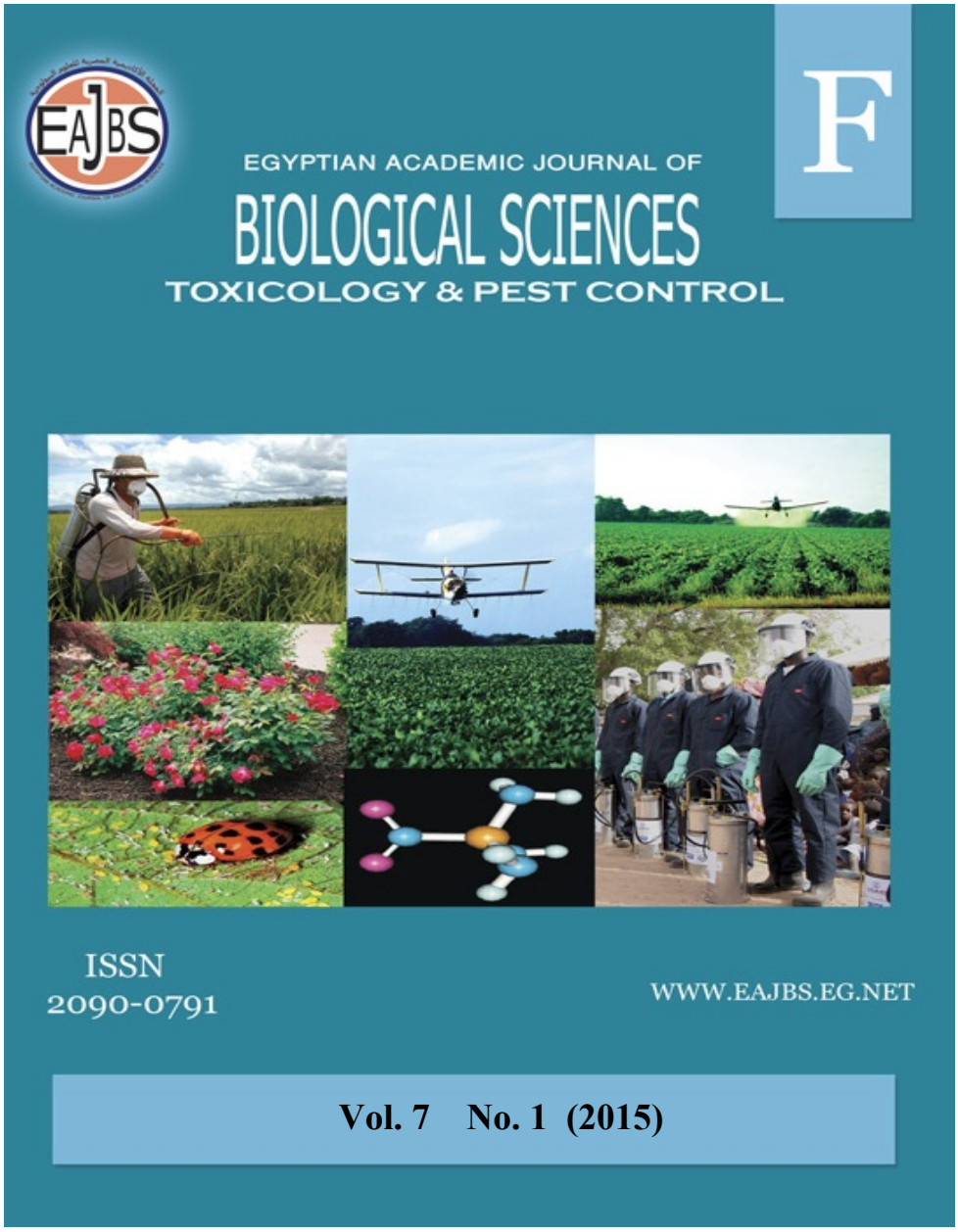

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Citation :*Egypt.Acad.J.Biolog.Sci. (F.Toxicology &Pest control) Vol.7(1)pp145-152(2015*

