

Flora of South Australia

5th Edition



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5th Edition | Edited by Jürgen Kellermann

SANTALACEAE¹

B.J. Lepschi² (*Korthalsella* by B.A. Barlow³)

Perennial herbs, shrubs, vines or small trees; hemiparasitic on roots or aerially on stems or branches, glabrous or variously hairy. Leaves alternate or opposite, sometimes decussate, rarely whorled, simple, entire, sometimes scale-like, caducous or persistent; stipules absent. **Inflorescence** axillary or terminal, a sessile or pedunculate raceme, spike, panicle or corymb, sometimes condensed or flowers solitary, usually bracteate, bracts sometimes united to form a bracteal cup; flowers bisexual or unisexual (and plants monoecious or dioecious), actinomorphic, perianth 1-whorled; tepals (3) 4–5 (–8), free or forming a valvately-lobed tube or cup; floral disc usually lobed, rarely absent; stamens as many as tepals and inserted opposite them; anthers sessile or borne on short filaments; carpels (2) 3 (–5); ovary inferior or superior; ovules 1–5 or lacking and embryo sac embedded in mamelon; style usually very short, rarely absent; stigma capitate or lobed. **Fruit** a nut, drupe or berry, receptacle sometimes enlarged and fleshy; seed 1 (2), without testa, endosperm copious.

A family of 44 genera and about 875 species; almost cosmopolitan, well developed in tropical regions. Thirteen genera (five endemic) and 67 species (55 endemic) in Australia and island territories; five genera and 15 species in South Australia.

As currently circumscribed, Santalaceae is polyphyletic with respect to Viscaceae (Old World) and Opiliaceae (pantropical) (Der & Nickrent 2008) and should probably be divided. *Anthobolus* may also be better placed in Opiliaceae (cf. Der & Nickrent 2008). Some recent classifications (e.g. Angiosperm Phylogeny Group 2003; Mabberley 2008) include the Viscaceae within the Santalaceae, and this treatment is adopted here. The term ‘deciduous’ is used in this treatment to refer to the shedding of foliar organs at a particular stage of growth rather than in a specific season. *Anthobolus leptomerioides* F.Muell. has been recorded for the NW region of S.A. by various authors, e.g. Black (1948), Stauffer (1959), Jessop (1986), Barker *et al.* (2005). Black appears to have misinterpreted locality details of two Helms collections of this species from Skirmish Hill, SW of the Tomkinson Range in arid W.A. near the S.A. border, made during the Elder Scientific Exploring Expedition of 1891. This species is not known to occur in S.A., but populations occur close to the north-western corner of the state in both W.A. and the N.T.

Reference: George (1984), Harbaugh (2007), Lepschi (2008), Stauffer (1959).

1. Small (usually < 10 cm high) aerial parasites; stems strongly flattened and forming cladodes, inflorescences highly condensed, borne in the articulations of the cladodes..... 3. **Korthalsella**
- 1: Shrubs or trees, hemiparasitic on roots; stems and inflorescences not as above
 2. Leaves scale like, sessile, caducous, deciduous or persistent, < 12 mm long
 3. Ovary inferior
 4. Flowers subtended by a single caducous or deciduous bract 4. **Leptomeria**
 - 4: Flowers subtended by 3–20 persistent bracts, 3–4 of which are involucrel 1. **Choretrum**
 - 3: Ovary superior

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Fig. 1. A-E, *Choretrum spicatum* subsp. *continentale*: A, branch; B, young growth; C, leaf, abaxial view; D, leaf, side view; E, flower. F-I, *C. spicatum* subsp. *spicatum*: F, young growth; G, leaf, abaxial view; H-I, leaf, side view. J-N, *C. chrysanthemum*: J, branch; K, young branch, cross section; L, older branch, cross section; M, flower; N, tepal. O-S, *C. glomeratum*: O, branch; P, young branch, cross section; Q, older branch, cross section; R, flower; S, tepal. Illustration by G.R.M. Dashorst.

- 5. Flowers distinctly pedicellate (pedicel > 1 mm long); ripe fruit with succulent epicarp, fruiting receptacle absent, pedicel thickened distally in fruit..... **Anthobolus**
- 5: Flowers sessile; fruit with dry or scarcely succulent epicarp, fruiting receptacle fleshy, succulent, often brightly coloured **2. Exocarpos**
- 2: Leaves well developed, not scale like, petiolate, persistent, > 15 mm long **5. Santalum**

1. CHORETRUM R.Br.

Prodr. 354 (1810).

(Greek, *choris* (separate) and *etron* (abdomen); the receptacle is separated from the persistent perianth by a lobed rim at its apex.)

Glabrous subshrubs, shrubs or (not in S.A.) small trees; branchlets terete to prominently angular, with longitudinal ridges; leaves alternate, scale-like, sessile, persistent. **Inflorescence** axillary or less often terminal, flowers solitary, or 2–3 in a condensed pedunculate cluster (these rarely to 7-flowered in compound inflorescences); flowers bisexual, obscurely pedicellate, 5-merous, subtended by 3–20 persistent bracts, 3–4 of which are involucral; tepals fleshy, the apex incurved, thickened and hooded, glabrous or with a minute tuft of hairs on the adaxial surface; disc shallowly to moderately lobed; ovary inferior, style very short, stigma obscurely or distinctly stellate. **Fruit** a drupe, epicarp fleshy or more or less dry, crowned with persistent perianth; endocarp large. **Sour-bushes.**

A genus of eight species endemic to southern Australia, represented in all states except the Northern Territory and Tasmania. Three species in South Australia.

1. Inflorescence a solitary flower subtended by 8–20 bracts; branchlets terete..... 3. **C. spicatum**
- 1: Inflorescence 2–7-flowered (solitary flowers may also rarely be produced), flowers subtended by 3–4 bracts; branchlets prominently angular to angular-terete
2. Tepals yellow to golden-yellow, proximal margins and base of tepals entire to occasionally suberose; branchlets angular to prominently angular (especially when young), frequently becoming angular-terete to (very rarely) terete with age..... 1. **C. chrysanthum**
- 2: Tepals white to cream, proximal margins and base of tepals suberose to minutely papillate; branchlets prominently angular 2. **C. glomeratum**

1. **Choretrum chrysanthum** F.Muell., *Trans. Philos. Soc. Victoria* 1: 23 (1855). — *C. glomeratum* var. *chrysanthum* (F.Muell.) Benth., *Fl. Austral.* 6: 218 (1873); *C. chrysanthum* F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 103 (1856), *nom. illeg.*; *Choretrum glomeratum* auct. non R.Br.: Jessop in Jessop & Toelken, *Fl. S. Austral.* 1: 157 (1986), partly (FR plants only). — **Illustr.:** *Fl. Austral.* 22: 45, fig. 15A, D (1984), as *C. glomeratum* var. *chrysanthum*; *Fl. S. Austral.* 1: 156, fig. 82B (1986).

Erect shrub to 2 m, yellowish-green to green; branchlets angular to prominently angular, becoming angular-terete to (very rarely) terete with age, rarely slightly pendulous, 0.9–1.8 mm diam., longitudinally ridged, the ridges minutely tuberculate to smooth; leaves triangular to narrowly triangular, 0.5–1 mm long, 0.2–0.3 mm wide, apex acute to narrowly acute, margin suberose (especially distally), minutely tuberculate or rarely entire. **Inflorescence** usually a pedunculate 2–3-flowered cluster (inflorescences rarely compound and then up to 7-flowered), or occasionally a pedunculate solitary flower, individual flowers subtended by 3 bracts, all of which are involucre; bracts ovate to depressed ovate, elliptic or rounded-triangular, 0.7–1.2 mm long, 0.4–1 mm wide, apex rounded to shortly acuminate or acute, margin suberose to erose; tepals yellow to golden-yellow, drying yellowish to dull yellow-brown, 1.2–1.5 mm long, proximal margins and base entire or occasionally suberose. **Fruit** poorly known, ?greenish, globose, longitudinally ribbed (due to ornamentation on endocarp), 5–6 mm long. **Fig. 1J–N, Pl. 1A.**

S.A.: ?NW, NU, FR, EP, NL, MU, SL, SE; W.A.; N.S.W.; Vic. Grows in sand, loam and sandy-clay in mallee and eucalypt woodland. Flowers: Oct.–Jan.

