
Relationship between biological, ecological parameters and microplastic concentration in Mediterranean fish species

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Abstract

Every year, ca. 300.000 million tons of single-use plastic objects are produced worldwide for different uses and applications which often enter and persist for centuries the marine environment as waste due to their low-recycling rates, durability, high resistance, and inadequate disposal. Once entered the sea, plastics dispersed in marine ecosystems can be fragmented in smaller particles by exogenous factors becoming microplastics (MPs = 0.001 mm < plastics < 5 mm). Due to MP small size, numerous marine organisms, including benthic, demersal and nectonic fish species, can more easily uptake bioavailable MPs from the surrounding environment, and negatively impact them. MPs can represent a hazard also for humans through the consumption of contaminated edible marine species. From this assumption the aims of this work are: (i) to detect MPs abundance and type (i.e. color, shape, size) in five fish species of commercial interest (*Gobius paganellus*, *Micromesistius poutassou*, *Mullus barbatus*, *Sardina pilchardus*, *Trachinus draco*) and (ii) to analyze the influence of biological (i.e. fish length, weight) and ecological (i.e. diet, habitat) parameters on MPs contamination of fish. Results shows that MPs were found in all detected species. Blue fibers < 1mm were the most abundant MPs type observed. Among all species, the highest quantity of MPs was found in *S. pilchardus* stomachs, while the lowest quantity in *M. barbatus*. Abundance of MPs found is not related to the length, weight and stomach fullness. As regards habitats, a greater quantity of MPs was observed in species inhabiting pelagic habitats. As regards the relationship MPs-feeding habits, a higher abundance of MPs was observed in the species *T. trachurus* and *M. barbatus* that fed mainly Crustaceans and Gasteropods Molluscs. This study contributes to shed light on the factors affecting the MP concentration in the most frequent edible marine fish species of Tyrrhenian Sea.

Keywords: microplastics, fish, habitat, diet, Mediterranean Sea

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