MICROPLASTICS TRANSPORT IN EUROPE`S RIVER SYSTEMS

Latvian Institute of Aquatic Ecology

Current situation in river systems

Evidence suggests that freshwater systems may share similarities to marine systems in the types of forces that transport microplastics (e.g. surface currents); the prevalence of microplastics (e.g. numerically abundant and ubiquitous); the approaches used for detection, identification and quantification (e.g. density separation, filtration, sieving and infrared spectroscopy); and the potential impacts (e.g. physical damage to organisms that ingest them, chemical transfer of toxicants) (Microplastics in freshwater systems: A review of the emerging threats, identification of knowledge gaps and prioritisation of research needs, 2015).

Rivers are proposed as the main source of plastics for seas and oceans. However, inland waters are poorly investigated compared to marine waters to date (Microplastics in Freshwater: What Is the News from the World?, 2020). In near future more research will be done and information about transport pathways of microplastics into the Baltic sea will be clarified.

WHAT IS MICROPLASTICS?

Marine littering is one of the greatest environmental challenges of our time and plastic is one of the most common types of garbage in the sea. Microplastics are plastic particles that are smaller than 5 mm in size.

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About the study

Aim of the current research at Latvian Institute of Aquatic Ecology is to evaluate the amount, composition and prevalence of microplastic particles (in size range >10µm) in Daugava (industrial river) and Lielupe (agricultural river) rivers' surface water. From Jan until Feb 2020 four water samples from river Daugava and five water samples from river Lielupe were collected. In order to collect the samples Universal Filtering Object (UFO) was used (made in Aalborg University). Further processing of samples was done in the laboratory. In the first step all the organic particles which could complicate the analysis of samples were removed. In order to understand the background contamination a 10µm metal filter was exposed to the environment at sampling sites.

Results and Conclusions

Results indicate that particles in size range >500µm are in an abundant amount in all the sampling sites and most of them are classified as fibers. The results from Aalborg University regarding particles in size range 10-500µm suggests that particle concentrations are in medium range. However, in industrial river MP concentrations and mass were two times higher than for the agricultural river while the polymer composition was similar. 15 different polymer types were identified in both rivers identified, dominated by polyester followed by polyethylene (PE), polyamide (nylon) PA, polypropylene (PP), polyurethane (PU), polyvinyl chloride (PVC) and cellulose acetate (CA).

Also, results were in similar order of magnitude compared to a study from the Netherlands (Mintenig et al. 2020).

ABOUT THE REPORT
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Publisher: Latvian Institute of Aquatic Ecology, agency of Daugavpils University
Release year: 2021

FANPLESSTIC-SEA

This fact sheet has been produced within FanpLESStic-sea, a project working with preventing and decreasing the pollution of microplastics in the water and the Baltic Sea.

Project period: Jan 2019 - Dec 2021
Total project budget: 3 m. euro
Partners:
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