



## Abstract

# Microplastics in Influent and Effluents of Estonian Wastewater Treatment Plants <sup>†</sup>

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This study is the first systematic investigation of microplastics in influents and effluents of Estonian wastewater treatment plants (WWTPs) using continuous sampling filtration method and FTIR-spectroscopy. The aim of the study was to evaluate the efficiency of WWTPs in removing microplastics from the treated water. In total, six WWTPs from all over Estonia were included in the study. For sampling, 14, 25 and 1450 L samples of wastewater were collected from the influents before and after the screen and effluents, respectively, and filtrated over 24 h on three layers (5, 0.4, 0.33 mm) of metal sieves. For microplastics analysis, organics in the sample were oxidized and the samples were transferred to 10  $\mu$ m polycarbonate filters for microscope-aided characterization. Selected particles were identified using  $\mu$ FTIR. Contamination controls from sample collection, preparation and characterization steps were analyzed in parallel. The results showed that microplastics were present in all the samples, with the highest concentrations observed in the influent sampled before the screen. The most common polymer types identified were polyester, polyethylene and polypropylene. The study found that the treatment process was effective at removing larger-sized microplastic fractions but less effective in removing smaller ones. The obtained data are also important for estimating the microplastics load that reaches the environment in WWTP sludge used in agriculture and landscaping. According to Koelmans et al. (2019) [1], the results of the study can be considered of high quality and are hence important for implementing microplastics mitigation strategies and control. The study established baseline levels of microplastics in the influent and effluent of Estonian WWTPs.



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## Reference

1. Koelmans, A.A.; Mohamed Nor, N.H.; Hermesen, E.; Kooi, M.; Mintenig, S.M.; De France, J. Microplastics in freshwaters and drinking water: Critical review and assessment of data quality. *Water Res.* **2019**, *155*, 410–422. [[CrossRef](#)] [[PubMed](#)]

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