

Parasitism by the endoparasitoid, *Cotesia flavipes* induces cellular immunosuppression and enhances susceptibility of the sugar cane borer, *Diatraea saccharalis* to *Bacillus thuringiensis*.

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Abstract:

Cotesia flavipes Cameron (Hymenoptera: Braconidae), is a gregarious larval endoparasitoid of the sugarcane borer, *Diatraea saccharalis* Fabricius (*Lepidoptera: Crambidae*). The aim of this research was to analyze cellular immunosuppression of *D. saccharalis* parasitized by *C. flavipes* in terms of encapsulation, melanization, and hemocyte nodule formation. The encapsulation assay was done 1 and 6 days after parasitoid oviposition. In addition, the susceptibility of parasitized and nonparasitized larvae to *Bacillus thuringiensis* HD 73 strain was assessed. 3, 12, and 24 h after bead injection; the percentages of encapsulation were significantly higher in unparasitized larvae compared to larvae parasitized 1 and 6 days after oviposition. Interestingly, there was a significant reduction in numbers of beads encapsulated at 1 day after oviposition compared to 6 days, and unparasitized larvae. The percentage of melanized beads decreased significantly in parasitized larvae compared to control. There was a reduction in the number of nodules in parasitized larvae compared to unparasitized controls. Larvae that were injected with polyndavirus 24 h before beads were injected showed significantly reduced encapsulation responses relative to control larvae. The *D. saccharalis* parasitized by *C. flavipes* exhibited higher susceptibility to *B. thuringiensis*. These results suggest that parasitization induced host immunosuppression, and the immunosuppression factors could impair the defense capacity against microbial pathogens--causing an increase in pathogen susceptibility.