RESEARCHES CONCERNING THE DETERMINATION OF BIOCENOSIS COMPOSITION FROM LAKE VENETIA - IASI

Valerica Gîlcă[1], I. Gîlcă[1], Doina Leonte[1], Elena Ignat[2]

[1]University of Agricultural Sciences and Veterinary Medicine-Iasi, Romania
[2]High School "Stefan Luchian" Stefanesti, Botosani, Romania

Abstract

The purpose of the research was to determine the composition of the biocenoses in Venice lake, Iasi county. Research was conducted in the summer of 2016 for three months, June, July and August respectively. For the determination of phyto and zooplacton, three samples were taken from the surface of the lake, and for studying phyto and zoobenthos, the samples were collected from the substrate level.

Also, three more samples were collected to determine the necton specific species. For collecting phytoplankton, we used the graduated cup method, which the easiest way for collecting samples. To collect the necton, trawl and tramme were used. For the collection of zooplankton, used a planktonic nettingh consisting into a metallic frame with dimension of 10-15 cm to which it was fixed a conical bag of silk screen and in the top attached and a conical metal cup with tap. The collection of macrobenthos samples was carried out in the seaside area using a metal frame with dimension of 0,8 m^2 to determine the density and qualitative composition of macrophytes. The collection of the zoobenthos was made with a drag, and the analysis of the samples was done in the laboratory.

As a result of the researches carried out in the phytobenthos structure, 4 species of cyanophytes, 5 species of bacillaryophites, 3 species of euglenophytes and 5 species of chlorophytes was indentified. Of the four most systematic groups, the most abundant were chlorophytes followed by bacilariofites, and the fewest euglenophytes. In the zooplankton structure four systematic groups were identified, the most abundant being the ciliophores followed by cladocere and rotifers. In the phytobenthos structure, the most numerous species were: Phragmites, Glyceria and Typha. Among the main zoobenthos groups the most numerous were oligochetes, ephemeropter larvae, diptere and chironomide. In the structure of the necton dominated the group of fish.

The investigated aquatic basin has a rich trophic base, which is an important source of food for hydrobionts.

Key words: biocenosis, plankton, necton, benthos, water

MATERIAL AND METHOD

The research aimed at determining the composition of biocenoses in the Lake of Venice, Iaşi County. Research was conducted in 2016 for three months, June, July and August respectively.

For the determination of phyto and zooplacton, three samples were taken from the surface of the lake, and for studying phyto and zoobenthos, the samples were collected from the substrate level. Also, three more samples were collected to determine the necton specific species.

For collecting phytoplankton, we used the graduated cup method, making it the easiest way to harvest the samples.

The graduated pit was introduced into the water without disturbing it, extracting a sufficient amount of water. To obtain good results, the water was left for 24-72 hours to decant sediments on the bottom of the bottle. Then the water was removed and the sample to be analyzed was collected by means of a pipette, placing a drop on a blade, followed by a slat, and the sample was analyzed by microscope. For the analysis, the optical combination was used: for the beginning, the

*Corresponding author:
m_valerica_univagro@yahoo.com
The manuscript was received: 19.09.2017
Accepted for publication: 02.11.2017

eye 10x, then 20x and then the 40x, of the total surface were chosen 4-6 fields of which the individuals were counted.

The net and the volume were used to collect the necton. Both the identification and counting of fish, reptiles and amphibians was made with the naked eye.

For zooplankton collection, a planktonic mesh consisting of a 10-15 cm (10-15 cm) metal frame was attached to which a conical bag of silk screen was attached and a conical metal cup with tap was attached to the top. Then, 20 liters of water was filtered through the fillet, the amount of water being dependent on the zooplankton density. The zooplankton was placed in glass vials provided with a stopper. Sample analysis was done by microscope using the Kolkwitz countdown chamber, 1 ml capacity.

Microbenthos harvesting was carried out from the surface of the soft substrate of the lake, aspirating with a glass tube having a diameter of 6 mm, being bent in a straight angle and on the vertical arm with a rubber thread. For the quantitative study a scraped surface of 0.8 m2 was measured, then 3 ml of biodiesel was collected, which was placed in a bottle, water added and a preservative used in the zooplankton samples.

In the laboratory the sample was taken using a gravimetric pipette placed on a blade, then covered with the lamella and studied under a microscope for the identification and counting of the species. The collection of macrobenthos samples was carried out in the seaside of lake by means of a 0,8 m^2 metal frame to determine the density and qualitative composition of macrophytes.

