



New synonymy in *Ptychanthus striatus* (Lejeuneaceae, Marchantiophyta)

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Abstract

Morphological and molecular evidence shows that *Spruceanthus wiggintonii* A.E.D.Daniels, K.C.Kariyappa & P.Daniel from southern India is a synonym of the widespread *Ptychanthus striatus* (Lehm. & Lindenb.) Nees.

Key words: liverwort, molecular phylogeny, Ptychanthoideae, *Spruceanthus wiggintonii*, taxonomy

Introduction

Daniels *et al.* (2010) published a new species *Spruceanthus wiggintonii* Daniels, Kariyappa & Daniel (2010 : 121) from the Western Ghats (Tamil Nadu and Kerala states), southern India. The authors suggested that the species was closely allied to *S. thozetianus* (Gottsche & F.Muell. in Mueller 1880: 63) Thiers & Gradstein (1989: 62) but differed from the latter by having 10-keeled perianths, entire female bracteoles and larger spores. Examination of isotype (Daniels 1433) and paratype (Kariyappa 109) material of *S. wiggintonii*, however, shows that the material belongs to *Ptychanthus striatus* (Lehm. & Lindenb. in Lehmann 1832: 16) Nees (1838: 212) rather than the genus *Spruceanthus* Verdoorn (1934: 151) because of the following characters: 1) branches predominantly of the *Frullania*-type (predominantly *Lejeunea*-type in *Spruceanthus*); 2) median leaf cells elongate and with cordate trigones (isodiametric and with simple-triangular to radiate trigones in *Spruceanthus*); 3) keel of inner female bracts with a large wing (wing absent in *Spruceanthus*). The 10-keeled perianths, entire female bracteoles and rather large spores are also characteristic of *P. striatus*. The latter species is a common and widespread epiphyte in montane rainforests in the tropical and subtropical regions of Asia, Oceania and northern Australia (e.g., Zhu & So 2001, Ahonen *et al.* 2005). Our conclusion on the status of *S. wiggintonii* is supported by the original illustration of this species, which fits *P. striatus* well, and by molecular evidence.

Materials and methods

Sampling, DNA extraction and sequencing

To reveal the phylogenetic position of *Spruceanthus wiggintonii*, a total of 23 samples from 16 species representing 7 genera of the core Ptychanthoideae were investigated in this study, including two samples of *Lopholejeunea* (Spruce 1884: 119) Schiffner (1893: 119, 129), two of *Mastigolejeunea* (Spruce 1884: 100) Schiffner (1893: 129), one of *Phaeolejeunea* Mizutani (1968: 130), eight of *Ptychanthus* Nees (1838: 211), six of *Spruceanthus* (including the paratype of *S. wiggintonii*), two of *Thysananthus* Lindenb. in Lehmann (1844: 24) and two of *Acrolejeunea* (Spruce 1884: 115) Schiffner (1893: 128) as outgroup representatives based on the clade A4 of Wilson *et al.* (2007). Thirteen *trnG*, 11 *trnL-trnF* and 11 nrITS sequences from Sukkharak *et al.* (2011) were used

Acknowledgements

The first author thanks Mr. Martin J. Wigginton, Dr. Wen Ye and Dr. Yu-Mei Wei for helpful advice. We are grateful to Dr. David Meagher and an anonymous reviewer for constructive comments on the manuscript. This research was supported by the National Natural Science Foundation of China (nos. 31170190, 31300171) and PhD Program Scholarship Fund of ECNU 2009.

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