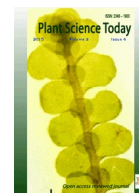




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Research Communication

***Plagiochila sisparensis* Steph. - a vulnerable liverwort from Nilgiri Hills, Western Ghats**

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Abstract

Plagiochila sisparensis Steph., an endemic liverwort of Western Ghats - Sri Lanka hot spot, is recently rediscovered from Avalanche in Nilgiri hills (Tamil Nadu), the area is adjacent to its home place. The species was only recorded from India in 1921 from Sispara (Kerala). After more than 90 years gap it has been rediscovered. The species is easily separable from other species of *Plagiochila* sect. *Tayloriae*, and characterized by moderately imbricate leaves which are oblong in shape, spinose teeth, mostly restricted to ventral margin of the leaves. Detailed information is given on its morphology and ecology, and a comparison of similar species of the same section is also discussed.

Keywords

Bryophyta; Nilgiri Hills; Plagiochilaceae; *Plagiochila*; Vulnerable species; Western Ghats

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Introduction

The Nilgiri hills of Tamil Nadu is a part of Nilgiri Biosphere Reserve (NBR) and is formed by north south hill ranges which rise from coastal plains of peninsular India, with a few isolated peak such as Dodabetta peak (2667 m) and Mukuruti peak (2554 m). The Nilgiri lies between 10° 1' - 11° 47' latitude and 76° 12' to 77° 15' longitude spreading on an area of about 2549 sq Km. One side of the area touches the Silent valley of Kerala through Sispara pass while other side by Mudumalai National Park of Nilgiri hills and Bandipur Tiger Reserve of Karnataka.

Genus *Plagiochila* belongs to family Plagiochilaceae of hepaticae (Bryophyta) and is known as one of the most chaotic genus among the liverworts with about 1800 names described so far, from the world, out of which about 480 names were reported from Asia (So and Grolle, 2000). The taxonomic parameters used for species differentiation

of genus *Plagiochila* includes small to robust plants, simple, dichotomous to dendroid branch habit, stem usually differentiated in to thick - walled, 2-3 layered cortical zone and thin walled medullary cells. Leaves are succubus, alternate and usually toothed, rarely entire or very small teeth while leaf insertion is sub-transverse to oblique, dorsal margin of leaf usually longly decurrent, rhizoids restricted only on ventral surface, underleaves vestigial, paraphyllia sometimes present, perianth usually campanulate with truncate mouth, asexual reproduction by means of several devices; flagilliferous branches, caducous leaves or by propagule. The Nilgiri Hills of Tamil Nadu is one of the centers of diversification of liverwort taxa including *Plagiochila*. After critical evaluation it has been found that genus *Plagiochila* are represented by 16 genuinely species in Nilgiri hills are *Plagiochila acuta* Steph., *P. beddomei* Steph., *P. duthiana* Steph., *P. elegans* Mitt., *P. flexuosa* Mitt., *P. indica* Mitt. *Ex* Steph., *P. fruticosa* Mitt., *P. gracilis* Lindenb. & Gott.,

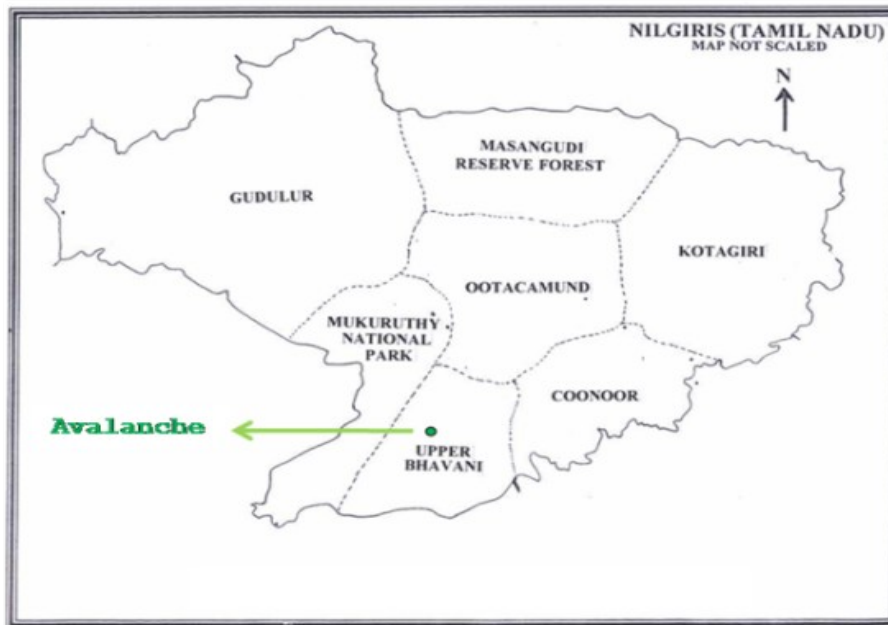


Fig 1. Nilgiris map showing location in Avalanche where the species rediscovered.

P. junghuhniana Sande Lac., *P. nepalensis* Lindenb., *P. peradenyensis* Schiffn., *P. sciophila* Nees ex Lindenb., *P. semidecurrans* (Lehm. & Lindenb.) Lindenb., *P. sisparensis* Steph., *P. subtropica* Steph and *P. javanica* (Swartz) Nees & Mont. (Srivastava *et al.*, 2007, Srivastava *et al.*, 2002, Srivastava and Verma, 2004; Verma, 2005; Verma and Srivastava, 2008). In which *Plagiochila sisparensis* is a vulnerable taxa and earlier known from Sispara pass (ca. N 11°12' to N 11°20' and E 76°25' to E 76°43'), juncture of Tamil Nadu and Kerala. After original discovery in 1921 by Stephani, the species was also once documented from Sri Lanka, which is also part of Western Ghats - Sri Lanka Hot spot (Inoue, 1979). However, recently the species rediscovered from Avalanche in Nilgiri Mountains adjacent to Sispara which receive full force of the southwest monsoon. The species belongs to *Plagiochila* sect. *Tayloriae* Carl, with two species in Nilgiri hills, namely *P. flexuosa* Mitt. and *P. sisparensis* St. The area of occupancy is less than 2000km² and found in less than ten localities. It therefore meets the IUCN criteria for Vulnerable based on the small area and the decline in habitat quality and extent (Hallingbäck *et al.*, 2000). The species, recently listed by corresponding author himself without any description and illustration (Verma and Srivastava, 2011). A description of species, illustration and threatened category discussed here.

Materials and Methods

The material for the present study is based on collections from Avalanche in Nilgiris (Fig.1). For the authentication of the species the specimens loaned from Conservatoire et Jardin Botaniques, through the courtesy of the curator. The dry plants were soaked in mild warm water for 2-3 hours for proper stretching of plant specimens to get its natural look (shape). The line drawing was drawn by the

corresponding author himself with the help of Camera Lucida.

Observations

Plagiochila sisparensis Steph., *Sp. Hep.* 6: 207 (1921). (Fig. 2. a-J; Fig. 3)

Plants in diffused patches, light green, light brown (in herbarium), up to 42 mm long, 2.5-3.9 mm wide, sparsely branched, dichotomous, branching *Frullania*-type. Stem 15 cells across the diameter, differentiated, cortical cells 3-4 layered, extremely thick-walled, brown in colour, medullary cells thin-walled, trigones indistinct. Leaves remote, obliquely inserted, horizontally spreading, oblong (ob-lanceolate), 1.34 -1.79 mm long, 0.82-1.1 mm wide, dorsal margin shortly decurrent, minutely revolute, ventral margin also shortly decurrent, narrowly incurved near the base, dorsal margin almost straight (weakly arched), with 1-2 small, 1-(2) celled teeth on distal half, apex broadly rounded, ventral margin arched, with 2-3 cells long teeth, total teeth 10 (12) in number; apical cells 11-14 × 21-32 μm with indistinct trigones, median cells 14-16 × 21-32 μm with feebly developed trigones, basal cells large 22-32 × 29-43 μm, trigones sub-nodulose. Fertile plant not seen.

Type locality: Nilgiri hills- Sispara (Stephani, 1921).

Range: Oriental region: INDIA, Sri Lanka (Stephani, 1921 and Inoue, 1979).

Distribution in India: South India: Kerala (Sispara pass) (see Stephani, 1921); Tamil Nadu - Nilgiri hills [Upper Bhavani (Avalanche)].

Ecology: Plants growing in rough mats on angiospermic trees as corticolous population.

Characteristics of the species: 1. Plants in diffuse patches, sparsely and dichotomously branched 2. Leaf oblong-lanceolate 3. Teeth very small, 1-2 (3) on ventral and apical margins.

