R.Baker & H.G.Smith 442
 var. *nitida* (J.D.Hook.) Ewart 191
australis D.Carr & S.Carr 88, 89, 91, 459
badjensis Beuzev. & Welch 360, 363, 487
bauerlenii F.Muell. 360, 361, 363, 487
baileyana F.Muell. 116, 117, 119, 462, 498, 505
bakeri Maiden 249, 251, 415, 496
balladoniensis Brooker 242, 244, 474
bancroftii (Maiden) Maiden 321, 322, 483
banksii Maiden 341, 349, 351, 485
barberi L.Johnson & Blaxell 336, 343, 484
barmedmanensis Maiden 428
baudiniana D.Carr & S.Carr 310
baueriana Schauer 413, 414, 415, 492
 var. *conica* (Deane & Maiden) Maiden 412
baxteri (Benth.) Maiden & Blakely ex J.Black 146, 147, 149, 464
 var. *pedicellata* Maiden & Blakely ex J.Black 146
beardiana Brooker & Blaxell 263, 266, 476
beasleyi Blakely 428
beauchampiana Elwes & A.Henry 442
behiana F.Muell. 382, 384, 385, 489, 496
 var. *purpurascens* F.Muell. ex Benth. 392
bennettiae D.Carr & S.Carr 429

Eucalyptus continued

- benthamii* Maiden & Cambage 361
 var. *benthamii* 361, 362, 363, 487
 var. *dorrigoensis* Blakely 362, 363, 487
beyeri R.Baker 417, 419, 423, 493
biangularis Simmonds 429
?bicolor Cunn. ex Mitch. 384, 496
 var. *parviflora* F.Muell. ex Benth. 383
 var. *xanthophylla* Blakely 378
bicostata Maiden, Blakely & J.Simm. 353
bigalerita F.Muell. 313, 315, 482
bipileata Blakely 429
biturbinata L.Johnson & K.Hill 204, 205, 470, 507, 509
blackburniana Maiden 429
blakelyi Maiden 324, 325, 326, 328, 440, 483
 var. *irrorata* Blakely 325
 var. *parvifructa* Blakely 325
blaxlandii Maiden & Cambage 147, 149, 437, 439, 464
bleeseri Blakely 79, 81, 458
bloxsomei Maiden x, 103, 104, 105, 460
boormanii Deane & Maiden 429
bosistoana F.Muell. 397, 398, 401, 491
botryoides Smith 199, 200, 429, 434, 438, 441, 470
 var. *lynei* Blakely 429
 var. *platycarpa* Blakely 200
bottii Blakely 184
bourlieri Trabut 429
bowmanii F.Muell. ex Benth. 404
brachyandra F.Muell. 193, 195, 469
brachycalyx Blakely 296, 297, 300, 480
 var. *chindoo* Blakely 296
 var. *protrusa* (J.Black) H.Eichler 296
brachycorys Blakely 311, 312, 315, 481
brachyphylla C.Gardner 238, 239, 474
brachypoda Turcz. 329
brassiana S.T.Blake 330, 331, 335, 483
brevifolia F.Muell. 314, 315, 316, 482
brevipes Brooker 280, 284, 478
brevirostris Blakely 429
brevistylis Brooker 137, 138, 139, 464
bridgesiana R.Baker 347, 348, 351, 485
 subsp. *malacoxylon* 347
 var. *amblycorys* (Blakely) Cameron 347
brockwayi C.Gardner 250, 251, 475, 496
brookeriana A.M.Gray 333, 336, 337, 343, 484
brownii Maiden & Cambage 382, 383, 385, 489, 496
bucknellii Cambage 429
buprestium F.Muell. 133, 135, 139, 463, 496

INDEX

Eucalyptus continued

- burdettiana Blakely & Steedman **210**, 211, 212, 471
- burgessiana L.Johnson & Blaxell **178**, 180, 468
- burracoppinensis Maiden & Blakely 262, 273, 276, 446, 477, 497
- caerulescens Naudin 421
- caesia Benth. 3, 4, **268**
 subsp. caesia x, xiv, **268**, 269, 270, 477
 subsp. magna Brooker & Hopper **268**, 269, 477
- cajuputea F.Muell ex Miq. 400
- calcareana Boomsma **288**, 289, 290, 479
- calicicola Brooker **128**, 132, 463
- calicultrix (F.Muell. ex Miq.) F.Muell. ex Blakely 399
 var. *obscura* Blakely 430
 var. *porosa* Blakely 399
- caleyi Maiden **420**, 423, 493
- californica Kinney 430
- caliginosa Blakely & McKie **152**, 157, 434, 411, 465
- callanii Blakely 430
- calophylla R.Br. ex Lindley **97**, 98, 99, 430, 432, 444, 460
 var. *hawkeyi* Blakely 430
 var. *maideniana* Hochr. 98
 var. *parviflora* Blakely 98
 var. *rosea* Guilfoyle 430
 var. *rubra* Guilfoyle 430
- calycogona Turcz. **279**, 284, 478
 var. *celastroides* (Turcz.) Maiden 279
 var. *gracilis* (F.Muell.) Maiden 278
 var. *spaffordii* Blakely 279
- camaldulensis Dehnh. 320, **327**, 328, 329, 381, 428, 435, 437, 440, 441, 447, 483
 var. *acuminata* (Hook.) Blakely 327
 var. *brevirostris* (F.Muell. ex Miq.) Blakely 327
 var. *obtusa* Blakely 327
 var. *pendula* Blakely & Jacobs 327
 var. *subcinerea* Blakely 327
- cabbageana Maiden **387**, 391, 490, 496
- cambagei Deane & Maiden 348
 var. *pallens* (Benth.) Deane & Maiden 349
- cameronii Blakely & McKie 152, **153**, 157, 465
- camfieldii Maiden **148**, 149, 150, 438, 465
- campanifructa Blakely 430
- campanulata R.Baker & H.G.Smith 169
- campaspe S.Moore **236**, 239, 473
- camphora R.Baker **334**, 335, 484, 505
- canaliculata Maiden 202, **204**, 205, 470, 500
- cannonii R.Baker 145
- capitellata Smith 142, **148**, 149, 150, 438, 465, 503

Eucalyptus capitellata continued

- var. *latifolia* Benth. 146
- capricornia D.Carr & S.Carr **86**, 87, 459
- carnabyi Blakely & Steedman ex Blakely 430
- carnea R.Baker 142
- carnei C.Gardner **234**, 239, 473
- celastroides Turcz. **279**
 subsp. *celastroides* 279, **280**, 284, 478
 subsp. *virella* Brooker **280**, 284, 478
- centralis D.Carr & S.Carr **92**, 93, 96, 459
- cephalocarpa Blakely **372**, 375, 488
- ceracea Brooker & Done **120**, 124, 462
- cerasiformis Brooker & Blaxell **226**, 229, 472
- ceratocorys (Blakely) L.Johnson & K.Hill 304, **305**, 481, **508**
- chapmaniana Cameron **365**, 369, 487
- chippendalei D.Carr & S.Carr 91, **92**, 459
- chisholmii Maiden & Blakely 430
- chloroclada (Blakely) L.Johnson & K.Hill **324**, 325, 326, 328, 483, **508**
- chlorophylla Brooker & Done 377, 381, 489
- chrysantha Blakely & Steedman 430
- cinerea F.Muell. ex Benth. **372**, 373, 375, 440, 488
 subsp. *cephalocarpa* 372
 var. *multiflora* Maiden 372
 var. *nova-anglica* (Deane & Maiden) Maiden 371
- citriodora Hook. **106**, 107, 108, 109, 461
- cladocalyx F.Muell. 251, **252**, 475, 501
- clavigera Cunn. ex Schauer 70, **71**, 457
 var. *dallachiana* (Benth.) Maiden 68
 var. *diffusa* Blakely & Jacobs 69
 var. *gilbertensis* Maiden & Blakely 72
- clelandii (Maiden) Maiden 292, **293**, 295, 479
- cliftoniana W.Fitzg. 80
- cloeziana F.Muell. **122**, 124, 462, 501
- cneorifolia DC. 3, **247**, 251, 445, 475
- coccifera J.D.Hook. **192**, 195, 442, 469
 var. *parviflora* Benth. 192, 442
 var. *viridifolia* Summerh. 442
- codonocarpa Blakely & McKie 181
- coerulea R.Baker & H.G.Smith 420
- collina W.Fitzg. **79**, 80, 81, 458
- colossea F.Muell. 442
- comitae-vallis Maiden 295, **296**, 480
- concinna Maiden & Blakely **297**, 300, 480
- concolor Schauer 245
- conferruminata D.Carr & S.Carr **211**, 214, 471
- conferruminata auct. non D.Carr & S.Carr 213
- confertiflora F.Muell. **69**, 70, 457
- confluens W.Fitzg. ex Maiden **316**, 317, 322, 482

INDEX

Eucalyptus continued

- congener Maiden & Blakely 431
- conglobata (R.Br. ex Benth.) Maiden **290**, 291, 295, 479
- subsp. *fraseri* Brooker 291
- ?var. *anceps* R.Br. ex Maiden 291
- conglomerata Maiden & Blakely **153**, 157, 465
- conica Deane & Maiden **412**, 414, 436, 440, 492
- coniophloia D.Carr & S.Carr **85**, 87, 458
- connata Dum.-Cours. 443
- connerensis D.Carr & S.Carr **89**, 91, 459
- conoidea* Benth. 223
 - var. *marginata* Benth. 224
- consideniana Maiden 167, 168, **169**, 170, 467
- coolabah* Blakely & Jacobs 379
 - var. *arida* Blakely 379
 - var. *rhodoclada* Blakely 379
- cooperiana F.Muell. 256, **257**, 476
- cordata Labill. **370**, 371, 375, 488
- cordata* Lodd. 371
- cordieri Trabut 431
 - var. *brachypoma* Blakely 348
 - var. *nortonii* Blakely 349
- cordieri auct. non* Trabut 349
- coriacea Cunn. ex Schauer 164
- cornuta Labill. 207, **208**, 209, 210, 433, 471
- coronata C.Gardner **126**, 127, 462
- corrugata Luehm. **298**, 300, 480
- corticiosa* L.Johnson 338
- corymbosa* Smith 100
 - var. *terminalis* F.Muell. ex Bailey 443
- corynocalyx* F.Muell. 252
- cosmophylla F.Muell. 202, **207**, 209, 471
 - var. *leprosula* (F.Muell. ex Miq.) F.Muell. ex Maiden 207
 - var. *rostrigera* F.Muell. ex Maiden 207
 - f. *leprosula* F.Muell. ex Miq. 207
- costata* F.Muell. & Behr ex F.Muell. 303
- cotinifolia* Colla 443
- crawfordii Maiden & Blakely 431
- crebra F.Muell. **407**, 410, 429, 434, 437, 438, 440, 446, 491
 - var. *citrata* F.Muell. 408
 - var. *macrocarpa* Domin 407
- crenulata Blakely & Beuzev. xvi, **345**, 351, 445
- crucis Maiden **267**
 - subsp. *crucis* **267**, 268, 269, 477
 - subsp. *lanceolata* Brooker & Hopper **267**, 269, 477
- cullenii Cambage **408**, 410, 491
 - var. *trivalvis* Blakely 408
- cultrifolia Naudin 431

