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Multi-Level Approach of the Ecotoxicological Impact of a Combined Sewer Overflow on a Peri-Urban Stream

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ABSTRACT

In periurban zones, urban wet weather discharges have been recognized as the most significant vector of pollution in aquatic environments. The discharge of this water without treatment into the aquatic environment could present an ecotoxicological risk for biocenosis. The aim of the INVASION project is to assess the potential ecotoxicological impact of a combined sewer overflow (CSO) on a peri-urban stream. A comparative study between upstream and downstream areas of the CSO allowed observing significant effects of this overflow on the river. We studied three layers of stream: surface water, benthic layer and hyporheic layer. To characterize the potential ecotoxicological risk of water and sediments, we used a battery of 4 bioassays: *Daphnia magna*, *Vibrio fischeri*, *Brachionus calyciflorus* and *Heterocypris incongruens*. In parallel, we measured the physico-chemical parameters: ammonium (NH_4^+), chromium (Cr), copper (Cu) and lead (Pb). An ecological risk is greatest for the hyporheic zone in downstream river, particularly for the solid phase. These results corroborated with the physico-chemical data obtained.

KEYWORDS

Combined Sewer Overflow; Ecotoxicity; Pollutants; Stormwater; Stream; Urban Wet-Weather Flow

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