



## 57 MYRTACEAE <sup>1</sup>

Alan M Gray <sup>2</sup>, Lyn A Craven <sup>3</sup>, Brendan J Lepschi <sup>3</sup>

Small shrubs to tall trees. Leaves evergreen, opposite or alternate; stipules usually absent, rarely minute and caducous (*Calytrix*); petiolate or sessile; lamina simple, usually entire, usually with translucent oil glands. Inflorescence a cyme or sometimes a cymose umbel, panicle, raceme or flower solitary. Flowers bisexual, actinomorphic; receptacle perigynous or epigynous, sometimes extended forming a tubular structure (hypanthium) adnate to and level with or projecting above the ovary; calyx, corolla and stamens then inserted at the summit of the hypanthium. Perianth usually free, rarely united (*Eucalyptus*). Sepals 4–5, often persisting as projections around rim of hypanthium. Petals 4–5, often imbricate in bud, usually free and falling after anthesis. Stamens 5–numerous, inserted in 1 or several rows on a disk (staminophore), at the summit of the ovary or lining the hypanthium tube above and surrounding the ovary; filaments free or connate at the base, in a ring or grouped into 5 bundles opposite the petals; anthers dorsifixed, versatile or adnate, dehiscent by longitudinal slits or terminal pores, connective gland sometimes present. Nectar secreting disk usually present. Carpels united; ovary inferior to superior, 1–10 locular, placentation usually axile, each loculus with 2–many ovules; stigma usually small, simple, capitate or sometimes cupular. Fruit dry or succulent; dry fruit usually capsular, dehiscent loculicidally at the summit by valves equal in number to the loculi; succulent fruit berries or rarely drupes, 1–many seeded, succulent and indehiscent. Seed: endosperm scanty or lacking.

A family of about 135 genera with over 5300 species, chiefly in the Southern Hemisphere with two main areas of distribution: south-eastern Asia to Australia and tropical America. About one half of the species are found in three genera: *Eugenia* L. (> 1100 spp.), *Syzygium* (1200–1500 spp.) and *Eucalyptus* (c. 800 spp.). Australia is a major centre of diversity for the family with c. 80 genera (many endemic) and c. 1600 species (most endemic); in Tasmania 9 genera (1 introduced) and 56 (2 introduced) species. Myrtaceae are placed in the Myrtales and are closely related to Vochysiaceae (S America, W Africa).

A family of much economic and ornamental value. Species of *Eucalyptus* provide an important resource of timber for many purposes including building and construction materials as well as a source of pulp for the paper and board industries. Seed of many important commercial timber species has been transported overseas for use in large scale forestry and reforestation projects as well as for land reclamation and rehabilitation. Some species of *Eucalyptus*, *Leptospermum*, *Kunzea* and *Melaleuca* provide a number of highly valuable oils and other chemical products used for industrial and pharmaceutical purposes. Spices and condiments are obtained from species of *Eugenia* (Cloves) and *Pimenta* Lindl. (Allspice). Edible fruits are produced by many species including *Acca* O.Berg (incl. *Feijoa* O.Berg), *Eugenia* L., *Psidium* L. (Guava), *Syzygium* and *Ugni* Turcz. A great many species are of outstanding ornamental and amenity value, from trees to smaller shrubs, and are grown by the Australian horticultural industry and incorporated in large and small landscaping projects. Some species of *Eucalyptus*, *Melaleuca* and *Leptospermum* are significant weeds overseas and in Australia.

Synonymy: Baeckeaceae, Chamelauciaceae, Heteropyxidaceae, Kaniaceae, Leptospermaceae, Melaleucaceae, Myrrhiniaceae, Psiloxylaceae.

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Key reference: Wilson (2011).

External resources: accepted names with synonymy & distribution in Australia (APC); author & publication abbreviations (IPNI); mapping (ALA, AVH, NVA); nomenclature (APC, APNI, IPNI).

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| 1. Inflorescence terminal, paniculate; fruit a fleshy drupe, succulent, white, flushed purple, indehiscent, 8–10 mm diameter; adult leaves opposite, not decussate   | 1 <i>Syzygium</i>     |
| 1: Inflorescence axillary or terminal, cymose umbels or spikes, compact heads or solitary; fruit capsular, woody or coriaceous, if fleshy then dark reddish purple, dehiscent, < 6 mm diameter; adult leaves alternate or if opposite, decussate | 2                     |
| 2. Inflorescence a cymose umbel; calyx and corolla each, or together coalescing and forming 1 or 2 deciduous caps (opercula)   | 9 <i>Eucalyptus</i>   |
| 2: Inflorescence a spike or raceme, or terminal cluster, or flowers solitary; perianth of calyx and corolla always present, sometimes very small or deciduous  | 3                     |
| 3. Inflorescence 1–3-flowered, subsessile; flowers (1.5–)2–2.5–3(–5) mm diameter; petals small, < 3 mm diameter, but conspicuous   | 4                     |
| 3: Inflorescence 1-many-flowered, sessile or pedunculate; flowers (5–)8–15(–25) mm diameter; petals minute and inconspicuous, or large, 3–5 mm diameter, and conspicuous   | 5                     |
| 4. Leaves flat; receptacle narrowly cylindrical-obconic, conspicuously 10-ribbed   | 2 <i>Thryptomene</i>  |
| 4: Leaves terete or plano-convex; receptacle hemispheric-obconical, not ribbed   | 3 <i>Baeckea</i>      |
| 5. Sepals persistent, longer than the petals, terminating in long, filiform awn-like appendages  | 4 <i>Calytrix</i>     |
| 5: Sepals ± deciduous, shorter than or equal to the petals, without awn-like appendages  | 6                     |
| 6. Plants prostrate or decumbent; branches slender, wiry; flowers solitary, terminal or axillary   | 5 <i>Euryomyrtus</i>  |
| 6: Erect trees or shrubs, if prostrate then the branches stout; flowers solitary or 2–3 together or crowded in spikes, or heads  | 7                     |
| 7. Flowers many, in crowded spikes or small, terminal compact heads; petals greenish, inconspicuous; stamens ± conspicuous, all free or joined at the base into 5 bundles  | 6 <i>Melaleuca</i>    |
| 7: Flowers solitary or 2–3 together or in small, compact heads in leaf axils; petals white to pale pink, conspicuous   | 8                     |
| 8. Stamens exserted; fruit ± succulent, persisting for one season or less  | 7 <i>Kunzea</i>       |
| 8: Stamens inserted; fruit woody or coriaceous, rarely succulent, persisting for one to several seasons  | 8 <i>Leptospermum</i> |

## 1 \* SYZYGIIUM

### Lyn A Craven

*Syzygium* Gaertn., *Fruct. Sem. Pl.*, 1: 166 (1788).

Synonymy: *Acmena* DC., *Prodr.* (DC.) 3: 262 (1828). [For full synonymy see Craven et al. (2006), APC, APNI].

Trees or shrubs. Leaves opposite, petiolate, with 1 or more intramarginal veins. Inflorescences terminal and/or axillary, sometimes cauliflorous (not in Tas.), or a panicle. Sepals 4 (not in Tas.) or 5, minute or large, deciduous or persistent, or sepals fused into a calyptra (not in Tas.). Petals 4–8, caducous. Stamens numerous; filaments free; anther sacs parallel or divergent, dehiscing by longitudinal slits. Ovary inferior, 2-locular; ovules 2–9 per locule. Fruit drupaceous. Seed 1(–7).

A genus with perhaps 1200 to 1500 species, all in the Old World but with the majority in Malesia, represented in Australia by nearly 80 species.

Key references: Hyland (1983); Craven et al. (2006); Craven & Biffen (2010).

**1 \* *Syzygium smithii* (Poir.) Nied., *Nat. Pflanzenfam.* [Engler & Prantl] III. 7: 85 (1893)**

Lilly Pilly

*Eugenia elliptica* Sm., *Trans. Linn. Soc. London* 3: 281 (1797), *nom. illeg., non* Lam. (1789); *E. smithii* Poir., *Encycl. Suppl.* 3: 126 (1813); *Myrtus smithii* (Poir.) Spreng., *Syst. Veg.* 2: 487 (1825); *Acmena floribunda* var.  $\beta$  *elliptica* DC., *Prodr.* (DC.) 3: 262 (1828); *Syzygium brachynemum* F.Muell., *Fragm.* (Mueller) 4: 59 (1864), *nom. illeg.*; *Eugenia brachynema* F.Muell., *loc. cit.*, *nom. illeg.*; *Acmena smithii* (Poir.) Merr. & L.M.Perry, *J. Arnold Arbor.* 19: 16 (1938); *Lomastelma smithii* (Poir.) J.H.Willis, *Vict. Naturalist* 73: 197 (1957).

*Illustrations:* Hyland, *Austral. J. Bot., Suppl. Ser.* 9: 4, fig. 1, 1 & 3 & 7 (1983); Jones, *Ornamental Rainforest Plants in Australia* 58 & 61 (1986); Floyd, *Rainforest Trees of Mainland South-eastern Australia* 241 & 242 (1989).

Trees or shrubs to 20 m tall. Leaf lamina 1.6–16.7 cm long, 0.6–8.5 cm wide, ovate to elliptic to obovate, often narrow; base cuneate to attenuate to rounded; apex long acuminate to acute; primary and secondary venation distinctly different; tertiary venation inconspicuous on both surfaces; intramarginal vein present and 0.1–2.0 mm from the margin; secondary intramarginal vein absent; oil glands visible to the unaided eye in transmitted light and sparse or moderately dense. Inflorescences among the leaves, terminal to distal axillary. Flowers cream or white. Hypanthium stipitate, bowl-shaped, 3–6 mm long. Sepals uniform in size or nearly so, persistent, 0.2–0.3 mm long. Petals 4 or 5, early caducous, coherent (by their inflexed tips) or not coherent; oil glands up to 10 per petal. Ovules 6–22 per locule, pendulous, arranged irregularly; style 0.6–2.0 mm long. Mature fruit white or mauve, 8–20 mm long; embryo enclosing an intrusive mass of placental tissue that interlocks the 2 free cotyledons. Flowering (mainland states) Oct.–Mar., most commonly Nov.–Dec.; fruiting Mar.–Oct., most commonly Apr.–Aug.

Tas. (KIN); also Qld, NSW, Vic. Occurs at least as an adventive in King Island, but could be expected to also occur adventively in eastern and northern Tasmania; from sea level to c. 25 m elevation.

The ripe fruit is edible but rather insipid; it has been used to make “bush tucker” jam.

**2 THRYPTOMENE****Alan M Gray**

*Thryptomene* Endl. *Stirp. Herb. Hugel.* 6 (1838), *nom. cons.*

Synonymy: *Gomphotis* Raf., *Sylva Tellur.* 103 (1838), *nom. rej.* *Tryptomene* F.Muell., *Fragm.* (Mueller) 1(5): 11 (1858), *orth. var.*

Erect, small to medium shrubs, heath-like. Leaves opposite, decussate, small, sessile or petiolate. Inflorescences 1–3-flowered, leafy spikes or racemes, or terminal clusters. Hypanthium adnate to ovary, not or scarcely extending above the summit of the ovary, obconical to cylindrical, smooth, ribbed or rugulose. Sepals 5, entire, membranous or petaloid. Petals 5, white to pink, orbicular to obovate, free, entire. Stamens 5, opposite the sepals, or rarely 10 or more and opposite sepals and petals, shorter than the petals; filaments free; anthers versatile, dehiscent by pores; connective gland prominent, clavate or urceolate. Ovary inferior, unilocular; ovules 2 or 4, in 2 superposed layers; style barely exerted. Fruit small, dry, dehiscent, enclosed by the persistent calyx. Seed usually solitary.

A genus of about 32 species, in southern, central and north-eastern Australia.

**1 *Thryptomene micrantha* Hook.f., *Hooker's J. Bot. Kew Gard. Misc.* 5: 299, t. 8 (1853)**

Ribbed Heath-myrtle

*Illustrations:* Green, *Fl. S. Austral.* 2: 951, fig. 485e (1986); Jeanes, *Fl. Victoria* 3: 1041, fig. 215g-h (1996); Whiting et al., *Tasmania's Natural Flora* 245 (2004); Wapstra et al., *Tasmanian Plant Names Unravelling* 203 (2010).

Small, slender shrubs, 25–130 cm high, branches spreading to erect. Leaves opposite, well dispersed or sometimes crowded toward the ends of younger branches; lamina 4–6(–8) mm long, flat, narrow-obovate or rarely broad-ovate, base narrowed to a short petiole, margins entire, abaxial surface with numerous conspicuous oil glands, adaxial surfaces with smaller, scattered glands particularly along the mid vein, apex blunt. Flowers subsessile, along the smaller branches of the current season's growth. Hypanthium conspicuously 10-ribbed. Sepals c. 1.4 mm long, half as long as the receptacle, broadly oblong, blunt, persistent. Petals 5, white, sometimes tinged with pink in bud, persistent, a little longer than the sepals. Stamens 5; filaments very short, incurved, inserted at the margin of a nectar-secreting disk. Fruit a narrow cylindrical-obconical capsule, conspicuously ribbed. Flowering & fruiting Jun.–Feb.

Tas. (TSE); also SA, Vic. Locally common in dry, sandy heaths and open shrubberies on the east coast; particularly common on granitic soils at Freycinet Peninsula; from sea level to c. 75 m elevation. Two collections, both made in 1959, from the Buckland-Orford area require confirmation. The species is listed as Rare under the Tasmanian *Threatened Species Protection Act 1995*.

### 3 BAECKEA

#### Alan M Gray

*Baeckea* L., Sp. Pl. 1: 358 (1753).

Synonymy: *Baeckia* Andrews, *Bot. Repos.* 9: 598 (1810), *orth. var. Baechea* A.Colla, *Hortus Ripul.* 1 (1824), *orth. var. Baecka* Cothenius, *Disp.* 10 (1790), *orth. var. Beckea* C.H.Persoon, *Syn. Pl.* 1: 234 (1805), *orth. var.*

Small shrubs, heath-like. Leaves opposite, sometimes decussate, shortly petiolate. Inflorescences 1(Tas.)–3-flowered, bracteoles 2 or 3; flowers sessile or pedicellate. Hypanthium adnate to the ovary and extending shortly beyond ovary summit, obconical to campanulate, smooth or rugulose. Sepals 5, entire, persistent, occasionally with thickened central portion, margins entire or fimbriate. Petals 5, white, sometimes tinged pink in bud, orbicular or obovate, free, entire. Stamens 5–15, in one row, shorter than the petals; filaments free; anthers versatile, dehiscing by parallel or divergent slits; connective gland globular, smaller than anther cells. Ovary inferior, (1)2(3)-locular; ovules in 2–3 longitudinal rows; style emerging through but free from the floral disk, lengthening after anthesis. Fruit capsular, chartaceous to woody, surmounted by persistent sepals; valves enclosed, dehiscence loculicidal, apical. Seeds numerous.

A genus of about 14 species: 2 species in Western Australia, 12 in south-eastern Australia with 1 extending to south-eastern Asia; two species in Tasmania, one endemic.

Key reference: Bean (1997).

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|--|-------------------------|
| 1. Leaves obovate-oblong, blunt, plano-convex, 2–6 mm long; oil glands conspicuous               | 1 <i>B. gunniana</i>    |
| 1: Leaves narrow-linear, acute, ± terete or plano-convex, 6–12 mm long; oil glands inconspicuous | 2 <i>B. leptocaulis</i> |

#### 1 *Baeckea gunniana* Schauer, *Repert. Bot. Sys.* 2: 920 (1843)

*Alpine Heath-myrtle*

*Tetrapora gunniana* (Schauer) Miq., *Ned. Kruidk. Arch.* 44(1): 150 (1856) [as *Tetraspora gunniana*]. *Baeckea micrantha* Hook.f., *Hooker's Icon. Pl.* 3: t. 309 (1840), *nom. illeg., non DC.* (1828). *Baeckia Gunniana* Hook.f., *Bot. Ant. Voy. III (Fl. Tasm.)* 1 (1): 142 (1856), *orth. var. Baeckia gunniana* Rodway, *Tasman. Fl.* 52 (1903), *orth. var.*

*Illustrations:* Jeanes, *Fl. Victoria* 3: 1037, fig. 214i–j (1996); Kirkpatrick, *Alpine Tasmania* 42, fig.16a (1997); Wilson, *Fl. New South Wales* 2, rev. ed.: 213 (2002); Whiting et al., *Tasmania's Natural Flora* 220 (2004); Simmons et al., *A Guide to Flowers and Plants of Tasmania*, ed. 4, 21 (2008).

Densely branched shrubs, 50–150 cm high or prostrate and ground-hugging due to wind-pruning. Leaves densely crowded, erect or spreading, shortly petiolate; lamina 2–6 mm long, obovate-oblong, plano-convex, thick, conspicuously glandular-dotted, strongly and pleasantly aromatic when bruised, apex acute or rounded. Flowers axillary, along older and younger branches, shortly pedicellate. Hypanthium smooth.

Sepals 5, mostly < 1 mm long, broad-triangular, blunt, persistent. Petals 5, white, c. twice as long as the sepals. Stamens 5(-7), not opposite petals; filaments geniculate, inflexed. Fruit 2-3 mm diameter, cupular-hemispheric. Flowering & fruiting Sep.-May.

Tas. (BEL, TCH, TSE, TSR, TWE); also NSW, Vic. Abundant in wet heaths and shrubberies in exposed montane areas of the west, Central Plateau and north-east; from c. 450-1500 m elevation.

**2 *Baeckea leptocaulis*** Hook.f., *Hooker's Icon. Pl.* 3: t. 298 (1843) [as *Baeckia leptocaulis*]

*Slender Heath-myrtle*

*Illustrations:* Stones & Curtis, *The Endemic Flora of Tasmania* 5: t. 98, No. 162 (1975); Whiting et al., *Tasmania's Natural Flora* 221 (2004); Wapstra et al., *Tasmanian Plant Names Unravelling* 188 (2010).

Small shrubs, 0.5-1.5(-2) m high, usually with slender, erect branches. Leaves erect to suberect, slightly recurved, bases attenuated; lamina 5-12(-15) mm long, narrow-linear, concave adaxially, convex abaxially, or almost terete, oil glands present but hardly conspicuous, apex acute or acuminate. Flowers pedicellate in the axils of the upper leaves of younger branches. Hypanthium smooth to rugulose. Sepals 5, pink, 0.5-1.0 mm long, rounded or triangular, persistent. Petals 5, white, 2-3 times as long as the sepals. Stamens 5(-7), irregularly spaced, not opposite petals; filaments geniculate, inflexed. Fruit 2-3 mm diameter, cupular-cylindrical. Flowering & fruiting Nov.-Apr.

Tas. (TNS, TSR, TWE); endemic. Widespread and frequent in wet heaths, sedgelands and low, open shrubberies in the west, south-west and north-west of the state; from sea level to c. 1000 m elevation.

## 4 CALYTRIX

**Alan M Gray, Lyn A Craven**

*Calytrix* Labill., *Nov. Holl. Pl.* 2: 8, t. 146 (1806).

Synonymy: *Calythrix* DC., *Prodr.* (DC.) 3: 208 (1828). *Calycothrix* Meisn., *Pl. Vasc. Gen.* (Meisner) 1(4): 107 (1837), *nom. illeg.*; *Trichocalyx* Schauer, *Monographia Myrtacearum Xerocapicarum* 228 (1843). *Lhotskya* Schauer, *Linnaea* 10: 309 (1836).

Small to large shrubs, heath-like. Leaves alternate, rarely opposite or whorled, shortly petiolate. Flowers shortly pedicellate, solitary in the axils of the upper leaves, below the ends of the branches, or in rather crowded terminal, leafy heads; bracteoles 2, persistent or caducous, enclosing the base of the flower. Hypanthium adnate to ovary, extended above the ovary into a long, slender tube, free from or adnate to the style for part of its length. Sepals 5, spreading, persistent, the apex of each extending in a long, filiform awn. Petals 5, white to pale pink, lanceolate to elliptic, free, deciduous. Stamens numerous, in 1 or more rows, about as long as the petals; anthers versatile, dehiscing by longitudinal slits; connective gland small. Ovary inferior, unilocular; ovules 2; style slender. Fruit dry, indehiscent, enclosed within the persistent, fusiform hypanthium and persistent calyx. Seed solitary.

An Australian genus of about 80 species found in all states but principally Western Australian.

Key reference: Craven (1987).

**1 *Calytrix tetragona*** Labill., *Nov. Holl. Pl.* 2: 8, t. 146 (1806)

*Common Fringe-myrtle*

*Calytrix glabra* R.Br., *Edward's Bot. Reg.* 5, t. 409 (1819); *Calycothrix glabra* (R.Br.) Hook.f., *Bot. Ant. Voy. III (Fl. Tasm.)* 1(2): 127 (1856). *Calycothrix glabra* var. *ciliata* Hook. f., *loc. cit.* *Calycothrix glabra* var. *glaberrima* Hook. f., *loc. cit.* *Calytrix ericoides* A.Cunn., *Geogr. Mem. New South Wales* 350 (1825); *Calytrix virgata* A.Cunn., *Bot. Mag.* 61: t.3323 (1834), *nom. illeg.*; *Calycothrix virgata* Schauer, *Nov. Actorum Acad. Caes. Leop.-Carol. Nat. Cur.* 19 suppl. 2: 247 (1841), *nom. illeg.*; *Calycothrix glabra* var. *virgata* Hook.f., *loc. cit.* *Calycothrix behriana* Schldl., *Linnaea* 20: 650 (1847). *Calycothrix scabra* var. *minor* Schldl., *loc. cit.* *Calycothrix diversi-*

*folia* Turcz., *Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersberg* 317 (1852); *Calythrix diversifolia* (Turcz.) B.D.-Jacks, *Index Kew.* 1(\*2): 398 (1893) [as *Calythrix diversifolia*]. *Calycothrix schlechtendalii* Miq., *Nederl. Kruidk. Arch.* 4: 116 (1856). *Calycothrix leucantha* Miq., *loc. cit.* 117. *Calycothrix rosea* Miq., *loc. cit.* 117. *Calycothrix squarrosa* Miq., *loc. cit.* 118. *Calycothrix monticola* Miq., *loc. cit.* 118. *Calycothrix muelleri* Miq., *loc. cit.* 119. *Calycothrix tetragona* (Labill.) F.Muell., *Fragm. (Mueller)* 4(27): 36 (1864). *Calythrix tetragona* Benth., *Fl. Austral.* 3: 50 (1867); Rodway, *Tasman. Fl.* 51 (1903), *orth. var.*

Illustrations: Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2, 197, fig. 49 (1975); Jeanes, *Fl. Victoria* 3: pl. 16a-d (facing p. 853); 1041, fig. 215b (1996); Wilson, *Fl. New South Wales* 2, rev. ed.: pl. 12 (preceding p. 135); 205 (2002); Whiting et al., *Tasmania's Natural Flora* 222 (2004); Simmons et al., *A Guide to Flowers and Plants of Tasmania*, ed. 4, 145 (2008); Wapstra et al., *Tasmanian Plant Names Unravelling* 189 (2010).

Erect, much branched shrubs 0.5–3.0 m high, branches glabrous or with a sparse to dense cover of hairs. Leaves often crowded, suberect to spreading, very shortly petiolate; lamina 3–6 mm long, linear, terete or trigonous, oil glands hardly conspicuous, apex blunt or mucronulate. Flowers solitary, often profuse in the axils of the upper leaves forming leafy heads, subsessile but the hypanthium elongated, particularly in the fruiting stage, and resembling a pedicel 8–12 mm long; bracteoles 2, free, 3–5 mm long, scarious, keeled, the margins ciliate. Sepals 5, ovate to suborbicular, spreading and forming a shallow cup, margins scarious, apex abruptly contracted into a long, filiform awn, 5–10(–15) mm long. Petals usually pale pink, sometimes white, 3–7 mm long, elliptic to lanceolate. Stamens 20–45, about as long as the petals. Flowering & fruiting all year though mainly Aug.–Jan.

Tas. (FUR, KIN, TNM, TNS, TSE); also WA, SA, Qld, NSW, Vic. Common in damp, sandy heaths on the east, north and north-west coasts and on the islands of Bass Strait; from sea level to c. 300 m elevation. As presently circumscribed this species is very variable across its range. Comprehensive investigation into the population genetics of the numerous morphotypes combined with morphological studies, and taking into account spatial and ecological factors, is required.

## 5 EURYOMYRTUS

### Alan M Gray

*Euryomyrtus* Schauer, *Linnaea* 239 (1843).

Synonymy: *Baেকেea* section *Euryomyrtus* (Schauer) Benth. & Hook.f., *Gen. Pl.* (Endlicher) (1838).

Small, straggling, erect or prostrate subshrubs. Leaves opposite, well dispersed or loosely imbricate, shortly petiolate. Inflorescences 1-many flowered, terminal or axillary, on short spur branches (brachyblasts); bracteoles 2, persistent. Hypanthium narrowly to broadly obconic-hemispherical to barrel-shaped, oil glands obvious in some species. Sepals 5, erect to slightly spreading, slightly keeled, petaline in some species. Petals white, pink or mauve-purple, spreading or slightly reflexed, claw short or absent; floral trichomes sometimes present, few to many, inserted near stamens. Stamens 3–c. 30, in 1 row, shorter than petals; filaments free; anthers versatile, dehiscing by longitudinal slits; connective gland clavate to cylindrical or subspherical. Ovary inferior, 3(4)-locular, lower  $\frac{1}{3}$ – $\frac{3}{4}$  adnate to hypanthium; ovules 2–6 per loculus; style fusiform to cylindrical, inserted deeply into the ovary. Fruit a loculicidal capsule; valves opening widely at summit. Seeds solitary to several.

A genus of 8 species; 5 species restricted to Western Australia, 1 in New South Wales and 2 species in Victoria and Tasmania. The separation of the two species in Tasmania can be difficult. The key presented here follows that of Trudgen (2001).

Key reference: Trudgen (2001).

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| 1. Flowers erect; corolla (5–)7–10(–15) mm diameter, petals white or mauve-purple; floral trichomes 2–15, always present; stamens 10, rarely fewer; connective gland large, clavate      | 1 E. ramosissima |
| 1: Flowers nodding; corolla 3–5 mm diameter, petals white, ± tinged with pink or red above or below; floral trichomes few or absent; stamens (3–)5–10; connective gland small, spherical | 2 E. parviflora  |

**1 *Euryomyrtus ramosissima* (A.Cunn.) Trudgen, *Nuytsia* 13(3): 560 (2001)***Rosy Heath-myrtle*

*Baeckea ramosissima* A.Cunn., *Geog. Mem. New South Wales* 349 (1825) [as *Baeckia ramosissima*]. *Baeckea diffusa* Sieber ex DC., *Prodr.* (DC.) 3: 230 (1828); *Euryomyrtus diffusa* (Sieber ex DC.) Schauer, *Linnaea* 17: 239 (1843). *Baeckea diffusa* var. *striata* DC., *Prodr.* (DC.) 3: 230 (1828). *Baeckea alpina* Lindl., *Three Exped. E. Australia* 2: 178 (1838); *Euryomyrtus alpina* (Lindl.) Schauer, *Linnaea* 17: 239 (1843). *Baeckea thymifolia* Hook.f., *Hooker's Icon. Pl.* 3 (2): t. 284 (1840) [as *Baeckia thymifolia*]; *Euryomyrtus thymifolia* (Hook.f.) Schauer, *Linnaea* 17: 239 (1843). *Baeckea affinis* Hook.f., *Hooker's Icon. Pl.* 3 2: t. 284 (1840), *nom. illeg.* *Euryomyrtus stuartiana* F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 149 (1856). *Euryomyrtus leptospermoides* F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 149 (1856), *nom. nud.* *Baeckia diffusa* Hook.f., *Bot. Ant. Voy. III (Fl. Tasm.)* 1 (1): 142 (1856), *orth. var.*

*Illustrations* (some as *E. ramosissima*): Green, *Fl. S. Austral.* 2: 894, fig. 462d (1986); Jeanes, *Fl. Victoria* 3: 1037, fig. 214g (1996); Wilson, *Fl. New South Wales* 2, rev. ed.: 214 (2002); Whiting et al., *Tasmania's Natural Flora* 237 (2004); Simmons et al., *A Guide to the Flowers and Plants of Tasmania*, ed. 4, 148 (2008); Wapstra et al., *Tasmanian Plant Names Unravelling* 199 (2010).

Prostrate to procumbent shrubs to c. 60 cm high; branches wiry, diffuse, widely spreading, often rooting at the nodes. Leaves spreading to suberect; lamina 2–10(–15) mm long, 0.5–2.0 mm wide, linear or narrowly lanceolate to elliptic-lanceolate, or narrowly ovate, base rounded, flat or  $\pm$  concave, texture slightly thickened, margins sometimes minutely ciliate toward the apex, apex acute. Flowers axillary, solitary, rarely 2, erect at anthesis, sometimes  $\pm$  deflexed in fruit; pedicels as long as or sometimes 2–3 times as long as the leaves; bracteoles  $\pm$  cordate, inserted c.  $\frac{1}{2}$  to  $\frac{2}{3}$  along the pedicel. Sepals brownish-purple, broadly triangular, apex blunt, rounded, margins entire to minutely fimbriate. Petals white, pale pink to mauve-purple, sometimes with darker blotches, often glossy, 3–5 mm diameter, orbicular, margins crenulate, minutely ciliate-fimbriate; numerous floral trichomes present. Stamens 10, rarely fewer, those opposite the petals longer than those opposite the sepals, connective gland large, clavate. Fruit broadly obconic-hemispherical, 3.0–4.5 mm diameter. Flowering & fruiting Aug.–Dec.

Tas. (BEL, FUR, KIN, TNM, TNS, TSE, TSR, TWE); also SA, NSW, Vic. Widespread and locally frequent in damp, sandy heaths, light, open forests and woodlands throughout the state, local in the west; from sea level to c. 500 m elevation.

**2 *Euryomyrtus parviflora* Miq., *Ned. Kruidk. Arch.* 4: 149 (1856)***Creeping Heath-myrtle*

*Baeckea prostrata* Hook.f., *Hooker's Icon. Pl.* 3: (2) t. 284 (1840) [as *Baeckia prostrata*]; *B. ramosissima* subsp. *prostrata* (Hook.f.) G.W.Carr, *Telopea* 1: 416 (1980); *Euryomyrtus ramosissima* subsp. *prostrata* (Hook.f.) Trudgen, *Nuytsia* 13(3): 563 (2001).

*Illustrations* (as *B. ramosissima* subsp. *prostrata*): Jeanes, *Fl. Victoria* 3: 1037, fig. 214h (1996); Wilson, *Fl. New South Wales* 2, rev. ed.: 214 (2002).

Prostrate to weakly decumbent shrubs, 5–10(–20) cm high, much branched and spreading widely, to 5(–8) m or more, sometimes rooting at the nodes. Leaves spreading; lamina 3–10(–12) mm long, 1.5–2.5 mm wide, linear to narrowly ovate or narrow-oblong, base rounded, texture usually thin, flat, margins entire or minutely ciliate, apex subacute to rounded. Flowers axillary, solitary, usually deflexed at anthesis; pedicels as long as or longer than the leaves; bracteoles broadly triangular, inserted within the distal  $\frac{2}{3}$  of the pedicel. Sepals green or reddish, broadly triangular, apex rounded, margins minutely ciliate-fimbriate. Petals usually white or sometimes tinged pink, scarcely glossy, 1.5–2.5 mm diameter, orbicular, margins fimbriate; floral trichomes absent or, rarely, few. Stamens 3–7(–10) connective gland small, spherical. Fruit 3–4 mm diameter. Flowering & fruiting Aug.–Nov.

