



## Short communication

A rare new species of the genus *Wiborgiella* (Crotalarieae, Fabaceae)J.S. Boatwright<sup>a,\*</sup>, N.A. Helme<sup>b</sup><sup>a</sup> Department of Biodiversity and Conservation Biology, University of the Western Cape, Private bag x17, Bellville 7535, Cape Town, South Africa<sup>b</sup> PO Box 22652, Scarborough 7975, Cape Town, South Africa

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## ABSTRACT

The new species *Wiborgiella argentea* is described. It is closely similar to *Wiborgiella leipoldtiana* and *W. fasciculata* but differs in its single-stemmed habit, densely sericeous leaves, wing petals that are longer than the keel and details of the fruit. It is known from the Robertson area where it occurs in Robertson Karoo, on rocky, south facing shale slopes.

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## 1. Introduction

The genus *Wiborgiella* Boatwr. & B.-E.van Wyk comprises nine species of legumes endemic to the Greater Cape Floristic Region of South Africa (Boatwright et al., 2010). It was described to accommodate several anomalous species of the genus *Lebeckia* Thunb. s.l. as well as one species of *Wiborgia* Thunb. (Boatwright et al., 2009, 2010). *Wiborgiella* is related to the genera *Aspalathus* L. and *Wiborgia* (Boatwright et al., 2008), but differs from these in the often inflated pods and 6 + 4 anther configuration (Boatwright et al., 2009, 2010). Both *Aspalathus* and *Wiborgia* differ from *Wiborgiella* in having a 4 + 1 + 5 anther arrangement. Furthermore, *Aspalathus* is characterised by few-seeded pods (1 to ±2-seeded) and sessile leaves, and *Wiborgia* species by their unique winged, indehiscent samara-like fruit (Boatwright et al., 2009, 2011).

Most of the *Wiborgiella* species are highly localized with five of the species listed as threatened (critically endangered, endangered, vulnerable or critically rare), one listed as near threatened and three of least concern (Raimondo et al., 2009). This is partly due to the large scale transformation of habitat that has taken place in various parts of the Western Cape, and also to the small natural ranges of many of the species.

In this paper a new species from the Western Cape Province of South Africa is described. It was discovered by Mr. Nick Helme in 2012 during field surveys around the Vrolijkheid Nature Reserve near Robertson, and this appears to be the first record of this species.

## 2. Materials and methods

Morphological data on the new species were gained through examination of herbarium material from NBG and in situ observations. Drawings were done using a stereoscope (WILD M5) with a *camera lucida* attachment.

## 3. Species treatment

3.1. *Wiborgiella argentea* Boatwr. & Helme, sp. nov.

Similar to *Wiborgiella leipoldtiana* and *W. fasciculata* in its short calyx lobes, yellow flowers and long, inflated pods but differs in the densely sericeous leaves, wing petals that are slightly longer than the keel and linear pods that are longer than those of *W. fasciculata*.

Type: South Africa. Western Cape, Worcester (3319): 6 km east of McGregor, Strykhoogte, just east of top of pass (–DD), 6 Oct 2012, Helme 7481 (NBG!, holo.).

Erect reseeding shrub up to 1.5 m in height. Branches brown, sericeous to glabrescent, young branches densely sericeous, older branches covered in longitudinally splitting bark. *Stipules* absent. *Leaves* digitately trifoliolate; petiole 2–5(–7) mm long, tuberculate, becoming hard and persistent on older branches after leaves have been shed in early summer; leaflets elliptic to obovate, densely sericeous on both surfaces becoming glabrescent with age on upper surface, subsessile, terminal leaflet 3–9 × 1–4 mm, lateral leaflets 3–5 × 1–3 mm; apex obtuse to retuse; base cuneate. *Inflorescence* terminal racemes, ±15–25 mm long with 5 to 10 flowers; pedicels 2–3 mm long, sericeous; bract narrowly lanceolate, 2.0–2.5 mm long, sericeous,

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Fig. 1. Flowers and leaves of *Wiborgiella argentea*. Photograph: Nick Helme.

