

**THE TOXIC EFFECT OF SOME PLANT
EXTRACTS AND ORTUS AGAINST
TETRANYCHUS URTICAE KOCH AND *EUSEIUS
SCUTALIS* ATHIAS-HENRIOT**

BASMA M. ABOU-EL-NOUR*’ SHALABY H.HASSAN,
NEVEEN F. ARAFAT**.**

* AL-Azhar University, Faculty of Science (for girls)

** Plant Protection Research Institute (ARC)

ABSTRACT

Laboratory experiment was conducted in Plant Protection Research Institute. This study aimed to investigate the efficiency of some plant extracts against *Tetranychus urticae* (Koch) on castor bean and eggplant leaves and its effects on the predatory mite, *Euseius scutalis* (Athias-Henriot). The results were recorded after 24, 72 hours and 7 days of treatment. The obtained data indicated that the sunflower extract was the most toxic to the female of *T. urticae* when fed on castor bean leaves, while, when fed on eggplant leaves the castor bean extract with hexane was the most toxic after 24 hours of treatment. After 72 hours of treatment on castor bean leaves, the most toxic plant extract to the adult female was the castor bean extract with hexane, but when fed on eggplant leaves the most toxic one was the sunflower extract with water, while, after 7 days of treatment when adult female fed on castor bean and eggplant leaves data showed that the most toxic extract was the castor bean extract with petroleum ether. Data indicated that the most toxic extract on the predatory mite was the sunflower extracts on castor bean leaves, while on eggplant leaves the most toxic was the castor bean leaves extract with petroleum ether after 7 days.

keywords: plant extracts, tetranychus.

INTRODUCTION

Tetranychid mites are considered of great important pests to the field vegetable crops and horticulture. The two-spotted spider mite, *Tetranychus urticae* Koch infesting different agricultural crops such as eggplant [*Solanum melongena* (Nees) Fam.: Solanaceae] and castor bean [*Ricinus communis* L. Fam.: Euphorbiacaca]. In Egypt, many problems have been encountered as a result of the extensive use of synthetic acaricides. Increasing problems concerning with the application of such acaricides including acaricide resistance, residual contamination of human foods, mammalian toxicity and pollution of the environment. For that, entire world are going to reduce chemicals use and trying to introduce predators and botanical extracts such as natural products. Amer *et al.*, (1989); Potenza *et al.*, (1999) and Hosny *et al.*, (2001) studied the toxicity of various extracts of seeds of *Abrus precatorius* to females of *Tetranychus urticae*. Abo-Taka *et al.*, (1986); El-Beheiry *et al.*, (1987) and Abd el Samad *et al.*, (1996) studied the toxic effect of the plant extracts and some acaricides and its side effect. The present work aims to use selective safe substances (plant extracts) and Ortus (acharicide) for controlling the two-spotted spider mite, *Tetranychus urticae* Koch fed on castor bean and eggplant leaves and its effects on the predatory mite, *Euseius scutalis* (Athias-Henriot).

MATERIALS AND METHODS

1. The red mite, *Tetranychus urticae* Koch (Acarina : Tetranychidae) and the predator culture:

Two-spotted spider mite colonies were obtained from castor bean plants from Giza Governorate and reared under laboratory conditions at $25\pm 2^{\circ}\text{C}$ and $65\pm 5\%$ RH on sweet potato plant, *Ipomea batatas*.

The predator used in this study was [*Amblyseius gossip* (El-Badry), *Euseius scutalis* [Athias-Henriot] (Acari: Phytoseiidae) which was collected and described by El-Badry (1967), it has been of a particular interest to biologists concerned with the development of IPM systems.

2. Plant extracts investigated in the present study:

2. Castor bean leaves were extracting according to Su (1985) method using petroleum ether, hexane and water. Sunflower with water 75%. The castor plant extracts and sunflower with different concentrations (0.5, 1.0, 1.5 and 2.0%). Mortality was recorded after 1, 3 and 7 days post treatment. Statistically analysis was conducted according to Abbott's (1925). The toxicity index (Ti) was determined by using Sun's equation (1950) as follows:

Equations:

- 1- Abbott's formula (1925): used to correct% mortality according natural mortality.

$$\text{Mortality (\%)} = \frac{\text{Mortality \% of treatment} - \text{Mortality \% of control}}{100 - \text{Mortality \% of the least compound}} \times 100$$

- 2- Sun (1950) as follows:

$$\text{Toxicity index (\%)} = \frac{\text{LC}_{50} \text{ of the most effective compound}}{\text{LC}_{50} \text{ of the least compound}} \times 100$$

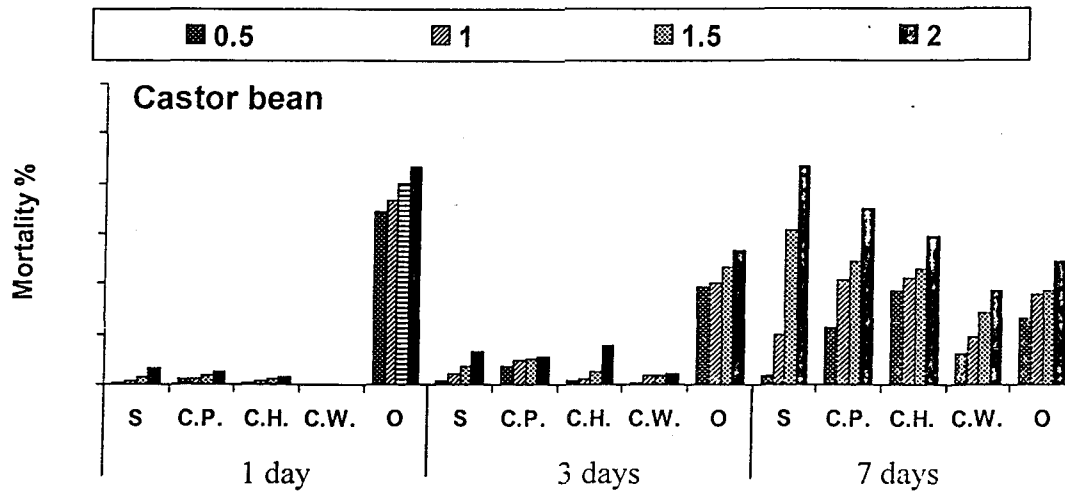


Fig. (1): Corrected mortality% of adult females of *Tetranychus urticae* Koch treated with four concentrations of the plant extracts and one acaricide (Ortus).

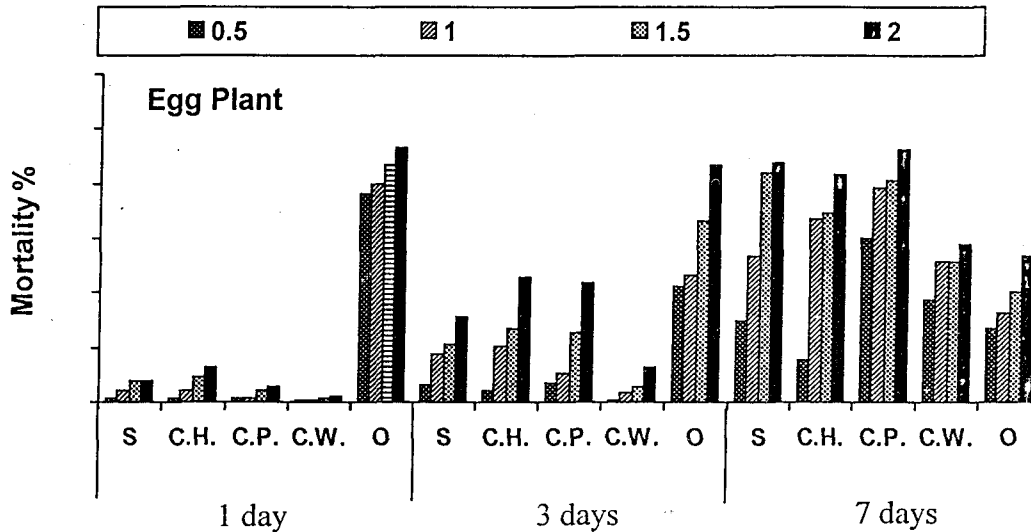


Fig. (2): Corrected mortality% of adult females of *Tetranychus urticae* Koch treated with four concentrations of the plant extracts and one acaricide (Ortus).

