Hypnum plumaeforme Wilson - New addition to the Bryoflora of Western Himalayas, India

Afroz Alam[1]*, Vinay Sharma[1], Shiv Charan Sharma[1] and Sonu Yadav[2]
[1]Department of Bioscience and Biotechnology, Banasthali Vidyapith,
Tonk- 304 022, (Rajasthan) India
[2]Department of Botany, University of Lucknow, Lucknow-226 007 (U. P.) India
*afrozalamsafvi@gmail.com

Abstract: The present contribution revealed the occurrence of *Hypnum plumaeforme* Wilson belonging to family Hypnaceae (Bryopsida) for the first time in Munsiyari region of Uttarakhand state, which is a new addition to the bryoflora of Western Himalayas. Earlier this species was known only from eastern Himalayas (Nepal).

Keywords: Bryophyta, Hypnales, Hypnaceae, *Hypnum*, Western Himalayas.

1. Introduction

Order Hypnales (M. Fleisch.) W. R. Buck & Vitt is the most diversified order of mosses in Western Himalayan range of India. It is represented by 20 families, 104 genera and 306 species. Among 20 families, family Hypnaceae Schimp. has 15 genera with 32 species. The genus *Hypnum* Hedw. was earlier known only by 3 representatives viz. *H. cupressiforme*, *H. vaucheri* fo. *vaucheri* Lesq. and *H. subimponens* subsp. *ulophyllum* (Müll. Hal.) Ando (Lal, 2005; Alam et al., 2012; Alam, 2013).

In recent exploration to Munsiyari (Kumaon Himalayas) some plants were collected which superficially resembled with *Hypnum.* On close observation it was found that those specimens belong to *Hypnum plumaeforme*, a species earlier recorded from eastern Himalayan region of Nepal (Gangulee, 1969-1980). This study recognizes *Hypnum plumaeforme* Wils. from Munsiyari (Uttarakhand), as a welcome addition to the bryoflora of western Himalaya as it was earlier known only from Eastern Himalayas (Nepal).

2. Materials and Methods

Plant specimens were collected from Munsiyari (Uttarakhand), Western Himalayas, India. The collected specimens were deposited in Banasthali Vidyapith Herbarium (BVH), Rajasthan.

Description

Hypnum plumaeforme Wilson, Lond. J. Bot., 7: 277. 1848.
(Plate 1; Figs.1-10)

Synonyms:
Cupressina sinensmollusca Müll. Hal. Nuov. Giorn. Bot. Ital. n. ser. 3**:**121 (1896)

Plant yellowish green in colour, robust, glossy, forming trufts. Main stem creeping, 8-9 cm long, 3.0-3.5 mm wide, pinnately branched, stem in cross section elliptical, 4.4 mm long and 2.0 mm and wide, central strand absent, cortical cells 2.8µm long and 1.2 µm wide smaller than medullary cells, medullary cells 3.2µm long and 1.6 µm wide. Branch leaves dense, erectopatent, falcate to secund to hamate (erect and hooked at tip when dry), concave, ovate to lanceolate, 1.57 x 0.38 mm, apex narrow acute, margin denticulate at tip. Costa indistinct. Leaf cells linear with wavy, porose walls, ± 26.25 x 7.5 µ at tip: 41.25 x 7.5 µm at lower leaf. Extreme base cells tinted, large rectangualar (33.75 x 7.5 µm) with highly porose walls and with at least another irregular row of cells on top. Alar not much differentiated in the branch leaves but is differentiated with a number of larger cells in the stem leaves.
Fertile plants not seen.

Specimen examined: India, Western Himalayas: Uttarakhand-Munsiyari, 26th June, 2012 (alt. ca. 2050m), Leg. A. Alam & S. C. Sharma, 786208 (BVH).

Range: China, Japan, Korea, Russia, Taiwan, Ryukyu, Philippines, Tonkin, Nepal (Gangulee, 1969), Hawaii and India.

3. Discussion
Hypnum plumaeforme Wilson was earlier reported as east Asiatic species. The occurrence of *Hypnum plumaeforme* Wilson in western Himalayan region is a welcome addition to the species under *Hypnum*. Unfortunately, the fertile plants were not collected. Yet, the presence of *Hypnum plumaeforme* in this Munsiyari has further widened its range of distribution to western Himalayan region of India. This discovery once again highlighted the potential of this region of India in terms of bryodiversity. It has been a tendency of any potential region like western Himalayas that with every exploration trip there are always few species which had been registered as new additions in the existing bryodiversity (Nath et al., 2007; Nath et al., 2008; Saxena et al., 2010; Asthana and Sahu, 2012; Alam, 2013). Therefore, it should be a mission of bryologists to make a number of more frequent serious efforts to explore some lesser known areas beside the more famous bryo-rich spots to unravel the hidden species of western Himalayan bryoflora .

