



Ten new species of *Styphelia* (Ericaceae: Epacridoideae: Styphelieae), mostly from inland districts of south-west Australia, with updated descriptions for *S. breviflora*, *S. conchifolia* and *S. multiflora*, and a provisional key to species currently assigned to Group X

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Abstract: Ten new species and one new subspecies of *Styphelia* are described and illustrated: *S. coolgardiensis* Hislop, *S. implexa* Hislop, *S. inclusa* Hislop, *S. interioris* Hislop, *S. kirkalocka* Hislop, *S. pilosissima* Hislop, *S. recondita* Hislop, *S. sparsicoma* Hislop, *S. sporadica* Hislop and *S. tumida* Hislop. *Styphelia sporadica* comprises two subspecies, subsp. *sporadica* and subsp. *borealis* Hislop. Updated descriptions of three, long-established species from the group, *S. breviflora* (F.Muell.) F.Muell., *S. conchifolia* (Strid) Hislop, Crayn & Puente-Lel. and *S. multiflora* (R.Br.) Spreng., are provided for purposes of comparison, as well as taxonomic notes on the variable *S. hamulosa* (E.Pritz) Sleumer. Six of the new species are conservation-listed. A provisional key to species currently assigned to Group X is also included.

Keywords: Ericaceae, Epacridoideae, *Styphelia*, Western Australia, new species

Introduction

As currently recognised, Group X is the most morphologically diverse and one of the largest of the 12 phylogenetic groups in *Styphelia* Sm. resolved by Puente-Lelièvre *et al.* (2016) and includes both western and eastern Australian elements. Recent publications have begun the task of describing the many new taxa belonging to the group and have to date proceeded on a subgroup-by-subgroup basis (Hislop & Nguyen 2022; Hislop 2023a; Hislop 2023b; Hislop 2024); these corresponding to subclades of Group X within the published phylogenetic tree. An earlier publication (Hislop 2021) provided a key to the various species groups in Western Australia, as well as lists of their included taxa, both those confirmed in the molecular study of Puente-Lelièvre *et al.* (2016) and those inferred by morphological extrapolation (these being separately indicated).

In the introduction to Hislop & Nguyen (2022) it was noted that given the large size of Group X, the density of genetic sampling was relatively low compared to other groups and that further study was desirable before the formalisation of an infrageneric classification. Recently completed genomic research by Puente-Lelièvre and colleagues (in prep.) has emphasised the need for such work. The phylogenetic placement of one species, the previously unsampled *S. conchifolia* (Strid) Hislop, Crayn & Puente-Lel., was unexpected. In Hislop (2021), *S. conchifolia* was listed as a member of Group X, largely on the basis of its floral and foliar

morphology. However, the new study placed it in a part of the phylogenetic tree distant from the Group X clade but not grouping closely with any other of the established clades. This may indicate the presence of a previously unrecognised group with morphological attributes similar to those of Group X.

The knowledge that *S. conchifolia* does not group with confirmed members of Group X raises the question of whether the affinities of other unsampled taxa referred to the group may also lie with that species. Preliminary morphological investigation focussed mostly on shared fruiting characteristics, suggest that for at least several taxa that is indeed likely to be the case. Pending further research into this question, both the confirmed members of Group X, and the unconfirmed that could belong to the potentially new group, are keyed out together below.

Methods

This study was based on an examination of dried specimens housed at the Western Australian Herbarium, together with field observations of all taxa treated, apart from *S. kirkalocka* Hislop and *S. tumida* Hislop. Details of the methods used to measure plant parts and make other morphological observations are the same as those described in a recent paper (Hislop & Nguyen 2022). In most cases the descriptions detail the same morphological features in the same order for all species. But in the case of *S. implexa* Hislop and *S. interioris*

Hislop two additional characters, those of ovarian wall thickness and presence/absence of a fruiting umbo, were found to be informative. Because these appear likely to be characters of very limited utility, they were not recorded for the other species described here.

In this paper, type specimens that were examined in person are indicated with an exclamation mark (!); digital images of all other types were viewed online

at JSTOR Global Plants (JSTOR 2021) or via other herbarium websites.

Distribution maps are available on *Florabase* (Western Australian Herbarium 1998–). Bioregions referred to in the text follow *Australia's bioregions (IBRA)* IBRA7 (DCCEEW 2024).

Key to taxa of *Styphelia* currently assigned to Group X^{1,2}

¹ But note discussion in the introduction regarding the possible presence of a hitherto unrecognised group with morphological attributes similar to those of Group X.

² For those users whose starting point is the key to species groups in Hislop (2021), in which elements of Group X are keyed out separately, please note that couplet 5 below is the equivalent of couplet 18 in that key, so that the second lead at 5 below leads on from the first lead at 19 in that key.

1. Inflorescence axis apparently terminating in a flower, no bud rudiment present; style hairy, markedly tapering towards the base and readily detached from ovary apex; ovary densely hairy with the surface obscured throughout, the longest ovarian hairs 2–3 mm long; anther tips sterile (mostly from South Eneabba–southern Perth suburbs; with a disjunct, wheatbelt occurrence from Kellerberrin–Kukerin) *S. kingiana*
- 1: Character combination never as above
 2. Sepal margins distinctly undulate; drupe apex truncate with sharply defined shoulders; outer surface of corolla lobes distinctly papillose
 3. Leaves broadly elliptic to broadly obovate, apex obtuse; inflorescence single-flowered; style well exerted from corolla tube (SW of Eneabba–S of Badgingarra; a few wheatbelt records from the Wongan Hills and Dowerin areas) *S. crassiflora*
 - 3: Leaves narrowly elliptic to narrowly ovate, apex long-mucronate, pungent; inflorescence multi-flowered; style not exerted (restricted: Badgingarra area) *S. undulata*
 - 2: Sepal margins not undulate; drupe apex not as above; outer surface of corolla lobes glabrous or distinctly hairy
 4. Style not or barely exerted from corolla tube
 5. Ovary and drupe narrowly conical, narrowly fusiform or ± cylindrical, the style not or barely differentiated from the ovary, or if relatively well-differentiated, then ≤ 0.4 mm long (1.4–1.8 mm in *S. incerta*); ovary 3-locular, the individual locules minute and very obscure (only discernible under high magnification from a basal section of the ovary) *S. tamminensis* subgroup (refer to key in Hislop & Nguyen 2022)
 - 5: Ovary and drupe not as above, the style always well-differentiated from the ovary, usually > 0.4 mm long; ovary 5-locular (3-locular in *S. sporadica*), the locules readily discernible
 6. Leaf abaxial surface with deep, very narrow, ± closed grooves between the veins, very shortly hairy within the grooves (magnification of at least x 30 may be necessary to interpret this character)
 7. Abaxial sepal surfaces shortly hairy; ovary, style base and distal fruit surface shortly hairy (restricted: Kirkalocka Station, SE of Mount Magnet) *S. kirkalocka*
 - 7: Abaxial sepal surfaces, style base and ovary glabrous
 8. Leaves ovate to obovate, often broadly so, 2.0–4.5 mm long, 1.2–3.6 mm wide, apex long-mucronate, pungent with mucro strongly recurved, 0.3–0.6 mm long; sepals 2.0–2.5 mm long, minutely ciliolate with hairs < 0.05 mm long; fruit narrowly ellipsoid to ellipsoid, 3.6–4.2 mm long, 2.4–3.0 mm wide (N & NE of Kalbarri; NW of Mullewa) *S. brachygyna*
 - 8: Leaves ovate to depressed-ovate, 1.0–2.0 mm long, 0.8–1.8 mm wide, apex mucronate or not, if so, then mucro innocuous to sub-pungent, 0.05–0.2 (–0.3) mm long, slightly incurved to slightly recurved; sepals 1.3–1.6 mm long, prominently ciliate with hairs to 0.2 mm long; fruit narrowly ellipsoid, or occasionally narrowly obovoid, 2.0–2.6 mm long, 0.9–1.3 mm wide (Mukinbudin–Menzies–Mount Holland–Salmon Gums; Wubin–Paynes Find) *S. coolgardiensis*

- 6:** Leaf abaxial surface shallowly and openly grooved between the veins, either glabrous or with sparse scattered hairs
- 9:** Leaf apex innocuous, mucro lacking
- 10:** Ovary 5-locular; fruit depressed-globose or globose (E of Lake Grace–Frank Hann National Park–Cascade area) *S. inclusa*
- 10:** Ovary 3-locular; fruit narrowly ellipsoid or narrowly ovoid (N of Eurardy–East Yuna) *S. sporadica* subsp. *borealis*
- 9:** Leaf apex long-mucronate, pungent
- 11:** Ovary 3-locular; fruit narrowly ellipsoid, narrowly ovoid or occasionally narrowly obovoid; sepals 2.1–3.0 mm long (Latham–Ballidu–Koorda; Bruce Rock–Marvel Loch–Forrestania) *S. sporadica* subsp. *sporadica*
- 11:** Ovary 5-locular; fruit globose, ellipsoid to obovoid; sepals 1.2–2.0 mm long
- 12:** Inflorescence axis very reduced, without a discernible axis, strictly 1-flowered, ± enclosed by subtending leaf, apparently terminating at the flower, no bud-rudiment present (E of Koolyanobbing) *S. recondita*
- 12:** Inflorescence axis 1.1–3.1 mm long, 1–4-flowered, not enclosed by subtending leaf, terminating in a bud-rudiment
- 13:** Ovary ovoid to ellipsoid, 0.6–0.7 mm long, 0.4–0.5 mm wide, with a papillose apex; ovarian wall c. 0.05 mm thick; style 0.2–0.4 mm long; fruit 2.2–2.5 mm long, 2.0–2.5 mm wide, umbonate with a dark, papillose umbo; sepals narrowly ovate to ovate, abaxial venation not evident, the margins tapering ± smoothly from the base to the always acute apex (restricted to salt lake margins: S of Norseman–Lake Tay–E of Salmon Gums; Diemals) *S. implexa*
- 13:** Ovary globose to broadly obovoid, 0.5–0.8 mm long, 0.5–0.9 mm wide, with a smooth apex; ovarian wall 0.1–0.2 mm thick; style 0.4–0.6 mm long; fruit 3.4–5.2 mm long, 3.2–4.8 mm wide, umbo lacking; sepals ovate to broadly ovate, abaxial venation distinct, the margins more roundly contracted to an obtuse, subacute or acute apex (various habitats: Karara–Sandstone–Peak Charles–NE of Condingup) *S. interioris*
- 4:** Style clearly exerted from corolla tube
- 14:** Leaf apex innocuous, mucro lacking, but sometimes with a blunt callus tip
- 15:** Sepals manifestly recurved along their longitudinal axes
- 16:** Ovary 5-locular
- 17:** Leaves narrowly obovate to narrowly elliptic; inflorescence axis 1–4-flowered, 1.0–4.5 mm long, terminating in a bud-rudiment; fruit cylindrical or sometimes very narrowly ovoid, 3.5–4.5 mm long, 0.8–1.1 mm wide (W of Fitzgerald River N.P.–Scaddan–Israelite Bay) *S. cylindrica*
- 17:** Leaves shallowly triangular, depressed-ovate or broadly ovate; inflorescence axis strictly 1-flowered, 0.2–0.3 mm long, terminating at the flower; fruit narrowly ellipsoid, 2.0–2.5 mm long, 1.0–1.4 mm wide (Ongerup–E of Jerramungup; NW of Cascade) *S. microcardia*
- 16:** Ovary 2- or 3-locular
- 18:** Leaves flat to adaxially convex, the abaxial surface flat to very shallowly grooved between the veins, the longitudinal axes strongly recurved to circinate; longer petioles 0.5–1.0 mm long; bracteoles glabrous, 0.9–1.2 (–1.5) mm long; sepals glabrous, 2.1–2.9 mm long (N of Salmon Gums–Dalyup–NE of Condingup) *S. lacsalaria*
- 18:** Leaves planoconvex or adaxially concave, the abaxial surface usually distinctly grooved, the longitudinal axes slightly to moderately recurved; all petioles 0.1–0.3 mm long; bracteoles usually sparsely hairy, 1.5–2.0 mm long; sepals usually sparsely hairy, (2.6–) 2.8–3.5 mm long (Lake Tay–Peak Charles N.P.–upper Lort River) *S. halophila*
- 15:** Sepals ± straight and appressed to corolla throughout their length
- 19:** Leaf abaxial surface with deep, very narrow, often ± closed grooves between the veins, very shortly hairy within the grooves (magnification of at least ×30 may be necessary to interpret this character)
- 20:** Fruit depressed-globose or globose; style base not arising from a depression at ovary apex (Fitzgerald River N.P.–Munglinup) *S. conchifolia*

- 20:** Fruit narrowly ellipsoid or ellipsoid; style base inserted in a cylindrical depression that tightly envelops, but is free from ovary apex
- 21:** Bracteoles and sepals very shortly hairy, rarely \pm glabrous (central, southern and eastern wheatbelt; Coolgardie bioregion) *S. hamulosa* (inland variant)[#]
- 21:** Bracteoles and sepals glabrous (very occasionally with a few hairs in *S. kalbarriensis*)
- 22:** Petioles 0.5–1.2 mm long; leaves usually distinctly inflexed above the petiole, the longitudinal axes shallowly incurved or straight in the lower half, then recurved towards the apex; nectary partite (restricted: Moresby Range) *S. howatharra*
- 22:** Petioles 0.1–0.6 mm long; leaves not inflexed above petiole, the longitudinal axes incurved throughout or \pm straight but becoming incurved towards apex; nectary annular but with longitudinal grooves below the lobe sinuses (Kalbarri N.P.–Eurardy–East Yuna) *S. kalbarriensis*
- 19:** Leaf abaxial surface shallowly and openly grooved between the veins, either glabrous or with sparse scattered hairs
- 23:** Leaves usually ovate, broadly ovate, depressed-ovate or \pm orbicular, occasionally elliptic or broadly obovate, 1.5–4.0 mm wide, but most leaves > 2 mm wide
- 24:** Fruit depressed-globose or globose, glabrous; style base not arising from a depression at ovary apex (Fitzgerald River N.P.–Munglinup) *S. conchifolia*
- 24:** Fruit narrowly ellipsoid, glabrous or hairy; style base inserted in a cylindrical depression that tightly envelops, but is free from ovary apex (restricted: Moresby Range) *S. howatharra*
- 23:** Leaves narrowly elliptic or narrowly obovate, occasionally elliptic, 0.6–2.2 mm wide, but most leaves < 2 mm wide
- 25:** Inflorescences strictly single-flowered; fruit cylindrical, very narrowly obovoid, narrowly ellipsoid or oblongoid, 1.0–1.2 mm wide
- 26:** Inflorescences arising from axils of bract-like early seasonal leaves that are strongly dimorphic from regular leaves; inflorescence axis terminates at the flower, no bud-rudiment present; inflorescence axis bare below the bracteoles, bracts absent; fruit cylindrical to very narrowly obovoid, 3.8–4.2 mm long (restricted: NE of Lake King) *S. anomala*
- 26:** Inflorescences arising from the axils of regular, mature leaves; inflorescence axis terminating in a bud-rudiment; inflorescence axis with a fertile bract subtending the bracteoles with 3 or 4 sterile bracts on the axis below; fruit narrowly ellipsoid or oblongoid, 2.7–3.3 mm long (SE of Quairading–S of Bodallin–NW of Cascade–N of Borden) *S. planiconvexa*
- 25:** Inflorescences multi-flowered or a mixture of multi- and single-flowered, always some multi-flowered inflorescences present; fruit narrowly obovoid to claviform, 2.3–3.0 mm wide (W Stirling Range N.P.–W Fitzgerald River N.P.–Manypeaks area) *S. corynocarpa*
- 14:** Leaf apex manifestly mucronate, usually long-mucronate and pungent
- 27:** Leaf abaxial surface with deep, narrow, often \pm closed grooves between the veins, shortly hairy within the grooves (magnification of at least $\times 30$ may be necessary to interpret this character)
- 28:** Style base not arising from a depression at ovary apex; nectary annular but with longitudinal grooves below the lobe sinuses (Wyalkatchem–Southern Cross–Lake King–Kulin) *S. browniae*
- 28:** Style base inserted in a cylindrical depression that tightly envelops, but is free from ovary apex; nectary partite
- 29:** Sepal abaxial surfaces glabrous
- 30:** Longest leaves per specimen, 7–15 mm long, with mucros 0.5–1.3 mm; leaf longitudinal axis gently incurved to gently recurved (S Moresby Range–Arrino) *S. marginata*
- 30:** Longest leaves per specimen, 2.5–7 mm long, with mucros 0.2–0.5 mm; leaf longitudinal axis strongly recurved from the base (Geraldton Sandplain; northern and central wheatbelt; Esperance Sandplain) *S. hamulosa*[#]

- 29:** Sepal abaxial surfaces hairy, though sometimes sparsely so
- 31:** Leaf longitudinal axis gently incurved to gently recurved; leaf abaxial surfaces deeply, but openly grooved, the groove bottoms clearly visible, with a dense or moderately dense indumentum of spreading hairs (to about 0.5 mm) both on the exposed vein surfaces and within the grooves, giving a grey hairy aspect; style 2.9–4.1 mm long; sepals 2.7–3.4 mm long (restricted: E of Brookton) *S. pilosissima*
- 31:** Leaf longitudinal axis strongly recurved from the base; leaf abaxial surfaces with ± closed grooves, the groove bottoms not visible, shortly hairy within the grooves, very rarely on the exposed vein surfaces; style to 2.2 mm long; sepals to 2.5 mm long (Geraldton Sandplain; northern and central wheatbelt; Esperance Sandplain) . *S. hamulosa*[#]
- 27:** Leaf abaxial surface shallowly and openly grooved between the veins, the groove bottoms always clearly visible, either glabrous or with sparse scattered hairs
- 32:** Leaves depressed-ovate to narrowly ovate, or broadly to narrowly elliptic, 2.5–4.5 mm long, 1.4–4.0 mm wide; fruit narrowly ellipsoid to ellipsoid, 1.0–2.6 mm wide (well away from the south coast)
- 33:** Sepals 1.8–2.2 mm long, the margins ciliolate with hairs to c. 0.1 mm long; style (1.2–) 1.6–2.2 mm long, the base not arising from a depression at ovary apex; fruit narrowly ellipsoid to ellipsoid, 2.0–2.6 mm wide, often with an apical hair tuft (NE of Hyden–E of Koolyanobbing–E of Forrestania) *S. sparsicoma*
- 33:** Sepals c. 3 mm long, the margins ± glabrous; style c. 3 mm long, the base inserted in a cylindrical depression that tightly envelops, but is free from ovary apex; fruit narrowly ellipsoid c. 1 mm wide, glabrous throughout (Watheroo area) *Styphelia* sp. **Watheroo**
- 32:** Leaves narrowly elliptic, narrowly obovate or sometimes narrowly ovate, 4.0–17 mm long, 1.2–3.0 mm wide; fruit depressed-globose, globose, broadly ovoid or broadly ellipsoid, 3.0–6.0 mm wide (south coast and hinterland)
- 34:** Leaf mucros 0.3–1.0 mm long; sepals 2.2–3.4 mm long; corolla tube 1.6–2.5 mm long, obovoid or broadly obovoid, inner surface usually glabrous or occasionally with a few hairs immediately below the lobes; corolla lobes 2.0–3.0 mm long; style 1.7–3.0 mm long
- 35:** Branchlet indumentum dense or moderately dense, with hairs to 0.2 mm long; corolla tube 2.2–2.5 mm long; corolla lobes 2.5–3.0 mm long; fruit globose, broadly ovoid or broadly ellipsoid drupes, 5.0–6.5 mm long and 4.5–6.0 mm wide (Cape Le Grand N.P.) *S. multiflora*
- 35:** Branchlet indumentum sparse, with hairs < 0.05 mm long, or branchlets glabrous; corolla tube 1.6–2.0 mm long; corolla lobes 2.0–2.6 mm long; fruit depressed-globose or sometimes globose 3.0–3.6 mm long by 3.0–4.2 mm wide (Cascade–Munghlinup–Israelite Bay) *S. breviflora*
- 34:** Leaf mucros 1.0–1.7 mm long; sepals 4.0–4.2 mm long; corolla tube 4.2–4.5 mm long, broadly obovoid in the lower half, contracting abruptly to a much narrower portion, so producing a medial bulge, inner surface densely hairy in the upper half with hair tufts projecting downwards into the bulge; corolla lobes 4.0–4.2 mm long; style 5.0–5.5 mm long (Cape Arid N.P.) *S. tumida*

Refer notes below on variation within *S. hamulosa* as currently recognised.

Taxonomy

Styphelia breviflora (F.Muell.) F.Muell.

Syst. Census Austral. Pl. 107 (1882). — *Leucopogon breviflorus* F.Muell., *Fragm.* 4: 102 (1864). — **Type citation:** “In collibus virgultosis arenosisque ad sinum marinum Israelite Bay. Maxw.”. **Syntypes:** Israelite Bay, *s.dat.*, *G. Maxwell s.n.* (MEL75730, PERTH 01163698!).