Tas. (FUR, BEL, TNS, TSE, TWE); also SA, NSW, Vic. Locally common in heaths and shrubberies and under light forest, in the east and north of the state; from sea level to c. 250 m. elevation.

## 6 MELALEUCA

Lyn A Craven, Brendan J Lepschi

*Melaleuca* L., *Syst. Nat. Ed. 12* 2: 509 (1767), *nom. cons.*

Synonymy: *Cajuputi* Adans., *Fam. Pl.* (Adanson) 2: 84, 530 (1763) [as *Kajuputi*]. *Callistemon* R.Br., *Voy. Terra Austral., App. III* (1814). *Myrtoleucodendron* Kuntze, *Rev. Gen. Pl.* 1: 241 (1891).

Shrubs or trees. Leaves spiral, decussate or ternate, small to medium-sized, the venation pinnate to parallel. Inflorescence a spike or cluster or sometimes flowers solitary, terminal at first and then the axis tip generally developing into a leafy shoot, the basic floral unit a monad, dyad or triad; bracts usually brown, scarious or sometimes leaf-like, soon shed, bracteoles 2. Hypanthium fused to the ovary in the proximal region only or for up to three-quarters the length of the ovary or rarely for almost all the length of the ovary. Sepals (0)5, entire, free. Petals 5, free. Stamens few to numerous, longer than petals; filaments fused for part of their length into 5 bundles and inserted on a staminal ring or free and not in bundles and then the filaments inserted on the hypanthium apex with the staminal ring obsolete; anthers versatile with two parallel cells that open via longitudinal slits. Ovary half-inferior, 3-celled; ovules few to numerous. Fruit a loculicidal capsule within a usually woody to subwoody fruiting hypanthium; valves opening at summit. Seeds many.

As currently circumscribed, a genus of about 270 species of which about 260 occur in Australia, with several of these extending into Malesia and one to New Caledonia; one species is endemic to Lord Howe Island and seven species are endemic to New Caledonia. Eight species occur in Tasmania.

*Melaleuca* is polyphyletic with respect to 10 Australian genera including *Callistemon* (see Ladiges et al. 1999; Brown et al. 2001; Edwards et al. 2010). New Caledonian and Australian species of *Callistemon* were transferred to *Melaleuca* by Craven and Dawson (1998) and Craven (2006) respectively. A broader circumscription for *Melaleuca* has been called for (Edwards et al. 2010), though this has not been accepted by all Australian herbaria (see APC). For further discussion see Craven (2006) and Edwards et al. (2010). A broader circumscription of *Melaleuca* has been adopted here though the only other genus affected in the state is *Callistemon*.

The oils contained in the leaves of some species of *Melaleuca* contain a number of compounds of pharmaceutical value. Plants are cultivated in plot plantations and the topmost leaves are harvested on a 'rotational' basis.

Key references: Craven & Lepschi (1999); Craven (2006).

- |  |                        |
|--|------------------------|
| 1. Leaves decussate  | 2                      |
| 1: Leaves alternate (occasionally ternate)   | 3                      |
| 2. Flowers mauve, purple or pink; fruit distinctly embedded in the rhachis   | 3 <i>M. gibbosa</i>    |
| 2: Flowers white or pale to lemon yellow; fruit not embedded in the rhachis  | 7 <i>M. squarrosa</i>  |
| 3. Stamens free throughout   | 4                      |
| 3: Stamens fused at the base into 5 bundles  | 5                      |
| 4. Leaves 20–79 mm long, 4–17 mm wide, untwisted; flowers (stamens) pale yellow, lemon or rarely pink or pinkish-red; cotyledons obvolvate | 4 <i>M. pallida</i>    |
| 4: Leaves 14–37 mm long, 1.8–5.0 mm wide, twisted; flowers (stamens) yellow or green; cotyledons flattened, plano-convex                   | 8 <i>M. virens</i>     |
| 5. Inflorescences on secondary shoots among or below the leaves, spicate   | 1 <i>M. armillaris</i> |
| 5: Inflorescences terminal or pseudoterminal on the branchlets, capitate or spicate  | 6                      |



6. Branchlets terete; leaves narrowly ovate, very narrowly ovate, linear-ovate, subulate or ovate, oil glands sparse; flowers (stamens) purple, mauve, pink or purplish-pink, rarely cream to white 6 *M. squamea*
6. Branchlets ridged (the leaf bases continuing down the stem); leaves generally linear or nearly so (narrowly elliptic, linear-elliptic, very narrowly ovate, linear-ovate, linear, or very narrowly obovate), oil glands dense or moderately dense; flowers (stamens) white, cream or yellow 7

7. Fruit with the calyx lobes developed into teeth 2 *M. ericifolia*

7. Fruit with the calyx lobes weathering away (also becoming somewhat embedded in the hypanthium wall) 5 *M. pustulata*

**1 *Melaleuca armillaris*** (Sol. ex Gaertn.) Sm., *Trans. Linn. Soc. London* 3: 277 (1797), **subsp. *armillaris***

*Giant Honeymyrtle*

*Metrosideros armillaris* Sol. ex Gaertn., *Fruct. Sem. Pl.* 1: 171, t. 34, fig. 5 (1788); *Myrtoleucodendron armillare* (Sol. ex Gaertn.) Kuntze, *Revis. Gen. Pl.* 1: 241 (1891).

*Illustrations*: Carrick & Chorney, *J. Adelaide Bot. Gard.* 1: 307, fig. 17 (1979), as *M. raphiophylla*; Cowley et al., *Austral. Syst. Bot.* 3: 186, fig. 9a (1990); Wrigley & Fagg, *Bottlebrushes, Paperbarks and Tea Trees ...*, 238 (1993); Holliday, *Field Guide Melaleucas* 22–23 (1996); Walsh & Entwisle (Eds), *Fl. Victoria* 3: 1030, fig. 212y-bb (1996).

Shrubs or trees, 1–4 m tall; bark pale brown, soft, flaky. Branchlets glabrescent, lanuginulose. Leaves alternate, 10–30 mm long, 0.9–1.3 mm wide, 10–35 times as long as wide, shortly petiolate; lamina rapidly glabrescent (the lanuginulose hairs ephemeral), linear, narrowly elliptic, linear-obovate or linear-elliptic, in transverse section lunate, transversely linear, transversely semielliptic or very broadly obovate, base attenuate, apex acuminate, narrowly acuminate or narrowly acute; veins 3, parallel; oil glands moderately dense, distinct to obscure, more or less in rows or scattered. Inflorescences spicate, on secondary shoots among or below the leaves, interstitial, with 25–50 monads, up to 25 mm wide. Hypanthium glabrous, 1.0–1.5 mm long. Calyx lobes c. 0.9–1.0 mm long, glabrous, scarious in a marginal band up to 0.3 mm wide. Petals 2–3 mm long, deciduous. Stamens 11–17 per bundle; filaments white, cream or creamy-yellow, 9.5–10.3 mm long; the bundle claw 4.7–7.0 mm long, 0.6–0.8 times as long as the filaments. Style 10–13.5 mm long; ovules c. 75–80 per locule. Fruit 4.0–4.5 mm long, with sepaline teeth. Cotyledons subobovate (almost plano-convex) or obovate. Flowering (Apr.) Sep.–Dec.

Tas. (FUR, TSE\*); also NSW, Vic.; naturalised in WA, SA, ACT. Apparently native to the islands of Bass Strait including Curtis (Curtis Group), Rodondo (Anser Group), Long and Dog Islands (Furieux Group). The species can persist in disturbed urban areas such as rubbish tips (e.g. near Hobart and Binalong Bay).

**2 *Melaleuca ericifolia*** Sm., *Trans. Linn. Soc. London, Bot.* 3: 276 (1797)

*Coast Paperbark*

*Myrtoleucodendron ericifolium* (Sm.) Kuntze, *Revis. Gen. Pl.* 1: 241 (1891); *Cajuputi ericifolia* (Sm.) A. Lyons, *Pl. Nam.* 74 (1900). *Melaleuca pinifolia* Colla, *Hortus Ripul. App.* 2: 352, adnot. (1826). *Melaleuca gunniana* Schauer, *Repert. Bot. Syst. (Walpers)* 2: 928 (1843). *Melaleuca gunniana* var. *capitata* F. Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 120 (1856). *Melaleuca ericaefolia* Hook. f., *Bot. Ant. Voy. III (Fl. Tasm.)* 1(2): 129 (1856), *orth. var.*

*Illustrations*: Wrigley & Fagg, *Bottlebrushes, Paperbarks and Tea Trees ...*, 262 (1993); Holliday, *Field Guide Melaleucas* 82–83 (1996); Walsh & Entwisle (Eds), *Fl. Victoria* 3: 1033, fig. 213e-h (1996); Wapstra et al., *Tasmanian Plant Names Unravelling* 202 (2010).

Shrubs or trees, 1–8 m tall; bark papery-flaky, pale brownish or white. Branchlets glabrescent, lanuginulose. Leaves alternate or ternate, 5–18 mm long, 0.5–1.7 mm wide, 6–25 times as long as wide, subsessile; lamina glabrescent, lanuginulose, very narrowly elliptic, very narrowly ovate, linear-elliptic, linear-ovate or linear, in transverse section flattened transversely semielliptic (occasionally approaching transversely elliptic or strongly flattened semitransversely elliptic), base attenuate, apex acute or narrowly acute; veins 3, parallel; oil glands dense, distinct to obscure, scattered. Inflorescences spicate or capitate, pseudoterminal, with 10–40 monads, up to 20 mm wide. Hypanthium 1.0–1.8 mm long, hairy or glabrescent. Calyx lobes 0.5–0.7 mm

long, abaxially glabrous, herbaceous to the margin. Petals 1.2–2.2 mm long, deciduous. Stamens 7–14 per bundle; filaments white or cream, 5–9 mm long, the bundle claw 1.0–2.5 mm long, 0.2–0.3 times as long as the filaments. Style 5–10.5 mm long; ovules 30–45 per locule. Fruit 2.5–3.6 mm long, with sepaline teeth. Cotyledons subobovulate (almost plano-convex). Flowering Sep.–Jan., May.

Tas. (FUR, KIN, TNM, TNS, TSE); also NSW, Vic. Widespread in near coastal areas in the northern half and the islands of Bass Strait. Usually found in wetter areas such as along gullies, creek banks in heaths, shrubberies, woodlands and forests; from sea level to c. 450 m elevation.

### 3 *Melaleuca gibbosa* Labill., *Nov. Holl. Pl.* 2: 30, t. 172 (1806)

*Slender Honeymyrtle*

*Myrtoleucodendron gibbosum* (Labill.) Kuntze, *Revis. Gen. Pl.* 1: 241 (1891).

*Illustrations*: Jessop & Toelken (Eds), *Fl. S. Austral.* 2: plate 30 & 938, fig. 478d (1986); Wrigley & Fagg, *Bottlebrushes, Paperbarks and Tea Trees ...*, 266 (1993); Holliday, *Field Guide Melaleucas* 90–91 (1996).

Shrubs, 0.1–3.0 m tall; bark soft, greyish-brown. Branchlets usually glabrous or soon glabrescent (when present, the hairs (lanuginulose-puberulous to lanuginulose with some puberulous hairs also) are ephemeral). Leaves decussate, 1.5–6.0 mm long, 1–4 mm wide, 1.0–2.8 times as long as wide, subsessile to sessile; lamina usually glabrous or soon glabrescent (the indumentum as for the branchlets), broadly obovate, obovate, broadly elliptic, elliptic or broadly ovate, in transverse section sublunate, lunate, sublunate-involute or V-shaped, base cuneate to rounded or rarely approaching truncate, apex rounded or broadly acute; veins 3, parallel; oil glands moderately dense or dense, distinct or obscure, more or less in rows to scattered. Inflorescences spicate or capitate, with 4–18 monads, up to 12 mm wide. Hypanthium 1.0–1.5 mm long, glabrous. Calyx lobes 0.5–0.9 mm long, abaxially glabrous, scarious in a marginal band 0.1–0.4 mm wide. Petals 1.3–2.6 mm long, deciduous. Stamens 9–25 per bundle; filaments mauve, purple or pink, 3.5–5.5 mm long; bundle claw 0.5–1.7 mm long, 0.2–0.4 times as long as the filaments. Style 5.5–7.5 mm long; ovules c. 35–50 per locule. Fruit distinctly embedded in the rhachis, with sepaline teeth (at maturity the teeth have weathered to the point of being blunt undulations or have weathered away completely). Cotyledons plano-convex. Flowering Aug.–May.

Tas. (FUR, KIN, TNM, TNS, TSE); also SA, Vic. Found in the north-east and east, as well as on the Furneaux group. Found in damp areas especially near the coast; from sea level to c. 600 m elevation.

### 4 *Melaleuca pallida* (Bonpl.) Craven, *Novon* 16: 472 (2006)

*Yellow Bottlebrush*

*Metrosideros pallida* Bonpl., *Descr. Pl. Malmaison* 101, t. 41 (1816); *Callistemon pallidus* (Bonpl.) DC., *Prodr.* (DC.) 3: 223 (1828) [as *C. pallidum*]. *Callistemon salignus* var. *hebestachyus* Benth., *Fl. Austral.* 3: 121 (1867); *C. salignus* f. *hebestachys* Siebert & Voss, *Vilmorin's Blumengartneri* 1: 312 (1896). *Callistemon salignus sensu* J.D.Hooker, *Bot. Ant. Voy. III (Fl. Tasm.)* 1(1): 131 (1855); G.Bentham, *Fl. Austral.* 3: 120 (1867); L.Rodway, *Tasman. Fl.* 53 (1903), *non* (Sim.) DC. (1828). *Callistemon salignus* var. *australis sensu* Benth., *Fl. Austral.* 3: 121 (1867) *p.p.* (Tasmanian material), *non* Benth. (1867). *Callistemon paludosus sensu* W.M.Curtis & D.I.Morris, *The Student's Flora of Tasmania* 1: 203 (1975), *non* F.Muell. (1858).

*Illustrations* (as *C. pallidus*): Costermans, *Native Trees and Shrubs of South-Eastern Australia* 245 (1981); Wrigley & Fagg, *Bottlebrushes, Paperbarks and Tea Trees ...*, 67 (1993); Walsh & Entwisle (Eds), *Fl. Victoria* 3: 1025, fig. 211z-bb (1996); Wapstra et al., *Tasmanian Plant Names Unravelling* 188 (2010)].

Shrubs or trees 1–25 m tall; bark fibrous or somewhat papery, hard, yellowish-brown, light brown or dark grey. Branchlets glabrescent, sericeous to sericeous-pubescent. Leaves alternate, 20–79 mm long, 4–17 mm wide, 2.3–7.5 times as long as wide, long- to short-petiolate, untwisted; lamina glabrescent, sericeous or sericeous-pubescent, narrowly elliptic, narrowly obovate, elliptic or obovate, in transverse section linear, sublunate or broadly v-shaped, base attenuate or very narrowly attenuate, apex shortly acuminate or obtusely shortly acuminate; veins pinnate, 6–16; oil glands sparse or moderately dense, distinct or obscure,

scattered. Inflorescences spicate, pseudoterminal and sometimes also upper axillary or interstitial, with 15–50 monads, 20–45 mm wide. Hypanthium hairy to glabrous, 3.1–4.2 mm long. Calyx lobes 1.0–2.2 mm long, abaxially hairy or glabrescent, herbaceous to the margin. Petals 2.9–6.0 mm long, deciduous. Stamens 34–70 per flower; filaments pale yellow, yellow, lemon or rarely pink or pinkish-red, 8–16 mm long; anthers yellow. Style 12–21 mm long; ovules c. 70–150 per locule. Fruit 3.9–6.6 mm long, the calyx lobes deciduous; cotyledons obvolvate. Flowering Oct.–Feb.

Tas. (BEN, FUR, TCH, TNM, TNS, TSE, TSR); also Qld, NSW, Vic. A widespread species usually found on damp but well-drained rocky substrates; from sea level to c. 1100 m elevation.

##### 5 *Melaleuca pustulata* Hook.f., *London J. Bot.* 6: 476, bis (1847)

Warty Paperbark

*Myrtoleucodendron pustulatum* (Hook.f.) Kuntze, *Revis. Gen. Pl.* 1: 241 (1891).

*Illustrations:* Wrigley & Fagg, *Bottlebrushes, Paperbarks and Tea Trees ...*, 295 (1993); Holliday, *Field Guide Melaleucas* 2: 44 & 48 (1997).

Shrub, 2–5 m tall; bark grey-fawn, soft, papery-flaky. Branchlets glabrescent to hairy, lanuginulose to lanuginulose-puberulous with some shorter pubescent hairs also. Leaves alternate or ternate (or subternate), 5–10 mm long, 0.5–1.6 mm wide, 4–9 times as long as wide, shortly petiolate to sessile; lamina glabrescent, lanuginulose to less often lanuginulose-puberulous, very narrowly elliptic to linear-elliptic or very narrowly obovate, in transverse section transversely semielliptic, shallowly lunate, flattened transversely semielliptic, depressed obovate or transversely, base narrowly cuneate to attenuate, apex acute to obtuse or acuminate; veins 3, parallel; oil glands moderately dense, distinct to obscure, more or less in rows. Inflorescences spicate or capitate, pseudoterminal, with 15–30 monads, up to 18 mm wide. Hypanthium 1.5–2.0 mm long, glabrous (rarely a few scattered puberulous hairs may be present near the base). Calyx lobes 0.4–0.6 mm long, abaxially glabrous, herbaceous to the margin or scarious in a marginal band up to 0.1 mm wide. Petals 1.9–2.0 mm long, deciduous. Stamens 5–9 per bundle; filaments yellow, 4.2–8.5 mm long, the bundle claw 0.5–1(–1.4) mm long, 0.08–0.2 times as long as the filaments. Style 6–7 mm long; ovules 50–70 per locule. Fruit 3–4 mm long, the calyx lobes weathering away (also becoming somewhat embedded in the hypanthium wall). Cotyledons subobvolvate (almost plano-convex). Flowering Sep.–Jan.

Tas. (TSE), endemic. Localised on East Coast around Oyster Bay in dry forest and along creeks and rivers.

##### 6 *Melaleuca squamea* Labill., *Nov. Holl. Pl.* 2: 28, t. 168 (1806)

Swamp Honeymyrtle

*Myrtoleucodendron squameum* (Labill.) Kuntze, *Revis. Gen. Pl.* 1: 241 (1891).

*Illustrations:* Jessop & Toelken (Eds), *Fl. S. Austral.* 2: plate 30 & 944, fig. 481c (1986); Wrigley & Fagg, *Bottlebrushes, Paperbarks and Tea Trees ...*, 306 (1993); Holliday, *Field Guide Melaleucas* 190–191 (1996); Wapstra et al., *Tasmanian Plant Names Unravelling* 202 (2010).

Shrubs, 0.4–2.0 m tall. Branchlets glabrescent, the indumentum commonly dimorphic with a sparse layer of long, spreading pubescent to sericeous-pubescent hairs overlying a dense layer of much shorter puberulous to lanuginulose-puberulous hairs (the latter rarely lanuginulose or sericeous-lanuginulose or absent and then the indumentum consisting only of pubescent to sericeous-pubescent hairs). Leaves alternate, 4.5–12 mm long, 1–3 mm wide, 1.5–9.0 times as long as wide, sessile to shortly petiolate; lamina glabrescent, pubescent to sericeous-pubescent, occasionally some puberulous to lanuginulose-puberulous hairs persist on the petiole/leaf blade base, narrowly ovate, very narrowly ovate, linear-ovate, subulate or ovate, in transverse section linear or sublunate, base cuneate to attenuate or rounded, apex narrowly acute to acute; veins 3–5, parallel; oil glands sparse; obscure to distinct, scattered. Inflorescences capitate or spicate, with 3–26 monads, up to 20 mm wide. Hypanthium glabrous or rarely glabrescent to hairy, 2–3 mm long. Calyx lobes 0.5–1.0 mm long, abaxially glabrous or rarely glabrescent, herbaceous to the margin or scarious in a marginal band up to 0.1 mm wide. Petals 1.5–3.0 mm long, deciduous. Stamens 4–9 per bundle; filaments

purple, mauve, pink, purplish-pink or rarely cream to white, 5.0–7.7 mm long; bundle claw 0.4–1.0 mm long, 0.07–0.2 times as long as the filaments. Style 7–10 mm long; ovules 20–30 per locule. Fruit 3.5–7.0 mm long, the calyx lobes deciduous or weathering away (and then the extreme basal portion of the calyx may become woody and persist as a more or less prominent ring around the hypanthium rim). Cotyledons plano-convex. Flowering June–Apr.

Tas. (all regions except MIS); SA, NSW, Vic. A widespread species, especially in peaty heaths, from sea level to > 1000 m elevation.

**7 *Melaleuca squarrosa*** Donn ex Sm., *Trans. Linn. Soc. London, Bot.* 6: 300 (1802)

*Scented Paperbark*

*Myrtoleucodendron squarrosom* (Donn ex Sm.) Kuntze, *Revis. Gen. Pl.* 1: 241 (1891). *Melaleuca myrtifolia* Vent., *Jard. Malmaison* 1: 47, t. 47 (1804). *Melaleuca squarrosa* var.  $\beta$  *glabrata* F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 122 (1856).

*Illustrations:* Jessop & Toelken (Eds), *Fl. S. Austral.* 2: 944, fig. 481D (1986); Wrigley & Fagg, *Bottlebrushes, Paperbarks and Tea Trees ...*, 306 (1993); Holliday, *Field Guide Melaleucas* 192–193 (1996); Wapstra et al., *Tasmanian Plant Names Unravelling* 202 (2010).

Shrubs or trees, 0.5–10 m tall; bark pale grey or light brown, thick, papery. Branchlets glabrescent, pubescent to sericeous-pubescent and usually grading into shorter puberulous to pubescent hairs (rarely the longer hairs may be more or less sericeous or matted). Leaves decussate, 5–16.2 mm long, 2.5–8.2 mm wide, 1.2–4.6 times as long as wide, shortly petiolate to subsessile; lamina glabrescent, sericeous-pubescent to pubescent with sericeous hairs, occasionally with some lanuginose-pubescent hairs also, ovate to narrowly ovate, broadly ovate, elliptic or broadly elliptic, in transverse section transversely linear, base attenuate, subcordate, cordate or rounded to truncate, apex acute to narrowly acute, acuminate or obtusely shortly acuminate; veins, 5–7 parallel; oil glands moderately dense, distinct to obscure, more or less in rows to scattered. Inflorescences spicate, with 4–20 triads, up to 22 mm wide. Hypanthium 2–3 mm long, hairy (usually only at the base) or glabrous. Calyx lobes 0.7–1.0 mm long, abaxially glabrous or rarely hairy, scarious in a marginal band up to 0.1 mm wide or herbaceous to the margin. Petals 2.0–2.7 mm long, deciduous. Stamens 6–12 per bundle; filaments pale- or lemon- yellow to white, 6–8.6 mm long; bundle claw 0.6–1.8 mm long, 0.08–0.2(–0.6) times as long as the filaments. Style 7–10 mm long; ovules c. 10–20 per locule. Fruit 2.7–3.5 mm long, the calyx lobes weathering away (the extreme basal portion of the lobes may become woody and persist as a low ring or series of undulations around the hypanthium rim). Cotyledons obvolvate. Flowering Aug.–Mar.

Tas. (all regions except MIS): also SA, NSW, Vic. A widespread taxon found in damp areas; from sea-level to c. 500 m elevation.

The bark at the base of larger specimens of this species may be spongy and up to 5 cm thick or more.

**8 *Melaleuca virens*** Craven, *Novon* 16: 473 (2006)

*Prickly Bottlebrush*

*Metrosideros viridiflora* Sims, *Bot. Mag.* 52: t. 2602 (1825); *Callistemon viridiflorus* (Sims) Sweet, *Hort. Brit.* [Sweet] 155 (1826) [as *C. viridiflorum*]; *C. salignus* var. *viridiflorus* (Sims) F.Muell., *Fragm.* (Mueller) 4: 55 (1864); *C. salignus* f. *viridiflorus* (Sims) F.Muell. ex Siebert & Voss, *Vilmorin's Blumengartneri* 1: 312 (1896).

*Illustrations* (as *C. viridiflorus*): Wrigley & Fagg, *Bottlebrushes, Paperbarks and Tea Trees ...*, 75 (1993); Wapstra et al., *Tasmanian Plant Names Unravelling* 188 (2010).

Shrubs or small trees 1–3 m tall; bark grey-brown, smooth to scaly and slightly fissured. Branchlets glabrescent, or pubescent (rarely appearing appressed and then the hairs matted). Leaves alternate, 14–37 mm long, 1.8–5.0 mm wide, 4–13 times as long as wide, long- or shortly petiolate, twisted; lamina glabrescent, pubescent to sericeous-pubescent, narrowly elliptic, narrowly ovate or ovate, often slightly falcate, in trans-

verse section transversely linear (occasionally slightly sublunate), base narrowly cuneate to very narrowly obtuse, apex narrowly acute or shortly acuminate; veins parallel-pinnate (the pinnate veins obscure), with 3(–7) parallel veins; oil glands sparse or moderately dense, distinct, scattered. Inflorescences spicate, pseudoterminal or rarely approaching interstitial, sometimes also upper axillary, with 20–80 monads, 30–50 mm wide. Hypanthium glabrous, 2.8–4.0 mm long. Calyx lobes 1.0–2.2 mm long, abaxially glabrous, herbaceous to the margin. Petals 2.7–4.9 mm long, deciduous. Stamens scattered around the hypanthium apex or 5-grouped opposite the petals, 19–36 per flower; filaments yellow or green, 12–23 mm long, anthers yellow. Style 14–22 mm long; ovules c. 100–150 per locule. Fruit 4.5–6.0 mm long, the calyx lobes deciduous. Cotyledons flattened plano-convex. Flowering Nov.–May.

Tas. (BEN, FUR, TCH, TNS, TNM, TSE, TSR, TWE), endemic. Widespread especially in wet, montane habitats; from sea level to c. 1100 m elevation.

## 7 KUNZEA

### Alan M Gray

*Kunzea* Rchb., *Consp. Regn. Veg.* 175 (1828).

Synonymy: *Pentagonaster* Klotzch, *Allg. Gartenzeitung* (Otto & Dietrich) 13 (1836). *Salisia* Lindley, *Sketch Veg. Swan R.* 1: x (1839); *Kunzea* section *Salisia* (Lindl.) Benth., *Fl. Austral.* 3: 112, 115 (1867). *Tillospermum* Griff., *Monthly Review* (Salisbury) 75: 74 (1814).

Shrubs or small trees. Leaves usually alternate, shortly petiolate. Flowers in head-like clusters, axillary or apparently terminal, usually sessile to subsessile, or sometimes pedunculate-pedicellate; bracts present, imbricate, sometimes forming an involucre. Hypanthium campanulate, base often bulbous, enclosing ovary, glabrous to pilose, oil glands often prominent. Sepals 5, persistent in fruit. Petals 5, free, broadly obovate to orbicular, shortly clawed. Stamens numerous, in one or more distinct rows, all or most much longer than the petals; filaments fee; anthers dehiscent by longitudinal slits; connective gland large, dark brown, spheroid, prominent. Ovary half-inferior, 2–5 locular; ovules 1 to many; style long. Fruit a loculicidal capsule, dehiscent at the apex, or rarely fleshy and indehiscent. Seeds 1–2 per locule.

A genus of approximately 36 species in temperate Australia and New Zealand. The genus is undergoing critical revision and its circumscription may change.

- |   |                       |
|---|-----------------------|
| 1. Flowers and fruit almost sessile, in clustered heads; all stamens longer than petals; floral bracts present but caducous before anthesis | 1 <i>K. ambigua</i>   |
| 1: Flowers and fruit pedunculate and pedicellate; some stamens shorter than petals; floral bracts absent                                    | 2 <i>K. ericoides</i> |

**1 *Kunzea ambigua* (Sm.) Druce, *Bot. Soc. Exch. Club Brit. Isles* 1916: 629 (1917)**

*White Kunzea*

*Leptospermum ambiguum* Sm., *Trans. Linn. Soc. London* 3: 264 (1797). *Metrosideros corifolia* Vent., *Jard. Malmaison* 1: 46, t. 46 (1803); *Stenospermum corifolium* (Vent.) Sweet., *Hort. Brit.* [Sweet], ed. 2 209 (1830); *Kunzea corifolia* (Vent.) Schauer, *Pl. Preiss.* 1(1): 124 (1844). *Kunzea corifolia* Rchb., *Consp. Regn. Veg.* 175 (1828), *nom. inval.*

*Illustrations:* Jeanes, *Fl. Victoria* 3: 1021, fig. 210g-i (1996); Harris et al., *One Hundred Islands: the Flora of the outer Furneaux* 171 (2001); Wilson, *Fl. New South Wales* 2, rev. ed.: 177 (2002); Whiting et al., *Tasmania's Natural Flora* 238 (2004); Simmons et al., *A Guide to Flowers and Plants of Tasmania*, ed. 4, 151 (2008); Wapstra et al., *Tasmanian Plant Names Unravelled* 200 (2010).

Shrubs 1–4 m high, often densely branched, glabrous or the younger shoots villous. Leaves alternate, often clustered on very short lateral branches, ± sessile; lamina 8–12 mm long, 1.0–1.5 mm wide, linear to narrow lanceolate-oblongate, erect or the tips recurved, flat or concave, oil glands present, sometimes sparsely villous, margins entire, apex blunt. Flowers subsessile, crowded in the upper leaf axils or on the leafy lateral branches, appearing like terminal heads; floral bracts present before anthesis but soon caducous.

Hypanthium campanulate to urceolate, glabrous with oil glands obvious, or shortly pubescent and then oil glands obscured. Sepals green 1.5–2.0 mm long, ovate to narrowly triangular. Petals white, occasionally flushed pink in bud, c. 2.5–3.0 mm long, orbicular. Stamens numerous; all filaments c. twice as long as petals; anthers versatile, gland of connective dark brown, spheroid, prominent. Style c. as long as the stamens. Fruit a semisucculent to leathery capsule, dehiscing by terminal valves, not persisting. Flowering & fruiting Aug.–May.

Tas. (BEL, FUR, TNM, TSE); also NSW, Vic. Widespread and frequent in sandy heaths and open, light forest in the north-east, east coast and islands of the Furneaux Group, sometimes forming pure stands.

Note: The oils contained within the leaves of this species have recently-developed commercial applications. The species is now cultivated in plot plantations for 'rotational' harvesting of the top-most regrowth foliage.

**2 \* *Kunzea ericoides*** (A.Rich.) Joy Thomps., *Telopea* 2: 379 (1983)

*Burgan*

*Leptospermum ericoides* A.Rich., *Voy. Astrolabe, Botanique* 1:338 (1832). *Baেকেa phyllicoides* A.Cunn. ex Schauer, *Repert. Bot. Syst. (Walpers)* 2(5): 921 (1843); *Kunzea phyllicoides* (A.Cunn. ex Schauer) Druce, *Bot. Exch. Club Soc. Brit. Isles Report for 1916, Suppl. 2*: 629 (1917); *Leptospermum phyllicoides* (A.Cunn. ex Schauer) Cheel [as *L. phyllicoideum*], *J. & Proc. Roy. Soc. New South Wales* 76: 231, t. X (1943). *Kunzea peduncularis* F.Muell., *Trans. & Proc. Victorian Inst. Advancem. Sci.* 1: 124–125 (1855). *Kunzea leptospermoides* Miq., *Ned. Kruidk. Arch.* 44(1): 146 (1856).

*Illustrations*: Jeanes, *Fl. Victoria* 3: 1021, fig. 210j-l (1996); Richardson et al., *Weeds of the South-East, an Identification Guide for Australia* 314 (2006); Wrigley et al., *Australian Native Plants* ed. 4, 386 (1998).

Erect shrubs or small trees, 2–6 m high, young stems pubescent. Leaves alternate, very shortly petiolate; lamina 6–25 mm long 1.0–4.5 mm wide, narrow elliptical to oblanceolate, spreading, bright green to grey-green, finely pubescent to glabrous, ± flat, margins entire, apex acute to acuminate. Flowers solitary or many in umbelliform heads; peduncles 3–8 mm long, pedicels 3–6 mm long, crowded in upper leaf axils or on leafy lateral branches; floral bracts absent. Hypanthium hemispherical or campanulate, rugulose, glabrous to pubescent, oil glands inconspicuous. Sepals green, often reddish at the base, 1.0–1.5 mm long, triangular. Petals white, 2.5–5.0 mm long, orbicular. Stamens numerous, some shorter than the petals, some longer; anthers versatile, gland of connective small, white or reddish, inconspicuous. Style c. ½ as long as the stamens. Fruit a leathery capsule, dehiscing by terminal valves, not long persistent. Flowering & fruiting Aug.–May.

Tas. (FUR, TNM, TNS, TSE); native to Qld, NSW, Vic., New Zealand. Originally introduced into Tasmania as a horticultural feature plant. *Kunzea ericoides* is a prolific seed producer. It has escaped from cultivation and is spreading in disturbed areas and bushland adjacent to housing, especially in the south of the state. A very variable and polymorphic species. Thought by some to be somewhat intermediate between *Leptospermum* and *Kunzea* and may perhaps be better placed in a distinct genus (Jeanes 1996).

## 8 LEPTOSPERMUM

### Alan M Gray

*Leptospermum* J.R.Forst. & G.Forst., *Char. Gen. Pl.* 47: t. 36 (1775).

Synonymy: *Leptospermopsis* S.Moore, *J. Linn. Soc., Bot.* 45: 202 (1920). *Macklottia* Korth., *Ned. Kruidk. Arch.* 1: 196 (1847).

Shrubs, or sometimes trees. Leaves alternate, usually shortly petiolate. Flowers sessile to subsessile, solitary or 2–3 together in the leaf axils or at the ends of short branches; bracts usually present, small, scarious, caducous. Hypanthium broadly campanulate to hemispherical or turbinate. Sepals 5, caducous, rarely persisting until anthesis. Petals 5, orbicular to broadly obovate. Stamens numerous, in a single row, shorter than the petals; filaments free; anther versatile, dehiscing by slits; gland at connective small, inconspicuous.

Ovary inferior or half-inferior, (3–)5(–10) locular; ovules numerous; style simple, mostly inserted in a small depression. Fruit a loculicidal capsule, woody or coriaceous, rarely succulent; valves opening at summit; in most species ripe fruit may persist for one or more years. Seeds usually numerous, with many sterile and narrower infertile seeds (chaff).

A genus of about 85 species with 82 species (80 endemic) in Australia, 4 species from Malesia to New Guinea and 1 species in New Zealand; 8 species (4 endemic) in Tasmania. Some species are popular ornamentals, and *Leptospermum* species in general, particularly *L. scoparium*, are of commercial importance in the production of manuka honey. Many of the Tasmanian species exhibit considerable variation; hybridism may be a factor in some of the observed variation. Further critical study of the genus is desirable.

Notes: Leaf oil glands are usually more readily visible in dried material. To reveal the colouration of the fruit, it may be necessary to scrape or scratch the outer layers of the hypanthium.

The name *L. pilosum* Schauer is based on Tasmanian material but as the type could not be located it could not be assigned to any species (see Thompson 1989).

Key reference: Thompson (1989).

- |  |                          |
|--|--------------------------|
| 1. Capsules opening by 7–11 valves   | 1 <i>L. laevigatum</i>   |
| 1: Capsules opening by 4–7 valves  | 2                        |
| 2. Capsule ± succulent or coriaceous, dark reddish or purple, soft, not woody; scarcely persisting for more than one season  | 2 <i>L. glaucescens</i>  |
| 2: Capsule woody, grey or brownish, mostly hard when mature; usually persisting on plant for several seasons   | 3                        |
| 3. Hypanthium and immature capsule glabrous or minutely silky-hairy; indumentum hardly conspicuous; surface of hypanthium not or scarcely scaly, flaking   | 4                        |
| 3: Hypanthium and immature capsule conspicuously silky-hairy or pubescent; surface of hypanthium scaly, flaking  | 5                        |
| 4. Leaves usually concave, apex acute with pungent tip; fruit 5–9 mm diameter (widespread)   | 3 <i>L. scoparium</i>    |
| 4: Leaves usually flat, apex blunt, mucronulate but not pungent; fruit 8–15 mm diameter (east coast)   | 4 <i>L. grandiflorum</i> |
| 5. Mature leaves closely silky-hairy, pubescent or glabrescent, at least on the abaxial surface; margins usually ciliate   | 5 <i>L. lanigerum</i>    |
| 5: Mature leaves glabrous, rarely with a few long hairs, margins sometimes ciliate   | 6                        |
| 6. Leaves coarse, blunt, 3–5(–8) mm long, (1.5–)2–5 mm wide (mostly confined to dolerite montane habitats at > c. 750 m)   | 6 <i>L. rupestre</i>     |
| 6: Leaves relatively thin, apex acute to acuminate, 5–15(–25) mm long, (2–)3–5 mm wide (confined to riparian habitats, at sea level to c. 1000 m elevation)  | 7                        |
| 7. Leaves dull, narrow elliptic-oblong; fruit turbinate, base narrowed into short pedicel, hardly obscured by flakes or scales of hypanthium wall (riparian corridor habitats in the W & S)                                  | 7 <i>L. riparium</i>     |
| 7: Leaves shining, elliptic to narrow-oblongate; fruit sessile, sides ± parallel, base broad, flat; attachment to branch obscured by flakes and scales of hypanthium wall; widespread, from sea level to c. 1000 m elevation | 8 <i>L. nitidum</i>      |

**1 *Leptospermum laevigatum* (Gaertn.) F.Muell., *Ann. Rep. Govt. Bot.* 22 (1858)**

Coast Teatree

*Fabricia laevigata* Gaertn., *De Fructibus et Seminibus Plantarum* 1: 175 (1788).

*Illustrations:* Lyne, *Fl. Victoria* 3: 1013, fig. 208d (1996); Harris et al., *One Hundred Islands: The Flora of the Outer Furneaux* 178 (2001); Thompson & Logan, *Fl. New South Wales* 2, rev. ed.: 183 (2002); Woolmore et al.,

*King Island Flora* 61 (2002); Whiting et al., *Tasmania's Natural Flora* 239 (2004); Wapstra et al., *Tasmanian Plant Names Unravelling* 200 (2010).

Shrubs or small, much branched, erect or spreading trees to 5(–8) m; bark on smaller stems smooth, becoming rough with age. Younger branchlets green, silky-pubescent-glabrescent. Leaves spreading, very shortly petiolate; lamina obovate to broadly obovate, 15–30(–35) mm long, 5–8(–10) mm wide, flat, glabrous, grey-green, with 3–5 longitudinal veins, very small oil glands on both surfaces, margins smooth, apex blunt or mucronate. Flowers c. 20 mm diameter, solitary, axillary, sessile or subsessile. Hypanthium 3–5(–8) mm long, glabrous. Sepals broadly triangular, 1.5–3.0 mm long, glabrous or with scattered silky hairs, caducous. Petals white, 6–8 mm long. Ovary 7–11-locular; apex ± silky, flat or the valves convex. Fruit 6–8 mm diameter, broadly turbinate to hemispherical, woody, with 8–10 prominent longitudinal ridges; persisting 2–3 seasons. Seed pale, rusty-brown, c. 2 mm long, angular, the angles narrowly winged. Flowering & fruiting Aug.–Jan.

Tas. (FUR, KIN, TNS, TSE); also SA, NSW, Vic.; naturalised in WA, Qld. Locally frequent on sandy coastal heaths in the north-east and north-west of the state and the Bass Strait islands; from sea level to about 150 m. elevation. In the south and elsewhere, reported to be spreading in disturbed situations, especially from earlier plantings for coastal conservation and reclamation, e.g. at Carlton Beach and Bridport.

## 2 *Leptospermum glaucescens* S.Schauer, *Linnaea* 15: 421 (1841)

### *Smoky Teatree*

*Eriostemon trinervis* Hook., *Hooker's J. Bot.* 1: 254 (1834) [as *E. trinerve*]. *Leptospermum erythrocarpum* Summerh. & H.F.Comber, *Field notes of Tasmanian Plants Collected by H.F. Comber 1929 / 30*: 34 (1930). *Leptospermum flavescens* sensu J.D.Hooker, *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 139 (1856); G.Bentham, *Fl. Austral.* 3: 104 (1867); L.Rodway, *Tasman. Fl.* 53 (1903), non Sm. (1797). *Leptospermum myrtifolium* sensu J.D.Hooker, *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 140 (1856); G.Bentham, *Fl. Austral.* 3: 108 (1867); L.Rodway, *loc. cit.*, non Sieber ex DC. (1828). *Leptospermum sericeum* sensu W.M.Curtis, *The Student's Flora of Tasmania* 1: 198 (1956), non Labill. (1806).

*Illustrations*: Curtis & Stones, *The Endemic Flora of Tasmania* 6: t. 126, No. 209 (1978); Harris et al., *One Hundred Islands: The Flora of the Outer Furneaux* 178 (2001); Whiting et al., *Tasmania's Natural Flora* 238 (2004).

Shrubs or trees, (1–)5–10(–20) m high; bark grey, shallowly fissured, papery, flaking. Younger branchlets glabrous or minutely silky-hairy. Leaves spreading, bases narrowed to a short petiole; lamina oblong to oblanceolate or obovate, (3–)5–8(–20) mm long, 3–5(–8) mm wide, flat or slightly concave, usually glabrous, green or ± glaucous, occasionally shortly pilose and greyish, with 3 longitudinal veins but these often obscure, oil glands obscure on both surfaces, margins smooth, apex rounded or shortly mucronate. Flowers 10–15 mm diameter, solitary or 2 to 3 together terminating short lateral branches. Hypanthium 3–5 mm long, silky-hairy, glabrescent. Sepals, broadly triangular, 0.5–2.0 mm long, silky-hairy, ± persisting until fruit matures. Petals white, 3–5 mm long. Ovary 4–6 locular, apex silky-glabrescent, valves convex. Fruit 4–6 mm diameter, hemispherical-obconic, succulent, dark reddish-purple, drying to coriaceous but not woody, silky hairy when young, then smooth; not persisting much beyond one season. Seed dark brown, 0.5–1.0 mm long, angular. Flowering & fruiting Aug.–May.

Tas. (FUR, KIN, TCH, TNS, TSE, TSR, TWE); endemic. Widespread and abundant almost throughout the entire state; from sea level to c. 1000 m. elevation, in wet, sandy heaths, shrubberies and near-coastal forests in the far south and west. The species exhibits considerable variation in size and form from a small, slender, spreading shrub to a taller, much-branched shrub or small tree. However, in some situations, in near-coastal forests in the far south and west of the state, it may be a large tree to 15(–20) m high with a trunk 30–50 cm diameter, and a relatively small crown.



**3 *Leptospermum scoparium* J.R.Forst. & G.Forst., *Char. Gen. Pl.* 72 t. 36 (1775)**

Common Teatree

*Melaleuca scoparia* (J.R.Forst. & G.Forst.) L.f., *Suppl. Pl.*: 343 (1782); *Leptospermum scoparium* var. *linifolium* DC., *Prodr.* (DC.) 3: 227 (1828), *nom. illeg.*; *L. scoparium* var. *scoparia* Hook.f., *Bot. Ant. Voy. III (Fl. Tasm.)* 1(2): 138 (1856), *orth. var.*, autonym. *Philadelphus scoparius* var. *myrtifolius* Aiton, *Hort. Kew.* (W. Aiton) 2: 156 (1789); *Leptospermum scoparium* var. *myrtifolium* (Aiton) W.T.Aiton, *Hort. Kew.* (W.T.Aiton) 3: 181 (1811) [see Thompson (1989) for discussion on authority]. *Leptospermum linifolium* Dum.Cours., *Le Bot. Cult.*, ed. 2, 5: 384 (1811), *nom. illeg.* *Leptospermum scoparium* var. *eximium* B.L.Burt, *Bot. Mag.* t. 9582 (1939).

*Illustrations*: Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2, 200, fig. 50 (1975); Lyne, *Fl. Victoria* 3: 1017, fig. 209c (1996); Harris et al., *One Hundred Islands: The Flora of the Outer Furneaux* 178 (2001); Thompson & Logan, *Fl. New South Wales* 2, rev. ed.: 186 (2002); Woolmore et al., *King Island Flora* 62 (2002); Whiting et al., *Tasmania's Natural Flora* 242 (2004); Simmons et al., *A Guide to Flowers and Plants of Tasmania*, ed. 4, 153 (2008).

Small to large shrubs, (1–)3–5 m, or trees 8–10(–15) m high; sparsely to intricately branched; bark dark grey, brittle, flaking. Younger branchlets reddish, silky-hairy, glabrescent. Leaves suberect to spreading, shortly petiolate; lamina narrow-elliptic to narrow elliptic-lanceolate or broadly obovate-orbicular, 5–15(–20) mm long, 2–5(–8) mm wide, glabrous, oil glands scarcely visible on adaxial surface, margins flat to incurved, minutely denticulate, apex acute, ± pungent. Flowers 10–15 mm diameter, sessile to shortly pedunculate, solitary or 2–3 together on short axillary branches. Hypanthium 2.5–4.0 mm long, glabrous. Sepals triangular, 1.5–2.5 mm long, glabrous, caducous. Petals white, rarely pale pink 4–7 mm long. Ovary 4–6 locular; apex glabrous, convex above the level of the sepals. Fruit 5–9 mm diameter, broadly hemispherical, woody, the walls eventually only slightly scaly, flaking; long-persisting. Seed dark, rusty-brown, 1.5–2.5 mm long, slender, curved. Flowering & fruiting Aug.–Apr.

Tas. (BEL, FUR, KIN, TCH, TNM, TNS, TSE, TSR, TWE); also NSW, Vic., New Zealand. Widespread and abundant in a variety of habitats: heaths, sedgelands, woodlands, dry and wet forests; from sea level to about 1000 m. elevation. The species exhibits considerable variation in size and form from a small, sparsely branched shrub to a large, intricately branched shrub or small to medium tree; in some wetter forests in the north, west and south-west of the state, it may be a medium tree exceeding 15 m tall and with a spirally fluted trunk 20–25(–35) cm in diameter, with long, flaky, tattered grey bark. A number of different forms in different habitats and localities throughout the species' distribution have been recognised at varietal rank.

In Tasmania, a coastal form, *L. scoparium* var. *eximium*, had previously been recognised. However, it differs only in the overall size of the leaves which are broadly obovate-orbicular, but within the stated dimensional parameters and is here included in *L. scoparium*. The differences are minor and not always clear-cut and difficulty in separating the two may be encountered as intermediate forms commonly occur in the transition zones between coastal and inland environments. In New Zealand, numerous varieties of pink, red and double-flowered forms of the species have been developed by the horticultural industry.

**4 *Leptospermum grandiflorum* Lodd., G.Lodd. & W.Lodd., *Bot. Cab.* 514 (1821)**

Autumn Teatree

*Leptospermum flavescens* f. *grandiflorum* (Lodd., G.Lodd. & W.Lodd.) Siebert & Voss, in Voss, *Vilmorin's Blumengartneri. Dritte Neubearbeitete Auflage* 1: 310 (1856); *L. flavescens* var. *grandiflorum* (Lodd., G.Lodd. & W.Lodd.) Benth., *Fl. Austral.* 3: 105 (1867); *L. flavescens* f. *grandiflorum* (Lodd., G.Lodd. & W.Lodd.) Siebert & Voss, *Vilmorin's Blumengartneri. Dritte Neubearbeitete Auflage* 1: 310 (1896). *Leptospermum polygalifolium* var. *grandiflorum* (Lodd., G.Lodd. & W.Lodd.) Domin, *Biblio. Bot.* 22(89): 1006 (1930). *Leptospermum nobile* Miq., *Ned. Kruidk. Arch.* 44(1): 145 (1856). *Leptospermum rodwayanum* Summerh. & H.F.Comber, *Field notes of Tasmanian Plants Collected by H.F. Comber 1929/30*: 55 (1930).

*Illustrations*: Curtis & Stones, *The Endemic Flora of Tasmania* 4: t. 81, No. 136 (1973); Whiting et al., *Tasmania's Natural Flora* 239 (2004).

Shrub, 1–5 m high, often profusely branched, spreading; bark greyish-brown, scaly. Younger branchlets minutely silky-hairy, glabrescent. Leaves suberect to spreading, shortly petiolate; lamina elliptical to obovate, 5–10(–20) mm long, 3–5 mm wide, flat, usually glabrous but sometimes when young with minute hairs giving the leaf a greyish appearance, oil glands conspicuous and  $\pm$  prominent on the abaxial surface, obscure on the adaxial surface, margins smooth, apex blunt or mucronulate. Flowers solitary, terminal, 1.5–3.0 cm diam., on short lateral branches, leaves deciduous on these branches which then appear as long (to 5 mm), stout pedicels. Hypanthium 3–5 mm long, glabrous. Sepals broadly triangular, 2–3 mm long, caducous. Petals white, rarely pale pink, 5–12 mm long. Ovary 4–6 locular, apex convex above the level of insertion of the sepals. Fruit 8–15 mm diameter, surface somewhat wrinkled; persisting for 3–5 seasons. Seed rusty-brown, 2–3 mm long, narrowly cuneiform. Flowering & fruiting Apr.–Oct.

Tas. (TSE); endemic. Locally frequent on the east coast and Tasman Peninsula, in dry shrubberies, usually on stony dolerite soils, and on the Freycinet Peninsula on rocky outcrops and shallow soils derived from granite; from sea level to about 550 m elevation.

### 5 *Leptospermum lanigerum* (Sol. ex Aiton) Sm., *Trans. Linn. Soc. London* 3: 263 (1797)

Woolly Teatree

*Philadelphus laniger* Sol. ex Aiton, *Hort. Kew.* (W.Aiton) 2: 156 (1789); *Leptospermum lanigerum* var. *lanigera* Hook.f., *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 139 (1856), *autonym*. *Philadelphus laniger* var. *canescens* Aiton, *loc. cit.* *Philadelphus laniger* var. *piliger* Aiton, *loc. cit.* (1789). *Leptospermum australe* Salisb., *Prodr. Stirp. Chap. Allerton*: 350 (1796). *Leptospermum lanigerum* var. *pubescens* DC., *Prodr.* (DC.) 3: 227 (1828), *nom. illeg.* *Leptospermum lanigerum* var. *grandifolium* [based on *L. grandifolium* Sm.] *sensu* J.D.Hooker, *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 139 (1856) [as var. *grandifolia*], *non* (Sm.) Hook.f. (1860) [Hooker (*l.c.*) based the name on the non-Tasmanian species *L. grandifolium* Sm. which is endemic to NSW, see also Thompson 1989]. *Leptospermum microphyllum* F.Muell. ex Miq., *Ned. Kruidk. Arch.* 44(1): 142 (1856), *nom. illeg.* *Leptospermum microphyllum* var. *viride* Miq., *Ned. Kruidk. Arch.* 44(1): 143 (1856). *Leptospermum microphyllum* var. *glaucum* F.Muell. ex Miq., *loc. cit.* *Leptospermum pubescens* f. *minor* Miq., *Ned. Kruidk. Arch.* 44(1): 144 (1856), *nom. illeg.* *Leptospermum pubescens* f. *angustifolia* Miq., *loc. cit.* *Leptospermum lanigerum* var. *montanum* Rodway, *Tasman. Fl.*: 52 (1903).

*Illustrations*: Lyne, *Fl. Victoria* 3: 1017, fig. 209f (1996); Thompson & Logan, *Fl. New South Wales* 2, rev. ed.: 191 (2002); Woolmore et al., *King Island Flora* 61 (2002); Whiting et al., *Tasmania's Natural Flora* 240 (2004); Simmons et al., *A Guide to Flowers and Plants of Tasmania*, ed. 4, 95 (2008); Wapstra et al., *Tasmanian Plant Names Unravelling* 201 (2010).

Shrubs or trees, sometimes tall, (2–)5–10(–20) m high; bark dark grey, fibrous and diagonally furrowed. Younger branchlets pilose and often pinkish. Leaves usually spreading, shortly petiolate; lamina narrow-oblong to obovate, 5–10(–15) mm long, 2–5 mm wide, flat or slightly concave, pubescent or silky-hairy, particularly on the abaxial surface, giving a silvery appearance, oil glands obscure on both surfaces, margins flat to recurved, apex blunt or acute to mucronate. Flowers sessile, c. 10–15 mm diameter, solitary or terminating short lateral branches. Hypanthium 3–5 mm long, villous. Sepals narrowly triangular to triangular, 2–4 mm long, acute, villous on outer surface, usually persisting until fruit matures. Petals white, 3–5 mm long. Ovary 5-locular, apex glabrous, convex to c. the level of the sepals. Fruit 5–8 mm diam., hemispherical, usually villous at first, becoming glabrescent and the outer wall ultimately scaly, flaking; persisting for 3–4 seasons. Seed pale brown, curved, 2–3 mm long, curved-angular. Flowering & fruiting Jan.–Dec.

Tas. (all regions except MIS); also SA, NSW, Vic. Widespread and abundant from sea level to 1200 elevation, in wet heaths, forests and along river banks, sometimes in pure groves. The species exhibits considerable variation in size and form, from small or large shrubs to small trees; in some submontane forests it may attain the status of a tall tree, often from 10–20 m high with a slender trunk 20–35 cm diameter.

**6 *Leptospermum rupestre* Hook.f., *Hooker's Icon. Pl.* 4: t. 308 (1841)***Mountain Teatree*

*Leptospermum scoparium* var. *microphyllum* S.Schauer, *Linnaea* 15: 425 (1841). *Leptospermum humifusum* S.Schauer, *loc. cit.*, *nom. illeg.* *Leptospermum grandifolium* var. *compactum* Miq., *Ned. Kruidk. Arch.* 44(1): 144 (1856).

*Illustrations:* Curtis & Stones, *The Endemic Flora of Tasmania* 5: t. 178, No. 163 (1975); Kirkpatrick, *Alpine Tasmania* 42, fig.42e (1997); Whiting et al., *Tasmania's Natural Flora* 241 (2004); Simmons et al., *A Guide to Flowers and Plants of Tasmania*, ed. 4, 29 (2008); Wapstra et al., *Tasmanian Plant Names Unravelling* 201 (2010).

Small, widely spreading, prostrate or bushy shrubs 1.0–2.5 m high; bark on older branches scaly, flaking; younger branchlets brownish, glabrous. Leaves crowded, suberect, shortly petiolate; lamina elliptical-obovate, (3–)5–8 mm long, (1.5–)2–5 mm wide, flat, rather thick, glabrous, often shining, oil glands conspicuous on both surfaces, margins smooth, apex blunt or acute. Flowers solitary or terminating short lateral branches, 12–15 mm diameter. Hypanthium 2–3 mm long, glabrous. Sepals broadly ovate-triangular, c. 1.5 mm long, caducous. Petals white, 3–6 mm long. Ovary 5-locular; apex reddish, convex. Fruit c. 4–5 mm diameter, hemispherical-campanulate, semiwoody, wall eventually becoming ± scaly; long-persisting. Seed brown, 1–2 mm long, angular. Flowering & fruiting Jan.–Mar.

Tas. (BEL, TCH, TSE, TSR, TWE); endemic. Widespread and frequent, mainly on dolerite mountains throughout the state, at about 750–1400 m elevation. Usually wind-pruned and moulded against rocks at higher elevations or in more sheltered positions a densely bushy shrub to about 2.5 m.

**7 *Leptospermum riparium* D.I.Morris, *Records of the Queen Victoria Museum* 50: 2 (1974)***River Teatree*

*Illustrations:* Curtis & Stones, *The Endemic Flora of Tasmania* 6: t. 152, No. 249 (1978); Whiting et al., *Tasmania's Natural Flora* 241 (2004).

Slender, straggling shrubs, 3–5 m high; bark on older branches and trunk grey-brown, flaking. Younger branchlets reddish, pubescent. Leaves spreading, narrowed to a short petiole; lamina narrow elliptic-oblong, 10–25 mm long, 2–5 mm wide, flat, dull, glabrous, or the veins on the abaxial surface sparsely hairy, oil glands visible on both surfaces, margins of younger leaves sparsely ciliolate, apex acute-acuminate. Flowers c. 2 cm diameter, solitary, terminal on axillary branches. Hypanthium 2–3 mm long, pubescent. Sepals narrow-triangular, 5–6 mm long, erect, pubescent, margins ciliolate, often persisting until well after fruit matures. Petals white. Ovary 5-locular, apex convex, glabrous. Fruit 5–8 mm diameter, hemispheric-turbinate, tapering toward the base, at first pubescent, later the outer wall separating and flaking, usually not obscuring the short pedicel; persisting for 2–3 seasons. Seed rusty-brown, c. 2–3 mm long, angular. Flowering & fruiting Nov.–Mar.

Tas. (BEL, TCH, TNS, TSR, TWE); endemic. Apparently confined to riparian habitats and presently known only from a number of river systems of the Tasmanian west, south-west and far north-west coasts; from sea level to about 250 m elevation. Two collections have been recorded from the north-east, at the Great Musselroe River and the Apsley River.

**8 *Leptospermum nitidum* Hook.f., *Bot. Ant. Voy. III (Fl. Tasman.)* 1(2): 139 (1856)***Shiny Teatree*

*Leptospermum flavescens* var. *nitidum* (Hook.f.) Rodway, *Tasman. Fl.* 53 (1903); *L. pubescens* var. *nitidum* (Hook.f.) Domin, *Biblioth. Bot.* 89(4): 1007 (1921).

*Illustrations:* Whiting et al., *Tasmania's Natural Flora* 240 (2004); Kirkpatrick, *Alpine Tasmania* 42, fig. 16f (1997).

Erect, much-branched shrubs, or occasionally small trees, (1)2–4(–8) m high; bark grey, fibrous to flaky. Younger branchlets reddish, sparsely pubescent-glabrescent. Leaves suberect, base narrowed, shortly petiolate; lamina elliptic to narrow oblanceolate, 5–10(–15) mm long, 2–5 mm wide, flat, glabrous, shining, oil glands visible on both surfaces, margins often ciliolate, apex acute-acuminate. Flowers 15–25 mm diameter, solitary, axillary or terminal on short lateral branches. Hypanthium 3–5 mm long, silky-hairy. Sepals narrow-triangular, as long as the hypanthium, often erect,  $\pm$  persistent. Petals white, rarely somewhat pinkish, 5–10 mm long. Ovary 5(–7) locular, apex flat to slightly convex, glabrous. Fruit 5–10 mm diameter, hemispheric-cylindrical, scarcely tapering at the base, at first silky-hairy, later the outer wall scaly and flaking, scales obscuring the pedicel; long-persisting. Seeds pale brown, 1.0–2.5 mm long, angular. Flowering & fruiting Sep.–Apr.

Tas. (KIN, TCH, TNS, TSE, TSR, TWE); endemic. Widespread and abundant in wet heaths, sedge-lands and shrubberies, in the west and south-west of the state and on mountains and moorlands of the Central Plateau; from sea level to about 1000 m elevation.

## 9 EUCALYPTUS

### Alan M Gray

*Eucalyptus* L'Hér., *Sert. Angl.* p.11 (1789), t.20 (1792).

Shrubs ('*mallees*') to very tall trees. Plants usually heterophyllous with juvenile, intermediate and adult phases occurring in most species; sometimes the latter stages not attained. Juvenile leaves usually differing (often markedly) from adult foliage in outline and venation, opposite to subopposite, usually sessile to amplexicaul, rarely connate. Adult leaves mostly alternate, usually petiolate; lamina penninerved or parallel veined, mid-vein usually distinctive, intramarginal vein usually present, near to or distant from margin. Inflorescence terminal and paniculate (not in Tas.), or axillary, condensed, umbelliform dichasia, usually pedunculate, singly or rarely paired in leaf axils. Flowers 1, 3, 7 or more ( $\infty$ ) per umbel, rarely solitary, sessile or pedicellate. Calyx and corolla each or together completely coalescing and forming 1 or 2 caps (opercula). The outer operculum, if developed, sometimes persists for a short time but is soon deciduous, early in the development of the bud, and usually leaves a discernible scar or ring around its area of detachment. The inner operculum is shed (circumcissile), just prior to anthesis, exposing the stamens, stigma and a nectiferous disc. Stamens numerous, inserted on a variously deciduous staminophore; staminodes sometimes present; filaments free; anthers versatile, subversatile or adnate, dehiscent by slits or pores; connective gland dorsal or apical. Ovary inferior or partly superior, 2–7 locular; ovules many, ovulodes usually present; style simple. Fruit a loculicidal capsule, surrounded by and adnate to a usually woody hypanthium; operculum scar and staminophore of varying widths at, or just below the rim; valves at first surmounted by a nectiferous ring which desiccates at fruit maturity. Seeds few to many, usually with many infertile (abortive) seeds (chaff) present.

*Eucalyptus sensu stricto* (not including *Angophora* Cav. or *Corymbia* K.D.Hill & L.A.S.Johnson) comprises over 800 species, most endemic in Australia but several extending to parts of Malesia and the Philippines with 2 confined to those regions. In Tasmania there are 31 species, 16 endemic, and 4 subspecies, with the focus of endemism in the south-east of the state. *Eucalyptus* is an omnipresent feature of the Australian landscape inhabiting almost every geographic and climatic region of the continent. The genus includes the world's tallest flowering trees, i.e. *E. regnans*, some specimens of which have been officially recorded in excess of 110 m high. The smallest eucalypt, arguably *E. vernicosa*, may be fully mature and of considerable age at < 50 cm tall.

Many species are of high economic importance as sources of timber, pulp and many essential oils, as well as a source of nectar and pollen for honey production. Several species are planted for forestry, fuel, shelter and ornamental purposes, in Australia and overseas. In Tasmania, five taxa are of particular economic value in the sawn timber and pulp industries: *E. obliqua*, *E. regnans*, *E. delegatensis* subsp. *tasmaniensis* and, to a lesser extent, *E. sieberi* and *E. globulus* subsp. *globulus*; as sawn/dressed timber these are collectively known as 'Tasmanian Oak'.

The Tasmanian forestry industries have made use of extensive plantations of a species native to Victoria and New South Wales: *E. nitens* (Shining Gum). This species has been planted throughout the state, although not always on the most suitable of sites. Although many other species have been planted as ornamental or wind-break specimens in Tasmania, none are known to have become naturalised or are even considered to be potentially weedy. The large-scale planting of *E. nitens* may pose a potential risk of genetic 'contamination' to other Tasmanian species of the subgenus *Symphyomyrtus*, in particular to the closely related *E. globulus* (Tasmanian Blue Gum).

The taxonomy of *Eucalyptus* and related genera (*Angophora* & *Corymbia*) is complex and many systems of classification have been proposed (see review by West 2006). A great deal of research and study on the phylogeny and genetics of the genus *Eucalyptus* has been undertaken in the past and continues today (see West 2006 for review). The following treatment of the species and subspecies occurring in Tasmania seeks only to present an accurate circumscription and distribution of each taxon. Questions and discussions on inferred or demonstrated hybridism and phylogenetic and genetic relationships are not presented, although known hybrids are listed under their putative parent species. There is clear evidence of hybrid swarms and clines in Tasmania. These may make identifications problematic (see notes under individual species).

For the accurate identification of species, it is essential to record carefully details of the tree, individually and comparatively within a population. Note locality and geology, plant size, branching and canopy structure. Accurate notation of details of bark type, its variations, and extent on trunk and in the crown are essential and should be noted or photographed for identification purposes along with other material collected. In many populations, fire may have blackened or otherwise discoloured the bark, particularly in those species with fibrous bark. It is important that the bark details be assessed in mature specimens as the bark characteristics of some species do not become 'typical' until after the tree has passed the sapling stage. It is also most important to examine as many individuals as practicable to gain an over-all assessment of the bark type. Specimens of leaves, buds and fruits should also be collected, where practicable, for detailed study and comparisons. High resolution digital images of all features are often very useful.

When keying out taxa the following points must be taken into account:

- *Eucalyptus* may have two forms of foliage: 'juvenile', where the leaves are usually opposite and often glaucous and 'adult', where the leaves are usually alternate and not, or sometimes are, glaucous. Three Tasmanian species exhibit the phenomenon of neoteny, or paedomorphism, whereby the individual produces flowers in the axils of apparent juvenile leaves: *E. perriniana*, *E. cordata* (series *Orbiculares*) and *E. risdonii* (series *Insulanae*). The juvenile leaves are long persisting and the progression to an adult leaf phase either not occurring or, more commonly, delayed for an often very lengthy period. For these three species, both conditions are accommodated in the keys.
- The following key deals only with adult (mature) material. It does not refer to juvenile material unless stated. The adult phase may be quite green, despite the juvenile phase being strongly white-waxy or greyish glaucous. In some cases what appear to be non-glaucous examples do have parts that may exhibit this condition. An example is *E. globulus* where, in a tree bearing mature fruit only, there is no glaucousness apparent at all. However, should the tree be bearing buds or immature fruit, these may be quite waxy/glaucous, the condition disappearing at maturity. When collecting or examining material for identification it is essential that observations or collections include as much material as practicable. In doing so, the possibility of error is considerably reduced in the determination of features, for instance, the number of buds in an inflorescence (umbel), the presence or degree of glaucousness, etc. Care should be taken if material is collected from fallen twigs/branches or fruit in mixed populations.
- In this treatment the terms glaucous(ness) indicates the presence of a bluish-green to grey-green bloom. Waxy (white) is more or less self explanatory. All of these may be rubbed off a leaf, bud, etc., usually leaving a distinct green underneath.
- Leaf length measurements do not include the petiole.

- The number of buds/fruit in the inflorescence/infructescence is dependent upon the development of the buds in the dichasium. In Tasmanian eucalypts, a single bud may be initiated and developed; sometimes more (usually 3) may initiate with only one proceeding to full development, all but one abortive, thus giving rise to a solitary-flowered inflorescence as in *E. globulus* subsp. *globulus* and, in most cases, *E. vernicosa*. In a 3-flowered inflorescence, the 3 buds are nearly always produced in a symmetrical, cruciform arrangement, in a single plane, or the central bud a little offset. A 7-flowered inflorescence arises where the two outer buds of a 3-flowered arrangement develop a further bud on both sides, thus the arrangement appears as 1 central bud with 6 subsidiary buds arranged radially as in the spokes of a wheel; this is also a basically symmetrical arrangement (in plan). Further progression may eventuate in a 15-flowered inflorescence, a situation occasionally encountered in some Tasmanian species.
- Length of the fruit is taken from the base of the hypanthium to its rim and excludes disk and valves. The width is the widest diameter of the hypanthium.
- Dimensions of buds and fruits often vary substantially throughout populations and even within individual trees. The dimensions of buds and mature fruits given for the species described herein are averages of specimens examined for the following descriptions.
- The term 'retracted' as applied to the valves of a ripe eucalypt fruit indicates the valve to have shrunk away, level with the disk, to release the seed.

A number of names based on Tasmanian material cannot be applied because of lacking or poor type material (see also Chippendale 1988). *Eucalyptus amygdalina* var. *alpina* Maiden and *E. coccifera* var. *parviflora* Benth. probably are based on material of *E. coccifera* or *E. nitida*, while *E. hypericifolia* Dum.-Cours. may be based on material of *E. risdonii*. Bean (2009) considered that *E. ambigua* Labill. was an earlier (and valid) name for *E. nitida*, though investigation of photographs of the type material, indicated that is not be the case and the name is likely based on hybrid material (de Salas & Gray 2015). The names *E. nitida* and *E. tenuiramis* are both used in this treatment.

Other names have been based on hybrids: *E. amygdalina* var. *hypericifolia* Benth. (basionym of *E. salicifolia* var. *hypericifolia* (Benth.) Blakely) is based on a reputed hybrid between *E. amygdalina* and *E. risdonii* (see Pryor & Johnson 1971; Chippendale 1988); *E. viminalis* var. *macrocarpa* Rodway and *E. unialata* R.T.Baker & H.G.Sm. is based on a reputed hybrid between *E. viminalis* and *E. globulus* (see Rodway 1903; Chippendale 1988).

Key references: Johnson & Blaxell (1973); Chippendale (1988); Johnson & Hill (1990); Williams and Potts (1996); Nicolle (2006); Brooker (2000); Brooker & Kleinig (2006); West (2006).

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|--|------------------------|
| 1. Adult plants distinctly green, leaves glossy or dull but not glaucous or 'waxy'; very young branchlets and inflorescences may be sparingly glaucous in some species   | 2                      |
| 1: Adult plant distinctly glaucous or white-waxy; smaller branchlets and inflorescences always with some discernible trace of glaucousness, or waxiness  | 21                     |
| 2. Buds and fruit solitary, rarely 2 or 3  | 3                      |
| 2: Buds and fruit in symmetrical umbels of 3 or 7, or in asymmetrical umbels > 7   | 4                      |
| 3. Low shrubs or small, bushy trees 0.5 m to c. 4 m high. Leaves almost orbicular to broad-elliptic ovate, thick, glossy green, 1-3 cm long, 0.5-1.5 cm wide. Buds 3 but fruit usually 1 or 2 by abortion. Montane | 30 <i>E. vernicosa</i> |
| 3: Large trees, 20-30+ m high; leaves lanceolate, falcate 15-25(-60) cm long; fruit (8-)10-15(-25) mm diameter. Buds only waxy-glaucous. Lowland   | 31 <i>E. globulus</i>  |
| 4. Trees. Buds and fruit subrugose, usually with 2(-4) distinct longitudinal ribs; leaves 15-35 cm long. Buds only waxy-glaucous. Flinders Is.   | 31 <i>E. globulus</i>  |
| 4: Trees or shrubs. Buds and fruit smooth or slightly rugulose, ribs, if present 2, ± prominent; leaves 5-15 cm long; widespread   | 5                      |

5. Buds and fruit in symmetrical umbels of 3, or less by abortion; scars of abortion (detachment) usually discernible; examine as many samples as practical 6
- 5: Buds and fruit in symmetrical umbels of 7, or in  $\pm$  asymmetrical, random numbers  $< 7 >$  to  $\infty$ ; examine as many samples as practical 11
6. Peduncles 5–10(–25) mm long; fruit distinctly urceolate or  $\pm$  barrel-shaped 18 *E. urnigera*
- 6: Peduncles 3–5(–8) mm long; and fruit subspherical, or fruit sessile and hemispheric-campanulate 7
7. Buds and fruit sessile; fruit hemispherical-campanulate; leaves symmetrical, margins often crenulated, length:width ratio c. 3:1; freshly exposed bark often distinctive yellows and greens 8
- 7: Peduncles (3–)5–8 mm long; buds and fruit shortly pedicellate; fruit subspherical or ovoid-cylindrical; leaves asymmetrical; margins sometimes sinuate-undulate, not crenate, length:width c. 5–8:1; freshly exposed bark white, cream or greyish 10
8. Fruit 8–15 mm diameter or larger, hemispheric-campanulate to obconic, often shallowly 2-ribbed; disc broad, convex valves erect, exerted. Wet, poorly drained sandstone sediments or dolerite talus over sediments. Wellington Range, southern Central Plateau, southern coastal mountains, South Bruny Is. & Forestier Peninsula 28 *E. johnstonii*
- 8: Fruit 3–7.5 mm diameter, cylindrical-campanulate, not or weakly ribbed; disc  $\pm$  narrow, level to descending; valves enclosed, tips erect. Submontane, SW, W & NE of state, not confined to sedimentary formations 9
9. Small to tall trees; bark usually distinctive yellows and greens; fruit campanulate; disc broad, flat to  $\pm$  convex, valves erect, exerted. Submontane, W & SW of state 29 *E. subcrenulata*
- 9: Small, usually crooked trees; bark usually green to grey-bronze; fruit cylindrical to cylindrical-campanulate; disc  $\pm$  descending; valve tips erect, enclosed. Carr Villa, Ben Lomond & N end of Great Lake 16 *E. archeri*
10. Leaves lanceolate-falcate,  $\pm$  pendulous, margins rarely sinuate-undulate; fruit 5–8 mm diameter,  $\pm$  subspherical. Widespread from sea level to c. 450 m, throughout the state but not in west, except near Henty River [NB. western trees usually with umbels of 7 buds/fruit] 20 *E. viminalis*
- 10: Leaves lanceolate to broad linear-lanceolate,  $\pm$  pendulous, margins often sinuate-undulate; fruit (6–)8–10 mm diameter, hemispherical to ovoid-cylindrical. Submontane areas, Central Plateau & Eastern Tiers, usually above c. 450 m 22 *E. dalrympleana*
11. Buds and fruit in symmetrical umbels of 7, (1 central, 6 radially), if less, by abortion; order and scars of detachment usually discernible 12
- 11: Buds and fruit in  $\pm$  asymmetrical umbels, in random numbers of up to 7, or more 16
12. Fruit (4–)5 mm diameter; bark hard, fissured, persistent to tertiary branches (usually in cold, frosty, flat areas, often prone to waterlogging) 26 *E. rodwayi*
- 12: Fruit (5–)6–10 mm diameter; bark rough, flaky, often fissured, persistent for various heights at base; upper trunk and branches smooth, bark shortly ribbony 13
13. Buds ovoid to diamond-shaped; fruit obconic-turbinate or campanulate; disc level or convex, valves level or tips erect, exerted 14
- 13: Buds cylindrical-barrel-shaped; fruit cylindrical to cylindrical obconic or slightly urceolate, disc level or descending; valves enclosed, tips erect 15
14. Tall trees, or smaller trees with crown branching often 'untidy', sometimes sparsely leafy throughout; leaves glossy to dull-green, concolorous; margins smooth; oil glands in leaves obscure or not apparent; valves level, or slightly raised (widespread, usually in flat, moist localities) 23 *E. ovata*
- 14: Tall trees or well-formed large shrubs; canopy densely leafy but 'open' within, leaves usually glossy green, discolourous; margins shallowly crenate; oil glands conspicuous, particularly in juvenile leaves; valves usually strongly exerted. Widespread but local on inland watersheds of E & NE Tiers, local in NW and on King Island 25 *E. brookeriana*

15. Tall trees; leaves 10–25 cm long, falcate-lanceolate, concolorous; fruit sessile, cylindrical-ovoid, entire umbels always with 7 buds/fruit; (introduced, widely planted in plantations & wind-breaks) **27 \* E. nitens**
- 15: Straggling multi-stemmed shrubs (mallees), or small, impoverished trees; leaves 7–10(–15) cm long, lanceolate, weakly discolorous; fruit pedicellate, cylindrical-obconic to slightly urceolate, entire umbels (3) or 7-fruited; small populations local on low, east coast hills **24 E. barberi**
16. Leaves ovate to broad ovate-lanceolate, falcate, bases asymmetrical (oblique) 17
- 16: Leaves narrow linear to linear or elliptic-lanceolate or ovate to broad ovate-lanceolate, bases symmetrical (not oblique), rarely falcate 20
17. Usually very tall trees, (90 m+), trunk often shaft-like; crowns often relatively sparse due to wind damage. Bark confined to the basal portion for varying heights, thinly fibrous but brittle, decorticating above in long, often persistent ribbons. Inflorescences predominantly two per axil **2 E. regnans**
- 17: Tall trees, (90 m+), but often smaller at higher elevations; crowns often umbrageous. Bark extending over all trunk or sometimes to major branches and beyond, soft, fibrous, usually diagonally fissured. Inflorescences almost always singly in the axils 18
18. Tall trees or sometimes shorter, with massive trunk; crowns often dense, dark green, often umbrageous with large branches. Bark usually thick, grey, or blackened by fire, diagonally to longitudinally fissured, usually extending to the smaller branches. Predominantly lowland **1 E. obliqua**
- 18: Tall trees with bark not extending past the primary branches, if so only for a short distance, the remaining branches smooth, decorticating in flakes or short ribbons. Lowland or submontane 19
19. Tall trees, often with massive trunks; bark greyish brown, soft, finely fibrous, shallowly fissured, persistent on trunk and usually to the primary branches; decorticating from major branches and beyond in short strips or ribbons. Leaves often dull. Peduncles terete; all stamens perfect. Usually submontane, often replacing *E. regnans* at higher elevations; also in frost hollows inland **4 E. delegatensis**
- 19: Tall trees; bark dark grey-black, very hard, deeply fissured on trunk and sometimes bases of lower-most branches, abruptly smooth and white/cream in crown, young branchlets often lightly glaucous. Leaves usually ± glossy, bases scarcely oblique. Peduncles distinctly flattened; outer stamens anantherous. Restricted to east coast hills, from c. Bicheno to Georges Bay, & on Freycinet Peninsula **3 E. sieberi**
20. Leaves linear to narrow linear-lanceolate, average width usually 4–5(–7) mm; bark decorticating throughout, sometimes brittle, flaking at very base; trees virtually confined to soils derived from dolerite geology; N.B. occasional grey-glaucous trees occur in east coast populations **10 E. pulchella**
- 20: Leaves elliptic to elliptic-lanceolate, not linear, average width > 5 mm. Trees or mallee-like shrubs; bark smooth throughout, or rarely fibrous and variously persistent on trunk, rarely to lower primary branches. W, SW. NW & NE of state **9 E. nitida**
21. Shrubs or small trees; flowering and fruiting in apparent juvenile foliage phase; leaves opposite, sessile and amplexicaul or connate; Alternate, petiolate leaves occasionally produced, usually on far, distal portions of branches in mature crowns, particularly so in *E. perriniana* 22
- 21: Shrubs or small to large trees; buds and fruit nearly always produced on branches with alternate, petiolate (adult) leaves; juvenile leaves rarely present in mature crowns, if so without inflorescences 24
22. Opposite leaves sessile, amplexicaul, never connate. Adult leaves, if produced, shortly petiolate, broadly falcate-lanceolate, 8–15 cm long, 2–3.5 cm wide. Buds and fruit always (1–)3 in umbel **14 E. cordata**
- 22: Opposite leaves connate at base; buds and fruits (1–)3, or 7–15(–20+) 23
23. Buds and fruit 7–15(–20+); leaf apices acute to apiculate. Adult leaves rarely produced. Confined to low hills E of River Derwent estuary **6 E. risdonii**
- 23: Buds and fruit 1–3; leaf apices rounded to emarginate. Adult leaves, if produced, shortly petiolate, lanceolate-falcate, 5–10 cm long, 1.5–2.5 cm wide. Very rare, central SE of state **17 E. perriniana**



24. Large trees; buds and fruits solitary, or in groups of 2–3, buds and fruit strongly rugose; fruit (8–)10–15(–25) mm diameter; buds only waxy-glaucous. Leaves 10–25(–45+) cm long, falcate lanceolate  
31 *E. globulus*
- 24: Trees or shrubs; buds and fruits in groups of 3, smooth or sometimes rugulose; fruit 4–8(–14) mm diameter; leaves (3–)8–15 cm long, rarely more, symmetrical or falcate  
25
25. Leaf apex distinctly uncinatate; buds rugose, operculum ± depressed, much < 1/3 length of hypanthium; disc flat or slightly convex, valves level, retracted  
8 *E. coccifera*
- 25: Leaf apex not uncinatate; buds smooth or slightly warty, operculum much > 1/3 length of hypanthium; disc domed, valves erect  
26
26. Fruit subspherical; disc prominent, ascending, valves erect, exerted  
21 *E. rubida*
- 26: Fruit cylindrical, ovoid or urceolate; disc descending, valves enclosed  
27
27. Peduncles 5–10(–25) mm long; fruit distinctly urceolate; operculum often wider than rim of bud  
18 *E. urnigera*
- 27: Peduncles usually 1–5 mm long; fruit cylindrical to cylindrical-ovoid, or fruit hemispherical to pyriform-truncate; operculum not wider than rim  
28
28. Buds and fruit 3; operculum abscission scar present; fruit cylindrical to cylindrical-ovoid, disc descending, valves erect, enclosed  
29
- 28: Buds and fruit 7 to many; operculum abscission scar absent; fruit hemispherical to pyriform-truncate, disc level or convex, valves level  
30
29. Leaves, buds, fruit subglaucous to glaucous; buds rarely or not ribbed; fruit 5–9 mm long, 4–7 mm wide; small to moderate trees. Central Plateau and scattered on Eastern Tiers; a disjunct population occurs at Snug Plains in the SE  
15 *E. gunnii*
- 29: Leaves, buds fruit usually distinctly waxy-glaucous; buds and fruit often very white-waxy, often distinctly 2-ribbed; fruit 8–10(–12) mm long, 7–10 mm wide; small, usually open-crowned trees, very rare. Local at Cremorne & Government Hills in SE; often planted as ornamental  
19 *E. morrisbyi*
30. Buds very rugose, operculum ± depressed, umbonate, much < 1/3 length of hypanthium; fruit 8–10(–14) mm diameter. Montane  
8 *E. coccifera*
- 30: Buds not or slightly rugose, operculum domed, not or scarcely umbonate, c. 1/3 length of hypanthium; fruit 3–6(–10) mm diam. Lowland  
31
31. Leaves dull grey/bluish-green to strongly white-waxy, peduncles 5–20 mm long; fruit 6–10 mm diameter; ultimate branches arching, often long-pendulous. Sedimentary formations, central SE, SE & E; also granites and dolerite mid E coast  
7 *E. tenuiramis*
- 31: Leaves dull grey/bluish-green to subglaucous; peduncles (3–)5–7 mm long, subglaucous; fruit 3–5 mm diameter; ultimate branches arching but not pendulous; small trees. Serpentine formations in central NW  
13 *E. nebulosa*

**1 *Eucalyptus obliqua* L'Hér., Sert. Angl. p.11 (1789), t.20 (1792)**

*Stringybark, Brown-top*

*Eucalyptus pallens* DC., *Prodr.* (DC.) 3: 219 (1828). *Eucalyptus procera* Dehnh., *Cat. Horti Camald.* ed. 2: 6, 20 (1832). *Eucalyptus fabrorum* Schldl., *Linnaea* 20: 656 (1847). *Eucalyptus falcifolia* Miq., *Ned. Kruidk. Arch.* 44(1): 136 (1856). *Eucalyptus nervosa* F.Muell. ex Miq., *op. cit.*: 139 (1856), *nom. illeg. non Hoffsgg.* (1824). *Eucalyptus heterophylla* Miq., *op. cit.*: 141 (1856). *Eucalyptus obliqua* var. *megacarpa* Blakely, *Key Eucalypts* 194 (1934). *Eucalyptus obliqua* var. *degressa* Blakely, *op. cit.* 195 (1934).

*Illustrations:* Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 221 fig. 58d-e (1975); Chippendale, *Fl. Australia* 19: 162, fig. 58k-l (1988); Brooker & Slee, *Fl. Victoria* 3: 1000, fig. 204c (1996); Hill, *Fl. New South*

Wales 2, rev. ed.: 155, fig. 194 (2002); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 307 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 241 (2006).

Small to very large trees, 10–90 m high; lignotuber developed, coppicing readily, highly fire resistant. Trunk usually buttressed; branched from near ground level with moderately large, dense umbrageous crown, or shaft-like with a small, dense crown. Bark grey-brown, often charred and blackened by fire, thick, softly fibrous, often deeply longitudinally/diagonally fissured, persistent to the secondary and tertiary branches; younger branches smooth, greenish-yellow, bark peeling in short, narrow strips. Crown dark green, shining, usually dense, some yellow-orange senescent leaves often persisting. Juvenile leaves opposite for 2–3(–5) pairs; petioles 5–10 mm long; lamina green, ± discolorous at first, 4–10 cm long, (2–)3–6 cm wide, at first horizontally aligned but soon the petiole twisting and the lamina vertically aligned, ovate-lanceolate asymmetrical, base oblique, margins smooth, slightly thickened, apex acute or shortly acuminate. Adult leaves alternate; petioles channelled, 5–15 mm long; lamina dark green, concolorous, shining, ± coriaceous, (8–)10–15 cm long, 1.5–3.5 cm wide, ovate to broadly lanceolate-falcate, base ± oblique, intramarginal vein c. 1 mm from margin, lateral veins faint, at c. 20°–30° from mid-vein, margins smooth, slightly thickened, apex acuminate. Inflorescences axillary, sometimes apparently paniculate due to loss of subtending leaves, 7–15(–20+)-flowered; peduncle angular or flattened, 4–15 mm long. Buds yellow, clavate, 6–8 mm long, pedicels 2–5 mm long, operculum hemispherical, slightly apiculate, scar absent. Stamens irregularly flexed, all fertile. Mature fruit grey-green to grey, truncate-pyriform, ovoid to subglobular, 6–9 mm long, 6–8 mm wide; disc narrow, level or steeply descending; valves 3–4, enclosed, tips level. Seed dark brown to pale tan, homogenous. Flowering Nov.–May; fruit persisting for 2–3(–5) years.

Tas. (BEL, KIN, FUR, TCH, TNM, TNS, TSE, TSR, TWE); also SA, Qld, NSW, Vic. Widespread and abundant throughout the state; from sea level to c. 700 m elevation, mostly on fertile soils where it attains the best development, forming pure stands over a variety of understorey types, from wet forest to dry sclerophyll. Also tolerating shallow, infertile situations as a small, impoverished tree with a sparse, heathy-shrubby understorey. Although widespread throughout south-eastern Australia, the species is surprisingly absent from all of the Bass Strait Islands. One of the most economically important species of eucalypts, the timber is highly valued for construction, building, joinery, veneer and pulping purposes; in Tasmania, the timber is marketed as “Tasmanian Oak”.

Known hybrids: *E. obliqua* × *E. regnans*; *E. obliqua* × *E. tenuiramis*.

## 2 *Eucalyptus regnans* F.Muell., *Ann. Rep. Victorian Acclim. Soc.* in obs. 20: (1871)

*Giant Ash, Swamp Gum, Stringy Gum*

*Eucalyptus amygdalina* var. *regnans* F.Muell., *Gard. Chron.*, n.s. 419 (1877). *Eucalyptus regnans* var. *fastigiata* (H.Deane & Maiden) Ewart, *Fl. Victoria* 829 (1931).

*Illustrations*: Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 221, fig. 58a-c (1975); Chippendale, *Fl. Australia* 19: 162, fig. 58c-d (1988); Brooker & Slee, *Fl. Victoria* 3: 1000, fig. 204a (1996); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 305 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 245 (2006); Wapstra et al., *Tasmanian Plant Names Unravelling* 198 (2010).

Very tall trees, usually reaching 75–90(–110+) m tall; lignotuber not developed, not or weakly coppicing, highly fire sensitive. Trunk usually straight, shaft-like, often strongly buttressed at the base; branches usually confined to the upper 1/3 of the tree. Bark persistent at the base for varying heights, grey, soft, fibrous, and with shallow diagonal fissures, decorticating above in short or very long, tough ribbons, often lodged and hanging in the lower branches, exposed trunk smooth, green to grey with white to cream streaks and patches; younger branches greenish-yellow. Crown relatively small, sparse, uneven, conical in young trees, often wind-damaged in tall, older trees, some yellow-orange senescent leaves often persisting. Juvenile leaves opposite for 3–5 pairs; petioles 5–10 mm long; lamina green, ± discolorous, soft, 4–8 cm long, (2)–3–6 cm wide, at first horizontally aligned but soon the petiole twisting and the lamina vertically aligned, asymmetrical, ovate-lanceolate, base oblique, margins smooth, slightly thickened, apex acute or shortly acuminate. Adult leaves alternate; petioles channelled, 10–15 mm long; lamina dark green, concolorous,

shining, scarcely coriaceous, (8–)10–15 cm long, 1.5–3(–4.5) cm wide, broadly lanceolate-falcate, base  $\pm$  oblique, intramarginal vein c. 1 mm from margin, lateral veins faint, at c. 20° or a little less from mid-vein, margins smooth, slightly thickened, apex acute or acuminate. Inflorescences mostly paired in the leaf axil, sometimes solitary, sometimes apparently paniculate due to loss of subtending leaves, 7–15(–20+)-flowered; peduncle terete, 4–10 mm long. Buds yellow, clavate, 6–8 mm long, pedicels 2–5 mm long, operculum hemispherical-conical, scar absent. Stamens irregularly flexed, all fertile. Mature fruit grey-green, truncate-obconic, 5–8 mm long, 4–6 mm wide; disc level, narrowly convex or slightly descending; valves 3(–4), level or enclosed, tips level. Seed dark brown to pale tan, homogenous. Flowering Nov.–Jun.; fruit persisting for 1–3 years.

Tas. (BEL, KIN (absent from King Is.), TNS, TSE, TSR); also Vic. Widespread and common in the central south, eastern valleys of the Central Plateau and south-east of the state, locally common in the north-east and north-west, but absent from the Bass Strait Islands. Forming pure stands in sheltered valleys with fertile soils and good rainfall; from sea level to c. 600 m elevation. Usually emergent over tall, wet-forest understorey.

The species is the tallest flowering plant in the world with the largest recorded specimens reaching in excess of 130 m tall (Vic., 19th century). A tree in southern Tasmania was accurately measured to exceed 101 m tall in 2018. An important source of timber that is also marketed as “Tasmanian Oak”.

Known hybrid: *E. regnans*  $\times$  *E. obliqua*.

### 3 *Eucalyptus sieberi* L.A.S.Johnson, *Contr. New South Wales Natl Herb.* 3(3): 125 (1962)

*Tasmanian Ironbark, Silvertop Ash*

*Eucalyptus virgata* Sieber ex Spreng., *Syst. Veg.* 4(2): 196 (1827). *Eucalyptus sieberiana* F.Muell., *Eucalyptographia* 2: 9th Pl. (1879) *nom. illeg.* *Eucalyptus haemastoma sensu* L.Rodway, *Tasman. Fl.* (1903), *non* Sm. (1797).

*Illustrations:* Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 223, fig. 59d (1975); Chippendale, *Fl. Australia* 19: 174, fig. c-d (1988); Brooker & Slee, *Fl. Victoria* 3: 1008, fig. 207a (1996); Hill, *Fl. New South Wales* 2, rev. ed.: 163, fig. 231 (2002); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 331 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 297 (2006).

Trees to 30(–45) m tall; lignotuber developed, moderately fire resistant. Trunk sometimes buttressed; branches spreading to erect, younger branches often slightly glaucous, crimson to greenish later. Bark persistent on lower trunk, and sometimes extending to proximal portions of primary branches, soft, fibrous on younger trees, becoming very hard, dark grey to black, and often deeply diagonally fissured, upper trunk and primary branches and occasionally a little beyond, abruptly smooth, white or creamish, decorticating in short ribbons or flakes. Crown moderately dense, dull to shining, some red-crimson senescent leaves often persisting. Juvenile leaves opposite for 4–5 pairs; sessile or with petioles to c. 5 mm long; lamina grey or blue-green, dull, concolorous, reddish when senescent, 8–15 cm long, 5–7 cm wide, elliptic-ovate to broadly lanceolate-falcate, base usually oblique, margins scarcely thickened, apex acute. Adult leaves alternate  $\pm$  pendulous; petioles channelled or  $\pm$  flattened, 10–20 mm long; lamina dark green, glossy, concolorous, coriaceous, 8–15 cm long, 1.5–3 cm wide, lanceolate-falcate, base mostly oblique, intramarginal vein up to 3 mm from margin, lateral veins sparse,  $\pm$  prominent, diverging at 15°–20° from mid-vein. Inflorescences axillary, 7–15(–20+)-flowered; peduncles angular to ligulate, up to 5–16 mm long. Buds greenish-yellow to reddish, clavate, 5–7 mm long, pedicels 2–4 mm long; operculum hemispherical, slightly apiculate, scar absent. Stamens inflexed, outer stamens anantherous. Mature fruit reddish-brown, often mottled white, obconical to truncate-pyriform, 8–10 mm long, 7–9 mm wide; disc narrowly convex, slightly descending, valves 3(–4), slightly enclosed, or  $\pm$  level, retracted. Seed brown-black, homogenous. Flowering Jul.–May; fruit persisting for 1–3(–5) years.

Tas. (BEL, FLI (absent from Flinders Is.), TNM, TSE); also NSW, Vic. Common in the north-east of the state, from Freycinet Peninsula to Georges Bay, extending inland to the headwaters of the South Esk River; from sea level to c. 650 m elevation. Sometimes forming pure stands on poor, stony ground, usually on sloping terrain and often with sparse to very little accompanying undergrowth. Although common in eastern New

South Wales, Victoria and north-eastern Tasmania, the species is surprisingly absent from (in particular) the larger islands of the Furneaux Group in Bass Strait in similar habitats.

The timber, also known as “Tasmanian Oak”, is used for light construction work, framing, veneer and flooring; it is also harvested extensively for the production of woodchips for the pulp industry.

The transition from the coarse, almost black, basal bark, to the creamy-white bark of the upper trunk and branches is a notable feature of this species.

Hybrids recorded: *E. sieberi* × *E. amygdalina* (= *E. × taeniola* R.T.Baker & H.G.Sm.; possibly *E. amygdalina* var. *hypericifolia* [basionym of *E. salicifolia* var. *hypericifolia*], see Pryor & Johnson (1971) & Chippendale (1988)).

**4 *Eucalyptus delegatensis*** R.T.Baker, *Proc. Lin. Soc. New South Wales* 25: 305 t. 16 (1900), subsp. ***tasmaniensis*** Boland, *Austral. Forest Res.* 15 177 (1995)

*Gum-topped Stringybark, Blue Top*

*Eucalyptus gigantea* Hook.f., *Hooker's J. Bot. Kew Gard. Misc.* 6: 479 (1847), *nom. illeg., non* Dehnh. (1832). *Eucalyptus risdonii* var. *elata* Benth., *Fl. Austral.* 3: 203 (1867) [as *E. Risdoni*]; *E. tasmanica* Blakely, *Key Eucalypts* 214 (1934), *p.p.*

*Illustrations* (sometimes as *E. delegatensis*): Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 221, fig. 58f-g (1975); Chippendale, *Fl. Australia* 19: 162, fig. o-p (1988); Brooker & Slee, *Fl. Victoria* 3: 1006, fig. 206b (1996); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 325 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 285 (2006); Simmons et al., *A Guide to Flowers and Plants of Tasmania*, ed. 4, 55 (2008).

