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Fifteen new diatom (Bacillariophyta) species from Lake Ohrid, Macedonia

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Abstract

During recent observations of the diatom flora of Lake Ohrid, fifteen new species were found, each possessing unique morphological features: *Odontidium minutum, Staurosirella pulchella, Staurosirella lata, Fragilaria micra, Navicula subviridula, Prestauroneis tumida, Placoneis pseudabundans, Placoneis subelegans, Cymbopleura tumida, Gomphosphenia tenuis, Gomphonema mihoi, Gomphonema subaequale, Gomphonema perolivaceolacuum, Gomphonema linearoides* and *Gomphonema densistriatum.* We provide detailed descriptions for all fifteen species based on light and electron microscopy observations. Noteworthy is the high diversity recorded in the *Gomphonema olivaceum* species complex, which comprises eight species in total, three of which are described as new. We also provide a key for identification of species in the *G. olivaceum* complex in Lake Ohrid and a compilation of published data detailing the infraspecific diversity of this complex.

Introduction

The diatom flora of Lake Ohrid has been under investigation for more than a century (Krstic *et al*. 2006). There has been intensive study on diatoms during the last 15 years and more than 80 new species have been described (Krammer 1997, 2003, Lange-Bertalot 2001, Levkov *et al*. 2006a, 2006b, 2007, Levkov & Williams 2006). For example, a revision of the genus *Amphora* sensu stricto resulted in 23 species recorded from Lakes Ohrid and Prespa, of which 16 were new to science (Levkov 2009).

Recent observations on the diatom flora of Lake Ohrid, using samples collected from St. Naum springs and Lake Ohrid, revealed 15 new species, which are described here. The descriptions are based on light and electron microscopy observations. Of note is the high diversity recorded for the *Gomphonema olivaceum* species complex, which comprises in total eight species, three of which are formally described as new. We also provide a key for the identification of taxa within the *G. olivaceum* species complex and have compiled published data detailing the infraspecific diversity of this complex. Further comments on the taxonomy of several genera and species complexes are given.

Material & methods

Monthly samples were collected from St. Naum springs and Lake Ohrid from May 2002 to June 2003 and on a number of other occasions prior to 2008. Samples were prepared by acid digestion with K_2MnO_4/HCl, and permanent slides were mounted in Naphrax®. Photomicrographs were taken with a Nikon E–800, a digital Nikon Coolpix 4500, and a digital Axiocam MRc camera mounted on a Zeiss Axioplan microscope.

For SEM analyses, cleaned material was dried onto aluminum stubs and coated with gold/palladium using a sputter coater. SEM micrographs were taken using a Cambridge Instrument S4 Steroscan electron microscope operated at 5 kV.

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