Journal of Threatened Taxa

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ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

Note

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26 August 2018 | Vol. 10 | No. 9 | Pages: 12286–12289
10.11609/jott.4233.10.9.12286-12289

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Journal of Threatened Taxa | www.threatenedtaxa.org | 26 August 2018 | 10(9): 12286–12289

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Gentiana aperta (Gentianaceae) - a new record to India from Ladakh Himalaya

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Gentiana L. is the largest and most diverse genus of family Gentianaceae, consisting of c. 362 species (Ho & Liu 2001; Mabberley 2008; Shabir et al. 2017b) and is largely distributed in the meadows of temperate, sub-alpine and alpine regions in Asia, Europe and North America and a few species occur in the Andes of South America, Central America, eastern Australia, and northwestern Africa (Ho & Liu 2001; Struwe & Albert 2002). In India, the genus is represented by 68 species (Gupta et al. 2012; Maity 2014; Shabir et al. 2017a,b) mainly distributed in alpine and sub-alpine meadows of both the eastern and western Himalaya.

During the ongoing revisionary study on the genus *Gentiana* in the Indian Himalaya, some interesting specimens of the genus were collected from alpine slopes of Ldokchan and Spang-rings of Tumail in Kargil District of Jammu & Kashmir, India, at an elevation of 3900–4200 m. After critical examination of the specimens, we identified the species as *Gentiana aperta* Maxim., which has not been recorded in the Indian flora so far. Therefore, a detailed description along with photo plates and other relevant information of the species has been provided to facilitate its easy identification.

Gentiana aperta

Maxim., Bull. Acad. Imp. Sci. Saint-Pétersbourg 3, 27: 500. 1881; T.N. Ho & S. Liu, Worldwide Monogr. *Gentiana*: 386. 2001; T.N. Ho & J.S. Pringle in Z.Y. Wu & P.H. Raven, Fl. China 16: 86. 1995 (Image 1).

Type: China, Qinghai (as W Kansu, Tangut region), to Huangsui river (fl. Rako-gol), 10,000–11,000 ped., in meadows, in 1880, Przewalski *s.n*. (holotype: LE not seen; isotypes: K, P Images)

Annual herbs, 3.0–6.0 cm high. Stem prostrate to ascending, striate, branched from the base. Basal leaves wither on anthesis, leaf blades ovate, 3.0–4.0 × 1.6–2.0 mm, apex obtuse, margin indistinctly membranous, veins distinct; cauline leaves, widely spaced, 3–6 paired, elliptic, spathulate to oblong, 2.5–3.5 × 1.0–1.5 mm, apex acute, mid-vein distinct, margin membranous. Inflorescence terminal, solitary; pedicels 3.0–4.0 mm long. Calyx 4.0–5.0 mm long; tube 2.8–3.4 mm long; lobes more or less equal, ovate, 1.2–1.5 × 0.6–0.8 mm, apex acute. Corolla white, pale blue to blue, 5.0–7.0 mm long, dark spot in the throat, tube 4.5–4.8 mm long; lobes ovate-oblong, 1.0–1.5 × 0.7–0.8, apex obtuse to sub-rounded, margin entire; plicae 0.6–0.9 mm long, 2-cleft, apex acute, margin entire. Stamens 5; filaments

DOI: https://doi.org/10.11609/jott.4233.10.9.12286-12289

Editor: P. Lakshminarasimhan, Botanical Survey of India, Pune, India. **Date of publication:** 26 August 2018 (online & print)

Manuscript details: Ms # 4233 | Received 03 May 2018 | Final received 09 July 2018 | Finally accepted 25 July 2018

Citation: Shabir, M., P. Agnihotri, J.K. Tiwari & T. Husain (2018). *Gentiana aperta* (Gentianaceae) - a new record to India from Ladakh Himalaya. *Journal of Threatened Taxa* 10(9): 12286–12289; https://doi.org/10.11609/jott.4233.10.9.12286-12289

Funding: University Grants commission, New Delhi has provided financial assistance in terms of fellowship to the first author (MS) to carry out the research work.

Competing interests: The authors declare no competing interests.

Acknowledgements: We are thankful to the Director, CSIR-National Botanical Research Institute, Lucknow for the necessary facilities and encouragement. The first author (MS) is also thankful to the UGC, New Delhi for providing fund in terms of fellowship (UGC-SRF) to carry out the research work.

