

RESEARCH ARTICLE

Extended distribution of two orchids in Himachal Pradesh, Western Himalaya, India

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OPEN ACCESS

ARTICLE HISTORY

Received: 17 August 2024

Accepted: 20 December 2024

Available online

Version 1.0 : 17 February 2025



Additional information

Peer review: Publisher thanks Sectional Editor and the other anonymous reviewers for their contribution to the peer review of this work.

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Indexing: Plant Science Today, published by Horizon e-Publishing Group, is covered by Scopus, Web of Science, BIOSIS Previews, Clarivate Analytics, NAAS, UGC Care, etc. See https://horizonpublishing.com/journals/index.php/PST/indexing_abstracting

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CITE THIS ARTICLE

Thakur K, Kumar R, Kumar V. Extended distribution of two orchids in Himachal Pradesh, Western Himalaya, India. Plant Science Today (Early Access). <https://doi.org/10.14719/pst.4691>

Abstract

Here we present extended distribution of two orchid species in Himachal Pradesh. In India, *Calanthe trulliformis* King & Pantl. was previously restricted to the eastern Himalayan region, is now documented for the first time in the western Himalayas. Additionally, *Neottia longicaulis* (King & Pantl.) Szlach., earlier recorded from Uttarakhand and Sikkim, is now reported from Himachal Pradesh based on collections from Dhauladhar Wildlife Sanctuary, Kangra. Our findings include a detailed description, a photoplate, a locality map and comprehensive notes on these species' habitat, phenology, and distribution.

Keywords

Calanthe; Dhauladhar Wildlife Sanctuary; Orchidaceae; *Neottia*; new records

Introduction

Orchidaceae is a highly diverse and advanced family of monocotyledons. Globally, it encompasses approximately 28,000 species distributed across 736 genera (1). In India alone, the richness of orchid diversity is notable, with nearly 1256 species documented (2). Among these, 239 taxa spanning 72 genera are found in the Western Himalayas, including 13 species endemic to this region (3). Notably, Himachal Pradesh contributes significantly, with 84 taxa across 44 genera reported (4).

During a field exploration of the Andralli Mallah region of Dhauladhar Wildlife Sanctuary (DWLS), Kangra district, Himachal Pradesh, India, in July 2024, we collected two interesting taxa of orchids. After critically examining specimens and reviewing relevant literature (5-9), these were identified as *Calanthe trulliformis* King & Pantl. and *Neottia longicaulis* (King & Pantl.) Szlach., the species hitherto not reported from Himachal Pradesh (10-15). *Neottia longicaulis*, previously known only from Uttarakhand in the western Himalayas, now represents a new distributional record for Himachal Pradesh. Similarly, *Calanthe trulliformis*, an IUCN-threatened species earlier reported from the Eastern Himalayas, marks a novel distributional record for the Western Himalayas.

Materials and Methods

These specimens were collected from Andralli Mallah region, an eco-sensitive zone, DWLS, Himachal Pradesh. Photographs were captured using

a Nikon D7500 digital camera, and geo-coordinates were recorded using a Garmin eTrex 32x GPS device. Floral parts were dissected and examined using Olympus stereomicroscope SZ-61TR. The specimens were identified after consulting the relevant literature (5-9,13). The identity of both species was reconfirmed after examination of the specimens housed at various herbaria (BR, CAL, E, GH, K, L, P). Standard herbarium procedures were followed, and voucher specimens were deposited at the CSIR-IHBT, Palampur (PLP) herbarium. The acronym of cited herbaria was provided following Index Herbariorum (16-17).

Taxonomic Treatment

1. *Calanthe trulliformis*

King & Pantl., J. Asiat. Soc. Bengal, Nat. Hist. 64, 2: 337. 1895. Fig. 1.

