

TWO NEW RECORDS OF *PLAGIOTHECIUM* FROM INDIA

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Govind Wild Life Sanctuary in the Western Himalayas with its diverse vegetation types provides excellent habitats and microclimates for a lush growth of bryophytes. During investigations on the bryophytes of this region *Plagiothecium euryphyllum* (Cardot et Thér.) Z. Iwats. and *P. cavifolium* (Brid.) Z. Iwats. have been identified for the first time from India. *P. euryphyllum* is characterised by bright green to yellowish green plants, irregularly branched, complanate. Central strand developed. Leaves erectopatent, imbricate, ovate oblong, margin entire, acute to acuminate at apex, costa two forked, decurrent with hyaline, rectangular cells. Seta reddish, capsule erect to inclined, while plants of *P. cavifolium* are yellowish green, glossy, prostrate, irregularly branched, branches julaceous. Leaves appressed to stem, closely imbricate, erectopatent, ovate lanceolate, symmetrical, margin minutely dentate at apex, cells at alar region rectangular costa two short. Seta reddish brown, capsule erect, pyriform. A morpho-taxonomic account of above two taxa is provided.

Key words: Govind Wild Life Sanctuary, India, *Plagiothecium cavifolium*, *Plagiothecium euryphyllum*

INTRODUCTION

The genus *Plagiothecium* B. S. G. consists of about 90 species world-wide especially in the temperate zones (Buck and Ireland 1985). Vohra (1974) described a new species of *Plagiothecium* (*P. dehradunense*) from India. Gangulee (1980) described 6 species of *Plagiothecium* from India. Lal (2005) listed 11 taxa of *Plagiothecium* from India out of which 8 taxa are from the Western Himalayas, 2 from the Eastern Himalayas and 1 from South India. *Plagiothecium euryphyllum* (Cardot et Thér.) Z. Iwats. was earlier known from Bhutan, China, Japan, Formosa and Korea, while *P. cavifolium* (Brid.) Z. Iwats. was earlier

known from Bhutan, China, Europe, Korea, Japan, Nepal Himalayas, North America and Russian Far East. During recent investigations on the bryophytes of Govind Wild Life sanctuary, these two taxa have been identified at places on the way to Talhuti and Kedarkantha (Juda Tal), respectively in this region. Hence these two taxa are new additions to the bryoflora of India.

MATERIALS AND METHODS

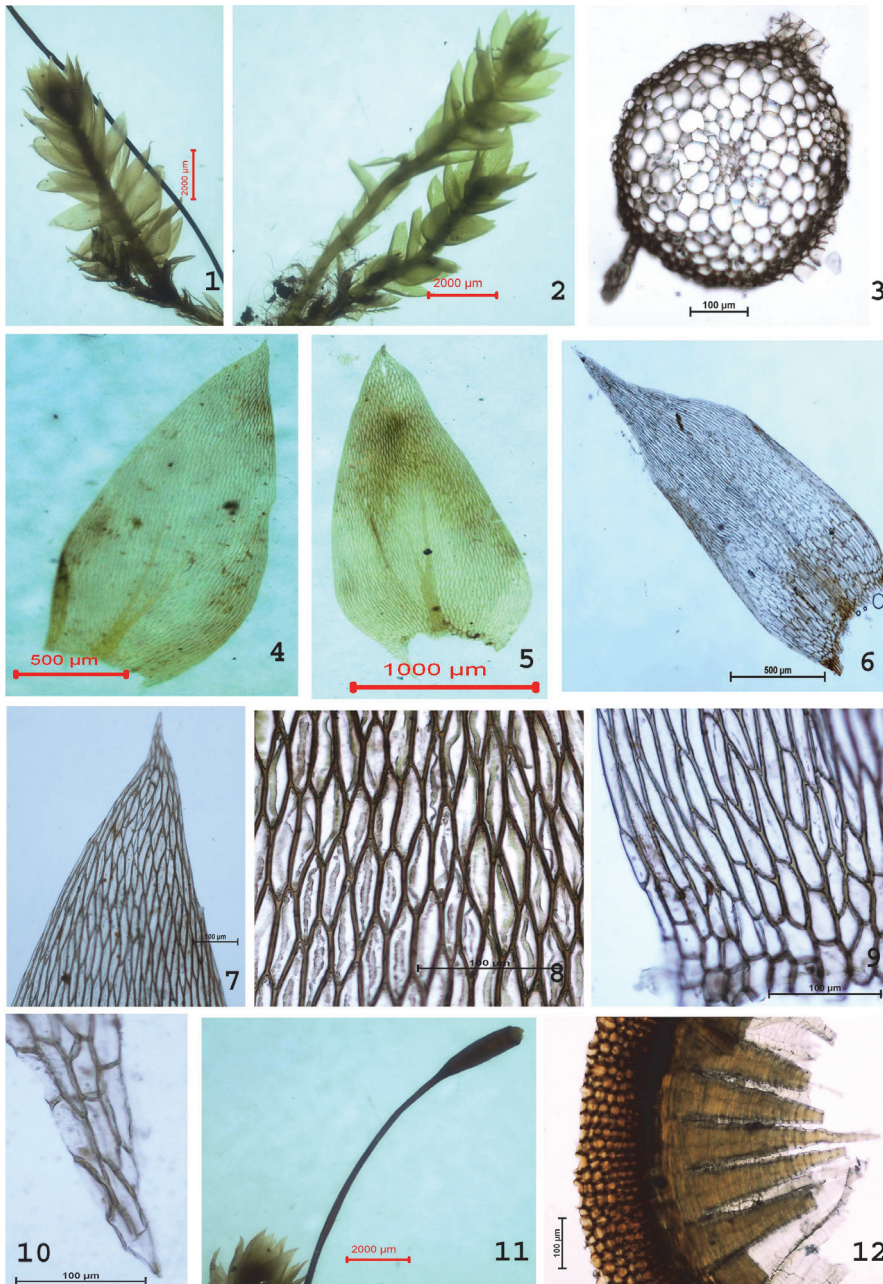
Plant specimens were collected on the way to Kedarkantha, Juda Tal and Talhuti, Govind Wildlife Sanctuary, Uttarakashi district of Uttarakhand, the Western Himalaya, India. The voucher specimens were deposited in the Bryophyte Herbarium, CSIR – National Botanical Research Institute, Lucknow (LWG). The nomenclature, identification and treatment of taxa follow Iwatsuki's revision on *Plagiothecium* (Iwatsuki 1970).

