Zagazig University
Faculty of Science
Botany and Microbiology Department

STUDY THE PESTICIDAL ACTIVITY OF THE BIOFILM PRODUCER GRAM POSITIVE *BACILLI* AGAINST COWPEA WEEVIL.

A Thesis

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Shahera Moabed Mohamed El-Sayed

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Botany and Microbiology Department
Faculty of Science
Zagazig University

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ABSTRACT

The present study aimed to determine and developed a new bioinsecticidal compounds which can be used as alternative to synthetic insecticides. It was considered more safety to human and the environment, in addition to it was more efficient and less toxic. So a laboratory study was investigated the effect of different *Bacillus* biofilms and their extracellular matrix (ECM) on the adult's mortality and reproduction of the cowpea weevil, *Callosobruchus maculatus* (F.) (Coleoptera: Bruchidae). In the investigated study among thirty Gram positive bacilli bacterial isolates, only four isolates recorded the highest abilities to biofilm formation also showed the heights efficacy against the cowpea weevil, at different concentrations 5, 10 and 20%. Results determined that the percentage of mortality of *C. maculatus* adults ranged between 13.36 and 63.43%, and it significantly increased by increasing the concentration of ECMs. Whereas the latent larval mortality did not exceed 31.42%, which was recorded at the highest concentration (20%) with ECM of the isolate no. 13, moreover, all the tested concentrations recorded a significant reduction in egg hatchability and ,female fecundity but the highest activity recorded by ECM of isolate no. 13 compared to other tested isolates. So, the most potent biofilm-producing isolate no. 13 was identified by using 16S rDNA gene sequence as *Bacillus flexus* S13, and submitted in GenBank under accession number MK292147. Also, this study throw light on the chemical composition of the extracellular matrix (ECM) of *Bacillus flexus* S13; biofilm' and its potential activity as insect biocontrol agents, in addition to investigated the insecticidal efficacy of ECM of *Bacillus flexus;* S13 against adults of *Callosobruchus maculatus*. The toxicity results revealed LC_{50} values as (22.6455 g/100ml and 10.8524 g/100ml) after 24 and 48 hr. respectively. Also, the Biochemical assays revealed a significant

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