

DISTRIBUTION OF THE SPECIES *TELESTES SOUFFIA* (Risso, 1827) (PISCES: CYPRINIDAE) IN THE UPPER TISA RIVER AND ITS TRIBUTARIES (MARAMUREȘ COUNTY - NORTH ROMANIA)

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Abstract. The species *Telestes souffia* (Risso, 1827) is represented by three subspecies across the European rivers (*T. souffia souffia* from the Rhone and the Var rivers; *T. souffia muticellus* in north-Italy and Switzerland; *Telestes souffia agassizi* VALENCIENNES 1844 from the Danube river and the uppermost Rhine drainage). In the Romanian rivers this species was one of the roughly recent recorded cyprinid fishes. Based on a few morphological features, the Romanian populations of this species were assimilated with those from the Upper Danube and the Rhine, respectively the subspecies *Telestes souffia agassizi*. However, a morphological study and the diagnosis on these populations are necessary. The range of *T. souffia agassizi* in the Romanian rivers was initially noted as covering only the northern rivers, respectively the upper Tisa and the river mouth of its main tributaries the Săpânța, the Iza and the Vișeu. After the first record of this species in 1959, during three decades there are no new investigations on the species range in the Maramureș rivers. The recent studies (1995-2008) focused on the fishfauna from the upper Tisa and its tributaries the Vișeu, the Iza, the Mara and the Săpânța reveals the actual range of *T. souffia agassizi* on these rivers. The new data prove also that the species distribution is wide than it was noted before. The species was recorded in 27 localities along the tributaries of the upper Tisa river.

Keywords: the Upper Tisa, *Telestes souffia*, species range.

Rezumat. Răspândirea speciei *Telestes souffia* (Pisces: Cyprinidae) în Tisa Superioară și afluenții săi din județul Maramureș – Nordul României. Specia *Telestes souffia* (Risso, 1827) este reprezentată în râurile Europei prin trei subspecii: *T. souffia souffia* în bazinul Rhonului și al Varului, *T. souffia muticellus* în nordul Italiei și *T. souffia agassizi* VALENCIENNES 1844 în bazinul Dunării și al Rinului superior. La noi în țară a fost una dintre speciile de ciprinide relativ recent semnalate în nordul României respectiv în Tisa superioară și afluenții săi. Pe baza unor caractere morfologice, populațiile de aici sunt considerate ca aparținând subspeciei *Telestes souffia agassizi* din Rinul superior și cursul superior al Dunării. Datele asupra morfologiei indivizilor necesită a fi completate. Aria de răspândire a acestei specii pe teritoriul României a fost inițial considerată ca acoperind numai cursul principal al Tisei superioare și sectorul de vărsare al afluenților Săpânța, Iza și Vișeu. După semnalarea speciei în 1959 o perioadă de aproximativ trei decenii nu au fost realizate studii asupra răspândirii acestei specii în râurile Maramureșului. Cercetările ihtiologice recente, desfășurate în perioada 1995-2008 în lungul Tisei superioare și în afluenții Vișeu, Iza, Mara și Săpânța au evidențiat actuala răspândire a speciei *Telestes souffia agassizi* care este mai extinsă comparativ cu datele existente anterior. Specia a fost identificată în 27 de localități în lungul afluenților Tisei superioare.

Cuvinte cheie: râul Tisa, *Telestes souffia*, răspândirea speciei.

INTRODUCTION

The species *Telestes souffia agassizi* VALENCIENNES 1844 is one of the recently recorded cyprinid species from the Romanian rivers. BĂNĂRESCU & BICHICEANU (1959) identified this fish species from the Săpânța brook, a tributary on the left of the Tisa river. The first indications available regarding the species range are restricted to the upper Tisa stretch and the river mouth of the main tributaries the Vișeu and the Iza. Some of the morphological characteristics of specimens from the Tisa suggest a relationship with the populations originated from the upper Danube and the Rhine (especially those from the tributary Neckar) (BĂNĂRESCU, 1964). As a consequence, the populations from the upper Tisa were provisory considered as belonging to the subspecies *T. souffia agassizi*. In spite of their close resemblance, there are some differences in the morphology and meristic features of these populations and a supplementary morphological study is necessary. Recently, it was presumed that the populations from the upper Tisa are representatives of one species with disjunctive distribution in the Danube drainage (ranged in the Tisa and the Sava rivers) or it represents a quite distinct monophyletic superspecific taxon (BĂNĂRESCU, 2002). Up to now, the genetic studies has confirmed the pertaining of the populations from the upper Rhone and the Var rivers to the nominated subspecies *T. souffia souffia* and those from Slovenia to the subspecies *T. s. agassizi* (MACHORDOM et al. 1999). A distinct clade of *Telestes* species is represented by *Telestes muticellus* that is ranged in north Italy (GILLES et al., 1998, ZARDOYA & DOADRIO 1998, SALZBURGER et al. 2003, ZACCHARA et al. 2007).

