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ORIGINAL ARTICLE

PRELIMINARY ASPECTS CONCERNING PHYTOPLANKTON STRUCTURE IN THE BALTA MARE – CARJA 1 FISH FARM*

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The present paper presents information on the structure and the dynamics of the water ecosystem's phytoplankton of the Carja 1 fish farm - Vaslui County, carps and Asian cyprinids are grown as common fish.
To establish the structure and the dynamics of the phytoplankton, two samples from 6 stations were taken in the spring and in the autumn, using of a Garmin GPS 7- type navigation system.
When analysing the number of individuals and the algae species present in the phytoplankton's structure, one can notice the low development level of the vegetable plankton.
From the quantity point of view, one can notice the numerical abundance of the clorophyceae in all the analysed samples. The dominant species were: *Scenedesmus acuminatus, Scenedesmus quadricauda, Tetrastrum staurogenieforme.* The small number of species and algae specimens determined in the phytoplankton's structure emphasizes the reduced level of trophicity and biodiversity of the analysed ecosystem.

Keywords: phytoplankton, species, density, abundance, ecosystem.

1. Introduction

In the aquatic ecosystems, the vegetable plankton (phytoplankton) represents the dominant primary producer of organic matter.

The specific structure of the algae populations, the domination of a systematic group and the level of quantitative development depend on the type and size of the fish basin, on its location and on the thermic conditions, on the chemical composition, on the biotop's trophic level, on the specific seasonal conditions, on the pollution influence etc.

The development of the vegetable plankton was analysed in Balta Mare of the Carja 1 fish farm, in the Murgeni area, Vaslui County, having as guide mark the road DNE581.

The basin has a 297 ha surface and a depth between 90 and 140 cm.

During autumn, 20% of the water is being evacuated together with the fish and the biological material. After fishing, water from the Prut river- the source, is being used to complete the water tank's level.

2. Materials and methods

In 2008 biological characteristics of the Balta Mare ecosystem were being analyzed. To establish the phytoplankton's structure and dynamics they prelevated two sets of biological samples, in spring (26th of May) and in autumn (13th of October) from 6 stations established with the help of a Garmin GPS 72-type navigation system, numbered C1-C5, C6A-E (feeding and evacuation), Figure 1. The phytoplankton samples were prelevated from the superficial horizon in 500 ml bottles, were immediately fixed with Lugol's solution in a ratio of 1:100 (1 ml of solution for 100 ml of sample). The samples were processed after a previous concentration through centrifugation at 1200 rotations

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per minute. The vegetal plankton was analysed from a qualitative (the number of individuals and species) and quantitative (the density and the numerical abundance) point of view.

Figure 1. Points of prelevation from Balta Mare (Carja 1 fish farm) - Romania

3. Results and discussions

In the spring samples the number of specimens varies between 576 exemplars /ml in the C4 station and 3040 exemplars /ml in the C1 station. In the phytoplankton's structure the reduced number of species was emphasized, precisely 21 taxons. From a quantitative point of view, the clorophyceae (32.3-79%) predominate with the species of *Scenedesmus acuminatus, Scenedesmus quadricauda, Tetrastrum staurogenieforme*

A great percentage in the algae biomass had also the euglenophyceae (31.3-53%) with the species of*Euglena acus, Euglena Viridis* (Figure 2), *Euglena tripteris, Trachelomonas armata*.

Isolated, the cianophyceae were noticed with the species of *Merismopedia punctata* and *Merismopedia glauca.*

The number of specimen has been maintained in relatively constant limits in the samples since October between 760-1596 ex/ml, the majority being the clorophyceae: 17-74% with the species of *Scenedesmus acuminatus, Trachelomonas armata, Crucigenia tetrapedia* (figure 3 and figure 4) and the euglenophyceae: 19-36%, (Table 1).

