

FEASIBILITY OF USING THE PREDATORY MITE *Euseius scutalis* (ATHIAS - HENRIOT) IN CONTROLLING *Eutetranychus orientalis* (KLEIN) ON CITRUS TREES

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ABSTRACT

Trials were carried out under field conditions to evaluate the efficacy of the predatory mite, *Euseius scutalis* (A-H.) against citrus brown mite, *Eutetranychus orientalis* (Klein) on citrus trees at EL BEHERA Governorate. The predatory mite *E.scutalis* was released on January 2010 at rate 40-70 adult females per tree (according to the size of tree) when infestation level of the prey citrus brown mite *E.orientalis* reached 4.2 individuals per leaf of citrus. The percentage reduction of prey population density was 82.88 after 12 months of release, then decreased to 52.46% after 21 months. So, it was felt necessary to carry out the second release of *E.scutalis* on November 25, 2011 when the infestation with moving stages of *E.orientalis* reached 4.9 individuals per leaf. The reduction percentage of *E.orientalis* after 13 months from the second release of the predatory mite was 70.19%. To serve the biological control programme. The side effect of 9 acaricides and some mineral oils were also tested against the predator motile stages under field condition three acaricides (Vertimec, Cascade and Ortes) and mineral oils were harmless to the predatory mite, *E.scutalis* Thus, it is advisable to use these compounds in IPM programme.

INTRODUCTION

The citrus brown mite *Eutetranychus orientalis* (Klein) attacks citrus and causes great injury in leaves and fruits (Zaher and Wafa, 1970; Rasmy *et al.*, 1972; and Kandeel *et al.*, 1986).

Due to the excessive use of acaricides, some problems appeared especially due to the missed of beneficial species. Therefore, it seems necessary to look forward to the use of natural enemies which are considered one of the new approaches for controlling mite pests (McMurtry *et al.*, 1984 and McMurtry, 1986).

The predatory mite, *Euseius scutalis* (A-H.) is considered one of the important predatory mite that control tetranychoid mites in citrus orchards in Egypt (El-Halawany *et al.*, 1992 and 1993).

The present work threw light on the role of the predatory mite, *Euseius scutalis* (A-H.) in controlling citrus brown mite, *Eutetranychus orientalis* on citrus trees along with the use of some acaricides and mineral oil against *E. orientalis*

MATERIALS AND METHODS

A- Release of the predatory mite *Euseius scutalis*, (A.-H.) on citrus trees:

Five feddans of citrus orchard infested with the citrus brown mite, *E.orientalis* was chosen in El-Behera governorate for conducting the experi-

ment . The predatory mite, *E.scutalis* was released at a rate of 40 - 70 adult females per tree on January 9, 2010 when the average level of infestation was 4.2 prey individuals per leaf

Another feddan infested with *E.orientalis* was taken as check to be compared with the above mentioned orchard supplied with the predators. Groups of ten adult females of the predator were transferred to each leaf disc of citrus then inserted in every plastic tube (1 cm diameter and 5 cm deep). The tubes were locked up to prevent adult females from escape. These tubes were transported to the orchard in ice cooler box, to keep the predator inactive. From 4 to 7 tubes were fixed around the middle level and according to the size of the tree, with a distance of one meter apart. Monthly samples of 100 leaves were inspected using 20 x hand lens in both the release and check areas . The percentage reduction of motile stages of *E.orientalis* was calculated according to the equation of Henderson and Tilton (1955).

B- Side effects of acaricides and mineral oils on *E.sutalis* under Field conditions were measured. The experiment design was randomized complete blocks. Treatment was conducted on four replicates, each included more than 6 trees. A caricides and mineral oils used and rates of application are presented in Tables 3 and 4 spraying was made by motor sprayer of 600 liters capacity. Samples of 20 leaves of citrus were taken from each replicate the first just before spraying as pre-count and three samples after treatment at three day intervals. Percentage population reduction was assessed according to the equation of Hendrson and Tilton (1955).

RESULTS AND DISCUSSION

A- Efficiency of the predatory mite, *E.scutalis* on *Eutetranychus orientalis* on citrus trees.

