

RESEARCH ARTICLE

New Insights into Plagiogrammaceae (Bacillariophyta) Based on Multigene Phylogenies and Morphological Characteristics with the Description of a New Genus and Three New Species

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Abstract

Plagiogrammaceae, a poorly described family of diatoms, are common inhabitants of the shallow marine littoral zone, occurring either in the sediments or as epiphytes. Previous molecular phylogenies of the Plagiogrammaceae were inferred but included only up to six genera: *Plagiogramma*, *Dimeregramma*, *Neofragilaria*, *Talaroneis*, *Psammogramma* and *Psammoneis*. In this paper, we describe a new plagiogrammoid genus, *Orizaformis*, obtained from Bohai Sea (China) and present molecular phylogenies of the family based on three and four genes (nuclear-encoded large and small subunit ribosomal RNAs and chloroplast-encoded *rbcL* and *psbC*). Also included in the new phylogenies is *Glyphodesmis*. The phylogenies suggest that the Plagiogrammaceae is composed of two major clades: one consisting of *Talaroneis*, *Orizaformis* and *Psammoneis*, and the second of *Glyphodesmis*, *Psammogramma*, *Neofragilaria*, *Dimeregramma* and *Plagiogramma*. In addition, we describe three new species within established genera: *Psammoneis obaidii*, which was collected from the Red Sea, Saudi Arabia; and *Neofragilaria stilus* and *Talaroneis biacutifrons* from the Mozambique Channel, Indian Ocean, and illustrate two new combination taxa: *Neofragilaria anomala* and *Neofragilaria lineata*. Our observations suggest that the