Figure 2. *Euglena viridis,* original foto

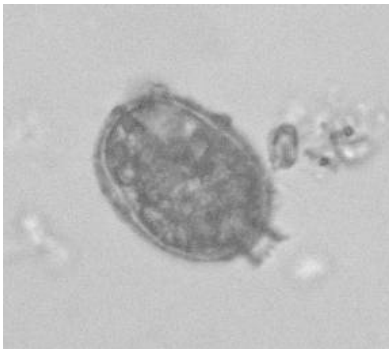


Figure 3. *Trachelomonas armata,* original foto

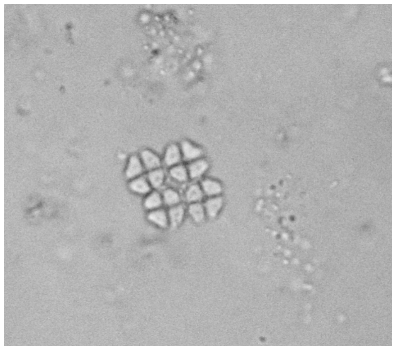


Figure 4. *Crucigenia tetrapedia,* original foto

In the graph representation in figure 5 one can notice that the phytoplankton is present in all the stations during the entire vegetative season, manifesting certain proportionality as far as the numerical

density in the 6 studied stations is concerned. The maximum values registered by the algae species in spring are at the C1 station and in autumn at the C5 station. In the graphics system in figures 6 and 7, from a quantitative point of view, one can notice the numerical abundance of the chlorophyceae in all the analysed samples.

Table 1. Structure phytoplankton in the Balta Mare – Carja 1 fish farm

Station	Date	No. ex/ml	The relative numerical abundance %					The dominat species
			Cyano -phyta	*Pyrro- phyta*	*Euglen o-phyta*	*Bacillario- phyta*	*Chloro- phyta*	
C1	26.05	3040	5	0	16	9	70	*Scenedesmus acuminatus S. quadricauda*
	13.10	1178	0	10	0	16	74	*Crucigenia tetrapedia Scenedesmus acuminatus*
C2	26.05	1824	0	0	31.3	8.3	60.4	*Scenedesmus quadricauda Euglena viridis*
	13.10	760	5	0	25	30	40	*Scenedesmus quadricauda Trachelomonas armata*
C3	26.05	1558	0	0	10	14	76	*Scenedesmus quadricauda S. acuminatus*
	13.10	1178	0	16	19.4	32.3	32.3	*Scenedesmus acuminatus Cryptomonas marsoni*
C4	26.05	576	0	0	7	14	79	*Tetrastrum staurogeniiforme*
	13.10	1294	6	9	15	53	17	*Trachelomonas armata*
C5	26.05	1522	2	0	48	12	38	*Scenedesmus acuminatus Euglena viridis*
	13.10	1596	0	17	24	9	50	*Trachelomonas armata; Cryptomonas marsoni*
C6 A-E	26.05	1368	0	17	53	19	11	*Cryptomonas ovata Trachelomonas armata*
	13.10	1102	3	17	35	10	35	*Crucigenia tetrapedia Scenedesmus acuminatus Trachelomonas armata*

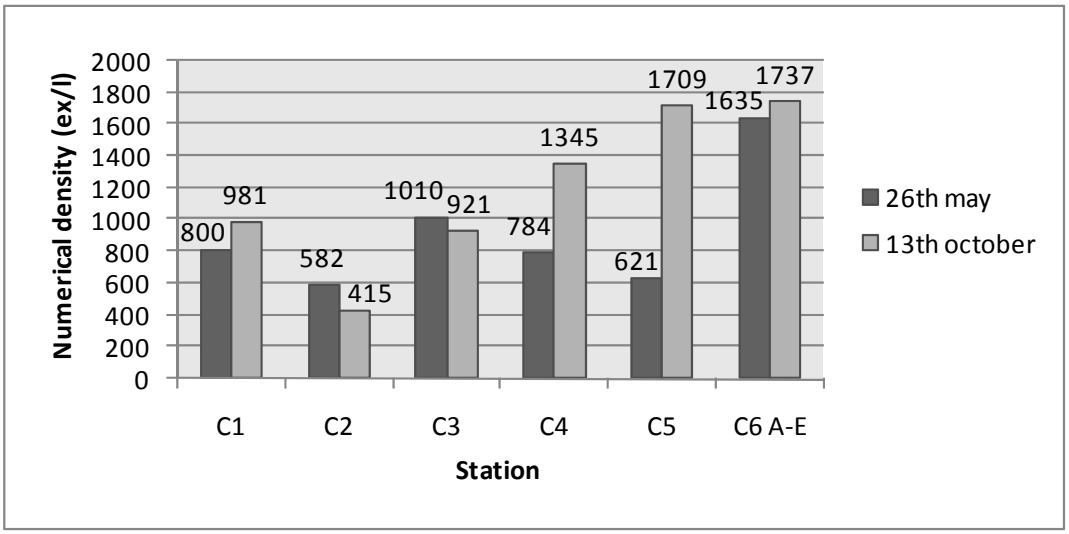
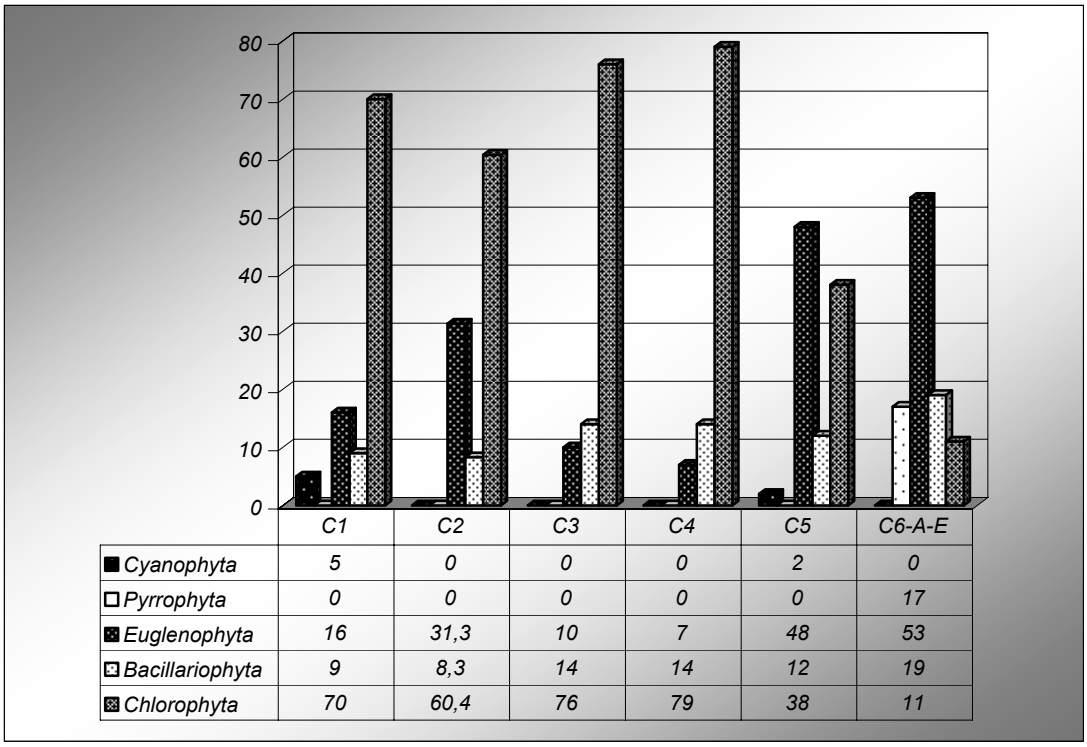
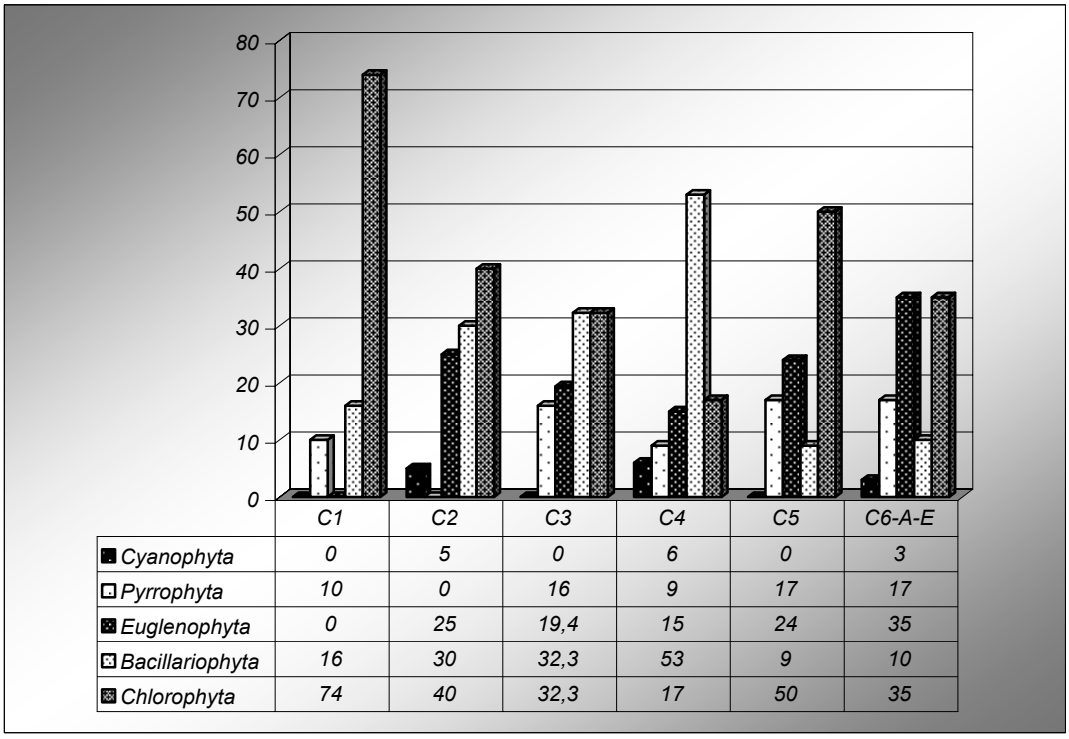


