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ACROLEJEUNEA AULACOPHORA (MARCHANTIOPHYTA), NEW TO ASIA FROM THE WESTERN GHATS

A. E. D. Daniels

Bryology Laboratory, Department of Botany and Research Centre, Scott Christian College (Autonomous), Nagercoil-629 003, Tamil Nadu, India; E-mail: dulipdaniels@yahoo.co.uk

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Acrolejeunea aulacophora (Mont.) Steph. is recorded for the first time in Asia. It was earlier known from Africa, Australia and New Caledonia. A detailed description with figures and a photographic plate is provided.

Key words: *Acrolejeunea aulacophora*, Marchantiophyta, Western Ghats

INTRODUCTION

The genus *Acrolejeunea* (Spruce) Schiffn. with 20 species, 5 subspecies and 1 variety world-wide, is pantropical in distribution (Gradstein 1975, Söderström *et al*. 2016). Interestingly, most of the species are either local or regional endemics.

In a course of study on the bryoflora of the Agasthyamalai Biosphere Reserve between 2009 and 2012, a species of *Acrolejeunea* was collected which was later determined as *Acrolejeunea aulacophora* (Mont.) Steph. According to Gradstein (1975), *A. aulacophora* is a disjunct species with an Afro-Australpacific distribution. Its discovery in the Western Ghats need not be a surprise since Africa, India and Australia were once part of the palaeocontinent the Gondwanaland. A detailed description with figures and a photographic plate is provided. The specimen is housed at Scott Christian College, Nagercoil (SCCN).

Acrolejeunea aulacophora (Mont.) Steph. can be readily distinguished from the already known species in India by the 2–5 one-celled, partially to fully inflexed teeth at leaf lobule free margin and the partially emergent ellipsoid perianth. Furthermore, a key is provided to distinguish the species so far known in India.

1a Leaf lobules with a distinct tooth at the junction of the lobe and lobule in addition to the two teeth at the free margin; perianth long-beaked
A. pycnoclada

1b Leaf lobules without the distinct tooth at the junction of the lobe and lobule; perianth short-beaked 2

