

Range extension of *Habenaria gibsonii* var. *foetida* to the northwestern Himalaya of India

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Short Report

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Abstract

Habenaria gibsonii var. *foetida* Blatt. & McCann, a terrestrial orchid of conservation significance, is reported for the first time from the North-Western Himalaya, India, thereby extending its known distribution to the Himalayan biodiversity hotspot. The taxon was recorded from the Shivalik Hills of Uttarakhand, growing on public land adjacent to Northern Tropical Moist Deciduous Sal Forest. Identification was confirmed through detailed morphological examination and comparison with relevant taxonomic literature. A comprehensive description of the taxon, photographs of the habit and floral morphology, habitat details, phenology, and distributional map are provided to facilitate accurate identification. Despite repeated field surveys, only a single flowering individual was encountered, suggesting that the species is rare in the region. The present record enriches the orchid flora of the North-Western Himalaya and highlights the importance of continued botanical exploration for documenting poorly known orchid taxa and generating baseline information for their conservation.

1. Introduction

India is one of the world's megadiverse countries and encompasses portions of four global biodiversity hotspots, namely the Himalaya, Indo-Burma, Western Ghats–Sri Lanka, and Sundaland (represented by the Nicobar Islands) [1, 2]. The North-Western Himalaya (NWH), forming the western extent of the Himalayan biodiversity hotspot, is a major centre of floristic diversity and endemism [3, 4].

Orchidaceae is among the most species-rich angiosperm families in India, represented by 155 genera and 1,268 taxa, including 1,239 species and 29 infraspecific taxa. Of these, *Habenaria* comprises 64 taxa, making it the third-largest orchid genus in the country after *Bulbophyllum* (139 taxa) and *Dendrobium* (116 taxa) [5]. The orchid flora of the North-Western Himalaya comprises 239 taxa distributed among 72 genera, including 130 terrestrial orchids. Within this flora, *Habenaria* is represented by 14 species [6].

Despite extensive floristic surveys in the North-Western Himalaya, orchid diversity in the region remains incompletely documented, particularly for rare and narrowly distributed taxa. Continued botanical exploration is therefore essential to improve our understanding of species distribution and to provide baseline information for taxonomy, conservation, and future floristic studies.

2. Material and methodology

Regular botanical expedition was conducted across the Himalayan region of Uttarakhand, India, between month of June and July 2026. During one such field survey, a single flowering individual of an unidentified *Habenaria* Willd. species was encountered on public land adjacent to National Highway 72 near Dehradun, Uttarakhand, along the margin of Northern Tropical Moist Deciduous Sal Forest (Forest Type 3C/C2; Champion & Seth, 1968).

The specimen was documented in situ by recording its habitat characteristics, growth habit, and associated vegetation. High-resolution photographs of the plant and its habitat were captured using a

Nikon D3500 digital camera. As only a single individual was located, destructive sampling was minimized, and only a limited number of flowers and leaves were collected to facilitate detailed morphological examination while ensuring minimal impact on the population. Photographs of the floral parts were captured using a Samsung Galaxy F54 smartphone. Critical literature survey revealed that the species was identified as *Habenaria gibsonii* var. *foetida* Blatt. & McCann.

Following morphological examination, the collected material was processed into a voucher specimen using standard herbarium preparation techniques following [7]. The voucher specimen was deposited in the Herbarium of the Forest Research Institute, Dehradun (DD). A distribution map for this species was prepared using ArcGIS 10.5 to illustrate its known geographic distribution, including the present record from the North-Western Himalaya.

3. Result and discussion

The study documents *Habenaria gibsonii* var. *foetida* Blatt. & McCann. From the North West Himalayan region of India. This variety differs from var. *gibsonii* by the presence of a strong fetid floral odour and the length of the petal mid-lobe (Table 1). We made multiple attempts to find more individuals of this species, but only a single plant was found, which indicates its occurrence is rare in the western Himalayan region. This species possesses potential threats from Anthropogenic disturbances, grazing, and natural calamities like landslides, hence required long term monitoring.

Till 2000 the species was only reported from western ghats hence considered endemic and placed under Critically Endangered category [8] but recent range of species stretches across India (9 states) and Indo-China region. Further this species is also included in

Appendix II of CITES (Convention on International Trade in Endangered Species of wild fauna and flora) and the Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India, has included it in the negative list of export [9].