Egypt. Acad. J. Biolog. Sci., 7(1): 145-152 (2015)

Egyptian Academic Journal of Biological Sciences
F. Toxicology & Pest control
ISSN: 2090 - 0791
www.eajbs.eg.net

Efficacy of Natural Compounds on The Pear Psylla, *Cacopsylla pyricola* (Hemiptera: Psyllidae), The Olive Scale Insect, *Parlatoria oleae* (Hemiptera: Diaspididae) and Their Natural Enemies in Pear Orchards in Egypt

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ARTICLE INFO

Article History
Received: 30/10/2015
Accepted: 1/11/2015

Key words:
Natural compounds, the pear psylla, *Cacopsylla pyricola* , Egypt.

ABSTRACT

Recently, the pear psylla, *Cacopsylla pyricola* (Förster) (Hemiptera : Psyllidae) and the olive scale insect, *Parlatoria oleae* (Colvee) (Hemiptera: Diaspididae) are the most important pests on pear trees in different locations in Egypt. The main purpose of this investigation is to investigate the effect of some different natural control compounds on the pear psylla, the olive scale and their natural enemies on pear trees in Ismailia and Gharbia Governorates throughout May and October 2013-2014, respectively. In the first season results indicated that, ,the four compounds (Jojoba oil, *Peacilomyces fumosoroseus,* Azadrachtin and *Verticellium lecanii*) gave moderate toxic effect against *C. pyricola* population nymphs and its predator, *Orius laevigatus* (Fieber) (Hemiptera: Anthocoridae). Mineral oil and Sulphur compounds gave 78.6% and 74.9 % and 70.3 % and 66.9 %of *C. pyricola* populations nymphs and its predator, *O.* laevigatus, respectively. On the other hand, *Malathion* gave high efficacy against nymphs of *C. pyricola* (88.0%) and its predator, O. *laevigatus* (82.5%). In the second season, the results indicated the same trend to which obtained in the first year. While, in the first season, for *P. oleae* populations and its parasitoid, Aphytis lingnanensis Compere (Hymenoptera:Aphelinidae) the results indicated that, the above mentioned gave moderate toxic effect . Mineral oil and Sulphur compounds gave 77.7 % & 73.9% and 70.2 % and 66.2 %% of *P. oleae* populations and its parasitoid, *A. lingnanensis*, respectively. While, *Malathion* gave high efficacy against *P. oleae* populations (87.0%) and its parasitoid, *A. lingnanensis* (82.9%) . In the second season, the results indicated that the same trend to the first year. It could concluded that treatments with Jojoba oil , *P. fumosoroseus,* Azadrachtin and *V. lecanii* gave moderate effect of the pear psylla and the olive scale and their natural enemies (parasitoid and predator), when comparing with Mineral oil, Sulphur and Malathion. This conclusion will be help in integrated pest management program of the two pests infested pear in Gharbia and Ismailia, Governorates.

INTRODUCTION

The pear psylla, *Cacopsylla pyricola* (Förster) (Hemiptera : Psyllidae) is the most serious species of pears and distributed in different parts of the world (Hodgson & Mustafa, 1984; Solomon *et al*., 1989; Horton *et al*., 1992; Horton, 1994; Alston & Murray, 2007 and Brown, 2008). In Egypt, it is a new emerged pest detected in pear orchards of Al-Arish, North Sinai and Ismailia Governorates (Ahmed, 2007).

Nymphs and adults of the pear psyllid are phloem feeders. Honeydew, produced by nymphs, drips or runs onto fruit, causing dark russet blotches or streaks. This results in downgrading of fresh and sometimes process in fruit in large numbers, pear psylla can stunt and defoliate trees and cause fruit drop. A carry-over effect may reduce fruit set the following year. These symptoms, called psylla shock, are caused by toxic saliva injected into the tree by feeding nymphs. When psylla are controlled to prevent fruit russet, psylla shock does not occur. Pear psylla also transmits a mycoplasma disease organism through its saliva. The disease damages sieve tubes in the phloem, which prevents synthesized nutrients moving down the tree and results in root starvation. Diseased trees may either decline slowly or collapse suddenly and then die (Hodgson & Mustafa, 1984 and Solomon *et al*., 1989).

Pear psylla's status as a major pest of pears is based on its damage potential and its ability to develop resistance to insecticides. The control of population numbers of pear psylla implies reducing stand instability (pear plantings) by combined methods: reduced insecticide application, use of specific insecticides-psyllocides, monitoring population of natural predators and creating conditions favouring their development and maintainance, introduction of less susceptible and 146 resistant pear cultivars and optimal pruning and other cultural measures (Injac, 1992 and Stamenkovic & Milenkovic, 1992).

The olive scale, *Parlatoria oleae* (Colvee) (Hemiptera: Diaspididae) infested different host plants especially economic crops , apple, plum, olive, pear and peach trees in Egypt (El-Minshawy *et al.*,1974).It is a serious pest on fruit and nut trees, on ornamental shade trees, shrubs and on ground covers, on forest trees, in greenhouses and on indoor plantings. Polyphagous pest that is introduced to new geographic areas is usually of higher economic importance. The main injury caused by this insect is the ingestion of plant sap. Its damage is manifested in reducing the number of healthy plant. Severely infested plants grow poorly and may drop leaves prematurely and suffer dieback of twigs and branches (Miller and Kosztarab, 1979).

Abdel-Megeed *et al.* (1992) evaluated the efficiency of conventional insecticids for the control of *P. oleae*. While Mohamed (2002) tested non-conventional insecticides in controlling *P. oleae.*

The aim of this work is to study the effect of different natural control compounds on the pear psylla, the olive scale and their natural enemies on pear trees in Ismailia and Gharbia Governorates.

MATERIAL AND METHODS

Material used:

Jojoba oil: Al kanz 2000 70% WE The application rate 10 ml /LW.

Sulphar WP S8 **:**The application rate 2.5 mg/LW.

Paecilomyces fumosoroeus **(Priority) :**An entomopathogenic fungi: 1 $\times 10^8$ unite/cm^3 (100 million), containing the fungus *P. fumosoroeus* , used at a rate of 5ml/LW.

Azadirachtin Azadirachtin *(Azadirachtin indica)* The application rate 5ml/L W. ***Verticellium Lecanii*:**An entomopathogenic fungi : 1 $\times 1.0^8$ unite/cm^3 (100 million), containing the fungus *V.lecanii,* Used at a rate of 5 ml/L W.

Mineral oil 96.6% EC: 9-fluoro-11B, 16 α, 17.21-tetrahydroxy pregna-1,4-diene-3,20- dione cyclic 16,17-acetal with acetone 15 ml/ L W.

Malathion 57% EC: a chemical insecticide of the common name Malathion and the chemical name, O,O-dimethyl-S- (1,2-dicarbethoxyethyl)

dithio-phosphate. It was applied at a rate of 1.5 ml/ L W.

Experimental design:

This study was conducted in Ismailia and Gharbia Governorates, Egypt, using pear infested by the pear psylla and the olive scale, respectively. Four experiments were conducted during May and October (2013) and repeated in the second season May and October (2014), respectively. In each treatment, 10 trees (replicates) were sprayed with one of the tested compounds or water (control). The compounds were applied using a knapsack sprayer (20 liters). The sample consists of 60 leaves, which were randomly collected. The pear psylla, the olive scale insect and their natural enemies (parasitoid and predator) were counted just before spraying and 1, 2 and 3 weeks after spraying. Samples were kept in fine perforated paper bags and transferred to the laboratory for careful examination; populations of the two pests and their natural enemies were counted by the aid of a stereomicroscope. Each leaf with petiole was stored in glass emergence tube and monitored daily for parasitoid emergence and counted the predators.

Statistical Analysis:

In four experiments, the percent reduction of infestation was calculated according to the equation of (Henderson and Tilton , 1955). The data was subjected to analysis of variance (ANOVA) and the means were compared by LSD test at 0.05 level, using SAS program (SAS Institute, 1988).

