GMR Genetics and Molecular Research
Online Journal
ISSN:1676-5680

Thesis Abstract

Effect of parasitism of *Diatraea saccharalis* (Lepidoptera: Crambidae) larvae by the wasp *Cotesia flavipes* (Hymenoptera: Braconidae) in defense reactions against abiotic agents: production and encapsulation reaction

C.C.C. Nunes and T.L. Silva

2006. Instituto de Biociências, Letras e Ciências Exatas, Universidade Estadual Paulista "Júlio de Mesquita Filho", Botucatu, São Paulo, SP, Brasil
PhD thesis. Orienting Prof.: E.A. Gregório

Corresponding author: T.L. Silva
E-mail: lucenabio@hotmail.com
DOI http://dx.doi.org/10.4238/2013.June.13.7

This study aimed to determine prophenoloxidase (proPO) activation and nitric oxide (NO) production in the hemolymph of *Diatraea saccharalis* larvae non-parasitized and parasitized by the wasp *Cotesia flavipes* and/or inoculated with abiotic agent (Sephadex beads), during parasitism/inoculation, and related to larval age; the ultrastructure of the capsule formed around the abiotic agent during parasitism was also examined. *D. saccharalis* larvae at 20 days of development (5th-instar larvae) were parasitized by *C. flavipes*. After different times of parasitism and/or inoculation with the abiotic agent (2 and 6 h, and 3 and 6 days), the sugarcane borer hemolymph was collected and frozen at -20°C for later analyses of *in vitro* proPO system activation and NO production. To observe the encapsulation response to the abiotic agent implant, the Sephadex beads were recovered and conventionally prepared for ultrastructural analyses. There was a significant reduction in both the activation of the proPO system and in NO production of *D. saccharalis* non-parasitized/inoculated larvae related to larval development, from 20 to 26 days. The parasitism by *C. flavipes* inhibited proPO system activation during the whole experimental time; NO production was inhibited only at initial (2 h) and early (6 h) parasitism. The inoculation of non-parasitized larvae with Sephadex beads increased proPO system activation, at all experimental times, but it did not increase the NO production of these larvae. The parasitism of *D. saccharalis* larvae by *C. flavipes* concomitant

with their inoculation with Sephadex beads significantly inhibited the activation of the proPO system, but it did not affect NO production levels at all times studied. The *D. saccharalis* larvae parasitized by *C. flavipes* were able to identify and encapsulate the Sephadex beads as the non-parasitized insects, based on ultrastructural analyses. Therefore, our results indicate that although there was an inhibition of the proPO system due to parasitism, the Sephadex beads were recognized as non-self and encapsulated, but the parasitoid was not recognized and successfully developed in the insect host hemocele. The hemocyte responsible for proPO synthesis in *D. saccharalis* was the oenocytoid; it was impossible to determine the hemocyte type responsible for NO production.

Key words: *Diatraea saccharalis*; *Cotesia flavipes*; Prophenoloxidase; Nitric oxide; Encapsulation; Parasitism

