



A new species of *Lobelia* (Lobeliaceae) from the Western Ghats of India

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ABSTRACT: A new species of *Lobelia*, *L. janardhananii* K.M.P.Kumar & Sunil is described from Kerala, India. It resembles *Lobelia heyneana* Schult. in herbaceous habit and axillary solitary flowers but differs from the latter by leaf shape, texture, flower length, compressed or ancipitous pedicel, characters of calyx lobe, the colour of corolla tube and lobe, size and colour of stamens, stylar length and seeds. A detailed description and photographs are provided for the identification of the species.

KEY WORDS: Agasthyamala Biosphere Reserve, Kerala, *Lobelia heyneana*, *Lobelia janardhananii*, perennial, taxonomy.

INTRODUCTION

Lobelia L. is the largest genus within the subfamily Lobelioideae, with about 415 species (Mabberley, 2017), is widely distributed across the world, but absent in the Middle East, Arctic, and some sections of the Central Asia region, with half of them native to South America (Wimmer, 1953; Lagomarsino *et al.*, 2014). The genus is characterized by resupinate flowers with zygomorphic corolla and connate anthers (Lammers, 2011a). In India, the genus is represented by 15 species (Biju *et al.*, 2016; Dash and Mao, 2021). Of which seven species are present in the southern part of Western Ghats (Biju *et al.*, 2016).

The first infrageneric classification of the genus was proposed by Presl (1836) with three sections. Recently, Lammers (2011b) placed all the species of *Lobelia* into 18 sections. According to Lammers (2011b) *Lobelia* sect. *Delostemon* (E. Wimm.) J. Murata represents *Lobelia alsinoides* Lam., *L. zeylanica* L.; *Lobelia* sect. *Stenotium* (C. Presl) Lammers with *L. heyneana*; *Lobelia* sect. *Hypsela* (C. Presl) Lammers with *L. nummularia* Lam. and *Lobelia* sect. *Rhynchopetalum* (Fresen.) Benth. is with *L. leschenaultiana* (C. Presl) Skottsb., *Lobelia nicotianifolia* Roth ex Schult (Fig. S1). As confirmed by Li *et al.* (2023), using completely sequenced plastomes, *L. heyneana* originated in Africa. One of the things that makes *L. janardhananii* interesting is that it may be a newly derived species from the extant and widespread ancestral species, *L. heyneana*.

During a field collection trip in Agasthyamala Biosphere Reserve of southern Western Ghats, we came across a population of *Lobelia* growing on stream sides and waterlogged areas. The newly located population indicated some similarities with *L. heyneana* Schult., but the extensive examination of the specimens revealed the distinctive characteristics that set it apart. Comprehensive

studies on the specimens from various herbaria (CAL, K, KFRI and MH) and review of relevant literature (Bentham, 1876; Clarke, 1882; Gamble, 1921; Cramer, 1983; Haridasan and Mukherjee, 1988; Singh and Diwakar, 2010; Wilde and Duyfjes, 2012; Sasidharan, 2013; Nayar *et al.*, 2014; Biju *et al.*, 2016) revealed that the species is quite distinct from the so far described species, hence described here as a new species.

TAXONOMIC TREATMENT

Lobelia janardhananii K.M.P.Kumar & Sunil, *sp. nov.*

Figs. 1 & 2

Type: INDIA. Kerala, Thiruvananthapuram District, Agasthyamala, Pongalapara, 77.242841N, 8.624767E, 1388 m a.s.l., 09 October 2020, C.N. Sunil & A.J. Robi 952 (holotype: LWG, isotypes: BAM, SNMH. (Table 1)

Diagnosis: *Lobelia janardhananii* sp. nov. is morphologically similar to *L. heyneana*, but differs in the rhomboid, elliptic or ovate leaves, 1.5–4 × 0.4–2 cm, attenuate base (vs. elliptic to sub-orbicular, 0.6–0.8 × 0.4–0.8 cm; base truncate and decurrent); flowers 14–17 mm long (vs. 8.7–9.2 mm long); pedicel compressed or ancipitous, bibracteolate near middle (vs. trigonous, bracteoles absent); sepals toothed, hirsute abaxially (vs. entire, glabrous on both sides); corolla tube blue (vs. tube white); upper lip 3–4 mm long, whitish-blue; lower lip bright blue (vs. upper lip white; lower lip pale violet); filament of stamens 4.5–5 mm long, purplish (vs. 1.3–1.4 mm long, light green).

