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POPULATION FLUCTUATION, BIOLOGICAL FEATURES OF DUBAS BUG (*Ommatissus lybicus* DeBerg (HOMOPTERA :TROPIDUCHIDAE) ATTACKING DATE PALM TREES (*Phoenix dactylifera* L.) AND ITS BIOLOGICAL CONTROL BY *Chrysoperla carnea* (Steph.) LARVAE.

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ABSTRACT

The Palm trees, attacking by many insect pests and among the most important of these insect pests Dubas bug *Ommatissus lybicus* DeBerg (Homoptera: Tropiduchidae). The study of the population fluctuation of Dubas bug *O. lybicus* was carried out in Helwan on date palms in correlation with studying associated natural enemies. Field studies were carried out during two successive seasons (2010/2011 and 2011/2012) by fortnightly visits to examine the fronds of the selected palms. The data showed that there are two generations per every year (spring and autumn generations) on Date palm trees. There was a negative correlation between Dubas numbers and each of temperature and relative humidity. There was no significant differences between the two seasons. The most widely spread predators were *Chrysoperla carnea* (Steph.), *Coccinella undecimpunctata* L., *Sphodromantis* sp. As respect to biological studies on dubas bug, *O. lybicus* were carried out in 2009. The obtained results showed that the insect pest had two annual generations (spring and autumn generations) and the adult passed through five nymphal instars before maturity. The spring generation lasted 166.5±12.85 days, while autumn generation lasted 145±6.20 days. The nymphal stage lasted 53.5±1.87 days for the spring generation and 51.5±1.87 days for the autumn generation. Adult females lived 63±5.6 days and 91.4±13.6 days in spring and autumn generations, respectively. The respective figures for males were 33.5±6 and 76±9 days. The number of deposited eggs ranged from 146.5±8.23 eggs/female for the spring generation to 146.5±2.45 eggs/female in autumn generation. The incubation period of the egg stage reached 117.5±1.87 days and 60±3.32days for spring and autumn generations, respectively. Statistical analysis showed that there were significant differences between developmental time means of eggs and adults for both generations. Results also showed that there were significant differences between spring and autumn life span periods (235.5±16.30 and 164±9.09 days, respectively). Nymphal stage of dubas bug showed five developmental instars with five moulting, with significant differences recorded among means of developmental periods among nymphal instars (8.5±1.29, 10.5±1.29, 13±1, 11.5±1.29, 14±1 and 8±1, 8.5±1.29, 12±1, 13±1, 13.5±1.29 days) for spring and autumn generations, respectively. The results showed significant differences between male and female longevities for both generations. The biological control of dubas bug by *Ch.carnea* Larvae, showed that the *Ch. carnea* larvae has the ability to consume average 16.4±6.9 nymphs of the first nymphal instar of dubas bug during 24 hours.

INTRODUCTION

The date palm (*Phoenix dactylifera* L.) is considered a symbol of life in the desert, because it tolerates high temperatures, drought and salinity more than many other fruit crop plant species, it is one of the oldest trees from which man has derived benefit. And it has been cultivated since ancient times. It is the only indigenous wild desert plant definitely domesticated in its native harsh environments (Zohary and Hopf, 2000). The date palm retains its value for cultivators as it gives a wide range of products and services, including many necessities of life. The date, primary product of the palm, is rich in protein, vitamins, and mineral salts. That is why it represents an essential element of diet for the cultivator himself and his animals. All secondary products of the palm result from annual pruning and have essential uses for the cultivator. Unfortunately, the date palms grown in the Arab region are under threat from diseases, pests, environmental changes and socio-economic factors. Of the estimated 120 million date palms in the world, over two-thirds are in Arab countries (FAO, 1982).

Arab countries possess 70% of the 120 million world's date palms and are responsible for 67% of the global date production (EL-Juhany, 2010).