3.1 Taxonomic treatment

Habenaria gibsonii var. *foetida* Blatt. & McCann, J. Bombay Nat. Hist. Soc. 36: 16 (1932).

Habenaria foliosa var. *foetida* (Blatt. & McCann) Bennet, J. Econ. Taxon. Bot. 5: 452 (1984).

Habenaria thailandica Seidenf., Dansk Bot. Ark. 31: 78 (1977). (Fig. 1)

Type: India, Maharashtra, Khandala, Monkey Hill, s.d., Hill, Hallberg s.n.; holotype: BLAT!

Annual tuberous herb, ca. 40 cm tall. Tuber, single ovoid and fleshy. Roots fleshy slender growing from stem above the tuber. Stem green cylindrical and glabrous, with lower region covered with leaf sheaths. Leaves 6–8, alternate, glabrous, ovate, oblong to lanceolate, 10–12 x 3–6 cm, margin entire and wavy, apex acute, base sheathing. Inflorescence lax raceme having 12–15 flowers synchronous in anthesis.

Bracts sheathing, 3 nerved, glabrous, strongly concave. Flowers bisexual, white along a green tinge, shortly pedicellate and having foul smell. Sepal 3, unequal, dorsal sepal concave, ovate-elliptic, ca. 0.7 x 0.75 cm hooded over the column, green; lateral sepals obliquely ovate-lanceolate, ca. 1-1.1 x 0.3-0.35 cm white with green tinge. Petals, 2 partite, ca. 0.9-1.1 cm long, sickle shaped, upper pair bending upwards and lower pair spreading laterally, white with green tips; Labellum 3 partite white towards the base turning green towards apex, subequal are spreading, ca. 1.2-1.4 cm, middle lobe longest ca. 1.4-1.5 cm, wider towards base. Spur, ca. 1.1-1.3 cm shorter than or as long as ovary, funnel shaped, green towards the apex. Column, 0.3-0.4 cm, erect, connective light green with emigrate apex. Rostellum 3 lobed, green shorter than anther, middle lobe triangular, lateral ones slightly bend upwards, narrow. Anther locules white, connective green, parallel to each other with slight outward projection. Staminodes 1.4-1.9 x 0.8-1 mm white to light green. Pollinia yellow, obovoid, kidney shaped. Staminal processes 2, free projected, white and fleshy. Ovary twisted, green ca. 1.6-1.8 cm long. Fruit a capsule, ca. 2 cm long.

Flowering Period

Flowering observed during month of July.

Distribution

Cambodia, Laos, Thailand and Vietnam [10], Philippines [11], India (Rajasthan [12], Telangana [13], West Bengal [14], Maharashtra, Karnataka, Chhattisgarh, Gujrat [15], Jharkhand [16], Odisha [17], Uttarakhand) Fig. 2.

Conservation Status

Not Evaluated

Specimens examined

INDIA, Uttarakhand, Mohand Range, 643 m asl, 23.07.2026, 30°13'11.49"N 77°56'16.22"E, Revan Y Chaudhari & Monal R Jadhav, 175247 (DD)

Table 1
Diagnostic characters distinguishing *Habenaria gibsonii* var. *foetida* from var. *gibsonii*.

Charters	<i>Habenaria gibsonii</i> var. <i>gibsonii</i> J.D Hook [Source:17]	<i>Habenaria gibsonii</i> var. <i>foetida</i> Blatt. & McCann
Height	Ca. 30 cm tall	Ca. 30–40 cm tall
Leaves	5–6 alternate, oblong- elliptic; Ca. 3.9-8 cm long with sheathing bases	5–6, alternate, oblong-elliptic, ca. 10–13 cm long, sheathing at base
Petals	The upper segment of bipartite petal is much longer than the lower segment (ca. 0.65 cm vs 0.37 cm)	The upper segment of bipartite petal is equal or slightly longer than lower on (ca. 1cm vs 0.9 cm)
Floral odour	Absent	Strongly fetid

Declarations

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Author contributions RYC – conducted the research, took original photographs, identification of the species, prepared the draft; MRJ – designed the study, Prepared Map, identification of the specimen, revised the manuscript; SAM- Photo plate preparation; Assists field survey; TAK – Plant identification, manuscript corrections.

