# Microplastics in surface sediments of the Ariake Bay

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Microplastics are small plastic pieces less than five *millimeters* long. Numbers of microplastics floating around Japan are much greater than those of global ocean average. Microplastic cycle in the ocean is not well understood, but their final destinations are sediments. Here we investigate microplastics deposited in surface sediments of the Ariake Bay. We obtained surface sediment samples at 11 sites off Kumamoto city in the Ariake Bay by using Ekman-Berge grab in December 2016. In addition, we collected surface samples from the river mouths of Shirakawa and Midorikawa Rivers. Sediment samples were freeze-dried, weighed ~50 g and washed on a stainless-steel screen with 63 micrometers mesh. The floating and sunken residues were recovered separately by filter paper and treated with 1N HCl and 10% hydrogen peroxide on a hot plate at 200-degree C for an hour. After reaction completed, residues were washed by pure water on a nylon screen with 63 micrometers mesh, recovered by filter paper and dried in an oven overnight at 40-degree C. We picked up potential microplastic particles greater than 150 micrometers under stereomicroscope. Identification of microplastics were performed by fourier transform infrared spectroscopy (FT-IR) using FT-IR alpha spectrometry. A total of 18 and 8 microplastics were identified in 11 surface sediment samples off Kumamoto in the Ariake Bay and 3 surface sediment samples from the river mouths, respectively. Most of identified microplastics were polypropylene (PP) and polyethylene (PE). Averaged microplastic contents at the 11 sites off Kumamoto was 29 pieces per kg of dry sediment. No clear trend between geographic distribution pattern of microplastics and distance from the Kumamoto coast/river mouths. Rough estimate for microplastic deposition rate off Kumamoto in the Ariake Bay (120 square kilometers) was ranging from 5 to 10 billion pieces per year. This suggests relatively rapid removal of microplastics from water column though their specific gravities are less than one.

Keywords: Microplastics, Marine sediments, Ariake Bay

 