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Annual load and emission factor of microplastics (MPs) discharged from Korean peninsula

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Rivers are considered to be the main inflow path for plastics in the oceans. So far, many studies have estimated the riverine plastic emission to the ocean based on socioeconomic data and/or hydrological data but riverine emission of microplastics based on monitoring data is very limited. We investigated the abundance of microplastics (MPs) in the river water column (surface and bottom water at a river mouth of each river) of the main five rivers of Korean peninsula. The survey was conduected two times in 2018, representing one for dry and one for rainy season. Dominant MPs were fragment and fibers in shape type, PP, PE, and PET in polymer type, and 20-200 μm in size class. MP particles of several hundreds to thousands were detected in surface and bottom water of each river. Surface water showed relatively high MP abundance in dry season while such a trend was not clear in rainy season. Our preliminary result estimated annual riverine MPs load from Korean peninsula to 22$\times$1012 items/year (equivalent to 43 ton/year). Emission factors of MPs were 1.4($\pm$1.6)$\times$106 items/capita/year or 3.3($\pm$3.1) g/capita/year. Measurement-based riverine emission of MPs was several factors greater than previous estimates based on socioeconomic data. Our preliminary data is based on duplicate measurement for each sample and will be updated by triplicate sample analysis data in future.