



## Plant Protection and Pathology Research

<http://www.journals.zu.edu.eg/journalDisplay.aspx?JournalId=1&queryType=Master>



## EFFICACY OF SOME INSECTICIDES AGAINST THE COWPEA APHID, *Aphis craccivora* Koch INFESTING COWPEA PLANTS AND THEIR ASSOCIATED PREDATORS UNDER LABORATORY AND FIELD CONDITIONS

Mohamed A. Hendawy<sup>1\*</sup>, A.A.A. Saleh<sup>2</sup>, A.S. Jabbar<sup>3</sup> and A.S.N. El-Hadary<sup>2</sup>

1. Pl. Prot. Dept., Fac. Agric., Zagazig Univ., Egypt
2. Pl. Prot. Res. Inst., ARC, Doki, Giza, Egypt
3. Pl. Prot. Dept., Fac. Agric., AL - Muthanna Univ., Iraq

Received: 30/07/2018 ; Accepted: 05/12/2018

**ABSTRACT:** This study was carried out to investigate the efficacy of four insecticides namely, kz oil, thiamethoxam, super- misrona oil and primiphosmethyl on the population of the cowpea aphid, *A. craccivora* Koch under laboratory and field conditions. Results showed that the mean numbers of the nymph and adult stages were irregularly decreased after treatment with all the examined insecticides. This decreasing lasted till the end of two weeks in case of kz oil, thiamethoxam, super-misrona and primiphosmethyl. The results revealed that primiphosmethyl proved to be the highest effective compound in the first and second seasons. On the other hand, thiamethoxam was the lowest effective one in both seasons. The other tested insecticides occupied intermediate positions between the highest and the lowest compounds. The tested insecticides could be descendingly arranged according to their reduction percentages in population as follows: primiphosmethyl > kz oil > super-misrona oil > thiamethoxam. The toxicity of the tested insecticides against the cowpea aphids under laboratory condations were studied. Results cleared that primiphosmethyl was the most toxic insecticide, whereas thiamethoxam was the lowest one causing 78.91, 83.97 and 50.70, 77.37% reduction in the first and second seasons, respectively. These insecticides, reached their maximum percent reduction in *C. undecimpunctata* population after the initial time of application. Meanwhile, the highest reduction percentage of *C. carnea* population was also detected after three days of treatment.

**Key words:** Insecticides, Cowpea plants, *Aphis craccivora*, *Coccinella undecimpunctata*, *Chrysoperla. Carnea*.

## INTRODUCTION

Cowpea is mainly cultivated for local consumption, either at green shell or at mature stage for dry seeds. Aphids are the most important insect pests of different crops all over the world (Ibrahim, 1994). On the other hand, faba bean and cowpea plants are of the most important crops in Egypt.

The cowpea aphid, *A. craccivora*, is considered one of the most injurious pests infesting these plantation and other leguminous

species by sucking the plant sap in Egypt (El-Heneidy *et al.*, 1998; El-Defrawi *et al.*, 2000; Abdel-Rahman *et al.*, 2005) and in other countries such as Srikanth and Lakkundi (1990), and Sharma and Yadav (1994) in India and Kuroli *et al.* (1999) in Hungary, and indirect damage by transmission of many virus diseases (Ortiz *et al.*, 2006). Field crops are attacked by a variety of insects and related pests, including aphids, cucumber beetles, seed corn maggot, squash bug, squash vine borer and two spotted spider mite. Estimation the number of

Corresponding author: Tel. : +201140205873

E-mail address: hendawy\_33@yahoo.com

pests present in field is an important component of effective management (**Dinham, 2003**). Direct and indirect effects of aphids feeding occur defoliation, leaf burning and even plant death are examples of direct effects. Indirect effects, include decreases in photosynthesis and transpiration. This combination of effects on the host plant often reduces the amount of yield for that crop (**Marcic *et al.*, 2007**).

