

A NEW SPECIES OF *GENTIANA* (GENTIANACEAE) FROM THE SIKKIM HIMALAYA

D. MAITY

Gentiana springateana D.Maity *sp. nov.* (Gentianaceae) is described from the Sikkim Himalaya and placed in *G.* section *Phyllocalyx* (Kusn.) T.N.Ho. This new taxon is described and illustrated, and compared morphologically with two related taxa, *Gentiana phyllocalyx* C.B.Clarke and *G. urnula* Harry Sm.

Keywords. *Gentiana springateana* D.Maity *sp. nov.*, Gentianaceae, Sikkim Himalaya.

INTRODUCTION

The genus *Gentiana* L. (Gentianaceae) comprises about 360 species and is widely distributed in the temperate and alpine regions of Northwest Africa (Morocco), America, Asia, Eastern Australia and Europe (Ho & Pringle, 1995; Mabberley, 2008). In India there are about 62 species (Garg, 1987), most of them distributed in the Himalaya. During an expedition to the Zemu and Lhonak valley in the Sikkim Himalaya, a few specimens of an attractive *Gentiana* were collected. Detailed literature studies (Clarke, 1883; Garg, 1987; Ubolcholaket, 1987; Ho & Pringle, 1995; Aitken, 1999; Ho & Liu, 2001; Hul, 2003), critical analysis of specimens and comparisons of almost all *Gentiana* species of the Himalaya (India, Nepal, Bhutan, Tibet) revealed this to be a new species, belonging in *Gentiana* section *Phyllocalyx* (Kusn.) T.N.Ho. It is related to *Gentiana phyllocalyx* C.B.Clarke, though it differs remarkably by its heteromorphic, oblong or triangular calyx lobes, short calyx tube, wider plicae and urceolate corolla. A detailed description, illustration and images of the new species are provided to facilitate its identity. A comparison of this new taxon with *Gentiana phyllocalyx* and *G. urnula* of section *Frigida* Kusn. is also provided (Table 1).

SPECIES DESCRIPTION

Gentiana springateana* D.Maity, *sp. nov. Sect. *Phyllocalyx* (Kusn.) T.N.Ho

Closely related to *Gentiana phyllocalyx* C.B.Clarke but calyx lobes very unequal, heteromorphic; larger two with leaf-like prominent venation; short calyx tube; urceolate corolla; wider plicae; short filaments and short style. – Type: Sikkim,

TABLE 1. Comparison of morphological features of *Gentiana springateana* D.Maity, *G. phyllocalyx* C.B.Clarke and *G. urnula* Harry Sm.

Character	<i>G. springateana</i> D.Maity	<i>G. phyllocalyx</i> C.B.Clarke	<i>G. urnula</i> Harry Sm.
Habit	Perennial, to 4 cm tall	Perennial, to 14 cm tall	Perennial, to 6 cm tall
Stolon	To 3 cm	To 5 cm	To 10 cm, much branched
Petiole	To 1.5 mm	To 8 mm	To 6 mm
Lamina			
– Shape	Truncate-flabelliform or obovate	Obovate	Truncate-flabelliform or obovate
– Size	0.6–1.5 × 0.4–1 cm	0.6–2.6 × 0.4–1.6 cm	0.7–1.7 × 0.5–1 cm
– Base	Decurrent into petiole	Decurrent into petiole	Decurrent into petiole
– Apex	Truncate and emarginate	Rounded and emarginate	Truncate and emarginate or retuse
– Margin	Cartilaginous and papillate (particularly upper two-thirds)	Minutely papillate	Cartilaginous and smooth
Flower	Terminal, solitary	Terminal, solitary	Terminal, solitary(–3)
Calyx			
– Tube	c.3 mm	3.5–6 mm	5–13 mm
– Lobe, nature	Very unequal, heteromorphic	Subequal, ± homomorphic	Equal, homomorphic
– Lobe, shape	Oblong or triangular	Linear to lanceolate	Obovate to orbicular, similar to leaves
– Lobe, size	1–10 × 1–2 mm	3–5 × 0.5–1 mm	3–7 × 7–8 mm
– Lobe, venation	Very prominent with secondaries in two larger; other three with ± distinct midvein	Indistinct	Midvein ± distinct
Corolla			
– Shape	Urceolate	Tubular-campanulate	Urceolate
– Size	2.5–2.6 × 1.5 cm	3–4.7 × 1–1.4 cm	2–3 × 0.8–1 cm
– Lobe, shape	Ovate-triangular to broadly ovate-triangular	Ovate to broadly ovate	Ovate to broadly ovate
– Lobe, size	3–4 × 3 mm	2–4 × 3–4 mm	2–3 × 4–6 mm
– Lobe, apex	Acute	Obtuse	Rounded and cuspidate or mucronate

