# RESEARCH CONCERNING THE STRUCRURE OF PLANCTON IN A FRESHWATER AQUATIC POOL IN THE SUMMER OF 2010

**GÎLCĂ VALERICA , GÎLCĂ I.**

*U.S.A.M.V. IAŞI;Str. Mihail Sadoveanu, nr. 6; e-mail: m_valerica_univagro@yahoo.ro*

***Abstract***

*The researchers was done at The Research Station for Aquaculture and Aquatic Ecology Iasi in the vegetation period of 2008 and had as an objective the identification of phyto and zooplankton formations from the ornamental lake populated with two species of fish, Cyprinus carpio şi Ctenopharyngodon idella, and the abundance of systematic groups.*

*The collecting of material realized in the period July-September 2010. The planctonic samples obtained throw filtration of 10 litters of water with the planctonic net. The material which was filtered was remake, quantitative and qualitative, in laboratory.*

*The remaking in laboratory consists in the sedimentation of the samples in time of 21 days, centrifugalization in time of 5 minutes. The numerical evaluation and the identification of species were done in laboratory with the microscope HC 1 using the counted camera. We established the qualitative components of every sample and, at the end, the frequency of phyto and zooplanktonic organisms.*

*The hydro biological analyze of water from the ornamental lake indicated an equilibrium between the main phyto and zooplanktonic groups developed in the sweet stagnant waters. Thus, the systemic phyto planktonic groups were represented of 18 taxons, the chlorophyll groups with 6 taxons and the cyanophiceae groups with 3 taxons.*

*The systemic zoo planktonic groups were represented by 8 taxons from witch 4 taxons for rotifers, 3 for crustaceans and 1 for insects. We observed that the best represented is the group of rotifers, especially in July and the purest represented is the group of crustaceans.*

**Key words:** ***ornamental lake, fish, aquaculture, water, plankton***

## INTRODUCTION

The researchers was done at The Research Station for Aquaculture and Aquatic Ecology Iasi in the vegetation period of 2010 and had as an objective the identification of phyto and zooplankton formations from the ornamental lake populated with two species of fish, Cyprinus carpio şi Ctenopharyngodon idella, and the abundance of systematic groups.

## MATERIAL AND METHOD

The collecting of material realized in the period July-September 2010. The plankton samples obtained throw filtration of 10 litters of water with the plankton net. The material which was filtered was remake, quantitative and qualitative, in laboratory.

The remaking in laboratory consists in the sedimentation of the samples in time of 21 days, centrifugalization in time of 5 minutes. The numerical evaluation and the identification of species were done in laboratory with the microscope HC 1 using the counted camera. We established the qualitative components of every sample and, at the end, the frequency of phyto and zoo-plankton organisms.

The hydro biological analyze of water from the ornamental lake indicated an equilibrium between the main phyto and zooplankton groups developed in the sweet stagnant waters. Thus, the systemic phyto plankton groups were represented of 18 taxon, the chlorophyll groups with 6 taxon and the cyanophiceae groups with 3 taxon.

The systemic zoo-plankton groups were represented by 8 taxon from witch 4 taxon for rotifers, 3 for crustaceans and 1 for insects. We observed that the best represented is the group of rotifers, especially in July and the purest represented is the group of crustaceans.

## RESULTS AND DISCUSSIONS

Table 1 is presented results of the hydro-biological analysis. After the plankton's deposit measured (seston volume) resulted that water in the ornamental fish's lakes in which we done the experiments ranged within the waters rich in plankton (15 - 30 ml/l).

Systematic phytoplankton groups were represented in the total of 18 taxon, the most represented group being the cloroficeea with 7 taxon, followed by the group of bacilarioficeea with 6 taxon. We noted as a general feature, at the beginning of the experiment, an explosive development of diatomeae, respectively the abundance of bacilarioficeae. Blue algae were more abundant towards the middle of summer (July). Worthy of note is the presence of the green algae as a number of taxon as well as their frequency. In generally, the Phytoplankton which was determined has small size.

