EFFICIENCY OF CERTAIN PLANT EXTRACTS ON *Aphis craccivora* Koch. AND ITS PREDATOR *Chrysoperla carnea* (Steph.) IN SOUTHERN VALLEY OF EGYPT.

By

Hamada Ahmed Haddad
B.Sc. Agric. Sci.(Plant Protection). Asyut Univ., 2001

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

MASTER OF SCIENCE

In

Agricultural Sciences
(Economic Entomology)

Department of Economic Entomology
Faculty of Agriculture
Cairo University
EGYPT
2012

SUPERVISION SHEET

EFFICIENCY OF CERTAIN PLANT EXTRACTS ON *Aphis craccivora* Koch. AND ITS PREDATOR *Chrysoperla carnea* (Steph.) IN SOUTHERN VALLEY OF EGYPT.

M. Sc. Thesis
In
Agric. Sci. (Economic Entomology)

By

Hamada Ahmed Haddad
B.Sc. Agric. Sci.(Plant Protection), Fac. Agric., Asyut Univ., 2001

SUPERVISION COMMITTEE

Dr. SAYED A. EL ARNAOUTY
Prof. of Economic Entomology, Fac. Agric., Cairo University

Dr. ESAM EL DEN A. EWEIS
Prof. of Pesticides, Fac. Agric., Cairo University

APPROVAL SHEET

EFFICIENCY OF CERTAIN PLANT EXTRACTS ON *Aphis craccivora* Koch. AND ITS PREDATOR *Chrysoperla carnea* (Steph.) IN SOUTHERN VALLEY OF EGYPT.

M. Sc. Thesis
In
Agric. Sc. (Economic Entomology)

By

Hamada Ahmed Haddad
B.Sc. Agric. Sci.(Plant Protection) Fac. Agric., Asyut Univ., 2001

Approval Committee

Dr. AHMED H. EL HENEIDY ……...

Emeritus Head Researcher of Biological Control, PPRI, ARC, Giza

Dr. AMAL I. AFEFY ……...……
Prof. of Economic Entomology, Faculty of Agric., Cairo University

Dr. SAYED A. EL ARNAOUTY …….
Prof. of Economic Entomology, Faculty of Agric., Cairo University

Dr. ESAM A. EWEIS .....
Prof. of Pesticides, Faculty of Agric., Cairo University

Date: / / 2012

DEDICATION

I dedicate this work
To the dearest person in my life,
My late mother.

ACKNOWLEDGEMENT

First of all ultimate thanks to ALLAH . The author would like to express his deepest thanks and gratitude to Dr. Sayed Ashraf El Arnaouty, Professor of Biological Control ,Department of Economic Entomology and Pesticides,Faculty of Agriculture , Cairo University ,Giza, for his Continuous guidance , supervision ,valuable suggestions and revision of thesis manuscript.

Greatest thanks to Dr. Esam A. Eweis Professor of Insecticides, Department of Entomology and Pesticides , Faculty of Agriculture, Cairo University ,Giza , for his Continuous guidance ,supervision ,valuable suggestions and revision of thesis manuscript

Special thanks to Dr. Suzan M. Kamel, Executive Director, Eng. Sahar O. Ibrahim and all my colleagues in the World Food Program (WFP), project 3214/3 and in the Center of Bio-Organic Agricultural Services (CBAS), Aswan, for their kind support, encouragement and assistance during the phases of the study.

Thanks also due to all the staff and colleagues at the Dept. of Economic Entomology and Pesticides, Faculty of Agriculture, Ciaro University, Giza, for their assistance during the whole course of the study.

Thanks to all members of my family and my parents for their kind help and patience throughout the whole period of this work.

Name of Candidate: Hamada Ahmed Haddad **Degree:** M. Sc.

Title of Thesis: Efficiency of Central Plant Extracts on *Aphis craccivora* Koch. and its Predator *Chrysoperla carnea* (Steph.) in Southern Valley of Egypt.

