

A study of aquatic molluscs in the Upper Tisa

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Introduction

In scientific literature we cannot find concrete reference to the distribution of molluscs in the Upper section of River Tisa. There are only general references to the fauna of molluscs in this area (Soós 1943, Jadin 1952, Grossu 1962, 1986, 1987).

The fauna of aquatic molluscs has many species that can serve as indicators. By studying them we can assess the quality of waters and the degree of alteration caused by human interference.

Keywords: aquatic molluscs, Upper Tisa

Material and Methods

The research was done on the Upper Tisa from its two sources (rivers Bila Tisa and Chorna Tisa) in the territory of Carpathian Ukraine down to the confluence with River Szamos in Hungary (Figure 1.). The research was carried out between 1-22 August 1995 within a single expedition.

Due to its tributaries, River Tisa is exposed to a series of influences. Therefore we also examined the molluscs in the rivers Teresva, Terebja and Batar.

The biological samples were collected at 16 testing sites.

Results and Discussion

The 16 testing sites and the occurrence of the 12 mollusc species are presented in Table 1.

The reduced diversity of the species populating this part of the river is obvious at first sight. The causes of this phenomenon are first of all the steep slopes of the riverbed. The high speed of the stream results in strong erosion. For the same reason large quantities of boulders are carried by the river. From the sources of the river down to site 13 (even down to the Hungarian border) the riverbed consists of large-sized boulders, which become more and more rounded going downstream.

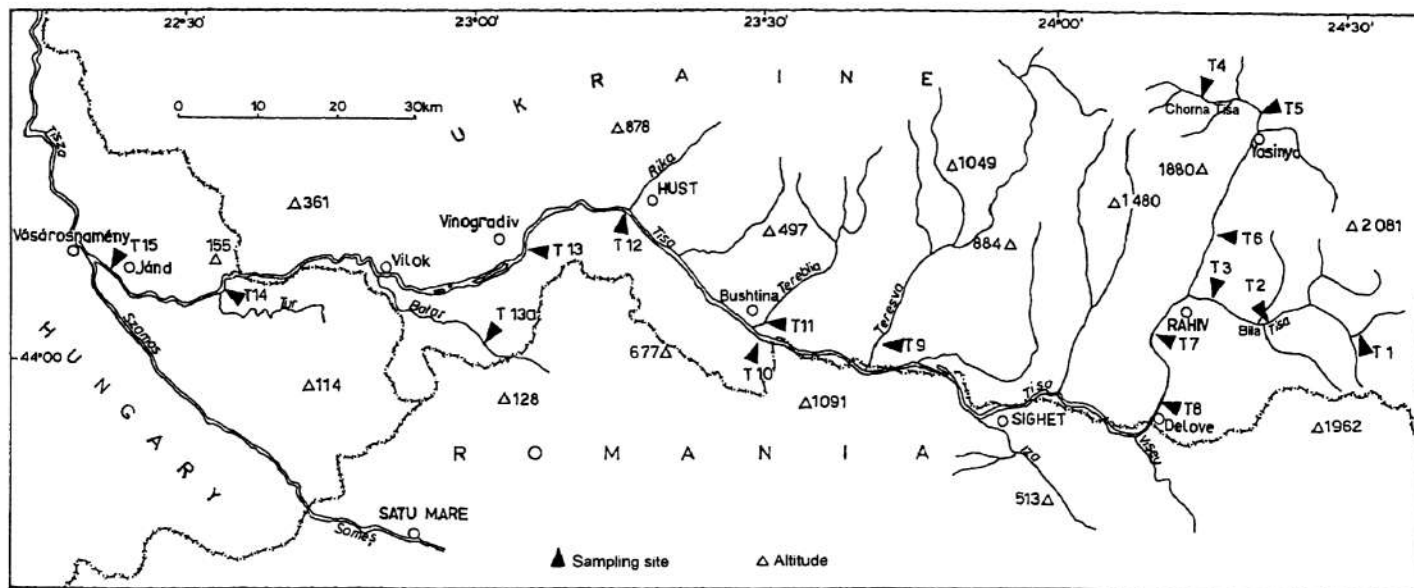


Figure 1. Sampling places

Species	Sites															
	1	2	3	4	5	6	7	8	9	10	11	12	13	13/ a	14	15
Theodoxus fluviatilis L. 1758	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
Lithoglyphus naticoides C.Pfeiff.1828	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
Radix peregra (O.F.Müll. 1774)	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-
Radix auricularia (L. 1758)	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
Stagnicola palustris (O.F.Müll.1774)	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
Galba truncatula (O.F.Müll.1774)	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-
Ancylus fluviatilis O.F.Müll.1774	-	+	+	-	+	+	+	+	-	+	-	+	-	-	-	-
Unio crassus Phips. 1788	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+
Unio pictorum L. 1758	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+
Unio tumidus Phips. 1788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
Anodonta cygnaea L. 1758	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+
Pseudanodonta complanata Rossm.1835	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+

Table 1. Distribution of mollusc species along the Upper Tisa

The very high floods (when the variation of water level is 2-3 m) carry these boulders and deposit them over extensive areas, forming in the lower zone many islands and branches. Even *Ancylus fluviatilis*, an exclusively rheophilic species, has a low abundance (0,1-15 ind/m²), since many individuals are destroyed by rolling pieces of rough sediment.

Most species of aquatic molluscs, especially bivalves, live in zones of slow flow, with sandy or muddy stable sediments. Thus, the bed of River Tisa does not provide favourable conditions for this fauna at sites 1-8, 10, 12 and 13, though water quality is good in this reach.

Conditions at sites 9 and 11 on the tributaries Terebia and Teresva are similar, but there are also habitats with stagnant water. The following species can be found in these habitats: *Radix peregra*, *R. auricularia*, *Stagnicola palustris* and *Galba truncatula*. The rich algal periphyton is favourable for the appearance of the above-mentioned species. We assume that this periphyton has developed as a result of eutrophication in these tributaries. Local inhabitants use large quantities of artificial fertilizers on the mountain pastures.

At station 14 on the Batar tributary we can find a fauna abounding in bivalves: *Anodonta cygnaea*, *Pseudanodonta complanata*, *Unio crassus* and *U. pictorum*. This tributary has slow flow and fine sediments. At the same place we could assess a 20% mortality of individuals, caused by the sewage of the neighbouring settlements.

At sites 14 and 15 the flow of the stream is slower, fine and stable sediments occupy a bigger surface, and the fauna is richer. We could find *Lithoglyphus naticoides* and *Unio crassus* at station 14 and *Theodoxus fluviatilis*, *Unio pictorum*, *U. tumidus*, *Anodonta cygnaea* and *Pseudanodonta complanata* at station 15.

Conclusions and Recommendations

1. There is only one species of Gastropoda (*Ancylus fluviatilis*) present in the mountain region of the Upper Tisa. Its occurrence here reflects the exceptional quality of the water.

2. The great amount of mineral nutrients in the tributaries Terebja and Teresva, and the presence of organic matter in the fine sediments of River Tisa downstream from Rahiv, are consequences of human interference.

3. The presence of *Theodoxus fluviatilis* in the Hungarian reach indicates good water quality.

4. The reduced relative diversity of the mollusc fauna does not have to be considered an alarm for this aquatic system. The Upper Tisa is a typical mountain river. At times of spring and autumn floods (3-4 m variation in water level) huge quantities of boulders are rolled.

References

- Durrant, P. M. (1977): Some factors that affect the distribution of *Ancylus fluviatilis* (Müller) in the river systems of Great Britain. - *J.Moll. Stud.* 43, 6-78.
- Grossu, A. V. (1962): *Mollusca, Bivalvia - Fauna R. P. R.* -3/3, Edit. Acad. Bucuresti.
- Grossu, A. V. (1986): *Gastropoda Romaniae* 1. - Edit. Litera, Bucuresti
- Grossu, A. V. (1987): *Gastropoda Romaniae* 2. -Edit. Litera, Bucuresti
- Jadin, V. I. (1952): *Moluski presnah vod CCCP.* - Akademii Nauk CCCP, Moscow, Leningrad.
- Horváth, A. (1955): Adatok a Tisza puhatestű faunájának ismeretéhez. (Contributions to the knowledge about the mollusc fauna of River Tisa.) - *Acta Zool. Szeged.* 2, 21-32.
- Horváth, A. (1955): Die Molluskenfauna der Teis. -*Acta Biol. Szeged.* 1, 174-180.
- Richnovszky, A., Pintér, L. (1979): A vizicsigák és kagylók (Mollusca) kishatározója. (Small handbook of aquatic gastropods and bivalves) *Vizdok*, Budapest
- Sárkány-Kiss, A. (1986): Die Verbreitung, Dynamik und die Rolle der Art *Ancylus fluviatilis* O. F. Müller, in den Zoozönosen der Gewässer der Mures Fluss-Bassins. - *Proc of the Eighth International Malacological Congress, Budapest, 1983*, 235-238.
- Sárkány-Kiss, A. (1995): Malacological survey on the Mureş (Maros) River. - In: *The Maros/Mureş River Valley*. Hamar, J. & Sárkány-Kiss, A. (eds.) *Tiscia monograph series*, 193-201.
- Soós, L. (1943): *A Kárpát-medence Mollusca faunája.* (The mollusc fauna of the Carpathian Basin) M. T. Akad. Budapest.

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