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Short communication

A new species of *Rafnia* (Crotalarieae, Fabaceae)

J.S. Boatwright *, B.-E. Van Wyk

Department of Botany and Plant Biotechnology, University of Johannesburg, P.O. Box 524, Auckland Park 2006, South Africa

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Abstract

The new species *Rafnia lebeckioides* J.S. Boatwright and B.-E. Van Wyk is described. It is known only from a few collections in the mountains around Worcester in the Western Cape Province of South Africa. The species differs from all others in the genus in its linear fruits, which are similar to those found in species of *Lebeckia* Thunb.

Keywords: Crotalarieae; Fabaceae; *Rafnia*; new species

1. Introduction

The genus *Rafnia* Thunb. comprises 19 species endemic to the fynbos regions of the Western and Eastern Cape Provinces (Campbell and Van Wyk, 2001). *Rafnia* differs from all other Cape legumes of the tribe Crotalarieae in the simple, sessile leaves combined with an almost complete absence of hairs, except at the tips of the calyx lobes and sometimes on the bracts and bracteoles (Van Wyk and Schutte, 1995; Campbell and Van Wyk, 2001). All the species are resprouting shrubs that regenerate from an underground lignotuber after fire.

An unusual and rare new species that is superficially similar to species of *Lebeckia* is described here as *Rafnia lebeckioides*. The linear leaves of this taxon resemble the acicular leaves found in *L.* sect. *Lebeckia* but differ in being flat and not terete. The fruits are especially unusual for *Rafnia* in being linear and flat, almost exactly like the fruits of some *Lebeckia* species, including *L. mucronata* Benth. and *L. gracilis* Eckl. and Zeyh. However, the sessile, simple, flat and glabrous leaves are typical for *Rafnia* and are not found in any species of *Lebeckia*. *R. lebeckioides* is superficially similar to those species of *Lebeckia* with a 5+5 or 6+4 arrangement of the anthers, but differs in its 5+4+1 anther configuration, which is found in all other species of *Rafnia*.

It is unfortunate that the only known collections of this seemingly rare species were filed among the unidentified specimens of *Lebeckia* in both the Bolus herbarium and the herbarium of the Royal Botanic Gardens, Kew, and were thus overlooked in the recent revision of the genus *Rafnia* (Campbell and Van Wyk, 2001). During ongoing studies in the genus *Lebeckia* it became clear that the material was misplaced in *Lebeckia* and that it represented an undescribed species of *Rafnia*.

2. Species treatment

Rafnia lebeckioides J.S. Boatwright and B.-E. Van Wyk, *sp. nov.*, a speciebus omnibus aliis leguminis linearibus multiseminibus, et seminibus valde angularibus differt. Non-nihil R. spicatae Thunb., R. angulatae Thunb. et R. capensi (L.) Schinz similis habitu parvo et foliis parvis, sed inflorescentiis racemosis non pseudo racemosis ex inflorescentiis 1–6-floris factis differt.

TYPE — South Africa, Western Cape Province, slopes of Fonteintjiesberg, south aspect [3319 CB], *Esterhuysen 30582* (BOL!, holo.; K!, iso.).

Small, glabrous, multi-stemmed perennial up to ?0.3 m. *Branches* densely leafy. *Leaves* simple, markedly secund, linear to subspathulate, (15–) 17–23 (−27)×1.5–3.0 mm, sessile, acute, base narrowly cuneate, glabrous. *Stipules* absent. *Inflorescence* terminal, racemose, on slender peduncle 40–70 mm long; racemes 20–40 mm long, with 9–13 flowers; pedicels 1.0–1.5 mm long; *bract* narrowly lanceolate, leaf-like, 3.0–

* Corresponding author.
E-mail address: jsboatwright@hotmail.com (J.S. Boatwright).

