

(181)

Synergism of Pheromone and Host-Plant Volatile Blends in the Attraction of *Leucinodes orbonalis* Guenee Males

Nusra M.S.F.^{1,2*}, Udukala D.N.¹, Paranagama P.A.², Amarasinghe L.D.³

¹College of Chemical Sciences, Institute of Chemistry Ceylon, Rajagiriya, Sri Lanka

²Department of Chemistry, University of Kelaniya, Kelaniya, Sri Lanka

³Department of Zoology and Environmental Management, University of Kelaniya, Kelaniya, Sri Lanka

*fathimanushra15@gmail.com

Abstract

Brinjal Fruit and shoot borer, *Leucinodes orbonalis* Guenee is considered to be the key insect pest that attacks brinjal plant. Insects such as *L. orbonalis*, which has extremely diverse adaptations such as hidden and protected lifestyles in the adult stage and concealed habits in the larval stage cannot be easily controlled with cover sprays of insecticides. Moreover, Pheromone-host plant odour interactions might also play a pivotal role in the evolution of mating communication and host-finding behaviour. The objective of the present work was to evaluate whether host plant volatiles synergise male *L. orbonalis* attraction to sex pheromone. Steam distillation method and super Q entrapment technique were used for the extraction of volatiles from brinjal plant leaves, shoots and fruits and sex pheromone from the insects respectively. Preliminary laboratory studies have shown that the male insects attracted to the host plant volatiles. Bioassay using Y-shaped olfactometer with different doses of the combination of sex pheromone and host plant volatiles were used to test the synergism. Two Whatman no. 1 filter papers (2.5 cm×2.5 cm) were used, one treated with a known amount of sex pheromone+host plant volatile and the other treated with equal amount of sex pheromone. In each experiment, the dose of sex pheromone was not changed and peak dose identified from the bioassay conducted previously was used. The dose of each host plant volatile was prepared by decreasing and increasing from the peak dose identified from the previous bioassays. Six doses of sex pheromone+fruit volatiles (25 µg+(8-48 mg)), sex pheromone+leaf volatile (25 µg+(12-42 mg)) and sex pheromone+shoot volatile (25 µg+(8-48 mg)) were tested using 15 male insects separately and each dose was replicated 5 times. The number of insects that moved into the sex pheromone+host plant volatile treated and sex pheromone treated arms within 5 minutes were recorded. This assay was carried out between 20.00–24.00 h and the test insects were not used repeatedly. Results revealed that all three types of volatiles from the host plant increased the attraction of male insects to the sex pheromone. In addition, the volatiles from brinjal fruits significantly increased the male attraction to the pheromone blend (p<0.05). The observed enhanced male attraction to the mixtures of pheromone and plant volatiles will facilitate the development of effective pest control programs for *L. orbonalis*.

Keywords: Sex pheromone, Host plant volatiles, Synergism, *Leucinodes orbonalis*, Pest management