

Horikawaella S. Hatt. & Amakawa (Marchantiophyta: Solenostomataceae) from Sikkim, India

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ABSTRACT

Rawat K. K., Sahu V., Verma P. K. & Asthana A. K. 2015. *Horikawaella* S. Hatt. & Amakawa (Marchantiophyta: Solenostomataceae) from Sikkim, India. Geophytology 45(1): 67-70.

Genus *Horikawaella* S. Hatt. & Amakawa, a rare taxon of Indian bryoflora, is endemic to Himalaya and is represented in India by single species *H. subacuta* (Herzog) S. Hatt. & Amakawa. It can easily be recognized by large, reddish-purple plants, leaves cordate to ovate, subtransversely arranged with large bulging-nodulose trigones and presence of dense verrucose-striolate cuticle on leaves as well as on stem. A detailed description of *Horikawaella subacuta*, based on fresh collection from Sikkim, is provided here.

Key-words: *Horikawaella subacuta*, Solenostomataceae, Hepaticae, Sikkim, India.

INTRODUCTION

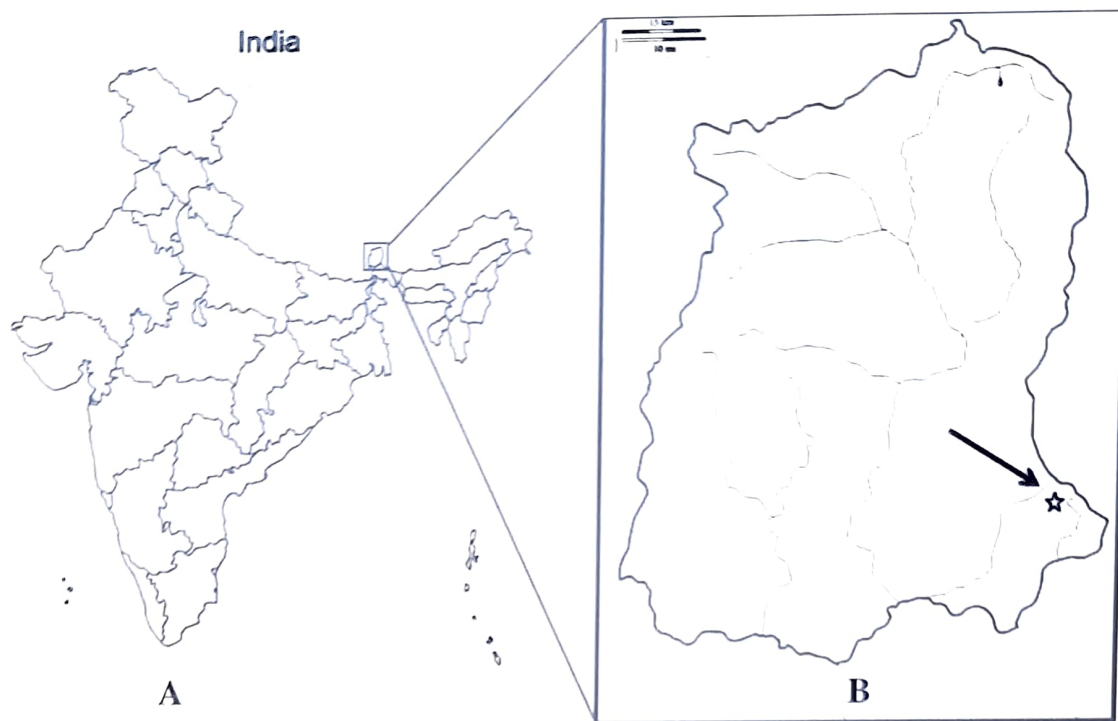
In India, genus *Horikawaella* was first reported by Herzog (1939) as *Anastrophyllum subacutum* Herzog from Sikkim. Grolle (1964) changed its status as *Cuspidatula subacutum* (Herzog) Grolle and subsequently listed it from eastern Himalaya (Grolle 1966). Hattori and Amakawa (1971) established the genus *Horikawaella* on the basis of *Anastrophyllum subacutum* Herzog [= *Horikawaella subacuta* (Herzog) S. Hatt. & Amakawa]. Amakawa (1975) reported another species *H. grosse-verrucosa* Amakawa & S. Hatt. from Nepal. Yi et al. (1998) reported third species of the genus, *H. rotundifolia* C. Gao & Y.-J. Yi from China, which has recently been merged to *Myliia taylorii* (Hook.) Gray by Li et al. (2013). Hence, the genus is now known to be

represented by only two legitimate species *H. subacuta* and *H. grosse-verrucosa*. Of these, only *H. subacuta* is known from India. Therefore, the genus is a Himalayan endemic having restricted distribution in India, Bhutan, China and Nepal. Since its discovery, the species has been listed from India (Hattori 1975, Long & Grolle 1990, Váňa & Long 2009). However, lack of a detailed taxonomic account was a limitation for identification of this taxon and therefore a detailed description of the Indian plants with fertile structures is provided here on the basis of recently collected plant specimens from Sikkim (Text-figure 1).

