

The taxonomy of the *Styphelia corynocarpa* subgroup (Ericaceae: Epacridoideae: Styphelieae)

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Abstract

Hislop, M. The taxonomy of the *Styphelia corynocarpa* subgroup (Ericaceae: Epacridoideae: Styphelieae). *Nuytsia* 34: 139–155 (2023). A small subgroup within the heterogeneous *Styphelia* Sm. Group X is recognised based on morphological and molecular data. A morphological synopsis of, and key to, the subgroup are provided, and all four member species are described and illustrated. Three of the four species are described as new, *S. anomala* Hislop, *S. cylindrica* Hislop and *S. planiconvexa* Hislop, while *S. corynocarpa* (Sond.) F.Muell. is given an updated description. *Styphelia anomala* has Western Australian conservation listing as Priority two.

Introduction

Group X is the most morphologically diverse of the 12 phylogenetic groups resolved in *Styphelia* Sm. by Punte-Lelièvre *et al.* (2016). In a recent paper Hislop and Nguyen (2022) noted that the Western Australian members of the group comprised several morphological elements that corresponded with well-supported terminal subclades in Group X, while acknowledging that some lower branch values within the group had little or no support. In that paper they treated one such subclade, to which they gave the informal name the *Styphelia tamminensis* subgroup. Another well-defined, but much smaller subgroup (the *Styphelia corynocarpa* subgroup) is reviewed here: it consists of *S. corynocarpa* (Sond.) F.Muell. and three previously undescribed species, one of which has long been confused with *S. crassifolia* (Sond.) F.Muell.

Methods

This study was based on an examination of dried specimens housed at the Western Australian Herbarium (PERTH), 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 & Nguyen 2022). Sepal colour is based on observations of dried specimens.

Bioregions referred to in the text follow *Interim Biogeographic Regionalisation for Australia* (IBRA) v. 7 (Department of Climate Change, Energy, the Environment and Water 2021).

Taxonomy of the *Styphelia corynocarpa* subgroup

Two of the species treated here, *S. corynocarpa* and *S. cylindrica* Hislop, were included in the phylogeny published in Puente-Lelièvre *et al.* (2016), the latter as *Leucopogon crassifolius* Sond. They were shown to have a very strong sister relationship but were placed within a larger subclade for which there was very weak basal support. The placement of the other two included here in the subgroup, *S. anomala* Hislop and *S. planiconvexa* Hislop, is based on extrapolation of critical morphological features.

Morphological synopsis of subgroup

Leaves helically arranged, long-petiolate; apex non-mucronate; lamina plano-convex or concave adaxially, narrowly obovate or narrowly elliptic, gently incurved to gently recurved; abaxial surface glabrous, openly grooved. *Inflorescences* arising from the axils of regular, mature leaves, or from bract-like, 'early seasonal leaves' (*sensu* Powell *et al.* 1997: 16) that are strongly dimorphic from regular leaves (in *S. anomala*), 1–6-flowered; flowers sessile or pedicellate (in *S. cylindrica*); axis erect, either terminating in a bud-rudiment or at the flower and the bud-rudiment absent (in *S. anomala*). *Sepals* not striate, glabrous abaxially, longer than to occasionally slightly shorter than the corolla tube. *Corolla* white or cream-coloured. *Corolla tube* usually shorter than the lobes, internal surface glabrous or with a narrow band of hairs at the apex, external surface glabrous. *Corolla lobes* erect in basal 1/2–2/3 and then spreading and recurved; outer surface glabrous; inner surface densely hairy with \pm terete and ornamented hairs. *Anthers* either partially exerted from the tube by at least 3/4 of their length or fully but very shortly exerted. *Filaments* terete, attached to the anther at least 3/4 above anther base, usually just below the apex, adnate to the corolla tube just below the sinuses. *Nectaries* either annular and lobed with deep longitudinal grooves below the sinuses, or partite. *Ovary* glabrous, 5-locular, pale to mid or occasionally dark green or straw-coloured to pale brown. *Style* \pm scabrous in the upper half, exerted from the corolla tube but not exerted beyond the erect bases of the corolla lobes, abruptly differentiated from the obtuse or subacute ovary apex, discontinuous with ovarian tissue and often arising from a depression at the ovary apex that tightly envelops, but is free from, the style base (i.e. the base is countersunk below the level of the ovary apex). *Drupe* \pm dry (mesocarp not, or poorly developed), with a well-defined gynophore, cylindrical, narrowly ellipsoid, narrowly ovoid or narrowly obovoid in shape, always much longer than the sepals.

Elsewhere within Group X, members of the *S. corynocarpa* subgroup are probably most likely to be confused with some of the narrower-leaved species from the *S. tamminensis* subgroup. Morphological features that can be used to distinguish between the two subgroups are as follows: internal corolla tube glabrous or with a sparse, narrow band of hairs at the apex (*cf.* always variously hairy in the upper half in the *S. tamminensis* subgroup); corolla lobes erect in basal 1/2–2/3 and then spreading and recurved (*cf.* usually spreading from close to the base); anthers either fully exerted from corolla tube or partially exerted by at least 3/4 of their length on filaments at least 0.5 mm long (*cf.* anthers wholly included or occasionally with just the tips exerted, the filaments very short to 0.2 mm long); style exerted from the corolla tube, ovary 5-locular (*cf.* style included, ovary 3-locular).

The morphology of two of the three taxa that grouped very weakly with *S. corynocarpa* + *S. cylindrica* in the phylogenetic tree of Puente-Lelièvre *et al.* (2016) give some limited support to a relationship with the *S. corynocarpa* subgroup. *Leucopogon* sp. Bremer Bay (K.R. Newbey 4667) and *L.* sp. Mount Heywood (M.A. Burgman 1211) have the long-petiolate leaves that are a feature of the subgroup, but their laminas are short and broad (often wider than long) and recurved along

their longitudinal axes, quite unlike those of the subgroup members. Both phrase-named taxa have the relatively uncommon character of recurved sepals and are therefore similar in that respect to *S. cylindrica*. The relative lengths of sepal to corolla tube, corolla tube to corolla lobes and style to corolla tube between the two phrase-named taxa and the *S. corynocarpa* subgroup are all quite comparable. So too is the position of the anthers relative to the corolla tube and stigma. *Leucopogon* sp. Bremer Bay shares with *S. anomala* an inflorescence axis that terminates at the flower rather than a bud-rudiment, although other aspects of the inflorescence structure are dissimilar. In terms of the taxonomically important fruit character, whereas members of the *S. corynocarpa* subgroup have relatively long fruit, always much longer than the sepals, the fruit of both *L.* sp. Bremer Bay and *L.* sp. Mount Heywood varies from a little shorter than, to a little longer than, the sepals.

The third taxon that grouped weakly with *S. corynocarpa* + *S. cylindrica* in the larger subclade is the informal phrase-name *Leucopogon* sp. ‘Koolyanobbing’. This entity is known from a single collection from a remote part of the Coolgardie bioregion. Its morphology is closest to that of *L.* sp. Jaurdi (M. Hislop 4172) although differing in several potentially significant respects. It likely represents a distinct species but with so little material available it is difficult to properly evaluate its status. The placement of *L.* sp. ‘Koolyanobbing’ in this subclade seems particularly problematic as in most respects its morphology closely resembles that seen in the members of the strongly supported subclade that includes *S. marginata* (W.Fitzg.) Hislop, Crayn & Puente-Lel. This apparent anomaly exemplifies the need for further genetic sampling of taxa currently referred to Group X in order to better understand relationships within that diverse grouping.