Eucalyptus continued

- cunninghamii Sweet **179**, 180, 183, 468, 508
- cupularis C.Gardner **320**, 322, 482
- currabubula Blakely 431
- curtisii Blakely & C.White **121**, 124, 462, 497, 500
- cuspidata* Turcz. 305
- cyanoclada Blakely 373, **381**, 385, 435, 489
- cyanophylla Brooker **287**, 288, 289, 479
- cyathiformis* Blakely & McKie 152
- cyclostoma Brooker **311**, 315, 481
- cylindriflora Maiden & Blakely **223**, 225, 472
- cylindrocarpa Blakely **310**, 315, 481
- cypellocarpa L.Johnson **349**, 351, 355, 486
- dalrympleana Maiden 361, **364**
 - subsp. *dalrympleana* **364**, 365, 369, 487
 - subsp. *heptantha* L.Johnson **364**, 369, 487
- daphnoides* Miq. 192
- dawsonii R.Baker **393**, 395, 412, 415, 490, 497
- dealbata Cunn. ex Schauer 325, **326**, 327, 328, 483, 508
 - var. *chloroclada* Blakely 324, 508
 - var. *populnea* Blakely 443
- deanei Maiden **197**, 198, 199, 470
- debeuzevillei* Maiden 166
- decepta* Blakely 405
- decipiens Endl. 3, **244**, **245**, 246, 474
 - var. *angustifolia* Schauer 245
- decorticans (Bailey) Maiden **403**, 404, 406, 491
- decurva F.Muell. 240, **241**, 244, 474
- deflexa Brooker 294, **299**, 300, 480
- deformis* Blakely 154
- deglupta Blume 193, 502
- delegatensis R.Baker **161**
 - subsp. *delegatensis* 162, **163**, 466
 - subsp. *tasmaniensis* Boland 162, **163**, 466
- dendromorpha (Blakely) L.Johnson & Blaxell 175, **176**, 180, 467
- deserticola D.Carr & S.Carr **74**, 75, 457, **495**
- desertorum* D.Carr & S.Carr 74, 495
- desertorum* Naudin 281, 495
- desmondensis Maiden & Blakely **228**, 229, 473
- deuaensis Boland, Gilmour & Brophy **147**, 494
- dextropinea* R.Baker 142
- dichromophloia F.Muell. 73, **83**, 84, 85, 86, 87, 458, 496
- dielsii C.Gardner **224**, 226, 229, 412
- diptera C.R.P.Andrews 235, **236**, 239, 473
- discolor* Desf. 443
- discreta Brooker 284, **285**, 478
- distans Brooker **379**, 381, 489
- divaricata* McAulay & Brett ex Brett 366
- diversicolor F.Muell. xi, 125, **196**, 199, 470, 499

INDEX

Eucalyptus continued

- diversifolia Bonpl. 123, **129**, 132, 463, 497
diversifolia Woolls 357
 dives Schauer 186, **187**, 188, 189, 431, 438, 469
 dixonii F.Wakef. 431
 dongarraensis Maiden & Blakely **288**, 289, 479
 doratoxylon F.Muell. **241**, 244, 474
 dorisiana Blakely 431
dorrienii Domin 243
 drepanophylla F.Muell. ex Benth. 404, **407**, 410, 491
 var. *leptophleba* (F.Muell.) Luehm. ex Burt-Davey 373
 drummondii Benth. **270**, 272, 430, 477
 drysdalensis D.Carr & S.Carr **84**, 87, 458
 dumosa Cunn. ex Oxley 285, **287**, 288, 289, 479
 var. *conglobata* R.Br. ex Benth. 290
 var. *puncticulata* Benth. 283
 var. *rhodophloia* Benth. 446
 var. *scyphocalyx* F.Muell. ex Benth. 301
 dundasii Maiden **307**, 315, 481, 497
 dunnii Maiden **346**, 347, 351, 485
 dwyeri Maiden & Blakely **326**, 328, 483, 508
 ebbanoensis Maiden **111**, 114, 461, 497
 ednaeana Blakely 431
 effusa Brooker 235, **237**, 239, 474
elaeophora F.Muell. 348
 elata Dehnh **187**, 195, 360, 445, 469
elongata Link 443
 erectifolia Brooker & Hopper **130**, 132, 463
 eremaea D.Carr & S.Carr **88**, 89, 90, 91, 459
 eremicola Boomsma **255**, 256, 476
 eremophila (Diels) Maiden **222**, 223, 225, 472
 subsp. *pterocarpa* (Blakely & Steedman) L.Johnson & Blaxell 222
 var. *grandiflora* (Maiden) Maiden 222
 var. *pterocarpa* Blakely & Steedman 222
 erythrandra Blakely & Steedman 431
erythrocalyx Oldfield & F.Muell. ex F.Muell. 274
 erythrocorys F.Muell. *Frontispiece*, **109**, 114, 461
 erythronema Turcz. 6, **223**, 498
 var. *erythronema* xi, **224**, 225, 472
 var. *marginata* (Benth.) Domin **224**, 225, 472
 var. *roei* Maiden 443
 erythrophloia Blakely **94**, 95, 96, 459
 eudesmioides F.Muell. **110**, 111, 114, 461
 var. *globosa* Blakely 110
eudesmoides F.Muell. 110
 eugenioides Sieber ex Sprengel **151**, 152, 153, 157, 437, 465
 var. *nana* Deane & Maiden 443

Eucalyptus continued

- ewartiana Maiden **264**, 265, 266, 476
 exilis Brooker **135**, 139, 463
 eximia Schauer 102, **105**, 108, 460, 502
 exserta F.Muell. 320, **330**, 331, 335, 483
 var. *parvula* Blakely 330
 fabrorum Schldl. 160
 falcata Turcz. **243**, 244, 245, 474
 var. *ecostata* Maiden 243
falcifolia Miq. 160
 fasciculosa F.Muell. **415**, 418, 492
 fastigata Deane & Maiden **159**, 162, 466
fergusonii R.Baker 417
 ferriticola Brooker & Edgcombe **73**, 75, 457
 ferruginea Schauer **74**, 75, 457
 fibrosa F.Muell. **404**, 408
 subsp. *fibrosa* **404**, 406, 429, 491
 subsp. *nubila* (Maiden & Blakely) L.Johnson **405**, 406, 436, 491
 ficifolia F.Muell. xii, **97**, 98, 99, 430, 432, 460
 var. *alba* Blakely 432
 var. *alba* Guilfoyle 432
 var. *carmina* Blakely 432
 var. *guilfoylei* Bailey 432
 var. *rosea* Guilfoyle 432
 fitzgeraldii Blakely 373, **376**, 381, 483
fletcheri R.Baker 413
flexilis Regel 443
 flindersii Boomsma **327**, 328, 331, 483
 flocktoniae (Maiden) Maiden 256, **257**, 476
floribunda Huegel ex Endl. 138
 foecunda Schauer 253, 280, **281**, 283, 284, 285, 478
 foelscheana F.Muell. 81, **82**, 458
 fordeana D.Carr & S.Carr **90**, 91, 459
 formanii C.Gardner **283**, 284, 478
 forrestiana Diels 3, 4, 302, **306**
 subsp. *dolichorhyncha* Brooker **307**, 308, 481
 subsp. *forrestiana* **307**, 308, 481
 subsp. *stoatei* (C.Gardner) C.J.Robinson 306
forsythii Maiden 421
 forthiana Blakely 432
 fraseri (Brooker) Brooker 290, **291**, 295, 479
 fraxinoides Deane & Maiden 174, **175**, 467
 var. *triflora* (Maiden) Maiden 175
 froggattii Blakely **402**, 406, 491
fruticetorum F.Muell. ex Miq. 400
fruticetorum auct. non F. Muell. ex Miq. 402
 fruticosa Brooker **282**, 284, 478
 gamophylla F.Muell. **115**, 119, 461
 gardneri Maiden 227, **228**, 229, 473
 georgei Brooker & Blaxell **286**, 287, 289, 479

INDEX

Eucalyptus continued

- gigantea* Desf. 352
gigantea J.D.Hook. 163
gilbertensis (Maiden & Blakely) S.T.Blake 72, 75, 457
gillennii Ewart & L.Kerr 331, 335, 484
gillii Maiden 259, 261, 432, 476
var. *petiolaris* Maiden 432
gittinsii Brooker & Blaxell 110, 114, 461
glandulosa Desf. 190
glaucua DC. 443
glaucua Hoffsgg. 443
glaucescens Maiden & Blakely 366, 367, 369, 487
glaucina (Blakely) L.Johnson 325, 328, 483
glaucophylla Hoffsgg. 444
globoidea Blakely 152, 153, 157, 430, 432, 465
var. *largifruta* Blakely 432
var. *subsphaerica* Blakely 152
globulus Labill. 344, 352, 429, 431, 432, 433, 435, 444, 445
subsp. *bicostata* (Maiden, Blakely & J.Simm.) Kirkpatr. 353, 355, 486
subsp. *globulus* 352, 355, 443, 486
subsp. *maidenii* (F.Muell.) Kirkpatr. 354, 355, 486
subsp. *pseudoglobulus* (Naudin ex Maiden) Kirkpatr. 353, 355, 434, 436, 437, 486
var. *bicostata* (Maiden, Blakely & J.Simm.) Ewart 353
var. *compacta* H.M.Hall 444
var. *compacta* Maiden 432
var. *stjohnii* R.Baker 353
gomphocephala DC. 208, 209, 433, 436, 471
var. *rhodoxylon* Blakely & Steedman 208
gomphocornuta Trabut 432
gongylocarpa Blakely x, 113, 114, 461
goniantha Turcz. 242, 243, 431
subsp. *goniantha* 242, 243, 244, 474
subsp. *semiglobosa* Brooker 241, 243, 244, 474
var. *clelandii* Maiden 293
goniocalyx F.Muell. ex Miq. 348, 349, 351, 442, 486
var. *acuminata* Benth. 349
var. *nitens* Deane & Maiden 351
var. *pallens* Benth. 349
var. *parviflora* Blakely & McKie 349
goniocalyx auct. non F.Muell. ex Miq. 351
gracilipes Naudin 444
gracilis F.Muell. 277, 278, 284, 478, 498
var. *breviflora* Benth. 278
var. *erecta* Blakely 278
var. *thozetii* Bailey 390
var. *viminea* Blakely 278

Eucalyptus gracilis continued

- var. *yilgarnensis* Maiden 278
grandifolia R.Br. ex Benth. 67, 69, 70, 457, 505
grandis W.Hill ex Maiden 197, 198, 199, 433, 470
var. *grandiflora* Maiden 433
grasbyi Maiden & Blakely 252
gregsoniana L.Johnson & Blaxell 166, 168, 466
griffithsii Maiden 297, 298, 300, 480
var. *angustiuscula* Blakely 297
grossa F.Muell. ex Benth. 232, 233, 234, 473, 502
guilfoylei Maiden 194, 195, 196, 469
gullickii R.Baker & H.G.Smith 342
gummifera (Sol. ex Gaertner) Hochr. 73, 95, 100, 101, 104, 436, 460
var. *intermedia* (R.Baker) Domin 95
gunnii J.D.Hook. 366, 367, 369, 487
var. *acervula* (Labill.) Deane & Maiden 334
var. *elata* J.D.Hook. 444
var. *glaucua* Deane & Maiden 366
var. *maculosa* (R.Baker) Maiden 341
var. *montana* J.D.Hook. 366, 370
var. *ovata* (Labill.) Deane & Maiden 334
var. *rubida* (Deane & Maiden) Maiden 365
var. *undulata* Rehder 444
gunnii auct. non J.D.Hook. 366
haemastoma Smith 167, 172, 174, 433, 438, 467, 503
var. *capitata* Maiden 171
var. *inophloia* C.White 167
var. *montana* Deane & Maiden 435
var. *sclerophylla* Blakely 171
haematoxylon Maiden 98, 99, 460
hallii Brooker 317, 322, 482
halophila D.Carr & S.Carr 246, 247, 251, 475
helmsii Maiden & Blakely 301
hemilampra F.Muell. 202
hemiphloia F.Muell. ex Benth. 396
var. *albens* (Benth.) Maiden 394
var. *microcarpa* Maiden 396
var. *parviflora* Benth. 444
var. *purpurascens* (F.Muell. ex Benth.) Maiden 392
henryi S.T.Blake 107, 108, 461
herbertiana Maiden 312, 319, 320, 322, 482
heterophylla Miq. 160
hillii Maiden 374
var. *alleniana* Blakely & Jacobs 374
hirsuta Link 454
hookeri F.Muell. 67
horistes L.Johnson & K.Hill 254, 255, 256, 475, 509