Regarding the species distribution, the first records indicated only the upper Tisa river and its tributary the Săpânța in Maramureș county (BĂNĂRESCU & BICHICEANU, 1959). The subsequent studies are not covering the entire range of the species in the upper Tisa drainage area. Further records of *T. souffia agassizi* refer to the lower reach of tributaries, the Iza and also from the river Vișeu downstream the locality Vișeu de Sus. In the drainage area of the Vișeu river (tributary on the left side of the Tisa) this species is mentioned in the Vaser and Novăț brooks. The presence of *T. souffia agassizi* in the Iza drainage area remains mentioned just as possible but there are no reliable data (BĂNĂRESCU, 1964). During the followings three decades there are no advances regarding the study of the distribution of this species. The presence of *T. souffia agassizi* in the main tributaries of the Tisa river was not sustained by new data. The presumable presence of this species in some rivers from the upper Tisa drainage area is based mainly on the

ascertaining of a less noticeable presence of human impact on these rivers (BĂNĂRESCU, 1994). In spite of this presumption, the recent investigations revealed the strong decline of *T. souffia agassizi* from the Vișeu river due to the mining activities (TELCEAN & GYÖRE, 2000, TELCEAN & BĂNĂRESCU, 2002). The presence of the species in the middle rivers, the Iza and the Vișeu was recent mentioned by HARKA & BĂNĂRESCU (1999) and further papers (CRISTEA, 2004) refer mainly to the previous data available from the literature. Consequently, the distribution of *T. souffia agassizi* in the upper rivers from the upper Tisa drainage system remains less studied and vaguely presented in different papers.

MATERIAL AND METHODS

The investigations on the fish fauna from the upper Tisa drainage area was carried out by multiple collecting trips during the years 1995, 1998, 2000, 2007 and 2008. There were attained numerous observations on the general fish fauna composition and abundance. The main purpose was the study on the *T. souffia agassizi* distribution and their characteristic habitat from the Tisa river and its tributaries. The fishing methods combine the electro-narcosis and the fishing nets. The electro-narcosis equipment was the low power type IUP 12 V 4-10 A, 360W (manufactured by RADET-Poland) and the medium-power electric gear FEG 5000 (manufactured by EFKO-Germany). The used catching nets have the mesh size of 5 mm. The specimens of *T. souffia agassizi* caught were directly recorded at the sampling sites and then released.

RESULTS AND DISCUSSIONS

The distribution of the fish species *Telestes souffia agassizi* in the upper Tisa drainage system is larger than it was considered initially. Nearby the Tisa river main channel, this species spread along the tributaries and their drainage system. In the fast-flowing brooks this fish is accompanied by the brown trout *Salmo trutta* and *Phoxinus phoxinus*. The characteristic habitat of this species is represented by upper and middle rivers with gravel bottom and swift current. The presence of the large stones on the riverbed is favourable for this species. In those places the specimens can find an anchorage during the flash flood. The rivers stretches with rubble bottom are not permanently inhabited by this species.

The actual distribution of the species *T. souffia agassizi* covers the Săpânța river, the entire drainage system of the Iza tributary and the lower stretch of the Vișeu tributary (Fig. 1). The species was identified in 34 localities along the Romanian sector of the upper Tisa and its tributaries from the Romanian territory (Table 1). The locations of these sites along the rivers are as follows:

In the **upper Tisa**: the species *T. souffia agassizi* are distributed along the entire Romanian sector of the river from the village Valea Vișeului to Teceu. The species range in this river is wide and exceeds the Romanian stretch of river. The uppermost site in which the species was captured is near the locality Broboia in Ukraine and the lowermost locality is Vilok, close to the Hungarian border. The population of *T. souffia agassizi* from the lowermost stretch of the upper Tisa remains less numerous comparing to those from the Romanian territory.

In the **Vișeu river** the presence of *T. souffia agassizi* is restricted in the lower part of river downstream the junction between the Tisa and its tributary, the Ruscova. The upper river is affected by water pollution from the mining industry and these populations became extinct. The species was mentioned also in the Vaser and the Novăț tributaries (BĂNĂRESCU, 1964). Recent investigations cannot identify this species in these rivers.

In the **Iza river**, the species *T. souffia agassizi* are well represented. In this river the species was identified between the localities Săcel and Sighet. The same wide distribution was observed in some tributaries, such as the Mara and the Cosău. In the Mara river the species *T. souffia agassizi* is distributed downstream the locality Mara along the entire river. In the Cosău river between the localities Budești and Sârbi, it was identified a spawning area of this species. In this river it was captured a female with numerous eggs late in June. It is possible that some populations to have a retarded spawning period in the cold water of the brooks. In the Rona rivulet, a tributary of the Iza in the lower sector, few specimens of *T. souffia agassizi* were captured. It is presumable that these specimens ascend from the Iza river.

The Săpânța is the river where the species *T. souffia agassizi* was initially recorded. The population from here maintains its former abundance downstream the Săpânța village. The uppermost site in which this species spread is located approximately three kilometres upstream the local trout fish-farm (or seven kilometres from the Tisa). The ascending of *T. souffia agassizi* far upstream in this river was not observed. This river represents a suitable site for the spawning of the populations from the Tisa.

The main threatening factors

The populations of *T. souffia agassizi* from the upper Tisa drainage area are threatened by human activities which indirectly affect these rivers. The sawdust storage close to the riverbed is the most extensive practice that threatens the entire fish fauna. In the upper part of the Vișeu tributary, due to the wastewaters spills from the mining activities the populations of *T. souffia agassizi* became extinct. The remaining populations from downstream are less abundant than in the Iza river. Another threatening factor is represented by stone extractions directly from the riverbed. Fortunately, this practice is restricted in few sites near the localities and the impact is reduced.

Table 1. The localities where *Telestes souffia agassizi* appears.
 Tabel 1. Localitățile în care a fost întâlnită specia *Telestes souffia agassizi*.

| River | Locality |
|---------|---|
| TISA | Downstream the junction with the Vișeu river: Lunca la Tisa; Downstream the junction with the Iza river: Sarasău: Teceul Mic; Săpânța junction. |
| IZA | Săcel: Dragomirești: Bogdan Vodă: Rozavlea: Strâmtura: downstream the junction with the Slătioara river: Bârsana: Oncești: Vadul Izei: Cearda. |
| RONA | upstream Sighetu Marmatei |
| MARA | Mara village: Hărniciești: Desești: Berbești |
| COSĂU | Budești: Sârbi: Călinești: Cornești: Ferești |
| VIȘEU | Ruscova river junction: Leordina: Petrova: Bistra: Valea Vișeului village. |
| SĂPÂNȚA | upstream the junction with the Tisa: upstream the Săpânța village |

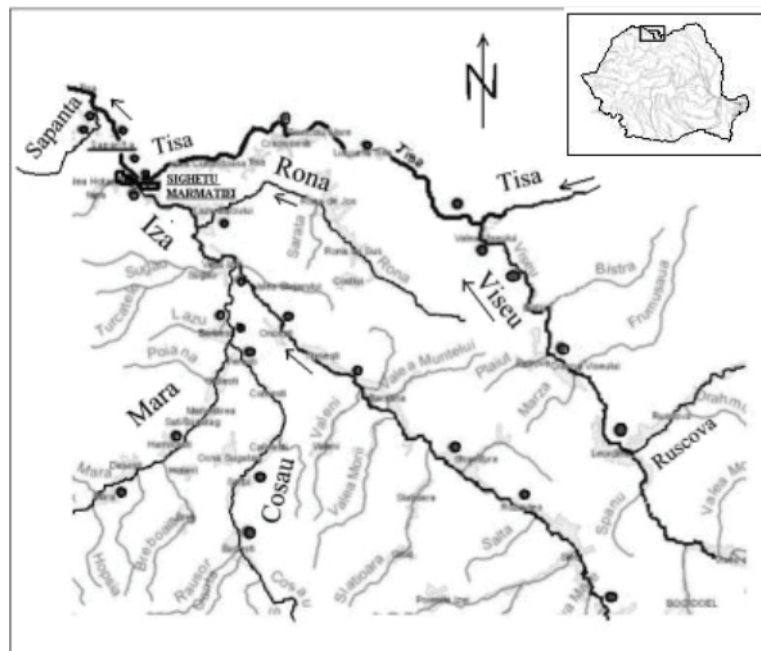


Figure 1. The distribution of species *Telestes souffia agassizi* in the upper Tisa and in the Romanian tributaries.
 Figura 1. Răspândirea speciei *Telestes souffia agassizi* în Tisa superioară și afluenții de pe teritoriul României.

CONCLUSIONS

The range of *Telestes souffia agassizi* in the Upper Tisa drainage area is considerably wider than it was initially described. A number of 28 localities from the Iza, the Vișeu and the Săpânța tributaries and 6 from the Tisa were added in the species distribution list. Our observations on this species are synthesized below:

The range of this species in Tisa river exceeds the Romanian territory and it occurs between localities Broboia and Villok (Ukraine);

The uppermost brooks from the tributaries drainage area are suitable for spawning of this fish. A retarded spawning period was observed in the Cosău upper tributary;

The most extensive threatening factor is represented by sawdust released in the rivers. The stone extractions directly from the riverbed have also a negative impact on the fish fauna near the localities;

The most endangered population is that from the Vișeu due to the mining spill. The water pollution affects the entire river in which *T. souffia agassizi* has less abundant population.

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