Key to species of the *S. corynocarpa* subgroup

1. Inflorescences strictly single-flowered
 2. Inflorescences arising from the axils of bract-like early seasonal leaves that are strongly dimorphic from regular leaves; inflorescence axis terminates at the flower, no bud-rudiment present; inflorescence axis bare below the bracteoles, bracts absent; drupe cylindrical to very narrowly obovoid, sometimes \pm curved, 3.8–4.2 mm long (restricted: NE of Lake King) ***S. anomala***
 - 2: Inflorescence arising from the axils of regular, mature leaves; inflorescence axis terminating in a bud-rudiment; inflorescence axis with a fertile bract subtending the bracteoles and with 3 or 4 sterile bracts on the axis below; drupe narrowly ellipsoid or oblongoid, 2.7–3.3 mm long (widespread: SE of Quairading–S of Bodallin–NW of Cascade–N of Borden) ***S. planiconvexa***
- 1: Inflorescences multi-flowered, or a mixture of multi- and single-flowered, always some multi-flowered inflorescences present
 3. Sepals 1.7–2.4 mm long, distinctly recurved distally; flowers with a short, thick pedicel, to 0.5 mm long, present below the bracteoles; drupe cylindrical or sometimes very narrowly ovoid, often \pm curved, 0.8–1.1 mm wide (W Fitzgerald River N.P.–Israelite Bay and as far inland as the Scaddan area) ***S. cylindrica***
 - 3: Sepals 2.3–3.0 mm long, appressed to the corolla; flowers sessile below the bracteoles; drupe narrowly obovoid or claviform, 2.3–3.0 mm wide (W Stirling Range N.P.–W Fitzgerald River N.P.–Manypeaks area) ***S. corynocarpa***

Species of the *S. corynocarpa* subgroup

Styphelia anomala Hislop, *sp. nov.*

Typus: north-east of Lake King, Western Australia [precise locality withheld for conservation reasons], 8 October 2006, M. Hislop 3659 (*holo*: PERTH 07802137; *iso*: CANB, CNS, MEL).

Leucopogon sp. Varley (M. Hislop 3659), Western Australian Herbarium, in *Florabase*, <https://florabase.dpaw.wa.gov.au/> [accessed 3 February 2023].

Erect *shrubs*, to *c.* 80 cm high and 40 cm wide, single-stemmed at ground level with a fire-sensitive rootstock. Young *branchlets* with a sparse indumentum of very short hairs, < 0.05 mm long. *Leaves* helically arranged, steeply antrorse; apex obtuse to subacute; base attenuate or cuneate; petiole well-defined, 0.5–1.5 mm long, adaxial surface sparsely hairy or ± glabrous, abaxial surface and margins glabrous; lamina usually narrowly obovate to narrowly elliptic, occasionally elliptic, 2.0–4.8 mm long, 1.0–1.5 mm wide, slightly discolorous, thick, usually planoconvex or sometimes the adaxial surface concave, longitudinal axis straight to gently incurved; adaxial surface shiny, glabrous, the venation not evident; abaxial surface paler, shiny, glabrous, with 3 prominent primary veins, shallowly and openly grooved between the veins; margins glabrous. *Inflorescence* axillary, erect, very reduced, arising from axils of bract-like, ‘early seasonal leaves’ that are strongly dimorphic from regular leaves; axis 0.2–0.4 mm long, 1-flowered, terminating at the flower, bud-rudiment absent; inflorescence *bracts* absent. *Bracteoles* broadly ovate, 1.0–1.4 mm long, 0.8–1.0 mm wide, keeled, obtuse to acute; abaxial surface glabrous; margins minutely ciliate. *Sepals* ovate or narrowly ovate, 2.2–2.7 mm long, 1.0–1.2 mm wide, obtuse to acute, the apex appressed to the corolla; abaxial surface glabrous, straw-coloured, the mid-vein usually well-defined and often 1 or 2 veins on either side also evident; adaxial surface with a discrete patch of hairs at the base and with some hairs in the upper half; margins minutely ciliate with hairs < 0.05 mm long or ± glabrous. *Corolla tube* cream-coloured, obovoid, slightly shorter than to slightly longer than the sepals, 1.8–2.2 mm long, 1.4–1.7 mm wide, glabrous externally, internal surface with a narrow transverse band of hairs at the apex, glabrous below. *Corolla lobes* cream-coloured, *c.* equal to or longer than the tube, 2.0–3.0 mm long, 0.6–0.8 mm wide at base, erect in basal 1/2–2/3 and then spreading and recurved, glabrous externally, internal surface with a dense indumentum of ± terete, distinctly ornamented hairs. *Anthers* partially exerted from the tube by 3/4–7/8 of their length, 0.6–0.8 mm long, apex ± emarginate. *Filaments* terete, 0.5–0.6 mm long, attached to anther just below the apex, adnate to tube just below the sinuses. *Nectary* either annular and lobed with deep longitudinal grooves below the sinuses, or clearly partite with scales 0.3–0.4 mm long, 0.3–0.3 mm wide, glabrous with the upper margins minutely papillose. *Ovary* obovoid to ellipsoid, 0.6–0.7 mm long, 0.4–0.5 mm wide, glabrous, 5-locular, pale to mid green. *Style* green below, straw-coloured above, abruptly differentiated from ovary apex, 1.8–2.3 mm long, slightly scabrous in the upper half, shortly exerted from the corolla tube, but not beyond the erect bases of the corolla lobes, discontinuous with ovarian tissue and arising from a depression at the ovary apex that tightly envelops, but is free from, the style base (i.e. the base is countersunk below the level of the ovary apex); stigma barely expanded. *Fruit* cylindrical to very narrowly obovoid, sometimes ± curved, 3.8–4.2 mm long, 1.0–1.2 mm wide (measurements based on very limited material), much longer than the sepals, circular in transverse section, with a well-defined gynophore; surface glabrous, shiny, green to mid-brown, smooth (mesocarp poorly developed), with pale longitudinal lines; apex obtuse; style shed before maturity. (Figure 1)

Diagnostic characters. Within the *S. corynocarpa* subgroup, distinguished by the following character combination: leaf lamina thick, usually plano-convex, or less often concave adaxially, with 3 promi-

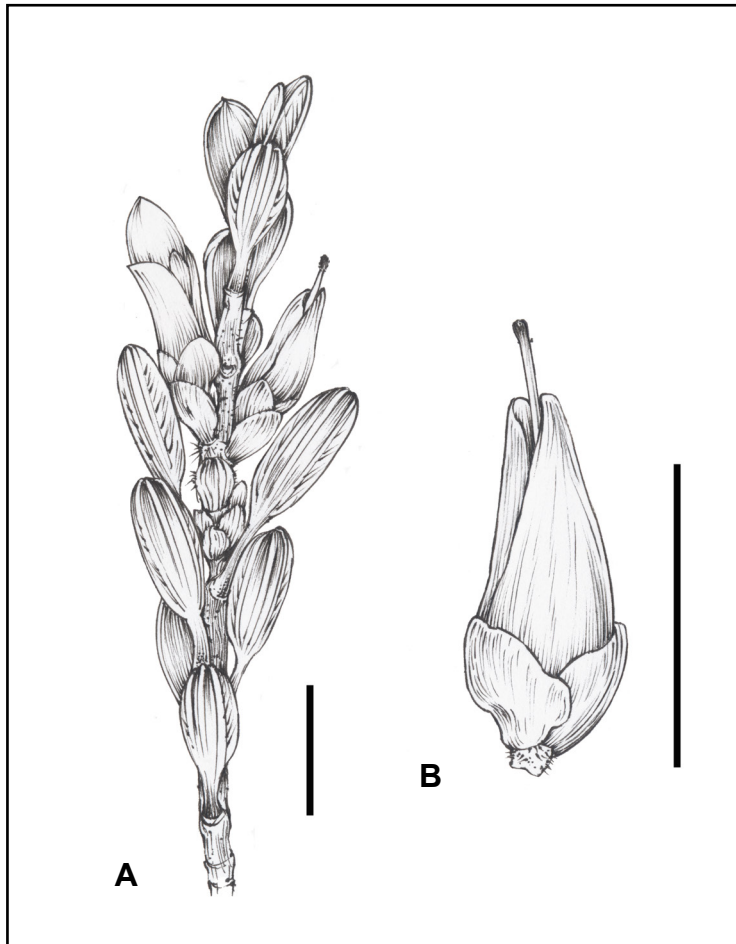


Figure 1. *Styphelia anomala*. A – flowering branchlet, showing inflorescences arising from bract-like, early seasonal leaves; B – inflorescence, showing bracteoles and sepals and the absence of bracts and bud rudiment. Scale bars = 2 mm. Voucher *M. Hislop* 3659. Drawings by Hung Ky Nguyen.

