



Popular science summary of the PhD thesis

PhD student	Rocío Rodríguez Torres
Title of the PhD thesis	Ingestion and effects of microplastics on marine planktonic food webs
PhD school/Department	DTU Aqua. Section for Oceans and Arctic

Science summary

Microplastic pollution is an issue of large public concern. Microplastics (MPs) are ubiquitous in the marine environment and their bioavailability make them a potential risk for the marine ecosystems. In this thesis, MPs concentrations were quantified in sea surface waters in the Arctic, where MP sampling is still scarce. Besides, the ingestion and effects of MPs were evaluated on arctic key copepod species. High-speed video observations were used to quantify the behavioral responses of copepods to diverse MP characteristics: polymer type, shape, absorbed pollutants or biofilm presence. A trait-based approach was applied to simplify the food web and evaluate the role of copepod feeding behavior in the entry of MPs in marine food webs. Lastly, based on a literature review, the ingestion of MPs by different organisms of the marine food webs was analyzed and the current trends in MPs investigation were identified to highlight necessities for future MPs research.

Microplastic ingestion varied with the prey :MPs ratio. However, arctic copepods were not affected by the ingestion of virgin MPs even above the current MP concentrations found in the arctic environment. Although co-exposure of MPs with crude oil induced feeding suppression. We have documented that copepods have the ability to select their prey and reject 80% of the captured MP particles independently of the MP characteristics. Furthermore, the presence of MP did not affect copepod's behavioral responses and the ingestion of MPs was similarly low independently of the type of feeding behavior. Therefore, based on our findings, the role of copepods as vectors for entry of MPs in marine food webs can be considered negligible.

This thesis has contributed with new knowledge on the impact of MPs at the base of the marine food web. In addition, it has resolved the mechanisms behind the interaction between copepod's feeding behavior and MP ingestion. Based on our results and the research trends found in the literature review, this thesis suggests new paths for future research in the ingestion and impact of MPs in planktonic marine food webs.