This taxon has variously been treated at specific rank or as a variety of *C. glomeratum*. While the two species are evidently closely related, they are sufficiently distinct to be recognised as separate species, and may be distinguished by the characters presented in the key. The distribution of *C. chrysanthum* is largely to the north of the range of *C. glomeratum*, although the two species do overlap on the Eyre Peninsula and in the south-east of the state.

(Rare status in S.A.)

2. **Choretrum glomeratum** R.Br., *Prodr.* 354 (1810). — *C. chrysanthum* auct. non F.Muell.: Jessop in Jessop & Toelken, *Fl. S. Austral.* 1: 157 (1986), partly (KI plants only). — **Illustr.:** *Fl. S. Austral.* 1: 156, fig. 82C (1986).

Erect shrub to 2.5 m, yellowish-green to green; branchlets prominently angular, rarely slightly pendulous, 1–1.7 mm diam., longitudinally ridged, the ridges minutely tuberculate to smooth; leaves triangular to narrowly triangular, 0.8–1.7 mm long, 0.3–0.4 mm wide, apex acute to narrowly acute, margin suberose (especially distally), minutely tuberculate or rarely entire. **Inflorescence** a pedunculate 2–5-flowered fascicle or raceme/corymb or a pedunculate solitary flower, individual flowers subtended by 3–4 bracts, 3 (rarely 4) of which are involucre; bracts ovate to depressed ovate or narrowly ovate to rounded-triangular, 0.3–0.9 mm long, 0.2–0.9 mm wide, apex rounded to obtuse or acute, margin suberose to erose or rarely entire; tepals white to cream, drying whitish, reddish- or pinkish-brown to brown (the distal portions frequently paler), 1–1.3 mm long, proximal margins and base suberose to minutely papillate. **Fruit** greenish to yellowish-, greenish-, reddish- or blackish-brown, sometimes flushed reddish-maroon, subglobose to globose, rarely broadly ellipsoid or broadly obovoid, smooth to ‘wrinkled’ or occasionally longitudinally ribbed (due to ornamentation on endocarp), 5–7 mm long, edible. **Fig. 1O–S, Pl. 1B–E.**

S.A.: EP, YP, MU, SL, KI, SE; W.A.; Vic. Grows mostly in sandy soils in mallee, mallee-heath and eucalypt woodland. Flowers: Sep.–May.

See notes under *C. chrysanthum*.

3. **Choretrum spicatum** F.Muell., *Fragm.* 1: 21 (1858).

Erect, frequently spreading shrub to 2 m, green to brownish- or yellowish-green; branchlets terete, 1.2–2.8 mm diam., longitudinally ridged, the ridges minutely tuberculate to smooth; leaves triangular to very narrowly triangular, 0.8–2.6 mm long, 0.4–0.7 mm wide; apex very narrowly acute to acute, margin entire to fimbriate. **Inflorescence** a pedunculate solitary flower, subtended by 8–20 bracts, 4 of which are involucre; bracts ovate to broadly ovate or rounded-triangular, 0.6–1.7 mm long, 0.4–1.5 mm wide, apex acute to rounded or acuminate (occasionally shortly so), margin fimbriate; tepals white to cream, occasionally flushed reddish-maroon (in life and when dry), 1–1.4 mm long, margins entire. **Fruit** green, flushed pinkish-red with age, subglobose to globose or broadly ellipsoid, longitudinally ribbed (due to ornamentation on endocarp), 3–4 mm long.

Two subspecies are recognised.

(Rare status in S.A.)

1. Leaves spreading-ascending to spreading or recurved, sometimes contorted with age;
KI only..... 3b. **C. spicatum** subsp. **spicatum**
1: Leaves appressed to ascending; SE region only..... 3a. **C. spicatum** subsp. **continentale**

3a. **Choretrum spicatum** subsp. **continentale** Lepschi, *J. Adelaide Bot. Gard.* 24: 53 (2010). — **Illustr.:** Lepschi, *J. Adelaide Bot. Gard.* 24: 54, Fig. 1A–F (2010), as ‘*Choretum*’.

Leaves appressed to ascending (spreading-ascending to spreading when subtending inflorescences), distal portion rarely slightly incurved or (on older leaves), spreading to recurved; apex narrowly acute to acute, margin entire to fimbriate. **Fig. 1A–E, Pl. 1F.**

S.A.: SE; Vic. Grows in sand and sandy loam, in heath or open eucalypt woodland with a dense shrubby understorey, frequently in low-lying sites. Flowers: Nov.–Jan.

3b. **Choretrum spicatum** F. Muell. subsp. **spicatum** — **Illustr.:** *Fl. Australia* 22: 45, fig. 15B (1984); *Fl. S. Austral.* 1: 156, fig. 82D (1986) (both as *Choretrum spicatum*); Lepschi, *J. Adelaide Bot. Gard.* 24: 54, Fig. 1G–I (2010), as ‘*Choretum*’.

Leaves spreading-ascending to spreading or recurved (rarely appressed to ascending on very young branchlets), sometimes contorted with age; apex very narrowly acute, margin suberose to (more usually) fimbriate. **Fig. 1F–I, Pl. 1G–H.**

S.A.: KI. Grows in sand, loamy-sand and clay in heath, shrubland, often in low-lying sites in mallee or eucalypt woodland or low open-forest, usually with a dense shrubby understorey. Flowers: Jul.–Feb.

2. **EXOCARPOS** Labill.

Voy. Rech. Pérouse 1: 155, t. 14 (1800), *nom. cons.*

(Greek, *exo* (outside) and *karpós* (fruit); the swollen fruiting receptacle resembles a pericarp below the drupe.)

Xylophyllos sect. *Exocarpos* (Labill.) Kuntze, *Lex. Gen. Phan.* 598 (1903).

Subshrubs, shrubs or trees, glabrous or minutely hairy with simple and stellate hairs; branchlets terete to angular or flattened, usually with longitudinal ridges; leaves alternate or (not in S.A.) opposite, scale-like or (not in S.A.) well developed, sessile to (not in S.A.) petiolate, caducous to persistent. **Inflorescence** an axillary, simple or compound spike, sometimes condensed (appearing clustered), usually only one fruit developing per inflorescence; flowers unisexual or bisexual, apparently sessile, 4–6-merous, subtended by a single persistent bract; tepals thin or fleshy, glabrous to minutely papillate or puberulous; disc shallowly to moderately lobed; ovary superior; style very short, stigma lobed. **Fruit** a drupe, subtended by the persistent perianth, epicarp dry or rarely somewhat fleshy, fruiting receptacle enlarged and fleshy; endocarp large. **Ballarts.**

A genus of 26 species in Malesia, Australia (including Lord Howe & Norfolk Islands), New Caledonia, New Zealand and the Hawaiian Islands. Eleven species (nine endemic) in Australia and island territories, five species in South Australia.

