Achroia grisella as Effective Decomposers of Polyethylene

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There have been reports/experiments showing the greater wax moth (Galleria melonella) can decompose polyethylene. There are two species of wax moth and the lack of attention to the lesser wax moth Achroia grisella in these studies led to the question of whether they can also decompose polyethylene. To test this, the larvae were separated into three different groups. Two of the groups were exposed to only polyethylene and the third was exposed to only food. The larvae were left alone and monitored for two weeks. The hypothesis was correct based on the results showing Achroia grisella were capable of decomposing the plastic. The larvae exposed to plastic seemed livelier while the worms with the food appeared less fit and developmentally paused. Larvae exposed to polyethylene had more mass than the other larvae. After the first experiment, there were still unanswered questions so a second test was designed. The objectives were to discover if the moths fully decompose the plastic by testing if any plastic remained after the larvae consumed it. The larvae were soaked in a hydrogen peroxide solution over heat and filtered through paper leaving behind material larger than 100 microns. This experiment supports that some microplastics do remain after digestion. This also confirms that they consume polyethylene, break it down, use some as energy, and excrete the rest as microplastics. The benefit is that they break down polyethylene while gaining energy from it without being harmed and they do decompose a small percentage of the polyethylene consumed.

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