

## LIFE CYCLE OF THE SPIDER, *UROCTEA LIMBATA* (C.L. KOCH) (ARANEAE: OECOBIIDAE) IN EGYPT

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### Abstract

The spiders, *Uroctea limbata* (C.L. Koch, 1843), of family Oecobiidae, were collected from greenhouses in Giza Governorate, Egypt. Their life cycle was studied in laboratories at 26-28°C and 60-70% R.H. The male ones reached their maturity after 6-7 spiderling instars, with an average of 230.7±3.4 days, while the females after 7-8 spiderling instars with an average of (273.1±3.1 days). Spiders were fed on different instars of the cotton leaf worm. Food consumption and mating behaviour were observed. This study is a necessary step to know the role of the spider, *U. limbata* in the biological control, especially in greenhouses.

**Keywords:** Spiders, Araneae, Oecobiidae, *Uroctea limbata*, life cycle, food consumption, Egypt.

### INTRODUCTION

Family Oecobiidae Blackwall, 1862 has a worldwide distribution and is represented in several countries both by native and some cosmopolitan and synanthropic species (Santos & Gonzaga, 2003). It includes six genera and 110 species; one of them is genus *Uroctea* Dufour, 1820 that includes 18 species distributed all over the world (Platnick, 2014). In Egypt, there are two genera and seven species of Oecobiidae; two species of them belong to genus *Uroctea*, i.e. *U. durandi* (Latreille, 1809) and *U. limbata* (C.L. Koch, 1843) (El-Hennawy, 2006). *U. limbata* is recorded from Alexandria, Abu Galoum, Nabq and Ras Mohammed in Egypt (El-Hennawy, 2006). Now, it is recorded from Giza too.

*Uroctea limbata* is the first dominant ground species inside greenhouses followed by *Nurscia albomaculta* (Lucas, 1846) while it is the second dominant species after *N. albomaculta* in the open fields of cucumber and pepper plants (Sallam *et al.*, 2009).

There is not any published biological study on *U. limbata* in or outside Egypt till now. Therefore, it is necessary to study its life cycle and to try to know its role in the agroecosystem especially inside greenhouses.

## MATERIALS AND METHODS

The spiders of *Uroctea limbata* (Fig.1) were found under stones, under plants and in the greenhouses corners. Two egg sacs of *U. limbata* were collected from cucumber and pepper greenhouses in Dokki region, Giza governorate and kept in plastic vials (3 cm diameter x 5 cm length). The newly hatched spiderlings were transferred and individually reared in translucent plastic container cells. They were fed once every two days on different stages of 1<sup>st</sup>-4<sup>th</sup> instars of larvae cotton leaf worm, *Spodoptera littoralis* (Boisduval, 1833). Each spider was supplied with known number of the larvae of *S. littoralis* as a prey for the first spiderlings till the adulthood. The rearing vials were kept in an incubator at 26-28±1°C and 60-70% R.H. Spider individuals were examined every two days and the numbers of consumed prey individuals were recorded and replaced by other live ones. After reaching male adulthood, young female were reared together to observe mating behaviour (Fig. 2) and oviposition. Obtained data recorded for 20 adult males and females.

## RESULTS AND DISCUSSION

### Egg sac, eggs and incubation period

The egg sac is spherical in shape, white in colour at first, covered with a lot of silk web and it becomes dark before hatching. The eggs inside the egg sac are spherical and white at the beginning and then become dark before hatching. Thirty six individuals hatched and emerged from the two egg sacs through a round pore at the tip of the egg sac. They were kept under laboratory conditions. The incubation period of *U. limbata* eggs lasted for 27.5±2.1 days inside the two egg sacs.

### Spiderlings

The spiderlings passed through 6-7 instars for males and 7-8 instars for females during their development (Table 1). These results agree with El-Hennawy & Mohafez (2003) for males of *Stegodyphus dufouri* (Audouin, 1825) (Family: Eresidae) but it differs for females (7 instars). Also, these results agree with Sallam (2004) for *Steatoda paykulliana* (Walckenaer, 1805) (Family: Theridiidae) for males but it differs for females (6-8 instars).

Spiderling duration averages were 12.2±2.0 & 19.6±3.1; 20.5±2.8 & 19.8±2.2; 21.8±3.0 & 33.3±3.3; 33.5±3.8 & 44.2±2.7; 43.3±3.7 & 46.6±2.0; 45.9±1.4 & 49.7±1.8; 37.0±2.5 & 35.5±1.6 and 20.8±2.0 days, for male and female, respectively. Total periods of spiderlings development differed according to sexes which were shorter for males than females.

The shortest instars were the 1st and the 2nd ones for both male and female; this data agree with that obtained by Sallam (2004) for males and females respectively, but not agree with that obtained by Sallam & El-Hennawy (2003) when the duration was longer during the first instar and then decreased during the 2<sup>nd</sup> and 3<sup>rd</sup> instars for the spider *N. albomaculata*.

Forty percent of males became adult after six moults, while sixty percent moulted seven times. Most females (80%) reached maturity after eight moults, while only 20% moulted seven times. The longest duration was the 6th instar for both females and males, respectively. The shortest instars were the 1st through the 3rd ones for both males and females.

### **Sex ratio**

The sex ratio of the spider, *U. limbata* adults was 1: 1 (male: female) which coincided with the spiders *N. albomaculata* (Sallam & El-Hennawy, 2003).

Table 1. Duration of the different developmental stages of the oecobiid Spider *Uroctea limbata*.

