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Diversity and distribution of taxa in the genus *Eunotia* Ehrenberg (Bacillariophyta) in Macedonia

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Abstract

Within the past few decades *Eunotia* (Bacillariophyceae) has been confirmed as one of the most species rich diatom genera. The remarkable diversity of this genus has been well documented for the tropical region of South America, and its wide distribution comprehensively demonstrated for North America and Canada, Europe, East and Southeast Asia, as well as the Subantarctic region. Till present day only twenty eight taxa of *Eunotia* have been reported for Macedonia, mainly from the various aquatic habitats of different mountains. The main focus of the present study is the diversity, taxonomy and general distribution of taxa belonging to *Eunotia* in Macedonian mountain regions. The area investigated covers most of the mountains in the western, south-western, southern, central and eastern part. In total 53 taxa have been observed, among which six are described as new species (*Eunotia atomus*, *E. fabaeformis*, *E. mariovensis*, *E. pseudominor*, *E. scardica* and *E. stojanovskii*). The morphological features, as observed by light microscopy (LM), are comprehensively described for each taxon. The ultrastructure of the valve, as observed by scanning electron microscopy (SEM), is additionally described for most of the taxa. The general distributional pattern, locality, altitude and substrate preference, for every taxon is also included. The distinctive characters between similar taxa are discussed and taxonomical notes are as well provided.

Key words: *Eunotia*, Macedonia, diatoms, taxonomy, distribution

Introduction

The genus *Eunotia* Ehrenb. (1837: 44) was originally established to accommodate diatom taxa having a distinct curvature to the valve, being asymmetrical about the apical axis. *Eunotia* is the type genus for the family Eunotiaceae Kütz. (1844: 32, 33). One of the most significant characters of this family, besides the curved and dorsiventral valves, is its distinctive raphe system. It is composed of quite short raphe slits, not directly associated with the sternum. The raphe slits are strongly curved, terminally positioned and often expanding onto the valve mantle. The presence of at least one rimoportula per valve is an additional distinctive feature of the family (Round *et al.* 1990, Lange-Bertalot *et al.* 2011). Other genera of the same family are *Desmogonium* Ehrenb. (1848: 539), *Amphicampa* (Ehrenb. 1854: 373) Ralfs in Pritchard (1861: 765), *Actinella* Lewis (1864: 343), *Semiorbis* Patrick in Patrick & Reimer (1966: 162) and more recently described *Eunophora* Vyverman, Sabbe & D.G. Mann in Vyverman *et al.* (1998: 96), *Amphorotia* Williams & Reid (2006a: 41, 42), *Colliculoamphora* Williams & Reid (2006b: 153) and *Perinotia* Metzeltin & Lange-Bert. (2007: 188).

Desmogonium, as a separate and distinct genus, has been critically assessed by Metzeltin & Lange-Bertalot (1998); nevertheless, the same authors found for it later on (Metzeltin & Lange-Bertalot 2007). *Amphicampa* is easily distinguished by the presence of strong undulations on both dorsal and ventral valve margin. *Actinella* and *Semiorbis* are also considered distinct genera due to the heteropolar valves in the former, remarkably curved to semi-circular valves in the latter, both striking features. A distinctive feature of *Eunophora* and *Amphorotia* is the frustule symmetry that is similar to the genus *Amphora* Ehrenb. ex Kütz. (1844: 107), namely the girdle bands in both *Eunophora* and *Amphorotia* being broad on the dorsal side and narrow on the ventral side (Vyverman *et al.* 1998, Williams & Reid 2006a). In addition, the raphe in