
Distribution and dynamic of anthropogenic microparticles and microplastics: A multi-compartment approach

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Abstract

Assessment of microplastic (MP) contamination is still needed to evaluate this threat and tackle this issue correctly. Here, MP and anthropogenic microparticles (AP) contamination was assessed in the Arcachon Bay, a meso-tidal embayment of the Atlantic coast of France. Studied sites were located outside the bay (ocean) and inside the bay (from the inlet to the back). Sea surface, water column, intertidal sediments and wild oysters (*M. gigas*) were sampled at different sites. A distinction was made between all AP (i.e. visually sorted) and MP (i.e. confirmed by ATR-FTIR spectroscopy). AP and MP were found at all sites from all sample types. Sea surface and water column displayed spatial variations for AP and MP concentrations while sediment and oyster samples did not. Regarding concentration for instance, samples from sea surface and water column, AP and MP displayed from low to high concentrations at oceanic stations while at the back of the bay concentrations were systematically among the lowest. However, the inlet of the bay displayed a particular pattern with high concentrations at sea surface and low ones in the water column. All these differences were probably due to the hydrodynamic within each compartment at each zone of the bay. Moreover, general patterns can be suggested to understand the distribution between compartments. Fragments and buoyant particles were mainly detected at sea surface while fibers and negatively buoyant particles were rather described in other compartments. These results strengthen the hypothesis that particle characteristics influence their behavior and their transport from one compartment to another. Overall, this study helps in understanding the spatial distribution and dynamic of AP and MP within four types of marine samples.

Keywords: microplastic, marine compartments, spatial distribution, coastal lagoon

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