Dubas bug *O. lybicus*, is a serious pest of date palm in the Sultanate of Oman. It has been recorded in Bahrin (El – Haidari , 1981); in Sudan (El Haidari, 1982); in Israel (Klien and Venezian,1985); in Qatar (Al – Azawi, 1986); in many Arab countries (EI-Haidari and AI-Hafidh, 1986); in date palm plantations in Iraq, Iran, Egypt, N. Africa (Hill and Waller, 1990); in Egypt (Hussein and Ali,1996) and in Libya (Lal and Naji, 1997). Dubas bug was recorded for the first time as a pest attacking young Date palm and Canary palm in Helwan governorate in April 2007, it was found to attack green fronds of the palm (Hussain, 2011). *O. lybicus* was referred to in earlier literature as the "*lybicus*" variety of *O. binotatus* it was raised to species status by Asche and Wilson (1989). *O. lybicus* is known in Arab area as "Dubas bug", and in some literature it is known as the "Old world date bug". This species is restricted to date palm on which it completes its life cycle. The infested date palm with *O. lybicus*, affected directly through the feeding of the mobile stages of this insect, and indirectly by producing copious amounts of honeydew, which then covers the fronds of the date palm. The deposited honeydew accumulates, supporting sooty mould growth, and under the rainless conditions of the desert (where date palm usually grow) a thick layer of dust may accumulate on honeydew-coated surfaces. After following the infestation, sometimes the frond surfaces tend to become chlorotic. In Iraq, losses of 50% of the date crop have been attributed to this insect (Kranz *et al*., 1978). Dates of infested palms are reported to be smaller and to ripen slowly, with high percentage of reducing sugars and sucrose (Hussain, 1985).

The present study was carried out to shed light on the occurrence, population density and bionomic observation of dubas bug and associated

natural enemies on date palm in Helwan city. A biological study of dubas bug has to be undertaken in order to enable proper plant protection measures at critical stages of the life cycle of the pest. It also aimed to studying the biological control for dubas bug by the predator *Ch. carnea* larvae under laboratory conditions.

MATERIALS AND METHODS

Study the population fluctuation of dubas bug *O.lybicus*. on date palm trees:

1. To study the population fluctuation of dubas bug *O. lybicus*, Thirty-two pinnates (replicates) of date palm trees infested by this insect, were selected in Helwan university court. Cairo Governorate. The numbers of eggs, nymphs and adults were counted fortnightly on four random pinnate per one frond, four fronds for each palm tree (one frond from each cardinal direction of the date palm tree), the number of each stage was recorded. The numbers of predators were recorded as well; these counts extended from March 2010 till March 2012, no control measures were applied for the inspected date palm (Hussain, 2011).
2. Data of the climatic factors was taken from Central Laboratory of Agricultural Climate.
3. Statistical analysis was carried out (correlation coefficient and T values).

Biological aspects of *O. lybicus* under semi field conditions:

1. Biological studies for the spring and autumn generations of dubas bug were carried out in 2009 on 10 date palm seedlings cultivated in plastic pots (25cm diameter x 25 cm. height) under semi field conditions.
2. Samples of Dubas bug adults were collected from the date palm at Helwan University Cairo Governorate in late November (autumn generation) in 2008.
3. The date palm seedlings were infested by dubas bugs adult, then covered with plastic cages displaying two muslin windows on the two sides for ventilation.
4. During the following days, the date palm seedlings were examined carefully to monitor newly egg-laying then the newly hatched nymphs. The duration of the nymphal instars were estimated. The adults were inspected daily until death. Longevity of adults (males & females), pre-oviposition, oviposition, post oviposition, life span periods and number of deposited eggs/female were estimated. Deposited eggs were left until hatching and the incubation period was determined.
5. Statistical analysis was carried out (T values).

