

**DESCRIPTION OF TWO NEW TAXA OF THE GENUS *AMPHIKRIKOS*
KORSHIKOV (CHLOROPHYTA) FROM BULGARIA**

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Abstract: In the paper are described and pictured two new species from genus *Amphikrikos* - *A. tetragranulata* sp. nova, from fishpond near village Mechka - Rousse district, Bulgaria and *A. bicingulus* sp. nova from fishpond near to Plovdiv - Bulgaria. The first new found algae species can be distinguished from other species of the genus by its four large long strip-like granules arranged parallel two by two, inclined relative to the long axis of the cell, and the second with two parallel sash of small granules.

Key words: *Amphikrikos*, morphology, new taxa, taxonomy

Introduction

The chlorophycean genus *Amphikrikos* Korshikov includes solitary nanoplankton with typically arranged incrustations on the cell wall surface (Krienitz, 1998). The genus *Amphikrikos* was originally described with one species - *A. minutissimus*. Later three other species were established (Hindák 1977, 1988; Komárek & Fott 1983). The genus was considered by Korshikov (1953) as a member of the Oocystaceae family, but Hindák (1977) and Komárek & Fott (1983) placed it in the family Chlorellaceae on the basis, that the mother cell walls do not markedly expand before liberation of autospores (Hindák & Hindáková, 2008).

Researching algae flora in the basins of the fish pond near village Mechka - Rousse district (August – September, 2014) and fish pond near Plovdiv (July, 2014) we found interesting algae species. This paper report on the morphology of two species of the genus *Amphikrikos* Korshikov. The description of two new found species is therefore given. Compared to other species of genus, these species are characterized by a different arrangement of incrustations on the cell wall.

Material and methods

Surface water samples were collected from the fish pond village Mechka (43°69'466"N 25°75'463"E) and fish pond near Plovdiv, Bulgaria (42°11'073"N 24°45'124"E) during the summer months. A plankton net of 10 µm mesh size was mostly used for phytoplankton samplings. The scooped samples were fixed with formaldehyde and allowed to stand undisturbed for 24 hours. A plastic tube was used to siphon off the phytoplankton concentrated at the bottom of sample bottle. During the review of material collected by two fish ponds we came across an interesting species of the genus *Amphikrikos*. Morphological observations were conducted under light microscope Olympus CX31 in the Department of Biology and Aquaculture at the Trakia University.

Results and discussion

The new found algae species can be distinguished from other species of the genus (Komárek & Fott, 1983; John et al., 2002) by its four large long strip-like granules arranged parallel two by two, inclined relative to the long axis of the cell. Similar long strip-like granules in the genus have two species - *A. buderi* (Heynig) Hindák and *A. hexacostata*

(Thompson) Hindak. The both species, apart from the long granules, as opposed to our species have a crown of small granules of the two poles (Heynig, 1961; Hindak, 1977; Komarek & Fott, 1983).

The features of the found materials and in the first place the number, shape and location of the granules gives us reason to point out as a new species, on which give the name:

Amphikrikos tetragranulata sp. nova

The species has a wide ellipsoidal cells with widely rounded poles; bearing the four relatively large (2.0 – 2.6 μm long, 0.8 – 1.5 wide) strip-like brown colored granules (fig. 1. a, b), arranged parallel two by two, inclined relative to the long axis of the cell in opposite directions, in some individuals one or two granules are not well developed (fig. 1. e, f); the chloroplasts are 2 (rare 1), lateral plate with pyrenoid, without mucosa (fig. 1. c, d). Reproduction - by auto spores which are formed on 4 or 8 into cell (fig. 1. h, i, j).

The cell size is 5.7 – (7.0) – 9.0 μm long and 3.1 – (4.4) – 6.2 μm wide (fig.1); the cells forming autosporas are 9.3 – 10.9 μm long and 5.2 – 6.2 μm wide (fig.1 h, i, j).

Habitat: Bulgaria – in the plankton of the fish pond near Mechka - Rousse (locus classic). The cells floating freely in the water, in August - September 2014.

The species name comes from the algae number of granules.

Diagnosis: Cellulae singulae, ovalis, sine tunica mucosa libere natanthes; polis latae rotundatis quaterna magna (2.0 – 2.6 μm longa 0.8 – 1.5 μm lata) granula brunea colorata habent quae in duobus partibus disposita, paralella alterum alteri et diclinata parti aequatoriali sunt; choroplastides una sive duae laminiformes parietalis cum pyrenoido; autosporis multiplicatur quae guaternis sive octonis formatur.

Dimensiones: Cellulae 5.7 – (7.0) – 9.0 μm longae et 3.1 – (4.4) – 6.2 μm latae; cellulae quae autosporas formatur 5.2 – 6.2 μm latae et 9.3 – 10.9 μm longae sunt.

Habitat (locus classicus): in piscine vico Metschka prope urbo Rousse (Bulgaria). Cellulae libere natantes inter alias algas planctonicus, VIII – IX 2014.

Typus: Fig. nostra 1

Researching the algal flora of fish pond near Plovdiv, Bulgaria (July, 2014) we found an interesting algae which identify as a new species of the genus *Amphikrikos*. Its cells are oval and have two sash parallel belt formed by several rows of small yellow-orange granules (fig. 2). In reference for genus *Amphikrikos* (Hindak, 1977; Komarek & Fott, 1983; John et al., 2002) it turned out that no similar species - with two parallel sash of small granules. This gave us reason to think that it is a new species, on which we give the name:

Amphikrikos bicingulis sp. nova

Single freely floating in the water, oval with widely rounded ends cells. Cells wall hyaline two wide sash (formed from arranged in a 4-5 rows, numerous small yellow-orange granules), which are located on both sides of the equatorial part (fig. 2). Protoplast and reproduction were not observed.