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3.5 mm long, glabrous; *bracteoles* 0.9–1.5 mm long, glabrous. *Flowers* 8–9 mm long, yellow, standard with brown streaking and wing petals turning red-brown (according to label information). *Calyx* 3.7–4.0 mm long, glabrous on outer surface, subequally lobed but upper sinus slightly deeper than lateral and lower sinuses, tube 1.4–1.6 mm long, lobes 1.6–2.3 mm long, subulate, with carinal lobe narrower than the others, tips minutely pubescent on inner surface. *Standard* suborbicular, 5.8–6.0 × 5.5–5.8 mm, slightly emarginate, glabrous, claw 1.0–1.2 mm long. *Wings* oblong, shorter than keel, 6.0–6.3 × 2.5–2.8 mm, obtuse, glabrous, with 7–8 rows of sculpturing, claw 1.8–2.2 mm long. *Keel* slightly rostrate, 6.7–6.9 × 2.8–3.1 mm, obtuse, glabrous, pocket absent, claw 2.0–2.2 mm long. *Anthers* dimorphic, four long, basifixed anthers alternating with five ovate, dorsifixed anthers, carinal anther intermediate in size and shape. *Pistil* subsessile, glabrous, ovary linear, 5.0–5.3 × 0.7–0.9 mm with 9–10 ovules; style 3.7–4.5 mm long, curved upwards, glabrous. *Pods* laterally compressed, subsessile, linear, 22–28 × 2.5–4.0 mm, 5–10 seeded, indehiscent. *Seeds* markedly angular, 2.5–2.6 × 2.2–2.3 mm, predominantly black with white spots, surface rugose (Fig. 1). Flowering occurs in summer, mainly in December.

3. Diagnostic characters and relationships

R. lebeckioides differs from all other species in the linear, many-seeded (five- to 10-seeded) pods and the markedly angular seeds. In all other *Rafnia* species the pods are obliquely lanceolate to oblanceolate or oblong and one- to five-seeded. Furthermore, the seeds are oblong-reniform to oblong-cordiform (Campbell and Van Wyk, 2001).

R. lebeckioides has the subequally lobed calyx, sessile and simple leaves, and glabrous vegetative and reproductive parts typical of all other *Rafnia* species. Within the genus, it shares some apomorphies with species of section *Rafnia*, notably the calyx without a trifid upper lip, sculpted wing petals and rostrate keel petals without pockets (Campbell and Van Wyk, 2001). It is one of only two species with a multi-flowered raceme — the other is *R. racemosa* Eckl. and Zeyh. (a large woody shrub). *R. lebeckioides* is small in stature and appears to only reach heights of up to 0.3 m (exact height unknown). As it is unlike

