Nuytsia
The journal of the Western Australian Herbarium

Volume 35: 233–262
Published: 28 November 2024
https://doi.org/10.58828/nuy01083

# Additions to the *Styphelia pendula* group (Ericaceae: Epacridoideae: Styphelieae) including updated descriptions for *S. erubescens*, *S. pendula* and *S. retrorsa*

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## Abstract

Hislop, M. Additions to the *Styphelia pendula* group (Ericaceae: Epacridoideae: Styphelieae) including updated descriptions for *S. erubescens*, *S. pendula* and *S. retrorsa*. *Nuytsia* 35: 233–262. Six new species from the *Styphelia pendula* group, *S. altivallis* Hislop, *S. innoxia* Hislop, *S. longiloba* Hislop, *S. porcata* Hislop, *S. speciosa* Hislop and *S. tarinensis* Hislop are described and illustrated. Four of these are conservation-listed. Updated descriptions of three, long-established species from the group, *S. erubescens* F.Muell., *S. pendula* (R.Br.) Spreng. and *S. retrorsa* Hislop, Crayn & Puente-Lel. are provided for purposes of comparison. A key to those members of the *S. pendula* group with strictly pendulous inflorescences is also included.

## Introduction

The *Styphelia pendula* group is one of the largest of the informal infrageneric groups established by Puente-Lelièvre *et al.* (2016; their Group V), with around 40 taxa in Western Australia, 30 of which were included in that study, while the remainder have been placed in the group based on morphological affinity. Not only was it a strongly supported clade in the published phylogenetic tree but unlike most of the other groups it also showed good internal resolution with three well-supported subclades evident. These are referred to here as subclade A (taxa allied to *S. pendula* (R.Br.) Spreng.), subclade B (taxa allied to *S. propinqua* (R.Br.) Spreng.) and subclade C (*S. racemulosa* (DC.) F.Muell. plus *S. filifolia* Hislop & Puente-Lel.). A recent paper (Hislop 2021a) included descriptions of six new taxa, all from subclade A. It is noteworthy that all taxa from the *S. pendula* group with strictly pendulous (rather than those with erect or spreading) inflorescences belong in subclade A, with the single exception of *S. filifolia*. However, this character does not define subclade A as it also includes species with spreading or erect inflorescences. The current paper completes the descriptions of new taxa from the subclade, while also providing updated treatments of three long-established species for purposes of comparison. The similarly large subclade B is also in need of further study and probably includes at least six undescribed taxa.

Although it is premature to present here a full morphological description of the *S. pendula* group, the recently published interim key to the Western Australian groups (Hislop 2021b) enables users to recognise the critical features that distinguish it.

## Methods

This study was based on an examination of dried specimens housed at the Western Australian Herbarium, together with field observations of all species treated. 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


ISSN 2200-2790 (Online)

& Nguyen 2022). Sepal colour is based on observations of dried specimens. Measurement of the style width is only given for the similar species, *S. longiloba* Hislop, *S. pendula* and *S. tarinensis* Hislop, where it has particular diagnostic importance and is measured 1 mm from the base. A floral character not previously used in the taxonomy of *Styphelia* was found to be informative in this species group and is included in the descriptions below. It was found that species varied in regard to the presence or absence of longitudinal ridges on either side of the adnate, decurrent filament bases of the internal corolla tubes. And where present the elevation of the ridges relative to the decurrent portions of the filament bases was also found to be important. This character is illustrated below for *S. porcata* Hislop, in which these ridges are particularly well developed (see description and associated figure).

Bioregions referred to in the text follow *Interim Biogeographic Regionalisation for Australia* (IBRA) v. 7 (Department of Agriculture, Water and the Environment 2012).

## Key to the Western Australian members of the *Styphelia pendula* group with strictly pendulous inflorescences

Note that not all members of the *S. pendula* group have pendulous inflorescences (refer to Hislop 2021a: 200 for definitions of inflorescence orientation), and that most species in the *S. conostephioides* group also have pendulous inflorescences (refer to the key to species groups in Hislop 2021b: 29–31 for distinguishing characters between the groups).

**1.** Leaf apices mucronate or not but if so the mucro innocuous, to 0.4 mm long (rarely to 0.6 mm and sub-pungent)

**2.** Leaves adaxially concave, the margins not recurved; leaf apex a broad callus tip (Porongurup and Stirling Range–Israelite Bay)..... **S. woodsii**

**2:** Leaves adaxially convex, the margins variously recurved to revolute (occasionally some leaves ± flat in a few species); leaf apex often clearly mucronate

**3.** Fruit strongly zygomorphic, bilaterally compressed, the style base displaced onto the adaxial edge; leaves mostly linear, occasionally very narrowly ovate, 12–27 mm long, with 3–5 well-defined sunken lines on adaxial surface (sporadically from N of Eneabba–Harvey) ..... **S. filifolia**

**3:** Fruit actinomorphic, circular in transverse section, the style base centrally fixed; leaves variously shaped but if linear then not > 11 mm long, without obvious sunken lines on the adaxial surface

**4.** Ovary 3(4)-locular; fruit cylindrical or very narrowly ellipsoid, 0.8–1.2 mm wide (widespread: New Norcia–Lake Muir–Gibson, and inland in the south of its range to Kojonup and Lake Magenta)..... **S. concinna**[1]

**4:** Ovary 5-locular, fruit variously shaped, but only *S. dielsiana* has the above combination of shape and width

**5.** Sepals and bracteoles shortly and densely hairy; fruit globose or occasionally broadly ellipsoid, 3.8–5.5 mm long, 3.8–5.5 mm wide (Busselton–Scott River–Donnybrook)..... **S. globosa**

**5:** Sepals and bracteoles glabrous; fruit variously shaped but if globose or broadly ellipsoid (*S. innoxia*), then 3.0–4.0 mm long, 2.0–3.4 mm wide

**6.** Leaves variably retrorse

**7.** Fruit globose or broadly ellipsoid; leaves variably retrorse, but never retrorse-appressed, 3.5–8.0 mm long (restricted: W of Highbury; SW of Harrismith) ..... **S. innoxia**

**7:** Fruit very narrowly ellipsoid to ± cylindrical; leaves usually ± retrorse-appressed, to *c.* 3.0 mm long (widespread: E Darling Range–Gt Eastern Hwy–Cascade –S of Pingrup).. **S. dielsiana**

**6:** Leaves mostly antrorse, a few shallowly retrorse leaves may be present

**8.** Corolla tube longer than the sepals

**9.** Fruit very narrowly ellipsoid to ± cylindrical; inflorescence axis with moderately

dense to dense indumentum; style base smoothly attenuated from ovary apex; stigma expanded (restricted; NW to SW of Lake Grace) ..... **S. tarinensis**

**9:** Fruit narrowly obovoid; inflorescence axis glabrous or with sparse indumentum; style base abruptly differentiated from ovary apex; stigma not expanded, filiform

**10.** Corolla tube obovoid, broadly obovoid or ± obconic, 2.3–3.7 mm long, 2.1–2.6 mm wide, usually longer than or occasionally slightly shorter than the lobes; corolla lobes 1.1–1.4 mm wide; style *c.* 0.1 mm wide near base; filaments attached to anthers 1/2–2/3 above anther base (Augusta–Collie–Mount Barker–Mt Manypeaks, with an apparent outlier SE of Kelmscott)..... **S. pendula**

**10:** Corolla tube broadly obovoid, depressed-obovoid or depressed-obconic, 1.3–2.0 mm long and 1.3–2.0 as wide, always shorter than the lobes; corolla lobes 0.7–1.0 wide; style 0.15–0.2 wide near base; filaments attached to anthers 1/3–1/2 above anther base (S of Pemberton–Albany–Stirling Range)..... **S. longiloba**

**8:** Corolla tube equal to or shorter than the sepals

**11.** Fruit narrowly ellipsoid to narrowly ovoid; leaves linear, the longer ones 8–16 mm long; stigma slightly expanded (restricted: E peaks, Stirling Range) ..... **S. psilopus**

**11:** Fruit narrowly obovoid; leaves very narrowly elliptic to very narrowly obovate, or linear to very narrowly obtriangular, the longer ones 4–9 mm long; stigma not expanded, filiform (S of Pemberton–Albany–Stirling Range)..... **S. longiloba**

**1:** Leaf apices always long-mucronate and sharply pungent, the mucros 0.4–2.0 mm long, always with some longer than 0.6 mm

**12.** Ovary 3(4)-locular; fruit cylindrical or very narrowly ellipsoid, 0.8–1.2 mm wide (widespread: New Norcia–Lake Muir–Gibson, and inland in the south of its range to Kojonup and Lake Magenta) ..... **S. concinna**[1]

**12:** Ovary 5-locular; fruit variously shaped, but not of the above combination of shape and width

**13.** Leaves mostly retrorse, varying from shallowly antrorse to strongly retrorse

**14.** Corolla tube longer than the lobes

**15.** Inflorescences 1- or 2-flowered; style 6.5–9.0 mm long; filaments attached to anthers 1/3–1/2 above anther base; fruit usually ovoid or narrowly ovoid, occasionally ellipsoid or narrowly ellipsoid (mostly Darling Range; N of Bindoon–Boyup Brook) ..... **S. nitens**

**15:** Inflorescences (1)2–5-flowered; style 3.0–6.0 mm long; filaments attached to anthers 1/2–3/4 above anther base; fruit usually variously obovoid or cylindrical, sometimes globose or narrowly ellipsoid

**16.** Fruit very narrowly obovoid to cylindrical, sometimes curved, 4.5–6.8 mm long, 2.0–2.7 mm wide; inner corolla tube with longitudinal ridges on either side of the decurrent filament bases strongly developed and distinctly higher than the filament bases themselves, the ridge apices usually produced into distinct lobes on one or both sides of the attachment point; wider leaves per specimen, 1.8–2.6 mm wide (W coastal plain, Lancelin–Neerabup)..... **S. porcata**

**16:** Fruit broadly to narrowly obovoid, narrowly ellipsoid, or globose, 3.2–5.5 mm long, 2.5–3.5 mm wide; inner corolla tube with longitudinal ridges on either side of the decurrent filament bases present but these lower than or of ± equal elevation to the filament bases themselves, apical lobes absent; wider leaves per specimen, 2.5–4.5 mm wide (Cataby–Moora–W of Toodyay, with an apparent outlier in the Nambung area)..... **S. retrorsa**

**14:** Corolla tube shorter than the lobes

**17.** Spreading, tangled shrubs; leaves linear or very narrowly ovate, 0.5–1.7 mm wide; inflorescence axes glabrous; filaments 0.3–0.6 mm long (wetlands, SE of Margaret River–E of Augusta..... **S. intricata**

**17:** Erect shrubs, never tangled; leaves mostly narrowly obovate or narrowly elliptic, occasionally narrowly ovate, wider leaves always > 1.7 mm;

inflorescence axes with a sparse to moderately dense indumentum, sometimes glabrous in *S. retrorsa*; filaments 0.5–1.2 mm long (plants of dry habitats)

**18.** Inflorescences 1- or 2-flowered; filaments attached to anthers 1/3–1/2 above anther base; corolla lobes 2.5–4.0 mm long (Denmark–Albany–Stirling Range)..... **S. inframediana**

**18:** Inflorescences (1)2–5-flowered; filaments attached to anthers 1/2–3/4 above anther base; corolla lobes 2.0–2.8 mm long

**19.** Fruit very narrowly obovoid to cylindrical, sometimes curved, 4.5–6.8 mm long, 2.0–2.7 mm wide; inner corolla tube with longitudinal ridges on either side of the decurrent filament bases strongly developed and distinctly higher than the filament bases themselves, the ridge apices usually produced into distinct lobes on one or both sides of the attachment point; wider leaves per specimen, 1.8–2.6 mm wide (W coastal plain, Lancelin–Neerabup)..... **S. porcata**

**19:** Fruit broadly to narrowly obovoid, narrowly ellipsoid, or globose, 3.2–5.5 mm long, 2.5–3.5 mm wide; inner corolla tube with longitudinal ridges on either side of the decurrent filament bases present but these lower than or of ± equal elevation to the filament bases themselves, apical lobes absent; wider leaves per specimen, 2.5–4.5 mm wide (Cataby–Moora–W of Toodyay, with an apparent outlier in the Nambung area) ..... **S. retrorsa**

**13:** Leaves mostly antrorse, a few shallowly retrorse leaves may be present

**20.** Corolla tube longer than the lobes

**21.** Leaves narrowly elliptic to narrowly obovate, 7–12 mm long, 1.9–3.6 mm wide, the margins usually barely recurved; fruit narrowly ellipsoid to narrowly obovoid, 3.4–4.3 mm long, 1.7–2.0 mm wide, without a gynophore (restricted: SW to NE of Walpole)..... **S. graniticola**

**21:** Leaves very narrowly elliptic to very narrowly obovate or linear to very narrowly obtriangular, 3.0–11 mm long, 0.5–1.8 mm wide, the margins variably recurved to revolute; fruit narrowly obovoid, 4.2–6.0 mm long, 1.7–2.2 mm wide, with a prominent narrow gynophore (Augusta–Collie–Mount Barker–Mt Manypeaks, with an apparent outlier SE of Kelmscott)..... **S. pendula**

**20:** Corolla tube shorter than the lobes

**22.** Leaves 3.5–9.0 mm long, including a mucro 0.4–0.8 mm long; bracteoles 0.8–1.0 mm long, including a mucro 0.1–0.2 mm long; inflorescences axes 2.0–5.2 mm long; fruit broadly obovoid to ellipsoid (Denmark–Albany–Stirling Range)..... **S. inframediana**

**22:** Leaves 8.0–21 mm long, including a mucro 0.7–2.0 mm long; bracteoles 1.0–1.6 mm long, including a mucro 0.2–0.7 mm long; inflorescence axes 3.0–10 mm long; fruit usually globose or sometimes broadly ellipsoid

**23.** Young branchlets with a sparse to moderately dense indumentum of short, straight hairs to *c.* 0.1 mm long; leaves 0.8–2.0 mm wide, the widest usually 1.8 mm or less; bracteole mucros 0.2–0.4 mm long; sepals 1.8–2.7 mm long (NW of Walpole–William Bay)..... **S. madida** subsp. **madida**

**23:** Young branchlets with a dense indumentum of straight or wavy hairs 0.1–0.4 mm long; leaves 1.5–3.8 mm wide, the widest usually at least 2.2 mm; bracteole mucros 0.4–0.7 mm long; sepals 2.5–3.0 mm long (just E of Albany–Bald Island)..... **S. madida** subsp. **hirtigera**

[1] As currently circumscribed *S. concinna* is the most variable of the pendulous-flowered species in the *S. pendula* group and it is quite likely that further study will conclude that segregate taxa should be recognised. It currently includes variants with consistently antrorse or strongly retrorse leaves, long-mucronate, pungent mucros or very short, innocuous mucros and with potentially significant variation in regard to flower number per inflorescence. What unites them is a 3(4)-locular ovary (the only species in the group not to have a 5-locular ovary) and a cylindrical or very narrowly ellipsoid fruit.

## Taxonomy

**Styphelia altivallis** Hislop, *sp. nov.*

*Type*: Warradarge area, Western Australia [precise locality withheld for conservation reasons], 30 April 2000, *M. Hislop* 1996 (*holo*: PERTH 05556309; *iso*: CANB, NSW 818914).