caducous; bracteoles linear, 1.0–1.5 mm long, sericeous, caducous. Flowers 10–12 mm long, yellow, with brown streaks on inner surface of standard. Calyx  $\pm$  4–5 mm long, densely pilose, subequally lobed, upper sinus often deeper than the lateral or lower sinuses,

carinal lobe narrower than the others; tube  $\pm$  3.5–4.0 mm long; lobes  $\pm$  1.0–1.5 mm long, deltoid, tips glabrous on inner surface. Standard 8.5–12.0 mm long, pilose along and around dorsal midrib in upper parts and flushed brown; claw linear,  $\pm$  2.5–4.0 mm long; lamina suborbicular to obovate, auriculate, 6–9  $\times$  6–7 mm; apex emarginate. Wings 9–12 mm long, glabrous; claw 3–4 mm long; lamina oblong, auriculate, slightly longer than the keel, 6–8  $\times$  3–4 mm, obtuse, with 4 to 5 rows of costal and transcostal lamellate sculpturing on upper basal and upper central parts. Keel 8–10 mm long, claw 3–4 mm long; lamina boat-shaped, upper margin convex, 6–7  $\times$  3.5–4.0 mm, obtuse, glabrous, pocket present. Anthers dimorphic, four oblong basifixed anthers alternating with five ovate dorsifixed anthers, carinal anther resembling the ovate dorsifixed anthers (4 + 6 configuration). Pistil very shortly stipitate, glabrous, ovary linear, 7–8  $\times$   $\pm$  1 mm with  $\pm$  12 ovules; style  $\pm$  3 mm long, curved upwards, glabrous. Pods linear, inflated, smooth, shortly stipitate, light brown, 20–25  $\times$  3–4 mm,  $\pm$  7-seeded, dehiscent. Mature seeds not seen (Figs. 1 and 2). Flowering time: August–October.

### 3.1.1. Diagnostic characters and relationships

The new species is similar to *Wiborgiella leipoldtiana* (Schltr. ex R. Dahlgren) Boatwr. & B.-E.van Wyk and *W. fasciculata* (Benth.) Boatwr. & B.-E.van Wyk in the short calyx lobes, yellow flowers and long, inflated pods. Although *Wiborgiella humilis* (Thunb.) Boatwr. & B.-E.van Wyk also has short calyx lobes, the pods are short, stipitate and elliptic to obovate. *Wiborgiella argentea* differs from *W. fasciculata* and *W. leipoldtiana* in its single-stemmed habit (*W. fasciculata* and *W. leipoldtiana* are multi-stemmed shrubs), densely sericeous leaves (leaves sparsely sericeous in *W. leipoldtiana* and pilose in *W. fasciculata*), wing petals that are slightly longer than the keel (wing petals shorter than the keel in both *W. leipoldtiana* and *W. fasciculata*) and linear pods (the pods are oblanceolate to elliptic in *W. leipoldtiana*) that are longer (20–25 mm long) than those of *W. fasciculata* (pods also linear in *W. fasciculata* but much smaller, 14–17 mm long). *Wiborgiella bowieana* (Benth.) Boatwr. & B.-E.van Wyk, like the new species, also occurs in the Robertson area but differs from *W. argentea* in the much larger calyx (9.0–10.5 mm long) with long lobes (3.0–3.5 mm long) and the pods that are ovate to lanceolate (calyx 4–5 mm long with the lobes 1.0–1.5 mm long in *W. argentea* and pods linear).

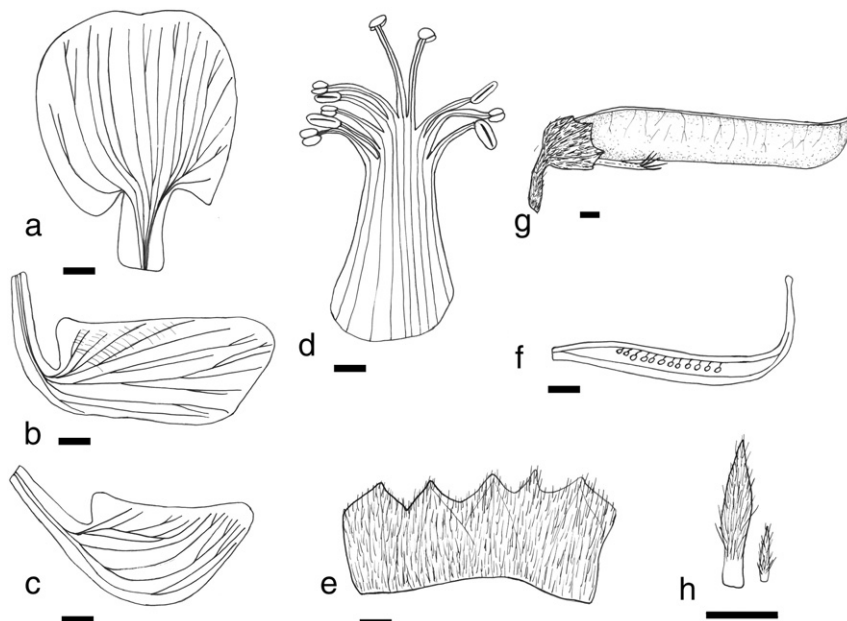


Fig. 2. Morphology of *Wiborgiella argentea*: (a) standard petal; (b) wing petal; (c) keel petal; (d) androecium; (e) outer surface of calyx (upper lobes to the left); (f) pistil; (g) pod in lateral view; (h) bract (left) and bracteole (right). Voucher specimen: (a–h) Helme 7481 (NBG). Scale bars: all 1 mm.