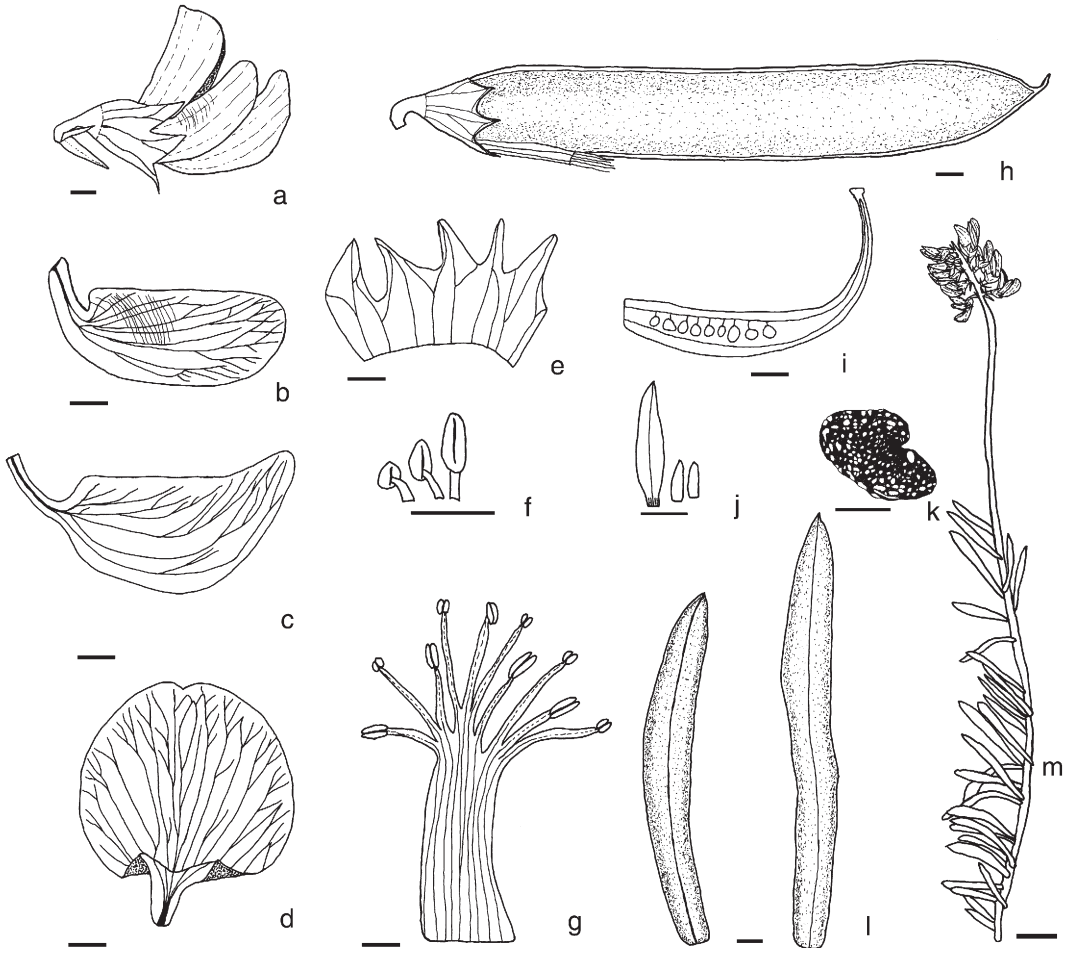

Fig. 1. Morphology of *Rafnia lebeckioides* (drawings by JSB): (a) lateral view of flower; (b) wing petal; (c) keel petal; (d) standard petal; (e) outer surface of the calyx (upper lobes to the left); (f) short, dorsifixed anther, intermediate carinal anther and long, basifixed anther; (g) androecium; (h) lateral view of pod; (i) pistil; (j) bract and bracteoles; (k) lateral view of seed; (l) abaxial surface of leaf; (m) flowering branch, showing the densely leafy branches and racemose inflorescence structure. Voucher specimens: (a, c, d, f, g, i, j bract only, l, m) *Esterhuysen 8297* (BOL); (b, e, j bracteoles only) *Esterhuysen 30582* (BOL); (h, k) *Esterhuysen 28900* (BOL). Scale bars: (a–l) 1 mm; (m) 10 mm.