Taxonomic description

Plagiothecium euryphyllum (Cardot et Thér.) Z. Iwats.
(Figs 1–12)

Plants bright green to yellowish green, glossy, prostrate, irregularly branched, branches 10–18 mm long and 2–4 mm wide including leaves, branches creeping to ascending, complanate. Stem rounded in cross section, 0.26–0.32 mm wide, cortical cells thick walled, 8–16 μm long and 8–12 μm wide, medullary cells 20–40 μm long and 16–36 μm wide, polygonal, thin walled, central strand developed. Leaves erectopatent, imbricate, ovate oblong, margin entire, acute to acuminate at apex, 1.48–2.4 mm long and 0.8–1 mm wide, apical cells 48–80 μm long and 8–12 μm wide, linear rhomboid, median leaf cells 100–140 μm long and 8–12 μm wide, porose, basal cells at alar region rectangular, 20–48 μm long and 16–20 μm wide, costa two forked, extending above middle, leaf base decurrent with hyaline, rectangular cells. Perichaetial leaves 1.5–2 mm long and 0.48–0.56 mm wide, costa faintly developed. Perichaetial leaves clasping the seta. Perichaetial leaf cells 100–120 μm long and 8 μm wide, linear flexuose, median leaf cells 80–120 μm long and 12 μm wide, margin entire. Seta reddish, 20–30 mm long, capsule erect to inclined, oblong-cylindrical, 3–4 mm long and 0.8–1 mm wide. Peristome teeth 0.56–0.64 m long, lanceolate, papillose.

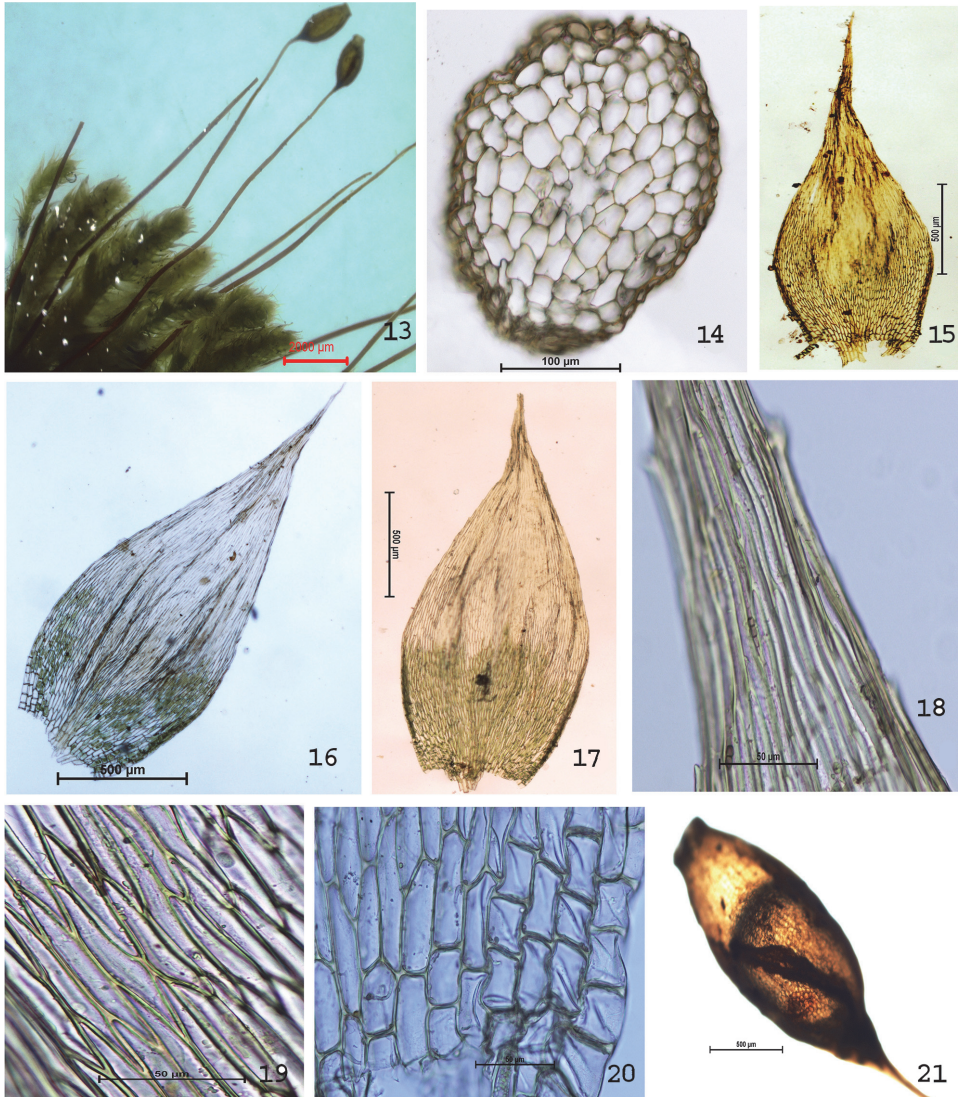
Plagiothecium euryphyllum can be differentiated from other species by having broadly acute apex and distinct hyaline alar cells. *P. euryphyllum* is closely related to *P. neckeroides*, but in the latter species leaf bases are widely decurrent and at the leaf apex propagules or rhizoids are produced.



Figs 1–12. *Plagiothecium euryphyllum* (Cardot et Thér.) Z. Iwats. – 1–2 = plants; 3 = cross section of stem; 4–5 = leaves; 6 = perichaetial leaf; 7 = apical leaf cells; 8 = median leaf cells; 9 = basal leaf cells; 10 = decurrence of leaf; 11 = capsule; 12 = peristome

Specimen examined: India, Western Himalayas, Uttarakhand, Uttarakashi, on the way to Talhuti, on soil covered rock. Lat.: 31° 04' 40.1" N; Long.: 78° 15' 04.2" E; Alt.: ca 2,155 m. Leg.: Vinay Sahu (265048A), 05.04.2013 (LWG).

Distribution: Bhutan, China, Formosa, India, Japan, Korea.



Figs 13–21. *Plagiothecium cavifolium* (Brid.) Z. Iwats. – 13 = plant; 14 = cross section of stem; 15–17 = leaves; 18 = apical leaf cells; 19 = median leaf cells; 20 = basal leaf cells; 21 = capsule

Plagiothecium cavifolium (Brid.) Z. Iwats.
(Figs 13–21)

Plants yellowish green, glossy, prostrate, irregularly branched, branches julaceous, 7–12 mm long. Stems rounded to elliptical in cross section, 0.28 mm long and 0.24 mm wide, outer cortical cells thick walled, 16–20 μm long and 8–12 μm wide, polygonal, medullary cells thin walled 32–40 μm long and 28 μm wide, polygonal, central strand present. Leaves appressed to stem, closely imbricate, erectopate, ovate lanceolate, symmetrical, margin minutely dentate at apex, 2–2.5 mm long and 0.8–1 mm wide, apex acute. Leaf apical cells 80–120 μm long and 8 μm wide, linear rhomboid, median leaf cells 100–120 μm long and 8 μm wide, at base alar cells differentiated, cells at alar region rectangular, 28–48 μm long and 12–16 μm wide, costa two forked, short. Perichaetial leaves ovate lanceolate, 1.5–1.8 mm long and 0.32–0.40 mm wide, costa absent. Seta reddish brown, 15–17 mm long, capsule erect, pyriform.

Specimens examined: India, Western Himalayas, Uttarakhand, Uttarakashi, on the way to Kedarkantha, Juda Tal, on bark. Lat.: 31° 03.116' N; Long.: 78° 11.096' E; Alt. ca 2,842 m. Leg.: Vinay Sahu (264909B), 05.04.2013 (LWG). – Eastern Himalayas, Nagaland, Kohima road (Kohima-Amgure National Highway), on bark. Alt.: 1,444 m. Leg.: V. Nath (248809), 03.08.2008 (LWG).

Distribution: Bhutan, China, Europe, India, Japan, Korea, Nepal Himalayas, North America, Russian Far East.

P. cavifolium differs from other species of the genus in having julaceous to subjulaceous erect branches, closely imbricate concave and symmetrical leaves. Earlier, specimens listed as *P. cavifolium* from the Nagaland by Bansal and Nath (2011) have also been investigated, which actually belong to *Campylodontium* in which alar cells are very prominent and costa is absent.

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