



Flora of South Australia

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ELAEOCARPACEAE¹

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Shrubs (sometimes ericoid) and trees (not in S.A.); bark without exudate, indumentum of simple hairs, sometimes gland-tipped or stellate; leaves spirally arranged, distichous, opposite or rarely whorled, simple, entire to serrate; stipules either present or none when colleters may occur. **Flowers** bisexual, solitary and axillary, in fascicles or terminal, or axillary simple or compound; inflorescence cymose or racemose; sepals usually free, variously toothed or lobed, sometimes entire; stamens 4–300, free; anthers basifixed, opening at apex by 1 or 2 pores; loculi 2–8 (9); ovules 1–30 per loculus, pendulous, anatropous, attached to axis in 1–2 series; style simple or apically branched. **Fruit** indehiscent (drupe or berry) or dehiscent. Seeds 1–many, up to about 15 per loculus.

A family comprising 12 genera and c. 550 species, widely distributed in tropical and warm temperate southern regions. In Australia 9 genera and c. 100 species.

The genera *Tremandra* R.Br. ex DC., *Platytheca* Steetz and *Tetratheca* traditionally comprised the Australian endemic family Tremandraceae (Thompson 1976). Recent molecular phylogenetic research (e.g. Savolainen *et al.* 2000, Bradford & Barnes 2001, Crayn *et al.* 2006) confirms that these three genera form a clade within Elaeocarpaceae, a family of mostly rainforest trees and shrubs widespread in tropical and subtropical regions and extending into temperate areas. Placement within Elaeocarpaceae has been formalised by APGII (2003) and Coode (2004). A specimen of *Platytheca galioides* Steetz was collected reportedly from Mount Rescue National Park in 1975. It has not been found again in this area despite further searches. The presence of this genus in S.A. is considered most unlikely and the single collection is now treated as an alien occurrence.

Reference: Coode (2004).

1. TETRATHECA Sm.

Spec. Bot. New Holland 1: 5, t. 2 (1793).

(Greek tetra (four) and theca (theke - cases), referring to the four anther loculi.)

Perennial shrubs to c. 1 m high, though often 20 cm or less, compact or diffuse, usually with numerous stems arising from a woody often rhizomatous branched root stock; stems terete with vertical ridges or wings, branching often infrequent, usually pubescent, hairs of various kinds, never stellate; leaves alternate, opposite or verticillate, linear to orbicular, sometimes reduced and scale-like, to 2 cm long, glabrous or glandular-pubescent; petioles short or absent. **Flowers** solitary, occasionally several together, axillary, usually subtended by minute bracts; peduncles filiform, often dark-coloured; bracts minute; sepals 4 or 5, usually dark-coloured, generally narrow to broad-ovate, obtuse to acuminate, the base (in S.A.) attached inside the receptacle rim, usually not persistent in fruit; petals 4 or 5, alternating with the sepals, involute around paired stamens in bud, deep lilac pink to pale pink or white, not persistent in fruit; stamens 8 or 10, in one whorl, hypogynous; anthers 4-locular, basifixed, with 2 narrow loculi arranged in