Erect *shrubs*, to c. 100 cm high and 80 cm wide, but usually smaller, single-stemmed at ground level with a

fire-sensitive rootstock. Young *branchlets* with a sparse indumentum of very short hairs, < 0.05 mm long or glabrous. *Leaves* helically arranged, mostly steeply antrorse; apex long-mucronate, pungent, the mucro straight or slightly inflexed, 0.3–0.8 mm long (but refer notes below for an exception); base attenuate; petiole usually well-defined, 0.5–1.4 mm long, hairy on the adaxial surface, glabrous or very sparsely hairy abaxially, glabrous or with a few hairs on the margins; lamina narrowly elliptic to narrowly obovate, 4–10 mm long, 1.2–2.4 mm wide, discolorous, strongly concave adaxially, longitudinal axis gently incurved; adaxial surface shiny, with a few basal hairs, otherwise glabrous,

venation not evident; abaxial surface paler, matt, or becoming shiny with age, glabrous, with 5–7 primary veins, openly and usually shallowly grooved between the veins; margins entire, glabrous, or with short, coarse, antrorse hairs, <0.05 mm long. *Inflorescence* axillary, erect; axis 1.8–4.5 (–5.5) mm long, 1–4-flowered, with a moderately dense to dense indumentum, ± terete below the lowest fertile bract, angular above, terminating in a bud-rudiment; flowers erect, sessile. *Fertile bracts* broadly ovate to depressed-ovate or broadly elliptic, 0.7–1.4 mm long, 0.8–1.2 mm wide, with 3–5 sterile bracts on the axis below. *Bracteoles* broadly ovate, depressed-ovate to transversely elliptic, 1.0–1.5 mm long, 1.1–1.3 mm wide, keeled, at least in the upper half, obtuse (not mucronate); abaxial surface glabrous, not or scarcely striate; margins ciliolate. *Sepals* narrowly ovate or ovate, 2.2–2.8 mm long, 1.0–1.3 mm wide, obtuse to acute; abaxial surface glabrous, straw-coloured, venation very obscure; adaxial surface with a basal tuft of hairs and a few, scattered hairs in the upper half; margins ciliate with hairs to 0.2 mm long, these crinkly towards the apex. *Corolla tube* white, obovoid or broadly obovoid, shorter than or c. equal to the sepals, 1.6–2.0 mm long, 1.5–2.0 mm wide, external surface glabrous, internal surface glabrous. *Corolla lobes* white, usually longer than or occasionally c. equal to the tube, 2.0–2.6 mm long, 0.7–1.0 mm wide at base, erect in basal $\frac{1}{2}$ – $\frac{2}{3}$ of their length and then spreading and recurved, external surface glabrous, internal surface with a dense, white indumentum of ± terete, ± straight, scarcely ornamented hairs. *Anthers* usually fully exerted from the tube, or sometimes partially exerted by c. $\frac{7}{8}$ of their length, 0.7–1.0 mm long, apex shortly emarginate. *Filaments* terete, 0.7–1.0 mm long, attached to anther $\frac{3}{4}$ – $\frac{7}{8}$ above the anther base, adnate to the tube just below the sinuses. *Nectary* partite, the scales 0.5–0.6 mm long, 0.4–0.5 mm wide, glabrous, or annular with the scales weakly cohering. *Ovary* ovoid to ellipsoid, 0.7–0.9 mm long, 0.5–0.7 mm wide,

glabrous, 5-locular, pale brown. *Style* 1.7–2.5 mm long, faintly scabrous, exerted from the corolla tube to a point c. level with the erect bases of the corolla lobes, well-differentiated from ovary apex, not arising from a depression; stigma distinctly expanded. *Fruit* usually depressed-globose, sometimes globose, 3.0–3.6 mm long, 3.0–4.2 mm wide, much longer than the sepals, circular in transverse section, gynophore absent; surface glabrous, strongly rugose at maturity (mesocarp well-developed); apex broadly rounded; style usually shed by maturity. **Fig. 1.**

Distribution & habitat. Distributed in mostly sub-coastal areas from Cascade and Munglinup eastwards to Israelite Bay, in the Esperance Plains and Mallee bioregions. Occurs on sandplain in heath or open mallee woodland, sometimes over laterite or granite.

Phenology. The main flowering period is from November to April. Mature fruit has been collected between September and December.

Conservation status. Has a fairly scattered distribution, but is quite well represented on the conservation estate. No conservation code required (Tanya Llorens, pers. comm.).

Affinities. *Styphelia breviflora* has not been included in any previous genetic studies but as noted in the treatment of *S. conchifolia*, below, it shares a very similar fruit morphology with the latter species. It differs most obviously from *S. conchifolia* in its narrowly elliptic to narrowly obovate leaves with long-mucronate and pungent leaf tips (cf. broadly ovate, depressed-ovate or ± orbicular, occasionally elliptic or broadly obovate with blunt callus tips in *S. conchifolia*). The closest relative of *S. breviflora* however, seems likely to be *S. multiflora* (R.Br.) Spreng., which has a more southerly distribution in the Cape Le Grand National Park (N.P.). Differences



Fig. 1. *Styphelia breviflora*, flowering plant *in situ*. — M. Hislop 2621. Photo: M. Hislop.

between the two are given below under the treatment of the latter species.

Note. A single specimen from north of Munglinup (*C.W. Parker 1628.06*) has leaves that terminate in a blunt callus tip rather than the usual pungent mucro. In all other respects however, it is typical of the species.

Other specimens examined

WESTERN AUSTRALIA. 32.75 km ENE of Muckinwobert Rock, 2.5 km NE of Melaleuca Rd on West Point Rd [NW of Cascade], 30 Sep. 1984, *M.A. Burgman 3966* (PERTH); 8.5 km E of Point Malcolm Rd on Fisheries Rd, where track hits W margin of Daringdella Lake, Nuytsland Nat. Res., 20 Apr. 1993, *G.F. Craig 2535* (PERTH; NSW, *n.v.*); Israelite Bay, 0.9 km NE of fisherman's shack along track to Gegalup, 21 Apr. 1993, *G.F. Craig 2552* (PERTH; NSW, *n.v.*); Mt Baring, Cape Arid N.P., 25 Apr. 1993, *G.F. Craig 2680* (PERTH); 22.7 km N of Fisheries Rd on Muntz Rd, 100–200 m along Tweedale Rd to W [Muntz Rd Nat. Res., NE of Condingup], 14 Nov. 1993, *G.F. Craig 3007* (PERTH); c. 600 m SW of the S foot of Mt Ragged, off rough track, 15 Dec. 1999, *M. Hislop 1960* (CANB, NSW, PERTH); Israelite Bay, 6.3 km NE of fisherman's shack on main track, 18 May 2002, *M. Hislop & F. Hort MH 2626* (PERTH); Fisheries Rd, 100 m W of where road becomes track, W of Cape Arid N.P. boundary, 19 May 2002, *M. Hislop & F. Hort MH 2637 A* (PERTH); Bishops Rd Nat. Res. (A29012) [E of Grass Patch], off E-W track leading to saline flats c. 400 m from W boundary, 27 Apr. 2007, *M. Hislop 3697* (NSW, PERTH); Parmango Rd, 27.9 km NE of Fisheries Rd [NE of Condingup], 5 Oct. 1986, *J.M. Powell 2876* (PERTH; HO, NSW, NY, *n.v.*); 4 miles [c. 6.4 km] S of Truslove, 19 Apr. 1953, *R.D. Royce 4085* (PERTH); [South Coast Hwy] c. 102 km from Esperance, at turnoff to Fuss Rd [near Munglinup], 15 Mar. 1983, *A. Strid 22431* (PERTH); Scaddan Rd, W of Backmans Rd, Scaddan, 23 Oct. 2020, *K. White, S. Willsher & D. Penson JW 02521* (PERTH); adjacent to railway access track, 180 m N from railway crossing at Stafford Rd, 29 km N of Esperance, 4 Nov. 2021, *K. White & K. Jenkins KW 177* (PERTH).

***Styphelia conchifolia* (Strid) Hislop, Crayn & Puente-Lel.**

Austral. Syst. Bot. 33:148 (2020). — *Leucopogon conchifolius* Strid., *Willdenowia* 16: 169–171, Figs 1a–f (1986). — **Holotype:** [Western Australia], Fitzgerald River N.P., c. 11 km WNW of East Mount Barren, 16 Mar. 1983, *A. Strid 22463* (C10010894). **Isotypes:** B100249490, G00342147, M0164714, NSW437900, PERTH055125061).

Erect *shrubs*, to c. 1.5 m high and 1.2 m wide, single-stemmed at ground level, with a fire-sensitive rootstock. Young *branchlets* with a sparse to moderately dense indumentum of short hairs to c. 0.05 mm long. *Leaves* helically arranged, variably antrorse and sometimes partially stem-clasping; apex a blunt callus tip, obtuse to acute; base usually rounded or cordate, occasionally cuneate; petiole well-defined, 0.3–0.8 mm long, adaxial surface shortly hairy, abaxial surface and margins shortly hairy or glabrous; lamina usually broadly ovate, depressed-ovate or ± orbicular, occasionally elliptic or

broadly obovate, 2.0–4.2 mm long, 1.5–4.0 mm wide, discolorous, strongly concave adaxially, longitudinal axis usually gently incurved or less often gently recurved; adaxial surface shiny, glabrous except for a few hairs at the base, venation not evident; abaxial surface paler, matt to slightly shiny, with 7–9 primary veins, the midrib scarcely more prominent than the others, openly to narrowly grooved and either glabrous or variably hairy between the veins, glabrous or shortly hairy on the exposed vein surfaces; margins entire, glabrous or minutely hairy, with coarse hairs <0.05 mm long. *Inflorescence* axillary, erect; 1.8–4.6 (–6.0) mm long, (1) 2–5-flowered, ± glabrous at base with a moderately dense to dense indumentum above, ± terete below the lowest fertile bract, angular above, terminating in a bud-rudiment; flowers erect, sessile. *Fertile bracts* broadly ovate to depressed ovate, 0.7–1.2 mm long, 0.7–1.2 mm wide, with 4 or 5 sterile bracts on the axis below. *Bracteoles* broadly ovate, depressed-ovate or ± orbicular, 0.8–1.2 mm long, 1.0–1.4 mm wide, ± keeled in the upper half, obtuse (not mucronate); abaxial surface glabrous, not striate; margins minutely ciliolate. *Sepals* narrowly ovate, 2.0–2.5 mm long, 1.0–1.3 mm wide, obtuse to acute; abaxial surface glabrous, straw-coloured, venation obscure; adaxial surface sparsely hairy in the upper half and usually also with a discrete tuft of hairs towards the base; margins ciliolate with hairs to 0.1 mm long. *Corolla tube* white, broadly obovoid to depressed-obovoid, slightly shorter than to slightly longer than the sepals, 1.5–2.0 mm long, 1.5–1.9 mm wide, external surface glabrous, internal surface glabrous. *Corolla lobes* white, usually longer than or sometimes equal to the tube, 1.8–2.4 mm long, 0.8–1.0 mm wide at base, erect in basal $\frac{1}{2}$ – $\frac{2}{3}$ of their length and then spreading and recurved, external surface glabrous, internal surface with a dense, white indumentum of ± terete, straight, ornamented hairs. *Anthers* partially exerted from the tube by c. $\frac{7}{8}$ of their length to fully exerted, 0.7–1.1 mm long, apex emarginate. *Filaments* terete, 0.5–0.8 mm long, glabrous, attached to the anther $\frac{3}{4}$ – $\frac{7}{8}$ above the base, adnate to the tube just below the sinuses. *Nectary* partite, the scales 0.3–0.5 mm long, 0.3–0.4 mm wide, or annular with weakly cohering scales, glabrous. *Ovary* broadly ovoid to ovoid, 0.7–1.0 mm long, 0.6–0.8 mm wide, glabrous, 5-locular, straw-coloured to pale brown. *Style* 1.6–2.1 mm long, scabrous at least in the upper half, exerted from the corolla tube to a point c. level with the erect bases of the corolla lobes, well-differentiated from ovary apex, not arising from a depression; stigma distinctly expanded. *Fruit* depressed-globose or globose, 3.2–4.2 mm long, 3.4–4.5 mm wide, much longer than the sepals, circular in transverse section, gynophore absent; surface glabrous, usually becoming distinctly rugose (mesocarp well-developed); apex broadly rounded; style usually shed by maturity.

Distribution & habitat. Distributed across the Fitzgerald River N.P. and eastwards towards Munglinup in the Esperance Plains bioregion. Occurs in deep sand or sand over laterite or spongolite in open mallee woodland or heath.

Phenology. Has an extended flowering period but especially between November and May. Fruit are similarly present over many months of the year with a peak in late spring or early summer when flowers and mature fruit often co-occur.

Conservation status. *Styphelia conchifolia* has a fairly restricted distribution centred on the Fitzgerald River N.P. Also known to occur in Lake Shaster Nat. Res. in the eastern part of the species' range. No conservation code required (Tanya Llorens, pers. comm.).

Affinities. As discussed in the introduction, a soon-to-be published genomic study strongly suggest that *S. conchifolia* belongs to a currently unrecognised species group. It shares a very similar fruit type with *S. multiflora* and *S. breviflora*, as well as *S. inclusa* Hislop, described below. Details of how *S. inclusa* differs from *S. conchifolia* are given under the treatment of that species. The other three species are readily distinguished by their narrowly elliptic or narrowly obovate leaves with pungent, long-mucronate apices.

In regard to their abaxial leaf morphology, most species currently assigned to Group X, as elsewhere in the genus, have one of two basic character states: the abaxial surfaces may be \pm flat to fairly broadly and shallowly grooved between the veins and are glabrous or sometimes with scattered hairs; or the grooves are narrow, deep, often \pm closed and shortly hairy, often densely so, within the grooves, although high magnification may be necessary to observe these hairs. *Styphelia conchifolia* however, is one of a very few species in which both character states are present, as well as specimens with a somewhat intermediate morphology.

Other specimens examined

WESTERN AUSTRALIA. 3.5 km N of Hopetoun (Res. 7853) and E of rubbish tip, 13 May 2005, *G.F. Craig 6460* (PERTH); W of lower Fitzgerald River, 12 July 1970, *A.S. George 9948* (PERTH); Jerdacuttup Rd, 7 km E of Bedford Harbour Rd, W of Munglinup, 9 Oct. 2006, *M. Hislop 3664* (PERTH); Lake Shaster Nat. Res., 500 m along track which runs S from Springdale Rd, opposite Bedford Harbour Rd, S of Munglinup, 26 Apr. 2008, *M. Hislop 3763* (CANB, MEL, NSW, PERTH); remnant bushland off N side of Dotterel Drive, 600 m E of Pardalote Pde, NE of Hopetoun, 28 Mar. 2017, *M. Hislop 4701* (CNS, PERTH); Twertup Creek, Fitzgerald River N.P., 21 July 1969, *K.R. Newbey 2817* (PERTH); 5 km SE of Bivouac Rocks, Fitzgerald River N.P., 9 May 1974, *K.R. Newbey 4144* (PERTH); 4 km SE of Bivouac Rocks, Fitzgerald River N.P., 19 Dec. 1978, *K.R. Newbey 5184* (PERTH; CANB, K, MEL, NSW, *n.v.*); near Twertup Creek, Fitzgerald River N.P., 19 Nov. 1984, *K.R. Newbey 10855* (PERTH; NSW, *n.v.*); 11 km NE of Woolbernup Hill, Fitzgerald River N.P., 22 Nov. 1985, *K.R. Newbey 11056* (PERTH); 13.5 km W of Annie Peak, Eyre Range, Fitzgerald River N.P., 11 Sep. 1986, *K.R. Newbey 11135* (PERTH); 13.5 km W of Annie Peak, Eyre Range, Fitzgerald River N.P., 24 May 1987, *K.R. Newbey 11531* (PERTH; CNS, NSW, *n.v.*); 1.5 km NW along Hamersley Drive from Telegraph Rd junction, Fitzgerald River N.P.,

19 Nov. 1985, *J.M. Powell 3370* (PERTH; AD, NSW, NY, *n.v.*); Fitzgerald River N.P., 50 km NE of Hamersley Drive, 10.3 km from N boundary, 1 Mar. 1989, *I. Salasoo 63/89* (PERTH).

Styphelia coolgardiensis Hislop, *sp. nov.*

Holotypus: Western Australia, Burra Rock Rd, 20.7 km south of Nepean–Spargoville Rd, S of Coolgardie, 19 May 2004, *M. Hislop & F. Hort MH 3197* (PERTH06779166!). **Isotypi:** CANB, CNS, K, MEL, NSW.

Leucopogon sp. Coolgardie (*M. Hislop & F. Hort MH 3197*) Western Australian Herbarium, *Florabase*, <https://florabase.dbca.wa.gov.au/> [accessed: 21 Aug. 2025].

Erect, compact *shrubs*, to c. 70 cm high and 90 cm wide, single-stemmed at ground level, with a fire-sensitive rootstock. Young *branchlets* with a sparse to moderately dense indumentum of short hairs to c. 0.08 mm long. *Leaves* helically arranged, variably antrorse; apex usually acute and mucronate or less often obtuse, the mucro slightly inflexed to slightly reflexed, very short and innocuous to sub-pungent, 0.05–0.2 (–0.3) mm long; base cuneate, rounded or cordate; petiole to c. 0.3 mm long, but often very short and poorly defined (the leaves \pm sessile), \pm glabrous throughout; lamina ovate to depressed-ovate, 1.0–2.0 mm long, 0.8–1.8 mm wide, \pm concolorous, strongly concave adaxially, longitudinal axis \pm straight to distinctly recurved; adaxial surface shiny, sparsely hairy to \pm glabrous, venation not evident; abaxial surface shiny, with 5–7 broad, primary veins occupying most of the surface area, the midrib scarcely more prominent than the others, deeply and narrowly grooved between the veins (grooves \pm closed), glabrous on exposed vein surfaces, very shortly hairy within the grooves; margins entire or sometimes erose, \pm glabrous, or with short, coarse hairs, <0.05 mm long. *Inflorescence* axillary, erect; axis 0.5–1.5 mm long, 1- or occasionally 2-flowered, with a moderately dense indumentum, \pm compressed below and above the fertile bract, terminating in a bud-rudiment; flowers erect, sessile. *Fertile bracts* broadly ovate to depressed-ovate, 0.3–0.5 mm long, 0.4–0.5 mm wide, and with 3 or 4 sterile bracts on the axis below. *Bracteoles* depressed-ovate to \pm orbicular, 0.7–1.2 mm long, 0.8–1.2 mm wide, not keeled, obtuse (not mucronate); abaxial surface \pm glabrous or very shortly and sparsely hairy, not, or scarcely striate; margins minutely ciliolate. *Sepals* ovate or broadly ovate, 1.3–1.6 mm long, 0.8–1.1 mm wide, obtuse to acute; abaxial surface glabrous, usually greenish to straw-coloured at flowering, but often becoming brown and necrotic, venation very obscure; adaxial surface with a few hairs towards the base and apex or \pm glabrous throughout; margins prominently ciliate, with crisped hairs to 0.2 mm long. *Corolla tube* white, broadly ovoid to broadly ellipsoid or broadly obovoid, slightly longer than, to slightly shorter than, the sepals, 1.0–1.7 mm long, 1.0–1.6 mm wide, external surface glabrous, internal surface glabrous or with a few hairs extending into the top of the tube

immediately below the lobes. *Corolla lobes* white, shorter than, to longer than the tube, 1.0–1.5 mm long, 0.7–0.9 mm wide at base, erect in the basal $\frac{1}{3}$ – $\frac{1}{2}$ of their length and then spreading and recurved, external surface glabrous, internal surface with a dense, white indumentum of \pm terete, straight, scarcely ornamented hairs. *Anthers* partially exerted from the tube (by $\frac{1}{3}$ – $\frac{2}{3}$ of their length), 0.6–1.0 mm long, apex emarginate. *Filaments* terete, 0.2–0.3 (–0.5) mm long, glabrous, attached to the anther just below the apex, adnate to tube just below the sinuses. *Nectary* annular, 0.2–0.4 mm long, glabrous, lobed. *Ovary* broadly ovoid, broadly ellipsoid to \pm globose, 0.6–0.7 mm long, 0.5–0.6 mm wide, glabrous, 5-locular, pale green to straw-coloured. *Style* 0.4–0.8 mm long, scabrous, included within the corolla tube, well-differentiated from ovary apex and not arising from a depression; stigma not, or barely, expanded. Fruit narrowly ellipsoid, or occasionally narrowly obovoid, 2.0–2.6 mm long, 0.9–1.3 mm wide, much longer than the sepals, circular in transverse section, gynophore absent; surface glabrous, \pm smooth or with rather indistinct longitudinal ribs (mesocarp not or scarcely developed); apex rounded; style usually persistent at maturity. **Fig. 2.**

Diagnostic characters. Among the species currently included in Group X, *S. coolgardiensis* is distinguished by the following character combination: lamina ovate to depressed-ovate, 1.0–2.0 mm long, 0.8–1.8 mm wide, adaxial leaf surface sparsely hairy to \pm glabrous, abaxial surface with deep, \pm closed grooves, shortly hairy in the grooves, otherwise glabrous, apex usually acute with a short, innocuous or sub-pungent mucro or sometimes obtuse; inflorescence 1- or 2-flowered, axis 0.5–1.5 mm long, terminating in a bud-rudiment; abaxial surface of bracteoles glabrous or very shortly and sparsely hairy; sepals 1.3–1.6 mm long, the abaxial surface glabrous, sepal margins prominently ciliate, with hairs to 0.2 mm long; corolla tube slightly longer than, to slightly shorter than, the sepals; corolla lobes shorter than, to longer than the tube; ovary 5-locular, glabrous; style 0.4–0.8 mm long, scabrous, included in the corolla tube; style base not countersunk below the level of the ovary apex; fruit narrowly ellipsoid or occasionally narrowly obovoid, usually with indistinct longitudinal ribs.

Distribution & habitat. The main area of distribution is from Mukinbudin, east to Menzies and then south to near Mount Holland and Salmon Gums in the Coolgardie, far south of the Murchison and far east of the Avon Wheatbelt bioregions. There is also an apparently somewhat disjunct occurrence between Wubin and Paynes Find in the far south of the Yalgoo bioregion.

Mostly occurs in open mallee or heathland communities on deep yellow sands. A couple of records indicate that it may sometimes also occurs over laterite.

Phenology. The main flowering period is between November and April, probably subject to adequate soil

moisture levels during the summer months. It is likely to be significant in this respect that the parts of the state where the species occurs although commonly hot and dry do usually experience at least sporadic seasonal rainfall events during the summer months. Mature fruit is present on specimens collected between May and December.

Etymology. From the place name Coolgardie, and the Latin *-ensis* (native of). Used here to refer to the Coolgardie bioregion, which is the centre of the species' distribution.

Conservation status. A widespread and locally frequent species which is known from one nature reserve and from a privately owned and managed conservation reserve. However, it is also known from localities close to other reserves and very likely occurs within those. No conservation code required (Tanya Llorens, pers. comm.).

Affinities. *Styphelia coolgardiensis* was not included in the phylogeny of Puente-Lelièvre *et al.* (2016) but was referred to Group X in Hislop (2021), based on its morphological attributes. It is one of several small-leaved members of Group X that occur on the yellow sandplains of the Coolgardie bioregion; two others, *S. recondita* Hislop and *S. sparsicoma* Hislop, are described below. By far the most common of these congeners, though, is *S. hamulosa* (E.Pritz.) Sleumer.

Styphelia hamulosa is a very widespread and variable species. The most widely distributed variant, hereafter referred to as the 'inland variant', is sympatric with *S. coolgardiensis* across most of the latter's geographic range. There is at least one record of the two growing in close proximity (i.e. *M. Hislop* 3577 and 3578, *S. coolgardiensis* and *S. hamulosa*, respectively), but it seems probable that this is a relatively frequent occurrence given their shared habitat preference. While the two have a very similar leaf morphology they can be readily distinguished by floral differences. In *S. coolgardiensis*, the sepals are up to 1.6 mm long, their abaxial surfaces are glabrous and the margins prominently ciliate with crinkled hairs to 0.2 mm long. By contrast the inland variant of *S. hamulosa* has longer sepals (at least 2 mm long) with their abaxial surfaces shortly hairy and margins minutely ciliate, with hairs to c. 0.05 mm long. In addition, whereas *S. coolgardiensis* has styles, 0.4–0.8 mm long (but usually no more than 0.6 mm), that are included in the corolla tube, in *S. hamulosa* the styles are exerted beyond the tube and always at least 1 mm long.