The use of insecticides in controlling aphids generally, leads to many problems, not only increasing resistant strains of aphids to these chemical substances, but also in induction of pollution to man and beneficial insects such as bees and other pollinators, insect parasitoids and predators (**Maghraby, 2012**).

Biological control is a satisfactory program in integrated pest management. Control of insect pests by biocontrol agents is defined as the action of these agents that maintains a pest population at a lower level. Parasitism of aphid has been shown to be density dependent (**Sinha and Singh, 1979; Walker *et al.*, 1984**). Pesticides and their residues often have direct effect on aphids, including mortality, decreased longevity and reduced fecundity. Therefore, the objective of this study was to evaluate the effect of four insecticides on aphids under laboratory conditions in addition to using for controlling aphids on field cowpea plants crop under field conditions.

## MATERIALS AND METHODS

The present study was carried out at the Laboratory of Plant Protection Research Institute, Sharkia Branch and the fields of Zagazig district, Sharkia Governorate, Egypt during 2016 and 2017 seasons on cowpea plants.

### Rearing of the Cowpea Aphid, *A. craccivora* (Koch)

The cowpea aphid clone was initially brought to the laboratory from a culture reared at Plant Protection Research Institute, ARC, Giza, Egypt. All stages of the aphid were maintained on young cowpea plants under standard conditions of  $25 \pm 5^\circ\text{C}$ ,  $65 \pm 5\%$  relative humidity and a photoperiod of 16 hr. light. Mature aphids were put on plants for 24 hr., resulting in neonate nymphs with an age of 0–24

hr., that were used throughout the experiments (**Ramadan, 1982**).

### Tested Insecticides

The insecticides used and their rates in gram active ingredient (a.i.) per faddan were as follows:

1- Trade name : KZ oil 95% Ec.

Common name: KZ oil.

Recommended rate : 1.5 l/100 l water.

2-Trade name : Actra 25% WG.

Common name: Thiamethoxam.

Recommended rate: 25 g/100 l water.

3-Trade name : Super-misrona oil 84% EC.

Common name: Super-misrona

Recommended rate: 1.5 l/100 l water.

4-Trade name : Actelic 50% EC.

Common name: primiphosmethyl.

Recommended rate: 375 ml/100 l water.

### Bioassay Test

The relative effects of kz oil, thiamethoxam, super-misrona and primiphosmethyl on mortality of aphid adults were assessed in the laboratory with 80 adults of cowpea aphid (4 replicates with 20 insects per replicate). The leaf dipping technique method was used in this test after preparation the concentrations of the tested insecticides. After that, the treated leaves were placed in glass petri-dishes. Few drops of water were added daily to maintain suitable moisture content. In addition to the check leaves which were treated by direct spray of water. Aphid adult were treated with the tested insecticides with different concentrations, then the dishes were kept under laboratory conditions. The mortality was determined after 24, 48 and 72 hr. (**Finney, 1975**).

### Field Studies

#### Efficiency of the tested insecticides against cowpea aphid on cowpea plants and their associated predators

The experiments were carried out at Kenayat city during the seasons of 2016 and 2017. The randomized block design was applied. An area (about 1/6 faddan) was divided into 5 plots (4 treatments for insecticides and 1 as control) and

each plot had an area 6×7 m. Motor sprayer (20 liters capacity) was used to spray the tested insecticides with recommended rates. Samples of 30 infested leaves were taken at random from each plot. Counts of aphids were made just before treatment then after, 3, 7 and 14 days post-treatment.

The reduction percentages of aphids population were calculated according to **Henderson and Tilton (1955)** as follows:

$$\text{Reduction (\%)} = \frac{A \times C}{B \times D} \times 100$$

Where:

A = number of individuals in treatment after application.

B = number of individuals in treatment before application.

C = number of individuals in control before application.

D = number of individuals in control after application.

### Statistical Analysis

Data were subjected to the analysis of variance test (ANOVA) and completely randomized design. The least significant differences (LSD) at 0.05% level were determined according to computer program constant and Duncan's multiple range tests.

## RESULTS AND DISCUSSION

### Toxicity of the Tested Insecticides to the Cowpea Aphid, *Aphis craccivora* Koch

The toxicity of pirimiphosmethyl, kz oil, super misrona oil and thiamethoxam to aphids after 24, 48 and 72 hr. post-treatment are recorded in Table 1. It is obvious that the insecticide primiphosmethyl exhibited the highest toxic one to the tested aphid at both levels of toxicity (LC<sub>50</sub> and LC<sub>90</sub>), however thiamethoxam revealed the lowest toxicity. The corresponding values of LC<sub>50</sub> and LC<sub>90</sub> after 72 hr. in case of the above-named first insecticide, were 0.21 and 0.96 mg/l, respectively. The kz and super-misrona oils occupied an intermediate position between the two aforesaid insecticides

as for both levels of toxicity, the effectiveness of the tested insecticides could be descendingly arranged as follows: primiphosmethyl > kz oil > super- misrona oil > thiamethoxam. The same phenomenon took place with 24 and 48 hr. post-treatment. The LC<sub>50</sub> values were 0.53, 2.81, 4.81, 23.66 and 0.44, 1.44, 3.33, 18.96 after the two previously mentioned periods, respectively. The results showed that primiphosmethyl was the highest toxic insecticide, while thiamethoxam was the lowest toxic one. So, at the LC<sub>90</sub> values the toxicity of preceding four insecticides could be descendingly arranged as follows: primiphosmethyl > kz oil > super- misrona oil > thiamethoxam, after 48 hr., of exposure. In this respect the insecticide primiphosmethyl was more toxic than kz oil with 5.29 times and 6.90 times than super- misrona oil, whereas the insecticide primiphosmethyl was more toxic than thiamethoxam with 62.14 times. This comparison was taken at LC<sub>50</sub> and 72 hr., post-treatment.

### Efficacy of the Tested Insecticides Under Field Conditions

#### First season (2016)

As shown in Table 2, reduction percentages in aphids population on cowpea plants for the tested insecticides, kz oil, thiamethoxam super-misrona oil and primiphosmethyl reduced by 88.21, 79.51, 77.82 and 85.88% as initial reduction percentage, while the residual reduction percentages were 59.86, 36.30, 24.78 and 75.42 for the previous tested insecticides, respectively. The general means of reduction percentages recorded were 69.31, 50.70, 42.46 and 78.91 for the same tested insecticides, successively.

The tested insecticides could be descendingly arranged according to their reduction percentages in aphids population as follows: primiphosmethyl > kz oil > super- misrona oil > thiamethoxam.

#### Second season (2017)

Results presented in Table 3 indicate that the mean reduction percentages of the cowpea aphid, *A. craccivora* population on cowpea plants after 72 hr. in the second season of the tested insecticides (for kz oil, thiamethoxam, super-misrona oil and primiphosmethyl) were 77.60, 60.70, 66.90 and 75.40, subsequently. On

**Table 1. Toxicity of primiphosmethyl, kz oil, super-misrona oil and thiamethoxam to the cowpea Aphid, *Aphis craccivora* Koch after different period of exposure**

Insecticide	time of exposure in hr.	LC <sub>50</sub> (mg/l)	LC <sub>90</sub> (mg/l)	Slope value
Primiphosmethyl	24	0.53	1.89	1.52
	48	0.44	1.22	0.99
	72	0.21	0.96	0.92
KZ oil	24	2.81	8.37	1.89
	48	1.44	5.07	2.55
	72	1.11	3.35	2.63
Super- misrona oil	24	4.81	12.75	1.66
	48	3.33	8.17	1.54
	72	1.45	5.95	1.68
Thiamethoxam	24	23.66	44.13	1.49
	48	18.96	34.24	2.65
	72	13.05	28.14	1.96

**Table 2. Reduction percentages of the cowpea aphid, *Aphis craccivora* Koch population on cowpea plants after the application of the tested insecticides during 2016 season**

Insecticide	Reduction percentages of aphids at indicated days post-treatment			Mean of residual effect (%)	Mean of general effect (%)
	Initial effect (3)	7	14		
KZ oil	88.21	61.34	58.38	59.86	69.31
Thiamethoxam	79.51	34.75	37.85	36.30	50.70
Super- misrona oil	77.82	27.87	21.69	24.78	42.46
Primiphosmethyl	85.88	79.64	71.20	75.42	78.91

**Table 3. Reduction percentages of cowpea aphid, *Aphis craccivora* Koch population on cowpea plants after the application of tested insecticides during 2017 season**

insecticide	Reduction percentages of aphids at indicated days post-treatment			Mean of residual effect (%)	Mean of general effect (%)
	Initial effect (3)	7	14		
KZ oil	77.60	80.20	85.10	82.65	80.97
Thiamethoxam	60.70	90.70	80.70	85.70	77.37
Super-misrona oil	66.90	79.60	69.50	74.55	72.00
Primiphosmethyl	75.40	91.00	85.50	88.25	83.97

the other hand, the mean reduction percentages of the residual effect of the above-mentioned insecticides recording 82.65, 85.70, 74.55 and 88.25%, respectively. While the mean percentages of the accumulation effect (general effect) were 80.97, 77.37, 72.00 and 83.97% for the aforementioned tested insecticides, successively.

In this respect the efficiency of the tested insecticides on the aphids were estimated by several investigators *e.g.*, **Gough (1990)**, **Sato et al. (2004)**, **Hossain et al. (2006)**, **Vostrel (2010)**, **Attia et al. (2012)** and **Bahlai et al. (2015)**, who compared the efficiency of different insecticides against the aphids infesting different crops. Also, **Amjad et al. (2012)** studied the combination of insecticides against aphids.

#### **Efficacy of the Tested insecticides Against the Predator Lady Beetles *Coccinella undecimpunctata* on Cowpea Plants**

The efficiency of four tested compounds against *C. undecimpunctata* on cowpea plants was relatively different from each other as shown from the results arranged in Tables 4 and 5. According to the general effect, it seemed that thiamethoxam and primiphosmethyl were more effective than the other insecticides, reaching their maximum percent of reduction in *C. undecimpunctata* population after initial time of application recording 74.91, 98.61, 75.85, 97.84 and 69.79, 97.01, 76.01, 98.14 for the insecticides kz oil, thiamethoxam, super-misrona oil and primiphosmethyl in the two investigated seasons, respectively. Thereafter, all tested insecticides showed decreasing reduction percentages till fourteen days after application. Means of general effect of thiamethoxam were 84.42 and 80.43 while significantly increased with (87.85 and 84.58%) in case of primiphosmethyl as well significantly decreased with kzZ oil (60.10 and 56.29%) and 64.42 and 64.68% with super-misrona.

On the other hand, **Al-Shannaf (2002)** stated that the predator *C. undecimpunctata* densities were three times more numerous in pheromone treated fields than the corresponding cotton field treated with conventional insecticides. *Coccinella* spp. insects showed the lowest reduction percents in their population density exhibiting mean of 37.67% in 1998 season and 50.22% in 1999 season, respectively.