The cells size are 7.8 – 9.4 long and 6.2 – 7.0 wide.

Habitat: Bulgaia - in the plankton of the fish pond - Plovdiv (locus classic). The cells floating freely in the water, very rare in July 2014.

The species name comes from the two sash of granules.

Diagnosis: Cellulae libere natanthes, ovalis cum polis latae rotundatis sine tunica mucosa; paries cellularum duobis cingulis granulorum, quae dense diposita aurantia colorata sunt (fig. 2). Propagatio non observatur.

Dimensiones: Cellulae 7.8 – 9.4 long and 6.2 – 7.0 late.

Habitat (locus classicus): in plancto piscine prope urbo Plovdiv (Bulgaria). Cellulae libere natantes inter alias algas planctonicus – raro, VII 2014.

Typus: Fig. nostra 2

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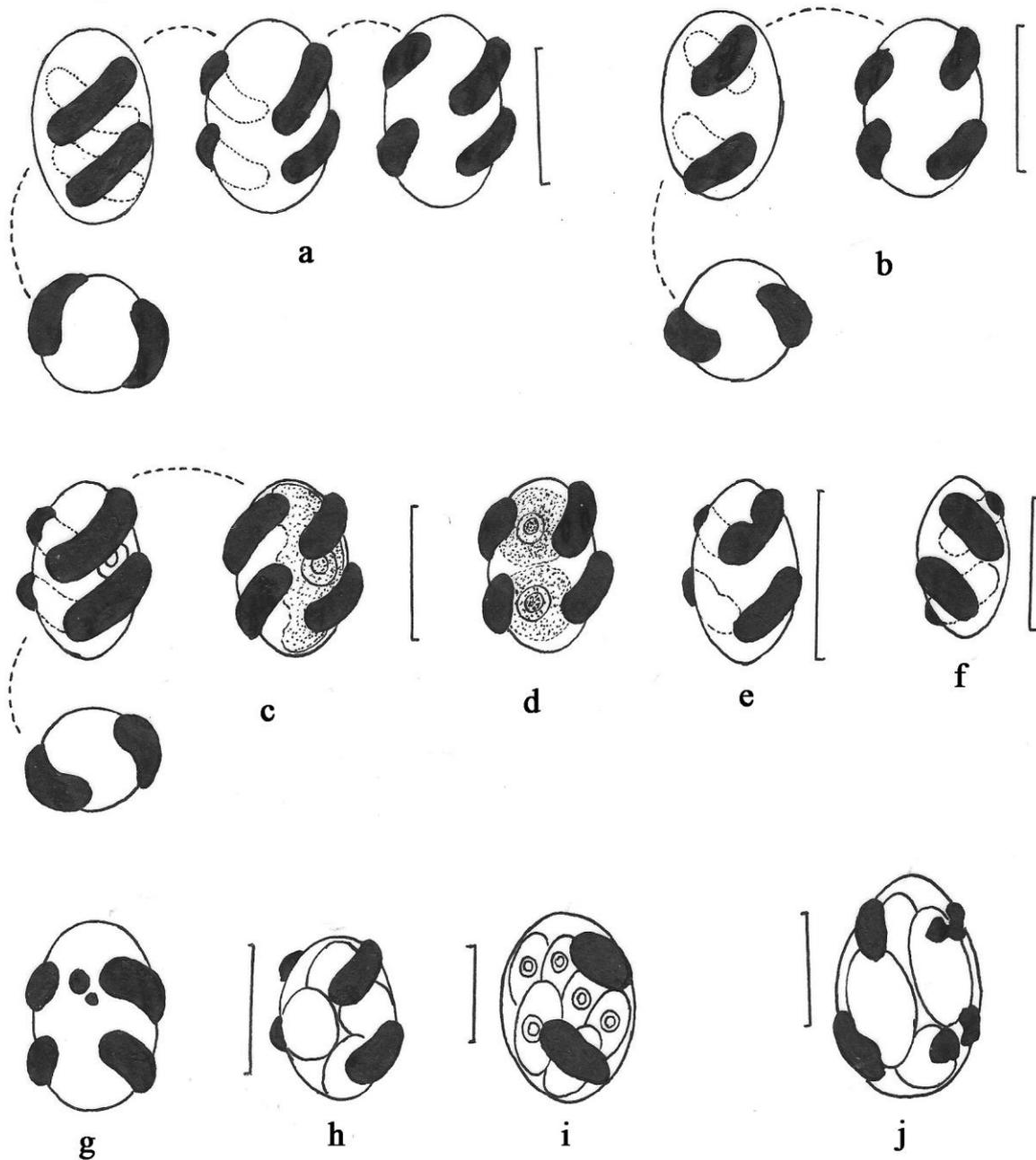


Fig. 1. *Amphikrikos tetragranulata* sp. nova: 1. a, b – cell with granules viewed from different directions; c – cell with 1 chloroplast; d – cell with 2 chloroplast; e, f – cell with slightly pointed poles; g – cell with additional granules; h, i, j – cell with autospores (scale bar 5 μ m).

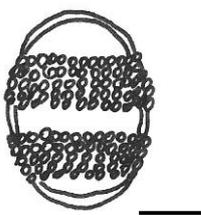


Fig. 2. *Amphikrikos bicingulis* sp. nova (scale bar 5 μ m).