

ICES/PICES 6 ZPS 2016/W4 Effects of microplastics on zooplankton

Microplastic ingestion: the role of taste

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Ingestion of microplastics by zooplankton has been confirmed both in vitro and in situ and negatively affects feeding rates, survival and fecundity in copepods. Here, we studied ingestion of 15 and 30 µm polystyrene beads by copepods and decapod larvae. Consistent amounts of plastic (0.333 mg l<sup>-1</sup>) were offered to *Acartia longiremis*, *Calanus finmarchicus*, *Pseudocalanus* sp. in 24 hour incubations. Due to the difference in size the resulting concentrations were 23 particles ml<sup>-1</sup> (30 µm) and 148 ml<sup>-1</sup> (15 µm). The smaller 15 µm beads were ingested more frequently than 30 µm beads by all species, due to higher encounter rates with the smaller particles. An exception was *Pseudocalanus* sp., which did not ingest particles of either size. We then investigated whether the ingestion of microplastics was influenced by the presence of a biofilm. A higher proportion of both *C. finmarchicus* and *A. longiremis* individuals ingested fouled microbeads than clean beads. The number of beads ingested was also significantly higher when the plastics were fouled. In the presence of algae more copepods ingested microplastic in both fouled treatments (with and without food) than in treatments with clean beads, but the number of plastics ingested was highly variable within replicates. After ingestion, microbeads passed through the gut and egestion in faecal pellets was observed within 1-3 hours. In a long-term exposure, microbeads did not affect survival of *C. finmarchicus* females. Our findings indicate that biofouling enhances microplastic ingestion and should be taken into account in estimates of potential for trophic transfer.

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