The Effect of Consuming Polyethylene on the Function and Consumption Rate of the Zophobas atratus Superworm

Schwarzbauer , Anja (School: Sarasota High School)

The study kicked off when curiosity arose as to whether superworm consumption of polyethylene could be a solution to reduce plastic in landfills, based on supporting findings. A question was proposed, asking whether superworms will prove a viable method to biodegrade polyethylene. After conducting thorough research, a hypothesis was formed: If the zophobas atratus superworms are contained in an environment with a hybrid of polyethylene and their preferred diet, polyethylene will be effectively degraded without negatively affecting the health or frass (excretions) of the worm. In order to conduct this experiment, each of the three conditions were set up in their respective containers and observed over a 28-day period. At the end of the testing period, frass was extracted from each condition and analyzed, and the change in mass of the polyethylene and survival rate of the worms was determined. After performing statistical tests, it was revealed that the collected data failed to reject the null hypothesis of the study. The results revealed that the superworms in the Hybrid condition were more efficient at biodegrading the PE sheets, however not enough data was gathered to determine the significance. Furthermore, there was no significant difference found between the masses of frass in the three respective conditions. This is due to a lack of equipment to properly analyze the effect of a polyethylene-based diet on their excretions. Consequently, although there are recognized issues in this study, the strong standardization of this experiment supports the credibility of the findings and project overall.

Awards Won:

Florida Institute of Technology: Full Tuition Presidential Scholarship