INDEX

Eucalyptus continued

houseana W.Fitzg. ex Maiden **318**, 322, 482
howittiana F.Muell. **194**, 195, 469, 498
huberiana Naudin 444
huberiana auct. non Naudin 359
hybrida Maiden 433
hypericifolia Dum.-Cours. 444
hypoleuca Schauer 138
imlayensis Crisp & Brooker **356**, 363, 486
incrassata Labill. **303**, 304, 305, 432, 481
 subsp. costata (F.Muell. & Behr ex F.Muell.)
 F.Johnstone & Hallam 303
 var. angulosa (Schauer) Benth. 305
 var. conglobata (R.Br. ex Benth.) Maiden 290
 var. costata (F.Muell. & Behr ex F.Muell.)
 N.Burb. 303
 var. dumosa (Cunn. ex Oxley) Maiden 287
 var. goniantha (Turcz.) Maiden 242
 var. protrusa J.Black 296
incrassata Sieber ex DC. 156
incurva Boomsma 331
inophloea Brogli 444
insignis Naudin 324
insizwaensis Maiden 433
insulana Bailey 330
insularis Brooker 136, **137**, 139, 463, 499
intermedia R.Baker **95**, 96, 97, 100, 101, 460
intertexta R.Baker **387**, 388, 391, 431, 490, 503
 var. diminuta Blakely 388
 var. fruticosa Blakely & Jacobs 387
 var. magna Blakely 388
isingiana Maiden 303
jacksonii Maiden **138**, 140, 144, 196, 464
jacobsiana Blakely **100**, 104, 460, 499
jensenii Maiden **409**, 410, 492
johnsoniana Brooker & Blaxell **135**, 139, 463
 499
johnstonii Maiden 344, **356**, 363, 486
joyceae Blakely 433
jucunda C.Gardner **112**, 114, 461, 499
jugalis Naudin 433
jutsonii Maiden **248**, 249, 251, 475
kalangadoensis Maiden & Blakely 433
kalganensis Maiden 433, 502
kartzoffiana L.Johnson & Blaxell **362**, 363, 487
kessellii Maiden & Blakely 242
kingmillii (Maiden) Maiden & Blakely **275**,
 276, 478
kirtoniana F.Muell. 433
kitsoniana Maiden **345**, 351, 485
kitsonii Luehm. ex Maiden 345
kochii Maiden & Blakely 253, **254**, 256, 475,
 509

Eucalyptus continued

kombolgiensis Brooker & Dunlop **71**, 72, 75,
 457
kondininensis Maiden & Blakely **292**, 295, 479
koolpinensis Brooker & Dunlop **376**, 377, 381,
 488
kruseana F.Muell. xiv, **237**, 238, 239, 474, 500
kybeanensis Maiden & Cambage **181**, 189, 468
lactea R.Baker 341
laeliae Podger & Chippendale **230**, 231, 233, 473
laevopinea R.Baker **143**, 144, 464
 var. minor R.Baker 151
 var. turbinata Blakely & McKie ex Blakely 433
lamprocalyx Blakely **77**, 78, 457
lamprocarpa Blakely 77
lamprocarpa F.Muell. ex Miq. 287
lanepolei Maiden **270**, 279, 477
langii Maiden & Blakely 252
lansdowneana F.Muell. & J.Brown **392**
 subsp. alborpurpurea Boomsma **392**, 395, 490
 subsp. lansdowneana **392**, 393, 395, 490
 var. leucantha Blakely 392
largeana Blakely & Beuzev. ex Blakely **382**, 384,
 385, 489, 496
largiflorens F.Muell. **384**, 385, 437, 489
 var. xanthophylla (Blakely) Cameron 378
laseronii R.Baker 434
 var. doleiformis Blakely & McKie ex Blakely
 434
 var. maxima Blakely & McKie ex Blakely 434
lateritica Brooker & Hopper **131**, 132, 463
latifolia F.Muell. **82**, 83, 87, 458
lehmannii (Schauer) Benth. 207, **213**, 214, 429,
 471
lehmannii auct. non (Schauer) Benth. 211
leichhardtii Bailey 102
leiophloia Blakely & Jacobs 82
 var. lepidophloia Blakely & Jacobs 82
lenziana D.Carr & S.Carr **89**, 91, 459
leptocalyx Blakely **301**, 304, 480
leptocarpa Blakely 434
leptophleba F.Muell. **373**, 374, 375, 488
leptophylla F.Muell. ex Miq. 281
 var. densa Blakely 281
 var. floribunda Blakely 282
 var. leptorhyncha Blakely 282
leptopoda Benth. 262, **263**, 264, 266, 476
lesouefii Maiden **293**, 294, 295, 480, 510
leucadendron Reinw. ex Vriese 312
leucophloia Brooker **316**, 322, 482
leucophylla Domin 377
leucoxydon F.Muell. 420, **421**, 425, 426, 433,
 436, 444, 445

INDEX

Eucalyptus leucoxylon-continued

- subsp. leucoxylon xvi, **422**, 423, 424, 493
- subsp. megalocarpa Boland **422**, 423, 493
- subsp. petiolaris Boland **424**, 427, 493
- subsp. pruinosa (F.Muell. ex Miq.) Boland 423, 424, 493
- var. *angulata* Benth. 422
- var. *erythrostema* F.Muell. ex Miq. 422
- var. *macrocarpa* J.Brown 422
- var. *minor* Benth. 425
- var. *pallens* Benth. 420, 425
- var. *pauperita* J.Brown 424
- var. *pluriflora* F.Muell. ex Miq. 434
- var. *pruinosa* F.Muell. ex Miq. 424
- var. *purpurea* H.M.Hall 444
- var. *rostellata* F.Muell. ex Miq. 444
- var. *rubra* Guilfoyle 445
- var. *rugulosa* F.Muell. ex Miq. 422
- ligulata Brooker **128**, 129, 132, 463
- ligustrina DC. **154**, 157, 428, 465
- lindleyana* DC. 445
 - var. *stenophylla* Blakely 187
- lindleyana auct. non* DC. 187
- linearis* Dehnh. 190
- lirata W.Fitzg. ex Maiden **117**, 118, 119, 462
- longicornis (F.Muell.) F.Muell. ex Maiden **252**, 256, 475
- longifolia* Lindley 445
- longifolia Link 202, **206**, 207, 209, 428, 434, 471
 - var. multiflora Maiden 434
 - var. turbinata Blakely & Beuzev. ex Blakely 434
- longirostrata (Blakely) L.Johnson & K.Hill **206**, 209, 470, **508**
 - f. *brevirostris* F.Muell. ex Miq. 327
- longirostris* F.Muell. ex Miq. 327
- loxophleba Benth. **238**, 500
 - subsp. *gratie* Brooker 239, **240**, 474
 - subsp. *loxophleba* 239, **240**, 474
 - var. *fruticosa* Benth. 238
- lucasia Blakely **389**, 391, 393, 490, 500
- lucens Brooker & Dunlop 412, **415**, 418, 492
- luehmanniana F.Muell. **164**, 168, 441, 466
 - var. *altior* Deane & Maiden 163
- macarthurii Deane & Maiden **357**, 358, 363, 386
- macrandra F.Muell. ex Benth. xiv, **217**, 220, 471
- macrocalyx* Turcz. 274
- macrocarpa Hook. 262, **271**, 272, 273, 430, 477, 499
- macrocera* Turcz. 208
- macropoda* Blakely 79
- macrorhyncha F.Muell. ex Benth. **143**, 146

Eucalyptus macrorhyncha continued

- subsp. cannonii (R.Baker) L.Johnson & Blaxell **145**, 149, 464
- subsp. macrorhyncha **145**, 149, 429, 464
- var. *brachycorys* Benth. 143
- var. *minor* Blakely 143
- f. *grandiflora* Maiden 445
- maculata Hook. 106, **107**, 108, 109, 436, 461, 500
 - var. *citriodora* (Hook.) Bailey 106
 - var. *citriodora* Bailey 106
 - var. *citriodora* Kinney 106
- maculosa* R.Baker 341
- mahoganii* F.Muell. 138
- maidenii* F.Muell. 354
 - var. *williamsoni* Blakely 434
- major (Maiden) Blakely **203**, 205, 470
- malacoxylon Blakely **347**, 351, 485
- mannensis Boomsma **249**, 251, 475
- mannifera Mudie **340**, 344
 - subsp. elliptica (Blakely & McKie) L.Johnson **341**, 343, 485
 - subsp. gullickii (R.Baker & H.G.Smith) L.Johnson **342**, 343, 485
 - subsp. maculosa (R.Baker) L.Johnson **341**, 343, 442, 485
 - subsp. mannifera **340**, 341, 342, 343, 485
 - subsp. praecox (Maiden) L.Johnson **341**, 343, 485
 - var. *elliptica* Blakely & McKie 341
- marginata Donn ex Smith 131, 137, **138**, 139, 140, 433, 464, 502
 - var. *staeri* Maiden 140
- marsdenii C.Hall 434
- mazeli* Naudin 445
- mcclatchiei Kinney 434
- mcintyrensis Maiden 435
- mckieana Blakely **154**, 157, 441, 465
- media Link 435
- meeboldii* Blakely 297
- megacarpa F.Muell. 124, **125**, 462
- megacornuta C.Gardner **210**, 211, 212, 471
- melanoleuca S.T.Blake **416**, 418, 492
- melanophloia F.Muell. 403, 408, **411**, 412, 414, 420, 428, 429, 435, 439, 492
 - var. *senta* Blakely 435
- melanoxylon Maiden **294**, 295, 480
- melissiodora* Lindley 106
- melliodora Cunn. ex Schauer x, 420, **421**, 422, 423, 425, 428, 435, 437, 439, 440, 493
 - var. *brachycarpa* Blakely 421
 - var. *elliptocarpa* Blakely 421
 - var. *murrurundi* Blakely 435
- merrickiae* Luehm. 501

INDEX

Eucalyptus continued

- merrickiae Maiden & Blakely 299, 301, **302**, 304, 480
- merrickiae auct. non Maiden & Blakely 301
- michaeliana Blakely **332**, 335, 484, 501
- micrantha DC. 172
- var. *signata* (F.Muell.) Blakely 171
- micranthera F.Muell. ex Benth. 3, 241, **245**, 251, 474
- microcarpa (Maiden) Maiden 394, **396**, 401, 441, 490
- microcorys F.Muell. **426**, 427, 493
- microneura Maiden & Blakely **379**, 381, 489
- microphylla Cunn. 179, 183, 508
- microphylla Willd. 445
- microtheca F.Muell. 373, **379**, 381, 385, 430, 435, 438, 439, 442, 489
- var. cymbaliformis Blakely & Jacobs ex Blakely 435
- miniata Cunn. ex Schauer x, xii, 116, **118**, 119, 120, 462
- mitchelliana Cambage **182**, 183, 189, 468
- mitchellii Cambage 182
- mitrata C.Gardner 126
- moluccana Roxb. 394, 395, **396**, 397, 429, 432, 433, 490, 501
- montana (Deane & Maiden) Blakely 435
- mooreana W.Fitzg. ex Maiden **318**, 319, 322, 482
- moorei Maiden & Cambage **183**, 428, 435, 439, 505
- var. arborea Blakely 435
- var. latiuscula Blakely **183**, 189, 468
- var. moorei **183**, 189, 468
- morrisbyi Brett **368**, 369, 488
- morrisii R.Baker **331**, 335, 484
- morrisonii Maiden 237
- mortoniana Kinney 435
- mucronata Link 435
- muelleri Miq. 287
- muelleri Naudin 334
- muelleri T.B.Moore 356
- muelleriana A.Howitt **142**, 143, 144, 146, 429, 436, 464
- multicaulis Blakely **170**, 174, 467
- multiflora Poiret 200
- var. *bivalvis* Blakely 200
- mundijongensis Maiden 435
- murphyi Maiden & Blakely 436
- myriadena Brooker **310**, 315, 481
- myrtifolia Link 445
- myrtiformis Naudin 445
- nanglei R.Baker 417
- neglecta Maiden **344**, 345, 351, 485

Eucalyptus continued

- nelsonii D.Carr & S.Carr **90**, 91, 459
- nepeanensis R.Baker & H.G.Smith 436
- nervosa F.Muell. ex Miq. 161
- nervosa Hoffsgg. 436
- nesophila Blakely **95**, 96, 460
- newbeyi D.Carr & S.Carr **211**, 216, 471
- nicholii Maiden & Blakely **339**, 343, 484
- nigra R.Baker **151**, 157, 465
- niphophila Maiden & Blakely 165
- niphophloia Blakely & M.Jacobs 83
- nitens (Deane & Maiden) Maiden **351**, 355, 486
- nitida J.D.Hook. 187, **191**, 195, 469
- nitida auct. non J.D.Hook. 188
- normantonensis Maiden & Cambage **378**, 381, 489
- nortonii (Blakely) L.Johnson **349**, 351, 486
- notabilis Maiden **201**, 205, 470
- nova-anglica Deane & Maiden **371**, 372, 373, 375, 488
- nowraensis Maiden 436
- nubila Maiden & Blakely 405
- nutans F.Muell. **219**, 220, 472
- obcordata Turcz. 219
- obliqua L'Hér. 1, **160**, 161, 162, 436, 466
- var. *alpina* Maiden 163
- var. *degressa* Blakely 161
- var. *discocarpa* Blakely 436
- var. *megacarpa* Blakely 161
- var. *microstoma* Blakely 436
- var. *pilula* Blakely 436
- oblonga DC. **154**, 157, 441, 465
- var. *rugulosa* Blakely 154
- obtusiflora DC. **177**, 178, 180, 441, 446, 468
- var. *dendromorpha* Blakely 176
- occidentalis Endl. **213**, 215, 216, 217, 471, 501
- var. *astringens* Maiden 215
- var. *californica* Kinney 445
- var. *eremophila* Diels 222
- var. *grandiflora* Maiden 222
- var. *macrandra* (F.Muell. ex Benth.) Maiden 217
- var. *?stenantha* Diels ex Maiden 213
- aff. occidentalis 429
- ochrophloia F.Muell. 389, **390**, 391, 490, 503
- ochrophylla Maiden & Blakely 297
- odontocarpa F.Muell. **113**, 115, 119, 461, 502
- odorata Behr 397, **400**, 402, 429, 430, 436, 505
- var. *angustifolia* Blakely **400**, 401, 491
- var. *calcicultrix* F.Muell. ex Miq. 399
- var. *erythrandra* F.Muell. ex Miq. 400
- var. *floribunda* Benth. 445
- var. *macrocarpa* Blakely 436

INDEX

Eucalyptus odorata continued

- var. *odorata* **400**, 401, 491
- var. *purpurascens* (F.Muell. ex Benth.) Maiden 392
- var. *refracta* Blakely 400
- var. *woollsiana* Maiden 397
- oldfieldii F.Muell. 272, **273**, 274, 477
- var. *drummondii* (Benth.) Maiden 270
- oleosa F.Muell. ex Miq. 252, **253**, 254, 256, 258, 281, 475, 506, 509
- var. *angustifolia* Maiden 253
- var. *borealis* C.Gardner 254, 509
- var. *flocktoni* Maiden 257
- var. *flocktoniae* Maiden 257
- var. *glauca* Maiden 258
- var. *kochii* C.Gardner 254
- var. *longicornis* F.Muell. 252
- var. *obtus*a C.Gardner 253
- var. *peeneri* Blakely 255
- var. *plenissima* C.Gardner 254
- oligantha Schauer **374**, 375, 376, 488
- ollaris D.Carr & S.Carr **84**, 87, 458
- olsenii L.Johnson & Blaxell **155**, 162, 465, 502
- opaca D.Carr & S.Carr **93**, 96, 459
- oraria L.Johnson **310**, 315, 481
- orbifolia F.Muell. **265**, 266, 267, 477
- oreades R.Baker **163**, 164, 168, 438, 466
- orgadophila Maiden & Blakely **388**, 391, 490
- orientalis D.Carr & S.Carr **93**, 96, 459
- ornata Crisp **243**, 244, 474
- ovalifolia* R.Baker 413
- var. *lanceolata* R.Baker & H.G.Smith 413
- ovata Labill. 333, **334**, 335, 336, 433, 435, 440, 484, 505
- var. *aquatica* Blakely 334
- var. *camphora* (R.Baker) Maiden 334
- var. *grandiflora* Maiden 334
- oviformis Maiden & Blakely 436
- ovularis Maiden & Blakely 238, **309**, 310, 315, 481
- oxymitra Blakely **264**, 265, 266, 476
- oxypoma Blakely 436
- pachycalyx Malden & Blakely **248**, 251, 475
- pachyloma Benth. **129**, 130, 132, 463
- pachyphylla F.Muell. **275**, 276, 446, 478
- var. *sessilis* Maiden 277
- pachypoda F.Muell. 437
- paliformis L.Johnson & Blaxell **176**, 180, 467
- pallens* DC. 160
- pallidifolia* F.Muell. 314
- paludosa* R.Baker 334
- panda S.T.Blake **419**, 423, 493
- subsp. *illaquens* L.Johnson 417

Eucalyptus continued

- paniculata Smith 416, **417**, 418, 419, 433, 492, 504
- var. *angustifolia* Benth. 417
- var. *conferta* Benth. 445
- papuana F.Muell. xi, 68, 70, 457
- paradoxa Maiden & Blakely 437
- parramattensis C.Hall **321**, 323, 328, 483
- var. *sphaerocalyx* Blakely 321, 323
- parvifolia Cambage **339**, 343, 484
- pastoralis* S.Moore 313
- patellaris F.Muell. 373, **374**, 375, 376, 488, 505
- patens Benth. **131**, 132, 463, 497
- patentiflora* Miq. 421
- patentinervis R.Baker 437
- pauciflora Sieber ex Sprengel **164**, 166
- subsp. *debeuzevillei* (Maiden) L.Johnson & Blaxell **166**, 168, 466
- subsp. *niphophila* (Maiden & Blakely) L.Johnson & Blaxell xi, **165**, 168, 466
- subsp. *pauciflora* xiii, **165**, 168, 430, 441, 466
- var. *alba* Ewart 165
- var. *cylindrocarpa* Blakely 437
- var. *densiflora* Blakely & McKie 437
- var. *nana* Blakely 166
- var. *rusticata* Blakely & McKie ex Blakely 437
- peacockeana Maiden 437
- peeneri (Blakely) Pryor & L.Johnson ex Boomsma **255**, 256, 475
- pellita F.Muell. **201**, 202, 205, 470
- peltata Benth. **102**, 103, 105
- subsp. *leichhardtii* (Bailey) L.Johnson & Blaxell **102**, 104, 460
- subsp. *peltata* **102**, 103, 104, 460
- pendens Brooker 100, **134**, 139, 463
- penrithensis Maiden 437
- perfoliata* Desf. 445
- perfoliata* R.Br. ex Benth. 77
- perplexa* Maiden & Blakely 409
- perriniana F.Muell. ex Rodway 369, **370**, 371, 488
- persicifolia* Lodd. 156
- petraea D.Carr & S.Carr 389, **393**, 395, 490
- petrophila Blakely 437
- phaeotricha* Blakely & McKie 151
- phellandra* R.Baker & H.G.Smith 185
- phlebophylla* F.Muell. ex Miq. 164
- phoenicea F.Muell. **120**, 124, 462
- pilbarensis Brooker & Edgecombe **231**, 233, 473
- pileata Blakely **290**, 295, 479
- pilligaensis Maiden 394, **397**, 401, 490
- pilularis Smith **156**, 157, 158, 441, 443, 465, 503
- var. *pyriformis* Maiden 156

INDEX

Eucalyptus continued

- pilularis* auct. non Smith 358
pimpiniana Maiden 302, **303**, 304, 481
piperita Smith **184**, 430, 435, 438
 subsp. *piperita* **184**, 185, 189, 433, 438, 468
 subsp. *urceolaris* (Maiden & Blakely)
 L.Johnson & Blaxell **185**, 189, 431, 468
 var. *brachycorys* Benth. 446
 var. *eugenoides* Benth. 447
 var. *laxiflora* Benth. 184
 var. *orophila* Blakely 437
 var. *pauciflora* Sieber ex DC. 446
planchoniana F.Muell. **159**, 160, 162, 466, 503
platycorys Maiden & Blakely **301**, 302, 304, 312, 480
platyphylla F.Muell. **313**, 314, 315, 440, 482
 var. *tintinnans* Blakely & Jacobs 313, 510
platypodos Cav. 200
platypus Hook. **219**
 var. *heterophylla* Blakely 220, **221**, 472
 var. *nutans* (F.Muell.) Benth. 219
 var. *platypus* **219**, 220, 221, 472
plenissima (C.Gardner) Brooker **254**, 256, 475, 509
pleurocarpa Schauer 109
plurilocularis F.Muell. 438
polyanthemos Schauer 412, **413**, 418, 492, 498
polybractea R.Baker **402**, 406, 491
polycarpa F.Muell. **94**, 95, 96, 97, 447, 460
 var. *oligocarpa* Blakely & Jacobs 88
polysciada F.Muell. 71
pontis D.Carr & S.Carr **80**, 81, 458
populifolia Desf. 324
populifolia Hook. 383
 var. *obconica* Blakely 438
populnea F.Muell. **383**, 384, 385, 429, 430, 438, 489
 var. *obconica* (Blakely) Cameron 438
porosa F.Muell. ex Miq. **399**, 401, 430, 491
porrecta S.T.Blake **80**, 81, 458
praecox Maiden 341
preissiana Schauer *xiii*, **126**, 127, 431, 433, 462
 var. *glauca* Regel 446
procera Dehnh. 160
prominens Brooker **232**, 233, 473
propinqua Deane & Maiden *x*, **203**, 204, 205, 470
 var. *major* Maiden 203
pruinosa Schauer 373, **381**, 385, 403, 489
pruinosa Turcz. 274
pyrioriana L.Johnson **359**, 363, 487
pseudo-piperita Maiden & Blakely 438
pseudoglobulus Naudin ex Maiden 353

Eucalyptus continued

- pterocarpa* C.Gardner ex P.Lang *xv*, **293**, 295, 480, 510
ptychocarpa F.Muell. *Cover*, **77**, 78, 458
pulchella Desf. *xiii*, 190, 195, 469
pulverulenta Link 443
pulverulenta Sims **371**, 375, 488
 var. *lanceolata* Howitt 372
 var. *ovatifolia* Dehnh. 446
pulverulenta auct. non Sims 372
pulviger Cunn. 371
pumila Cambage **332**, 335, 484, 503
punctata DC. 203, **204**, 205, 470, 508, 509
 var. *didyma* R.Baker & H.G.Smith 204, 508, 509
 var. *grandiflora* Deane & Maiden 204
 var. *longirostrata* Blakely 206, 509
puncticulata (Benth.) Blakely 283
purpurascens Link 438
 var. *petiolaris* DC. 100
pygmaea Blakely 438
pyriformis Turcz. *xv*, 262, **274**, 276, 477
 subsp. *youngiana* (F.Muell.) Boomsma 274
 var. *elongata* Maiden 274
 var. *kingsmillii* Maiden 275
 var. *minor* Maiden 446
pyrocarpa L.Johnson & Blaxell **156**, 157, 466
pyrophora Benth. **80**, 81, 458
 var. *compacta* Domin 446
 f. *compacta* Domin 446
quadrangulata Deane & Maiden **352**, 355, 486
quadricostata Brooker **409**, 414, 492
racemosa Cav. **172**, 174, 428, 467
 var. *longiflora* Blakely 446
 var. *macrocarpa* (Domin) Blakely 407
 var. *signata* (F.Muell.) R.D.Johnston & Marryatt 171
radiata Sieber ex DC. *x*, **185**, 187, 188, 438, 504
 subsp. *radiata* **186**, 187, 189, 431, 441, 468
 subsp. *robertsonii* (Blakely) L.Johnson & Blaxell **186**, 189, 469
 var. *australiana* (R.Baker & H.G.Smith) Blakely 185
 var. *subexserta* Blakely 186
 var. *subplatyphylla* Blakely & Mckie 185
radiodives R.Black 438
rameliana F.Muell. **271**, 272, 477
rameliana Trabut 438
rariflora Bailey 438
raveretiana F.Muell. **193**, 194, 195, 469
 var. *jerichoensis* Domin 379
redunca Schauer 226, **227**, 228, 229, 472, 505
 var. *angustifolia* Benth. 227

INDEX

Eucalyptus redunca *continued*

- var. *angustifolia* W.Fitzg. 446
- var. *elata* Benth. 226
- var. *melanophloia* Benth. 227
- var. *oxymitra* Maiden 228
- var. *subangusta* Blakely 227
- regnans F.Muell. **158**, 159, 162, 466, 504
- remota Blakely **170**, 171, 174, 467
- resinifera Smith 201, **202**, 205, 470, 495
 - var. *grandiflora* Benth. 202
 - var. *hemilampra* (F.Muell.) Domin 202
 - var. *kirtoniana* (F.Muell.) Deane & Maiden 433
 - var. *pellita* (F.Muell.) Bailey 201
 - var. *spectabilis* (F.Muell.) Bailey 201
- reticulata Link 438
- rhodantha Blakely & Steedman **271**, 272, 477
- rhodophloia* (Benth.) Blakely 446
- rigescens Blakely 439
- rigida Hoffsgg. 439
 - var. *luehmanniana* F.Muell. 439
- rigidula Maiden **281**, 284, 478
- risdonii J.D.Hook. **191**, 195, 439, 444, 469
 - var. *elata* Benth. 163
 - var. *hypericifolia* Rodway 446
- rivularis Blakely 439
- robertsonii* Blakely 186
- robsonae Blakely & McKie 439
- robusta Smith 199, **200**, 429, 433, 434, 437, 470
 - var. *bivalvis* (Blakely) Blakely 200
 - var. *rostrata* (Cav.) Pers. 446
- rodwayi R.Baker & H.G.Smith 333, **337**, 343, 484
- rossii R.Baker & H.G.Smith xi, **173**, 174, 430, 467
- rostrata Cav. 438, 446
 - var. *acuminata* (Hook.) Maiden 327
 - var. *borealis* R.Baker & H.G.Smith 327, **447**
 - var. *brevirostris* (F.Muell. ex Miq.) Maiden 327
 - var. *studleyensis* (Maiden) Ewart 440
- rostrata* Schldl. 327
- roycei S.Carr, D.Carr & A.S.George **112**, 113, 114, 461
- rubida Deane & Maiden 364, **365**, 369, 448, 487
- rubiginosa Brooker **123**, 124, 462, 504
- rubraulis Desf. 439
- rudderi Maiden **412**, 413, 414, 492
- rudis Endl. **329**, 335, 428, 483
- rugosa R.Br. ex Blakely **296**, 300, 480
- rummeri Maiden **386**, 391, 489, 504
- rupestris Brooker & Done **317**, 322, 482
- rupicola* L.Johnson & Blaxell 179, 508

Eucalyptus *continued*

- rydalensis* R.Baker & H.G.Smith 337
- salicifolia* Cav. 190, 407
 - var. *hypericifolia* (Benth.) Blakely 439
- saligna Smith 197, **198**, 199, 200, 431, 470, 507
 - var. *parviflora* Deane & Maiden 197
 - var. *protrusa* Blakely & McKie 198
- salmonophloia F.Muell. xi, 260, 261, **262**, 476, 505
- salubris F.Muell. **235**, 236
 - var. *glauca* Maiden **236**, 239, 473
 - var. *salubris* xi, **235**, 236, 239, 473
- santalifolia* F.Muell. 129
 - var. (?) *baxteri* Benth. 146
- sargentii Maiden 216, **217**, 471
- saxatilis Kirkpatr. & Brooker **367**, 369, 488
- scabra* Dum.-Cours. **447**
- sclerophylla (Blakely) L.Johnson & Blaxell **171**, 174, 431, 435, 437, 440, 467
- scoparia Maiden 338, 340, **342**, 343, 485, 501
- scyphocalyx (F.Muell. ex Benth.) Maiden & Blakely **301**, 304, 480
- scypoidea* Naudin ex Maiden 145
- seeana Maiden **320**, 321, 322, 483
 - var. *constricta* Blakely 321
- semicorticata* F.Muell. 156
- sepulcralis F.Muell. 133, **134**, 135, 139, 431, 463
 - var. *robusta* C.Gardner 431
- sessilis (Maiden) Blakely 276, **277**, 478
- setosa Schauer **73**, 75, 451, 506
- sheathiana Maiden 286, **287**, 289, 479
- shiressii* Maiden & Blakely 204
- shirleyi Maiden 403, 408, **411**, 414, 492
- siderophloia Benth. 403, 404, **405**, 406, 407, 432, 491
 - var. *glauca* Deane & Maiden 405
 - var. (?) *rostrata* Benth. 404
 - f. *decorticans* Bailey 403
- sideroxylon Cunn. ex Woolls x, 416, **425**, 428, 429, 431, 439
 - subsp. *sideroxylon* 422, **425**, 426, 427, 428, 493
 - subsp. *tricarpa* L.Johnson **425**, 427, 429, 493
 - var. *minor* (Benth.) Maiden 425
 - var. *pallens* (Benth.) Rehder 420
- sieberi L.Johnson 169, **170**, 174, 439, 440, 467
- sieberiana* F.Muell. 170
- signata F.Muell. **171**, 174, 467
- similis Maiden **116**, 118, 119, 462
- simmondsii* Maiden 191
- smithii R.Baker **357**, 363, 486
- socialis F.Muell. ex Miq. **258**, 259, 260, 261, 432, 476

INDEX

Eucalyptus continued

- sparsa Boomsma 397, **399**, 401, 491
sparsiflora Blakely 154
sparsifolia Blakely 154
spathulata Hook. **221**
 subsp. *spathulata* **221**, 225, 472
 subsp. *grandiflora* (Benth.) L.Johnson & Blaxell
 222, 225, 472
 var. *grandiflora* Benth. 222
spectabilis F.Muell. 201
spenceriana Maiden 378
sphaerocarpa L.Johnson & Blaxell **160**, 162, 466
splachnicarpon Hook. 97
spodophylla F.Muell. 381
squamosa Deane & Maiden **247**, 248, 251, 475,
 505
staeri (Maiden) Kessell & C.Gardner 137, **140**,
 144, 464
staigeriana F.Muell. ex Bailey **408**, 410, 492
stannariensis Bailey 122
steedmanii C.Gardner **222**, 225, 472
stellaris Blakely 439
stellulata Sieber ex DC. **182**, 183, 189, 434, 468,
 500
 var. *angustifolia* Benth. 183
stenophylla Link 447
stenostoma L.Johnson & Blaxell 167, **173**, 174,
 467
stjohnii (R.Baker) R.Baker 353
stoatei C.Gardner **306**, 308, 481
stoneana Bailey 373
stopfordii Maiden 439
stowardii Maiden **217**, 220, 471
striatallyx W.Fitzg. 285, 286, **292**, 293, 295,
 479
stricklandii Maiden 233, **234**, 473
stricta Sieber ex Sprengel **177**, 179, 180, 439,
 440, 468, 508
 var. *pyrifer* Blakely 439
 var. *rigida* Deane & Maiden 440
 var. *subcampanulata* Blakely 177
stuartiana F.Muell. ex Miq. 334, 347
 var. *amblycorys* Blakely 347
 var. *cordata* R.Baker & H.G.Smith 372
 var. *grossa* Maiden 347
 var. *longifolia* Benth. 334
 var. *parviflora* Deane & Maiden 447
stuartiana auct. non F.Muell. ex Miq. 347
studleyensis Maiden 440
sturgissiana L.Johnson & Blaxell **345**, 351, 485
subcrenulata Maiden & Blakely 355, **356**, 486
suberea Brooker & Hopper **136**, 139, 463, 506
submultiplinervis Miq. 164

Eucalyptus continued

- subulata* Cunn. ex Schauer 324
subviridis Maiden & Blakely 440
symonii D.Carr & S.Carr **88**, 89, 91, 459
synandra Crisp xiv, **263**, 266, 476
taeniola R.Baker & H.G.Smith 440
talyuberlup D.Carr & S.Carr **210**, 214, 471
tamala D.Carr & S.Carr 310
tasmanica Blakely 163, 190
taylori Maiden 440
tectifera F.Muell. **378**, 381, 489
tenandensis Maiden 440
tenuipes (Maiden & Blakely) Blakely & C.White
 121, 124, 462, 500
tenuiramis Miq. **190**, 191, 195, 469
tephrophloia Blakely 440
tereticornis Smith 323, **324**, 325, 326, 328, 433,
 434, 436, 437, 440, 441, 483
 var. *bancroftii* Maiden 321
 var. *brachycorys* Benth. 204
 var. *brevifolia* Benth. 321
 var. *dealbata* (Cunn. ex Schauer) Deane &
 Maiden 326
 var. *glaucina* (Blakely) Cameron 325
 var. *latifolia* Benth. 440
 var. *linearis* R.Baker & H.G.Smith 320
 var. *media* (Blakely) Cameron 441
 var. *pruiniflora* (Blakely) Cameron 324
 var. *rostrata* Ewart 327
 var. *squamosa* (Deane & Maiden) Maiden 247
terminalis F.Muell. xii, 89, **90**, 91, 94, 95, 459
 var. *carnosa* Bailey 447
 var. *longipedata* Maiden & Blakely 79
tessellaris F.Muell. **67**, 70, 457
 var. *dallachiana* Benth. 68
tetragona (R.Br.) F.Muell. xii, **109**, 114, 461,
 498
tetrapleura L.Johnson **417**, 418, 492
tetraptera Turcz. xv, 302, **305**, 308, 432, 481,
 498
tetrodonta F.Muell. **116**, 119, 461, 506
thozetiana F.Muell. ex R.Baker **390**, 391, 490
tindaliae Blakely **150**, 157, 465
tinghaensis Blakely & McKie 440
tintinnans (Blakely & Jacobs) L.Johnson &
 K.Hill **313**, 314, 315, 482, **510**
todtiana F.Muell. 130, **131**, 132, 133, 463, 497
torelliana F.Muell. **105**, 108, 461, 502, 506
torquata Luehm. 286, 294, **298**, 300, 480, 506
trabutii Vilmorin 441
trachyphloia F.Muell. **101**, 104, 460, 502, 507
 f. *fruticosa* Bailey 101
transcontinentalis Maiden **258**, 261, 476

INDEX

Eucalyptus continued

- triantha* Link 447
triflora (Maiden) Blakely 175, 180, 467
trivalvis Blakely 231, 232, 233, 473
tropica Cambage ex Maiden 377
tuberculata Parm. ex DC. 447
turbinata Behr & F.Muell. ex Miq. 258
umbellata (Gaertner) Domin 324
umbellata Dum.-Cours. 447
 var. *dealbata* (Cunn. ex Schauer) Domin 326
 var. *glaucina* Blakely 325
 var. *latifolia* (Benth.) Blakely 440
 var. *media* Blakely 441
 var. *pruiniflora* Blakely 324
umbonata D.Carr & S.Carr 85, 86, 87, 458
umbra R.Baker 140, 141, 428, 507
 subsp. *carnea* (R.Baker) L.Johnson 142, 144, 464
 subsp. *umbra* 141, 142, 144, 464
umbravarrensensis Maiden 3, 4, 317, 318, 322, 482
uncinata Turcz. 280, 282, 283, 284, 285, 478, 503
 var. *latifolia* Benth. 283
 var. *?major* Benth. 281
 var. *pedicellata* Hochr. 447
 var. *rostrata* Benth. 281
uncinata auctt. non Turcz. 282
undulata Colla 447
unialata R.Baker & H.G.Smith 441
urceolaris Maiden & Blakely 185
urnigera J.D.Hook. 368, 369, 429, 488
 var. *elongata* Rodway 368
urnularis D.Carr & S.Carr 85, 87, 458
variegata F.Muell. 106
vernica J.D.Hook. 354, 355, 486
verrucosa Colla 447
viminalis Hook. 67
viminalis Labill. 344, 358, 433, 441, 444
 subsp. *cygnetensis* Boomsma 359, 363, 487
 subsp. *viminalis* 358, 359, 363, 487
 var. *baeuerlenii* (F.Muell.) Deane & Maiden 361
 var. *dealbata* (Cunn. ex Schauer) C.Moore & Betche 326
 var. *huberiana* (Naudin) N.Burb. 359, 444
 var. *macrocarpa* Rodway 441
 var. *microcarpa* F.Muell. ex Miq. 448
 var. *pedicellaris* F.Muell. ex Deane & Maiden 357
 var. *racemosa* F.Muell. ex Blakely 359
 var. *rhynchocorys* F.Muell. ex Maiden 358
virens Brooker & Bean 419, 494
virgata Sieber ex DC. 441

Eucalyptus continued

- virgata* Sieber ex Sprengel 170
 var. *altior* Deane & Maiden 163
 var. *fraxinoides* (Deane & Maiden) Maiden 175
 var. *stricta* (Sieber ex Sprengel) Maiden 177
 var. *triflora* Maiden 175
viridis R.Baker 402, 406, 429, 431, 434, 444, 491
 var. *latiuscula* Blakely 441
 var. *ovata* Blakely 402
vitrea R.Baker 441
vitrea auct. non R.Baker 188
vittelina Naudin 441
wandoo Blakely 226, 227, 229, 231, 436, 472
wardii Blakely 441
watsoniana F.Muell. 102, 103, 104, 460
websteriana Maiden xv, 265, 266, 477
westoni Maiden & Blakely 441
whitei Maiden & Blakely 408, 410, 492
whittingehamei Landsborough 366
wiburdii Blakely 151
wilcoxii Boland & Kleinig 360, 363, 487
wilkinsoniana R.Baker 151
 var. *crassifructa* Blakely 151
willisii Ladiges, Humphries & Brooker 187, 188
 subsp. *falciformis* Newnham, Ladiges & Whiffin 188, 189, 469
 subsp. *willisii* 188, 189, 469
woodwardii Maiden 285, 286, 287, 289, 479
woollsiana R.Baker 396, 428
woollsii F.Muell. 206
xanthonema Turcz. 227, 229, 473
yagobie Maiden 442
yalatensis Boomsma 260, 261, 476
yangoura Blakely 152
yarraensis Maiden & Cambage 333, 334, 335, 484
yilgarnensis (Maiden) Brooker 278, 284, 478
youmanii Blakely & McKie 146, 149, 464
youngiana F.Muell. 274, 275, 276, 477
yumbarrana Boomsma 259, 260
 subsp. *striata* Boomsma 260, 261, 476
 subsp. *yumbarrana* 259, 261, 476
zygophylla Blakely 76, 78, 457
Eudesmia R.Br. 1, 498
 tetragona R.Br. 1, 109
Eurabbie 353
 Victorian 354
Ewart's Mallee 265
Faulconbridge Mallee Ash 178
Flat-topped Yate 215

INDEX

- Flooded Gum 198, 329
 Fluted Horn Mallee 217
 Forest Red Gum 324
 Fuchsia Gum 307
 Fuzzy Box 413

 Ghost Gum 68
 Ghost Gum, Darling Range 230
 Giant Mallee 253
 Gilbert River Bloodwood 72
 Gilbert River Box 379
 Gilja 296
 Gimlet *xi*, 235
 Silver-topped 236
 Two-winged 236
 Gimlets 235
 Gippsland Mallee 345
 Gippsland Manna Gum 359
 Gnaingar 120
 Goblet Mallee 302
 Goldfields Blackbutt 293
 Goodwood Gum 317
 Gooseberry Mallee 279
 Grampians Gum 147
 Green Mallee 403
 Grey Box 396
 Coast 398
 Craven 382
 Grey Boxes 394
 Grey Gum *x*, 203, 204, 206
 Griffith's 297
 Large-fruited 204
 Mountain 351
 Grey Ironbark 417
 Northern 405
 Queensland 407
 Grey Mallee 331
 Griffith's Grey Gum 297
 Guava 1
 Gully Gum 358
 Gum, Alpine Cider 367
 Apple 71
 Araluen 362
 Bancroft's Red 321
 Baradine 324
 Big Badja 360
 Black 337
 Blakely's Red 325
 Blue 422
 Bogong 365
 Brittle 341, 342
 Brittle Range 72

 Gum *continued*
 Burdett's 210
 Buxton 346
 Cabbage 68, 69, 71, 323
 Cape York Red 330
 Carbeen 69
 Cider 366
 Coral 299
 Cue York 292
 Cup 207
 Darling Range Ghost 230
 Deane's 197
 Desert 68, 113
 Dorrigo White 362
 Drooping Red 323
 Dunn's White 346
 Dwyer's Mallee 326
 Flooded 198, 329
 Forest Red 324
 Fuchsia 307
 Ghost 68
 Gippsland Manna 359
 Goodwood 317
 Grampians 147
 Grey *x*, 203, 204, 206
 Griffith's Grey 297
 Gully 358
 Halls Creek White 320
 Hard-leaved Scribbly 172
 Hillgrove 333
 Hyden Blue 286
 Jounama Snow 166
 Kalumburu 319
 Kimberley 316
 Kimberley White 318
 Kopi 292
 Kybean 339
 Large-fruited Grey 204
 Large-leaved Cabbage 69
 Large-leaved Spotted 107
 Lemon-flowered 286
 Lemon-scented 106
 Maiden's 354
 Mallee Snow 166
 Manna 358
 Marble 113
 Moore's 318
 Morrisby's 368
 Mottled 340
 Mountain 98, 364
 Mountain Grey 351
 Mountain Swamp 336

INDEX

Gum *continued*

Narrow-leaved Red 321
 Nepean River 361
 Northern Salmon 314
 Omeo 34
 Orange 321
 Parramatta Red 323
 Pink 415
 Poplar 313
 Queensland White 398
 Red 324
 Red-flowering 97
 Ribbon-barked 287
 Ringing 313
 River Red 329
 Rose 198
 Rough-barked Manna 359
 Salmon 262
 Salt River 217
 Scarlet 120
 Scarlet Pear 306
 Scribbly xi, 171, 172, 173
 Shining 351
 Shiny-barked 248
 Silver 346, 370
 Silver-leaved Mountain 371
 Slaty 393
 Slaty Red 325
 Snappy 72, 172, 314, 316
 Snow 165
 Southern Blue 353
 Spinning 370
 Spotted 107
 Spotted Mountain 342
 Steedman's 222
 Strickland's 234
 Sugar 252
 Swamp 334
 Sydney Blue 198
 Tasmanian Alpine Yellow 356
 Tasmanian Blue 353
 Tasmanian Snow 192
 Tasmanian Yellow 356
 Tingiringi 366
 Tumbledown 326
 Umbrawarra 317
 Urn 368
 Varnished 354
 Wallangarra White 342
 Weeping 134
 White 312
 Woila 155

Gum *continued*

Yarra 333
 Yellow 422
 York 240
 Gum-barked Coolibah 388
 Gum-top Ironbark 404
 Gum-topped Bloodwood 83
 Gum-topped Box 388
 Gums, Scribbly 167
 Snow 160
 Gungurru 268
 Gympie Messmate 122

 Halls Creek White Gum 320
 Hamelin Bay Mallee 129
 Hard-leaved Scribbly Gum 172
 Hillgrove Gum 333
 Hook-leaved Mallee 283
 Hopetoun Mallee 301
 Horn Mallee, Fluted 217
 Howitt's Box 194
 Hyden Blue Gum 286

 Illyarrie 110
 Inland Bloodwood 92
 Inland Yellow Jacket 117
 Ironbark x
 Blue-leaved 405
 Broad-leaved 404
 Caley's 420
 Cullen's 408
 Grey 417
 Gum-top 404
 Lemon-scented 409
 Narrow-leaved 407
 Northern Grey 405
 Queensland Grey 407
 Red 425
 Shirley's Silver-leaved 411
 Silver-leaved 411
 Square-fruited 417
 Tumbledown 419
 Wandi 409
 White's 408
 Ironbarks 403
 Ironbox, Black 193

 Jacket, Inland Yellow 117
 Kimberley Yellow 117
 Large-fruited Yellow 103
 Rusty 102, 103
 Yellow 103

INDEX

- Jarrah 138
- Jerdacuttup Mallee 243
- Jillaga Ash 173
- Jounama Snow Gum 166
- Jutson's Mallee 249

- Kalgan Plains Mallee 129
- Kalumburu Gum 319
- Kamarooka Mallee 402
- Kangaroo Island Mallee 291
- Kangaroo Island Mallee Ash 170
- Kangaroo Island Narrow-leaved Mallee 247
- Karri 196, 197
- Kimberley Gum 316
- Kimberley White Gum 318
- Kimberley Yellow Jacket 117
- Kingscote Mallee 297
- Kingsmill's Mallee 275
- Kondinin Blackbutt 292
- Kopi Gum 292
- Kybean Gum 339
- Kybean Mallee Ash 181

- Large-fruited Blackbutt 158
- Large-fruited Grey Gum 204
- Large-fruited Mallee 274
- Large-fruited Red Mahogany 201
- Large-fruited Yellow Jacket 103
- Large-leaved Cabbage Gum 69
- Large-leaved Spotted Gum 107
- Lemon-flowered Gum 286
- Lemon-scented Gum 106
- Lemon-scented Ironbark 409
- Leptospermum umbellatum* Gaertner 324
- Lerp Mallee 303
- Long-flowered Marlock 218
- Long-fruited Bloodwood 94
- Long-leaved Box 349
- Lucky Bay Mallee 128

- Mahogany, Blue Mountains 202
 - Broad-leaved White 141, 142
 - Dundas 250
 - Large-fruited Red 201
 - Narrow-leaved White 122
 - Red 202
 - Southern 200
 - Swamp 200
 - White 141
- Maiden's Gum 354
- Mallalie 110
- Mallee *xi*

- Mallee *continued*
 - Apple 133
 - Badgingarra 134
 - Baker's 249
 - Barren Mountain 179
 - Bell-fruited 126
 - Blue 115
 - Blue Mountains 178
 - Blue-leaved 287, 402
 - Bookleaf 237
 - Boorabbin 302
 - Bull 384
 - Burracoppin 273
 - Cap-fruited 224
 - Capped 290
 - Coarse-leaved 232
 - Comet Vale 296
 - Congoo 288
 - Crimson 392
 - Crowned 126
 - Curly 259
 - Desmond 228
 - Dongara 288
 - Ettrema 345
 - Ewart's 265
 - Fluted Horn 217
 - Giant 253
 - Gippsland 345
 - Goblet 302
 - Gooseberry 279
 - Green 403
 - Grey 331
 - Hamelin Bay 129
 - Hook-leaved 283
 - Hopetoun 301
 - Jerdacuttup 243
 - Jutson's 249
 - Kalgan Plains 129
 - Kamarooka 402
 - Kangaroo Island 291
 - Kangaroo Island Narrow-leaved 247
 - Kingscote 297
 - Kingsmill's 275
 - Large-fruited 274
 - Lerp 303
 - Lucky Bay 128
 - Many-flowered 257
 - Mt Le Grand 125
 - Narrow-leaved 246
 - Narrow-leaved Mountain 178
 - Oil 254
 - Ooldea 274

INDEX

Mallee *continued*

Open-fruited 218
 Pear-fruited 274
 Pimpin 303
 Plunkett 121
 Pokolbin 332
 Port Jackson 177
 Port Lincoln 290, 392
 Red 253, 258, 278
 Red-bud 275
 Red-flowered 224
 Ridge-fruited 305
 Rose 271
 Rough-fruited 298
 Round-leaved 265
 Sandplain 111
 Seaside 400
 Sharp-capped 264
 Silver 267
 Slender 241
 Small-fruited 309
 Soap 129
 Spearwood 241
 Stiff-leaved 281
 Sturt Creek 115
 Suggan Buggan 367
 Tammin 263
 Twin Peak Island 137
 Twin-leaf 115
 Victoria Desert 298
 Water 255
 Webster's 267
 White 223, 288
 White-leaved 285
 Woodline 310
 Woolbernup 128
 Mallee Ash, Bell-fruited 181
 Cliff 179
 Faulconbridge 178
 Kangaroo Island 170
 Kybean 181
 Whipstick 171
 Yellow-top 164
 Mallee Bloodwood 88
 Mallee Box 399
 Mallee Gum, Dwyer's 326
 Mallee Snow Gum 166
 Mallet, Blue 228
 Brown 215
 Silver 243
 Swamp 221
 Manna Gum 358

Manna Gum *continued*

Gippsland 359
 Rough-barked 359
 Many-flowered Mallee 257
 Marble Gum 113
 Marlock, Bald Island 211
 Black 227
 Long-flowered 218
 Marri 98
 Mountain 89
 McKie's Stringybark 155
 Mealy Bundy 349
 Mealy Stringybark 372
 Melville Island Bloodwood 95
 Merrit 257
 Messmate 161
 Gympie 122
 Messmate Stringybark 161
Metrosideros anomala Vent. 454
 apocynifolia Salisb. 449
 aromatica Salisb. 184
 cordifolia (Cav.) Pers. 454
 costata Gaertner 449
 floribunda Smith 452
 gummifera Sol. ex Gaertner 100
 hirsuta Andrews 454
 hispidula Smith 454
 lanceolata (Cav.) Pers. 449
 salicifolia Sol. ex Gaertner 407
 Migum 316
 Mirret 279
 Molloy Red Box 373
 'Monocalyptus' 4
 Moonbi Apple Box 348
 Moore's Gum 318
 Moort 219
 Red-flowered 219
 Moreton Bay Ash 68
 Morrel, Black 294
 Red 253
 Morrisby's Gum 368
 Mottlecah 271
 Mottled Gum 340
 Mountain Ash 158
 White 175
 Mountain Coolibah 388
 Mountain Grey Gum 351
 Mountain Gum 98, 364
 Silver-leaved 371
 Mountain Mallee, Narrow-leaved 178
 Mountain Marri 98
 Mountain Spotted Gum 342

INDEX

- Mountain Swamp Gum 336
- Mt Buffalo Sallee 182
- Mt Le Grand Mallee 125
- Mugga 425
- Myrtaceae 1

- Narrow-leaved Apple 450
- Narrow-leaved Box 397
- Narrow-leaved Ironbark 407
- Narrow-leaved Mallee 246
 - Kangaroo Island 247
- Narrow-leaved Mountain Mallee 178
- Narrow-leaved Peppermint 186, 340
- Narrow-leaved Red Gum 321
- Narrow-leaved Sallee 183
- Narrow-leaved Stringybark 154
- Narrow-leaved White Mahogany 122
- Needlebark Stringybark 159
- Nepean River Gum 361
- New England Ash 169
- New England Blackbutt 167, 169
- New England Peppermint 371
- Northern Grey Ironbark 405
- Northern Salmon Gum 314

- Oil Mallee 254
- Omeo Gum 344
- Ooldea Mallee 274
- Ooragmandee 311
- Open-fruited Mallee 218
- Orange Gum 321

- Paper-barked Box 376
- Parramatta Red Gum 323
- Pear Gum, Scarlet 306
- Pear-fruited Mallee 274
- Peeneri 255
- Peppermint *x*
 - Black 190
 - Broad-leaved 187
 - Narrow-leaved 186, 340
 - New England 371
 - Queensland 330
 - Risdon 191
 - River 187
 - Silver 191
 - Smithton 192
 - Swamp 337
 - Sydney 184, 185
 - Wattle-leaved 339
 - White 190
- Peppermint Box 400

- Peppermints 185
- Pigeon House Ash 176
- Pilliga Box 397
- Pimenta dioica (L.) Merrill 1
- Pimpin Mallee 303
- Pink Bloodwood 95
- Pink Gum 415
- Plunkett Mallee 121
- Pokolbin Mallee 332
- Poplar Box 383
- Poplar Gum 313
- Port Jackson Mallee 177
- Port Lincoln Mallee 290, 392
- Powderbark 231
- Pricklybark 131
- Princess, Silver 268
- Privet-leaved Stringybark 154
- Psidium guajava L. 1

- Queensland Grey Ironbark 407
- Queensland Peppermint 330
- Queensland White Gum 398
- Queensland White Stringybark 151

- Ramornie Stringybark 150
- Range Bloodwood 97
- Rate's Tingle 137
- Red Bloodwood 94
- Red Box 415
 - Molloy 373
 - Tropical 193
- Red Gum 324
 - Bancroft's 321
 - Blakely's 325
 - Cape York 330
 - Drooping 323
 - Forest 324
 - Narrow-leaved 321
 - Parramatta 323
 - River 329
 - Slaty 325
- Red Ironbark 425
- Red Mahogany 202
 - Large-fruited 201
- Red Mallee 253, 258, 278
- Red Morrel 253
- Red Stringybark 145
- Red Tingle 138
- Red-bud Mallee 275
- Red-flowered Mallee 224
- Red-flowered Moort 219
- Red-flowering Gum 97

INDEX

- Redheart 245
- Redwood 258
- Reid River Box 383
- Ribbon-barked Gum 287
- Ridge-fruited Mallee 305
- Ringing Gum 313
- Risdon Peppermint 191
- River Peppermint 187
- River Red Gum 329
- Rose Gum 198
- Rose Mallee 271
- Rose, Dowerin 274
- Rough-barked Apple 452
- Rough-barked Manna Gum 359
- Rough-fruited Mallee 298
- Rough-leaved Bloodwood 74, 83
- Round-leaved Mallee 265
- Rudder's Box 412
- Rusty Bloodwood 76
- Rusty Jacket 102, 103

- Sallee, Black 182
 - Mt Buffalo 182
 - Narrow-leaved 183
- Salmon Gum 262
 - Northern 314
- Salmonbark Wandoo 270
- Salt River Gum 217
- Sandhill Bloodwood 92
- Sandplain Mallee 111
- Scaly Bark 247
- Scarlet Gum 120
- Scarlet Pear Gum 306
- Scent Bark 338
- Scraggy Bloodwood 76
- Scribbly Gum xi, 171, 172, 173
 - Hard-leaved 172
- Scribbly Gums 167
- Seaside Mallee 400
- Sharp-capped Mallee 264
- Shining Gum 351
- Shiny-barked Gum 248
- Shirley's Silver-leaved Ironbark 411
- Silver Box 382
- Silver Gum 346, 370
- Silver Mallee 267
- Silver Mallet 243
- Silver Peppermint 191
- Silver Princess 268
- Silver-leaved Bloodwood 79
- Silver-leaved Ironbark 411
 - Shirley's 411
- Silver-leaved Mountain Gum 371
- Silver-topped Gimlet 236
- Silvertop Ash 170
- Silvertop Stringybark 143
- Slaty Gum 393
- Slaty Red Gum 325
- Slender Mallee 241
- Small-fruited Mallee 309
- Smithton Peppermint 192
- Smooth-barked Apple 449
- Smooth-barked Bloodwood 82
- Smooth-stemmed Bloodwood 79
- Smudgee 451
- Snap-and-rattle 278
- Snappy Gum 72, 172, 314, 316
- Snow Gum 165
 - Jounama 166
 - Mallee 166
 - Tasmanian 192
- Snow Gums 160
- Soap Mallee 129
- Southern Blue Gum 353
- Southern Mahogany 200
- Spearwood Mallee 241
- Spinning Gum 370
- Spotted Gum 107
 - Large-leaved 107
 - Mountain 342
- Spring Bloodwood 77
- Square-fruited Ironbark 417
- Steedman's Gum 222
- Stiff-leaved Mallee 281
- Strickland's Gum 234
- Stringybark, Bailey's 118
 - Blackdown 160
 - Blaxland's 148
 - Blue-leaved 150
 - Broad-leaved 152
 - Brown 146, 148
 - Camfield's 148
 - Cannon's 145
 - Darwin 116
 - Diehard 153
 - McKie's 155
 - Mealy 372
 - Messmate 161
 - Narrow-leaved 154
 - Needlebark 159
 - Privet-leaved 154
 - Queensland White 151
 - Ramornie 150
 - Red 145

INDEX

- Stringybark *continued*
 Silvertop 143
 Swamp 153
 Thin-leaved 151
 Tindale's 150
 White 151, 153
 Yellow 143
 Youman's 146
Stringybarked Bloodwood 101
Stringybarks 142
Sturt Creek Mallee 115
Sugar Gum 252
Suggan Buggan Mallee 367
Swamp Gum 334
 Mountain 336
Swamp Mahogany 200
Swamp Mallet 221
Swamp Peppermint 337
Swamp Stringybark 153
Swamp Yate 215
Sydney Blue Gum 198
Sydney Peppermint 184, 185
Symphomyrtus Schauer 1, 4
 lehmannii Schauer 1, 213
Syzygium aromaticum (L.) Merrill 1
- Tallerack 109
Tallow-wood 426
Tammin Mallee 263
Tasmanian Alpine Yellow Gum 356
Tasmanian Blue Gum 353
Tasmanian Snow Gum 192
Tasmanian Yellow Gum 356
Tenterfield Woollybutt 348
Thin-leaved Stringybark 151
Thozet's Box 390
Tindale's Stringybark 150
Tingiringi Gum 366
Tingle, Rate's 137
 Red 138
 Yellow 196
Torwood 286
Tropical Red Box 193
Tuart 208
Tumbledown Gum 326
Tumbledown Ironbark 419
Twin Peak Island Mallee 137
Twin-leaf Mallee 115
Twin-leaved Bloodwood 77
Two-winged Gimlet 236
- Umbrawarra Gum 317
- Urn Gum 368
- Variable-barked Bloodwood 83
Varnished Gum 354
Victoria Desert Mallee 298
Victorian Eurabbie 354
- Wadbilliga Ash 176
Wallangarra White Gum 342
Wandi Ironbark 409
Wandoo 227
 Salmonbark 270
Warty Yate 211
Water Mallee 255
Wattle-leaved Peppermint 339
Webster's Mallee 267
Weeping Box 374
Weeping Gum 134
Whipstick Mallee Ash 171
White Ash 164
White Box 394
White Gum 312
 Dorrigo 362
 Dunn's 346
 Halls Creek 320
 Kimberley 318
 Queensland 398
 Wallangarra 342
White Mahogany 141
 Broad-leaved 141, 142
 Narrow-leaved 122
White Mallee 223, 288
White Mountain Ash 175
White Peppermint 190
White Stringybark 151, 153
 Queensland 151
White's Ironbark 408
White-leaved Mallee 285
White-topped Box 352
Whitebark 319
Woila Gum 155
Woodline Mallee 310
Woolbernup Mallee 128
Woollybutt x, 206
 Camden 357
 Darwin 118
 Tenterfield 348
- Yapunyah 390
Yarra Gum 333
Yarri 131
Yate 208