TABLE 1. (*Cont'd*)

Pliteae			
– Shape	Horizontally truncate-emarginate	Obliquely triangular or horizontally truncate	Broadly ovate to subtruncate or shallowly oblong
– Size	3–4 mm (wide)	c. 1 mm (wide)	1–2 mm (wide)
– Margin	Erose-denticulate	Erose or dentate	Entire or denticulate
Stamens	Inserted below middle of corolla tube	Inserted at basal part of corolla tube	Inserted just below middle of corolla tube
Filaments	8–8.5 mm	8–14 mm	6–8 mm
Style	1.5–2 mm	2–5 mm	6–11 mm
Stigma lobes	Expanded, rounded, reflexed at anthesis, contiguous	Suborbicular, contiguous	Triangular, free

between Kalapathar and Muguthang, 4500–4800 m, 13 vii 2013, *Maity* 20362 (holo CUH; iso CAL). **Figs 1, 2.**

Perennial, glabrous herb, 3–4 cm tall (including flower) with sympodial growth; tap root weak, short. *Leaves* crowded at base, subsessile; stem leaves 1 pair; leaf blade truncate-flabelliform to obovate, 0.6–1.5 × 0.4–1 cm, base cuneate, decurrent into petiole, apex truncate-emarginate, margin cartilaginous, papillate (particularly apical two-thirds), midvein purplish, cartilaginous with prominent secondary on both sides (visible when dry); petiole to 1.5 mm long. *Flower* solitary, terminal. *Calyx* membranous, completely enveloped by upper two pairs of truncate-flabelliform to broad obovate leaves; tube short, c.3 mm long, narrowly campanulate; lobes oblong or triangular, 1–10 mm, very unequal; smaller one triangular, c.1 × 1 mm, apex acute; medium two ovate-triangular, c.3 × 1 mm, apex acute; larger two oblong, 8.5–10 × 1.5–2 mm, apex acute, margin entire; venation prominent with distinct secondaries. *Corolla* bright blue, urceolate, 2.5–2.6 × 1.5 cm; lobes ovate-triangular to broadly ovate-triangular, 3–4 × 3 mm, margin entire, apex acute; plicae horizontally truncate-emarginate, 3–4 mm wide, margin erose-denticulate. *Stamens* inserted at c.8 mm above base of corolla tube (below middle of corolla tube); filaments 8–8.5 mm, slightly expanded towards base; anthers ± sagittate, c.2 mm long, dorsifixed; gynophore slender, to 5 mm long. *Ovary* ellipsoid-ovoid, c.10 × 3 mm; style 1.5–2 mm; stigma lobes expanded, rounded, reflexed at anthesis, c.1 × 1 mm, contiguous.

Distribution. Endemic in the type locality, Sikkim.

Habitat. Plants growing on moss-covered rocks and loose soil in open alpine forests. As well as the specimens collected, several individuals along with young plants and seedlings were observed.

Flowering. June–July.

IUCN Red List Category. The type specimen was collected from a population of some 15 adult plants which covered an area of less than 1 sq. km. Juvenile plants or seedlings were also found. After a detailed search of the area around the type locality two populations were discovered. Given this situation, I consider the IUCN category of Critically Endangered (CR D) to be appropriate (IUCN, 2001).

Etymology. The specific epithet honours Lawrie S. Springate, 1951–2011, a renowned taxonomist and expert of eastern Himalayan plants, and my mentor, from whom I received most generous help as student and collaborator.

Paratype. Sikkim, below Lhunak La, 4800 m, 13 vii 2013, *D. Maity* 20366 (CUH).

DISCUSSION

The presumed closest relative of the new species is *Gentiana phyllocalyx*. These two species share several morphological characters, viz. truncate-flabelliform or



FIG. 1. *Gentiana springateana* D.Maity. A, habitat; B, part of type population with one mature plant and three young (marked with arrows).

