

## **ISOTACHIS INDICA MITT. (HEPATICAE): AN ENDEMIC AND THREATENED LIVERWORT REDISCOVERED FROM MEGHALAYA, INDIA**

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The genus *Isotachis* Mitt. (Balantiopsaceae) is represented by 26 species in the world (Hatcher, 1960, 1961; Schuster & Engel, 1997), distributed mainly in tropical and subtropical regions of Asia, Africa, Australia and New Zealand. In India, it is represented by three species, viz. *I. indica* Mitt., *I. armata* (Nees) Gottsche and *I. japonica* Steph., all confined to hilly regions especially Eastern Himalaya and NE India (Srivastava and Rawat, 2001; Das & Singh, 2007; Singh & Singh, 2009).

*Isotachis indica* was originally described by Mitten (1861) on the basis of collection made by J.D. Hooker and T. Thomson from Khasi Hills of Meghalaya more than 150 years ago. Afterwards, this species could never be collected again since its original collection. Hatcher (1961) and Srivastava and Rawat (2001) provided detailed taxonomic description of this species based on its type collection only. It is worthwhile to mention that this area is comparatively well explored and the Hepaticae of Khasi and Jaintia Hills have already been documented (Singh & Nath, 2007), but without any mention of this species.

Recently during an exploration near Mawsinram in the East Khasi Hills district of Meghalaya in the month of July 2010, a population of dark brown plants was observed by one of us (SKS). Subsequent morpho-taxonomic study revealed them to be *Isotachis indica* –an endemic species confined to Meghalaya alone, after a gap of about 150 years. It is interesting to note that this is only the second location of its occurrence other than its type locality Cherrapunjee (Churra) in the East Khasi Hills of the State.

**Isotachis indica** Mitt. in J. Proc. Linn. Soc., Bot. 5: 100. 1861; Hatcher, Nova Hedwigia 2 (4): 592.1960; Srivastava & Rawat in Curr. Sci. 80: 1484, 2001. (Figs. 1& 2).

Plant dark-brown, 60-80 mm long, 3-4 mm wide; branching lateral intercalary. Stem in cross-section suborbicular in outline, 444-507 x 324-440 mm, 11-14 cells across diameter, differentiated into cortical and medullary zones; cortical cells thick-walled, in 1-2 layers, subglobose-subquadrate, 23-50 x 15-30 mm, light brown; medullary cells thin-walled, slightly larger, oval – polygonal 40-60 x 20-43 mm, hyaline, trigones minute, triangular. Leaves incubous, alternate, imbricate above, occasionally approximate below, obliquely inserted, broadly ovate or rectangulate, 2.3-2.6 mm long, 1.6-1.8 mm broad, bilobed to 1/5 -1/4 (-1/3) of its length, dentate at margin, dentition up to 20 per leaf, 1-5 cell long, 1-2 (-3)-celled uniseriate at apex, acute, 2-3 cell broad at base; apical leaf cells triangular to subquadrangular 45-92.5 x 20-40 mm; median leaf cells pentagonal to hexagonal, 75-115 x 15-32.5 mm; basal leaf cells slightly elongated to rectangulate, 75-137.5 x 20-30 mm, cells thin-walled with minute triangular trigones; cuticle striolate-papillose. Underleaves overlapping, suborbicular to ovoid, 1.8-2 mm long, 1.5-1.8 mm wide, bilobed to (-1/5) 1/4 -1/3 (-1/2) of its length, lobes divergent; sinus shallow to deep, triangular or auriculate, margin dentate, dentition 10-18 per underleaf, acute, 1-4 cell long, 1-2 (-3)-celled uniseriate at apex, 2-4 cell wide at base. Fertile plant not seen.

**Specimen examined:** Growing over thin layer soil on very moist rock surface at Mawsinram area (altitude ca 1200m), 23.07.2010, S.K.Singh 118701(ASSAM).

**Distribution:** INDIA: Meghalaya (East Khasi Hills: Near Churra; near Mawsinram –present study). Endemic.

**Conservation status:** As the species is so far known from only two locations, including the type locality which of late has been under considerably stress because of the lime stone mining activities for the cement factories located closeby. Following the criteria of IUCN category, this species may be treated in Endangered (EN) category as it is distributed within the area less than c. 30 sq km.