It was found the development and relatively frequent development of cianoficeea which is linked to water temperature (values between 20-26 °C) and its contents in organic substances, and the source of water. Thus, during July and August 2010, when water temperature was between 20-26 ° C is an exponential cianoficeae development, which led to the phenomenon of "eutrophication" with negative influences of the level oxygen in water

and aquatic organisms. From the class of Euglenofitae the largest development have the Rhyzosolenia, presence can be explained by the high temperature of water and reduced consumption of this species by zooplankton.

From the group of cloroficeae a strong development observed at the Scenedesmus species in July and August, species that reproduce mostly at temperatures above 20 °C. Dominance of this species can be explained by reduced number of zooplankton that is a source of food.

*Table 1*

Phytoplankton dynamics within the aquatic pool

| **Taxon name** | **Data collection** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 30.07. 2010 | 05.08. 2010 | 12.08. 2010 | 19.08 2010 | 26.08. 2010 | 03.09 2010 | 20.09. 2010 | 27.09 2010 |
| **CYANOPHYCEAE** | | | | | | | | |
| *Anabaena* | *** | *** | **** | **** | *** | *** | ** | ** |
| *Mycrocystis* | ** | ** | ** | * | * | * | * | ** |
| *Gloeocapsa* | * | * | * | | | | * | * |
| **BACILLARIOPHYCEAE** | | | | | | | | |
| *Asterionela* | ** | *** | *** | *** | ** | ** | **** | **** |
| *Navicula* | ** | ** | * | * | * | * | *** | ** |
| *Cymbella* | | | | | | * | | |
| *Synedra* | *** | ** | * | | | | ** | ** |
| *Rhyzosolenia* | *** | *** | *** | *** | ** | ** | **** | ** |
| *Pinularia* | * | * | * | * | | | * | * |
| **CLOROPHYCEAE** | | | | | | | | |
| *Ulotrix* | | | | | | * | | |
| *Pediastrum* | ** | ** | ** | ** | * | * | ** | ** |
| *Scenedesmus* | *** | *** | ** | *** | ** | *** | *** | *** |
| *Fragillaria* | * | * | * | | | | | * |
| *Eudorina* | ** | ** | * | * | * | | | ** |
| *Closterium* | ** | ** | * | * | * | | ** | ** |
| *Pandorina* | * | * | * | | | | * | * |

*rarely; ** relatively rare, *** often, **** very frequency

*Table2*

Zooplankton dynamics within the aquatic pool

*rarely; ** relatively rare, *** often, **** very frequency

| Taxon name | Data collection | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 30.07. 2010 | 05.08. 2010 | 12.08. 2010 | 19.08. 2010 | 26.08. 2010 | 03.09. 2010 | 20.09. 2010 | 27.09. 2010 |
| **ROTIFERA** | | | | | | | | |
| *Brachionus* | *** | ** | ** | ** | * | * | **** | *** |
| *Keratella* | *** | ** | * | * | * | | *** | ** |
| *Trichocerca* | **** | *** | ** | ** | ** | * | **** | *** |
| *Rrotiferae's eggs* | **** | *** | ** | ** | ** | * | *** | ** |
| **CRUSTACEA** | | | | | | | | |
| *Bosmina* | * | * | | | | | * | * |
| *Cyclops* | ** | ** | * | | | | * | ** |
| *Daphnia* | *** | ** | ** | * | * | * | *** | ** |
| *Crustaceae's eggs* | ** | ** | * | * | * | | ** | ** |
| **INSECTA** | | | | | | | | |
| Insects' larva | * | * | * | | | | * | * |
| *Notonecta* | * | | | | | | * | |

Qualitative analysis of zooplankton (Table 2) was to determine the main taxonomic groups of zooplankton such as protozoa, rotiferae, copepodae, cladocerae

Systematic zooplankton groups were represented in of 8 taxon, 4 of which taxon to rotiferae 3 for crustaceans and 1 for insects. It is noted that the group is well represented by rotiferae, especially in July. Group of crustaceans is poorly represented, the taxon appearing with a very low frequency.

The results we presented in Table 2 show that in July and the first half of August, frequent and relatively frequent are the species belongs to the group of rotiferae, species carnivore. Rotiferae feed in particular bacteria and protozoa which indicates the presence in water of a rich phytoplankton and bacteria-plankton.