Erect *shrubs*, to *c.* 60 cm high and 60 cm wide, single-stemmed at ground level, with a fire-sensitive rootstock. Young *branchlets* with a moderately dense indumentum of very short hairs < 0.05 mm long. *Leaves* helically arranged, mostly patent to shallowly antrorse; apex long-mucronate, pungent, the mucro ± straight, 0.5–1.2 mm long; base attenuate or sometimes cuneate; petiole 0.8–1.8 mm long, adaxial surface hairy, abaxial surface glabrous, margins glabrous or shortly and sparsely hairy; lamina mostly narrowly elliptic, or occasionally narrowly obovate, 10–18 mm long, 2.8–5.8 mm wide, discolorous, adaxially convex to concave, longitudinal axis gently incurved to gently recurved; adaxial surface shiny, glabrous apart from a few basal hairs, venation either not evident or with 3–5 poorly defined veins; abaxial surface paler, glabrous, matt, with 7–9 primary veins, ± flat to openly and shallowly grooved between the veins; margins glabrous or with a few, minute, coarse hairs < 0.05 mm long. *Inflorescence* axillary, spreading at *c.* 45°–120°; axis 2.2–4.2 mm long, 1–2-flowered, with a moderately dense indumentum of very short hairs, ± terete below the uppermost fertile bract, planoconvex and narrowly winged above, terminating in a bud-rudiment; flowers spreading, shortly pedicellate below the bracteoles with a thick pedicel to 0.5 mm long or subsessile. *Fertile bracts* broadly ovate to ovate, 0.8–1.5 mm long, 0.7–1.5 mm wide, with 2–3 sterile bracts below the lowest fertile bract. *Bracteoles* broadly ovate to elliptic, 1.7–2.5 mm long, 1.7–2.0 mm wide, obtuse, obscurely keeled, not or very shortly mucronate; abaxial surface glabrous or very shortly and sparsely hairy, not striate; margins ciliolate. *Sepals* narrowly elliptic to narrowly obovate, 4.5–6.4 mm long, 2.0–3.0 mm wide, obtuse or subacute; abaxial surface glabrous or very shortly and sparsely hairy in the upper half, various shades of pink, sometimes fading to straw-coloured, venation indistinct or sometimes obvious; adaxial surface sparsely hairy in the upper half, glabrous below; margins minutely ciliolate with hairs to *c.* 0.1 mm long. *Corolla tube* red, cylindrical, usually longer than, or occasionally ± equal to, the sepals, 5.0–9.0 mm long, 2.6–3.6 mm wide, external surface glabrous, internal surface sparsely hairy to *c.* half way or a little below, the tissue on either side of the decurrent filament bases not or scarcely raised. *Corolla lobes* red, shorter than the tube, 4.0–5.6 mm long, 1.7–2.0 mm wide at base, erect in basal 1/2–2/3 of their length and then spreading and recurved, external surface glabrous, internal surface with a dense, pink indumentum of flattened, twisted and ornamented hairs. *Anthers* partially exserted from corolla tube (by *c.* 7/8 of their length) or fully exserted, 2.2–2.6 mm long, deeply emarginate (as far as the filament connective). *Filaments* terete, 1.4–2.0 mm long, attached to the anther 2/3–3/4 above anther base, adnate to the tube just below sinuses; *Nectary* annular, *c.* 0.5 mm long, glabrous, truncate. *Ovary* globose or depressed-globose, 1.0–1.4 mm long, 1.0–1.5 mm wide, glabrous, 5-locular, ± black. *Style* 5.5–11.5 mm long, scabrous towards the apex, exserted from the corolla tube but not beyond the erect lobe bases, abruptly differentiated from ovary apex; stigma much-expanded and ± 5-lobed. *Fruit* obovoid to narrowly obovoid, tapering to a rather broad, rugose gynophore, 5.0–6.0 mm long, 3.0–3.5 mm wide, much longer than the sepals, distinctly but bluntly angular in transverse section; surface smooth above the gynophore (mesocarp not developed); apex ± flat but with rounded shoulders; style shed before maturity. (Figure 1)

*Diagnostic characters*. Within the *S. pendula* group distinguished by the following character combination: leaves mostly patent to shallowly antrorse, narrowly elliptic or occasionally narrowly obovate, adaxially convex to concave, leaf apices long-mucronate and pungent, the mucro 0.5–1.2 mm long; inflorescences spreading, 1–2-flowered; sepals large, 4.5–6.4 mm long, 2.0–3.0 mm wide, glabrous or very shortly and sparsely hairy, obtuse or subacute, without an apiculus; corolla red; corolla tube usually longer than or sometimes ± equal to the sepals, longer than the corolla lobes, internal surface sparsely hairy to *c.* half way or a little below, not or scarcely raised on either side of the decurrent filament bases; ovary 5-locular, glabrous; style scabrous towards the apex; stigma much-expanded; fruit obovoid to narrowly obovoid, smooth above an often rugose gynophore.


**Figure 1.** *Styphelia altivallis*. A – flowering branchlet *in situ*; B – fruit. Scale bar = 1 mm. Voucher *M. Hislop* 2774 (B). Drawing by Skye Coffey. Photograph by Jolanda Keeble (unvouchered).

*Other specimens examined*. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 23 June 1978, *I.R. Clarke s.n.* (NSW, PERTH); 16 May 1998, *M. Hislop* 1048 (NSW, PERTH); 30 Sep. 2002, *M. Hislop* 2774 (PERTH); 7 July 2010, *C. Puente-Lelièvre, M. Hislop & E.A. Brown* CPL 58 (NSW, PERTH).

*Distribution and habitat*. A short-range endemic from the Warradarge–Eneabba area of the Geraldton Sandplains bioregion. Grows in white sand over laterite in species-rich heath or open woodland.

*Phenology*. Flowering is between April and June. Mature fruit has been collected at the end of September but is likely to be present at least until November.

*Etymology*. From the Latin *altus* (high) and *vallis* (a valley), in reference to the property Hi Vallee where the species occurs. Even within the floristically rich Lesueur Sandplains, the bushland on this farming property and eco-retreat is justifiably famous for its beauty and diversity. The name is applied here as a noun in apposition.

*Conservation status*. To be listed as Priority One under Conservation Codes for Western Australian Flora (Tanya Llorens pers. comm.). On the basis of current knowledge, it seems likely that this is a very rare plant. Aside from a scattered population on private farmland, the species is only known from a specimen collected in 1978 with the vague locality statement, ‘Eneabba’.

*Affinities*. In terms of gross morphology, the species most similar to *S. altivallis* is *S. erubescens* F.Muell. The two share a spreading inflorescence, much-enlarged stigma, and a ± dry fruit with a wrinkled gynophore. In addition, and most significantly, they are also the only Western Australian species within the *S. pendula* group to have hairs on the internal corolla surfaces. The most diagnostic differences between the two are as follows: in *S. altivallis* the anthers are either partially exserted (by *c.* 7/8 of their length) from the corolla tube or if fully exserted then only just, with the anther bases *c.* level with the mouth of the tube (*cf.* anthers always well-exserted from corolla tube in *S. erubescens*); fruit bluntly angular in transverse section (*cf.* circular); inner surfaces of corolla tube hairy to about half way or a little below (*cf.* hairy to ovary apex). In addition, most foliar, flower and fruit measurements in *S. altivallis* are close to or beyond the upper limits recorded for *S. erubescens*. Particularly notable in this regard are sepal length (4.5–6.4 mm long, *cf.* 2.6–4.0 mm in *S. erubescens*), anther length (2.2–2.6 mm long, *cf.* 1.5–2.2 mm) and corolla lobe width (1.7–2.0 mm, *cf.* 1.0–1.5 mm).

Flower colour is also informative. Although *S. erubescens* may have pink to red, as well as white flowers, coloured flowers are restricted to the southern part of that species' range. Across the rest of its distribution, including those populations closest to *S. altivallis*, the flowers are apparently always white. *Styphelia altivallis* by contrast has uniformly red flowers. The northernmost known occurrence of *S. erubescens* at Moore River National Park is about 110 km south of the most southerly occurrence of *S. altivallis*.

*Styphelia speciosa* Hislop, described below, is another member of the *S. pendula* group from the Geraldton Sandplains that frequently has pink to red flowers, and *S. altivallis* occurs within the distribution of that species. *Styphelia speciosa* differs from *S. altivallis* in having a glabrous rather than hairy inner corolla tube, more numerous sterile bracts on the inflorescence axes (4–6, *cf.* 2–3), much smaller sepals (2.0–2.5(3.0) mm long × 0.9–1.2 mm wide, *cf.* 4.5–6.4 mm long × 2.0–3.0 mm wide) and narrower fruit (1.6–2.5 mm wide, *cf.* 3.0–3.5 mm in *S. altivallis*) that are circular rather than bluntly angular in transverse section.

**Styphelia erubescens** F.Muell., *Fragm.* 6(42): 33 (1867) [*nom. nov.*]; *Leucopogon rubicundus* F.Muell., *Fragm.* 4(27): 102 (1864). *Type citation*: 'In montibus Warriup Hills, Mount Manypeak et Mount Gairdner. Maxw.'. *Type*: Mount Manypeak [Western Australia], *s. dat.*, *G. Maxwell s.n.* (*syn*: MEL 0089105 image!).

*Leucopogon racemulosus* var. *pauciflorus* Sond. in J.G.C. Lehmann (ed.), *Pl. Preiss.* 1(2): 312 (1845). *Type citation*: 'Huc pertinet specimen Drummondianum sub No. 482 in herb. Shuttleworth. asservatum, alterum Drummondianum a Cl. Alph. DC. mecum communicatum racemulisaxillaribus instructum est. In collectione Preissiana formas intermedias vidi. Intelligitur hanc speciem eodem jure ad sectionem quintam "Axilliflori" accenseri posse'. *Type*: [Western Australia], 1843, *J. Drummond* 482 (*syn*: MEL 0089102A *n.v.*, P 00760601 image!).

*Leucopogon rotundifolius* var. *oblongatus* Sond. in J.G.C. Lehmann (ed.), *Pl. Preiss.* 1(3): 324 (1845). *Type citation*: 'Crescit ad fluvium Canning. Herb. Preiss. No. 434 (ad sinum regis Georgii herb. Kunth!)'. *Types*: Canning River [Western Australia], 23 July 1839, *L. Preiss* 434 (*syn*: LD 1803425 image!, MEL 1512215 image!, MEL 1512222 image!, MEL 1512223!, S 08-5908 image!); King Georges Sound [Western Australia], *s. dat.*, *L. Preiss s.n.* (*syn*: MEL 2116243!).

*Leucopogon oxycedrus* var. *brevifolius* Benth., *Fl. Austral.* 4: 219 (1868). *Type citation*: 'Canning River, *Preiss*; Gordon plains, *Maxwell*; also *Drummond*, 5th Coll. n. 309'. *Types*: Canning River [Western Australia], 23 July 1839, *L. Preiss* 434 (*syn*: LD 1803425 image!, MEL 1512215 image!, MEL 1512222 image!, MEL 1512223!, S 08-5908 image!); Gordon Plains [Western Australia], *s. dat.*, *G. Maxwell s.n.* (*syn*: K 000348862 image!); [Western Australia], 1847–1849, *J. Drummond* V: 309 (*syn*: CANB 210963 image!, K000348863 image!).

[*Leucopogon oxycedrus auct. non* Sond.: G. Bentham, *Fl. Austral.* 4: 219 (1868) *p.p.*; F.L.E. Diels & E.G. Pritzel, *Bot. Jahrb. Syst.* 35: 477 (1904); W.E. Blackall & B.J. Grieve, *How to Know W. Austral. Wildfl.* IIIB: 342 (1981); J.W. Green, *Census of the Vascular Plants of Western Australia*, 2nd edn.: 138 (1985); J.R. Wheeler in N.G. Marchant *et al.*, *Fl. Perth Region*: 188 (1987); G. Paczkowska & A.R. Chapman, *The Western Australian flora, a descriptive catalogue*: 239 (2000); J.R. Wheeler in J.R. Wheeler *et al.*, *Fl. South West* 2: 604 (2002).]

Erect *shrubs* to *c.* 90 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 < 0.1 mm long. *Leaves* helically arranged, mostly shallowly antrorse to shallowly retrorse; apex long-mucronate, pungent, the mucro slightly inflexed to slightly deflexed, 0.6–1.3 mm long; base cuneate to attenuate; petiole 0.6–1.2 mm long, adaxial surface hairy, abaxial surface glabrous, margins usually sparsely hairy; lamina narrowly elliptic to narrowly obovate, 4–15 mm long, 1.8–5.0 mm wide, discolorous, curvature variable, usually convex adaxially with the margins variably recurved, less often flat to slightly concave, longitudinal axis straight to recurved; adaxial surface shiny, usually with some hairs towards the base and with 3–5 obscurely defined veins often evident; abaxial surface paler, glabrous, ± matt, with 5–9 primary veins, ± flat

to openly and shallowly grooved between the veins; margins with minute, antrorse hairs < 0.05 mm long or ± glabrous. *Inflorescence* axillary, spreading at *c.* 45°–120°; axis 1.5–3.6 mm long, 1–3(4)-flowered, with a dense indumentum of short hairs, terete or slightly compressed below the uppermost fertile bract, planoconvex and narrowly winged above, terminating in a bud-rudiment; flowers spreading, subsessile or rather obscurely pedicellate below the bracteoles with a thick pedicel to 0.3 mm long. *Fertile bracts* ovate or broadly ovate, 0.6–1.2 mm long, 0.5–1.0 mm wide, with 2–3 sterile bracts below the lowest fertile bract. *Bracteoles* ovate to depressed-ovate or ± orbicular, 1.2–2.0 mm long, 1.1–1.9 mm wide, obtuse, obscurely to distinctly keeled, not or shortly mucronate; abaxial surface very shortly hairy or glabrous, not striate; margins ciliolate. *Sepals* ovate or narrowly ovate, 2.6–4.0 mm long, 1.2–2.0 mm wide, usually obtuse or occasionally subacute, rarely with a very short apiculus; abaxial surface very shortly hairy mostly in the upper half, less often glabrous, straw-coloured or pink, venation obscure; adaxial surface sparsely hairy in the upper half, glabrous below; margins ciliolate with hairs to *c.* 0.1 mm long. *Corolla tube* white or various shades of pink to red, cylindrical or sometimes narrowly obovate, longer than the sepals, 4.5–7.1 mm long, 2.0–3.1 mm wide, external surface glabrous, internal surface hairy from the orifice to a point adjacent to the ovary apex, the tissue on either side of the decurrent filament bases not or scarcely raised. *Corolla lobes* white or various shades of pink to red, shorter than the tube, 3.5–4.6 mm long, 1.0–1.5 mm wide at base, erect in basal 1/2–2/3 of their length and then spreading and revolute, external surface glabrous, internal surface with a dense, white indumentum of flattened, twisted and ornamented hairs. *Anthers* well-exserted from the corolla tube, but only partially exserted from the erect basal portion of the corolla lobes, 1.5–2.2 mm long, deeply emarginate (as far as the filament connective). *Filaments* terete or somewhat compressed dorsiventrally, 1.7–3.0 mm long, attached to the anther 2/3–3/4 above the anther base, adnate to the tube just below the sinuses. *Nectary* annular, 0.4–0.5 mm long, glabrous, truncate. *Ovary* ellipsoid to narrowly ellipsoid, or obovoid to narrowly obovoid, 0.9–1.1 mm long, 0.5–0.8 mm wide, glabrous, 5-locular, very dark green to almost black. *Style* 5.8–10.5 mm long, scabrous at least in the distal half, exserted from the corolla tube and usually also beyond the erect lobe bases, abruptly differentiated from ovary apex; stigma much-expanded and ± 5-lobed. *Fruit* usually obovoid or narrowly obovoid and tapering rather abruptly towards a narrow gynophore, or occasionally narrowly ellipsoid and tapering more gradually towards a relatively broader gynophore, 3.8–5.5 mm long, 1.8–3.2 mm wide, much longer than the sepals, circular in transverse section; surface glabrous, essentially smooth above the gynophore (mesocarp not or very poorly developed); apex ± flat but with rounded shoulders; style shed before maturity. (Figure 2)

*Other specimens examined*. WESTERN AUSTRALIA: 5.7 km E along Orange Springs Rd from junction with Cowalla Rd, *c.* 50 m along firetrail to S of road, Badgingarra [error: Moore River] National Park, 4 Oct. 1997, *E.A. Brown* EAB 97/188 *& G. Taaffe* (NSW, NY, PERTH, UNSW); Cheyne Beach [S of caravan park along track to Bald Island], 27 Mar. 2006, *G. Byrne* 1824 (PERTH); 550 m along East Pillenorup track, from Chester Pass Rd, Stirling Range National Park, 20 Aug. 1986, *A.R. Chapman* 433 (HO, NSW, PERTH); Lake Ngartiminny, reserve 19203/4138, MacAlinden, 23 Aug. 2006, *R.J. Cranfield* 22538 (PERTH); W side of reserve off O'Connor Rd, 6 km ENE of Daradine, 2 May 1993, *V. Crowley* DKN 589 (PERTH); Cape Riche, 18 Mar. 1997, *R. Davis* 2868 (PERTH); 300 m W of Darkin Rd, 1.7 km S of Qualen Rd, Wandoo Conservation Park, *c.* 39.5 km WSW of Beverley, 11 Sep. 1997, *N. Gibson* 4086 (PERTH); Sheepwash State Forest [NE of Denmark], N boundary, 1.5 km W from boundary with Loc. 5251, 6 July 1994, *B.G. Hammersley* 1080 (PERTH); remnant bushland between Kwinana Fwy and St John of God Hospital, Murdoch, 9 May 1998, *M. Hislop* 1038 (NSW, PERTH); SW corner of block 3307, Clackline Nature Reserve, NE of Bakers Hill, 26 Apr. 1999, *M. Hislop* 1288 (PERTH); *c.* 7 km NW of Nannup on W side of Vasse Hwy, 23 May 1999, *M. Hislop* 1293 (NSW, PERTH); Moore River National Park, firebreak along N boundary adjacent Orange Springs Rd, 1.4 km W of E boundary of park, 17 June 2001, *M. Hislop* 2229 (PERTH); Hamilla Hill Nature Reserve [E of Cranbrook], N boundary firebreak adjacent gravel extraction site, 18 Apr. 2003, *M. Hislop* 2925 (PERTH); Reef Beach Rd, 800 m S of Borden–Bremer Bay Rd, W of Bremer Bay, 19 Apr. 2003, *M. Hislop* 2934 (PERTH); remnant bushland, cnr Wright St and Ranford Rd, Forrestdale, 11 Oct. 2004, *M. Hislop* 3323 (PERTH); Blythe Rd, Yelverton State Forest, 25 km NW of Margaret River, 25 Apr. 1990, *G.J. Keighery* 11310 (PERTH); 2.1 km along unnamed track from intersection of Banksia and Yanchep roads, NE of Yanchep, 3 Oct. 2001, *B. Koch s.n.* (PERTH); *c.* 15 km from Collie on the McAlinden Rd, 7 Aug. 2009, *F. Littleton* FL 106 (PERTH);