TAXONOMIC DESCRIPTION

Genus: *Horikawaella* S. Hatt. & Amakawa

Description: Erect or suberect plants, 1-3 cm



Text-figure 1. A. Map of India showing location of Sikkim. B. Locality in Sikkim from where plants of *Horikawaella subacuta* were collected.

long, robust, usually purplish; cordate to ovate, subtransversely inserted leaves covered by conspicuous verrucae, apex obtuse to subacute, ventral margin somewhat recurved, trigones nodulose; rhizoids sparse, hyaline to reddish; and dioecious, androecia terminal, bracts in 3-5 pairs, ventricose, perianth semi-exserted, fusiform, usually 4-plicate, bracts in 2 pairs (adopted from Li et al. 2013)

Horikawaella subacuta (Herzog) S. Hatt. & Amakawa, *Miscl. Bryol. Lichenol.* 5: 164. 1971.

Plate 1, figures A-K

≡ *Anastrophyllum subacutum* Herzog, *Ann. Bryol.* 12: 75. 1939.

≡ *Cuspidatula subacuta* (Herz.) Grolle, *J. Jap. Bot.* 39: 174. 1964.

Type: Sikkim Himalaya, Tsomgo Lake, between Gangtok and Nathu La, alt. 3600-3900 m., August 1937, leg. Troll (Holotype: JE).

Description: Plants medium sized, erect, 10-28 mm long, 1-2 mm wide, reddish-purple, old plants pale

brown; branching occasional, intercalary. Stem covered with distinct verrucae, 200-280 μm wide, 11-12 cells across diameter; cortical region 2-3 cell layered, cells thick-walled, pigmented, 16-20 \times 12-16 μm in size; median cells thin-walled, 16-36 \times 16-28 μm in size, trigones absent or minute. Rhizoids scattered, mostly on older portions of stem, usually hyaline, sometimes purple. Leaves imbricate, almost transversely inserted, conduplicate concave, cordate-triangulate, 0.96-1.12 mm long, 0.64-0.72 mm wide, bases slightly decurrent, margin entire, apex acute-subacute, apical cells polygonal, 8-16 μm in diameter; marginal cells squarrose to rectangulate, 8-16 \times 12-16 μm ; median cells polygonal, 16-20 \times 12-16 μm ; mid-basal cells rectangulate, 28-48 \times 12-20 μm ; trigones large, bulging-nodulose, reddish purple, cuticle densely verrucose-striolate. Underleaves absent. Dioecious. Only female plants were found with young perianth. Bracts in one pair, similar to leaves, larger in size; perianth terminal, with 1-2 subfloral innovation.

Plate 1

A-K. *Horikawaella subacuta* (Herzog.) Grolle. A. Plant habit. B. Plant portion, with female bracts and young perianth. C. Cross section of stem. D-E. Leaves. F. Apical cells of leaf. G. Marginal cells of leaf. H. Median cells of leaf. I. Basal marginal cells of leaf. J. Cross section of leaf, showing verrucae on surface. K. Leaf cuticle [All figures from K. K. Rawat 257352B (LWG)].

