



Quantification of the Pine Processionary Caterpillar *Thaumetopoea pityocampa* (Notodontidae) Haemocytes

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Abstract: *Thaumetopoea pityocampa* is an important pine pest in the Mediterranean basin and central Europe and larvae are called pine processionary caterpillars. To understand the resistance mechanism for management, a study on the immune system and reactions of the larva in different stage was conducted. The aim of our work is to identify the hemocytes of the caterpillar during the larval stages L₂, L₃ and L₄, as well as the quantification of the different cells during each stage. After extraction of the hemolymph by centrifugation, the cells were placed in culture medium and then incubated. Microscopic observation has shown that prohemocytes population appear early in hemolymph, they differentiate into plasmatocytes and granulocytes during the advanced stages. The quantification process has shown that granulocytes are the most abundant cell population in the hemolymph of the insect larvae. To investigate the role of hemocytes in immune responses, cells of *T. pityocampa* were co-incubated with bacteria, entomopathogenic nematodes and synthetic beads. Both humoral and cellular encapsulation processes was observed early in larval stages, all hemocytes seem to be involved in the formation of nodules and capsules against bacteria and microbeads. The entomopathogenic nematodes (*Steinernema feltiae*) were not recognized and encapsulated, but their presence can strongly damages host hemocytes.

Keywords: *Thaumetopoea pityocampa*, Prohemocytes, Plasmatocytes, Granulocytes, Entomopathogenic, *Steinernema feltiae*, Encapsulation