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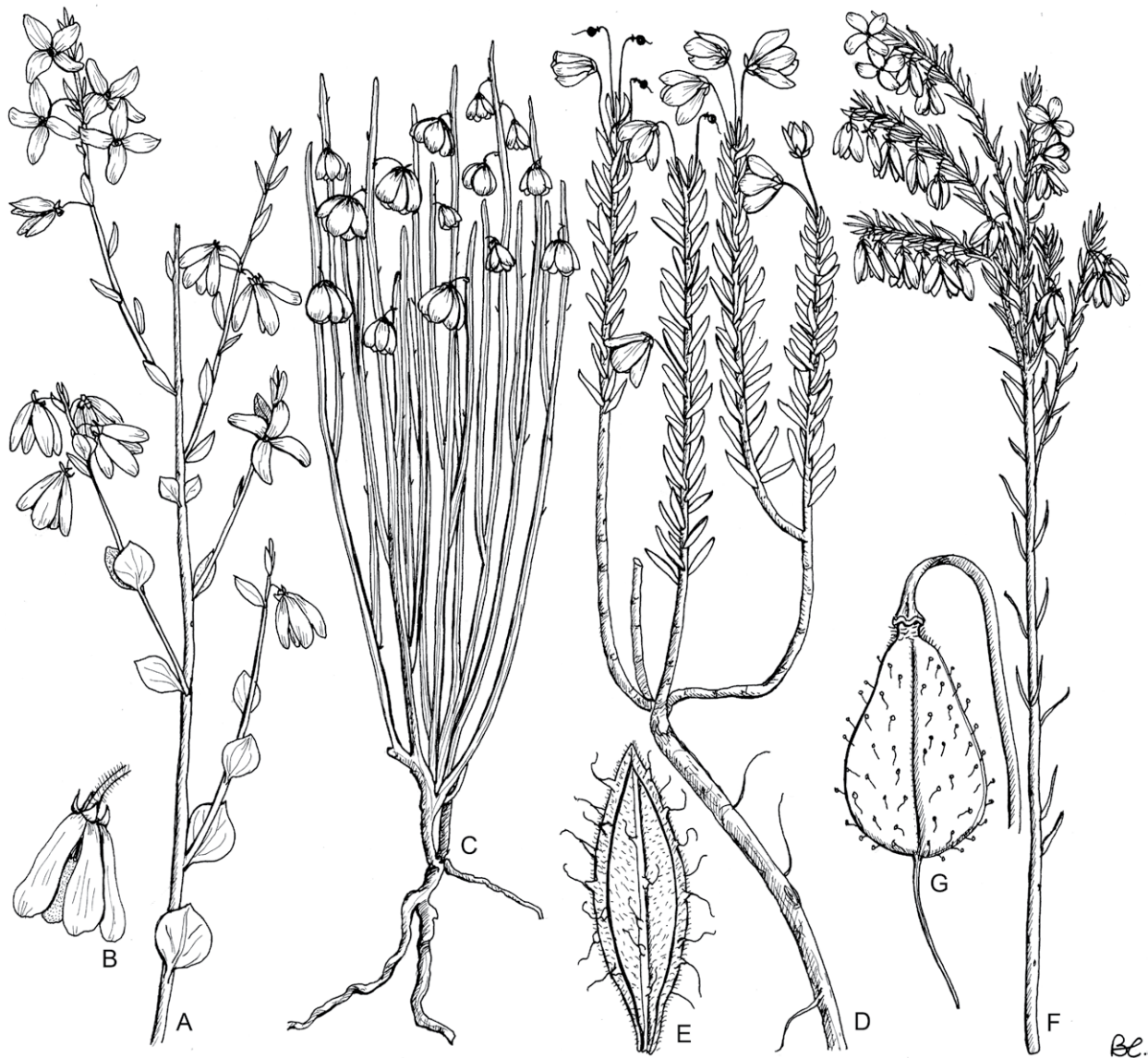


Fig. 1. A–B, *Tetradlea ciliata*: A, habit; B, flower; **C, *T. halmaturina*,** habit; **D–E, *T. insularis*:** D, habit; E, abaxial leaf surface; **F–G, *T. pilosa*:** F, habit; G, fruit. Illustration by B. Chandler, from *Flora of South Australia* 2: 787, Fig. 416 (1986).

front of a broader outer pair; ovary rarely glabrous, usually wholly or partly pubescent, compressed, with 1 or 2 ovules, occasionally more; style filiform. **Capsule** to 1 cm long, opening longitudinally; seeds 2–4 mm long, obovoid to cylindrical, brown and smooth, with fine hairs; adaxial appendage cream. **Pink-eyes.**

An Australian endemic genus of 48 currently recognised species. It is widely distributed throughout south-western and south-eastern Australia. Four species occur in S.A. Generally restricted to sandy or gravelly soils in heath and sclerophyll forest.

The *anther body* consists of the four loculi, the two largest behind the 2 smaller cells forming a “body”. The *anther tube* is at the top of the anther body, which gradually or suddenly contracts into a “tube”; the tube may be curved or straight, and often tapers towards the orifice.

References: Coode (2004); Thompson (1976).

- 1. Flowers 5-merous; plants with a generally leafless aspect, though some leaves may be present..... 2. ***T. halmaturina***
- 1: Flowers 4-merous; stems leafy
 - 2. Ovules 4 (2 in each cell); calyx conspicuously reflexed..... 1. ***T. ciliata***
 - 2: Ovules 2 (1 in each cell); calyx not reflexed
 - 3. Peduncles 1 cm or more long in mature flower and much longer than the leaves..... 3. ***T. insularis***
 - 3: Peduncles c. 1 cm long or less and never much longer than the leaves..... 4. ***T. pilosa***

1. **Tetratheca ciliata** Lindl. in T. Mitch., *Three Exped. Austral.* 2: 205 (1838). — **Illustr.:** *Fl. N.S.W.* 3: 77 (1992).

