**Lobostemon daltonii** (Boraginaceae): a new species from the Western Cape, South Africa

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Received 03 June 1998; revised 19 August 1998

A new species of *Lobostemon* Lehmann. (Boraginaceae), placed in the section *Fruticosi* Levyns, is described from Cape Infanta region in the Western Cape, South Africa. Illustrations of the macromorphology, indumentum, stigma and style, fruit as well as a distribution map, are provided.

**Keywords**: Boraginaceae, *Lobostemon daltonii*, new species, sect. *Fruticosi*.

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**Introduction**

*Lobostemon* Lehmann., with about 30 species, is the largest genus in the southern African Boraginaceae. This endemic genus is mainly confined to the winter-rainfall area of South Africa, occurring from Springbok to Mossel Bay, and further eastward along the coast to about Grahamstown, where the rain occurs throughout the year. Limited numbers of species exhibit a wide distribution range with the norm, however, tending to be highly localised distributions. Margaret Levyns last intensively studied the Bredasdorp-Cape Infanta area as part of a current systematic revision of the genus. During this time a new species, *Lobostemon daltonii* M.H. Buys, is described and named in recognition of Nick D’Alton. As a result, the new species *Lobostemon daltonii* M.H. Buys is described and named in recognition of Nick D’Alton’s friendly assistance during many visits to his farm.

**Materials and Methods**

All the material used in the study was collected during the peak flowering season, i.e. between August and October. At least five leaves were studied anatomically. Transverse sections of wax-embedded laminae were cut with a rotary microtome and stained with a mixture of Mowiol and an acceleration voltage of 10 kV. Sections were taken through the middle of the laminae. The stigma and leaf indumentum were studied with a Joel scanning electron microscope (SEM), using secondary-electron detection and an acceleration voltage of 4–5 kV. The outer surfaces of the mericarps and sepal indumentum were studied with a Philips XL30DX-4i SEM, using an acceleration voltage of 10 kV. Fresh material for observation in the SEM was dried using the CRYO method (Robards & Wilson 1993). Macromorphological studies were done in the field as well as from herbarium and conserved specimens.

**Species treatment**

*Lobostemon daltonii* M.H. Buys, sp. nov.

In section *Fruticosi*. Frutex florulentus. Folia sessilia, alterna, ovata ad obovata, utrinque inaequilatera pilosa, margin integro. Corola violacea vel azurea, influndibularis, subglobo-lanceolata, extra pubescentis. Stamina primo inclusa, demum exserta, epipetalosa, squamulosis staminibus parvis. Fructus schizocarpus, quadrifariatus, in lateribus tuberculatus.

*L. irigro* affinis sed indumento apicem sepalorum et praesertim sepalis recurvis differt.
Figure 1  *L. daltonii*. A. Young inflorescence; B. Flowering branch; C. Dissected sepals; D. Dissected petals; E. Young flower bud. Scale bar for A & B = 10 mm; for C, D & E = 20 mm.
Figure 2 Indumentum of the leaf margin of *L. daltonii*.

tuberculate, tubercles with a smooth apex, ridges reduced; dorsal side tuberculate, acute, keel wanting; ventral side tuberculate, convex, keel wanting; cicatrix triangular, concave.

Specimens studied

-3420: Potberg, Breede River side (BC), H. David s.n. sub PRE 41017 (PRE); Potberg, Breede River side, (BC), H. David s.n. sub NBG 45386 (NBG); Potberg, Breede River side (BC), H. David s.n. sub NBG 45388 (NBG); Potberg, Breede River side (BC), H. David s.n. sub STE 31998 (STE); Cape Infanta, about 3 km north of town (BD), J.H.J. Vlok 1709 (STE); Breede River, near mouth of river (BD), M.R. Levyus 8372 (BOL); On the road between Swellendam and Infanta, between turnoff to Ballyfor and 7 km beyond (BD), M.H. Buys 501 (PRE).

Leaf anatomy

Leaves isobilateral; amphistomastic, with the greatest number of stomata abaxially. Cuticle relatively thick, smooth. Epidermis cells relatively small, outer periclinal walls thickened; trichomes adaxially and abaxially, or glandular. Mesophyll differentiated into two layers palisade parenchyma adaxially and abaxially; hypodermis at the leaf margins and adaxial and abaxial to the midvein; collenchyma adaxial and abaxial to the midvein; phenolic compounds scattered throughout the mesophyll. Vascular bundles enclosed in parenchymatous bundle sheaths.

Figure 3 Indumentum of the sepals and petals in a flower bud of *L. daltonii*.

Figure 4 Multicellular, glandular trichomes on adaxial sepal apices of *L. daltonii*.

Indumentum

The leaf indumentum is chiefly spinous, comprising either simple or pustular, appressed trichomes. These trichomes have a smooth texture (Figure 2). Scattered stalked glandular trichomes occur on both leaf surfaces. The indumentum of the herbaceous stems are similar to those of the leaves. Woody stems become glabrous with the development of cork.

The indumentum of the flowers, particularly the sepals, deserve special mention. The flower buds of *L. daltonii* seem preoccupied in deterring unwanted visitors in that a rich profusion of glandular as well as non-glandular trichomes occur on the sepal and petal surfaces (Figure 3). The glandular, multicellular trichomes (Figure 4) are borne exclusively on the adaxial surface of the recurved sepal apices. The non-glandular trichomes are largely confined to the abaxial petal, and ab- and adaxial sepal surfaces.

Stigma and style

The stigmas produce no observable exudate and are, therefore, regarded as being dry. The receptive cells are concentrated in distinct zones or heads (Figure 5). The stigma of *L. daltonii* is bilobed, (or at best possesses highly reduced stigma branches) in that only the stigmatic region is free with the rest of the two carpels being fused. The surface of the stigmas in *L. daltonii* is distinctly papillate, with the papillae being of a unicellular nature.

Figure 5 The stigma of *L. daltonii*. 
These characters conform to those found in the majority of Lobostemon species as well as to those found by Heslop-Harrison and Shivanna (1977) in Echium L. and most of the other Boraginaceae taxa.

Fruit morphology

The gynoecium of Lobostemon is two carpelled, resulting in two mericarps with ripening. However, the two mericarps each become two-locular as a result of false septa, forming four mericarps (Hilger 1985 & pers. com.) The tuberculate mericarps of Lobostemon daltonii belong to Seibert's (1978) ‘Hockerform’ group. Buys and Van der Walt (1996) designate the corresponding term to be ‘ridge-type’ (Figure 6 and 7).

Taxonomic note

The first collection made of L. daltonii is that of Levy's 8372 (BOL) in 1947, identified to be L. trigonum (Thunb.) H. Buek, also a member of the section Fruticosi. However, L. daltonii differs from the latter in that its leaves are distinctly coriaceous and the basal leaves especially are transversely incurved as opposed to the herbaceous leaves in general and the incurved basal leaves of L. trigonum in the vicinity of L. daltonii. A form of L. trigonum occurring chiefly near Port Elizabeth does possess coriaceous leaves, but here the orientation of the leaves are transversely incurved. In addition, the young sepals' apices of L. daltonii are mostly recurved with a distinct brown glandular pubescence on the adaxial surface, whereas in L. trigonum the young sepal apices are incurved-applanate, with the pubescence being less distinct in nature. The majority of flower buds in L. daltonii as opposed to L. trigonum, often appear to possess only four sepals. The fifth sepal in the former case is enshrouded by the remaining four sepals (Figure 1E).

A preliminary cladistic analysis of section Fruticosi resulted in a poorly resolved clade. A discussion of affinities is purely speculative until additional data is forthcoming. Although L. daltonii may have some affinity to L. trigonum, the former shares the presence of coriaceous leaves, hairs spread unevenly on the adaxial leaf surfaces and an often obtuse leaf apex with L. collinus C.H. Wright, which also belongs to section Fruticosi. However, L. daltonii differs from L. collinus in possessing recurved sepal apices and flower buds arranged in two distinct rows. L. collinus possesses loosely arranged flower buds and applanate sepal apices. Furthermore, L. daltonii flowers mainly in Spring, while L. collinus flowers chiefly in Autumn.
Ecology and distribution

*L. daltonii* flowers mainly from October to November. It is restricted in its distribution, being found exclusively near Cape Infanta (Figure 8), preferring the loamy soils in the transition zone between Mountain Fynbos (Rebelo 1996a) and South and South-west Coast Renosterveld (Rebelo 1996b). Collections of *L. daltonii* have been few and far between, totalling four collectors with the present revision. This could be indicative of the relative remoteness of the locality. The precise number of individuals is currently unknown, although the impression obtained during field work is that there are a sufficient number present, not withstanding the overall restricted distribution range. Additional field work is required to determine the precise conservation status of the species.

Acknowledgements

We thank the Foundation for Research Development and the University of Stellenbosch for financial support.

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