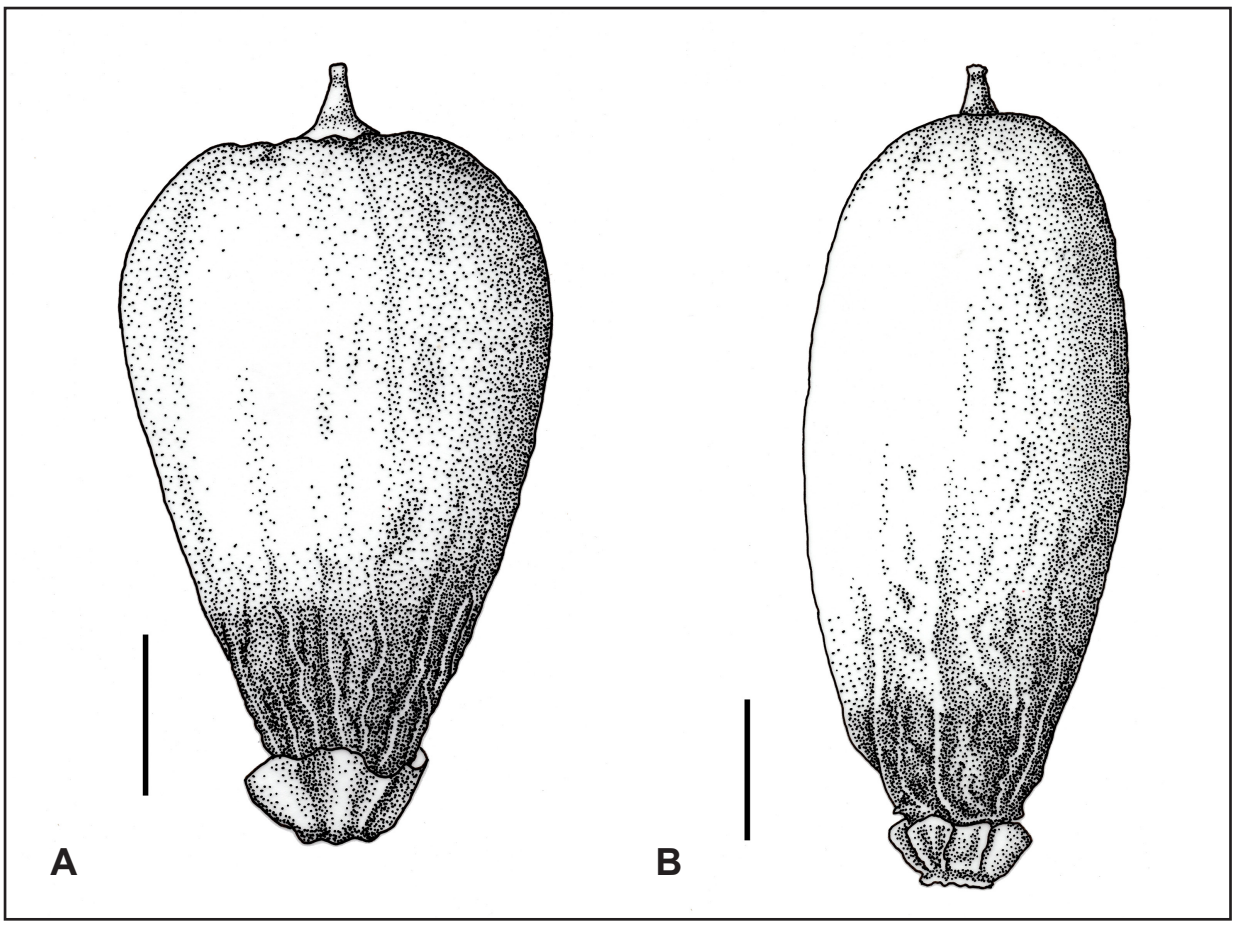


**Figure 2.** *Styphelia erubescens*. A, B – variation in fruit shape. Scale bars = 1 mm. Vouchers *R.J. Cranfield* 22538 (A), *B. Koch s.n.* (B). Drawings by Skye Coffey.

granite complex, *c.* 10 km S of Schulstaad Rd on Watershed Rd, S of Brookton Hwy, 7 June 1999, *L. Sage, F. Hort & J. Hort* LWS 1484 (CANB, NSW, PERTH); quadrat 2, Mt Martin Regional Botanic Park [E of Albany], *c.* 500 m WNW of Ledge Beach car park, 29 May 1999, *E.M. Sandiford, E. Croxford & P. Foreman s.n.* (PERTH); top of Boulder Hill [near Two People Bay], 2 May 1992, *G. Wardle-Johnson* GWJ 106 (PERTH).

*Distribution and habitat*. Widely distributed from Moore River National Park south to Augusta and east to near Bremer Bay, and inland as far as York and the Stirling Range; in the Swan Coastal Plain, Jarrah Forest, Warren, Esperance Plains and western edge of the Avon Wheatbelt bioregions. Grows in various forest, woodland or heathland communities, in deep sands, or shallow sandy soils over laterite, granite or quartzite, usually in dry situations but occasionally recorded in winter-wet habitats.

*Phenology*. The main flowering period is between April and June although many flowering collections have been made outside of that period, at least as late as August. Most fruiting collections have been made between August and October.

*Conservation status*. Widespread and locally common across a large area of the lower south-west of Western Australia. No conservation coding is recommended.

*Notes*. *Styphelia erubescens* is one of the most widespread and distinctive species in the *S. pendula* group. Until the recently published nomenclatural changes of Crayn *et al.* (2020) it had been generally referred to *Leucopogon oxycedrus* Sond. However, that had been a misapplication of the name as the type of that species is the plant now referrable to *S. nitens* Sleumer, previously known as *Leucopogon nutans* E.Pritz. Among its congeners *S. erubescens* can be readily identified by the following morphological features:

inflorescences spreading; stigma much expanded; internal corolla tube hairy from the orifice to the ovary apex; anthers well-exserted from the corolla tube; drupe more or less dry with a well-defined gynophore. In the far south of the species' range the corolla colour may be either white or various shades of pink to red (these frequently mixed in the same population), further north it is apparently always white.

Across the species' geographic range there is considerable variation in regard to leaf size and curvature, corolla size and colour, presence/absence of a short indumentum on bracteoles and sepals and fruit shape. With one possible exception the pattern of variation is overlapping in nature and not amenable to the recognition of segregate taxa. The most distinctive variant occurs in the north-west of the species' range, on the coastal plain from the south of Perth to Moore River National Park. Across most of its distribution *S. erubescens* has a fruit that is obovoid or narrowly obovoid in shape and which tapers, often abruptly, towards a much narrower gynophore. The coastal plain variant differs from this in having the fruit narrowly ellipsoid to narrowly obovoid and tapering more gradually to a relatively broader gynophore. In addition, it always has glabrous bracteoles and sepals whereas at least the sepals are usually shortly hairy in the upper half away from the coastal plain. Whether this variant warrants taxonomic recognition is a question best addressed with reference to molecular data.

*Typification*. In his protologue for *Leucopogon rubicundus*, Mueller (1864) gave three locations for *Maxwell* collections that he nominated as types for his new species: the Warriup Hills, Mount Manypeak and Mount Gardner. So far only the Mount Manypeak syntype has been accounted for.

**Styphelia innoxia** Hislop, *sp. nov.*

*Type*: near Harrismith, Western Australia [precise locality withheld for conservation reasons], 15 June 2022, *M. Hislop* 4897 (*holo*: PERTH 09544437; *iso*: CANB, CNS, K, MEL, NSW).

Erect, rather open *shrubs* to *c.* 120 cm high and 100 cm wide, single-stemmed at ground level, with a fire-sensitive rootstock. Young *branchlets* with a sparse to moderately dense indumentum of very short, patent hairs < 0.05 mm long. *Leaves* helically arranged, variably retrorse; apex obtuse to acute, with or without a poorly defined, innocuous mucro, to 0.2 mm long; base cuneate to ± cordate; petiole 0.2–0.5 mm long, adaxial surface hairy, abaxial surface glabrous, margins glabrous or very sparsely hairy; lamina narrowly obovate to obovate, 3.5–8.0 mm long, 2.2–3.8 mm wide, slightly discolorous, ± glaucous when young, convex adaxially, the margins variably recurved, longitudinal axis ± straight to distinctly recurved in the upper half; adaxial surface shiny at maturity, glabrous or shortly hairy towards the base, the venation usually not evident; abaxial surface slightly paler, glabrous, ± matt, with 5–7 primary veins, ± flat between the veins; margins either with very short, stiff, antrorse hairs < 0.05 mm long or ± glabrous. *Inflorescence* axillary, pendulous; axis 1.0–4.5 mm long, 1–2-flowered, with a sparse to moderately dense indumentum, terete below the uppermost fertile bract, planoconvex above, terminating in a bud-rudiment; flowers pendulous, pedicellate below the bracteoles, with a thick pedicel 0.3–0.7 mm long. *Fertile bracts* broadly ovate to depressed-ovate, 0.5–0.7 mm long, 0.5–0.8 mm wide, with 2–4 sterile bracts below the lowest fertile bract. *Bracteoles* transversely elliptic to depressed ovate, 0.7–1.2 mm long, 1.0–1.4 mm wide, obtuse to subacute, obscurely keeled, not or very shortly mucronate; abaxial surface glabrous, ± striate; margins minutely ciliolate. *Sepals* ovate, 2.0–2.5 mm long, 1.0–1.3 mm wide, obtuse to acute, with or without a short apiculus; abaxial surface glabrous, cream or straw-coloured, often with pink tinges in fruit, venation very obscure; adaxial surface sparsely hairy towards the apex; margins minutely ciliolate with hairs < 0.05 mm long. *Corolla tube* white, narrowly ellipsoid to ± cylindrical, longer than the sepals, 3.5–4.2 mm long, 2.0–2.4 mm wide, external surface glabrous, internal surface glabrous, the tissue on either side of the decurrent filament bases not or scarcely raised. *Corolla lobes* white, shorter than to equal to the tube, 2.7–4.0 mm long, 1.0–1.2 mm wide, erect in basal 2/3 of their length and then spreading and revolute to partially coiled, external surface glabrous, internal surface with a dense, white indumentum of ± flattened, twisted and ornamented hairs. *Anthers* fully exserted from corolla tube, but not beyond the erect, basal portion of the corolla lobes, 1.7–2.3 mm long, distinctly emarginate. *Filaments* terete, 1.0–1.2 mm long, attached to the anther *c.* 1/2 above anther base or a little below, adnate to the tube just below the sinuses. *Nectary* annular, 0.4–0.5 mm long, glabrous, lobed. *Ovary* ellipsoid to ovoid, 0.7–

1.0 mm long, 0.6–0.7 mm wide, glabrous, 5-locular, very dark green to almost black. *Style* 5.2–6.5 mm long, glabrous and smooth, exserted from the corolla tube beyond the erect corolla lobe bases, tapering smoothly from ovary apex; stigma not or barely expanded. *Fruit* broadly ellipsoid to globose, 3.0–4.0 mm long, 2.0–3.4 mm wide, much longer than the sepals, circular in transverse section, gynophore absent; surface glabrous, rugose at maturity (mesocarp well-developed); apex rounded; style mostly shed before maturity, usually breaking a little above the base. (Figure 3)

*Diagnostic characters*. Within the *S. pendula* group, distinguished by the following character combination: leaves variously retrorse, narrowly obovate to obovate, adaxially convex, leaf apices obtuse to acute, with or without a poorly defined mucro to 0.2 mm long; inflorescence pendulous, 1–2-flowered; sepals glabrous, obtuse to acute, with or without a short apiculus; corolla white; corolla tube longer than the sepals, longer than or equal to the lobes, internal surface glabrous, not or scarcely raised on either side of the decurrent filament bases; ovary 5-locular, glabrous; style glabrous and smooth; stigma not or barely expanded; fruit broadly ellipsoid to globose, rugose.

*Other specimens examined*. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 6 June 2004, *M. Hislop* 3245 (CANB, CNS, PERTH); 6 Oct. 2013, *M. Hislop* 4287 (PERTH); 28 Oct. 2021, *M. Hislop* 4875 (CANB, CNS, PERTH); 18 May 2021, *F. Hort & J. Hort* FH 4227 (CANB, PERTH); 27 May 2000, *G. Warren* 385 B (MEL, PERTH).

*Distribution and habitat*. Known from two rather disjunct localities, west of Highbury and south-west of Harrismith, in the south of the Avon Wheatbelt bioregion. At these localities it occurs in heath or woodland over a variety of substrates: sandy loam over either laterite or granite, at the base of lateritic breakaways and in clay-loam, possibly over quartzite.


**Figure 3.** *Styphelia innoxia*. A – flowering branchlet *in situ*; B – fruit. Scale bar = 1 mm. Vouchers *M. Hislop* 3245 (A), *M. Hislop* 4287 (B). Drawing by Skye Coffey. Photograph by Michael Hislop.

*Phenology*. Flowering collections have been made in May and June, and those with mature fruit in October.

*Etymology*. From the Latin *innoxius* (harmless), a reference to the lack of pungent leaf mucros in this species, in contrast to its probable close relatives in the *S. pendula* group.

*Conservation status*. To be listed as Priority Two under Conservation Codes for Western Australian Flora (Tanya Llorens pers. comm.). The two known occurrences of the species are about 50 km apart, one is in state forest and the other a nature reserve. At both localities the species is reasonably common. It likely also occurs somewhere in the intervening country between these two population centres, and ideally reserves in the area should be surveyed for its presence.

*Affinities*. Although not included in the phylogeny of Puente-Lelièvre *et al.* (2016) this species shares all key attributes of the *S. pendula* group and would therefore key out at the second lead of couplet 11 in the recently published interim key to species groups in Western Australian *Styphelia* Sm. (Hislop 2021b). Within that group it is most likely to be confused with either *S. retrorsa* Hislop, Crayn & Puente-Lel., a species that is disjunctly distributed to the north (refer below for details), or *S. inframediana* Hislop that has a more southerly distribution between Denmark, Albany and the Stirling Range. *Styphelia innoxia* differs most obviously from both these species in lacking long-mucronate, pungent leaf apices. From *S. retrorsa* it also differs in having a 1- or less often 2-flowered inflorescence (*cf.* (1)2–5-flowered in *S. retrorsa*). It can be further distinguished from *S. inframediana* in its broadly ellipsoid to globose fruit (*cf.* broadly obovoid to ellipsoid), generally wider leaves, 2.2–3.8 mm wide (*cf.* 1.0–2.5 mm), longer corolla tubes, 3.5–4.2 mm long (*cf.* 1.6–2.2(2.5)) and corolla lobes that are shorter than to equal to the corolla tube (*cf.* always longer than the tube in *S. inframediana*).

Two other members of the *S. pendula* group, *S. dielsiana* (E.Pritz.) Sleumer and *S. concinna* (Benth.) F.Muell. are similar to *S. innoxia* in that they also have retrorse leaves, pendulous inflorescences and often lack long-mucronate, pungent leaf tips (always absent in the former, present or absent in *S. concinna*). Both of these species occur in the same general area as *S. innoxia*. *Styphelia innoxia* differs from *S. concinna* in having the 5-locular fruit typical of the *S. pendula* group (rather than 3(4)-locular) and a globose to broadly ellipsoid (rather than narrowly ellipsoid to ± cylindrical) fruit. *Styphelia dielsiana* can be distinguished from *S. innoxia* by its consistently shorter leaves (to *c.* 3 mm long, *cf.* 3.5–8 mm in *S. innoxia*) that are ± retrorse-appressed (*cf.* variably retrorse but never retrorse-appressed in *S. innoxia*) and by its narrowly ellipsoid or ± cylindrical, rather than globose to broadly ellipsoid fruit.

**Styphelia longiloba** Hislop, *sp. nov.*

*Type*: close to Coalmine Beach, on track to Walpole, [Western Australia], 30 March 2021, *M. Hislop* 4848 (*holo*: PERTH 09332138; *iso*: CANB, CNS, K, MEL, NSW).

