



## **Urban and agricultural inputs of antibiotics in the Seine River basin**

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The fate and effects of antibiotics are emerging issues since trace levels have been detected in environmental samples. Despite increasing concern on the effects of these active contaminants, researches on their origins, occurrence and environmental fate are rather scarce, especially in France.

In order to have a better knowledge of the fate of these contaminants in the receiving waters, a large scale survey was performed in the Seine River basin, where surface waters were sampled at different locations, in rural or urban area, or near aquaculture facilities at different periods. Samples were analysed for 17 antibiotics, including quinolones and sulfonamides, with a few compounds used in human or veterinary medicine exclusively.

This survey showed that different compounds occurred at individual concentrations reaching 544 ng/L (sulfamethoxazole). All 17 compounds were detected at least once in the survey. Sulfamethoxazole was the most ubiquitous compound, and showed the highest concentrations. Norfloxacin and flumequine were found to be the most frequently detected quinolones. Investigations into the origins of this contamination were made by the means of a profile along the Seine River between Paris and Poses. It showed large inputs of norfloxacin, ofloxacin, trimethoprim and sulfamethoxazole from wastewater treatment plants.

Punctual appearances of veterinary fluoroquinolones rapidly dissipated indicate that non point sources e.g., surface runoff or leaching, may contribute to the river contamination. Analysis of river water from agricultural area showed a greater proportion of veterinary antibiotics in such watershed, and a notable impact of aquaculture facilities as a source of antibiotics to the surface waters was highlighted.