Separation Efficiency of Microplastics (Polyamide, Polyester, Polypropylene) from Water Samples (DI Water, Seawater, Seawater/DOC)

Interest in microplastics has been increasing, especially in the past five years, because they are harmful to environment even more so then larger plastics. Microplastics can be eaten by different marine species and they can cause many problems including death. They can be found any where in the water column and sediment. Microplastics are defined has a piece of plastic 5mm- 300μm in length. There have been many studies on methods for the separation of microplastics from environmental media but not on the efficiency of the methods. In this study, visual separation and density separation were used to remove three plastic types (polyamide, polyester, and polypropylene) from three different synthetic environmental media (DI water, Seawater, Seawater/DOC) to determine how well these methods work in recovering introduced microplastics (measured as separation efficiency). There was a significant difference in separation efficiency between the treatments but no significant difference across different plastic types. There was also a significant difference shown for the interaction term (treatments v. plastics). For some treatments and plastic types, the separation efficiency was over 100%, suggesting recovery of more microplastic than was introduced to the sample. Potential reasons for this include water still in with the plastics or a chemical reaction happening with the hydrogen peroxide and the microplastics, but future studies should be done to determine definitively why there was an increase in mass in the plastics. Overall, however, results show that the method has a good separation efficiency and should be looked at further to determine if it can be used on real environmental samples.

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