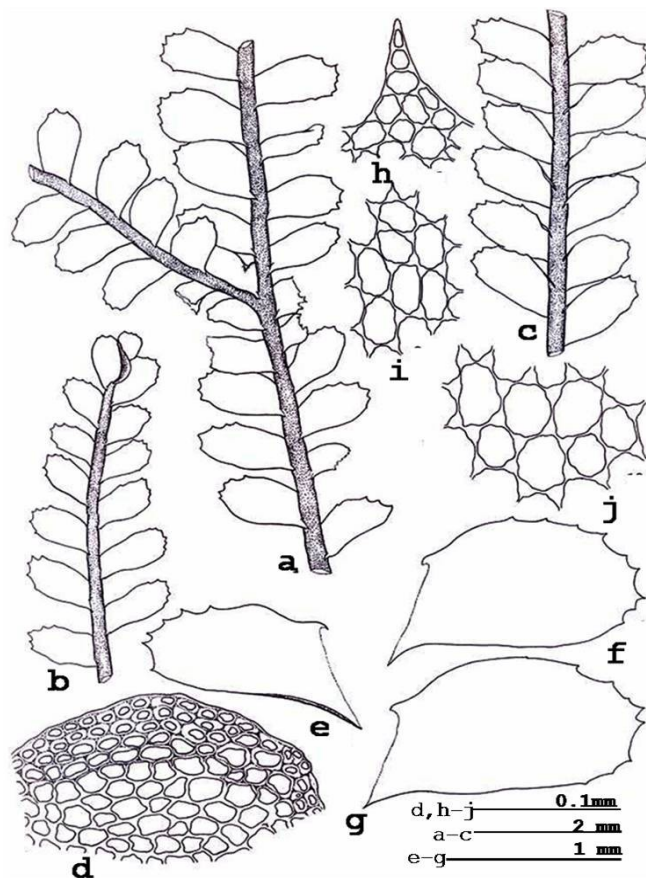


Fig 2. *Plagiochila sisparensis* Steph. a – j. a & b - Plant (Dorsal View); c - Plant (Ventral View); d - Cross section of stem, a portion; e - g Leaves; h - Apical cells of leaf; i - Median cells of leaf; j - Basal cells of leaf (All figures drawn from G 10961 except c & f drawn from LWU - 12572/2000).



Fig 3. *Plagiochila sisparensis* Steph., Image taken from LWU - 12572/2000

Specimen examined: South India: Tamil Nadu: Nilgiri hills – Sispara; collector unknown; Typus 010961 (G); 09.x.2000; Upper Bhavani (Avalanche); ca. 2200 m, Nilgiri Hills, Tamil Nadu, Western Ghats, S. C. Srivastava and Party, 12572/2000 (LWU).

Result and Discussion

This species was introduced by Stephani (1921) from Kerala (Sispara). After its original discovery the species was never collected till the present when this species encounter from Avalanche (Nilgiri hills). The plants were found growing in diffused patches. This species was also reported by Inoue (1979) as *P. pleuridentata* Inoue from Sri Lanka which was later synonymized by So and Grolle (2000) under *P. sisparensis*. This species is placed under *Plagiochila* sect. *Tayloriae* and is a close relative of *P. himalayana* of Himalayas, belonging to same section.

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References

- Hallingbäck, T., Hodgetts, N. P. Geissler, and B. C. Tan. 2000. The 2000 IUCN World Red List of Bryophytes <http://www.artdata.slu.se/guest/SSCBryo/WorldBryo.htm>
- Inoue, H. 1979. Contributions to the knowledge of the Plagiochilaceae of southeastern Asia XVIII. A review of the genus *Plagiochila* (Dum.) Dum. in Ceylon. *J Hattori Bot Lab* 46: 193 – 233.
- So, M. L. and R. Grolle. 2000. Checklist of *Plagiochila* in Asia. *J Hattori Bot Lab* 88, 199 – 243.
- Srivastava S. C., P. K. Verma, and A. Alam. 2007. *Plagiochila gracilis* Lindenb. & Gott. and *P. subtropica* St. in Western Ghats (Nilgiri Hills). *Phytotaxonomy* 6: 78-83.
- Srivastava, S. C. and P. K. Verma. 2004. Exploration of liverwort diversity on *Cinchona* plantation in Dodabetta, Nilgiri Hills, India. *Geophytology* 32: 1-18.
- Srivastava, S. C., P. K. Verma, and S. A. H. Rizvi. 2002. *Plagiochila peradenyensis* Schiffn. new to India. *Geophytology* 30, 75 – 79.
- Stephani, F. 1921. Species Hepaticarum 6: 177-240, Geneve.
- Verma P. K and S. C. Srivastava. 2011. Endemism in Liverworts of Western Ghats and their present status. *Arch Bryol* 99: 1-23
- Verma P. K., and S. C. Srivastava. 2008. *Plagiochila junghuhniana* Sande Lac. new to Indian Mainland (Nilgiri Hills, Western Ghats). *J Bombay Nat Hist Soc* 105 (2): 236-238.
- Verma, P. K. 2005. Studies in Hepaticae of Nilgiri hills with special reference to epiphytic taxa. Department of Botany, Lucknow University, Lucknow, xxv + 400 pp.