Description: Erect or ascending perennial herbs, 12–48 cm long. Stem trigonous, slightly winged, glabrous. Leaves 1.5–4 × 0.4–2 cm, rhomboid, elliptic or ovate, base attenuate, margins crenate, obtuse to subacute at apex, chartaceous, glabrous on the adaxial surface, pale green and distinctly scabrous on the nerves abaxially;

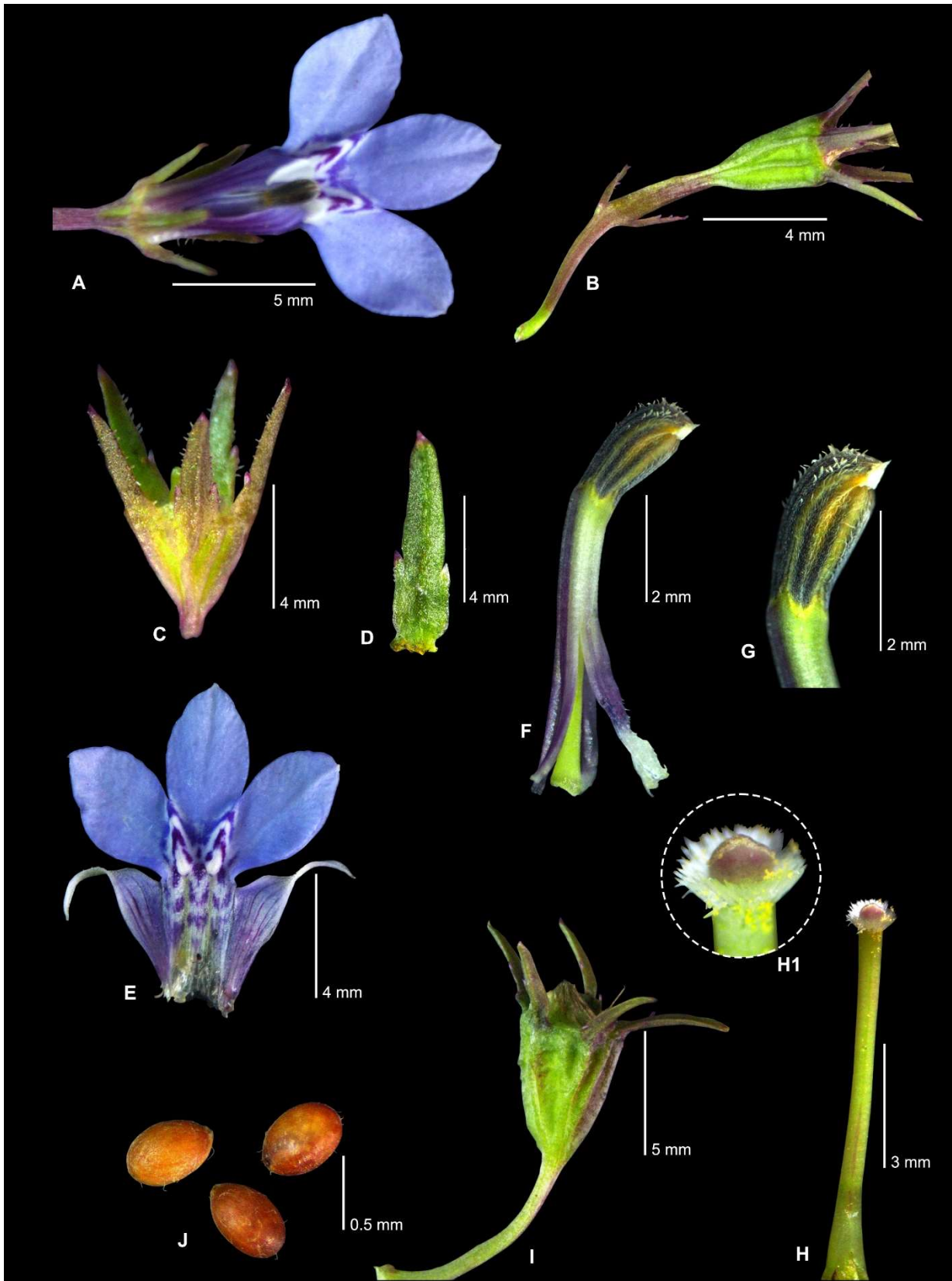


Fig. 1. *Lobelia janardhananii* sp. nov. **A.** Flower, **B.** Pedicel with bracteoles, **C.** Calyx, **D.** Calyx lobe, **E.** Corolla split open, **F.** Staminal column with anthers, **G.** Anthers, **H.** Style and stigma, **H1.** Stigma closeup view, **I.** Immature capsule, **J.** Seeds.

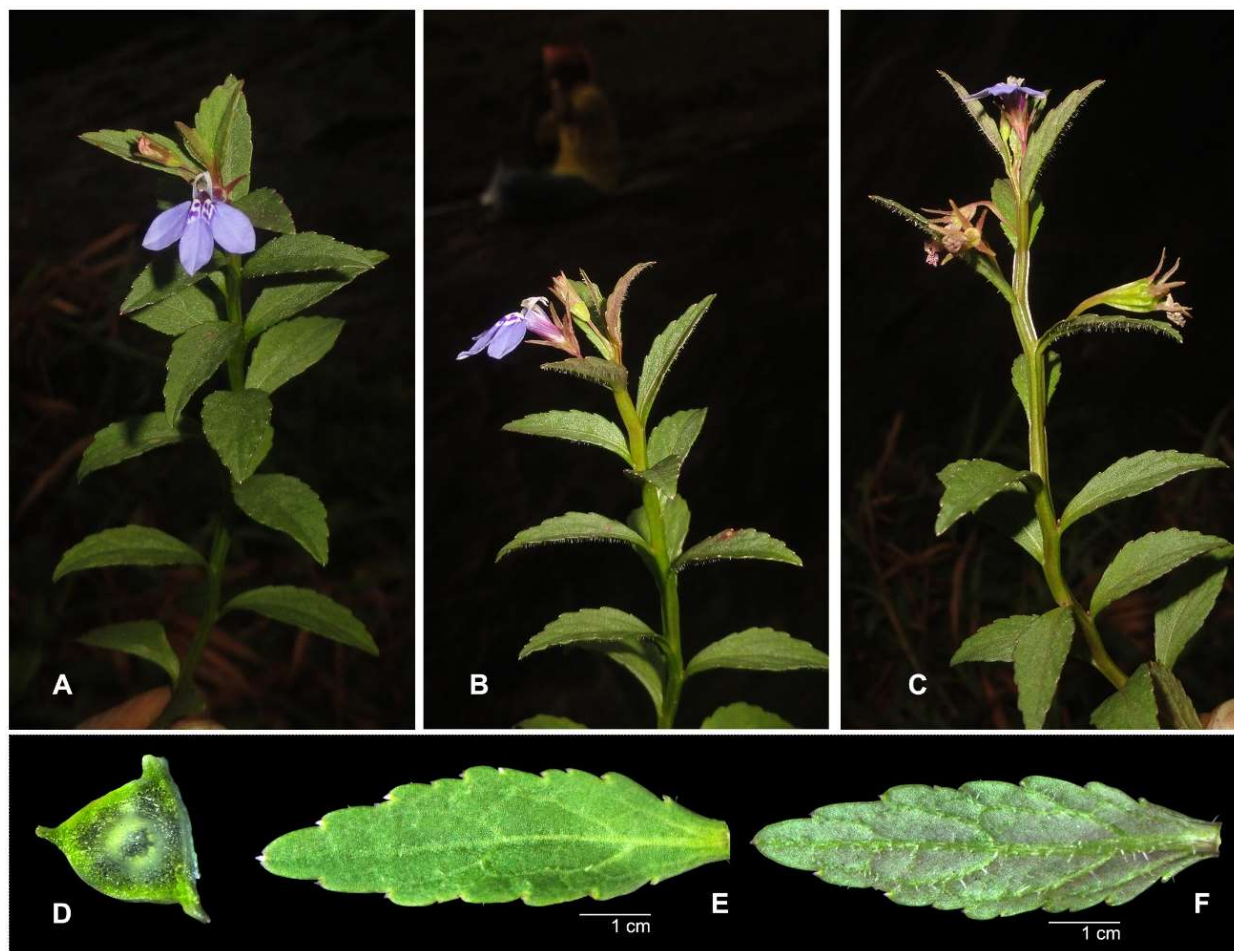


Fig. 2. *Lobelia janardhananii* sp. nov. **A–C.** Flowering shoot, **D.** C.S. of stem, **E.** Leaf adaxial side, **F.** Leaf abaxial side.

Table 1. Diagnostic characters of *Lobelia janardhananii* sp. nov. and *Lobelia heyneana* Schult.

