

***Leucopogon navicularis* (Ericaceae: Styphelioideae: Styphelieae),
another local endemic from the midwest region of Western Australia**

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Abstract

Hislop, M. *Leucopogon navicularis* (Ericaceae: Styphelioideae: Styphelieae), another local endemic from the midwest region of Western Australia. *Nuytsia* 22(2): 45–50. *Leucopogon navicularis* Hislop, a new and potentially rare species, is described, illustrated and its distribution mapped.

Introduction

In the last twenty years ongoing taxonomic research into genera within the subfamily Styphelioideae (Ericaceae) has led to the recognition of dozens of new taxa for Western Australia. While some of these have been recently published (e.g. Crayn *et al.* 2003; Lemson 2007; Hislop 2009a, 2009b, 2011) a large number, especially in *Leucopogon* R.Br. *s. lat.*, remain undescribed and currently recognised by informal names only (Western Australian Herbarium 1998–). The restricted distribution of many of these indicates a significantly higher incidence of short-range endemism in the family than had been hitherto appreciated. The majority of these taxa have come to light through the study of existing collections held at the Western Australian Herbarium. Others are strictly *de novo*, the result of an intensified collecting effort over much of south-western Australia in recent decades, which has been a significant factor in the dramatic increase in the accepted size of the State's flora over that period (Paczkowska & Chapman 2000; Chapman 2010). One important stream of new material coming into the Herbarium, particularly in the last decade, has been through collections made by botanists working for environmental consultancies. The new species of *Leucopogon s. str.* described in this paper came to the attention of the author via this source. Because of its apparent high conservation significance, the provision of a formal name for this taxon has been prioritized since its discovery in October 2010.

Methods

This study was based on an examination of dried specimens housed at PERTH, as well as observations of live plants in the field. The details of the methods used to measure plant parts and make other morphological observations are as described previously (Hislop 2009a). The inflorescence type of the species treated in this paper is of the kind described for the *Leucopogon gracilis* R.Br. group (Hislop 2009b). The basal point of the terminal inflorescence is therefore taken to be the lowest axil from

which a single flower arises (below which multi-flowered axillary inflorescences are often present), and for axillary inflorescences, the point of attachment to the main axis. The fertile bract measurements are taken from the upper three inflorescence nodes only. The distribution map was compiled using DIVA-GIS Version 5.2.0.2 and based on PERTH specimen data.

Taxonomy

Leucopogon navicularis Hislop, *sp. nov.*

A Leucopogoni oligantho affinis sed inflorescentiis longioribus, ovariis pilosis et floribus pedicellatis differt.

Typus: north-east of Dongara, Western Australia [precise locality withheld for conservation reasons], 11 June 2011, *M. Hislop* 4117 (*holo*: PERTH 08287139; *iso*: CANB, MEL, NSW).

Erect, compact *shrubs* to *c.* 60 cm high and 40 cm wide, single-stemmed at ground level with a fire-sensitive rootstock. Young *branchlets* with a moderately dense indumentum of patent, straight hairs, 0.02–0.15 mm long. *Leaves* helically arranged, steeply antrorse to antrorse-appressed, narrowly elliptic to narrowly ovate, *c.* 4–10 mm long, 1.2–2.8 mm wide; apex obtuse or subacute, without a callus; base attenuate to cuneate; petiole moderately well to well defined, cream-coloured or pale brown, to 1.5 mm long, glabrous on abaxial surface, hairy on the adaxial surface and usually with a few marginal hairs; lamina 0.15–0.20 mm thick, strongly concave adaxially, the margins incurved to \pm involute, longitudinal axis usually gently incurved, less often \pm straight; surfaces \pm concolorous; adaxial surface with a moderately dense to dense indumentum of short, white hairs, with 3–5 raised veins evident; abaxial surface glabrous, shiny, at least on mature leaves, with 3–5 flat, pale veins evident, the midrib rather more prominent than the others; margins \pm glabrous or minutely ciliolate towards the base. *Inflorescences* erect, terminal and upper-axillary; axis 2.5–7 mm long, with 4–12 rather densely arranged flowers, terminating in a bud-like rudiment or an attenuate point; axis indumentum of moderately dense to dense hairs, 0.05–0.12 mm long; flowers erect and pedicellate (pedicels 0.2–0.8 mm long) below the bracteoles, the uppermost within the inflorescence occasionally \pm sessile. *Fertile bracts* narrowly ovate, 1.0–2.2 mm long, 0.5–0.8 mm wide, those on the main axes usually larger and more leaf-like than those on axillary inflorescences. *Bracteoles* ovate, 0.8–1.4 mm long, 0.8–0.9 mm wide, subacute or acute, keeled; abaxial surface glabrous, scarious towards the margins; adaxial surface with short hairs on the distal half; margins minutely ciliolate. *Sepals* ovate, 1.9–2.2 mm long, 1.0–1.2 mm wide, obtuse to subacute; abaxial surface glabrous, the central portion greenish throughout, or more often tinged reddish in a submarginal band, becoming scarious towards the margins, the venation obscure to moderately conspicuous; adaxial surface shortly hairy towards the apex; margins ciliolate with hairs to *c.* 0.08 mm long. *Corolla tube* white, broadly campanulate, shorter than the sepals, 1.0–1.3 mm long, 1.4–1.6 mm wide, glabrous externally and internally. *Corolla lobes* white or variously tinged pink, much longer than the tube (ratio = 2.3–2.9:1), widely spreading from the base and recurved, 2.5–3.1 mm long, 0.7–1.0 mm wide, glabrous externally, densely bearded internally; indumentum white, 0.7–0.9 mm long near apex; glabrous tip *c.* 0.1 mm long. *Anthers* partially exerted from the tube (by 3/4–7/8 of their length), 1.3–1.6 mm long, strongly recurved towards the apex; sterile tips pale, moderately conspicuous 0.3–0.4 mm long. *Filaments* terete, 0.6–0.8 mm long, attached *c.* 2/3 above anther base, adnate to tube just below sinus. *Ovary* ellipsoid, 0.6–0.7 mm long, 0.45–0.55 mm wide, with antrorse-appressed hairs in the basal half, 2- or 3-locular. *Style* 0.3–0.5 mm long, often rather poorly differentiated, tapering smoothly from the ovary apex to the stigma, included within the corolla tube; *stigma* not or scarcely expanded; *nectary* annular, 0.3–0.4 mm long, shallowly lobed for up to 1/4 of its length, glabrous. *Fruit* narrowly ellipsoid, 2.5–2.8 mm long, 1.0–1.2 mm wide,

