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### Ingestion of microplastics by zooplankton in the western English Channel

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The abundance of larger plastic debris in many areas of the oceans is well documented; by contrast microplastics, especially those of a size ingestible by zooplankton, are often poorly quantified. Laboratory studies have established that suspension-feeding zooplankton readily ingest microplastics, although it remains unclear whether this is occurring in their natural environment. These knowledge gaps are mostly due to the difficulties of detecting such small debris and ascertaining whether ingestion occurred in the field. We will address these gaps and hence determine whether microplastic ingestion by zooplankton is an environmental concern, by documenting the availability of ingestible microplastics and the incidence of ingestion. We employed hydrodynamic modelling to predict the movements of particles in an area off the coast of Plymouth (UK), and used the model outputs to select six sites of expected high plastic abundance to sample across a one year time series. Using 63µm plankton nets, capturing debris of a smaller size range than is usually targeted, we assessed the abundance of microplastics at risk of ingestion by zooplankton. Concurrently, we sampled zooplankton using horizontal and vertical trawls and assessed microplastic ingestion by enzymatically digesting groups of copepods and decapod larvae. Our findings show that zooplankton are encountering and ingesting microplastics in the ocean. We will discuss whether this is occurring frequently enough to be of consequence to the health of the population as a whole, using our data concerning the quantity and distribution of smaller microplastic material combined with zooplankton abundance data.

Keywords: microplastics, zooplankton, ingestion

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