

RESULTS OF THE ZOOPLANKTON INVESTIGATION OF THE BAY AT ABÁDSZALÓK

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Abstract

The results of the qualitative and quantitative investigations of the Zooflagellata, Rotatoria, and Crustacea fauna of the bay at Abádszalók are giving a picture of the formation of the zooplankton to be expected after filling up the future reservoir.

Introduction

In the framework of studying the hydroecological problems of the future Kisköre Reservoir (in Middle Hungary), apart from investigating the supplying Tisza river (ÁDÁMOSI, et al. 1974, B. TÓTH 1975, VÉGVÁRI, 1975a) and an experimental area (BANCSE 1975, HAMAR 1975), in 1974 we had an opportunity to perform some investigations in the bay at Abádszalók, constituting about a tenth part of the future reservoir (12 sq.km surface), under conditions approaching the natural state of the area that will only be formed permanently after being filled up. The Tisza inundated the flood-plain on two occasions, owing to its inordinate water-movement (VÉGVÁRI 1975b). Thus we were enabled to carry out the investigations both under summer (July 3rd—August 27th) and autumn-winter (October 23rd—December 17th) weather conditions. During the work we have carried on physical and hydrochemical (VÉGVÁRI 1975c), bacteriological and algological investigations (HAMAR 1975), as well as Zooflagellata, Rotatoria, and Crustacea studies.

Material and method

The elaboration of the Zooflagellata fauna was performed by our colleague, J. HAMAR from living samples and by using ladled samples fixed with Lugol's solution, according to Utermöhl's technique. I wish to record my gratitude for his kind permission to publish his data, because in that way I could make my report on the zooplankton of the area investigated comprehending a much wider domain.

For investigating the Rotatoria and Crustacea plankton, we have used samples filtered through a plankton net made of a silk mesh tissue of 25 I/A quality. In case of all the samples, we have examined the complete material.

Zooflagellata fauna

In the course of the investigation, during the summer period, we could identify seven Zooflagellata species:

Bicoeca cylindrica (LACKEY) BOURR.

B. lacustris J. CLARK

B. planctonica KISS.

Bicoeca sp. (nova?)

Collodyction triciliatum CARTER

Stelexomonas dichotoma LACKEY

Monosiga ovata KENT

In the autumn period, we couldn't find any species at all, belonging to this group.

Species *Bicoeca* were found in the Tisza dammed (BANCSI 1975), in the experimental area filled up with Tisza water (BANCSI 1975), and in the main canals belonging to the reservoir. *Stelexomonas dichotoma* turns up in the Tisza. In the Bay, the Zooflagellata count has changed between 6 to 60 thousand ind./litre. In the investigating period, we did not find any organisms indicating pollution.

Rotatoria fauna

In the course of investigating the Rotatoria fauna of the bay at Abádszalók we found 53 taxons. The enumeration of species is contained in the following table:

It appears from the enumeration that during the comparatively short investigating period a considerable number of Rotatoria taxons could be found. In the summer period, the species number was nearly a double as compared with those observed in the autumn-winter period. A majority of the turned-up species are to be found in the Tisza (MEGYERI 1955, 1957, 1970, BANCSI 1975) and its backwaters (MEGYERI 1961), as well as in the borrowing area (VARGA 1928, 1930).

Taxon	summer	autumn-winter period
<i>Anuraeopsis fissa</i> (GOSSE)	+	-
<i>Asplanchna priodonta</i> GOSSE	+	+
<i>Asplanchna siboldi</i> LEIDIG	+	-
<i>Brachionus angularis</i> GOSSE	+	+
<i>Br. calyciflorus</i> var. <i>dorcas</i> (GOSSE)	+	+
<i>Br. calyciflorus</i> f. <i>amphiceros</i> (EHRB.)	+	-
<i>Br. calyciflorus</i> var. <i>dorcas</i> f. <i>spinosa</i> (WIERZEJSKI)	+	-
<i>Br. falcatus</i> ZACHARIAS	+	-
<i>Br. quadridentatus</i> typica HERMANN	+	-
<i>Br. quadridentatus</i> var. <i>brevispinus</i> (EHRB.)	+	-
<i>Br. quadridentatus</i> var. <i>cluniorbicularis</i> SKOR.	+	-
<i>Br. quadridentatus</i> var. <i>rhenanus</i> (LAUTERBORN)	+	-
<i>Colurella adriatica</i> EHRB.	+	-
<i>Conochiloides dossuarius</i> (HUDSON)	+	-
<i>Conochilus unicornis</i> ROUSSELET	+	-
<i>Euchlanis dilatata</i> EHRB.	+	+
<i>Dicranophorus epicharis</i> HARRING-MYERS	+	-
<i>Filinia longiseta</i> (EHRB.)	+	+
<i>Kellicottia longispina</i> (KELLCOTT)	-	+
<i>Keratella cochlearis cochlearis</i> (GOSSE)	+	+
<i>K. cochlearis</i> var. <i>macracantha</i> LAUTERBORN	+	-
<i>K. cochlearis</i> f. <i>micracantha</i> LAUTERBORN	+	+

Taxon	summer autumn-winter period	
<i>K. cochlearis</i> var. <i>tecta</i> (GOSSE)	+	-
<i>K. cochlearis</i> var. <i>irregularis</i> f. <i>angulifera</i> LAUTERBORN	+	-
<i>K. testudo</i> (EHRB.)	-	+
<i>K. valga</i> (EHRB.)	+	-
<i>K. quadrata</i> (O. F. MÜLLER)	+	+
<i>Lecane bulla</i> (GOSSE)	+	-
<i>L. closterocerca</i> (SCHMADRA)	+	-
<i>L. hamata</i> (STOKES)	+	-
<i>L. lunaris</i> (EHRB.)	+	+
<i>Lepadella rhomboides</i> (GOSSE)	+	+
<i>Lopohocharis salpina</i> (EHRB.)	-	+
<i>Pedalia mira</i> (HUDSON)	+	-
<i>Platylas patulus</i> (O. F. MÜLLER)	+	-
<i>Pl. quadricornis</i> var. <i>pentagona</i> WULFERT	-	+
<i>Polyarthra dolychoptera</i> IDELSON	-	+
<i>P. euriptera</i> WIERZEJSKI	+	-
<i>P. major</i> BURCKHARDT	+	-
<i>P. remata</i> SKORIKOV	+	-
<i>P. vulgaris</i> CARLIN	+	+
<i>Pompholyx sulcata</i> HUDSON	+	-
<i>Rotaria rotatoria</i> (PALLAS)	-	+
<i>Synchaeta grandis</i> ZACHARIAS	+	-
<i>S. oblonga</i> EHRB.	+	+
<i>S. pectinata</i> EHRB.	-	+
<i>Testudinella mucronata</i> (GOSSE)	+	+
<i>T. patina</i> (HERMANN)	-	+
<i>Trichocerca bicristata</i> (GOSSE)	-	+
<i>Tr. birostris</i> (MINKIVICZ)	+	+
<i>Tr. capucina</i> (WIERZEJSKI u. ZACHARIAS)	+	-
<i>Tr. pusilla</i> (JENNINGS)	+	-
<i>Trichotria pocillum</i> (O. F. MÜLLER)	-	+

After surveying the quantitative data of the summer period, it was striking that, corresponding to the season besides the species *Anuraeopsis fissa*, *Brachionus calyciflorus* f. *amphiceros*, *Filinia longiseta*, *Keratella cochlearis*, the species *Polyarthra remata* and *Synchaeta oblonga* preferring rather cool waters, were members of the plankton, occurring in a considerable number.

In the days following the flood, the number of the planctonical Rotatoria surpassed 90 thousand ind./100 l. Their quality then decreased more and more, reduced in a month (August 6th) to a minimum characterized by a value not more than 220 ind./100 l. Of that period, the aquatic macrovegetation breaking forth and the change in the production of the planktonical algae, *i. e.*, a considerable fall in the quantity of the algae serving for food to the Rotatoria species was characteristic. The flood passing, the macrovegetation perishing and being mineralized, rendered possible the development of recent alga (and jointly Rotatoria) maxima (on August 21st: 34 thousand ind./100 l; on August 27th: 94 thousand ind./100 l). The species combinations of the initial (July 3rd) and final periods (August 27th) were very similar to each other. The phytophilous species found in large number on August 27th (*Lecane* spp., *Lepadella* spp.) and *Conochiloides dossuarius* are worth mentioning. The latter one occurred in the initial period but occasionally, in a small number; at the end of August, however, it was one of the dominant species of the Rotatoria plankton.

Taxon	Summer aétumn-winter	
	Period	
Cladocera		
<i>Alona rectangula</i> SARS	+	+
<i>Bosmina longirostris</i> (O. F. MÜLLER)	+	+
<i>Ceriodaphnia megops</i> SARS	+	-
<i>Ceriodaphnia reticulata</i> (JURINE)	+	-
<i>Chydorus sphaericus</i> (O. F. MÜLLER)	+	+
<i>Daphnia cucullata</i> SARS	+	-
<i>Daphnia hyalina</i> var. <i>lacustris</i> SARS	+	+
<i>Diaphanosoma brachium</i> (LIÉVIN)	+	-
<i>Leptodora kindtii</i> (FÖCKE)	+	-
<i>Moina rectirostris</i> (LEYDIG)	+	-
<i>Pleuroxus aduncus</i> (JURINE)	+	+
<i>Scapholeberis kingi</i> SARS	+	-
<i>Scapholeberis mucronata</i> (O. F. MÜLLER)	+	-
<i>Simocephalus vetulus</i> (O. F. MÜLLER)	+	-
Calanoida		
<i>Eudiaptomus gracilis</i> G. O. SARS	+	+
Cyclopoida		
<i>Acanthocyclops vernalis</i> FISCHER	+	+
<i>Cyclops strenuus</i> FISCHER	+	-
<i>Megacyclops viridis</i> JURINE	+	-
<i>Mesocyclops leuckartii</i> CLAUS	+	-
<i>Thermocyclops oithonoides</i> G. O. SARS	+	-

In the autumn-winter period (October 23rd to December 17th) the dominant species of the plankton of Rotatoria were the psychrophilous *Polyarthra dolychoptera*, *Synchaeta oblonga*, *Synchaeta pectinata* and the euriek *Keratella cochlearis* preferring the rather cold waters. The tendency of the change in individual density was similar to that observed in the summer period, although the individual number of the occurring species was considerably lower than in Summer. The quick decrease in the comparatively high values (.3.700 ind./100 l) of the initial period (October 23rd to October 29th) was followed by a thin Rotatoria population (140—600 ind./100 l) for almost one month. Before the flood passing (December 10th to 17th), the individual density rose rocketing to 18—20 thousand ind./100 l.

Crustacea fauna

In the course of the investigation, 14 Cladocera, 1 Calanoida, and 5 Cyclopoida taxons were identified (Table 2).

Of the plankton of Crustacea, apart from the richness in species, the considerable plankton density was characteristic. The individual number of two from the 14 Cladocera species, namely *Bosmina longirostris* and *Moina rectirostris*, surpassed 5 thousand ind./100 l on several occasions. The individual density of the Cyclopoida species increased and later decreased, simultaneously with the multiplication of the species Rotatoria and Cladocera. In the period of the summer flood passing, there couldn't be found any well-developed individuals.

In the autumn-winter period, the plankton of Crustacea in the bay at Abádszalók was formed by not more than 5 Cladocera, 1 Calanoida, and 1 Cyclopoida. Their individual density, too, was considerably smaller than in Summer.

After comparing the zooplankton data of the Tisza as the supplying water-course of the future reservoir, and those of the bay at Abádszalók as a part of the reservoir that is to be considered as characteristic (Fig. 1), we may establish that in the reservoir

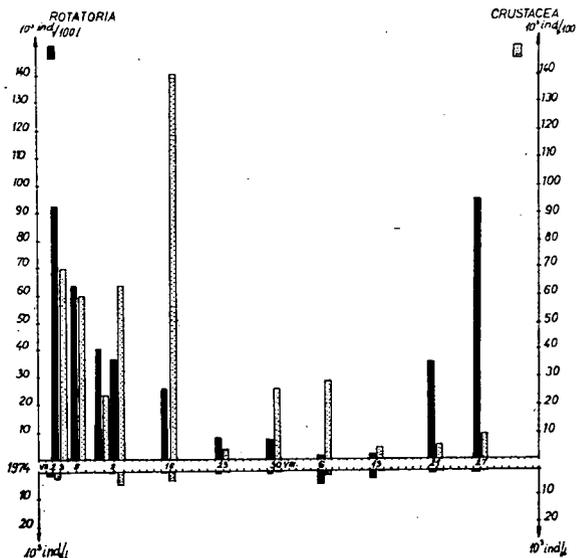


Fig. 1. The quantitative relation between the planktons of Rotatoria and Crustacea in the bay at Abádszalók and the Tisza

in the period after being filled up, there can develop a zooplankton stand that is considerably richer in species than that in the Tisza, having a 20 to 100 times greater individual density than the stand in the Tisza. The characteristic river-water plankton of the Tisza will be followed in the reservoir, in a comparatively short time, by the development of a backwater plankton, promoted also by spreading and multiplying of the fauna of the water-spaces of the flood-plains (backwaters, borrow areas).

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