INDEX

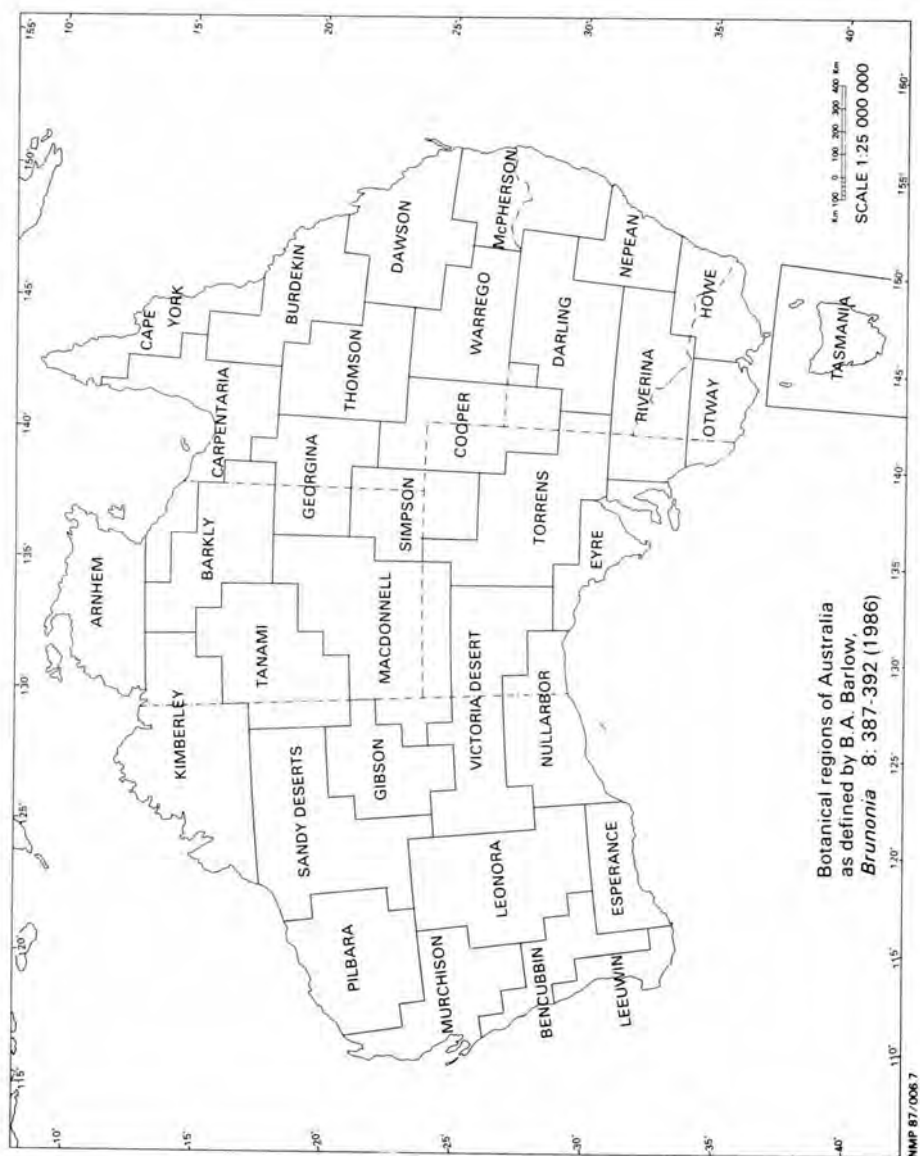
Yate continued

- Bushy 213
- Flat-topped 215
- Swamp 215
- Warty 211
- Yellow Bloodwood 105
- Yellow Box 421
- Yellow Gum 422
 - Tasmanian 356
 - Tasmanian Alpine 356
- Yellow Jacket 103
 - Inland 117
 - Kimberley 117
 - Large-fruited 103
- Yellow Stringybark 143
- Yellow Tingle 196
- Yellow-top Mallee Ash 164
- Yertchuk 169
- York Gum 240
- Yorrell 278
- Youman's Stringybark 146

Botanical Regions

The following are the abbreviations of the botanical regions shown in the map opposite and cited in the notes on distribution.

ARNM	Arnhem
BENC	Bencubbin
BKLY	Barkly
BURD	Burdekin
CARP	Carpentaria
COOP	Cooper
CYRK	Cape York
DARL	Darling
DWSN	Dawson
ESPR	Esperance
EYRE	Eyre
GBSN	Gibson
GGNA	Georgina
HOWE	Howe
KIMB	Kimberley
LEON	Leonora
LUWN	Leeuwin
MACD	MacDonnell
MCPH	McPherson
MRCH	Murchison
NEPN	Nepean
NULL	Nullabor
OTWY	Otway
PILB	Pilbara
RIVR	Riverina
SIMP	Simpson
SNDY	Sandy Deserts
TASM	Tasmania
THOM	Thomson
TNMI	Tanami
TRNS	Torrens
VICD	Victoria Desert
WRGO	Warrego



***Flora of Australia* — Index to families of flowering plants, current at January 1988.**

Bold figures denote published volumes.

	Volume		Volume		Volume
Acanthaceae	33	Cactaceae	4	Elaeagnaceae	16
Aceraceae	25	Caesalpiniaceae	12	Elaeocarpaceae	7
Actinidiaceae	6	Callitrichaceae	32	Elatinaceae	6
Agavaceae	46	Campanulaceae	34	Epacridaceae	9
Aizoaceae	4	Cannabaceae	3	Ericaceae	9
Akaniaceae	25	Cannaceae	45	Eriocaulaceae	40
Alangiaceae	22	Capparaceae	8	Erythroxylaceae	24
Alismataceae	39	Caprifoliaceae	36	Eucryphiaceae	10
Aloeaceae	46	Cardiopteridaceae	22	Euphorbiaceae	23
Alseuosmiaceae	10	Caryophyllaceae	5	Eupomatiaceae	2
Amaranthaceae	5	Casuarinaceae	3	Fabaceae	13, 14, 15
Anacardiaceae	25	Celastraceae	22	Fagaceae	3
Annonaceae	2	Centrolepidaceae	40	Flacourtiaceae	8
Apiaceae	27	Cephalotaceae	10	Flagellariaceae	40
Apocynaceae	28	Ceratophyllaceae	2	Frankeniaceae	8
Aponogetonaceae	39	Chenopodiaceae	4	Fumariaceae	2
Aquifoliaceae	22	Chrysobalanaceae	10	Gentianaceae	28
Araceae	39	Cistaceae	8	Geraniaceae	27
Araliaceae	27	Clusiaceae	6	Gesneriaceae	33
Arecaceae	39	Combretaceae	18	Globulariaceae	32
Aristolochiaceae	2	Commelinaceae	40	Goodeniaceae	35
Asclepiadaceae	28	Connaraceae	10	Grossulariaceae	10
Asteraceae	37, 38	Convolvulaceae	30	Gunneraceae	18
Austrobaileyaceae	2	Corsiaceae	47	Gyrostemonaceae	8
Balanopaceae	3	Corynocarpaceae	22	Haemodoraceae	45
Balanophoraceae	22	Costaceae	45	Haloragaceae	18
Basellaceae	5	Crassulaceae	10	Hamamelidaceae	3
Bataceae	8	Cucurbitaceae	8	Hanguanaceae	46
Berberidaceae	2	Cunoniaceae	10	Hernandiaceae	2
Betulaceae	3	Cuscutaceae	30	Himantandraceae	2
Bignoniaceae	33	Cymodoceaceae	39	Hippocrateaceae	22
Bixaceae	8	Cyperaceae	41, 42	Hydatellaceae	45
Bombacaceae	7	Datisceae	8	Hydrocharitaceae	39
Boraginaceae	30	Davidsoniaceae	10	Hydrophyllaceae	30
Brassicaceae	8	Dichapetalaceae	22	Icacinaceae	22
Bromeliaceae	45	Dilleniaceae	6	Idiospermaceae	2
Brunoniaceae	35	Dioscoreaceae	46	Iridaceae	46
Burmanniaceae	47	Dipsacaceae	36	Juncaceae	40
Burseraceae	25	Donatiaceae	34	Juncaginaceae	39
Byblidaceae	10	Droseraceae	8	Lamiaceae	31
Cabombaceae	2	Ebenaceae	10	Lauraceae	2

	Volume		Volume		Volume
Lecythidaceae	8	Papaveraceae	2	Sphenocleaceae	34
Leeaceae	24	Passifloraceae	8	Stackhousiaceae	22
Lemnaceae	39	Pedaliaceae	33	Stemonaceae	46
Lentibulariaceae	33	Philydraceae	45	Sterculiaceae	7
Liliaceae	45	Phytolaccaceae	4	Stylidiaceae	34
Limnocharitaceae	39	Piperaceae	2	Surianaceae	10
Linaceae	24	Pittosporaceae	10	Symplocaceae	10
Loganiaceae	28	Plantaginaceae	32	Taccaceae	46
Loranthaceae	22	Plumbaginaceae	5	Tamaricaceae	8
Lythraceae	18	Poaceae	43, 44	Theaceae	6
Magnoliaceae	2	Podostemaceae	18	Thymelaeaceae	18
Malpighiaceae	24	Polemoniaceae	30	Tiliaceae	7
Malvaceae	7	Polygalaceae	24	Tremandraceae	24
Melastomataceae	18	Polygonaceae	5	Trimeniaceae	2
Meliaceae	26	Pontederiaceae	45	Triuridaceae	39
Melianthaceae	25	Portulacaceae	5	Tropaeolaceae	27
Menispermaceae	2	Posidoniaceae	39	Typhaceae	45
Menyanthaceae	30	Potamogetonaceae	39	Ulmaceae	3
Mimosaceae	11, 12	Primulaceae	10	Urticaceae	3
Molluginaceae	5	Proteaceae	16, 17	Valerianaceae	36
Monimiaceae	2	Rafflesiaceae	22	Verbenaceae	30
Moraceae	3	Ranunculaceae	2	Violaceae	8
Moringaceae	8	Resedaceae	8	Viscaceae	22
Musaceae	45	Restionaceae	40	Vitaceae	24
Myoporaceae	33	Rhamnaceae	24	Winteraceae	2
Myristicaceae	2	Rhizophoraceae	22	Xanthophyllaceae	24
Myrsinaceae	10	Rosaceae	10	Xanthorrhoeaceae	46
Myrtaceae	19, 20, 21	Rubiaceae	36	Xyridaceae	40
Najadaceae	39	Ruppiaceae	39	Zannichelliaceae	30
Nelumbonaceae	2	Rutaceae	26	Zingiberaceae	45
Nepenthaceae	8	Salicaceae	8	Zosteraceae	39
Nyctaginaceae	4	Santalaceae	22	Zygophyllaceae	26
Nymphaeaceae	2	Sapindaceae	25		
Ochnaceae	6	Sapotaceae	10		
Olcaceae	22	Saxifragaceae	10		
Oleaceae	32	Scrophulariaceae	32		
Onagraceae	18	Simaroubaceae	25		
Opiliaceae	22	Smilacaceae	46		
Orchidaceae	47	Solanaceae	29		
Orobanchaceae	33	Sonneratiaceae	18		
Oxalidaceae	27	Sparganiaceae	45		
Pandanaceae	39				



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