Supervisors: Dr. SAYED A. EL ARNAOUTY
Dr. ESAM EL DEN A. EWEIS
Department: Economic Entomology and Pesticides
Branch: Economic Entomology **Approval: 29 / 2/ 2012**

ABSTRACT

Four different plants species; *Hyoscyamus muticus*, *Citrullus colocynthis*,Schrad, *Crozophora tinctoria* and *Ambrosia maritime* were chosen in order to investigate the toxticty of their leaf, stem, flower, fruit or root extracts (using ethanol, acetone, chloroform and hexane) to nymphs and adults of *Aphis craccivora* and its predator *Chrysoperla carnea*. The plant extracts were treated using direct spraying, thin layer film and feeding on infested insects. The results showed that, high concentration of *H. muticus* hexane stem extract and ethanol leaf extract using thin layer film and *H. muticus* ethanol leaf extract using direct spraying gave a high mortality rates after 24 and 48 h. For the *C. colocynthis*, stem extracts, high concentration in ethanol and hexane resulted also in high mortality rates of the pest after 24 and 48 h. For the *C. tinctoria* (leaves and flowers mixed), extracted by acetone using direct spraying gave a high mortality rates after 24 and 48 h. *A. maritime* flower and leaf extracts in chloroform and acetone, respectively, using direct spraying gave low mortality rates after 24 and 48 h. Moreover, these high plant extract concentrations had no detrimental effect to *Ch. carnea*, can be considered as safety adjuvants of prospect of integrated pest control.

Key words: plant extract, *Aphis craccivora* Koch. *Chrysoperla carnea* (Steph.)

LIST OF FIGURES

No. **Title** **Page**

LIST OF TABLES

No **Title** **Page**

CONTENTS

INTRODUCTION

The area of Nasser Lake has special characteristics as it is a largest artificial fresh water reservoir, in Upper Egypt desert. It is 500 km long (from which 350 km in Egypt) for 5 to 35 km large, with a total surface of 6216 km2. This fresh water resource is mainly used in irrigation projects of the Toshka depression.

The water quality has been threatened by the massive use of agricultural pesticides and fertilizers. However, today there is a shift towards safer farming methods, implementing bio-control strategies. Thus, in Aswan, a center for mass production of natural enemies against crop pests and for the production of bio-fertilizers, is working to reach that goal (WFP Nasser lake project report, 2004).

El-Gougary (1998) showed that ether and petroleum-ether extracts of *Atriplex halimus* displayed a strong aphicidal activity against *Aphis gossypii* with such LC_{50} values as 0.059% and 0.085%, respectively.

The efficacy of six plant extracts and 2 insecticides was evaluated for the control of *Aphis gossypii* and *Amrasca devastans* on okra. Aqueous leaf extracts of tobacco (2%), *Ipomoea carnea* (5%) and a seed extract of *Azadirachta indica* and *Pongamia glabra* [*P. pinnata*] (both at 5%) gave a similar level of control compared to endosulfan (0.06%) and monocrotophos (0.05%) (Kulat *et al.*, 1997).

Extracts from 5 medicinal plants (*Basella alba, Glycyrrhiza glabra, Phyllanthus fraternus, Plumbago rosea [Plumbago indica]* and *Thespesia populnea*) were tested for their effects on *A. gossypii*, the

vector of pumpkin mosaic virus [squash mosaic comovirus] in pumpkin (*Cucurbita moschata*) (Louis and Balakrishnan, 1996).

Extracts prepared from plants have a variety of properties including insecticidal, such as toxicity to nematodes, mites and other agricultural pests. They also have antifungal, antiviral and antibacterial properties against pathogens. Many farmers in developing countries do not have the resources to purchase and apply expensive synthetic pesticides. On the other hand, biological control, in the form of locally abundant natural enemies, together with the preparation of plant extracts from trees growing naturally in the surrounding area, have little to no cost, and are therefore uniquely suited to low-input integrated pest management systems. The research has to take into account the side effect of those extracts vital to the enemy, especially predators could be used to integrate with extracts in the fight against pests (EL Arnaouty *et al.*, 2003).

The aim of present study is to use certain plant extracts from the desert south of the valley and to measure their impact on aphids and natural enemies used in the programs of bio-control.

Scope of the study

The present study is trial to integrate the use of plant extracts and *Ch. carnea* to control *Aphis craccivora* in the Southern Valley of egypt.