

Romanichthys valsanicola is still fighting! How can we help?

Ilie C. TELCEAN*, Alfred Ș. CICORT-LUCACIU,
Istvan SAS and Severus D. COVACIU-MARCOV

University of Oradea, Faculty of Sciences, Department of Biology; 1, Universității, Oradea 410087, Romania
*Corresponding author, I. Telcean, E-mail: itelcean@uoradea.ro

Received: 24. May 2011 / Accepted: 07. August 2011 / Available online: 27. August 2011

Abstract. A subadult individual of *Romanichthys valsanicola* was identified in May 2011 in Vâlsan River, Brădetu locality. Its discovery confirms the species' survival, despite the extremely high anthropogenic pressure. The current threats upon the sculpin perch in comparison with the previous situation are taken into discussion, and solutions that should assure its survival are proposed.

Key words: *Romanichthys valsanicola*, Vâlsan River, anthropogenic impact, protection, biodiversity.

The Carpathian basin holds a distinct biodiversity, having a special past and evolution during the glacial periods (see in: Bodnariuc et al. 2002, Kenyeres et al. 2009, Varga 2010). However, despite the presence of several protected areas, the region has been strongly affected by man in the past, clear-cuts being massive in some areas of the Romanian Carpathians (Rozyłowicz et al. 2011). Although biodiversity is in global decline (see in: Butchart et al 2010, Cogălniceanu & Cogălniceanu 2010), a serious situation is registered in the case of freshwater environments (see in: Dudgeon et al. 2006, Suski & Cooke 2007, Turak & Linke 2011). The situation also seems valid in Romania, despite the fact that in freshwater environments there are species with a high conservation value. From these, the most distinct of all is the sculpin perch, *Romanichthys valsanicola*.

R. valsanicola is the most endangered fish species from Romania (Bănărescu 1994), being endemic in the hydrographic basin of Argeș River (Bănărescu 2005). According to the Romanian legislation, the sculpin perch is a species of national interest (OUG 57/2007). The species was relatively recently described (Dumitrescu et al. 1957), it has a great age and survived in the region in the glacial periods, multiple glacial refuges existing at the level of the Carpathians (Schmitt 2009). The species' distribution range during the described period also included, together with Argeș River, two tributaries, Râul Doamnei and Vâlsan, occupying a length of 21 km in the latter (Bănărescu et al. 2005). Dams were afterwards built on Argeș and Vâlsan, which, combined with other factors, led to the decline of the species and it was declared extinct from all three rivers (Stănescu 1971). Presently, it seems that *R. valsanicola* has survived only

in Vâlsan, where it is also found in a strong decline, strengthened by the anthropogenic pressure, being on the brink of extinction (Perrin et al. 1993). From a zoogeographic perspective, it is considered that the actual distribution range represents the last fragments of an initially larger area, at least with respect to the genus (Bănărescu 1998). From a conservative point of view, it is very important that *R. valsanicola* was the centre of a wide protection program, following which the evolution of the sculpin perch seems to have improved (Bănărescu & Vasiliu-Oromulu 2004a,b). However, the situation of the species has not yet been clarified, the last accessible scientific data regarding its observation dating from the year 2005 (Ionașcu & Crăciun 2009). There are recent studies upon the ichthyofauna of Argeș basin in which the species has not been signalled (Ureche et al. 2007). Thus, the survival of *R. valsanicola* in the region has been questioned by some local factors, which could have serious repercussions upon the protected area and its whole biodiversity. As a consequence, assuring the survival of the species is of great importance for the entire protected area established at the level of the hydrographic basin of Vâlsan River. The protection of this species has become a main objective for the caretaker of the protected area, immediately after receiving custody in 2010.

In order to solve the problem of the species' survival, a field trip was organised between 10 and 14 May 2011. In spring 2011 it was cold, snow spots remaining in the higher areas during the interval. Rain modified the turbidity and the flow of Vâlsan, despite the presence of the dam. The fishes were captured using electronarcosis with the help of a portable electrofisher, model Samus - 725MP, which allows to set several parameters of the elec-

tric impulses and does not harm the fishes. After having determined and photographed the captured fishes, we released them at the collecting points.

