# RESEARCH ON THE SPECTRUM OF A TAXONOMY OF AQUATIC BIOCOENOSIS

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**Abstract**

*Research goal is to determine the taxonomic spectrum of a freshwater aquatic ecosystem. Research were conducted in the resort of Research and Development Station for Aquaculture and Aquatic Ecology Iasi for a period of 48 days, starting on 1 June 2011 until 18 July 2011. Taxonomic and ecological spectrum of biocenosis is the percentage of various systematic units or environmental groups represented as ciclograme. To establish the taxonomic spectrum of a biocoenosis were collected several samples of phytoplankton, zooplankton and benthos, was done the systematic classification of species groups and then determined the abundance for each taxon or systematic group and dominance was calculated in percent. Processing samples in laboratory consists in the sedimentation for 21 days and centrifuged at 1500 rpm/min for 5 minutes. Numerical assessment and species identification was made in a laboratory using the HC 1 microscope and a counting chamber. Research conducted to determine the structure of biocenosis and drawing taxonomic spectrum of aquatic ecosystems studied in summer 2011 showed that phytoplankton species are present in highest proportion followed by zooplankton and benthonic organisms. Regarding the increased proportion of phytoplankton, whilst investigations point out that it is during the propagation, there actually is a positive correlation between phytoplankton, zooplankton and benthos.*

**Key words**: aquatic, species, taxon, range, ecosystem

## MATERIAL AND METHODS

In order to determine the taxons from the ecosystem studied were carried out 8 collections of plankton and benthos from the basin investigated. Water samples to determine plankton were immediately fixed on the ground with a formalin solution 3%, and then transported to the laboratory. Benthos samples were collected with quantitative dear. Sample processing was done in the laboratory of Hydrology and Hydrobiology, Faculty of Animal Science, the University of Agricultural Sciences and Veterinary Medicine Iasi.

Processing samples in their laboratory was to sedimentation for 21 days and centrifuged at 1500 rpm for 5 minutes. Numerical assessment and species identification was made in a laboratory on HC microscope using a counting chamber.

To establish the taxons spectrum of the water from the basin investigated was determined the abundance for each species and their dominance. Abundance is the number of individuals belonging to each species in the samples collected. Numerical dominance is the number of each species in relation to the total number of biocoenosis

in which:

$$D = \frac{nA}{N} \times 100$$

nA – number of individuals belonging to each species

N – total number of individuals from biocoenosis

## RESULTS AND DISCUSSIONS

Following investigations conducted between 1 June 2009-18 July 2009, on determining the structure of biocoenosis from aquatic ecosystems studied, in order to establish taxonomic spectrum have obtained a set of data presented in Tables 1, 2, 3 and Figures 1, 2, 3.

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Table 1 Phytoplankton biocoenosis structure

| Systematic group | Species | 1.06.2011 | | 10.06.2011 | | 17.06.2011 | | 24.06.2011 | | 30.06.2011 | | 5.06.2011 | | 11.06.2011 | | 18.06.2011 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | D % | A | D % | A | D % | A | D % | A | D % | A | D % | A | D % | A | D % |
| *Cyanophyta* | *Anabaena planctonica* | 70 | 12.91 | 67 | 10.97 | 40 | 8.87 | 40 | 8.88 | 50 | 10.98 | 50 | 9.29 | 62 | 10.23 | 71 | 10.01 |
| | *Spirulina major* | 65 | 12.06 | 54 | 8.84 | 34 | 7.54 | 28 | 6.22 | 31 | 6.81 | 43 | 7.99 | 51 | 8.41 | 66 | 9.31 |
| | *Oscillatoria simplicissima* | 57 | 10.57 | 25 | 4.10 | 41 | 9.09 | 44 | 9.77 | 42 | 9.43 | 57 | 10.59 | 61 | 10.1 | 70 | 9.87 |
| *Bacillariophyta* | *Synedra ulma* | 66 | 12.24 | 71 | 11.70 | 39 | 8.64 | 46 | 10.22 | 43 | 9.44 | 39 | 7.24 | 47 | 7.75 | 53 | 7.48 |
| | *Diatoma vulgare* | 43 | 7.98 | 64 | 10.50 | 28 | 6.20 | 27 | 6.0 | 25 | 5.48 | 27 | 5.03 | 33 | 5.44 | 46 | 6.49 |
| | *Flagillaria crotonensis* | 62 | 11.52 | 42 | 6.89 | 36 | 7.99 | 34 | 7.56 | 31 | 6.82 | 41 | 7.62 | 44 | 7.25 | 52 | 7.33 |
| *Euglenophyta* | *Euglena polymorpha* | 84 | 15.56 | 127 | 20.80 | 111 | 24.61 | 109 | 24.22 | 101 | 22.13 | 117 | 21.76 | 124 | 20.46 | 137 | 19.32 |
| | *Trachelomonas granulosa* | 92 | 17.06 | 81 | 13.27 | 92 | 20.40 | 92 | 20.45 | 98 | 21.50 | 115 | 21.38 | 127 | 20.96 | 145 | 20.46 |
| | *Trachelomonas plantonica* | - | - | 79 | 12.93 | 30 | 6.66 | 30 | 6.68 | 34 | 7.41 | 49 | 9.10 | 57 | 9.40 | 69 | 9.73 |
| Total | **4350** | **539** | 100 | **610** | 100 | **451** | 100 | **450** | 100 | **455** | 100 | **538** | 100 | **606** | 100 | **709** | 100 |