Slender shrubs to 1 m high; stems terete, branching alternate or occasionally opposite, with irregular longitudinal ridges, usually with dense erect hairs, rarely a few glandular hairs, occasionally glabrous and minute-tuberculate; leaves alternate, opposite or in whorls of 3 (–5), variable in size and shape, c. 20 × 15 mm in the lower region, narrow-elliptic to almost orbicular in the flowering region where they may be as small as c. 2 × 1 mm, margins flat or recurved usually undulate. **Flowers** 4-merous, single or 2 or 3 together; peduncles 3–9 (–12) mm long, with erect hairs and glandular hairs; sepals usually broad-ovate, acute to acuminate, with scattered hairs and a few glandular hairs, the upper part strongly reflexed, deciduous; petals, obovate to oblong, 6–18 mm long, dark- or pale-pink, occasionally white; stamens 8, 2.8–4.5 mm long; anther-body glabrous or with some short stiff hairs, flattened at the base, curved and tapering to a broad tube to 0.8 mm long with a broad orifice; ovary usually with short, velvety hairs and some small, glandular hairs; ovules 4. **Fruit** obovate to broad-ovate, 4–10 × 4–6 mm, apex emarginate or beaked; seeds obovoid, 2–3 mm long, brown, shining. **Pink-bells. Fig. 1A–B, Pl. 1A.**

S.A.: SE; N.S.W.; Vic.; Tas. In a variety of habitats from sandy coastal heath in Tas., to dry and montane areas of the mainland. Flowers: Aug.–Nov.

2. **Tetratheca halmaturina** J.M. Black, *Trans. & Proc. Roy. Soc. South Australia* 48: 256 (1924). — *T. ericifolia* var. *aphylla* Tate, *Trans. & Proc. Rep. Roy. Soc. South Australia* 12: 62 (1889).

Compact almost leafless shrubs to 20 (–50) cm high, branches first spreading then erect; stems rigid and terete or with longitudinal ridges with many small and scattered large tubercles occasionally with setae or gland-tipped hairs; leaves mostly alternate, ovate to rhomboid, 4–6 mm long, usually reduced to narrow-deltoid scales becoming withered at the top. **Flowers** 5-merous, single or 2 together in scale-leaf axils on the upper branches; peduncles 5–8 (–10) mm long, glabrous; sepals ovate to broad-ovate, obtuse to acuminate, glabrous, late deciduous; petals usually narrow-obovate, 8–13 mm long, dark-pink, rarely white; stamens usually 10; anther-body glabrous or with minute protuberances, 2.25–2.5 mm long, tapering to a tube with a narrow orifice with a curved lip; ovary usually glabrous or with scattered gland-tipped broad-based hairs, occasionally minute straight hairs; style stout, usually glabrous, 2–2.5 long; ovules 2. **Fruit** narrow-obovate, 6–8 × 2.5–4 mm, usually with a short beak; seeds cylindrical, slightly curved, 3.5–4 mm long, brown. **Curly pink-bells. Fig. 1C, Pl. 1B.**

S.A.: .KI. In scrub, mainly in the northern and western parts of Kangaroo Island; endemic to the Island. Flowers: Jul.–Dec.

3. **Tetratheca insularis** Joy Thomps., *Telopea* 1: 208 (1976). — *T. ericifolia* var. *pilosa* Tate in *Trans. & Proc. Rep. Roy. Soc. South Australia* 12: 62 (1889). *T. ericifolia* auct. non Sm.: J.M. Black, *Fl. S. Austral.* 2: 503 (1948).

Compact shrub to 20 (–60) cm high with spreading branches; stems stout and terete, branching close above a slender rootstock, longitudinally ridged, tuberculate, with small, dense, white, erect hairs and some longer, fawn, usually antrorse, setae; leaves alternate, opposite or often irregular in whorls of 3–5, ovate to narrow-ovate, 3–8 (–12) mm long, narrowing to a short, stiff point, usually recurved, margins flat to loosely revolute. **Flowers** 4-merous, single in the axils of upper and occasionally lower leaves; peduncles lengthening as the flower matures, 10–20 (–30) mm long, glabrous; sepals ovate to broad-ovate, 1.5–2 mm long, glabrous or with a few fine erect hairs, acuminate, deciduous; petals broadly ovate or obovate, 6–8 (–10) mm long, dark lilac-pink; stamens 8, 3–3.5 mm long, filaments broad, to 0.5 mm; anther-body glabrous, 2–2.5 mm long, flattened at the base, often strongly curved; anther-tube 1 mm long, curved, slender with a narrow orifice; ovary with dense short erect stiff hairs and small glandular hairs; style 1.5–2.25 mm long; ovules 2. **Fruit** obovate or cuneate, 4–6 × c. 4 mm; seeds shortly cylindrical, c. 3 mm long, with long fine spreading hairs. **Fig. 1D–E, Pl. 1C.**

S.A.: .KI. In mallee shrublands, predominantly in the western half of the island on laterite or ironstone, more rarely from limestone in *Eucalyptus diversifolia* mallee. Endemic to the island. Flowers: Aug.–Dec.

4. **Tetratheca pilosa** Labill., *Nov. Holl. Pl.* 1: 95 (1805). — *T. ericifolia* var. *pilosa* (Labill.) Maiden & Betche, *Census N.S.W. Pl.* 119 (1916), *nom. illeg., non* Tate (1889). *T. pilosa* subsp. *latifolia* Joy Thomps., *Telopea* 1: 213 (1976). — **Illustr.:** *Fl. N.S.W.* 3: 78 (1992).

Erect or spreading shrub to 60 cm high, arising from stout root stock; branches alternate, opposite or with several branches arising together, erect; stems terete or with longitudinal ridges giving a quadrangular appearance, often

with scattered, minute, erect to retrorse hairs and with tubercle-based setae, sometimes with short glandular hairs; leaves alternate, opposite or whorled, linear to broad-elliptic, 2–5 × 1–5 mm, margins closely revolute to flat. **Flowers** 4-merous, usually single in upper axils (rarely two); peduncles lengthening as the flower matures, 4–9 mm long, glabrous with gland-tipped hairs or with minute erect hairs; sepals with few or many glandular hairs, broad to narrow-ovate, obtuse, acute or acuminate, 1–2 (–2.5) mm long, deciduous; petals broad to narrow-obovate, oblong, ovate or elliptic, 3–12 mm long, dark- or pale-pink or white, occasionally differing on one plant; stamens 8, filaments 0.25–0.75 mm long, anther-body 1–2.5 mm long, flattened at the base, strongly curved and tapering to the anther-tube; anther-tube 0.25 to > 1 mm long, orifice narrow or broad; ovary with scattered glandular hairs and usually some short, stiff hairs, sometimes bearing long hollow hairs; style slender, usually glabrous, 1–3 mm long; ovules 2. **Fruit** obovate to cuneate or cordate, 3–4.5 × c. 2–3 mm long, often beaked; seeds almost oblong, c. 2.5 mm long, hairs appressed to spreading. **Pink-eyed Susan, hairy pink-bells. Fig. 1F–G, Pl. 1D–F, 2.**

S.A.: MU, YP, SL, SE; N.S.W.; Vic.; Tas. Widely distributed from southern N.S.W., throughout Vic. to northern Tas. and south-eastern S.A. In heath and sclerophyll. Flowers: predominantly June–Nov..

In 1976 Joy Thompson described two subspecies *Tetratheca pilosa* subsp. *pilosa* and *T. pilosa* subsp. *latifolia*, but she indicated that further study of the variation within the species was needed since they are very closely related and subspecific boundaries were not clear. She stated that on the mainland the subspecies were distinct and much more uniform than in Tasmania. Recent morphological (Downing 2005) and molecular (McPherson 2008) studies have confirmed that the subspecific ranking is artificial. *Tetratheca pilosa* has only ever been collected once from Yorke Peninsula (Stansbury); the collection is pre-1966 and the species is unlikely to still occur in the region.

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Pl. 1. A, *Tetraloche ciliata*. B, *T. halmaturina*, on ironstone substrate. C, *T. insularis*. D–F, *T. pilosa*: D, older flowers viewed from below; E, younger flowers; F, plant in stringybark forest, Adelaide Hills. Photos: A, D.N. Kraehenbuehl; B & C, A.C. Robinson, DENR; D & E, P.J. Lang; F, P.J. Lang, DENR.



A



B



C

Pl. 2. *Tetralthea pilosa*. A, buds and underside of leaves; B, detail of leafy shoot with younger flowers; C, older flowers. Photos: P.J.Lang, DENR.