In addition to the unusual inflorescence structure of *S. recondita* (described below), *S. coolgardiensis* differs from that species in its shorter leaves, 1.0–2.0 mm long (cf. 3.0–6.2 mm in *S. recondita*), inflorescence well-exserted from the subtending leaf (cf. \pm enclosed by subtending leaf) and prominently ciliate sepals with marginal hairs to 0.2 mm long (cf. minutely ciliate with hairs to c. 0.05 mm long).

From *S. sparsicoma*, *S. coolgardiensis* may be distinguished in the following ways: shorter leaves, 1.0–2.0 mm long (cf. 2.8–4.5 mm in *S. sparsicoma*), which either lack mucros or have short, innocuous or sub-pungent mucros, to 0.2 mm long (cf. usually pungent mucros 0.2–0.6 mm long); deep ± closed abaxial leaf grooves, which appear darker than the intervening veins and with short hairs always visible in the grooves (cf. open, glabrous or sparsely hairy abaxial leaf grooves, which appear paler than the veins); style included within the corolla tube, 0.4–0.8 mm long (cf. style exserted, (1.2–) 1.6–2.2 mm long); fruit 2.0–2.6 mm long and 0.9–1.3 mm wide, always glabrous (cf. 3.0–4.2 mm long, 2.0–2.6 mm wide, glabrous or with a sparse apical tuft of hairs).

Based on overall morphological similarity the closest relative of *S. coolgardiensis* seems likely to be the apparently restricted *S. kirkalocka*, described below. Differences between the two are discussed below in the treatment of that species.

Notes. *Styphelia coolgardiensis* is a variable species in regard to a number of morphological features: longitudinal curvature of leaf axis; presence, length and orientation of leaf apical mucro; shape of sepal apex; relative length of sepals to corolla tube and corolla lobes to corolla tube; degree of anther exertion from the corolla tube; and style length. However, these do not correlate in ways that suggest taxonomically significant divergence.

One specimen however, that had been previously assigned to this taxon has not been included in the above description. The collection *J. Turpin s.n.* (PERTH 09023054) from sand dunes in the Great Victoria Desert is geographically very disjunct, well to the east of all other records of the species. It differs in its larger floral and fruiting parts, i.e. sepals and corolla tubes 2 mm long, anthers 1.5 mm long, fruit ellipsoid, rather than narrowly so, and 1.5 or 1.6 mm wide. These apparent differences may ultimately be explained in terms of clinal variation assuming collections from the intervening country are forthcoming, but in the meantime the specimen is referred to *S. aff. coolgardiensis*.

Other specimens examined

WESTERN AUSTRALIA. Great Eastern Hwy, 11.9 km E of Yellowdine, 15 Oct. 1997, *E.A. Brown 97/289*, *Peter G. Wilson & N. Lam* (PERTH; CANB, NSW, *n.v.*); Great Eastern Hwy, c. 89 km E of Yellowdine, (c. 24.9 km W of Bullabulling roadhouse), 15 Oct. 1997, *E.A. Brown 97/294*, *Peter G. Wilson & N. Lam* (PERTH; MEL, NSW, NY, *n.v.*); SE of Yandhanoo Hill, Ninghan Station, S boundary, June 2004, *P. Curry 4009* (PERTH); c. 2 km E of Comet Vale, 16 Mar. 1978, *A.S. George 15115* (CNS, NSW, PERTH); W boundary of N block of Frog Rock Nat. Res., c. 150 m N of Frog Rock Rd, SW of Southern Cross, 17 Apr. 2006, *M. Hislop 3575* (CANB, CNS, MEL, NSW, PERTH); UCL, E side of Bodallin South Rd, 500 m S of Hitching Rd, 17 Apr. 2006, *M. Hislop 3577* (CANB, CNS, MEL, PERTH); railway maintenance track, 1.9 km W of Mt Walton Rd, NE of Southern Cross, 16 Nov. 2011, *M. Hislop 4169* (K, MEL, NSW, PERTH); internal firebreak adjacent to

Coolgardie–Esperance Hwy, c. 11.5 km N of Goldfields Hwy, W of Kambalda, 26 Mar. 2013, *M. Hislop 4247* (CANB, CNS, PERTH); Emu Fence Rd, c. 8 km S of Great Eastern Hwy, E of Southern Cross, 11 Dec. 2022, *M. Hislop 4993* (CANB, K, PERTH); UCL, Adelong Station [E of Menzies], 24 Oct. 1989, *G.J. Keighery 11882* (PERTH); 5 km NE of Boodarding Rock [E of Marvel Loch], 21 Sep. 1993, *G.J. Keighery 13921* (PERTH); SWATT Sandplain Survey, UCL, survey site SWA0704A, c. 72.31 km WNW of Koolyanobbing and c. 91.82 km W of Coolgardie, 17 Sep. 2013, *R. Meissner & C. Wilkins 5961* (PERTH); SWATT Sandplain Survey, UCL, survey site SWA0801C, c. 41.61 km SW of Ora Banda and c. 67.06 km ENE of Coolgardie, 1 Sep. 2013, *R. Meissner, M. Langley & S. Caddy-Retalic 5992* (PERTH); 52.3 km from Kambalda on a bearing of 197 degrees, site WMC 12, 6 Dec. 1997, *A.A. Mitchell 4987* (PERTH); Squires Block, adjacent to Barbalin North Rd, 35 km NW of Mukinbudin, 9 Mar. 2008, *M. Squire 113* (PERTH); Northern Forrestania Greenstone Belt survey site HLND02, UCL, [adjacent Jilbadji Nat. Res., c. 12.98 km NNE of Mt Holland], 29 Sep. 2009, *W.A. Thompson & J. Allen 1075* (CANB, PERTH); Reserve 34614, 300 m N of Salmon Gums East Rd, 3.2 km E of Salmon Gums, 8 Jan. 2023, *K. Walkerden KSW 216* (CANB, PERTH); Reserve 50437, 1.3 km NW of Coolgardie–Esperance Hwy and Salmon Gums West Rd intersection, 9 Mar. 2024, *K. Walkerden KSW 537* (CNS, K, NSW, PERTH); Quadrat WSWA W1 between 7 Mile Well and Granite Well, 10 m S of track, [Charles Darwin Res., NE of Wubin], 11 Oct. 2008, *Wildflower Society of WA WSWA W1/17A* (PERTH).

Styphelia hamulosa (E.Pritz.) Sleumer

Blumea 12:153 (1964). — *Leucopogon hamulosus* E.Pritz. in Diels & E.Pritz., *Bot. Jahrb. Syst.* 35(2): 478 (1904) — **Type citation:** “in distr. Irwin haud procul a Mingenew in plantiebus arenosis apertis flor. m. Jun. (D. 3068; E. PRITZEL Pl. Austr. occ. 382)”. **Syntypes:** Mingenew, June 1901, *L. Diels 3068* (MEL1513025); In frutices arenosis inter flumina Moore et Murchison, June 1901, *E. Pritzel 382* (BM001040135, GH00061361, HBG507614, L0006539, M0164706, P00760561, PERTH09008500!, S08-5840, US00113627).

Taxonomic notes. *Styphelia hamulosa* is widely distributed in subcoastal and inland districts from east of Geraldton to north-east of Esperance and is one of the most widespread species in the genus. As currently circumscribed it shows considerable, mostly geographically correlated variation across its range, most obviously in its foliar character. Leaves vary in terms of overall size, the presence/absence of a mucro, presence/absence of marginal teeth and the shape and curvature of the base. There is also variation in the presence/absence of a sepal indumentum, the detail of the sepal indumentum and size of the floral parts. Several potentially intergrading variants are recognisable.

Significant, unifying features present in all variants are the ± closed, abaxial leaf grooves, always with short hairs within the grooves, a style that is exserted from the corolla tube with a base that is countersunk below the level of the ovary apex. The fruit shape is uniformly narrowly elliptic to narrowly ovate and with only one or two very

rare exceptions the ovary is glabrous. Apart sometimes in the inland variant of the species (discussed below) which may have almost straight leaves, the longitudinal leaf axes are otherwise always strongly recurved from the base.

The type variant occurs in the Geraldton Sandplains and adjoining parts of the northern wheatbelt. It is the most robust of the variants with the largest leaves and flowers, longest leaf mucros and usually with denticulate leaf margins. It usually also has relatively long sepal hairs, although sometimes these may be altogether lacking. A very similar plant occurs in the Ravensthorpe area, but which differs in having always glabrous sepals and entire leaf margins.

The most distinctive and widespread of the common variants is referred to in this paper as the inland variant. It is characterised by its short leaves, that mostly lack mucros (or if present are very short), combined with very shortly hairy sepals. It is widely distributed in the central, southern and eastern wheatbelt and in the west of the Coolgardie bioregion. Specimens of this variant were sometimes referred to *Leucopogon* sp. aff. *hamulosus* or *L. hamulosus* subsp. '*obtusatus*' in litt. by earlier epacrid researchers, Jocelyn Powell and Elizabeth Brown, respectively.

Aside from the more widespread variants there are several other significantly anomalous morphotypes

that have clear affinities with *S. hamulosa* but which are known from few collections and/or very restricted areas. One of these currently goes by the name *Leucopogon* sp. Arrino (*M. Hislop* 2675). It is known from one or possibly two localities, at one of which it is growing in fairly close proximity to the typical variant of *S. hamulosa*, but in association with a system of breakaways. The latter is not a habitat usually associated with *S. hamulosa*, which almost always occurs on sandplains, either in deep sand or sand over laterite.

Two other populations of taxonomic interest occur north of Paynes Find (*M. Hislop* 4749) and in the Billeranga Hills west of Morawa (*K. McCreery* s.n., PERTH 08836620), both of these are also from upland, rocky habitats. It is likely that these apparently very local morphotypes represent distinct taxa, but the author has refrained from describing any of them at this stage. Ideally, the *S. hamulosa* complex should be the subject of a focussed molecular study in order to better understand relationships and potentially correlating patterns of morphological variation.

***Styphelia implexa* Hislop, sp. nov.**

Holotypus: Western Australia, Uncleared Crown Land, E side of Lake Tay, accessed via firebreak track [NW of Cascade], 4 Nov. 2023, *K. Walkerden* KSW 494 (PERTH09685421!). **Isotypi:** CANB, MEL.

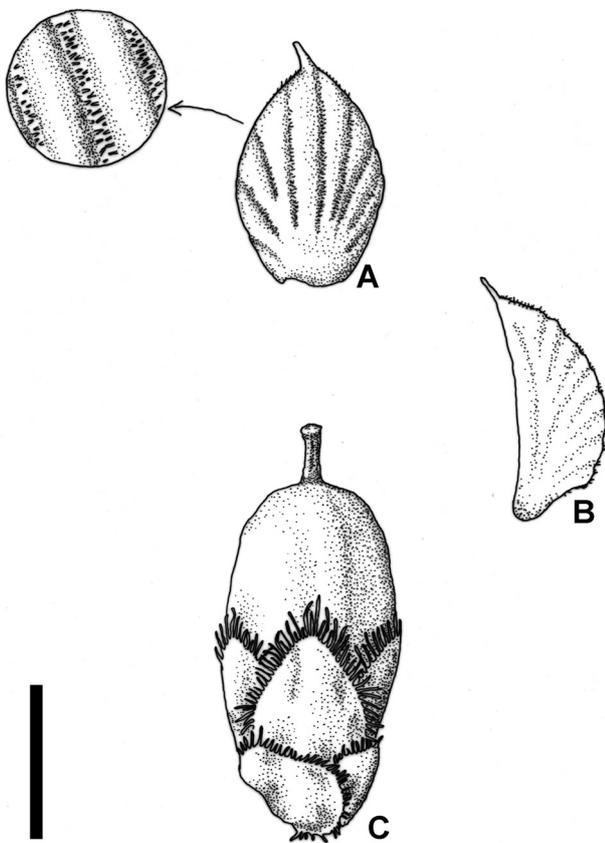


Fig. 2. *Styphelia coolgardiensis*: **A** Leaf, abaxial view, with detail showing groove hairs; **B** leaf, lateral view; **C** fruit. Scale bar = 1 mm. — *M. Hislop* 3197. Drawings by S. Coffey.

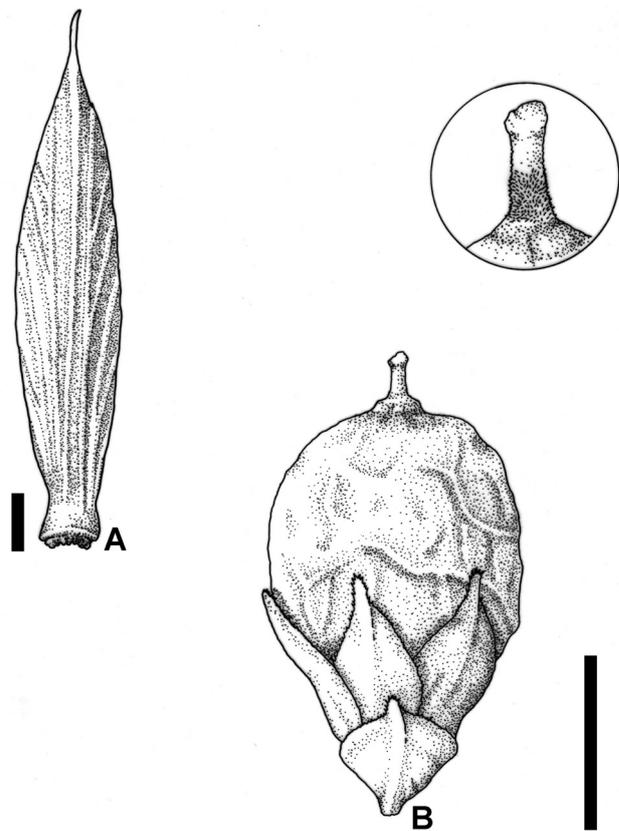


Fig. 3. *Styphelia implexa*: **A** Leaf, abaxial view; **B** fruit, with close-up of persistent style. Scale bars = 1 mm. — *M. Hislop* 2652. Drawings by S. Coffey.

Leucopogon sp. Salt Lake (G.F. Craig 3069) Western Australian Herbarium, *Florabase*, <https://florabase.dbca.wa.gov.au/> [accessed: 21 Aug. 2025].

Erect, compact, usually conspicuously tangled *shrubs*, to c. 80 cm high and 70 cm wide, single-stemmed at ground level, with a fire-sensitive rootstock. Young *branchlets* with a sparse indumentum of very short hairs, <0.05 mm long. *Leaves* helically arranged, shallowly antrorse to shallowly retrorse; apex long-mucronate, pungent, the mucro usually slightly inflexed, 0.6–1.1 mm long; base attenuate or sometimes cuneate; petiole usually well-defined, 0.5–0.8 mm long, glabrous throughout or with a few adaxial hairs; lamina narrowly ovate to narrowly elliptic, 5.0–10.0 mm long, 1.0–1.8 mm wide, discolorous, strongly concave adaxially, usually straight to gently incurved, very occasionally gently recurved; adaxial surface shiny, glabrous or with a few basal hairs, venation not evident; abaxial surface slightly paler, shiny, glabrous with 5–7 primary veins, flat or shallowly and openly grooved between the veins; margins entire, glabrous, or with short, coarse, antrorse hairs, <0.05 mm long. *Inflorescence* axillary, erect; axis 1.1–2.4 mm long, 1–4-flowered, with a dense indumentum, \pm terete below the lowest fertile bract, angular above, terminating in a bud-rudiment; flowers erect, sessile. *Fertile bracts* depressed-ovate, 0.5–0.8 mm long, 0.6–1.0 mm wide, with 3–6 sterile bracts on the axis below. *Bracteoles* broadly ovate to depressed-ovate, 0.7–1.0 mm long, 0.8–1.1 mm wide, \pm keeled, at least in the distal half, obtuse; abaxial surface glabrous, faintly striate; margins minutely ciliolate. *Sepals* ovate to narrowly ovate, 1.6–2.0 mm long, 0.7–1.0 mm wide, acute; abaxial surface glabrous, pale green or straw-coloured, but often becoming brown and necrotic, venation not evident; adaxial surface hairy; margins ciliolate with hairs to c. 0.05 mm long. *Corolla tube* white, obovoid or broadly obovoid, slightly longer than to \pm equal to the sepals, 1.3–1.7 mm long, 1.3–1.5 mm wide, external surface glabrous, internal surface glabrous. *Corolla lobes* white, slightly shorter to \pm equal to the tube, 1.2–1.5 mm long, 0.5–0.8 mm wide at base, erect in basal $\frac{1}{2}$ of their length and then spreading and recurved, external surface glabrous, internal surface with a dense, white indumentum of rather short, \pm terete, \pm straight, ornamented hairs. *Anthers* partially exerted from the tube by $\frac{1}{2}$ – $\frac{3}{4}$ of their length, 0.4–0.5 mm long, apex shortly emarginate. *Filaments* terete, 0.3–0.5 mm long, attached to the anther just below apex, adnate to tube just below sinuses. *Nectary* partite, the scales 0.3–0.5 mm long, 0.3–0.4 mm wide, glabrous. *Ovary* ovoid to ellipsoid, 0.6–0.7 mm long, 0.4–0.5 mm wide, papillose towards the apex, glabrous below, 5-locular, straw-coloured, ovary wall c. 0.05 mm thick. *Style* 0.2–0.4 mm long, papillose, included within the corolla tube, well-differentiated from ovary apex, not arising from a depression; stigma not expanded. *Fruit* globose or ellipsoid, 2.2–2.5 mm long, 2.0–2.5 mm wide, clearly umbonate (with a dark papillose umbo), much longer than the sepals, circular in transverse section, gynophore absent; surface glabrous, rugose (mesocarp well-developed), without

longitudinal striations; apex broadly rounded; style persistent at maturity. **Figs 3, 4.**

Diagnostic characters. Within species currently assigned to Group X distinguished by the following character combination: habitat preference for the surround of salt lakes; lamina narrowly ovate to narrowly elliptic, 5.0–10.0 mm long, 1.0–1.8 mm wide, abaxial surface glabrous, shallowly and openly grooved, apex usually slightly inflexed, long-mucronate, pungent; inflorescence 1–4-flowered, axis 1.1–2.4 mm long, terminating in a bud-rudiment; abaxial surface of bracteoles and sepals glabrous, abaxial surface of sepals without evident venation; sepal margins ciliolate with hairs to c. 0.05 mm long; corolla tube slightly longer than to \pm equal to the sepals; corolla lobes slightly shorter to \pm equal to the tube; nectary partite; ovary ovoid to ellipsoid, 5-locular, papillose towards the apex, glabrous below; style 0.2–0.4 mm long, included within the corolla tube; style base not countersunk below the level of ovary apex; fruit globose to ellipsoid, 2.2–2.5 mm long, 2.0–2.5 mm wide, umbonate, rugose, without longitudinal striations.

Distribution & habitat. Most collections have been made between Lake Dundas, south of Norseman, in the north, to Lake Tay in the south-west and then to an area east of Salmon Gums in the south-east; in the north of the Mallee and far south of the Coolgardie bioregions. There is however a very disjunct record from Diemals Station in the far south of the Murchison bioregion.

Styphelia implexa is always found in the littoral zone of salt lakes in open heath or sometimes open mallee woodland, growing in white or pale-yellow sand. Associated species include *Eucalyptus angustissima*, *Melaleuca thyoides*, *M. halmaturorum*, *Darwinia* sp. Karonie, *Cyathostemon* and *Tecticornia* species. Other epacrids recorded as growing in proximity are *Styphelia subulata*, *S. lacsalaria* and a small-leaved inland variant of *Conostephium drummondii*.

Phenology. The main flowering period appears to be between November and April. Mature fruit has been collected in June, September, November and December, but might be expected to be present at any time during the second half of the year.

Etymology. From the Latin *implexus* (interwoven, entwined), a reference to the tangled habit that is usually a conspicuous feature of this species.

Conservation status. *Styphelia implexa* is often locally common and is known to occur in two nature reserves in the Salmon Gums–Norseman area. Until quite recently the distribution of this species in salt-lake habitat to the east of the agricultural districts would have suggested that there were likely to be few conservation concerns. Now however, it has been established that such places may contain significant reserves of some valuable minerals, especially lithium

and potash. No conservation code is currently required (Tanya Llorens, pers. comm.).

Affinities. *Styphelia implexa* is most similar in gross morphology to *S. interioris*, described below. The most important differences between the two relate to features of the gynoecium. Where *S. implexa* has an ovoid to ellipsoid ovary, 0.6–0.7 mm long, 0.4–0.5 mm wide, with a papillose apex and a style 0.2–0.4 mm long; in *S. interioris* the ovary is globose to broadly obovoid, 0.5–0.8 mm long and 0.5–0.9 mm wide, lacks papillae and the style is usually longer at 0.4–0.6 mm long. There is also an obvious difference in the thickness of the ovarian wall: c. 0.05 mm in *S. implexa* compared to 0.1–0.2 mm in *S. interioris*. The fruit of *S. implexa*, although of similar shape to those of *S. interioris*, are significantly smaller (2.2–2.5 mm long, 2.0–2.5 mm wide, cf. 3.4–5.2 mm long, 3.2–4.8 mm wide in *S. interioris*) and clearly umbonate with a dark, papillose umbo.

Another useful distinction is in the sepals. In *S. implexa* they are narrowly ovate to ovate with no abaxial venation evident, and the margins tapering ± smoothly from the base to the always acute apex. *Styphelia interioris* differs from this in having ovate to broadly ovate sepals

with distinct venation and the margins more roundly contracted to an obtuse, subacute or acute apex.

There are also some vegetative characters that can be used to distinguish between the two. The characteristic, tangled growth habit of *S. implexa* is not observable in *S. interioris*. Where the leaf posture in *S. implexa* frequently includes retrorse as well as shallowly antrorse leaves, in *S. interioris* the leaves are always antrorse. And while the longitudinal leaf axes in *S. implexa* are mostly straight to gently incurved (only very occasionally recurved), in *S. interioris* some recurved leaves are nearly always present and in the north of that species' range all leaves may be recurved.

