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Polygala minarum (Polygalaceae), a new species endemic to southern Minas Gerais, Brazil

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Summary. A new species, *Polygala minarum* (Polygalaceae) subgenus *Polygala* series *Nudicaules*, is described from Lavras, Serra de Carrancas and São Sebastião do Paraíso in the south of Minas Gerais State, Brazil. The infrageneric placement and its conservation status are assessed and its habitat and phenology are discussed. The new species is compared with its morphologically allied species, *P. fontellana*, *P. poaya*, and *P. nudicaulis*. Illustrations, photographs, and a distribution map are also provided.

Key Words. subgenus *Polygala*, taxonomy.

Introduction

Polygala L., after its recent dismemberment, is now restricted to subgenus *Polygala* (Pastore *et al.* 2010; Abbott 2011; Pastore 2012; Pastore & Abbott 2012; Pastore & Moraes 2013). However, the genus remains the largest in number of species in Polygalaceae. *Polygala* has 100 species in Brazil. About 10% of them have very restricted distributions, being endemic to small regions at high altitudes, often above 1,000 m. The State of Minas Gerais has the highest number of species, with a total of 53 (Pastore *et al.* 2015), six of which are endemic to this state, five from Chapada Diamantina and one from Serra do Caparaó. Recent efforts to describe the Brazilian endemic species of *Polygala* have been important to the knowledge of endangered species of Central Brazilian savannas, for example *P. suganumae* J. F. B. Pastore & Marques and *P. patens* J. F. B. Pastore & Marques recently described from Chapada dos Veadeiros (see Pastore & Marques 2009; Pastore *et al.* 2014). The new species described here, *P. minarum*, is from savanna in Minas Gerais and is the first endemic species of Polygalaceae from the region of 'Lavras'.

Taxonomic Treatment

Polygala minarum *J. F. B. Pastore* **sp. nov.** Type: Brazil, Minas Gerais, Carrancas, Estrada para a Serra das Bicas, c. 5 km saindo da cidade ao lado esquerdo da estrada afloramento rupestre, 22 Feb. 2015, *Pastore* 5084 (holotype CTBS!; isotypes CEN!, HUEFS!, K!, NY!, RB!).

http://www.ipni.org/urn:lsid:ipni.org:names:77154534-1

Subshrub erect and branched from the base to 30 cm tall, with fleshy roots, lignose stems to 1 – 1.5 mm diam., strongly angular, densely puberulous, trichomes short-clavate, stems green without yellowish glands forming spots. *Leaves* all alternate, subsessile, rigid-chartaceous, secondary veins prominent; lamina 0.6 – 1.2 × 0.3 – 0.5 cm, lanceolate, apex acuminate, margin revolute and base acute, densely covered by small glandular trichomes. *Racemes* spiciform, 2.5 – 5 × 1 – 1.1 cm, reaching 7 cm after fruits have fallen, flowers congested; bracts 0.8 – 0.9 × 0.2 mm, lanceolate, apex acute, not ciliate, without yellowish spots, deciduous before the flowers open, c. 3 times longer than the bracteoles; bracteoles ovate, not ciliate; pedicel c. 0.9 mm, glabrous. *Flowers* lilac-coloured, 6 – 6.2 mm long; outer sepals not ciliate, with whitish spots; lower outer sepals 1.8 – 1.9 × 0.8 mm, ovate, with acute apex; upper outer sepals 2.6 × 1.5 mm, ovate, with apex obtuse, free from each other almost to the base; inner sepals (wings) 4.2 × 2.6 mm, obovate, with apex obtuse, margins not ciliate, about twice the length of mature fruits; lateral petals 3.6 × 2 mm; keel c. 4 mm long, cristate, with whitish spots around the dorsal central vein, caducous on mature fruits; crest 10 – 12-lobed; style arched, terminated by an oblique cymbiform pre-stigmatic cavity, posterior extremity with a conspicuously crested appendage with abundant trichomes and an anterior globose stigma. *Capsules* 3 – 3.1 × 3 mm, ovate, with whitish spots, style caducous in fruit; seeds c. 2.2 × 1.1 mm, ovoid, pubescent; appendages almost the same length as the seed, c. 2.1 mm. Figs 1, 2 and 3.

