



Three new araphid diatoms (Bacillariophyta) from the Maritime Antarctic Region

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Abstract

A revision of taxa from the genus *Staurosira* and *Staurosirella* from the Maritime Antarctic Region, formerly identified as *Staurosirella* (*Fragilaria*) *pinnata* and *Fragilaria alpestris*, resulted in the description of three new taxa: *Staurosira pottiezii* Van de Vijver sp. nov., *Staurosirella antarctica* Van de Vijver & E.Morales sp. nov. and *S. frigida* Van de Vijver & E.Morales sp. nov. Detailed light (LM) and scanning electron microscope (SEM) observations are used to better characterize the morphology and ultrastructure of these three new taxa. Comparisons with similar taxa and the ecological preferences of each species are added. The revision of these species confirmed the endemic nature of the Antarctic diatom flora.

Key words: Antarctica, Bacillariophyta, morphology, new species, *Staurosira*, *Staurosirella*, taxonomy

Introduction

Contrary to the relatively large amount of araphid taxa that have been described worldwide during the past 2 decades (e.g., Morales 2001, 2005, Morales & Edlund 2003, Morales *et al.* 2010a), only a few new taxa were described from the sub-Antarctic and Antarctic Region. The first was *Fragilaria maillardii* Le Cohu in Lange-Bertalot & Le Cohu (1985: 213), but later this was transferred to the raphid genus *Frankophila* (Lange-Bertalot 1997: 66) as *Frankophila maillardii* (Le Cohu) Lange-Bertalot & Rumrich (in Lange-Bertalot 1997: 71). In 1990, Reichardt & Lange-Bertalot described *Fragilaria germainii* E.Reichardt & Lange-Bert. (1990: 204), which, together with the sub-Antarctic species *Fragilaria husvikensis* Van de Vijver, Denys & Beyens (2000: 538), was transferred to the genus *Distrionella* (Williams 1990: 175) by Flower (2005), as *Distrionella germainii* (E.Reichardt & Lange-Bert.) R.Flower 2005: 62. Other relevant new taxa include *Opephora naveana* Le Cohu (1988: 107), described from the Kerguelen Islands (Le Cohu 1988), later transferred to *Pseudostaurosira* as *Pseudostaurosira naveana* (Le Cohu) E.Morales & Edlund (2003: 237), *Staurosira jolinae* Van de Vijver in Van de Vijver & Beyens (2002: 320), *Staurosira circula* Van de Vijver & Beyens (2002: 325), both described from Iles Crozet, and *Stauroforma inermis* Flower, Jones & Round (1996: 54), described from the South Orkney Islands (Flower *et al.* 1996). Despite this rather low number, araphid taxa are rather commonly reported from sub-Antarctic and Antarctic localities. Based on the list of records provided in Kellogg & Kellogg (2002), it is clear that the most reported taxa, *Staurosirella* (*Fragilaria*) *pinnata* (Ehrenb. 1843: 127) D.M.Williams & Round (1987: 274) (51 records), *Staurosira* (*Fragilaria*) *construens* var. *venter* (Ehrenb. 1854: pl. 8/1, fig. 12) P.B.Hamilton (in Hamilton *et al.* 1992: 29) (30 records), *Stauroforma* (*Fragilaria*) *exiguiformis* (Lange-Bert.) Flower, Jones & Round (1996: 53, basionym: *Fragilaria exiguiiformis* Lange-Bertalot 1993: 45) (29 records) and *Fragilariforma virescens* (Ralfs) D.M.Williams & Round (1987: 265; basionym: *Fragilaria virescens* Ralfs 1843: 110) (26 records), all show cosmopolitan distributions. This dominance of cosmopolitan taxa is in clear contrast with the nowadays generally accepted view that the Antarctic region is home to a highly specific diatom flora (Sabbe *et al.* 2003, Van de Vijver *et al.* 2005, 2011, Van Ormelingen *et al.* 2008, Vyverman *et al.* 2010) and raises questions regarding the correct taxonomic identity of the recorded populations. It has been demonstrated for a large number of raphid diatoms such as the genera *Hantzschia* (Zidarova *et al.* 2010), *Navicula* (Van de Vijver *et al.* 2011), *Muelleria* (Van de Vijver *et al.* 2010) and

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