BIOLOGY AND FEEDING CAPACITY OF THE PHYTSEIID MITE *AMBLYSIEUS GOSSIPI* EL- BADRY WHEN FED ON ADULT FEMALES OF *EUTETRANYCHUS ORIENTALIS* KLEIN TREATED WITH SOME ACARICIDES

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Abstract

Biology of the most common phytoseiid predator *Amblyseius gossipi* was influnenced with feeding on the citrus brown mite *Eutetranychus orientalis* treated with some acaricides. Tedifol proved to be the most effective chemical against the female predator fecundity as it inhibited egg laying completely. Kelthane / Sumithion prolonged the duration of predator development compared with the control and treatments with the other two acaricides.

Hatchability percentage of eggs of the resulting generation was reduced to zero % with kelthane / Sumithion, while it reached 10% with kelthane and more than 90% in the control.

INTRODUCTION

Members of the family Phytoseiidae are the most effective and wide spread predators of injurious plant - fedding mites. Neverthless, acaricides are used on a large scale to control phytophagous mites, thus affecting the population of phytoseiid mites.

Smith *et al* ., (1963) evaluated the effect of some chemical residues on the two phytoseiid mites *Typhlodromus fallacis* (Garman) and *phytoseiulus persimilis* Athias- Henriot . Overmeer and Zon (1982) recommended a standardized method for

testing the side feffect of pesticides on the phytoseiid mite *Amblyseius potentillae*. Brun *et al* ., (1983) studied the toxicity of the insecticides on the prdator mites *Phtoseiulus macropilis* Banks and *P. persimilis* Athias - Henriot. Grafton and Hoy (1983) determined the toxicity of acaricides on *Tetranychus urticae* and associated predatory mite *Metaseiutus occidenlalis* (Nesbitt)

In Egypt the effect of pesticides was studied by Hassan *et al* ., (1970) and Abo - El - Ghar *et al* ., (1971) on *Agistemus exsertus* (Gonz). El - Masry (1978), Osman *et al*., (1979 a and 1979 b) and El Banhaywy and Abou - Awad (1985) on *Amblyseius gossipi* El - Badry; and by Hassan *et al* ., (1986) on *Cheyletus malaccensis* Oudemans.

MATERIALS AND METHODS

Adult females of the prey citrus brown mite *Eutetranychus orientalis*, klein were sprayed with the LC_{25} of the acaricides Kelthane EC 18.5% (dicofol) , Kelthane/ Sumithion EC (Dicofol 18.5% + fenitrothion 20%) and Tedifol EC (Dicofol 18.5% + 6% tetradifon . The corresponding cncentrations were 920 , 3850 and 1220 ppm, respectively. Untreated females were sprayed with water only.

Twenty four hours after spray , alive prey females were introduced to newly hatched larvae of the predator A*mblysieus gossipi* . The predator larvae were individually confined to a castor oil leaf.

Predator lavae were left to develop until reaching adulthood and the amount of consumed prey individuals was recorded. Resultant predator females nd males were also cofined singly with their treated prey individuals to leaf discs until death. Experiment was conducted at a constant temperature of 27 $\pm$ 1^{o}C.

The indirect effect of the tested acaricides , kelthane , kelthane - sumnithion and Tedifol on the predaceous mite was studiel by using newly hatched larvae to feed on alive adult female of the tetranychid mite *Eutetranychus orientalis* (Klein) that was previousluy sprayed with 920 ppm Kelthane, 3850 ppm kelthane - Sumithion and 1220 ppm Tedifol.

Table 1. Duration of Different stages of *A. Gossipi* El - Badry fed on *E. Orientalis* adult females treated with acaricides at 27 ± 1°C.

Stage	Sex	Duration in days when treated with			
		Kelthane	Kelthane/ Sumithion	Tedifol	Control
Larva	Female	1.00±0.0	1.69±0.46	1.90±0.30	1.38±0.48
	Male	1.00±0.0	1.63±0.48	1.8±0.37	1.20±40
Protonymph	Female	4.44±0.57	5.76±0.42	2.8±0.30	2.61±0.37
	Male	4.29±0.45	5.12±0.29	2.50±0.50	1.80±0.40
Deutonymph	Female	6.23±0.72	6.15±0.66	4.30±0.45	3.22±0.41
	Male	5.29±0.45	5.62±0.48	4.00±0.58	2.60±0.49
Total Immature	Female	12.20±0.98	13.69±0.82	9.10±0.53	6.89±0.66
	Male	10.89±0.83	12.50±1.22	9.33±0.77	5.80±0.40
Life Cycle	Female	14.29±0.88	17.07±0.99	13.00±0.37	10.55±0.59
	Male	15.60±1.01	16.12±1.36	12.66±0.47	9.80±0.40
Generation	Female	23.00±2.10	61±1.77	15.90±0.92	14.16±0.76

RESULTS AND DISCUSSION

As presented in Table 1 , the duration of the immature stages differed according to the type of the acaricides used. The duration of total immatures averaged 12.20 , 13.69 , 9.10 , 6.89 days for female and 10.86 , 13.50, 9.33 and 5.80 for

male when fed on prey females treated with the LC_{25} of kelthane , kelthane/ Sumithion, Tedifol and water respectively.

Tedifol did not affect much the development of the predator compared with the control , while kelthane - Sumithion was more effective. It seems therefore that Tedifol could be considered as more specific on plant feeder mite than on the predatory mite (Table 2).

the generation period averaged 23.00 , 25.61 , 15.90 and 14.16 days when feeding on females treated with kelthane, kelthane - Sumithion, Tedifol and water, respectively.