Food consumption of *Ch. carnea* larvae from dubas bug nymphs:

1. The experiment was carried out on cultivated date palm seedlings in plastic pots (10 cm diameter x 15cm. height) consisting of (5 replicates and 1 control) under laboratory conditions (25^{o}c, 60% R.H).
2. Rearing of *O. lybicus* in Faculty of Agriculture, AlAzhar University. Culture of *O. lybicus* nymphs were reared on cultivated palm seedlings cultivated in plastic pots.

3. Rearing of *Ch. carnea* at the Chrysopa mass rearing unit, Faculty of Agriculture, Cairo University. Culture of *Ch. carnea* larvae were reared on *Ephestia kuehnilla* eggs.
4. Each date palm seedling and the control were infested by 50 dubas bug nymphs (1st instar). Then provided by *Ch. carnea* larva 2nd instar (one larva / one seedling) except for the control.
5. On the following day survival rate of dubas nymphs, was estimated *Ch. carnea* larva, rate of food consumption in 24 hours were calculated and compared to that of the control. The larvae were inspected daily until they reached pupal stage then the number of *Ch. carnea* at pupal stage were estimated.

RESULTS AND DISCUSSION

Population fluctuation of dubas bug:

Eggs, nymphs and adults were observed on green leaflets, females laid eggs on the midrib of the leaves and on the blade and the vein of the leaflets.

Population fluctuation of dubas bug in the first season 2010/ 2011:

Data presented and illustrated by (Figure 1) show that acertain number of eggs were found during two periods; the first period occurred through July 2010 with an average maximum density of 9 eggs / 32 leaflets on date palm, the second one recorded through the last months of 2010 with an average maximum density of 12.75 eggs / 32 leaflet on date palm during December (Fig. 1).

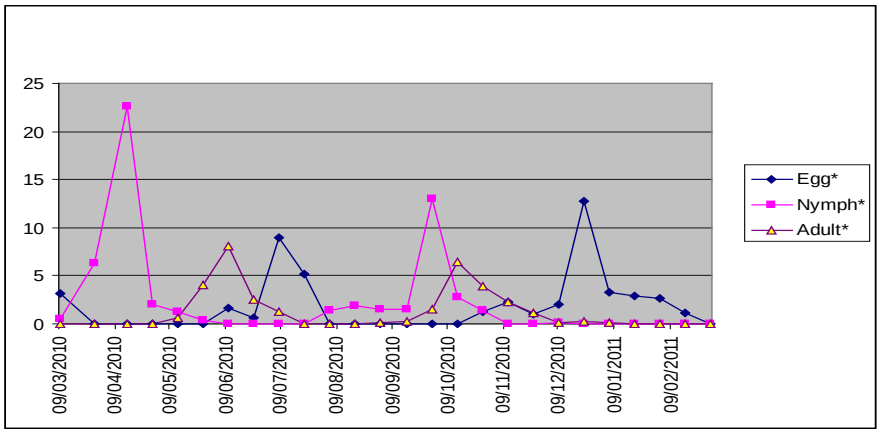

Fig.1. Population fluctuation of different stages of dubas bug *Ommatissus lybicus* DE BERG on date palm trees during 2010/2011.

Nymphs were recorded on date palm in higher numbers (22.59 nymphs /32 leaflets) on the 15th of April 2010, these numbers decreased gradually to disappear in July 2010, the nymphs appeared in August (1.34

nymphs /32 leaflets) and increased gradually to reach a peak in September. 2010, (13 nymphs /32 leaflets), then decreased gradually to disappear through the period extending from the first of January 2011 till the first week of March 2012 (Fig. 1).

As regard to adult stage on date palm, it was recorded on the 27th of May 2010 and the first peak of adult population density (8.03 adults /32 leaflets) occurred on the 10th of June. 2010, another peak (6.46 adults / 32 leaflets) was recorded on the 14th of Octoper 2010. Generally the adult stage was found throughout the various examination periods (Fig. 1).

Population fluctuation of dubas bug in the second season 2011/ 2012:-

Data presented and illustrated by (Figure 2) showed that the density of the different stages of dubas bug during 2011 / 2012 displays the same trend as that of 2010 /2011 approximately.