RESULTS AND DISCUSSION

The efficacy of natural compounds on pear psylla, *Cacopsylla pyricola* and its predator, *Orius laevigatus*:

In the first season (2013):

In the first season, the average of pre-treatments count of *C. pyricola* nymphs and its predator, Orius laevigatus (Fieber) (Hemiptera: Anthocoridae) were 48.3-55 and 15-23/leaf (Table 1).

Table 1: Average numbers of the pear psylid, *Cacopsylla pyricola* and its predator, *Orius laevigatus* after treatment with different compounds on olive trees during the first season (2013)

Treatment	Rate of Applic. /L.W.	Pre treatment count		Post spraying count after:						Average number		
				3		7		15				
		N	P	N	P	N	P	N	P	N	P	T
Jojoba oil	10ml	48.3	15	28.6	9.6	30	11	42.2	14.8	33.6	11.8	22.7
Azdrachtin	10ml	50	16.9	28	10.5	29.2	11.8	41	14.8	32.7	12.4	22.6
Verticellium lecanii	2.5gm	55	23	30	13.6	28.3	14	37.1	18.2	31.8	15.3	23.6
Peacilomyces fumosoroseus	5ml	51	17.4	26.1	10.0	24.5	9.9	33.9	13.5	28.2	11.1	19.7
Sulphur	5ml	53	19	24.9	9.8	23.8	10.3	22.5	10.1	23.7	10.1	16.9
Mineral oil	5ml	49	16.3	18.2	6.9	15.5	6.6	13	5.9	15.6	6.2	10.9
Malathion	2 gm	52.3	18.5	14.1	6	11.4	5.3	6.2	3.7	10.6	5.0	7.8
Control		54	21	67	26.5	83	35	103	43	84.3	34.8	59.6

N: Nymphs P. Predator T: Total

Results in Table (2) indicated that in the first year, the four compounds, (Jojoba oil, *P. fumosoroseus*, Azadrachtin and *V. lecanii*) gave moderate toxic effect against nymphs population of *C. pyricola* and its predator, *O. laevigatus* and percent reduction ranged between 55.6-64.3 % and 52.4- 60.9%, respectively. Mineral oil and Sulphur compounds gave 78.6%&74.9% and 70.3 % & 66.9 % nymphs population of *C. pyricola* and its predator, *O. laevigatus*, respectively. On the other hand, *Malathion* gave high efficacy against nymphs of *C. pyricola* (88.0%) and its predator, *O. laevigatus* (82.5%) (Table 2). Results of statistical analysis (F value and L.S.D.) (Table 2) showed that seven treatments had significant effect on populations.

Table 2: Reduction percentage of different compounds on the pear psylid, *Cacopsylla pyricola* and its predator, *Orius laevigatus* on olive trees during the first season (2013).

Treatment	Rate of Applic. /L.W.	%Reduction after:						Average %reduction		
		3		7		15				
		N	P	N	P	N	P	N	P	T
Jojoba oil	10ml	52.9	49.3	59.6	56	54.2	51.9	55.6d	52.4d	54
Azdrachtin	10ml	54.9	50.8	62.1	58.2	57.1	54.1	58.0cd	54.4d	56.2
Verticellium lecanii	2.5gm	56.1	53.2	66.6	63.5	64.7	61.4	62.5cd	59.4cd	60.95
Peacilomyces fumosoroseus	5ml	58.8	54.5	68.8	65.9	65.2	62.2	64.3cd	60.9cd	62.6
Sulphur	5ml	62.2	59.2	70.8	67.5	77.8	74.1	70.3bc	66.9bc	68.6
Mineral oil	5ml	70.1	66.5	79.5	75.8	86.1	82.4	78.6ab	74.9ab	76.75
Malathion	2 gm	78.3	74.3	85.9	82.9	99.8	90.3	88.0a	82.5a	85.25
F value								8.70	9.34	
L.S.D.								12	10.92	

N: Nymphs P. Predator T: Total

In the second season, 2014:

In the second season, the average pre-treatment count of *C. pyricola* nymphs and its predator, *O. laevigatus* were 48.7-53.7 and 18.3-21.3/leaf (Table 3). Results in Table (4) indicated that in the first year, the four compounds (Jojoba oil, *P. fumosoroseus,* Azadrachtin and *V.lecanii*) gave moderate toxic effect against *C. pyricola* population nymphs and its predator , *O.* laevigatus and percent reduction ranged between 57.8-66.9 % and 54.5- 63.8%, respectively.

