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A new species of the genus *Mallomonas* (Synurales, Chrysophyceae), *Mallomonas fimbriata*, *sp. nov*.

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Abstract

Mallomonas fimbriata, *sp*. *nov*. is described from bog pool, located in Cam Ranh Peninsula, Khanh Hoa Province, Central Vietnam. The description is based on silica-scale morphology studied by means of transmission and scanning electron microscopy. New species has 3 types of scales: oval body scales, caudal ones with robust, long, forward pointing spines and elongated, widened to distal part apical scales. Scales are thick, 3-layered, with inner reticulation. *Mallomonas fimbriata* and the similar *M*. *fenestrata* form a special group with unique features of scales structure close to the sections *Retrorsae* and *Quadratae*.

Introduction

Mallomonas Perty (1852: 170) represents the most diversified genus of the order Synurales. It is comprised of approximately 180 taxa species and infraspecific taxa according Kristiansen & Preisig (2007). The real diversity of the genus is unknown and probably strongly underestimated (Němcová & Kreidlová 2013, Škaloud *et al*. 2013). Investigations of the silica-scaled flagellates in some tropical Asian countries such as Malaysia (Dürrschmidt & Croome 1985, Neustupa & Řezáčová 2007), India (Saha & Wujek 1990, Wujek & Saha 1996), Sri-Lanka (Dürrschmidt & Cronberg 1989), Bangladesh (Takahashi & Hayakawa 1979), China (Wei & Yuan 2001) revealed a fairly rich tropical flora, including endemic taxa and unidentified scales. At the same time synurophycean algae in this huge region are still poorly studied. During intensive floristic investigations in East Asia, including North and Central parts, eight new species of the genus *Mallomonas* were described (Kim & Kim 2008, 2010, Jo *et al*. 2013, Ma & Wei 2013, Gusev & Kulikovskiy 2013, Kim *et al*. 2014). Our previous floristic investigation in Vietnam revealed diverse flora of synurophytes and allow describe two new species of the genus *Mallomonas* (Gusev & Nguyen 2011, Gusev 2012, 2013). The purpose of this study is to describe one more species—*Mallomonas fimbriata*, *sp*. *nov*.

Materials and methods

The bog pool (12° 04' N, 109° 11' E) from which the specimens were collected is located in Cam Ranh (Cam Ranh) Peninsula, Khanh Hoa (Khánh Hòa) Province, Vietnam. Samples were taken in May and June 2012. This area has a tropical monsoon climate. The average annual temperature ranges between 25–28 °C, the relative humidity is between 80–94%, the annual precipitation is 1800–2100 mm, and the annual evaporation is 1000–1200 mm. Plankton samples were taken using plankton net (mesh size 20 μm). For electron microscopy studies an aliquot of each sample was washed by repeated centrifugation in deionized water. Drops of the washed sample were dried or digested in sulfuric acid with potassium dichromate. For SEM studies samples were placed on the SEM stub and coated with gold for 10 minutes. SEM observations were carried out with JEOL 6510 LV scanning electron microscope. For TEM studies formvar coated grids (EMS FF200-Cu-50, Electron Microscopy Sciences) were used and observations were made on JEM-1011. Water mineralization, pH and temperature measurements were performed using the Hanna Combo (HI 98129) device, Hanna Instruments, Inc., USA.

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characters, that *M. fimbriata* and *M. fenestrata* form a distinct lineage close or included to this group (clade). Siver (1988) discussed the relationship between *M. retrorsa* and *M. fenestrata* and assumed that *M. fenestrata* should be included to the section *Retrorsae* if it has backwards orientated scales. Although whole cells with flagella were not found for *M. fimbriata* and backwards orientation of the scales was not confirmed, it is logic now to transfer it along with *M. fenestrata* to section *Retrorsae* because of the type of scales and structure similarity with *M. retrorsa*.

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