



## Comparison of two new species of *Mastogloia* (Bacillariophyceae) with other small members of section *Ellipticae*

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### Abstract

In this study, seven *Mastogloia* species belonging of the section *Ellipticae* are morphologically described through scanning electron microscopy, including two new taxa *M. matthaei* and *M. stellae*. They were collected as epiphytes on seagrasses from several tropical (Indonesia), subtropical (Egypt, Greece, Republic of Malta, Turkey) and temperate (Slovenia, Italy) regions of the world. All these species show typical characters of the Hustedt's section *Ellipticae*: elliptical valve outline, a flat valve surface and rounded apices. Moreover, this study provides novel information on the frustule ultrastructure and gives update of their current geographical distribution. Some nomenclatural inconsistencies have been resolved with the typification of *M. ovulum* and the related species, *M. emarginata*, from the original Miang Besar material in the Hustedt collection.

**Key words:** Bacillariophyceae, diatoms, *Mastogloia*, microphytobenthos, *Ellipticae*, SEM, taxonomy, ultrastructure

### Introduction

The genus *Mastogloia* Thwaites ex W. Smith (1856: 63) encompasses a fairly high number of epilithic and epiphytic species, with some 140, 340 and 410 taxa reported by Hustedt (1933), VanLandingham (1971) and Novarino (1989), respectively. It is mainly recognized as a marine genus frequently occurring in tropical to temperate regions, and also extending its distribution to brackish and freshwater (Cleve 1883, Stephens & Gibson 1979a, 1979b, 1980, Round *et al.* 1990, Lobban *et al.* 2012). Morphologically, the genus *Mastogloia* is isopolar and is mainly characterized by a modified valvocopula which consists in a series of adjacent partecta (i.e., chambers *sensu* Hustedt 1933) running internally along each valve margin to form a partectal ring (Paddock & Kemp 1990, Round *et al.* 1990, Pennesi *et al.* 2011, 2012). Hustedt (1933) classified the genus *Mastogloia* into ten sections mainly based on the valve outline, type of partecta, shape of areola, form of raphe, transapical striae in 10 µm and longitudinal pattern style, while he grouped all freshwater inland species in a separate and distinct section. For the first time when reviewing the genus *Mastogloia*, Pennesi *et al.* (2011, 2012) re-assessed the highly sculptured section *Sulcatae* by defining two subsets of species exhibiting or not some siliceous outgrowths (i.e., conopea, pseudoconopea) on the external valve surface.

Until 1975, the systematics of the *Mastogloia* was based on observations through light microscopy (Cleve 1895, Hustedt 1933, Voigt 1942, 1952, 1963, Proschkina-Lavrenko 1950, Foged 1975, Simonsen 1987). The coming of the scanning electron microscopy (SEM) in 1935 by Knoll has allowed an improvement of research in many fields including the study of diatom morphology (Ricard 1975, Paddock & Kemp 1990, Round *et al.* 1990). Indeed, Ricard (1975) described the valve ultrastructure of several species of *Mastogloia* using for the