Phytotaxa 191 (1): 141–153
www.mapress.com/phytotaxa/

Article

ISSN 1179-3155 (print edition)
PHYTOTAXA
ISSN 1179-3163 (online edition)

http://dx.doi.org/10.11646/phytotaxa.191.1.9

Rhoicosphenia michali: a new species of marine diatom (Bacillariophyta) from King George Island, Antarctica

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Abstract

Rhoicosphenia michali sp. nov., described from the shallow sublittoral zone in Antarctica, is the second species in the genus with just one raphe slit on its convex valve. The first species, *Rhoicosphenia flexa*, was also described from marine coastal habitats in the Southern Hemisphere. Here, the morphology and ecology of *R. flexa* and *R. michali* are compared. The new species described herein may be endemic to Antarctica and can be found as free living cells on the shallow seabed, although it mainly occurs on the red alga *Georgiella confluens,* which is endemic to Antarctica.

Introduction

The genus *Rhoicosphenia* was erected by Grunow (1860: 511) with the following description: "Gattung 35. *Rhoicosphenia* m. (*Gomphonema curvatum* auct.) Gestielt, keilförmig und sattelförmig gebogen. (Mittelknoten immer nur in der concaven Nebenseite)".

In "The Catalogue of Diatom Names" compiled by Fourtanier & Kociolek (2011) 44 taxa of *Rhoicosphenia* are considered to be valid. This includes 21 species and 23 varieties.

Despite containing a small number of species, *Rhoicosphenia* has distinct and diverse morphological features, which warrant its generic status. In girdle view the frustule is flexed, while most species have a wedge-shaped girdle. There are two different valve shapes: isopolar and heteropolar. The concave ventral valve—referred to as the R-valve (Mann 1982) possesses a central nodule and has a fully developed raphe system. The convex dorsal valve (D-valve) lacks a central nodule and usually has a reduced raphe system with short raphe slits close to both the head and foot poles (Round *et al.* 1990). Until now, *R. flexa* Giffen (Giffen 1970: 96; Levkov *et al*. 2010) was the only described species with a raphe slit close to the foot pole, but no raphe slit on the head pole of the convex valve.

Heteropolar *Rhoicosphenia* spp. have been widely found in the nearshore ecosystem in Antarctica (e.g., Ligowski 1986, 2001, Oppenheim & Pugh 1987, Blazewicz-Paszkowycz & Ligowski 2002, Al-Handal & Wulff 2008).

This paper describes a new species of the genus *Rhoicosphenia* from the epiphytic diatom community living on the red alga *Georgiella confluens* (Reinsch) Kylin (1956: 391) at King George Island, Antarctica and compares it with putatively allied species from *Rhoicosphenia* .

Materials and methods

The diatoms analyzed were collected at two locations from the environment surrounding King George Island, South Shetland Islands:

1. Admiralty Bay: sample D16: diatom epiphytes on *Georgiella confluens* collected on 19th December, 1995; sample 81: diatoms from the sea bottom at 8 m collected on 20th December, 2008; sample 148: diatoms from the sea bottom at 2 m collected on 4th January, 2009; sample 194: diatoms from the sea bottom at 12 m collected on 17th January, 2009; (RL).

Accepted by Patrick Kociolek: 15 Oct. 2014; published: 30 Dec. 2014

macrophyte identification, valuable remarks on *Rhoicosphenia* habitats and samples of benthic material collected by diving in Potter Cove. The lead author (RL) thanks Dr Richard Crawford for the possibility to use the facilities in the Hustedt Collection in the Alfred-Wegener-Institut für Polar-und Meeresforschung in Bremerhaven and to Dr Richard Crawford and Friedel Hinz for their help during the study funded by DAAD nr 323. We are thankful to two anonymous reviewers for their very helpful comments. The expedition to the Arctowski Station in 2008/2009 was financed under the program CLICOPEN IPY 34 by the Polish Academy of Sciences.

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