Table 3: Average numbers of the pear psylid, *Cacopsylla pyricola* and its predator, *Orius laevigatus* after treatment with different compounds on olive trees during the second season (2014).

Treatment	Rate of Applic. /L.W.	Pre spraying count		Post treatment count after:						Average number		
				3		7		15				
		N	P	N	P	N	P	N	P	N	P	T
Jojoba oil	10ml	53.7	21.3	29.8	13.4	33	15.5	44	21.1	35.6	16.7	26.2
Azdrachtin	10ml	49	18.6	26	11.4	28.5	12.8	38.6	18	31.0	14.1	22.6
Verticellium lecanii	2.5gm	50.5	19.2	25	10.8	24.2	11	34	15.9	27.7	12.6	20.2
Peacilomyces fumosoroseus	5ml	52	20.8	24.4	11.1	23.8	11.3	32	16.2	26.7	12.9	19.8
Sulphur	5ml	48.7	18.3	21	9.1	20.3	9.3	19.4	9.2	20.2	9.2	14.7
Mineral oil	5ml	51.3	19.6	18.7	8.5	16.8	8	12.8	6.9	16.1	7.8	12.0
Malathion	2 gm	53.5	21.0	15.1	7.2	11.7	6.1	4.8	3.7	10.5	5.7	8.1
Control		50.0	19.0	61.9	24.9	78	32	96	41.5	78.6	32.8	55.7

N: Nymphs P. Predator T: Total

Table 4: Reduction percentage of different compounds on the pear psylid , *Cacopsylla pyricola* and its predator, *Orius laevigatus* on olive trees during the second season (2014).

Treatment	Rate of Applic. /L.W.	%Reduction after:						Average %reduction		
		3		7		15				
		N	P	N	P	N	P	N	P	T
Jojoba oil	10ml	55.2	52	60.7	56.8	57.4	54.7	57.8d	54.5d	56.2
Azdrachtin	10ml	57.2	53.3	62.8	59.2	59	55.7	59.7d	56.1d	57.9
Verticellium lecanii	2.5gm	60.1	57.1	69.3	66	65	62.1	62.8cd	61.7cd	62.3
Peacilomyces fumosoroseus	5ml	62.1	59.3	70.7	67.8	68	64.4	66.9cd	63.8cd	65.4
Sulphur	5ml	65.2	62.1	73.3	69.9	79.3	77	72.6bc	69.7bc	71.2
Mineral oil	5ml	70.6	67	79.1	75.8	87.1	83.9	78.9ab	75.6ab	77.25
Malathion	2 gm	77.3	73.9	86	82.8	95.4	92	86.2a	82.9a	84.6
F value								8.76	8.61	
L.S.D.								10.6	10.71	

N: Nymphs P. Predator T: Total

Mineral oil and Sulphur compounds gave 78.9 %& 75.6% and 72.6 % & 69.7% of *C. pyricola* population nymphs and its predator, *O.*

laevigatus, respectively. On the other hand, *Malathion* gave high efficacy against nymphs of *C. pyricola* (86.2%) and its predator, *O. laevigatus* (82.9%) (Table 4). Results of statistical analysis (F value and L.S.D.) (Table 4) showed that seven treatments had significant effect on populations.

