DETECTING OF RESISTANCE IN CERTAIN FIELD STRAINS OF PINK BOLLWORM TO SOME INSECTICIDES AND THE ROLES OF BIOCHEMICAL AND MOLECULAR FACTORS

By

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ABSTRACT

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The efficiency of certain conventional insecticides (Chlorpyrifos & Lambda-cyhalothrin) and nanoparticle compounds (Silica, Aluminum and Chitosan) against the newly hatched as well as the 4th larvae of the pink bollworm laboratory strain, was evaluated. Also, the study involved monitoring resistance (%) in field populations collected from Fayoum Qalubia, Behira and Kafr-Elsheikh Governorates to the conventional and nanoparticle compounds by using the discriminating concentrate technique for development of selected resistance strains against conventional insecticides. The relationship between resistance (%) and some hydrolyzing and glutathione-S- transferases in the 4th instar larvae collected from different Governorates. The genetic diversity of pink bollworm field populations collected from different Egyptian Governorate, and the insecticide – resistance gene expression quantitation using real-time PCR were evaluated. Lambda Cyhalothrin was the highest toxic compound against the 1st and 4th instar larvae. The nanoparticle formulations of natural inorganic ore compounds were proved to be highly toxic to both instar larvae of *Pectinophora gossypiella* lab – strain, than each of traditional natural ore products. The nano chitosan was more efficient than traditional form. The resistance (%) was varied from Governorate to anther for the same tested compound by using discriminating concentration (LC_{99}) of certain compounds. The hydrolytic enzymes ie, phosphatase, non-specific β estrases as well as glutathione s-transferases were highly activate in investigated field populations strains of *Pectinophora gossypiella* than the laboratory, Moreover variations in the levels of enzyme activity from one Governorate to another for the

same enzyme was recorded. There were highly correlations between monitoring resistance (%) in the field populations, enzymatic assays activity as well as fingerprints of the RAPD-PCR analysis of the extracted DNA samples using four primers (B12, P13, C16 and C 18). The relative gene expression values among the two target genes, showed a higher expression level for *BtR* than *Cad1*

Key words: *Pectinophora gossypiella*, Discriminating concentration, Resistance, Tolerance, Biochemical aspects, (RAPD) PCR and Gene expression.

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