#### **Efficacy of the Tested Insecticides Against the Predator Aphid Lion, *Chrysoperla carnea* on Cowpea Plants**

Results presented in Tables 6 and 7 show that the four tested compounds did not cause complete mortality to *C. carnea* individuals found in cowpea field neither immediately after spraying (3 days) nor after any of the other two tested post-treatment intervals. The results obviously revealed that primiphosmethyl was the most effective compound causing in general, the highest percentage of *C. carnea* population reduction either after three days post-treatment or after any of the two tested post-treatment periods in both seasons. After three days from application, reduction percentages of 89.41 and 91.49 for primiphosmethyl followed by 61.54, 59.89; 77.41, 66.54 and 89.51, 93.41 for kz oil, super-misrona oil and thiamethoxam in the two seasons, then it reduced after 7 and 14 days, successively. Means of general effect of primiphosmethyl reduction in population were 78.66 and 81.39%, while thiamethoxam showed 75.99 and 79.43% followed significantly by super-misrona oil (64.1 and 56.18%) then kz oil (53.23 and 52.34%) in the two seasons, respectively. Highly significant differences were noticed between groups but they were significant and insignificant within groups.

These findings disagree with those of **Bendict et al. (1986)** who reported that number of predaceous insects were not significantly affected with chlordimee after treatment. **Hegab (2002)** evaluated the harmful side effects of three spray programmes (ES-Fevaporate, ES-Fenvalerate + Profenofos and ES-Fenvalerate + Profenofos+ thiodicarb) on the incidence of flying adults of some predaceous insects and reported that the three tested spray programmes had highly significant adverse effects on the population density of these arthropod species, recording 37.67 and 49.18% in 1998 and 1999 seasons, respectively. **Al-Shannaf (2010)** showed that seasonal reductions of aphid lion numbers were 62.29 and 58.14% in 2008 and 2009. On the other hand, **Abd-ElSamed et al. (2011)** mentioned that *C. carnea* and *C. undecimpunctata* had high reduction percentage after two days post-treatment. The reduction percentages decreased gradually as the time exposed after spray increased for all tested insecticides (Couracron, Dursban, Atabron and Consult) during the two cotton seasons.

Table 4. Effect of certain insecticides on the predator lady beetle, *Coccinella undecimpunctata* (L.) population associated with cowpea aphid during 2016 season

insecticide	Reduction of population at indicated days post-treatment (%)			Mean of residual effect (%)	Mean of general effect (%)
	Initial effect (3)	7	14		
KZ oil	74.91 <sup>b</sup>	61.98 <sup>c</sup>	43.41 <sup>d</sup>	52.69	60.10
Thiamethoxam	98.61 <sup>a</sup>	89.75 <sup>a</sup>	64.91 <sup>b</sup>	77.33	84.42
Super- misrona oil	75.85 <sup>b</sup>	68.41 <sup>b</sup>	49.01 <sup>c</sup>	58.71	64.42
Primiphosmethyl	97.84 <sup>a</sup>	90.61 <sup>a</sup>	75.09 <sup>a</sup>	82.85	87.85
LSD ≤ 0.05	3.39	1.66	3.34		

Table 5. Effect of certain insecticides on the predator lady beetle, *Coccinella undecimpunctata* (L) population associated with cowpea aphid during 2017 season

Insecticide	Reduction of population at indicated days post- treatment (%)			Mean of residual effect (%)	Mean of general effect (%)
	Initial effect (3)	7	14		
KZ oil	69.79 <sup>c</sup>	59.04 <sup>d</sup>	40.03 <sup>d</sup>	49.54	56.29
Thiamethoxam	97.01 <sup>a</sup>	86.15 <sup>b</sup>	58.14 <sup>b</sup>	72.15	80.43
Super- misrona oil	76.01 <sup>b</sup>	69.61 <sup>c</sup>	48.43 <sup>a</sup>	59.02	64.68
Primiphosmethyl	98.14 <sup>a</sup>	91.43 <sup>a</sup>	64.17 <sup>c</sup>	77.80	84.58
LSD ≤ 0.05	2.98	2.72	1.88		

Table 6. Effect of certain insecticides on the predator aphid lion, *Chrysoperla. carnea* (Steph.) population associated with cowpea aphid during 2016 season