We captured a *R. valsanicola* (Fig. 1) individual in Brădetu locality, on 12th May 2011. The individual was a subadult, which is important because it represents proof that the species is reproducing in Vâlsan River and the resulted individuals survive. This fact increases the chances of survival of the species. The aspect of the riverbed from the studied sector, with numerous large rocks (Fig. 2a), corresponds with the one described as a typical

habitat of the species (Bănărescu 1964). Other fish species captured alongside the sculpin perch are: *Barbus petenyi*, *Leuciscus cephalus*, *Alburnoides bipunctatus* from the Cyprinidae and *Sabanejewia romanica*, belonging to the Cobitidae family. In the past, two species of cyprinid fish were signalled in the sectors inhabited by the sculpin perch, namely *Gobio uranoscopus* and *Chondrostoma nasus*, which were found in competition with the first one (Stănescu 1971). We have not encountered these species, which probably withdrew to the inferior sector of the river, due to the flow modifications of Vâlsan.



Figure 1. Individual of *Romanichthys valsanicola* from Brădetu locality.



Figure 2. The aspect of the riverbed from the studied sector (a) and riverbed even at 50 m downstream, completely lacking in rocks (b).

R. valsanicola is probably not limited as distribution to the area from which it was captured by us, but it seems that its present distribution range is reduced and fragmented. The fragmentation is firstly due to the modification of the riverbed morphology by the locals that collected rocks for construction. This activity has been known from the past (Bănărescu et al. 1995), representing a serious danger to this species, which is less mobile (Ionaşcu & Crăciun 2009). The riverbed is extremely modified even at 50 m downstream from the area populated by the sculpin perch, almost completely lacking in rocks (Fig. 2b). Despite the fragmentation, small sectors favourable to the species can still be found in the area in which the species was recorded in the past. *R. valsanicola* is probably present in the short segment from upstream of Brădetu, where it had been previously observed (Perrin et al. 1993). We did not manage to identify it there, probably due to the high flow and turbidity of the water resulted from the rains.

The first author of the paper took part in the European project that aimed to assure the survival of the sculpin perch in Vâlsan, having the possibility to compare the current situation with the one from approximately 10 years ago. Probably the only change that advantaged the species in the past years has been the reduction of the pollution originated from the sanatorium from Brădetu, following the realising of a sewerage system, as it was recommended in the past (Bănărescu et al. 1995). On the other hand, the anthropogenic pressure upon the sculpin perch has strongly increased in the past 8 years. *R. valsanicola* is presently subjected to some organised anthropogenic activities performed at a large scale and also to the individual pressure of the locals, which, if accumulated, can be as important as the previous one. The dangers that threaten the species are the ones previously known (e.g.: Stănescu 1971, Bănărescu & Vasiliu-Oromulu 2004a, Bănărescu 2005), being represented by rock extraction from the meadow, flow decrease caused by the dam, pollution, fishing, etc. Clear-cuts, although not as intensive as in the Oriental Carpathians (Rozyłowicz et al. 2011), represent a high threat for the region's biodiversity, indirectly affecting the sculpin perch, due to the general modification of the region and the frequent passing of the vehicles through the water.

A vital danger for *R. valsanicola* is represented by the possible desilting of the storage dam, which could involve huge quantities of suspensions. Desilting the lake also took place in the past, in 1987,

which had catastrophic consequences, being considered as having the most serious effects upon the life conditions from Vâlsan (Bănărescu & Vasiliu-Oromulu 2004a). A new threat is represented by the modification of the shores. The action occurs in several places upstream of Muşăteşti, affecting both the water speed and the aspect of the riverbed and its substratum. The extraction of rocks from the riverbed modifies the aspect of the river in many places, the sectors without rocks being unfavourable for the species, which mostly lies hidden under them (Ionaşcu & Crăciun 2009). Unfortunately, the rocks that have been transported in the riverbed in the past (Bănărescu & Vasiliu-Oromulu 2004a) have been already collected by locals from many places.

Most of the territory initially occupied by *R. valsanicola* in Vâlsan is presently completely included in localities. Their impact is high, in many cases the houses reaching the vicinity of the water. The pressure of localities is manifested through water pollution, shore modification and elimination of their vegetation. The shores that were once covered with orchards are now occupied by households or even industrial objectives.