Results in(Table 1)indicated that the reduction percentage of *E.orientalis* after six months of release was 87,58%, then decreased to 52.46% after 21 months of release. The second release of the predatory mite *E.scutalis* was done on November 25, 2011 at the rate of 4.9 *E.orientalis* individuals per leaf. The redudation percentage of *E.orientalis* after 13 months later was 70.19% (Table2). Similar findings were reported by McMurtry *et al.* (1984), McMurtry (1986), El-Halawany *et al.*, (1992 and 1993).

B- The side effect of 9 acaricides on the predatory mite, *E.scutalis* was studied under field conditions. Data in (Table 3) showed that Vertimec 1.8% EC, Cascade 10% DC and Ortes 5% EC were harmless. Percentages reduction in the predator populations were 23.55, 23.18 and 25.48, respectively. Challenger 24% sc ortes 5% sc. Nearon 50% wp and Nomite 10% WP., were slightly harmful giving 29.74, 31.98, 34.54 and 37.15% reduction in populations of the predator, respectively.

The rest of acaricides, Concer 24% sc and mangnefieco 5% Ec were moderately harmful giving reduction percentages of 52.96 and 62.59%, respectively.

Thus, it is concluded that Vertimec 1.8% EC, Cascade 10% Dc and Ortes 5% EC can be considered as harmless and challenger 24%sc Nearon

50% EC and Nomite 10% WP., as slightly harmful acaricides and can be used in integrated control programmes.

These results are confirmed by those of Pfeiffer (1985), Perugia *et al.*, (1986), and El-Halawany *et al.* (1987).

The three mineral oils Shekrona 95% EC, Shekrona super 95% EC, and Star oil 95% EC, were harmless against *Escutalis*, giving percentages reduction of 21.12, 24.58 and 24.03, respectively (Table 4) These results are in agreement with those of *El-Halawany et al.* (1987, 1992).

Table 1. Monthly numbers and percentages of reduction in *Eutetranychus orientalis* (Klein) population after release of the predatory mite, *Euseius scutalis* (A.-H.) on citrus trees at El-Behera Governorate

Sampling date	Numbers and reduction% of moving stages predator of <i>E. orientalis</i> /100 leaves after release of the predator		Untreated (Control)
	Numbers	Reduction%	
January 9,2010 pre-count before release of the predator	420	-----	835
February, 2010	140	76.8	1200
March	100	73.83	760
April	160	80.38	1620
May	150	82.46	1700
June	252	84.34	3195
July	293	87.58	4690
August	139	81.83	1520
September	130	69.60	850
October	2.21	68.64	1400
November	102	68.79	650
December	122	66.39	722
January, 2011	46	82.88	534
February	72	78.04	652
March	69	71.58	482
April	113	68.17	706
May	111	66.73	723
June	137	65.07	780
July	129	64.46	722
August	195	60.44	980
September	206	53.60	883
October	201	52.46	840

Dale of release 9/1/2010.

Table 2. Monthly numbers and percentages of reduction in *Eutetranychus orientalis* (Klein) population after the second release of the predatory mite, *Euseius scutalis* (A-H.) on citrus trees at El Behera Governorate.

Sampling date	Numbers and reduction% of moving stages of <i>E. orientalis</i> /100 leaves after release of the predator		Untreated (Control)
	Numbers	Reduction%	
November 25/2011 pre-count before the 2 nd release of the predator release of the predator	490		732
December	120	80.41	920
January, 2012	110	80.02	821
February	90	78.69	630
March	120	76.73	772
April	110	79.57	801
May	120	78.94	852
June	140	77.14	910
July	170	75.02	1015
August	120	78.69	842
September	130	75.86	805
October	120	76.73	769
November	150	72.34	810
December 2012	180	70.19	902

Date of second release 25/11/2011

Table 3. Effect of acaricides on the predatory mite *Euseius scutalis* (A.-H.) population on citrus trees.

