



**SESSION VI**

**INSECTS AND MICROORGANISMS**

**Revision on the effects of an entomopathogen bacteria *Bacillus thuringiensis* on the immune response of Red Palm Weevil (*Rhynchophorus ferrugineus*), is it a question of gender?**

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Since their discovery, bioinsecticides based on *Bacillus thuringiensis* (Bt) have demonstrated targeted insect control with minimal environmental impact. Understanding the biology of insect pests, as well as interactions with pathogens and immune systems, can help to enhance their effect within these interactions.

On the basis of previous laboratory data and a systematic literature review we analyzed the effects induced by the entomopathogen bacteria Bt, on red palm weevil (RPW), an highly invasive pest of palms that had a significant economic, environmental and social impact when introduced into Italy. The bacteria-induced effects on physiology, immune response and stress answers in the RPW. *Rhynchophorus ferrugineus* Olivier (Coleoptera: Curculionidae) were considered. Previously a Bt strain, commercialized against another family of Coleoptera, was found to be a potential pathogen of RPW. Data showed that Bt interacts negatively with the growth and the vitality of RPW moreover with hemocytes of *R. ferrugineus* whose numbers decreased drastically in the hemolymph both in total number and in type. In particular, we focused on the Bt stress-induced infections considering the genders and the instars. The interaction between Bt and RPW hemocytes was analyzed by evaluating the expression heat shock proteins (HSPs) particularly HSP70 in the supernatant of the hemocyte lysate obtained from larvae and adults. HSPs are rapidly synthesized in the cells after stress exposition including infection by pathogens. The western blot analysis, showed that the HSP70 expression was modulated in the time (3h, 6h, 12h, 19, 24h) in the response to Bt treatment, highlighting that Bt is a stress factor for the larvae but also for adults. The protein expression was increased approximately seven times after 3 hours from treatment and after 6 hours it returning to control value. Data show difference in how males and females invest in Bt infection answer. Our data on immunity support the theory that males choose investment in reproduction over investment in immunity. In fact, *B. thuringiensis*-induced mortality data show the effect that females mount a stronger immune response and they also suffer lower mortality.

**KEY WORDS:** Red Palm Weevil; Hemocytes, HSP70, immune response.

**POSTER**