



Article

A 150 year-old mystery solved: Transfer of the rheophytic endemic liverwort *Myriocolea irrorata* to *Colura*

JOCHEN HEINRICHS^{1*}, SHANSHAN DONG¹, YING YU², ALFONS SCHÄFER-VERWIMP³, TAMÁS PÓCS⁴, KATHRIN FELDBERG¹, JÖRN HENTSCHEL⁵, ALEXANDER R. SCHMIDT⁶ & HARALD SCHNEIDER⁷

¹ Department of Systematic Botany, Albrecht von Haller Institute of Plant Sciences, Georg August University, Untere Karspüle 2, 37073 Göttingen, Germany. Email: jheinri@uni-goettingen.de, shanshan.dong@stud.uni-goettingen.de, kfeldbe2@uni-goettingen.de

² East China Normal University, Shanghai 200241, China. Email: yuying1019@126.com

³ Mittlere Letten 11, 88634 Herdwangen-Schönach, Germany. Email: moos.alfons@kabelbw.de

⁴ Botany Department, Institute of Biology, Eszterházy College, Eger, Pf 43, H-3301, Hungary, Email: colura@upcmail.hu

⁵ Department of Systematic Botany with Herbarium Haussknecht and Botanical Garden, Friedrich Schiller University, Fürstengraben 1, 07743 Jena, Germany. Email: j.hentschel@uni-jena.de

⁶ Courant Research Centre Geobiology, Georg August University, Goldschmidtstraße 3, 37077 Göttingen, Germany. Email: alexander.schmidt@geo.uni-goettingen.de

⁷ State Key Laboratory of Systematic and Evolutionary Botany, Institute of Botany, Chinese Academy of Sciences, Beijing 100093, China. Email: h.schneider@nhm.ac.uk

* Author for correspondence. Email: jheinri@uni-goettingen.de

Abstract

Myriocolea irrorata is an endemic rheophytic liverwort known from a few localities in the Eastern Andes of Ecuador. Morphologically it belongs to the Cololejeunea-Tuyamaella clade of Lejeuneaceae, however, due to its exclusively Radula-type branching, transversely inserted, hollow leaves, large size, and an extremely high number of clustered gynoecia it has often been regarded as an isolated element of this group. Phylogenetic analyses of a molecular dataset consisting of three markers (nuclear ribosomal ITS region, plastidic *trnL-F* region and *rbcL* gene) and 20 accessions resolved *Myriocolea* in one of the main clades of *Colura*, sister to the generitype *Colura calyptrifolia*. Based on the molecular topology and a reinterpretation of morphological traits, *Myriocolea irrorata* is transferred to *Colura*, as *Colura irrorata*. The example *Myriocolea/Colura* adds to growing evidence that rheophytic liverworts may develop unusual morphologies that hamper their classification using exclusively morphology.

Key words: Lejeuneaceae, liverwort, Porellales, taxonomy

Introduction

In 1857, the English botanist Richard Spruce collected a previously unknown rheophytic liverwort along the Río Topo of the Eastern Andes of Ecuador. Describing it in a new genus of Lejeuneaceae, *Myriocolea* Spruce (1884: 305), he stated that “anything more alien from the aspect of a *Lejeunea* cannot well be imagined” (Spruce 1884: 307). Using a very wide genus concept for *Lejeunea* Libert (1820: 372), Spruce only accepted two genera in Lejeuneaceae, *Lejeunea* with several hundreds of species, and the monospecific *Myriocolea* with its single representative *Myriocolea irrorata* Spruce (1884: 305). This species differs from all other Lejeuneaceae by the exclusive presence of Radula-type branches, transversely inserted leaves without well delimited lobuli, presence of numerous antheridia per bract, and an extraordinary high number of clustered gynoecia (Thiers 1983, Gradstein et al. 2004). By its up to ca. 5 cm long, stiff, protruding leafy shoots it is easily recognizable in the field, however, was not redetected until 2002. It grows on twigs of shrubs occurring along the Topo and Zuñac rivers, especially on the periodically submerged riverbanks (Gradstein & Nöske 2002, Gradstein et al. 2004).