

PRELIMINARY ASPECTS CONCERNING STRUCTURE PLANKTON IN THE LAKE HORIA – TULCEA COUNTY

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Abstract

The present study provides information about the structure plankton in lake Horia, Tulcea County. We analyzed the structure of plankton as a tool for assessing trends in the trophic status of the aquatic ecosystem Horia winter. In November 2016 the structure of phytoplankton were identified five taxonomic groups. Between species who were identified, Cymbella cistula, Monoraphidium contortum and Pediastrum bory are predominant species in these samples. In the structure of the zooplankton were three taxonomic groups. The samples are identified predominant copepods with species Cyclops strenuus and Eucyclops albidus in various stages of development and rotifers with the species Brachionus diversicornis and Brachionus urceolaris. The small number of species evidences a reduced biodiversity of plankton during the studied period.

Keywords: phytoplankton, structure, zooplankton

1. INTRODUCTION

The tiny floating, suspended, or weakly swimming biota of inland waters are collectively called plankton. The plankton of aquatic ecosystems are largely dependent on water movements for distribution and are highly diverse in form and function (Wetzel, 2001).

The plankton of lakes, reservoirs, and rivers consist of protists, bacteria, fungi, cyanobacteria, algae, and tiny animals. The very small, often microscopic, photosynthetic, or chemosynthetic organisms of the plankton are at the base of aquatic foodwebs (Gene, 2009). Phytoplankton is very important because they form the base with which the aquatic ecosystem is culminating (Reynolds, 1984). They are a source of food to almost all aquatic life either directly or indirectly. They are preyed upon by the animal component of the plankton, the zooplankton.

2. MATERIALS AND METHODS

The samples were taken in november 2017 from Lake Horia by six stations (established in the symmetry axle of the lake). The lake is located in the area of locality Horia, being limited to north, west and south by agricultural field, and the eastern limit is represented by the intercounty road 222 A. The surface of the lake is 230 ha.

The biological samples were fixed in the ground with Lugol solution (phytoplankton) and formalin 4 % (zooplankton), and the processing was made at the species level after the concentration through centrifugal action (1400 rot/min).

For the establishment of the main phytoplankton taxonomy groups, an extensive literature (Bourelly, 1966, Meffert, 1987, Krammer et al, 1986, 1988 and 1991).

Qualitative analysis of zooplankton from the samples determined the identification till species level for rotifers, cladocerans and copepods. The determination of main taxonomic groups was made after Negrea, 1983 for cladocerans, after Dussart et al, 2001 for copepods. Godeanu, 2002 for the rotifers,

3. RESULTS AND DISCUSSIONS

Phytoplankton

The qualitative analysis of phytoplankton from the Lake Horia revealed the presence of five taxonomic groups: Bacillariophyta, Chlorophyta, Euglenophyta, Pyrrophyta and Cyanophyta. The phytoplankton is constituted from ten species. This taxonomic groups are represented by:

- Bacillariophyta represented by a species *Cymbella cistula*, *Synedra acus*, *Navicula rynchocephala*, *N. placentula*;
- Chlorophyta with the species *Monoraphidium contortum* and *Pediastrum bory*;
- Pyrrophyta with the species *Cryptomonas marssoni*, *Peridinium cinctum*;
- Isolated species were identified *Aphanizomenon flos aquae* (Cyanophyta) and *Phacus sp.* (Euglenophyta).

From the point of view of abundance the dominant group was represented by bacillariophyceae 41%, followed by chlorophyceae 31% and pyrrophytes 24%. Other groups of algae are represented by a smaller number of species euglenophyceae and cyanophyceae 2% each (figure 1).