Plants 25–65 cm tall. Leaves 3–4, dark green; lamina narrowly elliptic to linear-lanceolate, 15–32 × 1.2–3 cm, acute at apex, margin entire, base sessile. Inflorescence 25–50 cm long, puberulous, 5–15-flowered. Inflorescence 30–38 cm long, puberulous, 6–18-flowered. Floral bracts linear-lanceolate, equal to or exceeding the stalked ovary, 1.8–2.8 cm, apex acuminate, green. Flowers are laxly arranged and spurred, sepals and petals are greenish yellow with brown markings inside, and the lip is white, with red-pink near the base, yellowing at the apex. Pedicel and ovary 1.5–2.5 cm long, puberulous. Dorsal sepal ovate-lanceolate, 1.4–1.8 × 0.3–0.5 cm, weakly pubescent, acuminate, 3-veined; lateral sepals similar to dorsal sepals, lanceolate, falcate, 3-veined. Petals linear-lanceolate, 1.0–1.5 × 0.2–0.4 cm, acute at apex. Lip adnate to the column, trowel-shaped, 1.0–1.2 × 0.4–0.6 cm, margins irregularly crenate-dentate at sides, acuminate at the apex with 2 converging lamellae spreading from the base to the apex of midway; spur much shorter than the pedicel and ovary, cylindric, greenish-yellow—Pollinia 8, unequal, in a group of 4.

Flowering: June-July

Fruiting: July-August

Habitat: Found at an elevation of ca 1350 m in association with *Rhododendron arboreum* Sm. *Quercus* sp., *Calanthe plantaginea* Lindl., *Ophiopogon* sp.

Distribution: India, Arunachal Pradesh, Sikkim, West Bengal, Himachal Pradesh (present report); Bhutan, Myanmar, Nepal.

Note: *Calanthe trulliformis* is an IUCN listed ‘vulnerable’ species (9). Originally, the species was described by King and Pantling in 1895 based on collections of R. Pantling from Mahaldaram, Sikkim (now in West Bengal).

Economic importance: Green elliptic to narrowly lanceolate leaves and an elegant inflorescence, making it a promising candidate for ornamental cultivation.

Specimen examined: India, Himachal Pradesh, Dhauladhar Wildlife Sanctuary, Andralli Mallah, 1900 m, 17 July 2024, K. Thakur, R. Kumar and V. Kumar 23835 (PLP00004431); Himachal Pradesh, Dhauladhar Wildlife Sanctuary, Andralli Mallah, 1900 m, 17 July 2024, K.

Thakur, R. Kumar and V. Kumar 23870 (PLP00004433).

2. *Neottia longicaulis*

(King & Pantl.) Szlach., Fragm. Florist. Geobot. Supp. 3: 117. 1995. *Listera longicaulis* King & Pantl., J. Asiat. Soc. Bengal, Nat. Hist. 65, 2: 126. 1895. Fig. 2

Plant 15–30 cm tall. Stem glabrous light green, with 1–2 light brown basal sheaths. Leaves 2, borne well above the ground, opposite, orbicular-ovate to reniform, subacute, at apex of stem. 2.5–3.5 × 2.5–3.5 cm, green, veined. Inflorescence 8–10 cm long, puberulous, 8–15 laxly arranged flowers, green; Floral bracts lanceolate, 5–7 × 1–2 mm, acuminate. Flowers 8–10 cm across, olive-green. Pedicel and ovary 7–9 mm long, glabrous. Dorsal sepal ovate-lanceolate, erect, 3.5 × 2.5 mm, 1-veined; lateral sepals falcate, ovate-lanceolate, ca 3.5 × 2 mm, reflexed, 1-veined. Petals ovate-lanceolate, erect, ca 3.5 × 1.2 mm long, reflexed, 1-veined. Lip elliptic-ovate, ca 11 × 8 mm long, broadest at the middle, margin entire, apex bifid, ca 2.5 mm deep sinus, margin ciliate, upper surface of nerve pubescent. Column ca 3 mm long, curved, green. Pollinia 2, sectile.

Flowering: July

Fruiting: Not seen.

Habitat: Found at an elevation of ca 1500 m in association with *Rhododendron arboreum* Sm. *Quercus* sp., *Polygonatum cirrhifolium* (Wall.) Royle, *Ophiopogon* sp.

Distribution: India, Himachal Pradesh (Present Report); Sikkim, Uttarakhand; Bhutan, Myanmar.

Note: *Neottia longicaulis* was described initially as *Listera longicaulis* by King and Pantling in 1895 based on collections from R. Pantling from Lachen Valley, Sikkim. Later, it was transferred to the genus *Neottia* by D.L. Szlachetko in 1995. Later, it was also reported by Uttarakhand (13). It is one of the lesser-known orchids, and in Uttarakhand, the distribution of this species is sporadic (13).

Specimen examined: India, Himachal Pradesh, Dhauladhar Wildlife Sanctuary, Andralli Mallah, 1990 m, 17 July 2024, K. Thakur, R. Kumar and V. Kumar 23885 (PLP00004430).

Acknowledgements

We are grateful to Dr Sudesh Kumar Yadav, Director, CSIR-IHBT, Palampur, for providing facility and support; Principal Chief Conservator of Forest, Shimla, Himachal Pradesh, for giving the survey permit; Dr Avishek Bhattacharjee and Dr Jeevan Singh Jalal, Scientists, Botanical Survey of India, Kolkata for confirming the species identification. KT thanks the Department of Science & Technology, Govt. of India, for providing the DST Inspire Fellowship (DST/INSPIRE FELLOWSHIP/FIRST INSTALM/2022/IF220539). The author, VK, acknowledges the financial support provided by CSIR (MLP-206 and RDSF-IHP002407). This manuscript represents CSIR-IHBT communication no.5637.



Fig. 1. *Calanthe trulliformis* King & Pantl.: A&B. habit, C. part of inflorescence, D. flower, E. fruits, F. floral bracts, G. column with pedicel and ovary, H. dorsal sepal, I. lateral sepals, J. petals, K. lip, L. lip enlarged view, M. anther cap, N. pollinia.