3.1.2. Distribution and habitat

The species is only known from a single locality and population, some 6 km east of McGregor, in the Breede River Valley (Fig. 3). The population occurs in Robertson Karoo vegetation (SKv7; Mucina et al., 2006) on steep, south-facing, rocky, shale slopes. Most of the population is found above the Strykhoogte Pass, with a few plants observed below the pass. A brief survey of the nearby slopes in May 2013 did not reveal a larger or more widespread population, and a brief survey of likely habitat in Vrolikheid Nature Reserve in August 2013 failed to yield the species.

3.1.3. Etymology

The species is named for the silvery appearance of the leaves and young vegetative parts.

3.1.4. Conservation status

The only known population is estimated to be between 100 and 200 plants, none of which are within the Vrolikheid Nature Reserve. The population covers an area of about 2 ha. About 30% of the population occurs within the road reserve, and the remainder is on private land that is heavily and regularly grazed and trampled by goats. The grazing clearly has an impact on the plants and habitat, although the woody nature and

height of the plants seems to afford them an element of protection. It is possible that further fieldwork will show the species to be present within the Vrolikheid Nature Reserve (some 1 km to the north), where seemingly suitable habitat is present, and where grazing pressure is likely to be lower. The conservation status of the species is assessed as CR B1ab(iii) + 2ab(iii) using IUCN (2001) criteria.

3.1.5. Additional specimens

South Africa. Western Cape Province. 3319 (Worcester): Strykhoogte (-DD) Aug 2013, N.A. Helme 7788 (NBG, BOL).

4. Insert into key of Boatwright et al. (2010)

- 5. Wings longer than the keel; pods narrowly ovate to linear; plants occurring in Saldanha, Hopefield and Robertson.....5a
  - 5a. Flowers pink with slightly down-curved wing petals flared outwards at the apex; outer surface of calyx purple; pods narrowly ovate; plants restricted to the Saldanha Peninsula and Hopefield.....2. *W. dahlgrenii*
  - 5b. Flowers yellow with straight wing petals curved inwards at the apex; outer surface of calyx green; pods linear; plants restricted to Robertson area.....10. *W. argentea*

