



BIOLOGICAL ASPECTS OF THE SPIDER, *Thantus albinii* (AUDOUIN) (ARANEIDA: PHILODROMIDAE) FEEDING ON FIVE TYPES OF PREYS

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ABSTRACT

The spider *Thantus albinii* (Audouin) was reared on five types of prey motile stages of the two spotted spider mite, *Tetranychus urticae* Koch; the leguminous aphid, *Aphis craccivora* Koch and first and second larval instars of the cotton leaf worm, *Spodoptera littoralis* (Boisd.); mixture of all the previous preys and different randomly preys included the previous preys plus *Aphis gossypii* Glover, *Thrips tabaci* Lind.; *Bemisia tabaci* (Genn.) and *Pectinophora gossypiella* (Saund). Incubation period averaged 10.8 to 12.3 days. Individuals pass through seven spiderlings before reaching adult. Spider *T. albinii* doesn't complete its life cycle when was fed on *T. urticae* and reached only to the third spiderling and died. The life cycle averaged 104 and 98.2, 64.1 and 59.9, 89.3 and 81.4 as well as 148.3 and 132.6 days for female and male when fed on the other four types of prey previously mentioned, respectively at $27 \pm 2^\circ\text{C}$ and $70 \pm 5\%$ RH. Female oviposition period lasted 14.5, 13.5, 15.7 and 19.8 days and the deposited egg sacs averaged 1.6, 1.7, 2.3 and 2.4 when fed on *A. craccivora*, *S. littoralis*, mixed preys and random preys, respectively.

Key words: Predatory spider, *Thantus albinii* (Audoium), biological aspects, preys.

INTRODUCTION

Spiders are cosmopolitan that live in many ecological environments. As predators, they play a considerable role in agroecosystem as biocontrol agents (Levy, 1998). Many authors studied the role of spiders in the biological control of different pests that infest most crops and orchards (Levy, 1970; Costello and Deane, 1995; Bert *et al.*, 1997). Therefore, this work deals with the biology of the spider, *Thantus albinii* (Audouin) (Araneida: Philodromidae) on five types of preys at $27 \pm 2^\circ\text{C}$ and $70 \pm 5\%$ RH, description of some biological aspects and to study the effects of the diversity of preys in the duration of spider and an attempt to simulate the wild life of the spider in nature.

MATERIALS AND METHODS

Thantus albinii (Audouin) individuals were collected from orchard fields at Alxendria Governorate by using sweeping or directly from

trees. The individuals were singly placed each in a translucent plastic cylindrical container of 4×3 cm in depth and diameter, respectively. The spider individuals were divided into five groups which each were supplied daily with known number of preys such as motile stages of the two spotted spider mite, *Tetranychus urticae* Koch; the leguminous aphid, *Aphis craccivora* Koch; the first and second larval instars of the cotton leaf worm, *Spodoptera littoralis* (Boisd.); mixture of all the previous preys and different randomly preys included the previous preys plus *Aphis gossypii* Glover, *Thrips tabaci* Lind., *Bemisia tabaci* (Genn.) and *Pectinophora gossypiella* (Saund). Ten females and males from each group were left to copulate and deposit their egg sacs which incubated at $27 \pm 2^\circ\text{C}$ and $70 \pm 5\%$ RH until emergence of the newly hatched spiderlings. The emerged spiderlings were put solitary in a test tube, closed with a piece of cotton. Every tube was supplied with known number of prey and inspected twice daily for recording the duration of the developmental stages.

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RESULTS AND DISCUSSION

Feeding Behavior

When the predator, *Thantus albinii* (Audouin) notices the prey, it usually comes close and moves around it for few seconds, then catches it between its chelicerae by the help of the front legs. Embedding its chelicerae in the prey, the predator starts to suck prey contents till leaving it as exuvium. The predator abdomen becomes enlarged and usually rests for few minutes before searching again for another one. No differences in feeding behavior were noticed when the spider fed on the types of the tested preys.

Mating Behavior

The virgin female stayed for about 12 days as a pre-mating period. The male was firstly placed in the test tube and then followed by the female. The latter started to come close to the male in relative movements for about 2-3 minutes, then climbed on her back for a while, then descended female raised her body laterally. Then male move under her, clasped all her appendages beneath her body. The male venter body was facing the female venter, then copulation occurred for 2-3 minutes. During this process, male stayed without any motion, then move for 5-10 seconds several times. The mating process took about 10-15 minutes.

Oviposition and Incubation Period

The mean incubation period averaged 10.8, 10.8, 10.3 and 12.3 for *A. craccivora*, the first and second larval instars of *S. littoralis*, mixture of all the previous preys plus *T. urticae* and different random preys included the previous preys plus *A. gossypii*, *T. tabaci*, *B. tabaci* and *P. gossypiella*, respectively (Table 1)

The eggs were yellowish in colour, almost spherical then become darker before hatching. The spiderlings stayed together before getting out from the egg sac. The newly hatched spiderlings did not feed for about 3 hours before the emergence of the following stage. The pre-oviposition periods of *T. albinii* were 8.4, 8.1, 7.4 and 9.6 days when the spider was fed on *A. craccivora*, *S. littoralis*, above mentioned preys plus *T. urticae* and random preys,

respectively. The oviposition periods lasted about 14.5, 13.5, 15.7 and 19.8 days on the previously mentioned preys, successively. The post-oviposition periods averaged 17.9, 31.1, 18.1 and 63.5 days when the spider was fed on the previous preys, respectively (Table 2).

Development and Adult Longevity

Each female and male passes through seven spiderlings before reaching the adult. The life cycle of female averaged 104.0, 64.1, 89.3 and 148.3 days on *A. craccivora*, *S. littoralis*, previous preys plus *T. urticae* and different random preys included the previous preys plus *A. gossypii*, *T. tabaci*, *B. tabaci* and *P. gossypiella*. The life cycle of males on the aforementioned types of preys averaged 98.2, 59.9, 81.4 and 132.6 days, successively (Table 1).

The life span of females averaged 144.8, 114.9, 130.4 and 211.9 days on the previously mentioned types of preys, respectively. The corresponding values of males were 127.2, 78.2, 117.1 and 198.8 days, successively. When the spider was fed only on *T. urticae* reached only to the third spiderlings and died before sex differentiation. The durations of the first, second and third spiderlings were 20.0, 37.5 and 37.8 days, respectively. The durations of female longevity were 40.8, 50.8, 41.1 and 63.6 days on the aforementioned types of preys, successively. The corresponding values of males were 29.0, 18.3, 35.7 and 66.2 days, respectively (Table 1).

Fecundity of Eggs

The spider female laid an average of 1.6, 1.7, 2.3 and 2.4 egg sacs when they fed on *A. craccivora*, *S. littoralis*, above mentioned preys plus *T. urticae* and random previous preys plus *A. gossypii*, *T. tabaci*, *B. tabaci* and *P. gossypiella*, respectively. The number of eggs in the egg sac averaged 23.6, 18.4, 33.1 and 36.4 eggs when the spider females were fed on the previous types of preys, successively (Table 2).

The obtained data in Tables 1 and 2 reveal that the relationship between the more diversity of available food in a random type of preys and more long durations of life cycle, life span and longevity of the spider may give us a general imagination about the main reason of long duration of the spider life span in wild life than in the captivity.

Table 1. Biological aspects of *Thantus albinii* (Audouin) when fed on *Tetranychus urticae* Koch, *Aphis craccivora* Koch, *Spodoptera littoralis* (Boisd.), the previous three preys and random preys under laboratory conditions of 27±2°C and 70±5% RH

Biological aspect	Sex	Average duration (in day)				
		<i>T. urticae</i>	<i>A. craccivora</i>	<i>S. littoralis</i>	The previous three preys	Random preys
Incubation period	-		10.8±0.9	10.8±0.9	10.3±0.5	12.3±0.5
1 st spiderling	♀	20±0.87	8.6±0.5	8.6±0.5	8.6±0.5	11.7±1.3
	♂		8.6±0.5	9±7.8	7.7±0.7	8.6±0.5
2 nd spiderling	♀	37.5±2.2	14.2±0.7	7.4±0.5	12.3±0.5	17.7±1.8
	♂		12.4±0.5	5±5.9	11.6±0.5	12.7±0.5
3 rd spiderling	♀	37.8±1.2	9.1±0.8	5.4±0.5	9.3±0.5	11.1±1.4
	♂		8.4±0.5	5.5±0.4	8.6±0.5	9.4±0.5
4 th spiderling	♀		16.2±0.8	7.3±0.5	12.3±0.5	20.4±0.5
	♂		15.8±1.1	6±0.9	11.5±0.5	19.4±0.5
5 th spiderling	♀		14.6±0.5	6.6±0.5	12.9±0.9	23±1.2
	♂		12.4±0.5	7.1±1.1	11.4±0.5	20.8±0.8
6 th spiderling	♀		11.1±1.1	9.1±0.8	9±0.9	23.1±0.6
	♂		10.6±0.5	8.3±0.5	7.9±0.8	21.6±2.1
7 th spiderling	♀		19.4±0.5	8.9±0.7	14.6±0.5	29±3.8
	♂		19.1±0.8	8.6±0.5	12.4±0.5	27.8±2.1
Total spiderlings	♀		93.2±2.6	53.3±1.4	79±2	136±5.3
	♂		87.3±1.9	49.1±2.1	71.1±1.6	120.3±2.6
Life cycle	♀		104±2.3	64.1±1.5	89.3±2.1	148.3±5.3
	♂		98.2±2.1	59.9±2.5	81.4±1.6	132.6±2.9
Longevity	♀		40.8±1.4	50.8±6.3	41.1±1.6	63.6±1.4
	♂		29±4.4	18.3±4.4	35.7±8.2	66.2±3.6
Life span	♀		144.8±3.1	114.9±6.8	130.4±2.4	211.9±5.3
	♂		127.2±4.2	78.2±3.6	117.1±8.6	198.8±3.5

Table 2. Pre-oviposition, oviposition, post-oviposition periods and fecundity of *Thantus albinii* (Audouin) on different prey types under laboratory conditions of $27\pm 2^\circ\text{C}$ and $70 \pm 5\%$ RH

Preys	Average period (in days)			Fecundity	
	Pre-oviposition	Oviposition	Post-oviposition	No. of eggs/sac	No. of egg sacs/female
<i>A. craccivora</i>	8.4±0.5	14.5±0.5	17.9±1.4	1.6±0.7	23.6±2.2
<i>S. littoralis</i>	8.1±0.9	13.5±1.2	31.1±1.1	1.7±0.7	18.4±1.7
<i>T. urticae</i> + <i>A. craccivora</i> + <i>S. littoralis</i>	7.4±0.5	15.7±0.8	18.1±1.9	2.3±0.5	33.1±5.7
Random preys	9.6±0.5	19.8±0.8	63.5±1.4	2.4±0.5	36.4±6.3

Putman (1967) described the life cycle of *Philodromus praelustris* Keyserling (family: Philodromidae). Females produced up to 12 egg sacs containing a total of over 299 eggs in insectary, but the later eggs did not hatch. During the oviposition period, the females deposited 6.3 sacs/female, each egg-sac contained about 31.1 eggs; the incubation period was 16 days. The spider females passed life cycle and life span longer than males.

The previous data agreed partially with those of El-Erksousy and Fawzy (2001) who found that *T. albinii* has seven spiderlings and the life cycle was valued 169.9 and 148.7 days for female and male, respectively when fed on the 3rd nymph of *Schizaphis graminum* (Rondani).

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النواحي البيولوجية للعنكبوت *Thantus albinii* (Audouin) عند التغذية على خمسة نماذج من الفرائس

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تعتبر العناكب الحقيقية من أهم الأعداء الحيوية التي تلعب دوراً هاماً في خفض تعداد الآفات الحشرية والحيوانية التي تصيب معظم المحاصيل وتسبب لها أضراراً بالغة كما ونوعاً مما وجهنا إلى تعظيم دور العناكب الحقيقية في البيئة لذلك أجرى هذا البحث لتربية ودراسة الكفاءة الافتراضية للنوع *Thantus albinii* (Audouin) من عائلة Philodromidae على خمسة نماذج من الفرائس وهي أكاروس العنكبوت الأحمر العادي ومن البقوليات ودودة ورق القطن وخليط من الثلاث آفات السابقة مجتمعة وكذلك تمت تربيته عشوائياً على ما سبق من آفات بالإضافة إلى دودة اللوز القرنفلية وتربس القطن ومن القطن وذبابة القطن والطمطم البيضاء، وقد وجد أن متوسط فترة دورة حياة الأنثى كان ١٠٤,٠ ، ٦٤,١ ، ٨٩,٣ و ١٤٨,٣ يوماً عند التغذية على من البقوليات ودودة ورق القطن وخليط من الفرائس مكون من أكاروس العنكبوت الأحمر ومن البقوليات ودودة ورق القطن وفرائس عشوائية مكونة مما سبق بالإضافة إلى تربس القطن ودودة اللوز القرنفلية وذبابة القطن والطمطم البيضاء على التوالي، وكان متوسط فترة دورة حياة الذكر هي ٩٨,٢ و ٥٩,٩ و ٨١,٤ و ١٣٢,٦ يوماً عند التغذية على نفس نماذج الفرائس السابقة على الترتيب، وكان متوسط فترات وضع البيض ١٤,٥ و ١٣,٥ و ١٥,٧ و ١٩,٨ يوماً عند التغذية على نفس نماذج الفرائس السابق ذكرها على الترتيب، ووضعت الأنثى متوسط ١,٦ و ١,٧ و ٢,٣ و ٢,٤ كيس بيض عند التغذية على ما سبق من نماذج الفرائس على التوالي.

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