

SOME CONSIDERATIONS ON THE STRUCTURE AND THE DYNAMICS OF THE PLANKTON BIOCENOSSES IN THREE ACCUMULATION LAKES FROM THE OLT RIVER VALLEY

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During the year 1993, three Olt river accumulation lakes have been investigated, namely: Mesteacănul / Bălan Lake (close by the river source situated), Arpaş Lake (downstream of Făgăraş town situated) and Băbeni Lake (downstream of Râmnicu Vâlcea town situated).

From each lake, there have been collected 2-4 samples in three characteristic months: May, July and September.

Phytoplankton and zooplankton lakes quantitative data will be presented in this paper.

Following the distribution of the two plankton cenosis (Tab. 1) could be observed an increase in the number of the taxa from upstream towards downstream, especially the number of phytoplankton - particularly Cyanophyceae and Chlorophyceae - and the number of zooplankton - particularly Rotifera and Crustacea. In Mesteacănul Lake from qualitative point of view diatoms are dominant (11 taxa out of 17) and Protozoa respectively (14 taxa out of 22); in the other lakes green algae are becoming dominant (32 taxa out 74 in Arpaş Lake and 46 taxa out of 93 in Băbeni Lake). The existing Diatoms and Protozoa remains constant as the number of taxa.

From the point of view of the present density of organisms one can be ascertained that from upstream towards downstream, the number of these increases (the minimal and also maximal values) (Tab. 2).

Generally (with only one exception) maximal values are founded close by the dam - therefore after these organisms have had the possibility of free multiplication in the lake, in conditions of stagnant water. However, we remark the fact that the minimal values of phytoplankton in Arpaş and Băbeni Lakes

Table 1.

Distribution of phytoplankton and zooplankton taxa

Lake	Phytoplankton		Zooplankton	
Mesteacănul / Bălan	Cyanophyta	3	Protozoa	14
	Dinophyta	1	Rotatoria	6
	Bacillariophyta	11	Copepoda	2
	Chlorophyta	2		
	Total	17	Total	22
Arpaș	Cyanophyta	6	Protozoa	16
	Dinophyta	4	Rotatoria	40
	Bacillariophyta	23	Cladocera	1
	Euglenophyta	9	Copepoda	1
	Chlorophyta	32		
Total	74	Total	58	
Băbeni	Cyanophyta	15	Protozoa	15
	Dinophyta	1	Rotatoria	1
	Chrysophyta	1	Cladocera	47
	Bacillariophyta	19	Branchiura	1
	Euglenophyta	11	Copepoda	2
	Chlorophyta	46		
Total	93	Total	68	

Table 2.

Phytoplankton and zooplankton minima and maxima

Lake	Phytoplankton (thous. cells/l)		Zooplankton (ex/l)	
	Minimum	Maximum	Minimum	Maximum
Mesteacănul/Bălan	19.21	102.3	7.5	86.0
	July	September	May	July
	Lake'Tail	Dam	Lake'Tail	Lake'Tail
Arpaș	46.2	2,719.0	39.6	3,718.6
	May	September	May	July
	Dam 7 m	Dam 7 m	Lake'Tail	Dam 3 m
Băbeni	262.57	11,550.26	155.0	2,905.1
	May	September	September	July
	Dam 4 m	Dam 0 m	Lake'Tail	Dam 4 m

are in the proximity of the dam, near the bottom of the basin, while the minimal values for zooplankton are always founded towards the tail of the lakes.

Analyzing the dynamics on the stations and seasons (Fig. 1-3), we ascertained very often an „antagonistic" phytoplankton-zooplankton evolution, exactly as a result of the process of algae consumption by Rotifera and herbivorous crustacean. The phytoplankton and zooplankton maxima differs in time: phytoplankton grows in the warm season, reaching higher values about

