Distribution and estimated tranport process of microplastics in deep-sea sediments of the Northwest Pacific

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Large plastic debris that have drifted ashore are miniaturized by the weathering effects of UV and heat, forming microplastics (MP) of 5 mm or less. These MPs are discharged and settled offshore, and the deep-sea floor is considered to be an accumulation site for MPs. The Kuroshio recirculation zone off the Boso Peninsula is located west of the Great Pacific garbage patch and has been observed to form litter patches at the surface. In the case of macro-litter, it has been shown that after accumulating in the surface layer, it sinks to the seafloor immediately below, forming one of the largest litter accumulations observed to date. However, information on the actual distribution and behavior of MPs in this area has not been obtained. In this study, we analyzed MPs in sediments from Sagami Bay to the triple junction and the abyssal plain to understand the actual distribution of MPs to deep-sea sediments and to estimate their transport process.
Sediment samples were collected by push corer operated with the SHINKAI 6500 or a lander system at three depth settings during the YOKOSUKA (YK19-11) cruise. Sediment cores were collected by using aluminum-made push corers from two depth settings in the bathyal depth of Sagami Bay, and the abyssal depth of the deep-sea plain. Samples were also collected with an acrylic-made undisturbed sediment sampler attached on a lander system at the hadal sites. The samples were analyzed for the number, type, frequency, and shape of polymers using micro FTIR.

Keywords: microplastics, deep sea sediment, deep sea topography

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