

BIOLOGY OF THE SPIDER *ULOBORUS WALCKENAERIUS* LATREILLIE, 1806 (ARANEIDA: (ULOBORIDAE) WHEN FED ON SOME PREY SPECIES IN LABORATORY.

M. A. M. Mohafez

Faculty of Agriculture, Al-Azhar University, Cairo, Egypt

(Received: Mar. 2 , 2010)

ABSTRACT: *This study was conducted to rear the spider *Uloborus walckenaerius* Latreille, 1806 when fed on some prey species under laboratory conditions. The study proved that the spider have four spiderlings for mal prolonged (70.41 days) and five spiderlings for female prolonged (88.41 days) before reaching adulthood. It also showed that first spiderling consumed the largest number of prey species (adult white fly), while the individuals of the second to fifth spiderlings fed on the larvae and adults of Jassid and *Drosophila* for both males and females. On the other hand, the adult spider males and females fed on the *Drosophila* insect during the lifespan. However, the life cycle and longevity periods of the spider lasted 82.41, 101.12 and 18.41and 56.42 days for male and female, respectively.*

Keywords: *Life span, Spiders, *Uloborus walckenaerius* Latreille, prey.*

INTRODUCTION

The spiders are distributed all over the world and have conquered all ecological environments with the exception of the open sea. Most spiders are relatively small, 2-11 mm body length, yet some large tarantulas may reach a body length of 80-90 mm. Male spiders are almost small and have shorter life span than females. All spiders are carnivores and almost prey upon other arthropods, mainly insects, although woodlice and centipedes may also be taken. It is important to study the different ecological aspects of the spiders to maximize their important role as biological control agents (Gabbour, *et al.* 1999). In Egypt, spiders are found to be predators on insect and mites, which cause serious damage for many agricultural crops. The predatory habits of spiders are beneficial in the control of different pests. Many authors studied the role of spiders in the biological control of different pests that infest crops and orchards [Levy, 1970; Mansour, *et al.* 1980; Mansour and Whitecomb, 1986; Nyffeler, 1988; Berg, *et al.* 1992 and (Costello and Deane, 1995)]. In Uloboridae, more than 250 species belonging to 18 genera have been described. (Opell and Eberhard, 1984) This work deals with the biology of the spider *Uloborus walckenaerius* Latreille, 1806 when fed on different prey species in the laboratory with description of some of its biological aspects.

MATERIALS AND METHODS

For collecting the spider *Uloborus walckenaerius* several adult females with egg sac were collected from orchard trees in El-Sharkia Governorate, and placed in translate plastic container cell with provisions for air exchange, kept under laboratory condition in the lab. Of Agriculture Faculty Al-Azhar University. Females were observed sub-light with whitefly larvae and adult to deposited there eggs, temperature ranged between 26-28°C and relative humidity was about 60-70% for individual rearing, thirty newly hatched spider lings were transferred singly to reaching cylinder glasses (15 cm diameter, 30 cm height) including some branches of plant of 25 cm high, each individual was supplied with a known number of the larvae and adult of whitefly *Bemisia tabaci*, and the Jessed (*Empoasca* sp.). Spider individuals were examined each two days the developmental duration of each spider ling was recorded also; the consumed preys were counted and replaced with fresh ones. Emerging females were copulated and left singly for ovi-position, where females fed on the adult of *Drosophila* fly *Drosophila* sp. Incubation period, number of egg sac and longevity were recorded. Data was analysis using standard division.

RESULTS AND DISCUSSION

Uloboridae is a fairly small family, which is represented by 265 species placed in 18 genera and 4 subfamilies. They range in size from small to medium (3-10 mm body size). They spin complete orb webs or sections of orbs similar to the Araneidae and related families. The plane of the web is often more or less horizontal. The spiral threads are made up of cribellate silk rather than silk with glue droplets as in the Araneidae. Uloborids are also unique among spiders in lacking poison glands. Once a prey is tangled in the web, it is very carefully covered with silk and feeding begins only when the prey is fully immobilised.

Ovi-position and eggs incubation periods.

The spider female usually stopped feeding tow days before starting egg deposition, and devoted her effort to web silky webbing using the spinnerets. Eggs were deposited once in a mass (an egg sac). Females laid their eggs in sacs, each one contained 13-17 eggs. The incubation period for male and female was 12 days (Table 1), female of spider *U. walckenaerius* during the ovi-position period. The adult female deposited numbers of egg sac average 5.71 ± 0.48 , egg sacs the number of eggs / egg sac average $16. \pm 0.70$ eggs. The average number/ female was 85 ± 5.19 eggs.