Treatment		Rate of application/100 liter of water	Pre-count pr 80 leaves	Population based on 80 leaves						Average %R
Common name	Trade name			3 days		1 st week		2 nd week		
				No.	% R	No.	% R	No.	% R	
Vertimec	Vertimec 1.8% EC	40ml	231	212	23.74	208	22.56	229	24.26	23.55
Flufenoxiuron	Cascade 10% DC	60ml	252	234	22.84	230	21.60	248	25.11	23.18
Fenbyroximate	Ortus 5% EC	50ml	188	161	27.83	172	21.41	178	27.95	25.48
Challenger	Chlorfempyr 24%SC	60ml	249	202	32.59	198	31.69	236	27.87	29.64
Fenbyroximate	Ortus 5% SC	50ml	198	155	34.95	152	34.06	184	29.28	31.98
Bromoprophyllate	Nearon 50% WP	150gm	199	149	37.78	146	36.98	172	34.23	34.54
Macomite	Macomite 10% WP	20gm	282	208	38.74	201	38.77	236	36.31	37.15
Concor	Spidilofen 20% SC	30cm	267	142	55.80	138	55.60	162	53.83	52.96
Magnifico	Hexythiozax 20% SC	40ml	238	104	63.69	89	67.88	128	59.07	62.59
Control	---		201	242	-	234	-	264	-	-

%R = % reduction

- 1- Harmless < 25%
- 2- Slightly harmful (25-50%).
- 3- Moderately harmful > 50 to 75%
- 4- Harmful > 75%

Table 4. Effect of some mineral oils on *E.scutals* (A.-H.) population on citrus trees .

Treatment (oils)	Rate of application/100 liter of water	pre-count	Population based on 80 leaves after treatment						Average % R
			3 days		1 st Week		2 nd week		
			No.	% R	No.	% R	No.	% R	
Shekrona	1.5 Liter	118	82	26.34	77	21.69	89	17.79	21.21
Shekrona super	1.5 Liter	146	91	29.07	81	24.12	89	24.66	24.58
Star oil	1.5 Liter	126	89	25.13	79	24.76	92	20.41	24.03
Control	-----	201	189	--	167	--	184	--	--

%R = % reduction

5- Harmless < 25%

6- Slightly harmful (25-50%).

7- Moderately harmful > 50 to 75%

8- harmful > 75%

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**استخدام المفترس الأكاروسي (*Euseius scutalis* (A.H.) في مكافحة
أكروس الموالح البني (*Euteranychus orientalis* (Klein)
منى سليمان الغباشي
معهد بحوث وقاية النبات – مركز البحوث الزراعية بالجيزة – الدقي.**

أجريت هذه الدراسة تحت الظروف الحقلية لتقييم كفاءة المفترس الأكاروسي *Euseius scutalis* (A.H.) ضد أكروس الموالح البني بمحافظة البحيرة على أشجار الموالح أطلق هذا المفترس الأكاروسي في شهر يناير سنة 2010 بمستوى إطلاق من 40-70 أنثى كاملة لكل شجرة طبقاً لحجم الشجرة عند متوسط إصابة بكاروس الموالح البني 2 و 4 فرداً على ورقة الموالح. وكانت نسبة الخفض في تعداد أكروس الموالح البني 82.88% بعد 12 شهراً من الإطلاق ثم انخفضت هذه النسبة إلى 52.46% في تعداد أكروس الموالح البني بعد 21 شهراً من الإطلاق. لذا كان من الضروري إعادة إطلاق المفترس الأكاروسي في شهر نوفمبر سنة 2011 عندما كان متوسط الإصابة بالأطوار المتحركة لأكاروس الموالح البني 4.9 فرداً على الورقة وكانت نسبة الخفض في تعداد أكروس الموالح البني بعد 13 شهراً من الإطلاق الثاني بالمفترس الأكاروسي 70.19% ولخدمة برنامج مكافحة الحيوية تم دراسة التأثير الجانبي لبعض المبيدات الأكاروسية والزيوت المعدنية على الأكاروس المفترس تحت الظروف الحقلية وتشير نتائج الدراسة بأنه يمكن استخدام الزيوت المعدنية والمبيدات الأكاروسية (فيرتيميك-كاسكيد- أورتس) في برنامج للمكافحة الحيوية حيث أعطت تأثيراً ضعيفاً على المفترس الأكاروسي.

قام بتحكيم البحث

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