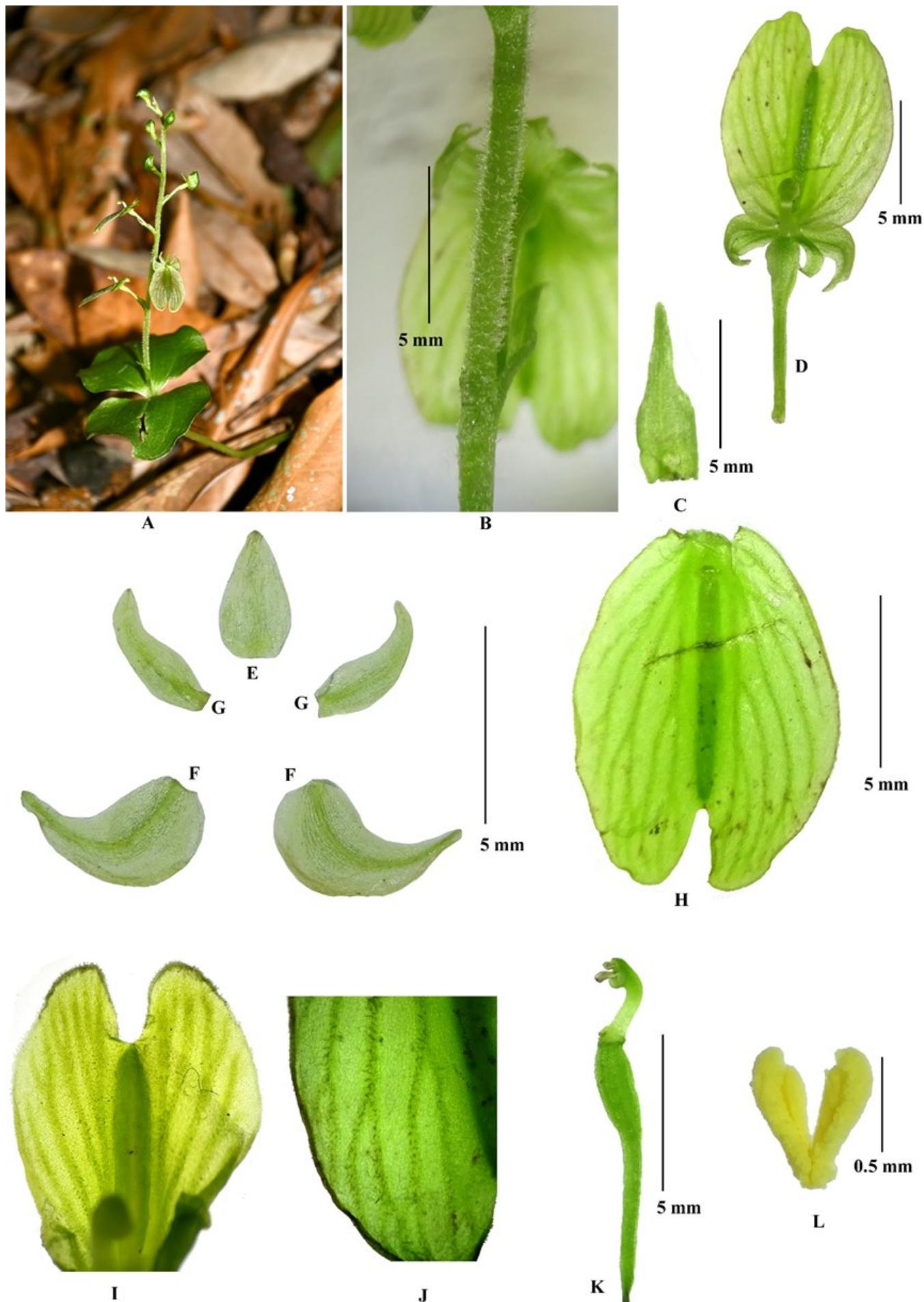


Fig. 2. *Neottia longicaulis* (King & Pantl.) Szlach.: A. habit, B. stem showing hairs, C. floral bracts, D. flower, E. dorsal sepal, F. lateral sepals, G. petals, H. lip, I & J. Lip showing hairs on margin and veins, K. column with pedicel and ovary, L. pollinia.