The distribution of *S. implexa* lies entirely within that of *S. interioris* and at some localities the two are known to grow in close proximity, e.g. *K.S. Walkerden 387* and *388* were collected within two or three hundred metres of each other. While *S. implexa* is confined to the close margins of salt lakes, *S. interioris* grows in wide variety of habitats, and even occasionally occurs close to saline features as in the above example.

Note. The very disjunct Diemals Station collection (*D.A. Blood 2955*) is fruiting-only but is quite typical. This suggests that the species may have a significantly



Fig. 4. *Styphelia implexa*, flowering plants *in situ*. — *M. Hislop 2652*. Photo: M. Hislop.

wider distribution than current records would indicate but is under-collected because of the inaccessibility of much of the intervening salt-lake country.

Other specimens examined

WESTERN AUSTRALIA. Diemals Station, 19 Sep. 1993, *D.A. Blood 2955* (PERTH); c. 20 km NW of Salmon Gums, 6 Dec. 2006, *G. Cockerton, D. True & S. Kern 12063* (PERTH); c. 35 km NW of Salmon Gums, off Kumar–Lake King Rd, 8 Nov. 2007, *G. Cockerton & N. McQuoid LCH 15971* (PERTH); 37.9 km S of Norseman along Coolgardie–Esperance Hwy, 18 Nov. 1993, *G.F. Craig 3069* (NSW, PERTH); 3.2 km E of Hobby Rd on Salmon Gums East Rd, c. 14 km ENE of Salmon Gums, 18 Nov. 1993, *G.F. Craig 3082* (PERTH); Res. at E end of Salmon Gums East Rd, on W edge of salt lake [E of Salmon Gums], 20 May 2002, *M. Hislop & F. Hort MH 2652* (CANB, NSW, PERTH); Kumar–Lake King Rd, 8.4 km from Esperance–Norseman Rd then 150 m N to shoreline of Lake Exclamation, 21 May 2002, *M. Hislop & F. Hort MH 2658* (PERTH); Nat. Res. A42943, Beete Rd, 10.1 km east of Coolgardie–Esperance Hwy and then c. 200 m to salt lake [Lake Gilmore, north of Salmon Gums], 22 Apr. 2010, *M. Hislop 4008* (CANB, CNS, PERTH); 26 km NW of Roberts Swamp, c. 50 km WNW of Grass Patch, 15 Nov. 1980, *K.R. Newbey 8175* (PERTH); on the edge of Lake Dundas, 5 km E of Coolgardie–Esperance Hwy, [S of] Norseman, 13 June 2013, *C. Reynolds CJR 215* (PERTH); UCL, S edge of Lake Tay, 20.6 km NNE of Cascade and Lake Tay Rd intersection [NW of Cascade], 7 May 2023, *K. Walkerden KSW 285* (CNS, PERTH); SW corner of Reserve 42943, 1.8 km NE of Coolgardie–Esperance Hwy and Beete Rd intersection, 4 Aug. 2023, *K. Walkerden KSW 374* (CNS, PERTH); UCL, Ngadju Exclusive Native Title area, 80 m N of Lake King–Norseman road res., 4.6 km WSW of Lake King–Norseman Rd and Coolgardie–Esperance Hwy intersection, 17 Aug. 2023, *K. Walkerden KSW 380* (CANB, PERTH); UCL, Ngadju Exclusive Native Title area, 815 m SW from intersection of Coolgardie–Esperance Hwy and Acacia mine track, 1.6 km N of Lake King–Norseman Rd and Coolgardie–Esperance Hwy intersection, 18 Aug. 2023, *K. Walkerden KSW 387* (CNS, NSW, PERTH); UCL, S of Three Star Lake, 21 km NW of Cascade and Lake Tay Rd intersection [NW of Cascade], 4 Nov. 2023, *K. Walkerden KSW 495* (K, MEL, PERTH);

Styphelia inclusa Hislop, *sp. nov.*

Holotypus: Western Australia, Frank Hann N.P., 21.7 km west of Ninety Mile Tank, 12 Nov. 2001, *M. Hislop 2465* (PERTH05918448!). **Isotypi:** CANB, NSW832177.

Leucopogon sp. Frank Hann (*K.R. Newbey 11499*) Western Australian Herbarium, *Florabase*, <https://florabase.dbca.wa.gov.au/> [accessed: 21 Aug. 2025].

Erect *shrubs*, to c. 60 cm high and 60 cm wide, single-stemmed at ground level, with fire-sensitive rootstock. Young branchlets with a sparse to moderately dense indumentum of short hairs to c. 0.05 mm long. *Leaves* helically arranged, usually steeply antrorse; apex a blunt callus tip, obtuse to subacute; base usually cuneate, sometimes attenuate or rounded; petiole well-defined,

0.3–0.6 mm long, adaxial surface shortly hairy, abaxial surface glabrous, margins glabrous or with sparse, short hairs; lamina narrowly elliptic to elliptic, narrowly obovate to obovate or occasionally narrowly ovate to ovate, 1.7–4.0 mm long, 0.9–2.0 mm wide, discolourous, concave adaxially or plano-convex, longitudinal axis usually straight or gently incurved, occasionally gently recurved; adaxial surface shiny, glabrous except for a few basal hairs, venation not evident; abaxial surface paler, matt to slightly shiny, with 5–7 primary veins, the midrib scarcely more prominent than the rest, openly grooved between the veins, usually glabrous or occasionally with a few scattered hairs; margins entire, glabrous or minutely hairy, with short, coarse, antrorse hairs <0.05 mm long. *Inflorescence* axillary, erect; 1.3–3.0 mm long, 1–3-flowered, with a moderately dense to dense indumentum, ± terete below the lowest fertile bract, angular above, terminating in a bud-rudiment; flowers erect, sessile. *Fertile bracts* broadly ovate, 0.6–1.0 mm long, 0.5–0.9 mm wide, with 3–5 sterile bracts on the axis below. *Bracteoles* broadly ovate or depressed ovate, 0.7–1.0 mm long, 0.8–1.0 mm wide, ± keeled in the upper half, obtuse (not mucronate); abaxial surface glabrous, not striate; margins minutely ciliolate. *Sepals* ovate, 1.5–2.1 mm long, 0.9–1.0 mm wide, acute or subacute; abaxial surface glabrous, very pale green to straw-coloured, venation obscure, except for a weakly defined midrib; adaxial surface with sparse hairs towards the apex and base; margins ciliolate with hairs to 0.1 mm long. *Corolla tube* white, obovoid or broadly obovoid, slightly longer than or equal to the sepals, 1.4–1.6 mm long, 1.3–1.5 mm wide, external surface glabrous, internal surface glabrous or with a few hairs immediately below the lobes. *Corolla lobes* white, slightly longer than to slightly shorter than the tube, 1.5–1.7 mm long, 0.5–0.7 mm wide at base, erect in basal ½ of their length and then spreading and recurved, external surface glabrous, internal surface with a dense, white indumentum of ± terete, straight, slightly ornamented hairs. *Anthers* partially exerted from the tube by ⅓–½ of their length, 0.5–0.7 mm long, apex emarginate. *Filaments* terete, 0.3–0.5 mm long, glabrous, attached to the anthers at least ⅞ above the base, adnate to the tube just below the sinuses. *Nectary* partite, the scales 0.4–0.5 mm long, 0.3–0.4 mm wide, or sometimes annular with the scales weakly cohering, glabrous. *Ovary* ellipsoid to ± globose, 0.5–0.6 mm long, 0.5–0.6 mm wide, glabrous, or sometimes with a sparse apical tuft of hairs, 5-locular, pale brown. *Style* 0.4–0.6 mm long, faintly scabrous, included within the corolla tube, well differentiated from ovary apex, not arising from a depression; stigma not or scarcely expanded. *Fruit* depressed-globose or globose, 2.2–3.5 mm long, 2.2–3.6 mm wide, much longer than the sepals, circular in transverse section, gynophore absent; surface glabrous or with a sparse apical tuft of hairs, becoming distinctly rugose (mesocarp well-developed); apex broadly rounded; style usually persistent at maturity. **Figs 5, 6.**

Diagnostic characters. The new taxon is distinguished from species currently included in Group X by the

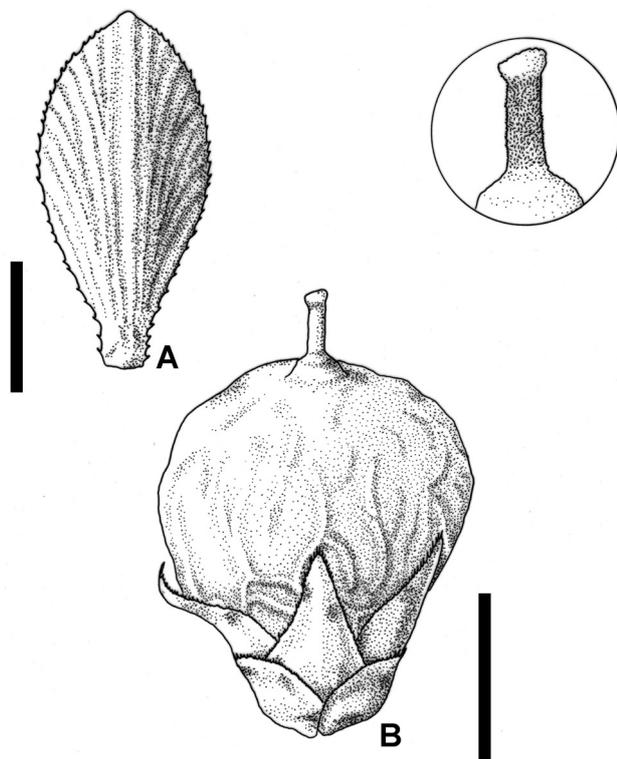


Fig. 5. *Styphelia inclusa*: **A** Leaf, abaxial view; **B** fruit, with detail of style and style base. Scale bars = 1 mm. — M. Hislop 2465. Drawings by S. Coffey.

following character combination: lamina narrowly elliptic to elliptic, narrowly obovate to obovate or occasionally narrowly ovate to ovate, 1.7–4.0 mm long, 0.9–2.0 mm wide, abaxial surface openly grooved, glabrous, apex a blunt callus tip, obtuse to subacute; inflorescence 1–3-flowered, axis 1.3–3.0 mm long, terminating in a bud-rudiment; sepal 1.5–2.1 mm long, the abaxial surface glabrous; corolla tube slightly longer than or equal to the sepals; corolla lobes slightly longer than, to slightly shorter than, the tube; ovary 5-locular, glabrous or sometimes with sparse apical hair tuft; style 0.4–0.6 mm long, included in the corolla tube; style base not countersunk below the level of the ovary apex; fruit depressed-globose or globose, distinctly rugose at maturity with well-developed mesocarp.

Distribution & habitat. *Styphelia inclusa* has a rather scattered distribution from east of Lake Grace eastwards to Frank Hann N.P. and the Cascade area in the Mallee and northernmost part of the Esperance Plains bioregions. Most commonly recorded in deep yellow sandplain, occasionally over laterite, in mallee woodland or heath.

Phenology. In common with most taxa currently assigned to Group X, flowering occurs from late spring



Fig. 6. *Styphelia inclusa*, flowering plant *in situ*. — M. Hislop 2661. Photo: M. Hislop.

through to late autumn, and mature fruit is mostly present during spring and early summer.

Etymology. From the Latin *inclusus* (enclosed), a reference to the style, which is included within the corolla tube.

Conservation status. A poorly known species with an apparently rather scattered distribution, although its range does extend eastwards beyond the agricultural districts. Known from two nature reserves and a national park. No conservation code required (Tanya Llorens, pers. comm.).

Affinities. In terms of general morphology, *S. inclusa* is most similar to *S. conchifolia*, which occurs disjunctly to the south. It differs most significantly from that species in its much shorter style (0.4–0.6 mm long, cf. 1.6–2.1 mm in *S. conchifolia*) that is included within, rather than well-exserted from, the corolla tube. This is clearly indicative of a different pollination strategy.

There are also useful foliar differences, with the leaves of *S. inclusa* being generally narrower (0.9–2.0 mm, cf. 1.5–4.0 mm), more erectly orientated and differently shaped (narrowly elliptic to elliptic, narrowly obovate

to obovate or occasionally narrowly ovate to ovate, cf. broadly ovate, depressed-ovate or \pm orbicular, occasionally elliptic or broadly obovate). And where the abaxial leaf surfaces of *S. inclusa* are always openly grooved and glabrous (occasionally with a few scattered hairs), those of *S. conchifolia* are often narrowly grooved and densely hairy within the grooves.

The floral parts and fruit of *S. inclusa* are also noticeably smaller, for example: sepals 1.5–2.1 mm long (cf. 2.0–2.5 mm in *S. conchifolia*); corolla tube 1.4–1.6 mm long, and lobes 1.5–1.7 mm (cf. 1.5–2.0 mm and 1.8–2.4 mm long respectively); fruit 2.2–3.5 mm long and 2.2–3.6 mm wide (cf. 3.2–4.2 mm long, 3.4–4.5 mm in *S. conchifolia*).

Another species that could possibly be confused with *S. inclusa* is *S. planiconvexa* Hislop. It has a similar leaf morphology and a distribution which entirely overlaps that of *S. inclusa*. The following floral and fruiting differences however provide a ready means of distinguishing between them. Where *S. inclusa* has an included style, 0.4–0.6 mm long, a 1–3-flowered inflorescence and a depressed-globose or globose fruit, in *S. planiconvexa* the style is well-exserted from the corolla tube, 1.8–2.7 mm long, the inflorescence is strictly single-flowered, and the fruit is narrowly ellipsoid or oblongoid.

Other specimens examined

WESTERN AUSTRALIA. Near corner of Rolland and Cascades Rds [NW of Cascade], 21 Apr. 2013, *W.R. Archer 2104139* (PERTH); Aerodrome Rd Nat. Res., c. 4.7 km SE of Fitzgerald Rd intersection, adjacent internal firebreak, [NW of Ravensthorpe], 2 Mar. 2006, *S. Barrett 1432* (PERTH); junction of Koornong and Fitzgerald North Rds [NW of Ravensthorpe], 1 Mar. 2006, *S. Barrett 1433* (PERTH); Lake King Rd, SW of intersection with Norseman–Esperance Hwy (50.9 km W of road to Peak Charles), 16 Oct. 1997, *E.A. Brown 97/303*, *Peter G. Wilson & N. Lam* (PERTH; CANB, NSW, NY, *n.v.*); Halls Track, 14 miles [c. 22 km] W of Phillips River [Aerodrome Rd Nat. Res., NW of Ravensthorpe], 4 Nov. 1965, *A.S. George 7313* (PERTH); c. 80 m due W of Ninety Mile Tank, E of Frank Hann N.P., 11 Nov. 2001, *M. Hislop 2451* (PERTH); Frank Hann N.P., 23.1 km W of Ninety Mile Tank, 12 Nov. 2001, *M. Hislop 2473* (PERTH); Lake King–Norseman Rd, 5.3 km E of Ninety Mile Tank, 21 May 2002, *M. Hislop & F. Hort MH 2661* (CNS, PERTH); N side of Koornong Rd, c. 200 m E of junction with Fitzgerald Rd, NW of Ravensthorpe, 9 Oct. 2006, *M. Hislop 3662* (CNS, MEL, PERTH); S boundary of Lakeland Nat. Res. A29023, c. 50 m SW of junction with internal firebreak on Fourteen Mile Rd [SE of Lake Grace], 30 May 2010, *M. Hislop 4018* (CNS, PERTH); 229.1 miles [c. 370 km] along Lake Grace–Ravensthorpe Rd [between Lake Grace and Newdegate], Ninety Mile Tank [Frank Hann N.P.], 6 Dec. 1986, *K.R. Newbey 11499* (MEL, PERTH); 8 Apr. 1966, *E.M. Scrymgeour 409* (PERTH); UCL, 5.6 km NW of Northover Soak, 6 km N of Hewby Swamp, 17.3 km NNW of Cascade and Lake Tay Rd intersection, 4 Nov. 2023, *K. Walkerden KSW 497* (PERTH); UCL, 16.85 km NW of Cascade and Lake Tay Rd intersection, 28 Oct. 2023, *K. Walkerden KSW 500* (PERTH);

UCL, 18.9 km NW of Cascade and Lake Tay Rd intersection, 4.2 km S of southern edge of Three Star Lake, 28 Oct. 2023, *K. Walkerden KSW 502* (PERTH); Res. 36004 (Peak Charles N.P.), 3.9 km SW of Peak Charles, 4 Aug. 2024, *K. Walkerden KSW 623* (PERTH); Cascade Rd at SLK 76.1, 40 m NW of road shoulder [NW of Cascade], 28 Oct. 2022, *K. Walkerden & J. Waters KSW 15322* (PERTH); Cascade Rd at SLK 75.99, SW side of the road [NW of Cascade], 28 Oct. 2022, *K. Walkerden & J. Waters KSW 15422* (PERTH).

Styphelia interioris Hislop, *sp. nov.*

Holotypus: Western Australia, Great Eastern Hwy, 10 km W of Bullabulling, 25 Feb. 2011, *K.R. Thiele 4102* (PERTH08429332!). **Isotypi:** CANB, MEL, NSW.

Leucopogon sp. Clyde Hill (*M.A. Burgman 1207*) Western Australian Herbarium, *Florabase*, <https://florabase.dbca.wa.gov.au/> [accessed: 21 Aug. 2025].

Erect *shrubs*, to c. 2 m high and 2 m wide, either single- or multi-stemmed at ground level, fire-tolerance of rootstock uncertain but possibly at least sometimes with the capacity to resprout after fire. Young *branchlets* with a sparse indumentum of very short hairs, <0.05 mm long or glabrous. *Leaves* helically arranged, \pm patent to steeply antrorse; apex long-mucronate, pungent, the mucro \pm straight, 0.7–1.5 mm long; base attenuate; petiole moderately well-defined, 0.4–1.0 mm long, glabrous throughout or with a few hairs on the adaxial surface and margins; lamina narrowly elliptic to narrowly obovate, 5.0–16.0 mm long, 1.0–2.2 mm wide, slightly discoloured, strongly concave adaxially, longitudinal axis straight to distinctly recurved; adaxial surface shiny, glabrous or with a few basal hairs, venation not evident; abaxial surface slightly paler, shiny, glabrous, with 5–7 primary veins, shallowly and openly grooved between the veins; margins entire, glabrous, or with short, coarse, antrorse hairs, <0.05 mm long. *Inflorescence* axillary, erect; axis 1.2–3.1 mm long, 1–3-flowered, with a dense indumentum, \pm terete below the lowest fertile bract, angular above, terminating in a bud-rudiment; flowers erect, sessile. *Fertile bracts* broadly ovate to depressed-ovate, 0.5–1.1 mm long, 0.5–1.0 mm wide, with 3–7 sterile bracts on the axis below. *Bracteoles* broadly ovate or depressed-ovate, 0.7–1.2 mm long, 0.8–1.3 mm wide, keeled, obtuse to acute; abaxial surface glabrous or sparsely hairy about the keel, faintly striate; margins minutely ciliate. *Sepals* broadly ovate or ovate, 1.3–2.0 mm long, 0.8–1.3 mm wide, usually obtuse to subacute, occasionally acute; abaxial surface glabrous or with a few a hairs in the distal half, pale green, but often becoming brown and necrotic, venation distinct, the midvein and 1 or 2 veins on either side usually evident; adaxial surface hairy, at least in part; margins sparsely and minutely ciliate with hairs <0.05 mm long or \pm glabrous. *Corolla tube* white, broadly obovoid or depressed-obovoid, usually slightly longer than, or sometimes slightly shorter than the sepals, 1.2–1.6 mm long, 1.5–2.2 mm wide, external surface glabrous, internal surface glabrous. *Corolla lobes* white, a little longer than to \pm equal to the tube, 1.5–2.0 mm long,

0.7–1.2 mm wide at base, erect in basal $\frac{1}{3}$ – $\frac{2}{3}$ of their length and then spreading and recurved, external surface glabrous, internal surface with a dense, white indumentum of rather short, \pm terete, \pm straight, scarcely ornamented hairs. *Anthers* partially exerted from the tube by $\frac{3}{4}$ of their length to fully exerted, 0.5–1.0 mm long, apex shortly emarginate. *Filaments* terete, 0.3–0.6 mm long, attached to anther at least $\frac{7}{8}$ above the anther base, adnate to tube just below sinuses. *Nectary* partite, the scales 0.2–0.5 mm long, 0.2–0.4 mm wide, glabrous. *Ovary* globose to broadly obovoid, 0.5–0.8 mm long, 0.5–0.9 mm wide, glabrous, 5-locular, straw-coloured to pale brown, ovary wall 0.1–0.2 mm wide. *Style* 0.4–0.6 mm long, faintly scabrous, included within, or c. equal to, the corolla tube, well differentiated from ovary apex, not arising from a depression; stigma not or scarcely expanded. *Fruit* globose to ellipsoid, 3.4–5.2 mm long, 3.2–4.8 mm wide, not umbonate, much longer than the sepals, circular in transverse section, gynophore absent; surface glabrous, \pm rugose (mesocarp usually well-developed), with distinct longitudinal striations; apex broadly rounded; style usually persistent at maturity. **Figs 7, 8.**

Diagnostic characters. Within species currently assigned to Group X distinguished by the following character combination: lamina narrowly elliptic to narrowly obovate, 5.0–16.0 mm long, 1.0–2.2 mm wide, abaxial surface glabrous, shallowly and openly grooved, apex \pm straight, long-mucronate, pungent; inflorescence 1–3-flowered, axis 1.2–3.1 mm long, terminating in a bud-rudiment; abaxial surface of bracteoles and sepals glabrous or sparsely hairy in part, abaxial surface of sepals with distinct venation; sepal margins glabrous or minutely ciliate with hairs < 0.05 mm long; corolla tube longer than, or sometimes slightly shorter than, the sepals; corolla lobes slightly longer than, to \pm equal to the tube; nectary partite; ovary globose to broadly obovoid, 5-locular, glabrous; style 0.4–0.6 mm long, included within or \pm equal to the corolla tube; style base not countersunk below the level of ovary apex; fruit globose to ellipsoid, 3.4–5.2 mm long, 3.2–4.8 mm wide, not umbonate, \pm rugose, with distinct longitudinal striations.

Distribution & habitat. Widely distributed in inland areas from Karara northwards to Sandstone and then south and east to Peak Charles and Clyde Hill, north-east of Condingup; in the Yalgoo, Murchison, Avon Wheatbelt, Coolgardie and Mallee bioregions. Grows in sand or loam soils in various heathland, shrubland or woodland communities on flat plains, or higher in the landscape over granite or ironstone, often in association with breakaways in the north of its range.

