Analysis of Biofilms on Microplastics Sampled From Wastewater Treatment Plant Effluent

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Microplastics have been a significant environmental pollutant that are recently beginning to be studied within the past decade. While their threats have been well-documented among a variety of marine and terrestrial wildlife, most of these studies aim for the negative effects of the microplastics themselves, and not what else they harbor. As such, this experiment aims to identify bacteria present on biofilms, (large concentrations of bacteria), on the microplastics to evaluate how these particles are a harbor for potentially dangerous microorganisms. Specifically, water that goes through wastewater treatment plants only has some of its microplastics removed, with some still being present with biofilms intact. This effluent that is the output of these plants often flows into freshwater sources such as rivers and lakes, which are often not only habitats for a plethora of organisms but in some cases the source of water that many people depend on. As such, this experiment's objective is to analyze and describe the bacteria on these biofilms to discover what microorganisms microplastics can serve as harbors for, even after wastewater treatment. Microplastics were isolated from the effluent through vacuum filtration, and the bacteria was isolated form the microplastics using horizontal vortexing and a PBS solution. After plating the bacteria was quantified through counting CFUs/mL. The bacteria was identified through sequencing and using NCBI BLAST to insert the nucleotide sequence.

Awards Won: