ASSESSMENT OF ICHTHYOFAUNA ALONG THE LOWER SECTOR OF THE OLT RIVER

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Abstract. The complex works for obtaining hydroelectric power of the Olt River included the construction of a series of reservoirs; among these reservoirs, there are no longer sectors with flowing water. This situation generated even more important changes in aquatic fauna than pollution (BĂNĂRESCU, 1964). One of the significant effects is the disappearance of the indigenous species living in flowing water, as most of the remaining specimens are old and cannot reproduce, thus leading eventually to the their total disappearance (IONESCU, 2001). For the ecological characterization of the ichthyofauna of the Olt River, especially based on the diversity and heterogeneity of the biotope, there were established four study sectors, three in the area of the reservoirs and one in the rheophilous sector of the Olt River.

Keywords: fish, rheophilous sector, stagnant sector, the Olt River.

Rezumat. Evaluarea ihtiofaunei din sectorul inferior al râului Olt. Amenajarea hidroenergetică complexă a râului Olt a creat o serie de lacuri, între care nu mai există practic porţiuni cu apă permanent curgătoare. Aceasta a condus la modificări ale faunei acvatice mai importante chiar decât poluarea (BĂNĂRESCU, 1954). Unul din efectele deosebite este cel al dispariţiei speciilor autohtone iubitoare de apă curgătoare, în marea lor majoritate rămânând doar exemplare bătrâne, care nu se mai pot reproduce conducând în final la dispariţia totală a acestora (IONESCU, 2001). Pentru caracterizarea ecologică a ihtiofaunei râului Olt, mai ales pe baza varietăţii şi heterogenităţii biotopului, au fost stabilite 4 sectoare de studiu, trei în lacurile de baraj şi unul pe sectorul reofil al râului Olt.

Cuvinte cheie: peşti, sector reofil, sector stagnofil, râul Olt.

INTRODUCTION

The hydrographical basin of the Olt modified a lot after the construction and commissioning of the chain of reservoirs located along its course, starting from Braşov County downstream to its mouth (BREZEANU et al., 1993; BREZEANU, 1999; BREZEANU & SIMON-GRUIŢA, 2002).

The Olt is one of the four largest rivers in Romania. The harnessing of the Olt River was based on a chain of hydroelectric power plants of dam type. After the system was achieved, a series of modifications of the morphology of the riverbed and banks of the Olt River occurred, as well as important changes in the flow regime of surface and groundwater, soil cover and biotic environment (SCUTELNICU & DRUŢĂ, 1990). .

In the studied areas, there are currently noticed some changes and an interesting evolution of the ecosystems (GÂŞTESCU, 1971; MIRON & MIRON, 1997). Thus, some new biotopes have emerged and expanded, namely the lentic biotopes, the physicochemical properties of the water have changed, the water temperature and conditions of oxygenation have changed and others, which have influenced the pre-existent species (BURIAN, 2002; DIACONU, 1999). The construction of the reservoirs led to the quantitative reduction of a number of species, as a consequence of the reduction of their habitat and thus, it led to the decrease of their functional contribution to the biological production; it also affected the genofund and the ecofund of the Olt River (NISTREANU & NISTREANU, 1999).

Instead of native species living in flowing water, there rapidly developed species adapted to stagnant water, which, prior to the construction of reservoirs, appeared accidentally or at a very low percentage, and which have currently become dominant (BUŞNIŢĂ & ALEXANDRESCU, 1963).

If the presence in the reservoirs of large quantities of fish species characteristic to stagnant water (significantly more specimens than those living in the proper river) meets the requirements of recreational fishing, it does not meet the requirements of nature protection (CIOBOIU, 2005).

One of the main objectives of nature protection is precisely to ensure the survival of most indigenous species and populations, which is not possible under these circumstances (NICOARĂ, 2002).

However, there is a surprisingly rich fauna, and in the area between Izbiceni and the Danube, species of significant scientific and economic value have been identified.

MATERIAL AND METHODS

The research objective was rendering the dynamics of fish populations in the lower sector of the Olt River.

The sampling for fish study was carried out by fishing by means of cork, lead on the bottom of the water and fishing nets.

In order to establish the structure of fish population, there were made the following operations:

- grouping of fish according to the species
- grouping of the specimens of each species according to their dimensions
- measurement of specimens
- weighing specimens of each species by size groups

In order to make the ecological characterization of the ichthyofauna of the Olt River, especially based on the variety and heterogeneity of the biotopes, there were established 4 study sectors, three in the area of Strejeşti, Ipoteşti, Izbiceni reservoirs and one along the rheophilous sector from Izbiceni to Islaz.

RESULTS AND DISCUSSIONS

The study of the composition and structure of fish populations presents certain difficulties related to sampling, which are, on the one hand, due to the nature of the aquatic environment, and, on the other hand, to that fact that fish are organisms with extremely varied sizes and a high degree of mobility.

In 1909, GRIGORE ANTIPA in 'Ichthyologic Fauna of Romania' mentioned 72 fish species present in the Olt River, fish also mentioned by BĂNĂRESCU in 1964. The number of species decreased a lot, and, now there are about one third of the species mentioned by Antipa in 1909.

In 2006, along the rheophilous sector of the Olt, there were identified 7 fish species (Table 1).

Table 1. Fish species identified along the rheophilous sector of the Olt River in 2006.

No.	Fish species	Number of specimens	Average dimension (cm)	Average weight (g)
1.	*Carassius gibelio* (Prussian carp)	18	14	115
2.	*Lepomis gibbosus* (pumpkinseed)	5	5	10
3.	*Alburnus alburnus* (common bleak)	2	5	5
4.	*Chondrostoma nasus* (common nase)	6	8	23.5
5.	*Abramis brama* (common bream)	3	10	34
6.	*Silurus glanis* (wels catfish)	1	12	80
7.	*Lota lota* (burbot)	1	19	80

Analyzing Figure 1, it can be noticed that the dominant species is the Prussian carp, followed by pumpkinseed and common nase, the rest of the species having a reduced share.

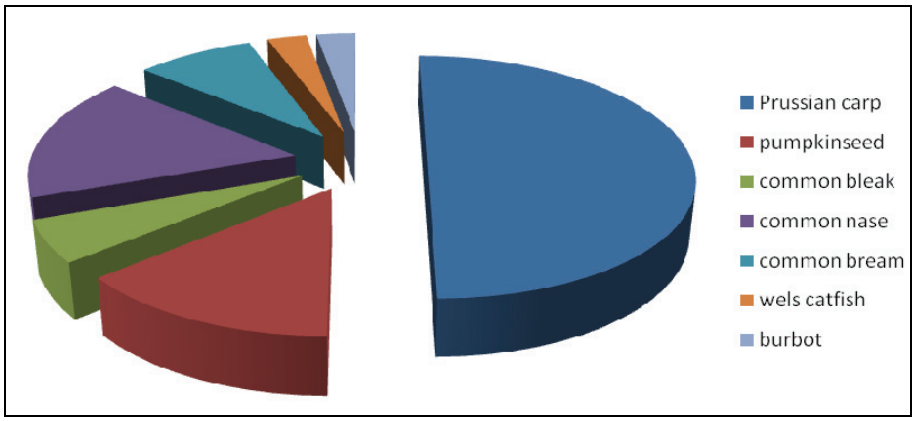

Figure 1. The share of fish species identified along the rheophilous sector of the Olt River in 2006.

In 2009, there were identified 12 fish species (Table 2). The dominant specie are: Prussian carp, common nase, common bleak and common bream (Fig. 2).

Table 2. Fish species identified along the rheophilous sector of the Olt River in 2009.

