



# *Pedicularis cheilanthifolia* var. *albida* (Orobanchaceae): A new record for the flora of Uttarakhand, India

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**ABSTRACT:** The herb *Pedicularis cheilanthifolia* var. *albida* (Pennell) P. C. Tsoong is reported and collected for the first time from the Rudraprayag District of Uttarakhand. The species was seen growing along a glacial stream in an alpine region between 4,100 and 4,400 m asl. Morphological characteristics of the species were examined and processed for herbarium deposition. To simplify taxon identification, a brief taxonomic description and illustration of the taxon are provided.

**Keywords:** Broomrape, Losewort, new record, Pedicularis, Uttarakhand, Western Himalaya

**RECEIVED** 4 February 2023; **REVISED** 3 March 2023; **ACCEPTED** 10 March 2023

## INTRODUCTION

*Pedicularis* L. encompasses more than 677 species worldwide, sparingly but widely dispersed (Baasanmunkh et al., 2021; POWO 2022) and forms the largest genus in the family Orobanchaceae. For the Indian flora, 84 species, 13 subspecies, and 9 varieties have so far been identified, with 17 species, 4 subspecies, and 5 varieties being endemic (Garg, 2009; Husain et al., 2010; Singh et al., 2016; Borah et al., 2020a, 2020b; Garg et al., 2020). *Pedicularis* commonly called 'White Lousewort' is one of the important taxa described by Linnaeus in 1737. The Latin term 'Pediculus' associated with lice is the source of the genus name *Pedicularis*. The *Pedicularis* species in the field was thought to be the cause of sheep becoming infected with lice in the past. A few species were also reversed to treat sheep and goats for lice infestations. Most *Pedicularis* species exhibit a characteristic known as "hemi-parasitism" where the roots of other plants living in their microhabitat can reach them and absorb secondary metabolites. During the floristic study of the family Orobanchaceae of Uttarakhand, India, specimens of *Pedicularis* spp. were collected from different localities of the Rudraprayag district (Fig. 1). They were distinguished based on the following features; loosely villous over the entire surface, corolla white; calyx margins recurved exposing the inner cilia.

## MATERIALS AND METHODS

The specimens were collected systematically, photographed, and processed in accordance with accepted taxonomic practices (Rao and Sharma, 1990). The herbarium sheets were prepared and deposited at the herbaria of HNB Garhwal University, Srinagar Garhwal Uttarakhand, and the Department of Botany, University of Jammu, India. The species was identified by studying and comparing the plant characters of the specimens with descriptions available in published literature (Hooker, 1884; Osmaston, 1978; Semwal and Gaur, 1981; Naithani, 1984; Gaur, 1999; Garg, 2009; Husain et al., 2010; Rai et al., 2012, 2017), and by comparing them with specimens already deposited at the herbaria of GUH, HBJU, BSI, and FRI Dehradun. Here, the species was described in detail and illustrated to make identification and discrimination simple.

## TAXONOMIC TREATMENT

*Pedicularis cheilanthifolia* var. *albida* (Pennell) P. C. Tsoong, Acta Phytotax. Sin. 33: 312, 1955; *P. albida* Pennell, Acad. Nat. Sci. Philadelphia Monogr. 5: 123, 1943 (Figs. 2, 3).

Erect or decumbent herbs, 10–15 cm tall; stems several, loosely villous over entire surface or the hairs shorter and in 4 lines. Leaves pinnatifid; radical leaves 2.5–10 × 0.5–1 cm,