RECOGNITION. The crested keel places *Polygala minarum* within *Polygala* subgenus *Polygala*, whereas

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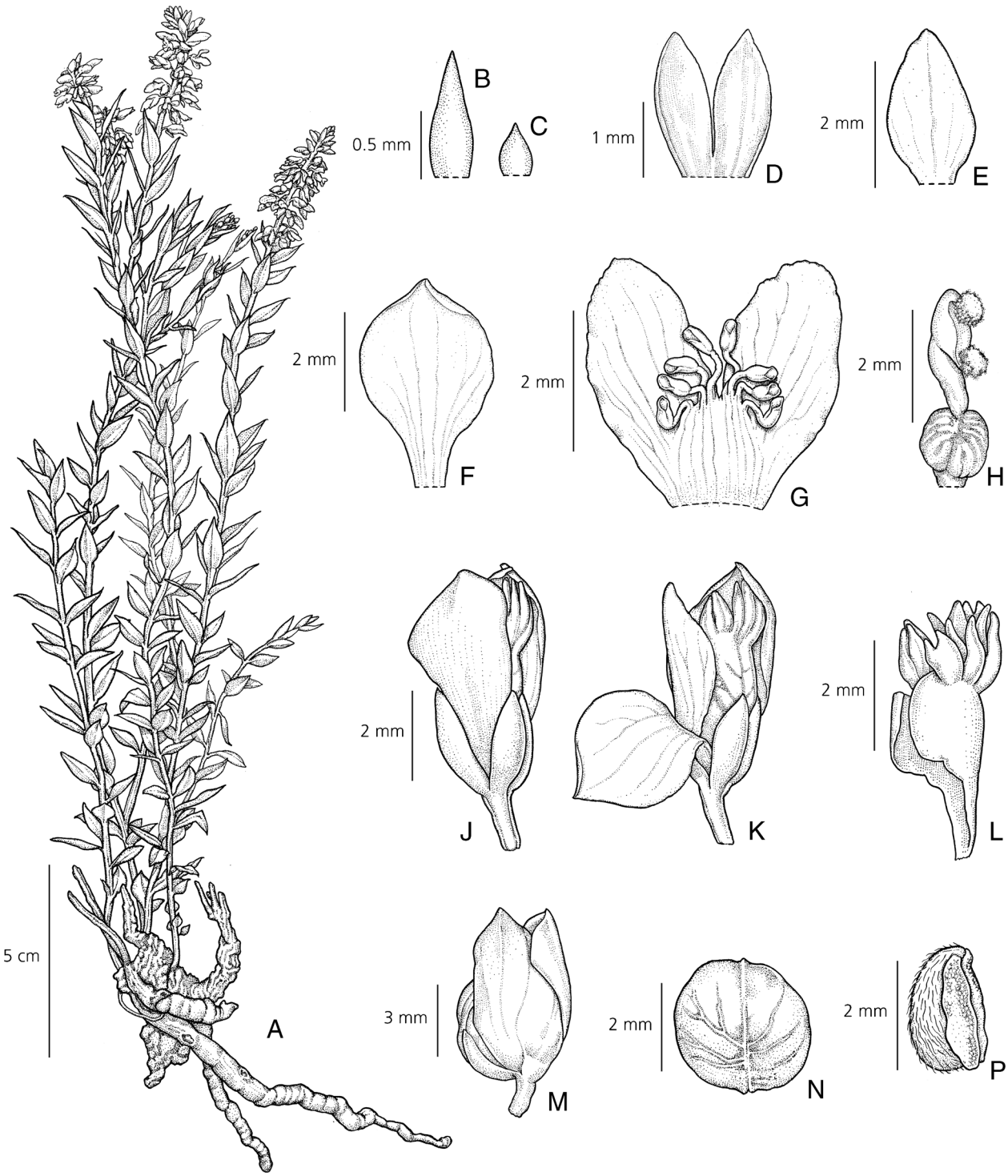


Fig. 1. *Polygala minarum*. **A** habit; **B** bract; **C** bracteole; **D** two superior outer sepals; **E** inferior outer sepal; **F** one of the two inner sepals (wings); **G** androecium and lateral petals; **H** gynoecium; **J** and **K** flower; **L** carina; **M** fruit with persistent calyx; **N** capsule; **P** seed. All from *Pastore* 5084. DRAWN BY JOÃO SILVEIRA.

