

THE PRESENCE OF TENCH AND ALLOCHTHONOUS FISH SPECIES IN SOME WATER COURSES OF VOJVODINA*

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*SUMMARY: Based on the data obtained through complex ichthyological research in waters of Vojvodina in the last thirty years, the presence of tench-*Tinca tinca* was monitored, as well as the presence of the following allochthonous fish species: *Ictalurus nebulosus*, *Lepomis gibbosus*, *Carassius gibelio*, *Ctenopharyngodon idella*, *Hypophthalmichthys molitrix*, *Aristichthys nobilis* and *Pseudorasbora parva* as an important disturbing factor of the above mentioned indigenous species. The results show significant decrease in number, and even extinction of tench, while the presence of imported species is increasing, especially brown bullhead, pumpkinseed sunfish and Prussian carp.*

Key words: *Tinca tinca*, allochthonous fish species, Vojvodina.

INTRODUCTION

Tench – *Tinca tinca* L. 1758 is one of the rarest and most endangered freshwater fish species today, both in Serbia and other parts of Europe. It has almost completely disappeared from the waters of Vojvodina, and that is why it is subject of the Rulebook on declaration and protection of protected and strictly protected wild species of plants, animals and fungi published in the Official Journal of the Republic of Serbia, no. 5/2010 from 5 February 2010. Furthermore, permanent close hunting season was declared for this fish species, based on the Law on Fisheries, Official Journal of the Republic of

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Serbia, no. 17 from 13 March 2009. It has also disappeared from fish farms, although its contribution was significant. It was bred in polyculture with carp, and during the 1960s it was the second most important species in carp fish ponds (Ćirković et al., 2008; 2009; 2012). After hydro-ameliorative measures, regulation of natural water flows, building embankments and dams, disappearance or reduction of flood plains around rivers, draining many standing waters, habitat of this species has been reduced drastically, and this trend continues (Maletin et al., 2008a).

Apart from the above mentioned, the remaining populations have almost completely disappeared due to introduction of allochthonous fish species. The greatest impact have had so called American complex species (black bullhead-*Ictalurus nebulosus* and pumpkinseed sunfish-*Lepomis gibbosus*) and Chinese or “Far East” complex (Prussian carp-*Carassius gibelio*, grass carp-*Ctenopharyngodon idella*, topmouth gudgeon-*Pseudorasbora parva*, silver carp-*Hypophthalmichthys molitrix* and bighead carp-*Aristichthys nobilis*) (Lenhardt et al., 2011). Black bullhead, pumpkin seed sunfish and topmouth gudgeon have direct negative impact on tench populations because they feed on fish roe, and the first two species also feed on tench young (Cakić et al., 2004). Prussian carp has an exceptionally great negative impact, because its specific reproduction (gynogenesis) disturbs tench spawn, it feeds on fish roe, and it is also direct competitor of tench in terms of diet and habitat. When large production, rapid increase in numbers, exceptional adaptability and aggressiveness of the Prussian carp are added to the above, it can be concluded that this species has almost completely ousted tench from its habitat (Maletin et al., 2005). Grass carp, through habitat destruction, also has indirect but great impact on tench populations. This species feeds on large amounts of water macrophytes (Ćirković et al., 2011), and it can thin out the water vegetation to such an extent that it can hinder tench spawn. In aquaculture, bighead carp and silver carp are in direct competition with tench for food because, before the introduction of these two species, undigested food discharged from digestive tract of the common carp was directly used by tench.

MATERIAL AND METHODS

The ichthyology material was collected in the periods of high, low and medium water levels with an electrofishing device and nets of various mesh diameters starting from 1980 in running and standing waters of Vojvodina, as well as in canal network of Danube-Tisa-Danube Hydro-system. It was determined by using the keys Simonović (2006).

RESULTS AND DISCUSSION

For the last thirty years, complex ichthyological research has been done in the waters of Vojvodina, the part of which was monitoring of the presence of tench-*Tinca tinca*, as well as the presence of the introduced species which are, apart from habitat degradation, its main disturbing factor. From the abundance of data, it can be seen that in most of the waters in Serbia, which are tench's natural habitats, this species is registered in a very small proportion. In the Koviljsko-Petrovaradinski rit Special Nature Reserve, the presence of tench was registered in the period between 1979 and 1996, and

later it disappears (Maletin et al., 1997a). Since then, at the same site, the proportional contribution of brown bullhead-*Ictalurus nebulosus*, pumpkinseed sunfish-*Lepomis gibbosus* and Prussian carp-*Carassius gibelio* has increased, which is, apart from the above mentioned authors, also stated at various points, brown bullhead was present with 37.50% (Okruglica), more than 42.57% at Šlajz and up to 48.63% at Dunavac (Luić et al., 2012). The significant presence of pumpkinseed sunfish at this site was registered in 1980 (13.47%) (Budakov et al., 1983), and with even greater proportional contribution it was registered in 1999 and 2008 (20.09% and 26.39% respectively at Arkanj and 37.16% at Šlajz) (Luić et al., 2012). In 1996, when tench was last recorded at this site, Prussian carp was present with 41.05% (Maletin et al., 2008b) and in 2000, its presence in the total catch at Tonja has risen up to 66.66% (Maletin et al., 2001). The significant presence of this imported species was also registered in 2006 at Arkanj (31.72%) (Maletin et al., 2008a), as well as in 2008 at Okruglica (37.50%) (Maletin et al., 2011). Tench was being registered in canals of Danube-Tisa-Danube Hydro-system with very small proportional contributed up to 2006, when it disappears (Maletin et al., 1997b; Maletin et al., 2008b). At this site, as it was mentioned before, the disappearance of tench also coincides with the increased presence of the above mentioned allochthonous species, especially Prussian carp, the proportional contribution of which moved from 41.51% in 1983 (Budakov et al., 1984) to 75.60% in 2006 (Marković et al., 2010). The similar state was registered at Bajski canal, where Prussian carp was present with 44.41% in 1996 (Maletin et al., 1997b), as well as at Vrbas-Bezdan, Odžaci-Sombor, Novi Sad-Savino Selo, Bački Petrovac-Karavukovo and Banatska Palanka-Noví Bečej canals, where its proportional contribution moved between 42.80% and 62.50% in the period between 1996 and 2006 (Maletin et al., 2011). The most significant tench presence in the waters of Vojvodina from the mid 1970s was registered in the Obedska Bara Special Nature Reserve in 1976 and it was 11.06% (Luić et al., 2012). Since then, its number has decreased, and at the same time, according to these authors, the presence of Prussian carp, the proportional contribution of which was 61.22% at this site in 1982, has increased. Concerning this imported species which, as it has previously been mentioned, directly endangers tench, the most drastic situation is in the Stari Begej-Carska Bara Special Nature Reserve, where the presence of Prussian carp has moved from 20.55% in 1984 (Kostić and Maletin, 1992) to 84.31% in 2007 (Marković et al., 2010). Tench was registered at this site in 1984 and 1988 with low proportional contribution (Kostić and Maletin, 1992). Concerning watercourses in Banat, the presence of tench in the Tamiš River has not been registered since 1998 (Maletin et al., 2002). At this site, the significant presence of pumpkinseed sunfish (17.39%) was registered in 2010, and of Prussian carp (21.54%) in 2009 (Šipoš et al., 2007). Among sites in Vojvodina where tench was present, the Zasavica Special Nature Reserve should be mentioned, because in 1998, at Valjevac point, tench was present with 7.38% and at Šumareva Čuprija with 3.15% (Simić et al., 2007). However, it should be stressed that brown bullhead was present with 38.52% and 59.84% respectively (Kostić et al., 2000). Furthermore, the Mrtva Tisa Nature Park should also be mentioned, where the presence of tench has not been registered since 1988 (Kostić and Maletin, 1992), but proportional contribution of pumpkinseed sunfish was 33% and of Prussian carp 20.50% at this site in 1996 (Maletin et al., 1996). In the last several years, the significant tench presence (4.95%) was recorded at Bara Trskovača Natural Monument in 2006, but the proportional contribution of pumpkinseed sunfish was also high (25.79%) (Maletin et al., 2008b). This author stresses that

repopulation with tench broodstock is the only way to increase the number of tench in this watercourse.

CONCLUSION

Based on the ichthyological material that has been collected with electrofishing device and nets of various mesh diameters in the last thirty years, in running and standing waters of Vojvodina, as well as in canal network of the Danube-Tisa-Danube Hydro-system, it can be concluded that the number of tench-*Tinca tinca* is significantly decreased, and that this species has even disappeared, while proportional contribution of imported species, especially brown bullhead-*Ictalurus nebulosus*, pumpkinseed sunfish-*Lepomis gibbosus* and Prussian carp-*Carassius gibelio*, is growing. All allochthonous species from American and Chinese complex, and especially the above mentioned ones, are one of the most prominent disturbing factors for tench.

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PRISUSTVO LINJAKA I ALOHTONIH RIBLJIH VRSTA U VODENIM TOKOVIMA

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Izvod

Na osnovu podataka dobijenih tokom kompleksnog ihtiološkog istraživanja voda Vojvodine u poslednjih trideset godine, posmatrano je prisustvo linjaka, *Tinca tinca*, kao i sledećih alohtonih ribljiv vrsta: terpana, *Ictalurus nebulosus*, sunčanice, *Lepomis gibbosus*, babuške, *Carassius gibelio*, belog amura, *Ctenopharyngodon idella*, belog tolstolobika, *Hypophthalmichthys molitrix*, sivog tolstolobika, *Aristichthys nobilis* i bezribice *Pseudorasbora parva* koje predstavljaju bitan faktor za nestajanje gore pomenute autohtone riblje vrste. Rezultati su pokazali značajno smanjenje broja, pa čak i nestanak linjaka, dok je istovremeno prisustvo alohtonih vrsta povećano, posebno kada su u pitanju terpan, sunčanica i babuška.

Ključne reči: linjak, alohtone riblje vrste, vodotokovi, Vojvodina.

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