A Sustainable Approach to Control the Destructive Red Palm Weevil Pests

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Red palm weevil (a beetle, Rhynchophorus ferrugineus) is a promising source of low-cost, high-quality protein commonly cultivated in Southeast Asia. We found a correlation in the increased weevil cultivation and the damage to palm plants, due to the uncontrolled growth rate of the weevils leading to economic loss in palm industries. This study mainly aims to develop a sustainable, organic, and cost-effective approach to control the weevil's metamorphosis rate to reduce the plant invasion by insects. We also aim to enhance the nutritional value of insect powder to address the global food shortage issue. Results show that feeding weevils with food containing specific herbs resulted in a significant reduction in the metamorphosis rate at pupation stage. Kra-jeab (a roselle Hibiscus sabdariffa) and kra-pao (a holy basil Ocimum tenuiflorum) decreased metamorphosis rate by 76.7% and 50.0%, respectively, with a higher reduction rate of 86.7% when the two herbs were combined. Interestingly, metamorphosis could not at all occur when using coconut coir to replace coconut fiber as insect’s nest bedding. Moreover, supplementing the optimized feed with soybean meals for 4 weeks led to 6.93% increase in protein. Insect powder was made, then protein and food parameters were analyzed. In conclusion, this work demonstrates the potential application of plant-based feed to slow down weevils’ metamorphosis rate to control their destructive impact on palm industries, thus likely to resolve issues between palm and insect farmers. The work also extends to making insect powder having high protein content to increase insect farmers' income.

Awards Won:
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