1. Inflorescence a spike of usually more than 8 flowers, rachis (excluding peduncle) 2–17 mm long, clearly visible between individual flowers
2. Leaves persistent, triangular to ovate-triangular (often broadly so), 0.5–1.7 mm long, apex straight; floral rachis densely puberulous 2. ***E. cupressiformis***
- 2: Leaves deciduous, very narrowly triangular to subulate, 2.5–6.5 mm long, apex usually prominently recurved; floral rachis glabrous except for puberulous excavated portion (visible when flowers shed) 3. ***E. sparteus***
- 1: Inflorescence a condensed spike of 2–8 flowers, rachis (excluding peduncle) 0.4–2.5 mm long, often obscured by the closely packed bracts and flowers
3. Leaves very broadly triangular to rounded-triangular or ovate to broadly ovate, 0.5–1 mm wide, apex obtuse to acute; bracts 1.3–1.6 mm wide, densely puberulous; fruit densely puberulous with stellate hairs, fruiting receptacle maturing red, depressed obovoid to transversely elliptic, puberulous with stellate hairs 1. ***E. aphyllus***
- 3: Leaves narrowly triangular to subulate, 0.2–0.3 mm wide, apex acute to narrowly acute; bracts 0.4–0.7 mm wide, puberulous or ciliate; fruit glabrous, fruiting receptacle maturing whitish, pinkish or purplish when mature, obovoid to broadly obovoid, glabrous
4. Branchlets angular to prominently angular; leaves persistent, but distal portion soon weathering away. On heavy soils associated with watercourses or floodplains in MU and SE regions 4. ***E. strictus***
- 4: Branchlets angular-terete; leaves persistent (distal portion rarely weathering away). On sandy soils along the coast 5. ***E. syrticola***

1. ***Exocarpos aphyllus*** R.Br., *Prodr.* 357 (1810), as '*Exocarpos aphylla*' — *Xylophyllus aphyllus* (R.Br.) Kuntze, *Revis. Gen. Pl.* 2: 589 (1891); *E. leptomerioides* F.Muell. ex Miq., *Ned. Kruidk. Arch.* 4: 103 (1856), as '*Exocarpos leptomerioides*'. — **Illustr.:** *Pl. W. N.S.W.* 225 (1981); *Fl. Austral.* 22: 38, fig. 13G (1984).

Erect, often rounded and divaricately-branched shrub or small tree to 5 m, green to yellowish-green, occasionally glaucous, young growth sparsely to moderately puberulous, glabrescent with age, but hairs persisting in branchlet furrows; branchlets subterete to terete, 1.2–3 mm diam., longitudinally ridged, the ridges smooth, 0.2–0.5 mm wide, furrows between the ridges <0.05–0.1 mm wide; leaves persistent (gradually weathering away), young leaves sparsely to densely puberulous, especially on margins, becoming glabrous with age, very broadly triangular to rounded-triangular or ovate to broadly ovate, 0.5–0.6 × 0.5–1 mm, apex obtuse to acute, straight to rarely slightly incurved. **Inflorescence** a condensed spike (rarely compound) of 6–8 flowers; rachis densely puberulous, 1.5–2.5 mm long; bracts broadly ovate to depressed ovate, densely puberulous, 0.4–0.5 × 1.3–1.6 mm, apex obtuse to rounded; tepals glabrous or minutely papillate to puberulous, yellowish-green to yellowish-brown, 0.6–0.8 mm long. **Fruit** greenish to dark greenish-black, ellipsoid to broadly ellipsoid, densely puberulous with stellate hairs, 3–5 mm long; fruiting receptacle red to dark red when mature, depressed obovoid to transversely elliptic, puberulous with stellate hairs, c. 2 mm long, edible. **Fig. 2D, Pl. 1I–K, 2A–C.**

S.A.: LE, NU, GT, FR, EA, EP, NL, MU, YP, SL, KI; W.A.; Qld; N.S.W.; Vic. Grows in sand (including dunes), loam or clay soils in shrubland, mallee and eucalypt woodland, often in rocky sites. Flowers: throughout the year, but mainly Aug.–Dec.

Superficially similar to and sometimes confused with *E. syrticola* (see Jessop 1986), but readily distinguished by the features outlined in the key. Some variation in indumentum and floral features is evident in this taxon, and two entities can be recognised. The most widespread form has whitish indumentum on the young growth and inflorescences, and greenish-yellow tepals. It occurs throughout the range of the species in S.A. and also in W.A., Qld, N.S.W. and Vic. The second form has dense, matted, dark reddish-brown to brownish-black indumentum on the young growth and inflorescences, and yellowish to yellowish-brown tepals. This form appears to be less widespread, and also occurs in southern W.A.

2. ***Exocarpos cupressiformis*** Labill., *Voy. Rech. Pérouse* 1: 156, t. 14 (1800), as '*Exocarpos cupressiformis*'. — *Xylophyllus cupressiformis* (Labill.) Kuntze, *Revis. Gen. Pl.* 2: 589 (1891); *E. dasystachys* Schldtl., *Linnaea* 20: 580 (1847), as '*Exocarpos dasystachys*'. — **Illustr.:** L.F.Costermans, *Native Trees Shrubs S.E. Austral.*, 168, 169 (1981); *Fl. Austral.* 22: 38, fig. 13D (1984).



Fig. 2. A, *Exocarpos cupressiformis*; B, *E. sparteus*; C, *E. strictus*; D, *E. aphyllus*; E, *E. syrticola*. Illustrations by B. Chandler, from *Flora of South Australia* 1: 159, Fig. 83 (1986).

Erect shrub or small tree to 8 m, green, young growth sparsely to densely puberulous, glabrescent with age, but hairs persisting in branchlet furrows; branchlets angular to angular-terete, often pendulous distally, 0.3–1.4 mm diam., longitudinally ridged, the ridges smooth, furrows between the ridges usually < 0.05 mm wide; leaves persistent, young leaves sparsely puberulous, especially on margins, becoming glabrous with age, triangular to ovate-triangular, often broadly so, 0.5–1.7 × 0.4–0.9 mm, apex acute, straight. **Inflorescence** a spike of 8–25 flowers; rachis densely puberulous, 3–9 mm long; bracts broadly ovate to depressed ovate, sparsely to densely puberulous, 0.2–0.4 × 0.2–0.3 mm, apex obtuse to rounded; tepals glabrous to minutely papillate or puberulous, yellowish-green, c. 0.5 mm long. **Fruit** green to dark green, ellipsoid to broad ellipsoid, glabrous or rarely with scattered minute hairs, especially when young, 3.5–4 mm long; fruiting receptacle orange-red to red when mature, densely puberulous when young, becoming glabrous with age, obovoid to ellipsoid, 4–6 mm long, edible. **Fig. 2A, Pl. 2D–H.**

S.A.: FR, EP, NL, MU, YP, SL, KI, SE; Qld; N.S.W.; A.C.T.; Vic.; Tas. Grows in sand (including dunes), loam, clay-loam or rarely clay soils, mostly in eucalypt woodland or open forest, but also recorded from *Allocasuarina* and *Callitris* woodland. Flowers: throughout the year, but mainly Oct.–May.

3. ***Exocarpos sparteus*** R.Br., *Prodr.* 356 (1810), as '*Exocarpos sparteus*'. — *Xylophyllus sparteus* (R.Br.) Kuntze, *Revis. Gen. Pl.* 2: 589 (1891); *E. glandulaceus* Miq., *Pl. Preiss.* 1: 619 (1845), as '*Exocarpus glandulacea*'. — **Illustr.:** *Fl. Austral.* 22: 38, fig. 13E (1984); *Fl. Victoria* 4: 30, fig. 3C (1996).

Erect shrub or small tree to 6 m, green to yellowish-green, occasionally glaucous, densely puberulous or minutely papillate in branchlet furrows and adjacent leaf axils, indumentum persisting or weathering away; branchlets prominently angular to angular-terete, sometimes pendulous distally, 0.7–1.9 mm diam., longitudinally ridged, the ridges smooth to minutely tuberculate, 0.1–0.2 mm wide, furrows between the ridges < 0.05–0.2 mm wide; leaves deciduous, glabrous, very narrowly triangular to subulate, 2.5–6.5 × 0.3–0.6 mm, apex narrowly acute, usually prominently recurved. **Inflorescence** a spike of 4–28 flowers; rachis glabrous (excavated portion densely puberulous, visible when flowers shed), 2–17 mm long; bracts narrowly triangular to depressed ovate, glabrous, 0.3–0.8 × 0.3–0.6 mm, apex narrowly acute or obtuse to broadly acuminate; tepals glabrous, yellowish, 0.5 mm long. **Fruit** green to reddish-brown or reddish, glabrous, oblong-ellipsoid to subglobose, 3.5–5 mm long; fruiting receptacle pinkish-red to orange-red when mature, glabrous, obovoid to broadly obovoid, broadly ellipsoid or subglobose, 3–5 mm long, edible. **Fig. 2B, Pl. 2I–K, 3A–B.**

S.A.: NW, LE, FR, EP, NL, MU, YP, SL, SE; W.A.; N.T.; Qld; N.S.W.; Vic. Grows in sand (including dunes), loam and clay-loam in hummock grassland, shrubland, mallee, eucalypt woodland and open forest. Flowers: throughout the year.

