

***Muriella australis* J. Phillipson (Chlorophyta), a new species for the algal flora of Bulgaria**

Ivan Kirilov Kiryakov¹ & Katya Naneva Velichkova²

¹ Department of Botany, Paisiy Hilendarski University of Plovdiv, Plovdiv, Bulgaria.

² Department of Biology and Aquaculture, Agricultural Faculty, Trakia University, Stara Zagora, Bulgaria

Resumen

Correspondence

K.N. Velichkova

E-mail: genova@abv.bg

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Muriella australis J. Phillipson (Chlorophyta), una nueva especie para la flora de algas de Bulgaria

Se cita una nueva especie de alga para Bulgaria. Esta rara especie (sólo conocida su *locus classicus* de Australia, aislada de suelo) se ha encontrado también en los montes Rópode, en la capa aerofilica del lecho de las fuentes de la villa de Slaveyno (provincia de Smolyan). Se ha extendido la diagnosis de la especie. Se ha realizado una revisión de la especie y del género.

Palabras clave: *Muriella*, Nueva cita, Algas raras, Bulgaria.

Abstract

A new species and genus *Muriella australis* for the algal flora of Bulgaria are reported in this article. This rare species (known only from *locus classicus* in Australia, isolated from soil) was discovered also in Rhodope Mountains, Bulgaria in aerophilic coating on the bed of the fountains in village Slaveyno (Smolyan district). The diagnosis of the species was extended and expanded. A review of the species to the genus concerned was accomplished.

Key words: *Muriella*, New record, Rare algae, Bulgaria.

Introduction

Six species belong to the genus *Muriella* Petersen: *Muriella aurantica* Vischer, *Muriella australis* J. Phillipson, *Muriella magna* Fritsch et John, *Muriella decolor* Vischer, *Muriella zofingiensis* (Dönz) Hindák and *Muriella terrestris* Petersen.

Later, some species have dropped out of the genus. This was the case with *Chlorella zofingiensis* Dönz., which Hindák (1982) added to the genus under the name *Muriella zofingiensis* (Dönz) Hindák. Afterward, Kalina & Punčochárová (1987) argued for the transfer this species

to the genus *Mychonastes* Simpson & Van Valkenburg, based on their observations from scanning electron microscopy. Fučíková & Lewis (2012), however, resurrected the genus *Chromochloris* Kol & F.Chodat and relate *M. zofingiensis* to the synonyms of *Chromochloris zofingiensis* (Dönz) Fučíková & Lewis and proposed the transfer of *M. zofingiensis* to the genus *Chromochloris*.

According to Hindák (1982), *M. aurantiaca* Vischer was synonymized with *M. zofingiensis* (Dönz) Hindák, but it has since been demonstrated that *M. aurantiaca* belongs to a separate chlorophycean genus, *Pseudomuriella* Hanagata

(Hanagata 1998, Fučíková *et al.* 2011).

The species *M. terrestris* is polytypic. It is relatively uncommon. So far, it has been reported only in Southern Europe: Italy (soil; pine forest in Brixen, South Tyrol), Croatia (soil in Lavsa Island). Two forms of it were described: f. *majculata* Broady and f. *major* Bourrelly, as well as var. *reticulata* Broady known only from its classical field Vestfold Hills, Antarctica, isolated from amongst moss plants with an abundant epiphytic growth of *Nostoc* sp. (Bourrelly 1966, Broady 1982).

The species *M. decolor* is a typical aerophytic alga but, in Antarctica, it was found for the first time growing in a soil habitat (Andreeva 1998).

According to Andreeva (1998), the species *M. magna* is also of unknown status. But according to other authors, the species belongs to the genus *Chromochloris* (Day *et al.* 1995, John & Tsarenko 2002, Tsarenko 2011).

M. australis was described by Phillipson (1935) in Australia and New Zealand. Its classical field is in the Victoria state where it was isolated from soil (aerophilic form) (Komárek & Fott 1983, Day *et al.* 1995, Ettl & Gärtner 1995, Andreeva 1998).

The object of the manuscript is to describe the morphological characteristics of *Muriella australis* J.Phillipson, which is a newly found species for the algal flora of Bulgaria.

Material and Methods

We came upon this very rare and interesting algae on 27.10.2012. It was evolving among aerophilic coating on the concrete bed of "Kumchovska fountain" in the village Slaveyno (41°37'52.72"N, 24°51'43.55"E), Rhodope Mountains, located about 1050 masl.

