Optimization of Green Lacewing (Mallada basalis) Survivability From Hatching and Foraging Behavior

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Mealybugs are a global pest problem that threatens plants in various settings. Using insecticides to eliminate mealybugs has been associated with harmful environmental and human health problems. A promising alternative using the Green Lacewing (Mallada basalis) has emerged as biological control. However, Green Lacewings released in nature have low survival rates due to low egg hatchability and cannibalism behavior in larvae. In this study, we optimized the survivability of Green Lacewings by investigating their hatching and foraging behavior. We studied the effects of temperature, photoperiod, wavelength, and vibration frequency on egg hatchability. We also investigated the effects of food types and foraging obstacles on cannibalism rates which can have an impact on Green Lacewing survivability and reproductive success. Our results showed that specific conditions could maximize egg hatchability, increasing the chances of survival for Green Lacewings. We also found that certain types of food and foraging obstacles can significantly reduce cannibalism rates, thereby increasing the survival rate of Green Lacewings. Combining our results, we developed an innovative approach to optimize Green Lacewing survivability using modified leaves as an egg incubator. Our innovation has been shown to increase the survivability of Green Lacewings released into natural environments by 5 folds, resulting in reduced pest infestations for farmers. Thus, our study proposes an effective and sustainable biological pest control method that is more effective than insecticides and is environmentally friendly.

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