Erect *shrubs*, to *c.* 100 cm high and 70 cm wide, but usually smaller, single-stemmed at ground level, with a fire-sensitive rootstock. Young *branchlets* with a sparse to moderately dense indumentum of short hairs < 0.05 mm long, or sometimes ± glabrous. *Leaves* helically arranged, mostly steeply antrorse; apex obtuse to acute, a broad callus or innocuous mucro, to 0.4 mm long; base attenuate or cuneate; petiole 0.5–1.2 mm long, adaxial surface hairy, abaxial surface and margins glabrous; lamina very narrowly elliptic to very narrowly obovate (when margins recurved) or linear to very narrowly obtriangular (when margins revolute), 3.0–9.0 mm long, 0.5–1.8 mm wide, the margins variably recurved to revolute, longitudinal axis ± straight to slightly recurved; adaxial surface shiny, glabrous or with a few hairs towards the base, venation usually not evident; abaxial surface, glabrous, ± matt, with 5–7 primary veins, ± flat or very shallowly and openly grooved between the veins; margins glabrous or very occasionally with sparse apical hairs. *Inflorescence* axillary, pendulous; axis 2.0–9.0 mm long, 1–2(3)-flowered, glabrous or very occasionally with sparse hairs, terete below the uppermost fertile bract, planoconvex and ± winged above, terminating in a bud-rudiment; flowers pendulous, pedicellate below the bracteoles with a thick pedicel, 0.4–1.0 mm long. *Fertile bracts* ovate or broadly ovate, 0.5–0.6 mm long, 0.4–0.6 mm wide,

with 2–5 sterile bracts below the lowest fertile bract. *Bracteoles* broadly ovate, transversely elliptic, to ± orbicular, 0.8–1.1 mm long, 0.8–1.1 mm wide, obtuse, keeled, not or very shortly mucronate; abaxial surface glabrous, not or scarcely striate; margins ciliolate. *Sepals* narrowly ovate, 1.4–2.3 mm long, 0.8–1.1 mm wide, acute or subacute, with or without a short apiculus; abaxial surface glabrous, straw-coloured, venation obscure; adaxial surface hairy in the distal half, glabrous below; margins ciliolate with hairs < 0.05 mm long. *Corolla tube* white, broadly obovoid, depressed-obovoid or depressed-obconic, usually as wide or wider than long, equal to or slightly longer than the sepals, 1.3–2.0 mm long, 1.3–2.0 mm wide, external surface glabrous, internal surface glabrous, the tissue on either side of the decurrent filament bases slightly raised, but lower than or ± equal to the filament bases themselves. *Corolla lobes* white, always longer than the tube, 2.2–3.6 mm long, 0.7–1.0 mm wide at base, erect in *c.* basal 2/3 of their length and then spreading and revolute to partially coiled, external surface glabrous, internal surface with a dense, white indumentum of flattened, twisted and ornamented hairs, the hairs particularly dense in the lower half and usually projecting conspicuously into the top of the tube. *Anthers* partially exserted from the corolla tube (by *c.* 7/8 of their length) or sometimes fully exserted (with anther base level with top of the tube), 1.3–2.2 mm long, emarginate, usually partially obscured by the dense corolla lobe hairs. *Filaments* terete, 0.4–1.0 mm long, attached to the anther 1/3–1/2 above anther base, adnate to the tube just below the sinuses. *Nectary* annular, 0.3–0.5 mm long, glabrous, variably lobed to ± truncate. *Ovary* ellipsoid or ovoid, 0.6–1.0 mm long, 0.4–0.6 mm wide, glabrous, 5-locular, very dark green to ± black. *Style* 2.9–4.0 mm long, 0.15–0.2 mm wide, glabrous and smooth, exserted from the corolla tube beyond the erect corolla lobe bases, abruptly differentiated from ovary apex; stigma not expanded. *Fruit* narrowly obovoid, 3.8–6.0 mm long, 2.2–2.3 mm wide, much longer than the sepals, circular in transverse section, with a well-defined gynophore; surface glabrous, smooth above the gynophore; apex rounded; style shed before maturity. (Figure 4A, B)

*Diagnostic characters*. Within the *S. pendula* group distinguished by the following character combination: leaves mostly steeply antrorse, very narrowly elliptic to very narrowly obovate, when margins recurved, or linear to very narrowly obtriangular when margins revolute, convex adaxially with the margins variably recurved to revolute, leaf apices with a broad callus or innocuous mucro, to 0.4 mm long; inflorescences pendulous, 1–2(3)-flowered; sepals glabrous, acute or subacute, with or without a short apiculus; corolla white; corolla tube equal to or slightly longer than the sepals, much shorter than the lobes, internal surface glabrous, raised into longitudinal ridges on either side of the decurrent filament bases that are lower than or of ± equal elevation to the filament bases themselves; ovary 5-locular, glabrous; style glabrous and smooth, 0.15–0.2 mm wide; stigma not expanded; fruit narrowly obovoid, mostly smooth above a well-defined gynophore.

*Other specimens examined*. WESTERN AUSTRALIA: Walpole–Nornalup National Park, 27 Apr. 1988, *A.R. Annels* 274 (PERTH); 7.1 km S of Wallace Rd on South Western Hwy, N of Walpole, 22 May 2001, *R.J. Cranfield* 16384 (PERTH); Forest Reserve, Spencer Rd, 5 km W of Narrikup, 24 Apr. 1996, *E.J. Croxford* 7356 (PERTH); Speedway Reserve, Reddale Rd, off Albany Hwy, Albany, 25 Aug. 1996, *E.J. Croxford* 7365 B (PERTH); Mooliarup Rd, near Orana Farm, off Takalarup Rd, 25 km NNE of Albany, 11 Apr. 2000, *E.J. Croxford* 8286 (PERTH); 27.3 miles [*c.* 44 km] from Walpole–Shannon River, 3 May 1972, *H. Demarz* 3750 (PERTH); BCRC site 12, Rate Forest Block, Romance Rd [Mt Roe National Park, N of Denmark], 11 Oct. 2007, *C.P. Dornan* 545 (PERTH); Torbay, W of Albany, May 1903, *W.V. Fitzgerald s.n.* (PERTH); 28 miles [*c.* 45 km] SE of Shannon, 24 Apr. 1962, *A.S. George* 3697 (CNS, PERTH); E side of South Western Hwy, 2.25 km S of Deeside Coast Rd intersection [Shannon National Park, E of Northcliffe], 7 May 1991, *N. Gibson & M. Lyons* 722 (PERTH); Kangaroo Rd, 2.2 km E of Collis Rd [N of Walpole], 7 May 1991, *N. Gibson & M. Lyons* 733 (PERTH); Stirling Range National Park, Formby Rd South, 4.6 km N of Chester Pass Rd, 22 Apr. 2005, *M. Hislop* 3428 (CANB, CNS, MEL, PERTH); Stirling Range National Park, Formby Rd South, 4.6 km N of Chester Pass Rd, 31 Aug. 2005, *M. Hislop* 3491 (PERTH); Denmark–Mount Barker Rd, 13.8 km N of Albany–Denmark Rd, 18 Apr. 2003, *F. Hort & J. Hort* 1968 (CANB, CNS, PERTH); vicinity of Mt Pingerup track, Walpole, 21 Apr. 1989, *W. Jackson* BJ 101 (PERTH); 6 km W of Redmond, NW of Albany, 9 May 1986, *G.J. Keighery* 8074 (PERTH); Crowea State Forest approx. 1 km from junction with Crowea Rd and 3 km from junction with Datchett Rd, on Orchard [?Orchid] Rd [SE of Pemberton], 14 May 2006, *C. Perry* 35 (PERTH);

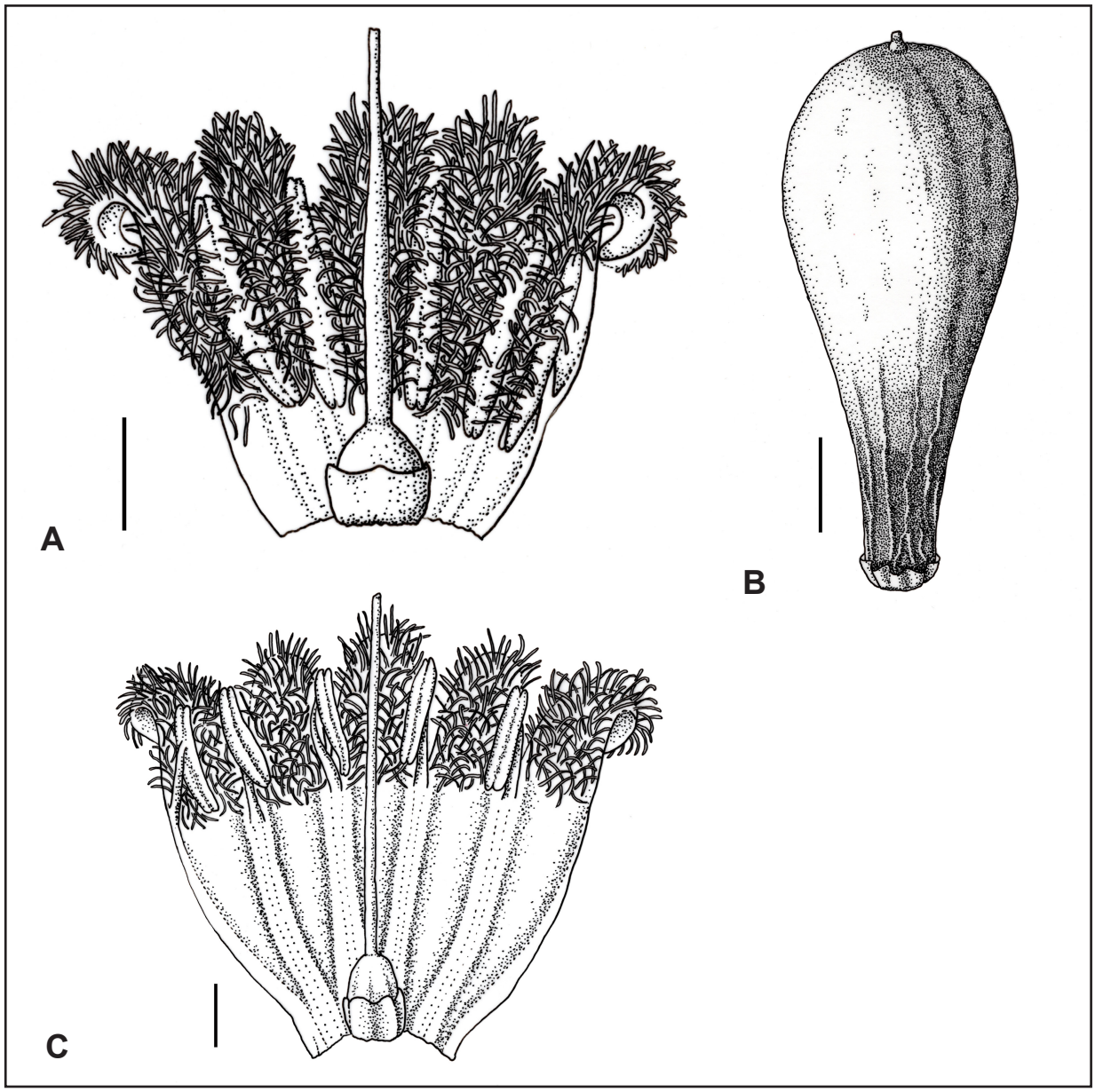


**Figure 4.** *Styphelia longiloba*. A – corolla, internal view; B – fruit. *Styphelia pendula*. C – corolla, internal view. Scale bars A–C = 1 mm. Vouchers *F. Hort & J. Hort* 1968 (A), *M. Hislop* 3491 (B), *M. Hislop* 3300 (C). Drawings by Skye Coffey.

entrance of road to Mt Trio track, Stirling Range National Park, 22 July 1982, *J.M. Powell* 1917 (CANB, K, L, NSW, PERTH); site 135, ENE off Angrove Rd [N of Walpole], 24 Aug. 1997, *K.A. Redwood* 389 (PERTH); climbing path, summit of Mt Toolbrunup, Stirling Range National Park, Mar. 1966, *F.A. Spratt* 20 (PERTH).

*Distribution and habitat*. Distributed from south of Pemberton eastwards to Albany and north to the Stirling Range; in the Warren, far south of the Jarrah Forest and far west of the Esperance Plains bioregions. Occurs in forest, woodland and heath, in sandy soils, most often in winter-wet but sometimes also dry habitats.

*Phenology*. Flowering is between March and June with a peak in April and May. Mature fruit has been collected between August and October.

*Etymology*. From the Latin *longus* (long) and *lobus* (lobe), a reference to the long corolla lobes, relative to the tube length, which is a notable feature of the species.

*Conservation status*. Fairly widely distributed in a part of Western Australia that has generally good coverage of native vegetation and also known to be well represented on the conservation estate. No conservation coding is recommended.

*Affinities*. *Styphelia longiloba* has hitherto been confused with *S. pendula*, a species with which it is sympatric across its range except for in the Stirling Range. When flowering the two can be readily distinguished on the basis of differences in the size and shape of the corolla tubes, in the relative proportions of the tubes to the corolla lobes, and of the tubes to sepal length. *Styphelia longiloba* has corolla tubes that are equal to or slightly longer than the sepals and always much shorter than the corolla lobes; the tubes are broadly obovoid, depressed-obovoid or depressed-obconic in shape, 1.3–2.0 mm long and 1.3–2.0 mm wide, and usually as wide or wider than long. By contrast in *S. pendula* the corolla tubes are always longer than the sepals (usually markedly so) and mostly longer than the lobes (occasionally slightly shorter); the tubes are obovoid, broadly obovoid or ± obconic, and are 2.3–3.7 mm long, 2.1–2.6 mm wide, and always longer than wide. The corolla lobes also include other useful differentiating features. The lobes of *S. longiloba* are narrower than those of *S. pendula* (0.7–1.0 mm wide at base compared to 1.1–1.4 mm wide in *S. pendula*) and are noticeably more densely hairy in the lower half with the hairs often obscuring the anthers and projecting conspicuously into the tube.

Other differences between the species are those of style width and the attachment point of filament to anther. The styles of *S. longiloba* are noticeably broader than those of *S. pendula*, being 0.15–0.2 mm wide as measured 1 mm above the ovary, compared to *c.* 0.1 mm in *S. pendula*. And where the filaments are attached to the anthers about a third to halfway above the anther base in *S. longiloba*, in *S. pendula* the attachment point is halfway to two-thirds above the base, but mostly above halfway. There is also a difference in flowering time between the two, with little overlap. *Styphelia longiloba* flowers between March and June (mostly in April and May). While flowering in *S. pendula* has been recorded over many months of the year (between May and November), the period July to September is when most flowering collections have been made.

Aside from the fact that the two species have substantially overlapping distributions, the most likely reason that *S. longiloba* has remained unrecognised for so long is because in its foliar and fruiting characters it is almost indistinguishable from *S. pendula*. The only partial difference in vegetative character is that while there is a variant of *S. pendula* that has pungent, long-mucronate leaf tips, in *S. longiloba* the leaf tips are always innocuous. Fruiting specimens can only be distinguished if style remnants are present (which they frequently are), these being broader in *S. longiloba* as detailed above. Time of collection also has some utility. Specimens with mature fruit collected in the period August to October are much more likely to be *S. longiloba*. Still, this does mean that sterile specimens, those in early bud, as well as some in fruit, cannot be confidently assigned to either species.

*Notes*. A lone specimen from the western Stirling Range (*S. Barrett* 1481) is not typical of *S. longiloba*, which is known to occur sporadically towards the east of the range. Its floral morphology is somewhat intermediate between *S. longiloba* and *S. pendula.* The corolla tube is markedly longer than the sepals and at *c.* 2.5 mm long is considerably longer than has been recorded for *S. longiloba*, but the corolla lobes (*c.* 3.0 mm) are significantly longer than the tube and beyond the size range recorded for *S. pendula*. Other critical features, those of style width (barely wider than 0.1 mm), corolla lobe width (*c.* 1.2 mm) and the relatively sparse hairs towards the base of the corolla lobes suggest *S. pendula*. The latter species has not otherwise been recorded from the Stirling Range and pending further collections from that area the specimen is referred to *S. aff. pendula*.

Ernst Pritzel described *Leucopogon pendulus* var. *robustus* from material that he and his colleague Ludwig Diels collected near the settlement of Serpentine. Since those type collections were made in May 1901 the only specimens (*P. Foreman & G. Smith* 607; *M. Hislop* 4274) closely matching them have come from a single, small reserve near Pinjarra, about 35 km south of Serpentine. The morphology of the type does not closely match either that of *S. longiloba* or *S. pendula*, having some floral attributes of each and with a somewhat different fruit character to either. It combines corolla proportions (tube *c.* 2.3 mm long,

lobes *c.* 3.3 mm) and style width (0.2 mm) more like those of *S. longiloba* with the filament to anther attachment point (*c.* 2/3 up the anther), corolla lobe width (1.2 mm) and longer style (*c.* 5 mm long) of *S. pendula*. The fruit shape is obovoid-ellipsoid with the widest part of the fruit extending further into the central portion than in the typical, narrowly obovoid fruit of *S. longiloba* and *S. pendula*. The fruit width is also greater (up to 2.8 mm wide) than recorded in either species. The area of its occurrence represents a significant outlier in the distributions of both *S. longiloba* and *S. pendula*. It is closest geographically to disjunct populations of *S. pendula* in the northern Darling Range but bears no close resemblance to plants from that area which are quite typical for that species.

While at this stage I consider *L. pendulus* var. *robustus* a name of uncertain application there is certainly a case for its recognition as a distinct taxon. However, given the paucity of material and the rather subtle nature of the differences that have been identified here it seems prudent to seek to confirm their consistency with material from other populations. A potential problem with this approach is the fact that there is relatively little conserved bushland remaining in the Serpentine–Pinjarra area of the Swan Coastal Plain and what remains is often badly degraded by environmental weeds and the presence of the root-rot pathogen, *Phytophthora cinnamomi*. The optimum taxonomic placement of the var. *robustus* morphotype is probably best determined with reference to genomic data.