S = Sunflower C.H. = Castor plant extract with hexane
 C.P. = Castor plant extract with petroleum ether
 C.W. = Castor plant extract with Water O = Ortus

3. Toxicity of tested plant extracts and Ortus to adult females of spider mite, *T. urticae* and predatory mite, *E. scutalis*:

The toxic effect for the tested materials was evaluated by leaf disc dip technique according to Siegler (1947). Four discs of castor bean and egg plant leaves were dipped in each concentration for 5 seconds and left to dry. Each treatment was replicated four times.

To measure the toxic effect of tested plant extracts and Ortus on predatory mite, *E. scutalis*, all treatments were evaluated by leaf discs dip-technique. A series of concentrations for each tested plant extract and Ortus were prepared. Then, four discs of castor bean and egg plant leaves were dipped in each concentration for 5 seconds and left to dry. A number of the preys, *T. urticae* were added as a food for *E. scutalis*. Then, 5 adult female predatory mites were transferred to each disc using a brush (No 0.0). The discs were placed on a moist filter paper, which rested on a moist cotton wool pads in Petri dishes.

4. Experimental technique:

4.1. Advantages of leaf discs as experiment arenas:

Leaf discs are convenient means of providing experimental arenas of standard size. Standardization of arena size has the advantage that offering a known number of red spider mites automatically provides those red spider mites a fixed density (number/unit area). Discs can be cut so as provide a more uniform surface with respect to feeding and oviposition sites than whole leaves.

RESULTS

The data showed in Figs (1 & 2) indicate that the mortality percentage of the spider mite, *T. urticae* Koch when fed on egg plant

ABOU EL-NOUR et al.

leaves was, significantly different after one day from the treatment which recorded 93.33, 8.00, 12.66 and 6.00 at 2% concentration for Ortus, sunflower, castor bean leaves extracts with hexane, petroleum ether and water, respectively. While mortality percentage of *T. urticae*, when fed on castor bean leaves after one day at (2.0%) reduced to reach, 86.66, 6.667, 5.333, 2.667 and 0.00 for Ortus, sunflower, castor bean leaves extracts with petroleum ether, hexane, and water, respectively.

The results clearly showed a positive correlation between the spider mite, *T. urticae* Koch mortality rate and concentration of plant extracts and acaricide Ortus, in other words, increasing concentration materials led to increasing mortality rate for *T. urticae* Koch.

Data in Table (1) shows that the efficiency of the plant extracts to adult female of *T. urticae* Koch using castor bean leaf discs after 24 hours, 3 and 7 days. The mortality percentage of sunflower recorded after one day was 6.667% at concentration 2.0% and 0.667% at concentration 0.5%. Castor bean leaves extract with petroleum ether recorded mortality rate 5.33% and 2.0% at concentration 2.0% and 0.5%. Castor bean leaves extract with hexane recorded mortality rate 2.667% and 0.667% at concentration 2.0% and 0.5%. Acaricide Ortus recorded 86.66% and 68.6% at concentration 2.0% and 0.5%.

After 3 days in case of sunflower extract (table 1) the mortality percentage was ranged from 1.33% by using the lowest concentration on (0.5%) to 13.33% when using the highest concentration (2.0%). In case of castor bean leaves extract with hexane, petroleum ether and water, mortality percentage ranged from 1.33% to 15.33%, 7.33% to 10.66% and 0.67% to 4.33% at (0.5 % and 2.0%), respectively. Acaricide Ortus recorded mortality percentage from 38.6% to 53.33% at concentration (0.5% and 2.0%), respectively.

THE TOXIC EFFECT OF SOME PLANT EXTRACTS

Table (1): Efficiency of the plant extracts with different solvents and acaricide (Ortus) against adult females of spider mite, *Tetranychus urticae* Koch when fed on castor bean leaves (*Ricinus communis* L.) one, 3 and 7 days after treatment at 25±2°C and 65±5% RH.

