Evaluating the Viability of Reducing Plastic Waste with Tenebrio molitor

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Man-made polymers create a strain in waste management strategies as decomposition is not practical and combustion of these material creates greenhouse gases. The researched method will decrease the amount of greenhouse gases produced while breaking down these polymers into compost. Previous research demonstrates that Styrofoam was the most readily consumed man made polymer by Tenebrio molitor. This experiment's goal was to demonstrate if a personal composter could decompose Styrofoam waste, decrease carbon dioxide emissions, and create a sustainable mealworm colony. To test these goals, 2,000 mealworms were put into four separate areas (500 worms each); two areas were given a weekly amount of Styrofoam (15g) and two areas were given a monthly amount of Styrofoam (60g). One weekly and one monthly area were provided clean Styrofoam; while the other groups consisted of dirty Styrofoam meaning it was not rinsed with water. The mass of Styrofoam, compost, and mealworms was tracked for eight weeks. At the end of eight weeks it was determined that the dirty Styrofoam was consumed at a higher rate than clean Styrofoam, mealworm colonies are sustainable on a pure Styrofoam diet while carbon dioxide emission were decreased by an average of 95.85%. This project demonstrates that the use of mealworms may be a feasible, environmentally friendly option in reducing the amount of man-made polymers in landfills.