**Styphelia pendula** (R.Br.) Spreng., *Syst. Veg.*, ed. 16 1: 657 (1824); *Leucopogon pendulus* R.Br., *Prodr.*: 545 (1810). *Type citation*: '(M.) *v.v.*'. *Type*: King George Sound [Albany, Western Australia], December 1801, *R. Brown s.n.* (*syn*: BM 000907506!, BM 000907507!, G 00455447 image!, K 000348780 image!, K 000348781 image!, MEL 1513050!, P 00760591 image!, P 00760592 image!).

*Leucopogon secundiflorus* Sond. in J.G.C. Lehmann (ed.), *Pl. Preiss.* 1(2): 320 (1845). *Type citation*: 'Ad sinum regis Georgii leg. cl. Preiss. (King George's Sound, Hügel! New South Wales, Fraser!'. *Types*: King George's Sound [Albany, Western Australia], *s. dat.*, *L. Preiss s.n.* (*syn*: *n.v.*); King George's Sound [Albany, Western Australia], 1837 [January 1834], *C.A.A.F. Hügel s.n.* (*syn:* K 000348779 image!); 'New South Wales' [?Western Australia], *s. dat.*, *C. Fraser s.n.* (*syn*: MEL 89129 image!).

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 to moderately dense indumentum of short hairs < 0.05 mm long. *Leaves* helically arranged, variably antrorse, mostly steeply so; apex variable, obtuse to acute, either a broad callus or clearly mucronate with an innocuous mucro to 0.4 mm long, occasionally the mucro longer, sharply pungent and up to 0.8 mm long; base attenuate, cuneate or rounded; petiole 0.4–1.0 mm long, adaxial surface hairy, abaxial surface glabrous, margins usually glabrous; lamina very narrowly elliptic to very narrowly obovate (when margins recurved) or linear to very narrowly obtriangular (when margins revolute), 3.0–11 mm long, 0.5–1.8 mm wide, discolorous, convex adaxially, the margins variably recurved to revolute, longitudinal axis slightly incurved to slightly recurved; adaxial surface shiny, glabrous or with a few hairs towards the base, venation usually not evident; abaxial surface paler, glabrous, ± matt, with 5–7 primary veins, ± flat or very shallowly and openly grooved between the veins; margins glabrous. *Inflorescence* axillary, pendulous; axis 1.8–6.0 mm long, 1–2(3)-flowered, glabrous or with a sparse, very short indumentum, terete below the uppermost fertile bract, planoconvex and often ± winged above, terminating in a bud-rudiment; flowers pendulous, pedicellate below the bracteoles with a thick pedicel, 0.4–1.0 mm long. *Fertile bracts* broadly ovate or ovate, 0.5–0.8 mm long, 0.5–0.6 mm wide, with 2–4 sterile bracts below the lowest fertile bract. *Bracteoles* broadly ovate, depressed-ovate to transversely elliptic, 0.7–1.0 mm long, 0.8–1.2 mm wide, obtuse, keeled, usually very shortly mucronate; abaxial surface glabrous, not or scarcely striate; margins ciliolate. *Sepals* ovate or narrowly ovate, 1.7–2.4 mm long, 0.9–1.3 mm wide, acute to obtuse, with or without a short apiculus; abaxial surface glabrous, straw-coloured, venation obscure; adaxial surface hairy in the distal half, glabrous below; margins ciliolate with hairs < 0.05 mm long. *Corolla tube* white, obovoid, broadly obovoid or ± obconic, longer than the sepals, 2.3–3.7 mm long, 2.1–2.6 mm wide, external surface glabrous, internal surface glabrous, the tissue on either side of the decurrent filament bases raised into longitudinal ridges ± equal to, or more often distinctly higher than, the filament bases themselves. *Corolla lobes* white, usually shorter than or occasionally slightly longer than the tube, 2.0–2.7 mm long, 1.1–1.4 mm wide at

base, erect in basal 1/2–2/3 of their length and then spreading and recurved to revolute, external surface glabrous, internal surface with a dense, white indumentum of flattened, twisted and scarcely ornamented hairs. *Anthers* usually partially exserted from corolla tube (by *c.* 3/4–7/8 of their length) or sometimes fully exserted (with anther base level with top of the tube), 1.2–1.9 mm long, emarginate, not obscured by corolla lobe hairs. *Filaments* terete, 0.8–1.0 mm long, attached to the anther 1/2–2/3 (but usually > 1/2) above anther base, adnate to the tube just below the sinuses. *Nectary* annular, 0.3–0.5 mm long, glabrous, variably lobed. *Ovary* ellipsoid or narrowly ellipsoid, 0.7–1.0 mm long, 0.5–0.7 mm wide, glabrous, 5-locular, very dark green to ± black. *Style* 3.5–5.0 mm long, *c.* 0.1 mm wide, glabrous and smooth, exserted from the corolla tube beyond the erect corolla lobe bases, abruptly differentiated from ovary apex; stigma not expanded. *Fruit* narrowly obovoid, 4.2–6.0 mm long, 1.7–2.2 mm wide, much longer than the sepals, circular in transverse section, with a prominent narrow gynophore; surface glabrous, smooth above the gynophore or sometimes with some longitudinal ridges immediately above it; apex rounded; style shed before maturity. (Figure 4C)

*Other specimens examined*. WESTERN AUSTRALIA: cnr Lejune and Seaton Ross roads [S of Bridgetown], 15 Sep. 1993, *A.R. Annels* ARA 3623 (NSW, PERTH); Gull Rock Rd in Gull Rock National Park [E of Albany], 6 Aug. 2011, *G. Byrne* 4157 (PERTH); track into Perup Nature Cottages, Perup Nature Reserve [E of Manjimup], 15 Aug. 2018, *G. Byrne* 6890 (PERTH); Lake Ngartiminny, Reserves 19203/4138, MacAlinden, 23 Aug. 2006, *R.J. Cranfield* 22593 (PERTH); Mt Melville, Albany, 6 June 1999, *P. Foreman* 49 (PERTH); 12.5 km W of Frankland R [River], Muir Hwy [W of Rocky Gully], 2 Nov. 1977, *A.S. George* 15025 (PERTH); transect 3, Lake Pleasant View on S side of lake, *c.* 35 km NE of Albany, 2 Oct. 2001, *N. Gibson* 3873 (PERTH); Granite Rd, *c.* 3 km N of Denmark River [N of Denmark], 26 Sep. 2000, *B.G. Hammersley* 2658 (PERTH); environs of Fernhook Falls campsite on Deep River, NW of Walpole, 2 Sep. 2005, *M. Hislop* 3506 (NSW, PERTH); summit of Mt Pingerup, NW of Walpole, 2 Sep. 2005, *M. Hislop* 3508 (NSW, PERTH); 150 m S along Tailing Rd which intersects with Mordalup Rd, 3.1 km E of Tone River crossing, W of Frankland, 23 Aug. 2008, *M. Hislop* 3817 (CANB, PERTH); Mt Barker hill, close to summit, near Mt Barker township, 9 May 2009, *M. Hislop* 3876 (CANB, PERTH); Water Reserve 23229/1255, Canning River East Branch, Brookton Hwy, S side of river *c.* 750 m SW of Omeo Rd, 19 July 2005, *F. & B. Hort* 2533 (AD, K, PERTH); Millinup Rd, Porongurup National Park, 35 km NNE of Albany, 9 July 1986, *G.J. Keighery* 8162 (PERTH); McAffee Creek crossing, Jalbarragup Rd [W of Nannup], 4 Sep. 2008, *G.J. & B.J. Keighery* 1371 (AD, MEL, PERTH); C. Milton's property, 3 km S of Mt Barker, 25 Oct. 1977, *K.F. Kenneally* 6501 (PERTH); Collie basin, 26 Jan. 1982, *J. Koch* CJK 598 (PERTH); *c.* 16 km SSW of Busselton, 31 May 1995, *B.J. Lepschi* 1860 (BRI, CANB, NY, PERTH); *c.* 7 km out of Collie travelling to Cardiff, 5 Nov. 2008, *F. Littleton* 97 (PERTH); Nuyts Wilderness, Walpole–Nornalup National Park, *c.* 1.5 km ENE of Mt Hopkins, 27 Aug. 2005, *E.D. Middleton* EDM 720 (PERTH); Long Swamp area, 4.6 km W from S end of Scott River Rd [E of Augusta], 24 Aug. 1986, *J.M. Powell* 2628 (BRI, MO, NSW, NY, PERTH); Mt Manypeaks, E ridge track, 27 Aug. 1986, *J.M. Powell* 2666 (CANB, CHR, NSW, PERTH); 1.1 km NW of Shannon River bridge on South-Western Hwy, 10 Nov. 1985, *J.M. Powell* 3114 (NSW, NY, PERTH); Gnarawary Rd, between Margaret River and Witchcliffe, 2 July 1998, *J. Scott* 11 (PERTH); 24 km SE of Pemberton on road to Northcliffe, 1 Oct. 1967, *P.G. Wilson* 6293 (CANB, PERTH).

*Distribution and habitat*. Widely distributed from Augusta to Collie, south to Mount Barker and then eastwards in near coastal localities to Mt Manypeaks, with an apparent outlier in the northern Darling Range south-east of Kelmscott; in the Jarrah Forest, Swan Coastal Plain and Warren bioregions. Occurs in a variety of plant communities in sand or light loam soils, in both winter-wet and dry habitats.

*Phenology*. Flowers have been recorded between May and November, with a peak between July and September. Mature fruit has similarly been collected over an extended period between September and January.

*Conservation status*. Widespread and locally common. No conservation coding is recommended.

*Notes*. Among its congeners *S. pendula* is usually readily distinguished by the following morphological

features: erect, narrow leaves with mostly non-pungent apices and often strongly recurved margins; inflorescences pendulous, corolla tubes that are always significantly longer than the sepals and usually longer than the corolla lobes; filaments usually attached to the anthers about two-thirds above the anther base; stigma unexpanded; fruit narrowly obovoid with a well-defined gynophore.

*Typification*. The type collections of *S. pendula* were made by Robert Brown close to Albany in December 1801. These specimens are fruiting-only and as described above, *S. pendula* is very similar to *S. longiloba* in the fruiting condition. Because the latter species also occurs in the vicinity of Albany it is necessary therefore to confirm which of the two the type represents. Style remnants are no longer present in the 220-year-old specimens, but a couple of other indicators strongly suggest that the type is of the species treated here as *S. pendula* and not the newly described *S. longiloba*. The type material is of a variant of *S. pendula* that has long-mucronate, pungent leaf tips and which is fairly common in the Albany area. As far as is known *S. longiloba* never has pungent leaf tips. The December collecting date offers another clue in that it seems less likely that fruit of the earlier flowering *S. longiloba* would still be present at the end of the year.

**Styphelia porcata** Hislop, *sp. nov.*

*Type*: near Yanchep, Western Australia [precise locality withheld for conservation reasons], 19 May 2005, *M. Hislop & L.W. Sage* MH 3446 (*holo*: PERTH 07293178; *iso*: CANB, CNS, MEL, NSW 830976).

*Leucopogon* sp. Yanchep (M. Hislop 1986), Western Australian Herbarium, in *Florabase*, https://florabase.dbca.wa.gov.au/ [accessed 2 August 2024].

*Leucopogon* sp. A Perth Flora, Western Australian Herbarium, in *Florabase*, https://florabase.dbca.wa.gov.au/ [accessed 5 November 2024].

*Leucopogon* sp. A, N.G. Marchant, J.R. Wheeler, B.L. Rye, E.M. Bennett, N.S. Lander, T.D. Macfarlane, *Fl. Perth Region* 1: 193 (1987).

Erect *shrubs* to *c.* 70 cm high and 70 cm wide, single-stemmed at ground level, with a fire-sensitive rootstock. Young *branchlets* with a moderately dense indumentum of ± straight, patent hairs to *c.* 0.1 mm long. *Leaves* helically arranged, shallowly antrorse to strongly retrorse; apex long-mucronate, pungent, the mucro slightly inflexed to slightly deflexed, 0.4–1.0 mm long; base attenuate to cuneate; petiole 0.4–0.8 mm long, adaxial surface hairy, abaxial surface glabrous, margins glabrous or hairy; lamina narrowly to very narrowly obovate, 5–13 mm long, 1.2–2.6 mm wide, discolorous, convex adaxially, the margins variably recurved, longitudinal axis ± straight to slightly recurved in the upper half; adaxial surface shiny, hairy towards the base or glabrous throughout, with 3–5 obscurely defined veins sometimes evident; abaxial surface paler, glabrous, ± matt, with 5–7 primary veins, ± flat or openly and shallowly grooved between the veins; margins glabrous. *Inflorescence* axillary, pendulous; axis 2.0–6.4 mm long, (1)2–4(5)-flowered, with a very sparse to moderately dense indumentum, terete below the uppermost fertile node, planoconvex or subterete above, terminating in a bud-rudiment; flowers pendulous, pedicellate below the bracteoles, with a thick pedicel 0.3–1.0 mm long. *Fertile bracts* ovate to broadly ovate, 0.5–0.8 mm long, 0.5–0.7 mm wide, with 2–5 sterile bracts below the lowest fertile bract. *Bracteoles* transversely elliptic to ± orbicular, 0.7–1.0 mm long, 0.8–1.2 mm wide, obtuse, obscurely keeled, not or very shortly mucronate; abaxial surface glabrous, not or scarcely striate; margins ciliolate. *Sepals* ovate or narrowly ovate, 1.5–2.0 mm long, 0.7–1.1 mm wide, obtuse to subacute, with or without a short apiculus; abaxial surface glabrous, straw-coloured, venation very obscure; adaxial surface sparsely hairy towards the apex; margins ciliolate with hairs to *c.* 0.1 mm long. *Corolla tube* white, obovoid to broadly obovoid, or ± obconic, longer than the sepals, 1.7–3.0 mm long, 1.7–2.2 mm wide, external surface glabrous, internal surface glabrous, the tissue on either side of the decurrent filament bases produced into well-defined, longitudinal ridges that are distinctly higher than the filament bases themselves, the ridge apices usually produced into distinct lobes. *Corolla lobes* white, slightly longer than to shorter than the tube, 2.0–2.7 mm long, 1.0–1.3 mm wide at base, erect in basal 1/2–2/3 of their length and

then spreading and revolute, external surface glabrous, internal surface with a dense, white indumentum of flattened, twisted and ornamented hairs. *Anthers* fully exserted from corolla tube, but not exserted beyond the erect, basal portion of the corolla lobes, 1.0–1.5 mm long, distinctly emarginate. *Filaments* terete, 0.8–1.0 mm long, attached to the anther 1/2–2/3 above anther base, adnate to the tube just below the sinuses. *Nectary* annular, 0.3–0.4 mm long, glabrous, lobed. *Ovary* narrowly ellipsoid to narrowly ovoid, 0.7–1.0 mm long, 0.5–0.7 mm wide, glabrous, 5-locular, very dark green to almost black. *Style* 3.0–4.7 mm long, glabrous and smooth, exserted from the corolla tube beyond the erect corolla lobe bases, tapering smoothly from ovary apex; stigma not or barely expanded. *Fruit* very narrowly obovoid to cylindrical, sometimes curved, 4.5–6.8 mm long, 2.0–2.7 mm wide, much longer than the sepals, circular in transverse section, gynophore absent; surface glabrous, ± rugose at maturity (mesocarp usually well-developed), with broad longitudinal ribs evident; apex rounded; style shed before maturity, usually breaking a little above the base. (Figure 5)

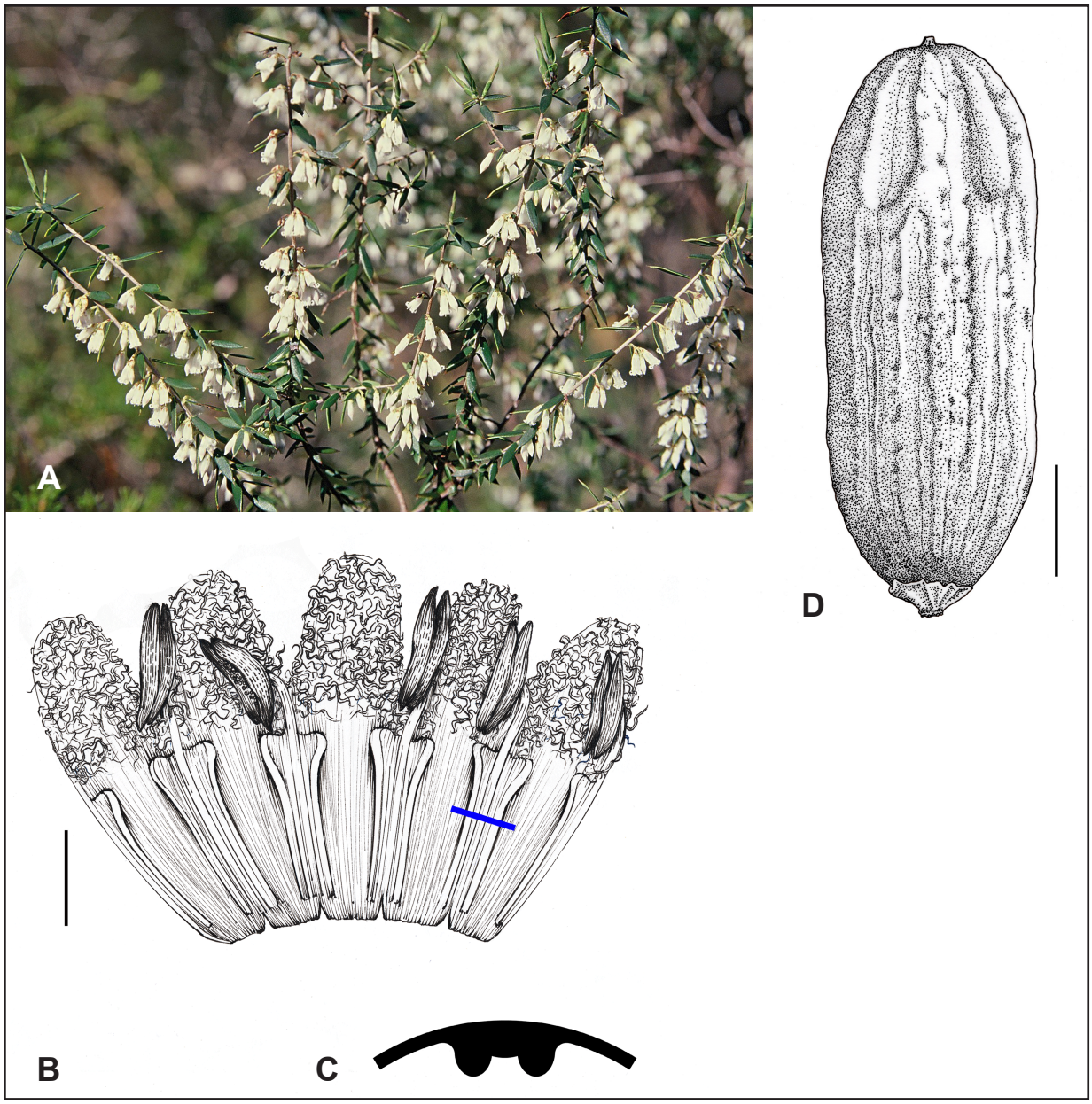


**Figure 5.** *Styphelia porcata*. A – flowering branchlet *in situ*; B – corolla, internal view; C – portion of transverse section of internal corolla tube (as indicated by the blue line in B) showing two ridges on either side of a decurrent filament base; D – fruit. Scale bars B, D = 1 mm. Vouchers *M. Hislop* 2238 (A), *M. Hislop & L.W. Sage* MH 3446 (B, C), *M. Hislop* 2336A (D). Drawings by Hung Ky Nguyen (B, C) and Skye Coffey (D). Photograph by Michael Hislop.