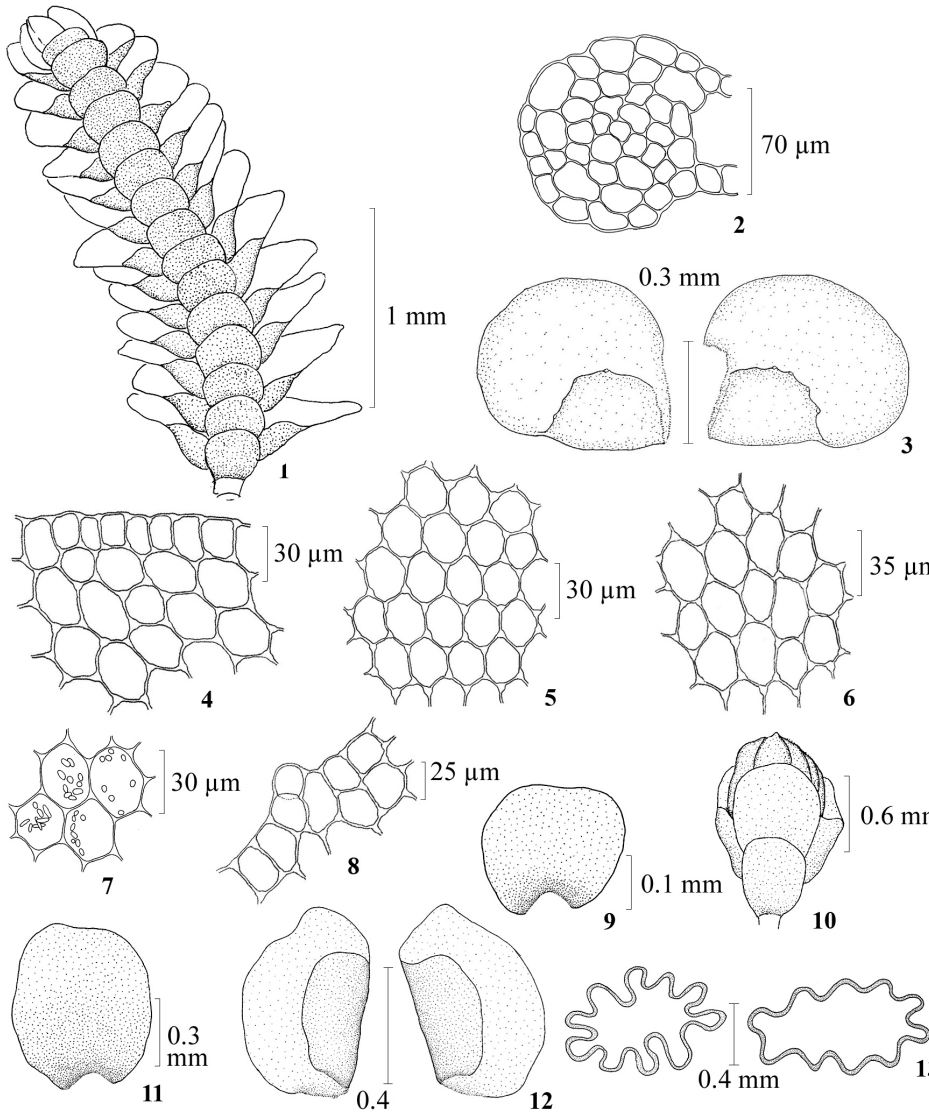
2a	Leaf lobules 1- or 2-toothed at free margin	3
2b	Leaf lobules 3- or more-toothed at free margin	4
3a	Leaf lobules oblique at apex, 2-toothed	***A. pusilla***
3b	Leaf lobules truncate at apex, 1-toothed	***A. parvula***
4a	Underleaves recurved at apex	5
4b	Underleaves not recurved at apex	6
5a	Leaf lobules 3–8-toothed at free margin	***A. meghalayensis***
5b	Leaf lobules (3–)4–6-toothed at free margin	***A. recurvata***
6a	Leaf lobule free margin semicircular	7
6b	Leaf lobule free margin more or less straight to slightly curved	8
7a	Leaf lobule free margin with 2–5 one-celled, partially to fully inflexed teeth; perianth partially emergent, ellipsoid	***A. aulacophora***
7b	Leaf lobule free margin with 4–9 two- or three-celled, partially to fully erect teeth; perianth immersed to emergent, obovoid-obpyriform	***A. fertilis***
8a	Underleaves reniform	9
8b	Underleaves orbicular to suborbicular	10
9a	Leaf lobules ovate-oblong with one or two small, 1- or 2-celled teeth at free margin	***A. securifolia*** subsp. ***hartmannii***
9b	Leaf lobules ovate-oblong with three or four small, one-celled teeth at free margin	***A. sandvicensis***
10a	Perianth 8–10-plicate	***A. infuscata***
10b	Perianth 4- or 5-plicate	***A. sikkimensis***

Acrolejeunea aulacophora (Mont.) Steph., Bot. Jahrb. Syst. 20: 317 (1895) (Figs 1–22)

Basionym: *Phragmicoma aulacophora* Mont., Ann. Sci. Nat., Bot. 2, 19: 259 (1843); ≡ Gradst., J. Hattori Bot. Lab. 28: 332. (1974) & Bryophyt. Biblioth. 4: 91 (1975); Söderström *et al*., PhytoKeys 59: 400 (2016). – Type: South Pacific Is., (Australia) Gambier, Mangareva, *Hombron s.n*. (Herb. Mont. – PC).

