{rokbox title=|Graphical abstract :: Image: Authors| thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-marine-sediments-microplastics-fibers-fagiano-et-al-2022-thumb.jpg|}images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-marine-sediments-microplastics-fibers-fagiano-et-al-2022.jpg{/rokbox}

V. Fagiano, M. Compa, C. Alomar, B. Rios-Fuster, M. Morató, X. Capó, S. Deudero, 2022. **Breaking the paradigm: Marine sediments hold two-fold microplastics than sea surface waters and are dominated by fibers.**
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Abstract: We conducted one of the first studies to integrate the quantification and characterization of microplastics (MPs), including fibers, in different habitats (sea surface, seafloor and beach sediments) of a coastal Mediterranean marine protected area, analyzing their ingestion in several marine species. The objectives of the study were to evaluate the distribution of MPs according to shape and polymer, to assess the contribution of fibers to local plastic pollution and to evaluate their ingestion in fish and invertebrates species that inhabit the study area (*Pagrus pagrus*, *Serranus scriba*, *Spondyliosoma cantharus*, *Diplodus vulgaris* , *Oblada melanura* , *Holothuria forskalii* , *Holothuria tubularis* , *Holothuria polis, Arbacia lixula, Paracentrotus lividus, Modiolus barbatus, Mytilus galloprovincialis* and *Arca noae*). A total of 111 environmental samples were analyzed. The mean abundance of MPs (excluding fibers) quantified in beach sediments (13,418.86 ± 28,787.99 MPs/m2) was two orders of magnitude higher than that found in seafloor sediments (76.92 ± 108.84 MPs/m2), which in turn was two orders of magnitude higher than sea surface samples (0.17 ± 0.39 MPs/m2). The fibers were the most abundant shape of MPs identified in all habitats. Variability in MPs ingestion was detected between species, with ingestion rates ranging from 43 % to 100 % for general MPs and ranging from 7 % to 100 % for fibers. The highest ingestion was observed in Holoturians, representing suitable bioindicators for plastic pollution. The composition of the polymer varies weakly depending on habitats and biota, but the result is strongly correlated with the morphology of the plastic. Fibers were mainly composed of cellulose

acetate (29 %), styrofoam of polystyrene (18 %), and filaments, films and fragments of polyethylene and polypropylene. The results highlighted the need to expand integrated approaches to effectively study marine plastic pollution and to undertake efficient actions to limit the input of plastics, particularly fibers, into the marine environment.

Keywords: Microplastic, Marine protected area, Microplastic ingestion, Plastic pollution, fiber pollution