Figure 5. The phytoplankton numerical density (ex/ml)



	C1	C2	C3	C4	C5	C6-A-E
Cyanophyta	5	0	0	0	2	0
Pyrrophyta	0	0	0	0	0	17
Euglenophyta	16	31,3	10	7	48	53
Bacillariophyta	9	8,3	14	14	12	19
Chlorophyta	70	60,4	76	79	38	11

Figure 6. The phytoplankton's numerical abundance (%) in spring (26th of May)



	C1	C2	C3	C4	C5	C6-A-E
Cyanophyta	0	5	0	6	0	3
Pyrrophyta	10	0	16	9	17	17
Euglenophyta	0	25	19,4	15	24	35
Bacillariophyta	16	30	32,3	53	9	10
Chlorophyta	74	40	32,3	17	50	35

Figure 7. The phytoplankton's numerical abundance (%) in autumn (13th of October)

4. Conclusions

The density of the algae species is relatively constant and proportional in all the analysed samples. From a quantitative point of view, one can notice the numerical abundance of the chlorophyceae in all the analysed samples.

The small number of species and algae specimen determined in the phytoplankton's structure emphasizes the reduced level of trophicity and biodiversity of the analysed ecosystem.

In as far as classic aquaculture is concerned; the phytoplanctofags species are preferred, as there is no need for additional feeding, the result being the low financial/economic products, materialized in the available/accessible price for consumers.

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