شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

HANAA ALY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

HANAA ALY

STUDIES ON RESISTANCE OF CERTAIN FIELD STRAINS OF THE MEDITERRANEAN FRUIT FLY, *CERATITIS CAPITATA* (WIED.) (DIPTERA: TEPHRITIDAE) AGAINST SOME ENVIRONMENTALLY-SAFE BIOPESTICIDES AND CONTEMPORARY PESTICIDES

Submitted By

Rasha Seleem Abou El Fotouh Abdel-Aziz

B.Sc. of Agricultural Sciences, Higher Institute of Agricultural Cooperation, 2002
Diploma in Environmental Sciences, Institute of Environmental Studies & Research, Ain Shams University, 2009
M. Sc. in Environmental Sciences, Institute of Environmental Studies & Research, Ain Shams University, 2015

A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Doctor of Philosophy Degree
In
Environmental Sciences

Department of Environmental Agricultural Sciences
Institute of Environmental Studies and Research
Ain Shams University

2021

APPROVAL SHEET

STUDIES ON RESISTANCE OF CERTAIN FIELD STRAINS OF THE MEDITERRANEAN FRUIT FLY, *CERATITIS CAPITATA* (WIED.) (DIPTERA: TEPHRITIDAE) AGAINST SOME ENVIRONMENTALLY-SAFE BIOPESTICIDES AND CONTEMPORARY PESTICIDES

Submitted By

Rasha Seleem Abou El Fotouh Abdel-Aziz

B.Sc. of Agricultural Sciences, Higher Institute of Agricultural Cooperation, 2002
Diploma in Environmental Sciences, Institute of Environmental Studies & Research, Ain Shams University, 2009
M. Sc. in Environmental Sciences, Institute of Environmental Studies & Research, Ain Shams University, 2015

A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Doctor of Philosophy Degree
In
Environmental Sciences
Department of Environmental Agricultural Sciences

This thesis was discussed and approved by:

Name — Signature

1-Prof. Dr. Sayed Mohamed Abdel Latif Dahroug
Emeritus Prof. of Pesticides – Plant Protection Department
Faculty of Agriculture
Ain Shams University

2-Prof. Dr. Sahar Mohamed Abdel Wahab
Prof. of Pomology
Faculty of Agriculture
Cairo University

3-Prof. Dr. Nazmi Abdel-Hamid Abdel-Ghany
Emeritus Prof. of Pomology – Horticulture Department
Faculty of Agriculture
Former Vice-President of Ain Shams University

4-Prof. Dr. Kadry Weshahy Mahmoud
Emeritus Prof. of Pesticides Chemistry &Toxicology
Plant Protection Department - Faculty of Agriculture
Ain Shams University

2021

STUDIES ON RESISTANCE OF CERTAIN FIELD STRAINS OF THE MEDITERRANEAN FRUIT FLY, *CERATITIS CAPITATA* (WIED.) (DIPTERA: TEPHRITIDAE) AGAINST SOME ENVIRONMENTALLY-SAFE BIOPESTICIDES AND CONTEMPORARY PESTICIDES

Submitted By

Rasha Seleem Abou El Fotouh Abdel-Aziz

B.Sc. of Agricultural Sciences, Higher Institute of Agricultural Cooperation, 2002
Diploma in Environmental Sciences, Institute of Environmental Studies & Research, Ain Shams University, 2009
M. Sc. in Environmental Sciences, Institute of Environmental Studies & Research, Ain Shams University, 2015

A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Doctor of Philosophy Degree
In
Environmental Sciences
Department of Environmental Agricultural Sciences

Under the Supervision of:

1-Prof. Dr. Kadry Weshahy Mahmoud

Emeritus Prof. of Pesticides Chemistry &Toxicology Plant Protection Department - Faculty of Agriculture Ain Shams University

2-Prof. Dr. Nazmi Abdel-Hamid Abdel-Ghany

Emeritus Prof. of Pomology – Horticulture Department
Faculty of Agriculture - Former Vice-President of Ain Shams University

3-Prof. Dr. Ahmed Mahmoud Zaki Mosallam

Emeritus Research Prof. Plant Protection Research Institute
Agriculture Research Center

2021

ACKNOWLEDGEMENT

First of all, I do thank **Allah** for the gifts he has given me.

