

Ingestion, accumulation and trophic transfer of microplastics in the benthos of the Belgian part of the North Sea and Westerschelde estuary

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Global plastic production has reached 322 million tonnes per year in 2015 (PlasticsEurope, 2015). Due to careless waste management or accidental discharges around 10% of the newly produced plastics end up in the marine environment (Thompson et al., 2006). Plastic debris in the oceans can be found in different forms, but in recent years especially microscopic particles known as microplastics (particles smaller than 5mm) are of growing concern. In 2015 the JPI Oceans project PLASTOX was established to investigate the ingestion, food-web transfer and ecotoxicological impact of microplastics on key European marine species and ecosystems. In the framework of PLASTOX infaunal and epifaunal benthic invertebrate and fish species were sampled in the Belgian Part of the North Sea and saltmarshes along the Schelde estuary. The organisms were digested using KOH (1M) after which the solution was filtered. Suspicious particles were isolated from the filters and plastics analysed using infrared spectroscopy (μ -FTIR; ATR-objective). Preliminary analysis for the sampled salt marsh benthos shows that microplastics > 20 μ m occur in all species. Both particles and fibres are present with an average concentration of ~1 microplastic per individual but concentrations vary strongly between replicate individuals. Analysis of microplastic presence in the sediment, water column and biota will reveal insights in the distribution of microplastic pollution in the sampled ecosystems and generate hypotheses about the potential for trophic transfer of microplastics that remain to be confirmed in future experiments.

Keywords: microplastics; benthos; continental shelf seabed; saltmarsh; PLASTOX