Habitat and Ecology: The species is found in the shola forests of Munnar in Idukki district, Kerala at an altitude of 2,000 m. The associated species in the community are Cryptocarya anamalayana, Phoebe wightii, Vernonia arborea, and Symlocos laurina.

*C. travancoricum* is apparently similar to or even confused with *C. sulphuratum* at a glance. This may be the reason for workers to erroneously treat *C. sulphuratum* Nees as *C. travancoricum* Gamble in their respective floras (Mohanan and Henry 1994; Ramachandran and Nair 1988). Mohanan and Sivadasan (2002) treated *C. filipedicellatum* Kosterm. collected from Athirimala as *C. travancoricum* Gamble by oversight. On close observation these species can be differentiated by the differences in leaf shapes, ending of lateral nerves to leaf apex, and inflorescence, and can be distinguished by the following key.

1a. Leaves ovate or linear lanceolate; lateral nerves not reaching the apex of leaves, raceme axillary or pseudoterminal ................................................................. 2

1b. Leaves ovate-elliptic to lanceolate elliptic to elliptic; the basal lateral nerves reaching the apex of the leaves; panicle always in the axils of terminal leaves ......................... *C. sulphuratum*

2a. Young leaves sericeous beneath; peduncle 3–7 cm long, stout, 3–5 flowered ................................... *C. travancoricum*

2b. Young leaves glabrous beneath, peduncle 3–3.5 cm long, slender, 3–9 flowered .......... *C. filipedicellatum*

Specimens Examined: Kerala: Idukki district, Munnar, ±2,000 m, 20.ii.2006, fl., Geethakumary & A.G. Pandurangan 48491 (TBGT); Travancore, Chemunji near Ponmudi, alt. 1,200 m, Apr., fl., Bourdillon 545 (TBGT).

ACKNOWLEDGEMENTS

The authors are grateful to the Director, TBGRI, for facilities and constant encouragement; the Joint Director, Botanical Survey of India, Coimbatore, for permitting us to consult the herbarium (MH); and to Mr. S. Sureshkumar, Asst. Artist, TBGRI, for the illustration.

REFERENCES


16. TWO NEW RECORDS OF MOSSES FOR THE INDIAN MAINLAND FROM THE AGASTHYAMALAI BIOSPHERE RESERVE IN THE WESTERN GHATS, INDIA

A.E.D. Daniels1,2,* AND J.L. MABEL1,3

1Bryology Laboratory, Botany Department & Research Centre, Scott Christian College (Autonomous), Nagercoil 629 003, Tamil Nadu, India.

2Email: dulipdaniels@yahoo.co.uk

3Email: j lenseshamabel@gmail.com

*Corresponding author

Introduction

Studies on the bryoflora of the Agasthyamalai Biosphere Reserve were first initiated about a decade ago by the senior author (Daniels 2003). Among the work done, Daniels and Daniel (2004) added the liverwort *Leptolejeunea balansae* to the Indian mainland, and subsequently, the mosses *Calymperes motleyi*, *Fissidens robinsonii*, *Leucophanes glaucescens*, and *L. nicobaricum* (Daniels and Daniel 2005).

In this paper, we report the occurrence of two mosses, *Taxithelium vernieri* and *Trichosteleum punctipapillosum*, earlier known to be distributed only in the Andaman and Nicobar Islands in India, in the Indian mainland from the Agasthyamalai region of the Western Ghats. Each of these species is provided with the correct name, basionym/
synonyms, if any, a detailed description, notes on the habitat and distribution and an illustration. Specimens cited are deposited at SCCN (Herbarium, Botany Department, Scott Christian College, Nagercoil).


Plants corticolous, forming tufts, delicate, glossy, pale green. Stem creeping, 2–6 cm long, pinnately branched. Leaves spreading, concave, ovate-lanceolate, 1–1.3 x 0.2–0.4 mm, revolute on one side at base, toothed at margin for 2/3 above, faintly deflexed and acute at apex, ecostate; cells linear, papillate at tip, sometimes with a few, fine papillae in a row in lumen; apical cells 8–48 x 4–8 μm; median ones 60–100 x 4–6 μm; basal ones 12–40 x 4–8 μm; alar cells quadrate, 20–32 x 8–12 μm, hyaline. Sporophyte not seen.

