

TWO INTERESTING RECORDS OF LIVERWORTS FROM MEHAO WILDLIFE SANCTUARY, ARUNACHAL PRADESH, INDIA

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During the detailed morphotaxonomic study of specimens collected from Mehao Wildlife Sanctuary, Arunachal Pradesh the authors came across specimens of *Archilejeunea minutilobula* Udar & Awasthi and *Colura tenuicornis* (A. Evans) Steph. A perusal of relevant literature (Lal, 1977; Udar & Awasthi, 1981; Zhu & So, 2001) reveals that while the former had been so far confined to Western Ghats, the latter was hitherto known from only China, Taiwan and West Bengal (Darjeeling) in India. The two have been described and illustrated to facilitate their easy identification.

Archilejeunea minutilobula Udar & Awasthi, *Geophytology* 11 (1): 72, 1981. (Fig.-1).

Plants blackish green to olive brown when fresh, almost black in herbarium, 7 – 20 mm long, 0.5 – 0.9 mm wide, branching intercalary; branches 0.5 – 1.13 mm long. Stem in cross section 0.07 – 0.09 mm in diameter; cortical cells in 12 – 14 vertical rows, quadrangular – polygonal, 8 – 22 × 12 – 22 µm, thick walled, slightly larger or almost equal to the medullary cells; medullary cells in 13 – 15 vertical rows, polygonal, 10 – 22 × 8 – 20 µm, thick walled, without trigones. Leaves alternate, distant to slightly imbricate, obliquely – widely spreading; lobes oblong – ovate, 0.2 – 0.5 mm long, 0.2 – 0.4 mm wide, margin entire, apex rounded – obtuse; lobe cells thin walled, with indistinct intermediate thickenings, trigones triangular; apical lobe cells quadrate, 12 – 18 × 12 – 14 µm; middle lobe cells more or less isodiametric, 14 – 24 × 12 – 20 µm; basal lobe cells similar to median cells in shape, 16 – 32 × 12 – 28 µm; lobule small, 0.05 – 0.14 mm long, 0.03 – 0.06 mm wide, tooth indistinct. Underleaves distant, entire, reniform, 0.16 – 0.2 mm long, 0.2 – 0.27 mm wide, wider than long, margin entire. Fertile plants not seen.

Specimens examined: Lithophytic, in shady and moist place under constantly dripping water. Eastern Himalaya, Arunachal Pradesh, Lower Dibang Valley, Mehao Wildlife Sanctuary, on way to Sally Lake, ca 274.32 m, 18.02.2006, S. Das & M. Dey 38906 (CAL).

Distribution: India: Western Ghats (Tamil Nadu: Mettupalaiyam; Maharashtra: Mahabaleshwar) (Udar & Awasthi, 1981); Eastern Himalaya: Arunachal Pradesh (present study). Endemic.

Colura tenuicornis (A. Evans) Steph., *Sp. Hepat.* 5: 942. 1916. *Colurolejeunea tenuicornis* A. Evans, *Trans. Connecticut Acad. Arts* 10: 455. 1900. (Fig.-2).

