

## Typification of *Lasiopetalum* and an interim key to the Western Australian species of the genus (Malvaceae: Byttnerioideae)

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### Abstract

Shepherd, K.A. & Wilkins, C.F. Typification of *Lasiopetalum* and an interim key to the Western Australian species of the genus (Malvaceae: Byttnerioideae). *Nuytsia* 29: 181–192 (2018). *Lasiopetalum ferrugineum* Sm. is lectotypified and selected as the type for *Lasiopetalum* Sm. Notes on the variation within *L. rosmarinifolium* (Turcz.) Benth. are provided, with *L. rosmarinifolium* var. *latifolium* (Turcz.) Benth. and *L. sp.* Kukerin (C.A. Gardner 13646) treated as synonyms. A preliminary key to the species of Western Australian *Lasiopetalum* is also presented.

### Introduction

*Lasiopetalum* Sm. is an endemic Australian genus with a centre of diversity in southern Western Australia (Western Australian Herbarium 1998–). Currently there are 41 species recognised within the state; however, published information about the group is limited. All previous keys to the members of the genus (Bentham 1863; Blackall & Grieve 1974, 1988; Grieve 1998; Marchant *et al.* 1987; Wheeler *et al.* 2002) are woefully out of date due to the recognition in recent years of ten new species and the reinstatement of *L. laxiflorum* (Benth.) F.Muell. and *L. glutinosum* (Lindl.) F.Muell. (Western Australian Herbarium 1998–; Shepherd *et al.* 2006; Bennett & Shepherd 2007; Meissner *et al.* 2014; Shepherd & Wilkins 2015, 2017, 2018). Providing up-to-date information on this genus is critical as 29 (58%) of the 50 taxa currently recognised in Western Australia are listed as rare or priority taxa of conservation concern (Smith & Jones 2018). Many of these are poorly known and lack detailed descriptive information, which poses significant problems particularly for conservation managers. Furthermore, there is little public information available for the seven unnamed informal taxa that remain on the Western Australian vascular plant census (Western Australian Herbarium 1998–). To partially remedy this, an interim key to the Western Australian species of *Lasiopetalum*, including these seven phrase-named taxa, is provided.

The opportunity is also taken to lectotypify *Lasiopetalum* and discuss the variation evident within *L. rosmarinifolium* (Turcz.) Benth., whereby two synonyms are established within it.

### Typification and new synonymies

**Lasiopetalum** Sm., *Trans. Linn. Soc. London* 4: 216 (1798). *Lectotype*, here designated: *Lasiopetalum ferrugineum* Sm. ex Andrews.

*Notes.* See below for explanation of lectotypification.

**Lasiopetalum ferrugineum** Sm. ex Andrews, *The Botanist's Repository for New, and Rare Plants* 3: t. 208 (1802). *Type specimen*: 'Mr. Lee's Garden, 1796; seeds from New South Wales.' (*lecto*, here designated: LINN-HS 403.1.1 image! [two left hand fragments '1']; *isolecto*?: 1909.LBG.8413 image!).

*Lectotypifications.* Smith (1798) established *Lasiopetalum* Sm. (Malvaceae) without providing a specific epithet for the species upon which this initial description was based. The first species to be formally recognised was *L. ferrugineum* Sm. ex Andrews, where Andrews (1802) acknowledged Smith for coining the name: 'For the Generic and Specific titles of this plant we are indebted to Dr. Smith, P. L. S. &c. and we do not think more appropriate ones could have been invented.' The plant illustrated in this publication (Pl. 208) was stated to have been 'raised at the Hammersmith Nursery, from seeds received from New South Wales in 1791'; however, no specimens attributed to being cultivated at that nursery have been located to date. While the illustration could serve as a type we argue the original material used by Smith to produce the generic description is available. Images of specimens from the Herbarium of James Edward Smith held at the Linnean Society of London can be viewed via [http://linnean-online.org/smith\\_herbarium.html](http://linnean-online.org/smith_herbarium.html).

The earliest specimen of *Lasiopetalum* in the collection, which is designated here as the lectotype, comprises two fragments of *L. ferrugineum* on the left hand side of a single sheet (LINN-HS 403.1.1) with the description '1. Mr. Lee's Garden, 1796; seeds from New South Wales.' There is an annotation in Smith's hand on the bottom right of this sheet initialled 'J.E.S.' that states '*Lasiopetalum ferrugineum* Andr. t. 208 -' acknowledging the illustration in Andrews (1802). Smith (1812), in his entry in Rees' Cyclopaedia under *L. ferrugineum*, referenced the Andrews publication and also stated the species was 'Native of marshes in New South Wales, from whence the seeds were received in 1791, by Messers Lee and Kennedy.' An older collection of *L. ferrugineum* (LINN-HS 403.1.2) on the right hand side of the same sheet, designated with the following note '2. New South Wales. Mr. Lambert. 1803', is not type material. An annotation also in Smith's hand was found on a second sheet of *L. ferrugineum* (1909.LBG.8413) from his collection held at the World Museum Liverpool (LIV). This specimen has a note that states it was cultivated in the Cambridge garden from seeds collected in New South Wales. As no date is provided it is unclear if this material represents a possible isolectotype.