The collection of the zoobenthos was done with grabbing dear, and sample analysis was done in the lab. In order to carry out the analysis, the samples were washed with a hole site and the organisms found were placed in Petri dishes and identified with a microscopic magnifying glass.

RESULTS OBTAINED

Following the research carried out in the Lake of Venice - Iasi to determine the main types of aquatic biocenosis, a series of results were obtained in the tables and figures below.

Table 1 Structure of phytoplankton and zooplankton in the Lake of Venice

	The main species of plankton		Nr. specimens / l water (average of the three collections)	
	Fitoplankton	**Zooplankton**	**19.495**	**18678**
Class / Order	**Cyanophyta**	**Rotifera**	**4556**	**2822**
	Oscillatoria fragilis	*Keratella cochlearis*	1136	930
	Anabaena affinis	*Branchianus calyciflorus*	1657	1112
	Nostoc sp.	*Keratella quadrata*	998	780
	Mycrocistis aeruginosa		765	-
Class / Order	**Bacillariophiceae**	**Cladocera**	**5392**	**8726**
	Fragillaria crotonensis	*Bosmina longirostris*	1456	2340
	Cymbela lanceolata	*Dapnia pulex*	2718	3456
	Navicula cryptocephala	*Daphnia magna*	1218	2980
	Pinularia viridis	*Chydarus sphaericus*	1785	876
	Diatoma sp.	*Daphnia galeata*	1214	985
Class / Order	**Euglenophyta**	**Copepoda**	**2657**	**1604**
	Euglena viridis	*Cyclops vernuus*	1514	1245
	Euglena polymorfa	*Paracyclops sp.*	912	234
	Trachelomonas sp.	*Macrocyclops distritus*	231	125
Class / Order	**Chlorophyta**	**Ciliophora**	**6890**	**5524**
	Closterium aciculare	*Paramaecium aurelia*	928	1670
	Scenedesmus acutus	*Paramaecium caudatum*	1217	1978
	Spyrogira sp.	*Tintinnidium lacustris*	2340	1876
	Cladophora glomerata		1970	-
	Oedogonium sp.		435	-

