Metabolic Costs and Chemical Profiles of Wax Production in Cryptolaemus montrouzieri and Tenuisvalvae notata

Authors : Nataly De La Pava, Christian S. A. Silva-Torres, Arodí P. Favaris, José Maurício S. Bento

Abstract : The lady beetles Tenuisvalve notata and Cryptolaemus montrouzieri are important predators of mealybugs (Hemiptera: Pseudococcidae). Similar to the prey, these lady beetles produce wax filaments that cover their body during the larval stage. It has been hypothesized that lady beetle body wax chemical profiles are similar to their prey as i) a mechanism of camouflage and ii) conveying protection to the lady beetle larvae against aphid-tending predatory ants. In this study, we tested those hypotheses for the predators T. notata and C. montrouzieri and two mealybug prey species, Ferissia dasyrilii, and Planococcus citri. Next, we evaluated the influence of feeding on cuticular chemistry during predator development and identified possible metabolic costs associated with wax production. Cuticular wax samples were analyzed by GC-MS and GC-FID. Also, the metabolic cost linked to wax production was evaluated in the 4th instar larvae of the two predators when subjected to body wax removal from 0 to 4 times. Results showed that predator body wax profiles are not similar to the chemical profile of prey body wax. There was a metabolic cost associated with wax removel; predators (male and female) showed a significant reduction in adult body weight when the wax was removed. This suggests the reallocation of energy to wax replacement instead of growth. In addition, it was detected effects of wax removal on fecundity and egg viability. The results do not support the hypothesis that predators mimic the cuticular wax composition of prey as a means of camouflage. **Keywords :** biological control, body wax, coccinellids, cuticular hydrocarbons, metabolism cost, reproduction

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