The presence of frequent and relatively frequent from the cladocerae species of a Daphnia is explained by reproduction at temperatures between 16-26 °C and a pH value between 6-8.5 characteristics of temperature and pH recorded in our experiment. Is uneven spread of zooplankton on the vertical of water, being is influenced by environmental factors and seasonal trends. Thus in epipelagial are several zooplankton species, being dominant copepodae and cladocerae while in depth the rotiferae are dominant.

The Copepodae is a valuable food for rearing larvae, size range (between 80-200 micrometers at naupliu and between 1-3 mm in adults) providing full set of nutritional needs during the development of larvae and juveniles of fish, but slow reproduction (20 days to adult stage) explains the relatively common presence of these species.

The frequent and very frequent of rotiferae is largely determined by the rate of reproduction, which depends on the individual diet and relatively high water temperature

**CONCLUSIONS**

Hydro-biological analysis of water from the aquatic basin in which was conducted the experiments showed the existence of a balance between the main phytoplankton groups and zooplankton, which develops in stagnant fresh water.

- Systematic phytoplankton groups were represented in the total of 18 taxon; the group of cloroficeae was the best represented with 7 taxon, followed by the group of bacilarioficeae with 6 taxon, and 3 taxon for cianoficeae group;

- From the group of cloroficeae a strong development registered at the Scenedesmus species in July and August during which reproduce mostly at temperatures above 20 °C;

- Systematic zooplankton groups were represented in total of 8 taxon, 4 of which taxon to rotiferae 3 for crustaceans and 1 for insects;

- It was found that the most represented group is rotiferae, especially in July, while crustaceans group is less represented;

- From the group of crustaceans was frequent and relatively frequently the presence of Daphne species, frequency which is explained by the reproduction of this species at temperatures between 16-26 °C and a pH value between 6 -8.5;

- The frequent and very frequent presence of rotiferae is largely determined by the rate of reproduction, which depends on the number of individuals, diet and relatively high temperature (20 °C).

**REFERENCES**


1. BATTES K, MĂZĂREANU C., PRICOPE F., CĂRĂUŞU I., MARINESCU VIRGINIA, RUJINSCHI RODICA, 2003, *Producţia şi productivitatea ecosistemelor acvatice*, Editura "Ioan Borcea", Bacău,pag.29-285;
2. BATTES K., 1985, *Probleme de nutriţia peştilor*, Cosfătuirea pe probleme de piscicultură, Galaţi, 1985;
3. BARNABE G., 1991, *Bases biologiques et ecologiques de l aquaculture*, Editura Lavoiser, Tec et Doc, Paris;
4. BOIŞTEANU TAISIA, 1980, *Hidrobiologie,* Editura Univ. "Al. I. Cuza", Iaşi, pag. 34-253;
5. CURTEAN-BĂNĂDUC ANGELA, 2001, *Practicum de hidrobiologie*, Editura Mira Design, Sibiu, pag. 145;
6. MACOVEI VALERICA, LEONTE DOINA, LEONTE C., 2006, *Cercetări privind valorificarea hranei de către unele specii de peşti de apă dulce,* International, scientific symposium "European achievements and expectations in animal production", Facultatea de Zootehnie, Iaşi, pag. 63;
7. NAGY-TOTH FR., BARNA ADRIANA, 1998, *Alge verzi unicelulare (Clorococcales),* Determinator, Presa Universitară, Cluj Napoca;
8. NEGREA ŞT., 1983, *Fauna R.S.R., Crustacea-Cladocera*, vol.IV, Editura Academiei Române Bucureşti;
9. PRICOPE F., BATTES K., PETROVICI MILCA, 2007, *Hidrobiologie- lucrări practice,* Editura Alma Mater, Bacău, pag. 23-70;
10. PIŞOTĂ I., ZAHARIA LILIANA, DIACONU D., 2005, *Hidrobiologie,* Editura Universitară Bucureşti, pag. 22-31;
11. STAN TR., PĂSĂRIN B., 1999, *Acvacultură*, curs, Editura Univ. De ŞtiinţeAgricole şi Medicină veterinară, Iaşi, pag. 7-120;
12. VASILESCU G., 1986, *Hidrobiologie* curs, Universitatea Galaţi, 1986;
13. VERDU M.A. 1991, *La aquiculture en el mundo, Xunta de Galicia*, Espagna;