Table 2 demonstrates pre-oviposition, oviposition and post-oviposition periods which were 7.18 , 9.63 and 2.24 days for predator fed on prey treated with kelthane and 8.54 , 2.92 and 6.69 days for predator fed on prey treated with kelthane - Sumithion . The longevity was 2.9 days per female for Tedifol , while preoviposition, oviposition, post-oviposition and longevity were 3.61, 12.38 11.22 and 27.22 days per female in the check. The life span was 35.43, 35.23, 15.9 and 37.78 days per predaor female fed on prey treated with kelthane , kelthane -Sumithion, Tedifol and untreated prey, respectively . Data in Table 2 clearly showed that Tedifol was the most effective against the female fecundity as it stopped egg laying completely.

Kelthane / Sumithion and kelthane alone decreased the total number of deposited eggs per female to 1.62, 4.68 eggs, respectively compared with 13.61 eggs in the control . Egg incubation period of the first generation after kelthane treatment averaged 3.42 days with 90% hatchability which was nearly similar to that of the control (3.66 days) . eggs of the first generation after kelthane / Sumithion treatment did not hatch.

With repect to the feeding capacity of predator immatures and adult, data in Taple 3 indicated that the three tested acaricides at the concentration used decreased the predation capacity. Kelthane / Sumithion was the most effective in decreasing the daily rate of consumed prey individuals during the immature stages and adult , the protonymph and adult consumed a daily rate of 0.41, 0.50 and 0.35 prey/ female , respectively , while these were 0.54 , 0.71 and 0.69 prey / female , respectively , in the control . The daily rate consumption of protonymph, deutonymph and adult predator female under kelthane and Tedifol treatments averaged 0.63, 0.87 and 0.62 for the fitst treatment and 0.52 , 0.67 and 0.93 for the latter .

Table 2. Duration of different stages of *A. Gossipi* El - Badry fed on *E. Orientalis* adult females treated with acaricides at 27 + 1°C.

Stage	Sex	Duration in days when treated with			
		Kelthane	Kelthane/ Sumithion	Tedifol	Control
Pre-oviposition Period		9.18±1.88	8.54±1.78	—	3.61±0.59
Oviposition Period		9.63±2.84	2.92±2.05	—	12.39±1.11
Post-oviposition Period		2.44±1.29	6.69±2.39	—	11.22±2.97
Longevity	Female	19.75±2.58	18.15±2.14	2.90±0.94	27.22±3.27
	Male	8.29±2.91	7.00±1.22	3.66±1.37	8.00±1.09
Life span	Female	35.43±2.26	35.23±1.57	15.90±0.94	37.78±2.97
	Male	22.57±2.38	23.12±2.26	16.33±1.60	17.80±0.98
No. of deposited eggs/one female					
Average		4.68±0.84	1.62±062	—	13.6±1.64
Daily rate		0.48	0.55	—	1.10

Table 3. Number of *E. orientalis* adult females treated with acaricides and consumed by different stages of the predator *A. gossipi* El - Badry .

Predator Stage	No. of consumed prey individula treated with							
	Kethane		Kethane/ Sumithion		Tedifol		Control	
	T	D	T	D	T	D	T	D
Larva	----	----	----	----	----	----	----	----
protonymph Female	3.15±0.96	0.63	2.38±0.73	0.41	1.45±0.49	0.25	1.17±0.37	0.45
Male	2.57±0.49	0.59	1.89±0.57	0.37	2.14±0.64	0.61	1.00±50	0.55
protonymph Female	2.75±092	0.87	3.07±0.70	0.50	2.89±0.74	0.67	2.28±0.44	0.71
Male	3.87 ± 1.05	0.73	2.62±0.99	0.46	2.86±0.83	0.72	1.60±048	0.61
Adult female longevity	12.17±1.79	0.62	6.42±1.83	0.35	2.70±0.78	0.93	18.66±2.32	0.69
Adult Male longevity	6.11±1.66	0.74	2.82±0.71	0.40	3.17±1.77	0.86	5.33±1.37	0.66

T = Total
D = Daily rate.

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الحيوية والقدرة الغذائية للحلم الفايتوسيدي أمبيلسيس جوسيبي البدري عند تغذيته علي الإنات الكاملة لأكاروس إيوتترانيكس أوريونتالس (كلين) معامل ببعض المبيدات الأكاروسية

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تتأثر بيولوجيا امبلزيس جوسيبياي أكثر مفترسات فصيلة فيتوسييدي شيوعاً بالتغذيه علي أكاروس الموالح البني إيوتترانيكس أوريونتالس المعامل ببعض المبيدات الأكاروسية. أظهرت الدراسة أن مبيد تديفول مستحلب كان أكثر المبيدات فعالية ضد خصوبه أنثي المفترس حيث يثبط وضع البيض كلية . يطيل الكلثين – سومثيون فترة تطور المفترس مقارنة بالغير معامل بالمبيدين الأكاروسين تديفول مستحلب وكلثين مستحلب ولقد انخفضت النسبة المئوية لفقس بيض الجيل الأول الي الصفر لمبيد كلثين – سوميثون مستحلب بينما كانت ١٠٪ لمبيد كلثين وأكثر من ٩٠٪ بالنسبة للمقارنة.