ment abaxial veins, shallowly and openly grooved between the veins; inflorescence strictly arising from the axils of bract-like, early seasonal leaves, axis 0.2–0.4 mm long, inflorescence bracts absent below the bracteoles, terminating at the flower, bud-rudiment absent; sepals appressed to the corolla; fruit cylindrical to very narrowly obovoid, sometimes \pm curved, 3.8–4.2 mm long, 1.0–1.2 mm wide.

Other specimen examined. WESTERN AUSTRALIA: [locality withheld for conservation reasons] 14 Nov. 1979, *K.R. Newbey* 6540 (PERTH).

Distribution and habitat. Currently only known from a small area north-east of Lake King in the central portion of the Mallee bioregion, where it grows in sandy loam over laterite. Associated vegetation is low heathland.

Phenology. The two collections of the species at the Western Australian Herbarium are more or less in full flower, one in October, the other in November. Both also have a few fruit present.

Etymology. From the Latin *anomalus* (anomalous, abnormal), a reference to the highly unusual configuration of the inflorescence.

Conservation status. Currently listed as Priority Two (Western Australian Herbarium 1998–) under Conservation Codes for Western Australian Flora under the name *Leucopogon* sp. Varley (M. Hislop 3659). The species is only known from two records north-east of Lake King, one of which is just within the boundary of Frank Hann National Park. Because this is a remote and difficult-to-access part of the state, and the preferred habitat of the species is a common one in the area, there is a strong likelihood that further populations will come to light over time. Still, it does seem very unlikely that it is widely distributed.

Affinities. *Styphelia anomala* was not included in the phylogeny of Puente-Lelièvre *et al.* (2016), but aside from the anomalous inflorescence features, other floral and foliar characteristics strongly indicate that its affinities lie with members of the *S. corynocarpa* subgroup, especially *S. cylindrica*.

Two aspects of the inflorescence structure of *S. anomala* are unusual in the *Styphelieae* generally. While some species will produce inflorescences from the axils of ‘early seasonal leaves’ (*sensu* Powell *et al.* 1997: 16) as well as those of regular, mature leaves, *S. anomala* is the only example known to the author where inflorescences are restricted to the former. The other anomalous feature is that the single-flowered inflorescence axis terminates at the flower, with no bud-rudiment present, and no inflorescence bracts below the two bracteoles. In this regard it is similar to species from the *S. blepharolepis* group (or Group XI *sensu* Puente-Lelièvre *et al.* 2016), although in that group multiflowered inflorescences co-occur with single-flowered, and the former do have fertile bracts and terminate in a bud-rudiment. These inflorescence features readily distinguish *S. anomala* from its congeners in the *S. corynocarpa* subgroup, which all have regular inflorescences with fertile and sterile bracts and terminate with a bud-rudiment.

The distribution of *S. anomala* lies within that of the widespread *S. planiconvexa* Hislop, described below. The two species share a consistently single-flowered inflorescence and could therefore be confused. Aside from the distinction in inflorescence structure as explained above, the fruit size and shape of the two species is significantly different: cylindrical to very narrowly obovoid, sometimes \pm curved and 3.8–4.2 mm long in *S. anomala*, *cf.* narrowly ellipsoid or oblongoid, 2.7–3.3 mm long in *S. planiconvexa*. And whereas the latter species has a red or pink style and frequently pink-flushed sepals, in *S. anomala* the style is straw-coloured and green and the sepals straw-coloured.

The mostly cylindrical fruit of *S. anomala* is very similar to that of *S. cylindrica* and it seems likely that the two are each other’s closest relative. In addition to the different inflorescence arrangement, *S. anomala* can be readily distinguished by sepal posture: appressed to the corolla in *S. anomala* *cf.* prominently recurved in the upper half in *S. cylindrica*. The distribution of *S. anomala* lies disjunctly to the north of that of *S. cylindrica*, with the northernmost population of the latter occurring about 85 km distant from the nearest population of *S. anomala*, based on current data.

Styphelia corynocarpa (Sond.) F.Muell., *Syst. Census Austral. Pl.* 107 (1882); *Leucopogon corynocarpus* Sond. in J.G.C. Lehmann, *Pl. Preiss.* 1(3): 322 (1845). *Typus*: In Novae Hollandiae ora merid.-occid. prope promontorium Cape Riche [south coast of Western Australia], Nov. 1840, *L. Preiss* 379 (ex parte) (syn: LD 1803361 image!, MEL 1510198B!).

Erect, open *shrubs*, to *c.* 150 cm high and 80 cm 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, steeply antrorse; apex obtuse to acute, if acute terminating in blunt callus tip to 0.2 mm long; base usually attenuate, sometimes \pm cuneate; petiole well-defined, 0.8–2.0 mm long, adaxial surface shortly hairy, abaxial surface glabrous, margins glabrous or sparsely hairy; lamina narrowly obovate to narrowly elliptic, 4.0–13.0 mm long, 1.0–2.2 mm wide, discolorous, concave adaxially, longitudinal axis gently incurved to gently recurved; adaxial surface shiny, glabrous or with a few hairs towards the base, the venation not evident or appearing as indistinct sunken lines in the lower half; abaxial surface paler, shiny, glabrous, with 3–5 prominent, primary veins, shallowly to quite deeply and openly grooved between the veins; margins \pm glabrous or with minute, coarse, antrorse hairs, < 0.05 mm long. *Inflorescence* axillary, erect, arising from axils of regular, mature leaves; axis 2.0–8.0 mm long, (1)2–5(6)-flowered, \pm terete towards the base, angular above, with a moderately dense indumentum of short hairs, terminating in a bud-rudiment; flowers erect, sessile. *Fertile bracts* variable, from depressed-ovate to ovate, 0.7–1.2 mm long, 0.7–1.0 mm wide, subtended by 3–5 sterile bracts. *Bracteoles* ovate, broadly ovate to \pm orbicular, 1.2–1.5 mm long, 1.0–1.2 mm wide, keeled, sometimes rather obscurely, obtuse to subacute; abaxial surface glabrous; margins ciliolate. *Sepals* ovate to narrowly ovate, 2.3–3.0 mm long, 1.0–1.3 mm wide, obtuse to acute, the apex appressed to the corolla; abaxial surface glabrous, straw-coloured, the mid-vein and sometimes 2 or 3 either side usually evident; adaxial surface with discrete patches of hair towards the base and apex; margins ciliolate with hairs < 0.05 mm long or \pm glabrous. *Corolla tube* white, but usually drying dark reddish-brown, broadly obovoid or obovoid, shorter than the sepals, 1.4–1.8 mm long, 1.3–1.7 mm wide, glabrous externally and internally. *Corolla lobes* white, longer than the tube, 2.2–2.8 mm long, 0.7–0.9 mm wide at base, erect in the lower 1/2–2/3 and then spreading and \pm recurved, glabrous externally, internal surfaces with a dense indumentum of \pm terete, distinctly ornamented hairs. *Anthers* either partially exerted from the tube by at least 7/8 of their length or \pm fully exerted, 0.6–1.0 mm long, apex \pm emarginate. *Filaments* terete, 0.5–0.6 mm long, attached to anther just below the apex, adnate to tube just below the sinuses. *Nectary* very thick, either annular and lobed with deep longitudinal grooves below the sinuses, or \pm partite with scales 0.3–0.4 mm long, 0.2–0.3 mm wide, glabrous with the upper margins papillose. *Ovary* obovoid to broadly obovoid, 0.5–0.7 mm long, 0.5–0.7 mm wide, glabrous, 5-locular, mid green or pale brown. *Style* straw-coloured, abruptly differentiated from the ovary apex, 1.6–2.1 mm long, scabrous at least in the upper half, shortly exerted from the corolla tube, but not beyond the erect bases of the corolla lobes, discontinuous with ovarian tissue and usually arising from a depression at the ovary apex that tightly envelops, but is free from, the style base, or less often apparently arising directly from the ovary apex; stigma slightly expanded. *Fruit* narrowly obovoid or claviform, 4.0–6.2 mm long, 2.3–3.0 mm wide, much longer than the sepals, circular in transverse section, with a well-defined gynophore; surface glabrous, shiny, brown or dark green, \pm dry, smooth (mesocarp poorly developed), with pale longitudinal lines; apex obtuse to subacute; style shed before maturity. (Figures 2A, 3A)