Characters	<i>Lobelia janardhananii</i>	<i>Lobelia heyneana</i>
Plant height	12–48 cm	8–17 cm
Leaves	1.5–4 × 0.4–2 cm, rhomboid, elliptic or ovate; base attenuate	0.6–0.8 × 0.4–0.8 cm, elliptic to sub-orbicular; truncate and decurrent base
Leaf texture	glabrous on the adaxial surface and distinctly scabrous on the nerves abaxially	glabrous on both surfaces
Flower	14–17 mm long	8.7–9.2 mm long
Pedicel	compressed or ancipitous	trigonus
Bracteole	bibracteolate near middle of pedicel	absent
Calyx lobe	3.5–5 × 0.6–1 mm; toothed; hirsute	1.1–1.5 × 0.2–0.3 mm; entire; glabrous on both surface
Corolla	tube 4.5–5 mm long, blue; adaxial lobes 3–4 mm long, white to whitish-blue; abaxial lobes 1–1.3 cm across, bright blue	tube 1.9–2 mm long, white; adaxial lobes 0.9–1 mm long, white; abaxial lobes 0.9–1 mm across, pale violet, white at base of lobe, dark violet streaks originate from the base of lower lip and continue to half of lobe
Stamen	filament 4.5–5 mm long, purplish; anthers 1.9–2 mm long	filament 1.3–1.4 mm long, light green to transparent; anthers 0.7–0.75 mm long
Style	6–7.5 mm long; ring of stiff white hairs below the apex	1.5–1.6 mm long; glabrous

nerves 3–5 pairs, raised below; petioles c. 4 mm long, winged or absent; stipules 0. Flowers solitary in the axils of upper leaves, 1.4–1.7 cm long, 1–1.3 cm across, blue; pedicels 7–16 mm long, glabrous, purple or green, compressed or ancipitous, bibracteolate near middle; bracteoles 3–4.5 × 0.3–0.4 mm, linear, toothed on

margins, acute at apex, sparsely hairy or glabrous, very rarely bracteoles absent. Hypanthium 3–4 × 3–3.2 mm, obconical, ribbed, glabrous. Calyx lobes 5, 3.5–5 × 0.6–1 mm, linear, subulate, margins toothed, acute at apex, hirsute; fruiting calyx lobes c. 6 × 1 mm, glabrous. Corolla 1.2–1.4 cm long, bilabiate, adaxial lip with 2 erect



lobes and abaxial lip with 3 spreading lobes; tube 4.5–5 mm long, blue; adaxial lobes 3–4 mm long, c. 1 mm wide at the base, subulate, twisted, narrowed towards apex, whitish-blue to whitish; abaxial lip 1–1.3 cm across, bright blue, the lobes 5–6 × 3–3.5 mm, ovate, obtuse to subacute at apex. Stamens 5; filaments connate distally, free below, 4.5–5 mm long, purplish, basal part of all filaments equally wide; anthers 1.9–2 mm long, sparsely hirsute, ventral pair of anthers with apical dense tufts of filiform hairs. Ovary inferior, obconic, 3.2–3.6 mm long; style 6–7.5 mm long, terete, slender, with a ring of stiff white hairs below the apex; stigma bilobed. Capsule 5–6 × 4–5 mm, obconical, with persistent calyx, 10-ribbed. Seeds many, 0.5–0.6 × 0.4–0.5 mm, ovoid, slightly compressed, brownish; testa striate.

Etymology: The specific epithet is to honour the contributions of Sri. N.K. Janardhanan, Gardner, Herb Garden, Arya Vaidya Sala, Kottakkal, for his 45 years of dedicated service towards the conservation of threatened plants, especially medicinal plants.

Phenology: Flowering and fruiting observed from August to November.

Habitat and Distribution: *Lobelia janardhananii* is presently known from the Agasthyamala Biosphere Reserve in the Western Ghats, India. It grows among the grassland adjacent to rocky outcrops at an elevation of around 1400 m a.s.l. The associated species are *Exacum travancoricum* Bedd., *Impatiens agastyamalayensis* (Bhaskar) A. Joe, Bhaskar & M. Sabu, *Laurembergia agastyamalayana* A.N. Henry, *Sivadasania josephiana* (Wadhwa & H.J. Chowdhery) N. Mohanan & Pimenov and *Uniyala gossypina* (Gamble) K.S. Kumar & Arum.

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