

PLASTIC DOESN'T TASTE GOOD! EFFICIENT TASTE-DISCRIMINATION OF MICROPLASTICS IN PLANKTONIC COPEPODS

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Abstract: Planktonic copepods are the most abundant animals in the ocean and key players in global biochemical processes. Recent modeling suggests that zooplankton ingestion of microplastics (MPs) can disrupt the biological carbon pump and accelerate a global loss of oceanic oxygen. Here we investigate the behavioral responses and ingestion rates of a model feeding-current generating copepod when exposed to microplastics of different characteristics by small-scale video observations and bottle incubations. We found that copepods rejected 80% of the microplastics after touching them with their mouth parts, in essence exhibiting a kind of taste discrimination. High rejection rates of microplastics were independent of polymer type, shape, presence of biofilms, or sorbed pollutant (pyrene), indicating that microplastics are unpalatable for feeding-current feeding copepods and that post-capture taste discrimination is a main sensorial mechanism in the rejection of microplastics. In an ecological context, taking into account the behaviors of planktonic copepods and the concentrations of microplastics found in marine waters, our results suggest a low risk of microplastic ingestion by zooplankton and a low impact of microplastics on the vertical exportation of fecal pellets.

Key words: zooplankton, copepods, feeding behavior, microplastic, taste discrimination

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