

# ***Polygala retiefiana* (Polygalaceae), a new species described from South Africa**

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## **Abstract**

A new species of *Polygala* (Polygalaceae), *P. retiefiana*, is described from the KwaZulu-Natal and Free State provinces of South Africa. It is endemic to the country.

**Key words:** plant taxonomy, biodiversity, Polygalaceae, *Polygala retiefiana*, endemic, South Africa

With the order Polygalales no longer accepted, the Polygalaceae belong now to the order Fabales, the circumscription of which (Chase *et al.* 1993) includes four families: Fabaceae, Polygalaceae, Quillajaceae and Saurianaceae. These families have as common characteristic the monosymmetric flowers (Tucker 2003) where one of the petals, or two united petals, form a keel (carina) which covers the androecium and gynoecium. This group of plants with papilionaceous or pseudo-papilionaceous flowers is well-characterised both molecularly (APG III 2009) and ontogenically (Bello *et al.* 2010). Interfamilial relationships and patterns of floral evolution were also found between these four families (Bello *et al.* 2012).

The Polygalaceae include c. 1300 species in 17–25 genera, depending on the classification followed, as several genera have been recently segregated (Pastore *et al.* 2010, Abbott, 2011, Pastore 2012, Pastore & Abbott 2012). They have a cosmopolitan distribution but are absent from the Arctic and Antarctic regions. *Polygala* Linnaeus (1753: 701) is a cosmopolitan genus with about 750 species, widespread mainly in tropical and subtropical regions. The genus is divided into several subgenera, but with the exception of three species from northwestern Africa, all African species belong to the subgenus *Polygala*. In Africa, *Polygala* is represented by over 210 species (Paiva 1998) of which c. 80 species occur in southern Africa (Botswana, Lesotho, Namibia, South Africa and Swaziland). Of these, c. 55 species are endemic to the region.

At first sight the flowers of plants of *Polygala* resemble papilionaceous (legume) flowers. However, the similarity is only superficial: in the flowers of species of *Polygala* the wings are comprised of two petaloid sepals, not petals; instead of the standard of the papilionaceous flower, the polygalaceous flower has two petals; and whereas the papilionaceous flower has a keel composed of two petals, *Polygala* flowers have a single, boat-shaped, central, inferior petal, called a carina, with a fimbriate appendage (crest). This peculiar flower morphology has attracted considerable attention to the genus. The first reference to African *Polygala* known in the literature is by Commelin (1697: tab. 46) who illustrated *Polygala arborea myrtifolia* [= *Polygala myrtifolia* Linnaeus (1753: 703)], a South African species introduced and naturalized in many mild-climate regions of the world (Paiva 1998). In spite of interest in the genus, and its high level of endemism in the southern African region, *Polygala* was only partially revised for South Africa by Levyns (1955), for Namibia by Friedrich-Holzhammer & Merxmüller (1968) and for Botswana by Exell (1960), but a complete revision is still lacking.

As part of on-going revisionary work on the genus in Africa (Paiva 1998, 2007, 2008, 2011), an undescribed species of *Polygala* was recently recorded in the collections of South Africa's National Herbarium (PRE). The species is here described and illustrated.



**Figure 1:** A. Habit. B. Crest. C. Flower. D. Flower with calyx removed. E. Fruit. F. Seed. A–D from *Jacobsz 347*; E from *Trauseld 471*; F from *Jacobsz 137*. Scale bars: A, 20 mm; B, 0.5 mm; C–E, 2 mm (between C&D); F, 1 mm. Artist: Gillian Condry.

## Taxonomy

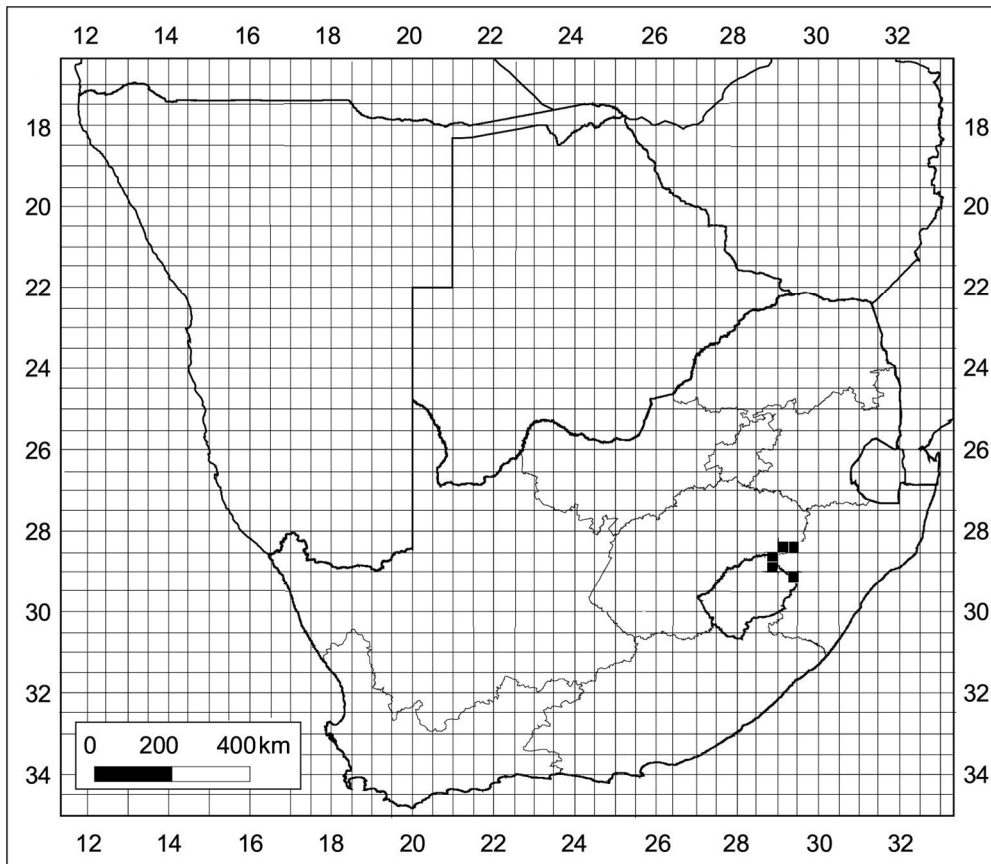
***Polygala retiefiana* Paiva & Figueiredo, sp. nov.** (Fig. 1)

**Diagnosis:**—It is distinct from the closely related *Polygala garcinii* based on its smaller flowers that have asymmetric wing sepals of 8.0–8.5 mm long (instead of symmetric wing sepals, 8–11 mm long) and a carina of 4.0–4.5 mm long (instead of 7–10 mm long).

**Type:**—SOUTH AFRICA: Free State: Harrismith District, Berg Manyenyeza op die plaas [on the farm] Rensburgskop, 2829AD, 1800 m elev., 17 January 1977, *Jacobsz 347* (holotype: PRE!).

Perennial herb, with a woody base. Stems slender, 20–30 cm long, branched, angled, glabrous. Leaves alternate, subsessile (petiole up to 0.5 mm long, glabrous), linear, 8–18 × 0.5–1.0 mm, acute, glabrous. Flowers pinkish, in few-flowered (5–16 flowers), terminal racemes, erect, up to 8 cm long, rachis and peduncle glabrous; pedicels 3–4 mm long, glabrous; bract linear, 2.0–2.5 mm long, glabrous, persistent; bracteoles linear, ca. 1 mm long, glabrous, persistent. Posterior sepal linear-lanceolate, 4.00 × 1.25 mm, acute, glabrous; wing sepals asymmetrically elliptic, 8.0–8.5 × 5 mm, glabrous; anterior sepals linear-lanceolate, 3 × 1 mm, acute, glabrous, free. Upper petals obovate, 3.0–3.5 × 1.5 mm, unequally bifid; carina 4.0–4.5 × 1.75–2.0 mm; crest 1.5–2.0 mm long, fimbriate. Stamens 8. Capsule widely-elliptic to almost obovate in outline, 5.0–5.5 × 4 mm, asymmetrically bilobate, glabrous, winged (wing 0.5–0.75 mm wide). Seeds ellipsoid, 2.75–3.0 × 1.25 mm, sparsely sericeous-pubescent; caruncle 0.5 mm long, long-hairy, with three long appendages, ca. 1.5 mm long.

**Distribution and habitat:**—*Polygala retiefiana* is endemic to South Africa, where it occurs in grasslands in summer-rainfall areas, at elevations of up to 1800 m above sea level, around the border of the KwaZulu-Natal and Free State provinces of the country and neighbouring Lesotho (Fig. 2). All the collections of this species recorded to date



**Figure 2:** Distribution of *Polygala retiefiana*.

have been made on the Drakensberg proper, close to and immediately north of the Drakensberg Alpine Centre of Endemism (DAC) as defined by Van Wyk & Smith (2001).

**Phenology:**—Flowers recorded from October to March, therefore from early to late summer in the Southern Hemisphere.

**Conservation status:**—This species is represented in PRE by five collections only, the most recent one dating from 1977, which may be an indication of its rarity.

**Etymology:**—The species is named after Dr Elizabeth Retief (born in Bloemfontein on 11 October 1947) a South African taxonomist who worked at the National Herbarium of

South Africa from 1970 to 2010. She co-authored the recently described *Polygala sekhukhuniensis* Retief, S.J.Siebert & A.E.van Wyk in Siebert *et al.* (2010).

**Additional specimens examined (paratypes):**— SOUTH AFRICA: Free State: Harrismith District, 2829AC, 4 March 1962, *Jacobsz 137* (PRE!). KwaZulu-Natal: Bergville district, Drakensberg National Park, slopes of Plowman's Kop, 2828DB, 29 October 1938, *Hafstrom & Acocks 822* (PRE!); Mont-aux-Sources, 2828DD, 1800 m elev., 4 October 1950, *Sidey 2018* (PRE!); Eastcourt district, Giant's Castle Game Reserve, Munden Stream, 2929AB, 1620 m elev., date unrecorded, *Trauseld 471* (PRE!).

## Discussion

*Polygala retiefiana* belongs to *Polygala* sect. *Psychanthus* (Rafinesque (1814: 116)) De Candolle (1824: 321). The species included in this section are distributed in southern and southeastern Africa. The main characters distinguishing the section are: flowers in terminal or pseudo-lateral racemes, anterior sepals free, wing sepals large and covering the capsule, upper petals bilobed to subentire and seeds pubescent and carunculate, with the three branches of the caruncle  $\pm$  the same length.

The specimens of *Polygala retiefiana* had been previously identified as *P. refracta*, but the two species are easily distinguishable on account of the terminal racemes of *P. retiefiana* (as opposed to lateral racemes of *P. refracta*), in other words, the secondary fertile branches (with racemes) in *P.refracta* are much shorter compared to *P.retiefiana*. *Polygala retiefiana* appears to be more closely related to *Polygala garcinii*, a species also endemic to South Africa, but which is restricted to the winter-rainfall areas of the Western Cape province. *Polygala retiefiana* differs from *P. garcinii* in the smaller size of the flowers and shape of the wing sepals. A characteristic feature of the new species is that the caruncle is long-hairy, with three long appendages.

*Polygala retiefiana* occurs in summer-rainfall areas of South Africa, but it appears to be sparsely distributed, as no recent specimens were found in PRE; the most recent specimen found in the collection dates from 1977. Since the area where the species occurs is well

represented in PRE, the lack of recent material of this species may be an indication of its relative rarity.

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