the angular stems and whitish spots on floral parts is associated with the species *P. poaya* Mart. (from series *Densifolium* Marques), *P. nudicaulis* A. W. Benn. (type of series *Nudicaules* Chodat included in series *Tenues* Chodat (1893) by Marques 1988), and *P. fontellana* Marques & A. C. A. Aguiar (described

Fig. 2. *Polygala minarum,* whole plant, collected as *Pastore* 5084 (type). PHOTO BY J. FLORIANO B. PASTORE

without series). Almost certainly, these species are related each other and the current series delimitation in *Polygala* doesn't represent a phylogenetic perspective.

Polygala minarum is morphologically closest to *P. poaya*. However, it is readily recognised by its lanceolate leaves 0.6 – 1.2 × 0.3 – 0.5 cm, and flower size 6 – 6.2 mm (vs elliptic leaves 2.5 – 4 × 0.9 – 1.6 cm, flowers 7 – 8 mm in *P. poaya*). *P. minarum* also can be recognised by its phenology not being tied to a response to fire, as occurs in *P. poaya* (see Table 1).

DISTRIBUTION. Brazil, southern portion of the State of Minas Gerais, Lavras, Carrancas and São Sebastião do Paraíso. Map 1.

SPECIMENS EXAMINED. BRAZIL. Minas Gerais: Serra da Bocaína / Antena – Lavras, 15 May 1987, *Carvalho et al.* s.n. [P 138]. Carrancas, Pedreira do Guilherme, 22 April 2006, *Batista et al.* 1360 (BHCB); Estrada para a Serra das Bicas, c. 5 km saindo da cidade ao lado esquerdo da estrada afloramento rupestre, 22 Feb. 2015, *Pastore* 5084 (CEN, CTBS, HUEFS, K, NY, RB). Carrancas, Fazenda Grão-Mogol, 6 Oct. 1998, *Kinoshita et al.* 98-167 (UEC), Pedreira do Guilherme, 8 Oct. 1988, *Kinoshita et al.* 98-579 (UEC), Serra de Carrancas, afloramento junto a sede da fazenda do Sr. João Galdêncio, 8 Oct. 1998, *Kinoshita* 98-548 (UEC). Lavras, Serrinha, entrada dá acesso à Retransmissora da CEMIG, 7 Dec. 1983, *Leitão-Filho et al.* 15304 (UEC). São Sebastião do Paraíso, Termópolis, 8 Sept. 1982, *Leitão-Filho et al.* 14155 (UEC).

HABITAT. *Polygala minarum* occurs in rocky field areas, called *campo limpo rupestre*, in red clay soil; altitudes between c. 880 – 1100 m.

CONSERVATION STATUS. *Polygala minarum* occurs close to areas with occurrence of ferruginous laterite which is of economic interest for iron and other material exploration. Therefore, the conservation status fits within the criteria VU (B1: a, b3) of IUCN (2012); the known area of occupancy is estimated to be less than 2,000 km^2 and, because its habitat is of strong economic interest for mining activity, a continued decline of habitat quality and quantity is anticipated.

PHENOLOGY. *Polygala minarum* has fleshy roots and occurs in an area of rocky field (campo rupestre) where vegetation is not dense (low amount of

