



The Impact of Agricultural Pollution in the Water Quality of Rimmik River Based on Macrozoobenthos as a Bio-Indicator

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Abstract: The aim of this study was to assess the impact of pollution caused by the agriculture activities on the quality of water of Rimmik river in the municipality of Rahovec, using macrozoobenthos as an indicator of the ecological status of the river. Considering that the agricultural activity in this region is highly developed and the chemicals are used in an uncontrolled way, the river and the streams that run through this region are polluted to a great extent. In its flow, Rimmik river collects a large amount of organic and inorganic fertilizers and pesticides, washed out by rainfall from the arable land into the river, together with the sewage water from the surrounding inhabited areas and waste from the wine industry. At the same time, the water of Rimmik river is used for irrigation of the arable lands, which brings down the level of the water amount during summer. The samples were taken between March and August 2008 in four points along the entire river. Besides macrozoobenthos samples, some physical and chemical parameters have also been measured, like: water and air temperature, pH, dissolved oxygen (DO), turbidity, ammoniac (NH_4^+), phosphates (PO_4^{2-}). The biological testing of the water was done as per Hilsenhoff's Biotic Index, (1987), with values of this index varying between the lowest 3.42 in the first locality to 7.83 in the third locality. This means that the quality of water was excellent in the first locality, whereas it started to greatly deteriorate in the second and third localities, with a tendency of improvement in the fourth locality. The diversity of macrozoobenthos communities is shown through Shannon Weaver's Diversity Index, with relative abundance of special taxa used. This index was calculated on the family level and these values were highest in the first locality with 2.25, which shows a higher diversity, while the lowest value was registered in the third locality with 0.50 where the number of taxa was also lower. The highest number of species were found in the spring area, composed mostly from the larvae of insect order *Trichoptera*, *Ephemeroptera* and *Plecoptera*, while as a result of pollution the number of species in the mid and lower flow decreases and was dominated by the indicators of polluted waters.

Keywords: *macrozoobenthos, agricultural pollution, Rimmik River, Biotic index, water quality*

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