

Influence of tubificid worms on nutrient fluxes across water-sediment interface in fish farm settling ponds

The influence of tubificid worms on nutrient translocation from water to fish farm sediments accumulating in settling ponds was addressed under laboratory conditions. Small microcosms of 0.5 L were filled up with 35 g of sludge from a fish farm settling pond and 0.15 L of filtered settling pond water. The experimental set up consisted of one control line (no worms added), a second experimental line with 1 mg of tubificid worms·g⁻¹ fresh sediment (550 individuals·m⁻²) and a third experimental line with 40 mg of tubificid worms·g⁻¹ fresh sediment (22 000 individuals·m⁻²). Nutrients translocation was determined by monitoring overlaying water concentration of ammonia, nitrate and phosphate for ten days. Results showed that abundances of 550 individuals·m⁻² had no significant influence on the fluxes of nutrients here considered. However, the influence of higher abundances of tubificids (22 000 individuals·m⁻²) was of significant extent on the translocation of nitrate and phosphate. Accordingly, bioturbation of tubificids caused 55% lower nitrate uptake by the sediment when compared to control conditions. Phosphorus released by the sediments of the control condition was ca. 90% higher than that recorded under abundances of tubificids (22 000 individuals·m⁻²). Results obtained allowed us to estimate that fish farm settling ponds highly colonized by tubificid worms (22 000 individuals·m⁻²) may contribute to decrease phosphorus discharge (in terms of soluble phosphorus) in ca. 5 g of P·ton⁻¹ of fish produced.

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