Mealworms... A Potential Solution to the Global Plastic Problem

Rawinski, Alyssa (School: Monte Vista High School)

Approximately 267 aquatic species are negatively affected by plastic garbage in the ocean (Barry, 2009). The prevention of this problem starts on land with effective recycling methods. The purpose of this project was to determine if mealworms (Tenebrio molitor) could be an effective method to recycle plastics. My study analyzed polystyrene and two plastics that haven't been tested (polypropylene and low-density polyethylene). I also tested two sizes of polystyrene: 30 milligram (mg) and 100mg pieces; and a ratio mixture of 75% plastic and 25% potato. I had two control groups fed potato in 30mg and 100mg pieces (all referred to as "variable groups"). I took measurements for 29 days on plastic weight, and weight and number of worms. The worms consumed all three kinds of plastic with a preference for polystyrene. Eating plastic did not cause more worms to die, when compared to the controls. However, eating strictly plastic slowed the worms' metamorphic rate. My 75% plastic mixture indicated a normal metamorphic rate, while still eating plastic. Surprisingly, every variable group lost weight. Also, mealworms were excreting more than they were consuming. I measured CO_2 output for the worms and couldn't conclude whether the worms were metabolizing the plastic although, a Stanford study concluded that mealworms can metabolize polystyrene (Yang, 2015). The overall goal of my project was to learn more about the mealworms' ability to help with recycling and according to my research, there is a good possibility that mealworms might be a solution to cleaning up the planet.

Awards Won: