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Hydrobiological and piscicultural features of certain small basins within the Oltenia Plain

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Abstract. Along the Preajba Valley, there were built 12 small basins (1 – 6 hectares and depths of 1-3 meters). From the ecological point of view, the basins belong to the category of eutrophic ecosystems. The primary and secondary production is represented by high values of the phytoplankton, zooplankton and zoobenthos. Ichthyofauna is made up of the following species: *Cyprinus carpio, Carassius gibelio, Rutilus rutilus, Abramis brama, Perca fluviatilis, Sander lucioperca.* The piscicultural production is estimated at 100 – 200 Kg/ha.
Key words: piscicultural hydrobiology, basins.

Résumé. Sur le parcours de la rivière Preajba 12 petits lacs de barrage ont été construits (1-6 ha, profonds de 1-3m). De point de vue écologique, les lacs font partie de la catégorie des écosystèmes eutrophiques. La production primaire et secondaire est donnée par les hautes valeurs du phytoplancton, zooplancton et zoobentos. L'ichtyophaune est composée des espèces suivantes: *Cyprinus carpio, Carassius gibelio, Rutilus rutilus, Abramis brama, Perca fluviatilis, Sander lucioperca.* La production piscicole est estimée à 100-200 Kg/ha.
Mots clés: hydrobiologie piscicole, lacs.

Rezumat. Pe cursul râului Preajba s-au construit 12 mici lacuri de baraj (1 – 6 ha cu adâncimi de 1 -3 m). Din punct de vedere ecologic, lacurile fac parte din categoria ecosistemelor eutrofe. Producţia primară şi secundară este dată prin valorile ridicate ale fitoplanctonului, zooplanctonului şi zoobentosului. Ihtiofauna este alcătuită din următoarele specii: *Cyprinus carpio, Carassius gibelio, Rutilus rutilus, Abramis brama, Perca fluviatilis, Sander lucioperca.* Producţia piscicolă este estimată la 100 – 200 Kg/ha.
Cuvinte cheie: hidrobiologie piscicolă, lacuri.

Introduction. The hydrographic system of the Preajba Valley is located along the lower sector of the Jiu River (Figure 1). From the geographic point of view, the basin is situated within the Oltenia Plain (Brezeanu & Gâştescu 1996). The ecological feature of the area resides in the fact that, within a geographical space that covers only 40 sq km, there develops a wide range of aquatic ecosystems: springs, streams, rivers, lakes, and marshes (Bănărescu 1990).

Along the main course of the Preajba Valley, there were built 12 small basins for piscicultural uses (Cioboiu & Brezeanu 2002).

Material and Method. In order to evaluate the hydrobiological and piscicultural features of the area in question, we established a research program covering a period of four years. There have been established the qualitative and quantitative structure of the planktonic and benthonic populations during characteristic seasonal stages. The basins were periodically populated with fish species supplied from fisheries and natural lakes.

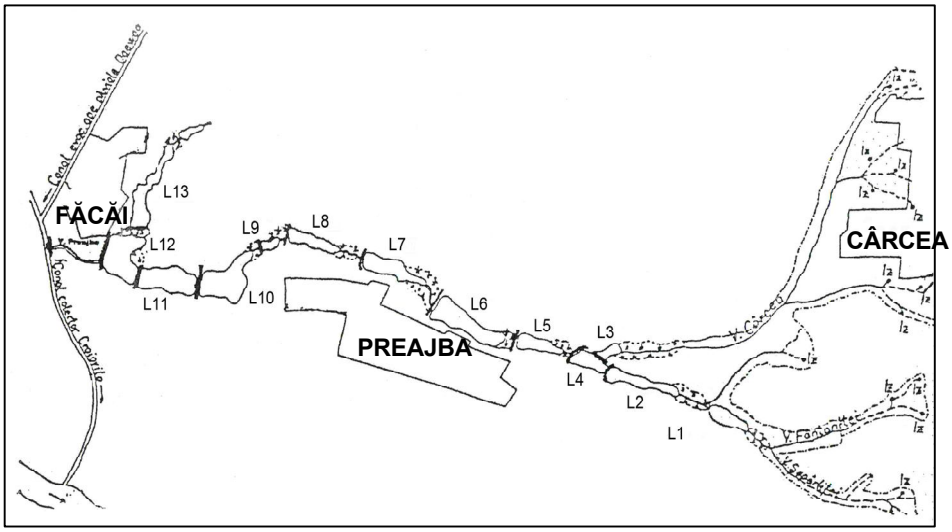

Figure 1. Sketch of the Preajba Valley hydrographical basin

Results and Discussion. The surface of the basins oscillates between 1 and 6 hectares, while the depth between 1 and 3 meters. The basins belong to the category of eutrophic ecosystems. The main factor that triggers the trophy state is the high quantity of nutrients (nitrogen, phosphorus) carried by rain water into the basins from the neighboring agricultural fields. From the point of view of the quality conditions characteristic to surface water, the basins belong to the 2nd quality category.

