

NOTE

PSEUDO-NITZSCHIA NANAOENSIS SP. NOV. (BACILLARIOPHYCEAE) FROM THE CHINESE COAST OF THE SOUTH CHINA SEA¹

Yang Li,²  Huan Chang Dong

Guangzhou Key Laboratory of Subtropical Biodiversity and Biomonitoring, Guangdong Provincial Key Laboratory of Healthy and Safe Aquaculture, College of Life Science, South China Normal University, West 55 of Zhongshan Avenue, Guangzhou 510631, China

Sing Tung Teng

Faculty of Resource Science and Technology, Universiti Malaysia Sarawak, Kota Samarahan 94300, Sarawak, Malaysia

Stephen S. Bates

Fisheries and Oceans Canada, Gulf Fisheries Centre, P.O. Box 5030, Moncton, New Brunswick, Canada E1C 9B6

and Po Teen Lim

Bachok Marine Research Station, Institute of Ocean and Earth Sciences, University of Malaya, Bachok, Kelantan 16310, Malaysia

Pseudo-nitzschia nanaoensis sp. nov. is described from waters around Nan'ao Island (South China Sea), using morphological data and molecular evidence. This species is morphologically most similar to *P. brasiliana*, but differs by a denser arrangement of fibulae, interstriae, and poroids, as well as by the structure of the valvocopula and the narrow second band. *Pseudo-nitzschia nanaoensis* constitutes a monophyletic lineage and is well differentiated from other species on the LSU and ITS2 sequence-structure trees. *Pseudo-nitzschia nanaoensis* makes up the basal node on the LSU tree, and forms a sister clade with a group of *P. pungens* and *P. multiseriata* on the ITS2 tree. The ability of cultured strains to produce domoic acid was assessed, including its possible induction by the presence of a copepod and brine shrimp, by liquid chromatography–tandem mass spectrometry. However, no strains showed detectable domoic acid.

Key index words: domoic acid; ITS2; morphology; *Pseudo-nitzschia*; ribosomal RNA genes

Abbreviations: ASP, amnesic shellfish poisoning; CBCs, compensatory base changes; DA, domoic acid; HCBCs, hemi-CBCs; LC-MS/MS, liquid chromatography–tandem mass spectrometry

species produce domoic acid (DA), the neurotoxin associated with amnesic shellfish poisoning (ASP; Lelong et al. 2012, Trainer et al. 2012). The number of species in the genus has increased abruptly in the past two decades, currently comprising 51, of which 26 are toxigenic (Lundholm 2018). An accurate species-level identification framework is required to understand the cryptic species and variation in toxicity within *Pseudo-nitzschia* taxa (Lelong et al. 2012, Trainer et al. 2012). A combination of molecular approaches has increasingly been applied to describe novel species of *Pseudo-nitzschia*, especially information on the second internal transcribed spacer region (ITS2) of nuclear encoded ribosomal DNA. In the last two decades, nearly 20 new species have been described and erected based on morphological and molecular evidence (Lim et al. 2012, 2013, Lundholm et al. 2012, Teng et al. 2014, 2015, 2016, Li et al. 2017) but there have been few reports from China (Li et al. 2017).

Four monoclonal strains, coded as MC4188, MC4206, MC4213, and MC4215, were established from samples offshore Nan'ao Island (23.4215° N, 117.3254° E), located near the north coast of the South China Sea, on May 25, 2017 (Appendix S1 in the Supporting Information). Using combined morphological and molecular data (Appendix S1), we describe a novel species, *P. nanaoensis* sp. nov.

Pseudo-nitzschia nanaoensis Yang Li & H.C. Dong **sp. nov.** (Figs. 1 and 2; Figs. S1 and S2 in the Supporting Information, Table S1 in the Supporting Information)

Description: Cells lanceolate in valve view, 54.7–73.0 µm long and 1.7–2.0 µm wide. Cells form stepped colonies with 1/10–1/12 of cell overlap.

Pseudo-nitzschia has become one of the most intensively studied diatom genera because some of its

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²Author for correspondence: e-mail li-3-yang@163.com.

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