

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

By

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

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DEDICATION

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

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ABSTRACT

Four different plants species; *Hyoscyamus muticus*, *Citrullus colocynthis*, Schrad, *Crozophora tinctoria* and *Ambrosia maritime* were chosen in order to investigate the toxicity 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
1.	Effect of <i>Citrullus colocynthis</i> , Schrad (hexane) leaf extract used directly at different concentrations on the mortality rate of fourth nymphal instar of <i>A. craccivora</i>	40
2.	Effect of <i>Citrullus colocynthis</i> , Schrad (hexane) stem extract used directly at different concentrations on the mortality rate of fourth nymphal instar of <i>A. craccivora</i>	40
3.	Effect of <i>Citrullus colocynthis</i> , Schrad (ethanol) stem extract used directly at different concentrations on the mortality rate of fourth nymphal instar of <i>A. craccivora</i>	41
4.	Effect of <i>Citrullus colocynthis</i> , Schrad (hexane) fruit extracts used directly at different concentrations on the mortality rate of fourth nymphal instar of <i>A. craccivora</i>	42
5.	Effect of <i>Hyoscyamus muticus</i> (ethanol) leaf extracts used directly at different concentrations on the mortality rate of fourth nymphal instar of <i>A. craccivora</i>	45
6.	Effect of <i>Hyoscyamus muticus</i> (hexane) stem extracts used directly at different concentrations on the mortality rate of fourth nymphal instar of <i>A. craccivora</i>	45
7.	Effect of <i>Hyoscyamus muticus</i> (ethanol) root extracts used directly at different concentrations on the mortality rate of fourth nymphal instar of <i>A. craccivora</i>	46
8.	Effect of <i>Hyoscyamus muticus</i> (ethanol) flower extracts used directly at different concentrations on the mortality rate of fourth nymphal instar of <i>A. craccivora</i>	46
9.	Effect of <i>Ambrosia maritime</i> .L (acetone) leaf extracts used directly at different concentrations on the mortality rate of fourth nymphal instar of <i>A. craccivora</i>	48
10.	Effect of <i>Ambrosia maritime</i> ,L chloroform flower extracts used directly at different concentrations on the mortality rate of fourth nymphal instar of <i>A. craccivora</i>	49

11. Effect of <i>Crozophora tinctoria</i> (acetone) leaf and flower extracts directly used at different concentrations on the mortality rate of fourth nymphal instar of <i>A. craccivora</i>	51
12. Effect of <i>Hyoscyamus muticus</i> (ethanol) leaf extracts at different concentrations on the mortality rate of fourth nymphal instar of <i>A.</i> <i>craccivora</i> using the thin layer film technique.....	53
13. Effect of <i>Hyoscyamus muticus</i> (hexane) stem extracts at different concentrations on the mortality rate of fourth nymphal instar of <i>A.</i> <i>craccivora</i> using the thin layer film technique.....	54
14. Effect of <i>Hyoscyamus muticus</i> (acetone) flower extracts at different concentrations on the mortality rate of fourth nymphal instar of <i>A.</i> <i>craccivora</i> using the thin layer film technique.....	54
15. Effect of <i>Hyoscyamus muticus</i> (acetone) leaf extracts at different concentrations on fourth nymphal instar <i>A. craccivora</i> mortality rate by feeding technique.....	58
16. Effect of <i>Hyoscyamus muticus</i> (hexane) leaf extracts at different concentrations on fourth nymphal instar <i>A. craccivora</i> mortality rate by feeding technique.....	58
17. Effect of <i>Hyoscyamus muticus</i> (acetone) flower extracts at different concentrations on fourth nymphal instar <i>A. craccivora</i> mortality rate by feeding technique	59
18. Effect of <i>Hyoscyamus muticus</i> (hexane) flower extracts at different concentrations on fourth nymphal instar <i>A. craccivora</i> mortality rate by feeding technique.....	59
19. Effect of <i>Hyoscyamus muticus</i> (acetone) leaf extracts 1, 1.5 and 2% directly applied on larvae and pupal stage of <i>Ch.carnea</i>	63
20. Effect of <i>Hyoscyamus muticus</i> (acetone) leaf extracts 1, 1.5 and 2% directly applied on larvae and pupal stage of <i>Ch. carnea</i>	63
21. Effect of <i>Hyoscyamus muticus</i> 1 % (acetone) leaf extracts on larvae and pupal stage <i>Ch. carnea</i> using the thin layer film.....	65
22. Effect of <i>Hyoscyamus muticus</i> 1 % (acetone) leaf extracts on larval instars duration of <i>Ch. carnea</i> using the thin layer film.....	65
23. Effect of <i>Hyoscyamus muticus</i> 2 % (acetone) leaf extracts on <i>Ch.</i> <i>carnea</i> using the feeding technique 24h after treatment.....	67

