



Fallacia decussata, sp. nov. : a new marine benthic diatom (Bacillariophyceae) from Northeast Asia

YUHAN LI^{1,2}, HIDEKAZU SUZUKI², TAMOTSU NAGUMO³, JIRO TANAKA², ZHONGMIN SUN¹ & KUIDONG XU^{1*}

¹ Institute of Oceanology, Chinese Academy of Sciences, 7 Nanhai Road, Qingdao 266071, China

² Graduate School of Marine Science and Technology, Tokyo University of Marine Science and Technology, Konan 4-5-7, Minato-ku, Tokyo 108-8477, Japan

³ Department of Biology, The Nippon Dental University School of Life Dentistry at Tokyo, 1-9-20 Fujimi, Chiyoda-ku, Tokyo 102-8159, Japan

* Corresponding author (E-mail: kxu@qdio.ac.cn)

Abstract

Fallacia decussata is described as a new marine littoral diatom from Northeast Asia. Its morphology was examined with light, scanning and transmission electron microscopy. *Fallacia decussata* has a unique feature, viz., possessing 2–4 pores on each side of raphe terminal fissures, while all congeners have either invariably a single pore or only a slit. This species differs from congeners also by a combination of morphological features including: i) elliptical valves with broadly round poles; and ii) convex and centrally strongly constricted lateral sterna, forming a more or less X-shaped central area; iii) striation density of 25–28 in 10 µm. This species is an epipsammic diatom currently known from intertidal zone in the northwest Pacific Ocean.

Key words: Bacillariophyceae, epipsammic, *Fallacia decussata*, intertidal sediments, marine diatom

Introduction

The genus *Fallacia* A.J.Stickle & D.G.Mann in Round *et al.* (1990: 667) is characterized by a combination of morphological features, namely a single H-shaped plastid, lyre-shaped hyaline lateral areas and a finely porous conopeum partly or completely covering the striae (Round *et al.* 1990). *Fallacia* species are widely distributed and are important components of benthic diatom flora in marine and estuarine intertidal sediments (Round *et al.* 1990; Sabbe *et al.* 1999). So far, more than one hundred species have been included in *Fallacia* (Guiry & Guiry 2015). Most species are small in cell size (mostly 10–20 µm long). Thus, their identification is usually difficult under light microscope (LM).

With increasing utilization of scanning electron microscopy (SEM) and transmission electron microscopy (TEM), ultrastructure of many species has been revealed. Many new species have been described based on both LM and ultrastructural features (Witkowski 1991, 1993, Sabbe *et al.* 1999, Garcia 2003, Witkowski *et al.* 2000, Li *et al.* 2014a, b). The outline of the valve, the position and shape of the longitudinal lateral area (equivalent to longitudinal sterna under SEM) and the conopeum have been suggested as to important features to distinguish species (Sabbe *et al.* 1999, Garcia 2003). Among these, the morphology of conopeum could only be observed under SEM and TEM, and the area of the conopeum and the presence of pegs connecting the margin of the conopeum and the valve mantle are two important features (Garcia 2003). The structure of pegs has been observed in *Fallacia hodgiana* (Patrick & Freese 1961: 189) Yu H.Li & Hidek.Suzuki in Li *et al.* (2014b: 33), *F. obfusata* M.Garcia (2003: 313), *F. schoemana* (Foged 1975: 43) Witkowski, Lange-Bertalot & Metzeltin (2000: 213), *F. tenera* (Hustedt in A.W.F.Schmidt *et al.* 1936: pl. 405) D.G.Mann in Round *et al.* (1990: 669), and *F. vittata* (Cleve 1894: 80) D.G.Mann in Round *et al.* (1990: 670), whereas there is no pegs in *F. nummularia* (Greville 1859: 29) D.G.Mann in Round *et al.* (1990: 669) and *F. pygmaea* (Kützinger 1849: 77) A.J.Stickle & D.G.Mann (1990: 668) (Sabbe *et al.* 1999, Garcia 2003, Li *et al.* 2014a, b).

In this study, we describe a new species of *Fallacia* from marine and estuarine sandy sediments in Northeast