The coating, which is constantly wet from the spray of the water flowing from the fountain, was grass green. The dominant species in that coating was the filamentous green alga *Klebsormidium crenulatum* Kütz. As subdominants we identified three types from Cyanophyta: two filamentous *Oscillatoria* sp., *Lyngbya* sp., and a cocal *Gloeocapsa* sp. Very rarely cells of *Staurastrum* sp. (Chlorophyta) were observed.

Studies were conducted on living material from the field immediately after collection (time

from 28.10 to 10.11.2012). The collected material (13 samples) was examined on a light microscope Olympus CX31 at the Department of Biology and Aquaculture at the Trakia University.

Morphological features were recorded on the basis of this alga material and relevant literature sources (Komárek & Fott 1983, Ettl & Gärtner 1995).

In this coating, *M. australis* was thoroughly developed represented by both vegetative and reproductive cells-forming autospores.

Results

Since the diagnosis made by the author of the species is very brief, and presented iconography (Phillipson 1935) represents only globular cells, we believe that the diagnosis should be further completed with data from the population of the village Slaveyno (Smolyan), Bulgaria.

Young cells (and autospores) were slightly oval or ovoid, and the old ones were globular.

The autospores were 10-13 X 7-11 µm of size and they had (3)-4-(5) chloroplasts. The size of old cells was 10-21 µm, some of them forming autospores reached 29 µm, which exceeded by far those in the diagnosis (Phillipson 1935). According to Komárek & Fott (1983) the cells are spherical with parietal disc-shaped chloroplast. In our samples, most of the old cells contained up to 13 (rarely more) chloroplasts with polygonal borders, arranged close to the wall (Fig. 1A). The cells were uninucleate. The cell wall was smooth, and become thicker in old cells. In some cells, a bubble swelling of the wall, described by Phillipson, resulting from the peeling of the outer layer (Fig. 1B) was found. In the population from Bulgaria, the species also reproduced by autospores. Their number was usually 8, but there were findings with 2-4, and rarely 16 autospores (Fig. 1C).

Most species of the genus *Muriella* were isolated from soil (Ettl & Gärtner 1995, Andreeva 1998), so aerophilic algal coating is a new type of habitat for the species discussed in this article.

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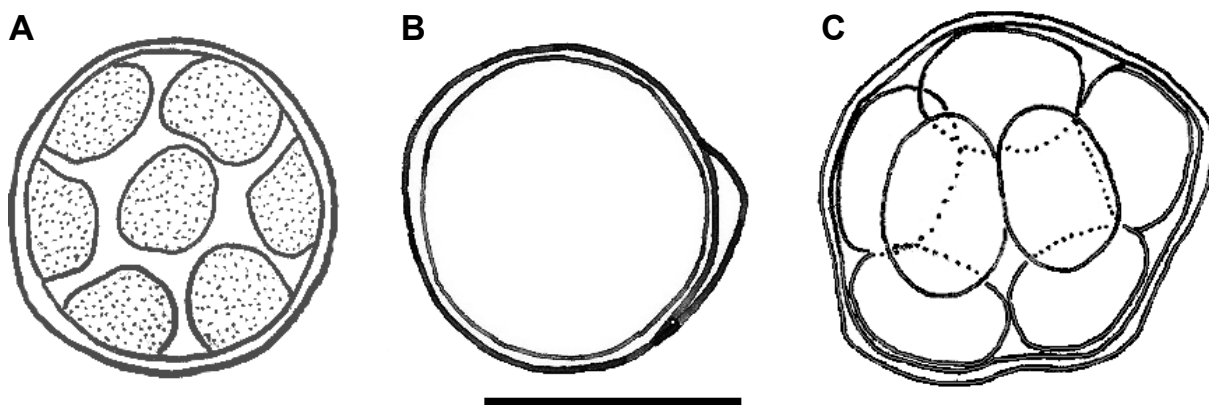


Figura 1. *Muriella australis*. **A:** Célula vegetativa con cloroplastos; **B:** Abultamiento en la pared; **C:** Autoesporas en célula reproductora. Barra de escala: 20 μm .

Figure 1. *Muriella australis*. **A:** Vegetative cell with chloroplasts; **B:** Bubble swelling of the wall; **C:** Autospores in reproductive cell. Scale bar 20 μm .

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