4.4. FISH-FAUNISTIC SURVEY OF THE JÁSZSÁGI CANAL SYSTEM

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4.4.1. INTRODUCTION

The Jászsági main canal is one of the biggest irrigation canals branching out of the Kisköre Reservoir. The primary role of the canal system part the which is to provide irrigation water for the agricultural production and to fulfil the water demand of many fish ponds. With the continuous expansion of the canal system, nowadays there is an artificial surface water spread to the whole Jászsági-plain formed.

Only few data were available on the fish fauna of the Jászsági canal system. Endes and Harka (1985, 1987) examined the vertebrate fauna of the Jászsági-plain and the Heves-Borsodi-plain. An important survey is given by Harka (1985, 1987), about the fishes of Kisköre Reservoir. More current data can be found in the works of Kovács (1990, 1995) and Györe (1995 a,b). Considering a wider region, Harka (1988) redorded the spread of the Proteorhinus marmoratus in the catchment area of the River Tisza. Pintér (1991) described the appearance of another, previously rare fish species. He investigated the spread of the Ictalurus melas in the water system of the River Tisza. In his opinion, the fish-farms dealing with this species are responsible for its spread.

4.4.2. MATERIALS AND METHODS

During the faunistical survey we investigated the segment of the so-called J-III-1 and J-III-2 irrigation canal at Sajfok-Kőtelek and the segment of the Dobai main canal between Tiszasüly and Kőtelek. These canals provide water to the fish ponds.

For the survey of the fish fauna we applied several methods. The most data derived from yearly fishing. With this method we gained information mainly on the bigger and older fishes. Thus, we had to complete our survey with the fishing pointing to the smaller-sized species. We compared our results with the literature data concerning the fish fauna of the water regions (upper segment of the Jászsági main canal, Millér main canal, Kisköre Reservoir) in this area.

Besides our own investigations we followed the official fishing. Moreover, we included our previous faunistical investigations done at a canal joining the Jászsági canal system.

In the nomenclature, we followed Pintér (1992).

The Jászsági main canal receives its water from the Kisköre Reservoir. The water supply provides the irrigation water and fish pond nutriment water from the first half of March until the end of October and the beginning of November. The water amount given off to the main canal is about 2-5m^3/sec usually. During summer these values are often much higher to fulfil the higher demands, for the spring this is lower-rate.

The water quality of the Jászság main canal and its side branches can be regarded good as for the fish pond-utilisation. The water of the canal system is first-class in the most cases but sometimes second-class water quality occurred for some components (dissolved oxygen, nitrite, dissolved orthophosphate content).

4.4.3. RESULTS

Following fish species were recorded

Acipenseridae:

Acipenser ruthenus L. Rare. Nowadays we can find less individuals even in the River Tisza.

Esocidae:

Esox lucius L. It is often occurring in the canal system, even according to the literature data. Its reproduction guild is phytophil (Bíró, 1993), so the floating and fixed pondweeds of the canals provide the conditions of its reproduction.

Cyprinidae:

Rutilus rutilus L. Common almost everywhere, it appeared in high numbers in all three years and literature data also mention it. Its reproduction guild is phyto-lytophil, so it can reproduce in the canal.

Ctenopharyngodon idella Cuv. et Val. Its constant appearance in the investigated area is due to the supply from the fish ponds and the introduction. Its presence helps to maintain the physical state of the macrovegetation by consumption.

Hypophthalmichthys molitrix Cuv. et Val. Its population is mainly from introduction and it likely can colonize frrom the from fish ponds, too.

Aristichthys mobilis Rich. Appears every year but in a smaller number than the Hypophthalmichthys molitrix Cuv. et Val. No data on this species in the literature.

Scardinius erythrophtalmus L. Appears in low numbers but often. Literature data also include it (Endes and Harka 1985, 1987)

Leuciscus idus L. Occurred every year but in low numbers.

Leucaspius delineatus Heckel It occurred only in 1994 in the canal but Endes and Harka (1985) recorded from the Millér and the Jászság canals. Although it is phytophil, making it possible, it still could not spread in the canal system. This can be explained by its higher oxygen demand, which not provided during summer in the canal.

Aspius aspius L. It is recorded by Endes and Harka (1987). No reproduction can take place in the canal.

Alburnus alburnus L. Common. As a phyto-lytophil species, it can reproduce in the investigated area.

Blicca bjoerkna L. Endes and Harka caught in the Jászsági canal and the Millér main canal. It is rare in the investigated area.

Abramis brama L. Frequent species, reproduction is also possible in the canal system.

Abramis sapa L. Rare.

Tinca tinca L. It appears everywhere and constantly because of the slow water flow and the steady water-type.

Chondrostoma nasus L. It appears at Jászsági canal accidentally from the reservoir. No reproduction in the canal.

Barbus barbus L. Its appearance is similar to *Chondrostoma nasus* L.

Gobio gobio L. As a psammophilous species, cannot reproduce in the canal.

Pseudorasbora parva Schegel It is high number everywhere. Its population is increasing. In fishponds its overproduction can cause a damage.

Rhodeus sericeus amarus Bloch Our only ostracophyl fish species. A significant shell population is likely to be present, on the basis of the appearance of this species in masses.

Carassius carassius L. Frequent species.

Carassius auratus L. It breeds in the Kolopi Fishfarm, the population may originated from there. The environmental conditions are favourable for its reproduction.

Cyprinus carpio L. Common everywhere in the canal.

Cobitidae:

Cobitis taenia L. Reproduces in the canal. It occurs probably in several localities.

Siluridae:

Silurus glanis L. Introduced and coming from the fish ponds.

Ictaluridae:

Ictalurus nebulosus Le Sueur The conditions are favourable for this species everywhere in the canal. Therefore, its populations are growing.

Ictalurus melas Rafinesque A few individuals come out of the Kolop Fishfarm. It probably has a stable populaiton. The way of life is similar to that of the Ictalurus nebulosus. Pintér recorded from the River Tisza in 1991. Thus, its appearance in other segments of the canal system is possible. It reached Tiszasüly in May 1995 from HAKI in Szarvas and two months later it ran away from the fish ponds to the canal.

Centarchidae:

Lepomis gibbosus L. Occurs everywhere but in a small number.

Percidae:

Perca fluviatilis L. Everywhere common. It appeared in the canal every year, the literature mentions it, too.

Gymnocephalus cernuus L. Its distribution is similar to that of the Perca fluviatilis.

Stizostedion lucioperca L. It is an important part of the good haul of fishermen of the canal. It can come from the reservoir and the two big fish farms.

Gobiidae:

Proterorhinus marmoratus Pall. Previous data mention it from the Danube. Harka found it first in the water system of the River Tisza and its further distribution in East Hungary is possible. During our investigations it appeared in 1993 at one of the fish ponds. This fish pond next to Szolnok gets its water supply from the Millér main canal that is part of the Jászsági canal system. Its presence is possible in the whole canal system.

4.4.4. Discussion

During our survey, we found 30 species in the investigated area, this is more than mentioned in literature (Endes and Harka, 1985, 1987). But fewer than in the Kisköre Reservoir. This differences are brought about by the environmental conditions and the different investigation intervals. The dominance situations are similar. From the fishing data the *Cyprinus carpio* and the *Carassius species* are characteristic for the Kisköre Reservoir. (Tájékoztató 1995) According to our survey these species were the most frequent. From the 11 protected species, two occurred in the canal system, *Leucaspius delineatus* and *Cobitis taenia*.

The fish fauna of the Jászsági canal system represents a shift between the species of the river and the lake associations. The water flows slowly in the canal, thus due to the strong sedimentation those fish species disappear that prefer the fast flowing water and the sandy, flinty riverbed (e.g. *Chondrostoma nasus, Barbus barbus*). The appearance of these species is accidental and they cannot reproduce here. Those species occur in high numbers that prefer steady and slow water and gain their nutriment from the silt (*Tinca tinca, Cyprinus carpio*). From the predatory fish, Ictalurus nebulasus occurs in the highest rate but Esox lucius and the *Stizostedion lucioperca* can be found, too.

The fish pond farming has an effect on the composition of the fish fauna. The presence of the ornamental fish species in the samples shows this well. The appearance of Ictalurus meals and the distribution of Pseudorasbora parva is due to the water-

management in fishponds. Pseudorasbora parva can overproduce in the fish ponds, where fish are fed and in the canal it is a competitor of other species.

The fish fauna of the canal system is influenced by the various utilisation methods. The upper part of the Jászsági main canal is rather angling water, whereas the lower is used for fishing. During the fish introductions of the past years 3 years *Cyprinus carpio* were disposed to the canal.

In the fish industry it is impossible to take the long-term interests into consideration. Under the present uncertain economic and regulations conditions the investments can only be recovered in a short term.

4.4.5. Summary

The Jászsági canal system was established at the same time the Kisköre

Reservoir was built. The fish fauna of the canal system has been examined by few researchers, and the previous data relate to the reach of Jászsági main canal at Heves county. In the present fish-faunistic survey the reach of J-III-2 irrigation canal at Sajfok-Kőtelek and the connecting to this reach of the Dobai-canal at Tiszasüly-Kőtelek was examined. In the course of the qualitative and quantitative survey, completed with the data of previous observations, altogether 30 species were found at the examined area. It is proved that the fish fauna of canal system shows transition between river's and pond's fauna. In addition to environmental conditions the different economical utilisation and the fish breeding affect the composition of the fish fauna, too.

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