بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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MONA MAGHRABY

TOXICOLOGICAL AND BIOCHEMICAL STUDIES ON THE TWO-SPOTTED SPIDER MITE *Tetranychus urticae* KOCH (ACARI: TETRANYCHIDAE) ON CUCUMBER CROP IN GREEN HOUSES

By

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B.Sc. Agric. Sci. (Plant Protection), Fac. Agric., Cairo Univ., 2005
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THESIS

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APPROVAL SHEET

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Title of Thesis: Toxicological and Biochemical Studies on the Two-spotted Spider Mite *Tetranychus urticae* Koch (Acari:Tetranychidae) on Cucumber Crop in Green Houses

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ABSTRACT

The cucumber crop is considered one of the most important crop. Researchers have sought to find different ways to control of *Tetranychus urticae* , which is considered the most harmful pest to the cucumber crop, especially in greenhouses.

This work aims to: Find natural alternatives that are safe for humans and the environment to control this pest, so we selected four plant extracts (Henna, Wild mint, Mint and Basil) and orange peel oil to study their effect on the *T. urticae* , and three acaricides were selected for comparison abamectin,bifenazate and cyflumetofen. The results were that after 24 hours, orange peel oil and Henna extract achieved the highest mortality of 74% for both treatments, and the lowest mortality in the Mint treatment was 28%. After 48 hours, orange peel oil achieved a highest percentage 88%, followed by Henna treatment acheave 78% mortality and the lowest treatment was Basil 54%. Experiments were carried out on cucumbers (Hisham's variety) during the 2018 and 2019 seasons. The results showed that in 2018, the treatments of cyflumetofen and Bifenazate achieved the lowest spider counts, which were 1.05 and 1.6 mite / square inch, respectively. and finally, Mint was treated with a count of 14.55 mite/ square inch. In the 2019 season, cyflumetofen and Bifenazate topped the reduction in the census, reaching 1.22 and 1.55 mite/ square inch, respectively, and in the last two treatments, Mint and Abamectin, which reached to 9.25 and 11.9 mite/ square inch, respectively. The census of the pesticides Bifenazate and Cyflumetofen was reduced during the two seasons 2018-2019, where the percentage of reduction in 2018 was 94.96 and 96.6%, and in 2019 it was 94.11 and 96.7%, respectively. In a laboratory experiment to test the effect of oil and extracts on the predator *Phytoseiulus persimilis*, it was found that after 72 hours, the results showed that 72, 70 and 68% are the mortality achieved in orange peel oil, Henna and Basil, respectively, and the Wild mint treatment the lowest mortality , which was 36%. We also conducted an experiment to find the repellent effect of oil and plant extracts on the spider. It was found that the oil and extracts have a significant repellent effect, except for the Henna extract. From the above results, we chose the best three treatments, which are orange peel oil, Henna and Wild mint extract. An analysis of the chemical compounds present in orange peel oil, Henna and Wild mint extract was done by GC-MS, and it was found that the main compounds in orange peel oil are D-lemonen with a percentage of 92.42%, linalool at a rate of (2.13%) and β-myrcene at a rate of (1.30%), while it was The main compounds in Wild mint extract are Pulegone (38.61%), Menthol (24.93%), Trans-p-Menthon-3-one (14.32%), and Cis-p-Menthon-3-one (7.93%). Henna contains many compounds, the most important of which are 2-Hydroxy-1, 4-napthoquinone (Lawsone) (15.26%), Turanose (13.65%), Methyl, α-D-glucofuranoside (12.08%) and Benzylidenecamphor (12.08%) (9.44%) and 2,3-napthoquinone (6.53%) and it was found that these components of orange peel oil and both extracts are responsible for causing changes in the enzymatic activity of the spider. In order to know the nature of the effect of the previous components on the spider, we conducted physiological studies to estimate some related enzymes of the pest that was treated with oil and extracts.The activity of enzymes including Glutathione-S-transferase (GST), Acetylcholinestrerase (AchE), Digestive enzymes (Lipase and Protease) and carbohydrate hydrolyzing enzymes (Invertase, Trehalase and Amylase).

Key words: *Tetranychus urticae*, Biopesticides, Alternative botanical , Enzymatic activity , *Phytoseiulus persimilis*, Repellency, Chemical compounds.

DEDICATION

Firstly, I dedicate this work to ALLAH and for serving my religion. Secondly, I wish to express my infinite thanks to my parents, my brothers, my sisters, and my wife for their help in finishing this work. Finally, to my sons.

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