In the present work, *Malathion* gave high efficiency against nymphs of *C. pyricola* and its predator, *O. laevigatus*. While results of (Krysan, 1990) had a contradicting effect. Results indicated that organophosphorous insecticide (Basudin), was not efficient enough on pear psylla. The results of Erler (2004a, b, c) suggested that the botanical insecticides Aksebio2 (a natural botanical product) could used in psylla control instead of synthetic insecticides and may serve as an IPM component in pear orchards .But here the botanical extracts Azadrachtin gave moderate toxic effect against population nymphs of and its predator, *O. laevigatus*.

The efficacy of natural compounds on olive scale, *Parlatoria oleae* and its parasitoid, *Aphytis lingnanensis*:

In the first season, 2013:

In the first season, the average pre-spraying counts of *P. oleae* population and its parasitiod, *Aphytis lingnanensis* Compere (Hymenoptera: Aphelinidae) were 54-61 and 19-26/leaf (Table 5). Results in Table (6) indicated that in the first year, the four compounds (Jojoba oil, *P. fumosoroseus,* Azadrachtin and *V. lecanii*) gave moderate toxic effect against population of *P. oleae* and its parasitiod, *A. lingnanensis* and percent reduction ranged between 57.7-66.8 % and 54.5-65.9%, respectively.

Table 5: Average numbers of the armored scale insect, *Parlatoria oleae* and its parasitoid, *Aphytis lingnanensis* after treatment with different compounds on olive trees during the first season (2013).

Treatment	Rate of Applic. /L.W.	Pre treatment count		Post treatment count after:						Average number		
				3		7		15				
		P.	Pa	P.	Pa	P.	Pa	P.	Pa	P.	Pa	T
Jojoba oil	10 ml	57	22	32	13	31	13.8	39	18.7	34	15.2	24.6
Azdrachtin	10 ml	54	19	29	10.7	27	11.2	35.7	15.6	30.6	12.5	21.6
Verticellium lecanii	2.5 gm	59	24	28.4	12.5	25.2	12.1	33.5	16.8	29.0	13.8	21.4
Peacilomyces fumosoroseus	5 ml	56	21	26	10.5	22.8	10.0	29.4	14.2	26.1	11.6	18.9
Sulphur	5 ml	61	26	27	12.7	25.4	12.9	23.4	13.3	25.3	13.0	19.2
Mineral oil	5 ml	58	23	22	9.9	18	9	13	7	25.1	8.6	16.9
Malathion	2 gm	60	25	16	8.0	11	6.6	4	3.7	10.3	6.1	8.2
Control		59	24	72	29	83	36	95	44	83.3	36.3	59.8

P. Populations Pa. Parasitoid T. Total

Table 6: Reduction percentage of different compounds on the armored scale insect, *Parlatoria oleae* and its parasitoid, *Aphytis lingnanensis* on olive trees during the first season (2013).

Treatment	Rate of Applic. /L.W.	% Reduction after:						Average % reduction		
		3		7		15				
		P.	Pa	P.	Pa	P.	Pa	P.	Pa	T
Jojoba oil	10ml	54	51.5	61.4	58.2	57.6	53.7	57.7d	54.5c	56.1
Azdrachtin	10ml	56	53.4	64.5	60.8	59	55.3	59.8cd	56.5c	58.2
Verticellium lecanii	2.5gm	60.9	56.9	69.7	66.4	64.8	61.9	65.1cd	62.8c	64.0
Peacilomyces fumosoroseus	5ml	62	58.7	71.1	68.3	67.4	63.2	66.8bcd	65.9bc	66.4
Sulphur	5ml	63.8	59.6	70.5	67	76.2	72.1	70.2bc	66.2bc	68.2
Mineral oil	5ml	69	64.4	78	74	86.1	83.4	77.7ab	73.9ab	75.8
Malathion	2 gm	78.2	73.6	87	83.2	95.9	92	87.0a	82.9a	85.0
F value								8.45	7.29	
L.S.D.								10.73	11.20	

P. Populations Pa. Parasitoid T. Total

Mineral oil and Sulphur compounds gave 77.7 % & 73.9% and 70.2% & 66.2% of *P. oleae* population and its parasitiod, *A. lingnanensis*, respectively. On the other hand, *Malathion* gave high efficacy against *P. oleae* population (87.0%) and its parasitiod, *A. lingnanensis* (82.9%) (Table 6). Results of statistical analysis (F value and L.S.D.) (Table 6) showed that seven treatments had significant effect on populations.