Treatment	Conc.	One day		3 days		7 days	
		Corrected mortality%	LC ₅₀	Corrected mortality%	LC ₅₀	Corrected mortality%	LC ₅₀
Sunflower	0.5	0.667	14.967	1.33	8.546	4.00	1.306
	1.0	1.333		4.66		20.00	
	1.5	2.667		7.33		61.33	
	2.0	6.667		13.33		87.33	
Castor bean leaves with petroleum ether	0.5	2.000	310.826	7.33	6.118	22.667	1.268
	1.0	2.000		9.33		42.00	
	1.5	3.333		10.00		49.333	
	2.0	5.333		10.66		70.00	
Castor bean leaves with hexane	0.5	0.667	269.289	1.33	70.251	37.33	1.441
	1.0	1.333		2.00		42.667	
	1.5	2.000		5.33		46.00	
	2.0	2.667		15.33		59.333	
Castor bean leaves with water	0.5	0.00	-	0.67	9137.61	12.667	3.717
	1.0	0.00		4.00		18.66	
	1.5	0.00		4.00		28.66	
	2.0	0.00		4.33		37.33	
Ortus	0.5	68.600	0.176	38.60	1.869	26.66	2.667
	1.0	73.33		40.00		35.66	
	1.5	80.00		46.66		37.33	
	2.0	86.66		53.33		48.66	

Table (2): Efficiency of the plant extracts with different solvents and acaricide (Ortus) against adult females of spider mite, *Tetranychus urticae* Koch when fed on egg plant leaves *Solanum melongena* (Nees) one, 3 and 7 days after treatment at 25±2°C and 65±5% RH.

Treatment	Conc.	One day		3 days		7 days	
		Corrected mortality%	LC ₅₀	Corrected mortality%	LC ₅₀	Corrected mortality%	LC ₅₀
Castor bean leaves with hexane	0.5	1.33	8.069	4.00	2.308	15.33	0.924
	1.0	4.00		20.66		67.33	
	1.5	9.33		26.66		69.33	
	2.0	12.66		46.00		83.33	
Castor bean leaves with petroleum ether	0.5	1.33	35.906	7.33	2.668	60.00	0.362
	1.0	1.33		10.66		78.66	
	1.5	4.00		25.33		81.33	
	2.0	6.00		44.00		92.66	
Sunflower	0.5	1.33	18.814	6.66	4.205	30.00	0.875
	1.0	4.00		17.33		54.00	
	1.5	8.00		21.33		84.00	
	2.0	8.00		31.33		87.33	
Castor bean leaves with water	0.5	0.667	1078.46	0.67	6.937	37.33	1.149
	1.0	0.667		3.33		51.33	
	1.5	1.33		5.33		51.33	
	2.0	2.00		12.66		58.00	
Ortus	0.5	76.30	0.133	42.30	0.778	26.66	2.096
	1.0	80.00		46.66		32.66	
	1.5	86.66		66.66		40.00	
	2.0	93.33		86.68		53.33	

ABOU EL-NOUR et al.

After 7 days in case of sunflower extract and castor bean leaves extract with petroleum ether, hexane and water, the mortality percentage ranged from 4.0% to 87.33% & 22.667% to 70.00% & 37.33% to 59.333% and 12.667% to 37.33% at concentration 0.5% and 0.2%, respectively. The mortality percentage after treatment with Ortus ranged from 26.66% to 48.60% at 0.5% and 2.0% concentration respectively.

Data in Table (2) records the efficiency of the plant extracts to adult female of *T. urticae* Koch using egg plant leaf discs after 24 hours, 3 and 7 days. Castor bean leaves extract with hexane after one day recorded mortality percentage 12.66% and 1.33% at concentration 2.0% and 0.5% then sunflower recorded 8.00% and 1.33% mortality at concentration (2.0% and 0.5%). Castor bean leaves extract with petroleum ether recorded 6.00% and 1.33% mortality percentage at the same concentration. The castor bean leaves extract with water recorded 2.00% and 0.667% while Ortus mortality percentage ranged from 93.33% to 76.3% at concentration 2.0% and 0.5% respectively. Results indicated that after 3 days, sunflower recorded 46.00% and 4.00% mortality at concentration (2.0% and 0.5%), castor bean leaves extract with hexane recorded 44.00% and 7.33% mortality percentage at concentration (2.0% and 0.5%), then castor bean leaves extract with petroleum ether recorded 31.33% and 6.66% mortality percentage at the used concentration. The castor bean leaves extract with water recorded 12.66% and 0.67% mortality at concentration (2.0% and 0.5%). The mortality percentage ranged from 86.68% to 42.3% at concentration 2.0% and 0.5%, respectively for Ortus.

