

THE ECOLOGICAL CONDITION OF THE MUREȘ/MAROS RIVER

Abstract



The Mureș/Maros river is a common Romanian-Hungarian river and a tributary to the Tisza which is the main river of the Carpathian Basin.

The ecological study of the common Mureș/Maros river was co-ordinated by the Non Governmental Organisations (NGOs) Tisza Klub, Szolnok (Hungary) and Liga Pro Europa, Târgu Mureș (Romania), in 1991. The Project was sponsored by the Regional Environment Center for Central and Eastern Europe, Budapest. These organisations invited biologists, ecologists, chemists and geologists from Romania and Hungary, who studied the Mureș/Maros river valley from many angles during a 28 days expedition. The scientific results of these studies were published in the volume "The Maros/Mureș River Valley" in 1995. This publication is the information basis for this material. The data, collected by the specialists, was made public through different means of popularising media: press articles, round-table discussions and as an information basis for the adaptation of environment decisions, ecological education and others. The authors of this volume proposed to process these results at an accessible level and to show them in a uniform manner to be understood by specialists from non-biological or ecological domains and by the general public. To facilitate the understanding of the contents, the first chapters are complemented by a short introduction to water ecology and protection. In the main part we mention some characteristics of the water as a habitat and the main groups of organisms and aquatic associations. Special consideration is given to the pollution of the fresh waters, their classification according to their trophic

substant content, to the eutrophic phenomena and the system of the saprobiology and to their importance in limnology. Using the terms and ideas outlined in these parts we briefly tried to describe the processes that are involved in the natural clearing of the water and the factors responsible for it, in a close correlation with the ecological equilibrium notion. Because the largest part of the river Mureş/Maros lies on Romanian territory and this is where the pollution takes place, we have highlighted some essential features of the water legislation in Romania to provide the uninformed readers with a basic knowledge about the obligations and rights concerning fresh waters. With this chapter the main part is finished and is followed by a hydrographic description of the Mureş/Maros basin and a short survey from the first researchers who studied this basin. After the description of the methods that were used for the scientific investigations, follows the ecological description of the river Mureş/Maros. The ecological characteristics are presented from the spring to the confluence on the basis of 15 sampling sites situated along the river in 1991. Each of these stations is described, concerning their general and special natural environment (the river and its bed) characteristic values of the physical and chemical parameters, the bacteriological indicators, the plankton and benthos associations, some important fish species, etc. On the larger areas the flora and the vegetation of the river Mureş/Maros is described and the birds are characterised. At every station we interpreted all the physico-chemical and biological values in correlation with the ecological state of the river, fixing the natural perturbing factors, the artificial pollutants and their effect on the river biogenises. In the last chapter we realised a synthesis of the above-described elements and we propose ideas for the ecological rehabilitation and the reconstruction of the most affected areas.

The river Mureş/Maros as a whole has many specific features determined by the geological, geographical and hydrological conditions. The river springs in a hilly country and has the characteristics of a mountain river in the Topliţa-Deda Gorge.

In the next zone the river runs through a second gorge (Ilia-Zam) and flows into the field of Arad. This zone division is reflected in the structures of the communities of organisms. The modification of the biogenesis between the stations does not always reflect human impact but has to be studied from the point of view of the particularities of the habitat. The river Mureş/Maros has many zones with their own landscape, aesthetic and

scientific values that have to be protected for the future generations. We have to enumerate the peat bogs at Voşlobeni, Joseni and Remetea, the Toplița-Deda Gorge, the oxbow of the river Mureș/Maros at Târgu Mureș, the salt deserts at Ideciu, Nagylak, Makó and Szeged and the last group of forests at Bezdin and Arad (Ciala Forest). Strict protective dispositions would assure the existence of many vulnerable and endangered species, assuring a great diversity of the gene base of this river, which is representative for the geographical region where it belongs. Unfortunately numerous towns and industries along the river unfavourably reflect the ecological condition of the river.

The physio-chemical parameters of the water show a good to very good water-quality from the Mureș/Maros river spring to Reghin. Except for the bacteriological indexes, the living organisms also indicate a good water-quality. The first signs of the human influence appear in the Sărmaș area, and they can be attributed to the farm-buildings lying on the banks. Up to Târgu Mureș (upstream) the river can be considered polluted, according to its high organic substance and to the number of the coliform germs. This is worsened by the presence of an artificial dam, which slows the water down. Downstream from Târgu Mureș the river is polluted by organic substances, nutritives (which increases the eutrophication) and by poisonous pollutants coming from the local industry. The bacteriological indexes also indicate a bad condition. This radical change of the ecosystem causes great damages to the natural clearing of the river. The situation is worsened by the pollutants from the rivers Arieș and Târnava. After their inflow, the influence of the pollutant substances (mainly heavy metals) creates an increase in the relatively resistant organisms. To illustrate the above mentioned on *p. 184* we present the changes in the spreading of the big shellfishes. Between 1978-1991, it has been observed that these organisms disappeared from the river stretch between the inflow of the river Târnava and the river Tisza (Hungary), because of the heavy metal content of the water and the sediments. Despite the natural chemical and biological clearing of the water, the quality of the river improves only a little on the long way to Arad. The insufficiently cleaned sewage, loaded with complex pollutant substances, deals the river its last blow. Therefore the river Mureș/Maros can be considered as one of the most polluted rivers of Transylvania.

Based on the studied ecological characteristics we created a sketchy map presenting the degree of pollution and the polluted stretches of the river (*see p. 185*).

In the conclusion we make some proposals for the restoration of the situation of the river Mureş/Maros, proposals that can be applied to all rivers in the Carpathian Basin.

