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[Monitoring microplastics in coastal waters of a biosphere reserve: a case study in Menorca \(Spain\)](#)

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Abstract: This study provides with evidence of the presence of sea surface microplastics in a UNESCO marine biosphere reserve: the island of Menorca in the north-western Mediterranean Sea. From a total of 90 samples, in 100% of the samples, microplastics were observed with a mean value of 0.18 ± 0.01 items/m². According to data, no significant differences were observed for sampling period with very similar values between 2021 (0.17 ± 0.02 items/m²) and 2022 (0.18 ± 0.02 items/m²). However, significant differences were observed regarding sampling area (both site and locality) suggesting that sea surface plastics in the study area might be more dependent of the spatial scale rather than on the temporal scale. Fibre type microplastics predominated over fragments, films, pellets, and foams, but in the commercial Port de Maó, almost 50% of the identified items were foams which could be related to the transportation of packed goods to this port. Results from the model applied to study the relation between waste management indicators and microplastic abundance indicate that when considering all marine litter categories, the explanatory variables are plastic waste generated by residents population (tonnes/year/km²) and waste collection rate (%), whereas if only plastics are considered, the indicator regarding waste per capita (kg/hab/year) is also included. Data in this study is obtained through a harmonized protocol which can be used to define baseline and threshold values to evaluate good environmental status regarding descriptor 10 of the Marine Strategy Framework Directive.

Keywords: Plastic pollution, Marine ecosystems, Human impacts, Marine Protected Areas, Waste management