How Does Microplastics Shed From K-Pods Impact Primitive Behaviors, as Assessed Using Caenorhabditis elegans as a Model Organism?

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Microplastics are widespread pollutants that pose risks to human health. Caenorhabditis elegans, a small nematode with a simple nervous system, is commonly used in biological research to assess potential human effects. This project investigates the impact of microplastic exposure from K-pods on C. elegans, focusing on their movement and reproduction. The study aims to understand the potential effects K-pods may have on humans. If we infuse the petri dishes with water brewed from K-Cups in a Keurig machine, it will influence the organisms' movements and reproduction due to the potential significant amounts of microplastics released during the brewing process. To test this, two solutions were prepared: water brewed with a K-Cup (coffee extracted) and water brewed without a K-Cup. We mixed out solutions into our agar plates while making the plates. Then we transferred C. elegans to the dishes by cutting a square of a different plate or using a mini spatula to transfer 5 to each plate. Then we recorded every day for four days. The results showed that microplastic-exposed C. elegans reproduced significantly less (ANOVA $P < 0.01$) compared to the control group. Additionally, worms in microplastic-infused dishes frequently exhibited abnormal behaviors such as omega bending, indicating toxicity and stress. The ANOVA analysis ($P < 0.01$, F-value = 190) confirmed significant differences between groups. These findings support the hypothesis that microplastics affect C. elegans behavior and reproduction. The observed abnormal movements suggest potential neurological or stress-related responses, highlighting the broader risks microplastics may pose to environmental and human health.

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