

Plastics and Plankton: What do we know?

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Plastic litter is an abundant and widespread pollutant of the marine environment. Discussion of plastic debris at the G7 summit in 2015 highlighted increasing environmental, economic, public and political concern about this ubiquitous marine contaminant. While the prevalence of large plastic items has historically received the most attention small plastic debris < 5mm in size, termed microplastics, is of equal concern to scientists. Current assessment of microplastics in our seas is hindered by technical challenges, especially determining the prevalence of microplastics of a size to be ingested by zooplankton. As part of this talk we will discuss the sampling and distribution of microplastics in coastal regions. Of key concern is that the small size of microplastics means they are readily mistaken for prey and can be ingested by marine organisms from across the food web, subsequently causing harm to the organisms themselves and potentially ecosystem function and biogeochemical processes. Here we consider the interactions between marine zooplankton and microplastics. By employing bio-imaging techniques the ingestion and adherence of polystyrene microplastics (2-31 µm) have been visualised by a range of filter-feeding zooplankton taxa. Our focus has been on copepods and the impact of microplastic ingestion in the laboratory; the results of which show that the presence of microplastics negatively impact upon the feeding rates of a range of copepods, decreasing their energy reserves and in turn resulting in reduced reproductive success and increased mortality. Our work has gone on to show that zooplankton in their natural environment ingest microplastics, and the risk this may pose to zooplankton will be discussed.

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