Actinellopsis murphyi gen. et spec. nov.: A new small celled freshwater diatom (Bacillariophyta, Eunotiales) from Zambia

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Abstract

In this paper we describe Actinellopsis murphyi gen. et spec. nov. a small heteropolar and dorsiventral diatom from a seep habitat in Zambia. This novel taxon has the chief distinguishing characteristic, along with its cell symmetry, of having the raphe positioned wholly in the valve face and not extending onto the mantle. It is further placed within the Peroniaceae as it possesses a straight raphe on the valve face and rimoportulae, and the frustules are heteropolar with regard to the length of the raphe. We also transfer the fossil diatom Actinella giraffensis to Actinellopsis as the morphological characteristics of this taxon are consistent with those of the generitype.

Key words: Zambia, Africa, new genus, Actinella, Peronia

Introduction

Given the size and diversity of climatic and geomorphological features, the diatom flora of (sub)tropical Africa has been poorly investigated. This holds true in particular for Zambia with only one detailed study of a section of its diatom flora (Cholnoky 1970). This country has a relatively high rainfall for the region and there are a multitude of aquatic resources and habitats including lakes, swamps (wetlands), streams and rivers, often having waterfalls, which in turn are responsible for the creation of a variety of moist sub-aerial habitats. All of these water bodies provide a varied and diverse habitat for diatoms. From 2010 to 2012 a project was undertaken to survey and document various aquatic organisms from rivers and streams around Zambia. The SAFRASS project (www.safrass.com) has as its main aim the development of capacity building tools for river quality monitoring in Zambia. Diatoms were one of the water quality indicator groups chosen for this project and as such were sampled from more than 150 localities around the country forming the most complete survey of the diatom flora of Zambia to date. Although rivers were the primary target habitat for sample collection, periodically wetted and sub-aerial habitats were also sampled and it is in this type of habitat in which an interesting member of the Eunotiales was found.

The order Eunotiales P.C. Silva (1962: 835) is a well-defined lineage of raphe bearing diatoms, the only known group to possess both a raphe system along with one or more rimoportulae (Round et al. 1990). The order has two families, the Eunotiaceae Kützing (1844: 32), which includes the vast majority of the described diversity of the order (Round et al. 1990), and the Peroniaceae (G. Karsten) Topachevs’kyj & Oksiyuk (1960: 301; basionym: Peronioideae G. Karsten 1928: 203,268), a small group into which a single genus, Peronia Brébisson & Arnott ex Kitton (1868:16), is placed. Peronia, like members of the Eunotiaceae, has a raphe system and rimoportulae, but unlike the members of that family, Peronia has a raphe system completely on the valve face (as opposed to having a short portion of the raphe on the valve face, and the majority of the raphe on the valve mantle) and the valves are dissimilar, with one having a longer raphe system than the other (Hustedt 1930, Patrick & Reimer 1966).
Acknowledgements

J.C. Taylor is the recipient of South African National Research Foundation (NRF) incentive funding. Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and therefore the NRF does not accept any liability in regard thereto. The material from Zambia was by J.C. Taylor, under the auspices of the SAFRASS project funded by the European Commission ACP Programme. J.C. Taylor is a beneficiary of a mobility grant from the Marie Curie Actions of the European commission co-financed by the Belgian Federal Science Policy. The authors are also grateful to Luc Ector (Gabriel Lippmann Public Research Center, Luxembourg) for valuable comments in earlier version of the manuscript. We appreciate the helpful comments offered by the editor and anonymous reviewers.

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