

# TAXONOMICAL STUDY OF PLANKTONIC DIATOMS IN THE MARINE LAKE (ROGOZNICA, EASTERN ADRIATIC COAST)

Jelena Godrijan<sup>1\*</sup>, Zrinka Burić<sup>1</sup>, Koraljka Kralj<sup>1</sup>, Marija Gligora<sup>1</sup>, Katarina Caput<sup>1</sup>, Eva Acs<sup>2</sup>, Keve Kiss<sup>2</sup>, Irena Ciglenečki<sup>3</sup>

<sup>1</sup>University of Zagreb, Faculty of Science, Rooseveltov trg 6, Zagreb HR-10000, Croatia, E-mail: zburic@biol.pmf.hr

<sup>2</sup>Hungarian Danube Research Station of the Inst.Ecol.Bot. of Hung.Acad.Sci., Jávorka S. u.14, Göd. H-2131, Hungary

<sup>3</sup>Rudjer Boskovic Institute, Center for Marine and Environmental Research, Zagreb, Croatia; temporary address: 1145 Budapest, Torontal u.34, Hungary

We investigated phytoplankton composition, abundance, as well as temporal and spatial distribution in the naturally eutrophicated and periodically anoxic marine Lake Rogoznica (Fig 1) in the period from April 2004 to March 2005. The research provided first data on nanophytoplankton. The lake is karstic and stratified, with regard to temperature and salinity (Fig 2). The layer below the halocline (6-7 m) has low oxygen saturation and high sulphur concentration. The phytoplankton cells were identified using inverted microscope (Zeiss Axiovert 200). Extreme ecological conditions resulted in low species diversity with high abundance.

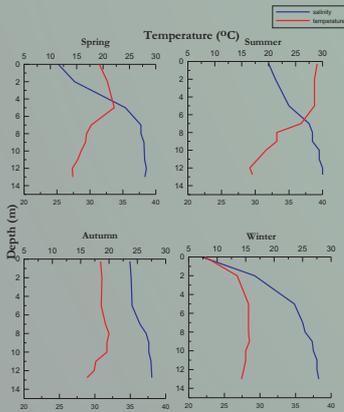


Figure 2. Temporal and vertical distribution of temperature and salinity in the lake (2004/2005).



Figure 3.



Figure 4.



Figure 5.

The recognizable nanoplankton community was composed of the following higher taxa: diatoms, dinoflagellates, coccolithophorides, cryptophytes and green flagellates. Pennate diatoms dominated the community in summer and late autumn with maximum abundance along the halocline. Centric diatoms were present throughout the year in the whole water column, with maximum development in winter. The scanning electron microscope (HITACHI S-2600-N) provided evidence on the pennate diatoms *Brachysira aponina* (Fig 3) and *Thalassionema nitzschioides* (Fig 4, 5) and centric diatoms *Podosira* sp. (Fig 6), *Hyalodiscus* sp. (Fig 7), *Thalassiosira* sp. (Fig 8, 9) and one unidentified species (Fig 10). The morphometric parameters of species are summarized in

Table 1. Morphometrical parameters of investigated diatoms.

Genus	<i>Brachysira</i> (Fig 3)	<i>Thalassionema</i> (Fig 4, Fig 5)	<i>Podosira</i> (Fig 6)	<i>Hyalodiscus</i> (Fig 7)	<i>Thalassiosira</i> (Fig 8)	<i>Thalassiosira</i> (Fig 9)	Unidentified centric (Fig 10)	
Valva	Navicularid, 31 µm long, 3 µm wide, raphe straight, external corner endings slightly expanded, axial area very narrow, weak lamellating towards the valve centre	Narrow-linear, parallel sides and blunt rounded ends, hexagonal, arrow-head shaped spine at one pole, 11 µm long, 3 µm wide	Diameter: 11, thick, hemispherical	Diameter: 25 µm, thick, circular, wavy-hemispherical, smooth edges, areolae arranged in rows, axilla open to the outside with circular pores, axilla not perforated	Diameter: 22 µm, circular with flat valve face, axilla open to the outside with circular foramina	Diameter: 25 µm, circular with flat valve face, thick	Diameter: 8 µm, circular with serrated edges, long fulguriferous tubes scattered over the whole of the valve	
Chain	-	Mostly two cell zig-zag chain	-	-	-	-	-	
Labiate process	-	Interaxial, at valve pole, club-like	Small oval structures, regularly scattered over the whole of the valve	One ring of simple marginal processes (2)	?	Simple openings, scattered over the whole of the valve	?	
Serrated processes	-	-	-	-	-	? Marginal, simple inside openings	Inside openings; central tube with 4 satellite pores	
Relationship between marginal areolae/ processes and central/ interaxial	-	-	-	Every 8-10 central 1 labiate process	-	-	-	
Areolae	Uniseriate striae	Marginal areolae, interaxial striae internally open with small openings	Areolae arranged in decussate rows within radial sector	Areolae open to the inside by round pores, at center area the areolae openings are missing	Areolae are smaller on the valve mantle, arranged in arcs	Areolae hexagonal pattern	Canals in regular rows	
Presence of marginal chambers	?	?	-	-	?	-	Large, oval, 4-6 chambers between two serrated processes	
Striae in 10 µm	37-39	9-10	-	35	-	-	-	

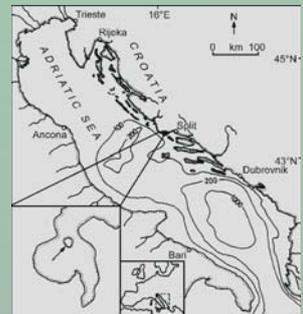


Figure 1. Map of investigated area.

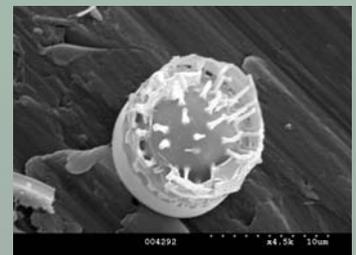


Figure 10.



Figure 9.

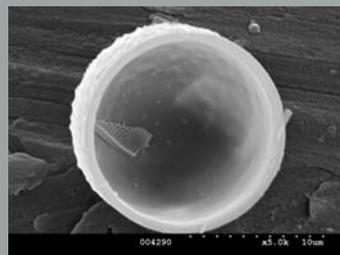


Figure 6.

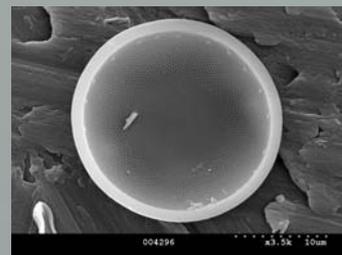


Figure 7.

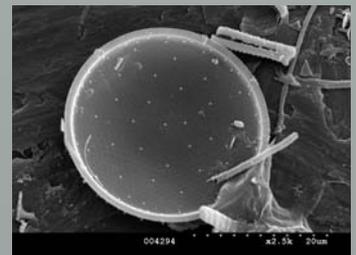


Figure 8.