4. **Exocarpos strictus** R.Br., *Prodr.* 357 (1810), as '*Exocarpos stricta*'. — *Xylophyllus strictus* (R.Br.) Kuntze, *Revis. Gen. Pl.* 2: 589 (1891); *Omphacomeria psilotoides* A.DC., *Prodr.* 14: 681 (1857). — **Illustr.:** Stauffer, *Mitt. Bot. Mus. Univ. Zürich* 213: t.10 (1959); *Fl. Victoria* 4: 30, fig. 3D (1996).

Erect shrub or small tree to 6 m, greyish-green, occasionally glaucous, usually densely puberulous or minutely papillate in branchlet furrows (indumentum sometimes absent or poorly developed) and adjacent leaf axils, indumentum persisting or weathering away; branchlets angular to prominently angular, sometimes pendulous distally, 0.8–1.6 mm diam., longitudinally ridged, the ridges smooth to minutely tuberculate, 0.1 mm wide, furrows between the ridges 0.1–0.4 mm wide; leaves persistent, but the distal portion soon weathering away, young leaves ciliate, at least distally, becoming glabrous with age, triangular to subulate, 0.6–1.4 × 0.2–0.3 mm, apex acute to narrowly acute, straight. **Inflorescence** a condensed spike of 2–8 flowers, rachis densely puberulous, 0.4–1 mm long; bracts broadly ovate to depressed ovate, puberulous or ciliate, 0.3–0.4 × 0.5–0.6 mm, apex obtuse to rounded or sometimes broadly acuminate; tepals glabrous or minutely papillate, yellowish-green, sometimes tinged reddish, c. 0.5 mm long. **Fruit** green to blackish- or purplish-green, ellipsoid to broadly ellipsoid, 3–4 mm long, glabrous; fruiting receptacle whitish, pinkish or purplish when mature, obovoid to broadly obovoid, 3–4 mm long, glabrous, edible. **Fig. 2C.**

S.A.: MU, SE; Qld; N.S.W.; A.C.T.; Vic.; Tas. Grows in sand or (more usually) clay or clay-loam soils associated with watercourses or floodplains, mostly in *Eucalyptus camaldulensis*/*E. largiflorens* woodland. Flowers: Aug.–Jan.

Closely related and superficially similar to *E. syrticola*, but distinguishable by vegetative characters and habitat preference as outlined in the key. The relationship of these taxa to each other and the related Tasmanian endemic *E. humifusus* R.Br. in Tasmania and the Bass Strait Islands, however, is less well understood (see Lepschi (2008) for further discussion).

(Rare status in S.A.)

5. **Exocarpos syrticola** (F.Muell. ex Miq.) Stauffer, *Mitt. Bot. Mus. Univ. Zürich* 213: 173, t.9, 23B (1959). — *E. strictus* var. *syrticola* F.Muell. ex Miq. *Ned. Kruidk. Arch.* 4: 104 (1856), as '*Exocarpos stricta* var. *syrticola*'. — **Illustr.:** Stauffer, *Mitt. Bot. Mus. Univ. Zürich* 213: t.9 (1959); *Fl. Victoria* 4: 30, fig. 3E (1996).

Erect shrub to 4 m, green, usually densely puberulous or minutely papillate in branchlet furrows (sometimes absent or poorly developed) and adjacent leaf axils, indumentum persisting or weathering away; branchlets angular-terete, 1.8–2.5 mm diam., longitudinally ridged, the ridges smooth to minutely tuberculate, 0.2–0.5 mm wide, furrows between the ridges < 0.05–0.3 mm wide; leaves persistent (distal portion rarely weathering away), narrowly triangular to subulate, young leaves ciliate, at least distally, becoming glabrous with age, 0.5–1.5 × 0.2–0.3 mm, apex acute to narrowly acute, straight to rarely slightly incurved. **Inflorescence** a condensed spike of 4–8 flowers; rachis usually densely puberulous (rarely sparsely hairy), 0.8–2.5 mm long; bracts broadly ovate to depressed ovate, ciliate (rarely with some scattered hairs), 0.4–0.7 × 0.4–0.7 mm, apex obtuse to rounded or sometimes broadly acuminate; tepals glabrous, yellowish-green, sometimes tinged reddish, 0.5 mm long. **Fruit** purplish or blackish, glabrous, ellipsoid to broadly ellipsoid, 3–4 mm long; fruiting receptacle whitish to pinkish when mature, glabrous, obovoid to broadly obovoid, 3–5 mm long, edible. **Fig. 2E, Pl. 3C–F.**

S.A.: EP, YP, SL, SE; Vic.; Tas. Grows in sand, sand dunes and sandy-loam in coastal shrublands and mallee. Flowers: Aug.–Dec.

See notes under *E. strictus*.

3. KORTHALSELLA Tiegh.

Bull. Soc. Bot. France 43: 83, 163 (1896).

(After Pieter Willem Korthals, 1807–1892, a Dutch botanist.)

B.A. Barlow

Bifaria Tiegh., *Bull. Soc. Bot. France* 43: 163–164 (1896); *Heterixia* Tiegh., *Bull. Soc. Bot. France* 43: 163, 177 (1896); *Pseudixis* Hayata, *Bot. Mag. Tokyo* 29: 31 (1915).

Aerial stem-parasitic monoecious small perennials (mostly less than 15 cm high but rarely reaching 60 cm), erect, entirely glabrous except for the floral cushions; stems green or yellowish, usually articulated at the nodes; internodes terete or compressed or most often strongly flattened in one plane forming a cladode; leaves opposite, rudimentary,

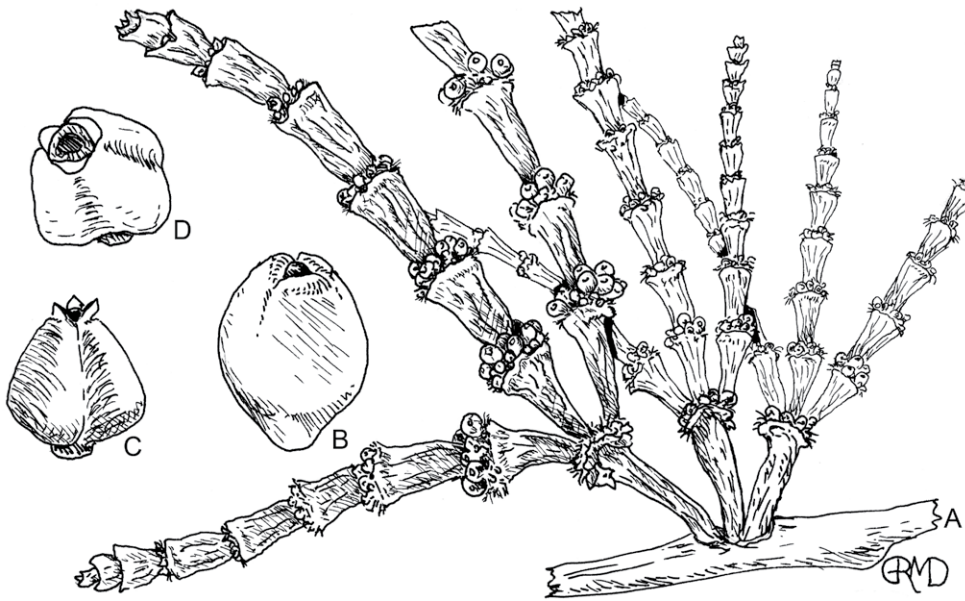


Fig. 3. *Korthalsella leucothrix*: A, plant on host branch; B, male flower; C–D, female flower. Illustration by G.R.M. Dashorst, from *Flora of South Australia* 1: 172, Fig. 93 (1986).

