Marine microlitter in the Mediterranean coast of Málaga, Spain; findings from urban and non-urban beaches including protected area sites

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Abstract

Anthropogenic litter, including plastic, is now ubiquitous in the marine environment and is principally known to accumulate on sandy beaches. The aim of this study was to acquire a better understanding of marine litter in the Mediterranean coast of Málaga (Spain). Eleven beaches, including urban, non-urban and those within Special Protected Areas, were surveyed for marine microlitter. Samples were collected by citizen scientists and sent to be thoroughly examined including ATR-FTIR. A total of 1,007 items (52.12 g) were collected among the eleven beaches. Sand samples were also collected to study grain size classification. Plastic litter was present at every beach type, including microplastics at all but one. Of the ten polymer groups and eight shape types recorded, Polypropylene fragments (22.61%) and Polystyrene foams (14.78%) were most abundant. Remarkably, organic matter (cellulose and seaweed) represented 15.65% of the samples analysed, highlighting the probability that citizen science beach cleans may overestimate the actual presence of plastics and showing the importance of FTIR-ATR analysis. The results obtained from this study provide greater insight into the sources and potential impacts of marine microlitter in the beach environment.

Keywords: Marine Litter, Málaga, Plastic, Beach, Citizen Science

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