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Topic: Marine biology and ecology



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ABSTRACT Subject :

A journey through the cryptic diversity of Fragilariaceae and the description of a new Antarctic species, *Gedaniella antarctica* sp. nov. (Fragilariales, Bacillariophyta) from Terra Nova Bay (Ross Sea).

Abstract 01/03/2023 13:56:44

The araphid diatoms of the Fragilariaceae family are commonly used as bio-indicators in environmental assessments and as feedstock for different industrial applications. Recent taxonomic research highlighted significant limitations in the study of these microalgae based solely on the morphological features. Most Fragilariaceae display a broad spectrum of morphologies and many diagnostic characters are indistinguishable if observed only through light microscopy. In this sense, sample misidentification is common and could have serious implications on environmental surveys and laboratory experiments. To overcome to this issues, we 1) combined phylogenetic analyses of the small subunit rDNA (18S rDNA), *rbcL* and *psbC* genes, with key morphological features used in the traditional identification of Fragilariaceae, 2) tested alternative tree topologies to evaluate the relationships among existing taxa and 3) traced the evolution of morphological traits using a phylogenetic context. Molecular phylogeny and topology tests suggested that the latest combinations of the genus *Pseudostaurosira* and the recent revision of genera *Gedaniella*, *Serratifera*, *Sarcophagodes* and *Nanofrustulum* were not monophyletic. Our results supported the monophyly of a group of Fragilariaceae within small araphid diatoms, including the genera: *Cratericulifera*, *Plagiotriata*, *Castoridens*, *Opephora*, *Staurosira*, *Staurosirella*, *Punctastriata*, *Psammotaenia*, *Hendeyella*, *Stauroforma*, *Pseudostaurosira* sensu Li, *Nanofrustulum* sensu Li, *Serratifera* sensu Li and *Gedaniella* sensu Li. Analyses of the Antarctic strain IMA070A collected during the XXXIV Italian Antarctic Expedition using fine structural features of the frustule and molecular data revealed that this diatom belongs to a distinct lineage within the genus *Gedaniella*, which we describe here as *Gedaniella antarctica* sp. nov.