The eutrophic character of the ecosystems results from the features of the qualitative and quantitative structures of the plant and animal populations belonging to these specific biocoenoses.

The phytoplankton structure is characterized by the presence of 75 species belonging to the following taxonomic groups: Cyanophyceae, Euglenophyceae, Pyrrophyceae, Heterokontae, Bacillaryophyceae and Chlorophyceae. The highest number of species is registered in the case of Bacillaryophyceae and Chlorophyceae. The same report is characteristic with regard to numerical density and biomass (Niculescu et al 1999).

Table 1

Numerical (samples/l) and biomass (mg/l) density on taxonomic groups of the phytoplankton (average values)

Taxonomonic groups	*Numerical density thousand samples/l*	*Biomass mg/l wet substance*
Cyanophyceae	76	0.335
Euglenophyceae	51	0.144
Pyrrophyceae	1	0.003
Heterokontae	7	0.045
Bacillaryophyceae	543.5	1.142
Chlorophyceae	394.5	0.841
Total	1073	2.510

As the aquatic macrophites (*Phragmites communis, Typha angustifolia, Scirpus lacustris, Carex riparia*) cover large surfaces of the shore area, periphyton displays an important contribution of their primary production.

Zooplankton is specific to eutrophic lakes, fact that is also reflected by the great number of zooplanktonic populations. Rotifera made up the most numerous group (40 species) followed by Testaceae and Copepoda with 8 species and Cladocera, 7 species. Their production is also reflected by the numerical and biomass density, the maximum values being registered by the Rotifera and Cladocera (Parpală et al 2002).

Table 2

Numerical (samples/l) and biomass (µg/l) density on taxonomic groups of the zooplankton (average values)

Taxonomic group	*Numerical density (samples/l)*	*Biomass (µ/l) wet substance*
Ciliata	2.4	0.24
Testacea	16.6	9.54
Rotifera	257.1	121
Cladocera	13.04	170
Copepoda	156	689
Total	445	991

Zoobenthos mainly depends on the nature of the facies. The benthic biocoenoses are specific to silt (dominant) and detritus facies. According to the features of the benthic biotope, the structure of the zoobenthos acquires an obvious diversity proven by the presence of 13 large groups of invertebrates. If we take into account the numerical density, the most important groups are the Chironomida (4,693 samples/sq m), Gamarida (3,506 samples/sq m), and Gastropoda (386 samples/sq m).

Table 3

Zoobenthos structure (average values)

Taxonomic	Basin VI			Basin XII		
groups	S. no./sq m	Ab. %	F %	S. no./sq m	Ab. %	F %
Chironomidae	4,693	50.3	100	800	26.4	100
Gamaridae	3,506	37.6	33	-	-	-
Ostracoda	267	2.8	66	440	14.5	66
Heteroptera	213	2.2	100	160	5.2	100
Gastropoda	386	4.1	66	200	6.6	66
Bivalvia	53	0.5	33	-	-	-
Cladocera	-	-	-	227	7.4	33
Copepoda	-	-	-	320	10.5	33
Efemeroptera	160	1.7	66	267	8.8	66
Plecoptera	-	-	-	453	14.9	33
Isopoda	26	0.3	33	80	2.6	66
Oligocheta	-	-	-	53	1.7	33
Hirudinea	13	0.1	33	27	0.9	33
Total	9,317	100.00		3027	100.00	

One of the main reasons the basin were built for is the piscicultural function (Bănărescu 1964). The source of the fish populations of the basins is the periodical population with species brought from the natural pools, as well as from fisheries. The main species living in the basins are: *Cyprinus carpio, Carassius gibelio, Rutilus rutilus, Abramis brama*, *Perca fluviatilis, Sander lucioperca*. The piscicultural production oscillates between 100–200 Kg/ha and it is mainly exploited through sportive fishing.

Conclusions. The research regarding the structures and the hydrobiological and piscicultural functions of certain basins located within the Oltenia Plain revealed that their main feature is the uniqueness of their presence within a plain area with an excessive continental climate. The ecological – hydrobiological – piscicultural attributes stand for the unitary character of these basins within the Carpathic–Danubian space.

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