**Lasiopetalum rosmarinifolium** (Turcz.) Benth. *Fl. Austral.* 1: 264 (1863). *Sarotes rosmarinifolia* Turcz. *Bull. Soc. Imp. Naturalistes Moscou* 25(3): 149 (1852). *Type citation*: 'N. Holl. *Drum. V. n. 266*'. *Type specimens*: 'Swan River to Cape Riche [Western Australia], 1848, *J. Drummond* 5: 266 (*holo*: KW 001000136 image!; *iso*: G 00358459 image!; G 00358460 image!; K 000686573 [right hand specimen] image!; MEL 236526 image!; P 02142988 image!).

*Lasiopetalum rosmarinifolium* var. *latifolium* (Turcz.) Benth. *Fl. Austral.* 1: 265 (1863). *Sarotes latifolia* Turcz. *Bull. Soc. Imp. Naturalistes Moscou* 25(3): 150 (1852). *Type citation*: 'N. Holl. *Drum. V. n. 265*'. *Type specimens*: 'Swan River to Cape Riche [Western Australia], 1848, *J. Drummond* 5: 265 (*holo*: KW 001000137 image!; *iso*: G 00358461 image!; G 00358462 image!; K 000686575 [left hand specimen] image! and K 000686576 [right hand specimen] image!; MEL 236525 image!; P 02142989 image!).

*Lasiopetalum* sp. Kukerin (C.A. Gardner 13646), Western Australian Herbarium, in *FloraBase*, <https://florabase.dpaw.wa.gov.au/> [accessed 23 January 2018].

*Notes.* Considerable effort has been made over the years to clarify the variation in *L. rosmarinifolium* (Turcz.) Benth. and the complex has even been the subject of a Botany honours project at The University of Western Australia (Orifici 1996). This detailed taxonomic investigation confirmed the distinctiveness of the informal taxon *L. sp.* Mt Ragged (T.E.H. Aplin 4349) due to the presence of a mixture of stellate and glandular hairs on the outer calyx and ovary (see Figure 1F); however, the remaining variation across *L. rosmarinifolium s. lat.* remained intractable.

*Lasiopetalum rosmarinifolium* var. *latifolium* (Turcz.) Benth. is currently listed as a name of ‘uncertain application’ on the *Australian Plant Name Index* (CHAH 2006–). This taxon is not recognised in Western Australia (Western Australian Herbarium 1998–) but it has never been formally synonymised in the literature. While there is considerable morphological variation evident within *L. rosmarinifolium s. lat.* we also do not formally recognise var. *latifolium* here, although we do acknowledge that with further work it may be supported as distinct and warrant some form of taxonomic recognition. Originally described as *Sarotes latifolia* Turcz., *L. rosmarinifolium* var. *latifolium* generally represents specimens within the complex that have styles that are glabrous in the upper half (or with very few reflexed hairs) and with dense stellate hairs towards the base. The stellate hairs on the outer calyx tend to have shorter and thicker arms and some specimens (including the type) have leaves that are wider than typical, but all of these features are highly variable. Most specimens that correspond to var. *latifolium* are found near Ravensthorpe and extend eastwards through to a population near Cocklebidy.

Some time ago the phrase name *L. sp.* Kukerin (C.A. Gardner 13646) was proposed to formalise the manuscript name *L. leucogriseum* ms (E.M. Bennett Jan. 1999 *in sched.*) to account for specimens within the complex usually found west of Ravensthorpe that have reflexed, fan-like hairs on the style and woolly stellate hairs on the outer calyx. It is clear after examining images of type material of *Sarotes rosmarinifolia* Turcz. housed at the National Herbarium of Ukraine (KW) (via *Global Plants*, <https://plants.jstor.org/>) and from the protologue, that this phrase name corresponds to typical *L. rosmarinifolium*. While two broad groups within *L. rosmarinifolium s. lat.* have been outlined here, there remains significant variation that cannot be readily categorised (including differences in the number of carpels in the ovary) and all features tend to overlap to some degree.