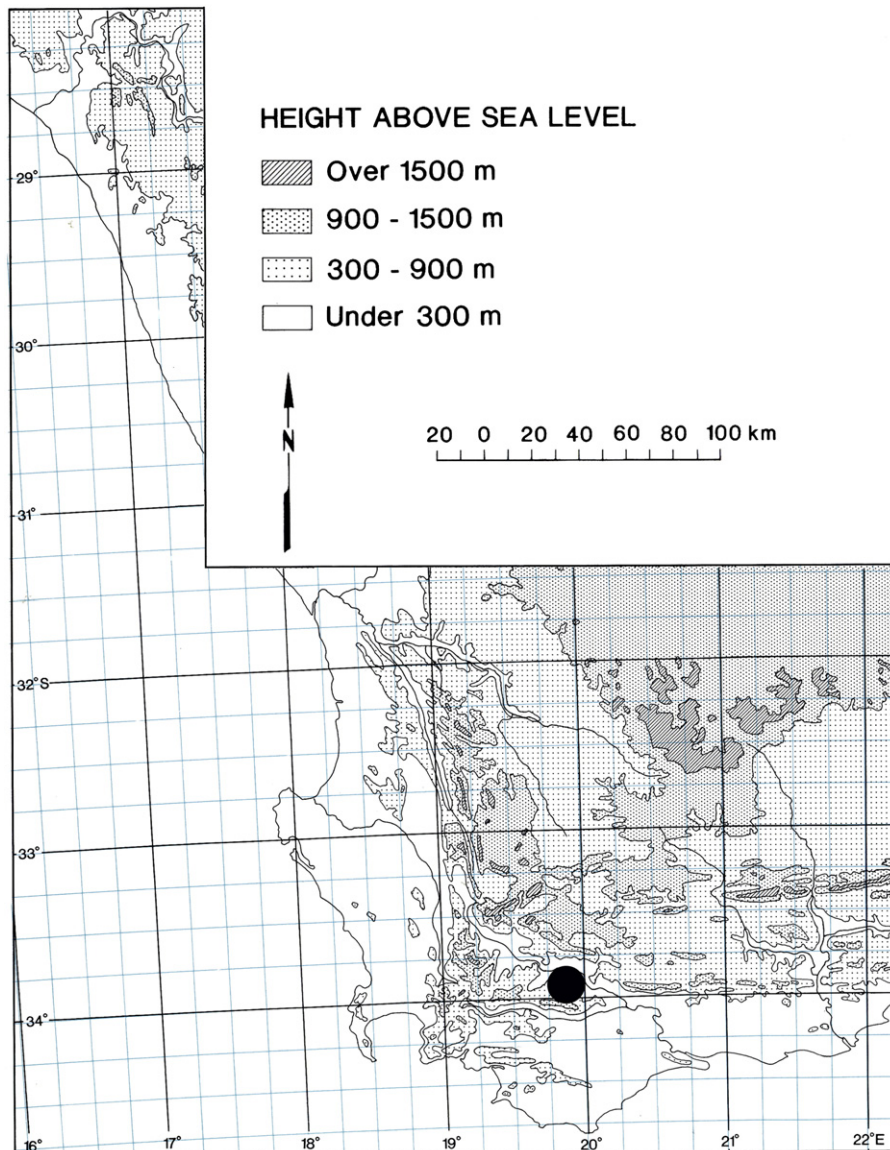


Fig. 3. Known geographical distribution of *Wiborgiella argentea*.

5. Wings shorter than the keel; pods oblanceolate to elliptic, linear or obovate; plants occurring in the Eastern Cape, Niewoudtville, Gifberg, Albertinia or from Sutherland north to the Anenous Mountains.....6
6. Petiole base neither tuberculate nor persistent; standard petal upright.....7. *W. mucronata*
6. Petiole base tuberculate and persistent; standard petal reflexed .....7
7. Leaflets linear to spatulate; pods long-stipitate; pods 4–6 mm long.....4. *W. humilis*
7. Leaflets linear-oblanceolate to ovate; pods short stipitate; pods more than 14 mm long.....8
8. Pods linear; flowers 9–10 mm long; Albertinia.....3. *W. fasciculata*
8. Pods oblanceolate to elliptic; flowers 10–13 mm long; from the Sutherland area northwards to the Anenous Mountains .....6. *W. leipoldtiana*

## References

- Boatwright, J.S., Le Roux, M.M., Wink, M., Morozova, T., Van Wyk, B.-E., 2008. Phylogenetic relationships of the tribe Crotalariaeae (Fabaceae) inferred from DNA sequences and morphology. *Syst. Bot.* 33, 752–761.
- Boatwright, J.S., Tilney, P.M., Van Wyk, B.-E., 2009. The generic concept of *Lebeckia* (Crotalariaeae, Fabaceae): reinstatement of the genus *Calobota* and the new genus *Wiborgiella*. *S. Afr. J. Bot.* 75, 546–556.
- Boatwright, J.S., Tilney, P.M., Van Wyk, B.-E., 2010. Taxonomy of *Wiborgiella* (Crotalariaeae, Fabaceae), a genus endemic to the Greater Cape Region of South Africa. *Syst. Bot.* 35, 325–340.
- Boatwright, J.S., Wink, M., Van Wyk, B.-E., 2011. The generic concept of *Lotononis* (Crotalariaeae, Fabaceae): reinstatement of the genera *Euchlora*, *Leobordea* and *Listia* and the new genus *Ezoloba*. *Taxon* 60, 161–177.
- IUCN, 2001. IUCN Red List Categories and Criteria Version 3.1. Prepared by the IUCN Species Survival Commission.
- Mucina, L., Jürgens, N., Le Roux, A., Rutherford, M.C., Schmiedel, U., Esler, K.J., Powrie, L.W., Desmet, P.G., Milton, S.J., 2006. Succulent Karoo biome. In: Mucina, L., Rutherford, M.C. (Eds.), *The Vegetation of South Africa, Lesotho and Swaziland, Strelitzia 19*. South African National Biodiversity Institute, Pretoria, pp. 221–299.
- Raimondo, D., von Staden, L., Foden, W., Victor, J.E., Helme, N.A., Turner, R.C., Kamundi, D.A., Manyama, P.A. (Eds.), 2009. *Red List of South African plants, Strelitzia 25*. South African National Biodiversity Institute, Pretoria.