much longer than the calyx, the shoulders rounded, tapering \pm smoothly to style base, hairy in the lower 1/2 with a rather sparse antrorse indumentum (hairs *c.* 0.2 mm long), the surface with irregular longitudinal ridges; style persistent. (Figures 1, 2)

Specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 14 Oct. 2010, *D. Coultas & A. Saligari* CR Opp 3 (PERTH); 14 Oct. 2010, *D. Coultas & A. Saligari* CR Opp 5 (PERTH); 11 June 2011, *M. Hislop* 4118 (PERTH).

Distribution and habitat. Apparently restricted to a small area north-east of Dongara (Figure 3) in Geraldton Sandplains IBRA bioregion (Department of the Environment, Water, Heritage and the Arts 2008), where it grows on a low lateritic rise in a loamy sand soil. The associated vegetation is disturbed heathland in which *Allocasuarina humilis*, *Gastrolobium spinosum* and *Hibbertia hypericoides* are locally dominant species.

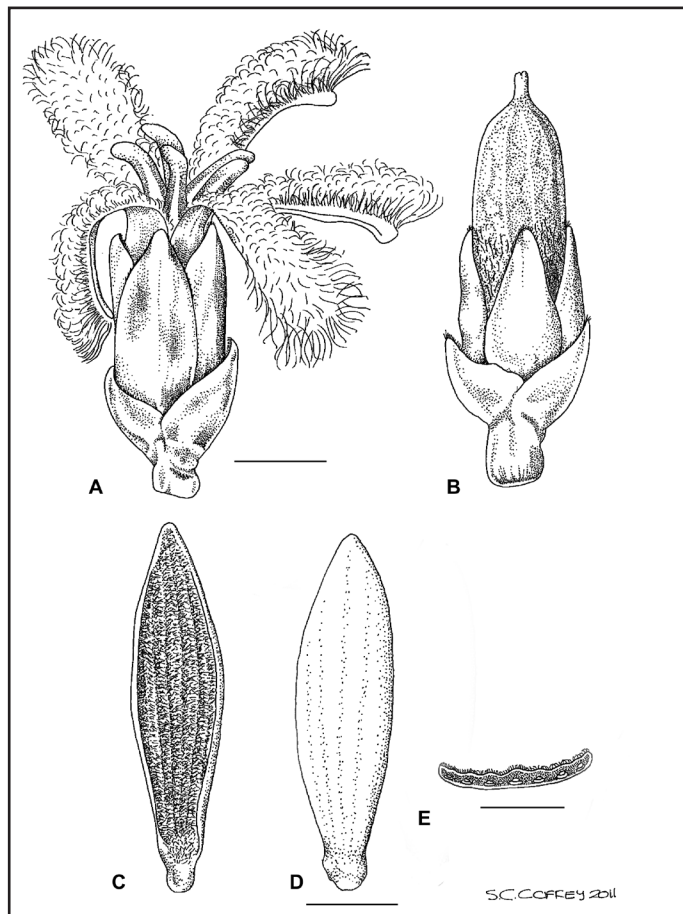


Figure 1. *Leucopogon navicularis*. A – flower; B – fruit; C – leaf, adaxial surface; D – leaf, abaxial surface; E – leaf section. Scale bars = 1 mm (A, B); 2 mm (C, D); 1 mm (E). Drawn by Skye Coffey from *M. Hislop* 4117