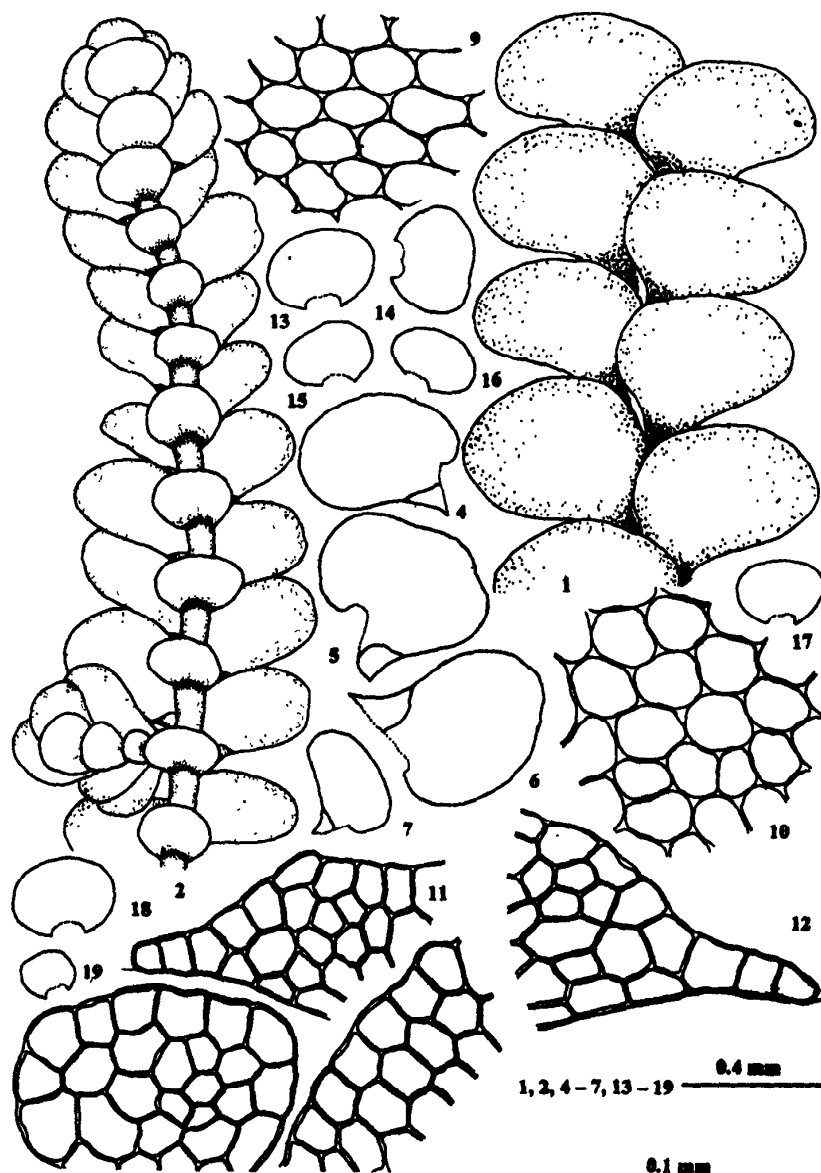


Fig. 1 : *Archilejeunea minutilobula* Udar & Awasthi : 1. A portion of plant (dorsal view); 2. The same (ventral view); 3. Cross-section of stem; 4.-7. Leaves; 8. Apical cells of leaf lobe; 9. Median cells of leaf lobe; 10. Basal cells of leaf lobe; 11.-12. Lobules; 13-19. Underleaves.

Plants pale – yellowish green when fresh, olive green in herbarium, 2 – 4 mm long, 1.5 – 2.2 mm wide, irregularly branched, branching *Lejeunea*-type. Stem in cross section 61 – 81 μm in diameter; cortical cells in 6 – 7 vertical rows, rectangular – quadrate, 16 – 36 $\times$ 12 – 32 μm , thin walled; medullary cells in 1 – 3 vertical rows, quadrate – polygonal, 20 – 32 $\times$ 12 – 16 μm , thin walled. Leaves alternate, distant, lanceolate, obliquely spreading; lobes 0.7 – 1.0 mm long, 0.4 – 0.8 mm wide at base, 0.09 – 0.1 mm wide at apex, dorsal margin arched, entire, ventral margin almost straight; lobe cells thin walled, trigones indistinct; marginal lobe cells subquadrate – rectangular, 20 – 28 $\times$ 20 – 24 μm ; median lobe cells polygonal, 22 – 36 $\times$ 18 – 24 μm ; basal lobe cells more or less similar as median cells; lobule large, as long as the leaf lobe, cylindrical, 0.06 – 0.12 mm wide at base, 0.15 – 0.24 mm wide in middle, distally broadened, terminating into a sac; sac lanceolate, forming a long tubular beak towards apex, hyaline papillae present at apex of beak. Underleaves distant,