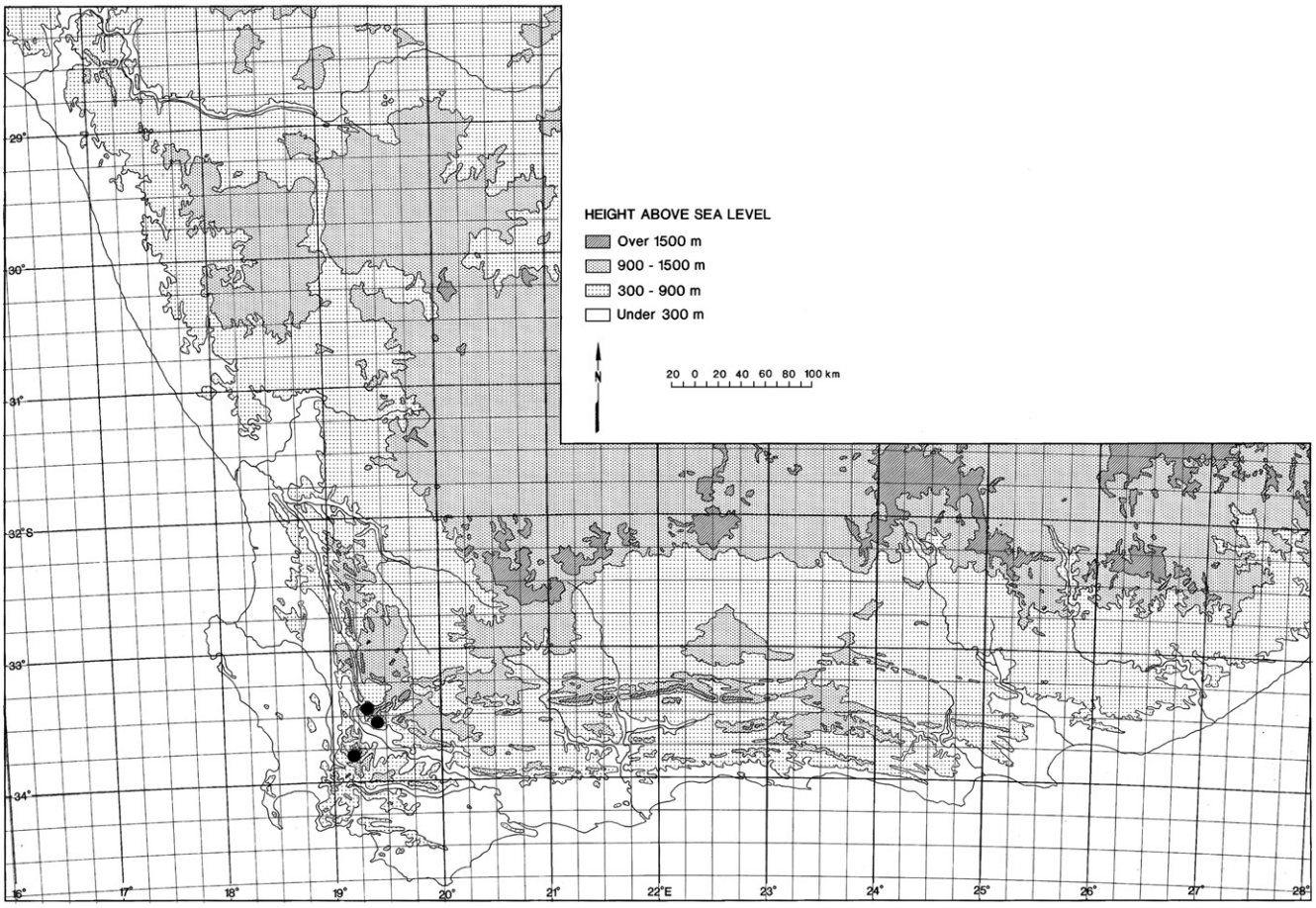

Fig. 2. The known geographical distribution of *Rafnia lebeckioides*.

any of the species of *Rafnia* it is not clear to which members of the genus it is related. Obtaining fresh material for molecular systematic studies is imperative to assess the phylogenetic position of this species.

4. Distribution and habitat

R. lebeckioides occurs on the Hex River and Du Toit's Mountains around Worcester in the South Western Cape Province at altitudes between 1500 and 1800 m (Fig. 2). It has mainly been collected on southern to south-eastern slopes in recently burnt vegetation, where it has been recorded on stony, slightly marshy soil.

Additional specimens examined

−**3319** (Worcester): Waaihoek Mountain (−AD), *Esterhuysen 8297* (BOL); Waaihoek Peak, south-eastern slopes (−AD), *Esterhuysen 28900* (BOL); Du Toit's Peak, summit ridge (−CC), *Esterhuysen 29038* (BOL).

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