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Abstract

Effects of Combined Administration of Entomopathogenic Bacteria to *Drosophila suzukii* Larvae †

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Abstract: Many invasive insect species that have moved from eastern areas, among them *Drosophila suzukii* Matsumura (Diptera: Drosophilidae), also named spotted wings drosophila (SWD), is becoming a serious threat to the cultivation and marketing of thin-skinned red fruits. The SWD, endemic to Southeast Asia, have been introduced in North America and Europe a decade ago. The control of the diffusion of SWD, is carried out with various methods, based on different strategies, but the use of pesticides is still extremely common. Possible alternatives to chemical pesticides are biological control methods based on bioinsecticides. Up to now, biological control has been performed mainly through the application of single bioinsecticides, but the major limitation is that they produce appreciable results only in quite long time, so it would be desirable to obtain a significant mortality in the shortest time of treatment; the use of targeted combinations of more bioinsecticides, could represent an improvement in the control techniques of *D. suzukii*.In this research we carried out a preliminary investigation on the effects of administration of *Bacillus thuringiensis* (Bt) with *Xenorhabdus nematophila* (Xn) isolated from *Steinernema carpocapsae*, or with Xn secretions, on *D. suzukii* early instars larvae. Firstly, we assayed the lethal effects of individual bioinsecticides administration, then we evaluated a possible increase in efficacy induced by their combination. Moreover, we have analyzed the morphology of the host gut to evaluate a possible damage caused by combination Bt-Xn after oral uptake. From the results obtained in the laboratory, it emerges that biological control techniques carried out by means of bioinsecticide combinations, can improve the action, therefore the effectiveness, of these methods, which could subsequently be tested and applied in the field.

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