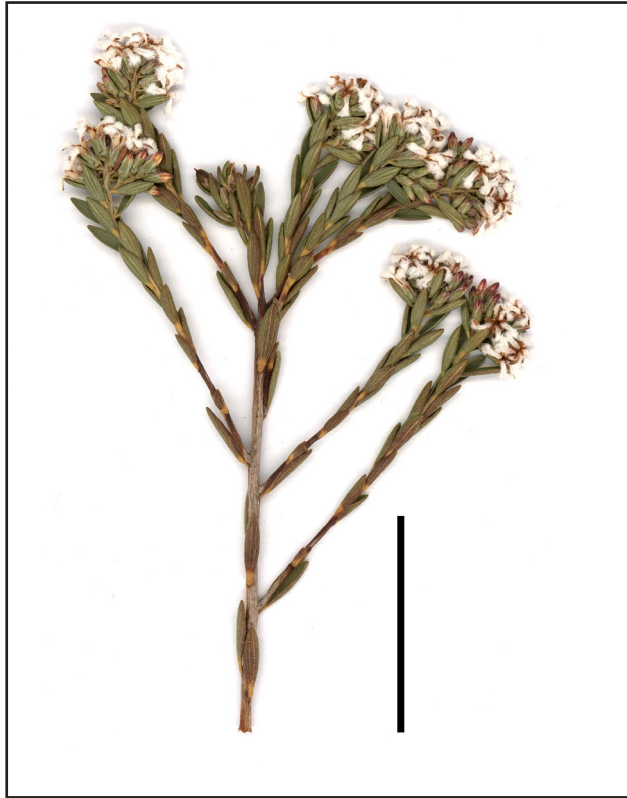


Figure 2. *Leucopogon navicularis*. Scan of flowering branchlet from *M. Hislop* 4117. Scale bar = 2 cm.

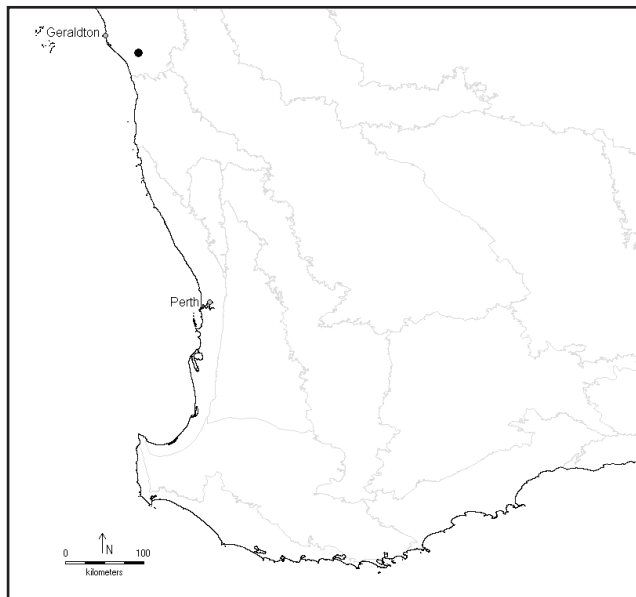


Figure 3. Distribution of *Leucopogon navicularis* in Western Australia.

Phenology. Collections made in October are mostly in late bud with just a few open flowers, while the June collections are close to full flower but with a number of mature fruit also present. This suggests that, in common with some other members of *Leucopogon s. str.* that occur in the Geraldton Sandplains, flowering begins in mid to late spring and continues into the summer, presumably as long as soil moisture levels allow. There then follows a hiatus after which flowering resumes following the first significant rains of autumn.

Etymology. The epithet is Latin for for boat-shape, a reference to the leaf shape.

Conservation status. Recently listed as Priority One under Department of Environment and Conservation (DEC) Conservation Codes for Western Australian Flora. This species is currently known only from one small roadside population. It is however fairly close to the large Burma Road Nature Reserve and even closer to good-sized tracts of potential habitat on private property. In addition, there appears to be nothing remarkable about the habitat at the type location, so there does seem to be a reasonable prospect of finding more populations.

