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Effect of Food on the Biological Aspects and Life Table Parameters of the Predatory Mite, *Cheletogenes ornatus* (Canestrini & Fanzago) (Acari: Cheyletidae)

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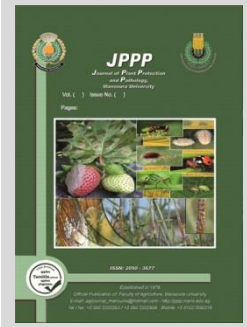

ABSTRACT

Biological characteristics, life table parameters and predation rate of the predatory mite, *Cheletogenes ornatus* (Canestrini & Fanzago) (Acari: Cheyletidae) were studied when reared on eggs and immature stages of different types of food; the date scale insect, *Parlatoria blanchardii* (Targ.) and three phytophagous mite pests [*Tetranychus urticae* Koch (Tetranychidae), *Raoiella indica* Hirst (Tenuipalpidae) and *Acarus siro* Linnaeus (Acaridae)] under laboratory conditions. Females of the predatory mite passed through two nymphal stages before reaching adulthood, while predatory male passed through only one stage. *Cheletogenes ornatus* male and female fed successfully on the four tested preys mentioned previously. *Acarus siro* increased the oviposition period of *C. ornatus* females to 18.92 days with daily rate of deposited eggs 5.18 eggs/ day. So, *Acarus siro* seemed to be the most favorable prey for the predatory mite, *C. ornatus* compared with other tested preys.

Keywords: *Cheletogenes ornatus*, life table parameters, *Tetranychus urticae, Raoiella indica, Acarus siro*, date scale insect.

INTRODUCTION

Date palm trees and its fruits are usually attacked by several pests that are, in most cases, well adapted to the oasis environment. Damage caused by pests is considerable and leads to heavy economic losses (Savary and Willocquet, 2014; Avelino *et. al*., 2015).

The long-term intensive use of acaricides badly leads to the dominance of resistant population that could not be affected by chemical pesticides and that would be reflected on plant yield (HuVaker *et al*. 1969; Cross *et al*. 2001; Stumpf and Nauen 2001; Sato *et al*. 2004; Fraulo and Liburd, 2007). Biological control is the most important component of integrated pest management to decrease populations of phytophagous mites (Rhodes and Liburd 2005; Rhodes *et al*. 2006).

The predatory mite *Cheletogenes ornatus* (Canestrini & Fanzago) inhabits fruit trees, field crops, vegetables and ornamental plants. It is usually found in association with scale insects and phytophagus mites (Yousef, 1970; Zaher *et al*., 1970; Yousef and Shehata, 1971; Rasmy *et al*., 1972 a, b; El-Halawany *et al*., 1984; Zaher, 1984).

Cheletogenes ornatus was noticed to be associated with tenuipalpid mites and to chase its prey as it waits in ambush under old scale shields crawlers (Avidov *et al*., 1968; Arruda *et al*., 1969; Saglam and Cobanoglu, 2010).

Other cheyletids were observed feeding on armored scale insect crawlers in the field such as *Hemicheyletia bakeri* Ehara that fed on the yellow scale insects, *Aonidiella citrine* Coquillett in Florida (Muma 1975). *Cheletominus berlesei* Oudemans was observed feeding on the lantania scale, *Hemiberlesia lataniae* Signoret and hemisarcopted mites In California, and observed feeding on *Parlatoria* spp. in Israel (Gerson, 1967 and Gerson *et al*., 1990).

Acarus siro was first observed as a natural enemy of mite pests in stored products at the beginning of the 20th century (Ewing 1912). The granary experiments showed that *Cheyletus eruditus* (Schrank) is a very effective predator. Under favorable conditions, *C. eruditus* was able to eradicate a population of *A. siro* in about 2 months, Moreover, this predator cannibalistically exterminates itself once it eradicated the prey (Norris, 1958; Zdarkova and Feit, 1999).

Mesbah and Omar (2014) reared *C. ornatus* on three different types of food; eggs and immature stages of *Raoiella indica*, (Tenuipalpidae) and crawlers of date scale insect, *Parlatoria blanchardii* at laboratory conditions. *Cheyletus eruditus* was also reared on different types of prey; e.g. *Lepidoglyphus destructor* Schrank (Barker 1991), *Dermanyssus gallinae* De Geer (Buffoni *et al*.1997), but most often *A. siro* (e.g. Boczek 1957). Zaher& Soliman (1971) reported that the predator, *C. ornatus* was successfully reared on the olive scale insects, *Parlatoria oleae* Colveée.

The present work aims to study the biological aspects and life table parameters of the cheyletid mite, *Cheletoge nes ornatus* and its ability to control the date scale insect and three tested phytophagous mite pests (*T. urticae, R. indica* and *A. siro*).

MATERIALS AND METHODS

Cheletogenes ornatus was reared on eggs and immature stages of four different types of preys; the date scale insect, *P. blanchardii* and three mite pests (*T. urticae, R. indica* and *A. siro*) at 23± 5 °C and 70±5% RH.

1.*Parlatoria blanchardii*

Eggs and motile stages of the date scale insect, *P. blanchardii* collected from date palm trees at Gamasa, Dakahlia governorate.

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2.phytophagous mites culture

Phytophagous mites (*T. urticae* and *R. indica*) were collected from date palm trees at Gamasa, Dakahlia governorate and reared on leaves of *Ricinus communis* placed in Petri dishes (9 cm in diameter) containing cotton soaked in tap water and changed routinely every 2-3 days.

3.Culture of *Acarus siro*

They were collected from stored dates and Cheese, and wheat flour was served as food.

4.Culture of the Predator mites, *Cheletogenes ornatus*

Cheletogenes ornatus individuals were taken from date palm trees, Phoenix dactylifera at Gamasa, Dakahlia governorate. Pure culture was made by using leaf discs of Ricinus communis placed in Petri dishes (9 cm in diameter) containing cotton soaked in tap water and changed routinely every 2-3 days. Females were left 24 hours and their oviposited eggs were used for biological aspects.

Biological aspects of the tested predatory mite were checked twice daily using a stereomicroscope. Couples were kept together until the end of study; when a male died, it was replaced with a new one. The duration of pre-oviposition, oviposition and post-oviposition periods as well as longevity and fecundity were recorded. The daily observations continued until the death of the last individual.

5.Statistical analysis

Data were analyzed by one-way analysis of variance (ANOVA) and mean comparison using L.S.D to test the significant differences between mean values using SAS statistical software (SAS Institute 2003).

6.Life table parameters

The experiment was analyzed by life 48 computer program (Abou-Setta *et al*.,1986) to find out the most suitable prey, (*P. blanchardii*, *T. urticae*, *R. indica* and *A. siro*) at 23±5°C and 70±5% relative humidity.

RESULTS AND DISCUSSION

The developmental periods (from egg to adult) of *C. ornatus* females and males were significantly affected by food type.

Incubation period

As shown in Table (1), incubation periods of cheyletid mites, *C. ornatus* were not affected by different types of prey, which recorded 3.83, 3.58, 5 and 3.92 days for females and 3.75, 3.67, 3.58 and 3.83 days for males when fed on *A. siro*, *T. urticae*, *R. indica* and *P. blanchardii*, respectively.

Table 1. Mean durations (per days) of *Cheletogenes ornatus* reared on different types of food at 23 ± 5°C, 70±5% RH.