### Notes on the key to species of *Lasiopetalum* in Western Australia

The size and shape of juvenile leaves can vary significantly compared to those on adult plants. For example, the leaves of young *L. occidentale* K.A. Sheph. & C.F. Wilkins may be multi-lobed but as the plants mature they become consistently trilobed (Shepherd & Wilkins 2017). Juvenile leaves can be larger or smaller in size than typical and the indumentum may change during development (e.g. hair density can appear to decrease as the leaf lamina begins to expand). Due to this potential variation all characters in the key are based on observations of fully developed leaves from mature plants.

The presence, size, colour and type of hairs are often diagnostic in *Lasiopetalum* (and similar to hairs in the closely related genus *Thomasia* J. Gay, some species of which serve as vouchers for illustrations in Figure 1). As stated in Shepherd and Wilkins (2017), stellate hairs have multiangulate arms (Figure 1B) while flat scale-like hairs have fused arms that are rotate (align in one plane) (Figure 1H). Indumentum density is defined here as ‘tomentose’ when the hairs are very densely arranged and the epidermis obscured, ‘dense’ when hairs are overlapping but the epidermis is visible, ‘moderately dense’ when hairs are touching laterally, and ‘scattered’ when the hairs are well-separated. Some species have a

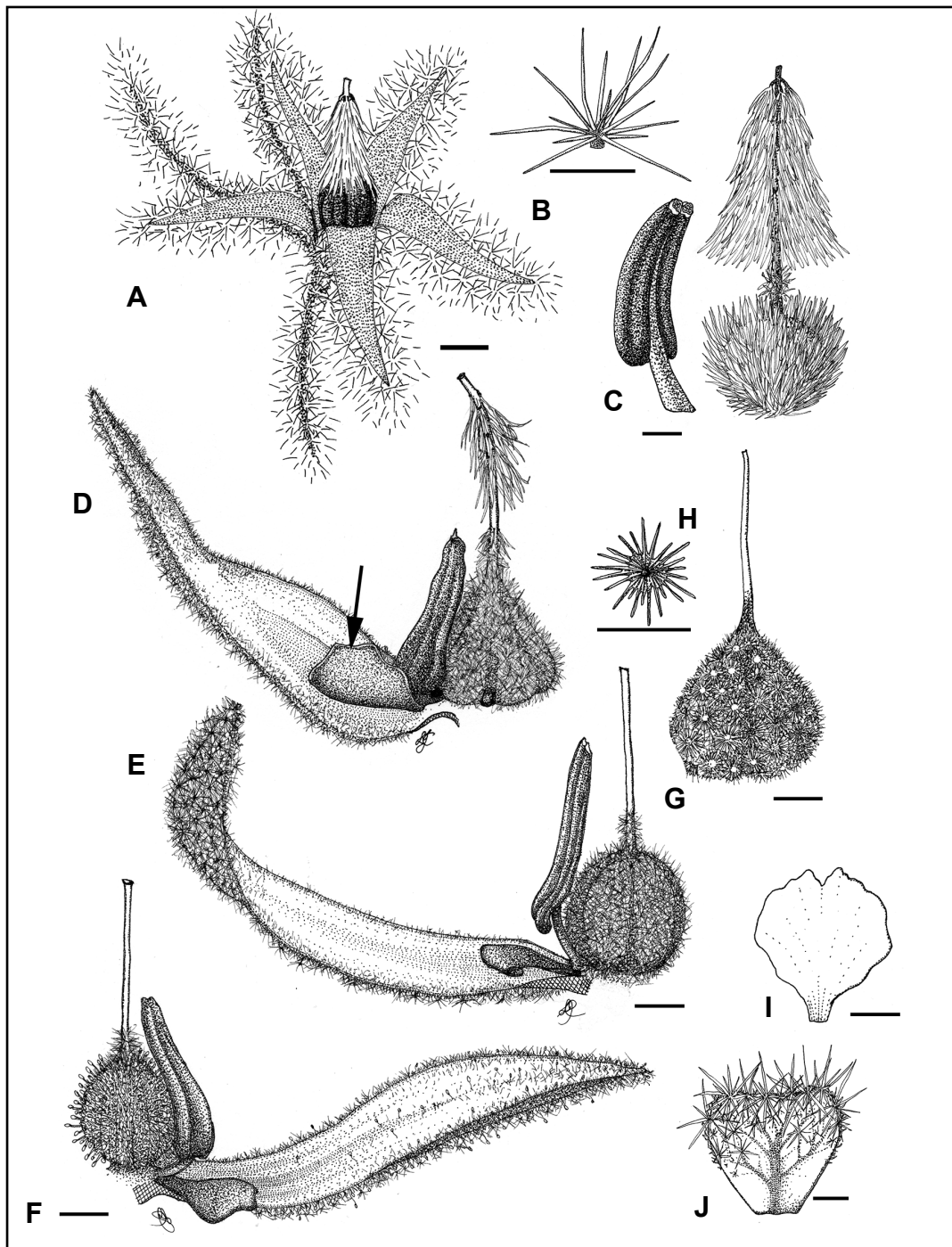


Figure 1. Floral features of *Lasiopetalum*. A – flower with a woolly indumentum on the outer calyx; B – multitangulate stellate hair; C – anther with an obtuse apex, style with tomentose fan-like hairs, ovary covered in long, silky hairs; D – style with scattered fan-like hairs, glabrous scale-like petal (arrow); E – glabrous style, ovary with ‘close’ stellate hairs, each arm < 0.4 mm long; F – ovary with a mix of stellate and glandular hairs; G – ovary with scale-like hairs; H – flat scale-like hair; I – scale-like petal; J – scale-like petal with stellate hairs. Scale bars = 0.25 mm (H); 0.5 mm (C, G, I, J); 1 mm (B, D, E, F); 1.25 mm (A). Vouchers: *L.* sp. Watheroo (K. Shepherd & C. Wilkins KS 220) (K.A. Shepherd & C.F. Wilkins KS 220) (A, C, J); *Thomasia foliosa* J.Gay (K.A. Shepherd KS 399) (B, G, H); *L. rosmarinifolium* (K.A. Shepherd s.n.) (D, E); *L.* sp. Mt Ragged (T.E.H. Aplin 4349) (voucher unknown) (F); *T. rulingioides* Steud. (K.A. Shepherd et al. KS 201) (I).

