

Plastic is one of the most commonly used materials. Humans produce about 300 million tons of plastic is produced globally each year. Microplastics, usually under 50 microns in diameter, are incredibly small pieces of plastic debris that make their way into water systems and the like. These microplastics can come from brushing ones teeth, washing certain fabrics, and industrial waste. Water filtration systems are unable to filter out these plastics due to the inability to capture such small pieces of plastic. Therefore, they end up getting into the local water system. Our research is specifically observing the effects of microfibers and microbeads on freshwater daphnia. Daphnia are crustacean filter feeders that usually range from 1mm to 5mm in size. This aquatic creature is an ideal candidate to observe when testing microbead and microfiber effects on living aquatic organisms due to their sensitivity to changes in the ecosystem. They are also known to consume plastic particles; since daphnia are filter feeders, they take in any particle of a certain size that they come across as sustenance. These particles include microbeads and microfibers of course. Our experimental design is as follows: our team will have two seperate groups of daphnia, one exposed to microfibers and one exposed to microbeads. Within these two groups will be three groups of 20, each exposed to microplastics for 24 hours, 3 days, and a week. Food will include microfiber/microbeads and ground fish food with a consistent concentration. At the end of each time period we are measuring for mortality, reproductive rates, and growth. Initial results show that microplastics can be found and observed within the digestive tract of daphnia.