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Assessment of Spatial and Temporal Variations of Some Biological Water Quality Parameters in Mat River, Albania

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Abstract : Worldwide demographic developments of recent decades have been associated with negative environmental consequences. For this reason, there is a growing interest in assessing the state of natural ecosystems or assessing human impact on them. In this respect, this study aims to evaluate the change in water quality of the Mat River for a period of about ten years to highlight human impact. In one year, period of study, several biological and environmental parameters are determined to evaluate river water quality, and the data collected are compared with those of a similar study in 2007. Samples are collected every month in five stations evenly distributed along the river. Total coliform bacteria, the number of heterotrophic bacteria in water, and benthic macroinvertebrates are used as biological parameters of water quality. The most probable number index is used for evaluation of total coliform bacteria in water, while the number of heterotrophic bacteria is determined by counting colonies on plates with Plate Count Agar, cultivated with 0.1 ml sample after series dilutions. Benthic macroinvertebrates are analyzed by the number of individuals per taxa, the value of biotic index, EPT Richness Index value and tolerance value. Environmental parameters like pH, temperature, and electrical conductivity are measured onsite. As expected, the bacterial load was higher near urban areas, and the pollution increased with the course of the river. The maximum concentration of fecal coliforms was 1100 MPN/100 ml in summer and near the most urbanized area of the river. The data collected during this study show that after about ten years, there is a change in water quality of Mat River. According to a similar study carried out in 2007, the water of Mat River was of 'excellent' quality. But, according to this study, the water was classified as of 'excellent' quality only in one sampling site, near river source, while in all other stations was of 'good' quality. This result is based on biological and environmental parameters measured. The human impact on the quality of water of Mat River is more than evident.

Keywords : water quality, coliform bacteria, MPN index, benthic macroinvertebrates, biotic index
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