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Data availability: Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

Ethics approval consent to participate: The plant material (*Habenaria gibsonii* var. *foetida*) used in this study was collected from wild populations on non-protected, public land adjacent to National Highway 72 near Dehradun, Uttarakhand, India (30°13'11.49"N 77°56'16.22"E). The collection did not occur within any protected area, reserve forest, or private land. In accordance with national and local guidelines, no special permits or licenses were required for the collection of non-threatened, wild plant specimens from this site.

Consent for Publication: Not applicable. Plant reproducibility: The plant material (*Habenaria gibsonii* var. *foetida*) was collected from wild populations on non-protected, public land adjacent to National Highway 72 near Dehradun, Uttarakhand. The species was identified by the authors (Revan Yogesh Chaudhari, Monal Rajendra Jadhav and Tanveer A Khan) and a voucher specimen has been accessioned at the Forest Research Institute in Dehradun, India (DD) with Voucher No. 175247.

Competing interests: The authors declare no competing interests.

Clinical trial number: Not applicable.

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Figures

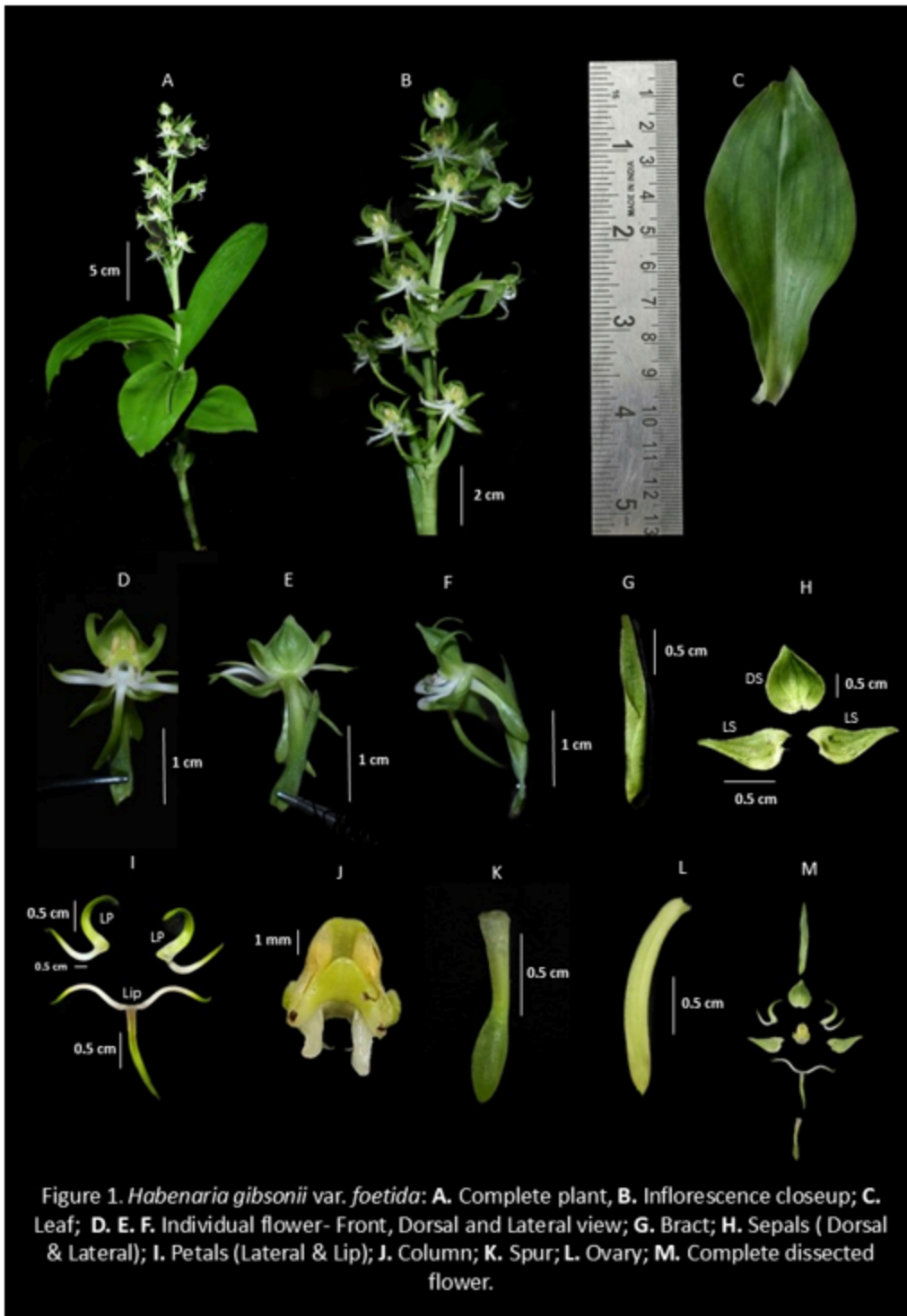


Figure 1

See image above for figure legend.

