Biodegradation of Plastic by Galleria mellonella, Tenebrio molitor, and Zophobas morio

Seid, Lisa (School: The Mississippi School for Mathematics and Science)

Plastic pollution affects the world: land, water, and air. It may take up to 500 years for certain types of plastics to biodegrade in the environment. This can be especially harmful to the biodiversity of certain ecosystems. Current recycling processes are low efficiency and are limited in their ability by their own detrimental pollution. However, some species of worms have been discovered to biodegrade certain types of plastic. Worms would be a natural solution to this synthetic problem. The objective of this study is to investigate which worm – Galleria mellonella, Tenebrio molitor, and Zophobas morio – has the highest rate of plastic biodegradation. Plastic bottle (polyethylene terephthalate) and plastic bag (high-density polyethylene) samples were distributed amongst containers with 90 worms in each. Each container was weighed by difference, empty and with the substrate of plastic. The difference in masses recorded were not determined significant, accurate, or precise enough to draw a conclusion. The type of plastic and size most likely plays a role in the capabilities of degradation and consumption. Based on these results, the null hypothesis failed to be rejected.

Awards Won: