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Persistence pays off: resolution of *Lasiopetalum hapalocalyx* (Malvaceae: Byttnerioideae), a new species from south-western Australia

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SHORT COMMUNICATION

This new species was first collected in 1995 near Cape Riche on the south coast of Western Australia but its taxonomic status has remained unresolved, in part due to a lack of adequate material. Over the following 25 years, a further 35 specimens of this species and its closest allies were collected during regional surveys or through targeted field research and submitted to the Western Australian Herbarium (Western Australian Herbarium 1998–). Access to this additional material has ultimately facilitated its taxonomic resolution.

Allied to a group of species related to *Lasiopetalum cordifolium* Endl. and characterised by a dense cone of stalked, fan-like hairs along the style (Figure 1C, E), discolorous leaves, and one to three, narrow epicalyx bracts, this lovely species is distinctive in having leaves with an acute apex and delicate star-shaped flowers with narrow calyx lobes that are covered in stellate and glandular hairs. It is only known from a few localities that occur in close proximity and very few plants have been observed at each site, suggesting this species may merit listing as Threatened. This makes it a priority for further survey work to better inform its conservation status and ongoing management.

Lasiopetalum hapalocalyx K.A.Sheph. & C.F.Wilkins, *sp. nov.*

Type: near Wellstead, Western Australia [precise locality withheld for conservation reasons], 27 October 2016, *K.A. Shepherd & C.F. Wilkins* KS 1650 (*holo*: PERTH 08877653; *iso*: CANB, MEL).

Lasiopetalum sp. Wellstead (K.A. Shepherd & C.F. Wilkins KS 1650), Western Australian Herbarium, in *FloraBase*, https://florabase.dpaw.wa.gov.au/ [accessed 30 January 2018].

Erect and slender or spreading *shrub* 0.3–0.7 m high, 0.8–1 m wide. *Young stems* with a tomentose indumentum of stellate hairs with 8–12 erect arms each to 0.15 mm long, with or without occasional glandular hairs to 0.15 mm long. *Petioles* 3.1–9.4(–14) mm long, indumentum as for young stems. *Leaves* stiff, broadly ovate, moderately discolorous, 7.5–23 mm long, 5.3–19.1 mm wide, base slightly cordate, apex acute; margins entire, scarcely recurved; abaxial surface with a close tomentum of stellate hairs with *c.* 10 erect arms each to 0.15 mm long, glandular hairs absent; adaxial surface smooth, early

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glabrescent. *Inflorescence* a loose dichasium with 5–11 flowers, 19–31 mm long. *Peduncles* 5.1–14 mm long, with a close tomentum of stellate hairs with *c.* 12 erect arms each to 0.15 mm long, with scattered red-tipped glandular hairs to 0.3 mm long. *Pedicels* 2.1–3.7 mm long, indumentum as for peduncles but with moderately dense rather than scattered glandular hairs. *Bract* narrowly ovate, 0.8–3.8(–4.5) mm long, 0.3–0.5 mm wide. *Epicalyx bract* usually attached below the calyx, very narrowly ovate to linear, 1.5–4 mm long, 0.3–0.5 mm wide; both surfaces with a tomentose indumentum of stellate hairs with 6–10 erect arms each to 0.2 mm long, with or without scattered red-tipped glandular hairs to 0.3 mm long. *Calyx* creamy white (sometimes with a pink blush) with dark red markings at the base of each lobe, 6.2–7.4 mm long, with a tube 0.4–1.3 mm long; lobes narrowly ovate, 4.9–6.8 mm long, 1.7–2.3 mm wide, outer surface with dense stellate hairs with 8–12 erect arms each to 0.2 mm long, with moderately dense red-tipped glandular hairs *c.* 0.3 mm long; inner surface base and central lobe with moderately dense, soft, simple or stellate hairs with 1–5 arms each to 0.15 mm long, glandular hairs absent. *Staminal filaments* 0.3–0.5 mm long. *Anthers* 1.5–1.9 mm long, 0.7–0.8 mm wide. *Ovary* 0.9–1 mm long, 0.9–1 mm wide; outer surface with a tomentose indumentum of stellate hairs to 0.2 mm long, without glandular hairs. *Style* 2.7–3 mm long, with a dense cone of white, stalked, fan-like stellate hairs. *Fruit* and *seed* not seen. (Figure 1A–C)

Diagnostic features. *Lasiopetalum hapalocalyx* may be distinguished from all other members of the genus with fan-shaped stellate hairs on the style by the following combination of characters: broadly ovate leaves with an acute apex, a single narrowly ovate epicalyx bract, a loose inflorescence of creamy white flowers with dark markings at the base of each narrowly ovate (1.7–2.3 mm wide) calyx lobe.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 13 Sep. 2011, *S. Barrett* 2063 (PERTH); 16 Aug. 2015, *S. Barrett* 2231 (PERTH); 20 Oct. 1995, *K.A. Shepherd & J.A. Wege* KS 291 (PERTH); 20 Oct. 1995, *K.A. Shepherd & J.A. Wege* KS 292 (PERTH); 27 Oct. 2016, *K.A. Shepherd & C.F. Wilkins* KS 1648 (PERTH).

