

An estimation of microplastics sedimentation flux in a coastal sea

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Plastics production has been increasing each year. It is estimated that 4.8-12.7 million tons of plastics flowed out into the ocean in 2010. The plastics weathers due to UV degradation and fragmented into small pieces. Generally, the plastic particles of the 0.3-5mm in size are called microplastics. They are likely to be incorporated into the ecosystem and there is concern about bad influence on ecosystem. Recent studies have found that microplastics sink to the sea bottom. However, the sedimentation flux has not been clarified yet. In this study, the sedimentation flux of microplastics was estimated. We collected and analyzed the sediment cores from the bottom of Beppu Bay. Beppu Bay is suitable for the core sampling, because sediments have not been vertically disturbed. Five cores were taken using Gravity Corer. Four sediment cores were for microplastic analysis, and one for dating sediment layers. The sedimentary age was determined using the Pb-210 method. Microplastics extracted from the four core samples were analyzed by FT-IR to determine the polymer type. A total of 142 pieces of microplastic were detected. The most common polymer type among plastics was polyethylenewhich accounted for 55% of the total in number. The average sedimentary flux from 1998 to 2017 was calculated as 217 [pieces/m²·y)].

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