In the second season, 2014:

In the second season, the average pre-spraying counts population of *P. oleae* and its parasitiod, *A. lingnanensis* were 55-61.5 and 18-27.2/leaf (Table 7). Results in Table (8) indicated that in the first year, the four compounds (Jojoba oil, *P. fumosoroseus,* Azadrachtin and *V. lecanii*) gave moderate toxic effect against population of *P. oleae* and its parasitiod, *A. lingnanensis* and percent reduction ranged between 60.0-66.3 % and 56.9-62.4%, respectively.

Table 7: Average numbers of the armored scale insect, *Parlatoria oleae* and its parasitoid, *Aphytis lingnanensis* after treatment with different compounds on olive during the second season (2014).

Treatment	Rate of Applic. / L.W.	Pre treatment count		Post treatment count after:						Average number		
				3		7		15				
		P.	Pa	P.	Pa	P.	Pa	P.	Pa	P.	Pa	T
Jojoba oil	10 ml	56	20	29	12.77	26.9	12.52	40.4	19.8	32.1	15.0	23.6
Azdrachtin	10 ml	60.7	25	32	16.7	30.9	16.2	42.5	24.2	35.1	19.0	27.1
Verticellium lecanii	2.5 gm	61.5	27.2	30.2	16.6	27.8	15.8	36.9	23	31.6	18.5	25.1
Peacilomyces fumosoroseus	5 ml	58	22	27.6	12.9	23.9	12.6	32.8	18	28.1	14.5	21.3
Sulphur	5 ml	60	24	25.9	13.1	24.3	12.9	21	12.79	23.7	12.9	18.3
Mineral oil	5 ml	59	22.6	20.7	10.5	18	9.9	14	8.8	17.6	9.7	13.7
Malathion	2 gm	55	18	15	6.7	10.8	5.3	2.5	2.7	9.4	4.9	7.2
Control		57.9	22	69.2	30	84.3	38.1	99	49	84.2	39.0	61.6

P. Populations Pa. Parasitoid T. Total

Table 8: Reduction percentage of different compounds on the armored scale insect, *Parlatoria oleae* and its parasitoid, *Aphytis lingnanensis* on olive trees during the second season (2014).

Treatment	Rate of Applic. /L.W.	%Reduction after:						Average %reduction		
		3		7		15				
		P.	Pa	P.	Pa	P.	Pa	P.	Pa	T
Jojoba oil	10ml	56.7	53.2	67.1	63.9	57.9	55.6	60.6c	57.6c	59.1
Azdrachtin	10ml	55.9	51.1	65.1	62.9	59.1	56.6	60.0c	56.9c	58.5
Verticellium lecanii	2.5gm	59	55.3	69	66.5	65	62.1	64.3c	61.3bc	62.8
Peacilomyces fumosoroseus	5ml	60.2	57	71.7	67	67	63.3	66.3bc	62.4bc	64.4
Sulphur	5ml	63.9	60	72.2	69	79.6	76.1	71.9bc	68.4bc	70.2
Mineral oil	5ml	70.7	66	79.1	74.8	86.2	82.6	78.7ab	74.5ab	76.6
Malathion	2 gm	77.2	72.8	86.6	83	97.4	93.3	87.1a	83.0a	80.1
F value								6.27	5.36	
L.S.D.								12.15	12.61	

P. Populations Pa. Parasitoid T. Total

Mineral oil and Sulphur compounds gave 78.7 %& 74.5 %and 71.9% &68.4 % of *P. oleae* population and its parasitiod, *A. lingnanensis*, respectively. On the other hand, *Malathion* gave high efficacy against *P. oleae* population (87.1%) and its parasitiod, *A. lingnanensis* (83.0%) (Table 8). Results of statistical analysis (F value and L.S.D.) (Table 8) showed that seven treatments had significant effect on populations.