Phenology. Flowering from mid- to late spring (August–October) and fruiting from late spring to early summer.

Distribution and habitat. Endemic to the Esperance Plains bioregion of the South West Botanical Province where it grows in pale brown loamy sand in low *Eucalyptus* mallee shrubland with *Kennedia*, *Synaphea*, *Boronia* and *Gompholobium*.

Conservation status. Listed as Priority One under Conservation Codes for Western Australian Flora (Smith & Jones 2018), under the name *L.* sp. Wellstead (K.A. Shepherd & C.F. Wilkins KS 1650). It is known from three population centres that are less than 40 km apart and plants have either been observed near road verges or noted as rare. A Threatened status may be warranted.

Etymology. The epithet is derived from the Greek *hapalo-* (soft-) and *kalyx* (calyx), and refers to its soft and delicate flowers.

Vernacular name. Wellstead Lasiopetalum.

Affinities. According to a recently published taxonomic key to species of *Lasiopetalum* in Western Australia (Shepherd & Wilkins 2018), *L. hapalocalyx* (as *L.* sp. Wellstead) is morphologically allied to the *L. cordifolium* group, which also includes *L. cardiophyllum* Paust and two potentially new taxa, *L.* sp. Weam Reserve (M. Hislop 2755) and *L.* sp. Denmark (B.G. Hammersley

Figure 1. Comparison of *Lasiopetalum hapalocalyx* (A–C) and morphologically allied taxa (D–F). A – habit; B – ovate leaves and loose inflorescence, note the single, linear epicalyx bract at the base of each flower (red arrow); C – creamy white flowers showing the characteristic deep red markings at the base of the narrow calyx lobes, and style with a dense cone of white, fan-like hairs; D – *L.* sp. Denmark (B.G. Hammersley 2012), with acuminate leaf apices; E – *L. cordifolium*, with a compact inflorescence of pale pink flowers with broad calyx lobes; F – *L. cardiophyllum*, with heart-shaped leaves and bright pink flowers. Vouchers: *K.A. Shepherd & C.F. Wilkins* KS 1648 (A–C); *K.A. Shepherd & C.F. Wilkins* KS 1645 (D); *K.A. Shepherd & C.F. Wilkins* KS 1647 (E); *K.A. Shepherd & S.R. Willis* KS 1656 (F). Photographs by K.A. Shepherd (A–D, F) and Carol Wilkins (E).

2012). All of these taxa have dense, stalked, fan-like stellate hairs along the length of the style, leaves with a dense tomentum of stellate hairs on the lower surface and narrow, ovate to linear epicalyx bract(s) near the base of each flower (Figure 1B).

Like *L. hapalocalyx*, *L. cardiophyllum* and *L.* sp. Weam Reserve have leaves that are usually less than 20 mm long and narrow calyx lobes (1.5–2.6 mm wide). *Lasiopetalum cardiophyllum* is distinct from *L. hapalocalyx* in having heart-shaped leaves (vs broadly ovate) and bright pink flowers (vs creamy white and sometimes tinged with pale pink) (Figure 1F), while *L.* sp. Weam Reserve is unique

within the *L. cordifolium* group because it has three epicalyx bracts rather than one. *Lasiopetalum cardiophyllum* and *L.* sp. Weam Reserve grow in woodlands on lateritic soils near Boddington and Brookton respectively, while *L. hapalocalyx* is found in low mallee shrubland on sandy soils near the south coast of the State.

Lasiopetalum cordifolium can be distinguished from *L. hapalocalyx* by its generally larger leaves that are (9–)13–44 mm long (vs 7.5–23 mm), broader calyx lobes (3.5–4.5 mm wide vs 1.7–2.3 mm), and compact rather than loose inflorescence (Figure 1E). *Lasiopetalum* sp. Denmark can be separated from *L. hapalocalyx* by its distinctly acuminate leaves that are 28–47 mm long (Figure 1F) and broader calyx lobes (2.6–3.4 mm wide). These two taxa also occur in the south-west of Western Australia; however, they are distributed further west than *L. hapalocalyx*, with scattered populations extending from the Two Peoples Bay area, to the Stirling Range and Lake Muir region.

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