Insecticide	Reduction of population at indicated days post- treatment (%)			Mean of residual effect (%)	Mean of general effect (%)
	Initial effect (3)	7	14		
KZ oil	61.54 <sup>c</sup>	57.84 <sup>c</sup>	40.32 <sup>d</sup>	49.08	53.23
Thiamethoxam	89.51 <sup>d</sup>	79.49 <sup>a</sup>	58.97 <sup>b</sup>	69.23	75.99
Super-misrona oil	77.41 <sup>b</sup>	64.94 <sup>b</sup>	49.95 <sup>a</sup>	57.45	64.10
Primiphosmethyl	89.41 <sup>a</sup>	83.16 <sup>a</sup>	63.41 <sup>c</sup>	73.29	78.66
LSD ≤ 0.05	2.99	3.27	3.52		

Table 7. Effect of certain insecticides on the predator aphid lion, *Chrysoperla carnea* (Steph.) population associated with cowpea aphid during 2017 season

Insecticide	Reduction of population at indicated days post-treatment (%)			Mean of residual effect (%)	Mean of general effect (%)
	Initial effect (3)	7	14		
KZ oil	59.89 <sup>c</sup>	55.71 <sup>b</sup>	41.42 <sup>c</sup>	48.57	52.34
Thiamethoxam	93.41 <sup>a</sup>	82.91 <sup>a</sup>	61.98 <sup>b</sup>	72.45	79.43
Super- misrona oil	66.54 <sup>b</sup>	58.84 <sup>b</sup>	43.17 <sup>c</sup>	51.01	56.18
Primiphosmethyl	91.49 <sup>a</sup>	85.18 <sup>a</sup>	67.51 <sup>a</sup>	76.35	81.39
LSD ≤ 0.05	3.40	3.43	2.53		

