The Influence of Visible Light on the Consumption Rate of Expanded Polystyrene by Zophobas morio Larvae

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The process of disposing of expanded polystyrene (EPS) is by burning it in municipal incinerators. This process gives off EPS microplastics, which can find their way into water, food, blood, and major organ systems. Zophobas morio larvae are capable of consuming and breaking down EPS within their digestive tracks without causing the spread of microplastics. Studies of the consumption of EPS by Z. morio larvae are typically conducted under white or no visible light treatments. This study tested whether the color of visible light influenced the consumption rate of EPS by Z. morio larvae. If Z. morio larvae consume EPS under visible light, then visible light will influence the amount of EPS consumed. If results suggest that the consumption rate is influenced by visible light colors, then Z. morio larvae could be a solution for recycling EPS. This study's procedure placed Z. morio larvae into 25 jars under one of six visible light treatments of red, yellow, green, blue, white, and no visible light. Each jar contained a pre-weighed block of EPS and six Z. morio larvae. After two weeks, the Z. morio larvae were removed from the jars, and the difference between each pre-weighed EPS block to the weight of the same partially consumed block was recorded in three trials. The data indicates that green visible light resulted in the greatest amount of EPS consumed by Z. morio larvae with the blue visible light treatment holding a close second. In conclusion, results indicate that green visible light, compared to no visible light could be used to influence the Z. morio larvae to consume more EPS. Green visible light and Z. morio larvae could make the recycling process of EPS more environmentally friendly when used in households or by local environmental organizations.

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