

Speciation of pharmaceutical products and trace metals within the aqueous/sediment/colloidal fractions in a suburban watershed with both lab-experimental and field approaches (Egoutier, France)

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Emerging organic and inorganic contaminants released in the environment are likely to damage water quality and soils, by accumulating in hotspots. Suburban hydrosystems, especially small ones, are particularly sensitive to that kind of pollution due to a faster response. In some urban watersheds, pharmaceuticals products (PPs) and trace metals (TMs) contamination is mainly observed within the interface sediment of retention areas, such as the Beulie pond in the Egoutier watershed, Loiret, France [1]. After determining their concentrations and their sources, the fate of these substances remains unclear, especially their pathways through the Egoutier stream, and finally beyond the catchment, when the stream flows into the Loire river. Thus, the current study aims to understand the adsorption role of each potential carrying phase in the speciation of emerging contaminants in the continuum of water-colloids-sediment.

To answer this problematic, we decided to study sediment samples from the Beulie pond, since they integrate a higher temporal scale than those present in the stream. Indeed, 15 sediment-water interface samples were collected in September 2021 with an Ekman grab, then dried (105°C, 48 hours), crushed and sieved at 160 µm. Particles size and their distribution within sediments, as well as fine particles (< 63 µm) content, were determined using laser granulometry, and clays composition using XRD. TMs and PPs characterization and quantification were performed by respectively ICP-MS and GC-MS/LC-MS, depending on the targeted organic molecules. Finally, total organic carbon content was measured by Rock-Eval pyrolysis. The objective is to use those granulometric, mineralogical and geochemical data to create a spatially representative Beulie bulk sample, which will be used to perform further experiments. We will especially proceed to a sequential extraction [2], which must enable us to get a first outlook of the organic and inorganic pollutants speciation in the continuum of water-colloids-

sediment in a contaminated urban watershed.

References

[1] Ledieu et al. (2021), *Chemosphere* 279, 130385.

[2] Tessier et al. (1979), *Anal. Chem.* 51, 844–851.