



Editorial: Microplastics in the Mediterranean Sea

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Editorial on the Research Topic

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INTRODUCTION

Microplastics (MPs) pollution is a threat to the marine environment worldwide (Andrady, 2011) from the tropics to the poles (Waller et al., 2017). The Mediterranean Sea, a semi-closed basin, is heavily affected by this pollution as well (Llorca et al., 2020). The aim of this special issue was to collect the latest studies on MPs pollution in the Mediterranean Sea. MPs are plastic particles smaller than 5 mm in size that derive from industrial products (primary microplastics) or from the fragmentation of large plastic pieces (secondary microplastics) (Auta et al., 2017). MPs are found floating on the surface, along with those in the water column, in sediments, and up to the deep sea (Van Cawenberghe et al., 2013). MPs can be ingested by aquatic biota and they can be a vehicle for other pollutants such as persistent organic pollutants (POPs), that can be adsorbed and concentrated from the surrounding seawater. As a result, MPs can transfer several toxic pollutants via the food chain (Fytianos et al., 2020). This editorial introduces to the Research Topic “Microplastics in the Mediterranean Sea,” highlighting the pollution of MPs in this peculiar ecosystem and aiming at a better understanding of the occurrence, distribution, and toxicity presence and the study of MPs in the Mediterranean Sea.

SUMMARY OF PAPERS

This Research Topic includes 6 papers covering some aspects of MPs in the Mediterranean: impact of MPs on marina fauna, impacts on marine lagoons, the toxicity of plastic-associated chemicals, and finally an overview on sources of pollution, marine health, and regulatory policies. In particular, four papers have been published on marine fauna, two that have carried out “*in vitro*” studies, one on the copepod *Calanus helgolandicus* and the other on the sea urchin *Paracentrotus lividus*, one on wild specimens of the turtle *Caretta caretta*, and the last one on the farmed fish species *Sparus aurata*. These studies highlight that all four species, although in various ways were shown to be affected (from lowering in the metabolic energy levels, toxicity, bioconcentration of plasticizers, or microorganisms associated with MPs) related to the ingestion of microplastics. One study was focussing on the presence of MPs and associated contaminants in the Mar Menor lagoon, a large hypersaline coastal lagoon, showing the presence of several contaminants attached to the plastic particles, and finally, the latest paper published is a review on the main risks and the future linked to the presence of microplastics in the Mediterranean Sea. All contributions serve to raise awareness on the issue of marine microplastics pollution, but they also serve to understand where scientific

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research focusses upon in order to better understand and trying to carry out targeted interventions in order to solve one of the most serious environmental problems of this century.

PERSPECTIVES AND CONCLUSIONS

A review of MPs pollution studies was carried out on 20 coastal Mediterranean countries (from France to Cyprus) highlighting that the whole Mediterranean is affected by this type of pollution showing that the Mediterranean countries due to strong anthropogenic pressure, tourism, industries, maritime activities, coastal pollution are heavily polluted by plastics, and microplastics (Fytianos et al., 2020).

Furthermore, there is a lack of information in countries such as Albani and Algeria where research on microplastics has not yet been carried out. Another badly uncovered factor to consider is the circulation of water, which is the main dispersion mechanism of MPs worldwide.

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Knowing these premises, we must ask what can we do to stop microplastic pollution? Prevention is the key, regulations are necessary to avoid the use of single-use plastic, to encourage the use of recyclable plastic to reduce the introduction of plastics and microplastics in the marine environment. Moreover, common mitigation strategies are necessary to have policies developed that are common to all Mediterranean countries in order to address the problem in a unique way, but also to know the microplastics flow at a global scale.

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