World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:9, No:07, 2015

Sublethal Effect of Tebufenozide, an Ecdysteroid Agonist, on the Reproduction of German Cockroach (Blattodea: Blattellidae)

Authors : Samira Kilani-Morakchi, Amina Badi, Nadia Aribi

Abstract : German cockroach, Blattella germanica, is known to be an important pest due to its high reproductive potential and its ability to build up large infectious populations. The infestations were generally controlled by neurotoxic insecticides including organophosphates (OP), carbamate and pyrethroids. An alternative cockroach's control approach is the use insect growth regulators (IGRs). The relative fewer effects of these chemicals on non-target insects and animals, and their favourable environmental fate, make them attractive insecticides for inclusion in integrated pest management programmes. The juvenoids and chitin synthesis inhibitors are two classes of IGRs that have received the most attention for useful chemicals to manage German cockroaches while ecdysone agonists were mostly used to control Lepidopteran species. In the present study, the sublethal effects of the non-sreroidal ecdysone agonist tebufenozide were evaluated topically on adults of the B. germanica. The effects on reproduction were observed in adults females of cockroaches that survived exposure to LD25 (146 µg/g of insect) of tebufenozide. Dissection of treated females showed a clear reduction in both the number of oocytes per paired ovaries and the size of basal oocytes, as compared to controls. In addition, tebufenozide significantly reduced the mating success of pairs and altered the fertility as shown through the reduction of ootheca development and total absence of viable nymph. Tebufenozide disrupted the German cockroach reproduction by interfering with homeostasis of the insect hormones. In conclusion, the overall results suggested that tebufenozide can be used as a biorational insecticide for controlling cockroaches.

Keywords : B. germanica, ecdysteroid agonist, tebufenozide, reproduction
Conference Title : ICESE 2015 : International Conference on Environmental Science and Engineering
Conference Location : Paris, France
Conference Dates : July 20-21, 2015