Other specimens examined. WESTERN AUSTRALIA: Hume Peak, Stirling Range National Park, 6 Oct. 1995, *S. Barrett* 589 (PERTH); Formby South Rd, 2.1 km W of junction with Chester Pass Rd, Stirling Range National Park, 24 Oct. 1997, *E.A. Brown* 97/411, *P.G. Wilson & N. Lam* (NSW, PERTH); Along Sandlewood Rd [S of Borden], 11 Oct. 2013, *G. Byrne* 4912 (PERTH); [intersection] Millers Point Rd and Bremer Bay Rd, 8 Nov. 1978, *R.J. Cranfield* 1107 (CANB, PERTH); Wellstead, c. 95 km NE of Albany, 8 Nov. 1978, *R.J. Cranfield* 1115 (CANB, PERTH); 4.9 km E along Chillinup Rd from junction with Kojaneerup West Rd [South Stirling], 20 Nov. 2013, *R. Davis & M. Davis* RD 12388 (PERTH); 5½ miles [c. 8.8 km] E of Manypeaks, 10 Dec. 1964, *A.S. George* 6490 (PERTH); Fitzgerald River National Park, 1–2 km N of Quaalu Homestead, 19 Oct. 1991, *W. Greuter* 22976 (PERTH); mid NW slopes of Barnett Peak, Stirling Range National Park, 2 June 2001, *M. Hislop* 2215 (PERTH); Hamilla Hill Reserve [E of Cranbrook], central upland, 30 Dec. 2001, *M. Hislop* 2524 (PERTH); Moorialup Reserve, off Moorialup Rd, 4 km E of Takalarup Rd, E of Porongurup, 16 Nov. 2003,

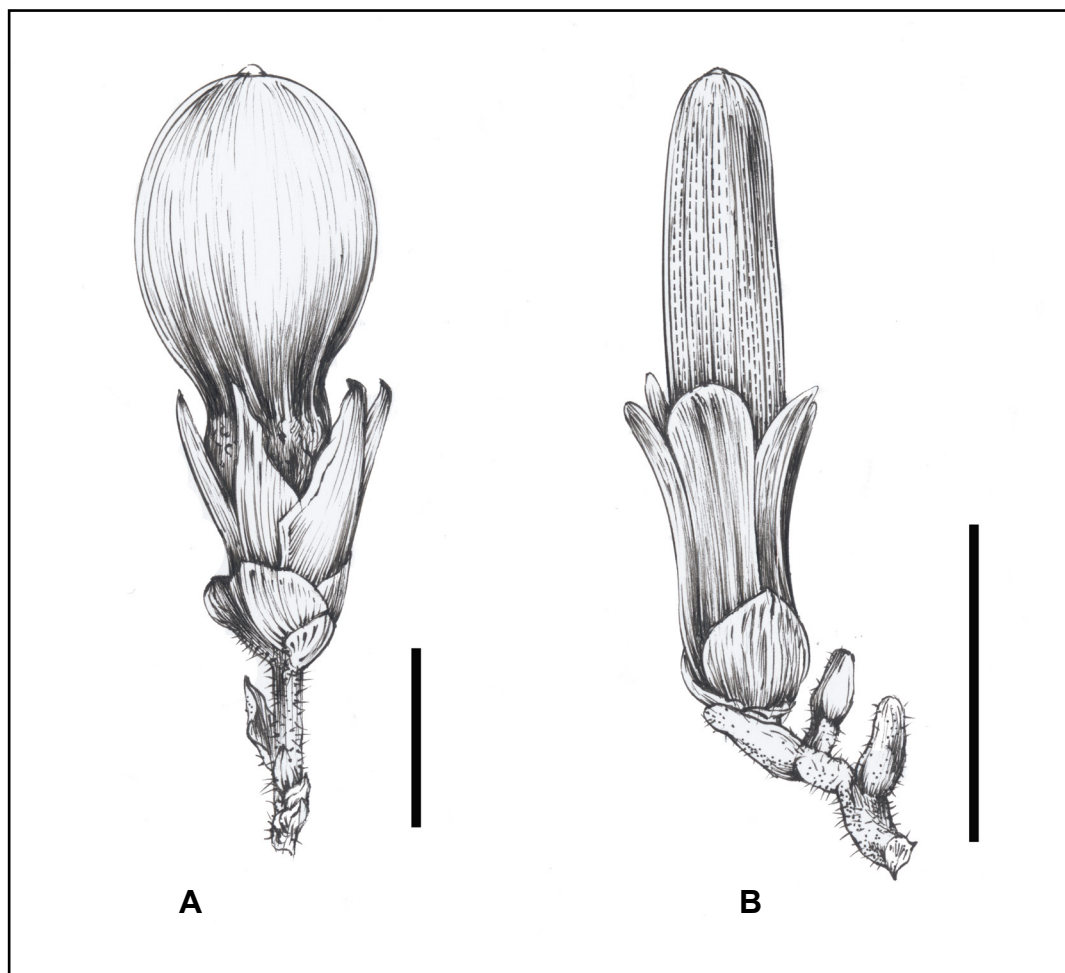


Figure 2. A – *Styphelia corynocarpa*, fruiting inflorescence; B – *Styphelia cylindrica*, fruiting inflorescence. Scale bars = 2 mm. Vouchers R.J. Hnatiuk 761411 (A), M. Hislop 2289 (B). Drawings by Hung Ky Nguyen.

M. Hislop 3085 (CNS, PERTH); c. 10 km S of South Bluff, Stirling Range National Park, 28 Oct. 1976, R.J. Hnatiuk 761411 (PERTH); Takenup, Kalgan River, 10 Nov. 1982, G.J. Keighery 5898 (PERTH); quadrat 3, Reserve 13240, Cheynes Bay, N of Cape Riche, 24 Oct. 1996, J.W. Mercer 54 (PERTH); 0.8 km W of Mt Maxwell turnoff [Fitzgerald River National Park], 2 Aug. 1986, J.M. Powell 2396 (HO, K, NSW, PERTH); Mettlers Lake Rd, SW of Wellstead, 3 Aug. 1986, J.M. Powell 2431 (HO, K, NSW, PERTH); Pillenurup track, 1–2 km W from Gold Holes, Stirling Range National Park, 30 Aug. 1986, J.M. Powell 2728B (NSW, PERTH); junction of Devils Creek Rd and track to Mt Maxwell, 17 Nov. 1985 J.M. Powell 3338 (NSW, NY, PERTH); 0.4 km N of Quaalup Homestead on Gairdner Rd [Fitzgerald River National Park], 16 July 2010, C. Puente-Lelievre & E.A. Brown CPL 97 (NSW, PERTH); Murray Rd, halfway between Gordon Inlet Rd and Devils Creek Rd [NNW of Bremer Bay], 23 Oct. 1982, A. Strid 20949 (PERTH).

Distribution and habitat. Distributed from the western end of the Stirling Range National Park to western parts of the Fitzgerald River National Park, and south to the Manypeaks area; in the Esperance

Plains and far southern tip of the Jarrah Forest bioregions. Grows in deep sand or in sand over laterite or quartzite, often high in the landscape. Associated vegetation is mostly heath or open mallee woodland.

Phenology. Peak flowering is between October and December, but collections with some flowers present have been made in all seasons of the year. The conspicuous, shiny fruit are apparently persistent on plants for many months and are frequently present on flowering collections.

Conservation status. Although not having a particularly wide distribution, the species is often locally common and is well represented on the conservation estate. No conservation listing is recommended here.

Styphelia cylindrica Hislop, *sp. nov.*

Typus: 28.3 km from Mylies Beach turnoff, 10.5 km from Telegraph track on Hamersley Drive, Fitzgerald River National Park, Western Australia, 14 July 1982, J.M. Powell 1824 (*holo:* PERTH 02953897!; *iso:* CANB 310798 *n.v.*, K *n.v.*, L *n.v.*, MEL 0629359 *n.v.*, NSW 406098 *n.v.*).

Styphelia sp. South Coast (J.M. Powell 3374), Western Australian Herbarium, in *Florabase*, <https://florabase.dpaw.wa.gov.au/> [accessed 3 February 2023].

Leucopogon crassifolius auct. non Sond.: G. Bentham, *Fl. Austral.* 4: 224 (1868); W.E. Blackall & B.J. Grieve, *How to Know W. Austral. Wildfl.* IIIB: 344, 349 (1981); G. Paczkowska & A.R. Chapman, *West. Aust. Fl.: Descr. Cat.:* 237 (2000); Western Australian Herbarium, in *Florabase*, <https://florabase.dpaw.wa.gov.au/> [before March 2018].

Erect, open *shrubs*, to c. 120 cm high and 80 cm 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, steeply antrorse; apex obtuse to acute, if acute terminating in a blunt callus tip to 0.2 mm long; base usually attenuate, occasionally \pm cuneate; petiole well-defined, 0.4–1.8 mm long, adaxial surface shortly hairy, abaxial surface and margins glabrous or occasionally the margins with a few hairs; lamina narrowly obovate to narrowly elliptic, 2.5–5.5 mm long, 0.8–1.8 mm wide, discolorous, thick, either concave adaxially or plano-convex, longitudinal axis gently incurved to gently recurved; adaxial surface shiny, glabrous or with a few hairs towards the base, the venation not evident; abaxial surface paler, shiny, glabrous, with 3 prominent, primary veins, shallowly to deeply and openly grooved between the veins; margins usually glabrous or sometimes with minute, coarse, antrorse hairs, < 0.05 mm long. *Inflorescence* axillary, erect, arising from axils of regular, mature leaves; axis 1.0–4.5 mm long, 1–4-flowered, \pm terete towards the base, bluntly angular above, with a sparse to moderately dense indumentum, terminating in a bud-rudiment; flowers erect, shortly pedicellate below the bracteoles, with a pedicel to 0.5 mm long. *Fertile bracts* ovate or broadly ovate, 0.5–0.8 mm long, 0.4–0.5 mm wide, subtended by 0–2 sterile bracts. *Bracteoles* ovate or broadly ovate, 0.8–1.3 mm long, 0.7–1.0 mm wide, keeled, obtuse; abaxial surface glabrous; margins ciliolate. *Sepals* narrowly ovate to oblong, 1.7–2.4 mm long, 0.6–1.0 mm wide, usually obtuse, less often subacute, distinctly recurved in the upper half; abaxial surface glabrous, straw-coloured, the mid-vein usually well-defined and often 1 or 2 veins on either side also evident; adaxial surface with a discrete patch of hairs at the base and sometimes also with some hairs in the upper half; margins minutely and irregularly ciliolate with hairs < 0.05 mm long or \pm glabrous. *Corolla tube* white to cream-coloured, but usually drying reddish-brown, broadly obovoid or obovoid, shorter than or \pm equal to the sepals, 1.4–1.9 mm long, 1.2–1.6 mm wide, glabrous externally and internally. *Corolla lobes* white to cream-coloured, longer than the tube, 2.3–3.2 mm long, 0.5–0.7 mm wide at base, erect in

basal 1/2–2/3 and then spreading and recurved, glabrous externally, internal surface with a dense indumentum of \pm terete, distinctly ornamented hairs. *Anthers* either partially exerted from the tube by at least 3/4 of their length or sometimes \pm fully exerted, 0.6–0.8 mm long, apex \pm emarginate. *Filaments* terete, 0.5–0.6 mm long, attached to anther just below the apex, adnate to tube just below the sinuses. *Nectary* either annular and \pm lobed with deep longitudinal grooves below the sinuses, or less often clearly partite with scales 0.2–0.4 mm long, 0.2–0.3 mm wide, glabrous with the upper margins papillose. *Ovary* broadly obovoid, less often broadly ellipsoid, 0.5–0.6 mm long, 0.4–0.6 mm wide, glabrous, 5-locular, mid or sometimes dark green. *Style* pale green to straw-coloured, abruptly differentiated from ovary apex, 1.5–2.1 mm long, scabrous at least in the upper half, shortly exerted from the corolla tube, but not beyond the erect bases of the corolla lobes, discontinuous with ovarian tissue and usually arising from a depression at the ovary apex that tightly envelops, but is free from, the style base, or less often apparently arising directly from the ovary apex; stigma distinctly expanded. *Fruit* cylindrical or sometimes very narrowly ovoid, often \pm curved, 3.5–4.5 mm long, 0.8–1.1 mm wide, much longer than the sepals, circular in transverse section, with a well-defined gynophore; surface glabrous, shiny, dark brown or greenish-brown, smooth (mesocarp poorly developed), with pale longitudinal lines; apex obtuse; style shed before maturity. (Figures 2B, 3B)

Diagnostic characters. Within the *S. corynocarpa* subgroup distinguished by the following character combination: leaf lamina thick, either concave adaxially or plano-convex, with 3 prominent, abaxial veins, shallowly to deeply and openly grooved between the veins; inflorescence arising from axils of regular, mature leaves, 1.0–4.5 mm long, 1–4-flowered with bracts present below the bracteoles, terminating in a bud-rudiment; flowers shortly pedicellate below the bracteoles, with a short thick pedicel to 0.5 mm long; sepals distinctly recurved distally; fruit cylindrical or sometimes very narrowly ovoid, 3.5–4.5 mm long, 0.8–1.1 mm wide.