Eggs were almost spherical, yellowish in colour, and then became darker before hatching. Spiderlings stayed together before getting out from egg sac. During rearing spiderlings, four individuals died before reaching maturity, one individual died after 1st moulting, other one individual died after 2nd

Biology of the spider uloborus walckenaerius latreillie, 1806

moulting, and two individuals died after 3rd moulting. The remaining 26 individuals reached maturity; 12 males (46.15%) and 14 females (53.84%) recorded 1: 1.17 sex ratio and. All males and females reached maturity after 4 and 5 moults, respectively. The life cycle duration was 81-85 days for males and 96-113 days for females, respectively.

The spiderlings became adult males after 81-85 days egg hatching, and died after longevity of 18.41±2.34 days, became adult females 96-113 days after egg hatching, and died after longevity of 56.42 ± 6.06 days longer than males. The variation of life span of both males and females appears evidently in Table (1). The mean of male lifespan period was 100 ±1.46 days, while mean of female lifespan was 156.66±8.54 days respectively.

Table (1). Duration of different stages of the spider species *Uloborus walckenaerius* fed on different prey species.

Developmental stage	Duration (days)					
	Male			Female		
	Range	Mean	S.D.	Range	Mean	S.D.
Incubation period	12	12	0.0	12	12	0.0
1 st spiderling instar	19-21	20.16	0.71	19-22	20.85	0.84
2 nd spiderling instar	16-21	18.13	1.46	16-24	19.47	2.41
3 rd spiderling instar	13-18	15.11	1.81	14-22	15.38	2.51
4 th spiderling instar	14-19	16.00	1.91	13-18	16.41	2.24
5 th spiderling instar	-	-	-	16-21	17.11	1.84
Life cycle	81-85	82.41	1.64	96-113	101.12	5.01
Longevity	15-22	18.41	2.34	49-70	56.42	6.06
Life span	98-103	100	1.64	138-170	156.66	8.54

Sex ratio. During one generation of *Uloborus walckenaerius* mated female deposited eggs which gave males and females in a ratio of 1: 1.7 for both sexes.

Longevity:

Most spiders of temperate regions live only one year, but some may live two years. The primitive spiders are renowned for their longevity. The orthognath purse-web spider *Atypus* sp. can survive 7 years and large tarantulas over 20 years (Berland, 1932; Canard, 1986).

Most males died shortly after mating, in Table (2) male longevity was 18.41±2.34 days. Female spider of *U. walckenaerius* spent 9.14±1.21 days as pre-oviposition period, 19.07±2.05 days as oviposition period and 28.21± 4.97 days as post-oviposition. Average female longevity 56.42± 6.06 days, while

the average life span was 100 ± 1.46 and 156.66 ± 8.54 days for male and female, respectively.

Table (2). Longevity and number of eggs/sac and number of sacs/female of spider *Uloborus walckenaerius* at 27-28 °C and 60-70% R.H.

Development period of female	Mean	S.D.
Pre-ovi-position	9.14	1.21
Ovi-position	19.07	2.05
Post-ovi-position	28.21	4.97
Average of total number of egg-sacs per female	5.71	0.48
Average number of eggs per egg-sac	16	0.70
Average number of deposited eggs per female	85	5.19

Feeding behaviour:

Spiderlings feed on different prey species, hunting them actively. All the spiderling stages and adults feed only on live and mobile prey. They feed on *Drosophila* larvae and adults, housefly larvae and adults, and Jessed. The first instar spiderlings should be fed on small larvae from Jessed and adults of whitefly. The 2nd and 3rd instar spiderlings fed on larvae of *Drosophila* and adult Jassids. All adult male and female spiders fed on adult *Drosophila* insects.

Adults and immature of the spider *U. walckenaerius* came slowly near to the different prey species and moved around the prey for a few seconds, then caught it between its chelicerae then imbedded its chelicerae in the prey body which was partially sucked. The spider then used its mouthparts in sucking the prey contents leaving only the wings. Feeding on a fly took 2-3 minutes of external digestion. Data in Table (3) show that consumption rate per day ranged 4-6 flies for first instar, 6-9 flies for second instar, and 4-9 flies for other stages of spiderlings. This result is agreed with Hamada, 2003; (Mohafez, 2004) and (Sallam, et al. 2009).

Table (3). Daily food consumption of *Uloborus walckenaerius* in laboratory when fed on different prey species.

Developmental stage	Number of prey species individual/day					
	Male			Female		
	Range	Mean	S.D.	Range	Mean	S.D.
1 st spiderling instar	4-6	5.31	0.74	4-6	5.5	0.62
2 nd spiderling instar	6-8	7.16	0.11	7-9	8.21	0.54
3 rd spiderling instar	5-8	6.25	0.08	5-9	6.41	0.64
4 th spiderling instar	4-6	4.41	0.21	5-8	6.0	1.01
5 th spiderling instar	-	-	-	6-9	8.04	0.71

ACKNOWLEDGEMENT

The author is indebted to Mr. Hisham K. El-Hennawy. No words can adequately express my gratitude to him.

REFERENCES

- Berg, M.A., S.A.S. Dippenaer, V.E. Deacon and S.H. Anderson (1992). Interaction between citers psylla , *Trioxa erytreae*(Hem.Trioxididae) and spiders in an unsprayed citers orchard in the Transvaal Lowveld. *Entomophaga*,37:599-608.
- Berland, L. (1932). Les arachnides. In Encyclopedie entomologique (Paris: Lechevaliev), 79.
- Canard, A. (1986). Donnees sur le development,le croissance,le cycle biologique et levaluation demographique de le Mygaleomorpha. Soc.,Roy. Belge. Ent 33.
- Costat, 22 (1998). A computer program for statistical analysis.
- Costella, M.J. and K.M. Deane (1995). Spider (Araneae) species composition and seasonal abundance in San Joauin Valley grape Vinyards. *Env. Entomol.*, 24 : 823-831.
- Gabbour, S.I., A.M. Hussein and H. K. El-Hennawy (1999). Spider populations' aspects associated with different crops in Menoufiya Governorate. Nile Delta, Egypt. *J. Agric. Res.* 77 (3): 1163-1179.
- Gihan, M. E. Sallam, M. A. Mohafez and Nahla A.I. AbdEl-Azeim (2009). Notes on the life history and behaviour of the crab spider *Thomisus onustus* (Walckenaer, 1805) (Aranae) (Thomisidae) *Al-Azhr J. of Agric Sci.* 7: 81-88.
- Hamada, E. G. I. S. (2003). Studies on true spiders associated with some vegetable crops. M Sc. D. Thesis Faculty. Agric. Menoufiya 138 pp.
- Levy, G. (1970). The life cycle of *Thomisus onustus* (Thomisidae:Araneida) and outlines of the classification of the life histories. *J. Zool. Lond*, 160: 523-536.
- Mansour, F. and W. Whitecomb (1986). The spiders of a citrus grove in Israel and their role as biocontrol agants of *Ceroplastes floidensis* (Homoptera: Coccidae). *Entomophaga*, 31: (3) 269-276.
- Mansour, F., D. Rosenm and A. Shulov (1980). Biology of *Cheirachanthium mildi* (Araneidae Clubionidae). *Entomophaga*.25 (3): 237-248.
- Mohafez, M. A. (2004). Ecological and biological studies on spider in Egypt. Ph. D. Thesis, Faculty of Agriculture, Al-Azhr University, 178 pp.
- Nyffeler, M. and G. Benz (1988). Feeding, ecology and predatory importance of wolf spider (*Pardosa* spp.) Aranae: Lycosidae) in winter wheat field *J. Apple. Entomol.*,106: 123-134.
- Opell, D. and W.G. Eberhard (1984). Resting postures of orb-weaving uloborid spiders. *J. Arachnol.*11: 369-376.

الدراسة المعملية لملاحظة دورة حياة العنكبوت
ULBORUS WALCKENAERIUS LATREILLIE, 1806
والذي ينتمي لعائلة Uloboridae

وقد تم تغذيته على الفرائس المختلفة تحت الظروف المعملية

محمد عبدالعال محمد محافظ

كلية الزراعة . جامعة الأزهر

الملخص العربي

أوضحت النتائج أن الذكور من أفراد هذا العنكبوت تمر بأربعة أطوار حتى تصل للطور الكامل الكامل. وتستغرق فترة زمنية قدرها (٧٠.٤١) يوم، بينما تستغرق الأنثى فترة زمنية قدرها (٨٨.٤١) يوم حتى تصل للطور الكامل.

أوضحت الدراسة أيضاً أن الطور الأول يستهلك عدداً أكبر من الفرائس (الذبابة البيضاء) بينما قلت الأعداد في الطور الخامس الذي كان قد تم تغذيته على يرقات الجاسيد والدروسوفيللا لكل من الذكور والإناث.

هذا وقد تم تربية أفراد هذا النوع من الذكور والإناث على حشرة الدروسوفيللا أيضاً بعد الوصول الى الطور الكامل من دورة الحياة وحتى نهاية العمر وقد تراوحت كلاً من دورة الحياة وطول العمر بين (٨٢.٤١ ، ١٠١.١٢) و (١٨.٤١ ، ٥٦.٤٢) يوم للذكور والإناث على التوالي.