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Phenotypic studies on terrestrial stigonematacean Cyanobacteria from the Atlantic Rainforest, São Paulo State, Brazil

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Abstract

The terrestrial cyanobacterial microflora of the Atlantic Rainforest is very rich and particular, occurring among numerous epiphytic plant communities, but also growing on mosses, tree barks, various wooden substrates, rocks, and on soil (mainly lateritic). The diversity of terrestrial populations from the genera *Fischerella* (2 species) and *Stigonema* (7 species), collected in different tropical and subtropical zones of the Atlantic Rainforest is described in this article. One of the *Fischerella* morphotypes was not recognizable according to the available literature, and it was described as a new species (*Fischerella clavata*). Several *Stigonema* taxa are morphologically characterized and further data on their variability and diversity are provided. Three new species are described for the genus *Stigonema* (*S. fremyi*, *S. corticola*, and *S. parallelum*), and one is raised to species level (*S. crassivaginatum*).

Key words: biodiversity, Stigonemataceae, new species, Mata Atlântica

Introduction

The Atlantic Rainforest is one of the most important biodiversity hotspots worldwide considering its high number of endemic taxa and high level of impact (Myers *et al.* 2000). This forest was originally distributed along the entire Brazilian coast, but is now restricted only to fragments preserved in National or State Parks, mainly in southeastern Brazil and includes tropical and subtropical zones (Rizzini 1997). The fragmentation of this biome is related to the intense deforestation brought by urbanization, agriculture, pasture, extractivism, and large tourism companies (Leal & Câmara 2005). Certainly, several habitats had already been destroyed before their biodiversity could be studied.

The cyanobacterial diversity of this biome still remains poorly studied, despite recent species and genera of Cyanobacteria that have been described for this area over the past years (Branco *et al.* 2006, Fiore *et al.* 2007, Sant'Anna *et al.* 2011). However, these new taxa belong to cyanobacterial groups other than the stigonematacean types and only one species of *Stigonema* Bornet & Flahault (1886: 62) (*S. gracile* Silva & Sant'Anna 1988: 393) and one of *Hapalosiphon* Bornet & Flahault (1886: 54) (*H. santannae* Lemes-da-Silva, Branco & Necchi-Júnior 2010: 920) have been described for the Atlantic Rainforest.

During our studies on the terrestrial cyanobacteria from the Atlantic Rainforest, we observed that the genus *Stigonema* and related morphotypes are highly diversified in this area. The knowledge of this diversity, including several possible endemic morphotypes, is very important for future phylogenetic studies on this group in tropical and subtropical regions. Obtaining cultures of these organisms is difficult (Hoffmann *et al.* 2005), and this is the main reason why the phylogenetic relationships among the *Stigonema*-like types are still

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