woolly outer calyx where the tomentose hairs are long and intertwined (Figures 1A, 2B). The first step in the key separates species based on the presence or absence of hairs along the upper section of the style. Previously, species with stalked and reflexed stellate hairs that form a ‘cylindrical or conical mass’ along the length of the style (Figure 1A, C) were segregated into sect. *Corethrostylis* (Endl.) Benth. (Bentham 1863); however, this character is not consistent as species such as *L. rosmarinifolium* have some populations with glabrous styles and others that have styles with dense fan-like hairs along the upper section (Figure 1D–F). It should be noted that this species, like other taxa that are variable, may appear more than once in the key (designated by \*). Ovary indumentum is also variable and hairs may be long and silky (Figure 1C), scale-like (Figure 1G), ‘close’ where the arms of the stellate hairs are short and < 0.4 mm long (Figure 1E), or papillate (covered in small wart-like bumps) as seen in *L. monticola* Paust. Finally the ovary may be covered in glandular hairs or a mixture of stellate and glandular hairs (Figure 1F) as seen in species such as *L. sp. Mt Ragged* (T.E.H. Aplin 4349).

Other distinctive floral characters include the presence of: reduced or scale-like petals (steps 2 and 11) that may be glabrous (Figure 1I; 2A) or covered in stellate hairs (Figure 1J); epicalyx bracts (step 4) that are large and petaloid (Figure 2B; also see Shepherd & Wilkins 2018) or linear to narrowly oblong



Figure 2. Informative floral characters in *Lasiopetalum*. A – reduced, scale-like petals (white arrow); B – style with a dense, conical mass of hairs (white arrow); epicalyx bract petaloid and broadly ovate (blue arrow); C – epicalyx bracts linear near the base of the calyx lobe (white arrow); D – epicalyx bracts fused to the base of each flower. Vouchers: *L. drummondii* Benth. (K.A. Shepherd & C.F. Wilkins KS 1605) (A); *L. rotundifolium* Paust (K.A. Shepherd & C.F. Wilkins KS 1619) (B); *L. glutinosum* subsp. *latifolium* (Benth.) K.A. Sheph. & C.F. Wilkins (K.A. Shepherd & S.R. Willis KS 1565) (C); *L. discolor* Hook. (R. Cumming s.n.). Images by K.A. Shepherd (A–C) and R. Cumming (D).

(Figure 2C); and anthers that are apically-beaked (step 30) and  $> 3$  mm long (referred to as rostrate anthers; see Shepherd & Wilkins 2015) or with an obtuse or sub-acute apex (Figure 1C, 2B). Another feature that is somewhat difficult to describe is the fusion of the base of the epicalyx bracts (step 38). In some species the epicalyx bracts may be partially fused at the very base but this fusion is more obvious in *L. discolor* Hook. and *L. adenotrichum* R.A.Meissn. & Rathbone. Bentham (1863) stated that the bracts in *L. discolor* form an ‘involucre around the soft woolly flower-heads’ (Figure 2D). Finally, an inflorescence (step 9) may be loose when the flowers are well-spaced (Figures 2C, 3A) or compact such that the bases of the flowers are in close proximity or touching (Figures 2A, D, 3B).

Aspects of this key are adapted from those previously published in Shepherd and Wilkins (2015, 2017).

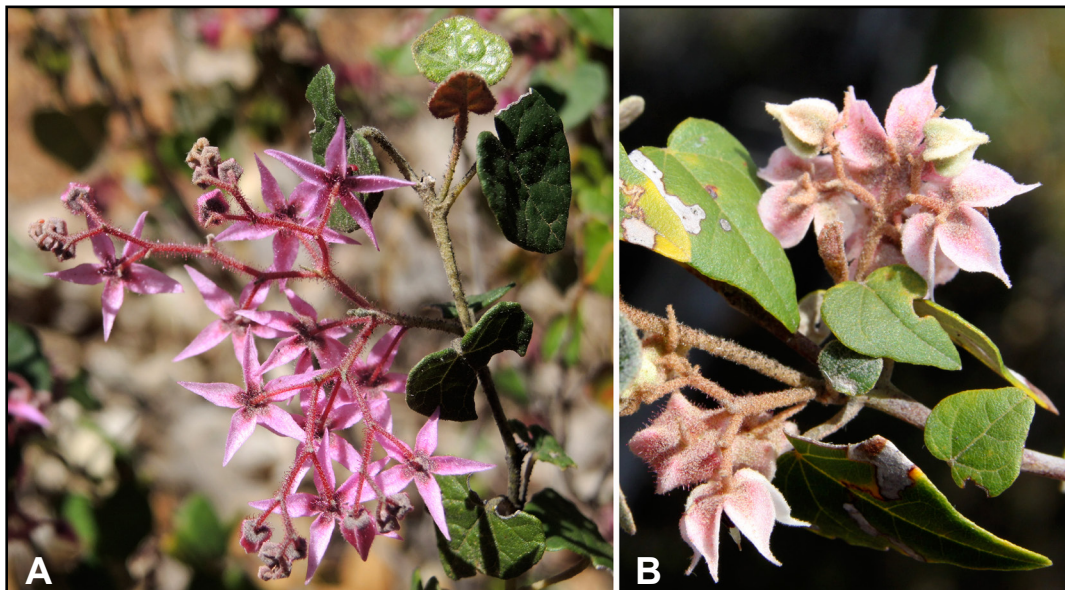


Figure 3. *Lasiopetalum* inflorescences. A – loose; B – compact. Vouchers: *L. cardiophyllum* Paust (K.A. Shepherd & S.R. Willis KS 1656) (A) and *L. cordifolium* Endl. (K.A. Shepherd & C.F. Wilkins KS 1647) (B). Images: K.A. Shepherd.

### Interim key to *Lasiopetalum* in Western Australia

\*taxa appear in more than one section of the key

1. Style upper 1/2 to 2/3 with stalked, reflexed, fan-shaped, stellate hairs (either a dense conical mass, scattered or occasional)
  2. Apical leaves  $\pm$  opposite, with alternate leaves below; scale-like petals present
    3. Epicalyx bracts with stellate hairs and scattered red glandular hairs; calyx  $< 4$  mm long (Kalbarri–Murchison Gorge).....**L. oppositifolium\***
    - 3: Epicalyx bracts with stellate hairs only; calyx  $> 4$  mm long (Shark Bay–Garden Island).....**L. angustifolium**
  - 2: All leaves alternate; scale-like petals present or absent
    4. Epicalyx bracts petaloid, ovate to broadly ovate
      5. Epicalyx bracts three (one large, two small), cream, close to the base of the calyx (Quairading–E of Jerramungup).....**L. microcardium**
      - 5: Epicalyx bract solitary, bright pink, distant from the base of the calyx