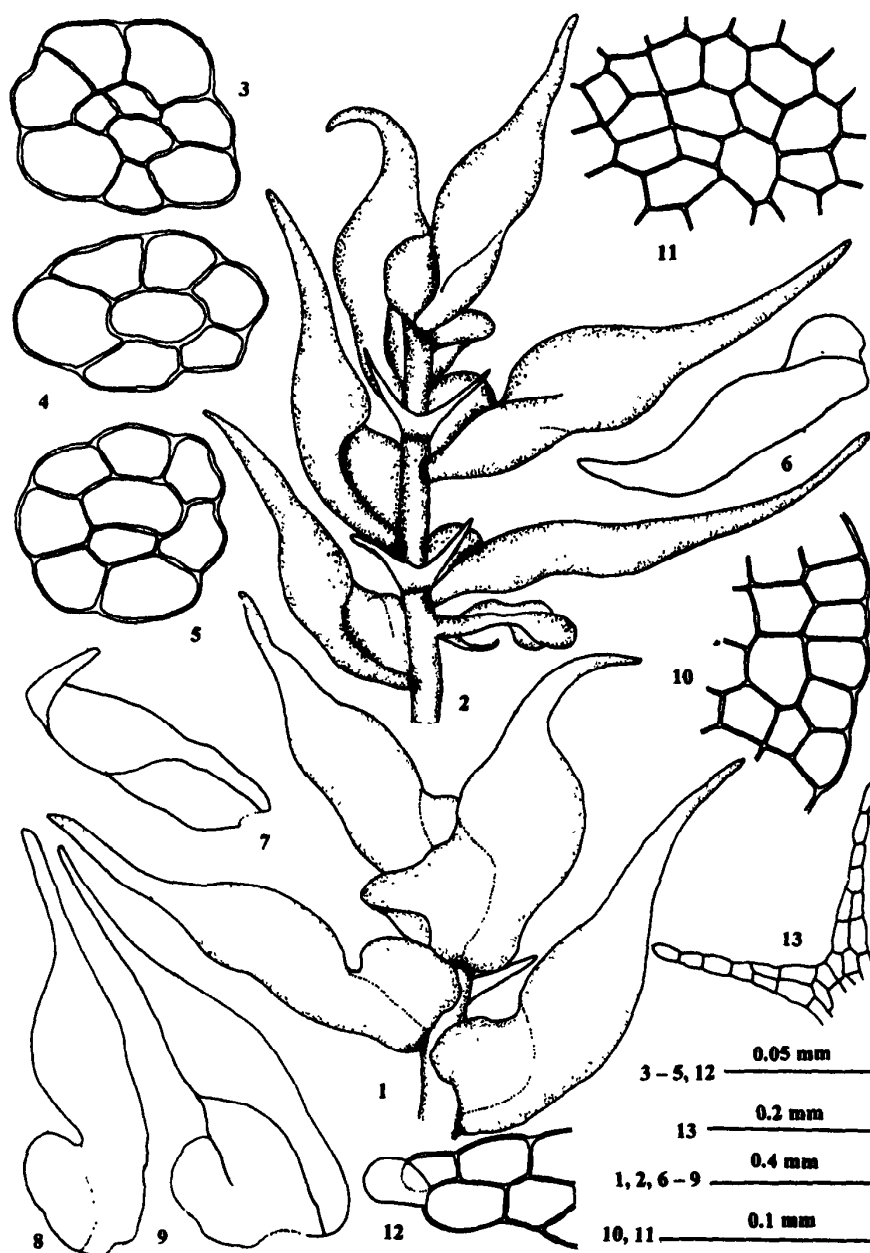


Fig. 2 : *Colura tenuicornis* (A.Evans) Steph. : 1. A portion of plant (dorsal view); 2. The same (ventral view); 3.-5. Cross-section of stem; 6.-9. Leaves; 10. Marginal cells of leaf lobe; 11. Median cells of leaf lobe; 12. Apical portion of lobule with hyaline papilla; 13. An underleaf .