Affinities. Within the Geraldton Sandplains the species most likely to be confused with *L. navicularis* are *L. oliganthus* E.Pritz. and its dubiously distinct, close relative *L. cochlearifolius* Strid. This species-pair, together with *L. sp.* Three Springs (M. Hislop 2504) and one or two other potentially distinct taxonomic entities, form a complex which is widespread in the region between the Moore and Arrowsmith Rivers. They have in common with *L. navicularis* similarly-shaped, concave leaves which may be glabrous or variously hairy, but never with the dense, short indumentum restricted to the upper surfaces, which is a characteristic of the new species. Members of the *L. oliganthus* complex can always be distinguished from *L. navicularis* by their very short, contracted inflorescences which are clustered towards the ends of short lateral branchlets (and always overtopped by the subtending leaves), filaments which are inserted well below the sinus of the corolla tube and in having a glabrous ovary. The wider affinities of this complex are problematic and the two described species, *L. oliganthus* and *L. cochlearifolius*, were not placed within the informal subgeneric classification proposed by Hislop and Chapman (2007).

Although potential differences between species in terms of their vegetative hair characters are frequently unreliable in the tribe *Styphelieae* Bartl. generally, there is evidence (as discussed in Hislop 2009b) that a dense indumentum on the upper leaf surface, of the kind seen in *L. navicularis*, does have taxonomic significance. Another similar-looking taxon that shares this character is *L. elegans* Sond. subsp. *psorophyllus* Hislop from the south coast of Western Australia. The latter, however, has much longer sepals and shorter filaments (i.e. 2.9–3.8 mm long and 0.1–0.2 mm long respectively, compared to 1.9–2.1 mm and 0.8–1.0 mm for *L. navicularis*) and, being a member of the *L. gracilis* species group, a very different, laterally compressed fruit (refer to Hislop 2009b for a detailed description of the fruit type for this group).

The affinities of *L. navicularis* are problematic. It has the same distinctive flowering pattern (described under Phenology above) as the members of a group of mostly unnamed taxa from the Geraldton Sandplains (discussed under the treatment of *L. nitidus* Hislop in Hislop (2011) and referred to below as the Northern group). Also in common with that group, the fruit is dry, narrow and with appressed hairs towards the base. There is a potentially significant difference, however, in regard to the fruit apex. Whereas in members of the Northern group the drupe apex is truncate with a narrow, sometimes indistinct apical rim, the fruit of *L. navicularis* curves gently from its widest part (about the middle) to the style base (Figure 1B). And where *L. navicularis* has pedicellate flowers, members of the Northern group have strictly sessile flowers which are the norm for the genus.

Notes. One collection (i.e. *M. Hislop* 4118) shows abnormal growth. Some of the leaves are distorted, the bracts, bracteoles and sepals are often not well differentiated from each other and some flowers have six corolla lobes. It is not known whether this is the result of disease, genetic disorder or spray drift from hormonal herbicide. Measurements from this collection were not included in the above description.

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References

- Chapman, A.R. (2010). Western Australian flora statistics. <http://florabase.dec.wa.gov.au/statistics/> [accessed July 2011]
- Crayn, D.M., Brown, E.A. & Powell, J.M. (2003). A revision of *Lissanthe* (Styphelioideae: Ericaceae). *Australian Systematic Botany* 16: 595–619.
- Department of the Environment, Water, Heritage and the Arts (2008). *Interim Biogeographic Regionalisation for Australia (IBRA), Version 6.1.* <http://www.environment.gov.au/parks/nrs/science/bioregion-framework/ibra/index.html> [accessed October 2011]
- Paczkowska, G. & Chapman, A.R. (2000). *The Western Australian flora: a descriptive catalogue.* (Wildflower Society of Western Australia: Nedlands, WA.)
- Hislop, M. & Chapman, A.R. (2007). Three new and geographically restricted species of *Leucopogon* (Ericaceae: Styphelioideae: Styphelieae) from south-west Western Australia. *Nuytsia* 17: 165–184.
- Hislop, M. (2009a). The taxonomy of *Leucopogon bossiaea* and allied species (Ericaceae: Styphelioideae: Styphelieae) from the central south coast of Western Australia. *Nuytsia* 19: 17–35.
- Hislop, M. (2009b). New taxa in the *Leucopogon gracilis* group (Ericaceae: Styphelioideae: Styphelieae). *Nuytsia* 19: 211–228.
- Hislop, M. (2011). New, locally endemic taxa in *Leucopogon* (Ericaceae: Styphelioideae: Styphelieae) from the Perth and midwest regions of Western Australia. *Nuytsia* 21: 75–89.
- Lemson, K.L. (2007). New species of *Andersonia* (Ericaceae) of conservation concern. *Nuytsia* 17: 195–213.
- Western Australian Herbarium (1998–). *FloraBase — The Western Australian Flora.* Department of Environment and Conservation. <http://florabase.dec.wa.gov.au/> [accessed June 2011]