6. Leaves orbicular to sub-orbicular, base deeply cordate *c.* 1/3 of leaf length
7. Leaves thick and stiff, lower surface tomentose (Pingelly–Narrogin) ..... **L. rotundifolium**
- 7: Leaves thin and pliable, lower surface with scattered stellate hairs (Dandaragan) ..... **L. rupicola**
- 6: Leaves narrowly to broadly ovate, base slightly to moderately cordate < 1/4 of leaf length
8. Leaves thick and stiff; margin strongly recurved to inrolled
9. Inflorescence compact, 19–50 mm long; calyx lobes 2–2.6 mm wide, mauvish pink with dark red to red at the base and centre of each lobe (Wongan Hills–Newdegate) ..... **L. molle**
- 9: Inflorescence loose, (21–)35–74 mm long; calyx lobes 1.3–2.1 mm wide, mauvish pink with dark red at the base only (N of Badgingarra–Toodyay) ..... **L. decoratum**
- 8: Leaves thin and pliable; margin slightly to moderately recurved
10. Lower leaf surface with a mix of small stellate hairs and occasional larger stellate hairs (Darling Ra. E of Perth–Dryandra) ..... **L. bracteatum**
- 10: Lower leaf surface with occasional larger stellate hairs only (Perth–Augusta; Tarin Rock) ..... **L. membranaceum**
- 4: Epicalyx bracts non-petaloid, linear or narrowly oblong
11. Scale-like petals present
12. Outer calyx and ovary with stellate and glandular hairs (ovary sometimes with glandular hairs only) (E of Hopetoun–Israelite Bay) ..... **L. sp. Mt Ragged\***
- 12: Outer calyx and ovary with stellate hairs only
13. Style with scattered or occasional fan-shaped stellate hairs
14. Mature ovary > 2.5 mm wide (SE WA, southern SA, Vic, NSW) ..... **L. behrii\***
- 14: Mature ovary < 2 mm wide
15. Inflorescence a cyme of 3–9 flowers, each flower > 6 mm long (Bodalín–Albany –Cocklebidy) ..... **L. rosmarinifolium \***
- 15: Inflorescence a cyme of 8–15 flowers, each flower < 6 mm long (Stirling Range NP–Howick Hill) ..... **L. parvuliflorum\***
- 13: Style with a dense conical mass of fan-shaped stellate hairs
16. Leaves narrowly oblong, narrowly ovate to ovate or elliptic, usually > 3 mm wide
17. Apical leaves erect; upper surface rusty-brown from an indumentum of dense, rusty orange stellate hairs, late-glabrescent (Carnamah–SE of Mullewa) ..... **L. sp. Watheroo**
- 17: Apical leaves usually horizontal or reflexed; upper surface greyish green from an indumentum of tomentose, white stellate hairs with dark brown centres, early-glabrescent (Cataby–S of Geraldton) ..... **L. drummondii**
- 16: Leaves linear (L:W >10:1), usually < 2.5 mm wide
18. Flowers pink; calyx lobe < 1 mm wide at the base (Walkaway–Gingin) ..... **L. lineare**

- 18: Flowers greenish white; calyx lobe > 2 mm wide at the base  
(Bodalín–Albany–Cocklebidy)..... **L. rosmarinifolium\***
- 11: Scale-like petals absent
- 19: Leaves linear (L:W > 10:1) to narrowly oblong usually ≤ 2.5 mm wide  
(Chiddarcooping NR–Boxwood Hill)..... **L. fitzgibbonii**
- 19: Leaves narrowly ovate to ovate or elliptic, usually > 3 mm wide
- 20: Trailing subshrub; stem and outer calyx indumentum of scale-like hairs;  
leaves usually < 6 mm long (Bindoon–Toodyay; NE of North Bannister)..... **L. caroliae**
- 20: Erect subshrub to shrub; stem and outer calyx indumentum of multiangulate  
stellate hairs; leaves > 6 mm long
- 21: Leaves always multilobed; ovary and fruit winged between carpel fusion  
lines (Serpentine NP)..... **L. pterocarpum**
- 21: Leaves entire, sinuate, trilobed or multilobed; ovary and fruit not winged
- 22: Lower leaf surface glabrous or with scattered to moderately dense  
stellate hairs with arms > 0.2 mm long
- 23: Leaves thickened and firm; lower leaf surface glabrous or with scattered,  
stellate hairs on veins only (Bullsbrook–North Bannister). .... **L. glabratum**
- 23: Leaves thin and pliable; lower leaf surface with a scattered to  
moderately dense indumentum of stellate hairs
- 24: Indumentum of pale brown, golden or ferruginous (rarely purple-red),  
stellate hairs present on new growth of the stem, pedicels and  
peduncle; calyx lobes 0.7–1.1 mm wide, base dark red
- 25: Leaves entire, multilobed or sinuate; inflorescence usually with  
≥ 10 flowers (Bullsbrook –Walpole–Boat Harbour)..... **L. floribundum**
- 25: Leaves always distinctly trilobed; inflorescence always with  
< 10 flowers (Margaret River region)..... **L. occidentale**
- 24: Indumentum of bright red, stellate hairs (on new growth); calyx  
lobes 1.4–2.3 mm wide, base dark red with green at junction of lobes
- 26: Lower leaf surface with two layers of stellate hairs (large and small);  
calyx lobes 1.4–1.7 mm wide, inner surface with stellate hairs;  
aril a cream-brown cap with 2–5 arms, 1.6–2.3 mm long  
(Kellerberrin–Kwolyin)..... **L. mouleian**
- 26: Lower leaf surface with one layer of large stellate hairs; calyx  
lobes (1.7–)2–2.8 mm wide, inner surface glabrous; aril a white  
cap with 2 arms, c. 1.3 mm long (Mt Lesueur)..... **L. rutilans**
- 22: Lower leaf surface with a dense tomentum of stellate hairs, each with  
short arms < 0.2 mm long
- 27: Leaves usually < 20 mm long; calyx lobes 1.5–2.6 mm wide
- 28: Inflorescence loose, 23–41 mm long; one epicalyx bract
- 29: Flowers bright pink; occurs in jarrah-marri woodland on laterite  
(Boddington–Cranbrook)..... **L. cardiophyllum**
- 29: Flowers white or with a pale pink tinge; occurs in  
open mallee in loamy sand (Wellstead)..... **L. sp. Wellstead**