*Isotachis indica* is closely allied to *I. japonica*. However, former is clearly distinct from the latter by having bifid leaves which is occasionally trifid while the leaves of *I. japonica* are characteristically bis-bifid to

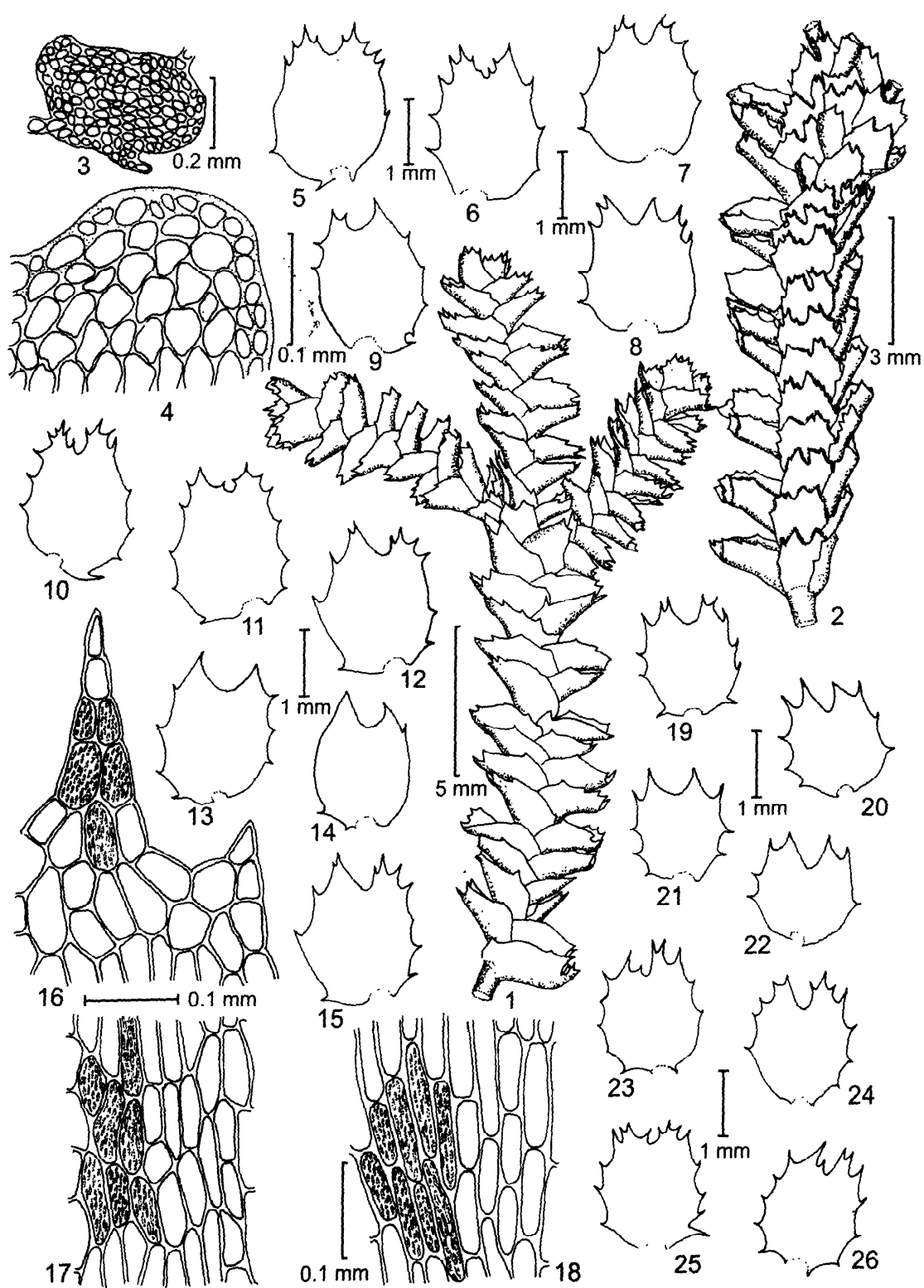


**Fig. 1.** *Isotachis indica* Mitt. 1. A portion of the plant in dorsal view. 2. The same in ventral view. 3. Cross section of stem. 4. A portion of the same magnified. 5-15. Leaves. 16. Marginal leaf cells towards apex. 17. Median leaf cells. 18. Basal leaf cells. 19-26. Underleaves.