Tall trees, 20–85(–100) m high; lignotuber often not present, not coppicing readily. Trunk stout, often buttressed; branches large, widely spreading with umbrageous crown. Bark on trunks of saplings smooth, mottled with mosaic of blue-grey patches. Bark on mature trees, grey to reddish-brown, softly fibrous, usually not very thick, shallowly diagonally fissured, persistent to and sometimes onto lower primary branches, smooth above and decorticating in thin ribbons, exposed bark white-cream streaked bluish-grey; younger branches crimson on exposed surfaces, greenish on reverse, or mottled bluish-grey, slightly glaucous. Crown moderately dense with a dull, blue-grey appearance, some red-crimson senescent leaves often persisting throughout. Juvenile leaves opposite for 2–4 pairs, pendulous; petioles 2–5 mm long; lamina blue-grey, dull, concolorous, crimson when senescent, soft, 6–9 cm long, 4–7 cm wide, at first horizontally aligned, but soon the petiole twisting and the lamina vertically aligned, asymmetrical, broadly ovate-lanceolate to almost orbicular, base oblique, margins smooth, apex conspicuously apiculate. Adult leaves ± pendulous, alternate; petioles flattened or channelled, 10–40 mm long; lamina concolorous, dark grey-green, usually subglossy, coriaceous, 5–15 cm long, 2–3(–3.5) cm wide, lanceolate to broad-lanceolate, falcate, base ± oblique, intramarginal vein indistinct, c. 2 mm from margin, lateral veins ± conspicuous, at 15°(–20°) from mid-vein, margins smooth, apex acuminate. Inflorescences axillary, sometimes apparently paniculate due to loss of subtending leaves, 7–15(–20)-flowered; peduncle terete or angular, 8–15 mm long. Buds reddish, often mottled white, clavate, 6–8 mm long, pedicels 2–5 mm long, operculum conical-hemispherical, often shortly apiculate. Stamens irregularly flexed, all fertile. Mature fruit red-brown, pedicellate, turbinate to truncate-pyriform, 8–12 mm long, 6–10 mm wide; disc descending, rarely level, valves 3–5, level or enclosed. Seed pale to mid brown, homogenous. Flowering Nov.–Mar.; fruit persisting 3–5+ years.

Tas. (BEL, FLI (absent from Flinders Is.), TCH, TNM, TNS, TSE, TSR, TWE); endemic. Widespread and abundant except in the west, far north-west and far north-east, forming pure stands at higher elevations and in areas of fertile soils and moderate rainfall; from c. 500 m to 1000 m elevation. Replaces *E. obliqua* at higher elevations and forms an emergent overstorey to wet-forest associations and sub-montane shrubberies. An important source of timber, also marketed as “Tasmanian Oak”; also extensively harvested for the wood-chip industry.

Boland, (1985) demonstrated some variations between Tasmanian populations and those from NSW and Vic. *Eucalyptus delegatensis* subsp. *delegatensis*, occurs in New South Wales and Victoria.

The Tasmanian subspecies is distinguished from the latter in the more orbicular juvenile leaves, the apex of which is strongly apiculate, the verrucose young (seedling) stems, and the bark which is more extensively persistent on the upper trunk and often onto the proximal portions of the primary branches. There has been considerable confusion as to the correct application of the earlier, illegitimate name *E. gigantea* Hook.f. *non* Dehnh., now correctly, *E. delegatensis* RT Baker. For clarification, refer to Gray, (1976).

## 5 *Eucalyptus pauciflora* Sieber ex Spreng., *Syst. Veg.* 4(2): 195 (1827), subsp. **pauciflora**

*Cabbage Gum, Weeping Gum*

*Eucalyptus coriacea* Schauer, *Repert. Bot. Syst.* (Walpers) 2(5): 925 (1843). *Eucalyptus submultiplinervis* Miq., *Ned. Kruidk. Arch.* 44(1): 138 (1856). *Eucalyptus phlebophylla* Miq., *op. cit.*: 140 (1856). *Eucalyptus sylvicultrix* F.Muell. ex Benth., *Fl. Austral.* 3: 201 (1867), *nom. inval.* *Eucalyptus piperita* Sm. var. *pauciflora* DC., *Prodr.* (DC.) 3: 219 (1828), *nom. dubium* [in synonymy under *E. coriacea* by J.D.Hooker, *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 136 (1856)].

*Illustrations* (sometimes as *E. pauciflora*): Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 223, fig. 59a-c (1975); Chippendale, *Fl. Australia* 19: 168, fig. 59e-f (1988); Brooker & Slee, *Fl. Victoria* 3: 1006, fig. 206c (1996); Hill, *Fl. New South Wales* 2, rev. ed.: 160, fig. 221 (2002); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 326 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 295 (2006); Simmons et al., *A Guide to Flowers and Plants of Tasmania*, ed. 4, 109 (2008); Wapstra et al., *Tasmanian Plant Names Unravelled* 195 (2010).

Small to medium trees 5–20 m high, rarely taller; lignotuber sometimes developed, coppicing ability moderate after fire or other damage. Trunk short and relatively massive and gnarled, or taller and straight, sometimes ± buttressed; branches erect or spreading widely. Bark smooth, decorticating throughout in small flakes or short ribbons, sometimes a little persistent rough bark at the extreme base, exposed bark white or cream with yellow, reddish or grey patches, the darker colours consistent with older bark; younger branches green, becoming yellow or red later, ± pendulous. Crown usually somewhat sparse. Juvenile leaves opposite for a few pairs, sessile or with petioles 3–5 mm long; lamina dull green, concolorous, coriaceous, 8–18 cm long, 3–8 cm wide, ovate, base sometimes ± oblique, margins smooth, apex acute or apiculate. Adult leaves alternate; petioles channelled or angular, 8–20 mm long; lamina concolorous, dark green and shining, or sometimes slightly bluish-glaucous, coriaceous, 8–18 cm long, 3–7.5 cm wide, lanceolate-falcate to broad-lanceolate, base narrowed, intramarginal vein distinct, up to 3 mm from margin, lateral veins conspicuous, semilongitudinal, at less than (5°–)10°(–15°) from mid-vein, apex acuminate. Inflorescences axillary, 7–15<sup>+</sup>-flowered; peduncle terete to angular, 1–1.5 cm long. Buds clavate, usually reddish, sometimes ± glaucous, ± verrucose, 5–9 mm long, up to 4 mm wide, sessile or pedicels to c. 3 mm long; operculum hemispherical, often minutely apiculate, scar absent. Stamens irregularly flexed, all fertile. Mature fruit green to reddish-brown, sessile or shortly pedicellate, cupular to hemispheric, or pyriform truncate, 7–12 mm long, 8–12 mm wide; disc broad, convex, level or shallowly descending, valves 3(–4) level or slightly enclosed, retracted. Seed pale to dark brown, homogenous. Flowering Oct.–Apr.; fruit persisting for 2–3(–5) years.

Tas. (BEL, FLI (absent from Flinders Is), TCH, TNM, TNS, TSE, TSR, TWE); also SA, Qld, NSW, Vic. Widespread, common in the central and eastern parts of the state; from sea level in the south-east and north-east, to c. 1050 m elevation on the Central Plateau. Tolerating a wide range of conditions, from the rain-shadow and poor soils of the Tasmanian Midlands and north-east, to moist but well drained situations of the Central Plateau with submontane, shrubby understorey. Absent from the north-west, west and south-west of the state. Although widespread throughout eastern Australia and parts of Tasmania, the subspecies is surprisingly absent from (in particular), the eastern Bass Strait islands in similar habitats.

There are a number of subspecies of *E. pauciflora*. These are confined to Victoria and New South Wales (including ACT) (see Chippendale (1988), Brooker and Slee (1996), Hill (2002), Brooker and Kleinig (2006) and Nicolle (2006)).

Hybrids recorded: *E. pauciflora* subsp. *pauciflora* × *E. amygdalina*; *E. pauciflora* subsp. *pauciflora* × *E. pulchella*.

## 6 *Eucalyptus risdonii* Hook.f., *London J. Bot.* 6: 477 bis (1847) [as *E. Risdoni*]

*Risdon Peppermint*

*Illustrations:* Stones & Curtis, *The Endemic Flora of Tasmania* 2: t. 47, No. 78 (1969); Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 225, fig. 60d (1975); Chippendale, *Fl. Australia* 19: 195, fig. e-f (1988); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 273 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 279 (2006); Simmons et al., *A Guide to Flowers and Plants of Tasmania*, ed. 4, 111 (2008).

Small spreading shrubs (mallees), or small, impoverished trees to c. 5(–8) m high; lignotuber well developed, the plants coppicing readily and regenerating vigorously after fire or other damage. Trunk one or several, distorted, leaning and irregularly branched or straight and evenly branched, not buttressed. Bark smooth throughout or with a little hard, scaly-flaky bark persistent for a metre or less at the base, decorticating above in large flakes, patches or short ribbons, exposed bark irregular patches of white-cream to pale or dark grey depending on age; younger branches smooth, glaucous, trunk and branches sometimes with circular scars formed by the fallen connate leaf pairs, persisting until the first bark is shed. Crown uneven, moderately dense. Juvenile leaves opposite, at first free for a very few pairs, sessile, soon becoming connate; lamina silvery-white glaucous to dull grey-green, the pair together 3–8 cm long, 1–3(–5) cm wide, spreading or slightly erect, semi-orbicular to broadly elliptical, usually ± indented at the union of their common bases, margin slightly thickened, venation obscure, apex rounded, acute or apiculate; when dead and dry remaining on the branch for some time before disintegrating and falling. Intermediate leaves often present in older crowns, and showing a gradual transition in degree of basal union, insertion, size and outline between juvenile and presumed adult forms; leaves in mature crown predominantly of the juvenile form and bearing inflorescences in both axils. Adult leaves sometimes produced in mature plants; petioles 2–10 mm long; lamina white to dull grey-glaucous, concolorous, 5–7(–10) cm long, 1–2 cm wide, elliptic to falcate-lanceolate, base attenuated, margins slightly thickened, intramarginal vein 1–3 mm from margin, lateral venation obscure, 10°–15°(–25°) from mid-vein, apex acute to apiculate and usually uncinat. Inflorescences axillary, 7–15(–20+)-flowered; peduncle terete, 10–25 mm long. Buds very glaucous, minutely warty-glandular, clavate, hypanthium tapered, 3–5(–7) mm long, 2–3(–5) mm wide, pedicels obscure or 3–5(–7) mm long, compressed, operculum flattened-hemispherical, rugulose, scar absent. Stamens inflexed, all fertile. Mature fruit glaucous or mottled, green or reddish beneath wax, pedicellate, hemispherical to truncate-globular, 5–10(–12) mm long, 5–8(–12) mm wide; disc narrow, level or descending, valves 3–4 level or enclosed, retracted. Seed pale orange to mid brown, homogenous. Flowering Jul.–Feb.; fruit persisting 3–5+ years.

Tas. (TSE); endemic. A species of very restricted distribution, in the Meehan Range, a series of hills chiefly of impoverished Permian sediments (mudstones), just east of Hobart on the eastern shores of the River Derwent, and ± parallel to the estuary, from sea level to c. 500 m elevation. Usually forming locally pure stands on insolated northerly slopes, with a sparse, low, shrubby-heathy understorey.

*Eucalyptus risdonii* is most closely related to *E. tenuiramis*. The species is listed as 'Rare' under the Tasmanian *Threatened Species Protection Act* 1995.

Hybrids recorded: *E. risdonii* × *E. amygdalina* (= *E. amygdalina* var. *hypericifolia*); *E. risdonii* × *E. tenuiramis*.

## 7 *Eucalyptus tenuiramis* Miq., *Ned. Kruidk. Arch.* 4: 128 (1856)

*Silver Peppermint*

*Eucalyptus tasmanica* Blakely, *Key Eucalypts*: 214 (1934), p.p.

*Illustrations:* Stones & Curtis, *The Endemic Flora of Tasmania* 1: t. 1, No. 1 (1967), as *E. tasmanica*; Chippendale, *Fl. Australia* 19: 195, fig. c-d (1988); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 277 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 272 (2006).

Small to medium trees, glaucous throughout, “elite” trees graceful and “willow-like” in appearance, 5–10(–25) m high; lignotubers developed and coppicing freely in response to fire or other damage. Trunk short and gnarled, or taller and fairly straight, sometimes buttressed; often branched from low levels, major branches large, semi-erect to spreading; ultimate branches slender and long-pendulous, sometimes from high in the crown almost to ground-level. Bark smooth, decorticating throughout or with a little rough, scaly persistent bark at the base, freshly exposed bark white-cream, slightly “chalky-dusty”, older patches elongated, greyish or green-black; younger trunks and branches often with circular leaf scars, persisting until the first bark is shed; younger stems glaucous often reddish-crimson beneath wax, sparsely verrucose-glandular. Crown open to moderately dense with an overall silvery, greyish appearance. Juvenile leaves opposite for 10–20+ pairs, at first free, sessile, soon becoming connate, the pair together 5–8(–14) cm long, 3–5 cm wide, spreading or slightly erect, broadly elliptical to oblong, usually  $\pm$  indented at the union of their common bases, margin slightly thickened, oil glands and venation obscure, apex rounded, acute or acuminate-apiculate. Adult leaves often preceded by many pairs of intermediate leaves, these subsessile, to shortly petiolate and subopposite, sometimes sub-distichous, broadly lanceolate; ultimate adult leaves alternate; petioles 5–15(–20) mm long, terete to angular; lamina glaucous, the wax abrading and the leaf dull, bluish-grey, concolorous, coriaceous, 5–9(–12) cm long, 1–2.5 cm wide, elliptic to falcate-lanceolate, base attenuated, margins slightly thickened, intramarginal vein 1–3 mm from margin, lateral venation obscure,  $10^{\circ}$ – $15^{\circ}$ (– $25^{\circ}$ ) from mid-vein, apex acute to acuminate-uncinate. Inflorescences axillary, 7–15(–20+)-flowered; peduncle terete, 5–15(–20) mm long. Buds minutely warty-glandular, very glaucous, clavate, 3–5(–8) mm long, 3–5 mm wide, pedicels obscure, compressed, operculum hemispherical, flattened or slightly apiculate, scar absent. Stamens inflexed, all fertile. Mature fruit very glaucous-white at first, then often mottled, green or red-brown after abrasion of wax; pedicels 3–5 mm long, hemispherical to truncate-pyriform, or subglobular, 3–5(–10) mm long, 5–8(–12) mm wide, disc narrow, convex, level or slightly descending, valves 3–4, level or  $\pm$  enclosed, retracted. Seed pale tan to brown, homogenous. Flowering Sep.–Mar.; fruit persisting for 3–5 years.

Tas. (TSE); endemic. Widespread and common, forming pure stands in the central east and in the south-east of the state, from sea level to c. 600 m elevation. Usually on insolated sites on Permian mudstone formations but also on Triassic sandstones. Disjunct populations occur on the Freycinet Peninsula on Devonian granitic gravels and in the nearby Eastern Tiers on Jurassic dolerite. Some forms occur on exposed coastal dolerite formations on the Tasman Peninsula. These are typically shrubby and much wind-pruned, and usually with little or no trace of glaucousness evident; some show a superficial resemblance to forms of *E. coccifera*. In some populations of *E. tenuiramis*, inflorescences have been observed in the axils of juvenile leaves leaves of coppice shoots, illustrating the close relationship between this species and *E. risdonii*.

The understorey associated with *E. tenuiramis* is often sparse, consisting of low, open shrubby-heathy communities. There are several reports of, and unconfirmed collections from, trees with affinity to *E. tenuiramis* from elsewhere in the state including islands of the Furneaux Group. Further field inspections and collections are necessary to resolve the identity of these reports. The species is very closely related to *E. risdonii* and forms clinal intergrades with that species where populations are sympatric.

Hybrids recorded: *E. tenuiramis*  $\times$  *E. amygdalina*; *E. tenuiramis*  $\times$  *E. obliqua*; *E. tenuiramis*  $\times$  *E. risdonii*.

## 8 *Eucalyptus coccifera* Hook.f., *London J. Bot.* 6 477 (1847)

*Tasmanian Snow Gum, Snow Peppermint*

*Eucalyptus daphnoides* Miq., *Ned. Kruidk. Arch.* 44(1): 133 (1856). *Eucalyptus coccifera* var. *parviflora* Benth., *Fl. Austral.* 3: 204 (1867). *Eucalyptus alpina* R.Br. ex Maiden, *Report on the Ninth Meeting of the Australasian Association for the Advancement of Science*: 365 (1903), *nom. inval.*

*Illustrations*: Stones & Curtis, *The Endemic Flora of Tasmania* 3: t. 48, No. 79 (1971); Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 195, fig. 63i–j (1975); Chippendale, *Fl. Australia* 19: 162, fig. k–l (1988); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 275 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 275 (2006); Simmons et al., *A Guide to Flowers and Plants of Tasmania*, ed. 4, 19 (2008).

Stunted shrubs or small, gnarled trees at higher elevations, or medium to tall trees in sheltered habitats, 5–8(–20) m high; lignotubers developed, usually coppicing readily following fire or other damage. Trunk small and slender, much twisted and deformed, or rather massive, and appearing buttressed, or sometimes tall and fairly straight; branches few, often large, spreading and twisted. Bark smooth, decorticating throughout, rarely a little hard, flaking bark persisting at the base, remainder smooth, white to cream or with yellow to reddish tones where freshly exposed, shining when wet; younger branches reddish or yellow, glaucous to very glaucous, often red-crimson beneath wax and freely verrucose-glandular. Crown relatively even, open, greyish in appearance, dull or somewhat shining; reddish senescent leaves often present. Juvenile leaves opposite for 10–20+ pairs, becoming subopposite, sessile to very shortly petiolate, spreading; lamina subglaucous to dull green broadly elliptic to almost orbicular, 2–4.5 cm long, 1.5–3.5 cm wide, base cordate, margins slightly crenulate, apex apiculate. Adult leaves alternate; petioles 5–10(–20) mm long, flattened-angular; lamina concolorous grey-blue, subglaucous, becoming subglossy due to wind abrasion of wax, coriaceous, 3–4.5(–7.0) cm long, 0.8–1.5(–2) cm wide, elliptic to broadly elliptic,  $\pm$  symmetrical or slightly falcate, base long-narrowed, intramarginal vein c. 1–2 mm from margin, lateral veins faint, 15°–30° from mid-vein, margins thickened, apex long-acuminate, strongly uncinata. Inflorescences axillary, 3–7(–15)-flowered, (predominantly 3(–7)-flowered on Mt Wellington). Buds very glaucous, clavate to elongated-obconic, sessile, rugose, angular, with longitudinal compression ridges, 3–5(–7) mm long, 3–5 mm wide, operculum depressed-hemispheric, umbonate, very wrinkled, constricted at insertion of hypanthium, scar absent or obscure. Stamens inflexed, all fertile. Mature fruit sessile or very shortly pedicellate, hemispherical to broadly obconic, 7–10 mm long, 8–10(–14) mm wide; disc wide, level to convex, valves 3–5, level, retracted. Seed pale to dark brown, homogenous. Flowering Oct.–Apr.; fruit persisting for 3–5(–8) years.

Tas. (TCH, TSE, TSR, TWE); endemic. Widespread and abundant, forming pure stands on dolerite mountains and plateaux, particularly the Central Plateau, the central south and south-east mountain ranges and the Eastern Tiers, from c. 650 to 1200 m elevation; Almost completely absent from the dolerite mountains of the north-east. Probably an important stabilising plant on dolerite talus slopes and boulder fields, in association with mixed montane shrub communities.

Trees on the Wellington, Hartz and Mt Field ranges have a characteristic bud-number pattern. On Mt Wellington, the greater proportion of trees bear 3-flowered umbels, with 7-flowered umbels occasional, whereas on Hartz and Mt Field ranges, 7-flowered umbels are the norm. As a rule, elsewhere in the state, the pattern is usually 7 buds or greater ( $\infty$ ).

Hybrids recorded: *E. coccifera*  $\times$  *E. amygdalina*; *E. coccifera*  $\times$  *E. nitida*.

### 9 *Eucalyptus nitida* Hook.f., *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 137, t. 29 (1856)

*Smithton Peppermint, Shining Peppermint*

*Eucalyptus amygdalina* var. *nitida* (Hook.f.) Benth., *Fl. Austral.* 3: 203 (1867). *Eucalyptus simmondsii* Maiden, *Crit. Rev. Eucalyptus* 6(7): 344, Pl. 232(3) (1923).

*Illustrations:* Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 223, fig. 59e (1975); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 274 (2006); Chippendale, *Fl. Australia* 19: 195, fig. 63g-h (1988); Nicolle, *Eucalypts of Victoria and Tasmania* 273 (2006).

Small mallees or medium to tall trees, (3–)5–10(–30) m high; lignotuber well developed, coppicing readily, highly fire tolerant. Trunk usually slender and straight, or sometimes of poor form, buttressed in larger forms, branches usually sparse, slender, spreading to suberect. Bark retention very variable, grey to light grey-brown, persistent flaky-fibrous and shallowly fissured on the main trunk, rarely onto the branches, decorticating above and on branches in long, narrow strips and ribbons, the exposed bark white-cream with dull yellow to green-grey streaks or, particularly on mallees and smaller trees, deciduous almost throughout, the patterns and colours as above; younger stems often red-crimson, verrucose-glandular. Crown sparse to moderately dense, dark green, glossy, smaller twigs and branches contrasting yellow, with shed bark often lodged and hanging from lower branches. Juvenile leaves opposite for 10–20 pairs, sessile or very shortly petiolate, spreading to suberect; lamina dull green to grey-green, discolorous, 3–10 cm long, 1.5–5 cm wide,



broadly ovate to elliptic-ovate, base cordate, margins slightly crenulate, apex acute or apiculate. Adult leaves alternate; petioles 5–15 mm long, angular, recurved; lamina dark green, usually glossy, concolorous, ± coriaceous, 5–12 cm long, 1–1.5 cm wide, elliptic-lanceolate to lanceolate, falcate, base narrowed, intramarginal vein indistinct, c. 1 mm from margin, lateral veins very faint, mostly < 20° from mid-vein, margins slightly thickened, apex acuminate-uncinate. Inflorescences axillary, (7–)15–25<sup>+</sup>-flowered; peduncle terete to angular, 3–5(–8) mm long. Buds green-yellow, minutely warty, clavate, 3–7 mm long, 1.5–2.5 mm wide, pedicels obscure; operculum hemispherical, slightly apiculate, scar absent. Stamens mostly inflexed, all fertile. Mature fruit green to brownish, sessile to shortly pedicellate, often very crowded and retained for long periods on older, thicker branches, cupular-hemispheric to turbinate-truncate, (3–)5–7 mm long, 4–7 mm wide, disc level or slightly convex, valves 3–4, level, retracted. Seed pale tan to brown, homogenous. Flowering Sep.–Apr.; fruit persisting for 3–5(–10+) years.

Tas. (all regions except BEL, MIS); endemic. Widespread and abundant, particularly in the west, south-west and north-west and also scattered in the NE coastal regions and on the islands of the Furneaux Group, from sea level to c. 750 m elevation. Usually associated with skeletal, siliceous, nutrient-poor soils where it is commonly a small tree or multistemmed shrub (mallee), often arising from a large lignotuber. Bark smooth, yellow-greenish, decorticating throughout in long, narrow ribbons. This mallee form is widespread on the Buttongrass (*Gymnoschoenus*) sedgelands throughout much of western and south-western Tasmania. On fertile soils of river valleys in the far south, very tall, sometimes even massive trees to c. 30 m are not uncommon, with smooth, yellow-grey bark decorticating throughout, or fibrous and persistent almost to the major branches. These large specimens, often co-occur with *E. regnans* and *E. subcrenulata*, all emergent over wet sclerophyll understorey.

A form of this (?) species occurring in the Furneaux Islands requires further investigation.

Hybrids recorded: *E. nitida* × *E. amygdalina*; *E. nitida* × *E. coccifera*.

## 10 *Eucalyptus pulchella* Desf., *Cat. Pl. Horti Paris.*, ed. 3: 284 (1829)

*White Peppermint*

*Eucalyptus amygdalina* var. *angustifolia* F.Muell. ex Burt Davey, *Cycl. of Amer. Hort.* 2: 555 (1900). *Eucalyptus linearis* Dehnh., *Cat. Horti Camald.*, ed. 2.: 6, 20 (1832).

*Illustrations:* Stones & Curtis, *The Endemic Flora of Tasmania* 3 t. 59, No. 99 (1971); Chippendale, *Fl. Australia* 19: 195, fig. 63a-b (1988); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 271 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 269 (2006).

Small to medium trees, usually of very graceful form, 8–10(–20) m high; lignotuber developed, coppicing readily following fire or other damage. Trunk well proportioned, usually straight but occasionally gnarled and leaning, rarely buttressed in larger trees; branches slender, spreading to suberect with umbrageous crown. Bark smooth, decorticating throughout, sometimes a small amount of flaking, persistent bark at the very base in older trees, exposed bark dull white to cream with elongated streaks and patches of grey to fawn; younger branches dull yellow to yellow-green or reddish, often verrucose-glandular. Crown 'graceful', open and mostly rather sparse, dark green. Juvenile leaves opposite for c. 10–15 pairs, then subopposite, sessile to very shortly petiolate, suberect; lamina green, concolorous, shining, texture soft, 3–6 cm long, 0.2–0.3(–0.5) cm wide, narrow-linear, base narrowed, margins smooth to slightly crenulate, venation not visible, apex acute. Adult leaves alternate; petioles 3–5(–10) mm long, terete; lamina green, glossy (or, in some east coast populations, dull bluish-glaucous), coriaceous, 6–13 cm long, 0.4–0.5(–0.7) cm wide, narrow linear, linear-lanceolate/falcate, base long-narrowed, margins smooth, intramarginal vein obscure, lateral veins indistinct, apex acute or shortly acuminate-uncinate. Inflorescences axillary, (7–)15–20<sup>+</sup>-flowered; peduncle terete, 3–8 mm long. Buds clavate, green-yellow, shortly pedicellate, 3–5 mm long, 3–4 mm wide; operculum hemispherical, scar absent. Stamens mostly inflexed, all fertile. Mature fruit green to reddish-brown, shortly pedicellate, cupular to hemispheric to pyriform-truncate, 5–6 mm long, (4–)5–6 mm wide, disc narrow, level to slightly descending, valves 3–4, level or slightly enclosed, retracted. Seed pale brown-yellowish, homogenous. Flowering July.–Mar.; fruit persisting for 2–3 years.

Tas. (BEL, TCH, TNM, TSE, TSR); endemic. Widespread on hills and slopes in the south-east and east of the state and the slopes of the southern Central Plateau and Eastern Tiers, from sea level to c. 600 m elevation. Usually associated with soils formed on dolerite. Forms pure or mixed stands in open, dry sclerophyll forests with a shrubby, heathy or grassy/sedgy understorey. In the north of the state and the eastern 'Midlands', in particular, many forms intermediate between this species and *E. amygdalina* occur, usually with some fibrous bark, at least on the trunk, and with very narrow leaves. These forms are difficult to assign to either *E. amygdalina* or *E. pulchella*. A form with greyish-blue foliage is sometimes encountered in some eastern, near-coastal populations. This form is otherwise typical of the species.

Hybrids recorded: *E. pulchella* × *E. amygdalina*; *E. pulchella* × *E. pauciflora* subsp. *pauciflora*.

### 11 *Eucalyptus amygdalina* Labill., *Nov Holl. Pl.* 2: 14, t. 154 (1806)

*Black Peppermint, Brown Peppermint*

*Eucalyptus salicifolia* Cav., *Icon. (Cavanilles)* 4(1): 24 (1797) [as *E. salicifolius*]. *Eucalyptus globularis* DC., *Prodr. (DC.)* 3: 219 (1828), *nom. inval.* *Eucalyptus glandulosa* Desf., *Cat. Pl. Horti Paris.*, ed. 3: 284, 408 (1829).

*Illustrations:* Stones & Curtis, *The Endemic Flora of Tasmania* 2: t. 24, No. 39 (1969); Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 223, fig. 59f-g (1975); Chippendale, *Fl. Australia* 19: 189, fig. 62y-z (1988); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 270 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 271 (2006).

Small, mallee-like shrubs, or medium to tall trees, (5–)8–20(–25) m high; small lignotubers developed, coppicing readily, moderately fire resistant. Trunk sometimes buttressed in larger trees; branched from near ground level or unbranched for the lower ⅓, with a small to medium, sparsely branched crown. Bark grey to grey-brownish and shallowly fissured, brittle, variously persistent to the primary branches; smaller branches with bark decorticating in long or short narrow strips and ribbons, exposed bark yellow-green. Crown dark-greyish to dull green, or with olive tones, moderately dense, leaves pendulous. Juvenile leaves opposite to subopposite for 10–20 pairs, sessile or very shortly petiolate, spreading to slightly erect; lamina dull, bluish-grey green, ± discolorous, texture thin, oblong to elliptic-lanceolate, 5–8(–12) cm long, 1–2 cm wide, oil glands and lateral veins ± distinct, base rounded or slightly cordate, margins irregularly and shallowly crenate, apex acute or shortly apiculate. Adult leaves alternate; petioles angular to terete, 10–15 mm long; lamina dark grey-green, or occasionally lighter green and subglossy, concolorous, supple, 8–10(–15) cm long, (0.8–)1–1.5 cm wide, narrow elliptic-lanceolate to linear-lanceolate, falcate, base narrow, long-tapering, intramarginal vein indistinct, lateral veins obscure, (5°–)15°–20° from mid-vein, margin slightly thickened, apex acuminate-uncinate. Inflorescences axillary, 7–15(–25<sup>+</sup>)-flowered; peduncles 3–5 mm long. Buds yellow, sometimes obscurely subglaucous, clavate, pedicels 2–3 mm long, operculum hemispherical, scar absent. Stamens mostly inflexed, all fertile. Mature fruit green-brownish, often crowded, mottled, hemispherical to cupular, 5–7 mm long, 5–7 mm wide; disc convex, ± ascending or level, valves 3–4 level or ± enclosed, retracted. Seed pale tan to mid brown, homogenous. Flowering Aug.—Mar.; fruit persisting for 3–5 years.

Tas. (BEL, FLI, TCH, TNM, TNS, TSE, TSR, TWE); endemic. Widespread and abundant throughout the state except in the far south, south-west, west and submontane regions of the Central Plateau, from sea level to c. 750 m elevation. Found in a wide range of habitats, mainly on infertile soils. Frequently forming pure stands but most often in association with other *Eucalyptus* species in mixed forests, with low, shrubby or heathy understorey. In the east and south-east it is mainly associated with impoverished, acidic Triassic sandstone sediments. It intergrades with, and is replaced by, *E. nitida* in the west and south-west of the state. Forms with affinities to the latter species also occur in the Furneaux group. Further critical observation of this population is required. Following damage by fire, the flush of 'new' leaves on the coppice regrowth is usually a bright, pale green. The timber is rarely harvested commercially but has a high reputation as an excellent fire-wood and for its durability in the ground, and was formerly much used for split fence posts and railings.