Table 2 Zooplankton biocoenosis structure

| Systematic group | Species | 1.06.2011 | | 10.06.2011 | | 17.06.2011 | | 24.06.2011 | | 30.06.2011 | | 5.06.2011 | | 11.06.2011 | | 18.06.2011 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | D % | A | D % | A | D % | A | D % | A | D % | A | D % | A | D % | A | D % |
| *Rotifera* | *Brachianus calyciflorus* | 16 | 12.5 | 27 | 16.78 | 21 | 13.30 | 38 | 21.11 | 47 | 23.27 | 46 | 23.47 | 52 | 25.62 | 48 | 24 |
| *Cladocera* | *Daphnia cucullata* | 69 | 53.9 | 78 | 48.44 | 76 | 48.10 | 83 | 46.11 | 88 | 43.60 | 81 | 41.32 | 80 | 39.40 | 87 | 43.5 |
| *Ciliophora* | *Paramecium aurelia* | 43 | 33.6 | 56 | 34.78 | 61 | 38.6 | 59 | 32.78 | 67 | 33.13 | 69 | 35.21 | 71 | 34.98 | 65 | 32.5 |
| Total | **1421** | **128** | 100 | **161** | 100 | **158** | 100 | **180** | 100 | **202** | 100 | **196** | 100 | **203** | 100 | **200** | 100 |