Phenology. The main flowering period is between November and May with the exact timing likely to be dependent on local rainfall events in the months between late spring and autumn, but there are numbers of collections made outside of these months in which some flowers are present. Most fruiting collections have been made between May and October.

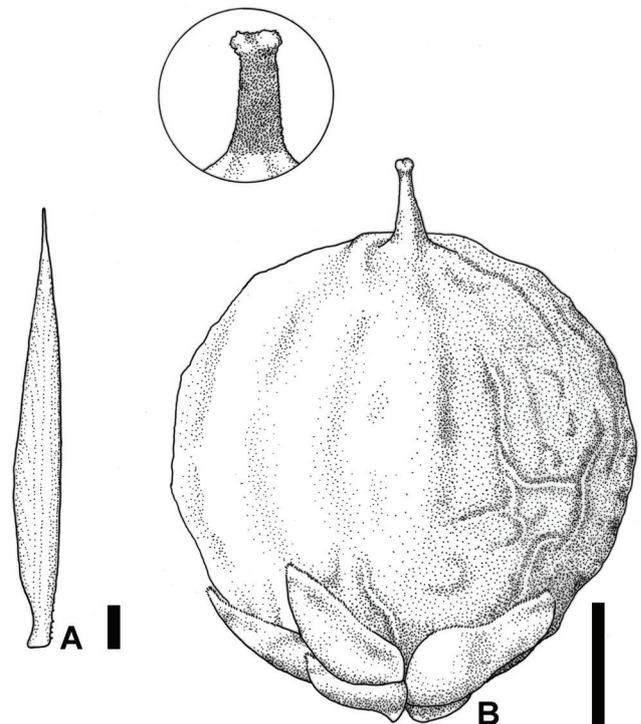


Fig. 7. *Styphelia interioris*: **A** Leaf, abaxial view; **B** fruit, with detail of style and style base; **C** flowering branchlet *in situ*. Scale bars = 1 mm. — A, B M. Hislop 3199, C K.R. Thiele 4102. Drawings by S. Coffey; Photo: K. Thiele.

Etymology. From the Latin *interior* (the interior), in reference to the inland distribution of the new species, which extends further into the arid interior of Western Australia than any other epacrid, with the single exception of *S. deserticola* Hislop.

Conservation status. A widespread and often locally common species. No conservation code required (Tanya Llorens, pers. comm.).

Affinities. Based on overall morphological similarity the closest relative of *S. interioris* seems likely to be *S. implexa*. Differences between the two species are discussed above in the treatment of that species.

Early collections of *S. interioris* were mostly assigned to *S. brevifolia*, a species with similarly shaped leaves and



Fig. 8. *Styphelia interioris*, flowering plants *in situ*. — M. Hislop 2655 (A, B). Photos: M. Hislop.

fruit. The new species differs most significantly from *S. brevifolia* in having a style, 0.3–0.6 mm long, that is included within, or is \pm equal to, the corolla tube, whereas in *S. brevifolia* the style is 1.7–2.5 mm long and well exerted from the tube. Other differences include shorter sepals (1.3–2.0 mm long, cf. 2.2–2.8 mm in *S. breviflora*), shorter corolla tubes (1.2–1.6 mm long, cf. 1.6–2.0 mm) and straight to distinctly recurved leaf axes (gently incurved in *S. breviflora*).

Another taxon with a similar gross morphology to *S. interioris* and which has a narrowly sympatric distribution is the typical subspecies of *S. sporadica* Hislop, described below. It can be distinguished from that taxon by its 5- rather than 3-locular ovary and globose to ellipsoid fruit (cf. narrowly ellipsoid, narrowly ovoid or occasionally narrowly obovoid in *S. sporadica*). Other useful distinguishing features are the generally smaller floral parts of *S. interioris*, for example sepals 1.3–2.0 mm long and corolla tubes 1.2–1.6 mm long (cf. 2.1–3.0 mm and 1.5–2.0 mm, respectively, in *S. sporadica*) and the fact that at least some leaves are recurved along their longitudinal axes (cf. usually gently incurved, sometimes \pm straight).

Notes. As might be expected for such a widely distributed species there is some noteworthy morphological

variation in *S. interioris*, the most obvious of which is foliar. In northern populations the leaves are generally shorter and narrower and more recurved across their longitudinal axes. Although there is little variation in flower size the fruit are also generally somewhat smaller in the north of the species' range. The usual fruit shape is globose at maturity, less often broadly ellipsoid. The only two available fruiting collections from the somewhat disjunct north-eastern populations in the Sandstone area have rather narrower-than-usual ellipsoid fruit but without any apparent correlating differences that might distinguish them from other northern populations.

Other specimens examined

WESTERN AUSTRALIA. 20 km S of Norseman Post Office along Coolgardie–Esperance Hwy and Picnic Lake track, 7.5 km S of rail crossing, 3 Jan. 2004, *B. Archer* 2480 (PERTH; MEL *n.v.*); site 4, near Mt Gibson [SW of Paynes Find], 24 June 1997, *P.G. Armstrong s.n.* (PERTH); Mungada Hemitite project, Mungada Ridge, c. 60 km S of Yalgoo, 25 Apr. 2006, *D. Coultas s.n.* (PERTH); 3 km S of Peak Charles Rd on Peak Eleanor Rd (Fields Rd), then 0.65 km E along track to W side of Peak Eleanor, Peak Charles N.P., 18 Sep. 1993, *G.F. Craig* 2939 (PERTH); 4 km NNE of homestead on White Wells Station, 22 Nov. 1992, *R.J. Cranfield* 8570 (PERTH); 11 km NW of Clyde Hill

[c. 70 km NE of Condingup], 4 May 1983, *M.A. Burgman* & *S. McNee 1207* (PERTH); Karara Station, W of shearing shed, 25 Oct. 1992, *L.A. Craven, F.A. Zich* & *A.M. Lyne 8902* (PERTH; CANB, *n.v.*); Mt Walton EPA Intractable Waste Compound, 100 km NE of Koolyanobbing, 17 Nov. 1996, *Ecologia ECOL 83* (PERTH); 28 miles [c. 45 km] N of Paynes Find, 15 Apr. 1960, *A.S. George 699* (PERTH); 3 km NW of Bimbijy Station homestead, 19 Apr. 1976, *A.S. George 14243* (PERTH); 5 km N of Pass in Die Hardy Range [S of Diemals], 4 July 1976, *A.S. George 14317* (CANB, PERTH); Esperance–Norseman Rd, 2.1 km N of Salmon Gums, 21 May 2002, *M. Hislop* & *F. Hort MH 2655* (MEL, NSW, PERTH); railway track maintenance road, 20 km E of Southern Cross–Koolyanobbing Rd, E of Koolyanobbing, 18 May 2004, *M. Hislop* & *F. Hort MH 3182* (CANB, PERTH); Woodline track between Burra Rock and Cave Hill, 24.3 km from turn at Burra Rock, S of Coolgardie, 20 May 2004, *M. Hislop* & *F. Hort MH 3199* (CNS, PERTH); W boundary of Lochada Station [NE of Perenjori], near Warragee Well, 6 July 2004, *G.J. Keighery 16635* (CNS, PERTH); 12 km NE of Bungalbin Hill, Helena and Aurora Range, c. 50 km NNE of Koolyanobbing, 25 Sep. 1995, *B.J. Lepschi 2002* (PERTH; CANB, NSW, *n.v.*); Mount Jackson, 6 Nov. 2000, *L. Mattiske 197-2/640* (CNS, PERTH); 52.3 km from Kambalda on a bearing of 197 degrees, 6 Dec. 1997, *A.A. Mitchell 5000* (PERTH); 46 km E of McDermid Rock, c. 60 km WNW of Norseman, 16 July 1979, *K.R. Newbey 5309* (MEL, PERTH; NSW, *n.v.*); McPhearson Rock, 30 km SSW of Norseman, 6 Dec. 1986, *K.R. Newbey 11502* (NSW, PERTH); Sandstone, Heritage Track at turnoff to London Bridge, 29 Oct. 1994, *S. Patrick SP 2115* (PERTH); small breakaway, W side of Sandstone–Booylgoo Rd, 7 km N of turnoff Leinster Rd, 23 June 1995, *S. Patrick SP 2286* (PERTH).

Styphelia kirkalocka* Hislop, *sp. nov.

Holotypus: Western Australia, Kirkalocka Station [SE of Mount Magnet; precise locality withheld for conservation reasons], 24 June 2006, *A.S. George 17738* (PERTH08644306!). **Isotypi:** CANB, MEL.

Styphelia sp. Kirkalocka (*A.S. George 17738*) Western Australian Herbarium, *Florabase*, <https://florabase.dbca.wa.gov.au/> [accessed: 21 Aug. 2025].

Erect *shrubs*, to c. 60 cm high, rootstock unknown, but most likely fire-sensitive. Young *branchlets* with a moderately dense indumentum of mostly recurved hairs to c. 0.1 mm long. *Leaves* helically arranged, variably antrorse; apex acute and mucronate, the mucro straight to slightly inflexed, sub-pungent, rather brittle, 0.2–0.5 mm long; base cordate or rounded; petiole 0.2–0.5 mm long, abaxial surface and margins glabrous, adaxial surface with apical hairs; lamina ovate or broadly ovate, 1.5–3.0 mm long, 1.0–1.7 mm wide, ± concolorous, strongly concave adaxially, longitudinal axis ± straight in the lower half becoming slightly incurved towards the apex; adaxial surface densely hairy, venation not evident; abaxial surface with 5–7 broad, primary veins occupying most of the surface area, the midrib scarcely more prominent than the others, deeply and narrowly grooved between the veins (grooves ± closed), very shortly hairy both on exposed vein surfaces and within the grooves; margins

usually erose, and with short, coarse hairs <0.05 mm long. *Inflorescence* axillary, erect; axis 1.4–1.8 mm long, 1- or 2-flowered, with a dense indumentum, ± compressed below the lowest fertile bract, bluntly angular above, terminating in a bud-rudiment; flowers erect, sessile. *Fertile bracts* broadly ovate, 0.9–1.2 mm long, 0.7–0.8 mm wide, with 3 sterile bracts on the axis below. *Bracteoles* broadly ovate or broadly elliptic, 1.6–2.0 mm long, 1.4–1.7 mm wide, broadly ovate to broadly elliptic, keeled distally, obtuse to subacute (not mucronate); abaxial surface shortly hairy, not or scarcely striate; margins minutely ciliolate. *Sepals* ovate, 2.5–2.8 mm long, 1.2–1.3 mm wide, obtuse to subacute; abaxial surface shortly hairy, straw-coloured, venation very obscure; adaxial surface with a discrete tuft of hairs towards the base and with scattered shorter hairs above; margins ciliolate, with hairs to 0.1 mm long. *Corolla tube* white, broadly ellipsoid or broadly obovoid, shorter than the sepals, 1.4–1.7 mm long, 1.5–1.6 mm wide, external surface glabrous, internal surface sparsely hairy towards the apex. *Corolla lobes* white, c. equal to or slightly shorter than the tube, 1.4–1.6 mm long, 0.7–0.8 mm wide at base, erect in the basal 1/3–1/2 of their length and then spreading and recurved, external surface glabrous, internal surface with a dense, white indumentum of ± terete, straight, slightly ornamented hairs. *Anthers* partially exerted from the tube (by c. 2/3 of their length), 1.0–1.2 mm long, apex emarginate. *Filaments* terete, 0.5–0.6 mm long, attached to the anther just below the apex, adnate to tube below the sinuses. *Nectary* annular, 0.3–0.4 mm long, shallowly lobed. *Ovary* ovoid to ellipsoid, 0.9–1.1 mm long, 0.7–0.9 mm wide, shortly hairy in the upper 2/3, 5-locular, straw-coloured to pale brown. *Style* 0.8–1.1 mm long, shortly hairy in the lower half, ± equal to corolla tube, not arising from a depression, tapering gradually from ovary apex; stigma not, or barely expanded. Apparently immature *fruit* narrowly ellipsoid to narrowly ovoid, to at least 2.5 mm long and 1.5 mm wide, longer than the sepals, circular in transverse section, gynophore absent; surface shortly hairy in the upper half, distinctly ribbed below; apex rounded to subacute, ± flanged below the style base. **Fig. 9.**

Diagnostic characters. Among the species currently included in Group X distinguished by the following character combination: lamina ovate to depressed-ovate, 1.5–3.0 mm long, 1.0–1.7 mm wide, adaxial leaf surface densely hairy, abaxial surface with deep ± closed grooves, shortly hairy in the grooves and on the exposed vein surfaces, apex acute with a sub-pungent mucro; inflorescence 1- or 2-flowered, axis 1.4–1.8 mm long, terminating in a bud-rudiment; abaxial surface of bracteoles shortly hairy; sepals 2.5–2.8 mm long, the abaxial surface shortly hairy, sepal margins prominently ciliolate, with hairs to 0.1 mm long; corolla tube shorter than the sepals; corolla lobes shorter than or equal to the tube; ovary 5-locular, shortly hairy; style 0.8–1.1 mm long, shortly hairy in the lower half, ± equal to corolla tube; style base not countersunk below the level of the ovary apex; fruit narrowly ellipsoid or narrowly ovoid, hairy in the upper half.

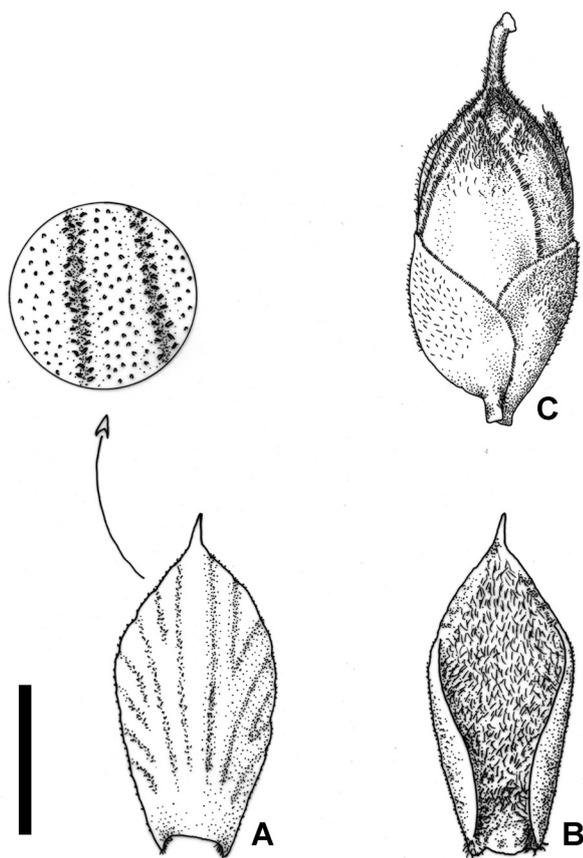


Fig. 9. *Styphelia kirkalocka*: **A** Leaf, abaxial view, with detail showing hairs; **B** leaf, adaxial view; **C** immature fruit. Scale bar = 1 mm. — R.L. Barrett & M.D. Barrett RLB 2667 SB. Drawings by S. Coffey.

Distribution & habitat. Known only from Kirkalocka Station, south-east of Mount Magnet, in the south-east of the Murchison bioregion. Grows on yellow sandplain in heath.

Phenology. The two flowering collections were made in May and June with the former having already shed numerous flowers suggesting that plants would be flowering by April, soil moisture levels allowing. The collection made in August has mostly immature fruit present.

Etymology. The epithet is from the place name, Kirkalocka. It is used as a noun in apposition.

Conservation status. Listed as Priority One under Conservation Codes for Western Australian Flora (Western Australian Herbarium 1998–) under the name *Styphelia* sp. Kirkalocka (A.S. George 17738). Currently known only from sandplain in a remote part of the Murchison where it has been recorded as locally common.

Affinities. As noted above, *S. kirkalocka* is similar to *S. coolgardiensis* and that is the species with which it is most likely to be confused. The most significant differences between the two are as follows. *Styphelia kirkalocka* has longer leaves, 1.5–3.0 mm, that are

densely hairy on their adaxial surfaces (cf. 1.0–2.0 mm with sparsely hairy or ± glabrous adaxial surfaces in *S. coolgardiensis*); larger bracteoles (1.6–2.0 mm long, 1.4–1.7 mm wide, cf. 0.7–1.2 mm long, 0.8–1.2 mm wide) and sepals (2.5–2.8 mm long, 1.2–1.3 mm wide, cf. 1.3–1.6 mm long, 0.8–1.1 mm wide); a longer style, 0.8–1.1 mm long, that is shortly hairy in the lower half (cf. 0.4–0.8 mm long and scabrous); and with a short indumentum on the sepals and ovary (cf. glabrous in *S. coolgardiensis*).

In common with *S. kirkalocka*, the variable *S. hamulosa* has usually hairy, abaxial sepal surfaces, and leaf abaxial surfaces with deep ± closed grooves and with short hairs in the grooves. *Styphelia kirkalocka* differs from all forms of that species in the following ways: the style ± equal to the corolla tube (cf. distinctly longer in *S. hamulosa*); style base not arising from a depression at ovary apex (cf. style arising from a cylindrical depression at the ovary apex that tightly envelops, but is free from, the style base); ovary and lower half of style shortly hairy (cf. ovary almost always glabrous, very rarely hairy, style glabrous). Other useful foliar differences are the densely hairy adaxial leaf surfaces of *S. kirkalocka* (cf. glabrous or sparsely hairy in the lower half in *S. hamulosa*) and the fact that the leaves are ± straight in the lower half becoming incurved towards the apex. By contrast in the forms of *S. hamulosa* that have long-mucronate leaf tips, similar to those of *S. kirkalocka*, the leaf axis is strongly recurved throughout.

Note. Remarkably, *S. kirkalocka* is one of four taxa that are currently only known from a remote sandplain on Kirkalocka Station. The others are *Banksia rosserae* Olde & Marriott, *Grevillea kirkalocka* Olde & Marriott and *Darwinia* sp. Kirkalocka (M. Crowhurst 296).

Other specimens examined [localities withheld for conservation reasons]

WESTERN AUSTRALIA. 13 Aug. 2004, R.L. Barrett & M.D. Barrett RLB 2667 SB (CNS, PERTH); 18 May 2006, B. Moyle 60 (PERTH).

***Styphelia multiflora* (R.Br.) Spreng.**

Syst. Veg. 1: 658 (1824). — *Leucopogon multiflorus* R.Br., *Prodr.* 542 (1810). — **Type citation:** “(M.) v.v.”. **Holotype:** [Western Australia], Lucky Bay, Jan. 1802, R. Brown s.n. (BM001040113). **Isotype:** BM001040114).

Leucopogon fraseri A.Cunn. ex DC., *Prodr.* 7(2): 753 (1839), *nom. illeg.* [non *Leucopogon fraseri* A.Cunn. (1839)] — *Styphelia fraseri* F.Muell., *Fragm.* 6: 56 (1867). — **Type citation:** “in orâ Novae-Hollandiae meridionali [...] (v.s. comm. à cl. Cunningham ex herb. Fraseri.)”. **Holotype:** South Coast, Australia, 1836 [southern coast of Western Australia], W. Baxter s.n. (G-DC G00455465, annotated “Sul: Baxter, ex herbario Fraseri m. Al. Cunningham”). **Isotype:** MEL88952).

? *Leucopogon multiflorus* var. *ulicinus* Benth., *Fl. Austral.* 4: 223 (1868). — **Type citation:** “Drummond”. **Type:** Not located.

Erect, spreading *shrubs*, to c. 1.5 m high and 1.5 m wide, rootstock unknown, but most likely fire-sensitive. Young *branchlets* with a dense or moderately dense indumentum of straight to slightly decurved hairs, to 0.2 mm long. *Leaves* helically and usually conspicuously densely arranged, mostly steeply antrorse; apex long-mucronate, pungent, the mucro straight to slightly inflexed, 0.5–1.0 mm long; base attenuate to ± cuneate; petiole usually well-defined, 0.7–1.3 mm long, densely hairy on the adaxial surface, glabrous or hairy on the abaxial surface, hairy on the margins; lamina narrowly elliptic, narrowly obovate or narrowly ovate, 7.0–14 mm long, 1.2–2.8 mm wide, discolorous, concave adaxially, longitudinal axis gently incurved; adaxial surface shiny, with a few basal hairs, otherwise glabrous, venation not evident; abaxial surface paler, shiny, glabrous, with 5–7 primary veins, openly and shallowly grooved between the veins; margins entire, glabrous or with short, coarse, antrorse hairs, <0.05 mm long. *Inflorescence* axillary, erect; axis 2.4–7.0 mm long, 1–7-flowered, with a dense indumentum, ± terete below the lowest fertile bract, angular above, terminating in a bud-rudiment; flowers erect, sessile. *Fertile bracts* broadly ovate to depressed-ovate, 0.8–1.3 mm long, 0.8–1.3 mm wide, with 4–5 sterile bracts on the axis below. *Bracteoles* depressed-ovate to transversely elliptic, 1.1–1.5 mm long, 1.2–1.5 mm wide, keeled, at least in the upper half, obtuse (not or scarcely mucronate); abaxial surface glabrous, not striate; margins ciliolate. *Sepals* narrowly ovate, 2.5–3.4 mm long, 1.2–1.5 mm wide, obtuse to acute; abaxial surface glabrous, straw-coloured, venation usually obscure, sometimes the midrib evident towards the apex; adaxial surface with a basal tuft of hairs and with scattered hairs above; margins prominently ciliate with hairs to 0.3 mm long. *Corolla tube* white, obovoid,

shorter than the sepals, 2.2–2.5 mm long, 1.6–2.2 mm wide, external surface glabrous, internal surface glabrous, or occasionally with a few hairs extending onto the tube immediately below the lobes. *Corolla lobes* white, longer than the tube, 2.5–3.0 mm long, 0.8–1.0 mm wide at base, erect in basal $\frac{1}{2}$ – $\frac{2}{3}$ of their length and then spreading and recurved, external surface glabrous, internal surface with a dense indumentum of ± terete, ± straight, scarcely ornamented hairs. *Anthers* fully exerted from the tube, or sometimes partially exerted by c. $\frac{7}{8}$ of their length, 1.0–1.3 mm long, apex shortly emarginate. *Filaments* terete, 0.8–1.1 mm long, attached to anther $\frac{3}{4}$ – $\frac{7}{8}$ above the anther base, adnate to the tube just below the sinuses. *Nectary* partite, the scales 0.5–0.7 mm long, 0.4–0.5 mm wide, glabrous. *Ovary* ovoid, 1.0–1.3 mm long, 0.6–0.9 mm wide, glabrous, 5-locular, pale brown or greenish-brown. *Style* 2.3–3.0 mm long, faintly scabrous, exerted from the corolla tube to a point c. level with the erect bases of the corolla lobes, well-differentiated from ovary apex, not arising from a depression; stigma distinctly expanded. *Fruit* globose, broadly ovoid or broadly ellipsoid, 5.0–6.5 mm long, 4.5–6.0 mm wide, much longer than the sepals, circular in transverse section, gynophore absent; surface glabrous, strongly rugose at maturity (mesocarp well-developed); apex broadly rounded; style usually shed by maturity. **Fig. 10.**

Distribution and habitat. Restricted to Cape Le Grand N.P. in the Esperance Plains bioregion, where it occurs in heath or occasionally low mallee woodland, either in deep white sand or shallow sand over granite.

Phenology. Mostly summer flowering, from December to April. Mature fruit have been collected in October and at the end of July.



Fig. 10. *Styphelia multiflora*, flowering plant *in situ*. — M. Hislop 1953. Photo: M. Hislop.

Conservation status. Currently listed as Priority Two under Conservation Codes for Western Australian Flora (Western Australian Herbarium 1998–).

Affinities. Morphologically, this species is close to *S. breviflora*. Two vegetative differences are important in distinguishing between the two. Relative to that of *S. breviflora* the branchlet indumentum of *S. multiflora* is obviously denser and longer (to 0.2 mm long, cf. to 0.05 mm or absent in *S. breviflora*). The leaves of *S. multiflora* are also more densely arranged and usually longer (7–14 mm long, cf. 4–10 mm).

There is a significant difference between the species in their fruiting character, with *S. multiflora* having globose, broadly ovoid or broadly ellipsoid drupes, 5.0–6.5 mm long, 4.5–6.0 mm wide, compared to those of *S. breviflora* which are depressed-globose or sometimes globose, 3.0–3.6 mm long, 3.0–4.2 mm wide. More generally there is also a marked tendency for the floral parts and inflorescence of *S. multiflora* to be larger: e.g. the inflorescence is 1–7-flowered and 2.4–7.0 mm long in *S. multiflora* (cf. 1–4-flowered and 1.8–4.5 (–5.5) mm long); sepals 2.5–3.4 mm long and 1.2–1.5 mm wide (cf. 2.2–2.8 mm by 1.0–1.3 mm); corolla tube 2.2–2.5 mm long (cf. 1.6–2.0 mm); corolla lobes 2.5–3.0 mm long (cf. 2.0–2.6 mm) and anthers 1.0–1.3 mm long (cf. 0.7–1.0 mm in *S. breviflora*).

During research associated with the current paper it became clear that populations from Cape Arid N.P., previously referred to *S. multiflora*, could not be considered conspecific with this species. These were found to differ in a number of significant ways from *S. multiflora* and that the recognition of a new species, *S. tumida* (described below), was necessary in order to accommodate them.

Note. Bentham's description (1868: 223) of *L. multiflorus* var. *ulcinus* Benth. was based on a Drummond collection of unknown provenance. In the scant prologue the following differences between the new variety and the type form are given: 'leaves narrower and very rigid; sepals almost acute, not ciliate; corolla tube shorter'. The name appears never to have had a wide currency, presumably because it was not clear how it should be applied, given that the description was vague enough to potentially fit a number of already named or potentially unnamed taxa. A recent search for type material of the variety using JSTOR Global Plants was unsuccessful. One thing that can be said about its identity though is that it is most unlikely to be conspecific with *S. multiflora* s. str. As far as is known Drummond never travelled east of what is today the Fitzgerald River N.P. (Erickson 1969: 168), and *S. multiflora* is restricted to the Cape Le Grand N.P., well to the east of there.

Other specimens examined [localities withheld for conservation reasons]

WESTERN AUSTRALIA. 7 Oct. 1992, *G.F. Craig* 2290 (PERTH); 12 Dec. 1960, *A.S. George* 2232 (PERTH; MEL,

n.v.); 21 Jan. 1966, *A.S. George* 7473 (PERTH; NSW, *n.v.*); 13 Dec. 1953, *M. Hislop* 1953 (NSW, PERTH); 21 Oct. 2011, *A. Markey & S. Dillon* NIB 9594 (PERTH); 19 July 1982, *J.M. Powell* 1869 (PERTH; AK, BISH, CANB, K, L, NSW, *n.v.*); 19 July 1982, *J.M. Powell* 1878 (PERTH; CANB, K, L, MEL, NSW, RSA, *n.v.*); 31 July 1986, *J.M. Powell* 2350 (PERTH; NSW, *n.v.*); 9 Apr. 1966, *E.M. Scrymgeour* 434 (PERTH); 10 Mar. 2015, *E. Shedley* 3/315 (PERTH); 3 Jan. 1983, *A. Strid* 21913 (PERTH); 7 Oct. 1966, *P.G. Wilson* 5572 (PERTH; CANB, *n.v.*).

***Styphelia pilosissima* Hislop, sp. nov.**

Holotypus: Western Australia, E of Brookton [precise locality withheld for conservation reasons], 21 July 2002, *M. Hislop* 2702 (PERTH06115039!). **Isotypi:** CANB, MEL.

Leucopogon sp. Brookton (*K. Kershaw & L. Kerrigan* KK 2192) Western Australian Herbarium, *Florabase*, <https://florabase.dbca.wa.gov.au/> [accessed: 21 Aug. 2025].

Erect, spreading *shrubs*, to c. 80 cm high and 80 cm wide, single-stemmed at ground level, with a fire-sensitive rootstock. Young *branchlets* with a dense indumentum of straight or curved, patent to retrorse hairs, to c. 0.4 mm long. *Leaves* helically arranged, shallowly to steeply antrorse; apex long-mucronate, pungent, the mucro slightly inflexed to slightly reflexed, 0.4–0.7 mm long; base cuneate; petiole 0.4–0.7 mm long, hairy on all surfaces or the margins glabrous; lamina ovate or narrowly ovate, 3.5–6.4 mm long, 1.8–3.3 mm wide, slightly discolorous, concave adaxially, longitudinal axis gently incurved to gently recurved; adaxial surface matt, usually sparsely hairy, sometimes the hairs ± confined to the base, venation not evident; abaxial surface paler, matt, with 7–9 primary veins, the midrib no more prominent than the others, deeply and openly grooved between the veins, usually hairy throughout, with a moderately dense to dense indumentum of spreading hairs, to 0.5 mm long, occasionally becoming ± glabrescent; margins entire, variably ciliate with hairs to 0.5 mm long. *Inflorescence* axillary, erect; axis 1.0–1.4 mm long, 1- or 2-flowered, with a moderately dense indumentum, ± terete below the lowest fertile bract, compressed and narrowly winged above, terminating in a bud-rudiment; flowers erect, sessile. *Fertile bract* broadly ovate, 0.8–1.2 mm long, 0.8–1.0 mm wide, with 4 sterile bracts on the axis below. *Bracteoles* depressed-ovate, 1.2–1.5 mm long, 1.3–1.5 mm wide, not or obscurely keeled, obtuse (not or minutely mucronulate); abaxial surface hairy, not or scarcely striate; margins minutely ciliolate towards the apex. *Sepals* narrowly ovate, 2.7–3.4 mm long, 1.1–1.4 mm wide, acute or subacute; abaxial surface with a moderately dense to dense indumentum of spreading hairs, straw-coloured, venation very obscure; adaxial surface usually with a discrete tuft of hairs towards the base; margins minutely ciliolate, with hairs <0.05 mm long or ± glabrous. *Corolla tube* white, obovoid to ellipsoid, or broadly so, shorter than the sepals, 2.0–2.8 mm long, 1.5–2.2 mm wide, external

surface glabrous, internal surface hairy in the upper portion below the lobes, glabrous in the lower half. *Corolla lobes* white, longer than the tube, 2.8–3.5 mm long, 0.8–1.2 mm wide at base, erect in basal $\frac{1}{2}$ – $\frac{2}{3}$ of their length and then spreading and recurved, external surface glabrous, internal surface with a dense, white indumentum of terete, straight, scarcely ornamented hairs. *Anthers* fully exerted from the tube, 1.0–1.3 mm long, apex shallowly emarginate. *Filaments* terete, 1.1–1.4 mm long, attached to the anther c. $\frac{3}{4}$ above the base, or a little above, adnate to the tube just below the sinuses. *Nectary* partite, the scales 0.4–0.5 mm long, 0.2–0.4 mm wide, glabrous. *Ovary* ovoid, 0.8–1.0 mm long, 0.5–0.7 mm wide, glabrous, 5-locular, pale green, longitudinally grooved. *Style* 2.9–4.1 mm long, scabrous towards the apex, and sometimes also towards the base, exerted from the corolla tube to a point about level with the erect bases of the corolla lobes, arising from a depression at the ovary apex that tightly envelops, but is free from, the style base (i.e. the base is countersunk below the level of the ovary apex); stigma distinctly expanded. *Fruit*¹ narrowly ellipsoid, 2.6–2.8 mm long, 1.4–1.5 mm wide, slightly shorter than the sepals, circular in transverse section, gynophore absent; surface glabrous, irregularly grooved longitudinally (mesocarp weakly developed) with 5 raised lines extending from the style base; apex subacute below a narrowly truncate rim; style shed before maturity. **Figs 11, 12.**

Diagnostic characters. Within Group X, *Styphelia pilosissima* is distinguished by the following character combination: young branchlets with a dense indumentum of long hairs to c. 0.4 mm long; lamina ovate to narrowly ovate, 3.5–6.4 mm long, 1.8–3.3 mm wide, concave adaxially, abaxial surface with a conspicuous indumentum of spreading hairs to c. 0.5 mm long, deeply and openly grooved, apex long-mucronate, pungent; inflorescence 1- or 2-flowered, axis 1.0–1.4 mm long, terminating in a bud-rudiment; bracteoles and sepals hairy with spreading hairs; sepal margins \pm glabrous or minutely ciliolate, with hairs < 0.05 mm long; corolla tube shorter than the sepals; corolla lobes longer than the tube; nectary partite; ovary 5-locular, glabrous; style 2.9–4.1 mm long, scabrous, exerted beyond the corolla tube; style base countersunk below the level of the of the ovary apex; fruit narrowly ellipsoid irregularly grooved longitudinally.

Distribution & habitat. Known from a small area east of Brookton in the central southern part of the Avon Wheatbelt bioregion. Grows in yellow, sandy loam over laterite in heathland. Associated species include *Hakea scoparia*, *Gastrolobium stowardii*, *Daviesia cardiophylla*, *Cryptandra myriantha* and *Grevillea dryandroides*.

Phenology. Collections in full flower have been made in July and August. The specimen *K. Kershaw & L. Kerrigan* KK 2192, collected at the end of September, is mostly in early fruit although with some apparently mature fruit also present.

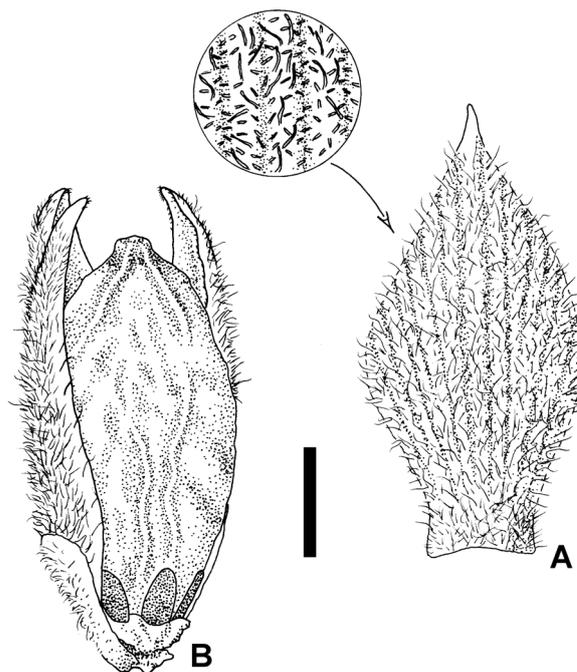


Fig. 11. *Styphelia pilosissima*: **A** Leaf, abaxial view with detail; **B** fruit. Scale bar = 1 mm. — A *M. Hislop* 2701, B *K. Kershaw & L. Kerrigan* KK 2192. Drawings by S. Coffey.

Etymology. From the Latin *pilosissimus* (very hairy), a reference to the indumentum of branchlets, leaves and sepals.

Conservation status. Known only from a single roadside population in a heavily cleared part of the wheatbelt where it co-occurs with a threatened species of *Grevillea*. Listed as Priority One under Conservation Codes for Western Australian Flora (Western Australian Herbarium 1998–) as *Leucopogon* sp. Brookton (*K. Kershaw & L. Kerrigan* KK 2192). As it was listed almost 20 years ago and with no new populations found in the intervening years it may be time for its status to be reviewed.

Affinities. *Styphelia pilosissima* is a member of Group X and was included (as *Leucopogon* sp. Brookton) in the phylogenetic study of Puente-Lelièvre *et al.* (2016). It belonged to a very strongly supported subclade, referred to as the *S. marginata* subgroup in a recent paper (Hislop 2023b). Among its congeners the species with which it is most likely to be confused is *S. hamulosa*. It can be distinguished from all variants of that widespread species by the following combination of foliar characters: leaf abaxial surfaces openly grooved with a dense or moderately dense indumentum of spreading hairs (to about 0.5 mm) both on and within the grooves, giving a grey hairy aspect; leaf lamina gently incurved to gently recurved; apex long-mucronate with a mucro 0.3–0.7 mm long.

¹ The fruit description was based on a single specimen and therefore cannot be regarded as definitive.



Fig. 12. *Styphelia pilosissima*, flowering plant *in situ*. — *M. Hislop 2701*. Photo: M. Hislop.

Styphelia hamulosa across all variants is characterised by its very narrow, \pm closed grooves with minute hairs usually restricted to the grooves and mostly only visible under magnification. A recent collection from south of Hyden (*R. Davis & M. Hislop RD 12959a*) is similar to *S. pilosissima* in having densely hairy leaves with open abaxial grooves. This collecting locality is about 160 kms to the east of the population of *S. pilosissima* and the plants differ in having much smaller leaves (to about 2.2 mm long) with an obtuse apex. Flowers of this entity have not yet been seen but it also seems likely to represent a distinct taxon.

Of those variants of *S. hamulosa* with long-mucronate and pungent leaf apices, *S. pilosissima* is further distinguished by other foliar differences. In *S. hamulosa* the longitudinal axes of the leaf laminae are strongly recurved and the leaf bases are frequently rounded or cordate and \pm stem-clasping. By contrast in *S. pilosissima* the lamina is gently incurved to gently recurved and the base is always cuneate and never stem-clasping. There is even a usable distinction between the two in terms of simple leaf length. While only the type variant of *S. hamulosa* can have leaves longer than 4 mm (and then only occasionally), specimens of *S. pilosissima* always have leaves in excess of that figure.

In terms of floral distinctions there are two readily usable size differences. The style length of *S. pilosissima* is 2.9–4.1 mm long, while the type variant of *S. hamulosa* (which has the largest flowers in the species) has a maximum style length of 2.2 mm. Similarly, the sepals of *S. pilosissima* are longer, 2.7–3.4 mm long, compared to a maximum of 2.5 mm. The type variant of *S. hamulosa* occurs in the Geraldton Sandplains and adjoining northern parts of the Avon Wheatbelt, well to the north-west of the Brookton area.

Other specimens examined [localities withheld for conservation reasons]

WESTERN AUSTRALIA. 4 June 1998, *R. Campbell 596* (PERTH); 29 Aug. 2008, *J.M. Collins 501* (PERTH); 21 July 2002, *M. Hislop 2701* (NSW, PERTH); 29 July 2015, *B. Hort NM 140* (PERTH); 28 Sep. 2000, *K. Kershaw & L. Kerrigan KK 2192* (CNS, PERTH).

Styphelia recondita* Hislop, *sp. nov.

Holotypus: Western Australia, Jaurdi Station, NE of Southern Cross [precise locality withheld for conservation reasons], 16 Nov. 2011, *M. Hislop 4172* (PERTH08327564!). **Isotypi:** CANB, CNS, MEL.

Leucopogon sp. Jaurdi (*M. Hislop 4172*) Western Australian Herbarium, in *Florabase*, <https://florabase.dbca.wa.gov.au/> [accessed: 21 Aug. 2025].

Erect, compact *shrubs*, to c. 70 cm high and 70 cm wide, single-stemmed at ground level, with a fire-sensitive rootstock. Young *branchlets* with a very sparse indumentum of very short hairs, <0.05 mm long, or entirely glabrous. *Leaves* helically arranged, antrorse, usually steeply so; apex long-mucronate, pungent, the mucro \pm straight to slightly inflexed, 0.3–0.8 mm long; base cuneate or occasionally rounded; petiole 0.2–0.6 mm long, glabrous; lamina broadly to narrowly ovate, or broadly to narrowly elliptic, 3.0–6.2 mm long, 1.2–2.7 mm wide, \pm concolorous or the abaxial surface slightly paler, strongly concave adaxially, longitudinal axis usually gently incurved, sometimes \pm straight; adaxial surface \pm matt, glabrous or occasionally with a very few scattered hairs, venation not evident; abaxial surface \pm matt, glabrous or occasionally very shortly and sparsely hairy, with 5–7 primary veins, the midrib no broader than the others, shallowly and openly grooved between the veins; margins entire or irregularly denticulate, usually with very short, coarse,

antrorse hairs, <0.05 mm long, or sometimes glabrous. *Inflorescence* axillary, very reduced, sessile (no discernible axis present), erect, ± enclosed by the subtending leaf, 1-flowered, terminating at the flower, bud-rudiment absent. *Bracts* 2 or 3, the basal two opposite, if a third is present then very similar to the bracteoles. *Bracteoles* if present not opposite, ovate to elliptic, 1.0–1.1 mm long, 0.6–0.8 mm wide, not keeled, obtuse to subacute; abaxial surface glabrous, not or barely striate; margins minutely ciliolate. *Sepals* ovate to narrowly ovate, 1.2–1.5 mm long, 0.7–0.9 mm wide, acute; abaxial surface glabrous, pale green, venation quite distinct at flowering, the midvein and 1 or 2 veins on either side; adaxial surface sparsely hairy throughout; margins minutely ciliolate with hairs <0.05 mm long. *Corolla tube* white, ellipsoid to broadly ellipsoid, as long as or a little longer than the sepals, 1.4–2.0 mm long, 1.4–1.8 mm wide, external and internal surfaces glabrous. *Corolla lobes* white, as long as, or slightly longer than the tube, 1.5–2.0 mm long, 0.7–0.9 mm wide at base, erect in c. basal ½ of their length and then spreading and recurved, external surface glabrous, internal surface with a dense indumentum of retrorse, terete, ± straight and lightly ornamented hairs. *Anthers* partially exerted from the tube (by c. ⅔ of their length), 0.5–1.0 mm long, apex emarginate. *Filaments* terete, 0.2–0.4 mm long, glabrous, attached to the anther ¾–⅞ above the base, adnate to tube just below the sinuses. *Nectary* annular with weakly cohering scales or partite, 0.2–0.4 mm long, glabrous, if annular then strongly lobed with deep grooves between the lobes. *Ovary* ellipsoid, 0.6–0.8 mm long, 0.5–0.6 mm wide, glabrous, 5-locular, pale green to yellow-green. *Style* 0.4–0.6 mm long, minutely scabrous, included within the corolla tube, tapering smoothly from ovary apex and not arising from a depression; stigma not or barely expanded. *Fruit* ellipsoid to obovoid, 2.7–3.2 mm long, 2.0–2.3 mm wide, much longer than the sepals, circular in transverse section, gynophore absent; surface glabrous, ± rugose (mesocarp rather weakly developed at maturity); apex subacute, tapering to the base of the usually persistent style. **Fig. 13A.**

Diagnostic characters. From all species currently included in Group X, *S. recondita* can be distinguished by the following character combination: lamina broadly to narrowly ovate, or broadly to narrowly elliptic, 3.0–6.2 mm long, 1.2–2.7 mm wide, abaxial leaf surface openly grooved between the veins, glabrous or with a few short hairs in the grooves, apex mucronate, pungent; inflorescences strictly 1-flowered, without a discernible axis, terminating at a flower, no bud-rudiment present; abaxial surfaces of bracteoles and sepals glabrous, sepal margins minutely ciliolate with hairs <0.05 mm long; corolla tube about as long as, or slightly longer than the sepals; corolla lobes as long as, or slightly longer than the tube; ovary 5-locular, glabrous; style 0.4–0.6 mm long, minutely scabrous, included in the corolla tube; style base not countersunk below the level of the ovary apex; fruit ellipsoid to obovoid, ± rugose.

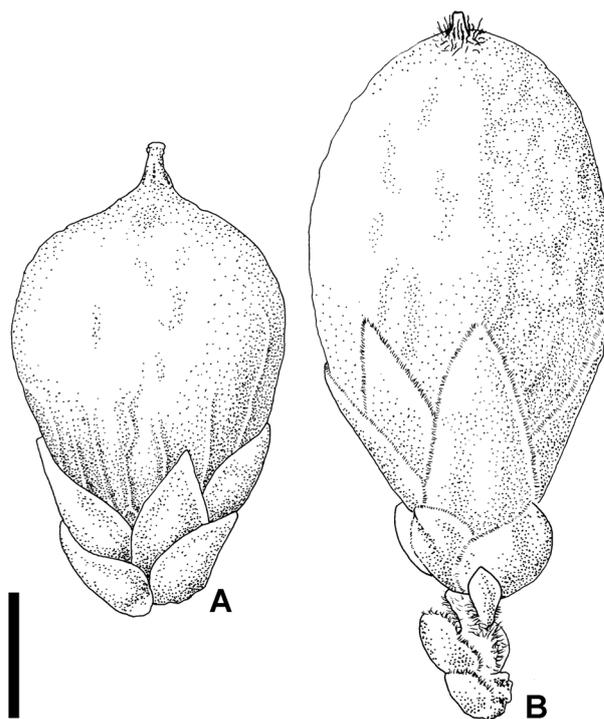


Fig. 13. Fruiting inflorescence: **A** *Styphelia recondita*; **B** *Styphelia sparsicoma*. Scale bar = 1 mm. — A M. Hislop 4173, B M. Hislop 4159. Drawings by S. Coffey.

Distribution & habitat. Known only from remote country east of Koolyanobbing in the north of the Coolgardie bioregion where it grows on yellow sandplain in open mallee woodland. Associated species include *Eucalyptus leptopoda*, *E. concinna*, *Callitris preissii*, *Thryptomene kochii*, *Leptospermum fastigiatum*, *Beyeria sulcata* and *Triodia scariosa*.

