REPORT

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Species

Pseudotaxiphyllum distichaceum (Mitt.) Z.Iwats - A fascinating gemmiferous moss from the *Cedrus* forest floor at lohaghat, Kumaun Himalaya (Uttarakhand)

Bhandari M✉, **Tewari SD**, **Joshi P**

Department of Botany, Indira Priyadarshni Government Post Graduate Girls College of Commerce, Haldwani (Nainital) Uttarakhand, India

✉**Corresponding author**

Manisha Bhandari, Research Scholar, Department of Botany, Indira Priyadarshni Government Post Graduate Girls College of Commerce Haldwani, Nainital, 263139, India; Mob no: 7454885727, E-mail: bmannu4@gmail.com

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ABSTRACT

During the bryoexploratory study of the *Cedrus deodara* (Roxb. ex D.Don) G.Don forest at lohaghat in Champawat district (1700-1800m), Uttarakhand, we came across an interesting gemmiferous, pleurocarpous moss, viz., *Pseudotaxiphyllum distichaceum* (Mitt.) Z.Iwats growing on a slightly acidic (pH 6.6-6.8) sloppy soil of *Cedrus* forest floor associated with other mosses like *Atrichum* obtusulum (C. Muell.) Jaeg. and *Pohlia flexuosa* Hook. The prominent vermiform, twisted multicellular gemmae demarcate this moss

species from others. A perusal of earlier literature revealed that this moss is a new record for the kumaun region of Northwest Himalaya.

Keywords: *Pseudotaxiphyllum*, *Isopterygium*, gemmiferous, *Cedrus* forest floor, kumaun Himalaya.

1. INTRODUCTION

The genus *Pseudotaxiphyllum* Z. Iwats belongs to one of the dominant pleurocarpous moss families Hypnaceae. By far, 11 species of this interesting moss are known to be distributed terrestrially all over the world (Ireland & Buck 2009). Earlier, *P.distichaceum* species was kept under the genus *Isopterygium* Mitt. as *I. distichaceum* (Mitt.) Jaeg., and now synonymized as *P.distichaceum* (Ireland & Buck, 2009). In India, this particular genus is represented by 2 species viz., *P.distichaceum* and P. pohliaecarpum (Sull. & Lesq.) Z.Iwats (Daniels, 2010). However, Gangulee as early as (1978-80) treated *Pseudotaxiphyllum distichaceum* as *Isopterygium distichaceum*. The present species is distinguished from other species of *Pseudotaxiphyllum* by their distinct thin mat-forming, complanate, yellowish-green glossy shoots (Plate 1, fig 1). Furthermore, the species is reported to reproduce asexually using the prominent vermiform, twisted multicellular gemmae, clustered in leaf axils near shoot tips (Plate 1, fig 2-3). Additionally, Ireland (1991) separated both the genus *Pseudotaxiphyllum* and *Isopterygium* based on a few diagnostic characters like rhizoids, paraphyllia, propagules, and leaf apices. However, in India, this moss has only been reported from Himanchal Pradesh and Shimla, located in the Western Himalayan region (Lal, 2005). For the first time, this gemmiferous moss species is being described based on the collection made from the *Cedrus deodara* forest floor at Lohaghat region (1700m- 1800m) of the district Champawat, Uttarakhand that constitutes the Kumaun region of Northwest Himalaya.

2. MATERIALS AND METHODS

The collected moss samples were brought to the laboratory for further identification. Temporary slides of the gametophytic part were prepared in 30% glycerine for microscopic characterization. Camera Lucida drawing as well as microphotographs were prepared for proper identification. The voucher specimens are deposited in the Department of Botany, I.P.G.P.G.G.C.C. Haldwani, Nainital. With the help of available literature, the identification work was performed.

3. RESULTS AND DISCUSSIONS

Taxonomic Description

Plants terrestrial, glossy to yellowish-green, pleurocarps, irregularly branched, creeping with 8 mm to 15 mm long and 1-2 mm in wide shoots. Branch and stem leaves are similar, complanate, arranged in 2- ranked about 1.30-1.43mm in length and 0.39-0.43 mm in width, asymmetric, lanceolate, or ovate-lanceolate, acute- acuminate tip with a serrate margin. Costa short, double or absent, cells linear- vermiform, often flexuose, liner- Fusiform in middle and smooth, prorulose at a distal region about 109-126mm in length and 6.66mm in width, alar cells are quadrate to short rectangular about 33.3-53.28mm in length and 9.99-13.32mm in width (Plate 2, fig. 1-8). Sporophyte not seen.

Specialized Asexual propagules

At shoot apices, clusters of beautifully yellowish- green colored, multicellular, twisted- vermiform gemmae ranging from 0.41-0.49 mm length and 0.26 mm width with 1-5 acute teeth at apices distinguishing it from other associates (Plate 1, fig. 2-3).

