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Abstracts

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Characterization of the freshwater environmental status by a genomic approach

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Abstract
The Water Framework Directive (2000/60 / EC) (WFD) was adopted as a result of a global need to achieve the environmental sustainability. WFD imposed a change of environmental management objectives from a simplistic approach that includes pollution control (variability of physico-chemical parameters) into a holistic approach based on the biological models response to pressure factors.
This paper presented a comparative study for assessment of freshwater ecosystems quality between conventional morphology-based identification methods and alternative DNA metabarcoding methods. These alternative methods were based on a rapid and specific identification of biological models (macroinvertebrates), used bioindicators for the environmental management, based on their DNA. Briefly, the DNA has been extracted, then specie specific genes were PCR amplified in the presence of particular primers. The PCR products were sequenced and then compared to a reference library to identify the specific benthic communities.
The study area focused on a lotic freshwater ecosystem (Teleajen river) highly impacted by anthropogenic pressure, especially downstream Ploiesti city. The qualitative and quantitative analyses of benthic communites along Teleajen river showed a highly specific diversity with five phyla (Nematoda, Annelida, Mollusca, Arthropoda and Chordata) and six classes. The maximum density of detritivore organisms was recorded in the middle and lower sampling sites due to organic suspensions and wastewater loadings. Among macroinvertebrates, larvae of *Ordella* sp., *Ecdyonurus* sp., *Siphlonurus* sp. (Ephemeroptera), *Ryacophyla* sp., and *Hydropsyche angustipennis* (Trichoptera) were representative species for the studied biocenosis.
Keywords: DNA metabarcoding; Teleajen river; environmental status.

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