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Research Article

A NEW SPECIES EUDORINA EHRENBERG (VOLVOCACEAE, CHLOROPHYTA) FROM BULGARIA

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ABSTRACT

From a small ephemeral basin in Plovdiv (Bulgaria) were found and described a new species of the genus *Eudorina* (Chlorophyta, Volvcoales) - *E. plurivacuolata* sp. nov. The closest to the newly described species are *Eudorina unicocca* and *Eudorina elegans*.

Keywords: *Eudorina*, Chlorophyta, new taxa

INTRODUCTION

Eudorina is a genus of colonial green algae from family Volvocaceae. *Eudorina* colonies consist of 16, 32 or 64 individual cells grouped together. Each individual cell contains flagella which allow the colony to move as a whole when the individual cells beat their flagella together¹. There are 16 species (and infraspecific) names in the database at present, of which 6 have been flagged as currently accepted taxonomically. According another authors *Eudorina* is a cosmopolitan volvocacean genus, comprising about eight species^{2,3}.

MATERIAL AND METHODS

In the spring of 2012 (April) we came across a "bloom" in ephemeral basin remained in the marble bowl in the Ancient Theatre of Plovdiv, Bulgaria (42°08'490"N 24°45'039"E). The water layer was about 3 cm deep in grassy green "bloom". The study of the material collected was performed with a microscope "Olympus CX31" in the department "Biology and Aquaculture" in Trakia University. In collected material relatively rarely found colonies of species of the genus *Eudorina*, which attracted our attention with the given below important in the taxonomy of the genus characteristics.

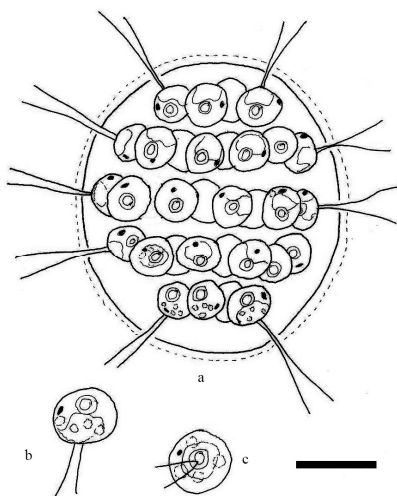
RESULTS AND DISCUSSION

The colonies are with 32 identical by size and functions cells covered by a thin (some "wrinkled") mucous

envelope. The cells are spherical or slightly oval, cup-shaped chloroplast with an equal edge, small in the middle of the cell stigma and a pirenoid (very rarely some of the cells have 2 pirenoids). The flagella long up to 25 µm. The contractile vacuoles are four (rarely more) located on the front end of the cell in the basis of flagella. The above listed, important in the taxonomy of the genus, features give us reason to give of the newly described taxon rank of species under the name: *Eudorina plurivacuolata* sp. nov. (Figure 1). The closest to the newly described species are *Eudorina unicocca* G. M. Smith⁴ and *E. elegans* Ehrenberg⁵⁻⁷ (Table 1). *Eudorina plurivacuolata* are distinguished from *E. unicocca* by the following features: 1. The contractile vacuoles in the newly described species are 4 (rarely 5-6), while in *E. unicocca* is 1 (rare 2); 2. The chloroplast in *E. plurivacuolata* is with smooth edge, and in *E. unicocca* - serrated edge. *Eudorina plurivacuolata* are distinguished from *E. elegans* by: 1. Number of pirenoid in the newly described species is one (very rare two), while in *E. elegans* - one in young and up to 5 in the old cells; 2. The contractile vacuoles in the species found in Bulgaria are 4 (rarely 5-6), and in *E. elegans* are two; 3. The size of eyespot in *Eudorina plurivacuolata* - small, the same in all cells of the coenobia, while in *E. elegans* - large eyespot in front cells and gradually smaller in the cells from the rear end; 4. The absence of mucous envelope in *E. elegans*

Table 1: A comparison between *Eudorina unicocca* G. M. Smith, *E. elegans* Ehrenberg and *E. plurivacuolata* sp. nov.

	<i>E. unicocca</i> G.M. Smith	<i>E. elegans</i> Ehr.	<i>E. plurivacuolata</i> sp. nov.
Coenobia shape	ellipsoidal, ovoid to spherical with mucous envelope	ellipsoidal to spherical without mucous envelope	ellipsoidal (rare spherical) with a thin (some "wrinkled") mucous envelope
Coenobia size	60-130 X 50-160 µm	60 - 200 µm	50-83 X 50-80 µm
Number of cells in coenobia	16-32	32 (rarely 16 or 64)	32
Cells shape	Spherical (or a slightly oval)	Spherical (or ellipsoidal)	Spherical (or a slightly oval)
Cells size	5,5 -18,0 µm in the front cells are slightly smaller	(12) 16 - 24 µm all cells are equally large	8,8 - 15,0 µm in the front cells are slightly smaller
Chloroplast	cup-shaped with serrated edge	cup-shaped with smooth edge	cup-shaped with smooth edge
Eyespot	small in the front half of the cell	small in the rare half of the cell	small in the all cell
Pyrenoid	1	1 in young (up to 5 in old cells)	1 (very rarely 2)
Contractile vacuole	1-2	2	4 (and more)

**Figure 1: *Eudorina plurivacuolata*: a - colony, b - cell lateral view, c - cell top view (scale 10 µm)*****Eudorina plurivacuolata* sp. nov. (Figure 1)****Description**

Colonies, spherical or slightly elongated composed from 32 spherical cells, as the front cells are slightly smaller with a firm wall, with mucous envelope; the colonies 50 - 83 µm length, 48 - 80 µm width; cells 8,8 - 15,0 µm in diameter; flagella til 25 µm longs, passing through the colonial envelope; chloroplast single, cup-shaped, filling the whole cell; pyrenoid one (very rare 2); eyespot small, in the first part of the cells.; nucleus more or less central; 4 (and more) anterior contractile vacuoles.

Type locality

Bulgaria - Plovdiv Antique theatre (locus classicus), ephemeral basin in the spring (18.04.2012; 42°08'490"N 24°45'039"E).

REFERENCES

1. Smith GM. Phytoplankton of Inland Lakes of Wisconsin, Part I, Wisconsin Geological and Natural History Survey, Madison, WI; 1920.
2. Goldstein M. Speciation and mating behavior in *Eudorina*. J. Protozool 1964; 11: 317-334. <http://dx.doi.org/10.1111/j.1550-7408.1964.tb01762.x>
3. Nozaki H, Krienitz L. Morphology and phylogeny of *Eudorina minodii* (Chodat) Nozaki et Krienitz, comb. nov. (Volvocales, Chlorophyta) from Germany. Eur. J. Phycol 2001; 36: 23-28. <http://dx.doi.org/10.1080/09670260110001735158>
4. Smith GM. A consideration of the species of *Eudorina*. Bull Torrey Bot. Cl 1931; 57: 359-364.
5. Dedusenko-Ščegoleva NT, Matvienko AE, Škorbatov LA. Volvocineae. In: Opredelitel Presnovodnich Vodoroslej SSSR t. 8, Izdat. A. N. SSSR, t. 8, Izdat. A. N. SSSR, Moskva Leningrad; 1959.
6. Huber-Pestalozzi G. Volvocales. In: Das Phitoplankton des Subwassers. 5 T., Sweicerbart, Stuttgart; 1961.
7. Ettl H, Chlorophyta I. Phytomonadina in Suswasser flora von Mitteleuropa, Band 9: WEB Gustav Fischer Verlag Jena; 1983.

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