PLOS ONE

RESEARCH ARTICLE

Diversity in the Globally Distributed Diatom Genus *Chaetoceros* (Bacillariophyceae): Three New Species from Warm-Temperate Waters

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Citation: Li Y, Boonprakob A, Gaonkar CC, Kooistra WHCF, Lange CB, Hernández-Becerril D, et al. (2017) Diversity in the Globally Distributed Diatom Genus *Chaetoceros* (Bacillariophyceae): Three New Species from Warm-Temperate Waters. PLoS ONE 12(1): e0168887. doi:10.1371/journal.pone.0168887

Editor: Ross Frederick Waller, University of Cambridge, UNITED KINGDOM

Received: August 10, 2016

Accepted: December 5, 2016

Published: January 13, 2017

Data Availability Statement: All relevant data are within the paper and its Supporting Information files. The submitted sequences are available in the NCBI database, and the accession numbers are included in S1 and S2 Tables.

Funding: Natural Science Foundation of China, Nos. 31370235 and 31570205. Association of European Marine Biological Laboratories, Grant Agreements 227799 and 1555. Royal Thai Government. Faculty of Science, University of

Abstract

Chaetoceros is one of the most species rich, widespread and abundant diatom genera in marine and brackish habitats worldwide. It therefore forms an excellent model for in-depth biodiversity studies, assessing morphological and genetic differentiation among groups of strains. The global *Chaetoceros lorenzianus* complex presently comprises three species known to science. However, our recent studies have shown that the group includes several previously unknown species. In this article, 50 strains, mainly from high latitudes and from warm-temperate waters, were examined morphologically and genetically and the results compared with those of field studies from elsewhere. The strains clustered into five groups, two of which are formed by *C. decipiens* Cleve and *C. mitra* (Bailey) Cleve, respectively. Their species descriptions are emended based on samples collected close to the type localities. The three other groups are formed by new species, *C. elegans* sp. nov., *C. laevisporus* sp. nov. and *C. mannaii* sp. nov. Characters used to distinguish each species are: orientation of setae, shape and size of the apertures, shape, size and density of the poroids on the setae and, at least in some species, characters of the resting spores. Our aim is to cover the global species diversity in this complex, as correct species delineation is the basis for exploring biodiversity, distribution of organisms, interactions in the food web and effects of environmental changes.

Introduction

Diatoms constitute one of the most abundant and diverse phytoplankton groups, with estimates of 200.000 species [1]. These numbers are rough estimates, and the present number of species described is only 12.000 [2]. Recent studies on marine genera such as *Pseudo-nitzschia*