Secretion of Microplastics on the Seafloor

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Microplastics have become ubiquitous in marine ecosystems. Toxic chemicals can leach from microplastics posing significant health risks to marine life. Removal of microplastics is difficult due to their small size. A solution to this problem must incorporate holistic means to sequester microplastic debris from seawater. Previous research showed clams consuming microplastics from the water column. Excrement from clams was observed to contain microplastics. This research further explores how clams can sequester microplastics from the water column by excretion. Here clams were fed live phytoplankton and exposed for 24 hours to a medium with microplastics and/or fine grains of sand. Falling frequencies were measured using time recorded video of collected fecal waste descending a burette filled with saltwater. Observation of particles revealed the following average frequencies of descent: fecal matter with microplastics (1.10 s-1); plain fecal matter (1.34 s-1); fecal matter with microplastics and sand (3.04 s-1); and fecal matter with sand (3.46 s-1). Results show fecal particles containing microplastic to be more buoyant and fall at slower rates when compared to particles without microplastics. Falling rates provide a view of how sequestered microplastics by excretion from clams have the potential to be deposited and buried on the seafloor.

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