Biological aspect (days)	Sex	Prey species				L.S.D
		Acarus siro	*Tetranychus urticae*	*Raoiella indica*	*Parlatoria blanchardii*	
egg	♀	3.83 ± 0.38^{a}	3.58 ± 0.49^{a}	3.42 ± 0.49^{a}	3.92 ± 0.38^{a}	0.569
	♂	3.75 ± 0.41^{a}	3.67 ± 0.26^{a}	3.58 ± 0.38^{a}	3.83 ± 0.41^{a}	0.485
larva	♀	4.75 ± 0.49^{b}	5.25 ± 0.88^{ab}	5.5 ± 0.45^{ab}	5.58 ± 0.38^{a}	0.760
	♂	4.17 ± 0.38^{c}	6 ± 0.84^{a}	5.17 ± 0.26^{b}	6.58 ± 0.58^{a}	0.653
protonymph	♀	6.08 ± 0.66^{b}	6.17 ± 0.52^{b}	7.42 ± 0.66^{a}	8 ± 0.32^{a}	0.673
	♂	5.25 ± 0.38^{d}	6.92 ± 0.38^{c}	6.08 ± 0.49^{b}	7.58 ± 0.38^{a}	0.539
deutonymph	♀	5.08 ± 0.61^{b}	5.08 ± 0.66^{b}	7.08 ± 0.58^{a}	7 ± 0.55^{a}	0.666
Immature stages	♀	15.92 ± 1.17^{b}	16.5 ± 1.38^{b}	20 ± 0.77^{a}	20.58 ± 0.97^{a}	1.232
	♂	9.42 ± 0.68^{d}	12.92 ± 0.97^{c}	11.25 ± 0.52^{b}	14.17 ± 0.41^{a}	0.792
life cycle	♀	19.75 ± 0.99^{b}	20.08 ± 1.36^{b}	23.42 ± 0.58^{a}	24.5 ± 1^{a}	1.314
	♂	13.17 ± 0.68^{d}	16.58 ± 1.07^{c}	14.83 ± 0.61^{b}	18 ± 0.71^{a}	0.888
longevity	♀	24.5 ± 2.01^{b}	25.67 ± 1.03^{b}	26 ± 1.64^{b}	28.08 ± 1.32^{a}	1.781
	♂	19.92 ± 1.03^{b}	22.75 ± 1.99^{a}	21.08 ± 1.16^{b}	24 ± 0.84^{a}	1.655
life span	♀	44.25 ± 1.97^{c}	45.75 ± 2.04^{c}	49.42 ± 1.88^{b}	52.58 ± 1.74^{a}	2.599
	♂	33.08 ± 1.29^{d}	39.33 ± 2.71^{b}	35.92 ± 0.92^{c}	42 ± 0.89^{a}	1.918

Mean ±SD, L.S.D (P>0.05).

Means within rows followed by the same letter were not significantly different at 0.05 level.

Immature stages

Females of the predatory mite passed through two nymphal stages before reaching adulthood, while predatory male passed through only one stage. These results agree with those of Zaher *et al*. (1981) and Moraes *et al*. (1989).

The longest immature period of *C. ornatus* lasted 20.58 and 14.17 days when fed on eggs and motile immature stages of *P. blanchardii*, while the shortest immature period lasted 15.92 and 9.42 days when fed on eggs and motile immature stages of *A. siro*, for females and males, respectively (Table 1).

Life cycle

Table (1) also showed that the duration of life cycle for both sexes of *C. ornatus* were highly affected by the type of food employed. The total period averaged 19.75, 20.08, 23.42 and 24.5 days for female and 13.17, 16.58, 14.83 and 18 days for male when reared on eggs and immatures of *A. siro*, *T. urticae*, *R. indica* and *P. blanchardii*, respectively. Data obtained matches with observations of Atwa, *et al*. (2018), who reported that the total life cycle period averaged 22.08 and 22.43 days for male and 29.25 and 29.77 days for female when reared on eggs and immatures of *Acarus farrie* Oudemans, respectively.

Adult longevity

Concerning the adult male and female longevity of *C. ornatus*, it was observed that this period was significantly affected by the food type, reached to the longest when fed on eggs and immature stages of *P. blanchardii*, that recorded 28.08, 24 days for females and males, respectively. *Cheletogenes ornatus* also showed the lowest period when fed on eggs and immature stages of *A. siro*, that recorded 24.5, 19.92 days for females and males individuals, respectively (Table 1). These results are in accordance with results documented by Mesbah *et al*. (2017), who described that Cheyletid mite, *Cheletomorpha lepidopterorum* female longevity lasted 21.58 , 18.9 and 19.83 days changed to 17.6 , 16 and 15.7 days for male

when it fed on *Goheria wahabeii* El-Naggar, *Blomia tropicalis* Bronswijk and *Petrobia latens* Muller, respectively.

Oviposition and fecundity of *Cheletogenes ornatus* females

Concerning the fecundity of *C. ornatus* females, the highest number of deposited eggs were observed when fed on *A. siro* that recorded 97.33 eggs/ female with a daily rate 5.18 egg/female/day, while the lowest number was observed with *P. blanchardii*, that recorded 69.83 eggs/ female with daily rate 4.33 egg/female/day (Table 2). In addition, the longest oviposition period 18.92 days was observed when *C. ornatus* females fed on eggs and immatures of *A. siro*, while the shortest period 16.17 days was observed when fed on eggs and motile stages of *P. blanchardii*. These results agree with those of Atwa, *et al*. (2018), who mentioned that the highest number of deposited eggs was observed when the *C. ornatus* adult females fed on eggs of *Acarus farrie* (Oudemans) and recorded 71.5 eggs/ female with a daily rate 3.28 egg/female/day at 25 °C. In addition, the lowest number of deposited eggs at 20°C was observed when the females fed on eggs of *A. farrie* 44.5 eggs/ female with daily rate 2.16 egg/female/day. The longest oviposition period observed was 22.52 days, at 25 °C, while the shortest period was 20.75 days at 20 °C when the adult females fed on eggs of *A. farrie*. Similarly, Zaher *et al*., (1981) explained that *C. ornatus* female deposited 47.7 and 53.3 eggs when fed on eggs of *Chrysomphalus aonidum* (Linnaeus) and *Tetranychus urticae*, and 37.7 and 39.2 eggs when fed on immatures of *Parlatoria oleae* (Clovee) and *Cenopalpus puleher* (Canestrini & Fanzago), respectively.

Table 2. Effect of food on female longevity and fecundity of the predatory mite *Cheletogenes ornatus* when reared on different types of food at 23 ± 5°C, 70±5% RH.

Biological aspect (days)	Prey species				L.S.D
	Acarus siro	*Tetranychus urticae*	*Raoiella indica*	*Parlatoria blanchardii*	
Preoviposition	2.08 ± 0.61^{d}	3.08 ± 0.49^{c}	4 ± 0.71^{b}	5.92 ± 0.66^{a}	0.693
Oviposition	18.92 ± 0.98^{a}	18.33 ± 0.98^{a}	16.67 ± 0.41^{b}	16.17 ± 0.68^{b}	1.196
Postoviposition	3.5 ± 0.86^{b}	4.25 ± 0.42^{b}	5.33 ± 0.75^{a}	6 ± 0.84^{a}	0.772
longevity	24.5 ± 2.01^{b}	25.67 ± 1.03^{b}	26 ± 1.64^{b}	28.08 ± 1.32^{a}	1.781
fecundity	97.33 ± 2.25^{a}	87.83 ± 1.72^{b}	74.5 ± 1.05^{c}	69.83 ± 1.83^{d}	1.914
Daily rate	5.18 ± 0.45^{a}	4.8 ± 0.3^{b}	4.47 ± 0.16^{c}	4.33 ± 0.23^{d}	0.367

Mean ±SD, L.S.D (P>0.05).
Means within rows followed by the same letter were not significantly different at 0.05 level.

Predation capacity

Cheletogenes ornatus male and female fed successfully on the four tested preys mentioned previously. The number of consumed prey individual differed according to introduced prey. *Cheletogenes ornatus* has a high predation capacity when its all developmental stages fed on eggs and immatures of *A. siro*, which seemed to be the most preferable tested prey followed by *R. indica*, *T. urticae* and *P. blanchardii*. The highest prey consumption rate during *C. ornatus* life span averaged 162.83 and 123.5 prey, although the lowest one averaged 107.83 and 91.67 prey for females and males, respectively. These results matches with those of Zaher *et al*., (1981), who explained that *C. ornatus* fed on mite eggs and immatures significantly greater than scale insects. *Cenopalpus pulcher* seemed to be the most preferable prey, followed by *T. urticae*, *P. oleae* and *C. aonidum*. In addition, Wafa, *et al*. (1970) reported that the adult female and male of *Eutogenes africanus* Wafa & Soliman consumed an average of 186 and 156 eggs of *P. oleae*, respectively.

Table 3. Prey consumption of *Cheletogenes ornatus* when fed on different types of food at 23±5°C & 70±5% RH.

		Prey species				L.S.D
		Acarus siro	*Raoiella indica*	*Tetranychus urticae*	*Parlatoria blanchardii*	
larva	♀+♂	8.17 ± 0.75^{a}	7.5 ± 0.84^{a}	7.5 ± 0.55^{a}	4.67 ± 0.52^{b}	0.815
	♂	9.5 ± 0.55^{a}	8.5 ± 0.55^{b}	6.83 ± 0.75^{c}	5 ± 0.89^{d}	0.844
protonymph	♂+♀+♀	18.17 ± 0.75^{a}	16.67 ± 0.82^{b}	15.17 ± 1.17^{c}	8.67 ± 1.03^{d}	1.153
	♂+♂+♀	30.67 ± 1.86^{a}	27.17 ± 0.41^{b}	22.67 ± 0.82^{c}	15.67 ± 0.82^{d}	1.342
deuto	♂+♀+♀	28.5 ± 1.52^{a}	23.83 ± 1.17^{b}	20.83 ± 1.17^{c}	15.5 ± 1.05^{d}	1.491
Immatures	♂+♀+♀	54.83 ± 2.14^{a}	48 ± 1.79^{b}	43.5 ± 1.87^{c}	28.83 ± 1.47^{d}	2.207
	♂	40.17 ± 2.14^{a}	35.67 ± 0.52^{b}	29.5 ± 0.84^{c}	20.67 ± 1.51^{d}	1.682
Preoviposition		21.17 ± 1.17^{b}	22.67 ± 0.82^{a}	18.17 ± 0.75^{c}	18 ± 1.26^{c}	1.234
Oviposition		59.83 ± 1.47^{a}	57 ± 1.55^{b}	47.5 ± 1.76^{c}	44 ± 1.79^{d}	1.985
Postoviposition		27 ± 1.55^{a}	23.17 ± 1.17^{b}	24.33 ± 0.82^{b}	17 ± 2.83^{c}	2.123
longevity	♀+♂+♀	108 ± 1.41^{a}	102.83 ± 1.47^{b}	90 ± 2.28^{c}	79 ± 2.28^{d}	2.298
	♂	83.33 ± 1.03^{a}	81.17 ± 2.79^{ab}	80 ± 2.83^{b}	71 ± 2.76^{c}	2.977
life span	♂+♀+♀	162.83 ± 2.64^{a}	150.83 ± 2.86^{b}	133.5 ± 2.74^{c}	107.83 ± 2.04^{d}	3.117
	♂	123.5 ± 2.88^{a}	116.83 ± 2.99^{b}	109.5 ± 2.74^{c}	91.67 ± 2.16^{d}	3.267

Mean ±SD, L.S.D (P>0.05).
Means within rows followed by the same letter were not significantly different at 0.05 level

1.Life table parameters

The mean generation time (T_c) of the predatory mite, *C. ornatus* was significantly affected by the type of food (Table 4). The longest time needed for one generation recorded 32.57 days when mite fed on eggs and immatures of *R. indica*, while the shortest was 29.57 days when fed on eggs and immatures of *A. siro*. Life table parameters were as follow, net reproductive rate (R_o): 43.80, 39.53, 33.45 and 31.28 per generation; Intrinsic rate of natural increase (r_m): 0.13, 0.12, 0.11 and 0.11 individuals/female/day; Finite rate of increase (e^{rm}): 1.14, 1.13, 1.11 and 1.11 Individuals/female/day when female fed on the four different foods mentioned above, respectively. These results matches with those of Mesbah *et al*., (2017), who explained the possibility of using some Acaridida species as facilities food for the mass-rearing of Cheyletid Predators and *Cheletomorpha lepidopetrorium* Shaw. Life

table parameters of *Cheletomorpha lepidopetrorium* showed that the highest intrinsic rate of natural increase (r_m) was reached as 0.206 when fed on immature stages of *Goheria wahabeii* El-Naggar (Acaridida: Labidophoridae) which considered as the optimal prey, the lowest r_m value as 0.177 was obtained when fed on immature stages of *Petrobia latens* Muller (Actinidida: Tetranychidae). Also, (Yassin *et al*., 2008) reared *Cheletomorpha lepidopterorum* on immature stages of different mite prey belonging to suborder Actinidida (*T. putrescentiae* Schrank, *Lepidoglyphus destructor* Schrank, *Rhizoglyphus echinopus* (F.&R.) and *Caloglyphus betae* Attiah) at different temperatures 20, 25 and 30°C and 70 % R.H. *Cheletomorpha lepidopterorum* showed a higher fertility and lived longer on *T. putrescentiae* as food than on other diets. Otherwise, Zaher *et al*. (1981) described that *Cenopalpus pulcher* Canestrini and Fanzago shortened *C. ornatus* immature period and adult longevity better than scale insects. McMurtry and Scriven (1964) noticed that the rate of development of *Amblyseius hibisci* Chant when fed on crawlers of the scale insect *Hemiberlesia lataniae* Signoret was lower than when fed on tetranychid mites; *Panonychus citri* (McGregor), *Oliyonychus punicae* (Hirst) and *Eotetranychus sexmaculatus* (Riley). In addition, Pena *et al*. (2009) reported *Cheletomimus* sp. preying on *R. indica* and its densities increased as *R. indica* grew and spread to a new locations.

Table 4. Effect of different food on life table parameters of the predatory mite, *Cheletogenes ornatus* at 23±5°C & 70±5% RH.

Parameters	Prey species			
	Acarus siro	*Tetranychus urticae*	*Raoiella indica*	*Parlatoria blanchardii*
Life cycle	19.75	20.08	23.42	24.50
Oviposition period [a]	18.92	18.33	16.67	16.17
Mean total fecundity (egg/♀)	97.33	87.83	74.5	69.83
Daily rate (egg/♀/day)	97.33	87.83	74.5	69.83
Sex ratio (females/total)	0.70	0.62	0.72	0.56
Mean generation time (T_c) [a]	29.57	29.90	32.57	32.30
Net reproductive rate (R_o) [b]	43.80	39.53	33.45	31.28
Intrinsic rate of increase (r_m) [c]	0.1٧	0.1٤	0.1٢	0.11
Finite rate of increase (e^{rm})	1.1٥	1.13	1.1٢	1.1٠

[a] **Days,** [b] **Per generation,** [c] **Individuals/female/ day.**

At the end of study and from data obtained, it is concluded that *C. ornatus* male and female fed successfully on the four tested preys mentioned previously but *A. siro* seemed to be the most favorable prey for the predatory mite, *C. ornatus* or followed by *T. urticae* and *R. indica* then *P. blanchardii*. *A. siro* increased the oviposition period of *C. ornatus* females to 18.92 days with daily rate of deposited eggs 5.18 eggs/ day compared with other tested preys. So, the results of the present study indicate the possibility of using *A. siro* as facilities food for the mass-rearing of *Cheletogenes ornatus* potentially fostering wider use of these biological control agents.

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تاثير نوع الغذاء علي الخواص البيولوجيه وجداول الحياه للمفترس الاكاروسي *Cheletogenes ornatus* Canestrini & Fanzago (Acari: Cheyletidae)

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معهد بحوث وقاية النباتات قسم بحوث أكاروس الفاكهه والعناكب – فرع المنصورة

تم تربيه المفترس الاكاروسي *Cheletogenes ornatus* علي اربعه انواع من الفرائس المختلفه :البيض والاطوار غير البالغه لحشره النخيل القشريه والبيض والاطوار غير البالغه لثلاثه انواع من الاكاروسات *Tetranychus urticae* Koch (family: Tetranychidae) و *Raoiella indica* Hirst (family: Tenuipalpidae) و *Acarus siro* Linnaeus (family: Acaridae)) كل نوع علي حده تحت ظروف معمليه. واسفرت النتائج ان المفترس الاكاروسي تغذي تغذيه ناجحه واكمل دوره حياته علي الاربعه فرائس المستخدمه في التجربه. بينما اتضح ان افضل نوع غذاء للمفترس كان الحلم الاكاروسي *A. siro* مقارنه بباقي الفرائس المستخدمه. حيث ادي الي اطاله فتره وضع البيض لاناث المفترس الي 18.92 يوم وكان متوسط عدد البيض الموضوع 5.18 بيضه في اليوم. وعلاوة على ذلك، عند دراسة جداول حياة المفترس الكليتدى كانت اعلي عدد للاناث المتوقعه لكل انثي في الجيل الواحد (*Ro*) عندما تغذي علي *Acarus siro* حيث كانت 43.80 بيضه/ انثي/ جيل، بينما كانت اقل عدد للاناث المتوقعه (*Ro*) عندما تغذت علي حشره النخيل القشريه حيث كانت 31.28 بيضه/ انثي/ الجيل، وكانت أعلى معدل زيادة نوعيه لأنثى المفترس (r_m) عند التغذية على البيض والاطوار غير البالغه للاكاروس *Acarus siro* حيث كانت 0.17 انثي/ انثي/ اليوم، في حين كانت أقل معدل زيادة نوعيه (r_m) 0.11 انثي/ انثي/ اليوم عندما تتغذى على البيض و والاطوار غير البالغه لحشره النخيل القشريه . لذا ، بدا أن *Acarus siro* هو الفريسة الأكثر ملاءمة للمفترس *C. ornatus* مقارنة مع باقي الفرائس التي تم اختبارها