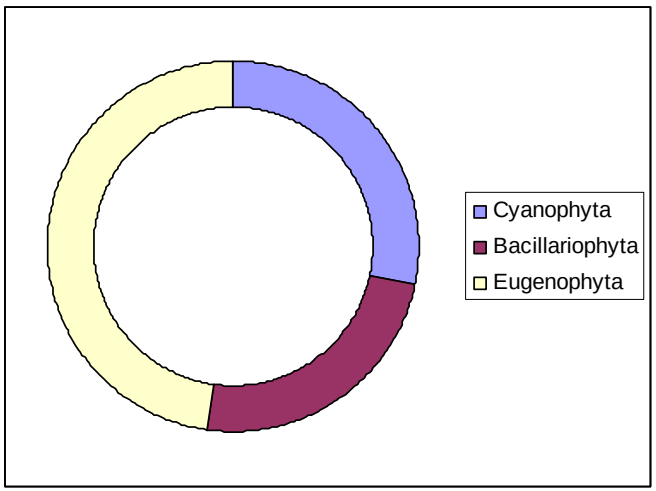


Figure 1. Phytoplankton biocoenosis structure

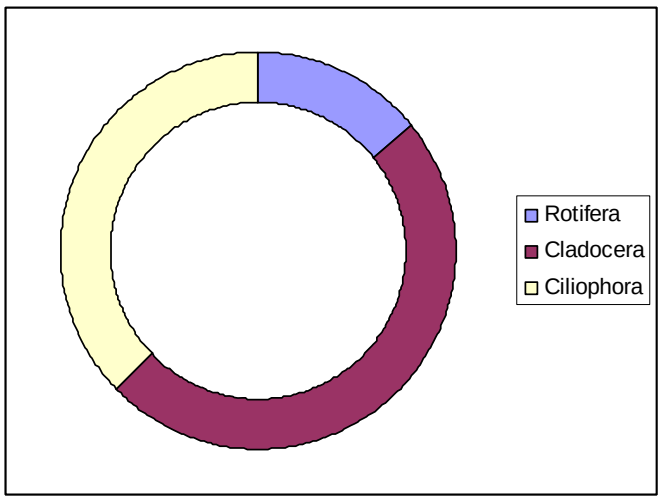


Figure 2. Zooplankton biocenosis structure

Table 3 Benthic biocenosis structure

| Systematic group | Species | 1.06.2011 | | 10.06.2011 | | 17.06.2011 | | 24.06.2011 | | 30.06.2011 | | 5.06.2011 | | 11.06.2011 | | 18.06.2011 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | D % | A | D % | A | D % | A | D % | A | D % | A | D % | A | D % | A | D % |
| *Polychaeta* | *Nereis diversicolor* | 17 | 12.67 | 15 | 10.49 | 23 | 14.74 | 19 | 12.10 | 22 | 13.25 | 27 | 15.08 | 32 | 17.78 | 31 | 16.58 |
| *Olygochaeta* | *Tubifex tubifex* | 99 | 73.89 | 107 | 74.82 | 114 | 73.08 | 121 | 77.07 | 119 | 71.69 | 123 | 68.72 | 125 | 69.44 | 129 | 68.98 |
| *Hirudinea* | *Piscicola geometra* | 18 | 13.44 | 21 | 14.69 | 19 | 12.18 | 17 | 10.83 | 25 | 15.06 | 29 | 16.20 | 23 | 12.78 | 27 | 14.44 |
| Total | **302** | **134** | 100 | **143** | 100 | **156** | 100 | **157** | 100 | **166** | 100 | **179** | 100 | **180** | 100 | **187** | 100 |

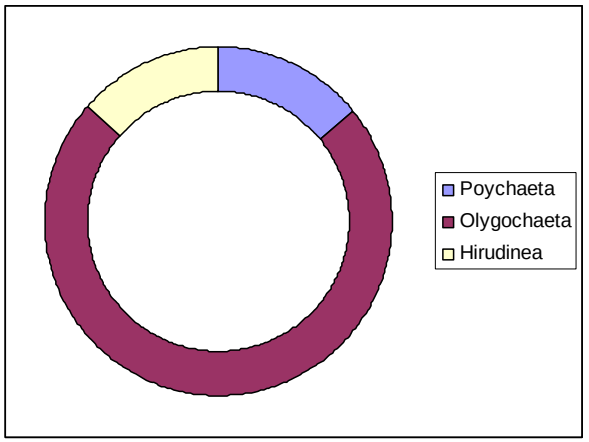


Figure 3 Benthic biocenosis structure

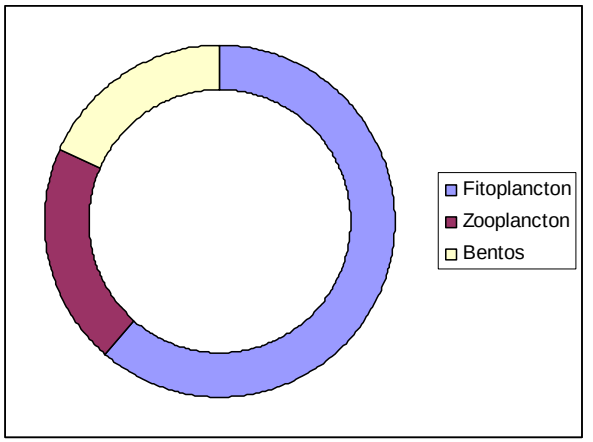


Figure 4 Aquatic biocenosis structure studied

## CONCLUSIONS

The results of the quantitative and qualitative determination of aquatic biocenosis structure studied, showed that throughout the research have identified a total of 7073 organisms, including phytoplankton organisms 4350, 1421 zooplankton organisms and 1302 benthic organisms. We find thus that phytoplankton species are present in highest proportion followed by zooplankton and then the benthic organisms.

Following collections and analysis performed on the biocenosis structure in a water pool in the summer of 2011 within the Aquaculture and Aquatic Ecology Station Science enables us to say that the ecosystem has a homogeneous structure and is present during our research all biocoenosis specific for aquatic ecosystem (plankton, benthos)

Regarding the increased proportion of phytoplankton, in the research period that it is during the propagation, there is a positive correlation between phytoplankton, zooplankton and benthos.

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