Other specimens examined. WESTERN AUSTRALIA: Ravensthorpe–Hopetoun Rd, 3.2 km N of Hopetoun Post Office, just N of cemetery, 18 Oct. 1997, *E.A. Brown* 97/319, *P.G. Wilson & N. Lam* (CHR, NSW, NY, PERTH, UNSW); 8.6 km E of Neds Corner Rd on Cascades Rd, 1.3 km S of Cascades Rd, Reserve 36183, Oct. 1984, *M.A. Burgman* 4537 (PERTH); 130 km W of Esperance, next to Rockhole Rd, 5 Nov. 1978, *R.J. Cranfield* 1039 (CANB, PERTH); Munglinup, 7 Nov. 1978, *R.J. Cranfield* 1085 (CANB, K, NSW, PERTH); track to Lucky Bay from Thistle Cove, Cape Le Grand National Park, 7 Oct. 2003, *D.M. Crayn* 660, *A.J. Perkins & K.A. Kron* (NSW, PERTH, WFU); 5 km NE of Esperance to Israelite Bay Rd on road to Mt Ragged, 28 Nov. 1985, *D.B. Foreman* 1304 (AD, CANB, MEL, NSW, PERTH); c. 19 km E of Ravensthorpe on Esperance Rd, 16 Nov. 1998, *M. Hislop* 1208 (CNS, NSW, PERTH); Fitzgerald River National Park, corner Hamersley Inlet Rd and Edwards Point track, 31 Aug. 2001, *M. Hislop* 2289 (CNS, PERTH); Cape Arid National Park, Fisheries Rd, 22.1 km E of park boundary, 18 May 2002, *M. Hislop & F. Hort* MH 2617 (CNS, PERTH); behind Jerdacuttup school, Jerdacuttup, Oct. 1979, *N.S. Lander s.n.* (NSW, PERTH); 100 m SE of Mylies Beach turnoff on Hamersley Drive, Fitzgerald River National Park, W of Hopetoun, 5 Nov. 1996, *B.J. Lepschi & T.R. Lally* BJL 3182 (BRI, CANB, NSW, PERTH); 1.5 km NNW of Hellfire Bay carpark, 1.9 km E of Mt Le Grand summit, 5.9 km W of Lucky Bay campsite, Cape Le Grand National Park, 24 Nov. 2011, *A. Markey & B. Bayliss* NIB 9592 (PERTH); 20 km E of Scaddan on Styles Rd, 11 Sep. 1984, *P. van der Moezel* PGV 464 (PERTH); lower slopes of Frenchman Peak, Cape Le Grand National Park, 18 July 1982, *J.M. Powell* 1864A (CANB, L, NSW, PERTH); track to Diamonds Hill, 2 km N of Israelite Bay track, Cape Arid National Park, 30 July 1986, *J.M. Powell* 2333A (HO, NSW, PERTH); Cape Arid National Park, 1.2 km from W boundary on track to Israelite Bay, 30 July 1986, *J.M. Powell* 2336 (HO, NSW, PERTH); 15.7 km SSE from Old Ongerup Rd junction on Hamersley Drive, Fitzgerald River National Park, 2 Sep. 1986, *J.M. Powell* 2838 (HO, NSW, PERTH); base of East Mt Barren track [Fitzgerald River National Park], 18 July 2010, *C. Puente-Lelievre & E.A. Brown*



Figure 3. A—*Styphelia corynocarpa*, flowering plant *in situ*.; B—*Styphelia cylindrica*, flowering plant *in situ*. Vouchers M. Hislop 3085 (A), M. Hislop 3057 (B). Photographs by Michael Hislop.

CPL 104 (NSW, PERTH); Helms Forestry Reserve 23527 [NNW of Esperance], 28 Aug. 2011, C.D. Turley & R.M. Hoggart 32/811 (PERTH).

Distribution and habitat. Widely distributed in coastal and subcoastal districts from the western end of the Fitzgerald River National Park to Israelite Bay and as far inland as the Scaddan area; in the Esperance Plains and adjacent parts of the Mallee bioregions. Occurs in heath and open mallee woodland in deep sand or over laterite, quartzite or granite.

Phenology. Flowers over many months of the year but with a peak between September and December. While many flowering collections also include some fruit, the highest numbers of mature fruit are present on collections made between May and August.

Etymology. From the Latin *cylindricus* (cylindrical), a reference to the usual fruit shape.

Conservation status. Widespread and locally common over a large area. No conservation listing is recommended here.

Affinities. *Styphelia cylindrica* is a member of Group X *sensu* Puente-Lelièvre *et al.* (2016). In the published phylogeny, under the name *Leucopogon crassifolius*, it grouped very strongly (100% support) on a long branch with *S. corynocarpa*, but within a part of the tree that lacked basal support. Before the

phrase name *Styphelia* sp. South Coast (J.M. Powell 3374) was added to Florabase (Western Australian Herbarium 1998–) in March 2018, this species had been erroneously treated as *Leucopogon crassifolius* Sond. since Bentham's time (1868). Refer to the notes under *Styphelia crassifolia* (Sond.) F.Muell. in Hislop and Nguyen (2022) for more details regarding this longstanding name misapplication.

The distributions of *S. cylindrica* and *S. corynocarpa* overlap in the Fitzgerald River National Park and it is with the latter species that *S. cylindrica* is most likely to be confused. Both species have a relatively tall, open habit, prominently petiolate leaves of comparable shape as well as a generally similar inflorescence and floral character. They differ most obviously in the length and posture of the sepals: 1.7–2.4 mm long and distinctly recurved distally in *S. cylindrica*, cf. 2.3–3.0 mm long and more or less appressed to the corolla in *S. corynocarpa*. They also differ in the shape and size of the drupe: *S. cylindrica* has a cylindrical drupe (sometimes very narrowly ovoid), 0.8–1.1 mm wide, while in *S. corynocarpa* it is narrowly obovoid or claviform and 2.3–3.0 mm wide. In addition, *Styphelia cylindrica* is unusual in Group X in having a short, thick pedicel (to 0.5 mm long) below the bracteoles, as commonly seen in the species of Group V (*sensu* Puente-Lelièvre *et al.* 2016), while in *S. corynocarpa* the flowers are quite sessile.

The other two members of the subgroup, *S. anomala* and *S. planiconvexa* have more inland distributions than those of *S. cylindrica* or *S. corynocarpa*, and both can be readily distinguished by their strictly 1-flowered inflorescences. Further differences between *S. cylindrica* and *S. planiconvexa* are given under the treatment of the latter species.

Styphelia planiconvexa* Hislop, *sp. nov.

Typus: Bending Reserve (No 25681), 8 km E of Bending Railway Siding, Western Australia, 13 July 1982, J.M. Powell 1775 (*holo*: PERTH 02953706!; *iso*: CANB 332772 *n.v.*, K *n.v.*, L *n.v.*, MEL 0642193 *n.v.*, MO *n.v.*, NSW 406318 *n.v.*, RSA *n.v.*).

Leucopogon sp. Wheatbelt (S. Murray 257), Western Australian Herbarium, in *Florabase*, <https://florabase.dpaw.wa.gov.au/> [accessed 3 February 2023].

Erect *shrubs*, to c. 90 cm high and 70 cm wide, but usually < 70 cm high, single-stemmed at ground level with a fire-sensitive rootstock. Young *branchlets* with a moderately dense to dense indumentum of spreading, often decurved hairs, to 0.2 mm long. *Leaves* helically arranged, steeply antrorse to ± antrorse-appressed; apex usually obtuse, or occasionally subacute; base usually attenuate, or sometimes ± cuneate; petiole well-defined, 0.4–1.2 mm long, sometimes incurved, adaxial surface hairy, abaxial surface glabrous, margins glabrous or sparsely hairy; lamina narrowly elliptic, or narrowly obovate, 2.0–3.4 mm long, 0.6–1.2 mm wide, discolorous, sometimes distinctly inflexed immediately above the petiole, thick, usually plano-convex or less often concave or convex adaxially, longitudinal axis ± straight to gently incurved; adaxial surface shiny, glabrous or sparsely hairy in the lower half, the venation not evident; abaxial surface paler (often ± glaucous when young), shiny, glabrous, with 3 prominent primary veins, shallowly to deeply and openly grooved between the veins; margins often variably ciliate on young leaves, with hairs to 0.3 mm long, usually glabrous or very sparsely hairy. *Inflorescence* axillary, erect, arising from axils of regular, mature leaves; axis 0.6–1.0 mm long, 1-flowered, ± terete in lower half, distinctly compressed above the fertile node, with a sparse to moderately dense indumentum, terminating in a bud-rudiment; flowers erect, sessile. *Fertile bracts* broadly ovate to depressed-ovate, 0.4–0.7 mm long, 0.5–0.8 mm wide, subtended by 3 or 4 sterile bracts. *Bracteoles* broadly ovate, depressed-ovate to ± orbicular, 0.8–1.4 mm long, 0.8–1.3 mm

wide, keeled, but usually obscurely so, obtuse; abaxial surface glabrous or rarely very shortly hairy; margins minutely ciliate to \pm glabrous. *Sepals* narrowly ovate or occasionally ovate, 1.8–3.2 mm long, 0.9–1.2 mm wide, usually obtuse, less often subacute, the apex appressed to the corolla; abaxial surface glabrous, straw-coloured or frequently partly flushed pink, the venation obscure, only the midrib usually evident; adaxial surface usually glabrous, very occasionally with a few basal hairs; margins minutely ciliate with hairs < 0.05 mm long or \pm glabrous. *Corolla tube* white, obovoid or narrowly obovoid, shorter than, equal to, or rarely slightly longer than the sepals, 1.5–2.2 mm long, 1.4–1.6 mm wide, glabrous externally and internally. *Corolla lobes* white, longer than or equal to the tube, (1.6)2.0–3.2 mm long, 0.7–0.9 mm wide at base, erect in basal 1/2–2/3 and then spreading and recurved, glabrous externally, internal surface with a dense indumentum of \pm terete, lightly ornamented hairs. *Anthers* slightly exerted from the tube, but not exerted beyond the erect bases of the corolla lobes, 0.5–1.0 mm long, apex shallowly emarginate. *Filaments* terete, 0.5–0.8 mm long, attached to the anther at least 3/4 above anther base, usually just below the apex, adnate to the tube just below the sinuses. *Nectary* very thick, either annular and lobed with deep longitudinal grooves below the sinuses, or clearly partite with scales 0.2–0.3 mm long, 0.2–0.3 mm wide, glabrous, the margins not papillose. *Ovary* ellipsoid to obovoid, 0.5–0.6 mm long, 0.3–0.5 mm wide, glabrous, 5-locular, straw-coloured to pale brown. *Style* pink or red, well-differentiated from ovary apex, 1.8–2.7 mm long, slightly scabrous in upper half, smooth below, exerted from the corolla tube but not beyond the erect bases of the corolla lobes, discontinuous with ovarian tissue, apparently arising directly from the ovary apex; stigma slightly expanded. *Fruit* narrowly ellipsoid or oblongoid, 2.7–3.3 mm long, 1.0–1.2 mm wide, usually longer than or sometimes \pm equal to the sepals, circular in transverse section, with a well-defined gynophore; surface glabrous, shiny, dark green or greenish-brown, smooth or with indistinct longitudinal ribs (mesocarp poorly developed); apex obtuse to subacute; style shed before maturity. (Figures 4, 5, 6)

Diagnostic characters. Within the *S. corynocarpa* subgroup, distinguished by the following character combination: leaf lamina thick, usually plano-convex or, less often, concave or convex adaxially, with 3 prominent, abaxial veins, shallowly to deeply and openly grooved between the veins; inflorescence arising from the axils of regular, mature leaves, 0.6–1.0 mm long, strictly 1-flowered with bracts present below the bracteoles, terminating in a bud-rudiment; flowers sessile below the bracteoles; sepals appressed to the corolla; fruit narrowly ellipsoid or oblongoid, 2.7–3.3 mm long, 1.0–1.2 mm wide.

Other specimens examined. WESTERN AUSTRALIA: Cascades Rd, 13 km NW of Rolland Rd [NW of Cascade], 21 Apr. 2013, *W.R. Archer* 21041310 (PERTH); Bending Nature Reserve, [NE of Kondinin], 7 Oct. 2009, *R.L. Barrett & M.D. Barrett* RLB 5916 (CNS, CANB, PERTH); Beynon Rd along the edge of Breakaway Ridge Reserve, Newdegate, 1 Sep. 2010, *G. Byrne* 3925 (CNS, PERTH); UCL Lake King townsite, site 3, 17 Nov. 2006, *A.M. Coates* AC 5843 (PERTH); Pingaring–Varley Rd North, 30 Sep. 2004, *A.S. George* 17668 & *E.G.H. Oliver* (PERTH); remnant vegetation W side of Lake Varley–Hyden Rd, 43 km S of Hyden, 28 June 1999, *M. Hislop* 1316 (CANB, NSW, PERTH); Southern Cross–Forresteria Rd, 53 km S of Burbridge Rd, 8 Aug. 2000, *M. Hislop* 2106 (PERTH); Antonio Rd, 3.9 km W of Ivey Rd, S of Bodallin, 25 July 2005, *M. Hislop* 3482 (CNS, K, PERTH); E outskirts of Lake King, 25 July 2006, *M. Hislop* 3616 (CANB, CNS, K, MEL, PERTH); surrounds of gravel extraction site, Floater Rd, 7 km N of Woodenup Rd, N of Ravensthorpe, 27 June 2007, *M. Hislop* 3715 (CNS, NSW, PERTH); Lake King–Cascades Rd, 29.7 km S of Norseman road, 15 May 2002, *M. Hislop & F. Hort* MH 2595 (CNS, PERTH); Boolanelling Nature Reserve, Copestakes Rd, [N of Corrigin], 4 Aug. 2009, *F. Hort, J. Hort & B. Hort* FH 3430 (CANB, K, MEL, PERTH); North Karlgarin Nature Reserve, Bending Reserve Rd, NE of Kondinin, 4 July 2007, *G.J. & B.J. Keighery* 1185 (CANB, CNS, MEL, NSW, PERTH); 2.3 km S along Whittington Rd from Middleton Rd, S of Corrigin, 25 May 2000, *K. Kershaw* 2095 (CNS, MEL, PERTH); on track to Hatters Hill from Digger