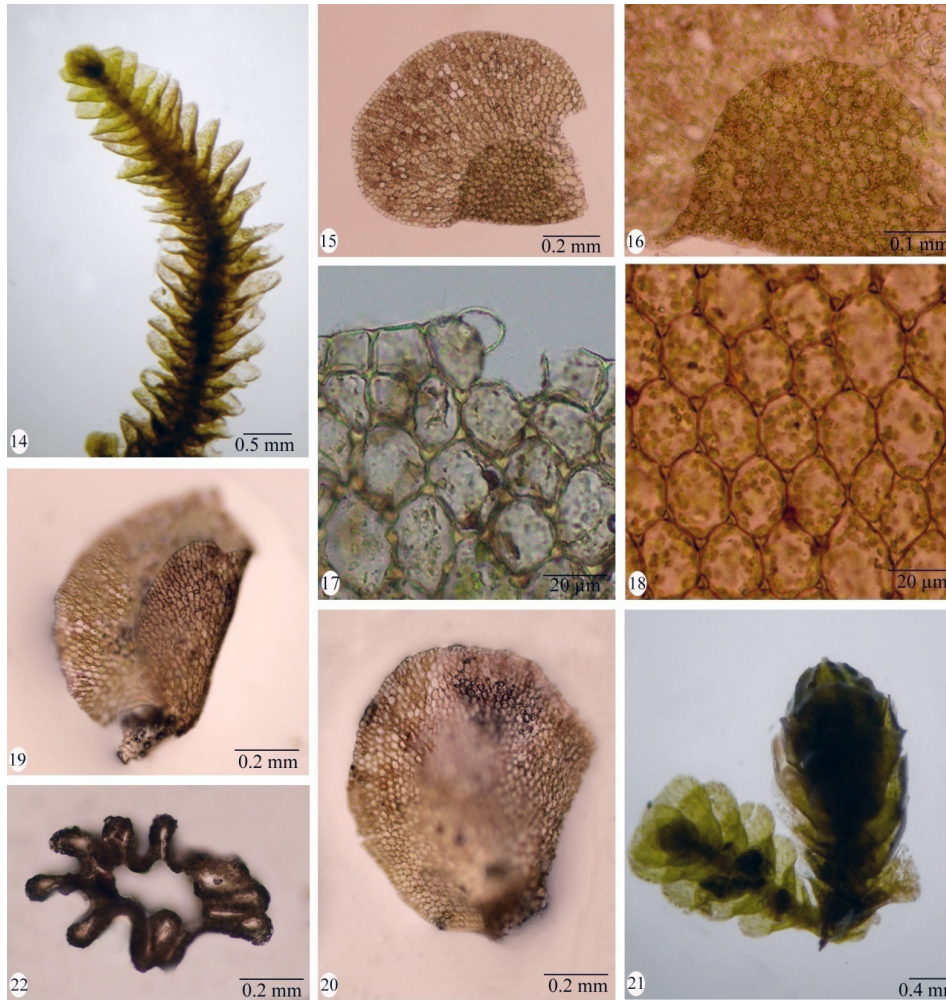
Plants 5–10 mm long, 1–1.5 mm wide, greenish to brown. Stems irregularly pinnately branched, of *Lejeunea*-type, *ca* 0.15 × 0.12 mm in cross sec-

tion, with 14–16 cortical cells enclosing 23–25 smaller, medullary cells; ventral merophyte 4 cells wide; ventral cortical cells quadrate to subrectangular; cells 8–32 × 4–24 µm, quadrate-hexagonal, thin-walled. Microphyllous branches absent. Leaves imbricate, incubous, weakly squarrose, concave, widely spreading, 0.64–0.72 × 0.54–0.57 mm, rounded-ovate, entire, rotundate, faintly



Figs 1–13. Acrolejeunea aulacophora (Mont.) Steph. – 1 = plant; 2 = cross section of stem; 3 = leaves; 4 = leaf apical cells; 5 = leaf median cells; 6 = leaf basal cells; 7 = leaf cells with oil bodies; 8 = leaf lobule cells; 9 = underleaf; 10 = perianth; 11 = female bracteole; 12 = female bracts; 13 = cross sections of perianth (drawn from Daniels, A. E. D. *et al.*, 3928 p. p.)

falcate at apex; cells irregularly rounded-hexagonal, with small, cordate trigones; apical cells 20–32 × 16–24 μm; median ones 20–32 × 16–28 μm; basal ones 24–40 × 20–28 μm; oil bodies 6–10 per cell, 2–8 × 2–4 μm, narrowly ellipsoid, homogenous; lobules 0.3–0.35 × 0.2–0.25 mm, suborbicular, *ca* 1/2 as long as lobe, swollen along keel, gradually flattening towards free margin; free margin semicircular in outline, with 2–5 small one-celled rounded teeth, rarely 2 in first tooth, partially to fully inflexed; hyaline papilla a little below the base of first tooth. Underleaves imbricate, sinuately inserted, with arched insertion, broader than long, 0.22–0.25 × 0.26–0.28 mm, suborbicular to orbicular,



Figs 14–22. Acrolejeunea aulacophora (Mont.) Steph. – 14 = portion of plant; 15 = leaf; 16 = leaf lobule; 17 = hyaline papilla of leaf lobule; 18 = leaf median cells; 19 = female bract; 20 = female bracteole; 21 = perianth; 22 = cross section of perianth (from Daniels, A. E. D. *et al.*, 3928 p. p.)

with a rounded or faintly truncated apex, entire. Autoicous? Male inflorescence not seen. Female inflorescences terminal on stems or branches without subgynoecial innovations; bract lobes ovate to oblong-ovate, 0.8–0.83 × 0.51–0.56 mm, entire at margin; bract lobules small, *ca* 1/4 as long as lobe, 0.55–0.58 × 0.27–0.32 mm, oblong; bracteoles oblong, *ca* 0.72 × 0.64 mm, faintly wavy at margin. Perianth slightly emergent, ellipsoid, *ca* 1.5 × 0.8 mm, 10-keeled, beaked. Sporogonium not seen.

