

The Role of Microbe-Microplastics Associations in Marine Nematode Feeding Behaviors

Authors : A. Ridall, J. Ingels

Abstract : Microplastics (MPs; < 5 mm) have been cited as exceptionally detrimental to marine organisms and ocean health. They can carry other pollutants and abundant microbes that can serve as food for other organisms. Their small particle size and high abundance means that non-discriminatory feeders may ingest MPs involuntarily and microbial colonization of the particles (a niche coined 'Plastisphere') could facilitate particle ingestion. To assess how marine nematodes, the most abundant member of the meiofauna (32-500 um), are affected by microbe-MP associations, an experiment was conducted with three MP concentrations (low, medium, and expected high values of MPs in a local bay system), and two levels of microbe-MP associations (absence or presence). MPs were introduced into sediment microcosms and treatments were removed at three distinct time points (0, 3, and 7 days) to measure mean MP consumption/individual nematode. The quantitative results from this work should inform on microbial facilitation of MP ingestion and MP effects on seafloor ecology. As most MP feeding experiments use straight-from-package or sterile MPs, this work represents an important step in realizing the effects of MPs and their plastispheres in coastal sediments where they likely accumulate microbial biofilms prior to their ingestion by marine metazoans. Furthermore, the results here convey realistic effects of MPs on faunal behaviors, as the MP concentrations used are based on field measurements rather than artificially high levels.

Keywords : ecosystem function, microbeads, plastisphere, pollution, polyethylene

Conference Title : ICMPP 2023 : International Conference on Microplastics and Plastic Pollution

Conference Location : Vancouver, Canada

Conference Dates : September 25-26, 2023