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A New Species of *Polygala* (Polygalaceae) from Brazil

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ABSTRACT. One new species for Polygalaceae from Brazil is described, illustrated, and compared with related species of *Polygala* L. subg. *Hebeclada* (Chodat) S. F. Blake. *Polygala marquesiana* J. F. B. Pastore & T. B. Cavalcanti is an attractive caespitose subshrub from the state of Goiás, occurring in the high-altitude areas of Serra Geral do Paranã in the central part of the Brazilian savannas.

RESUMO. Uma nova espécie de Polygalaceae para o Brasil é descrita, ilustrada e comparada com espécies relacionadas de *Polygala* L. subgênero *Hebeclada* (Chodat) S. F. Blake. *Polygala marquesiana* J. F. B. Pastore & T. B. Cavalcanti é um belo subarbusto do estado de Goiás, que ocorre em elevadas altitudes da Serra Geral do Paranã, na porção central do cerrado brasileiro.

Key words: Brazil, IUCN Red List, *Polygala*, Polygalaceae, subgenus *Hebeclada*.

Expeditions in Brazil have been undertaken to increase the knowledge of the Brazilian Polygalaceae. These efforts have resulted in the collection of many interesting plants of the family, a number of which represent rare and endemic species. *Polygala* L. is first among the 18 genera in number of species in the Polygalaceae, with about 730 recognized species (Paiva, 1998) and 180 Brazilian species (Marques, 1979, 1984). The genus is widely distributed in all continental areas globally except in the Arctic, Antarctic, and New Zealand (Paiva, 1998), with the greatest diversity concentrated in South America. Ongoing efforts to revise *Polygala* species in the state of Goiás, within the central Brazilian savanna, have confirmed the presence of one species as undescribed in the genus.

The subgenus *Hebeclada* (Chodat) S. F. Blake is morphologically well delimited from the other subgenera of *Polygala* (Marques, 1979) by the upper

posterior sepals, which are almost fully connate, with the style curved at a 90° angle and 4–5 times longer than the ovary and with the keel ecrystate. Some studies, such as those of Eriksen (1993) and Persson (2001), provide evidence that subgenus *Hebeclada* would be better treated as a distinct genus. However, the application of a generic name for this taxon depends not only on the results of a phylogenetic analysis, but also on a question of nomenclature regarding the status of Rafinesque's generic name *Alsemeia*, previously used by Small (1933).

Polygala subg. *Hebeclada* is only known from continental America (Marques, 1979) with a total of about 22 species. Members of the group are well represented in the Brazilian flora, the majority of which are endemic to high-altitude serras of the Campos Rupestres biome. In the Chapada dos Veadeiros of Goiás State alone, 12 species have been identified, four of which are endemic: *P. xyloclada* Chodat, *Polygala* sp. ined. 1, *Polygala* sp. ined. 2, and *P. marquesiana*.

Polygala marquesiana J. F. B. Pastore & T. B. Cavalcanti, sp. nov. TYPE: Brazil. Goiás: Alto Paraíso, povoado de São Jorge, beira da estrada para Colinas do Sul, após 4 km de São Jorge, ca. 14°11'48"S, 47°50'34"W, 16 Nov. 2007 (fl), Pastore et al. 2325 (holotype, CEN; isotypes HUEFS, K, MO, NY, RB). Figure 1.

Polygala marquesiana ad subgen. *Hebecladam* (Chodat) S. F. Blake sepalis superioribus externis fere omnino connatis et carena non cristata pertinens. *Polygalae hebecladae* DC. affinis sed bracteis post anthesim persistentibus et trichomatibus in foliis caulibusque sericeis differt. Ab omnibus speciebus subgeneris *Hebecladae* disco basi ovarii praesentia et foliis distalibus linearibus differt.

Caespitose herbs 25–36 cm tall, less congested distally; stems 1.8–2 mm diam., cylindrical, rigid,

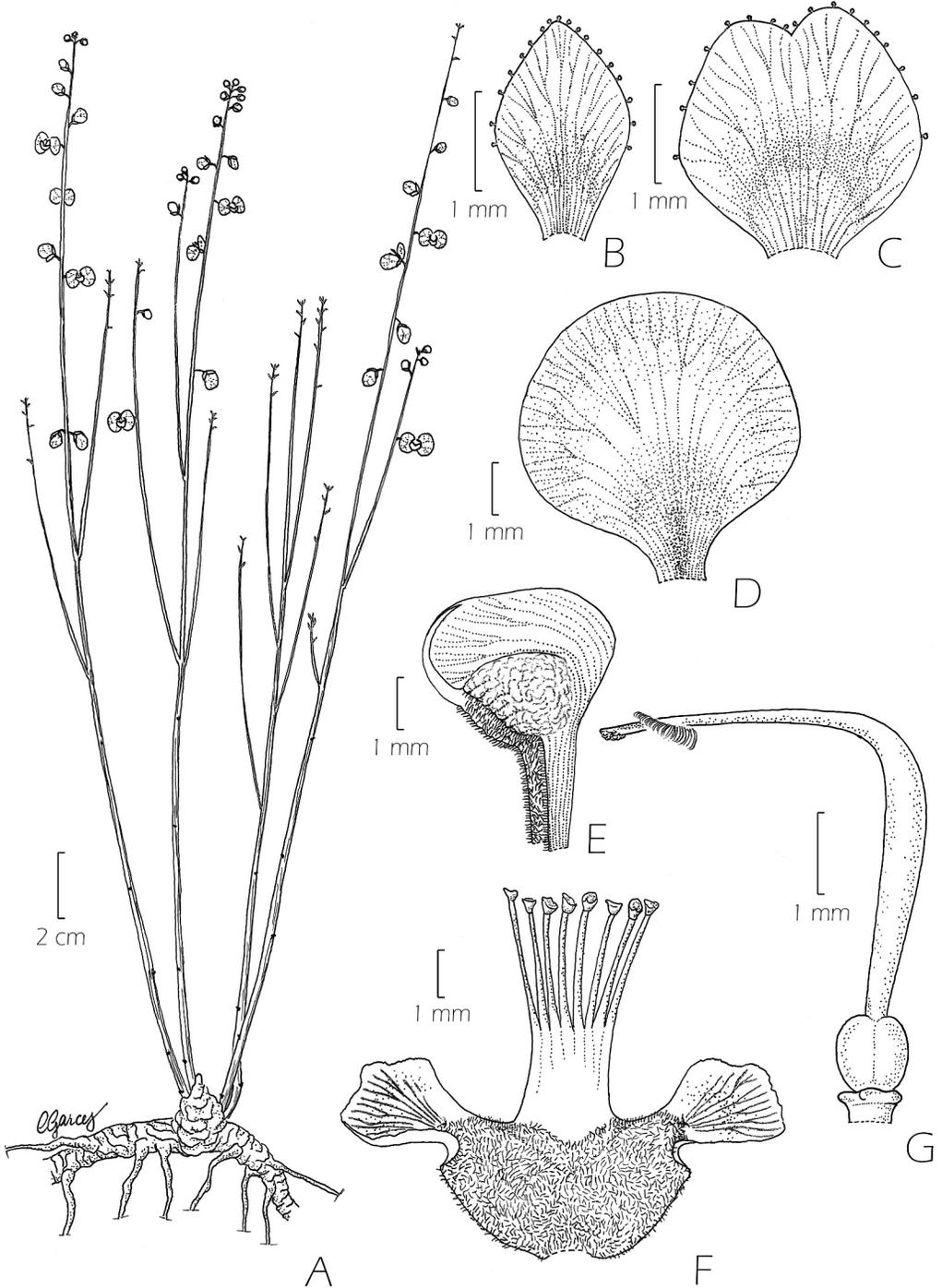


Figure 1. *Polygala marquesiana* J. F. B. Pastore & T. B. Cavalcanti. —A. Habit. —B. Inferior outer sepal. —C. Superior outer sepals. —D. Inner sepal. —E. Carina. —F. Androecium and lateral petals. —G. Gynoecium with disc around the ovary base. Drawn from the holotype, Pastore & Suganuma 218 (CEN).

glaucous, green to purple at the base, glandular-punctate, trichomes glandulous and sparse, basally more concentrated; roots fleshy, well developed, white to yellow. Leaves minute in size, 1–4 × 1–3 mm,

diminishing in size toward stem-apex, linear, caducous, green to purple when young, glabrous to glabrescent, subsessile. Terminal raceme 3–10 cm, lax; rachis striate, glabrous or with sparse simple

Table 1. Morphological comparison of *Polygala marquesiana* and related species.

	Inner sepals (wings)	Pediceal	Indument of stems	Leaf	Bracts
<i>P. xyloclada</i>	suborbicular	curved	puberulent	elliptic to oval	subpersistent
<i>P. rhodoptera</i>	suborbicular	curved	pubescent	elliptic to oval	persistent
<i>P. hebeclada</i>	elliptic	erect or patent	pubescent	elliptic to oval	persistent
<i>P. marquesiana</i>	suborbicular	curved	puberulent	linear	caducous
<i>Polygala</i> sp. ined. 1	elliptic	curved	pubescent	linear	persistent

trichomes, glandular-punctate; pedicel 2–3 mm, curved in fructification, glabrous or with fine, sparse trichomes; bracts and bracteoles glabrous, linear, delicate, caducous, the central ones 2 mm, the lateral ones 0.3 mm. Flowers 6–8 mm; outer sepals subequal, green, sometimes purple, subfleshy, apex acute, concave, venation dichotomous, conspicuous, glandular trichomes on the margin; the inferior sepal 3.6–3.9 × 3–3.1 mm; the superior sepals 2.5–2.8 × 2.7–3 mm, almost completely connate to the margin; inner sepals (wings) 5.3–6 × 5.3–6.5 mm, suborbicular, lilac, equal to or shorter than the carina, apex rounded, venation dichotomous, conspicuous; lateral petals ca. 5 × 2.1 mm, lilac with transverse white stripes toward apex, rose to white toward base, apex rounded, basally puberulent on ventral side; keel 5–5.7 mm, deep lilac, not cristate, almost trilobate, puberulent on the inner surface, apex yellow; base ciliate, 4.6–5 mm, unguiculus 1.4–1.8 mm, cuculus 3.6–4.3 mm wide; style bent in middle at ca. 90° angle, stamens 8, filaments white, glabrous; anthers ca. 0.5 × 0.4 mm, slightly obovate, yellow; ovary ca. 0.8 × 0.8 mm, suborbicular, glabrous, pale green; disc around ovary base ca. 0.18 × 0.9 mm. Mature fruits not seen; immature capsules elliptic, green; seeds oblong, white, puberulent with white trichomes.

Distribution and IUCN Red List category. Despite the fact that neither of the two collecting sites, which are about 55 km apart at between 810 and 1010 m elevation, falls within a conservation area, the area between them and adjacent areas form part of the Chapada dos Veadeiros National Park (Goiás). It is probable, therefore, that further populations will eventually be found in the intervening areas, where access is necessarily more restricted. Our fieldwork indicates that the new species almost certainly has a total population of less than 1000 individuals. We therefore recommend that it be considered Vulnerable (VU D1) according to IUCN Red List criteria (IUCN, 2001).

Phenology and ecology. *Polygala marquesiana* is unmistakable in the field, with its deep lilac, showy flowers, caespitose habit, and presence of glandular trichomes on the stems. *Polygala marquesiana* is not only morphologically different from other members of

the subgenus, but also displays unusual ecological features. *Polygala marquesiana* is rarely found fertile because the plant flowering occurs as a response to burning. This species was collected again with flowers (*Pastore et al.* 2325) after 12 subsequent visits in different months in the same area, where it was collected for the first time (*Pastore & Sukanuma* 218). It is worth noting that, during all this period, no fires occurred in the collection area. *Pastore et al.* 2325, as well as the paratype, which was collected in Cavalcante, were found in an area recovering from recent fires.

It should be noted that individuals were more than a meter apart in the field but were actually linked by a fleshy root system. This indicates the importance of vegetative reproduction in this species, which could compensate for infrequent flowering, and could also explain why the species is so poorly represented in the herbaria that we visited.

Etymology. The epithet honors Brazilian botanist Maria do Carmo Mendes Marques, of the Rio de Janeiro Botanical Garden, the noted authority on Polygalaceae of South America, who has collected many interesting Polygalaceae during the course of her investigations and has published both important contributions and new species for the family.

Relationships. Closely related species (*Polygala hebeclada*, *P. rhodoptera* Martius ex A. W. Bennett, *P. xyloclada*, and *Polygala* sp. ined. 1) are analyzed in Table 1.

Paratype. Brazil. **Goiás:** Goiás: Alto Paraíso, povoado de São Jorge, beira da estrada para Colinas do Sul, ca. 14°10'46"S, 47°49'01"O, 4 Jan. 2003 (fl), *Pastore & Sukanuma* 218 (CEN). Cavalcante: ponte sobre o rio Tocantins, Km 79, 13°40'50"S, 47°52'35"O, 30 Oct. 2004, *Cavalcanti et al.* 3523 (BR, CEN, MO).

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