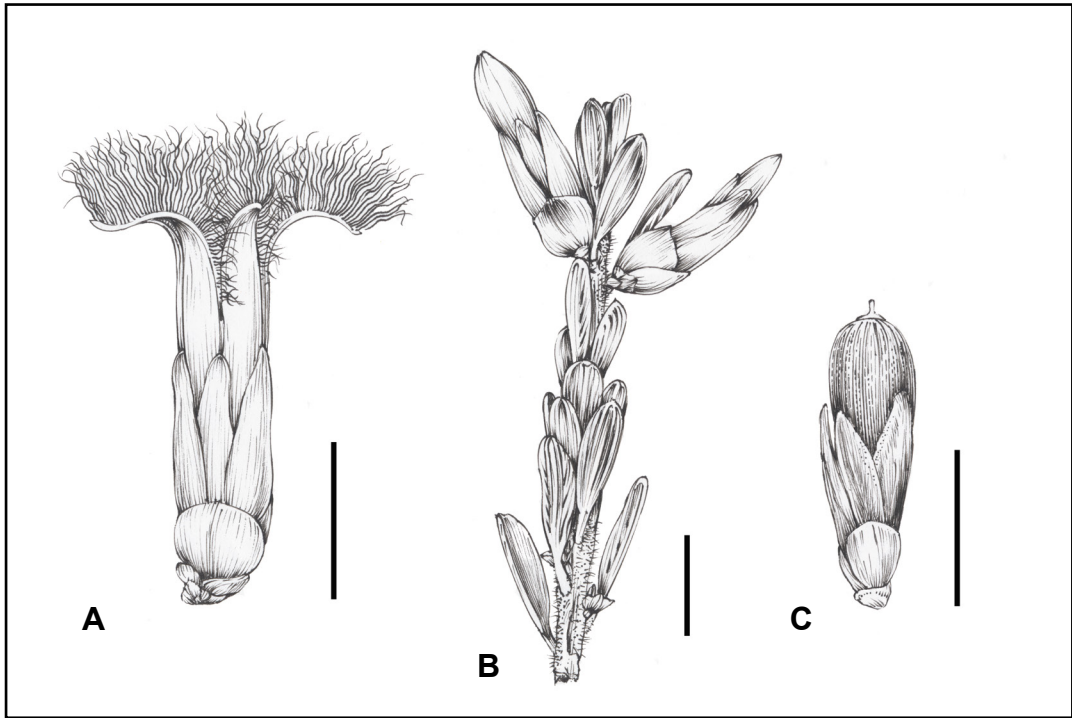


Figure 4. *Styphelia planiconvexa*. A – flowering inflorescence; B – flowering branchlet, showing inflorescences arising from leaf axils; C – fruit. Scale bars = 2 mm. Vouchers *M. Hislop* 1316 (A, B), *R.L. Barrett & M.D. Barrett* RLB 5916 (C). Drawings by Hung Ky Nguyen.



Figure 5. *Styphelia planiconvexa*, flowering plant *in situ*. Voucher *M. Hislop & F. Hort* MH 2595. Photograph by Michael Hislop.



Figure 6. *Styphelia planiconvexa* flowering branchlet *in situ*. Voucher G. Byrne 2065. Photograph by Geoff Byrne.

Rocks, 22 Aug. 2001, K. Kershaw & M. Golding KK 2277 (NSW, PERTH); 19.7 km ENE of East Hyden Bin Rd on Hyden–Lake King Rd, 20 km ENE of Hyden, 11 Aug. 1996, T.R. Lally & B.J. Lepschi TRL 1144 (PERTH); 13 km S of Mt Glasse, Bremer Range, 21 July 1979, K.R. Newbey 5390 (PERTH); Borden–Pingrup Rd, 39.3 km S of junction with Katanning road, 6 Aug. 1986, J.M. Powell 2452A (HO, K, NSW, PERTH); Hartleys Reserve (S boundary), 14.3 km S of Corrigin on Corrigin South Rd, 15 July 1999, L.W. Sage, J.P. Pigott & E.B. Pigott LWS 1539 (CNS, K, MEL, PERTH).

Distribution and habitat. Widely distributed in the southern wheatbelt south of Great Eastern Highway and eastwards into uncleared land beyond the agricultural zone. Extends from south-east of Quairading eastwards to north-west of Cascade, and from south of Bodallin in the north to north of Borden in the south; mostly in the Avon Wheatbelt and Mallee bioregions with more limited occurrences in the far west of the Coolgardie and far north of the Esperance Plains bioregions.

Mostly grows in sand or sandy loam soils over laterite, less often in deep sand. Associated vegetation is heath or open mallee woodland.

Phenology. Plants may flower over many months of the year, at least between April and September, depending on the rainfall pattern during the period late summer to early winter. Fruiting collections have been made between September and November but could certainly be expected outside this period given the extended flowering time.

Etymology. From the Latin *planus* (flat) and *convexus* (convex), a reference to the usual transverse section of the leaves.

Conservation status. A widespread and locally common species, which is known to occur in many nature reserves.

Affinities. Although not included in the phylogeny of Puente-Lelièvre *et al.* (2016), *S. planiconvexa* shares many critical morphological attributes with *S. corynocarpa* and *S. cylindrica* and they are considered likely to be its closest relatives.

Before the name *Leucopogon* sp. Wheatbelt (S. Murray 257) was added to Florabase in September of 1999 the species had mostly been referred to *Leucopogon crassifolia* auct. non Sond. (i.e. *S. cylindrica* as described above) or informally to the ‘Wheatbelt variant’ of *S. leptantha* (Benth.) F.Muell. Jocelyn Powell, a prominent researcher in the taxonomy of the epacrids in the 1980s and 1990s, recognised that it was a distinct taxon and sometimes referred to it as *L. sp. aff. crassifolia* on her collection labels.

Although *S. planiconvexa* has frequently been misidentified as *S. cylindrica* there are a number of easily interpreted differences between the two. The most obvious pertain to the sepals (appressed to the corolla in *S. planiconvexa*, *cf.* recurved in the upper half in *S. cylindrica*) and the inflorescence (very short, 0.6–1.0 mm long and strictly 1-flowered in *S. planiconvexa*, *cf.* 1.0–4.5 mm long and 1–4-flowered in *S. cylindrica*). The fruit also differ: being narrowly ellipsoid or oblongoid, 2.7–3.3 mm long, 1.0–1.2 mm wide, and always straight in *S. planiconvexa* *cf.* cylindrical or sometimes very narrowly ovoid, 3.5–4.5 mm long, 0.8–1.1 mm wide, and often \pm curved in *S. cylindrica*. The short, thick pedicel (to 0.5 mm long) of *S. cylindrica* is also lacking in *S. planiconvexa*, where the flowers are sessile below the bracteoles.

Although *S. planiconvexa* had been previously referred to as the ‘Wheatbelt variant’ of *S. leptantha* (Benth.) F.Muell., the two species are only superficially similar. *Styphelia leptantha* is a confirmed member of the *S. pendula* group (or Group V) from the Geraldton Sandplains and far north of the Swan Coastal Plains bioregions. It is somewhat anomalous within that group because of its adaxially concave leaves and in having the point of attachment of filament to anther rather higher than is usual in the group, about 3/4 above anther base. In respect to these characters, *S. leptantha* is similar to species from Group X, although the very dark ovary is typical of the *S. pendula* group, refer interim key to *Styphelia* groups in Western Australia (Hislop 2021: 29–31). While *S. leptantha* shares with

S. planiconvexa similarly shaped, non-mucronate leaves and an erect inflorescence, the two are readily distinguished. Relative to the leaves of *S. planiconvexa*, those of *S. leptantha* are always adaxially concave (rather than usually planoconvex) with the wider leaves at least 1.5 mm wide (*cf.* to 1.2 mm). In terms of floral differences, *S. leptantha* has the corolla tube always much longer than the sepals and the stigma greatly expanded at anthesis, whereas in *S. planiconvexa* the tube is usually shorter than, or more or less equal to, the tube (rarely slightly longer) and the stigma only slightly expanded. The fruit of the two species is also very different: strongly angular in transverse section in *S. leptantha*, circular in *S. planiconvexa*.

Styphelia planiconvexa is the only species within the subgroup to have a red or pink style and to frequently have pink-flushed sepals; the other three species having straw-coloured or greenish styles and straw-coloured sepals.

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