STUDIES ON THE RESISTANCE OF THE INSECT *Aphis gossypii* (Glover) TO SEVERAL INSECTICIDES WHICH ARE RELATED TO DIFFERENT CHEMICAL GROUPS

By

Rasha Ibrahim Abdelmotaleb
B.Sc. Agric. Sci. (Pesticides), Fac. Agric., Cairo Univ., 1999

THESIS
Submitted in Partial Fulfillment of the Requirements for the Degree of

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In

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APPROVAL SHEET

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Title of Thesis: Studies on the resistance of the insect *Aphis gossypii* (Glover) to several insecticides which are related to different chemical groups.

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ABSTRACT

The resistance to certain chemical insecticides belonging to different groups was investigated in 4 field strains of the cotton aphid, *Aphis gossyp*ii (Glover) (Homopetra: Aphididae) collected from Behiera, Dakahlia, Menoufia and Beni-Suef Governorates of Egypt during 2008-2010 cotton growing seasons. Slide-dipping method was followed. Results indicated that the organophosphates profenofos and chlorpyrifos were the most effective insecticides and recorded the least resistance levels and the highest toxic action when compared with the other tested organophosphorus compounds. A similar result was obtained in the case of the carbamate carbosulfan, the pyrethroid deltamethrin and the neonicotinoids imidacloprid and acetamiprid. The rest of tested insecticides showed moderate to high levels of resistance combined with low toxicities. chlorpyrifos methyl, chlorpyrifos ethyl, carbosulfan, deltamethrin, imidacloprid and acetamiprid may be recommended for the integrated management of cotton aphid.

Enzyme activities of esterases and acetylcholinesterase (AChE) were also investigated in 6 field strains of cotton aphid. Field strains exhibited higher levels of α - and β - esterase activities and lower AChE activity than those achieved for the susceptible strain. Esterases seem to play an important role in insecticide resistance to the different groups. AChE may also play a role in the resistance to organophosphates and carbamates. A positive correlation between esterase activity and insecticide resistance and a negative correlation between AChE and organophosphate and carbamate resistance was recognized but all correlations were statistically insignificant. In conclusion, esterase and AChE activities seem to be unrelated to insecticide resistance.

Key words: Cotton aphid, *Aphis gossypii*, Resistance, Cross resistance, Total protein, α- and β-esterase and acetylcholinesterase (AChE).

DEDICATION

I dedicate this thesis to my late Mother, ***Mrs. Fardous Abdel Aziz****. Who taught me how to persevere and prepare myself to face challenges with faith and humility. She was a constant source of inspiration to my life. Although she is not here to give me strength and support I always feel her presence, which urges me to achieve my goals in life.*

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