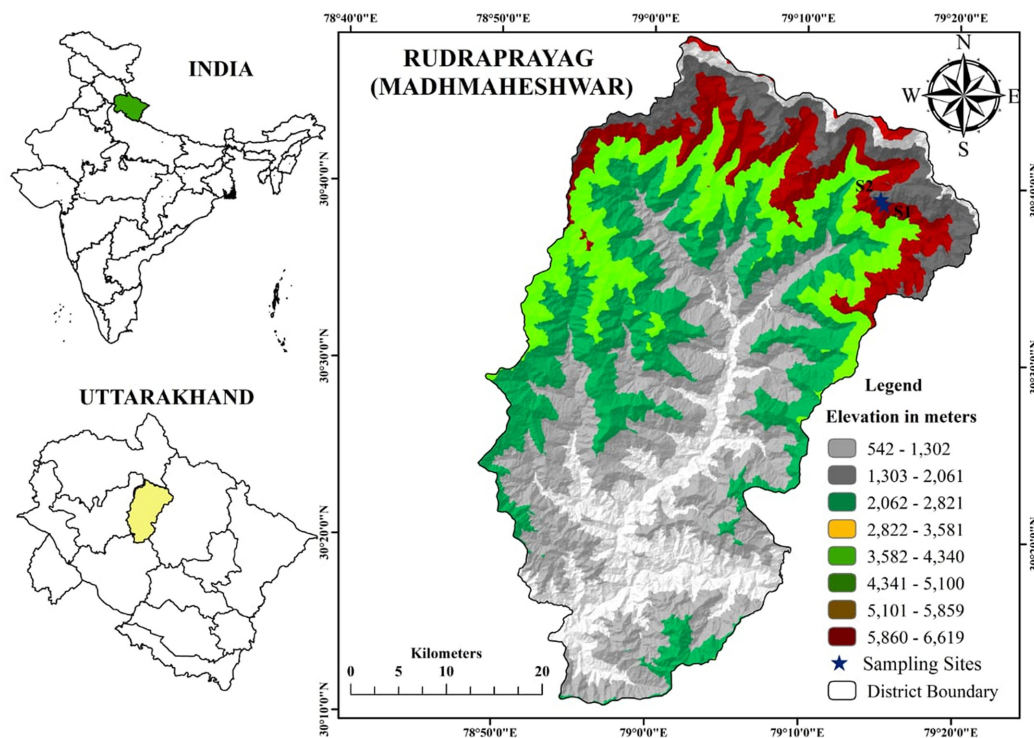


Fig. 1. Distribution map of *Pedicularis cheilanthifolia* var. *albida* (Pennell) P. C. Tsoong in Uttarakhand, India.

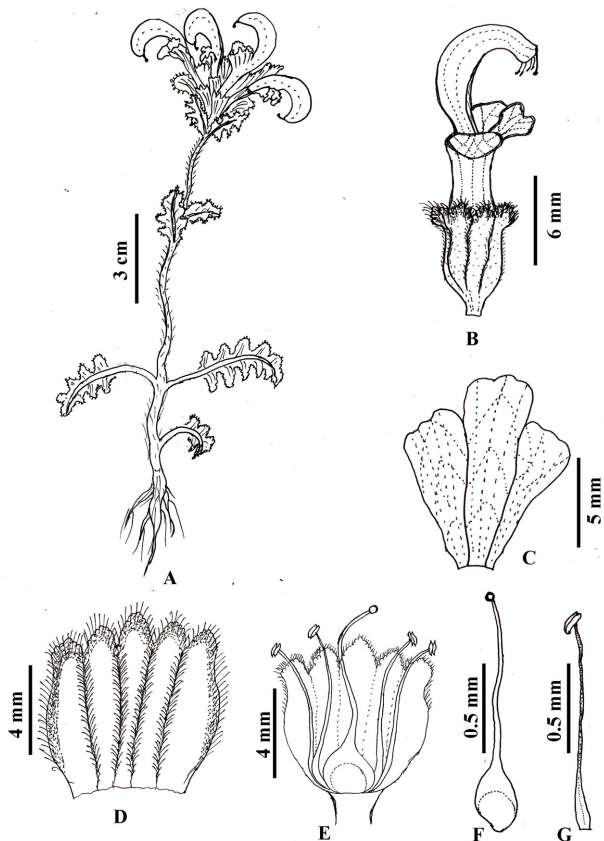


Fig. 2. *Pedicularis cheilanthifolia* var. *albida* (Pennell) P. C. Tsoong. A. Habit. B. Flower in lateral view. C. Labium. D. Calyx split open. E. Calyx with pistil and stamens. F. Pistil. G. Stamen.

long petioled, densely tufted, finely pubescent; cauline leaves 1–4 cm long, in whorls of 3–6, sessile or sub-sessile, glabrous; rachis narrowly winged; lamina irregularly toothed, with 2–3 pairs of callose-cuspidate pairs of pinnae; pinnae 2–3 mm long, 9–15 pairs. Inflorescence of 3–5 fascicles, villous, often so congested as to appear a single head-like cluster. Flowers 2–2.3 cm long, almost stalkless or pedicellate; pedicel 2–5 mm long, glabrous; bracts lowest sometimes leaf-like, upper bract smaller, lanceolate, hairy. Corolla zygomorphic, tubular, 18–20 mm long, white; tube 10–11 mm long, recurved about 30–45 degrees from the calyx, glabrous, equal or longer than the calyx; galea non-beaked, 8–12 mm long, recurvingly-arched above the lower lip, much longer than the labium, distal part rounded encasing the anthers ending in a more or less rounded or acute apex; labium very short 5–7 mm long, 3-lobed, glabrous, lateral lobes wider than long and spreading laterally. Calyx tube 6–10 mm long, sparsely or densely hairy, 4–5-lobed, dentate, often cleft up to 1/3rd depth; lobes short, obtuse, irregularly developed, the mid-posterior short or lacking, the postero-laterals longest and with lobulate margin, margin straight or recurved to expose the inner cilia. Stamens 4, didynamous, dorsifixed, opposite the middle of the ovary; anthers 1.5–2 mm long, cells acute at the base; filaments all glabrous minutely pubescent at the base; style simple protruding out of galea, glabrous; stigma capitate.



