



Thesis Abstract

**Ultrastructural and cytochemical
characterization of hemocytes in
Diatraea saccharalis (Lepidoptera:
Pyralidae) larvae parasitized by the wasp
Cotesia flavipes (Hymenoptera: Braconidae)**

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This study describes the morphology of the hemocytes in *Diatraea saccharalis* larvae during parasitism by the wasp *Cotesia flavipes*, determined by transmission electron microscopy using conventional and cytochemical techniques. Twelve-day-old *D. saccharalis* larvae were naturally infected with the wasp *C. flavipes*. After different times of parasitism (6, 72, and 144 h), the hemolymph of the sugarcane borer was collected and the hemocytes obtained by centrifugation; the pellets were prepared for ultrastructural analyses using conventional and cytochemical techniques. As control, we used hemolymph from *D. saccharalis* larvae not parasitized, aged 20, 23, and 26 days. The development of the *C. flavipes* larvae in the hemocoel of the host insect *D. saccharalis* did not trigger either adhesion of the hemocytes nor capsule formation around the parasitoid. Plasmotocytes exhibited an increase in the amount of rough endoplasmic reticulum, Golgi complex and cortical vacuoles during parasitism, indicat-

ing they were activated for secretory activity. The response of granulocytes to the parasitism involved the release of the content of structured granules and an increase in both the number and volume of the digestive vacuoles, as well as of the rough endoplasmic reticulum. Oenocytoids showed electron-lucent cytoplasm and cell lysis in long-term parasitism, although we did not observe melanization either in the host hemocoel or around the parasitoid surface. Spherulocytes displayed signs of degranulation with intensity proportional to the time of parasitism. Vermiform cells were the hemocytes least affected by the parasitism, showing only an increase in the number of peripheral vacuoles. Teratocytes were found in close relationship with the parasitoid larval cuticle as well as with the different hemocytes of the insect host, *D. saccharalis*, although we could not determine the functional meaning of such interactions. There was no cytochemical modification (acid phosphatase, trimetaphosphatase and phenoloxidase activities, and surface negative charges) in any of the cellular compartments of the different hemocyte types of the insect host *D. saccharalis* that could be related to the parasitism by the wasp *C. flavipes*. Our results led us to conclude that although there was no effective defense reaction of the host hemocytes against the parasitoid and that all the different hemocyte types showed specific ultrastructural modifications during parasitism, there is a hemocytic reaction against the invader, the parasitoid larvae.

Key words: *Diatraea saccharalis*; Hemocyte; *Cotesia flavipes*; Parasitoid; Ultrastructure; Cytochemistry; Parasitism