each pair forming a border mostly less than 1 mm high at each node and subtending the flower clusters. **Flowers** developing successively in lateral clusters, usually surrounded and separated by multicellular sparsely branched thick-walled hairs (derived from floral bracts) which often form a raised mound (floral cushion); flower clusters sometimes coalescing and completely encircling the stem at each node; first-formed flower arising in an axillary position and usually male; subsequent flowers developing laterally to the first and often also in further transverse rows below

the first, mostly female; male flowers globose to obconic in bud, c. 0.5 mm in diam., attenuate at the base and shortly stipitate, 3-merous; tepals persistent, triangular, valvate; anthers 3, 2-locular, introrse, united into a synandrium with a common apical pore; female flowers globose to pear-shaped, usually less than 0.5 mm in diam., 3-merous; tepals triangular, persistent at the top of the ovary. **Fruit** berry-like, pear-shaped or ellipsoid, seldom reaching 3 mm in length, crowned by the persistent tepals, weakly explosive at maturity; seed discus-shaped, c. 1 mm in diam.

A genus of probably about 15 species, distributed from Japan to Australia and New Zealand, extending eastwards to several Pacific archipelagos and westwards to Indian Ocean islands and Ethiopia. In mainland Australia 7 species; 1 species in S.A.

The genus was included in Viscaceae in the previous edition of the *Flora of South Australia* (1986).

1. *Korthalsella leucothrix* Barlow, *Brunonia* 6: 48 (1983). — *K. japonica* f. *japonica* auct. non (Thunb.) Engl.: Molvray, *Novon* 7: 272 (1997), partly; *K. opuntia* auct. non (Thunb.) Merr.: J.M.Black, *Fl. S. Austral.* ed. 2, 2: 279 (1948); *Viscum articulatum* auct. non Burm.f.: J.M.Black, *Fl. S. Austral.* 2: 171 (1924). — **Illustr.:** *Fl. Austral.* 22: 139, Fig. 34F–G (1984).

Plants to 9 cm high, much-branched, with 1–4 stems arising directly from the haustorial attachment; stems many-noded; basal internode terete in the lower part, compressed in the upper part, 10–25 mm × 2–3 mm; succeeding internodes slightly compressed at the base, compressed but not double-edged at the apex, progressing from c. 20 mm × 3 (–5) mm to c. 10 mm × c. 2 mm, widest at or near the apex, rounded at the margins when fresh, conspicuously longitudinally wrinkled when dry; branches up to 8 at the first and second nodes, mostly flattened transversely to the plane of flattening of the parent stem but with subsidiary branches sometimes flattened in the same plane as the parent stem; venation not visible superficially; rudimentary leaves distichous except for the lower ones sometimes decussate, each pair together more or less uniformly continuous around the node, c. 0.7 mm high. **Hairs** of the floral cushion usually long, dense, white, just visible between the flowers in young clusters, developing into distinct protruding tufts around the fruits in older clusters; flowers produced at every node, in 3–4 rows, c. 20 per cluster, with the opposite clusters together encircling the stem; male flowers solitary or few in the central positions in each cluster. **Fruit** ellipsoid, c. 2 mm long. **Jointed mistletoe. Fig. 3.**

S.A.: NU, GT, FR; W.A. In arid areas from the Flinders Ranges westwards to Western Australia Flowers: at all times of the year.

Exclusively parasitic on *Acacia* (e.g. *A. aneura*, *A. ramulosa*).

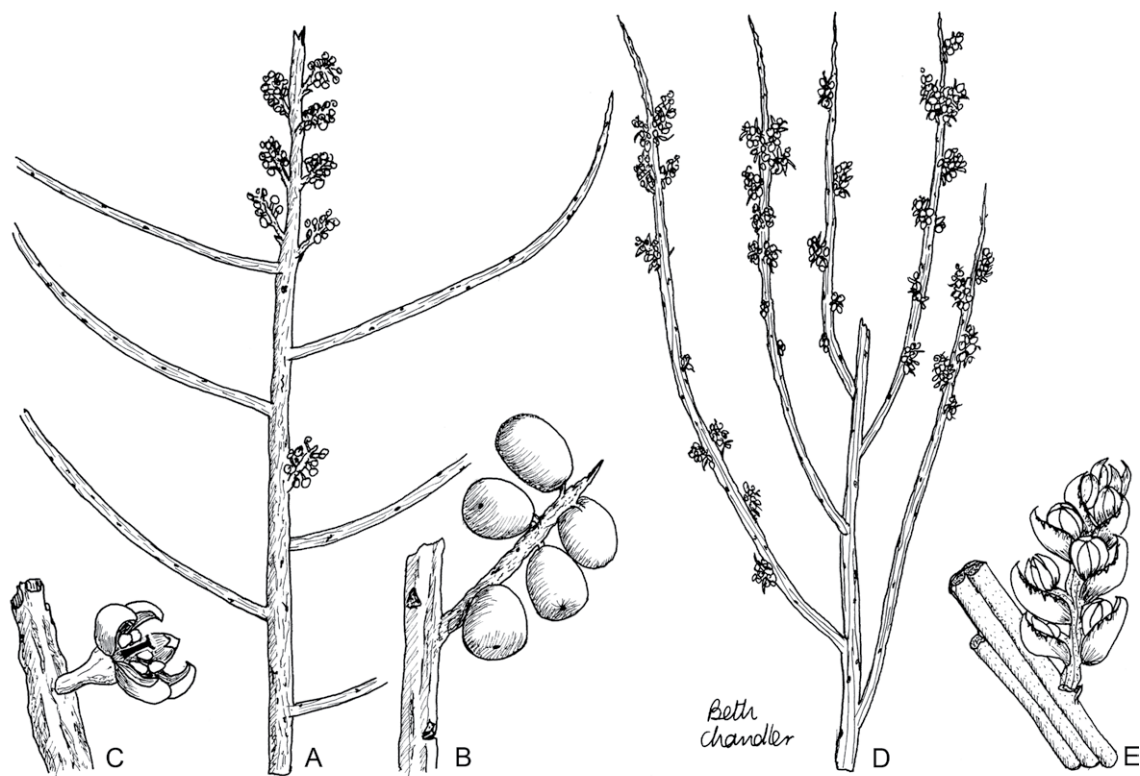


Fig. 4. A–C, *Leptomeria aphylla*: A, flowering branch; B, fruiting branch; C, flower. D–E, *L. preissiana*: D, flowering branch; E, inflorescence. Illustration by B. Chandler, from *Flora of South Australia* 1: 160, Fig. 84 (1986).

4. LEPTOMERIA R.Br.

Prodr. 353 (1810).

(Greek, *leptos* (slender) and *meros* (part), referring to the slender branchlets.)

Glabrous subshrubs or shrubs; branchlets terete to angular, usually with longitudinal ridges; leaves alternate, scale-like or (not in S.A.) well developed, sessile, caducous to (not in S.A.) persistent. **Inflorescence** an axillary or less often terminal, simple or rarely compound raceme, spike-like raceme or corymb; flowers bisexual, obscurely pedicellate, 4–6 merous, subtended by a single caducous or (not in S.A.) persistent bract; tepals thin or fleshy, the apex incurved, thickened and hooded, apparently glabrous or variously hairy adaxially; disc shallowly to deeply lobed; ovary inferior, style very short, stigma lobed. **Fruit** a drupe, epicarp fleshy or dry, crowned with persistent perianth; endocarp large. **Currant-bushes.**

A genus of 17 species endemic to southern Australia, represented in all states except the Northern Territory, with the centre of diversity in the south-west of Western Australia. Two species in South Australia.

1. Tepals reddish, maroon or purplish; branchlets more or less smooth or 'wrinkled' to slightly striate. Widespread in the southern part of the state..... 1. *L. aphylla*
- 1: Tepals whitish; branchlets distinctly longitudinally ridged. Confined to granite inselbergs in EP region..... 2. *L. preissiana*

1. ***Leptomeria aphylla*** R.Br., *Prodr.* 354 (1810). — *L. pungens* F.Muell., *Trans. & Proc. Victorian Inst. Advancem. Sci.* 1: 41 (1855). — **Illustr.:** *Fl. Austral.* 22: 50, fig. 16D (1984); *Fl. N.S.W.* 3: 60 (1992).

Erect, often rounded and divaricately-branched shrub to 3 m, green to yellowish-green; branchlets terete, pungent; more or less smooth or 'wrinkled' to slightly striate, occasionally glaucous; leaves broadly to narrowly ovate or subulate, 0.7–1.6 × 0.3–0.6 mm, apex narrowly acute to acuminate. **Inflorescence** a raceme (very rarely more or less corymbose) of 10–30 flowers; rachis often glaucous, 1–17.5 mm long; bracts caducous, ovate to broadly ovate or more or less elliptic, or obovate to broadly obovate, 0.4–0.9 mm × 0.2–0.3 mm, apex narrowly acute to acuminate; tepals reddish, maroon or purplish, 0.5–0.8 mm long, margin with a small (< 0.1 mm long), rounded-triangular to ovate lobe on the central part, usually with a small tuft of minute hairs on the adaxial surface at

or just above the point of filament insertion. **Fruit** green, ripening maroon, purplish or brownish-red, often glaucous, ellipsoid to oblong-ellipsoid, 5–8 mm long, epicarp fleshy, edible. **Fig. 4A–C, Pl. 3G–J.**

S.A.: EP, NL, MU, SL, KI, SE; Vic. Grows in sand or loam in open eucalypt forest, woodland, mallee and heath. Flowers: mainly Jan.–June.

2. **Leptomeria preissiana** (Miq.) A.DC., *Prodr.* 14: 678 (1856). — *Choretrum preissianum* Miq. in Lehm., *Pl. Preiss.* 1: 608 (1845). — **Illustr.**: *Fl. Australia* 22: 50, fig. 16I (1984).

Erect, often broom-like shrub to 3 m, green; branchlets angular-terete, pungent to occasionally innocuous, longitudinally ridged, the ridges smooth; leaves narrowly to very narrowly ovate or subulate, 1.5–3.5 × 0.3–0.5 mm, apex acuminate. **Inflorescence** a 7–25 flowered raceme, rachis 3–30 mm long; bracts caducous to more or less deciduous, broadly to narrowly ovate or subulate, or elliptic to narrowly elliptic or oblong, 1–2.8 × 0.3–0.4 mm, apex acuminate; tepals white, 0.8–1.2 mm long, very prominently hooded and much thickened adaxially, margin of the unthickened portion entire, minute hairs present on the proximal part of the adaxial surface. **Fruit** poorly known, ?green, probably ripening reddish, globose to subglobose, longitudinally ribbed (due to ornamentation on endocarp), 2–4 mm long, epicarp slightly fleshy. **Fig. 4D–E, Pl. 3K–L, 4A.**

S.A.: EP; W.A. Grows on granite inselbergs. Flowers: Sep.–Oct.

The S.A. occurrence of this species is widely disjunct from the main distribution in south-western W.A., where *L. preissiana* is widespread in a range of habitats. Description based partly on Western Australian material.

(Endangered in S.A.)

5. SANTALUM L.

Sp. Pl. 1: 349 (1753).

(Greek, *santalón*, from the Arabic sandal, referring to the Indian sandalwood.)

Fusanus L., *Syst. Veg.* ed. 14, 754, 765 (1784); *Santalum* sect. *Fusanus* (L.) F.Muell., *Fragm.* 1: 85 (1859). *Encarya* T.Mitch., *Three Exped. Australia* 2: 100 (1838); *Mida* sect. *Encarya* (T.Mitch.) Kuntze, *Lex. Gen. Phan.* 367 (1903).

Glabrous shrubs or trees; bark brown or dark-grey, rough; leaves opposite, alternate or whorled, petiolate, persistent. **Inflorescence** an axillary or terminal panicle, sometimes condensed; flowers bisexual, obscurely pedicellate to pedicellate, 4-merous, subtended by a single caducous bract; tepals fleshy, adaxial surface with a minute tuft of hairs; disc obscurely or prominently lobed; ovary inferior or semi-inferior, style short or long, stigma lobed. **Fruit** a drupe, epicarp fleshy or more or less dry, perianth caducous to persistent; endocarp large. **Sandalwoods.**

A genus of c.25 species occurring from Indomalaysia to Australia, Polynesia, Hawaii and Juan Fernandez. Four species in South Australia.

This treatment largely follows existing taxonomic concepts (cf. George 1984, Jessop 1986), but *Santalum* is in need of a modern taxonomic revision throughout its range. Information on the colour of the floral parts, which may prove important for separating some taxa, is not well documented and requires additional observation.

1. Tepals ≥ 2.5 mm long, floral tube ≥ 3 mm long; disc prominently lobed, the lobes developed into tongue-like projections, style ≥ 3 mm long; ripe fruit purplish, 8–12 mm long 2. **S. lanceolatum**
- 1: Tepals < 2.5 mm long, floral tube < 3 mm long; disc shallowly lobed, without tongue-like projections, style < 1 mm long; ripe fruit yellowish, brownish, reddish or bright red, 13–25 mm long
2. Endocarp more or less smooth; leaf apex obtuse to rounded (acute to minutely acuminate in young leaves); branchlets generally rigid, not pendulous; leaves green to greyish-green..... 4. **S. spicatum**
- 2: Endocarp rugose, deeply pitted; leaf apex narrowly acute to acuminate, frequently uncinat; branchlets often pendulous; leaves light green to yellowish-, bluish- or greyish-green
3. Leaves opposite, 3–15 mm wide; perianth persistent; ripe fruit more or less sweet..... 1. **S. acuminatum**
- 3: Leaves opposite, subopposite or 3-whorled, 2–5 mm wide; perianth caducous to early deciduous; ripe fruit very bitter..... 3. **S. murrayanum**