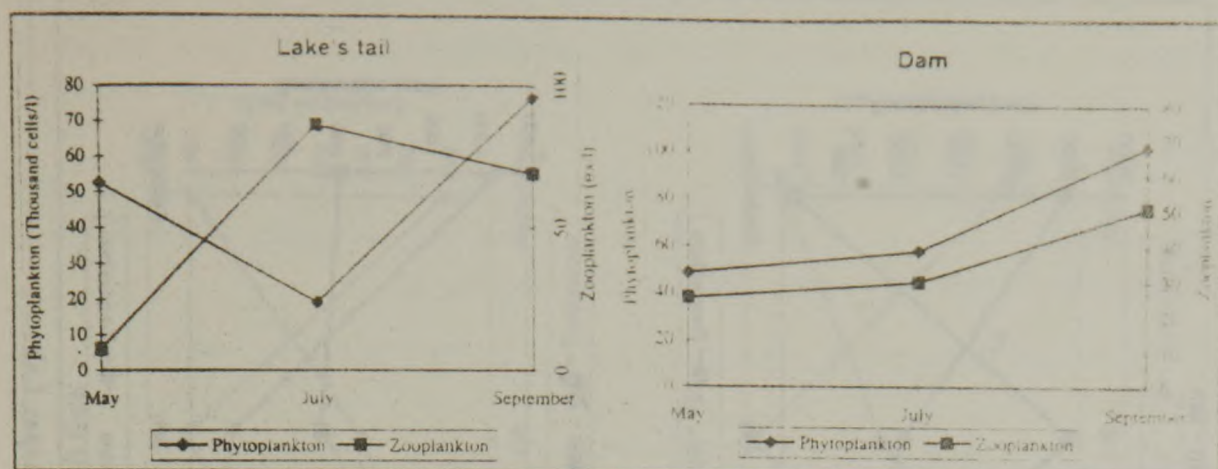


Fig. 1. Quantitative Dynamics of the Zooplankton and Phytoplankton in Mesteacanul Lake

autumn; zooplankton shows higher values in summer, which obviously determines a decrease of number of algae; in opposition, in autumn the number of consumers being low, algae could freely multiply. The biological material produced in the accumulation lakes mentioned above is permanently flowing downstream, constituting on one hand a supplement of organisms which could contribute to the river self purification, and on the other hand constituting a food supplement for rheophile organisms. These are absent from the accumulation lakes, but, as a result of food supplement contribution they can easily multiply in the Olt River, where they are creating more stable and more numerous benthic biocenoses (but these are partly dependent on stagnant water forms). Regarding the role of water quality indicators, we ascertained a passage from oligotrophic towards β - α mesosaprobic forms, from Mesteacănul Lake towards Băbeni Lake. More significant from this point of view are the animals, reflecting water quality, not only by existing species, but particularly by capacity of bacterioplankton and phytoplankton consumers.

Conclusions

Phytoplankton and zooplankton of the studied lakes show qualitatively, as well as quantitatively an obviously increase from the source towards the river mouth. In Mesteacănul Lake, diatoms, Protozoa respectively, are qualitatively prevalent while in the other lakes green algae, rotifers respectively are dominant.