*Diagnostic characters*. Within the *S. pendula* group distinguished by the following character combination: leaves shallowly antrorse to strongly retrorse, narrowly to very narrowly obovate, 1.2–2.6 mm wide, adaxially convex, leaf apices long-mucronate, pungent, the mucro 0.4–1.0 mm long; inflorescences pendulous, (1)2–4(5)-flowered; sepals glabrous, obtuse to subacute, with or without a short apiculus; corolla white; corolla tube longer than the sepals, slightly shorter than to longer than the lobes, internal surface glabrous, with 10 well-defined, longitudinal ridges extending on either side of the decurrent filament bases for the full length of the tube, these raised distinctly higher than the adnate portion of the filaments; ovary 5-locular, glabrous; style glabrous and smooth; stigma not or barely expanded; fruit very narrowly obovoid to cylindrical, rugose, gynophore absent.

*Other specimens examined*. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 4 Nov. 1979, *J. Dodd* 55 (PERTH); 31 May 1966, *A.R. Fairall* 1758 (PERTH); 16 Apr. 2000, *M. Hislop* 1986 (CANB, CNS, NSW); 21 May 2000, *M. Hislop* 2018 (NSW, PERTH); 24 June 2001, *M. Hislop* 2237 (PERTH); 24 June 2001, *M. Hislop* 2238 (PERTH); 24 June 2001, *M. Hislop* 2240 (PERTH); 16 Sep. 2001, *M. Hislop* 2311 (PERTH); 21 Oct. 2001, *M. Hislop* 2336 A (CNS, PERTH), 2336 B (CANB, PERTH); 28 Nov. 2004, *M. Hislop* 3382 A (PERTH); 30 May 1990, *G.J. Keighery* 11159 (PERTH); 23 Nov. 2017, *B. Morgan* IOBM-43 (PERTH); 30 Aug. 1979, *J.M. Powell* 1338 (AD, NSW, PERTH); 3 June 1965, *F.G. Smith* 1792 (PERTH); 17 June 1965, *F.G. Smith* 1805 (PERTH).

*Distribution and habitat*. Distributed sporadically in near-coastal areas from the Lancelin area southwards to Neerabup in the northern half of the Swan Coastal Plain bioregion. Occurs on yellow sand, often over limestone, in low woodland or heath. Commonly associated species include *Banksia attenuata*, *B. menziesii*, *B. prionotes*, *B. sessilis*, *Eucalyptus todtiana*, *Acacia lasiocarpa*, *Jacksonia calcicola* and *Hakea costata*.

*Phenology*. Peak flowering is in May and June. Mature fruit is present from late September until November.

*Etymology*. From the Latin *porcatus* (ridged), a reference to the prominent, longitudinal ridges on the inner corolla tubes.

*Conservation status*. Listed as Priority Three under Conservation Codes for Western Australian Flora (Western Australian Herbarium 1998–), as *Leucopogon* sp. Yanchep (M. Hislop 1986).

*Affinities*. In the published phylogeny of Puente-Lelièvre *et al.* (2016), *S. porcata* (as *Leucopogon* sp. Yanchep) was one of sixteen taxa that were placed in a well-supported subclade of the *S. pendula* group. Resolution within this subclade was poor however, and the majority of taxa, including *S. porcata*, were grouped in a polytomy. *Styphelia retrorsa* (as *Leucopogon* sp. Northern Scarp) was another taxon that was placed in that polytomy and based on overall morphological similarity that species may be the closest relative of *S. porcata*. The two share a very similar vegetative morphology and a usually 2–5-flowered, pendulous inflorescence. At flowering the most useful distinction between them is to be found on the internal surfaces of the corolla tube. In *S. porcata* the longitudinal ridges on either side of the decurrent filament bases are strongly developed and distinctly higher than the filament bases themselves. The ridge apices are usually produced into distinct lobes on one or both sides of the attachment point of the free portion of the filaments. This character varies between species in the *S. pendula* group, with most having either no ridge development or if ridges are developed, as in the case of *S. retrorsa*, then they are of no greater elevation than the adnate portion of the filaments.

Relatively long drupes that are very narrowly obovoid to cylindrical are another feature by which *S. porcata* may be distinguished from *S. retrorsa*. Although the latter species is unusually variable in regard to fruit shape, as described below, specimens with narrowly obovoid fruit that fall within the length range for *S. porcata* may be distinguished by their greater width (usually about 3 mm) and hence have a broader overall profile. In terms of macro spotting features the two can also mostly be distinguished by leaf width: wider leaves per specimen, 1.8–2.6 mm wide in *S. porcata*, 2.5–4.5 mm in *S. retrorsa*. The distributions of the two species are allopatric with *S. porcata* occurring exclusively on the western part of the Swan

Coastal Plain and *S. retrorsa* mostly on the Darling scarp to the east, with a limited occurrence in the east of the coastal plain. The apparently isolated population of *S. retrorsa* that occurs in the Nambung area (refer below) is about 70 km north of the most northerly known populations of *S. porcata*.

Three other members of the *S. pendula* group occur in western parts of the Swan Coastal Plain and could conceivably be confused with *S. porcata*: *S. insularis* (DC.) Hislop, Crayn & Puente-Lel., *S. propinqua* (R.Br.) Spreng. and *S. racemulosa* (DC.) F.Muell. All three of these species can be distinguished from *S. porcata* by their erect to spreading, rather than strictly pendulous, inflorescences, and in having distinctly expanded stigmas (*cf.* not or barely expanded in *S. porcata*).

**Styphelia retrorsa** Hislop, Crayn & Puente-Lel., *Austral. Syst. Bot.* 33(2): 152 (2020) [*nom. nov.*]; *Leucopogon ovalifolius* Sond. in J.G.C. Lehmann (ed.), *Pl. Preiss.* 1(3): 324 (1845). *Type citation*: 'In planitie arenosa Quangen, Victoria, d. 20. Mart. 1840. Herb. Preiss. No. 417'. *Type*: [Western Australia], 20 March 1840, *L. Preiss* 417 (*syn*: LD 1242445 image!, MEL 1512208!).

*Leucopogon* sp. Northern Scarp (M. Hislop 2233), Western Australian Herbarium, in *Florabase*, https://florabase.dbca.wa.gov.au/ [before February 2020].

Erect, rather open *shrubs* to *c.* 100 cm high and 100 cm wide, single-stemmed at ground level, with a fire-sensitive rootstock. Young *branchlets* with a moderately dense indumentum of straight or gently curved, patent hairs to *c.* 0.2 mm long. *Leaves* helically arranged, shallowly antrorse to strongly retrorse; apex long-mucronate, pungent, the mucro ± straight, 0.6–1.2 mm long; base attenuate to cuneate; petiole 0.8–1.3 mm long, adaxial surface hairy, abaxial surface and margins glabrous or hairy; lamina narrowly elliptic to narrowly obovate, 8–18 mm long, 1.8–4.5 mm wide, slightly discolorous, convex adaxially, the margins variably recurved, longitudinal axis ± straight to slightly recurved; adaxial surface shiny, variably hairy in the lower half with 3–5 obscurely defined veins sometimes evident; abaxial surface slightly paler, glabrous, ± matt, with 5–7 primary veins, ± flat or very openly and shallowly grooved between the veins; margins either with very short, stiff, antrorse hairs < 0.05 mm long or ± glabrous. *Inflorescence* axillary, pendulous; axis 2.5–7.2 mm long, (1)2–5-flowered, with a very sparse to moderately dense indumentum or sometimes glabrous, terete below the uppermost fertile node, planoconvex above, terminating in a bud-rudiment; flowers pendulous, pedicellate below the bracteoles, with a thick pedicel 0.5–1.0 mm long. *Fertile bracts* ovate to broadly ovate, 0.5–1.2 mm long, 0.4–0.8 mm wide, with 2–5 sterile bracts below the lowest fertile bract. *Bracteoles* depressed-ovate, transversely elliptic to ± orbicular, 0.5–1.0 mm long, 0.9–1.2 mm wide, obtuse, obscurely keeled, not or very shortly mucronate; abaxial surface glabrous, not or scarcely striate; margins ciliolate. *Sepals* ovate or narrowly ovate, 1.7–2.2 mm long, 0.9–1.2 mm wide, obtuse to acute, often with a short apiculus; abaxial surface glabrous, straw-coloured, venation very obscure; adaxial surface sparsely hairy; margins ciliolate with hairs to *c.* 0.1 mm long. *Corolla tube* white, narrowly obovoid, obovoid, or narrowly ellipsoid, longer than the sepals, 2.3–3.8 mm long, 1.8–2.2 mm wide, external surface glabrous, internal surface glabrous, the tissue on either side of the decurrent filament bases raised into longitudinal ridges that are lower than or of ± equal elevation to the filament bases themselves. *Corolla lobes* white, distinctly shorter than to slightly longer than the tube, 2.4–2.8 mm long, 0.9–1.2 mm wide at base, erect in the basal 2/3 of their length or a little higher and then spreading and revolute to partially coiled, external surface glabrous, internal surface with a dense, white indumentum of flattened, twisted and ornamented hairs. *Anthers* partially exserted (by at least 7/8 of their length) or fully exserted from the corolla tube, but not exserted beyond the erect basal portion of the corolla lobes, 1.2–1.7 mm long, distinctly emarginate. *Filaments* terete, 0.9–1.2 mm long, attached to the anther 1/2–3/4 above the anther base, adnate to the tube just below the sinuses. *Nectary* annular, 0.3–0.5 mm long, glabrous, lobed. *Ovary* ellipsoid to ovoid, 0.6–1.0 mm long, 0.5–0.8 mm wide, glabrous, 5-locular, very dark green. *Style* 3.0–6.0 mm long, glabrous and smooth, exserted from the corolla tube beyond the erect corolla lobe bases, tapering smoothly from ovary apex; stigma not or very slightly expanded. *Fruit* broadly to narrowly obovoid, narrowly ellipsoid, or globose, 3.2–5.5 mm long, 2.5–3.5 mm wide, much longer than the sepals, circular in transverse section, gynophore absent; surface glabrous, ± rugose at maturity (mesocarp usually well-developed), often with longitudinal ribs evident; apex rounded; style shed before maturity, leaving only the broken base. (Figure 6)

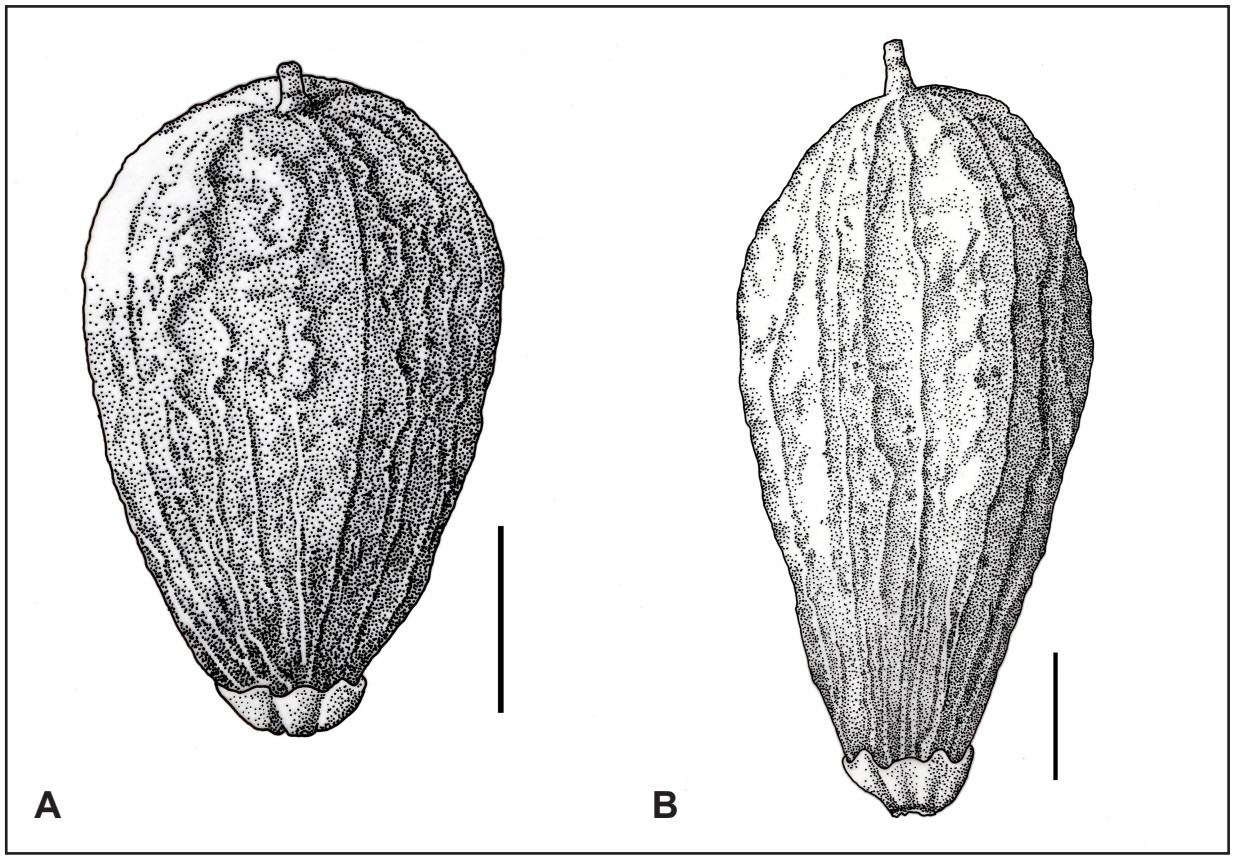


**Figure 6.** *Styphelia retrorsa*. A, B – variation in fruit shape. Scale bars = 1 mm. Vouchers *M. Hislop* 2332A (A), *M. Hislop* 2332B (B). Drawings by Skye Coffey.

