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Poster Communication Abstract – PH.16

INDUCED IMMUNOSUPPRESSION AS A STRATEGY TO ENHANCE INSECT BIOCONTROL

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The identification of new bioinsecticides and of their appropriate delivery way is one of the approaches currently being pursued to reduce the use of chemical insecticides. Among these strategies, the use of natural antagonists as a source of virulence factors or of molecular technologies that mimic the negative effect of these latter on the host insects pave the way toward the development of new bio-inspired tools of pest suppression. The use of RNA interference (RNAi) to artificially down-regulate host genes negatively targeted by virulence factors of natural antagonists appears to be particularly promising. In fact, we have recently shown that the RNAi mediated silencing of a gene (Sl 102) controlling the cellular immune response (encapsulation and nodulation) in Spodoptera littoralis (Lepidoptera: Noctuidae) enhances the killing activity of the entomopathogen Bacillus thuringiensis. Here we explore two delivery strategies of dsRNAs targeting Sl 102 gene, based on sonicated heat-killed E. coli and transgenic tobacco plant expressing Sl 102 dsRNA. The experimental larvae showed marked immunosuppression associated with a significant transcriptional down-regulation of the target immune gene. The resulting immunosuppressed phenotype showed a very high mortality when exposed to sub-letal doses of Bt (Xentari). Therefore, the ingestion of dsRNA, delivered under realistic field conditions, has the potential to enhance the Bt insecticide activity on S. littoralis larvae. Moreover, the possible occurrence of a synergistic effect of a gene silencing strategy concurrently impairing two complementary arms of the cellular immune response (Sl 102 and gasmin genes) in S. littoralis was performed. From a theoretical point of view, the induction of a reduced immune competence in the target pest appears to be ecologically more sustainable as it can enhance the ecological services provided by natural antagonists.