Hybrids recorded: *E. amygdalina* × *E. coccifera*; *E. amygdalina* × *E. pauciflora* subsp. *pauciflora*; *E. amygdalina* × *E. nitida*; *E. amygdalina* × *E. pulchella*; *E. amygdalina* × *E. risdonii* (= *E. amygdalina* var. *hypericifolia*); *E. amygdalina* × *E. sieberi* (= *E. × taeniola*; possibly *E. amygdalina* var. *hypericifolia* [basonym of *E. salicifolia*]).

var. *hypericifolia*], see Pryor & Johnson (1971) & Chippendale (1988)); *E. amygdalina* × *E. tenuiramis*; *E. viminalis* × *E. amygdalina* (possibly named *E. amygdalina* var. *hypericifolia* [basionym of *E. salicifolia* var. *hypericifolia*], see Pryor and Johnson (1971) and Chippendale (1988)).

## 12 *Eucalyptus radiata* Sieber ex DC., *Prodr.* (DC.) 3: 218 (1828), subsp. **radiata**

*Forth River Peppermint, Narrow-leaved Peppermint*

*Eucalyptus amygdalina* var. *radiata* (Sieber ex DC.) Benth., *Fl. Austral.* 3: 203 (1867). *Eucalyptus amygdalina* var. *australiana* R.T.Baker & H.G.Sm., *Pap. & Proc. Roy. Soc. Tasmania* 1911: 201 (1912), *nom. inval.* *Eucalyptus australiana* R.T.Baker & H.G.Sm., *J. & Proc. Roy. Soc. New South Wales* 49: 514 (1916); *E. radiata* var. *australiana* (R.T.Baker & H.G.Sm.) Blakely, *Key Eucalypts* 211 (1934). *Eucalyptus phellandra* R.T.Baker & H.G.Smith, *A Research on the Eucalypts especially in regard to their Essential Oils*, ed. 2: 280 (1920). *Eucalyptus radiata* var. *subplatyphylla* Blakely & McKie, *op. cit.*, 212 (1934). *Eucalyptus radiata* var. *subexserta* Blakely, *op. cit.*, 211 (1934). *Eucalyptus radiata* subsp. *robertsonii* sensu W.M.Curtis & D.I.Morris, *The Student's Flora of Tasmania* (1975), *non* (Blakely) L. Johnson & Blaxell (1973).

*Illustrations*: Chippendale, *Fl. Australia* 19: 189, fig. 62o-p (1988); Brooker & Slee, *Fl. Victoria* 3: 1003, fig. 205b (1996); Hill, *Fl. New South Wales* 2, rev. ed.: 153, fig.188a (2002); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 264 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 259 (2006).

Medium to tall trees, 10–15(–25) m high; lignotuber development and coppicing abilities unknown. Trunk straight, usually unbranched for c. ⅓ of tree height in taller trees, rarely buttressed; branches stout, erect to spreading with conical to umbrageous crown. Bark grey to grey-black, finely fibrous, slightly shallowly, longitudinally to diagonally fissured, persistent to primary and secondary branches and sometimes beyond; younger branches smooth, yellowish-green. Crown dense, dull bluish-green to green. Juvenile leaves opposite, sessile for up to 20 pairs, spreading; lamina dull bluish-green, discolorous, 5–7 cm long, 1.5–2 cm wide, elliptic to broad lanceolate, base rounded to amplexicaul, margins shallowly and distantly subcrenate, scarcely thickened, apex acute. Adult leaves alternate; petioles slender, 3–5 mm long; lamina green, scarcely shining, concolorous, texture thin, 5–10(–12) cm long, 0.7–1(–2) cm wide, lanceolate, falcate, base abruptly narrowed, margins not thickened, intramarginal vein 1–1.5 from margin, lateral veins faint, 15°–20° from mid-vein, apex acuminate, uncinata. Inflorescences axillary, (7–)15–20<sup>+</sup>-flowered; peduncles slender, terete, 0.5–10 mm long. Buds crowded, clavate to narrowly obconic, 4–6 mm long, 3–4 mm wide, hypanthium tapering into pedicel, pedicels 2–3 mm long; operculum conical, scar absent. Stamens mostly inflexed, all fertile. Mature fruit grey or grey-green, pedicellate, pyriform truncate to hemispherical 6–7.5 mm long, (3–)4–6 mm wide; disc narrow, convex or slightly descending, valves enclosed or level, retracted. Seed brown-black, homogenous. Flowering: Sep.–Jan. (Vic., NSW); fruit persisting for several years.

Tas. (TCH, TNS); also NSW, Vic. In Tasmania, confined to wet or dry sclerophyll forests with shrubby understorey, on the lower slopes and on alluvial soils in the headwaters of the Forth, Mersey and Wilmot River systems, at elevations between 250–400 m. Probably more widespread in the past, but now limited due to Hydro-Electric dam impoundments and Forestry operations in the general areas of its occurrence. Listed as Rare under the Tasmanian *Threatened Species Protection Act 1995*.

The populations described here as *E. radiata* subsp. *radiata* have a complex taxonomic history. Initially, these populations were ascribed to *E. robertsonii* Blakely by Jackson (1965). Johnson and Blaxell (1973) reduced *E. robertsonii* to subspecific rank under *E. radiata* and included a comment "Reports of subsp. *robertsonii* (as *E. robertsonii*) from Tasmania (Jackson 1965) refer in fact to a distinct, undescribed taxon related to *E. amygdalina*". However, Curtis and Morris (*op. cit.*) in *The Student's Flora of Tasmania* considered that these populations were indeed referable to *E. radiata* subsp. *robertsonii* which has been followed in the various censuses for Tasmania (see Buchanan 2005). Chippendale (1988) in the *Flora of Australia* lists both *E. radiata* subsp. *radiata* and *E. radiata* subsp. *robertsonii*, and indicated that the species does not occur in Tasmania. *Eucalyptus robertsonii* was reinstated by Johnson and Hill (1990) who described two subspecies, *E. robertsonii* subsp. *robertsonii* and *E. robertsonii* subsp. *hemisphaerica*, though neither was considered to occur in Tasmania. In both the *Flora of Victoria* (Brooker & Slee 1996), and the *Flora of New South Wales* (Hill 2002), *E. radiata* subsp. *radiata* is listed as being found in both Victoria and New South Wales while the other

two subspecies, subsp. *robertsonii* and subsp. *sejuncta* are confined to New South Wales. Brooker and Kleinig (2006) and Nicolle (2006), refer the Tasmanian populations, discussed here, to *E. radiata* subsp. *radiata* and consider *E. radiata* subsp. *robertsonii* to be endemic to New South Wales. However, Rankin (2009) confirmed that the Tasmanian populations are referable to *E. radiata* subsp. *radiata*. Despite this, there is still some question as to whether the Tasmanian entity is indeed referable to *E. radiata* or whether it is a distinct, undescribed taxon. Further research is necessary to resolve this question.

### 13 *Eucalyptus nebulosa* A.M.Gray, *Kannunah* 3: 42 (2008)

*Serpentine Peppermint, Misty Peppermint*

*Illustrations:* Gray, *Kannunah* 3: 43, figs 1–3 (2008).

Small trees, 3.5–5(–7) m tall; lignotuber development and coppicing characteristics unknown. Trunk not buttressed, usually unbranched for the lower  $\frac{2}{3}$  then sparsely and evenly branched, compression wrinkles evident at major branch angles. Bark smooth throughout, decorticating in small, elongated strips or short ribbons, freshly exposed bark dull cream-white, chalky-dusty, occasionally yellowish or pale greenish-bronze, aging to dull grey or grey-green; younger branches glaucous, becoming prominently warty-tuberculate and reddish. Crown umbrageous, open, uniform bluish-grey. Juvenile leaves opposite for 5–8 pairs, sessile to very shortly petiolate; petioles to c. 2 mm long; lamina grey-blue, concolorous, thickly coriaceous, elliptic, 2.5–4.5 cm long, (1–)1.5–2.5 mm wide, base rounded, margins slightly thickened, apex acute to apiculate. Adult leaves alternate; petioles 10–15(–20) mm long, flattened; lamina pale grey-blue to glaucous, dull, older leaves subglossy after abrasion of wax,  $\pm$  coriaceous, 50–80(–110) mm long, 8–12(–15) mm wide, narrow elliptic, subfalcate, base attenuated, margins slightly thickened, intramarginal vein 0.5–1 mm from margin, lateral veins distinct,  $10^{\circ}$ – $20^{\circ}$ (– $30^{\circ}$ ) from mid-vein, apex long acuminate-uncinate. Inflorescences 7–11(–15)-flowered; peduncle (3–)5–7 mm long, terete to angular-biconvex, expanded toward the distal portion. Buds subglaucous, clavate, glandular, sessile or shortly pedicellate; operculum hemispherical, scar absent. Stamens mostly inflexed, all fertile. Mature fruit minutely verrucose, subglaucous, hemispherical or subtrubinate, 3–5 mm long, 3–5 mm wide; pedicels compressed, 2–3 mm long; disc narrow, level or convex, valves 3–4 level to enclosed, tips erect but scarcely protruding. Seed reddish to dark brown, homogenous. Flowering Dec.–Mar.; fruit persisting for 2–3 years.

Tas. (TWE); endemic. The species forms an extensive and discrete population between the Wilson and Huskisson Rivers, tributaries of the Pieman River, in the northern part of the west coastal region of Tasmania. It is the dominant tree species with a shrubby-sedgy understorey on Cambrian serpentine rock formations of low hills and ridges at c. 200–300 m elevation. It is also known from near the Heazlewood River at the bridge on the Savage River Rd., and from the Harman River area near Parsons Hood, in the Meredith Range Regional Reserve. Further field work is necessary to determine the full extent of the species.

### 14 *Eucalyptus cordata* Labill., *Nov. Holl. Pl.* 2: 13, t. 152 (1806)

*Heart-leaved Silver Gum, Tasmanian Silver Gum*

*Illustrations:* Stones & Curtis, *The Endemic Flora of Tasmania* 2: t. 31, No. 51 (1969); Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 217, fig. 57c (1975); Chippendale, *Fl. Australia* 19: 375, fig. 98a-b (1988); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 169 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 105–107 (2006).

Small, impoverished mallees to medium-tall trees, 3–8(–20) m high; lignotuber well developed, coppicing readily (particularly subsp. *cordata*). Trunks one or several, tall, straight, not buttressed; often branched from near ground-level, the branches numerous, very slender, spreading, often horizontal, or trunks slender and poorly formed with sparse, diffuse branching. Bark decorticating throughout in flakes or short basal ribbons, older bark dark grey to grey-black, freshly exposed bark pale grey-tan to greenish or with yellow-bronze tones, larger trees sometimes with persistent tan-grey, fissured, fibrous bark near the base. Younger branches glaucous, minutely verrucose; in eastern forms mostly cylindrical (terete) in transverse section; in western forms mostly 'square' (quadrangular) and with the angles  $\pm$  winged. Crown in larger trees silvery to

grey-blue, dense, columnar, branched almost to ground-level or, mostly in the upper ½, ± conical to spreading; mallee forms with crown uneven, sparse to moderately dense; both forms with leaves often much insect damaged. 'Juvenile' leaves opposite to subopposite, sessile, spreading to slightly erect, lamina silvery-grey, glaucous, concolorous, texture thin, 5–7(–9) cm long, 5–7(–10) cm wide, sometimes wider than long, orbicular to broadly oblong-ovate, sessile, base cordate-amplexicaul, margins thickened, crenate or entire, lateral venation widely spaced, at 45°–60° from mid-vein, apex rounded, emarginate or apiculate. Intermediate leaves, usually present in older crowns, show a gradual transition of insertion, size and outline between juvenile and adult forms. 'Typical' alternate, petiolate, adult leaves usually only developing at the distal extremities of mature trees, particularly in the western form; coriaceous, 5–10(–15) cm long, 2–3.5 cm wide, lanceolate, slightly falcate, base rounded or slightly narrowed, margins distantly crenate or entire, intramarginal vein 2–3 mm from mid-vein, lateral veins faint, at 40°–45° from mid-vein, apex acuminate. Inflorescences axillary, 3-flowered, sometimes appearing apical and 6-flowered due to two opposing umbels terminating a "blind" twig, pedunculate; peduncle flattened-angular, (3–)5–10 mm long. Buds very white-glaucous, sessile or the central bud very shortly pedicellate, obovoid-cylindrical or turbinate, 7–8 mm long, 4–10 mm wide; operculum flattened-hemispherical, umbonate or rostrate, c. ½ length of hypanthium, sometimes flared and wider than the hypanthium, scar visible. Stamens spreading, all fertile. Mature fruit glaucous, green beneath wax, grey-brown with age, smooth or 2-ribbed, hemispherical to turbinate or truncate-globular, 7–9–12 mm long, 7–10(–13) mm wide; disc narrow, descending, valves enclosed, erect. Seed heterogeneous, fertile seed black, flattened-ellipsoidal, chaff light tan, copious. Flowering Apr.–Jul. (subsp. *cordata*), Sep.–Nov. (subsp. *quadrangulosa*); fruit persisting for 2–5+ years.

Tas. (TSE); endemic. Occurs in small, scattered, discrete populations in the south and east of the state, from near sea level to c. 700 m elevation, usually on clay soils of dolerite origin and with a wet or dry sclerophyll understorey. Within their respective ranges, both subspecies sometimes occur in very isolated, small, discrete copses within the canopies of a range of other *Eucalyptus* species.

Two subspecies are recognised: a western form, subsp. *quadrangulosa*, which develops into a small tree usually with a single trunk and a compact or rather open, even crown; this form occurs mostly west of the Derwent estuary, and an eastern form subsp. *cordata*, which is usually a small impoverished mallee with several stems and an uneven crown, or a small tree, occurring mostly east of the River Derwent, including Maria and Bruny Islands. The larger tree form, subsp. *quadrangulosa*, with the neat, columnar habit, and sometimes branching to almost ground level, is often cultivated for windbreak purposes, or as ornamental specimens. The attractive glaucous-blue foliage is, however, very susceptible to depredation by a number of chewing insects which may cause extensive and unattractive damage to almost every leaf.

1. Usually small, impoverished mallees or small trees. Young stems cylindrical in transverse section. Leaves smaller and rounded than in subsp. *quadrangulosa*. Fruit not ribbed. Small, discrete populations predominantly east of the River Derwent to coastal locations 14a subsp. *cordata*
- 1: Small to medium trees often of good form. Young stems square in transverse section. Leaves a little larger and more heart-shaped than in subsp. *cordata*. Fruit often obscurely bi-ribbed. Discrete populations predominantly west of the River Derwent 14b subsp. *quadrangulosa*

#### 14a *Eucalyptus cordata* Labill. subsp. *cordata*

*Heart-leaved Silver Gum, Tasmanian Silver Gum*

*Illustrations:* Nicolle, *Eucalypts of Victoria and Tasmania* 105 (2006); Nicolle, Potts & McKinnon, *Pap. & Proc. Roy. Soc. Tasmania* 142(2), fig. 1a, 2 (2008).

Small, impoverished trees or mallees, 3–6(–8) m high; lignotuber well developed, coppicing readily; branches numerous, slender, diffuse, younger branches papillose-verrucose, variously glaucous, cylindrical in transverse section. Crown grey-green, uneven, sparse to moderately dense, leaves often much insect damaged. Leaves 5–7(–9) cm long, 5–7(–10) cm wide, apex rounded to emarginate. Intermediate leaves, if developed, opposite to subopposite, becoming petiolate; lamina showing gradual transition in size and outline between juvenile and 'typical' adult forms. 'Typical' adult leaves rarely developed, alternate or subopposite; petioles to 15 mm long; lamina grey-green, concolorous, coriaceous, lanceolate, 5–8(–15) cm long, 2

—3.5 cm wide. Peduncles terete to ± flattened-angular. Buds and mature fruit usually smooth, not or faintly two-ribbed. Flowering Apr.–Jul.; fruit persisting for 2–5+ years.

Tas. (TSE); endemic. Small, discrete populations of this subspecies occur as isolated copses in dry sclerophyll forest or woodlands, with a heathy-shrubby understorey, on doleritic soils from sea level to c. 400 m elevation, chiefly east of the River Derwent, Maria Island, and the Tasman Peninsula.

The small population occurring on Penguin Island, adjacent to Fluted Cape, at the southern end of Adventure Bay, Bruny Island, is probably the site of the type collection of the species by Labillardière, in 1804.

**14b *Eucalyptus cordata* subsp. *quadrangulosa*** D.Nicolle, B.M.Potts & G.E.McKinnon, *Pap. & Proc. Roy. Soc. Tasmania* 142(2) (2008)

*Heart-leaved Silver Gum, Tasmanian Silver Gum*

*Illustrations:* Nicolle, *Eucalypts of Victoria and Tasmania* 107 (2006), as *E. cordata* subsp. 'western'; Nicolle, Potts & McKinnon, *op. cit.* 142(2), fig. 1b, 3, 4 (2008); Wapstra et al., *Tasmanian Plant Names Unravelling* 190 (2010).

Shrubs or small to medium trees, (3–)8–20 m high, occasionally with two or more stems, not buttressed; lignotuber present, coppicing readily; branches numerous, almost to ground level in open-grown trees, slender, suberect to ± horizontal, younger branches papillose-verrucose, variously glaucous, quadrangular in transverse section, sometimes the angles ± winged. Crown grey-green, in taller trees compact, even, leaves often insect damaged. Leaves 5–7(–10) cm long, 5–7(–10) cm wide. Intermediate leaves opposite to subopposite; becoming petiolate; petiole to 15 mm long; lamina showing gradual transition in size and outline between juvenile and adult forms. Adult leaves sometimes developing at the distal portions of branches in older crowns, alternate, petiolate; petioles 8–15(–25) mm long; lamina grey-green, concolorous, coriaceous, lanceolate, slightly falcate, 8–15 cm long, 3.5 cm wide. Peduncles angular to flattened. Buds and mature fruit sometimes distinctly two-ribbed. Flowering Sep.–Nov.; fruit persisting for 2–5+ years.

Tas. (TSE); endemic. Small, discrete populations of this subspecies are scattered mainly in the foothills of the Mt Wellington Range, from near New Norfolk to Huonville, chiefly on moist dolerite soils in mixed wet forests, from c. 400–700 m elevation.

**15 *Eucalyptus gunnii*** Hook.f., *London J. Bot.* 3: 499 (1844)

*Cider Gum*

*Eucalyptus whittingehamei* Landsb., *Trans. & Proc. Bot. Soc. Edinburgh* 20: 516 (1896). *Eucalyptus gunnii* var. *montana* Hook.f., *Bot. Mag.* 127: t. 7808 (1901), *nom. illeg.* *Eucalyptus whittinghamensis* Elwes & A.Henry, *Trees Great Britain* 6: 1617, 1642, t. 363, 365, fig. 4 (1912), *nom. illeg.*

*Illustrations:* Stones & Curtis, *The Endemic Flora of Tasmania* 2: t. 39, No. 66 (1969); Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 216, fig. 56a-b (1975); Chippendale, *Fl. Australia* 19: 369, fig. 97k-l (1988); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 167 (2006).

Small to medium trees, 8–25 m high, or, rarely, mallees to c. 3–5 m high; lignotuber well developed, in mallee forms sometimes very large and extensive; coppicing ability variable. Trunk sometimes buttressed, with branches in some forms massive and often arising close to ground level, often widely divaricate, rarely steeply angled. Bark persistent to c. 3–6 m, grey-tan, rough and flaky, smooth above, decorticating in short strips and ribbons, exposed bark yellow to greenish-bronze or olive tan; younger branches reddish to yellow, slightly glandular-verrucose, green to subglaucous. Crown mid to dark green or greyish-green, usually dense, umbrageous, even. Juvenile leaves opposite for many pairs, sessile or very shortly petiolate; lamina bluish-green to grey-green, concolorous, moderately thin, 2–3(–4.5) cm long, orbicular to broadly ovate, base amplexicaul, margins sub-entire or crenulate, apex rounded, apiculate or emarginate. Adult leaves alternate, petiolate; petioles 5–10(–20) mm long; lamina dull grey-green to glaucous, concolorous, cori-

aceous, 4–6(–8.5) cm long, (1.5–)2–3.5 cm wide, lanceolate to ovate-elliptic, scarcely falcate, base narrowed, margin scarcely thickened, intramarginal vein c. 1 mm from margin, lateral veins very faint, at 30°–50° from mid-vein, apex acute. Inflorescences axillary, 3-flowered; peduncle angular, 5–10 mm long. Buds green-yellow or reddish, or glaucous, fusiform to cylindrical or suburceolate, 5–8 mm long, 3–5 mm wide, sessile or shortly pedicellate; operculum conical to hemispheric-rostrate, c.  $\frac{1}{3}$  as long as the hypanthium, sometimes flared and wider than the hypanthium, scar visible. Stamens inflexed, all fertile. Mature fruit often glaucous, grey-brown or sometimes green with reddish markings below wax, 5–9 mm long, 4–7 mm wide, campanulate, sub-hemispheric to ovoid-truncate, cylindrical to sub-urceolate, particularly when immature, disc narrow, descending, valves 3–4, erect, enclosed or the tips level. Seed heterogeneous, fertile seed grey-black, ellipsoidal, smooth or lacunose, chaff dark brown, scanty. Flowering Nov.–Mar.; fruit persisting 2–5 years.

Tas. (BEL, TCH, TNS, TSE, TSR, TWE); endemic. Widespread on the Central Plateau and higher elevations of the Eastern Tiers, at c. 500–1200 m elevation. Locally common in submontane forests and shrubberies, tolerating wet, marshy conditions, frost hollows, plateaux etc., where severe frosts and very low temperatures may occur in winter. There is an interesting disjunct population at Snug Plains, c. 30 km south-west of Hobart. Here, unconfirmed records have reported ground temperatures nearing –20°C, following a series of clear, still, winter nights.

This species is perhaps the most cold tolerant of the eucalypts and has been widely planted in Europe, particularly in England, as an amenity plant and for its attractive foliage. The small,  $\pm$  orbicular, glaucous juvenile foliage is highly ornamental and is much sought after for use in floral arrangements, both in Australia and overseas.

The common name Cider Gum alludes to a sugary sap which exudes from the bark and leaves of the trees, or from cuts made in the bark, and collects in crotches and hollows. Mixed with rainwater, the sap often undergoes natural fermentation, resulting in a mildly intoxicating liquid reportedly drunk by Tasmanian Aboriginal people and early European colonists, said to be not unlike cider. Many insects, birds and marsupials also use the sweet sap as a major seasonal food source.

The *E. gunnii* group is morphologically complex and many forms are demonstrable; some forms are probably ecoclinal. Further research is required to clarify the morphological and taxonomic boundaries within this complex. Two subspecies of *E. gunnii* are currently recognised.

1. Small to medium trees with suberect to spreading branches and small crowns; twigs, leaves, buds and fruits grey-green to subglaucous; oil glands in leaves readily discernible; buds and mature fruit subhemispheric to ovoid-truncate (Central Plateau, Eastern Tiers, Snug Plains) 15a subsp. *gunnii*
- 1: Large trees usually with massive, widely spreading branches and large, rounded crowns; twigs, leaves, buds and fruit very glaucous; oil glands in leaves scarcely conspicuous; buds and mature fruit distinctly cylindrical to suburceolate (chiefly eastern, western and southern shores of Great Lake, Miena) 15b subsp. *divaricata*

### 15a *Eucalyptus gunnii* Hook.f. subsp. *gunnii*

*Cider Gum*

*Illustration:* Nicolle, *Eucalypts of Victoria and Tasmania* 97 (2006).

Small to medium trees or, rarely, mallees (3–)8–45 m high; mallee form often with extensive lignotuber and vigorous coppicing ability; branches suberect to spreading, rarely massive, younger stems subglaucous or smooth, greenish yellow. Crown moderately sparse to rather dense and tending to be uneven. Juvenile leaves grey-green to subglaucous 2–3(–4.5) cm long and about as wide. Buds greenish yellow or with reddish markings, usually slightly glaucous, but the wax soon abrading off, fusiform to cylindrical. Mature fruit grey-brown or greenish with red markings, campanulate, subhemispheric to ovoid-truncate. Flowering Feb.–Mar.

Tas. (BEL, TCH, TNS, TSE, TSR, TWE); endemic. Widespread on the Central Plateau and the Eastern Tiers, with a disjunct population at Snug Plains, south-west of Hobart.

Hybrid recorded: *E. gunnii* subsp. *gunnii* × *E. archeri*; *E. gunnii* subsp. *gunnii* × *E. dalrympleana* subsp. *dalrympleana* (= *E. irbyi* Baker & Smith).

**15b *Eucalyptus gunnii* subsp. *divaricata*** (McAulay & Brett) B.M.Potts, *Pap. & Proc. Roy. Soc. Tasmania* 135: 57–61 (2001)

*Miena Cider Gum*

*Eucalyptus divaricata* McAulay & Brett, *Pap. Proc. Roy. Soc. Tasmania* for 1937: 94 (1938).

*Illustrations*: Potts, *Pap. & Proc. Roy. Soc. Tasmania* 135: 58 pl. 1; 59 pl. 2, 3 (2001); Nicolle, *Eucalypts of Victoria and Tasmania* 99 (2006); Wapstra et al., *Tasmanian Plant Names Unravelling* 191 (2010).

Medium trees, 8–15 m high, often with large trunk, often buttressed; lignotuber developed and coppicing ability moderate; branches massive and often arising close to ground level, widely divaricate, to suberect, young stems very glaucous greenish-yellow to reddish beneath wax. Crown blue-grey, usually dense and umbrageous. Juvenile leaves greyish to blue-grey, glaucous, 2–2.5(–3) cm long and about as wide or sometimes a little wider than long. Adult leaves grey-glaucous, 4–6(–8.5) cm long, 1.5–3.5 cm wide. Buds glaucous, grey-white, suburceolate. Mature fruit subglaucous, greenish-brown beneath wax, cylindrical to suburceolate. Flowering Nov.–Jan.

Tas. (TCH); endemic. Restricted to the Central Plateau, particularly in the vicinity of Miena on the western shores of Great Lake, at higher elevations in areas of cold air pooling and drainage.

Significant numbers of this subspecies, over extensive areas, are suffering decline and eventual death. Many environmental factors, including drought and animal browsing, and possibly climate change, are contributing to this phenomenon. Mortality is such that the subspecies is now listed as “Endangered” under the *Environmental Protection & Biodiversity Conservation Act* (1999) and the *Tasmanian Threatened Species Protection Act* (1995).

**16 *Eucalyptus archeri*** Maiden & Blakely, *Crit. Rev. Eucalyptus* 8: 56 (1929)

*Alpine Cider Gum*

*Illustrations*: Chippendale, *Fl. Australia* 19: 369, fig. 97m–n (1988); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 168 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 95 (2006).

Small trees, stunted shrubs or mallees, 3–8(–12) m high; lignotuber developed, coppicing ability not known. Trunk usually crooked and often leaning, mostly branched from c. ½ tree height, the branches sparse, suberect to spreading. Bark smooth, decorticating in short strips and ribbons from a little above the base, creamy-white, aging to tan, grey-green and often with bronze tones; younger branches glandular-verrucose, green-yellow, not glaucous. Crown dark green, glossy, fairly dense. Juvenile leaves opposite, spreading, sessile; lamina dull, green, concolorous, ovate to suborbicular, 2–4.5 cm long, 2–4 cm wide, base rounded to cordate, margin entire or subcrenate, apex rounded, apiculate or slightly emarginate. Adult leaves alternate, petiolate; petioles terete, 10–15 mm long; lamina glossy green, concolorous, coriaceous, lanceolate to broad lanceolate, slightly falcate, 5–10 cm long, 1.5–3 cm long, base narrowed, intramarginal vein c. 1 mm from margin, lateral veins indistinct, 40°–50° from mid-vein, margins slightly thickened, entire, apex acuminate. Inflorescences axillary, 3-flowered; peduncle thick, flattened, 1–4 mm long. Buds not glaucous, subcylindrical to obovoid-obconical, sessile, 3–4.5 mm long, 3–5 mm wide, operculum conical-hemispheric, slightly apiculate, c. ½–⅓ as long as hypanthium, scar visible. Stamens inflexed, all fertile. Mature fruit grey-brown, surface ± wrinkled, ± obconical to cylindrical-campanulate, 5–8 mm long, 3–7 mm wide; disc moderately broad, descending, valves 3–4 enclosed, tips erect, ± level with rim. Seed heterogeneous, fertile seed black, flattened-ellipsoidal, chaff light tan, copious. Flowering Dec.–May; fruit persisting 2–3 years.

Tas. (BEL, TCH, TSE, TSR, TWE); endemic. Restricted to a few populations in the northern Great Lakes, Central Plateau region and the north-eastern highlands (Ben Lomond), at c. 950–1200 m elevation, in montane scrub and open woodland, on shallow, peaty, dolerite soils, and on dolerite talus.



Replaced by, and intergrades clinally with, the very closely related *E. gunnii* subsp. *gunnii* at slightly lower elevations (on the Central Plateau only), particularly in frost hollows with impeded drainage and cold air pooling.

Hybrid recorded: *E. archeri* × *E. gunnii* subsp. *gunnii*.

**17 *Eucalyptus perriniana*** F.Muell. ex Rodway, *Pap. & Proc. Roy. Soc. Tasmania* for 1883: 181 (1894)

*Spinning Gum*

*Eucalyptus gunnii* var. *montana* Hook.f., *Bot. Mag.* 127: t. 7808 (1901), *nom. illeg.*; *Eucalyptus perriniana* R.T.Baker & H.G.Sm., *Pap. & Proc. Roy. Soc. Tasmania*: 163 (1913), *nom. illeg.*, *nom. superfl.*

*Illustrations*: Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 217, fig. 57a-b (1975); Chippendale, *Fl. Australia* 19: 369, fig. 97u-v (1988); Brooker & Slee, *Fl. Victoria* 3: 970 fig. 197b (1996); Hill, *Fl. New South Wales* 2, rev. ed.: 123 fig. 54 (2002); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 162 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 109 (2006); Simmons et al., *A Guide to Flowers and Plants of Tasmania*, ed. 4, 109 (2008); Wapstra et al., *Tasmanian Plant Names Unravelling* 194 (2010).

Shrubs, mallees or small crooked trees, 2–5(–8) m high; lignotubers well developed and coppicing strongly following fire or other damage. Trunk(s) slender, crooked, leaning, branched from near ground level, major branches spreading, crooked. Bark decorticating from near the base in short strips and ribbons, freshly exposed bark dull, cream-white, aging to grey, tan or olive, greenish-bronze, trunk and branches with circular scars formed by the fallen connate leaf pairs, persisting until the first bark is shed; younger branches glaucous. Crown grey-green, sparse, 'untidy', often confined to the outer extremities. Juvenile leaves opposite, sessile, connate; lamina grey-glaucous, the pair together 3–6(–8) cm wide, 3.5–6(–8) cm long, orbicular to oblong or broadly elliptic, often constricted at their common bases, margin thickened, venation obscure, apex rounded, emarginate or minutely apiculate, when dead and dry, detaching at their insertion, but remaining on the branch for some time before disintegration and falling. Intermediate leaves often present in older crowns, and showing a gradual transition in degree of basal union, insertion, size and outline between juvenile and presumed adult forms; leaves in mature crown predominantly of the juvenile form and bearing inflorescences in both axils. Adult leaves eventually produced in larger, mature plants; petioles 5–10(–20) mm long, flattened; lamina grey-blue or grey-green, dull, concolorous, 5–10 cm long, 1.5–2.5 cm wide, lanceolate, only slightly falcate, base narrowed, margins thickened, reddish, intramarginal vein obscure, c. 2 mm from margin, lateral veins faint, at 30°–45° from mid-vein, apex acute or acuminate. Inflorescences axillary, 3-flowered; sessile or peduncle to c. 2.5 mm, terete, glaucous. Buds glaucous, sessile to shortly pedicellate, ovoid to fusiform, 3–6 mm long, 2.5–4 mm wide; operculum hemispheric to bluntly conical, c. 1/3 length of the hypanthium, scar visible. Stamens inflexed, all fertile. Mature fruit glaucous, reddish-brown beneath wax, hemispheric to subcylindrical, 3–5 mm long, 3–6 mm wide; disc narrow, level or descending, valves 3–4, tips erect, level with rim. Seed heterogeneous, fertile seed grey-black, cuboid, flattened-ellipsoidal, chaff dark brown, copious. Flowering Nov.–May; fruit persisting for 2–3 years.