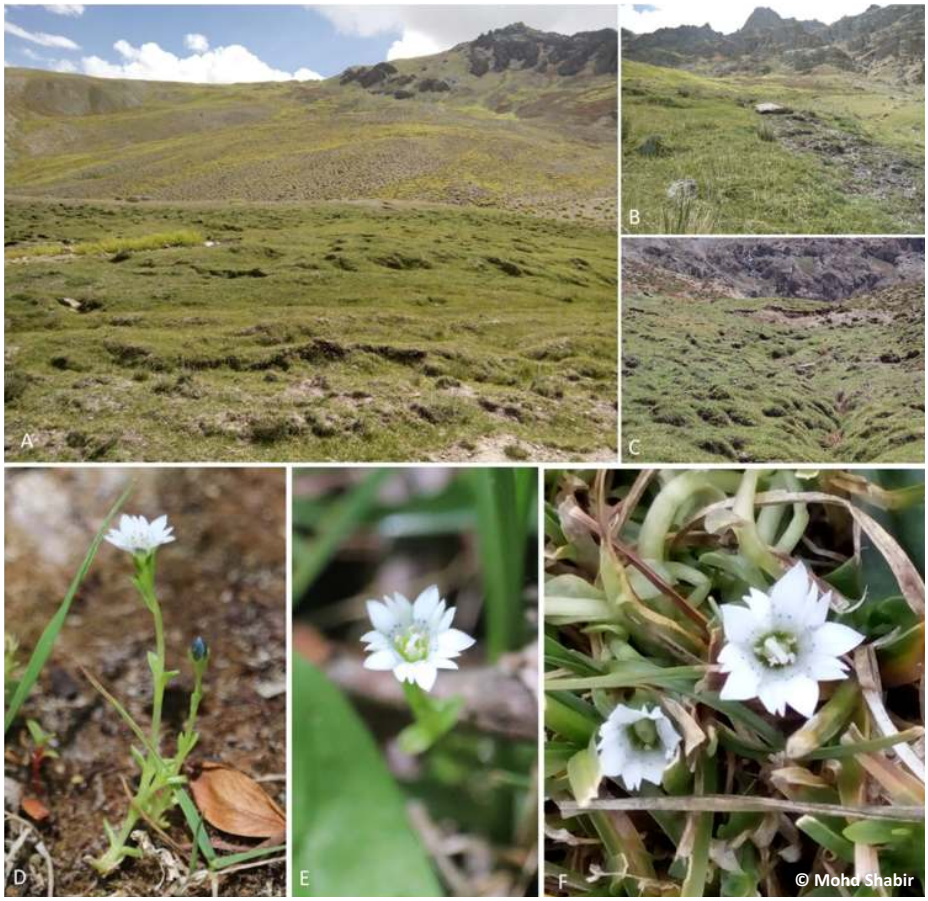

Image 1. *Gentiana aperta* Maxim.: A– C - habitats; D - habit; E–F - flowers.

inserted near the middle of the corolla, 2.0–4.0 mm long; anther ellipsoid to orbicular, 0.35–0.45 × 0.18–0.30 mm. Style short; stigma bifid, recurved, lobes semi-orbicular; ovary 2.5–2.7 × c. 1.8 mm. Capsules 3.6–4.3 mm long; stipe 0.8–1.2 mm long. Seeds ellipsoid, 0.7–0.8 ×0.28–0.33 mm; seed coat reticulate.

Flowering & Fruiting: June–September.

Habitat: The species was found growing on the west facing alpine slopes of Ldokchan and Sprang-rings in Tumail, Kargil of the Ladakh Himalaya, India, associated with *Gentiana leucomelaena* Maxim, *Gentiana aquatica* L., *Gentianopsis detonsa* (Rottb.) Ma, and *Gentianella tumailica* M. Shabir, Agnihotri, Tiwari & Husain.

Distribution: China (Ho & Pringle 1995; Ho & Liu 2001), new to India.

Specimens examined: 309906 (LWG), India, Jammu & Kashmir, Ladakh, Kargil, Tumail, 3,900–4,000 m, 12.viii.2016, coll. Mohd Shabir; 309908 (LWG), India, Jammu and Kashmir, Ladakh, Kargil, Tumail, 4,200m, 12.viii.2016, coll. Mohd Shabir; China: Gansu, Regio Tangut, 30.viii.1980, N.M. Przewalski s.n. (P); Gansu, Regio Tangut, 30.viii.1980, N.M. Przewalski s.n. (K).

Conservation status: Data deficient (DD).

Taxonomic notes: *Gentiana aperta* Maxim., belonging to Section *Chondrophyllae* Bunge, under the genus *Gentiana* was described by Maximowicz (1881) from Gansu, China. In the present state of our knowledge, this species is so far known only from China, and is endemic to the mountains of northeastern Qinghai and northwestern Gansu. The species growing in the Indian Himalaya is characterized by white to bluish-white flowers, apex of corolla lobes acute to sub-acute, dark-blue spot on the corolla throat, spots less dense on the throat and plicae deeply bifurcate, 2-cleft with both segments acute and entire, whereas, the plants growing in China have flowers bluish-white, apex of corolla lobes obtuse, yellowish-white spots on the corolla throat and spots scattered densely up to the base. *Gentiana aperta* is allied to *Gentiana leucomelaena* Maxim. In India, *G. leucomelaena* is distributed in Jammu & Kashmir, Himachal Pradesh, Uttarakhand, and the Sikkim Himalaya, and differs from *G. aperta* in having calyx lobes lanceolate to linear-lanceolate, apex acuminate, mid-vein prominent, plicae oblong, apex obtuse and

Image 2. Map showing existing and new localities of *Gentiana aperta* Maxim.

