Cairo University
Faculty of Science

Biochemical and Molecular Biological Studies to Resistance Mechanism in Whitefly *Bemisia tabaci* (Gennadius)

Presented by

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A Thesis Submitted to Faculty of Science

In Partial Fulfillment of the

Requirements for

Ph.D. degree in

Biochemistry

Chemistry Department

Faculty of Science

CairoUniversity

2021

Abstract

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Title of the thesis: Biochemical and molecular biological studies to resistance mechanism in whitefly *Bemisia tabaci* (Gennadius).

Degree: Ph.D. in Biochemistry

Because of excessive application of different classes of insecticides for controlling whitefly *Bemisia tabaci* (Gennadius) [Hemiptera: Aleyrodidae], the development of resistance in laboratory strain of *B.tabaci* against organophosphours insecticide (primiphos- methyl) were studied for ten generations under laboratory conditions. The resistance ratio (RR) was 22.23 fold in G_{10} compared with susceptible strain (SS). Also, the development of resistance in seven field populations were collected from Egypt governorates, during season 2018 against different classes of insecticides (pyrethroids, organophosphorus, carbamates and neonicotinoids) were studied. The activity levels of detoxifying enzymes [acetylcholinesterase (AChE), glutathione -S- transferase (GST) and Carboxylesterase (CarE)] were determined in resistance strain and field populations of different governorates, compared to the control. Results showed significant changes in levels of enzymes activity. Applying molecular biological technique to identification the resistance mechanism by studying the role of sodium channel (Sc) and acetylcholinesterase gene (*Ace* gene) in field populations and resistance strain, the sequences were aligned using Clustal W program, the results showed changes at the level of the nucleotide bases, it was significant, that led to a change in the sequence of the resulting amino acids.

Keywords: *Bemisia tabaci*, insecticides resistance, detoxifying enzymes, sodium channel and acetylcholinesterase gene.

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