PRELIMINARY DATA REGARDING THE QUALITATIVE COMPOSITION OF PLANKTONIC CRUSTACEAN POPULATIONS AND HORIZONTAL DISTRIBUTION OF CRUSTACEAN SPECIES, FROM IZVORU MUNTELUI – BICAZ DAM LAKE

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Abstract. Planktonic crustaceans are the principal food source for the fishes feeding with plankton, their juveniles and the juveniles of other fish species, resulting that they have high nutritional value, which is varying with the species. The qualitative composition of zooplankton and crustacean populations, from this lake, registered very big variations through time. At the beginning these variations were very big but in time those variations decreased in size as a sign of the maturation of the ecosystem. This aspect of the ecosystem evolution was described in many studies until 1983. Since then, we have just a few data regarding the evolution in the qualitative composition of zooplankton and crustacean populations. This paper is part of a study which wants to present the actual qualitative composition of planktonic crustacean population and the spatial distribution of species, but also wants to gather quantitative data. The paper presents the data gathered in the first one and a half year since the beginning of this study, data regarding the actual qualitative composition of planktonic crustacean population and the spatial distribution of species.

Keywords: crustacean population, variation, qualitative composition, spatial distribution.

Rezumat. Date preliminare privind compoziţia calitativă a populaţiilor de crustacee planctonice şi distribuţia pe orizontală a speciilor de crustacee în Lacul Izvoru Muntelui – Bicaz. Crustaceele pelagice sunt cele care formează zooplanctonul nutritiv în ecosistemele acvatice, fiind principala resursă trofică pentru peştii planctonofagi, alevinii acestora precum şi alevinii altor specii de peşti, valoarea nutritivă a crustaceelor planctonice variază în funcţie de specie. La început variaţiile au avut amplitudine foarte mare dar cu timpul amplitudinea a scăzut ca dovadă a maturizării ecosistemului. Acest aspect al evoluţiei ecosistemului lacului a fost pus în evidenţă prin multe studii pana în 1983. De atunci datele cu privire la evoluţia sub aspect calitativ al populaţiilor de crustacee planctonice sunt foarte puţine. Lucrarea de faţă face parte dintr-un studiu mai amplu în care vom urmări pe lângă determinarea compoziţiei calitative actuale a populaţiilor de crustacee planctonice şi aspecte cantitative. În această lucrare sunt prezentate datele obţinute în perioada de un an şi jumătate de la începutul studiului referitoare la compoziţia calitativă a populaţiilor de crustacee planctonice şi la distribuţia pe orizontală a speciilor.

Cuvinte cheie: populaţie de crustacee, variaţii, compoziţie calitativă, distribuţie spaţială.

Introduction

The subject of this study is Izvoru Muntelui – Bicaz dam lake, created in the year 1960 on Bistriţa river. The lake has 34 km in length, 2 km maximum width, a surface of 3105 ha, a maximum depth of 90 m in the dam area and a maximum volume of 1.200.000.000 m^3. The main tributary streams are the rivers Bistriţa and Bistricioara but also important tributary are smaller streams like Largu, Hangu, Buhalniţa, Potoci, Schitu, Izvoru Alb and Secu (Băncilă, 1989).

From the beginning the lake was the object of a evolution process through which the biocoenosis characteristic to water streams were replaced by biocoenosis characteristic to dam lakes ecosystem with a characteristic flora and fauna.

The researches regarding the qualitative composition of lake Izvoru Muntelui – Bicaz zooplankton have begun from the lakes formation moment. The first data where

published by Miron (1963). In 1979 Corneanu finds new species and sub specific units for the Bistrița dam lakes fauna. Further and deeper researches regarding the qualitative composition of the zooplankton from this lake where made by Rodica-Ileana Rujinschi and Constantin Rujinschi from 1970 to 1975, and in 1981.

In 1983 Miron *et al.* published a book called "Izvoru Muntelui – Bicaz, Limnological monography", which contains all data (geographical, geological, hydrological, climatic and biological data) gathered since the beginning of lake existence.

The researches made until this moment showed that the qualitative composition of zooplankton and especially of the planktonic crustacean populations from this lake suffered important modifications.