Developmental Stages	Duration (Days)					
	Male			Female		
	Range	Mean	S.D	Range	Mean	S.D
1 <sup>st</sup> Instar	11-16	12.2	2.0	16-22	19.6	3.1
2 <sup>nd</sup> Instar	18-26	20.5	2.8	19-26	19.8	2.2
3 <sup>rd</sup> Instar	20-30	21.8	3.0	25-35	33.3	3.3
4 <sup>th</sup> Instar	30-38	33.5	3.8	38-49	44.2	2.7
5 <sup>th</sup> Instar	35-47	43.3	3.7	44-50	46.6	2.0
6 <sup>th</sup> Instar	44-48	45.9	1.4	45-52	49.7	1.8
7 <sup>th</sup> Instar	35-40	37.0	2.5	35-40	35.5	1.6
8 <sup>th</sup> Instar	--	--	--	20-25	20.8	2.0
Life cycle	225-235	230.7	3.4	267-277	273.1	3.1

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Figs. 1-2. *Uroctea limbata* (C.L. Koch, 1843). 1. Subadult Female. 2. Male and Female at pre-copulation position.

**Food Consumption**

During the study the food consumption of spider, *U. limbata*, different spiderling instars and adults when fed on various spiders instars of *S. littoralis* larvae. Both first and second instars of spiderlings were fed on the first instar of *S. littoralis*. Third and fourth instars of spiderlings were fed on the second instar of prey. Fifth and sixth instars of spiderlings were fed on the third instar of the prey, while the seventh and eighth instars of spiderlings were fed on the fourth instar of the prey. Number of consumed prey by different spiderling instars is represented in Table (2).

The spider attacked the *S. littoralis* larvae seizing the membrane between head and thorax to feed and suck its contents. The spiderling instars could consume  $343 \pm 4.4$  &  $408 \pm 4.4$  larvae of *S. littoralis* for male and female respectively (Table 2). Females consumed more larvae of *S. littoralis* than males; this results agree with Sallam & El-Hennawy (2003), El-Hennawy & Mohafez (2003) and Sallam (2004).

Table 2. Food consumption of the oecobiid spider *Uroctea limbata*.

Developmental Stages	Number of consumed prey individuals					
	Male			Female		
	Range	Mean	S.D.	Range	Mean	S.D.
1 <sup>st</sup> Instar	15-30	20.8	3.0	18-30	22	2.2
2 <sup>nd</sup> Instar	18-30	23.1	2.1	22-33	24.1	1.9
3 <sup>rd</sup> Instar	20-35	23.8	3.3	28-43	28	3.9
4 <sup>th</sup> Instar	31-45	39.6	4.0	33-62	44	3.2
5 <sup>th</sup> Instar	50-90	72.2	1.4	59-100	94	3.7
6 <sup>th</sup> Instar	60-102	92.3	2.9	60-118	97.0	3.1
7 <sup>th</sup> Instar	72-111	90	2.8	75-120	92	3.9
8 <sup>th</sup> Instar	--	--	--	35-93	53	2.5
Life cycle	246-398	343	4.4	322-523	408	4.4

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## REFERENCES

1. El-Hennawy, H.K. 2006. A list of Egyptian spiders (revised in 2006). *Serket*, 10(2): 65-76.
2. El-Hennawy, H.K. & Mohafez, M.A. 2003. Life history of *Stegodyphus dufouri* (Audouin, 1825) (Arachnida: Araneida: Eresidae) in Egypt, A step on the way from asocial to social. *Serket*, 8(3): 113-124.
3. Platnick, N. I. 2014. The world spiders catalog, version 14.5. American Museum of Natural History, online at <http://research.amnh.org/entomology/spiders/catalog/index.html>
4. Sallam, G.M.E. 2004. Life Cycle of *Steatoda paykulliana* (Walckenaer, 1805) in Egypt (Araneida: Theridiidae). *Serket*, 9(2): 37-40.
5. Sallam, G.M. & El-Hennawy, H.K. 2003. Biological aspects of *Nurscia albomaculata* (Lucas,1846) (Arachnida: Araneida: Titanoecidae) in Egypt. *Serket*, 8(4): 147-150.
6. Sallam, G.M.E., Abd El-Azim, N.A.I. & Mohafez, M.A. 2009. Seasonal occurrence of spider (Araneida) in open and green house fields of cucumber and pepper in Egypt. *Egyptian Academic J. Bio. Sci. (Zoology)*, 1(1): 29-36.
7. Santos, A.J. & Gonzaga, M.O. 2003. On the spider genus *Oecobius* Lucas, 1846 in South America (Araneae, Oecobiidae). *J. Natural History*, 37: 239-252.

**دورة حياة العنكبوت, *Uroctea limbata* (C. L. Koch),  
في مصر (Araneae: Oecobiidae)**

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تم جمع العنكبوت *Uroctea limbata* من الصوب الزراعيه للخيار والفلفل من محافظة الجيزة وتمت تربيتة فى المعمل عند 26-28 م° 60-70% رطوبه نسبيه لدراسه دوره حياتة. تصل الذكور الي طور البلوغ بعد 6-7 اطوار عنكبوتية (3,4±230,7 يوما) و الانثى بعد 7-8 اطوار عنكبوتية (3,1±273,1 يوما). تم تغذية اطوار العنكبوت علي اعمار مختلفة من يرقات دودة ورق القطن. تم ملاحظة معدل التغذية و سلوك التزاوج. هذه الدراسة تعتبر هامة لمعرفة دور العنكبوت محل الدراسه في مجال المكافحة البيولوجية خاصة داخل نظام الصوب الزراعية.