

Analogous simulation of nutrient transformation processes in stream sediments

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Abstract

The main transformation processes effected by the natural microbial consortium of upper Iskar River with predominant participation of sediment biofilm were simulated in the laboratory by the use of portable devices (chambers). The dynamics of real heterotrophic respiration, organic matter oxidation, denitrification and ammonification were analysed by oxygen depletion, reduction of chemical oxygen demand, nitrate uptake and ammonium accumulation, under the conditions prevailing during high and low flow periods. The experimental results showed fast oxygen consumption and high process rates – indicators for intensive respiration by a heterotrophic microbial consortium and good functioning of the ecosystem component studied. The nitrogen transformations occurred at slower rates but in mutual dynamic balance and their simultaneous realisation was due to precise, adaptive division in time and space.

Keywords: respiration, COD-oxidation and nitrogen transformation (RONT) processes, analogous simulation, chambers, river sediments