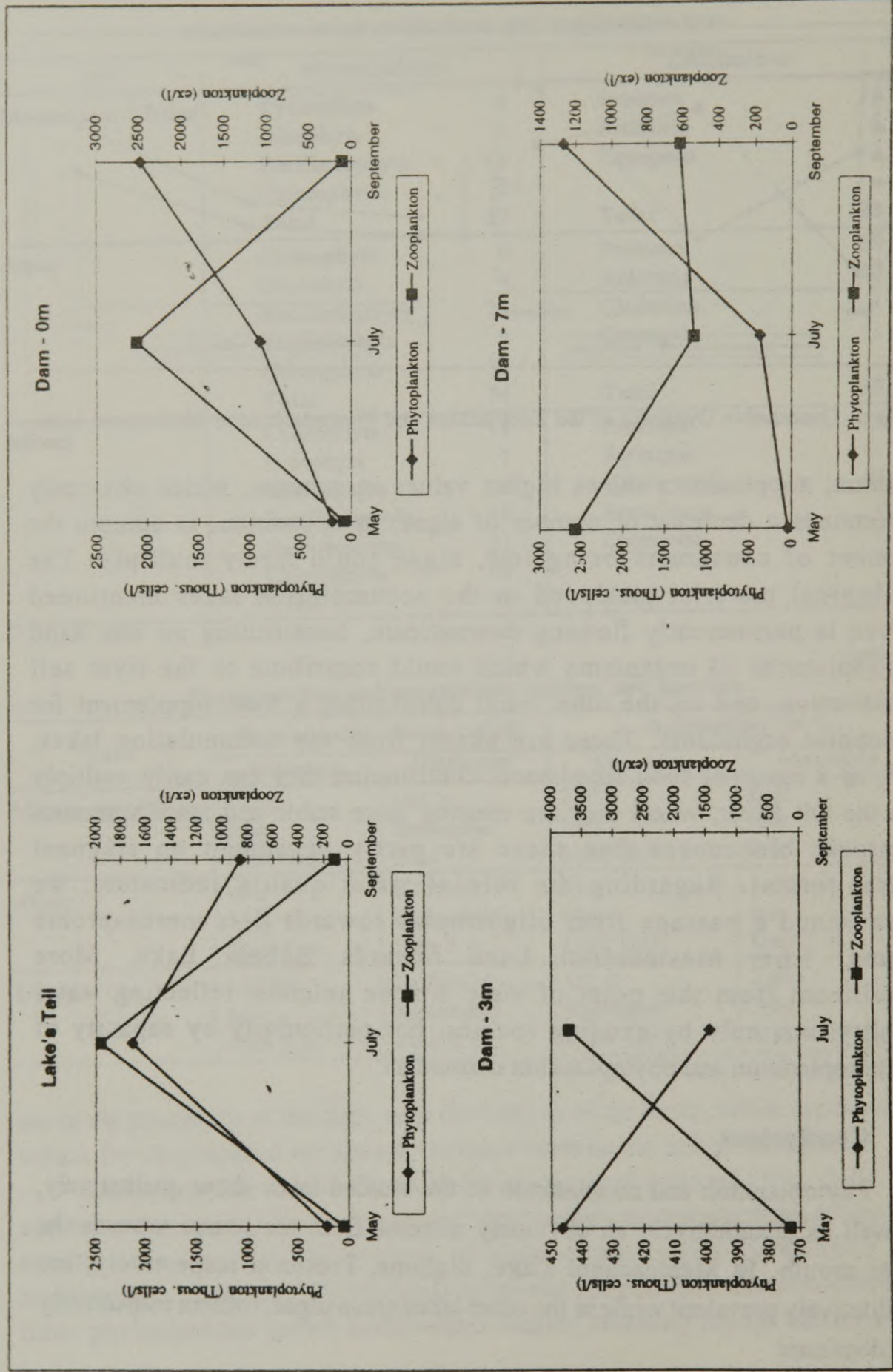
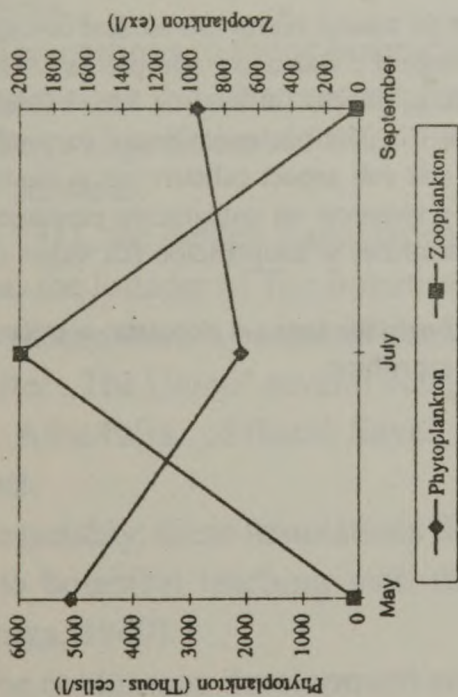
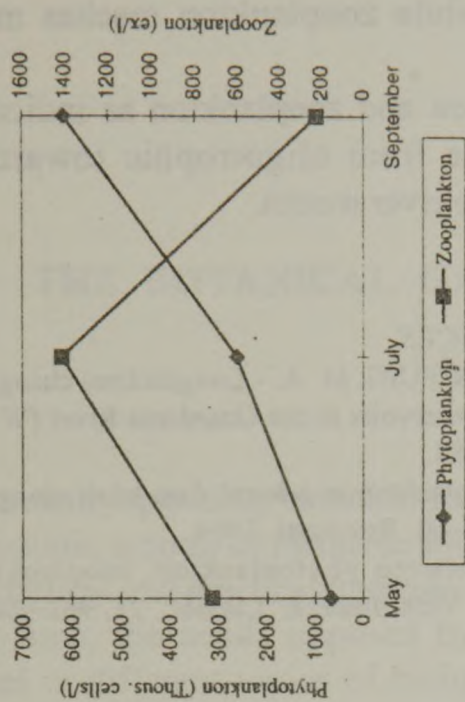