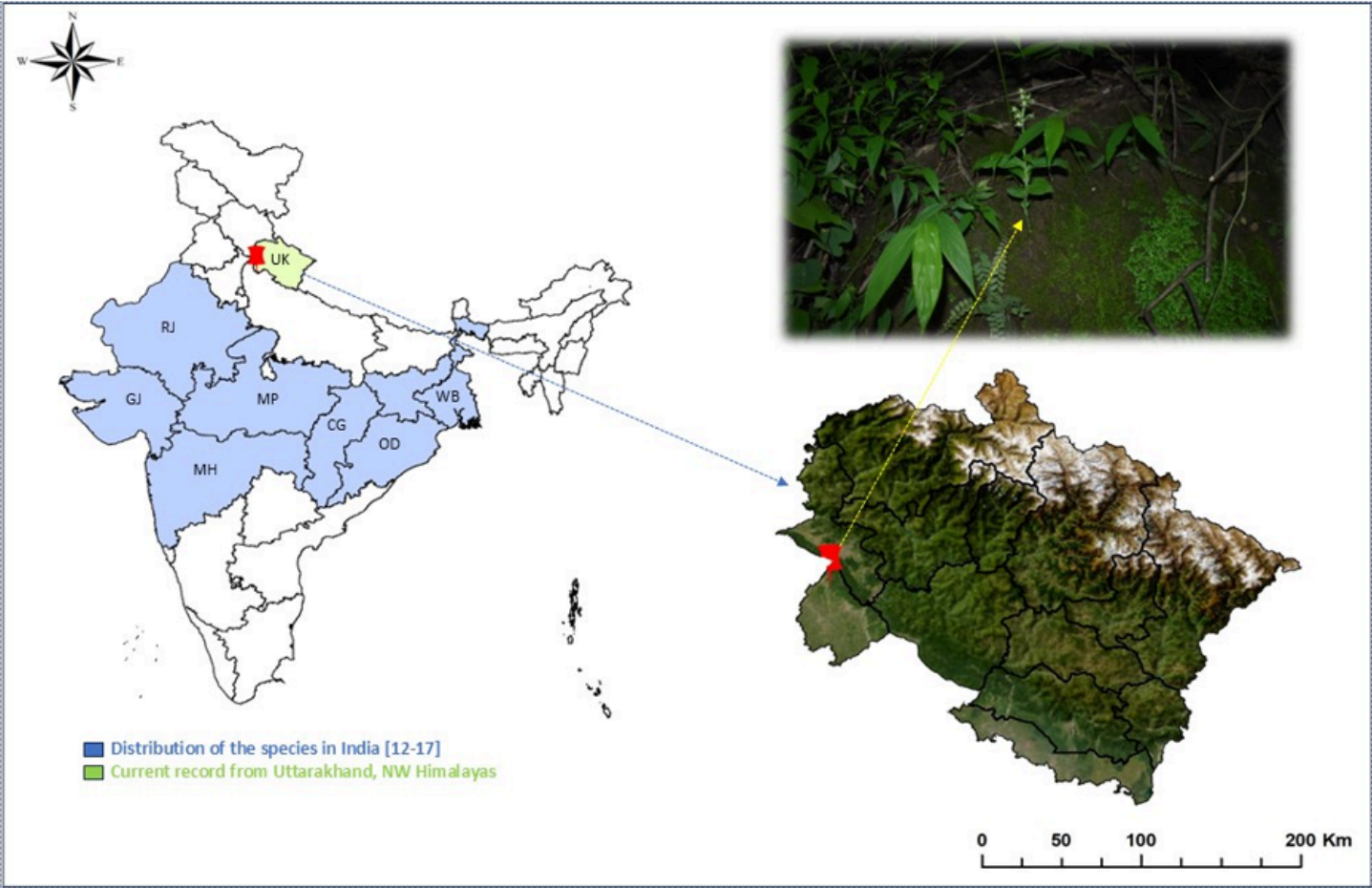


Figure 2

Distributional map of *Habenaria gibsonii* var. *foetida* in India