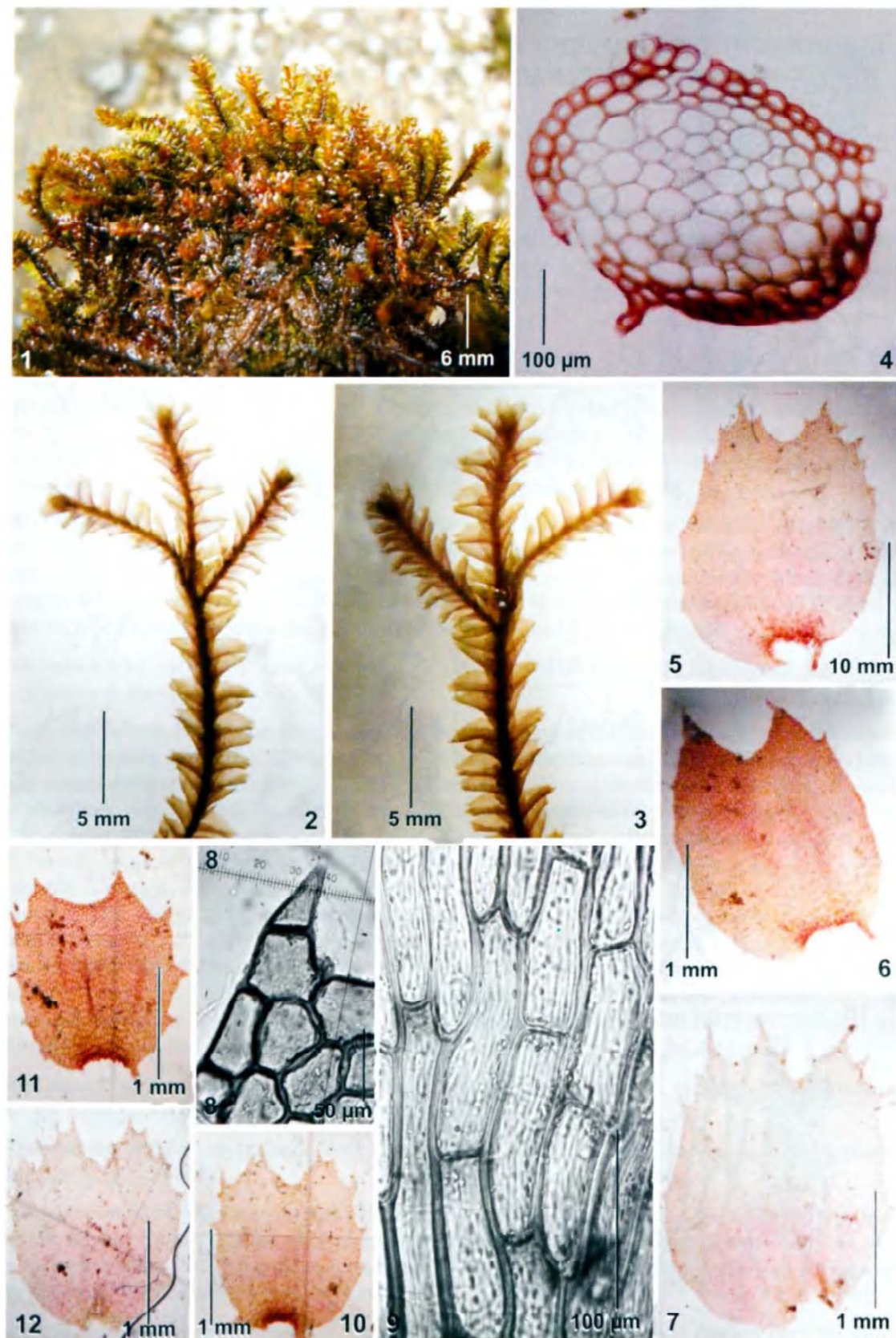


**Fig. 2.** *Isotachis indica* Mitt. 1. Habit. 2. A portion of plant in dorsal view. 3. The same in ventral view. 4. Cross Section of the stem. 5-7. Leaves. 8. Marginal cells towards apex. 9. Basal leaf cells. 10-12. Underleaves.

occasionally trifid (Hatcher, 1960, 1961; Srivastava & Rawat 2001; Singh & Singh, 2009). Hatcher (1961) also emphasized on the differences in underleaves of the two species with the former having dentate to ciliate-dentate margins as against dentate margin in the latter.

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