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# Characterization of suspended solids in treated wastewater: a case study in Budapest

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Wastewater effluents are the main sources of microplastic particles (fibers, fragments, cosmetic products), as well as the natural and "man-made" cellulose-based fibers in the riverine environment. Numerous studies have been conducted to qualify and quantify these solid particles in the effluents and rivers. In the riverine environment both the suspended and bottom sediments are in the center of attention. In order to characterize the particle emission, the largest wastewater treatment plant of Central Europe located at the bank of Danube in Budapest, we collected effluent samples in framework of regular sampling campaigns in 2022 and 2023. Using stainless-steel screens with diameter of 20 cm and respective pore size of 710, 180 and 63 μm, 140-150 L treated wastewater were transported through this sieve system. The separated size fractions from the sieves were washed by distilled water and filtered applying glass fiber filters with pore size of 0.7 μm. To remove the biofilms and organic residues from the filter hydrogen peroxide (30%) treatment was used. For characterization of particles on basis of size (length and diameter), shape, colour and texture Nikon stereo-and polarization microscopes were applied. The chemical composition was identified by means of FTIR spectroscopy. The concentration of solid particles in the size range above 63 μm amounted to 0.21 item/L. Among the particles the fibers were dominant with length and diameter of 120-845 μm, 9-21 μm, respectively. Both natural and "man-made" cellulose-based fibers, as well as plastic (polyester, polyamide) fibers were identified.