**Habitat:** Corticolous on *Syzygium* sp. and terricolous, in evergreen forests, c. 820 m.

**Distribution:** Southeast Asia and India (Nicobar Islands and W. Ghats of Tamil Nadu).

**Specimens Examined:** Western Ghats, Tamil Nadu, Kanyakumari dist., Seafield, c. 820 m, 18.xi.2008, A.E.D. Daniels & J.L. Mabel 86, 94.


Plants monoecious, forming mats, glossy, yellow-green. Stem creeping, 0.5–2 cm long; branches pinnate, 3–8 mm high. Leaves imbricate, erectopatent, concave, 0.9–1.2 x 0.4–0.6 mm, ovate-lanceolate, crenulate at margin, acute and faintly toothed at apex, ecostate; apical cells 28–42 x 4–6 mm, narrow, rhomboid, elongate, papillate on cell tip;
median ones 52–64 x 4–8 mm, rhomboid, elongate, with papillae in centre and tip; alar region with 3, inflated, oblong, 54–68 x 16–32 mm hyaline cells, with a few smaller, 12–48 x 4–12 mm irregular ones above them. Sporophytes on main stem. Setae c. 1 cm high, erect, slender, faintly papillose above. Capsules horizontal to drooping, c. 0.65 x 0.4 mm, ovoid. Peristome teeth 2-tiered, c. 240–320 x 40–48 mm; outer tier horizontally striate, papillose towards apex; inner tier membranous, segmented, faintly horizontally striolate, papillose throughout. Spores 8–12 x 8–11 mm globose, faintly papillose, pale brown.

**Habitat:** Corticolous on Elaeocarpus venustus Bedd. in evergreen forests, c. 1,100 m.

**Distribution:** INDIA: Andaman Islands and W. Ghats of Tamil Nadu.

**Specimens Examined:** Tamil Nadu, Kanyakumari dist., W. Ghats, Muthukuzhivayal, c. 1,100 m, 31.iii.2009, A.E.D. Daniels & J.L. Mabel 268.

**Discussion**

'Taxithelium vernieri' can be readily distinguished from *T. kerianum* (Broth.) Broth. and *T. nepalense* (Schwägr.) Broth. by the presence of unipapillate leaf cells against the seriate-papillate ones present in the latter two. *Taxithelium laevisulcum* Dixon, a closely allied species, differs from *T. vernieri* in possessing a single papilla in the centre of the leaf cells, whereas the latter has it at cell apex.

*Trichosteleum punctipapillosum* can be readily distinguished from *Z. boschii* (Dozy & Molk.) A. Jaeger, *T. glaucovirens* (Mitt.) Broth., *T. hamatum* (Dozy & Molk.) A. Jaeger and *T. luxurians* (Dozy & Molk.) Broth. in the absence of a row of oblong, tinted cells at alar attachment with a few cells at alar region inflated, whereas in *T. punctipapillosum*, the alar region is differentiated by 3 inflated, oblong, hyaline cells. *Trichosteleum stereodentoides* Broth. ex Gangulee, which has the same feature, can be distinguished from the former by the presence of pluripapillate cells at midleaf. *Trichosteleum stissophyllum* (Hampe) A. Jaeger, a very closely allied species, differs from *T. punctipapillosum* in having unipapillate leaf cells and only 2 inflated cells at the alar region which are tinted. *Trichosteleum luxurians* and *T. stissophyllum* are now *Papillidiopsis luxurians* (Dozy & Molk.) W.R. Buck & B.C. Tan (vide Buck & Tan, 1990) and *P. stissophylla* (Hampe) B.C. Tan & Y. Jia (vide Tan & Yu, 1999) respectively, and *Trichosteleum hamatum* is *Radulina hamata* (Dozy & Molk.) W.R. Buck & B.C. Tan (vide Buck & Tan, l.c.).

**ACKNOWLEDGEMENTS**

We thank the Tamil Nadu Forest Department for permission to explore the area and help in the field; Dr. P. Daniel, formerly Joint Director, BSI, Coimbatore, for going through the original manuscript; and Dr. S.C. Rose, Principal, Scott Christian College, for encouragement. The financial assistance from Ministry of Environment and Forests (All India Coordinated Project on Taxonomy), Government of India, New Delhi, is gratefully acknowledged.

**REFERENCES**


