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Garlic (*Allium sativum* L.) Oil: A Potential Green Pesticide for Storage Insect Pest Management

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Abstract

Due to the ever increasing problems with pesticides, more attention is given for the potential use of green pesticides of plant origin in storage insect pest management systems. The present study, therefore, was carried out with the view of evaluating the growth regulatory potential of oil extracted from garlic (*Allium sativum*) cloves, against a major storage pest, *Corcyra cephalonica* in the search for a more effective, economical and eco-friendly alternative for synthetic pesticides. Oviposition deterrence, egg hatch inhibition and adult emergence were used as indices of growth regulation. In all bioassays, five different concentrations of garlic oil dissolved in n-hexane (0.5, 1.0, 2.0, 3.0 and 4.0% v/v) were tested under laboratory conditions (29±20° C and 84±2% RH). In two types of bioassays, a single-choice apparatus which contained garlic oil treated surface and a dual-choice apparatus with both treated and untreated surfaces on which the number of eggs laid by mated female moths after 24 hours was taken as a measure of oviposition deterrence. Contact effects on egg hatch inhibition were evaluated by recording the number of eggs hatched after seven days, by exposing them to different oil treatments for nine hours. Adult emergence was determined by the number emerged from 15-17 d old larvae fed on oil-treated food medium. The oviposition deterrent effect significantly increased with the increase of oil concentration in both single-choice and dual-choice bioassays. The results revealed that at the highest concentration (4.0% v/v), the lowest number of eggs were laid thus indicating the highest oviposition deterrence (107.7±4.9) when compared with that of the control (201.5±3.9). Similarly, observation of the egg hatch inhibition showed that the highest oil concentration was the most effective, eliciting 63% reduction when compared with the control (0.00%). Furthermore, in contrast to the control where 100% adult emergence was observed, significantly very low emergence was recorded at the highest concentration (23.00%), clearly indicating that garlic oil evokes potent growth retardant effect on the moths. The overall findings of the study thus strengthen the possibility of using garlic oil as a green pesticide to suppress *C. cephalonica* populations successfully.

Keywords: *Allium sativum*, Garlic oil, *Corcyra cephalonica*, Growth regulatory effects