24. Effect of <i>Hyoscyamus muticus</i> 2 % (acetone) leaf extracts on second, third larval instar and pupal stage of <i>Ch. carnea</i> using the feeding technique 24h after treatment.....	67
25. Effect of <i>Hyoscyamus muticus</i> 2 % (hexane) flower extracts on <i>Ch. carnea</i> by feeding technique 24 h after treatment.....	69
26. Effect of release of <i>Ch. carnea</i> L2 larvae on <i>A. craccivora</i> population on faba bean plants in the field	75
27. Effect of release of <i>Ch. carnea</i> L2 larvae on <i>L. trifolii</i> population on faba bean plants in the field.....	75
28. Effect of <i>Hyoscyamus muticus</i> leaf extracts at concentrations 25 ml/3L of water and 25ml/2L of water, respectively on <i>A. craccivora</i> population on faba bean plants in the field.....	80
29. Effect of <i>Hyoscyamus muticus</i> leaf extracts at concentrations 25, ml/3L of water and 25ml/2L of water, respectively on <i>L. trifolii</i> on faba bean plants in the field.....	80
30. Effect of release of <i>Ch. carnea</i> L2 larvae and <i>H. muticus</i> ethanol and hexane leaf extracts at the respective concentrations of 25 ml/3L of water and 25 ml/2L of water on <i>A. craccivora</i> population on faba bean plants in the field.....	85
31. Effect of <i>Ch. carnea</i> L2 larvae and <i>H. muticus</i> ethanol and hexane leaf extracts at the respective concentrations of 25, ml/3L of water and 25ml/2L of water on <i>L. trifolii</i> on faba bean plants in the field.....	85

LIST OF TABLES

No	Title	Page
1.	Names and taxonomy of some regional plants used as Plant extracts in this study.....	32
2.	Effect of <i>Citrullus colocynthis</i> Schrad extracts different concentrations used directly on the fourth nymphal instars of <i>A. craccivora</i>	39
3.	Effect of, <i>Hyoscyamus muticus</i> (hexane) plant extracts used directly at different concentrations on fourth nymphal instars of <i>A. craccivora</i>	44
4.	Effect of different concentrations of acetone plant extracts of <i>Ambrosia maritime</i> , L leaves used directly on the mortality rate of fourth nymphal instar of <i>A. craccivora</i>	48
5.	Effect of <i>Crozophora tinctoria</i> acetone (leaves and flowers mixed) extract directly used at different concentrations on the mortality rate fourth nymphal instar of <i>A. craccivora</i>	51
6.	Effect of <i>Hyoscyamus muticus</i> (ethanol) leaf extract at different concentrations on fourth nymphal instar <i>A. craccivora</i> mortality rate using the thin layer film technique.....	53
7.	Effect of <i>Hyoscyamus muticus</i> extracts used at different concentrations on fourth nymphal instar <i>A. craccivora</i> mortality by feeding technique.....	57
8.	Effect of <i>Hyoscyamus muticus</i> (acetone) leaf extracts used at different concentrations directly applied on larvae and pupal stage of <i>Chrysoperla carnea</i>	61
9.	Effect of <i>Hyoscyamus muticus</i> (acetone) leaf extracts on <i>Chrysoperla carnea</i> using thin layer film technique.....	64
10.	Effect of <i>Hyoscyamus muticus</i> (acetone) leaf extracts on larvae and pupal stage <i>Chrysoperla carnea</i> by feeding technique.	66
11.	Effect of <i>Hyoscyamus muticus</i> (hexane) flower extracts on <i>Chrysoperla carnea</i> using the feeding technique.....	68
12.	Effect of population release of <i>Ch. carnea</i> L2 larvae on <i>A. craccivora</i> and <i>L. trifolii</i> on faba bean plants in the field	74
13.	Effect of <i>Hyoscyamus muticus</i> ethanol and hexane leaf extracts at concentrations of 25, ml/3L of water and 25ml/2L of water respectively, on <i>A. craccivora</i> and <i>L. trifolii</i> population on faba bean	

plants in the field.....	79
14. Effect of release of <i>Ch. carnea</i> L2 larvae and <i>H. muticus</i> ethanol and hexane leaf extracts the respective concentrations 25 ml/3L of water and 25ml/2L of water on <i>A. craccivora</i> and <i>L. trifolii</i> population on faba bean plants in the field.....	84

CONTENTS

INTRODUCTION	1
Scope of the study	2
REVIEW OF LITERATURE	4
1. Impact of plant extracts on pests	4
a. Efficacy of neem.....	13
b. Relative efficacy of the plant extracts on pests.....	16
c. Solvent choice.....	19
2. Impact of plant extracts on natural enemies	24
MATERIALS AND METHODS	32
Preparation procedures of plant extracts	32
1. Rearing of <i>Aphis craccivora</i> Koch.	33
2. Rearing of <i>Chrysoperla carnea</i> (Steph.)	33
Laboratory studies	34
1. Impact of plant extracts on <i>Aphis craccivora</i>	34
a. Impact of plant extracts directly applied on <i>Aphis craccivora</i>	34
b. Impact of <i>Hyoscyamus muticus</i> extracts on <i>Aphis craccivora</i> using thin layer film technique.....	35
c. Impact of <i>Hyoscyamus muticus</i> extracts on <i>Aphis craccivora</i> using feeding technique.....	35
2. Impact of <i>Hyoscyamus muticus</i> extracts on <i>Chrysoperla carnea</i>	35
a. Impact of <i>Hyoscyamus muticus</i> leaf extracts directly applied on <i>Chrysoperla carnea</i>	35
b. Impact of <i>Hyoscyamus muticus</i> extracts on <i>Chrysoperla</i> <i>carnea</i> using thin layer film technique.....	36
c. Impact of plant extracts on <i>Chrysoperla carnea</i> using feeding technique.....	36
Field studies	36
Statistical analysis	37

RESULTS AND DISCUSSION	38
1. Laboratory studies	38
a. Impact of plant extracts on <i>Aphis craccivora</i>	38
1. Impact of plant extracts directly applied on <i>Aphis craccivora</i>	38
2. Impact of <i>Hyoscyamus muticus</i> extracts on <i>Aphis craccivora</i> using the thin layer film technique.....	52
3. Impact of <i>Hyoscyamus muticus</i> extracts on <i>Aphis craccivora</i> using feeding technique.....	55
b. Impact of plant extracts on <i>Chrysoperla carnea</i> (Steph.).....	60
1. Impact of <i>Hyoscyamus muticus</i> leaf extracts directly applied on <i>Chrysoperla carnea</i>	64
2. Impact of <i>Hyoscyamus muticus</i> leaf extracts on <i>Chrysoperla</i> <i>carnea</i> using the thin layer film technique.....	64
3. Impact of <i>Hyoscyamus muticus</i> leaf extracts on <i>Chrysoperla</i> <i>carnea</i> using feeding technique	66
2. Field studies	69
SUMMARY	86
REFERENCES	89
ARABIC SUMMARY	

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 LC₅₀ 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.