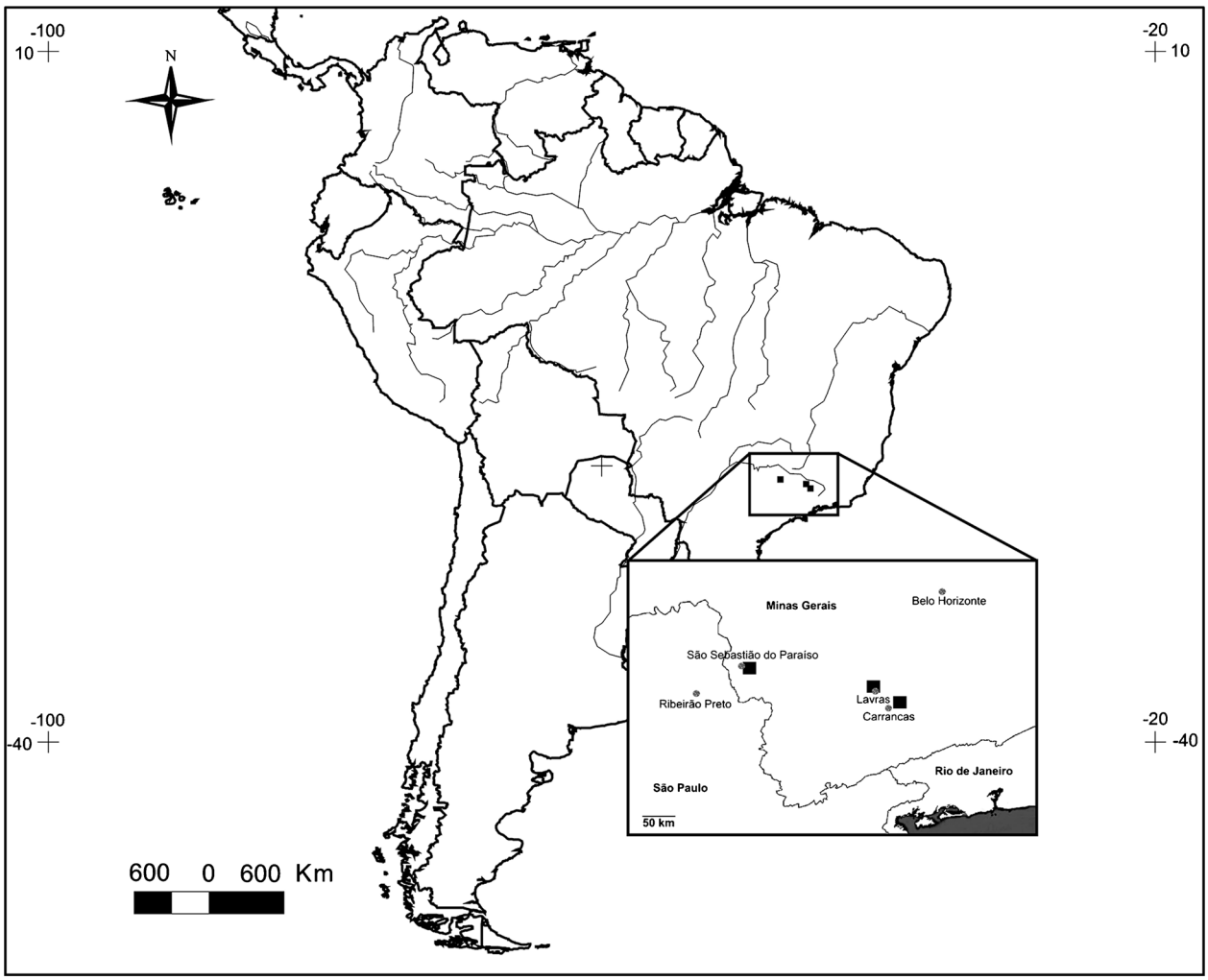
Fig. 3. *Polygala minarum,* inflorescence, collected as *Pastore* 5084 (type). PHOTO BY J. FLORIANO B. PASTORE

Table 1. Table to compare differences between *Polygala minarum* and allied species.

	Leaf shape	Leaf texture	Leaf size (cm)	Flower size (cm)	Occurrence
P. fontellana	narrowly ovate to lanceolate	membranaceous	1.7 – 3 × 0.7 – 1	4.8 – 5	North of MG and BA
P. nudicaulis	linear to scale-like	rigid chartaceous		3.5 – 4	South of MG and SP
P. minarum	lanceolate	rigid chartaceous	0.6 – 1.2 × 0.3 – 0.5	6 – 6.2	South of Minas Gerais
P. poaya	elliptic to narrowly elliptic	leathery	2.5 – 4 × 0.9 – 1.6	7 – 8	savannas of Brazil, Bolivia and Paraguay

organic material available), and most populations were found on the border of streams. Therefore, this species seems not to be adapted to the intense fire region of savanna. *P. minarum* flowers September, October, December, February and April. This system of flowering throughout much of the year (during the dry and rainy seasons in savannas of Central Brazil) is also shared by other related species, *P. fontellana*, *P. nudicaulis*, and *P. poaya*.

ETYMOLOGY. *Polygala minarum* is a reference to the state of Minas Gerais.



Map 1. Distribution map of *Polygala minarum*.

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