After 7 days, in case of castor bean leaves extract with petroleum ether mortality percentage ranged from 92.66% to 60.00% at concentration (2.0% and 0.5%), for castor bean leaves extract with

THE TOXIC EFFECT OF SOME PLANT EXTRACTS

hexane ranged from 83.33% to 15.33% at concentration (2.0% and 0.5%). Treatment with castor bean leaves extract with water gave mortality 58.00% to 37.33% while with sunflower it gave mortality 87.33% to 30.0% at concentration 2.0% and 0.5%.

In Table (3) data showed that the efficiency of the plant extracts after 7 days from the treatment on castor bean leaves.

Mortality percentage which recorded ranged from 48.00% to 0.00% at concentrations (2.0 % 0.5%), respectively for sunflower.

In castor bean leaves extract with petroleum ether, hexane and water mortality percentage ranged from 17.6% to 0.0%, 19.2% to 0.0% and 4.5% to 0.0% at concentrations (2.0% & 0.5%), respectively. On the other hand, acaricide Ortus recorded from 36.3% to 8.5% at concentrations (2.0% & 0.5%) respectively.

Data showed that there was no observed toxicity effect of all plant extracts or Ortus acaricide on the adult female's predatory mite after 24 and 72 hours from the treatment.

Data in Table (4) showed mortality percentage which recorded ranged from 26.00% to 0.00% at concentrations (2.0% and 0.5%), respectively for sunflower. Castor bean leaves extract with petroleum ether, hexane and water mortality percentage ranged from 31.0 to 0.0%, 18.5% to 0.0% and 5.0% to 0.0% at concentrations (2.0% & 0.5%), respectively. On the other hand, acaricide Ortus recorded from 9.2% at 0.5% and 37.9% at 2.0% concentration.

ABOU EL-NOUR et al.

Table (3): Efficiency of the plant extracts with different solvents and acaricide (Ortus) against adult females of predatory mite, [*Amblyseius gossipi* (El-Badry), *Euseius scutalis* Athias-Henriot] on castor bean leaves (*Ricinus communis* L.) 7 days after treatment at 25±2°C and 65±5% RH.

Treatment	Conc.	Corrected mortality%	LC ₅₀
Sunflower	0.5	0.0	85.689
	1.0	4.0	
	1.5	9.0	
	2.0	18.0	
Castor bean leaves with petroleum ether	0.5	0.0	101.172
	1.0	5.0	
	1.5	6.6	
	2.0	17.6	
Castor bean leaves with hexane	0.5	0.0	93.959
	1.0	5.6	
	1.5	10.3	
	2.0	19.2	
Castor bean leaves with water	0.5	0.0	556.626
	1.0	1.6	
	1.5	3.2	
	2.0	4.5	
Ortus	0.5	8.5	102.356
	1.0	15.6	
	1.5	27.2	
	2.0	36.3	

Table (4): Efficiency of the plant extracts with different solvents and acaricide (Ortus) against adult females of predatory mite, [*Amblyseius gossipi* (El-Badry), *Euseius scutalis* Athias-Henriot] on egg plant leaves *Solanum melongena* (Nees) 7 days after treatment at 25±2°C and 65±5% RH.

Treatment	Conc.	Corrected mortality%	LC ₅₀
Sunflower	0.5	0.0	75.381
	1.0	6.0	
	1.5	11.0	
	2.0	26.0	
Castor bean leaves with petroleum ether	0.5	0.0	58.067
	1.0	7.0	
	1.5	17.5	
	2.0	31.0	
Castor bean leaves with hexane	0.5	0.0	76.562
	1.0	3.2	
	1.5	8.3	
	2.0	18.5	
Castor bean leaves with water	0.5	0.0	639.729
	1.0	2.0	
	1.5	3.0	
	2.0	5.0	
Ortus	0.5	9.2	139.468
	1.0	16.6	
	1.5	27.9	
	2.0	37.9	

DISCUSSION

The present study deals with general toxicological effects of some plant extracts (castor bean leaves with certain solvents hexane, petroleum ether and water, sunflower seeds with ethanol and Ortus) were tested against *Tetranychus urticae* Koch when fed on leaves of two different host plants (castor bean and egg plant leaves) and the predacious mite, *Amblyseius gossipi* (EL-Badry).

