
i-Plastic: Microplastics in river and ocean sediments from Portuguese North Eastern Atlantic Coastal – preliminary results

Beatriz Rebocho^{*1}, Andreia Guilherme^{†2}, Paula Sobral², Carla Palma^{‡1}, and Filipa Bessa³

¹Instituto Hidrográfico – Rua das Trinas, 49, 1249-093 Lisboa, Portugal

²MARE NOVA – Marine and Environmental Sciences Centre (MARE), Department of Environmental Sciences and Engineering, NOVA School of Science and Technology, NOVA University Lisbon, 2829-516 Monte da Caparica, Portugal, Portugal

³MARE UCoimbra – University of Coimbra, MARE - Marine and Environmental Sciences Centre / ARNET – Aquatic Research Network, Department of Life Sciences, Calçada Martim de Freitas, 3000-456 Coimbra, Portugal, Portugal

Abstract

The i-plastic project (<https://i-plastic.net>) aims to understand and predict the dispersion, accumulation, and impacts of microplastics (5 mm to 1 μ m) and nanoplastics (below 1 μ m) in marine environments from tropical and temperate land-ocean interface to the open ocean under distinct flow and climate regimes. Seasonal monitoring of the fluxes of microplastics in three different coastal areas will be done in Brazil, Portugal, and Spain. The i-plastic project assembles a multidisciplinary consortium of European and Brazilian experts from five institutes and four countries.

In Portugal, the ocean sampling area is located between Ovar and Vieira de Leiria, the estuarine area is in the Mondego River between Montemor-o-Velho and Figueira da Foz and the intertidal on the beaches adjacent to the mouth of the Mondego River.

This work presents the results from 60 samples collected by MARE-NOVA and Hydrographic Institute teams, in two campaigns – in autumn 2021 and spring 2022 – 40 beach samples, 8 of river bottom sediment, and 12 of ocean bottom sediment (IHPT-i-PLASTIC2021-1 and IHPT-i-PLASTIC2022-2).

The first results obtained show that all the sediment samples are contaminated with microplastics. In spring, the most common particles are blue fibers and white fragments. In autumn, the predominant particles are blue and white fragments. In both campaigns, Forte de Santa Catarina beach and Cabedelo beach are the most contaminated sites with microplastics. Moreover, in ocean and river sediments, the predominant microplastics found are fibers, while in the intertidal sediments they are fragments. These results will contribute to understanding the dispersion and accumulation of microplastics in this marine environment.

^{*}Speaker

[†]Corresponding author: a.guilherme@campus.fct.unl.pt

[‡]Corresponding author: carla.palma@hidrografico.pt

Keywords: microplastics, sediment, Atlantic Ocean, Mondego river, Portugal