

Treated and highly diluted wastewater impacts diversity and energy fluxes of freshwater food webs

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Abstract

The implementation of Wastewater Treatment Plants (WWTPs) brought great improvement in river ecological status. However, WWTP effluents still contain a complex cocktail of pollutants whose environmental effects might go unnoticed, masked by other stressors in the receiving waters or by spatiotemporal variability. We conducted a BACI (Before-After/Control-Impact) ecosystem manipulation experiment to assess the effects of a well-treated and highly diluted effluent on diversity and food web dynamics in an unpolluted stream. Although effluent toxicity was low, it reduced diversity, increased primary production and herbivory, and reduced energy fluxes associated to terrestrial inputs. Altogether, the effluent decreased total energy fluxes in stream food webs, showing that treated wastewater can lead to important ecosystem-level changes, affecting the structure and functioning of stream communities even at high dilution rates. Our study highlights the need for further efforts to treat polluted waters to conserve aquatic food webs.

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