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Microplastics Pollution around Coral Reefs in Samui Island, Southern Thailand

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Abstract

Microplastics pollution has recently drawn worldwide attention, and may have negative effects on ecosystems. Microplastics pollution has been confirmed in the world, and there are concerns with biological effects. Main objectives of this study were 1) development of a pretreatment procedure for microplastics larger than 10 μm and 2) to understand the occurrence of microplastics larger than 10 μm around coral area. In this study, we investigated the microplastics around the coral reefs of Samui Island in southern Thailand.

In October 2019, surface water, middle water, and sediments were collected at three sites around the coral reef in southern Thailand. Collected samples were pretreated by H_2O_2 with 55 ^oC and $FeSO_4$ in Thailand. Density separation by NaI (5.3M) also was carried out in Thailand. The components of microplastics were identified by FTIR and μ-FTIR (Agilent) in Japan.

Microplastics concentrations were from 761 to 9,690 particles/m^3 (first survey), and from 1,860 to 6,680 particles/m^3 (second survey), respectively.

We reviewed 31 papers with biological effects of microplastics on aquatic biota. Mass densities of microplastics were calculated from the number densities of microplastics in this study.

Average mass densities of microplastics were from 179 to 528 mg/m^3 around coral reefs in Samui Island, southern Thailand in this study. They almost reached to the 1,000 mg/m^3.

Keywords

microplastics, coral, Thailand