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Parabens, Paraben Metabolites and Triclocarban in Sediment Samples from the Trondheim Fjord, Norway

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Abstract : P-hydrobenzoic acid esters (parabens), paraben metabolites, and triclocarban (TCC) are a group of synthetic antimicrobials classified as endocrine disrupting chemicals (EDCs) and emerging pollutants. The aim of this study was to investigate the levels of these compounds in sediment near the effluent of a wastewater treatment plant (WWTP) in the Trondheim Fjord, Norway. Paraben, paraben metabolites, and TCC are high volume production chemicals that are found in a range of consumer products, especially pharmaceuticals and personal care products (PCPs). In this study, six parabens (methyl paraben; MeP, ethyl paraben; EtP, propyl paraben; PrP, butyl paraben; BuP, benzyl paraben; BezP, heptyl paraben; HeP), four paraben metabolites (4-hydroxybenzoic acid; 4-HB, 3,4-dihydroxybenzoic acid; 3,4-DHB, methyl protocatechuic acid; OH-MeP, ethyl protocatechuic acid; OH-EtP) and TCC were determined by ultra-high performance liquid chromatography-tandem mass spectrometry (UHPLC-MS/MS) in 64 sediment samples from 10 different locations outside Trondheim, Norway. Of these 11 target analytes, four were detected in 40 % or more of the samples. The sum of six parabens (∑Parabens), four paraben metabolites (∑Metabolites) and TCC in sediment ranged from 4.88 to 11.56 (mean 6.81) ng/g, 52.16 to 368.28 (mean 93.89) ng/g and 0.53 to 3.65 (mean 1.50) ng/g dry sediment, respectively. Pearson correlation coefficients indicated that TCC was positively correlated with OH-MeP, but negatively correlated with 4-HB. To the best of the author’s knowledge, this is the first time parabens, paraben metabolites and TCC have been reported in the Trondheim Fjord.

Keywords : parabens, liquid chromatography, sediment, tandem mass spectrometry
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