No.	Fish species	Number of specimens	Average dimension (cm)	Average weight (g)
1.	*Carassius gibelio* (Prussian carp)	14	17	195
2.	*Lepomis gibbosus* (pumpkinseed)	3	7	13
3.	*Alburnus alburnus* (common bleak)	5	8	10
4.	*Chondrostoma nasus* (common nase)	4	7	21
5.	*Abramis brama* (common bream)	5	12	37
6.	*Silurus glanis* (wels catfish)	2	17	125
7.	*Scardinius erythrophthalmus* (rudd)	3	10	65
8.	*Lota lota* (burbot)	3	18	78
9.	*Aspius aspius* (asp)	2	15	145
10.	*Cyprinus carpio* (carp)	5	18	250
11.	*Stizostedion lucioperca* (zander)	2	22	365
12.	*Perca fluviatilis* (European perch)	4	12	135

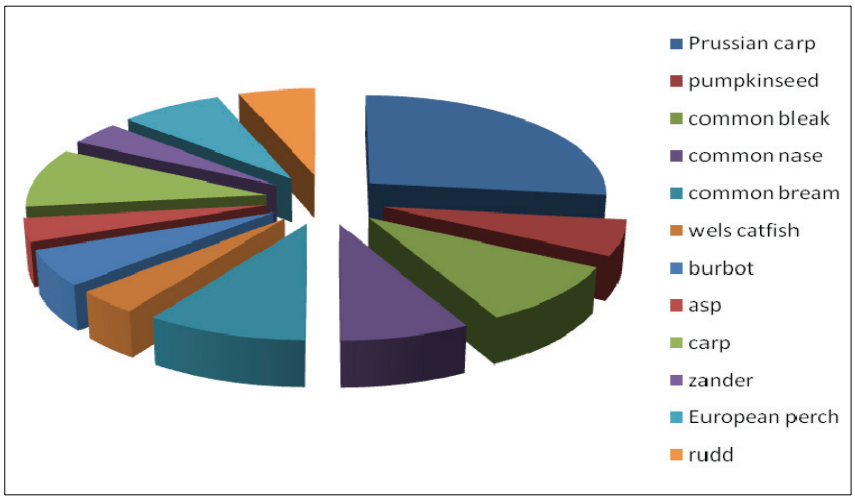

Figure 2. The share of fish species identified along the rheophilous sector of the Olt River in 2009.

The dominant fish species identified in 2012 (Table 3) are the Prussian carp, common nase, common bleak and common bream as well as in 2009 (Fig. 3).

Table 3. Fish species identified along the rheophilous sector of the Olt River in 2012.

No.	Fish species	Number of specimens	Average dimension (cm)	Average weight (g)
1.	*Carassius gibelio* (Prussian carp)	15	19	225
2.	*Esox lucius* (pike)	3	25	315
3.	*Alburnus alburnus* (common bleak)	5	7	9
4.	*Chondrostoma nasus* (common nase)	4	7	21
5.	*Abramis brama* (common bream)	4	10	36
6.	*Silurus glanis* (wels catfish)	2	21	210
7.	*Scardinius erythrophthalmus* (rudd)	3	11	70
8.	*Lota lota* (burbot)	1	17	69
9.	*Aspius aspius* (asp)	4	13	127
10.	*Cyprinus carpio* (carp)	4	16	228
11.	*Stizostedion lucioperca* (zander)	3	20	292
12.	*Perca fluviatilis* (European perch)	4	13	147
13.	*Barbus barbus* (common barbel)	2	20	300
14.	*Leuciscus cephalus* (chub)	1	15	230
15.	*Gobio gobio* (gudgeon)	1	10	23

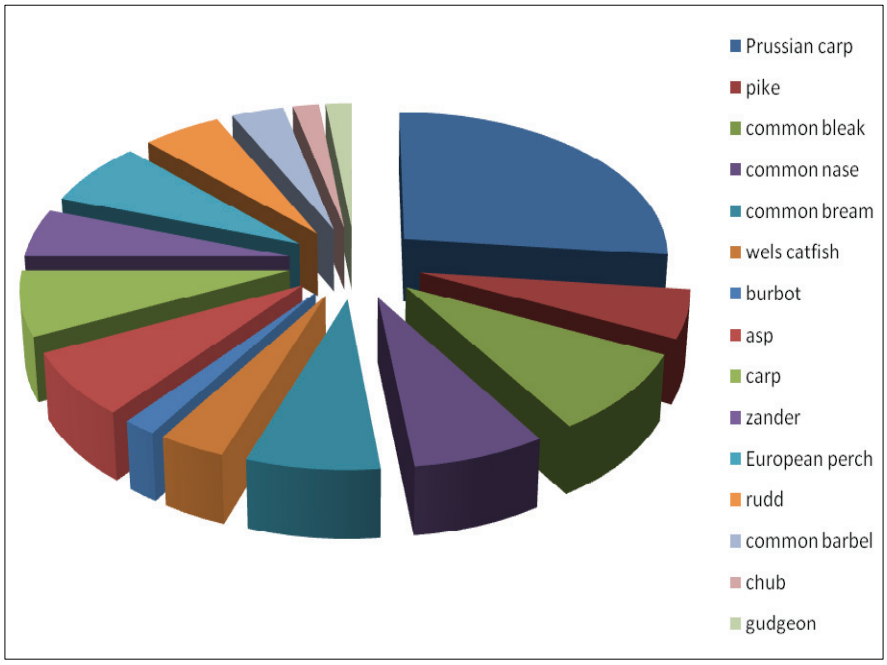

Figure 3. The share of fish species identified along the rheophilous sector of the Olt River in 2012.

Within the stagnant sectors, the dominant species are: Prussian carp (35%), carp (20%), wels catfish (10%), European perch (10%), zander (10%), pike (5%), common bream (5%) and rudd (5%) (Fig. 4).

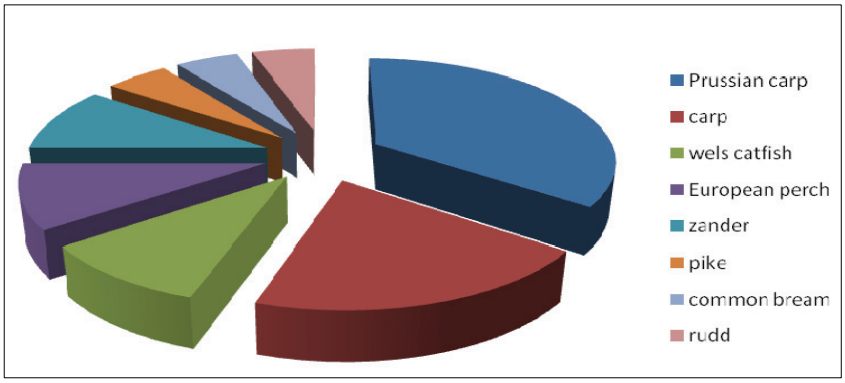

Figure 4. The share of fish species identified along the stagnant sector of the Olt River.

From the data, it can be noticed that the most numerous specimens are registered by the Prussian carp (*Carassius gibelio*) – present in all the studied sectors, to the mouth of the river, as it had been expected.

Cyprinus carpio (carp) is mainly present in the stagnant sectors, the number of specimens in case of this species being more reduced than in case of the Prussian carp, but greater compared to the rest of the fish species.

The highest number of specimens was captured in stagnant sectors, while along the rheophilous sector the number is lower and the dimensions of the specimens smaller.

CONCLUSIONS

The structure of the fish populations has been deeply affected; the complex harnessing of the Olt River in order to obtain hydroelectric power had a great impact on the fish populations living in the river, as well as on the fish population from the Danube that used to migrate on the Olt River to Drăgăneşti Olt to lay eggs as it changed the water flow regime; of the total fish species identified by Antipa in 1909, presently, there are about one-third left.

Thus, the Olt River transformed from a natural ecosystem to an anthropogenic ecosystem. Downstream Izbiceni, the impact of the constructions is reduced and the Olt River still preserves its natural aspect, thus ensuring optimum conditions for the development of the autochthonous ichthyofauna of the Olt and even of certain species characteristic to the Danube; consequently, in this sector, there is a greater variety of species of scientific and economic importance.

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