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Cymatosirella Dąbek, Witkowski & Sabbe *gen. nov.*, a new marine benthic diatom genus (Bacillariophyta) belonging to the family Cymatosiraceae

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Abstract

We present a new marine benthic diatom genus *Cymatosirella gen. nov.* The genus belongs to the family Cymatosiraceae and has been assigned to the subfamily Extubocelluloideae on the basis of ultrastructural cell wall features. It has isovalvate cells with undulate valves and is characterized by the absence of tubular processes and the occurrence of hollow spines which are observed for the first time in the Cymatosiraceae. The new genus contains four species, two of which are transferred from the genus *Cymatosira*, viz. *Cymatosirella capensis comb. nov.* and *Cymatosirella minutissima comb. nov.*, and two which are new to science, viz. *Cymatosirella benguelensis sp. nov.* and *Cymatosirella taylorii sp. nov. Cymatosirella capensis* is chosen as the generitype. The new genus includes a group of very small taxa inhabiting the intertidal zone of the Atlantic Ocean with three species in South Africa and one in Europe. *C. capensis* was originally described by Giffen from Langebaan Lagoon (a shallow marine inlet in the southern part of Saldanha Bay, Western Cape Province), on the basis of light microscopy only, and has to date only been illustrated by line drawings. *C. minutissima*, so far only known from the Westerschelde estuary (The Netherlands), has previously been documented in more detail using both light and electron microscopy. Here, we present the results of detailed light and electron microscopical investigations of *C. capensis*, both from its original type material and from recently collected samples from the type locality and neighboring littoral areas in the Western Cape Province, and of the new species *C. benguelensis* and *C. taylorii*, also from Western Cape localities. All species are compared with similar small taxa belonging to the Cymatosiraceae, subfamily Extubocelluloideae.

Key words: *Cymatosirella*, diatoms, Giffen, marine littoral, new genus

Introduction

The diatom family Cymatosiraceae Hasle, von Stosch & Syvertsen (1983) comprises bipolar centric taxa that belong to 13 extant genera and 5 fossil genera, divided into two subfamilies, the Cymatosiroideae and the Extubocelluloideae (Table 1). The fundamental difference between these two subfamilies is that Cymatosiroideae have heterovalvate cells with process on one valve and pili on the other, whereas Extubocelluloideae are isovalvate, which means that the process occurs or is observed very rarely (Hasle *et al.* 1983). Moreover, features like marginal spines, marginal ridge or pili, which are characteristic for Cymatosiroideae, are absent in Extubocelluloideae. Representatives of the family Cymatosiraceae are present in the fossil record since the Eocene (Witkowski *et al.* 2011). Some authors have suggested a relationship with pennate diatoms (Medlin & Kaczmarska 2004, Sorhannus 2004, 2007, Williams 2007, Witkowski *et al.* 2011). The Cymatosiraceae have been the subject of detailed taxonomic and ultrastructural studies during the last decades (cf. Salah 1955, Hasle *et al.* 1983, Takano 1985, Nakata 1987, Gardner & Crawford 1993, Riaux-

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