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Two new species of the genus *Gomphonema* (Bacillariophyceae) from Guayabo Waterfall, Cuba

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Abstract

In this paper two species of the genus *Gomphonema* from Salto del Guayabo, eastern Cuba, are described as new: *Gomphonema guayabense* sp. nov. and *G. curatorum* sp. nov. Both are characterized by a broad combined axial/central area bordered by short transapical striae and the lack of an isolated pore or stigmoids respectively. Detailed morphological descriptions based on light- and scanning-electron microscopy are presented. LM and SEM micrographs show the size ranges and ultramicroscopical details of the new species. In addition, similar taxa and distinctive features are discussed. The new taxa support a statement by Foged (1984) that the freshwater diatom flora of Cuba is poorly known thus far.

Key words: *Gomphonema guyabense, Gomphonema curatorum,* taxonomy, new species, waterfalls, mosses, diatom morphology

Introduction

Despite a considerable number of publications, the diatoms of the West Indian Islands are still not well known. Many papers deal with marine or fossil diatoms and studies on freshwater diatoms are mainly from the first half of the 20th century or contain only lists without figures or detailed descriptions. The most important "classical" papers are Østrup (1913, Virgin Islands), Hagelstein (1938, Puerto Rico & Virgin Islands) and Bourrelly & Manguin (1952, Guadeloupe) followed by more recent ones by Podzorski (1985, Jamaica) and Tudesque & Ector (2002, Guadeloupe). Cuba is the largest of these islands, but its diatom flora has hardly been investigated up to the present. Apart from some minor papers, e.g. Toledo (1989, 1992) there is only one more extensive study on diatoms from Cuba, Foged (1984). However, a glance at the plates does not show unusual or striking forms. One reason may be that only a few freshwater samples from the western part of the island have been investigated. But in his introduction Foged (1984: 9) writes "The Cuban freshwater diatom flora must be considered very rich in species on account of the size, the geological age of the island and of the numerous different biotopes in a favourable climate. But as a matter of fact it seems quite unknown up to now". In the present paper two remarkable species of the genus *Gomphonema* are described as new. Together with *Gomphonema insignaffine* E.Reichardt (2009: 164) and *G. krammeri* E.Reichardt (2005: 338), also described from Cuba, they are examples that confirm Foged's statement. A few new species from other genera like *Achnanthidium, Delicata, Encyonema, Encyonopsis* and *Pinnularia* can be found in Metzeltin & Lange-Bertalot (2007).

Material and methods

The new species described below were found in the following sample:

S2450 coll. Reichardt. Salto del Guayabo, elevation 546 m a.s.l. Waterfall in La Mensura National Park south of Mayari, Province Holguín, eastern Cuba. Mosses. Leg. Andreas Müller, 6 September 2003.

The sample was prepared according to standard techniques (*e.g.* Reichardt 2011). After a treatment with dilute hydrochloric acid it was by boiled in sulfuric acid and oxidized with nitric acid. Naphrax and Hyrax were used as

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fissures are very approximate, internally they are rather distant, conspicuously deflected to one side and terminating in an apically elongated central nodule. Other structures like the alveoli, pseudosepta or the unornamented valve mantles are also matching in both species.

Gomphonema guayabense and *G. curatorum* are not only new species that confirm Foged's (1984: 9) statement on the species diversity in Cuba cited in the introduction above, they are also remarkable because of their morphological features. The two species of the genus *Gomphonema* described earlier from Cuba also show unusual morphological details: *Gomphonema insignaffine* has a scattering of smaller holes over the internal opening of the stigmoid and *G. krammeri* bears multiple stigmoids in the central area. Therefore Foged's statement has to be extended: the Cuban freshwater diatom flora is not only very rich in species, but also in species that bear uncommon structures. It should be noted that the new species live in a semi aquatic moss habitat in a waterfall. There are other species of *Gomphonema* described from waterfalls that show uncommon morphological details, *e.g. Gomphonema yucatanense* Metzeltin & Lange-Bertalot (1998: 131) and *G. zairense* Compère (1995: 32) with biseriate areolae or *G. saravathense* Gandhi (1970: 766) and *G. submalayense* Gandhi (1970: 767) with multiple stigmoids.

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