- 28: Inflorescence compact, 13–20 mm long; three epicalyx bracts (Brookton)..... **L. sp. Weam Reserve**
- 27: Leaves > 25 mm long; calyx lobes 2.6–4.5 mm wide
30. Leaves ovate, apices acute; inflorescence compact; calyx lobes 3.5–4.5 mm wide (Dudin–Lake Muir–Two Peoples Bay)..... **L. cordifolium**
- 30: Leaves narrowly ovate to ovate, apices acuminate; inflorescence becoming loose; calyx lobes 2.6–3.4 mm wide (Mt Frankland–Stirling R.–N of Two Peoples Bay)..... **L. sp. Denmark**
- 1: Style upper 1/2 to 2/3 glabrous (base of style may have sessile stellate hairs)
31. Anthers > 3 mm long with an acuminate (rostrate) apex
32. Petals present (Whicher Range)..... **L. laxiflorum**
- 32: Petals absent
33. Epicalyx bracts towards base of pedicel; calyx lobes narrowly ovate; anthers densely stellate-hairy (Northam)..... **L. trichantherum**
- 33: Epicalyx bracts towards base of calyx; calyx lobes ovate; anthers glabrous
34. Calyx outer surface not viscid, with a moderately dense stellate indumentum throughout; bracts filiform, > 6 mm long, < 0.3 mm wide; epicalyx bracts 6–14 mm long
35. Leaves ovate, upper surface prominently rugose and persistently stellate hairy; ovary with papillose glands (New Norcia)..... **L. cenobium**
- 35: Leaves trilobed, upper surface smooth, glabrescent; ovary with dense white stellate hairs (Boonanarring NR)..... **L. venustum**
- 34: Calyx outer surface viscid with dense globular glands, sometimes also with white stellate hairs at the base; bracts very narrowly ovate or very narrowly oblong < 6 mm long, > 0.3 mm wide; epicalyx bracts 3.3–9 mm long
36. Leaves usually trilobed; pedicel and calyx outer surface with dense globular glands only or rarely also with scattered white stellate hairs at the base of the calyx (Darling Scarp)..... **L. glutinosum** subsp. **glutinosum**
- 36: Leaves ovate or shallowly trilobed; pedicel and calyx outer surface with dense globular glands and with a moderately dense to dense stellate indumentum at the base of the calyx (Moora–Boddington)<sup>1</sup>..... **L. glutinosum** subsp. **latifolium**
- 31: Anthers < 3 mm long with an obtuse or sub-acute apex
37. Leaves narrowly oblong to oblong or narrowly ovate to ovate, ≥ 3 mm wide
38. Leaves at apical nodes opposite to sub-opposite, with lower leaves alternate (Kalbarri–Murchison Gorge)..... **L. oppositifolium\***
- 38: Leaves all alternate
39. Epicalyx bracts oblong, (1–)1.8–2.4 mm wide, strongly fused at base

<sup>1</sup>In areas where the distributions of the two subspecies overlap these diagnostic characters may intergrade (see Shepherd & Wilkins 2015).

