
Microplastics in the Ria Formosa Lagoon: Ingestion by marine invertebrates with different feeding traits and from different habitats

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Abstract

Microplastics (MP), have now been found everywhere and are being linked to negative health effects in many marine animals. It is becoming clear that MP are ingested by many marine organisms in a range of different environments, but is it yet unclear what drives the variability between species. This study assesses MP ingestion by a range of macroinvertebrates from different trophic levels and feeding groups with the goal of identifying potential traits that explain patterns in the ingestion and accumulation. Four macrobenthic species were collected from the Ria Formosa, and tested for the amount, size and type of MP they contained. Additionally, sediments from the same locations were also analysed. Microplastic particles were extracted from the organisms using KOH (potassium hydroxide) and filtered over 5µm silicon filters; polymer type was then identified using micro FTIR spectroscopy. It was found that the amount of plastic and the polymer types of plastic ingested varied between species and locations with distinctly higher concentrations of Ethylen-Propylen-Rubber (EPR) in samples collected near Faro airport. It is hypothesized that this could be attributable to their behaviour and to their habitat. Interestingly, sediments collected from the same locations showed different patterns. The possible origin of the plastic is discussed as well as the potential of microplastic accumulation within taxa and their habitat.

Despite some clean-up efforts, marine plastic pollution does not seem to be declining, not least because of the increase of single use plastic during the covid19 pandemic. This will likely put even more pressure on intertidal ecosystems. Invertebrates are not only the base of marine benthic food webs, many are also used for direct human consumption, and accumulation of microplastic in these species would be concerning.

Keywords: macroinvertebrates, sediments, tyre rubber, intertidal

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