Circumscription of *Gentiana harwanensis* (Gentianaceae) and its addition to the flora of Eastern Himalaya

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**Abstract:** *Gentiana harwanensis* G.Singh is reported for the first time from Eastern Himalaya. This taxon has been treated earlier as a subspecies of *Gentiana capitata*. It is reinstated here as a distinct species. A detailed description, photo plate, notes on distribution and habitat are provided for easy identification.

**Keywords:** *Gentiana harwanensis*, Gentianaceae, New Record, Sikkim, Status.

**Introduction**

*Gentiana* L. s.l. (*Gentianaceae–Gentianeae*) consisting of about 365 species is widely distributed in the temperate and alpine regions of North–West Africa (Morocco), America, Asia, eastern Australia and Europe (Garg, 1987; Ho & Pringle, 1995; Maity, 2014; Anilkumar et al., 2015; Mabberley, 2017; Maity et al., 2018a, b). India harbours c. 69 species and most of them are distributed in the Himalayas.

During a plant collection trip to Lachung and its surrounding areas of north Sikkim, the authors collected a few specimens of *Gentiana* from subalpine grassy slopes. After comprehensive literature search (Clarke, 1883; Agarwal et al., 1981; Agarwal & Bhattacharyya, 1982; Ubocholaket, 1987; Garg, 1987; Ho & Pringle, 1995; Aitken, 1999; Ho & Liu, 2001; Hul, 2003), critical examination of specimens in consultation with the type and protologue and comparison of *Gentiana*

species of the Himalaya (India, Nepal, Bhutan, Tibet), the specimens were identified as *Gentiana harwanensis* G.Singh, which became a new record for Eastern Himalaya. Detailed description and photo plate are provided for easy identification. The circumscription of the species is also discussed and species status of *Gentiana harwanensis* is retained.

**Materials and Methods**

Plant specimens were collected from grassy slopes of Lachung Valley, North Sikkim at an elevation of about 2800 m. Habit and habitat photographs were taken and voucher specimens were deposited at CUH. Measurements of vegetative and floral parts were taken with a Leica EZ4E stereo microscope. Type (images) and protologue, and other authentic specimens deposited in CAL, KASH, K and NY were also examined.

**Taxonomic treatment**


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Fig. 1. *Gentiana harwanensis* G.Singh: a. Habit; b. Mature capsule; c. Dehisced capsule; d. Calyx - split open; e. Calyx - split open showing stamens; f. Gynoecium; g. Seed.
Erect annual herbs, 2–8 cm tall; taproot cylindrical, c. 3 cm long, c. 0.4 mm diam.; stems simple or with few branches above, angular often with fine purple lines, glabrous. Rosette leaves a few, present during anthesis; leaf blades spatulate, obovate or broadly elliptic 5–1 × 3–4(−9) mm, acute or rounded, mucronate, mucro cartilaginous, recurved, margins entire, smooth, cartilaginous; petioles short, c. 0.2 mm long, base fused to c. 0.15 mm long sheath, glabrous, midvein prominent, cartilaginous. Cauline leaves dense to lax, 3–4 pairs, shorter than internodes; leaf blade spatulate or oblanceolate 4–7(−1) × 3–4(−8) mm, smooth, apex acute, often purplish tinged, mucronate, mucro cartilaginous, recurved, margins entire, cartilaginous, midvein cartilaginous; petioles fused, forming a sheath 0.25–0.5 mm long, smooth.

Flowers terminal, solitary or a few, often in dichotomous pattern, sometimes condensed, 4(−5)–merous; pedicels c. 1 mm long, often surrounded by upper most pair of leaves, glabrous. Calyx campanulate, 3.3–5.5 × 1.5–2.2 mm; tube 2–3.5 mm long; lobes 4 or 5, broadly obovate or oblong, 1.3–3 × 0.7–1.2(−2) mm, subequal, margins cartilaginous, apex acute, mucronate, often purplish, 1-veined, moderately reflexed; midvein cartilaginous, sinus between lobes rounded or obtuse. Corolla campanulate, 4.8–7 mm long, bluish; tube 4–6 mm long; lobes 4 or 5, broadly oovate, 0.8–1.5(−3) × 0.8–1(−3) mm, apex acute; plicae ovate, 0.5–0.7 × 0.5–0.8 mm, bifid. Stamens 4 or 5, inserted below middle of corolla tube, 2.1–2.3 mm above corolla base; filaments 1–1.2(−4) mm long, white, slightly flattened towards base; anthers 0.5–1 mm long, yellow. Ovary ellipsoid, 2–3 × 1–2 mm, narrowly winged along ventral suture towards apex; stipe 0.5–0.7 mm long; style 0.4–1 mm long; stigma lobes oblong, 0.5–0.7 mm. Capsules obovoid to club-shaped, 4.5–5 × 2–3 mm; ventral suture winged, crested at apex, partially exserted, many-seeded; fruiting pedicel c. 3.5 mm long; seeds ellipsoid, c. 0.75 × 0.4 mm, reddish brown, reticulate.

**Distribution:** India.

**Habitat:** On rocks, grassy slopes and loose soil in open temperate to sub-alpine forests above 1700 to 4000 m elevation.

**Flowering:** February–May; **fruiting:** April–June.

**Specimen examined:** INDIA, Sikkim, below Lachung Valley, 2800 m, 10.03.2017, Dey, Ghosh & Midday 20127, 20134 (CUH).

**Discussion**

Singh (1976) described *Gentiana harwanensis* and considered *G. aquatica* L. as its morphologically allied species. Agrawal *et al.* (1981) reassessed the relationship of the species and stated that “*G. harwanensis* is more closely allied to *G. riparia* Kar. et Kir., *G. albicalyx* Burkill, *G. capitata* Buch.-Ham. ex D.Don rather than to *G. aquatica* L. and amended the description of the former species. Agrawal and Bhattacharyya (1982) subsequently considered *G. capitata* as more close to *G. harwanensis*. Phenologically *G. harwanensis* is more close to *G. capitata* than to *G. aquatica* as they flower early in the season (April–May), whereas latter species starts flowering in June. Garg (1987) in his revisionary account of the family Gentianaceae of the North West Himalaya retained *G. harwanensis* as a distinct species. However, Halda (1995) reduced *G. harwanensis* as a subspecies of *G. capitata*. Recently, Shabir *et al.* (2019) recorded it from Suru Valley in Kargil district of Ladakh and followed Halda (1995).

*Gentiana capitata* is characterized by stems being leafless in lower half, leaves congested into a dense head towards apex and plicae rounded and denticulate (rarely entire or with 2–3 dentate, thus sometimes appears as emarginate). However, the stems of *G. harwanensis* are leafy throughout with prominent basal rosettes. The basal rosette leaves are a few and present during anthesis. The plicae in *G. harwanensis*, is distinctly bifid and the inflorescence is much lax and never appears as congested head as in *G. capitata* (Table 1). Hence *G. harwanensis*, is treated as a distinct species following Singh (1976), Agrawal *et al.* (1981), Agrawal and Bhattacharyya (1982) and Garg (1987).

*Gentiana harwanensis* was described as endemic to Jammu and Kashmir by Singh (1976). Later, its occurrence in Uttarakhand state was confirmed by Agrawal *et al.* (1981), Agrawal and Bhattacharyya...
(1982) and Garg (1987). In a recent enumeration, Gupta et al. (2012) claimed the existence of this taxon in Himachal Pradesh, however, they did not cite any representative specimens. Shabir et al. (2017) mentioned Jammu and Kashmir as the only distribution locality of the species. However, both Agrawal et al. (1981), Agrawal and Bhattacharyya (1982) and Garg (1987) provided representative specimens from Uttarakhand (the then part of Uttar Pradesh). Even though, Agrawal and Bhattacharyya (1982) included Sikkim as one of the growing localities of the species, however they did not cite any specimen to justify their observation.

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**Literature Cited**