Habitat: Corticolous, in degraded evergreen forests, *ca* 800 m.

Distribution: Africa, Australia, New Caledonia, Samoa and India: Western Ghats of Tamil Nadu (Tirunelveli). Rare.

Specimens examined: Western Ghats: Tamil Nadu, Agasthyamalai, Tirunelveli Dist., Mahendragiri. Alt. *ca* 800 m a.s.l. Coll.: Daniels, A. E. D., Kariyappa, K. C. and Mabel, J. L. (3928 p.p.), 17.8.2010 (SCCN).

DISCUSSION

In India, so far 10 species of *Acrolejeunea* have been reported (Daniels *et al*. 2018, Singh *et al*. 2016). Of these, *A. fertilis* (Reinw. *et al*.) Spruce ex Schiffn., is from the Eastern Ghats, *A. sandvicensis* (Gottsche) J. Wang et Gradst. and *A. sikkimensis* are from the Western Ghats and the Himalaya. *Acrolejeunea securifolia* (Endl.) Watts. ex Steph. subsp. *hartmannii* (Steph.) Gradst. was recently added to the liverwort flora of India from the Western Ghats by Daniels *et al*. (2018). The present discovery of *A. aulacophora* in the Western Ghats raises the number of species to 11. *Acrolejeunea sikkimensis* (Mizut.) Gradst. is endemic to India (Gradstein 1975, Singh *et al*. 2016).

The features attributed by Gradstein (1975) to *A. aulacophora* are the presence of cordate trigones in laminal cells, leaf lobules suborbicular with semicircular free margin with 2–5 one-celled, rounded teeth that are partially to fully inflexed, and partially emergent perianth. Since all these characters are visible in the material to hand, it is best identified as *A. aulacophora*.

Acrolejeunea fertilis and *A. securifolia* subsp. *hartmannii* might be confused with *A. aulacophora*. However, a close observation would reveal the presence of 4–9 two- or three-celled, partially to fully erect teeth on the leaf lobule free margin in *A. fertilis* and one or two small, 1- or 2-celled partially to fully erect teeth on the leaf lobule free margin in *A. securifolia* subsp. *hartmannii*.

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REFERENCES

Daniels, A. E. D., Sreebha, R. and Kariyappa, K. C. (2018): *Bryoflora of Indira Gandhi National Park in Anamalai Hills, India*. – Bishen Singh Mahendra Pal Singh, Dehra Dun, India, 513 pp.

Gradstein, S. R. (1975): A taxonomic monograph of the genus Acrolejeunea (Hepaticae) with an arrangement of the genera of Ptychanthoideae. – *Bryophyt. Biblioth.* **4**: 1–162.

Singh, D. K., Singh, S. K. and Singh, D. (2016): *Liverworts and Hornworts of India, an annotated checklist*. – Botanical Survey of India, Kolkata, India, 439 pp.

Söderström, L., Hagborg, A., Konrat, M. v., Bartholomew-Began, S., Bell, D., Briscoe, L., Brown, L., Cargill, D. C., Costa, D. P., Crandall-Stotler, B. J., Cooper, E. D., Dauphin, G., Engel, J. J., Feldberg, K., Glenny, D., Gradstein, S. R., He, X., Heinrichs, J., Hentschel, J., Ilkiu-Borges, A. L., Katagiri, T., Konstantinova, N. A., Larraín, J., Long, D. G., Nebel, M., Pócs, T., Puche, F., Reiner-Drehwald, E., Renner, M. A. M., Sass-Gyarmati, A., Schäfer-Verwimp, A., Segarra Moragues, J. B., Stotler, R. E., Sukkharak, P., Thiers, B. M., Uribe, J., Váňa, J., Villarreal, J. C., Wigginton, M., Zhang, L. and Zhu, R.-L. (2016): World checklist of hornworts and liverworts. – *PhytoKeys* 59: 1–828.