Monitoring pollution in River Mureş, Romania, Part I: The limitation of traditional methods and community response

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With 2 figures and 6 tables in the text

Abstract: Four sites along the downstream part of River Mureş, Romania, were investigated in a pilot study aiming to combine the classical chemical-biological monitoring with modern techniques (biomarker analyses) in order to assess the effects of environmental contaminants on aquatic communities. Although significant point and diffuse sources exist, both chemical water analyses (oxygen, nutrients, PAHs, PCBs) and biological investigations (macrozoobenthos, phytoplankton, zooplankton) failed to detect severe pollution. Hence, community response was poor as self-purification is strong, which was reflected by beta-mesosaprobic conditions. Only high numbers of faecal coliforms and faecal streptococci, up to 1300 and 490 counts per 100 ml, respectively, surpassing the critical levels, indicated contamination by untreated sewage in the upper sites. Moreover, heavy metal contamination (high dissolved fraction of Cr, Cu and Zn in water; Cd and Cu up to 8.7 and 49.2 ppm in sediments, respectively) indicated mining and metallurgical activities in the area. This resulted in sub-lethal effects on fish, proving that current monitoring techniques are not sufficient to assess the ecological effects of environmental pollution. Gradually more sensitive modern methods should be applied.

Key words: Tisza tributary, pollution, monitoring, methodology, community response

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