Phenology. The flowering period is uncertain because the species is so poorly known, but in common with many species in Group X it seems likely that the onset of flowering is in late spring and may continue sporadically for many months if temperature and soil moisture conditions are favourable. The November collections have open flowers, numerous flower buds as well as some mature fruit. The September collections have a few flowers only present.

Etymology. From the Latin *reconditus* (hidden, concealed), a reference to the fact that the inflorescence is ± enclosed by the leaf lamina at anthesis.

Conservation status. This species is only known from a handful of collections. The fact that it is associated with a very common landform in a remote part of the state may indicate that it is relatively secure, but surveys are needed to better understand the extent of its distribution. To be listed as Priority One under Conservation Codes for Western Australian Flora (Tanya Llorens, pers. comm.).

Affinities. *Styphelia recondita* was not included in the phylogeny of Puente-Lelièvre *et al.* (2016), its position

in Group X is based on extrapolation of critical morphological features from other confirmed members of that group. In particular, it is clearly closely related to the entity *Leucopogon* sp. 'Koolyanobbing', that was included in the study and the status of which is discussed below under the Notes heading.

Those species most likely to be confused with *S. recondita* are *S. coolgardiensis*, *S. sparsicoma* and the inland variant of *S. hamulosa*.

Styphelia recondita has an unusual inflorescence structure that serves to distinguish it from all potentially confusing species. By far the most common configuration in *Styphelia* is for there to be a clearly defined inflorescence axis in which the flower/s (i.e. sepals plus corolla) are subtended by two opposite bracteoles and positioned in the axils of fertile bracts on the axis. And for that axis to extend above the last fertile bract (or only fertile bract in the case of single-flowered inflorescences) and terminate in a bud-rudiment (Fig. 13B). In *S. recondita* however, the inflorescence is without a discernible axis and terminates at a flower, there being no bud-rudiment. In addition, the bracteoles are frequently absent and when present are not regularly opposite. Instead, the flowers (or bracteoles if present) are subtended by two opposite basal bracts. On first examination therefore, when the bracteoles are absent, these bracts have the appearance of bracteoles (Fig. 13B).

In addition to the inflorescence differences, *S. recondita* can be distinguished from *S. sparsicoma* by its shorter style (0.4–0.6 mm long and included in the corolla tube, cf. (1.2–) 1.6–2.2 mm and exerted in *S. sparsicoma*) and in never having a hair tuft on ovary and fruit. From the inland variant of *S. hamulosa*, *S. recondita* can be distinguished by its glabrous rather than shortly hairy sepals, shorter style (0.4–0.6 mm long included in the corolla tube cf. at least 1.0 mm and exerted in *S. hamulosa*) and in having a different abaxial leaf morphology. While in *S. recondita* the abaxial leaf grooves are open, glabrous or sparsely hairy and appear paler than the intervening veins, in *S. hamulosa* the grooves are deeper and closed with short hairs always visible in the grooves, which appear darker than the veins.

Aside from the inflorescence structure other differences between *S. recondita* and *S. coolgardiensis* are given under that species.

Notes. The informal phrase name *Leucopogon* sp. 'Koolyanobbing' was used in the phylogeny of Puente-Lelièvre *et al.* (2016) to refer to an entity known from a single collection (*M. Hislop & F. Hort* MH 3185) that cannot be assigned to any published species or currently recognised phrase name. It occurs in the same general area as *S. recondita*, although from an area to the west of the known distribution of that species. And rather than yellow sandplain, it was collected on the margins of a salt lake growing among other species that favour

a subsaline habitat, including *S. subulata* (F.Muell.) Hislop, Crayn & Puente-Lel.

Leucopogon sp. 'Koolyanobbing' is very similar to *S. recondita* in its floral and inflorescence morphology but there are potentially significant differences in leaf and possibly fruiting characters. Whereas the longitudinal leaf axis of *S. recondita* is gently incurved or sometimes \pm straight, in sp. 'Koolyanobbing' it is strongly recurved. In place of the shallow, glabrous or very sparsely hairy abaxial leaf grooves of *S. recondita*, those of sp. 'Koolyanobbing' are deeper, narrower and denser and shortly hairy, as described above for *S. coolgardiensis*. While the overall shape of the fruit of sp. 'Koolyanobbing' is very similar to that of *S. recondita*, in the former there is a discrete, apical zone of cream-coloured tissue between the style base and the remainder of the green-coloured fruit. Such a zone is apparently lacking in the fruit of *S. recondita* although the paucity of fruiting material of either *S. recondita* or sp. 'Koolyanobbing' make this a rather tentative distinction at this stage.

It seems likely that sp. 'Koolyanobbing' represents a discrete taxon but with so little material to refer to it is desirable to delay a formal description until further collections are available.

Other specimens examined [localities withheld for conservation reasons]

WESTERN AUSTRALIA. 3 Aug. 2010, *D. Angus* DA 14 (PERTH); 16 Nov. 2011, *M. Hislop* 4173 (CANB, NSW, PERTH); 23 Sep. 2010, *S. Reiffer* SRE 360 (CNS, PERTH); 23 Sep. 2010, *S. Reiffer* SRE 361 (PERTH).

Styphelia sparsicoma* Hislop, *sp. nov.

Holotypus: Western Australia, W of Yellowdine [precise locality withheld for conservation reasons], 13 November 2011, *M. Hislop* 4159 (PERTH08327548!).

Isotypi: CANB, CNS, K, MEL.

Leucopogon sp. Yellowdine (*M. Hislop & F. Hort* MH 3194) Western Australian Herbarium, *Florabase*, <https://florabase.dbca.wa.gov.au/> [accessed: 21 Aug. 2025].

Erect, compact *shrubs*, to c. 100 cm high and 100 cm wide, single-stemmed at ground level, with a fire-sensitive rootstock. *Young branchlets* with a sparse indumentum of very short hairs, <0.05 mm long. *Leaves* helically arranged, moderately to steeply antrorse; apex mucronate, usually pungent, the mucro \pm straight, 0.2–0.6 mm long (but refer notes below for an exception); base cuneate to rounded; petiole conspicuous, 0.5–1.0 mm long, hairy on the adaxial surface, glabrous on abaxial surface, margins glabrous or sparsely hairy; lamina broadly to narrowly ovate, or broadly to narrowly elliptic, 2.5–4.5 mm long, 1.4–3.4 mm wide, discolorous, strongly concave adaxially, longitudinal axis gently incurved to distinctly recurved; adaxial surface slightly shiny with a few hairs towards

the base, otherwise glabrous, venation not evident; abaxial surface paler, matt, with 5–7 (–9) primary veins, the midrib no broader than the others, \pm openly grooved between the veins with a few, very short hairs in the grooves or glabrous; margins usually entire, occasionally erosulate, with coarse, antrorse hairs, to c. 0.05 mm long. *Inflorescence* axillary, erect; axis 1.4–2.8 mm long, (1) 2- or 3-flowered, hairy, somewhat compressed below the lowest fertile bract, angular above, terminating in a bud-rudiment; flowers erect, sessile. *Fertile bracts* ovate to depressed-ovate, 0.3–0.7 mm long, 0.4–0.8 mm wide, and with 3 or 4 sterile bracts on the axis below. *Bracteoles* broadly ovate to depressed-ovate, 0.6–1.2 mm long, 0.8–1.2 mm wide, obscurely keeled, at least in the upper half, obtuse to subacute; abaxial surface glabrous, not or barely striate; margins minutely ciliolate. *Sepals* ovate or narrowly ovate, 1.8–2.2 mm long, 0.8–1.1 mm wide, acute to subacute; abaxial surface glabrous, initially pale green or straw-coloured at flowering, but sometimes brown and necrotic particularly as fruit matures, venation obscure, only the midvein evident; adaxial surface with a zone of hairs towards the apex and sometimes also a few in a basal patch, otherwise glabrous; margins ciliolate with hairs to c. 0.1 mm long. *Corolla tube* white, obovoid or ellipsoid, slightly shorter than, to slightly longer than the sepals, 1.5–2.0 mm long, 1.4–1.5 mm wide, external and internal surfaces glabrous. *Corolla lobes* white, slightly longer than, to slightly shorter than, the tube, (1.3–) 1.6–2.0 mm long, 0.5–0.8 mm wide at base, erect in basal $\frac{1}{2}$ – $\frac{2}{3}$ of their length and then spreading and recurved, external surface glabrous, internal surface of \pm terete, \pm straight, ornamented hairs. *Anthers* partially exerted from the tube (by c. $\frac{7}{8}$ of their length), 0.6–1.0 mm long, apex shallowly emarginate. *Filaments* terete, 0.4–0.6 mm long, glabrous, attached to the anther just below the apex, adnate to tube just below the sinuses. *Nectary* annular with weakly cohering scales or partite, 0.5–0.7 mm long, glabrous, if annular then with deep grooves between the lobes. *Ovary* ellipsoid, narrowly ellipsoid, obovoid or narrowly obovoid, 0.6–0.8 mm long, 0.4–0.5 mm wide, glabrous or with a sparse apical tuft of hairs, (4) 5-locular, straw-coloured to pale brown. *Style* (1.2–) 1.6–2.2 mm long, sparsely hairy or glabrous in the lower half, scabrous in the upper, shortly exerted beyond the corolla tube, base well-differentiated from ovary apex and not arising from a depression; stigma slightly expanded. *Fruit* ellipsoid or narrowly ellipsoid, 3.0–4.2 mm long, 2.0–2.6 mm wide, much longer than the sepals, circular in transverse section, gynophore absent; surface glabrous or with a sparse apical tuft of hairs, \pm rugose (mesocarp well-developed at maturity); apex subacute to obtuse; style shed at maturity. **Fig. 13B.**

Diagnostic characters. Within species currently assigned to Group X, the new taxon is distinguished by the following character combination: lamina broadly to narrowly ovate, or broadly to narrowly elliptic, 2.8–4.5 mm long, 1.4–3.4 mm wide, abaxial leaf surface \pm openly grooved between the veins, with a few short hairs in the grooves or glabrous, apex mucronate, pungent;

inflorescences (1) 2- or 3-flowered, axis 1.4–2.8 mm long; abaxial surfaces of bracteoles and sepals glabrous, sepal margins ciliolate with hairs to c. 0.1 mm long; corolla tube a little shorter than, to a little longer than the sepals; corolla lobes slightly longer than, to slightly shorter than, the tube; ovary (4) 5-locular, glabrous or with a sparse apical tuft of hairs; style (1.2–) 1.6–2.2 mm long, sparsely hairy or glabrous in the lower half, scabrous in the upper, shortly exerted beyond the corolla tube; style base not countersunk below the level of the ovary apex; fruit ellipsoid or narrowly ellipsoid, \pm rugose.

Distribution & habitat. Extends sporadically from about 60 km north-east of Hyden northwards to the Trans-Australian railway line east of Koolyanobbing, and then south to country well east of Forrestania; in the west of the Coolgardie and far east of the Avon Wheatbelt bioregions. All collections are from yellow sandplain in shrubland or heath. Associated species include *Allocasuarina spinosissima*, *Banksia elderiana*, *Melaleuca cordata*, *Leptospermopsis fastigiata* and *Triodia rigidissima*.

Phenology. Appears to flower intermittently over many months but peak flowering probably occurs between November and April, soil moisture levels allowing; collections made in May and June are mostly in early fruit with few flowers present. Specimens with mature fruit present have been collected in September and November.

Etymology. From the Latin *sparsus* (scattered, sparse) and *-coma* (tuft of hairs), a reference to the sparse tuft of hairs that is frequently present at the ovary/fruit apex.

Conservation status. Listed as Priority Two under Conservation Codes for Western Australian Flora (Western Australian Herbarium 1998–) under the name *Leucopogon* sp. Yellowdine (*M. Hislop & F. Hort MH 3194*). Although *S. sparsicoma* has a fairly wide distribution it appears to be very sporadic and is not known to be locally common anywhere. Nevertheless, given that it occurs in a remote part of the state and its preferred habitat is a common one, there must be a good chance that future survey will bring to light other, larger populations. It has now been confirmed to occur in a national park.

Affinities. *Styphelia sparsicoma* is placed in Group X on the basis of shared critical morphological attributes. Three other small-leaved members of this group (*S. hamulosa*, *S. recondita* and *S. coolgardiensis*) occur in the yellow sandplains of the Coolgardie bioregion and it is with these that *S. sparsicoma* is most likely to be confused.

The inland variant of *S. hamulosa* is sympatric with *S. sparsicoma* across the range of the new species and the two are known to grow in close proximity to one another, for example *M. Hislop & F. Hort MH 3194* (*S. sparsicoma*) and *M. Hislop & F. Hort MH 3192*

(*S. hamulosa*), and *R. Meissner & C. Wilkins 5816* (*S. sparsicoma*) and *R. Meissner & C. Wilkins 5797* (*S. hamulosa*). *Styphelia sparsicoma* differs from all variants of *S. hamulosa* in having leaf abaxial surfaces that are openly grooved and either glabrous or with sparse hairs (cf. abaxial leaf surfaces with deep, \pm closed grooves and always shortly hairy in the grooves) and in having sepals slightly shorter than, to about equal to, the corolla tube (cf. sepals longer than the tube in *S. hamulosa*). In addition, *S. sparsicoma* is further distinguished from the inland variant of *S. hamulosa* by its usually pungent leaf apices, glabrous, rather than shortly hairy sepals, in frequently having hairs on the ovary and style and in usually having multi- rather than single-flowered inflorescences.

The morphological features that distinguish *S. sparsicoma* from *S. coolgardiensis* and from *S. recondita* are discussed above in the treatments of those two species.

Note. As described above in the case of *S. breviflora*, a single specimen of *S. sparsicoma* from north of Forrestania (*M. Hislop 4996*) is atypical for the species in having leaves that terminate in a blunt callus tip rather than the usual pungent mucro. However, there are no other morphological reasons to doubt that it belongs to this species.

Other specimens examined [localities withheld for conservation reasons]

WESTERN AUSTRALIA. 20 Sep. 2011, *D. Angus DA 151* (PERTH); 6 Jan. 2014, *N. Casson WAA 002607* (PERTH); 19 May 2004, *M. Hislop & F. Hort MH 3194* (PERTH); 12 Dec. 2022, *M. Hislop 4996* (CANB, PERTH); 13 June 1967, *A. Kessell 611* (PERTH); 21 Sep. 2013, *R. Meissner & C. Wilkins 5816* (PERTH); 22 Sep. 2013, *R. Meissner & C. Wilkins 5887* (PERTH); 17 Sep. 2013, *R. Meissner & C. Wilkins 5949* (PERTH); 7 Aug. 1986, *J.M. Powell 2251* (NSW, PERTH); 18 Jan. 2010, *T. S. Read s.n.* (PERTH).

Styphelia sporadica Hislop, *sp. nov.*

Holotypus: Western Australia, edges of old gravel extraction site, Southern Cross–Forrestania Rd, 4.5 km S of Emu Fence Rd, S of Marvel Loch, 15 Nov. 2011, *M. Hislop & J. Williams MH 4163* (PERTH08412901!). **Isotypi:** CANB, CNS, MEL.

Leucopogon sp. outer wheatbelt (*M. Hislop 30*) Western Australian Herbarium, in *Florabase*, <https://florabase.dbca.wa.gov.au/> [accessed: 21 Aug. 2025].

Erect, open *shrubs*, to c. 1.5 m high and 1.5 m wide, single-stemmed at ground level, with a fire-sensitive rootstock. Young *branchlets* usually with a sparse, or occasionally moderately dense indumentum of very short hairs, <0.05 mm long. *Leaves* helically arranged, antrorse, usually steeply so; apex either long-mucronate, pungent, the mucro \pm straight to slightly inflexed, 0.3–0.8 mm long, or a blunt callus tip; base usually cuneate or occasionally attenuate; petiole well-defined, 0.7–1.4 mm long, glabrous throughout or with a few

hairs on the adaxial surface; lamina elliptic to narrowly elliptic, ovate to narrowly ovate, or occasionally obovate to narrowly obovate, 3.0–8.5 mm long, 1.3–3.4 mm wide, discolorous, often distinctly inflexed immediately above the petiole, strongly concave adaxially, longitudinal axis usually gently incurved, sometimes \pm straight; adaxial surface shiny, \pm glabrous, or with a few hairs towards the base, venation not, or barely evident; abaxial surface paler, usually slightly shiny, glabrous throughout, with 7–9 primary veins, shallowly and openly grooved between the veins; margins entire, minutely hairy with coarse, antrorse hairs <0.05 mm long or \pm glabrous. *Inflorescence* axillary, erect; axis 1.1–2.8 mm long, 1–3-flowered, with a moderately dense to dense indumentum, \pm terete below the lowest fertile bract, angular to winged above, terminating in a bud-rudiment; flowers erect, sessile. *Fertile bracts* ovate to depressed-ovate, 0.6–1.6 mm long, 0.6–1.2 mm wide, with 3 or 4 sterile bracts on the axis below. *Bracteoles* broadly ovate to depressed-ovate, 0.8–1.5 mm long, 1.1–1.5 mm wide, not or obscurely keeled, obtuse (not or scarcely mucronulate); abaxial surface glabrous, not or indistinctly striate; margins minutely ciliolate. *Sepals* narrowly ovate, 2.1–3.0 mm long, 1.0–1.3 mm wide, acute or subacute; abaxial surface glabrous, pale green to straw-coloured, but often becoming brown and necrotic, venation very obscure; adaxial surface hairy with hairs concentrated towards the base and apex; margins ciliolate with hairs to 0.1 mm long. *Corolla tube* white, ellipsoid, narrowly ellipsoid or occasionally ovoid, shorter than the sepals, 1.5–2.0 mm long, 1.0–1.6 mm wide, external surface glabrous, internal surface glabrous or with a few hairs immediately below the lobes. *Corolla lobes* white, shorter than, to a little longer than the tube, 1.1–2.0 mm long, 0.5–0.8 mm wide at base, erect in basal $\frac{1}{3}$ – $\frac{2}{3}$ of their length and then spreading and \pm recurved, external surface glabrous, internal surface with a moderately dense, white indumentum of rather short, \pm terete, \pm straight, ornamented hairs. *Anthers* partially exerted from the tube (by $\frac{1}{3}$ – $\frac{2}{3}$ of their length), 0.5–0.9 mm long, apex shortly emarginate. *Filaments* terete, 0.2–0.3 mm long, attached to the anther c. $\frac{3}{4}$ above the anther base, adnate to tube just below the sinuses. *Nectary* usually clearly partite, or occasionally annular with scales weakly cohering towards the base, the scales 0.4–0.6 mm long, 0.3–0.5 mm wide, glabrous. *Ovary* ovoid, 0.6–1.1 mm long, 0.5–0.8 mm wide, glabrous or with a few apical hairs, 3-locular, pale green, straw-coloured or pale brown. *Style* 0.6–1.1 mm long, usually scabrous, at least in the upper half, sometimes with a few hairs at the base, c. equal to or barely exerted from the corolla tube, well-differentiated from the ovary apex and not arising from a depression; stigma not or barely expanded. *Fruit* narrowly ellipsoid, narrowly ovoid or occasionally narrowly obovoid, 4.2–8.0 mm long, 2.3–3.5 mm wide, much longer than the sepals, circular in transverse section, gynophore absent; surface glabrous, rugose (mesocarp well developed); apex obtuse or occasionally subacute; style usually persistent at maturity.

Diagnostic characters. Within species currently assigned to Group X distinguished by the following character combination: lamina elliptic to narrowly elliptic, ovate to narrowly ovate, or occasionally obovate to narrowly obovate, 3.0–8.5 mm long, 1.3–3.4 mm wide, abaxial surface glabrous, shallowly and openly grooved, apex ± straight to slightly inflexed, long-mucronate or a blunt callus tip; inflorescence 1- or 2 (3)-flowered, axis 1.1–2.8 mm long, terminating in a bud-rudiment; abaxial surface of bracteoles and sepals glabrous; sepal margins ciliolate with hairs to 0.1 mm long; corolla tube shorter than the sepals; corolla lobes shorter than, to a little longer than, the tube; nectary usually partite, or occasionally of weakly cohering scales; ovary 3-locular, glabrous or with a few apical hairs; style 0.6–1.1 mm long, usually scabrous, included or barely exerted from corolla tube; style base not countersunk below the level of ovary apex; fruit narrowly ellipsoid, narrowly ovoid or occasionally narrowly obovoid, rugose.

Etymology. From the Latin *sporadicus* (sporadic), a reference both to the scattered geographical distribution of the new species and the fact that it is generally infrequent at those sites where it does occur.

Affinities. *Styphelia sporadica* was not included in the phylogeny of Puente-Lelièvre *et al.* (2016) but was assigned to Group X (Hislop 2021) on the basis of its morphological attributes. However, for the reasons given in the introduction, the fact that this species

has a well-developed mesocarp may cast doubt on this placement.

Two allopatric subspecies are recognised mostly based on differences in foliar morphology.