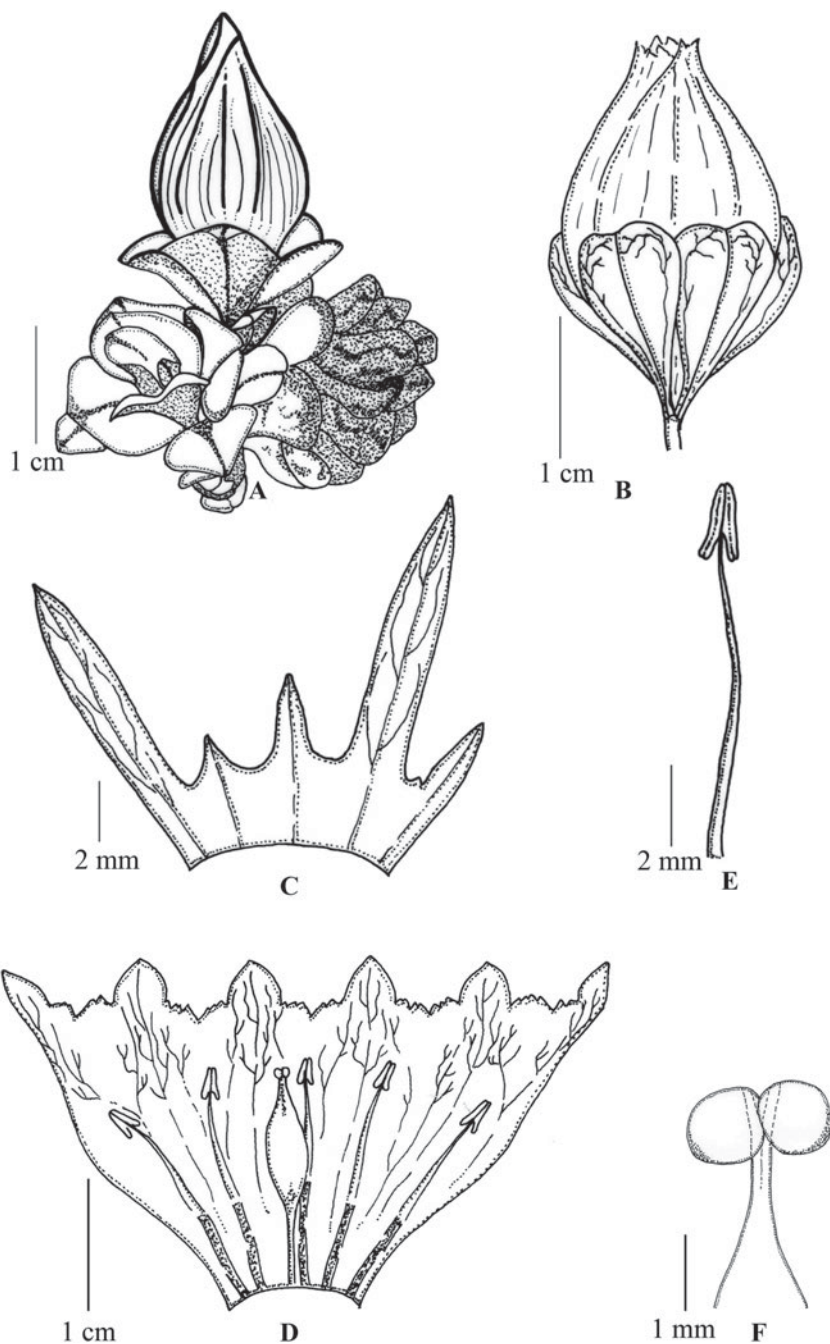


FIG. 2. *Gentiana springateana* D.Maity. A, habit; B, flower (note base completely enveloped by upper two pairs of leaves); C, calyx split open (ventral face); D, corolla split open showing stamens and gynoecium (ventral face); E, stamen (note basifixed anther); F, style and stigma (note reflexed stigma at anthesis). Drawn from the holotype, *Maity* 20362 (CUH).

obovate leaves, the calyx completely enveloped by the upper pairs of leaves and expanded rounded or orbicular stigma, but *Gentiana springateana* differs greatly from *G. phyllocalyx* in its clearly heteromorphic calyx lobes, short calyx tube, urceolate corolla, wider plicae, short filament and style. Presently, the genus *Gentiana* L. is divided into several sections. *Gentiana* section *Phyllocalyx* (Kusn.) T.N.Ho is characterised by perennial habit; calyx being completely surrounded by the upper pair of broad obovate (truncate-flabelliform) leaves and expanded, contiguous (before anthesis) stigma lobes (Ho & Pringle, 1995; Ho & Liu, 2001). The diagnostic features of the new species strongly support its inclusion within section *Phyllocalyx*.

Gentiana springateana is also related to *G. urnula* of *G.* section *Frigida* Kusn. by the shape of its leaves and urceolate corolla. However, the nature of the calyx, much shorter style and expanded stigma readily differentiate the new taxon from *Gentiana urnula* (see Table 1). There is no doubt that this new species is rare and locally endemic, and further botanical exploration of its distribution, habitat and ecology is highly recommended.

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