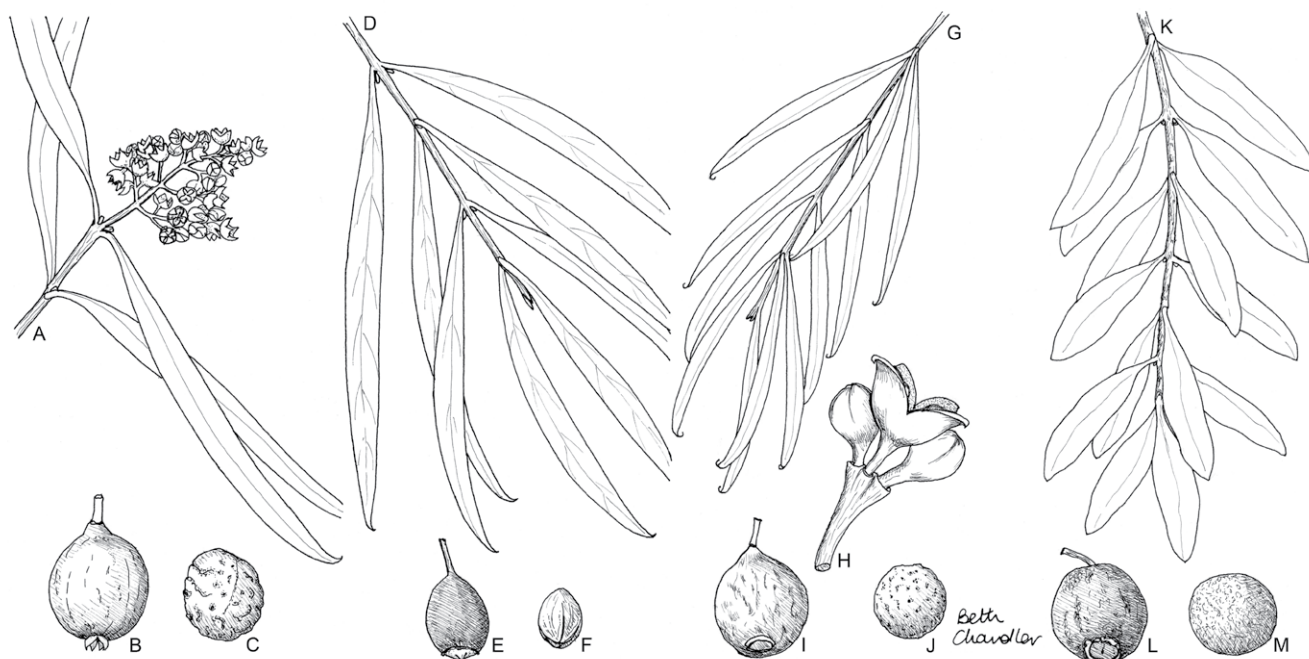


Fig. 5. A–C, *Santalum acuminatum*: A, flowering branch; B, fruit; C, seed. **D–F, *S. lanceolatum*:** D, branch; E, fruit; F, seed. **G–J, *S. murrayanum*:** G, branch; H, flowers; I, fruit; J, seed. **K–M, *S. spicatum*:** K, branch; L, fruit; M, seed. Illustration by B. Chandler, from *Flora of South Australia* 1: 161, Fig. 85 (1986).

1. ***Santalum acuminatum*** (R.Br.) A.DC., *Prodr.* 14: 684 (1857). — *Fusanus acuminatus* R.Br., *Prodr.* 355 (1810); *Mida acuminata* (R.Br.) Kuntze, *Revis. Gen. Pl.* 2: 589 (1891); *Eucarya acuminata* (R.Br.) Sprague & Summerh., *Bull. Misc. Information* 1927: 196 (1927). — **Illustr.**: *Fl. N. S.W.* 3: 58 (1992); *Fl. Victoria* 4: 34, fig. 4E (1996).

Shrub or small tree to 5 m, branchlets often pendulous; leaves opposite, very narrowly elliptic to very narrowly ovate, rarely narrowly elliptic, narrowly ovate or narrowly to very narrowly obovate, straight or sometimes falcate, light- or yellowish-green to greyish-green, 25–115 × 3–15 mm; apex narrowly acute to acuminate, frequently uncinat. **Inflorescence** a panicle of 7–150+ flowers; bracts ovate to broadly ovate, 0.5–1.5 × 0.5–0.7 mm, apex acute to acuminate, margin erose to entire or with 1–2 irregular, coarse teeth on one or both margins; floral tube 1.5–2 mm long, tepals greenish to cream or orange to reddish, adaxial surface minutely papillate, especially along margins, 1.5–2 mm long, disc shallowly lobed, style 0.2–0.3 mm long. **Fruit** bright red, often glossy, globose, 15–30 mm long, perianth persistent, edible; endocarp rugose, deeply pitted, kernel edible. **Quandong, native peach, sweet quandong, katunga, burn-burn.** Fig. 5A–C, Pl. 4B–H, 5K.

S.A.: NW, LE, NU, GT, FR, EA, EP, NL, MU, YP, SL, SE; W.A.; N.T.; Qld; N.S.W.; Vic. Grows in sand (including dunes), loam, clay-loam and clay soils in shrubland, mallee and woodland. Flowers: throughout the year, but mainly Sep.–May.

Some morphological variation is evident in this taxon. Plants from the NU region in S.A. (type locality is Fowlers Bay) and W.A. tend to have greyish-green leaves, and the tepals are described by collectors as orange or red. Plants from the remainder of the species distribution have light- or yellowish-green leaves and the tepals are described as greenish or whitish to cream. See also Randell (2000) for an examination of ploidy levels in this species.

A well known ‘bush food’, fruits of *S. acuminatum* are harvested from wild populations and the species is also grown commercially in S.A., N.S.W. and Vic.

2. ***Santalum lanceolatum*** R.Br., *Prodr.* 356 (1810). — *S. lanceolatum* var. *angustifolium* Benth., *Fl. Austral.* 6: 214 (1873); *S. leptocladum* Gand., *Bull. Soc. Bot. France* 66: 232 (1919). — **Illustr.**: *Fl. N.S.W.* 3: 58 (1992); *Fl. Victoria* 4: 34, fig. 4D (1996).

Shrub or small tree to 5 m, branchlets often pendulous, sometimes glaucous; leaves opposite, linear-elliptic to very narrowly elliptic or very narrowly ovate, rarely narrowly elliptic, narrowly ovate or narrowly obovate, straight or rarely weakly falcate, greyish or bluish-green, sometimes glaucous, 30–85 × 4–15 mm; apex narrowly acute to acuminate, frequently uncinat. **Inflorescence** a panicle of c. 10–70 flowers; bracts narrowly ovate to narrowly elliptic or ovate to elliptic, 1–2 mm × 0.3–0.6 mm wide, apex acute to narrowly acute or acuminate, margin

entire to suberose, or sometimes minutely papillate distally; floral tube 3–5 mm long, tepals whitish to cream or greenish, minutely papillate along inner margins, 2.5–3.6 mm long, disc deeply lobed, lobes developed into tongue-like projections, style 3–5 mm long. **Fruit** purplish, broadly elliptic to subglobose or more or less broadly obovoid, 8–12 mm long, perianth caducous to early deciduous, leaving a broad \pm circular scar at the apex, edible; endocarp more or less smooth. **Plumbush, native plumbush, cherrybush, northern sandalwood. Fig. 5D–F, Pl. 4I–K.**

S.A.: NW, L,E ,GT, FR, EA, EP, NL, MU; W.A., N.T., Qld, N.S.W.,Vic. Grows in sand (including dunes), sandy-loam, loam, clay-loam and clay soils, often associated with watercourses or sometimes in rocky sites, in shrubland, mallee, or woodland. Flowers: throughout the year, but mainly Oct.–May.

Harbaugh (2007) treated populations of *S. lanceolatum* occurring south of approximately 20° latitude (including S.A. plants) as the segregate taxon *S. leptocladium* Gand. Harbaugh's concepts have not been adopted by Australian botanists (Council Heads of Australasian Herbaria 2009), and a conservative approach is adopted here pending revision of Australian *Santalum*.

Harvested as a source of sandalwood in Qld, N.S.W. and Vic. since the mid 19th Century.

3. ***Santalum murrayanum*** (T.Mitch.) C.A.Gardner, *Bull. For. Dept. W. Austral.* 44: 9 (1929). — *Eucarya murrayana* T.Mitch., *Three Exped. Australia* 2: 100 (1838); *S. murrayanum* (T.Mitch.) C.A.Gardner, *Enum. Pl. Austr. Occ.* 35 (1930) (isonym). *S. angustifolium* A.DC., *Prodr.* 14: 685 (1857); *Fusanus acuminatus* var. *angustifolius* (A.DC.) Benth., *Fl. Austral.* 6: 216 (1873); *S. persicarium* F.Muell., *Trans. & Proc. Victorian Inst. Advancem. Sci.* 1: 41 (1855); *Fusanus persicarius* (F.Muell.) F.Muell. ex Benth., *Fl. Austral.* 6: 216 (1873); *Mida persicaria* (F.Muell.) Kuntze, *Revis. Gen. Pl.* 2: 589 (1891). — **Illustr.:** *Fl. N.S.W.* 3: 58 (1992); *Fl. Victoria* 4: 34, fig. 4F (1996).

Shrub or small tree to 4 m, branchlets often pendulous, sometimes glaucous; leaves opposite to subopposite or 3-whorled, linear-elliptic to very narrowly elliptic or rarely linear-obovate, straight or rarely weakly falcate, light green to greyish or bluish-green, sometimes glaucous, 17–55 \times 2–5 mm; apex narrowly acute to acuminate, frequently uncinat. **Inflorescence** a panicle of c. 10–60 flowers; bracts very narrowly to narrowly ovate, 1.2–2.4 \times 0.4–0.6 mm, apex acute to narrowly acute, margin entire or sometimes minutely papillate distally; floral tube 1.5–2.2 mm long, tepals cream or greenish, sometimes tinged reddish, adaxial surface often minutely papillate, especially along margins, 1.2–1.7 mm long, disc shallowly lobed, style 0.2–0.3 mm long. **Fruit** brownish-red to deep red, globose, 13–20 mm long, perianth caducous to early deciduous, leaving a broad, \pm circular scar at the apex; endocarp rugose, deeply pitted, kernel edible. **Bitter quandong. Fig. 5G–J, Pl. 5A–F, L.**

S.A.: FR, EP, MU, YP, SL, SE; W.A.; N.S.W.; Vic. Grows in sand (including dunes), sandy-loam and loam soils in mallee and woodland. Flowers: Oct.–Feb.

Farr *et al.* (1979) regarded Mitchell's "*Eucarya murrayana*" as invalid, and attributed publication of the name to Sprague & Summerhayes (1927), with the correct name for this taxon in *Santalum* then being *S. persicarium* F.Muell. This view is rejected here and Mitchell's name is regarded as validly published, in keeping with the established usage of the name by Australian authors (see also Jessop 1986).

4. ***Santalum spicatum*** (R.Br.) A.DC., *Prodr.* 14: 685 (1857). — *Fusanus spicatus* R.Br., *Prodr.* 355 (1810); *Mida spicata* (R.Br.) Kuntze, *Revis. Gen. Pl.* 2: 589 (1891); *Eucarya spicata* (R.Br.) Sprague & Summerh., *Bull. Misc. Information* 1927: 196 (1927). *S. cygnorum* Miq., *Pl. Preiss.* 1: 615 (1845); *Mida cygnorum* (Miq.) Kuntze, *Revis. Gen. Pl.* 2: 589 (1891), as '*Mida cignorum*'.

Shrub or small tree to 8 m, branchlets more or less rigid, spreading, sometimes glaucous; leaves opposite, narrowly elliptic to elliptic, narrowly obovate or rarely narrowly ovate, straight or rarely weakly falcate, green to greyish-green, often glaucous, 20–70 \times 5–25 mm; apex acute to minutely acuminate or obtuse to rounded in older leaves. **Inflorescence** a panicle of c. 15–100+ flowers; bracts ovate to broadly ovate or ovate-elliptic, 1–2 \times 0.7–1 mm, apex acute to acuminate, margin entire to suberose; floral tube 1.5–2 mm long, tepals reddish to deep reddish-maroon, adaxial surface minutely papillate, especially along margins, 1.5–1.7 mm long, disc shallowly lobed, style 0.2–0.3 mm long. **Fruit** yellowish to reddish-brown, subglobose, 20–25 mm long, perianth persistent; endocarp more or less smooth. **Sandalwood. Fig. 5K–M, Pl. 5G–J.**

S.A.: NW, NU, GT, FR, EA, EP; W.A. Grows in sand (including dunes), loam and clay, sometime associated with watercourses, in shrubland, woodland and mallee. Flowers: Mar.–June.

Genetic and morphological variation in W.A. populations of this species have been documented by Fox & Brand (1993) and Byrne *et al.* (2003, 2003a). The relationship of S.A. populations to the entities recognised by these authors has not been investigated to date.

Harvested as a source of sandalwood in S.A. from the late 19th Century until the early 1940s, and currently in W.A. (since approximately the 1840s). (Vulnerable status in S.A.)

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PL. 1. **A, *Choretum chrysanthum***, flowering stems. **B–E, *C. glomeratum***: B, flowering stems; C, detail showing buds and flowers; D, fruits; E, habit. **F, *C. spicatum* subsp. *continentale***, flowering stems. **G–H, *C. spicatum* subsp. *spicatum***: G, flowering stems; H, habit. **I–K, *Exocarpos aphyllus***: I, flowering stems; J, detail of developing fruit; K, spike with buds and flowers. Photos: A, D.N. Kraehenbuehl; B–D, I & J, T.M. Jaques; E, R.K. Sandercock, DENR; F, D.E. Murfet; G, D.J. Duval, DENR; H, S.A. Seed Conservation Centre, DENR; K, P.J. Lang, DENR.



Pl. 2. A–C, *Exocarpos aphyllus*: A–B, mature fruit with ripe receptacles; C, habit. D–H, *E. cupressiformis*: D, branchlets with flowering spikes; E, maturing fruit, F, mature fruit with ripe receptacles; G–H, habit. I–K, *E. sparteus*: I, young branchlets with leaves still attached; J, sub-mature fruit; K, mature fruit with ripe receptacles. Photos: A–B, L. Jansen; C & F, D.N. Kraehenbuehl; D, E & G, D.E. Muref; H, J. Burgher; I, A.C. Robinson, DENR; J, P.J. Lang, DENR; K, S.A. Seed Conservation Centre, DENR.



Pl. 3. A–B, *Exocarpos sparteus*: A, habit: large shrubs in coastal vegetation showing characteristic yellowish foliage; B, typical erect habit of young plant. **C–F, *E. syrticola*:** C, branchlets with dead apices and young globular inflorescence buds; D, flowering branchlets; E, branchlet with characteristic swollen apex, persistent triangular leaves, immature fruit and receptacle; F, branchlets bearing dark purplish-black mature fruit and a pale pink ripe receptacle. **G–J, *Leptomeria aphylla*:** G, flowering racemes; H, branchlet with fruit and persistent glaucous raceme rachises; I, habit; J, fruiting branches. **K–L, *L. preissiana*:** K, habit & habitat: goat-browsed shrub on granite outcrop; L, racemes in bud and sub-angular stem. Photos: A & D, T.M. Jaques, B & J, D.J. Duval, DENR; C & E, J.G. Conran; F & I, S.A. Seed Conservation Centre, DENR; G, D.E. Murfet; H, G. Carle; K–L, P.J. Lang, DENR.



Pl. 4. **A**, *Leptomeria preissiana*, detail of branchlets in bud, showing weak ridging on older stem. **B–H**, *Santalum acuminatum*: **B**, habit: tree in northern Flinders Ranges; **C**, bark; **D**, panicle in bud; **E**, flowering panicles and leaves; **F**, fruit; **G**, detail of flowers (only rarely 5-merous); **H**, habit and habitat: young trees on southern Yorke Peninsula with characteristic pale foliage. **I–K**, *S. lanceolatum*: **I**, buds & flowers of southern form from EA Region; **J** & **K**, northern form from NW region: **J**, foliage with fruit; **K**, habit. Photos: **A**, P.J. Lang, DENR; **B**, Botanic Gardens of S.A.; **C**, J. Burgher; **D** & **G**, P.J. Lang; **E**, D.E. Murfet; **F** & **H**, T.M. Jaques; **I**, S.A. Seed Conservation Centre, DENR; **J–K**, A.C. Robinson, DENR.



PL. 5. A–F. *L. Santalum murrayanum*: A, habit: small trees in sand heath; B, flowers; C, fruit; D, bark; E, stem showing 3-whorled leaves; F, inflorescences in bud; L, endocarps. G–J. *S. spicatum*: G, habit: small tree on rock outcrop; H, flowering panicles and leaves; I, mature fruit, J, halves of sectioned endocarp with extracted kernel on left; K, *S. acuminatum*, endocarps, showing variation in size and sculpturing. Photos: A, A. Carle; B–C, D.E. Murfet; D, F, & J–L, J. Burgher; E, G. Carle; G–H, P.J. Lang; I, D.N. Kraehenbuehl.