**Fig. 3.** *Pedicularis cheilanthifolia* var. *albida* (Pennell) P. C. Tsoong. **A.** Habit. **B.** Inflorescence.

**Phenology:** Flowering occurs from July to August, whereas fruiting occurs from September to November. It shows bimodal phenology.

**Habitat:** The species was observed in and collected along glacier streams, alpine grasslands and pastures locally called Bugyals.

**Specimens examined:** INDIA. Uttarakhand: Madhmaheshwar, Rudraprayag District, 30°39'03"N, 79°15'07"E, 4,200 m, 14 Aug 2022, *S. Singh, S. Thakur* 22013 (GUH); Madhmaheshwar, Rudraprayag District, 30°39'40"N, 79°14'58"E, 4,600 m, 15 Aug 2022, *S. Singh, S. Thakur* 16655 (HBJU).

**Conclusion:** *P. cheilanthifolia* var. *albida* is a new addition to the flora of Uttarakhand, India. It flourishes at the altitudinal range of 4,100–4,400 m a.s.l. in moist habitats of different localities in the Himalayan range of Uttarakhand and not have been reported so far from the state of Uttarakhand.

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## ACKNOWLEDGEMENTS

The authors are thankful to UGC, New Delhi for providing financial support in the form of scholarship. Authors are also grateful to the Heads of Department of Botany and Microbiology, H.N.B Garhwal University, Srinagar, Garhwal and University of Jammu for providing necessary facilities regarding herbarium consultation. We are also thankful to the Uttarakhand Forest officials for providing necessary permission to conduct the field work.

## CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

## LITERATURE CITED

Baasanmunkh, S., B. Oyuntsetseg, K. Khaliunaa, P. Kosachev and H. J. Choi. 2021. *Pedicularis incarnata* L. (Orobanchaceae): New species to the flora of Mongolia. *Mongolian Journal of*



- Biological Sciences 19: 51–54.
- Borah, D., N. Gap and R. K. Singh. 2020a. *Pedicularis khoiyangii* (Orobanchaceae), a new species from the Eastern Himalaya, India. *Phytotaxa* 430: 287–293.
- Borah, D., R. K. Singh and A. Garg. 2020b. Rediscovery of *Pedicularis demudata* (Orobanchaceae), a little known, rare herb after 135 years from India. *Phytotaxa* 461: 136–138.
- Garg, A. 2009. An insight into *Pedicularis cheilanthifolia* Schrenk complex (Scrophulariaceae). *Taiwania* 54: 266–272.
- Garg, A., R. K. Singh and B. S. Kholia. 2020. *Pedicularis raghvendrae* (Orobanchaceae), a new species from Sikkim Himalaya, India. *Phytotaxa* 452: 110–115.
- Gaur, R. D. 1999. Flora of the District Garhwal, North West Himalaya (with Ethnobotanical Notes). Transmedia, Srinagar, 811 pp.
- Hooker, J. D. 1884. *Pedicularis*. In *Flora of British India*, 4. Hooker, J. D. (Ed.), Reeve and Co., London, pp. 306–317.
- Husain, T., A. Garg and P. Agnihotri. 2010. Genus '*Pedicularis*' L. ('Scrophulariaceae') in India: A Revisionary Study. Bishen Singh Mahendra Pal Singh, Dehradun, 233 pp.
- Naithani, B. D. 1984. Flora of Chamoli, Vol. I–II. Botanical Survey of India, Howrah, 50 pp.
- Osmaston, A. E. 1978. Forest Flora for Kumaon. International Book Distributors, Dehradun, 605 pp.
- POWO. 2022. Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. Retrieved Aug. 23, 2022, available from <http://www.plantsoftheworldonline.org/>.
- Rai, I. D., B. S. Adhikari and G. S. Rawat. 2012. Floral diversity along sub-alpine and alpine ecosystems in Tungnath area of Kedarnath wildlife sanctuary, Uttarakhand. *Indian Forester* 138: 927–940.
- Rai, I. D., G. Singh and G. S. Rawat. 2017. Plants of Kedarnath Wildlife Sanctuary, Western Himalaya: A Field Guide. Bishen Singh Mahendra Pal Singh, Dehradun, 393 pp.
- Rao, R. R. and B. D. Sharma. 1990. A Manual for Herbarium Collections. Botanical Survey of India, Kolkata, 25 pp.
- Semwal, J. K. and R. D. Gaur. 1981. Alpine flora of Tungnath in Garhwal Himalaya. *Journal of Bombay Natural History Society* 78: 498–512.
- Singh, R. K., B. S. Kholia and J. V. Sudhakar. 2016. *Pedicularis artiae*, a new species of Orobanchaceae from Sikkim Himalaya, India. *Kew Bulletin* 71: 36.