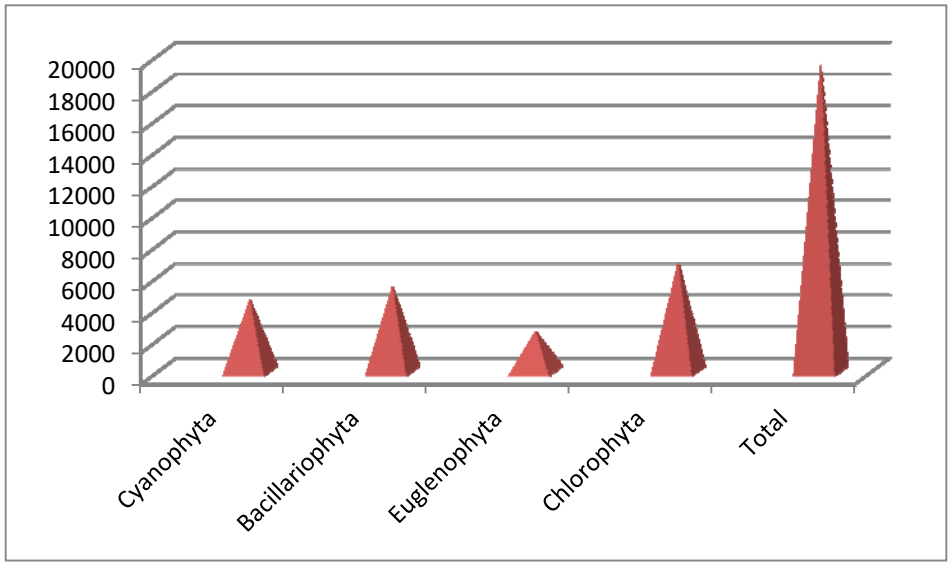

Fig. 1 The phytoplankton structure of the Venice lake

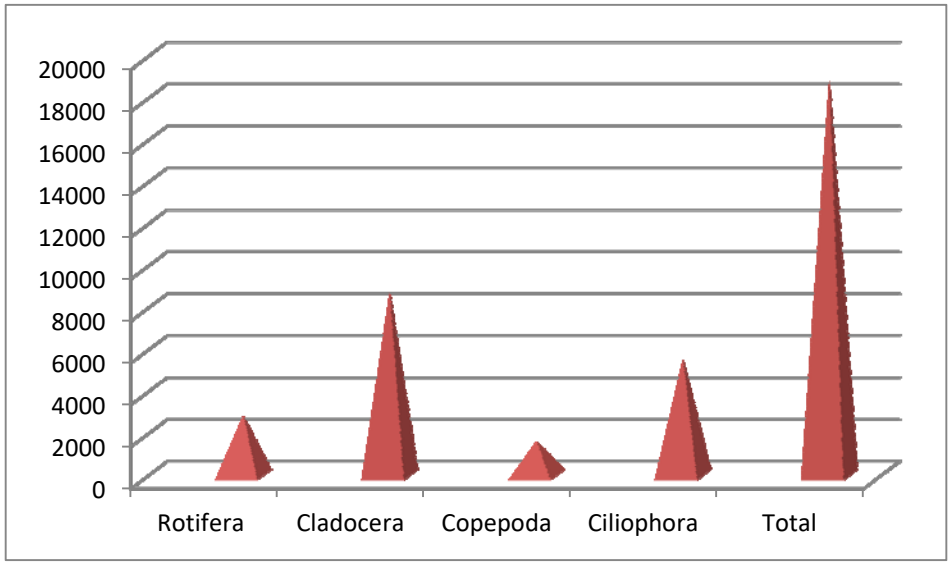

Fig. 2 Structure of zoobenthos in Venice

The data in Table 1, Figures 1 and 2 show that chlorophylls were dominant in the structure of phytoplankton, followed by bacillarilophytes, and less numerous were euglenophytes. Concerning zooplankton, the data obtained indicates a greater abundance of clusters followed by ciliofore, the least numerous being the copepods. The high abundance of chlorophylls can be explained by the high water temperature in July and August, which leads to an excessive development of algae in this systematic group. Also, the abundance of cladoceres are determined by the abundance of chlorophylls, and there is a direct correlation between the two systematic groups.

According to the results presented in Table 2, Figure 3, it is observed that the number of zoobentonic specimens per m^2 is much larger than the phytobentonic organisms, which are mainly represented by macrophytic species.

Table 2 Structure of phytopathogen and zoobenthos in the Venice lake

The main species of phytobenthos	Nr. specimens / m^2 (average of the three collections)	Main groups of zoobenthos	Nr. specimens / m^2 (average of the three collections)
Glyceria aquatica	16	*Oligocheta*	620
Equsetum palustre	14	*Ephemeroptera*	230
Phragmites communis	23	*Diptera*	326
Typha latifolia	14	*Chironomida*	160
Typha angustifolia	16	*Coleoptera*	24
Carex pseudocyperus	14	*Plecoptera*	61
Mentha longifolia	12	*Nematoda*	32
Mentha aquatica	7	*Hirudineea*	7
Bidens tripartitus	9	*Mollusca*	9
Total nr. exemplare	125		4637

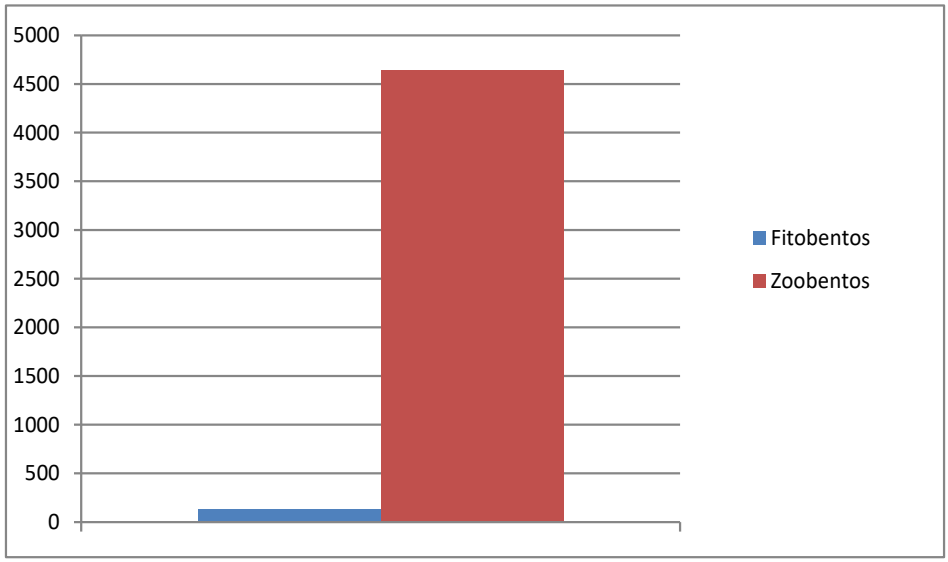

Fig. 3 The phyto and zoobenthos structure of the Venice lake

In the structure of the necton (table 3, figure 4), the fish group is dominant, the number of reptiles and amphibiens being much smaller.

Table 3 Structure of the necton from Lake Venice

Categories of organisms	Species	Nr. specimens	Total specimens / groups
Fish	*Cyprinus carpio*	31	221
	Carassius autatus gibelio	174	
	Perca fluviatilis	16	
Reptiles and amphibiens	*Natrix tesellata*	2	17
	Emys orbicularis	2	
	Rana esculenta	7	
	Rana ridibundus	6	

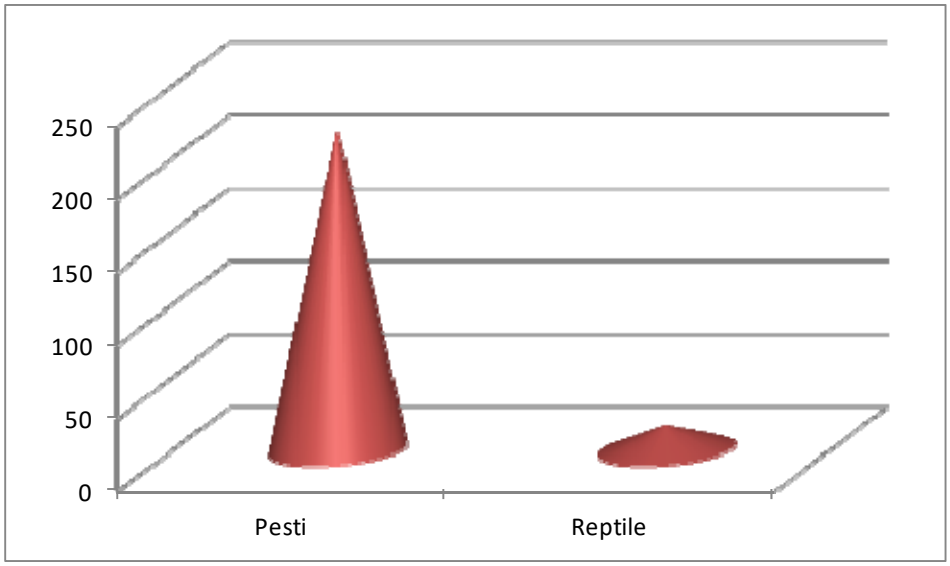

Fig. 4 Necton structure in Venice lake

CONCLUSIONS

Following the researches carried out in the summer of 2016 in the Lake of Venice in Iasi county concerning the structure of some biocenoses, a series of conclusions were drawn:

- Of the phytoplankton systemic groups, dominant was the chlorophytes group, followed by bacillariphytes and cyanophytes, a development determined by a series of physico-chemical indicators of water and in particular by the temperature factor, which favors the development of certain groups of algae.
- Regarding the zooplankton, the highest abundance was recorded by cladoceres followed by ciliofores, abundance which can be explained by the very large number of chlorophytes between these systematic groups, there being a direct correlation.
- In the structure of the benthos dominant there were the zoobentonic organisms, while the number of phytobentonic individuals was much smaller, the phyobenthos being represented by macrophytic species.
- In the structure of the abundant necton there was the group of fish compared to the other systemic groups, which make up the necton.

REFERENCES

[1] Bud I., 1999, Acvacultura- curs, U.S.A.M.V. Cluj-Napoca
[2] Boisteanu Taisia, 1980, Hidrobiologie, Universitatea "Al.I. Cuza" Iasi
[3] Ciolac A., 1997, Elemente de ecologie acvatica
[4] Fira Valeria, Nastasescu Maria, 1996, Zoologie, lucrari practice. Edit. "Ion Ionescu de la Brad" Iasi
[5] Gilca Valerica, 2010, Elemente de zoologie acvatica, Edit. "Ion Ionescu de la Brad" Iasi
[6] Margarint Iolanda, 1999, Zoologie, lucrari practice, Edit. Ion Ionescu de la Brad" Iasi
[7] Popescu Gh., 2000, Botanica, Edit. Universitatii din Craiova