R. valsanicola is still fighting the threats to which it is subjected, being present further on in Vâlsan River. Despite its reduced territory and the increasing anthropogenic impact, the sculpin perch persists in surviving and even occupying affected sectors, situated inside the localities. Moreover, it seems that the population is still capable of reproducing. However, *R. valsanicola* cannot fight on its own for a long time; vigorous measures must be implemented in order to save it. The fish species from the localities are also threatened in other cases (Duncan et al. 2010), the situation being even more difficult in a poor area, where the local pressure upon the natural resources is increased by a growing population. The measures necessary for the species' survival have been generally known for a long time (e.g.: Perrin et al. 1993, Bănărescu et al. 1995, Bănărescu 2005). The survival of the species decisively depends on maintaining the flow of the river at least at the present level and on ceasing to extract rocks from the riverbed (Bănărescu 2005). Together with these, the clear-cuts from the upper sectors must be reduced or completely stopped, and the modification of the riverbed must also be brought to an end. Desilting of the dam must be stopped with all costs, being the most serious threat upon the sculpin perch (Bănărescu & Vasiliu-Oromulu

2004a). Regarding the larger rocks from the riverbed, not only does their drawing has to be stopped, but also the caretaker would have to initiate restoration programs for the sectors suitable for the species from which the rocks were taken from; habitat restoration being considered an important action for the preservation of freshwater fishes (Maitland & Lyle 1992). The local communities would have to have access to other types of construction materials, thus avoiding the rock collection from the riverbed.

The sectors in which *R. valsanicola* is still present will have to benefit from the strictest protection possible, until some perspective measures are implemented. These will have to be permanently monitored by the caretaker, either using surveillance cameras or with personnel on the field. The protection of the sculpin perch will allow the conservation of the entire biodiversity of the areas populated by it, because, although the freshwater protected areas are usually aimed at fishes, they can also focus on other groups (Suski & Cooke 2007). In addition, the caretaker will have to immediately initiate actions that will establish exactly the distribution of the sculpin perch in Vâlsan, the length of the occupied territory and the size of the population. Afterwards, programmes regarding the species' conservation will have to be realised, in every country being necessary programmes concerning the conservation of threatened fish species (Maitland 1995). It is imperious that other rivers from the Argeş basin are thoroughly investigated, these being insufficiently studied (Kottelat & Freyhof 2007). These objectives are not easily obtained due to the problems with which the protected areas from Romania are faced; from which unsuitable funding can be mentioned (Ioja et al. 2010).

Acknowledgments. Our study was realised with the support of Freies Europa Weltanschauung Foundation, the caretaker of the Natural Protected Area Vâlsan River, to which we wish to thank in this manner. This study is part of the programme dedicated to the investigation of the biodiversity of the protected area Vâlsan River.

References

- Bănărescu, P. (1964): "Fauna R.P.R.", vol. XIII, Pisces - Osteichthyes. Editura Academiei R.P.R., Bucharest. [in Romanian]
- Bănărescu, P. (1994): The present - day conservation status of the fresh water fish fauna of Romania. *Ocrotirea Naturii și a Mediului Înconjurător* 38(1): 5-20.
- Bănărescu, P. (1998): On the relations between hydrography and the ranges of freshwater fish species and subspecies. *Italian Journal of Zoology* 65(Suppl.): 87-93.
- Bănărescu, P. (2005): Pisces (Pești). In: Botnariuc, N., Tatole, V. (eds), *Cartea Roșie a Vertebratelor din România*. Editura Academiei Române, 325p. [in Romanian].
- Bănărescu, P.M., Bless, R., Georgescu, A. (1995): Threatened fishes of the world: *Romanichthys valsanicola* Dumitrescu, Bănărescu and Stoica, 1957 (Percidae). *Environmental Biology of Fishes* 43: 144.
- Bănărescu, P.M., Vasiliu-Oromului, L. (2004a): The Life Nature Project "The survival of *Romanichthys valsanicola* (Pisces, Percidae)" - Results and perspective. *Proceedings of the Institute of Biology* 6: 13-17.
- Bănărescu, P.M., Vasiliu-Oromului, L. (2004b): Future investigations and actions necessary for insuring the survival of *Romanichthys valsanicola*. *Bacău, Studii și Cercetări, Biologie* 9: 107-108.
- Bodnariuc, A., Bouchette, A., Dedoubat, J.J., Otto, T., Fontugne, M., Jalut, G. (2002): Holocene vegetational history of the Apuseni mountains, central Romania. *Quaternary Science Reviews* 21: 1465-1488.
- Butchart, S.H.M., et al. (2010): Global Biodiversity: Indicators of Recent Declines. *Science* 328(5982): 1164-1168.
- Cogălniceanu, D., Cogălniceanu, G.C. (2010): An enlarged European Union challenges priority settings in conservation. *Biodiversity and Conservation* 19: 1471-1483.
- Dudgeon, D., Arthington, A.H., Gessner, M.O., Kawabata, Z.-I., Knowler, D.J., Lévêque, C., Naiman, R.J., Prieur-Richard, A.-H., Soto, D., Stiassny, M.L.J., Sullivan, C. (2006): Freshwater biodiversity: importance, threats, status and conservation challenges. *Biological Reviews* 81: 163-182.
- Dumitrescu, M., Bănărescu, P., Stoica, N. (1957): *Romanichthys valsanicola* n. gen. n. sp. (Pisces, Percidae). *Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa"* 1: 225-244.
- Duncan, R.S., Elliot, C.P., Fluker, B.L., Kuhajda, B.R. (2010): Habitat use of the Watercress Darter (*Etheostoma nuchale*): A Endangered Fish in an Urban Landscape. *American Midland Naturalist* 164(1): 9-21.
- Ioja, I.C., Pătroescu, M., Rozyłowicz, L., Popescu, V.D., Vergheleș, M., Zotta, M.I., Felciuc, M. (2010): The efficacy of Romania's protected areas network in conserving biodiversity. *Biological Conservation* 143(11): 2468-2476.
- Ionașcu, A., Crăciun, N. (2009): Use of telemetry in the conservation of the endangered fish species: *Romanichthys valsanicola* Dumitrescu, Bănărescu & Stoica, 1957 (Pisces: Actinopterygii: Perciformes: Percidae). *Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa"* 52: 497-513.
- Kenyeres, Z., Rácz, I., Varga, Z. (2009): Endemism hot spots, core areas and disjunctions in European Orthoptera. *Acta Zoologica Cracoviensia* 52B(1-2): 189-211.
- Kottelat, M., Freyhof, J. (2007): *Handbook of European freshwater fishes*. Kottelat, Cornol, Switzerland and Freyhof, Berlin, Germany.
- Maitland, P.S. (1995): The conservation of freshwater fish: Past and present experience. *Biological Conservation* 72(2):259-270.
- Maitland, P.S., Lyle, A.A. (1992): Conservation of freshwater fish in the British Isles: Proposals for management. *Aquatic Conservation: Marine and Freshwater Ecosystems* 2(2): 165-183.
- Perrin, J.F., Bless, R., Nalbant, T. (1993): *Romanichthys valsanicola* l'expédition de la dernière chance (octobre 1992, rivière Vilsan, Roumanie). *Revue Française d'Aquariologie* 20(2): 37-42.
- Rozyłowicz, L., Popescu, V.D., Pătroescu, M., Chișamera, G. (2011): The potential of large carnivores as conservation surrogates in the Romanian Carpathians. *Biodiversity and Conservation* 20: 561-579.
- Schmitt, T. (2009): Biogeographical and evolutionary importance of the European high mountain systems. *Frontiers in Zoology* 6: 9.

- Stănescu, G. (1971): *Romanichthys valsanicola* Dumitrescu, Bănărescu & Stoica (Pisces-Percidae), its distribution in Roumania and the causes of its extinction. *Věstník Československé Společnosti Zoologické* 35(2): 132-135.
- Suski, C.D., Cooke, S.J. (2007): Conservation of aquatic resources through the use of freshwater protected areas: opportunities and challenges. *Biodiversity and Conservation* 16: 2015-2029.
- Turak, E., Linke, S. (2011): Freshwater conservation planning: an introduction. *Freshwater Biology* 56(1): 1-5.
- Ureche, D., Bătes, K. W., Stoica, I. (2007): Ichthyofauna actual state in the upper and mid course of the river Argeş hydrographical basin. *Analele Științifice ale Universității "Al.I. Cuza" Iași, s. Biologie Animală* 53: 73-82.
- Varga, Z. (2010): Extra-Mediterranean Refugia, Post-Glacial Vegetation History and Area dynamics in Eastern Central Europe. pp.57-87. In: Habel, J.C., Assmann, T. (eds), *Relict Species: Phylogeography and Conservation Biology Part I*. Springer-Verlag, Berlin Heidelberg.
- ***** OUG nr. 57 / 2007 privind regimul ariilor naturale protejate, conservarea habitatelor naturale, a florei și faunei sălbatice. [în Romanian]