

A Review of the Promising Effectiveness of Insects in Waste Management

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Abstract

Waste management is an urgent global issue. Thus, developing innovative and longterm solutions is essential. Recently, there has been a growing interest in using insects for waste management as one of the main alternatives. One of the emerging applications is using insect larvae as a viable approach for breaking down hazardous organic waste and plastic waste. Aquatic insects effectively decompose water waste containing microplastics, as their decomposition rate has reached 50%. Another application uses vermicompost and insect-based bioconversion as bioeconomic waste management methods to produce pollution-free or non-toxic by-products from dayto-day waste. Insects such as black soldier flies, flesh flies, and some beetle species have been studied for their efficiency in converting various types of waste such as sewage sludge, municipal waste, food residues, restaurant and market waste, residual plant waste after oil extraction and non-organic waste into valuable resources. This article provides a comprehensive review of the promising effectiveness of insects in waste management, highlighting their ability to transform organic waste into valuable resources, minimize non-organic waste and contribute to sustainable practices.

Keywords

Black soldiers fly larvae, Yellow Mealworm Beetle, Darkling Beetle, aquatic insects.