Galleria mellonella Biodegradation of Polyethylene by Digestion

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The purpose of this experiment is to further investigate the ability of galleria mellonella (the larvae of the greater wax moth) to digest and naturally biodegrade polyethylene: plastic types 1,2, and 4, and to affirm how they best digest the plastic, and which plastic they are most effective in degrading. To do so, the experiment required 185 larvae that were split into groups of 15 to 17 amongst 12 habitats. The habitats were split into plastic types: 1,2, and 4, which each made up ⅓ of the habitats, and then further into ratio of plastic to worm food by mass (a oat and honey mixture) with ¼ of the habitats being majority worm food to minority plastic, ¼ half to half, ¼ minority worm food to majority plastic, and ¼ being only plastic. It was hypothesized that the worms would most efficiently digest the plastic when in the minority worm food to majority plastic habitats, as well as in the plastic 2 habitats. Biodegradation was measured every 48 hours by comparing the mass of the plastic to the previous measure, the health of the worms was also tracked for success of the experiment. However, results showed that the worms most efficiently and successfully digested plastic type 4,and in the evenly split worm food to plastic ratio habitats. This research proved the larvae could biodegrade polyethylene, and the effectiveness of utilizing them as sources to biodegrade plastic type 4, as well as how to best do so.