



Two new *Nitzschia* species (Bacillariophyceae) from China, possessing a canal- raphe-conopeum system

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Abstract

Two new species in the diatom genus *Nitzschia* were found in the middle intertidal zone, Xiamen Bay, southern China. Both new taxa belong to the subgenus *Nitzschia*, as inferred from the presence of a canal-raphe-conopeum system. The valves of both new species are dorsiventral. In *Nitzschia arierae* sp. nov., the raphe system is positioned centrally, the conopea fuse to the valve face at supporting points, and the zone of valve face subtended by the conopeum has areolae. In *Nitzschia gaoi* sp. nov., the raphe system is centrally positioned or slightly eccentric, two large conopea extend out from near the raphe while two small conopea extend out from each transverse costa and cover the striae, most part of the zone of valve face subtended by the conopeum has no areolae, and there are two long produced rostrate apices that both arch toward the ventral side or one apex arches and the other is straight. Both new species are epipelagic forms inhabiting the coastal environment.

Key words: Benthic diatom, *Nitzschia*, intertidal mud-flats, nitzschioid symmetry, Xiamen Bay

Introduction

Nitzschia Hassall (1845: 435) is a long-established and taxonomically difficult genus of raphid diatoms. Smith (1853) divided this large genus into six sections for the first time. Grunow (1862) further distinguished 11 unranked groups in this genus and later amended his own system (in Cleve & Grunow 1880) into 24 groups. Grunow's system is still in use with some modifications (e.g. Mann 1986, Round *et al.* 1990). Despite *Nitzschia* taxa are commonly recorded in most diatom assemblages from fresh to brackish and marine waters (Denys & Lange-Bertalot 1998), the determination and delimitation of many taxa with overlapping diagnostic criteria still remain difficult and unclear, because of the lack of comprehensive descriptions of nomenclatural types and undescribed variability of diagnostic features that often overlap (Hlúbiková *et al.* 2009).

Mann (1986) reviewed the infrageneric classification of *Nitzschia* and erected the subgenus *Nitzschia*, which possesses a suite of characters that, notably the presence of siliceous flaps on either side of the raphe system, are not found in other *Nitzschia* or *Hantzschia* species. Lobban & Mann (1987) examined *Nitzschia martiana* (C.A. Ag.) Van Heurck (1896: 406; basionym: *Homoeocladia martiana* C.A. Agardh 1827: 629) and transferred it into the section *Spathulatae* within the subgenus *Nitzschia*. Knattrup *et al.* (2007) gave a detailed description of *Nitzschia sigmoidea* (Nitzsch) W. Smith (1853: 38; basionym: *Bacillaria sigmoidea* Nitzsch 1817: 104) which is an important member in the subgenus *Nitzschia*. Furthermore, Mann & Trobajo (2014) added three new dorsiventral conopeum-bearing diatoms to the subgenus *Nitzschia*. Based on these previous references, it can be concluded that two important structures, canal raphe and conopeum, form a unique combination in the subgenus *Nitzschia*. This unique combination can be termed as the canal-raphe-conopeum system. Both new *Nitzschia* species analyzed in the present study possess this system. Here we describe these two new members of the subgenus *Nitzschia* and add two new examples for the canal-raphe-conopeum system.

Because China possesses an enormous coastline from north to south, there is a great potential to discover new diatom species in this littoral zone. Nevertheless, there are only few studies which presented new species in this area.