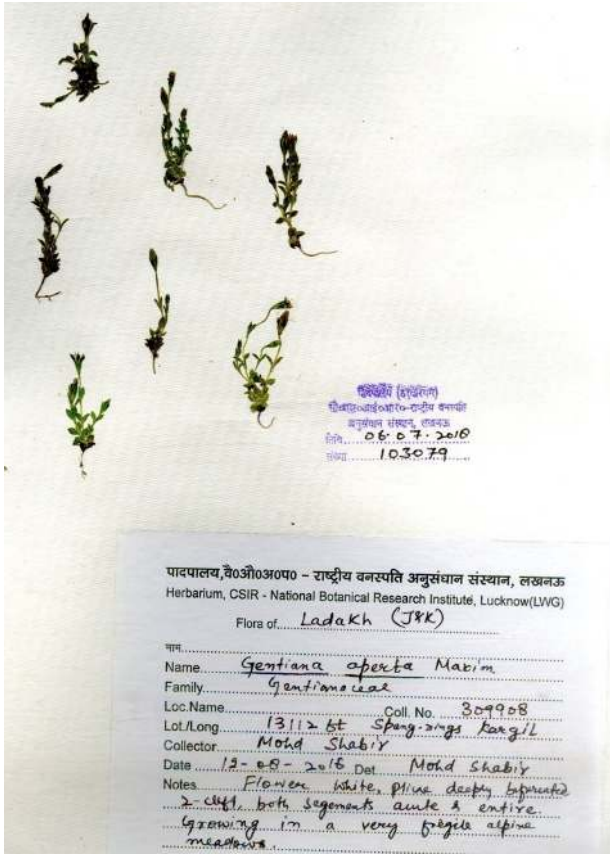

Image 3. Herbarium image of *Gentiana aperta* Maxim., (Mohd Shabir 309908 (LWG)).

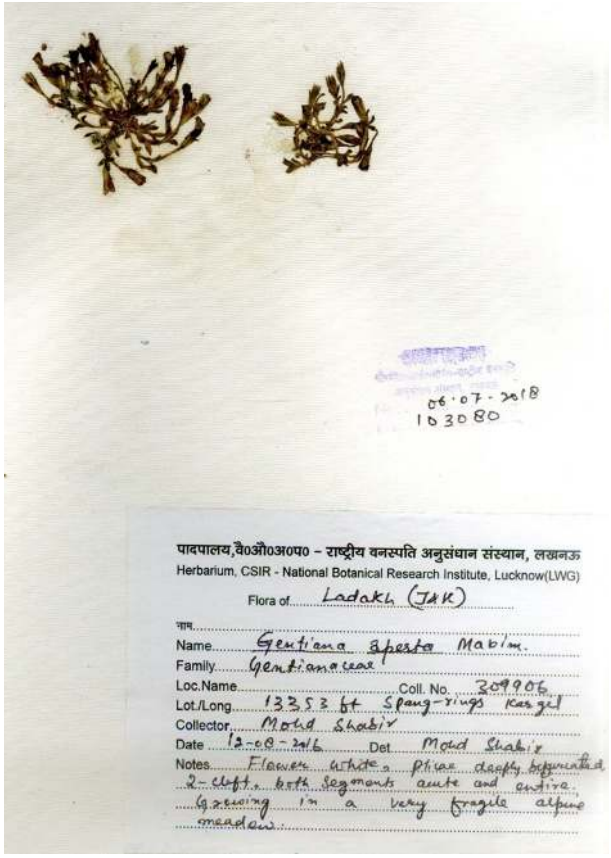

Image 4. Herbarium image of *Gentiana aperta* Maxim., (Mohd Shabir 309906 (LWG)).

margin irregularly laciniate.

Further, *G. aperta* also shows a taxonomic affinity with *Kuepferia pringlei* D. Maity & S.K. Dey, in the nature of habit and floral characters, but plicae well developed, as long as or near to the corolla lobe, apex deeply segmented with both segments acute and entire, not forming auricle, corolla lobes much shorter than the tube differentiate, the former from the latter. The report of *G. aperta* from the Ladakh Himalaya extends its range of distribution further southwestward.

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Journal of Threatened Taxa

www.threatenedtaxa.org

ISSN 0974-7907 (Online); ISSN 0974-7893 (Print)

August 2018 | Vol. 10 | No. 9 | Pages: 12147–12298
Date of Publication: 26 August 2018 (Online & Print)
DOI: 10.11609/jott.2018.10.9.12147-12298

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