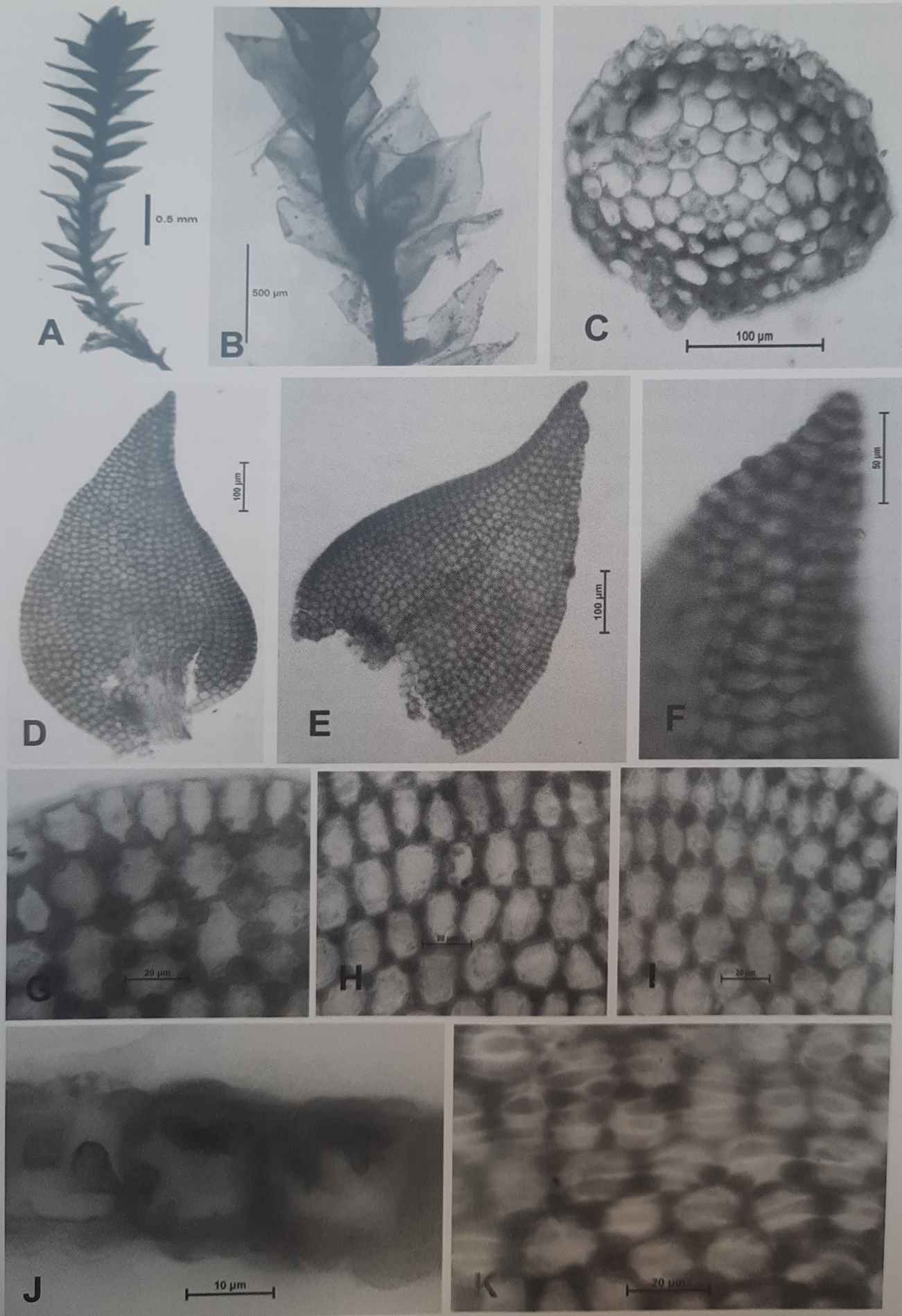


Plate 1

Specimens examined: India: Sikkim: on summit of a mountain near Gnathang, on soil amid *Rhododendron* and Juniper bushes; Lat. 25°17'45.6"N, Long. 88°49'54.8"E, alt. ca. 3903 m; 23.04.2014; K. K. Rawat 257352B, 257352D (LWG). India: Sikkim: Gnathang, on soil covered shady slopes; Lat. 27°17'37.2"N, Long. 88°49'41.4"E, alt. ca. 3749 m; 24.04.2013; K. K. Rawat 257355B (LWG).

Distribution: Bhutan, China, Nepal, India – Sikkim, Darjeeling (Herzog 1939, Grolle 1966, Hattori & Amakawa 1971, Hattori 1975, Long & Grolle 1990, Sun et al. 2002, Váňa & Long 2009, Li et al. 2013).

Remarks: The Indian plants completely agree with the generic description except for the number of female bracts. In our specimens, only one pair of female bracts was observed instead of two pairs. Plants of *H. subacuta* can be easily recognized from other liverworts by their distinct purple color, cordate-triangular leaves having large, bulging-nodulose trigones and densely verrucose-striolate cuticle. The plants look like large *Marsupella* or *Anastrophyllum* plants due to dark reddish-purple colour. However, they can be easily distinguished by dense verrucose cuticle on leaves and stem and by absence of bilobed leaves.

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