The obtained results here observed that Mineral oil and *Malathion* gave high efficacy against *P. oleae* population and its parasitiod, *A. lingnanensis*. These results agreed with the results of Abdel-Megeed *et al.* (1992), they indicated that Sumithion and Sumi oil at the recommended rate, proved to be most effective, followed by KZ oil. Also, in

the present work, the natural compound, Jojoba oil gave moderate toxic effect, while Mineral oil and *Malathion* gave high efficacy against *P. oleae* population and its parasitoid *A. lingnanensis*. These results agreed with the findings of Mohamed (2002), who tested Sumithion 50% (fenitrothion) (organophosphorus compounds), Super Masrona (mineral oil 94% EC), Jojoba extract (Nat. 1) and Jojoba oil (Acarol) on *P. oleae*. The results of the conducted experiment revealed that oil alone or mixed with other materials held superior category all over the time .

It could concluded that treatment with Jojoba oil, *P. fumosoroseus,* Azadrachtin and *V. lecanii* gave moderate effect of the pear psylla and the olive scale and their parasitoid and predato , when comparing with Mineral oil, Sulphur and Malathion. This conclusion will be help in integrated pest management program of the two pests infested pear in Gharbia and Ismailia, Governorates.

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ARABIC SUMMARY

تأثير المركبات الطبيعية على سيلد الكمثرى و حشرة الزيتون القشرية وأعدائهما الحيوية على أشجار الكمثرى

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اصيبت الكمثرى حديثا بسيلد الكمثرى و حشرة الزيتون القشرية والتى تعتبرا الآن من اهم الآفات التى تصيب الكمثرى فى مصر. يعتبر الهدف الرئيسى هو دراسة تأثير بعض المركبات الطبيعية على سيلد الكمثرى و حشرة الزيتون القشرية وكذلك الأعداء الحيوية المرتبطة بهما فى محافظتي الغربية و الإسماعيلية اثناء شهرى مايو وأكتوبر 2013-2014 . أثبتت النتائج في الموسم الأول (2013) على سيلد الكمثرى ان المركبات الاربعة زيت الجوجوبا و فطريات *Peacilomyces fumosoroseus* *Verticellium lecanii* والنيم اعطت تأثيرا معتدلا ضد حوريات سيلد الكمثرى و المفترس المرتبط بهذه الآفة. اما الزيت المعدنى و الكبريت كان لهم تأثير على الافة والمفترس تراوح ما بين 66.9% الى 78.6 % اما المبيد الفوسفورى فقد كان له تأثيرا قويا على الافة والمفترس معا وفى العام الثانى (2014) فقد كانت النتائج مماثلة لنتائج للعام الاول . اما حشرة الزيتون القشرية فقد أثبتت النتائج في الموسم الأول (2013) أن المركبات الاربعة زيت الجوجوبا وفطريات *Peacilomyces fumosoroseus* *Verticellium lecanii* والنيم اعطت تأثيرا معتدلا ضد التعداد الحشرى للآفة و الطفيل المرتبط بهما. اما الزيت المعدنى و الكبريت كان لهم تأثير على الافة والطفيل تراوح ما بين 66.2% الى 77.7% اما المبيد الفوسفورى فقد كان له تأثيرا قويا على الافة والطفيل معا وفى العام الثانى (2014) فقد كانت النتائج مماثلة لنتائج للعام الاول . من خلال هذا العمل يتضح ان زيت الجوجوبا والفطريات المستخدمة الى جانب مستخلص النيم والذى كانت نتائجهما متوسطة فى التأثير على حشرتى سيلد الكمثرى و حشرة الزيتون القشرية و الاعداء الحيوية المرتبطة بهاتين الآفاتين اذا تم مقارنتهما ب الزيت المعدنى و الكبريت و الملاثيون. تساعد هذه النتيجة فى المكافحة المتكاملة للآفاتين على الكمثرى فى محافظتى الغربية و الاسماعيلية.