*Other specimens examined*. WESTERN AUSTRALIA: Cooljarloo West [SE of Cervantes], 5 Nov. 2008, *D. Coultas & K. Greenacre* CM32-05 (PERTH); 2 km SSE of Walyoo Hill [N of Regans Ford], 12 June 1996, *R.J. Cranfield* 10744 (PERTH); Jam Hill Nature Reserve. W of Moora, 27 June 1988, *E.A. Griffin* 4810 (PERTH); Bidgerabbie Hill, SE of Dandaragan, 28 June 1988, *E.A. Griffin* 4819 (PERTH); chert ridge, about 15 km N of Moora, 26 Nov. 2000, *M. Henson* MJH 64 (PERTH); Yandin Rd, 2.1 km E of Brand Hwy, S of Cataby, 21 May 2000, *M. Hislop* 2020 (NSW, PERTH); Pollinelli Rd *c.* 600 m S of Seven Mile Rd, Julimar State Forest [SE of Bindoon], 5 June 2000, *M. Hislop* 2024 (CANB, NSW, PERTH); Marri Heights Rd, 8.8 km E of Brand Hwy, S side of fence line, SE of Regans Ford, 17 June 2001, *M. Hislop* 2233 (CNS, NSW, PERTH); W side of Fynes Rd, 300 m N of Red Gully Rd, SE of Regans Ford, 17 June 2001, *M. Hislop* 2235 (PERTH); Red Gully off Brand Hwy, E side of picnic area, S of Regans Ford, 17 June 2001, *M. Hislop* 2236 (PERTH); Gillingarra Rd, 1.6 km E of Brand Hwy, NE of Regans Ford, 24 June 2001, *M. Hislop* 2241 (PERTH); Pollinelli Rd *c.* 600 m S of Seven Mile Rd, Julimar State Forest [SE of Bindoon], 1 Oct. 2001, *M. Hislop* 2332 A (MEL, PERTH), 2332 B (PERTH), 2332 C (PERTH); Red Gully off Brand Hwy, E side of picnic area, S of Regans Ford, 21 Oct. 2001, *M. Hislop* 2344 A (CNS, MEL, PERTH), 2344 B (PERTH); Mount Byroomanning Nature Reserve, N of Bindoon, along E boundary S of Stephens Rd, 24 May 2015, *M. Hislop* 4428 (MEL, PERTH); Boonanarring Nature Reserve [N of Gingin], Boonanarring Rd, 4.25 km E of Brand Hwy, then 0.9 km NNE, 2 July 2001, *F. Hort* 1314 (CNS, PERTH); Bartletts Well Nature Reserve [N of Gingin], from Brand Hwy go 1.8 km E and 0.2 km N, 10 Oct. 2001, *F. & J. Hort* 1512 (PERTH); Boonanarring Nature Reserve, 4.2 km E of Brand Hwy on Boonanarring Rd, then NNE for 0.9 km, 12 Oct. 2001, *F. Hort* 1575 (PERTH); 9 km along Rowes Rd, opposite Lupin Valley Rd, 31 km WSW of Moora, 15 May 1984, *G.J. Keighery* 6859 (PERTH); Bartletts Well Nature Reserve, N of Gingin, 21 June 1995, *G.J. Keighery* 14196 (PERTH); 20 miles [*c.* 32 km] W of Moora, 3 Nov. 1954, *R.D. Royce* 4925 (PERTH).

*Distribution and habitat*. The main area of distribution is from Cataby and Moora in the north, then south and eastwards to the Toodyay area (but see notes on type locality below); in the far south of the Geraldton

Sandplains and north of the Swan Coastal Plain and Jarrah Forest bioregions. There is also an apparently disjunct occurrence in the Nambung area south-east of Cervantes. Mostly grows in sand or light loam over laterite, high in the landscape, less often in yellow sand on the coastal plain. Associated vegetation is usually Jarrah-Marri, sometimes Banksia woodland, or less often in heath.

*Phenology*. Flowering is between late April and June. Mature fruit is usually present from the second half of September to November.

*Conservation status*. This species has a fairly restricted distribution but is often locally common and is known to occur in several nature reserves and in state forest. No conservation coding is recommended.

*Notes*. As recognised here *S. retrorsa* is variable in fruit shape to an extent that has not been previously documented for any other western *Styphelia*. Infra-populational variation has been confirmed at one collecting site (*M. Hislop* 2332 A, 2332 B, 2332 C) where fruit shape on different plants varied from broadly to narrowly obovoid. Two fruiting collections from another reserve (*F. Hort* 1575, *P. Armstrong s.n.* PERTH 06740634) have obovoid and narrowly ellipsoid fruit respectively. What is particularly unexpected however, is the presence in the north-east of the species range of a morphotype with uniformly globose fruit (e.g. *R.D. Royce* 4925, *M. Henson* MJH 64). The question of whether a second cryptic taxon is present in this area requires further study.

The occurrence of a disjunct population of *S. retrorsa* on sandplain south-east of Cervantes appears somewhat surprising in the context of the species' overall distribution, it being well to the west of other collections at that latitude. There are two records from the area, about 3 km apart, one fruiting (*D. Coultas & K. Greenacre* CM32-05), the other sterile (*B. Morgan* BMor 1328). The fruiting specimen is quite typical for the species while the sterile specimen has leaves that are narrower than is usual, more like those of *S. porcata*. A recent effort by the author to collect flowering specimens from this population was not successful and it appears that the plant is an uncommon one in the area. Until flowering material is seen there remains some doubt regarding the identity of the plants in this area.

There are reasons to believe that a locality error is responsible for an apparent distributional outlier (*J.J. Alford* 954), putatively collected from the Bobakine Hills, south-west of Northam in 1986. Apart from the geographic disjunction, the specimen is also anomalous for being in late bud at the end of September, a time of year when plants of this species would normally be at least in early fruit. The collector is known to have been involved in a survey of the Boonanarring Nature Reserve during the same year and visited that reserve in March of 1986. It seems likely that the collection was in fact made at that time.

*Typification*. In his list of collecting localities for Preiss's Western Australian collections, Marchant (1990) interpreted the modern locality for the type specimen of *Leucopogon ovalifolius* (i.e 'Quangen, Victoria') as being near Wongamine, about 15 km east of Toodyay. There have been no subsequent collections from that area, which is about 35 km to the south-east of the nearest collection of the species currently held at the Western Australian Herbarium. It may be the case that it is now extinct east of Toodyay, an area that was subject to heavy clearing for agriculture in the decades following Preiss's visit to the Swan River Colony.

**Styphelia speciosa** Hislop, *sp. nov.*

*Type*: east side of Rose Thompson Road, 3.5 km south of Carnamah–Eneabba Road, [east of Eneabba], Western Australia, 15 July 2006, *M. Hislop* 3614 (*holo*: PERTH 07516177; *iso*: CANB, CNS, MEL, NSW).

*Leucopogon* sp. Coomallo (R.J. Cranfield 1457), Western Australian Herbarium, in *Florabase*, https://florabase.dbca.wa.gov.au/ [accessed 2 August 2024].

[*Leucopogon strictus* Benth., *Fl. Austral.* 4: 219 (1868) *p.p.*, with respect to: *J. Drummond* VI: 123 (BM 001040170 image!; K 000348868 image!), see D. Crayn *et al., Austral. Syst. Bot.* 33(2): 152 (2020).]

Erect *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 short hairs < 0.1 mm long. *Leaves* helically arranged, often ± glaucous, mostly shallowly to steeply antrorse, sometimes ± patent; apex long-mucronate, pungent (or very occasionally the leaf tip a blunt callus, see notes below), the mucro slightly inflexed to slightly deflexed, 0.3–1.0 mm long; base usually attenuate, occasionally ± cuneate; petiole 0.7–1.2 mm long, adaxial surface hairy, abaxial surface glabrous, margins glabrous or sparsely hairy; lamina narrowly obovate to narrowly elliptic, 7–18 mm long, 1.5–4.2 mm wide, slightly discolorous, usually convex adaxially with the margins variably recurved, occasionally ± flat (very occasionally slightly concave), longitudinal axis straight to slightly incurved; adaxial surface shiny, usually with some hairs towards the base with 3–5 obscurely defined veins often evident; adaxial surface slightly paler, glabrous, ± matt, with 5–7 primary veins, ± flat to shallowly and openly grooved between the veins; margins with minute, antrorse hairs < 0.05 mm long in the upper half or ± glabrous. *Inflorescence* axillary, spreading at *c.* 45°–120°; axis 1.6–3.2 mm long, 1–3-flowered, with a dense indumentum of short hairs, terete below the uppermost fertile bract, planoconvex and winged above, terminating in a bud-rudiment; flowers spreading, shortly pedicellate below the bracteoles with a thick pedicel 0.2–0.5 mm long. *Fertile bracts* ovate or broadly ovate, 0.5–0.8 mm long, 0.5–0.8 mm wide, with 4–6 sterile bracts below the lowest fertile bract. *Bracteoles* broadly ovate, depressed-ovate to ± orbicular, 1.0–1.5 mm long, 1.0–1.3 mm wide, obtuse, obscurely to distinctly keeled, not mucronate; abaxial surface glabrous, not striate; margins ciliolate. *Sepals* narrowly ovate, 2.0–2.5(3.0) mm long, 0.9–1.2 mm wide, obtuse or occasionally subacute, without an apiculus; abaxial surface glabrous, pale green, straw-coloured or pink, venation very obscure; adaxial surface with a few hairs towards the apex, otherwise glabrous; margins ciliolate with hairs to *c.* 0.1 mm long. *Corolla tube* white or various shades of pink to red, cylindrical, longer than the sepals, 5.6–6.7(8.0) mm long, 2.2–3.0 mm wide, external surface glabrous, internal surface glabrous, the tissue on either side of the decurrent filament bases not or scarcely raised. *Corolla lobes* white or various shades of pink to red, shorter than the tube, 2.2–3.2(3.5) mm long, 1.0–1.5 mm wide at base, erect in basal 2/3–2/3 of their length and then spreading and recurved to revolute, external surface glabrous, internal surface with a dense, white indumentum of flattened, twisted and ornamented hairs, becoming less hairy towards the base. *Anthers* exserted from the corolla tube, but not exserted beyond the erect, basal portion of the corolla lobes, 1.2–1.7 mm long, deeply emarginate (as far as the filament connective). *Filaments* terete, 1.2–1.8(2.2) mm long, attached to the anther 2/3–3/4 above the anther base, adnate to the tube just below the sinuses. *Nectary* annular, 0.3–0.5 mm long, glabrous, truncate. *Ovary* narrowly ellipsoid or occasionally ellipsoid, 0.8–1.1 mm long, 0.5–0.6 mm wide, glabrous, 5-locular, very dark green to almost black. *Style* 6.4–8.5(11) mm long, scabrous at least in the distal half, exserted from the corolla tube and beyond the lobe bases, usually well-differentiated from ovary apex; stigma much-expanded. *Fruit* cylindrical, narrowly ellipsoid or narrowly obovoid, 3.7–5.3 mm long (inclusive of gynophore), 1.6–2.5 mm wide, much longer than the sepals, circular in transverse section, with a well-defined gynophore; surface glabrous, smooth above the often prominently rugose gynophore; apex ± flat but with rounded shoulders; style shed before maturity. (Figure 7)

*Diagnostic characters*. Within the *S. pendula* group distinguished by the following character combination: leaves mostly shallowly to steeply antrorse, narrowly obovate to narrowly elliptic, adaxially convex or occasionally ± flat, leaf apices usually long-mucronate and pungent, the mucro 0.3–1.0 mm long; inflorescences spreading, 1–3-flowered; sepals 2.0–2.5(3.0) mm long, 0.9–1.2 mm wide, glabrous, obtuse or occasionally subacute, without an apiculus; corolla white or pink to red; corolla tube longer than the sepals and corolla lobes, internal surface glabrous, not or scarcely raised on either side of the decurrent filament bases; ovary 5-locular, glabrous; style scabrous, at least in the distal half; stigma much-expanded; fruit cylindrical, narrowly ellipsoid or narrowly obovoid, smooth above an often rugose gynophore.

*Other specimens examined*. WESTERN AUSTRALIA: [UCL bounded by Mt Adams Rd, Tompkins Rd and Natta Rd, 27 km SW of Mingenew], 26 July 2014, *D. Coultas* DC-14-02 (PERTH); Marchagee track, 1 km E of Brand Hwy [N of Badgingarra], 30 May 1980, *R.J. Cranfield* 1457 (CANB, PERTH);

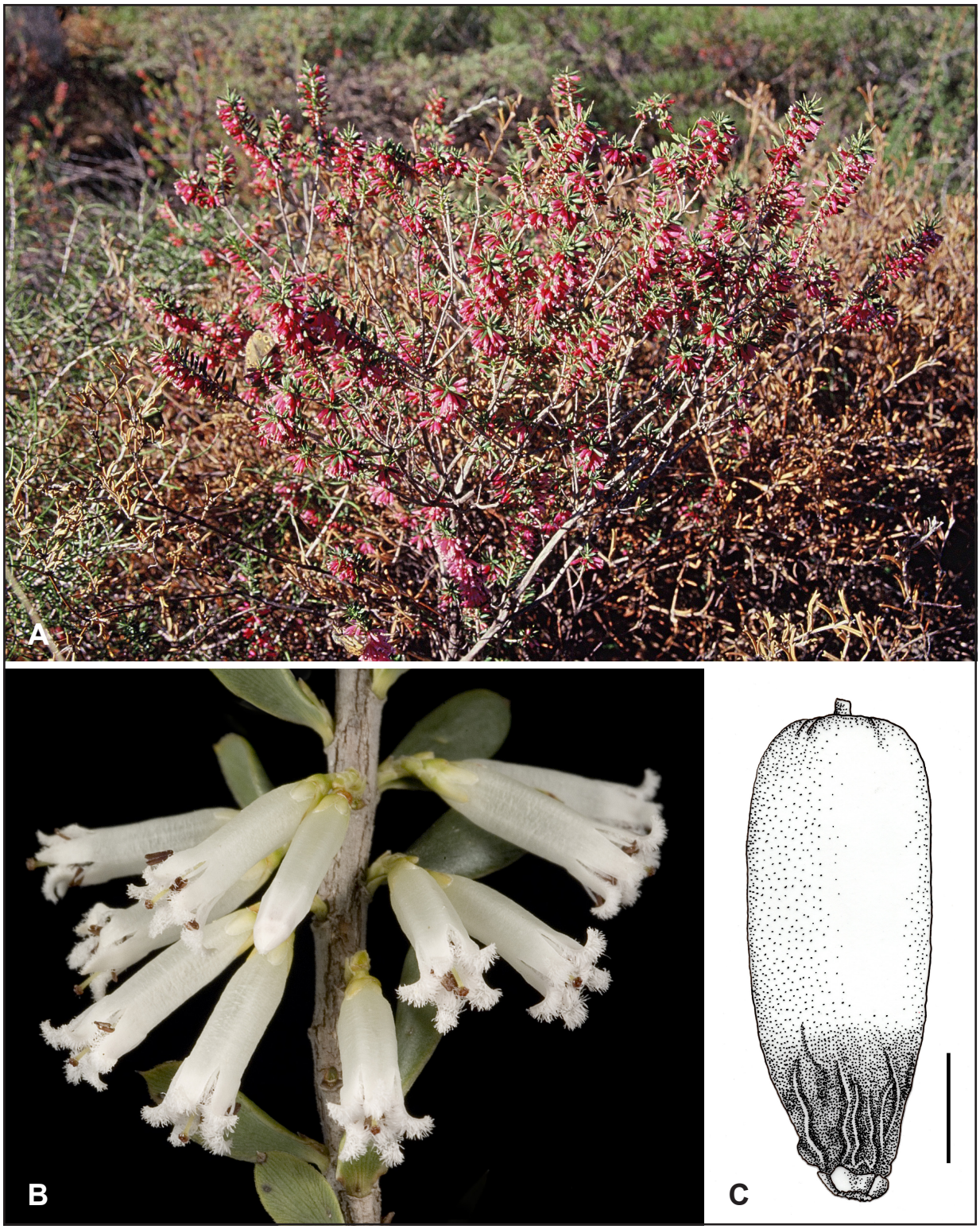


**Figure 7.** *Styphelia speciosa*. A – habit *in situ*; B – flowering branchlet *in situ*; C – fruit. Scale bar = 1 mm. Vouchers *M. Hislop* 2355 (A), *K.R. Thiele* 3244 (B), *M. Hislop* 2023 (C). Drawing by Skye Coffey. Photographs by Michael Hislop (A) and *Kevin Thiele* (B).

Cockleshell Gully, near Hill River, 10 June 1931, *C.A. Gardner s.n.* (PERTH 03011550); *c.* 8.5 miles [*c.* 13.7 km] SE of Badgingarra, 28 May 1965, *A.S. George* 6709 (NSW, PERTH); Mt Misery, W of Dandaragan, 11 Sep. 1988, *E.A. Griffin* 5041 (PERTH); remnant vegetation where Cataby Brook crosses Brand Hwy, Cataby, 29 May 1999, *M. Hislop* 1310 (CNS, NSW, PERTH); Yandin Rd, 2.1 km E of Brand Hwy, SE of Cataby, 21 May 2000, *M. Hislop* 2019 (NSW, PERTH); E side of Badgingarra Rd, 13 km S of North West Rd, N of Dandaragan, 21 May 2000, *M. Hislop* 2023 (CANB, NSW, PERTH); Yandin Rd,

2.1 km E of Brand Hwy, SE of Cataby, 3 Nov. 2001, *M. Hislop* 2354 (CANB, CNS, PERTH); Coomallo Nature Reserve, N side of Marchagee track, 1.1 km E of Brand Hwy, 3 Nov. 2001, *M. Hislop* 2355 (CNS, PERTH); S end Sundalara Rd, NE of Eneabba, 8 June 2002, *M. Hislop* 2680 (MEL, PERTH); Badgingarra National Park, Cadda Rd, 7.2 km W of Brand Hwy, 7 June 2010, *M. Hislop* 4029 (CNS, K, MEL, PERTH); Lesueur National Park, Banksia track, *c.* 4.8 km E of Stockyard Gully Rd, 1 July 2012, *M. Hislop* 4215 (CANB, CNS, PERTH); Coomallo Nature Reserve, 6 km [W] of Brand Hwy along Jurien Rd and then 1 km S along powerline track, 3 June 1988, *S.D. Hopper* 6359 (K, PERTH); Yandin Nature Reserve [SE of Cataby], 1.8 km E of Brand Hwy, 11 June 2002, *F. & J. Hort* 1759 (CANB, PERTH); W side of Black Arrow Rd and S of Jurien Rd [E of Jurien Bay], 8 June 2002, *M. Puckridge* 305 (PERTH); 1.1 km E of Peron Buffer along Brumby Buffer, then 80 m S [Lesueur National Park], 16 Oct. 2008, *W. Westcott* 08-22-8 (PERTH).