Tas. (TCH, TSE, TSR); also NSW, Vic. In Tasmania, very localised and rare, known only from three main localities in the central south-east, at Hungry Flats, Strickland and Tunnack. The species grows on poor, shallow, acidic soils in flat areas and hollows which may be either very dry or periodically inundated; at c. 500–600 m elevation. The species is listed as Rare under the *Tasmanian Threatened Species Protection Act* 1995.

A popular ornamental plant due to its unusual connate, sometimes almost orbicular, juvenile foliage. However, grown under ideal garden conditions, most trees will usually eventually develop crowns with leaves of adult form, to the disappointment of the grower. Constant pruning or lopping, which may lessen the aesthetic appeal, is necessary to maintain the desired juvenile leaf forms.

Hybrid recorded: *Eucalyptus perriniana* × *E. rodwayi*.

**18 *Eucalyptus urnigera* Hook.f., *London J. Bot.* 6: 477 bis (1847)**

Urn Gum

*Eucalyptus urnigera* var. *elongata* Rodway, *Tasman. Fl.* 58 (1903).

*Illustrations:* Stones & Curtis, *The Endemic Flora of Tasmania* 3: t. 71, No. 119 (1971); Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 216, fig. 56e (1975); Chippendale, *Fl. Australia* 19: 369, fig. 97s-t (1988); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 165 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 101 (2006); Wapstra et al., *Tasmanian Plant Names Unravelling* 199 (2010).

Small to moderately large tree, 8–15(–45) m high, sometimes reduced to a large shrub or a mallee at higher elevations; larger trees shallowly buttressed; lignotuber developed, coppicing fairly readily; well branched from near ground level in smaller trees or from c.  $\frac{2}{3}$  tree height in taller trees, branches often gnarled and twisted by exposure. Bark decorticating from the base in flakes, short strips and ribbons, exposed bark pale grey-tan with deep shades of green and orange to bronze, colours intensified when wet; younger branches reddish or yellow-green, verrucose. Crown dark green, shining or, with increasing elevation progressively becoming dull green-blue, and often misshapen in form. Juvenile leaves, opposite for many pairs, sessile; lamina green at lower elevation limit, grey-glaucous at the higher limits, slightly discolorous, texture soft, or somewhat coriaceous, 3–6 cm long, 3–6 cm wide, spreading, orbicular or broadly elliptical, base cordate-amplexicaul, margin crenulate, reddish, apex emarginate or apiculate-mucronulate. Adult leaves alternate, petiolate; petioles somewhat angular-flattened, verrucose, green or glaucous, 0.5–2 cm long; lamina dark green, glossy, or grey-blue to subglaucous at higher elevations, concolorous, coriaceous, 5–12(–15) cm long, (1.5–)2–4 cm wide, lanceolate, slightly falcate, base rounded to narrowed, margins entire or shallowly crenate, thickened, intramarginal vein c. 2 mm from margin, lateral veins faint but dense, at 30°–50° from mid-vein, apex acute to acuminate. Inflorescences axillary, 3-flowered; peduncle  $\pm$  flattened, 5–10(–25) mm long. Buds green or glaucous, cylindrical-urceolate, 8–12 mm long, 4–6 mm wide, pedicellate; operculum much shorter than the hypanthium, flattened-hemispherical, acute to rostrate, wider than the hypanthium above union, scar prominent. Stamens inflexed, all fertile. Mature fruit glaucous or green to red-brown, urceolate, or sometimes barrel-shaped and only slightly restricted below the rim, 10–15(–18) mm long, 7–10(–12) mm wide; pedicels (5–)10–15 mm long; disc broad, descending, valves 3–4, deeply enclosed. Seed heterogeneous, fertile seed grey-black, smooth to lacunose, chaff mid-tan, copious. Flowering Jan.–Jun.; fruit persisting 3–5+ years.

Tas. (TCH, TSE, TSR); endemic. Frequent on mountains of the southern Central Plateau and south-eastern highlands, also on Maria and Bruny Islands, at c. 600–1100 m elevation. Occurs usually on well-drained dolerite slopes and talus, in woodlands and submontane shrubberies, often as a subdominant component, associated with *E. coccifera*, *E. delegatensis* subsp. *tasmaniensis* and *E. subcrenulata*.

The taxonomic limits and the distribution of *E. urnigera* are presently not well circumscribed or documented and require further critical collection and evaluation (Williams & Potts 1996). The population occurring on Mt Wellington has been studied, involving the degree of glaucousness in adult and juvenile foliage and a number of intraspecific cline forms recognised (Barber & Jackson 1957). As well, a correlation of flowering times, corresponding with this cline, has been demonstrated (Potts & Reid 1985).

Hybrids recorded: *E. urnigera*  $\times$  *E. globulus* subsp. *globulus*  $\times$  *E. johnstonii* (possibly = *E. biangularis* Simmonds).

**19 *Eucalyptus morrisbyi* R.G.Brett, *Pap. & Proc. Roy. Soc. Tasmania* for 1938: 129 (1939)**

Morrisby's Gum

*Illustrations:* Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 216, fig. 56c-d (1975); Stones & Curtis, *The Endemic Flora of Tasmania* 6 t. 146, No. 241 (1978); Chippendale, *Fl. Australia* 19: 369, fig. 97q-r (1988); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 166 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 103 (2006); Simmons et al., *A Guide to Flowers and Plants of Tasmania*, ed. 4, 109 (2008); Wapstra et al., *Tasmanian Plant Names Unravelling* 193 (2010).

Small trees, 5–15 m high, lignotuber developed. Trunk not buttressed; well branched from near ground-level, the primary branches large, spreading. Bark decorticating throughout in flakes and short strips, sometimes with a little rough, brittle, flaking bark at the very base, exposed areas grey-tan to reddish tan with cream-white patches throughout; younger branches somewhat pendulous, very glaucous. Crown dull, bluish-grey, moderately dense, to quite sparse, even or rather misshapen. Juvenile leaves opposite, sessile to shortly petiolate; lamina dull white to grey-glaucous, slightly discolourous, texture soft, (1–)3–4 cm long, (1–)3–4.5 cm wide, orbicular to elliptic-ovate, often broader than long, base rounded to  $\pm$  cordate-amplexicaul, margin crenulate, veins visible, apex rounded, emarginate or apiculate. Intermediate leaves often present, showing a fairly rapid transition between juvenile and adult forms. Adult leaves alternate, petiolate; petioles angular, papillose, 1–3 cm long; lamina dull, pale grey to bluish-green, concolorous  $\pm$  coriaceous, (5–)8–12 cm long, (1.5–)2–3 cm wide, lanceolate to broad-lanceolate, slightly falcate, base long-narrowed, margins entire or slightly subcrenate, thickened, intramarginal vein c. 1 mm from margin, lateral veins faint, at 30°–50° from mid-vein, apex acute to acuminate. Inflorescences axillary, 3-flowered; peduncle angular or flattened and expanded immediately below buds, 5–10 mm long. Buds white-glaucous, hypanthium turbinate to obconic, 3–7 mm long, 3–5 mm wide, pedicellate; operculum hemispherical, long-rostrate, flanged and often wider than hypanthium above union, scar prominent. Stamens inflexed, all fertile. Mature fruit white to grey-glaucous, green beneath wax, cylindrical to fusiform, sometimes slightly urceolate and sometimes faintly two-ribbed, 8–10(–12) mm long, 7–10 mm wide, remains of operculum scar and staminophore often forming a prominent ridge and groove immediately below the rim, disc convex, descending, valves 4–5, enclosed, tips erect, level with rim. Seed heterogeneous, fertile seed grey-black, flattened-ellipsoid, smooth to lacunose, chaff dark brown, copious. Flowering Jan.–Jun.; fruit persisting 1–3 years.

Tas. (TSE); endemic. An extremely rare species that is known only to occur naturally in two small, isolated populations. One at Government Hills, just above the eastern shore of the River Derwent, and another a little farther to the south, just north of Cremorne, in dry, open woodland on mudstones and sandy loams, with a sparse understorey; from sea level to c. 100 m elevation. Listed as Endangered under the *Tasmanian Threatened Species Protection Act 1995*.

An ornamental species; fairly widely planted as an avenue and specimen tree. Other ornamental and conservation plantings have also been made in the south of the state and some in the north, e.g. at Launceston. Unfortunately, the foliage is often badly damaged by leaf-chewing insect larvae.

## 20 *Eucalyptus viminalis* Labill., *Nov. Holl. Pl.* 2: 12 t. 151 (1806)

*White Gum, Ribbon Gum*

*Eucalyptus angustifolia* Link, *Enum. Hort. Berol. Alt.* 2: 30 (1822). *Eucalyptus viminalis* var. *rhynochocorys* Maiden, *Forest Fl. N.S.W.* 7: 131 (1920).

*Illustrations:* Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 213, fig. 55a-d (1975).

Medium to very large trees, 10–90 m high; lignotuber developed, usually with vigorous coppicing ability. Trunks of larger trees sometimes buttressed; branches usually even and well formed, often steeply angled, but sometimes widely spreading. Bark persistent at the base for various extent, decorticating above in thin ribbons which are often retained in the crown, exposing a clean white-cream surface, variously streaked with grey or tan older patches; younger branches often reddish, often conspicuously glandular-verrucose. Crown often bright green, contrasting strongly with the white branches, slender branches pendulous. Juvenile leaves opposite for many pairs, sessile to very shortly petiolate; lamina green,  $\pm$  glossy, often reddish when young, slightly discolourous, texture soft, 4–9 cm long, 1.5–3 cm wide, lanceolate, often curved horizontally, the pair lunate, base rounded, cordate to amplexicaul, margin reddish, slightly uneven, veins visible, apex acute to acuminate. Adult leaves  $\pm$  pendulous alternate, petiolate; petioles papillose, angular, 10–20 mm long; lamina green, shining, concolorous, thin or  $\pm$  coriaceous, (8–)10–15(–20) cm long, 1–2.5(–3) cm wide, lanceolate, often strongly falcate, base narrowed or rounded, margins thickened, intramarginal vein c. 1 mm from margin, lateral veins distinct, from 30°–50° from mid-vein, apex acuminate. Inflorescences axillary, 3-flowered; peduncle angular, 3–5 mm long. Buds, green, ovoid-cylindrical to diamond-shaped, 5–8 mm long, to 3(–4) mm wide, subsessile or shortly pedicellate; operculum conical, as long as or

slightly longer than the hypanthium, scar visible. Stamens irregularly flexed, all fertile. Mature fruit green to grey-brown, hemispheric-turbinate to subglobular, 5–8 mm long, 5–8 mm wide, disc broad, convex, ascending, valves erect, exerted,  $\pm$  spreading. Seed heterogeneous, fertile seed black, flattened, ellipsoidal, lacunose, chaff reddish-brown, copious. Flowering Nov.–May; fruit persisting 2(–3) years.

Tas. (all regions except MIS); also SA, Qld, NSW, Vic. Widespread and frequent in open forests and woodlands, from coastal dunes to inland plains, slopes and foothills, from sea level to c. 600 m elevation. Sometimes forms small, pure stands, but is often in association with other *Eucalyptus* species, particularly those of subgenus *Monocalyptus*. Intergrades with *E. dalrympleana* subsp. *dalrympleana* at higher elevations, and with *E. rubida* subsp. *rubida* in colder, drier inland situations. This species is an important food source for a very rare, endemic bird, the forty-spotted pardalote, *Pardalotus quadragintus*. They feed on the sugary secretions (manna), of lerps, and other insects, as well as using the trees as nesting sites. They are virtually dependent on this particular species of *Eucalyptus*.

Four subspecies are recognised, two of which occur in Tasmania, one of them endemic. The subspecies not occurring in Tasmania are *E. viminalis* subsp. *cygnetensis* Boomsma (SA, Vic.) and *E. viminalis* subsp. *pryoriana* (L.A.S.Johnson) Brooker, Conners & Slee (Vic.).

Possible hybrid records; *E. viminalis* subsp. *viminalis*  $\times$  *E. globulus* (possibly named *E. viminalis* var. *macrocarpa* and *E. unialata*, see Rodway (1903) and Chippendale (1988); *E. viminalis* subsp. *viminalis*  $\times$  *E. ovata* var. *ovata*; *E. viminalis* subsp. *viminalis*  $\times$  *E. dalrympleana* subsp. *dalrympleana*.

- |  |                              |
|--|------------------------------|
| 1. Medium to large trees, (5–)10–90 m high; trunk usually with a little rough, scaly bark at the base; juvenile leaves narrow-lanceolate, thin, soft, base usually cordate-amplexicaul; buds/fruit 3; (widespread, absent from West Coast) | 20a subsp. <i>viminalis</i>  |
| 1: Small trees, 4–8(–10) m high; bark rough, hard, flaking, persistent on much of lower trunk; juvenile leaves broad-lanceolate to ovate, thick, coriaceous, base rounded; buds/fruit usually 7 (West Coast only)                          | 20b subsp. <i>hentyensis</i> |

### 20a *Eucalyptus viminalis* Labill. subsp. *viminalis*

*White Gum, Ribbon Gum*

*Illustrations*: Chippendale, *Fl. Australia* 19: 363, fig. 96i-j (1988); Brooker & Slee, *Fl. Victoria* 3: 980 fig. 200a (1996); Hill, *Fl. New South Wales* 2, rev. ed.: 133 fig. 99 (2002); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 197 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 131 (2006); Wapstra et al., *Tasmanian Plant Names Unravelling* 199 (2010).

Medium to tall trees (5–)10–90 m high; young stems conspicuously glandular-verrucose; terminal branchlets often quite pendulous. Bark decorticating throughout or with a little rough bark at the very base. Juvenile leaves lanceolate, 4–9 cm long, 1.5–3 cm wide, texture soft, base cordate to amplexicaul. Adult leaves: lamina (8–)10–15(–20) cm long, 1–2.5(–3) cm wide, subcoriaceous. Buds/fruit usually in umbels of 3, or less by abortion.

Tas. (all regions except MIS & TWE); also SA, Qld, NSW, Vic. Widespread and frequent, from sea level to c. 600 m elevation. A population of *E. viminalis* subsp. *viminalis* in the Evercreech Forest Reserve in north-eastern Tasmania, contains trees (the “White Knights”), which have been measured to heights in excess of 80 m. These trees almost rival *E. regnans* as the tallest in the genus and the tallest flowering plants in the world.

Hybrids recorded: *E. viminalis* subsp. *viminalis*  $\times$  *E. dalrympleana* subsp. *dalrympleana*; *E. viminalis* subsp. *viminalis*  $\times$  *E. ovata* var. *ovata*; *E. viminalis* subsp. *viminalis*  $\times$  *E. rubida* subsp. *rubida*.

### 20b *Eucalyptus viminalis* subsp. *hentyensis* Brooker & Slee, *J. Adelaide Bot. Gard.*, 21: 92 (2007)

*Henty River White Gum*

*Eucalyptus viminalis* subsp. *hentyensis* Brooker & Slee, *EUCLID Eucalypts of southern Australia*, ed. 2 (2002) [CD-ROM], *nom. inval.*

Small trees 4–8(–10) m high; young stems smooth to slightly glandular. Bark persistent on lower trunk, sometimes to the lower branches. Juvenile leaves broad-lanceolate to broad ovate-lanceolate, 5–8(–10) cm long, 2–3.5(–5.5) cm wide texture coriaceous, base rounded. Adult leaves: lamina (8–)10–15(–20) cm long, 2–3(–4.5) cm wide, texture coriaceous. Buds/fruit usually in umbels of 7, or less by abortion.

Tas. (TWE); endemic. Confined to the Henty River and Henty Dunes area, north of Macquarie Harbour, on the central Tasmanian west coast. Scattered along the lower reaches of the river and in mobile sand dunes just inland from the coast. A subspecies of doubtful distinction. Some trees have more extensive rough bark retention, larger and coarser juvenile leaves, and buds/fruits in clusters of 7 rather than 3.

**21 *Eucalyptus rubida*** Deane & Maiden, *Proc. Linn. Soc. New South Wales* (1899), subsp. ***rubida***

Candlebark

*Eucalyptus gunnii* var. *rubida* (H.Deane & Maiden) Maiden, *Proc. Lin. Soc. New South Wales Ser. 2*, 27: 561 (1902). *Eucalyptus rubida* subsp. *septemflora* L.A.S.Johnson & K.D.Hill, *Telopea* 4(2): 239 (1991).

*Illustrations*: Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 213, fig. 55b (1975) [as *E. rubida*]; Chippendale, *Fl. Australia* 19: 369, fig. 97e-f (1988) [as *E. rubida*]; Brooker & Slee, *Fl. Victoria* 3: 980, fig. 200e (1996); Hill, *Fl. New South Wales* 2, rev. ed.: 133, fig. 101 (2002); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 202 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 123 (2006); Wapstra et al., *Tasmanian Plant Names Unravelling* 197 (2010).

Tree 10–40 m high; lignotuber developed, coppicing ability moderate; branches erect to widely spreading, young stems sub-glaucous, becoming reddish, moderately papillose. Bark persistent at the base, grey-black, scaly, hard, remainder of trunk and branches smooth, decorticating in large patches or short ribbons, whitish, powdery with tan to grey patches or, seasonally, rich salmon pink to dark crimson, often with insect 'scribbles'. Crown greyish to dull green, sometimes the new leaves with a seasonally reddish hue, moderately dense, contrasting strongly with the white branches. Juvenile leaves opposite for many pairs, sessile; lamina glaucous, bluish-grey, concolorous, texture soft, 2–4.5 cm long and wide, orbicular to broadly elliptic, base amplexicaul, margins crenate, often red, apex emarginate or shortly apiculate. Adult leaves alternate, petiolate; petioles reddish, minutely papillose, terete, 5–15 mm long; lamina dull grey-glaucous to dark green, or sometimes ± glossy, concolorous (8–)10–15(–18) cm long, (1–)2.5–3 cm wide, lanceolate to narrow-lanceolate, falcate, base rounded or narrowed, margins slightly thickened, intramarginal vein 1–2 mm from margin, lateral veins visible, at 30°–45° from mid-vein, apex acute to acuminate. Inflorescences axillary, 3-flowered; peduncle 3–6 mm long, flattened. Buds often glaucous, ovoid-cylindrical to diamond-shaped, 4–8 mm long, 2–4 mm wide, sessile or pedicels to 3 mm long; operculum conical, as long as or a little longer than the hypanthium, scar visible. Stamens irregularly flexed, all fertile. Mature fruit greyish-brown, ± glaucous at first, hemispheric-turbinate to subglobular, 4–6 mm long and wide, disc broad, convex, ascending, valves erect, exerted ± spreading. Seed heterogeneous, fertile seed black, ellipsoidal, chaff reddish-brown, copious. Flowering Oct.–Feb.; fruit persisting 1–3 years.

Tas. (BEL, TCH, TSE, TSR,); also NSW, Vic. Sparsely distributed, generally on poor soils in inland eastern, south-eastern and north-eastern regions, usually in areas of low rainfall and high frost incidence, at c. 200–500 m elevation. Generally forms open woodlands of dry sclerophyll communities, with a sparse, shrubby or grassy-sedgy understorey, and is often subdominant to some species of subgenus *Monocalyptus*. Intergrades with and replaces *E. viminalis* subsp. *viminalis* on colder, drier sites and *E. dalrympleana* subsp. *dalrympleana* on more elevated sites further inland.

*Eucalyptus rubida* subsp. *barbigerorum* L.A.S.Johnson & K.D.Hill is found in northern New South Wales and differs from subsp. *rubida* in the rather more elliptical juvenile foliage and the retention of a dark, thick stocking bark.

Hybrids recorded: *E. rubida* subsp. *rubida* × *E. viminalis* subsp. *viminalis*; *E. rubida* subsp. *rubida* × *E. dalrympleana* subsp. *dalrympleana*.

**22 *Eucalyptus dalrympleana* Maiden, *Forest Fl. N.S.W.* 7: 137 (1920), subsp. *dalrympleana****Mountain White Gum*

*Illustrations* (sometimes as *E. dalrympleana*): Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 213, fig. 55c (1975); Chippendale, *Fl. Australia* 19: 369, fig. 97a-b (1988); Brooker & Slee, *Fl. Victoria* 3: 980 fig. 200d (1996) [as *E. dalrympleana*]; Hill, *Fl. New South Wales* 2, rev. ed.: 133 fig. 100 (2002); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 201 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 129 (2006).

Medium to large tree, 10–30(–45) m high; lignotuber developed, with vigorous coppicing ability. Trunk often buttressed; branches usually large, uneven, steeply angled or spreading in open-grown trees. Bark persistent only near the base, grey-black, hard, brittle, often diagonally fissured, remainder smooth throughout, decorticating in large flakes or long strips and ribbons, exposing a white-cream surface variably streaked with grey to pinkish or tan, or dull bronze patches; younger stems reddish, non-glaucous, glandular-verrucose. Crown mostly sparse, often disproportionately small or reduced in larger trees due to wind or snow damage. Juvenile leaves opposite, sessile to very shortly petiolate; lamina dull, pale bluish-green, concolorous, texture moderately thin, 3–6(–8) cm long, 3–6 cm wide, orbicular to elliptical-ovate, base rounded or amplexicaul, margin uneven, slightly undulate, apex acute to apiculate. Adult leaves alternate, petiolate; petioles 10–15(–30) mm long, flattened, channelled above; lamina green, dull to glossy, concolorous, coriaceous, often conspicuously sinuate-undulate, 10–15(–18) cm long, 1.5–2.5(–3.5) cm wide, lanceolate to falcate-lanceolate, base narrowed, margin thickened, intramarginal vein up to 1 mm from margin, lateral veins at 45°–55° from mid-vein, apex acuminate. Inflorescences axillary, 3-flowered; peduncle angular, flattened, 3–5(–8) mm long. Buds green to yellow, ovoid to diamond-shaped, (5–)8–12 mm long, 4–6 mm wide, sessile or shortly pedicellate; operculum conical to subrostrate, as long as the hypanthium, scar visible. Stamens irregularly flexed, all fertile. Mature fruit grey-green to brown, hemispherical to ovoid-cylindrical, 6–10 mm long, 6–8(–10) mm wide, disc narrow, convex-slightly ascending, valves 3–4, suberect, exserted. Seed heterogeneous, fertile seed black, flattened-ellipsoidal, lacunose, chaff dark brown, copious. Flowering Feb.–May; fruit persisting 2–5 years.

Tas. (BEL, TCH, TNM, TNS, TSE, TSR); also SA, NSW, Vic. Widespread and frequent on the Central Plateau, eastern and north-eastern tiers, at c. 450–850 m elevation, normally on moist but well-drained rocky slopes. Usually a subdominant tree in association with *E. delegatensis* subsp. *tasmaniensis* and *E. pauciflora* subsp. *pauciflora* in submontane wet forests and shrubby wet to dry sclerophyll woodlands, intergrading with and replacing *E. viminalis* subsp. *viminalis* in these cooler, moister environments and, similarly, replaced by *E. rubida* subsp. *rubida* in more lowland, colder, drier environments.

The distinctions between variants of each of the three species are not always clear, in particular, between *E. dalrympleana* subsp. *dalrympleana* and *E. viminalis* subsp. *viminalis*. The term 'vim-dal' is often informally applied to some of these indeterminate variants. Some variations apparent between Tasmanian populations and those from mainland Australia require critical evaluation. *Eucalyptus dalrympleana* subsp. *heptantha* L.A.S.Johnson occurs on the northern tablelands of New South Wales and differs in having 7-flowered inflorescences.

Hybrids recorded: *E. dalrympleana* subsp. *dalrympleana* × *E. viminalis* subsp. *viminalis*; *E. dalrympleana* subsp. *dalrympleana* × *E. rubida* subsp. *rubida*; *E. dalrympleana* subsp. *dalrympleana* × *E. gunnii* subsp. *gunnii* (= *E. irbyi* Baker & Smith).

**23 *Eucalyptus ovata* Labill., *Nov. Holl. Pl.* 2: 13 (1806), var. *ovata****Swamp Gum* (N Tas.), *Black Gum* (S Tas.)

*Eucalyptus stuartiana* F.Muell. ex Miq., *Ned. Kruidk. Arch.* 44(1): 131 (1856). *Eucalyptus stuartiana* var. *longifolia* Benth., *Fl. Austral.* 3: 44 (1867). *Eucalyptus muelleri* Naudin, *Rev. Hort. [Paris]* 57: 406 (1885), *nom. illeg.* *Eucalyptus paludosa* R.T.Baker, *Proc. Lin. Soc. New South Wales Ser. 2* 23: 167, t. vi (1898). *Eucalyptus gunnii* var. *ovata* (Labill.) H.Deane & Maiden, *Proc. Lin. Soc. New South Wales Ser. 2* 26: 136 (1901), *nom. illeg.* *Eucalyptus acervula sensu* J.D.Hooker, *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 135 (1856); L.Rodway, *Tasman. Fl.* 57 (1903), *non* Sieber ex DC. (1828).

*Illustrations:* Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 212, fig. 54a-b (1975) [as *E. ovata*]; Chippendale, *Fl. Australia* 19: 335, fig. 92q-r (1988); Jeanes, *Fl. Victoria* 3: 1000 fig. 204c (1996); Hill, *Fl. New South Wales* 2, rev. ed.: 121 fig. 48 (2002); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 130 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 57 (2006); Wapstra et al., *Tasmanian Plant Names Unravelling* 194 (2010).

Small to medium trees, often straggling and of poor form, 10–20 m high, but some forms large and well formed and up to 45 m high. Trunks of larger trees sometimes buttressed, often divided into a number of main axes; lignotuber small, coppicing readily following damage; branches often crooked and uneven, spreading to suberect. Bark variously decorticating, rough, hard, scaly or subfibrous, persistent at the base or sometimes extending to the major branches, shed in strips and short ribbons, leaving a smooth cream and grey-green to dull olive surface; younger branches grey-green, not glaucous. Crown dark green, glossy, sparse to moderately dense, uneven, sometimes “untidy”. Juvenile leaves opposite only for a few pairs then becoming alternate, shortly petiolate; lamina dull green, reddish when new, slightly discolourous, texture becoming coriaceous, 4–8(–10) cm long, 4–8 cm wide but sometimes up to 15 cm long and 8 cm wide, ovate or elliptical to almost orbicular, base rounded, margins thin, apex rounded or apiculate. Adult leaves alternate, petiolate; petioles glandular, flattened, channelled above, 10–30 mm long; lamina dark green, subglossy, concolorous, coriaceous, 8–10(–15) cm long, 2–3(–4) cm wide, elliptic, ovate to broadly lanceolate, rarely subfalcate, base long-narrowed, margin slightly thickened, intramarginal vein c. 2 mm from margin, lateral veins at 25°–35° from mid-vein, apex acute or acuminate. Inflorescences axillary, 7-flowered; peduncle terete, 5–15 mm long. Buds green, diamond-shaped, 5–10 mm long, to 4 mm wide; pedicels to 5 mm long; operculum conical or almost rostrate, as long as or slightly shorter than the hypanthium, scar visible. Stamens irregularly flexed, all fertile. Mature fruit green, to grey-brown, obconical or turbinate-truncate, 5–9 mm long, 5–8 mm wide, disc narrow, ± level or slightly convex-ascending, valves 3–4, level, or tips slightly raised. Seed heterogeneous, fertile seed grey-black, ellipsoidal, lacunose, chaff light brown, copious. Flowering Jun.–Feb.; fruit persisting 3–5 years.

Tas. (all regions except MIS); also SA, NSW, Vic. Widespread and common throughout the state, less so in the west and south-west; from sea level to c. 650 m elevation. Found on a variety of soils, from well drained sands to poorly drained, often water-logged clay soils, in sclerophyll forests and open woodlands, usually with an open, shrubby or grassy-sedgy understorey.

The other variety, *E. ovata* var. *grandiflora* Maiden, has larger leaves, buds and fruit than var. *ovata* and is confined to the southern coastal border areas of South Australia and Victoria.

Hybrids recorded: *E. ovata* var. *ovata* × *E. globulus*; *E. ovata* var. *ovata* × *E. viminalis* subsp. *viminalis*; *E. ovata* var. *ovata* × *E. barberi*; *E. ovata* var. *ovata* × *E. brookeriana*.

#### **24 *Eucalyptus barberi*** L.Johnson & Blaxell, *Contr. New South Wales Natl Herb.* 4 288 (1972)

##### *Barber's Gum*

*Illustrations:* Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 212, fig. 54c-e (1975); Stones & Curtis, *The Endemic Flora of Tasmania* 6: t. 125, No. 208 (1978); Chippendale, *Fl. Australia* 19: 343, fig. 93c-d (1988); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 135 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 65 (2006).

Small, poorly formed, straggling trees or many-stemmed mallees, 2–5(–8) m high; lignotuber strongly developed and extensive, coppicing vigorously; branches few, slender, sometimes crooked and uneven, spreading. Bark decorticating throughout in irregular flakes and small ribbons, exposed surfaces creamy-white to grey-tan rarely dull olive green; young stems reddish, glandular-verrucose. Crown dark green, very sparse, open. Juvenile leaves opposite, shortly petiolate; lamina green, sometimes with a white bloom, especially around the margins and along the major veins, later ± glossy, discolourous, texture ± coriaceous, 4–10 cm long, 1.5–2.5 cm wide, narrow-oblong or elliptic to elliptic-lanceolate, base rounded or slightly narrowed, margin irregularly subcrenate, apex acute or apiculate. Adult leaves alternate, lanceolate, petiolate; petioles reddish, glandular-verrucose, flattened, 1.5–2.5 cm long; lamina green, dull or glossy, concolorous, cori-

aceous, 7–10(–15) cm long, 1.5–3 cm wide, lanceolate to elliptic-lanceolate, slightly falcate, base narrowed, margins thick, sometimes obscurely crenate, intramarginal vein 0.5–1 mm from margin, lateral veins at 45°–50° from mid-vein, apex acute-acuminate. Inflorescences axillary, (3)–7-flowered; peduncle slightly flattened, 1–1.5 mm long. Buds greenish-yellow, broadly diamond-shaped to rhomboidal-obovoid, 0.5–10 mm long, to 7.5 mm wide; pedicels 3–5 mm long; operculum hemispheric to conical, often rostrate, as long as or a little shorter than the hypanthium, scar visible. Stamens irregularly flexed, all fertile. Mature fruit green or reddish-brown, 6–9 mm long, 5–8 mm wide, obconical or cylindrical-truncate or somewhat suburceolate, disc narrow, convex to descending, valves 3–4 enclosed, tips erect, level with rim. Seed heterogeneous, fertile seed black, flattened-ellipsoidal, chaff dark brown, copious. Flowering Mar.–Sep.; fruit persisting 3–5 years.

Tas. (TSE); endemic. Forming small, disjunct populations on the hills of the central east coast, between the Douglas River and Orford, at c. 150–500 m elevation. Usually on dry, dolerite hills and insolated rocky slopes and ridges, with an open, shrubby-sedgy understorey.