Sincere thanks are due to **Prof. Dr. Kadry Weshahy Mahmoud** Professor Emiretus of Pesticides chemistry and Toxicology, Faculty of Agriculture, Ain Shams University for giving me the honor to do this work under his supervision and I would like to express my deepest thanks and appreciation for his valuable scientific advice, guidance and criticizing the manuscript.

Deepest thanks and appreciation are extended to **Prof. Dr. Nazmi Abd El-Hamid** Vice-President of Ain Shams University, Professor of Pomology, Faculty of Agriculture, Ain Shams University for his guidance, continuous support and assistance during the phases of study as well as her valuable scientific advice and criticizing the manuscript.

There are no sufficient words to thank **Prof. Dr. Ahmed Mahmoud Zaki Mosallam** Research Professor Emiritus, Horticultural Insects Research Department, Plant Protection Research Institute, Agricultural Research Center, Ministry of Agriculture and Land Reclaimation for his keen revision of this manuscript, non-ending support and precious time. Also, he provided helpful information and he kindly dedicated to carry out this work.

There are no sufficient words to thank **Dr. Faten Attwa Akl** Associate Research Professor in Horticultural Insects Department, Plant Protection Research Institute, Agricultural Research Center,

Ministry of Agriculture and Land Reclaimation for his non-ending support and precious time. Also, she provided helpful information and he kindly dedicated to carry out this work.

Lastly, thanks are also due to my family specially **my Parents (Father and Mother), my Brothers and Sisters** and the entire members, colleagues **(Mai Kamal Daif and Taher Mahmoud Amara)** and technicians at both Departments of Horticulture Insects, Plant Protection Research Institute, Agricultural Research Center and Department of Agricultural Science, Institute of Environmental Studies & Research, Ain Shams University for their sincere cooperation to carry out this work.

ABSTRACT

In this work toxicity and development of resistance as well as biochemical effects of certain pesticides {Spinosad (Conserve 0.024% CB), Spinosad (Tracer 24 % SC), Spintoram (Radiant 12% SC), Malathion (Malatox 57% EC), Lambda-cyhalothrin (Karilot gold 5% EC) and Dimethoate (Dimetox 40% EC)} to both males and females of Mediterranean Fruit fly, *Ceratitis capitata* (Wied.) collected from three governorates (Qalubia, Sharkia and Behira) were studied. Karilot gold 5% EC was the most potent for males and females of *C. capitata* according to LC_{20}, LC_{50}, LC_{90} and LC_{99} values, but Conserve 0.024% CB was the lowest toxic pesticide. Dimetox 40% EC was the most effective compound showing the lowest values of % resistance for males of *C. capitata* of the three tested strains. Males of the Mediterranean fruit fly of Qaluobia strain were completely resistance to Tracer 24% SC and Karilot gold 5% EC 100%. Females of *C. capitata* of Qaluobia colony were completely resistant to Tracer 24 % SC, Radiant 12% SC, Malatox 57% EC and Karilot gold 5% EC recording 100% resistance for each. The same individuals showed 79.79 and 49.49% resistance to Conserve 0.024% CB and Dimetox 40% EC, respectively. Males and females of the field strains showed remarked higher levels of the biochemical aspects than in the laboratory strain. The flies collected from (Qaluobia, Behira and Sharkia) governorates showed the highest levels of the acid and alkaline phosphatase, acetylcholine esterase and total protein compared to laboratory strain. There were positive correlation between resistance levels in different field strains and the levels of the biochemical aspects in these strains.

Keywords:

- Mediterranean fruit fly, *Ceratitis capitata*, Pesticides, Biopesticides, Resistance, Discriminating, Biochemical, Spinosad, Spintoram, Malathion, Lambda-cyhalothrin, Dimethoate.

CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES