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, Volvocales) - 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 together⁷. 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 species⁸,⁹.

MATERIAL AND METHODS
In the spring of 2012 (April) we came across a "bloom" in an 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 pireoid (very rarely some of the cells have 2 pireoids). 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 Ehrenberg⁴,⁵ (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 pireoid 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.

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

**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**

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