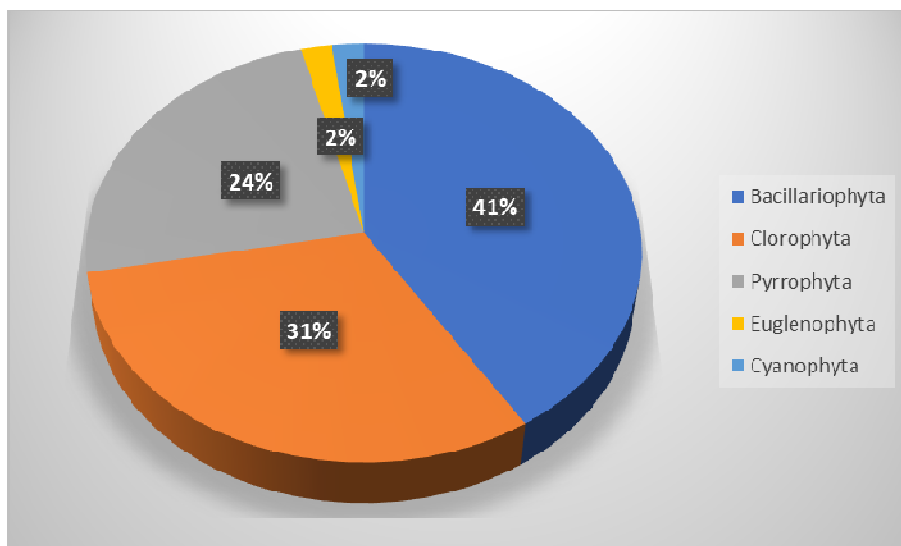


Figure 1. Abundance of phytoplankton

Zooplankton

The qualitative analysis of zooplankton from the Lake Horia revealed the presence of three taxonomic groups: rotifers, cladocerans and copepods. The zooplankton is constituted from a reduced number of species (5 species).

From those, in general, are copepods best represented as number of species (*Cyclops strenuus* and *Eucyclops albidus*), in nauplius form, copepodite, adults, followed by rotifers (*Brachionus diversicornis* and *Brachionus urceolaris*) and cladocerans (*Daphnia* sp.) in forms of eggs, nauplius, juveniles and adults.

The low temperatures favor the development of rotifers and copepods, these are more developed in early spring and autumn period, whereas in summer, at high temperature, high cladocerans are abundant. Cladocerans are totally missing from water in winter and they cross this period as preserving eggs and get out only in spring.

A water rich in organic substance permits abundant growth of zooplankton; especially *Daphnia* sp. species are the ones which develops in water concentrated in organic substance.

From the point of view of abundance the dominant group was represented by copepods 58%, followed by rotifers 33%. Other groups of zooplankton are represented by a smaller number of species cladocerans 9% (figure 2).

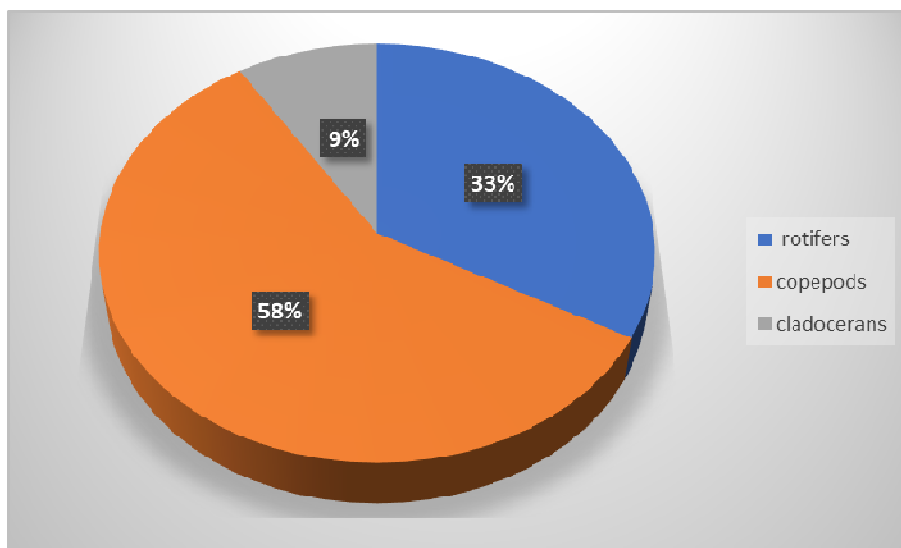


Figure 2. Abundance of zooplankton

4. CONCLUSIONS

In the studied phytoplankton samples, there have been identified 5 taxonomic groups of 10 species were identified. The best represented, both in terms of number of species and numerical abundance, is the group of diatoms.

The presence in relatively large abundances of the dinoflagellates is due to the fact that the slope of the ground allows for the accumulation of water from the adjacent lakes, with suspension contributions, fertilizers and herbicides used for the adjacent corn crop.

In the studied zooplankton samples, there have been identified 3 taxonomic groups of 5 species were identified. The best represented, both in terms of number of species and numerical abundance, is the group of copepods.

The presence in relatively large abundances of the cladocerans, especially *Daphnia* sp., indicates the existence of a larger quantity of organic substance.

The small number of species evidences a reduced biodiversity of plankton during the studied period.

5. ACKNOWLEDGEMENTS

Acknowledgements. This work was supported by a grant of the Romanian National Authority for Scientific Research and Innovation, CNCS/CCCDI – UEFISCDI, project number PN-III-P2-2.1-BG-2016-0417, within PNCDI III*.

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