

A taste of plastic - quantifying micro- and nanoplastic ingestion and interactions with feeding in daphnia magna (E)

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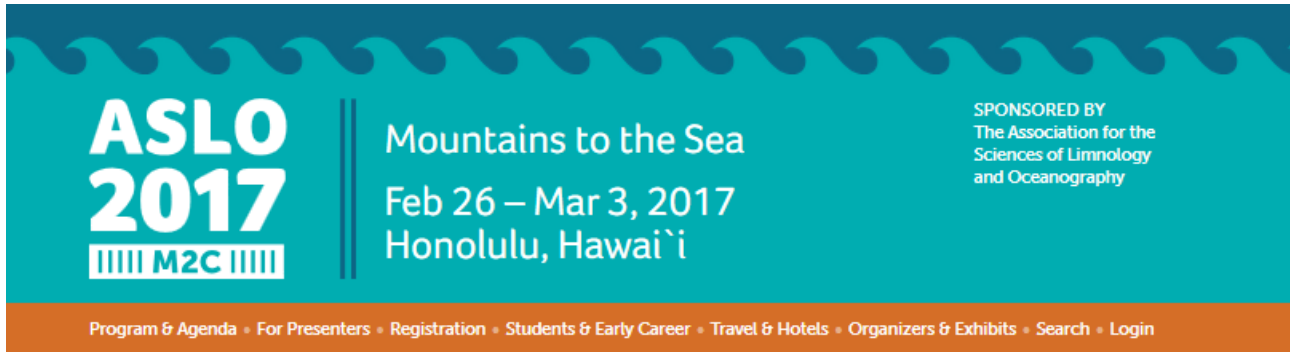
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VIEW ABSTRACT

A TASTE OF PLASTIC – QUANTIFYING MICRO- AND NANOPLASTIC INGESTION AND INTERACTIONS WITH FEEDING IN DAPHNIA MAGNA (E)

Aquatic ecosystems worldwide are polluted by microplastics and they are ingested by a broad range of organisms. Although research so far mainly focused on marine ecosystems, freshwater organisms are just as affected. Approaches to study microplastic ingestion are predominantly qualitative since quantitative measures are analytically challenging. The aim of this study was to develop and apply a quantitative approach to measure particle body burden to study uptake and depuration of micro- and nanoplastics in the freshwater flea *Daphnia magna*, using fluorescent polystyrene beads. The animals were first exposed to a particle concentration of 1 mg/l for 24 h (uptake) and thereafter transferred to clean medium for another 24 h (depuration). During both phases animals were sampled and particle body burdens were determined by measuring particle fluorescence in the dissolved tissue. To analyze the influence of particle size, the study was done with beads of 2 μm and 100 nm. It was furthermore analyzed how the processes are affected by food availability and how the particles in turn affect the feeding rate of *D. magna*. Both particle sizes were readily taken up and body burdens increased with exposure time. The 2 μm beads were taken up in a higher quantity. Likewise, depuration was more efficient for the bigger particles. Smaller particles remain in the organism for a longer time, potentially increasing their hazard. Food availability strongly influenced particle body burdens, with lower levels in the presence of food. In turn, the particles can potentially alter the animals' feeding rate, which could lead to impairments of physiology and fitness.

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DETAILS

Poster presentation

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