0.1–0.16 mm long, a 0.087 – 0.09 mm wide at base, 0.2 – 0.3 mm wide at apex, deeply bilobed; lobes divergent, linear, 6 – 7 cells long, 2 – 3 cells wide at base, 2 – 4 cells uniseriate at apex, margin entire. Rhizoidal disc present at underleaf bases; rhizoids hyaline, branched. Fertile plants not seen.

Specimens examined : Lignicolous on fallen leaf, growing in association with *Metzgeria* sp. Eastern Himalaya, Arunachal Pradesh, Lower Dibang Valley, Mehao Wildlife Sanctuary, Tewarigaon, ca 1219 m, 20.02.2006, S. Das & M. Dey 38951 (CAL).

Distribution: India: Eastern Himalaya (West Bengal: Darjeeling) (Lal, 1977); Arunachal Pradesh (present study); Taiwan, China (Zhu & So, 2001).

DISCUSSION

The genus *Archilejeunea* (Spruce) Schiffn., is represented in India by two species, viz. *Archilejeunea apiculifolia* Steph. and *A. minutilobula* Udar & Awasthi (Udar & Awasthi, 1981). The present study records *A. minutilobula*, an endemic species so far confined to Western Ghats, for the first time from Indian Himalayan region. The species is characterized by blackish green coloration of plants, oblong – ovate leaves with highly reduced, minute lobule without any distinct teeth (Fig. 1 : 4 – 7, 11, 12), lack of intermediate thickenings in the leaf lobe cells (Fig. 1 : 8 – 10), reniform underleaves (Fig. 1 : 13 – 19) and stem having 12 – 14 vertical rows of cortical and 13 – 15 rows of medullary cells (Fig. 1 : 3). Our specimens fully conform with the South Indian plants in all respects.

Colura Dumort. is a large, almost cosmopolitan genus of Lejeuneaceae, found primarily in tropical and subtropical regions. In India the genus is represented by five species, viz. *Colura acroloba* (Mont.) Ast, *C. acutifolia* Ast, *C. ari* Steph., *C. calyptrifolia* (Hook.) Dumort. and *C. tenuicornis* (A. Evans) Steph. (Lal, 1977, 1980, 2003; Udar & Awasthi, 1985). Of these, *C. calyptrifolia* and *C. tenuicornis* have been recorded from Darjeeling in West Bengal, *C. acutifolia* from Arunachal Pradesh and the remaining two species have so far been recorded from Andamans only. The present study, therefore, records *Colura tenuicornis* for the first time from Arunachal Pradesh. The species was earlier recorded from India (Darjeeling) by Lal (1977) without any taxonomic details. It is characterized by lanceolate leaves with elongated sacs forming a tubular beak (Fig. 2 : 6 – 9), absence of trigones and intermediate thickenings in leaf lobe cells (Fig. 2 : 10 – 12) and underleaves with slender and divergent lobes (Fig. 2 : 13). The plants from Arunachal Pradesh, show an interesting stem anatomy with 6 – 7 vertical rows of cortical and 1 – 3 rows of medullary cells (Fig. 2 : 3 – 5).

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REFERENCES

- UDAR, R. AND U.S. AWASTHI. The genus *Archilejeunea* (Spruce) Schiffn. in India. *Geophytology*. 11(1): 72 – 79. 1981.
- UDAR, R. AND U.S. AWASTHI. *Colura acroloba* (Mont.) Ast- New to Indian bryoflora. *J. Indian Bot. Soc.* 64: 284 – 286. 1985.
- LAL, J. *Colura acutifolia* Ast (Hepaticae)- new to Indian bryoflora. *Bull. Bot. Surv. India*. 45 (1 – 4): 227 – 228. 2003.
- LAL, J. *Colura* Dumort. (Hepaticae)- a genus new to Indian Flora. *Curr. Sci.* 46(17): 618. 1977.
- LAL, J. *Colura ari* Steph. (Hepaticae) from Andamans – a new record for India. *Bull. Bot. Surv. India*. 22(1 – 4): 207 – 209. 1980.
- ZHU, R.L. AND M.L. SO. Epiphyllous liverworts of China. *Nova Hedwigia*. 121: 232 – 235. 2001.