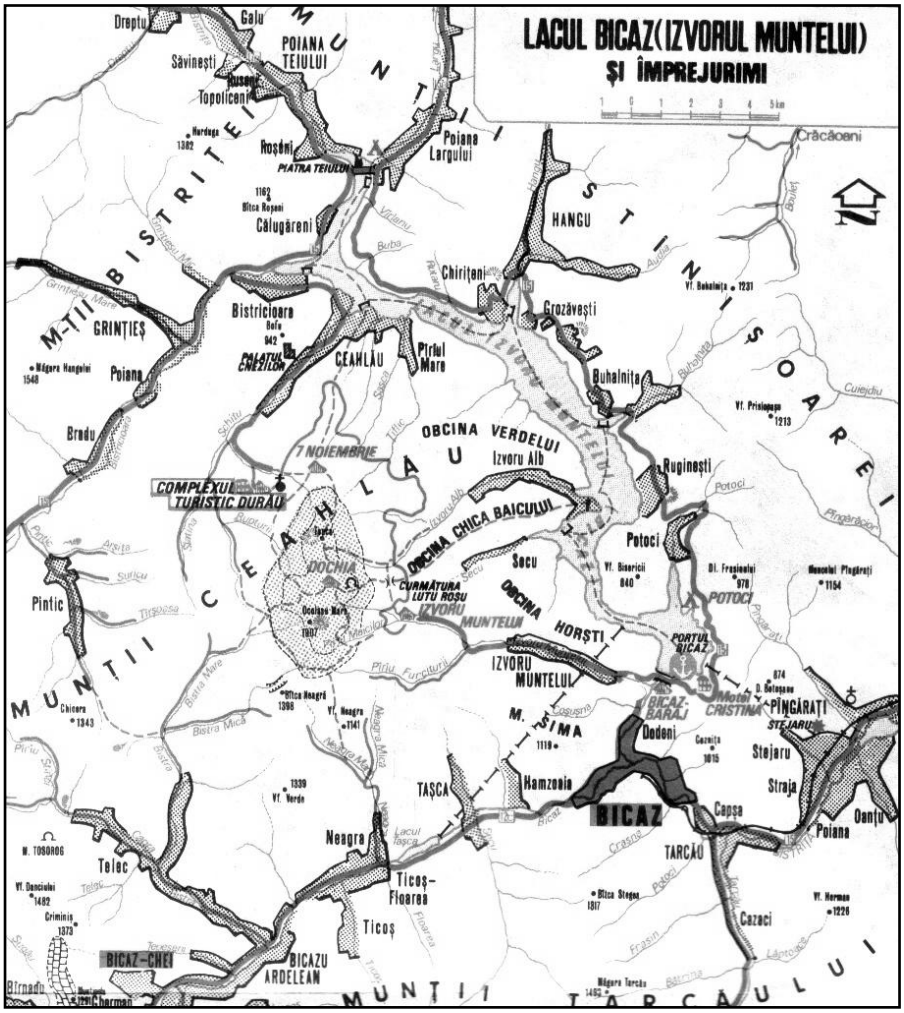

Figure 1. The geographical position of Izvoru Muntelui – Bicaz dam lake (Bâra & Grasu, 1981).

Materials and Methods

The data presented here are those gathered from November 2004 until June 2006 with the specification that the most part of time the study area was restrained to just one sampling point (Potoci). Sampling on the whole lake surface was made just in April, May and June 2006, that's why the data presented in this paper are not the final data regarding

this aspect and further researches will be made so we can present the real situation regarding the qualitative composition of planktonic crustacean population and the real distribution of species.

Knowing the ecological particularities of the flooded surface, the researches made at the level of this ecosystem on the planktonic crustacean populations were made by analyzing three representative categories of ecological areas:

- confluence zones (A) – corresponding to the areas where the principal tributaries of the lake and the main streams bring their water tribute to the lake (rivers Bistriţa, Bistricioara and the main streams Potoci, Buhalniţa, Hangu, Schitu, Izvoru Alb, Secu these main streams are forming gulfs at the confluence points).
- open water areas (B) – the biggest is the area from the middle of the lake called “şesul Hangului”.
- the last ecological category (C) is formed by the zones where the depth of the lake is over 50 meters (the Dam area and Rugineşi).

We have established eleven sampling points.

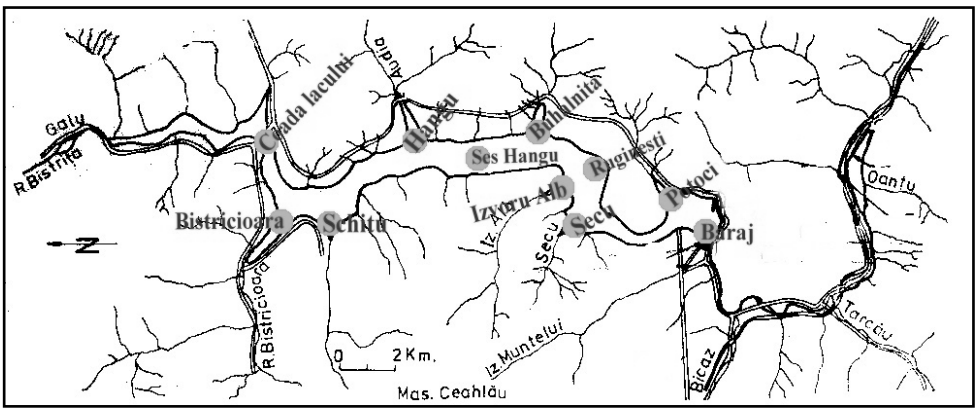

Figure 2. The position of sampling points on the lakes surface.

The sampling was made with a net which has the mesh size of 100 µm, which is the recommended size for planktonic crustaceans because the smallest individual of any species is bigger than this value of 100 µm. The biggest species from this lake is *Leptodora kindtii* Focke which has 2 mm.

Figure 3. Sampling net.

The samples were put in bottles on which was written the place, nature of sample the day, month and year. Each sample was pre conserved with 90° alcohol. The next step was to concentrate the sample by filtering and replacing the remaining water from the sample with alcohol for the good preservation of the animals. The analysis of the samples was made by examining the individuals using a binocular and a microscope.

Results and Discussion

The identification of taxa was made using a series of guides published by Negrea (1983) and Damian-Georgescu (1963, 1966, 1970).

We have identified until this moment a number of 23 taxa from those 34 taxa which were found in this lake previously to our study (Table 1).

After we have analyzed the samples we noticed that species like *Leptodora kindtii* Focke, *Daphnia magna* Straus and *Acanthocyclops vernalis* Fischer were found in ecological areas where they have not been found previously to this moment. Previously to this moment the species *Leptodora kindtii* Focke was found just in open water areas and in the zones with big depths, but in our study we noticed its presence also in confluence zones like Potoci gulf, *Daphnia magna* Straus was found previously just in the zones with big depths but we have found it also in open water areas like "şes Hangu", *Acanthocyclops vernalis* Fischer was found previously just in gulf areas and open water areas but at this moment we have found it also in the areas with big depths like the Rugineşti and Dam area.

Another observation is that even if previously the species *Alona guttata* G.O.S. was found in two ecological areas respectively in open water areas and in areas with big depths we have not found it in open water areas.

The last aspect observed after we have made the analysis of the collected samples and after analyzing the literature (Negrea, 1983) is that the even if in the previous papers published until 1983 the species *Diaphanosoma brachyurum* Lievin was considered as present in this lake the reality is that this species is not present in the lake instead we have identified the species *Diaphanosoma orghidani* (Negrea) which was described for the first time by Ştefan Negrea in 1983 after analyzing the material from Izvoru Muntelui – Bicaz dam lake and from other Romanian lakes and streams.

Table 1. The present qualitative composition of planktonic crustacean populations and the horizontal distribution, obtained using the criteria of ecological areas, of planktonic crustacean species from Izvoru Munteului – Bicaz dam lake.

Taxa	Ecological area		
	A	B	C
CLADOCERA			
Daphnia longispina (Müller)			+
Daphnia magna(Straus)		+ !!	+
Daphnia hyalina var. *lacustris* (Sars)	+	+	+
Daphnia cucullata (Sars)		+	+
Diaphanosoma orghidani (Negrea) !!	+	+	
Leptodora kindtii (Focke)	+ !!	+	+
Bosmina longirostris var. *typica* (Müller.)			+
Bosmina longirostris var. *cornuta* (Jurine)	+	+	+
Chydorus sphaericus (Müller)	+	+	+
Iliocryptus sordidus (Lievin)		+	+
Alona rectangula (Sars)	+	+	+
Alona guttata (Sars)		?	+
Leydigia leydigi (Schoedler)	+	+	+
Rhynchotalona rostrata (Koch)		+	
Ceriodaphnia megops (Sars)		+	+
COPEPODA			

Taxa	Ecological area		
	A	B	C
Eudiaptomus gracilis (Sars)	+	+	+
Cyclops furcifer (Claus)			+
Cyclops vicinus (Uljanin)	+	+	+
Cyclops rubens (Jurine)		+	+
Macrocyclops albidus (Jurine)		+	
Acanthocyclops vernalis (Fischer)	+	+	+ !!
Acanthocyclops viridis (Jurine)		+	
Canthocamptus staphylinus (Jurine)	+		

Conclusions

Analyzing the data gathered until this moment we can see that the qualitative composition of planktonic crustacean populations suffered big changes from 1983 until this moment, 11 species have not been found in the samples that we took.

The horizontal distribution of the planktonic crustacean species obtained by using the ecological areas criteria it is not very different but these small changes are very important because these changes could indicate important changes of the ecological conditions from this lake.

Because of the short period in which we could take samples from the entire lake surface the data presented in this paper are not the final ones and we cannot give an final verdict regarding these aspects so further researches will be done for obtaining the real situation.

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