
Interaction and transmission of daphnia microbiome to MP-containing aggregates

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Abstract

**Microplastic containing aggregates to not select for a distinct bacterial community
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Abstract:

Natural particles, biopolymers together with micro- and nanoplastics (MNP) form aggregates in the aquatic environment termed marine snow. The degree of aggregation is dependent on environmental factors such as salinity, ion-content as well as the presence of microorganisms and related extra-cellular polymers and alter the bio-availability and toxicity of the particles. Filter feeders such as *Daphnia magna* interact with these particles by changing their size and composition. Furthermore, their microbiome gets transmitted to the aggregates during the passage through their digestive system and the degree of selection depending on the content of MNP of aggregates are unclear. Recently, it was debated whether those particles would subset the bacterial community and select for potential pathogen bacteria.

In this study, we created environmentally realistic aggregates using different particle concentrations (TSS) (0.1-10 mg/l) with varying MNP ratios of (0-10%). We added *Daphnia magna* and allowed them to interact for 72h. After exposure, the aggregates were analyzed in terms of size as well as associated *Daphnia* microbiome. The aggregate associated microbiome was compared to the donor-daphniids as well as to the surrounding planktonic phase. Furthermore, we monitored *Daphnia* fitness parameters to assess toxicity related to particle size variability and MNP content.

We observed no fitness decrease in *Daphnia* related to MNP content, TSS content or aggregate size. Microplastics seem not exert a selective pressure on the transmitted microbiome at

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environmentally realistic ratio to natural particles. However, particle density is a significant driver for a distinct microbial community. More data analyses are ongoing.

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