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Article

Depth Profiles of Microplastic in Sediment Cores in the Mangrove Area of Kuala Gula Mangrove, Malaysia

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Abstract: Microplastics are widespread in coastal and marine environments, and sediments serve as a sink for microplastics. In this study, four sediment cores were collected from the Kuala Gula Mangrove area. The abundance of microplastics in mangrove sediments ranged from 25–130 items/kg dry weight. The highest abundance of microplastic was observed at the KG04 site near the mouth of the river. The number of microplastics by sampling site was significantly different ($p < 0.01$), with station KG04 having the highest fiber content. The dominant color of microplastics was blue, and the main shape was fiber. Rayon, cotton, Polyethylene terephthalate (PET), and azlon were observed from FT-IR, indicating that the potential sources of microplastic and fiber could come from household laundry wastewater. Microplastics tended to accumulate in deeper depths at KG01 ($p < 0.01$), whereas other stations showed no significant difference ($p > 0.05$). However, this study provides evidence that mangroves can be a trap for microplastics and can be used as baseline data for future studies.

Keywords: microplastic; sediment core; mangrove area; marine debris; aquatic pollution

1. Introduction

Over the last decades, plastic production has increased significantly and reached 367 million tons in 2020 due to increasing consumption [1]. Plastic pollution has now become a global environmental concern as an emerging contaminant in marine and coastal