Hybrid recorded: *E. barberi* × *E. ovata* var. *ovata*.

## 25 *Eucalyptus brookeriana* A.M.Gray, *Austral. Forest Res.* 9: 111 (1979) [as *E. brookerana*]

*Brooker's Gum*

*Illustrations:* Chippendale, *Fl. Australia* 19: 343, fig. 93a-b (1988); Brooker & Slee, *Fl. Victoria* 3: 963, fig. 196ac (1996); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 128 (1983); Nicolle, *Eucalypts of Victoria and Tasmania* 63 (2006).

Medium to tall tree, 10–45 m high; lignotuber not strongly developed and with only moderate coppicing ability. Trunk sometimes buttressed in larger trees; branches not large but even and well-formed, spreading, but sometimes steeply erect. Bark persistent at the base for 1–5 m, scaly, fissured or sometimes tessellated, decorticating in long flakes and ribbons, exposing a creamy-grey, to dull orange-bronze or olive-green surface; younger stems glandular-verrucose. Crown usually dark green, shining, newer leaves imparting a 'coppery' hue, canopy dense but rather open inside, sometimes extending to within a metre of the ground. Juvenile leaves opposite, shortly petiolate; lamina bright green, glossy, usually strongly discolorous, with distinctive oil glands, texture soft, 2–6(–8) cm long, 2–5(–7) cm wide, ovate to orbicular, margin strongly crenate, apex emarginate to apiculate. Adult leaves alternate, petiolate; petioles 1–2.5 cm long, angular-terete, glandular-verrucose; lamina dark green, glossy, discolorous, texture rather thin, oil glands conspicuous, 6–8(–10) cm long, 2–5 cm wide, broadly ovate-lanceolate, base shortly narrowed or ± rounded, margins not thickened, weakly to strongly crenate to sub-bicrenate, intramarginal vein up to 5 mm from margin, lateral veins prominent, 30°–50° from mid-vein, apex acute or apiculate. Inflorescences axillary, 7-flowered; peduncle angular, 5–12 mm long. Buds green, slightly warty, diamond-shaped to ovoid, 5–10 mm long, 3–5 mm wide; pedicels 2–5 mm long; operculum hemispherical to conical, rounded or umbonate, as long as or slightly shorter than the hypanthium, scar visible. Stamens inflexed, all fertile. Mature fruit green to grey, obconical to almost hemispheric or campanulate, 5–8 mm long, 5–7 mm wide; disc narrow, convex, slightly descending; valves enclosed, tips erect, exerted. Seed heterogeneous; fertile seed brown-black, flattened, ellipsoidal; chaff light brown, copious. Flowering Aug.–Dec.; Feb.–Mar.; fruit persisting 1–3 years.

Tas. (BEL, KIN, TCH, TNS, TSE, TSR, TWE); also Vic. Widespread but scattered in the Eastern Tiers and in the far north-west, and in scattered localities in central and western districts, generally occupying ridges and slopes in upper watersheds of river valleys at c. 100–250 m elevation in the west, and 200–700 m in the east. Usually on well-drained rocky soils with wet forest species or shrubby sclerophyll woodland.

A number of features are helpful in separating *E. brookeriana* from *E. ovata*: The leaves of *E. brookeriana* are usually distinctly ovate, thin in texture, and with the margins shallowly crenulated; as well, oil glands are conspicuous when the leaf is held up to the light. The mature fruit is ± campanulate rather than obconic and the disc narrow but convex and the valves are distinctly exerted, whereas in *E. ovata* the disc tends to be level and the valves retracted rather than exerted. The species requires further field study to more accur-



ately define its distribution and distinction, particularly in context with the closely related species *E. ovata* in areas where the two taxa are sympatric.

Hybrid recorded: *E. brookeriana* × *E. ovata* var. *ovata*.

**26 *Eucalyptus rodwayi*** R.Baker & H.G.Smith, *Pap. & Proc. Roy. Soc. Tasmania* 191 (1912)

*Swamp Peppermint*

*Eucalyptus aggregata* sensu W.M.Curtis, *The Student's Flora of Tasmania* 1: 209 (1956), non Deane & Maiden (1900).

*Illustrations:* Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 212, fig. 54f-g (1975); Stones & Curtis, *The Endemic Flora of Tasmania* 6: t. 136, No. 224 (1978); Chippendale, *Fl. Australia* 19: 343, fig. 93g-h (1988); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 138 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 71 (2006).

Small to medium trees, 10–30 m high; lignotuber usually well developed, coppicing ability good. Trunk not buttressed; branches large, spreading and often from half the height of the tree, or few, slender, and steeply angled. Bark grey-black, rough, hard, regularly and narrowly fissured, persistent to the tertiary branches where scaly and brittle, or, rarely, the younger branches smooth, creamy-white, ribbony. Crown dark green, moderately dense, even. Juvenile leaves opposite shortly petiolate; lamina dark green, glossy, discolorous, moderately thick, 3–5(–8) cm long, 1.5–2 cm wide, narrowly ovate to elliptic-lanceolate, base narrowed, margin irregular, apex acute or apiculate. Adult leaves alternate, petiolate; petioles papillose, flattened, 5–15 mm long; lamina green, dull to ± glossy, concolorous, coriaceous, 6–12(–15) cm long, 1–2 cm wide, elliptic to elliptic-lanceolate, base narrowed, margins slightly thickened, intramarginal vein faint, c. 0.5–1 mm from margin, lateral veins very faint, at 25°–40° from mid-vein, apex acuminate. Inflorescences axillary, 7-flowered; peduncle terete or slightly angular, 2–5 mm long. Buds green, diamond-shaped to ovoid, 2.5–3.5(–5) mm long, 1.5–3.5 mm wide; pedicels 1.5–3 mm long; operculum conical, c. ½ as long as the hypanthium, faint scar visible. Stamens irregularly inflexed, all fertile. Mature fruit grey, hemispheric-obconic, 3–4.5 mm long, 3–4.5 mm wide, disc narrow, slightly convex, valves 3–4, almost level, tips exerted. Seed heterogeneous, fertile seed brown-black, flattened, ellipsoidal, lacunose, chaff dark brown scanty. Flowering Nov.–Jun.; fruit persisting 3–5 years.

Tas. (all regions except KIN, MIS); endemic. Widespread on the Central Plateau, the Eastern Tiers and in the south-east, occasional in the north and north-east, from sea level to c. 1000 m elevation. Commonly on plains, hollows and seasonal wetlands subject to cold air pooling; able to tolerate waterlogging and poorly aerated, heavy soils, usually with an open, low-shrubby understorey, sedgeland or *Poa* grassland.

Hybrid recorded: *Eucalyptus rodwayi* × *E. perriniana*.

**27 \* *Eucalyptus nitens*** (H.Deane & Maiden) Maiden, *Crit. Rev. Eucalyptus* 2:272 (1913)

*Shining Gum*

*Eucalyptus goniocalyx* var. *nitens* H.Deane & Maiden, *Proc. Linn. Soc. New South Wales* 24: 463 (1899).

*Illustrations:* Chippendale, *Fl. Australia* 19: 350 fig. 95c,d (1988); Brooker & Slee, *Fl. Victoria* 3: 976 fig. 199e (1996); Hill, *Fl. New South Wales* 2, rev. ed.: 128 (2002); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3:188 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 153 (2006).

Medium to very tall trees, 40–50(–80) m high; lignotuber development unknown, coppicing ability minimal. Trunk usually straight, larger trees sometimes buttressed; occasionally branched from near the base; branches often large, suberect to spreading in open-grown trees. Bark often persistent at the base for c. 1–3 m, dark grey-brown and usually rough, scaly-ribbony, remainder of trunk decorticating in short strips or long ribbons, exposing a smooth surface, with elongated, grey or greenish to cream-white, patches. Seedling stems and younger branches acutely 4-angled. Crown dark green, shining, sparse to moderately dense. Juvenile leaves opposite, sessile, often ± distichous; lamina pale bluish-grey, glaucous, slightly discolorous,

texture ± soft, oil glands not visible, 7–12(–17) cm long, 4–6(–8) cm wide, oblong to broadly ovate-lanceolate, base cordate, usually amplexicaul, margin slightly undulate, apex acute to acuminate. Adult leaves alternate, petiolate; petioles ± glandular, flattened, channelled above, 10–30 cm long; lamina dark green, very glossy, concolorous, coriaceous, oil glands sparse, obscure, 12–15(–25) cm long, 1.5–2.5(–3.5+) cm wide, narrowly to broadly lanceolate, falcate, base attenuated, margin slightly thickened, intramarginal vein 2–3.5 mm from margin, lateral veins distinct, at 30°–50° from mid-vein, apex acuminate. Inflorescences axillary, 7-flowered; peduncle thick, terete or ± ligulate, 10–12 mm long, expanded immediately below the insertion of the buds. Buds sessile, green, glandular, at first closely crowded and often enclosed with a persistent envelope of coalesced bracts, ovoid, angular, in-curved, 5–7 mm long, c. 3 mm wide; operculum conical, c. ½ as long as the hypanthium, scar distinct. Stamens inflexed, all fertile. Mature fruit pale brown, shining, cylindrical to ovoid or fusiform, 4–7 mm long, 4–6 mm wide, disc narrow, descending, valves 3(–4), enclosed, tips erect, level with rim or slightly exserted. Seed heterogeneous, fertile seed black, flattened, ellipsoid, shallowly lacunose, chaff dark brown, copious. Flowering Jan.–Mar. (Vic. & NSW records); fruit persisting for 3–5 (?) years.

Tas. (BEL, KIN°, FLI°, TNM°, TNS°, TCH°, TSE, TSR°, TWE°); native in Victoria and New South Wales, chiefly in tall, moist, open forests on good soils, on the higher, eastern parts of the Great Dividing Range and tablelands of NSW; also in several disjunct highland areas in the Dorrigo and Barrington Tops areas. In Victoria it is scattered from north of Healesville to the Mt. Baw Baw area and the higher hills and tablelands on either side of the SE Vic.-NSW border; from 600–1500 m elevation.

Introduced in Tasmania. A very important, fast-growing, commercial species for saw-log and veneer industries as well as for wood-pulp. Extensively cultivated in large plantations in Vic., NSW and in suitable areas in other states. Plantations have also been established in suitable climatic regions in many other parts of the world, for example South Africa, New Zealand, South America and parts of Europe. Although a widespread plantation tree, the species has not escaped cultivation to a very great extent. Sporadic seedlings and small trees have been noted at the perimeters of older plantations, wherein the trees have developed to reproductive age. As well, natural regeneration has been noted in disturbed ground following the harvesting of mature plantations. It is not known to be invasive in undisturbed natural forest adjacent to plantations, however, extensive hybridisation between plantation-grown *E. nitens* and native species has been documented by Barbour *et al.* (2006).

In overall appearance, *E. nitens* is superficially very similar to *E. globulus*, however, in mature specimens the two are readily distinguished by their very different buds and fruit. In the sapling stage, the 'juvenile' leaves of *E. globulus* are nearly always distinctly opposite and decussate, whereas in *E. nitens* they are opposite and frequently ± distichous, due to twisting of the internodes between the pairs.

Hybrids recorded: *E. globulus* × *E. nitens*, *E. nitens* × *E. ovata*.

## 28 *Eucalyptus johnstonii* Maiden, *Crit. Rev. Eucalyptus* 6: 280 (1922)

*Yellow Gum*

*Eucalyptus muelleri* T.B.Moore, *Pap. & Proc. Roy. Soc. Tasmania* 208 (1887). *Eucalyptus johnstoni* Maiden, *Crit. Rev. Eucalyptus*, 6(6): 280 (1922), *orth. var.*

*Illustrations*: Stones & Curtis, *The Endemic Flora of Tasmania* 4: t. 93, No. 156 (1973); Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 216, fig. 56g-j (1975); Chippendale, *Fl. Australia* 19: 363, fig. 96a-b (1988); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 157 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 91 (2006).

Medium to tall trees, 25–50 m high; larger trees moderately buttressed, lignotuber developed, coppicing ability moderate; branches small, often crooked, steeply angled. Bark decorticating throughout except for a little hard, scaly bark at the base, remainder shed in large flakes, strips or short ribbons, exposed bark smooth, often vividly coloured, especially when wet, with shades of yellow, yellow-green, olive-bronze, to pale orange with darker green-grey patches; young stems yellow, sometimes angled and glandular-verrucose. Crown dark green, dense, often conical or sometimes, at high exposures, often uneven and wind or

snow-damaged. Juvenile leaves opposite, sessile or very shortly petiolate; lamina bright green, glossy, slightly discolourous, texture  $\pm$  soft, oil glands visible, 2.5–6 cm long, 2.5–5 cm wide, orbicular to broadly ovate, base cordate to amplexicaul, margin subcrenulate, apex rounded, apiculate or emarginate. Adult leaves alternate, petiolate; petioles glandular, flattened, channelled above, 1.3–3 cm long; lamina dark green, very glossy, concolorous, thickly coriaceous, 7–12(–15) cm long, 1.5–3(–5) cm wide, broad-ovate to broad lanceolate-subfalcate, base long-narrowed, margin thickened, strongly crenate-sub-bicrenate, intramarginal vein 2–4 mm from margin, lateral veins faint, at 20°–40° from mid-vein, apex acuminate. Inflorescences axillary, 3-flowered; peduncle thick, angular, 3–5 mm long, expanded just below the insertion of the buds. Buds green or dark red, rugose, 2-ribbed, ovoid to diamond-shaped, 5–10 mm long, 3–8 mm wide, crowded, sessile; operculum hemispherical, rugose, conical-umbonate, c.  $\frac{1}{2}$  as long as the hypanthium, scar distinct, prominent. Stamens inflexed, all fertile. Mature fruit green-grey, hemispheric-campanulate to obconic, (5–)8–12 mm long, 8–12(–15) mm wide, often prominently 2-ribbed, disc moderately broad, convex, valves (3–)4, slightly enclosed, tips erect, exerted. Seed heterogeneous, fertile seed black, flattened, ellipsoidal, lacunose, chaff reddish, scanty. Flowering Dec.–May; fruit persisting 3–5 years.

Tas. (TCH, TSE, TSR); endemic. Common in submontane situations in the south-east of the state and extending to the southern Central Plateau, south Bruny Island and the Tasman and Forestier Peninsulas, at c. 500–1000 m elevation. Associated with poorly drained sediments, often underlying dolerite talus or solifluction deposits. Usually in tall, wet forests, and often subdominant with *E. delegatensis* subsp. *tasmaniensis*, *E. urnigera* and, at the upper limits, *E. coccifera*. Jackson (1960) considered *E. johnstonii* to be one 'end' of a geographical clinal continuum associated with an increase in elevation and exposure. Other species included in this clinal range are *E. subcrenulata* and, at the extreme, *E. vernicosa*.

Hybrids recorded: *E. johnstonii*  $\times$  *E. globulus*; *E. johnstonii*  $\times$  *E. urnigera*; *E. globulus* subsp. *globulus*  $\times$  *E. johnstonii*  $\times$  *E. urnigera* (possibly = *E. biangularis* Simmonds).

## 29 *Eucalyptus subcrenulata* Maiden & Blakely, *Crit. Rev. Eucalyptus* 8: 59 (1929)

*Alpine Yellow Gum*

*Illustrations:* Stones & Curtis, *The Endemic Flora of Tasmania* 5: t. 93, No. 185 (1975); Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 221, fig. 58a-c (1975); Chippendale, *Fl. Australia* 19: 355, fig. 95q-r (1988); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 158 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 89 (2006).

Tall trees or sometimes large mallees, 5–25 m high; lignotubers well developed and coppicing readily; branches rather sparse, spreading, often twisted and crooked in higher elevation forms. Bark rough, hard and scaly at the base, decorticating above in elongated flakes, exposed surfaces smooth, often vividly coloured, especially when wet, with yellow to green or bronze-orange with green-grey patches; younger stems yellowish, angled, verrucose. Crown dark green, dense, rounded, often uneven and wind or snow-damaged. Juvenile leaves opposite, sessile or shortly petiolate; lamina bright green, glossy, slightly discolourous, texture soft, oil glands visible, 2–5 cm long, 2–4.5 cm wide, orbicular to broadly ovate, base cordate to amplexicaul, margin subcrenulate, apex rounded, apiculate or emarginate. Adult leaves alternate, petiolate; petioles flattened, slightly channelled above, 1–3.5 cm long, flattened, channelled above; lamina dark green, glossy, concolorous, thickly coriaceous, 4–8(–12) cm long, 1.5–3.5 cm wide, broad-elliptic, to elliptic-lanceolate, slightly falcate, base long-narrowed, margin thickened, often strongly subcrenate, intramarginal vein 2–4 mm from margin, lateral veins faint, at 20°–40° from mid-vein, apex acute to acuminate. Inflorescences axillary, 3-flowered; peduncle thick, angular, 2.5–3 mm long, expanded just below the insertion of the buds. Buds dark green, subrugose, sometimes faintly bicostate, diamond-shaped or ovoid to subcylindrical, 3–7 mm long, 2.5–5 mm wide, crowded, sessile; operculum conical-umbonate, subrugose, less than  $\frac{1}{2}$  as long as the hypanthium, scar distinct,  $\pm$  prominent. Stamens inflexed, all fertile. Mature fruit green to grey-green, campanulate to broad-obconic, faintly bicostate, 3.5–7 long, 5–7.5 mm wide, disc moderately broad, convex or level, valves 3(–)4, slightly enclosed, tips erect,  $\pm$  exerted. Seed heterogeneous, fertile seed black, flattened, ellipsoidal, faintly lacunose, chaff reddish, scanty. Flowering Dec.–Apr.; fruit persisting 3–5 + years.

Tas. (TCH, TSE, TSR, TWE); endemic. Widespread and common on the Central and Western Tiers and mountains of the central south-west including the Mt Field plateau and the Hartz Mountains, at c. 500–1200 m elevation, on well drained, rocky dolerite plateaus, slopes and talus, underlain by poorly drained sediments or solifluction deposits.

Forms locally small forests or associated as a subdominant with *E. delegatensis* subsp. *tasmaniensis* at the upper elevation limits of that species, and *E. coccifera* in submontane woodlands and shrubberies.

Jackson (1960) considered *E. subcrenulata* to be the 'mid-range' of a geographic clinal continuum associated with an increase in elevation and exposure. Other species included in this clinal range are *E. johnstonii* and *E. vernicosa*, at either extreme.

### 30 *Eucalyptus vernicosa* Hook., *London J. Bot.* 6: 478 bis (1847)

#### Varnished Gum

*Illustrations:* Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 216, fig. 56f (1975); Stones & Curtis, *The Endemic Flora of Tasmania* 5 t. 117, No. 195 (1975); Chippendale, *Fl. Australia* 19: 355, fig. 95o-p (1988); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 159 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 87 (2006).

Small shrubs usually with a very short, twisted trunk, sometimes almost prostrate or occasionally a mallee to 2 m, to 4 m when sheltered) m high; lignotuber well developed and with strong coppicing ability. Bark brownish-grey, decorticating throughout in small flakes, exposing a yellowish-orange to green-olive surface; branches small, numerous and diffuse, younger stems yellow-green, glandular-verrucose. Crown very dark, glossy green, often very dense, canopy-like and open inside. Juvenile leaves opposite for many pairs, sometimes  $\pm$  decussate, sessile for a few pairs then very shortly petiolate; lamina dark green, glossy, slightly discoloured, coriaceous, 1–3 cm long, 0.5–1.5 cm wide, almost orbicular to broad-elliptic or ovate, base rounded, margin thickened, obscurely crenate, apex rounded acute or apiculate. Adult leaves often crowded, alternate, petiolate; petioles 3–5 mm long thick, angular; lamina dark green, very glossy, concolorous, very thick-coriaceous, (1–)1.5–2(–3.5) cm long, (0.7–)1–1.5(–2.5) cm wide, broad-elliptical to ovate or shortly ovate-lanceolate, base rounded, margin thickened, pale, entire or obscurely crenate, intramarginal vein obscure, remote, mid-vein often prominent and almost keeled abaxially, lateral veins obscure adaxially, faint abaxially, apex acute or apiculate. Inflorescences axillary, often 3-flowered, usually apparently 1-flowered, but often so by abortion of the two lateral buds; peduncle thick, to 3 mm long, angular. Buds dark green, ovoid to rhomboid or fusiform, sometimes  $\pm$  angular, 5–8 mm long, 3–5 mm wide, sessile; operculum conical, almost rostrate, less than  $\frac{1}{2}$  as long as the hypanthium, scar distinct. Stamens inflexed, all fertile. Mature fruit green-grey to brownish, 5–8 mm long, 5–7 mm diameter, campanulate-hemispheric to turbinate, disc moderately wide,  $\pm$  descending, valves 3–4, enclosed, tips erect, occasionally exerted. Seed heterogeneous, very scanty, black, flattened, obscurely lacunose, chaff dark brown, very scanty. Flowering Nov.–Apr.; fruit persisting 1–2 years.

Tas. (TCH, TNM, TSE, TSR, TWE); endemic. Widespread but scattered on higher mountains of the west and south-west at c. 300–1300 m elevation, but occasionally at lower elevations on exposed plateaux and ridges. Usually on acid, moorland peat soils on siliceous rocks (quartzites, schists and conglomerates) or on heavy, wet peat soils associated with dolerite. A common component of low, heathy and dwarf coniferous shrubberies along with a large assemblage of other exposure-tolerant montane species, often well above the tree-line.

Jackson (1960) considered *E. vernicosa* to be one 'end' of a geographic clinal continuum associated with an increase in elevation and exposure. Other species included in this clinal range are *E. subcrenulata* and, at the other extreme, *E. johnstonii*.

*Eucalyptus vernicosa* is possibly the smallest species of eucalypt, capable of reaching sexual maturity while a small shrub < 50 cm tall.

**31 *Eucalyptus globulus* Labill. *Voy. Rech. Perouse* 1: 153, t. 13 (1800)***Tasmanian Blue Gum, Blue Gum**Eucalyptus globulosus* St.-Lag., *Ann. Soc. Bot. Lyon* 7: 125 (1880), *nom illeg.*, *nom. superfl.**Illustrations:* Curtis & Morris, *The Student's Flora of Tasmania* 1, ed. 2: 207, fig. 53a-c (1975).

Small, or medium to very tall trees, (4–)15–40–60 m high; lignotuber developed, with vigorous coppicing ability; branches often massive, either steeply angled, or spreading in open-grown trees. Bark persisting from base to c. 3–5 m, grey-black, hard, brittle, variously fissured, remainder smooth throughout, decorticating in large flakes or long, brittle strips or ribbons, often remaining lodged in the junctions of the larger branches, newly exposed areas dull white-cream to yellowish or greenish-bronze, older areas grey, mottled; younger branches yellow, often angular. Crown usually dense, dark green. Juvenile leaves opposite, decussate, sessile; lamina glaucous, white to blue-grey, concolorous, texture thin, waxy, (5–)8–18 cm long, (2–)5–10 cm wide, oblong to oblong-ovate/lanceolate, base rounded to amplexicaul, margins uneven, somewhat undulate, apex blunt or acuminate. Adult leaves alternate, petiolate; petioles 10–25 cm long, flattened or slightly channelled above; lamina dark green, glossy, concolorous, thickly coriaceous, 15–25(–60) cm long, (1.5–)2.5–4.5 cm wide, falcate lanceolate, base narrowed, margins not noticeably thickened, intramarginal vein 1.5–3 mm from margin, lateral veins at 30°–60° from mid-vein, apex acute to long-acuminate. Inflorescences axillary, 1-, 3- or 7-flowered, sessile or with peduncle to 5 mm long, thick, compressed. Buds often very white/waxy, glaucous, rugulose to strongly rugose, tuberculate, hemispherical, 2- or 4-ribbed, 5–10(–25) mm long, 8–12(–20) mm wide, sessile or shortly pedicellate; operculum flattened, flared and often wider than the hypanthium, hemispherical, conspicuously umbonate, shorter than the hypanthium, scar present, often indented, conspicuous. Stamens inflexed, all fertile. Mature fruit grey-green to brown, subglaucous at first, hemispherical to obconic-turbinate, 15–20 mm long, (8–)10–15(–25) mm wide, disc wide, flattened to convex-ascending, valves 3(–5), level or the tips slightly raised. Seed heterogeneous, fertile seed black, flattened-ellipsoidal, shallowly reticulate, chaff reddish-brown, copious. Flowering Jul.–Jan.; fruit persisting 3–5 years.

Tas. (BEL, FLI, KIN, TCH, TNS, TSE, TSR, TWE); also, Vic. Widespread and frequent in southern and south-eastern Tasmania, sometimes forming almost pure stands. Small, disjunct populations occur near the west and south-western coasts. Also common on King and Flinders Islands. It grows on a variety of soils and over a wide range of rainfall. On impoverished soils, in coastal areas, it may be a small, much-branched tree c. 4–5 m high with a short trunk. However, on good soils and in higher rainfall areas, in the south of the state, it reaches its maximum development and can be difficult to distinguish from *E. regnans*, from a distance, where the two species are sympatric.

*Eucalyptus globulus* subsp. *globulus* is very important commercially, and often marketed as 'Tasmanian Oak'. The timber is strong, dense and durable and is widely used for heavy construction work, e.g. poles, railway sleepers, wharf piles and wharf and bridge decking. The trees are also grown in large plantations for the veneer and wood-pulp industries. It has also been widely grown overseas, both as an ornamental species and for its timber. It was this species which was used during the Californian gold-rushes for pit props, shoring and railway sleeper purposes. Its very rapid rate of growth enabled the timber to be used from trees grown on the sites, from imported seed.

The familiar 'Tasmanian Blue Gum', with its large, flamboyant flower, is the Tasmanian state floral emblem. Although the tree is well known to most, the wisdom of its choice as an emblem, or 'icon' is open to some question. As a large tree, with the potential to attain heights of over 40+ m, in nearly as many years, it is not a plant for any suburban home garden, or even a well-frequented public park. Informally termed "widow-makers", older trees are well known for their tendency to suddenly shed large limbs, due to internal stresses and decay, thus rendering them a potentially hazardous addition to any garden or park.

The Tasmanian Blue Gum is of critical importance to the survival of the endangered swift parrot, *Lathamus discolor*. This migratory species breeds only in Tasmania and depends on the tree primarily as a food source, feeding on both the nectar and the pollen from the large flowers; as well, old branch hollows, etc. are used for nesting.

Various workers have treated the *E. globulus* complex as being represented either by four distinct species, or four subspecies, two of which occur in Tasmania. Curtis and Morris (1975) recognised *E. globulus* and *E. bicostata* (see below) as distinct species. Kirkpatrick (1975) reduced these, and *E. maidenii*, to subspecific rank under *E. globulus*. Chippendale (1988) and Brooker and Slee (1996) also maintained the four at subspecific rank. Subsequently, Brooker and Kleinig (2006) and Nicolle (2006) recognised all four as separate species. In this treatment, pending further research, the two Tasmanian representatives are recognised at subspecific ranking, according to Kirkpatrick (1975), Chippendale (1988), and Brooker and Slee (1996, 2006) and APC.

Possible hybrids records: *E. globulus* × *E. johnstonii*; *E. globulus* × *E. ovata* var. *ovata*; *E. globulus* × *E. viminalis* (possibly named *E. viminalis* var. *macrocarpa* and *E. unialata*, see Rodway (1903) and Chippendale (1988)).

- |   |                                  |
|---|----------------------------------|
| 1. Buds and fruit solitary, sessile; fruit rugose, hemispherical to turbinate, 12–25 mm diameter, usually with 4 distinct longitudinal ribs                       | 31a subsp. <i>globulus</i>       |
| 1: Buds and fruit in clusters of 3, pedunculate, pedicellate; fruit subrugose, obconic-turbinate, 8–15 mm diameter, usually with 2(–4) distinct longitudinal ribs | 31b subsp. <i>pseudoglobulus</i> |

### 31a *Eucalyptus globulus* Labill. subsp. *globulus*

*Tasmanian Blue Gum, Blue Gum*

*Eucalyptus gigantea* Dehnh., *Cat. Horti Camald.*, ed. 2.: 6, 20 (1832).

*Illustrations:* Chippendale, *Fl. Australia* 19: 355, fig. 95g-h (1988); Jeanes, *Fl. Victoria* 3: 1000, fig. 204c (1996); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 187 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 145 (2006); Wapstra et al., *Tasmanian Plant Names Unravelling* 189, 193 (2010).

Trees variable in size and stature, trees on exposed coastal sites often impoverished and 15 m or less in height, those on better sites often very tall, up to 60 m high with massive trunk and basal branches. Adult leaves 15–25(–60) cm long, 2.5–4.5 mm wide. Buds solitary, very white/waxy, glaucous, strongly rugose-tuberculate, hemispherical, 4-ribbed, 15–20 mm long, 12–15(–25) mm wide, sessile or very shortly pedicellate; operculum flattened, hemispherical, umbonate, shorter than the hypanthium, scar present, conspicuous. Mature fruit grey-green to brown, subglaucous at first, hemispherical to turbinate, 15–20(–25) mm long, 12–15(–25) mm wide, disc wide, flattened to convex-ascending, valves 3–(5), level or the tips slightly raised. Flowering Jul.–Jan.

Tas. (BEL, FLI, KIN, TCH, TNS, TSE, TSR, TWE); also, Vic. Distribution and ecology as for species though the subspecies is absent from Flinders Island. Occurs in a range of habitats and is not confined to coastal and dry forest habitats. Very large trees have been recorded growing along-side *E. regnans* in wet forests in the far south of the state.

Hybrids recorded: *E. globulus* subsp. *globulus* × *E. johnstonii* × *E. urnigera* (possibly = *E. biangularis* Simmonds).

### 31b *Eucalyptus globulus* subsp. *pseudoglobulus* (Naudin ex Maiden) J.B. Kirkp., *Bot. J. Linn. Soc.* 69: 101 (1975)

*Victorian Eurabbie*

*Eucalyptus globulus* var. *stjohnii* R.Baker, *Vic. Naturalist* 30: 127 (1913); *E. stjohnii* (R.Baker) R.Baker, *Hardwoods Australia* 218 (1919). *Eucalyptus bicostata* Maiden, Blakely & Simmonds, *Trees Other Lands, Eucalypts* 133 (1927).

*Illustrations:* Chippendale, *Fl. Australia* 19: 355, fig. 95k-l (1988); Brooker & Slee, *Fl. Victoria* 3: 975, fig. 994c (1996); Brooker & Kleinig, *Field Guide to Eucalypts* 1, ed. 3: 185 (2006); Nicolle, *Eucalypts of Victoria and Tasmania* 149 (2006).

Tall trees, 15–40 m high. Adult leaves 15–35 cm long, 1.5–4 cm wide. Buds in clusters of 3, green to subglaucous, rugulose, hemispherical-turbinate, 2(–4)-ribbed, 12–14 mm long, 8–10 mm wide; peduncles

broad, flattened, 6–10 mm long, pedicels 3–5 mm long; operculum flattened-hemispherical, prominently umbonate, scar present. Mature fruit green-brown, sometimes glaucous, subrugose, 2(–4)-ribbed, obconic-turbinate, 7–11 mm long, 8–15 mm wide, disc wide, flattened to convex, valves 3(–5), level or the tips ascending. Flowering Jan.–Feb.

Tas. (FLI); also Vic. In Tasmania, occurs only at the northern end of Flinders Island, in coastal localities. In Victoria it occurs mostly on coastal hills and plains.

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