

Microplastics in the Belgian Part of the North Sea: Spatial variability and ingestion by benthic biota

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Global plastic production has reached 322 million tonnes per year in 2015. Due to careless waste management or accidental discharges around 10% of the newly produced plastics end up in the marine environment. 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 benthic species of different trophic guilds (invertebrates, benthic-pelagic and demersal fish) were sampled in the Belgian Part of the North Sea. The organisms were digested using KOH (1M) after which the solution was filtered (20 µm). Suspicious particles were isolated from the filters and plastics analysed using infrared spectroscopy (µ-FTIR - ATR). Preliminary analysis from 4 stations that cover gradients in sediment and water column microparticle concentration show that microparticles are omnipresent with about 6-12 times higher concentrations in the sediment as compared to the water column. Microparticles were found in all of the 14 species that were analysed so far with black and blue fibers forming the majority of ingested particles. Concentrations varied between species (0.5-2.1 per individual) and were highest in benthic omnivores, while benthic-pelagic fish had less particles ingested than demersal fish species. Plastics formed the majority (96%) of particles in the sediment (77% Polyethylene terephthalate (PET), 22 % Polyethylene (PE), 1 % Nylon) and water column (80%; all PET), whereas only PET was found in the benthic biota that are analysed so far.

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