Synthesis of an Artificial Diet for Natural Enemy, Green Lacewing *Chrysopa oculata*

Abstract

The green lacewing, *Chrysopa oculata* (Neuroptera: Chrysopidae), also known as golden-eyed lacewing, is a voracious arthropod predator of soft-bodied crop pests like thrips, aphids, and mealybugs. This species differs from other green lacewings in that both larvae and adults are predatory. It's commercial mass rearing and release in agricultural cropping systems could be a potential biological pest control method. However, studies of *C. oculata* are limited, primarily because of minimal information on rearing and providing food for their predatory adults. Providing live/frozen soft-bodied insects like aphids is tedious, time-consuming, and challenging to maintain in both the quality and quantity of the prey. There are artificial diets prepared for other green lacewing species with adults that are not predacious. However, information on artificial diets for lacewings such as *C. oculata* with predatory adults is limited. Therefore, this study aimed to identify a low-cost artificial adult diet for *C. oculata* in which they can perform efficiently in development, reproduction, and survival. This experiment is an extended study of a previous experiment conducted where we evaluated five different artificial diets for *C. oculata*, out of which an artificial diet for non-predatory adults (a mixture of fructose, wheat germ, eggs, honey, and yeast) mixed with commercially available eggs of the moth *Ephestia kuehniella* was promising. In the current study, we used this diet as the control treatment with five new diet mixtures (treatments) to evaluate the performance of *C. oculata*. We conducted the experiment in an incubator in a controlled environment with 24˚c ± 1˚c temperature, 65 ± 10 % relative humidity, and light: day period of 14:10. We evaluated the egg, larval, pupal developmental time and survival, sex ratio of adult males and females, pre-oviposition period, and adult longevity on every 24 hours. Our results show that one or more treatments are promising for rearing of *C. oculata*.