40. Leaf surface slightly rugose, margin sinuate; indumentum of stellate hairs only (southern coastal WA, SA, Vic, Tas).....**L. discolor**
- 40: Leaf surface smooth, margin entire; indumentum a mix of stellate and glandular hairs to 0.7 mm long (Fitzgerald River NP) ..... **L. adenotrichum**
- 39: Epicalyx bracts narrowly oblong, narrowly ovate or filiform, 0.3–1.6 mm wide, slightly fused to free at base
41. Petals with a dense to tomentose indumentum of stellate hairs
42. Leaves ovate to hastate, margin flat; epicalyx bracts usually > calyx length; ovary 2-locular (E of Geraldton–Watheroo NP) ..... **L. sp. Coorow**
- 42: Leaves ovate, margin recurved to concave; epicalyx bracts < calyx length; ovary 3-locular (Kalbarri–W of Mullewa) ..... **L. oldfieldii**
- 41: Petals glabrous or with a few scattered stellate hairs only
43. Ovary papillate otherwise glabrous (Stirling Ra.–East Mt Barren) ..... **L. monticola**
- 43: Ovary stellate hairy, or with a mix of stellate and glandular hairs
44. Inflorescence a loose cyme with flowers well-spaced
45. Leaves with a distinctly acute to acuminate apex
46. Inflorescence 25–30(–50) mm long; peduncles to 25 mm long; flowers 4–6(–9); ovary stellate-hairy (Stirling Ra.)..... **L. dielsii**
- 46: Inflorescence 65–85 mm long; peduncles to 50 mm long; flowers 7–15; ovary glandular and stellate-hairy (Stirling Ra.) ..... **L. membraniflorum**
- 45: Leaves with an obtuse or sub-acute apex
47. Pedicels > 3.5 mm long; inner calyx bright pink (Dandaragan–S of Geraldton)..... **L. ogilvieanum**
- 47: Pedicels < 3.5 mm long; inner calyx white, cream or pale pink
48. Leaves ovate, *c.* 10–30 mm wide, upper surface glossy and viscid, base strongly cordate (Bremer Bay–Hopetoun).....**L. quinquenervium**
- 48: Leaves narrowly ovate to oblong, *c.* 4.5–13 mm wide, upper surface not glossy or viscid, base petiolate or slightly cordate
49. Calyx outer surface with white stellate hairs (Albany–Israelite Bay).....**L. indutum\***
- 49: Calyx outer surface with ferruginous stellate hairs (Cape Le Grande NP) ..... **L. maxwellii**
- 44: Inflorescence a compact cyme with flowers in close proximity or touching
50. Calyx outer surface with a woolly indumentum of stellate hairs, each with arms to > 0.6 mm long
51. Calyx outer surface with a mix of stellate and glandular hairs, waxy in appearance, inner surface white to cream (Lake King–Forrestania).....**L. ferraricollinum**
- 51: Calyx outer surface with stellate hairs only, not waxy in appearance
52. Calyx inner surface pink

53. Epicalyx bracts shorter than the calyx; calyx inner surface with stellate hairs on the outer margin only with moderately dense glands towards the centre and base (Beaufort Inlet–Cape Arid) ..... **L. compactum**
- 53: Epicalyx bracts as long as or longer than the calyx; calyx inner surface with stellate hairs only (Albany–Israelite Bay).....**L. indutum\***
- 52: Calyx inner surface cream or greenish-white (Bodallin–Albany–Cocklebidy)..... **L. rosmarinifolium\***
- 50: Calyx outer surface and ovary with a close tomentum of stellate hairs, each with arms < 0.4 mm long
54. Flowering ovary > 2.5 mm wide (SE WA, SA, Vic, NSW)..... **L. behrii\***
- 54: Flowering ovary < 2 mm wide
55. Inflorescence a cyme of 8–15 flowers, each calyx < 6 mm long (Stirling Range NP–Howick Hill). ..... **L. parvuliflorum\***
- 55: Inflorescence a cyme of 3–9 flowers, each calyx > 6 mm long
56. Inner calyx pink, lobes with glands present (Ravensthorpe) ..... **L. sp. Desmond**
- 56: Inner calyx whitish green or cream with glands absent (Bodallin–Albany–Cocklebidy)..... **L. rosmarinifolium\***
- 37: Leaves linear (L:W > 10:1) to narrowly oblong usually ≤ 3 mm wide
57. Outer surface of calyx with stellate and glandular hairs to 0.8 mm long; ovary with both kinds of hairs or only glandular hairs (E of Hopetoun–Israelite Bay)..... **L. sp. Mt Ragged\***
- 57: Outer surface of calyx with stellate hairs to 0.15–0.3 mm long, lacking glandular hairs; ovary with stellate hairs only
58. Inflorescence a cyme of 8–15 flowers, each flower < 6 mm long (Stirling Range NP–Howick Hill). ..... **L. parvuliflorum\***
- 58: Inflorescence a cyme of 3–9 flowers, each flower > 6 mm long (Bodallin–Albany–Cocklebidy) ..... **L. rosmarinifolium\***

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