

{rokbox title=| Study area of the sampling locations in the Mediterranean Sea to assess abundances of microplastics in the water column along the Iberian Peninsula coast :: Image: Authors|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-ubiquitous-vertical-distribution-compa-2022-thumb-et-al.jpg|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-ubiquitous-vertical-distribution-compa-2022-et-al.jpg{/rokbox}

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, 2023.

[Ubiquitous vertical distribution of microfibers within the upper epipelagic layer of the western Mediterranean Sea.](#)

Estuarine, Coastal and Shelf Science. Volume 266.5 March 2022.107741.

<https://doi.org/10.1016/j.ecss.2022.107741>

Abstract: The abundance of microplastics (plastic particles of less than 5 mm) along the sea surface and in seafloor sediments have been extensively documented worldwide; however, little is known in terms of the vertical distribution of microplastics in the water column, especially in the epipelagic zone. Considering the biological importance of this area, the quantification of microplastics available here is essential to identify potential impacts for marine organisms. This study reports the vertical distribution of microplastic abundances throughout the water column in two Marine Strategy Framework Directive (MSFD) demarcations from the western Mediterranean Sea during July 2019. Three concatenated 5-L Niskin bottles were used for sampling at 5, 15 and 25 m from the sea surface in stations with a total depth smaller than 50 m and at 5, 25 and 50 m from the sea surface in stations with a total depth greater than 50 m. This study demonstrates the ubiquitous abundance of microfibers, 96% of the microplastic items identified in the upper epipelagic layer of the western Mediterranean Sea. Microplastics exhibit a heterogeneous vertical and horizontal spatial distribution. Fragments had a very low representation (4% of the items) but showed a similar frequency of occurrence along all sampling depths. In terms of size, 68% of the microplastics were less than 2 mm in length. Microplastics quantified within the study area were mainly composed of low-density polyethylene (LDPE) and polypropylene (PP) (20% each) followed by cellulose acetate (CA) (16%) and polystyrene (PS) (14%). Regarding the spatial distribution of microplastics, higher abundances were found at intermediate distances (5–10 km from the coast) with mean values of 2.41 ± 1.90 items L^{-1} and further away (>20 km) from the coast, with mean values of 2.11 ± 1.80 items L^{-1} . A slight decreasing trend in the abundances of microplastics from the

sub-surface to deeper waters was also observed. Stations within MPAs waters showed no significant differences in microplastic abundances when compared to non-MPAs stations. Overall, the results of this study highlight the ubiquitous presence of microplastics, primarily microfibers, along the epipelagic layer of the Spanish Mediterranean continental shelf.

Keywords: Niskin bottles, Fibres, Pollution, Vertical distribution, Continental shelf.