Distribution and ecology

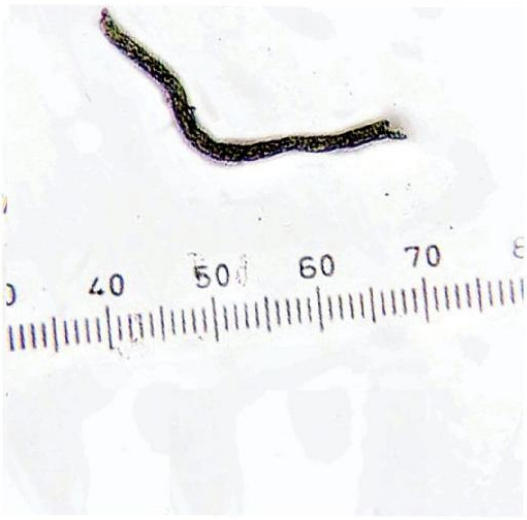
Eastern Himalaya, Western Himalaya, South India, and Nilgiri Hills. In nature, this moss species is not much conspicuous and is found associated with other moss species viz., *Atrichum* obtusulum (C. Muell.) Jaeg. and *Pohlia flexuosa* Hook., growing on a slightly acidic (pH 6.6-6.8) sloppy soil of the *Cedrus* forest floor.

Specimens Examined

India, Uttarakhand, Champawat District, Lohaghat 1700-1800m, 30.11.2019, Bhandari, M. Herbarium no. L16, L17.

1

2



3

Plate 1. *Pseudotaxiphyllum distichaceum* (Mitt.) Z.Iwats.

1. Wet plant shoots,
2. A cluster of vermiform gemmae on the shoot apices.
3. Vermiform multicellular gemmae with acute teeth at the apex.

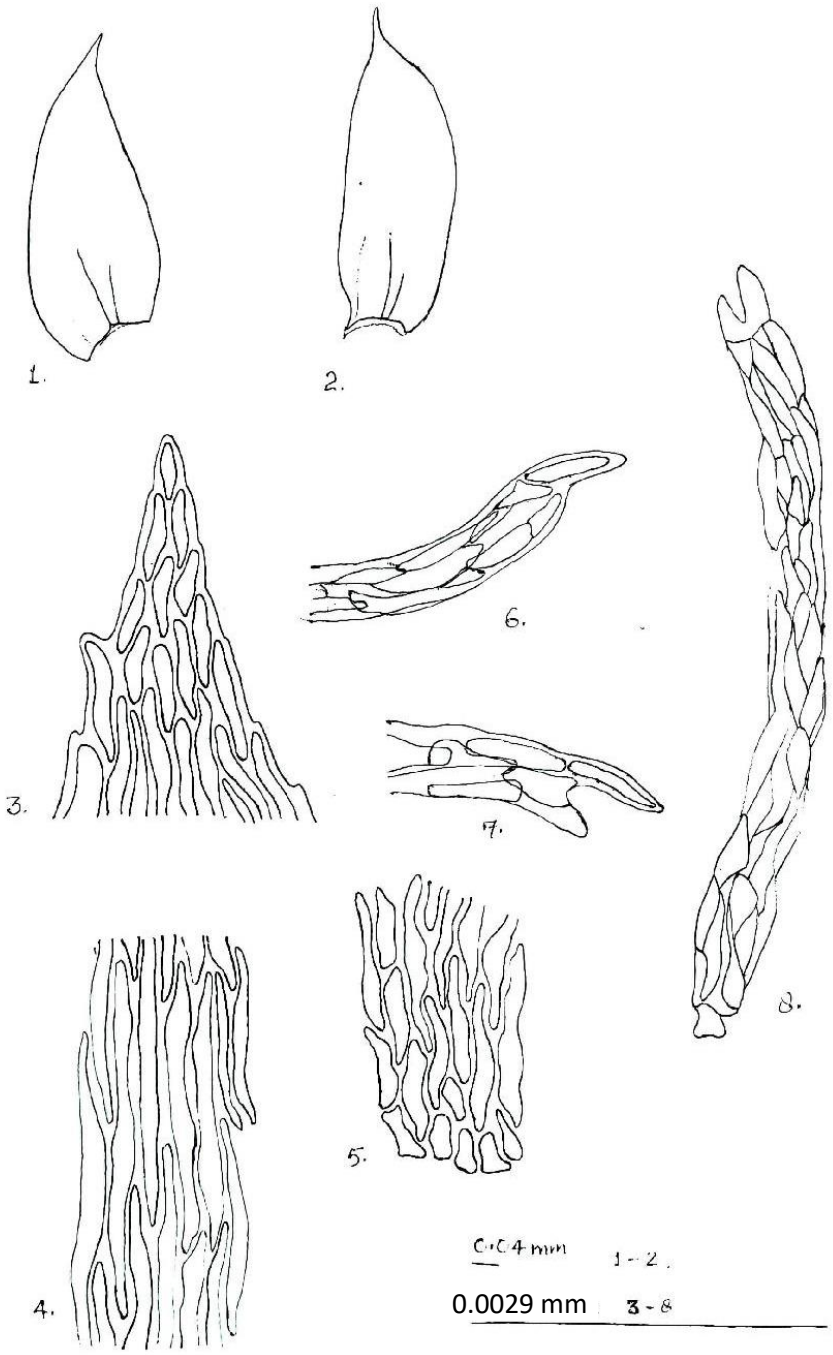


Plate 2. *Pseudotaxiphyllum distichaceum* (Mitt.) Z.Iwats.
1,2. Leaves,
3. Apical leaf cells,
4. Faintly prorulose middle cells,
5. Basal cells.
6,7,8. Vermiform propagules with 1-2 acute teeth.

4. CONCLUSION

This report will be the first of its kind to establish recordings of *Pseudotaxiphyllum distichaceum* (Mitt.) Z.Iwats. from the kumaun region of the northwest Himalaya, thereby significantly contributing to the scientific literature on this particular species.

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Conflicts of interest:

The authors declare no conflict of interest.

Data and materials availability

All data associated with this study are present in the paper.

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