The first period of egg laying extended from 23rd of June to 4th of August 2011 with a maximum density of 10.59 eggs /32 leaflets during July, while the second period extended from October 2011 till February 2012 on the date palm with a maximum density of 6.37 eggs /40 leaflets during December 2011 on date palm.

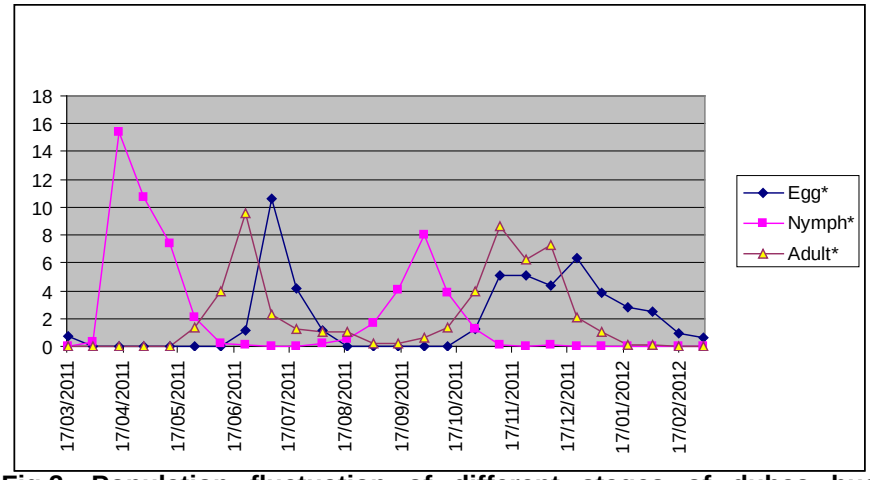

Fig.2. Population fluctuation of different stages of dubas bug *Ommatissus lybicus* DE BERG on date palm trees during 2011/2012.

Two population peaks of nymphs were recorded on date palm, the first peak 15.43 nymphs / 32 leaflets during April 2011, the second one 8.06 nymph / 32 leaflets on date palm during September 2011.

As respect to adult stage it occurred throughout the year and there were two peaks recorded, the first peak (9.62 adults /32 leaflets on date palm occurred during Jun. 2011 and the second one (8.59 adults/32 leaflets on date palm) during November 2011 (Fig. 2).

From these data it is clear that dubas bug has two generations per year, these results agree with Hussain, 1963; Hussain and Ali, 1996; Elwan and Al-Tamiemi, 1998; Al-Shamsi, 2003 and Hussain, 2011.

Correlation between some weather factors (temperature &R.H. %) and dubas numbers:

(Tables 1) showed that there was an insignificant correlation between temperature & dubas bug population densities (eggs, nymphs and adults), the same was observed between R.H.% and dubas bug population densities (eggs, nymphs and adults) on date palm for each season 2010/2011 and 2011/2012. No significant difference could discriminate a season from the other (Table 2).

Table 1: Correlation between some climatic factors (temperature &R.H. %) and dubas numbers:

Insect stage	Season 2010/2011				Season 2011/2012			
	Temp.		R.H.%		Temp.		R.H.%	
	r	p.value	r	p.value	r	p.value	r	p.value
egg	-0.303	0.132	0.083	0.687	-0.204	0.318	0.476	0.014
nymph	0.103	0.617	-0.214	0.294	0.171	0.404	-0.385	0.052
adult	0.325	0.105	-0.341	0.088	0.061	0.767	-0.273	0.177

Table 2:Statistical variance between different stages during (2010/2011 and 2011/2012).

