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The greater wax moth (*Galleria mellonella*) is a parasite in honey bee hives, feeding on honey, beeswax, and bee bread, causing colony losses and economic damage. In some cases, it consumes bee larvae and pupae and can even show cannibalism. They are commonly used as model organisms in studies of physiology, immunology, proteomics, and genomics. Recent studies show they can also consume low-density polyethylene (LDPE), making them important not just as bee pests but also as valuable model organisms. In this study, the ability of the greater wax moth to metabolize certain materials that it does not naturally feed on was investigated. To the best of our knowledge, this may be the first study to report that greater wax moths consume materials that are not their primary food, such as paper and dead adult bees. Our experimental groups consisted of the greater moth larvae that consumed beeswax, dead adult bees, paper, and plastic. In this study, the last larval stages of the greater wax moths, reared *in vitro*, were starved for a few hours before being transferred to specialized containers. After 48 hours of feeding, hemolymph extraction was performed. Scanning electron microscope (SEM) images were taken to document perforations caused by the consumption of materials such as beeswax, paper, dead adult bees, and plastic. Additionally, the chemical bond structures of hemolymph components were analyzed using FTIR spectroscopy, hydrocarbon profiles were identified by GC-MS, and the sugar profile was determined using HPLC. The FTIR analysis revealed molecular bond vibrations associated with structural changes in the materials consumed by the larvae, consistent with the GC-MS and HPLC results. Biochemical analyses showed that the greater wax moths metabolize organic products such as beeswax, dead adult bees and paper as well as plastic, a synthetic polymer. Hemolymph analysis revealed that hydrocarbon profiles varied depending on the diet. When comparing trehalose levels, the organic-fed groups (beeswax, dead adult bees, and paper) showed similar results, while the plastic-fed group had a higher trehalose level. Our study shows that the greater wax moth larvae can biodegrade and metabolize various materials other than their primary food.