Fig. 2. Quantitative Dynamics of the Zooplankton and Phytoplankton in Arpaş Lake

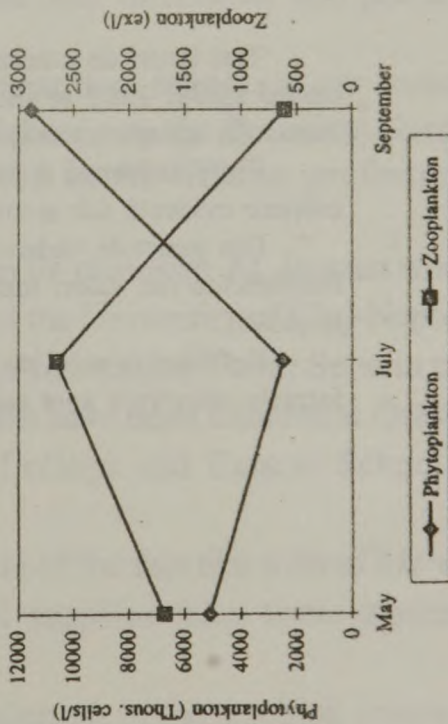
Lake's Tail



Left Side



Dam - 0m



Dam - 4m

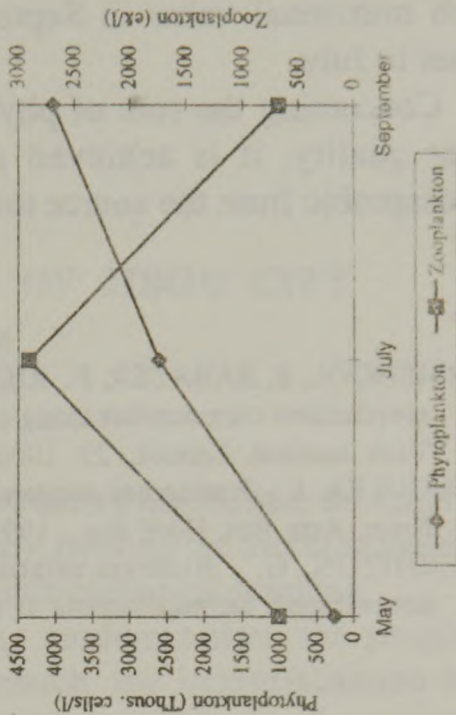


Fig. 3. Quantitative Dynamics of the Zooplankton and Phytoplankton in Babeni Lake

From quantitative point of view, one can be ascertained a permanent antagonism between phytoplankton and zooplankton. In all lakes the algae reach maximnal value in September, while zooplankton reaches maximal values in July.

Concerning the role of phytoplankton and zooplankton as indicators of water quality, it is achieved a passage from oligotrophic towards β - α mesosaprobic from the source towards the river mouth.

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Considerații asupra structurii și dinamicii biocenozelor planctonice din trei lacuri de acumulare de pe Valea Oltului.

Rezumat

Trei lacuri de acumulare dispuse pe traseul râului Olt au fost investigate în cursul anului 1993 și anume: Mesteacănul / Bălan (în apropierea izvoarelor), Arpaș (în apropierea orașului Făgăraș), și Băbeni (în aval de Rm. Vâlcea).

Fitoplanctonul și zooplanctonul din lacurile menționate au prezentat o creștere evidentă din amonte în aval, atât sub aspect calitativ cât și cantitativ.

Din punct de vedere cantitativ s-a remarcat un antagonism permanent între fitoplancton (cu valori maxime în septembrie) și zooplancton (cu valori maxime în iulie).

Referitor la rolul de indicatori ai calității apei s-a constatat o trecere de la formele oligotrofe spre cele β -a mesosaprobice.