*Distribution and habitat*. Distributed from south-east of Dongara to a little south of Cataby, in the Geraldton Sandplains and far north of the Swan Coastal Plain bioregions. Mostly recorded from lateritic heath, less often in open woodland. It is noteworthy that collections from the Eneabba area and northwards have been made in close association with breakaways.

*Phenology*. The main flowering period is between May and July. Mature fruit has been collected in October and November.

*Etymology*. From the Latin *speciosus* (showy), a reference to the plant's showy aspect during flowering when it is common for flower colour within one population to vary from white through various shades of pink to red.

*Conservation status*. Has a fairly wide, but localised, distribution in the Geraldton sandplains. Known to occur in three national parks and one nature reserve. No conservation coding is recommended.

*Affinities*. According to the phylogeny of Puente-Lelièvre *et al.* (2016) the closest relative of *S. speciosa* is *S. leptantha* (Benth.) F.Muell. (the two were placed in a sister relationship with a moderate level of support). There are several obvious differences between the two species. *Styphelia speciosa* has long-mucronate, pungent leaf tips (with the rare exception noted below), spreading inflorescences with white or pink to red flowers and drupes that are circular in transverse section. In *S. leptantha* by contrast the leaf tip is an innocuous callus, the inflorescence is erect and always white-flowered, and the drupe is strongly angular in section.

In terms of gross morphology, the species most similar to *S. speciosa* is *S. erubescens*. Indeed, collections of *S. speciosa* had been referred to 'the northern variant' of that species until early molecular results obtained during Puente-Lelièvre's PhD studies (Puente-Lelièvre 2013) indicated that it needed to be recognised as a distinct species. The phrase name, *Leucopogon* sp. Coomallo, was subsequently installed on Florabase (Western Australian Herbarium 1998–). Two always-reliable, and several useful but sometimes overlapping, character differences distinguish the two. *Styphelia erubescens* is notable in being one of only two members of the *S. pendula* group (along with *S. altivallis*, described above) that have hairs on the surfaces of the internal corolla tube. That *S. speciosa* is glabrous on this part of the corolla is therefore a critical difference between the two. Another is the number of sterile bracts on the inflorescence axis: 4–6 in *S. speciosa*, 2–3 in *S. erubescens*. Other usually useful differences are sepal size (2.0–2.5 mm long and 0.9–1.2 mm wide in *S. speciosa*, *cf.* 2.6–4.0 mm long and 1.2–2.0 mm wide in *S. erubescens*); corolla lobe length (2.2–3.2 mm long, *cf.* 3.5–4.6 mm); and filament length (1.2–1.8 mm, *cf.* 1.7–3.0 mm).

As noted above under the treatment of *S. altivallis*, flower colour is also taxonomically useful in this case, in that pink to red flowered variants of *S. erubescens* are restricted to the southernmost part of that species range. North of there it is only known to produce white flowers. The distributions of the two species approach each other closely in the north of the Swan Coastal Plain bioregion, with the northernmost known occurrence of *S. erubescens* at Moore River National Park only about 35 km south of the most southerly occurrence of *S. speciosa* at Yandin Hill. Differences between *S. speciosa* and *S. altivallis* are

given above under the treatment of the latter species.

A collection of *S. speciosa* (*J. Drummond* VI: 123) was cited by Bentham (1868) as one of two syntypes for his new species, *Leucopogon strictus* Benth. However, that material is not conspecific with the other syntype (*W.H. Harvey s.n.*) and because the latter represented the species to which the name has most commonly been applied it was recently selected as lectotype (Crayn *et al.* 2020: 152). Despite this early confusion the two species are readily distinguished even where fertile material is lacking. Whereas *S. speciosa* has leaf margins either with minute hairs < 0.05 mm long or ± glabrous, in *S. stricta* they are obviously ciliate with stiff hairs 0.1–0.2 mm long. And where the inflorescences of *S. speciosa* are clearly spreading, in *S. stricta* they are always erect. The fruit of the two species is also quite dissimilar: circular in transverse section for *S. speciosa*, rather sharply angular in *S. stricta*.

*Notes*. The two most northerly collections of *S. speciosa* (*D. Coultas* DC-14-02; *D. Coultas* DC opp 55) are anomalous in respect to aspects of their leaf morphology and in having some floral parts longer than any recorded elsewhere in the species' range. The collection *D. Coultas* DC-14-02 consists of several small pieces evidently taken from different plants. One of these pieces has pungent leaf tips with mucros to about 0.5 mm long (i.e. ± typical for the species), others have either well-developed, but innocuous mucros or else terminate in a very short callus. In addition, the curvature of the leaves in these specimens varies from slightly convex adaxially to slightly concave. The measurements given in brackets in the description after the normal measurement range for sepal length, corolla tube and lobe length, filament length and style length were all obtained from *D. Coultas* DC-14-02. While these measurements are clearly atypical, the often taxonomically important fruit character is consistent for the species. Pending further collections of this morphotype these specimens are provisionally treated here as representing infraspecific variation only.

**Styphelia tarinensis** Hislop, *sp. nov.*

*Type*: Tarin Rock Nature Reserve [east of Dumbleyung], Western Australia [precise locality withheld for conservation reasons], 25 April 2007, *M. Hislop* 3690 (*holo*: PERTH 07703880; *iso*: CANB, CNS, K, MEL, NSW).

*Leucopogon* sp. Dumbleyung (M. Hislop & F. Hort MH 3239), Western Australian Herbarium, in *Florabase*, https://florabase.dbca.wa.gov.au/ [accessed 2 August 2024].

Erect, open *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 very short hairs < 0.05 mm long. *Leaves* helically arranged, mostly steeply antrorse; apex obtuse to acute, with or without a poorly defined, innocuous mucro, to 0.2 mm long; base mostly cuneate to ± rounded, occasionally attenuate; petiole 0.4–1.0 mm long, adaxial surface hairy, abaxial surface glabrous, margins glabrous or sparsely hairy; lamina mostly narrowly obovate or narrowly elliptic, sometimes very narrowly obtriangular to ± linear where the margins are strongly recurved, 3.0–9.0 mm long, 1.2–2.6 mm wide, discolorous, convex adaxially, the margins variably recurved to revolute, longitudinal axis slightly incurved to slightly recurved; adaxial surface shiny, glabrous or with a few hairs towards the base, venation usually not evident; abaxial surface paler, glabrous, ± matt, with 5–7 primary veins, flat or very shallowly and openly grooved between the veins; margins glabrous. *Inflorescence* axillary, pendulous; axis 1.5–3.1 mm long, 1–2(3)-flowered, with a moderately dense to dense indumentum, terete below the uppermost fertile bract, planoconvex and often ± winged above, terminating in a bud-rudiment; flowers pendulous, pedicellate below the bracteoles with a thick pedicel, 0.5–0.7 mm long. *Fertile bracts* narrowly to broadly ovate, 0.6–1.2 mm long, 0.5–0.6 mm wide, with 2–5 sterile bracts below the lowest fertile bract. *Bracteoles* depressed-ovate to ± orbicular, 0.9–1.1 mm long, 1.0–1.2 mm wide, obtuse to subacute, obscurely keeled, not or very shortly mucronate; abaxial surface glabrous, not or scarcely striate; margins ciliolate. *Sepals* narrowly ovate, 2.0–2.5 mm long, 1.0–1.2 mm wide, acute or subacute, with or without a short apiculus; abaxial surface glabrous, straw-coloured, sometimes flushed pink in fruit, venation usually obscure, but sometimes the midvein evident towards the apex; adaxial surface with some hairs in the distal half,

glabrous below; margins ciliolate with hairs < 0.05 mm long. *Corolla tube* white, usually narrowly ellipsoid, or sometimes obovoid, longer than the sepals, 2.2–3.7 mm long, 2.0–2.6 mm wide, external surface glabrous, internal surface glabrous, the tissue on either side of the decurrent filament bases raised into longitudinal ridges that are lower than or of ± equal elevation to the filament bases themselves. *Corolla lobes* white, shorter than to longer than the tube, 2.2–3.3 mm long, 0.8–1.3 mm wide at base, erect in the basal 1/3–1/2 of their length and then spreading and revolute to partially coiled, external surface glabrous, internal surface with a dense, white indumentum of flattened, twisted and ornamented hairs. *Anthers* fully exserted from corolla tube, 1.0–1.7 mm long, shallowly emarginate, not obscured by corolla lobe hairs. *Filaments* terete, 0.8–1.2 mm long, attached to the anther 2/3–3/4 above anther base, adnate to the tube just below the sinuses. *Nectary* annular, 0.3–0.4 mm long, glabrous, lobed. *Ovary* narrowly ellipsoid to ovoid, 0.8–1.2 mm long, 0.5–0.6 mm wide, glabrous, 5-locular, very dark green to ± black. *Style* 2.7–4.5 mm long, 0.15–0.2 mm wide, glabrous and smooth, exserted from the corolla tube beyond the erect corolla lobe bases, tapering smoothly from ovary apex; stigma expanded. *Fruit* very narrowly ellipsoid to ± cylindrical, 3.3–4.0 mm long, 1.2–1.4 mm wide, much longer than the sepals, circular in transverse section, gynophore absent; surface glabrous, rugose at maturity (mesocarp well-developed), with mostly longitudinally aligned ridges and grooves; apex rounded but with narrow shoulders; style mostly shed before maturity. (Figure 8)

*Diagnostic characters*. Within the *S. pendula* group distinguished by the following character combination: leaves mostly steeply antrorse, usually narrowly obovate or narrowly elliptic, sometimes very narrowly obtriangular to ± linear where the margins are strongly recurved, convex adaxially with the margins variably recurved to revolute, leaf apices with or without a poorly defined, innocuous mucro, to 0.2 mm long; inflorescences pendulous, 1–2(3)-flowered; sepals glabrous, acute or subacute, with or without a short apiculus; corolla white; corolla tube longer than the sepals, shorter than to longer than the lobes, internal surface glabrous, raised into longitudinal ridges on either side of the decurrent filament bases that are lower than or of ± equal elevation to the filament bases themselves; ovary 5-locular, glabrous; style glabrous and smooth, 0.15–0.2 mm wide; stigma expanded; fruit very narrowly ellipsoid to ± cylindrical, rugose, gynophore absent.

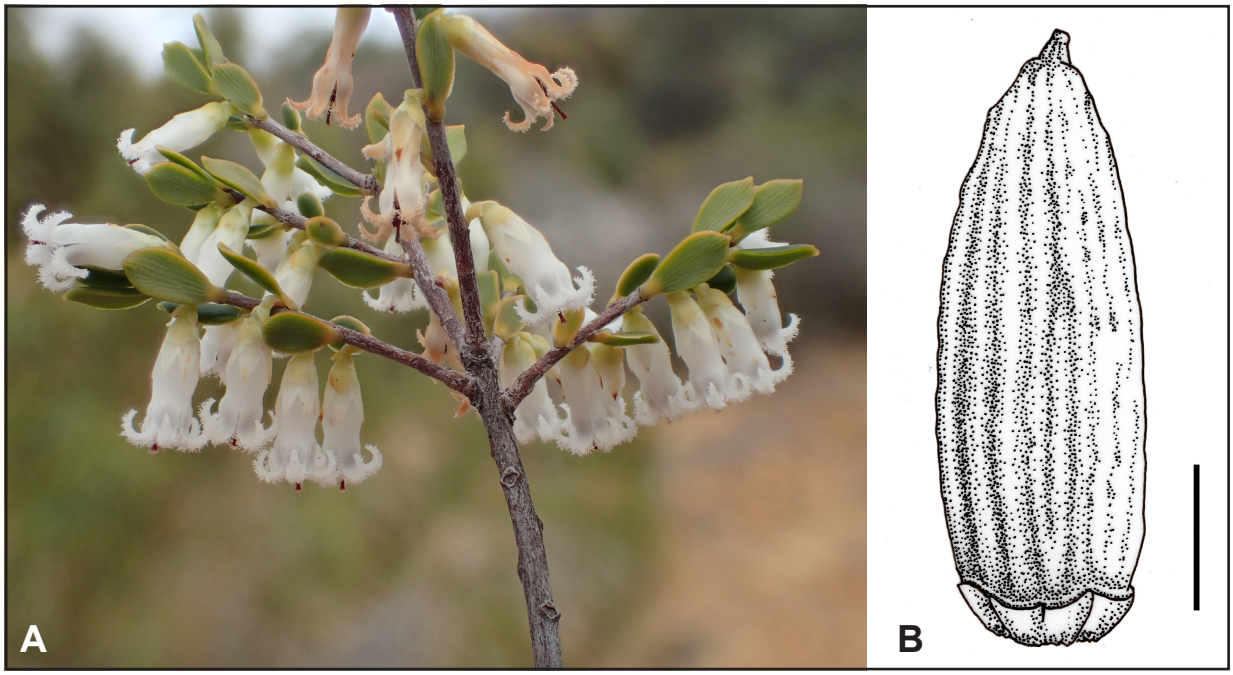


**Figure 8.** *Styphelia tarinensis*. A – flowering branchlet *in situ*; B – fruit. Scale bar = 1 mm. Voucher *M. Hislop* 3654 (B). Drawing by Skye Coffey. Photograph by Jolanda Keeble (unvouchered).

*Other specimens examined*. WESTERN AUSTRALIA [localities withheld for conservation reasons]: 7 Oct. 1997, *E.A. Brown* 97/225 *& G. Taaffe* (NSW, NY, PERTH, UNSW); 21 Apr. 2014, *G. Byrne* 5074 (PERTH); 25 May 2004, *M. Hislop & F. Hort* MH 3239 (CANB, K, NSW, PERTH); 25 May 2004, *M. Hislop & F. Hort* MH 3242 (PERTH); 7 Oct. 2006, *M. Hislop* 3654 (CNS, PERTH); 26 Apr. 2015, *M. Hislop* 4396 (PERTH); 29 June 2015, *M. Hislop* 4432 (PERTH); 12 Apr. 2018, *M. Hislop* 4748 (PERTH); 5 May 1999, *G.J. Keighery & N. Gibson* 5566 (PERTH); 19 Mar. 1970, *M.D. Tindale* 179 *& B.R. Maslin* (NSW, PERTH).

*Distribution and habitat*. Narrowly distributed in the Tarin Rock area, in the far west of the Mallee bioregion. Occurs in heath or open mallee woodland in sandy soils over laterite.

*Phenology*. Peak flowering is between April and June. Mature fruit has been collected in October but is also likely to be present in September and November. A collection from late June also has fruit close to maturity which probably indicates that flowering may begin in the late summer–early autumn period if sufficient moisture is available.

*Etymology*. From the place name Tarin Rock and the Latin *-ensis* (native of).

*Conservation status*. Recently listed as Priority Two under Conservation Codes for Western Australian Flora (Western Australian Herbarium 1998–), as *Leucopogon* sp. Dumbleyung (M. Hislop & F. Hort MH 3239). Although often locally common, *S. tarinensis* is a range-restricted species which is currently known to occur in three nature reserves and at one roadside locality.

*Affinities*. In gross morphology *S. tarinensis* is very similar to *S. pendula*. When fruiting the two species are easily separated, with *S. tarinensis* having a narrowly ellipsoid to ± cylindrical fruit compared to the narrowly obovoid fruit of *S. pendula*. Flowering specimens may be distinguished by differences in the inflorescence axis indumentum (moderately to densely hairy in *S. tarinensis*, *cf.* glabrous to sparsely hairy in *S. pendula*) and in the detail of the style and stigma. In *S. tarinensis* the stigma is noticeably expanded, while in *S. pendula* it is completely filiform. And whereas the style base of *S. tarinensis* is smoothly attenuated from the ovary apex and about 0.15–0.2 mm wide, in *S. pendula* it is more abruptly differentiated from the ovary and only *c.* 0.1 mm wide. There is another difference in the shape of the corolla tube: usually narrowly ellipsoid or sometimes obovoid in *S. tarinensis*, obovoid, broadly obovoid or ± obconic in *S. pendula*. Current records indicate that the closest that *S. tarinensis* and *S. pendula* approach each other is about 150 km.

## Acknowledgements

I would like to thank the following people for their help in the production of this paper: Skye Coffey and Hung Ky Nguyen for the fine illustrations, Jolanda Keeble for the images of *S. altivallis* and *S. tarinensis*, Kevin Thiele for the image of *S. speciosa*, Neil Gibson for his advice in regard to the type of *L. pendulus* var. *robustus* and to Kelly Shepherd for the important task of formatting the images to best effect. I would also like to thank Ben Anderson who in his editorial role made several suggestions that led to significant textural improvements.

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