



Taxonomy, distribution and autecology of *Planothidium bagualensis* sp. nov. (Bacillariophyta) a common monoraphid species from southern Brazilian rivers

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Abstract

A new species in the genus *Planothidium* is described, *Planothidium bagualensis* sp. nov., from rivers of the Rio Pardo hydrographical basin, Rio Grande do Sul, southern Brazil. This account is based on light and scanning electron microscopy. This rather common species was misidentified in previous studies conducted in Brazil as belonging to either a group of species related to *Planothidium lanceolatum* and its varieties, or *Planothidium frequentissimum*. The presence of a cavum (“hood”) in the rapheless valve, however, clearly separates it from *P. lanceolatum* sensu stricto which has only a sinus (“rimmed depression”); the wider and longer cells of *P. bagualensis*, besides having ultrastructural differences, sets it apart from *P. frequentissimum*. *Planothidium bagualensis* is widely reported in freshwater environments of southern Brazil. The species reached up to 45% of relative abundance in epilithic samples from eutrophic lotic environments of the Rio Pardo hydrographical basin. Traditional weighted-averaging approaches (WA) were applied to model phosphates (P), chemical oxygen demand (COD), total dissolved solids and pH optima. *P. bagualensis* is formally described and the literature reviewed to delimitate its distribution. Published photomicrographs corresponding to *Planothidium lanceolatum* sensu stricto from South America were up to date only found in the Andean Cordillera (Chile and Bolivia), but until now this taxon has never been illustrated in Brazil.

Key words: Taxonomy, new species, *Planothidium*, *Achnanthes*, Achnanthaceae, morphology, Brazil

Introduction

A recent investigation on type material of *Planothidium lanceolatum* (Brébisson ex Kützing) Lange-Bertalot (1999: 287¹; basionym: *Achnanthes lanceolata* Brébisson ex Kützing 1846: 247) (Van de Vijver *et al.* 2013) called attention to the presence (or absence) of this species in South America. *Planothidium lanceolatum* and its varieties are frequently mentioned from South America, being reported, for instance, from Argentina (Sala 1996, Maidana 2000, Gómez & Licursi 2001), Bolivia (Abbott *et al.* 2000, Morales *et al.* 2010), Brazil (Lobo & Torgan, 1988, Lobo *et al.* 2004, Burliga *et al.* 2005, Ludwig & Bigunas 2006), Chile (Bao *et al.* 1999), Colombia (Ramírez & Plata-Díaz 2008), Ecuador (Carrera Burneo & Gunkel 2003) and Peru (Calizaya-Anco *et al.* 2013).

In Brazil particularly, with the increased use of diatoms as indicators of environmental change (Lobo *et al.* 2004, 2010; Hermany *et al.* 2006, Bere & Tundisi 2010, Salomoni *et al.* 2011, Costa-Böddeker *et al.* 2012) it is mandatory to define precisely the identity of the most common taxa in order to improve the accuracy of the diagnostic tools that rely on diatom taxonomy and ecology. The development of a sound taxonomy, mainly in

1. The Article 11.4 of the ICN International Code of Nomenclature for algae, fungi, and plants (Melbourne Code) (McNeill *et al.* 2012) states that for any taxon below the rank of genus, the correct name is the combination of the final epithet of the earliest legitimate name of the taxon in the same rank, with the correct name of the genus or species to which it is assigned. In our case, *Achnanthidium lanceolatum* was originally described in 1846 by Kützing based on material from Falaise (Calvados department, France). The original transfer of *A. lanceolatum* to *Planothidium* in 1996 by Round & Bukhtiyarova (1996: 352) was declared invalid based on the absence of the publication of the basionym, which was rectified by Lange-Bertalot in 1999. Although at the same year Bukhtiyarova (1999: 94) proposed a new combination of *Planothidium lanceolatum*, the basionym was again incorrect (Kützing 1849 instead of Kützing 1846).

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