Key to subspecies of *S. sporadica*

1. Leaf apex innocuous, mucro lacking (N of Eurardy–East Yuna). . . . *S. sporadica* subsp. *borealis*
- 1: Leaf apex long-mucronate, pungent (Latham–Ballidu–Koorda; Bruce Rock–Marvel Loch–Forrestania) *S. sporadica* subsp. *sporadica*

Styphelia sporadica subsp. *sporadica*

Leaf apex long-mucronate, pungent, the mucro 0.3–0.8 mm long; *lamina* elliptic to narrowly elliptic, ovate to narrowly ovate, or occasionally obovate to narrowly obovate, 3.0–8.5 mm long, 1.3–3.4 mm long. **Figs 14A, B, 15.**

Distribution and habitat. The typical subspecies occurs in two apparently disjunct population clusters about 200 kilometres apart, on a north-west to south-east axis. The south-east cluster is distributed from Bruce Rock in the west to Marvel Loch in the east and south to the Forrestania area; in the far east of the Avon Wheatbelt, south-western edge of the Coolgardie and

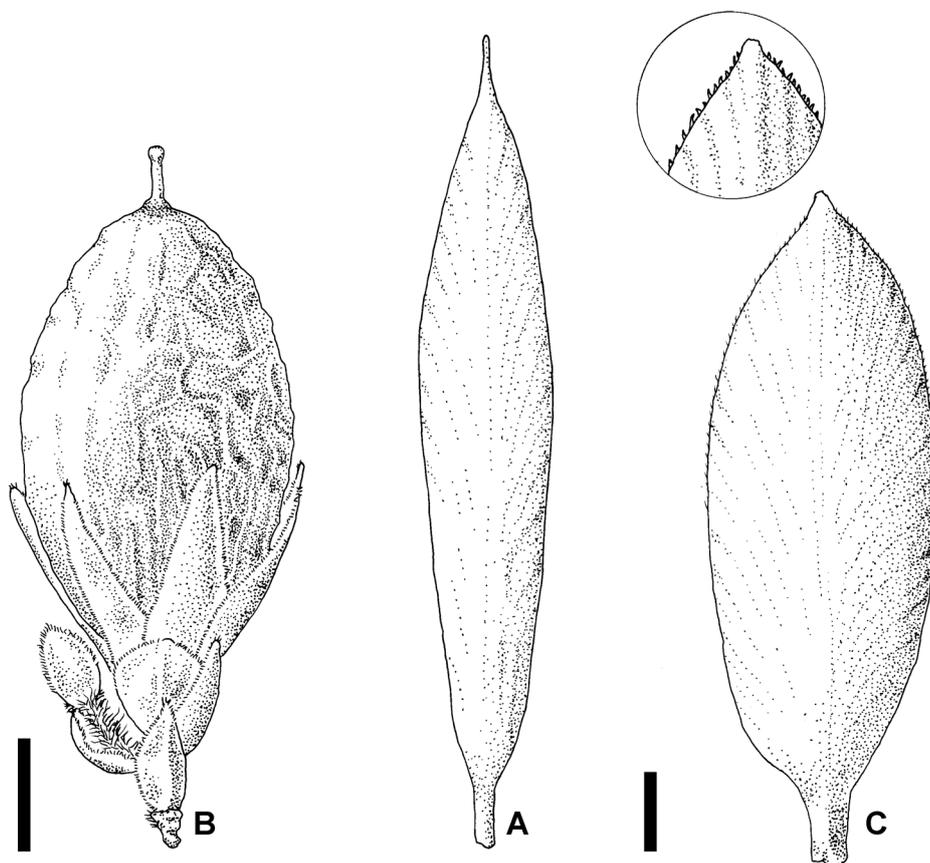


Fig. 14. *Styphelia sporadica*. **A–B** subsp. *sporadica*: **A** leaf, abaxial view; **B** fruiting inflorescence. **C** subsp. *borealis*, leaf, abaxial view. Scale bars = 1 mm. — A, B M. Hislop 3260, C M. Hislop 3553. Drawings by S. Coffey.



Fig. 15. *Styphelia sporadica* subsp. *sporadica*, flowering plant in situ. — M. Hislop 2175. Photo: M. Hislop.

far north of the Mallee bioregions. Apart from two outlying collections from north of Morawa and east of Pindar, the north-west cluster occurs from near Latham in the north, south to Ballidu and east to Koorda; in the north of the Avon Wheatbelt bioregion.

Mostly grows in deep yellow sand or less often sand over laterite, in heath or low open mallee woodland. Common associated species include *Eucalyptus burracoppinensis*, *E. rigidula*, *Melaleuca cordata*, *M. conothamnoides*, *Allocasuarina acutivalvis*, *A. campestris*, *Acacia yorkrakinensis*, *A. resinimarginea* and *Thryptomene kochii*.

Phenology. The main flowering period appears to be between October and April, although persistent dead flowers are often present at other times of the year. Mature fruit has been collected between May and September.

Conservation status. The typical subspecies is widely distributed and has been recorded from several nature reserves. However, it is not known to be common anywhere within its range and while no conservation code is required (Tanya Llorens, pers. comm.) at this stage it is a taxon that ideally should be monitored on an occasional basis.

Affinities. A useful diagnostic feature of *Styphelia sporadica* is its consistently 3-locular ovary; potentially confusing species that might be mistaken for subsp. *sporadica* all have 5-locular ovaries.

Among the latter, maybe the species with which it is most likely to be confused is *S. browniae* Hislop. The two are known to sometimes co-occur within the southern population cluster of subsp. *sporadica*, e.g. M. Hislop 3260 (*S. sporadica* subsp. *sporadica*) and M. Hislop 3261 (*S. browniae*). Aside from locule number other differences include the shorter (0.6–1.1 mm long), \pm included style of *S. sporadica* (cf. 2.6–3.4 mm long and well-exserted from the corolla tube in *S. browniae*), shorter filaments, 0.2–0.3 mm long (cf. 1.0–1.3 mm long) and shorter, glabrous sepals, 2.1–3.0 mm long (cf. 3.0–3.8 mm long and hairy in *S. browniae*).

Another potentially confusing species is *S. sparsicoma*, the distribution of which is mainly to the north of the southern population cluster of *S. sporadica* subsp. *sporadica*. Mostly it can be readily distinguished by its obviously shorter leaves (2.8–4.5 mm long, cf. 3.0–8.5 mm in subsp. *sporadica*) and also by its longer, clearly exserted style ((1.2–) 1.6–2.2 mm long, cf. 0.6–1.1 mm, and \pm included in subsp. *sporadica*) and longer filaments (0.4–0.6 mm long, cf. 0.2–0.3 mm).

Note. Despite an apparent disjunction of about 200 kilometres between the two population clusters of the typical subspecies, no corresponding morphological differences were identified during this study. Even the occasional presence of sparse hairs at the ovary apex and lower style, rather similar to those seen in *S. sparsicoma*, occurs in both population clusters.

Other specimens examined

WESTERN AUSTRALIA. Near Narembeen, S of Merredin, Sep. 1928, W.E. Blackall s.n. (PERTH); 224 km from Mount Magnet on Geraldton Rd [c. 11 km E of Pindar], 19 June 1963, Y. Chadwick 1654 (PERTH); 2 km ENE of Rabbit Proof Fence [c. 41 km NE of Hyden], 25 Feb. 1992, G.F. Craig & A.S. Weston 1931F (PERTH); remnant bushland on private property (I. Carlshausen), N of Wubin East Rd, E of intersection with Dalwallinu North Rd, E of Wubin, 8 Oct. 2000, M. Hislop 2175 (CNS, K, PERTH); remnant bushland on N side of Fuchsbichler Rd, 14.5 km E of Bruce Rock–Merredin Rd, NE of Bruce Rock, 11 July 2004, M. Hislop 3260 (CANB, PERTH); Emu Fence Rd, 3.7 km S of Bennett Rd, S of Marvel Loch, 15 May 2002, M. Hislop & F. Hort MH 2582 (CANB, MEL, PERTH); Forrestania–Southern Cross Rd, 32 km S of Dunbar Rd, locality of Forrestania, 15 May 2002, M. Hislop & F. Hort MH 2590 (NSW, PERTH); Cox Rd, 2.2 km S of Cramphorne Rd, E of Bruce Rock, 27 July 2002, M. Hislop 2709 (PERTH); Goodlands Res., off Denton Rd, 400 m N of Leeson Rd, locality of Goodlands, 9 Apr. 2005, M. Hislop 3417 (CANB, CNS, K); Petrudor Rock Res., N side of Jones Rd, 2.1 km E of Petrudor Rd [SE of Dalwallinu], 10 Apr. 2005, M. Hislop 3419 (MEL, PERTH); off Ballidu East Rd, on E outskirts of Ballidu, 24 Sep. 2005, M. Hislop 3518 (CNS, PERTH); Forrestania–Southern

Cross Rd, c. 1 km N of Parker Range Rd, 15 Nov. 2011, *M. Hislop & J. Williams MH 4168* (PERTH); Buntine Nat. Res., N of Wubin, along N–S firebreak towards Buntine East Rd, 21 Aug. 2019, *M. Hislop 4799* (MEL, PERTH); King Ingram Rd, c. 3.7 km W of Marvel Loch–Forrestania Rd, 12 Dec. 2022, *M. Hislop 4995* (K, PERTH); on road verge, Scotsman Rd, [4.4 km W of Black Rd, Koorda], 27 June 2001, *F. & J. Hort 1292* (PERTH); site L6D, 12 km ESE of Latham, 4 May 1997, *F. Keast L6B 075* (PERTH); Forrestania/Mt Holland, c. 12.2 km N of crossroads, 1 Nov. 2011, *P. Knapton 62* (PERTH); site 12, Reserve 15565, W of Yalgoo Rd, Morawa Shire [c. 25 km N of Morawa], 22 June 1993, *Morawa Tree Committee 327* (PERTH); near junction of Dalwallinu–Nugadong Rd West, 8.4 km N of Dalwallinu, 10 Aug. 1986, *J.M. Powell 2281* (PERTH; HO, NSW, *n.v.*); 16 km E of Latham–Coorow Rd junction on Maya South West Rd [S of Latham], 10 Aug. 1986, *J.M. Powell 2288* (PERTH; MEL, NSW, *n.v.*).

***Styphelia sporadica* subsp. *borealis* Hislop, subsp. nov.**

Holotypus: Western Australia, N of Eurardy Station [precise locality withheld for conservation reasons], 5 Dec. 2005, *M. Hislop 3553* (PERTH07421745!).

Isotypi: CANB, MEL.

Leaf apex a blunt callus tip; *lamina* usually elliptic to ovate, occasionally narrowly so, 3.0–7.0 mm long, 1.5–2.7 mm wide. **Fig. 14C.**

Diagnostic characters. Distinguished from the typical subspecies by its blunt callus leaf tips and usually proportionately shorter and broader leaf laminae.

Distribution & habitat. Occurs from north of Eurardy Res. south and east to the district of East Yuna in the north of the Geraldton Sandplains bioregion. Grows on yellow sandplain in heath or low, open woodland. Associated species include *Eucalyptus eudesmioides*, *Callitris arenaria*, *Conospermum microflorum*, *Ecdeio-colea monostachya* and *Calothamnus phellosus*.

Phenology. Flowers have been recorded between September and December and mature fruiting collections have been made between June and October.

Etymology. From the Latin *borealis* (northern), a reference to the distribution of this subspecies relative to that of the typical subspecies.

Conservation status. An infrequently collected and apparently uncommon taxon, but known to occur in two nature reserves and at Eurardy Res., a privately owned and managed conservation reserve. To be listed as Priority Two under Conservation Codes for Western Australian Flora (Tanya Llorens, pers. comm.).

Affinities. Maybe the only *Styphelia* species occurring north of Geraldton that might be confused with subsp. *borealis* are *S. brachygyna* Hislop and *S. kalbarriensis* Hislop & E.A.Br. The former shares a short style with subsp. *borealis*, but it is readily distinguished by its

long-mucronate and strongly recurved leaves and in having a 5-locular ovary.

In terms of general similarity, the smaller-leaved, inland form of *S. kalbarriensis* is probably most likely to be mistaken for subsp. *borealis*. It can be distinguished by its longer styles (1.6–2.2 mm long) that are well exerted from the corolla tubes, longer filaments (0.5–0.9 mm long) and by its 5- rather than 3-locular ovary.

Notes. Aside from the foliar differences between the two subspecies that are given above there may also be a difference in fruit size. Three of the collections of subsp. *borealis* cited above have fruit that exceed the maximum size recorded for the typical subspecies, i.e. to 8.0 mm long and 3.5 mm wide, compared to an upper limit of 6.0 mm wide and 3.2 mm wide.

It is noteworthy that the foliar morphology of the two northern outlying specimens of *S. sporadica* subsp. *sporadica* from north of Morawa and east of Pindar is quite typical of that taxon. However, another collection (*M. Hislop 4799*) of the typical subspecies from further south, at Buntine Nat. Res., has the leaf shape of subsp. *borealis* but the with the pungent leaf mucros and smaller fruit of the typical subspecies.

Other specimens examined [localities withheld for conservation reasons]

WESTERN AUSTRALIA. 16 Nov. 1997, *P.G. Armstrong s.n.* (PERTH); 13 Oct. 1964, *W.H. Butler s.n.* (PERTH); 6 Sep. 1966, *A.S. George 7883* (NSW, PERTH); 8 June 2005, *M. Hislop 3455* (PERTH); 24 Aug. 2020, *M. Hislop 4826* (CNS, PERTH); 12–16 Oct. 1976, *B.G. Muir 89(2.9)* (PERTH); 4 Sep. 1979, *J.M. Powell 1383* (PERTH; NSW, *n.v.*); 4 Sep. 1979, *J.M. Powell 1385* (PERTH; CANB, HO, K, NSW, *n.v.*); 6 Oct. 2018, *R. Simkin RS 2085* (PERTH); 22 Aug. 2015, *Wildflower Society of WA OVER ROAD 4/29* (PERTH).

***Styphelia tumida* Hislop, sp. nov.**

Holotypus: Western Australia, Cape Arid N.P. [precise locality withheld for conservation reasons], 25 Apr. 1993, *G.F. Craig 2701* (PERTH03554937!). **Isotypi:** NSW296428.

Erect *shrubs*, to c. 90 cm high, rootstock unknown, but most likely fire-sensitive. Young *branchlets* with a sparse to moderately dense indumentum, <0.05 mm long. *Leaves* helically arranged, mostly steeply antrorse; apex long-mucronate, pungent, the mucro slightly inflexed, 1.0–1.7 mm long; base attenuate; petiole well-defined, 0.8–1.6 mm long, very shortly hairy on all surfaces; lamina narrowly elliptic to narrowly obovate, 10–17 mm long, 2.0–3.5 mm wide, discolorous, usually slightly concave adaxially, sometimes flat or slightly convex, longitudinal axis straight or gently incurved; adaxial surface shiny, with a few basal hairs, otherwise glabrous, venation not evident; abaxial surface paler, matt, glabrous to very shortly hairy throughout, with 5–7 primary veins, openly but quite deeply grooved

between the veins; margins entire, glabrous, or with very short, coarse, antrorse hairs, <0.05 mm long. *Inflorescence* axillary, erect; axis 2.2–5.0 mm long, 1–3-flowered, with a dense indumentum, \pm terete below the lowest fertile bract, angular to winged above, terminating in a bud-rudiment; flowers erect, sessile. *Fertile bracts* broadly ovate to orbicular, 0.7–1.3 mm long, 0.7–1.2 mm wide, with 4–5 sterile bracts on the axis below. *Bracteoles* \pm orbicular, broadly elliptic to transversely elliptic, 1.5–1.8 mm long, 1.5–2.0 mm wide, keeled, obtuse (not or scarcely mucronate); abaxial surface glabrous, obscurely striate; margins ciliate. *Sepals* narrowly ovate, 4.0–4.2 mm long, 1.5–1.8 mm wide, subacute to acute; abaxial surface glabrous, straw-coloured, venation obscure; adaxial with a few basal and apical hairs, otherwise glabrous; margins ciliate with hairs to 0.1 mm long. *Corolla tube* white, broadly obovoid in the lower half, then narrowing conspicuously to a \pm cylindrical upper portion (thus appearing swollen about the middle), c. equal to the sepals, 4.2–4.5 mm long, 2.7–3.0 mm wide, external surface glabrous, internal surface densely hairy in the upper half and with well-defined, retrorse hair tufts projected into the central swelling, glabrous towards the base. *Corolla lobes* white, shorter than or c. equal to the tube, 4.0–4.2 mm long, 1.2–1.4 mm wide, erect in basal $\frac{1}{2}$ – $\frac{2}{3}$ of their length and then spreading and recurved, external surface glabrous, internal surface with a dense indumentum of \pm terete, \pm straight, ornamented hairs. *Anthers* fully exerted from the tube (with the base c. level with top of the tube), 1.5–1.8 mm long, apex shortly emarginate. *Filaments* terete, 1.2–1.4 mm long, attached to anther $\frac{2}{3}$ – $\frac{3}{4}$ above the anther base, adnate to the tube just below the sinuses. *Nectary* annular, 0.4–0.5 mm long, shallowly lobed with deep grooves below the sinuses, glabrous. *Ovary* ovoid, 1.3–1.5 mm long, 0.8–1.0 mm wide, glabrous, 5-locular, greenish-brown. *Style* 5.0–5.5 mm long, scabrous, exerted from the corolla tube to a point c. level with the erect bases of the corolla lobes, well-differentiated from the ovary apex, not arising from a depression; stigma distinctly expanded. *Fruit* broadly ellipsoid or broadly ovoid, 4.8–5.0 mm

long, 4.0–4.5 mm wide, much longer than the sepals, circular in transverse section, gynophore absent; surface glabrous, strongly rugose at maturity (mesocarp well-developed); apex broadly rounded; style usually shed by maturity. **Fig. 16.**

Diagnostic characters. Among the species currently included in Group X, *S. tumida* is distinguished by the following character combination: lamina narrowly elliptic to narrowly obovate, 10–17 mm long, 2.0–3.5 mm wide, glabrous or very shortly hairy throughout, openly but quite deeply grooved between the veins, apex long-mucronate and pungent; inflorescence 1–3-flowered, 2.2–5.0 mm long, terminating in a bud-rudiment; sepals large, 4.0–4.2 mm long, 1.5–1.8 mm wide, abaxial surface glabrous; corolla large, tube distinctly swollen about the middle with internal hair tufts, 4.2–4.5 mm long, 2.7–3.0 mm wide, lobes 4.0–4.2 mm long, 1.2–1.4 mm wide; nectary annular but with deep longitudinal grooves below the sinuses; ovary 5-locular, glabrous; style 5.0–5.5 mm long, scabrous, exerted from the corolla tube; style base not countersunk below the level of ovary apex; fruit broadly ellipsoid or broadly ovoid, strongly rugose.

Distribution & habitat. Known from a small area of coastal heathland over granite at Cape Arid N.P., towards the far east of the Esperance Plains bioregion.

Phenology. The single flowering specimen available during this study was collected in April. Mature fruit has been collected in November.

Etymology. From the Latin *tumidus* (swollen), a reference to the distinct, medial swelling of the corolla tube which is characteristic of the species.

Conservation status. Appears to be restricted to a small area in the south of Cape Arid N.P., where collector's notes suggest that it is not a common plant. To be listed as Priority Two under Conservation Codes for Western Australian Flora (Tanya Llorens, pers. comm.).

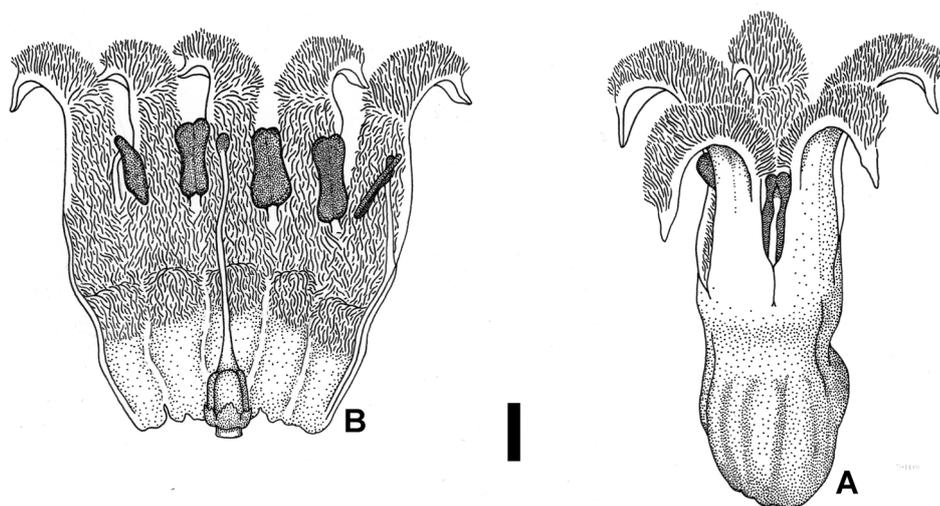


Fig. 16. *Styphelia tumida* corolla: **A** external view; **B** internal view. Scale bars = 1 mm. — G.F. Craig 2701. Drawings by R. Craig.

Affinities. *Styphelia tumida* has hitherto been confused with *S. multiflora* from the neighbouring Cape Le Grand area to the west. The two species are so different in regard to both qualitative and quantitative features that in some ways the confusion is surprising, but is maybe most likely explained by a lack of material. Of the four specimens at the Western Australian Herbarium, two are fruiting, another is almost sterile and only one is in flower. In this case however, the single flowering collection is enough to unequivocally conclude that it is a distinct species.

The flowers of *S. tumida* include a unique feature not seen elsewhere among the Western Australian members of the genus, and which is presumably related to a particular pollination strategy. The basal half of the corolla tube is broadly obovoid in shape, but then contracts abruptly to a much narrower, cylindrical portion below the lobes, so producing a conspicuously swollen region about the middle. The internal surface of the tube is densely hairy in the upper half with discrete tufts of hair projecting downwards into the swollen region.

Aside from this unusual configuration the flower size is significantly larger than that seen in any other species currently assigned to Group X, with the exception of the highly anomalous *S. kingiana* F.Muell. The larger floral parts therefore, enables an additional, ready distinction between *S. tumida* and *S. multiflora* with the former having larger sepals (4.0–4.2 mm long, 1.5–1.8 mm wide cf. 2.5–3.4 mm and 1.2–1.5 mm in *S. multiflora*); larger corollas, with the tubes 4.2–4.5 mm long, 2.7–3.0 mm wide and lobes 4.0–4.2 mm long, 1.2–1.4 mm wide (cf. tubes 2.2–2.5 mm long, 1.6–2.2 mm wide, and lobes 2.5–3.0 mm long, 0.8–1.0 mm wide). Similarly, the anthers (1.5–1.8 mm long cf. 1.0–1.3 mm) and style (5.0–5.5 mm long cf. 2.3–3.0 mm in *S. multiflora*) are significantly longer in *S. tumida*.

In terms of vegetative differences, the leaves of *S. tumida* are usually noticeably larger and with longer mucros (1.0–1.7 mm cf. 0.5–1.0 mm) than those of *S. multiflora* and the branchlet indumentum is sparse to moderately dense indumentum and <0.05 mm long (cf. dense or moderately dense to 0.2 mm long in *S. multiflora*).

The closer affinities of *S. tumida* remain to be determined and may not lie with either the confirmed members of Group X or the potentially new group alluded to above. While it shares some significant features with Group I (distinct corolla hair tufts) and Group IX (hairs in the upper half of internal corolla tube) and has the relatively large flowers associated with

those groups, other aspects of its morphology would make it anomalous in either of them.

Other specimens examined [localities withheld for conservation reasons]

WESTERN AUSTRALIA. 20 Oct. 1997, *E.A. Brown 97/354, P.G. Wilson & N. Lam* (PERTH; NSW, NY, *n.v.*); 23 Nov. 1985, *J.M. Powell 3451* (PERTH; HO, NSW, *n.v.*); 23 Nov. 1985, *J.M. Powell 3457* (PERTH; HO, NSW, *n.v.*).

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