Microplastics in sediments: a comparison within zones located worldwide with different impact

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Abstract

Marine sediments suffer daily from the impact of marine and terrestrial anthropogenic activities. The presence of microplastics in the marine environment is increasing in all its compartments, and as a consequence of several processes, most of these particles sink into the seabed. The present study aims to quantify and compare the abundance of microplastics in sediment samples collected in several world areas with different anthropogenic and natural impacts. A total of 25 samples from 6 coastal areas were collected during 2022 and 2023 in depths ranging from 1 to 426.52 m. A high diversity of sediment between locations was detected according to the Udden-Wentworth classification. Preliminary results show a mean value of 308.81 ± 418.29 items kg–1 D.W. when considering all study areas of the present study. Microplastic abundance ranges from 20.79 items kg–1 D.W. in Palma (Mallorca), characterized by a high touristic activity during summer months, to 872.95 items kg–1 D.W. in Ilha da Maré (Todos os Santos Bay, Brazil), the most urbanized area of the study areas considered in the present study. No correlation between the abundance of microplastics and depth was found ($R2$ = -0.043, p-value > 0.05). Moreover, results from this study indicate once more that fibres are the main category of microplastics observed in sediments, being 95.2% of the items identified, followed by fragments with a 4.6%. This is important since plastic fibres can be ingested by marine species feeding along the seafloor and can be transferred across the food web.

Keywords: fibers, seafloor, bays, anthropogenic impacts, plastic pollution

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