## REFERENCES

- Abd-ElSamed, A.A., A.A.A. Saleh and H.E. Megahed (2011). Effectiveness of certain insecticides against certain piercing sucking pests and common predators in cotton fields. *J. Appl. Sci.*, 26 (6):73-84.
- Abdel-Rahman, G.A., M.H. Belal, N.M. Ibrahim and E.A. Ali (2005). Observations on toxic effects of some desert plant extracts on the cowpea aphid, *Aphis craccivora* (Koch). *Egypt. J. Agric. Res.*, 83 (2): 609-621.
- Al-Shannaf, H.M.H. (2002). Studies on some cotton pests. Ph.D. Thesis, Fac. Agric., Zagazig Univ., 297.
- Al-Shannaf, H.M.H. (2010). Effect on sequence control sprays on cotton bollworms and side effect on some sucking pests and their associated predators in cotton fields. *Egypt. Acad. J. Biol. Sci.*, 3 (1): 221-233.
- Amjad, M.M., H. Bashir, M.D. Gogi, M. Aslam, K. Zia, M.A. Khan and L. Ali (2012). Evaluation of some acaricides on *Aphis craccivora* (Koch.) on cotton crop under laboratory and field conditions. *Pak. Entomol.*, 34 (2) :125-129.
- Attia, S.K., L. Griss, A.C. Mailleux, S. Heuskin, G. Lognay and T. Hance (2012). Acaricidal activities of *Sontolina africana* and *Hertia cheirifolia* essential oils against the two spotted spider mite (*Tetranychus urticae*). *Pest Manag. Sci.*, 68 (7): 1069-1076.
- Bahlai, C.A., W. Werf Vander, M. O'Neal, L. Hemerik and D.A. Landis (2015). Shifts in dynamic regime of an invasive lady beetle are linked to the invasion and insecticidal management of its prey. *Ecol. Appl.*, 25 (7): 1807-1818.
- Bendict, J.H., M.H. Walmsle, J.C. Sergers and M.F. Treacy (1986). Yield enhancement and insect suppression with chlordimeform (Fundal) on dry land cotton. *J. Econ. Entomol.*, 79: 238-242.
- Dinham. B. (2003). Growing vegetables in developing countries for local urban population and export markets. Problems confronting small – scale producers. *Pest Manag. Sci.*, 59: 575-582.
- EI-Defrawi, G.M., K. Azza Emam, LA. Marzouk and L. Rizkalla ( 2000). Population dynamics and seasonal distribution of *Aphis craccivora* Koch, and associated natural enemies in relation to virus disease incidence in faba bean fields. *Egypt. J. Agric. Res.*, 78 (2): 627-641.
- EI-Heneidy, A., G. Resk, A.M. Hekal and S. Abdel-Samad (1998). Impact of planting date on aphid populations and associated natural enemies on faba bean plants in Egypt. *Arab. J. Pl. Prot.*, 16 (2): 55-59.
- Finney, D.J. (1975). Probit Analysis. 3<sup>rd</sup> Ed., Camb. Univ., 333.
- Gough, N. (1990). Evaluation of miticides for the control of *Aphis craccivora* (Koch.) on field of roses in South Queensland. *Crop Prot.*, 9 (2): 119-127.
- Hegab, M.E.M. (2002). Studies on bollworms infesting cotton in Sharkia Governorate, Egypt. M.Sc. Thesis, Zagazig Univ., 207.
- Henderson, G. and W.F. Tilton (1955). Tests with acaricides against the brown wheat mite. *J. Econ. Entomol.*, 48: 157-161.
- Hossain, S.M.M. Haque and N. Nher (2006). Control of *Aphis craccivora* (Koch.) by some selected chemicals. *Univ. J. Zool.*, Rajshahi Univ., 25: 15-18.
- Ibrahim, AM.A. (1994). Aphids and their parasitoids on apple trees at Giza region, Egypt. *J. Biol. Pest Control*, 4 (1): 35-43.
- Kuroli, G., K. Pocsai and L. Nemeth (1999). Flight activity and population changes of aphids in faba bean. *Novenyvedelem*, 35 (11): 545-554.
- Maghraby, H.M.M. (2012). Studies on the parasitoid *Diaeretiella rapae* on some aphid species in Sharkia Governorate, M.Sc. Thesis, Fac. Agric., Moshtohor, Benha Univ., 222.
- Marcic, D., P. Lljajic, P. Peric, S. Krnjujic and I. Peric (2007). Experimental evaluation of insecticide efficacy in controlling *Brevicoryne brassicae*. *Incobbaye. Acta Horticulturay*, (729): 471- 475.

- Ortiz, V., E. Navarro, S. Castro, G. Carazo and J. Romero (2006). Incidence and transmission of faba beans necrotic yellows virus (FB NYV) in Spain. Spanish. J. Agric. Res., 4 (3): 255-260.
- Ramadan, M.S. (1982). Studies on insecticides resistance of *Aphis gossypii* in Egypt. M.Sc. Thesis, Fac. Agric., Tanta Univ., Egypt.
- Sato, M.E., T. Miyata, M.D. Silva, A. Raga and M.F.D.S. Filho (2004). Selections for fenpyroximate resistance and susceptibility and inheritance, cross-resistance and stability of fenpyroximate resistance in *Tetranychus urticae* Koch (Acari : Tetranychide). J. Appl. Entomol. Zool., 3 (2) : 293-302.
- Sharma, R.P. and A.S. Yadav (1994). Population dynamics of bean aphid (*Aphis craccivora* Koch) and its predatory complex in relation to crop type (lentil, lathyrus and faba bean) and weather conditions. J. Entomol. Res., 18 (1): 25-36.
- Sinha, T.B. and R. Singh (1979). Studies on the bionomics of *Trioxys indicus* Subba Rao and Sharma (Hymenoptera: Aphidiidae): A parasitoid of *Aphis craccivora* Koch (Hymenoptera: Aphidiidae) the area of discovery of parasitoid. Zetschrift fur Angewandte Entomol., 89 (2): 173-178.
- Srikanth, J. and N.H. Lakkundi (1990). Seasonal population fluctuations of the cowpea aphid, *Aphis craccivora* Koch and its predatory Coccinellids. Insect Sci. and its App., 11 (1): 21-26.
- Vostřel, J. (2010). Bifenazate, a prospective acaricide for spider mite (*Tetranychus urticae* Koch) control in Czech. Hops-plant Protect. Sci., 46 (3):135-138.
- Walker, G.P., L.R. Nault and D.E. Simonet (1984). Natural mortality factors acting on potato aphid (*Macrosiphum euphorbiae*) populations in processing tomato field in Ohio. Environ. Entomol., 13: 724-732.

## فعالية بعض المبيدات الحشرية على من اللوبيا والمفترسات المرتبطة به والذي يصيب نباتات اللوبيا تحت ظروف المعمل والحقل

محمد عبد العال هنداوي<sup>١</sup> - أحمد أمين أحمد صالح<sup>٢</sup> - أحمد شمخي جبار<sup>٣</sup> - أحمد صبري نجدي الحضري<sup>٢</sup>

١- قسم وقاية النبات - كلية الزراعة - جامعة الزقازيق - مصر

٢- معهد بحوث وقاية النباتات - الدقي - الجيزة - مصر

٣- قسم وقاية النبات - كلية الزراعة - جامعة المنيا - العراق

يهدف البحث إلي دراسة فاعلية أربعة مبيدات حشرية وهي الزيت المعدني كزد و ثياميثوكسام والزيت المعدني سوبر- مصرونا والمبيد الحشري بريميفوس ميثيل على تعداد من اللوبيا تحت ظروف المعمل والحقل علي محصول اللوبيا خلال موسمي ٢٠١٦ و ٢٠١٧ على طوري الحورية والحشرة الكاملة، أظهرت النتائج انخفاض متوسط تعداد الحوريات والحشرات الكاملة للمن بعد المعاملة لجميع المبيدات المختبرة حتي ١٤ يوما من المعاملة، أظهر المبيد الحشري بريميفوس ميثيل أعلى تأثير في الموسمين الأول والثاني في حين أظهر المبيد الحشري ثياميثوكسام أقل تأثير في كلا الموسمين وباقي المبيدات المختبرة احتلت مراكز وسطية بين المبيد العالي والمنخفض التأثير، يمكن ترتيب المبيدات المختبرة تنازليا حسب شدة فاعليتها طبقا للنسب المئوية للخفض في التعداد كتالي: بريميفوس ميثيل < زيت كزد < زيت سوبر مصرونا < ثياميثوكسام، وقد تم دراسة سمية المبيدات المختبرة علي من اللوبيا تحت ظروف المعمل، أظهرت النتائج أن المبيد الحشري بريميفوس ميثيل كان أكثر المبيدات سمية في حين كان المبيد الحشري ثياميثوكسام أقل المبيدات سمية، حيث كانت نسب الخفض في التعداد هي ٧١,٩١ ، ٨٣,٩٧ ، ٥٠,٧٠ و ٧٧,٣٧ للمبيدين السابقين في الموسمين الاول والثاني على التوالي وأظهرت النتائج أن المبيدات الحشرية بريميفوس ميثيل واثياميثوكسام كانت أكثر المبيدات تأثيرا وكانت اكبر نسبة تأثير لها علي تعداد أبو العيد ١١ نقطة بعد ثلاثة أيام من المعاملة، في حين أظهر المبيد الحشري بريميفوس ميثيل أكثر المبيدات فاعلية علي تعداد أسد المن وذلك بعد ثلاثة أيام من المعاملة.

المحكمون:

١- أستاذ بحوث متفرغ - معهد بحوث وقاية النبات - مركز البحوث الزراعية.  
أستاذ المبيدات المتفرغ - كلية الزراعة - جامعة الزقازيق.

١- أ.د. عبدالمنعم شوقي حسن مصطفى  
٢- أ.د. رفعت مصطفى محمد شريف