Many investigators proved that they were effective against phytophagous mites when tested in laboratory Singh *et al.* (1996), Ismail (1997), Abbassy *et al.* (1998) and AbdEl-Wahab (2003).

The results revealed that, the sun flower was the most toxic plant extract to adult females of *Tetranychus urticae* followed by castor bean leaves extracts with different solvents (hexane, petroleum ether and water). These results are in agreement with the findings of Doik *et al.* (2000).

The lowest mortality recorded on *T. urticae* Koch fed on castor bean than eggplant leaves was the treatment with castor bean extract with water, these results agree with the finding of El-Halawany *et al.* (1989).

The high concentration of the different plant extracts had a significant effect and resulted in a high percentage of mortality which agrees with the findings of Abd El-Wahab (2003). All tested extracts were more toxic to the prey than to the predator. These results similar to those founded by Jackel and Schmidt (1999) and Souliotis *et al.* (2000).

REFERENCES

- Abbassy, M. A.; El-Gougray, O. A.; El-Hamady, S. and Sholo, M. A. (1998): Insecticidal, acaricidal and synergistic effects of soosan *Pancreatium maritimum*, extracts and constituents. J. Egypt. Soc. Para., 28 (1): 197-205.
- Abbott's, W. S. (1925): A methods for computing the effectiveness of an insecticide. J. Econ. Entomol., 18 (7): 265.
- Doik, K.; Paik, C.; Park, J.; Kim, S.; Kim, D. I.; Paik, C. H.; Park, J. D.; Kim, S. S. and Kim, S. G. (2000): Relative toxicity of neem Azal-T/s to the predacious mite, *Amblyseius womersleyi* (Acari : Phytoseiidae) and the two spotted spider mite, *Tetranychus urticae* (Acari : Tetranychidae). Korean J. Appl. Entomol., 39 (1): 53-58.
- El-Badry, E. A. (1967): Five new phytoseiid mites from UAR with collection notes on three other species (Acarina : Phytoseiidae). Ind. J. Entomol., 29: 177-184.
- El-Beheiry, M. M.; Hasa, A. A. and Hoda, F. M. (1987): The relationships between diet, biological aspects and susceptibility to different pesticides of the predatory mite, *Amblyseius gossipi* (El-Badry). J. Agric. Res. Tanta Univ., 13 (4): 1177-1184.
- El-Halawany, M.E.; Ebrahim, G.A; Abo-El-Ghar, G. and Nassar, M. Z. (1989): Repellency and toxic effects of certain plant extracts on *Tetranychus arabicus* Attiah (Acarina: Tetranychidae). Agric. Res. Rev., 67: 69-74.
- Hosney, A. H.; Keratum, A. Y.; Salama, M. A. and Derballa, A. S. (2001): Fungicidal and acaricidal activity of some pesticides against *Alternaria solani* and *Tetranychus urticae*. J. Pest Cont. & Environ. Sc., 9 (1): 73-92.

- Ismail, S. M. M. (1997): Selectivity and joint action of melia azadrach L-fruit extracts with certain acaricides to *Tetranychus urticae* Koch and *Stethorus gilvifrons*. Mulsant. Annl. Agric. Sc. Moshtohor, 35 (1): 605-618.
- Jackel, B. and Schmidt, H.U. (1999): Plant extracts : possibilities and limitations .2. Reduction of damage by pests and effects of plant extracts on non-target organisms. Gesunde-Pflanzen, 51 (4): 101-108.
- Potenza, M.R.; Takmatsu, A.P. and Benedicote, L.H. (1999): Evaluation of plant extracts on the control of *Tetranychus urticae* Koch (Acari: Tetranychidae) in the laboratory conditions. Biologico-Sao-Paulo, 66(2): 91-97.
- Siegler, E. H. (1947): Leaf disc technique for laboratory tests of acaricides. J. Econ. Entomol., 40: 441-442.
- Singh, R. N.; Prithiviraj; Sigh, V. P.; Singh, P. K. and Wagner, K. G. (1996): Effect of a join on *Tetranychus urticae* Koch as compared with some pesticides. Zeitschrift fur Pflanzenkrankheiten und Pflanzenschutz J. Plant Diseases pf Production, 103 (2): 195-199.
- Souliotis, P. P.; Printziou, M. D. and Malissiova, Z. D. (2000): Side effects of Neemark (*Azadirachta indica* A. Juss) and two new vegetable oils formulation on *Tetranychus urticae* Koch and its predator, *Phytoseiulus persimilis* Athias-Henriot. Bolletino di Zoologia Agraria-e-di-Bachicoltura, 32 (1): 25-33.
- Su, H.C.F. (1985): Laboratory study of effects of *Anethum graveolens* seeds on four species of stored product insects. J. Economic Ent., 78(2):451-453
- Sun, Y. P. (1950): Toxicity index an improved method of comparing the relative toxicity of insecticides. J. Econ. Entomol., 43: 45-53.