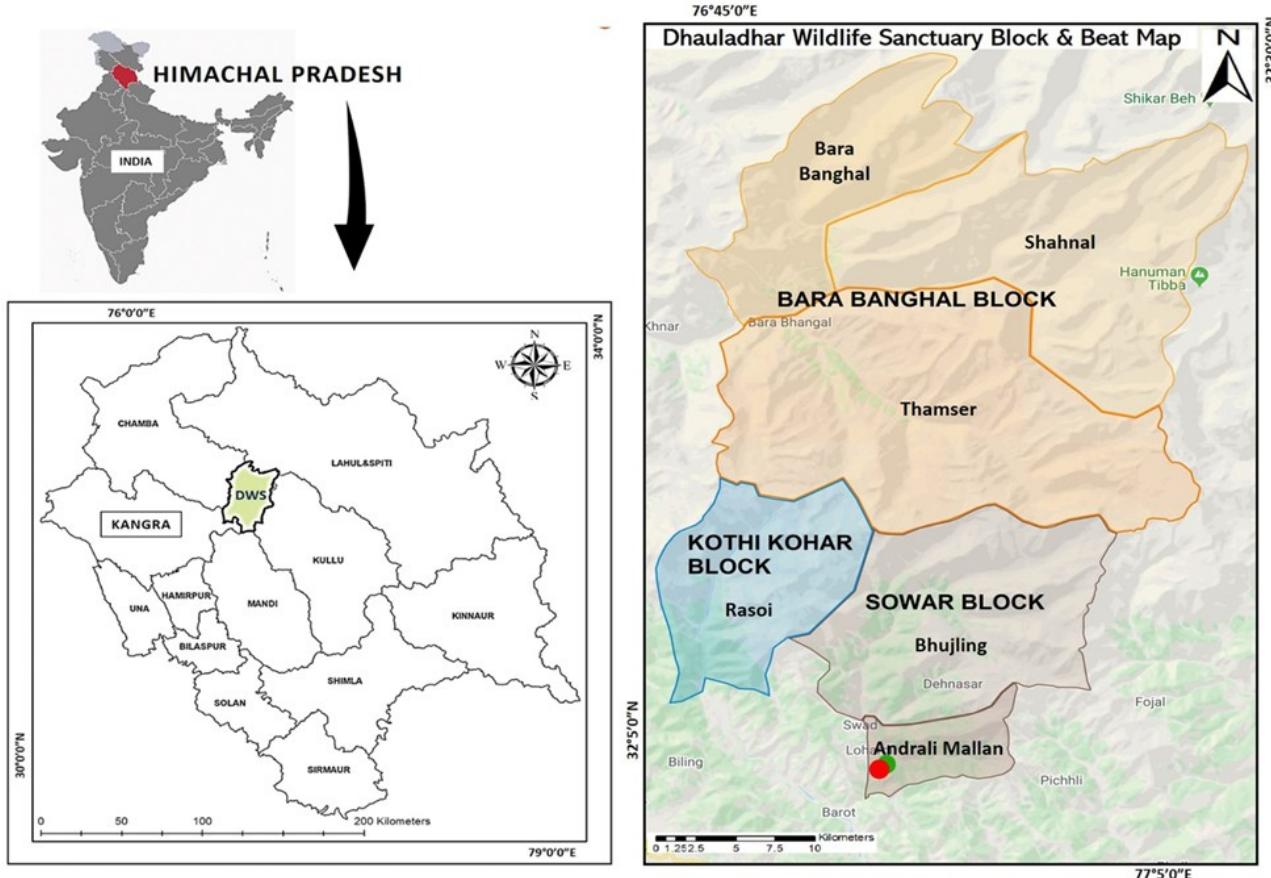


Fig. 3. Locality map of *Calanthe trulliformis* King & Pantl. (red dot) and *Neottia longicaulis* (King & Pantl.) Szlach., (green dot) in Himachal Pradesh [Source- Lyngdoh et al.(18)].

Author Contributions

KT & RK conducted fieldwork and collected plant specimens. KT & VK were involved in identification, and manuscript preparation. VK involved in illustration preparation, manuscript review and editing, and overall supervision. All authors read and approved the final manuscript.

Compliance with ethical standards

Conflict of interest: Authors do not have any conflict of interest to declare.

Ethical issues: None

References

- Christenhusz MJM, Byng JM. The number of known plant species in the world and its annual increase. *Phytotaxa*. 2016;261(3):201-17. <https://doi.org/10.11646/phytotaxa.261.3.1>
- Singh P. Orchids of India-a pictorial guide. Botanical Survey of India, Kolkata. 2019:546.
- Jalal JS, Jayanthi J. An annotated checklist of the orchids of western Himalaya, India. *Lankesteriana*. 2015;15(1):7-50. <https://doi.org/10.15517/lank.v15i1.18521>
- Vij SP, Verma J, Kumar SC. Orchids of Himachal Pradesh. Bishen Singh Mahendra Pal Singh, Dehradun, India; 2013. .
- King G, Pantling R. The orchids of the Sikkim-Himalaya. Ann Roy Bot Gard Culcutta. 1898;8:1-342.
- Pearce NR, Cribb PJ. The orchids of Bhutan. Edinburgh and Royal Government of Bhutan, Thimphu. 2002:1-546.
- Lucksom SZ. The orchids of Sikkim and North East Himalaya. Concept:Siliguri; 2007.
- Clayton D, Cribb PJ. The genus *Calanthe*. Natural History Publications (Borneo); 2013.
- Bhattacharjee A, Agrawala DK. The genus *Calanthe* R.Br. (Orchidaceae) in India. Botanical Survey of India, ENVIS Resource Partner on Biodiversity (Flora), BSI, Kolkata; 2022.
- Collett H. *Flora simiensis*. Thacker, Spink and Co.: Calcutta. 1921; 652. <https://doi.org/10.5962/bhl.title.138567>
- Chowdhery HJ, Wadhwa BM. Flora of Himachal Pradesh, vol. 3. Botanical Survey of India:Calcutta; 1984.
- Deva S, Naithani HB. The orchid flora of North West Himalaya. Bishen Singh Mahendra Pal Singh: Dehradun; 1986.
- Rau MA, Bhattacharyya UC. New records of three rare orchids from western Himalaya. *Bull Bot Surv India*. 1966;8:93-4. <https://doi.org/10.20324/nelumbo/v8/1966/76358>
- Jalal JS. Status, threats and conservation strategies for orchids of western Himalaya, India. *J Threat Taxa*. 2012;4(15):3401-09. <https://doi.org/10.11609/JoTT.o3062.3401-9>
- Derolia PK, Singh SK, Patil S, Sharma S. An annotated checklist of the flora of Himachal Pradesh, India. *Ann For*. 2019;27(1&2):1-294.
- Jain SK, Rao RR. A Handbook of field and herbarium methods. New Delhi: Today and Tomorrow's Printers and Publishers; 1977.
- Thiers BM. Index Herbariorum [Interent]. [17 Aug 2024]. Available From: <https://sweetgum.nybg.org/science/ih/>.
- Lyngdoh S, Rohane R, Bhatt U, Hussain A. Preliminary survey and framework for assessment of major fauna of Dhauladhar Wildlife Sanctuary. Survey Report. Himachal Pradesh Forest Dept and Wildlife Institute of India; 2020.