

國立臺灣海洋大學
海洋環境與生態研究所 專題討論

題目：東海海域的微塑料季節分布及野生捕撈魚類攝取量的估算

英文題目：Seasonal distributions of microplastics and estimation of the microplastic load ingested by wild caught fish in the East China Sea

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Abstract

Microplastic (MP) pollution in marine environments and organisms has received substantial international attention. However, long-term field studies of MPs are scarce. Here, we assessed the seasonal variation in MP abundance in the Zhoushan fishing ground (ZFG), one of the most abundant and productive fishing grounds worldwide, and analyzed the long-term MP accumulation in fish gastrointestinal tracts from September 2017 to June 2018. The most common MP particles in the ZFG were polyethylene terephthalate and polypropylene. After four seasons of continuous monitoring, we did not find accumulation of MPs in the fish after 10% KOH digestion. In total, 254 MP particles were removed from the gastrointestinal tracts of all fish. The average number of particles per fish was lower than that reported in previous global marine studies. There were significant differences among species. Moreover, this study provides the calculation of the weight of MPs ingested by fish and an estimate of the load of accumulated MPs in fish. According to the estimation, the load of MPs ingested by fish annually was approximately 3 kg in ZFG. These findings provide the long-term evidence of MP contamination in biota from the ZFG. The amounts of MPs ingested by fish require more detailed and improved investigation and estimation in further studies.

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中文摘要

海洋環境和生物體的微塑膠(MP)污染已備受國際間的關注。然而，微塑膠的長期實地研究仍缺乏。而舟山漁場(ZFG)是世界上漁業資源豐富的漁場之一，因此該研究評估了在 ZFG 中 MP 豐度之季節變化，並分析 2017 年 9 月至 2018 年 6 月魚體中腸胃道 MP 的長期累積。結果發現 ZFG 中最常見的 MP 顆粒是聚乙烯對苯二甲酸酯(PET)及聚丙烯(PP)。而在四季的連續監測下，經過 10%KOH 消化後之腸胃道，並未發現有 MP 的累積。平均每條魚之 MP 數量是低於先前全球海洋研究報告中的數量，且物種間之 MP 濃度存在著顯著差異。此外，該研究亦提供了魚類攝取 MP 的重量計算和魚類累積 MP 的負荷估算。據該負荷估算，ZFG 中的魚類攝取的 MP 負荷約為 3 kg/year。這些發現提供 ZFG 生物體中 MP 污染的長期證據，而未來的研究中魚類的 MP 的攝取量則需要更詳細的調查和估算。