تأثير سمية بعض المستخلصات النباتية ومبيد الأوريس ضد أكاروس العنكبوت الأحمر والمفترس الأكاروسي

بسمه محمد أبو النور*، شلبي حسن حسن**، نيفين فوزى عرفات**.*
*كلية العلوم (بنات) جامعة الأزهر
**معهد بحوث وقاية النبات- مركز البحوث الزراعية- الدقى- جيزة-مصر.

أجريت تجربة معملية في معمل معهد بحوث وقاية النباتات لدراسة فاعلية بعض المستخلصات النباتية (مستخلص الماء لبذور عباد الشمس ومستخلص أوراق الخروع مع بعض المذيبات مثل الهكسان والبتروليم إيثر والماء) علي أنثي العنكبوت الأحمر ذو البقعتين المتغذية علي أوراق الخروع والباذنجان ومفترسة مع عمل مقارنة باستخدام المبيد الأكاروسي الأوريس وأخذت النتائج بعد ٢٤ ساعة، ٣ أيام، ٧ أيام بعد المعاملة. أوضحت النتائج أن:

- (١) أعلي تأثير زيادة لمستخلص عباد الشمس ضد أنثي العنكبوت الأحمر المتغذية علي أوراق الخروع وعندما تغذت علي أوراق الباذنجان كان أعلى تأثير زيادة لمستخلص الخروع مع مذيب الهكسان بعد ٢٤ ساعة من المعاملة.
- (٢) وبعد ٧٢ ساعة من المعاملة مع التغذية علي نبات أوراق الخروع كانت اعلي نسبة زيادة لمستخلص الخروع مع الهكسان ومع التغذية علي نبات أوراق الباذنجان كانت أعلى نسبة زيادة لمستخلص عباد الشمس بينما بعد ٧ أيام من المعاملة مع تغذية أنثي العنكبوت الأحمر علي أوراق الخروع وأوراق الباذنجان كانت أعلى نسبة زيادة لمستخلص الخروع مع مذيب البتروليم إيثر.
- (٣) وأيضا أظهرت النتائج أن تأثير أعلي إنخفاض في تعداد المفترس كانت بعد ٧ أيام من المعاملة مع مستخلص عباد الشمس عند تغذية المفترس علي العنكبوت الأحمر المتغذي علي أوراق الخروع وعند التغذية علي أوراق الباذنجان كانت أعلى زيادة لمستخلص الخروع مع مذيب البتروليم إيثر.
- (٤) يتبين من ذلك أن المستخلص تزداد كفاءته وتصل الي أقصاها بعد اليوم السابع من المعاملة حيث تكون نسبة الإبادة عالية جدا بينما تأثير المبيد الأكاروسي الأوريس تقل كفاءته وتصل الي أدها بعد اليوم السابع حيث كانت الإبادة في أعلى معدلاتها بعد ٢٤ ساعة من المعاملة..
- (٥) وقد تبين من النتائج السابقة أن مستخلص الهكسان والبتروليم إيثر لأوراق الخروع أعلى في الإبادة ضد العنكبوت الأحمر عنه في المعامل بمستخلص الماء لأوراق الخروع. وقد تبين من النتائج السابقة أن جميع المستخلصات والمبيد الأكاروسي لهم تأثير أقوى كنسبة زيادة للعنكبوت الأحمر عنه علي المفترس.