

Four new small-celled naviculoid taxa from the Maritime Antarctic Region

Kateřina Kopalová^{1,2}, Ralitsa Zidarova³, Eileen J. Cox⁴ & Bart Van de Vijver⁵

¹Charles University in Prague, Faculty of Science, Department of Ecology, Viničná 7, CZ-12844 Prague 2, Czech Republic (k.kopalova@hotmail.com)

²Academy of Sciences of the Czech Republic, Institute of Botany, Section of Plant Ecology, Dukelská 135, CZ-37982 Třeboň, Czech Republic

³University of Sofia, Faculty of Biology, Department of Botany, 8 Dragan Tzankov Blvd., 1164 Sofia, Bulgaria (ralitz@abv.bg)

⁴The Natural History Museum, Cromwell Road, London, SW7 5BD, United Kingdom (e.cox@nhm.ac.uk)

⁵National Botanic Garden of Belgium, Department of Bryophyta & Thallophyta, Domein van Bouchout, B-1860 Belgium (vandevijver@br.fgov.be)

Introduction

In 2008, a detailed taxonomic and ecological study of the limno-terrestrial diatom flora of Livingston Island and James Ross Island (Maritime Antarctic Region) was begun to improve our understanding of the biodiversity and biogeography of the Antarctic diatom flora. During the survey, several unknown, small-celled naviculoid taxa (valve length < 20 µm) were also found and based on detailed scanning electron microscopy, four taxa were described as new to science.

Adlafia sp. A is characterized by its small dimensions, and separated from similar taxa, such as *A. muscora*, *A. suchlandtii* or *A. minuscula*, by its valve outline, which lacks substrate or capitate apices, and by its striation density.

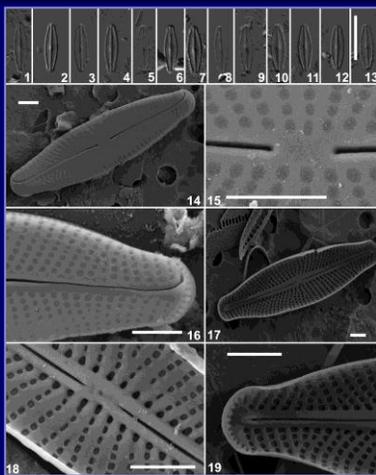
Chamaepinnularia sp. A shows some resemblance to *C. australomedioeris* but can be separated by the lack of a well-defined fascia, smaller valve dimensions and a more narrowly-lanceolate outline.

Mayamaea sp. A is related to *M. agrestis* but has less acutely rounded apices, clearly curved striae and larger central area due to the presence of shorter central striae.

Microcostatus sp. A is rather unclearly positioned as this taxon possesses several features that conflict with its position within the genus, such as the presence of a conopeum, and striae composed of one large elongated areola. However, the structure of the raphe, axial area, valve outline and valve dimensions justify its position within *Microcostatus*.

All four new taxa are illustrated using both LM and SEM. Details of their morphology and ecology are included.

All species will be described with following names:



1-19:

Adlafia submuscora sp. nov.

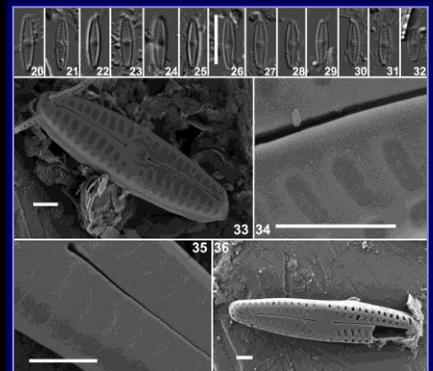
Valve dimensions (n=15): length 10-12 µm, width 2.5-3.1 µm. Valves lanceolate to narrowly lanceolate with clearly convex margins and protracted, substrate apices.

Adlafia submuscora has so far been found on several islands in the Maritime Antarctic Region including Livingston Island and James Ross Island. It is possible that this taxon has been confused with the much larger *Adlafia bryophila* (Petersen) Lange-Bertalot in Moser et al.

20-36:

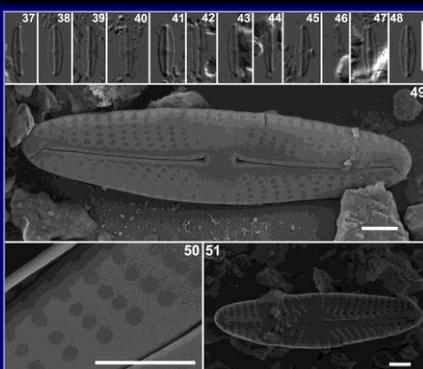
Chamaepinnularia antarctica sp. nov.

Valve dimensions (n=15): length 7.5-12.0 µm, width 2.4-2.8 µm. Valves (very) narrowly lanceolate with weakly convex, almost parallel margins, sometimes weakly substrate apices. Axial area narrow, less than ¼ of the total valve width, linear, widening towards the central area. Due to confusion with *C. australomedioeris*, the current distribution of *C. antarctica* is not well known.



37-51: *Mayamaea josefelsteri* Kopalová, Nedbalová & Van de Vijver sp. nov.

Valve dimensions (n=15): length 10.5-11.5 µm, width 2.9-3.4 µm. Valves elongated elliptical to elliptic-lanceolate with convex margins and bluntly rounded, non-protracted apices. Axial area rather narrow, linear. Central area rectangular to almost rounded, bordered by several (2-5) shortened striae. So far, *M. josefelsteri* has only been found on James Ross Island. Its presence on other localities of the Maritime Antarctic Region needs to be confirmed after having revision of the *Mayamaea* populations that were previously reported.



52-69: *Microcostatus australoshetlandicus* sp. nov.

Valve dimensions (n=15): length 6.5-9.0 µm, width 2.9-3.2 µm. Valves lanceolate to elliptic-lanceolate in smaller specimens with convex margins and almost non-protracted, cuneately rounded apices. *M. australoshetlandicus* was found on Livingston Island and Deception Island, two islands of the South Shetland Islands. At present, it has not been observed on James Ross Island (Kopalová et al. 2012, unpublished results). Due to its inconspicuous size, it is possible that the taxon is present on more Antarctic localities but has always been overlooked.