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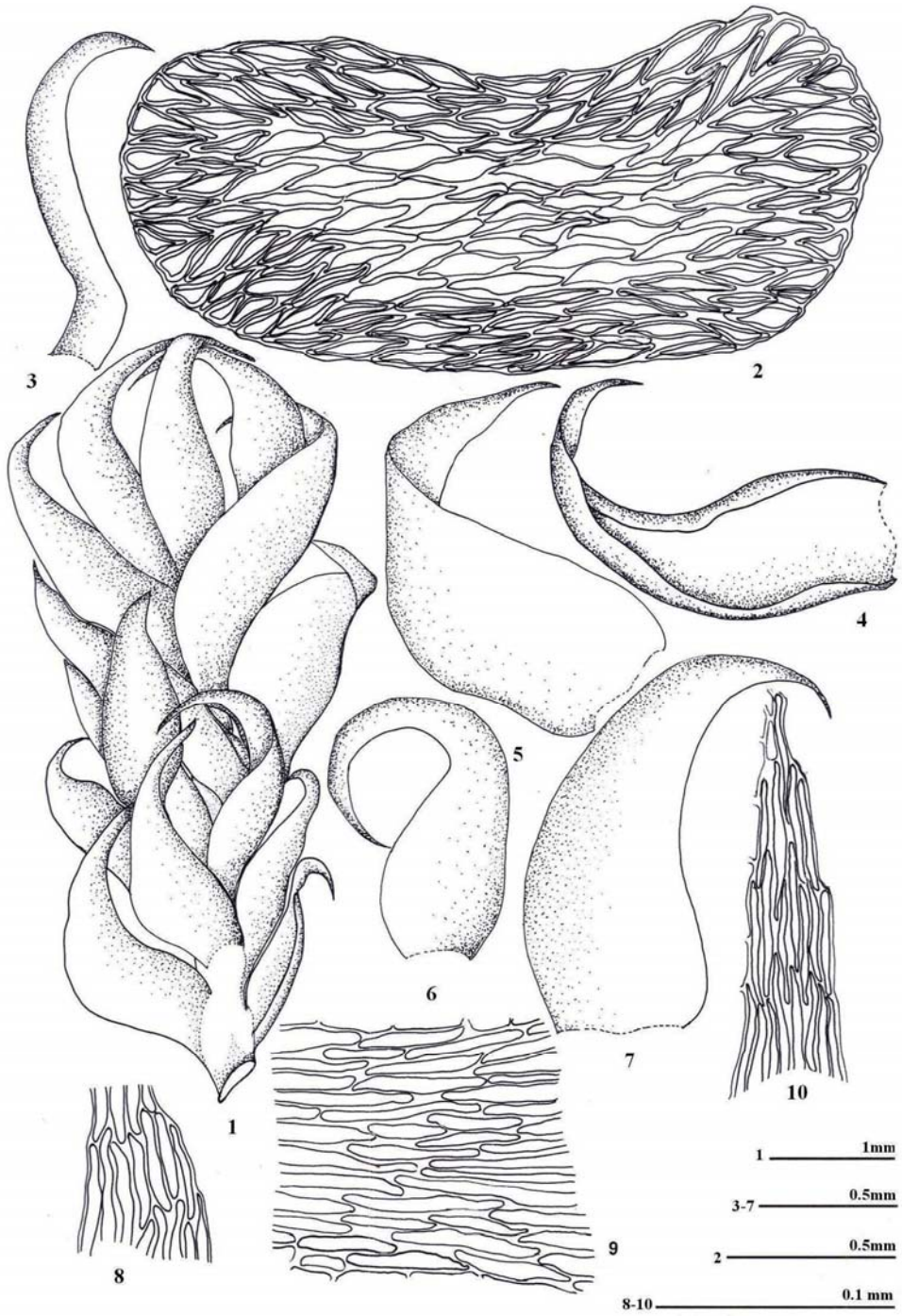

Plate 1: Figs. 1-10. ***Hypnum plumaeforme*** **Wils.: 1. A portion of plant, 2. Cross section of stem 3-7. Leaves, 8. Apical-median cells of leaf 9. Median-basal cells of leaf, 10. Marginal cells of leaf**

5. Literature

ALAM, A. (2013). Moss flora of Munsiyari (Uttarakhand), Western Himalayas, India. Archive for Bryology 161: 1-11.

ALAM, A., SHARMA, V., SHARMA, S. C. & TRIPATHI A. (2012). Bryoflora of Munsiyari and Dharchula Tehsil of Pithoragarh, Uttarakhand, Western Himalayas, India. Archive for Bryology 140: 1–11.

ASTHANA, A. K. & SAHU, V. (2012). Two mosses new to western Bryoflora. Phytotaxonomy 12: 63-67.

CHOPRA, R. S. & KUMAR, S. S. (1981). Mosses of the western Himalaya. Annales Cryptogamici et phytopathologici, vol 5. The Chronica Botanica Co. New Delhi, India.

GANGULEE, H. C. (1969-1980). Mosses of Eastern India ANDAdajacent regions. Fascicles 1-8. Books and Allied Limited, Calcutta.

LAL, J. **(**2005). A checklist of Indian Mosses, Bishen Singh Mahendra Pal Singh. Dehra Dun, India. pp. 1–164.

NATH, V., ASTHANA, A. K. & SAHU, V. (2007). *Fabronia secunda* Mont. – A New addition to western Himalayas. Indian Journal of Forestry 30(3): 353-354.

NATH, V., ASTHANA, A. K. & SAHU, V. **(**2008). Addition of three moss species to West Himalayan Bryoflora. Cryptogamie Bryologie 29(4): 387-392.

SAXENA, D., SONYIA & SUARABH. (2010). First report of the moss *Rhynchostegiella divaricatifolia* (Renauld & Cardot) Broth. from Western Himalayan region of India, *Phtyospecies*, U.K . **8**: 59–64.

SINGH, H., SAHU, V., HUSAIN T. & ASTHANA, A.K. (2010). *Macromitrium rigbyanum* Dixon. In: Bryological Notes: New national and regional bryophyte records, 24. Journal of Bryology 32: 232–241.

TEWARI, S. D. & PANT, G. (1994). Bryophytes of Kumaon Himalaya. Bishen Singh Mahendra Pal Singh. Dehradun, India.

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