Comparison	Mean Difference	T value	P value
2010/2011 eggs vs. 2011/2012 eggs	-0.066	-0.083	Ns p > 0.05
2010/2011 nymph vs. 2011/2012 nymph	0.377	0.030	Ns p > 0.05
2010/2011 adult vs. 2011/2012 adult	-0.754	-1.079	Ns p > 0.05

Associated insect's predators:

- Many eggs, larvae and adults of *Ch. carnea* were recorded on date palm.
- There were some adults of *C. undecimpunctata* on date palm.
- There were eggs and adults of *Sphodromantis sp* on date palm.

Biological aspects of dubas bug (*Ommatissus lybicus* DE BERG) under semi field conditions in 2009:

The results obtained revealed that *O.lybicus* had two generations/per year (spring and autumn generations) and the nymphs passed through five nymphal instars.

Spring generation:

The eggs hatching started in the third week of April and continued until last week of May and the incubation period was 115-120 days with an average of 117.5±1.87 days at 24.5±1.87^{0}C and 62.5±4.18% R.H. As presented in (Table 3), the nymphal stage lasted 51-56 days with a mean of 53.5±1.87 days in semi field conditions of. The adult female started egg laying in the fourth week of May and continued until the first week of July. The pre-oviposition averaged 10.7±1.7days at 27.9±2^{o}C and 45.9±5.6% R.H, oviposition period averaged 43.8±6.5 days at 29.9±13.1^{o}C and 50.3±13% RH. and post-oviposition period averaged 11±3 days at 30±1.5^{0}C & 56±4.2% R.H. (Table 4) .

The adult longevity averaged from 63±5.6 days for females (at 30.5±0.71^{0}C & 46.5±8.32% R.H.) to 33.5±6 days for males at 30.5±0.71^{0}C & 39.5±4.18% R.H. The number of deposited eggs ranged from133 to 160 eggs with an average of 146.5±8.23 eggs/female. The life span reached 235.5±16.30 days at 26±3.89^{0}C and 49.5±11.69 % relative humidity (Table 4). The generation period extended from 145 to188 days with an average of 166.5±12.85 days at 25.5±3.03^{0}C and 59.5±4.18 % relative humidity (Table 3).

Table 3: Biological aspects of *Ommatissus lybicus* DE BERG under semi field conditions in 2009 (spring generation):-

Generation	Spring generation		
Insect stage	Duration average / days +S.E	Climatic factors	
		Average T c˚+S.E	Average H %+S.E
Incubation period	117.5±1.87 (115-120)	24.5±1.87	62.5±4.18
Nymphal stsge:			
1st nymphal instar	8.5±1.29 (7-10)	24±2.7	46.5±9.38
2nd nymphal instar	10.5±1.29 (9-12)	24.5±2.4	43.5±8.22
3rd nymphal instar	13±1 (12-14)	25.5±3.02	45.5±7.64
4th nymphal instar	11.5±1.29 (10-13)	28±2.23	44±8.51
5th nymphal instar	14±1 (13-15)	28±2.16	47.5±6.49
Total nymphal period	53.5±1.87 (51-56)	26±3.89	46±9.66
Pre-oviposition	10.7±1.7 (9-13)	27.9±2	45.9±5.6
Generation period	166.5±12.85 (145-188)	25.5±3.03	59.5±4.18

Table 4: Some biological aspects of *Ommatissus lybicus* DE BERG adults under semi field conditions (Spring generation):

Adult stage	Duration average / days +S.E	Climatic factors	
		Average T c˚+ S.E	Average H %+ S.E
Oviposition	43.8±6.5 (33-50)	29.9±13.1	50.3±13
Post-oviposition	11±3 (7-15)	30±1.5	56±4.2
Adult female longevity	63±5.6 (55-70)	30.5±0.71	46.5±8.23
Adult male longevity	33.5±6 (25-40)	30.5±0.71	39.5±4.18
Numbers of eggs/female	146.5±8.23 (133-160)	-	-
Life span	235.5±16.30 (208-263)	26±3.89	49.5±11.69

Autumn generation:

The eggs hatching started on the third week of August and continued until the end of September and the incubation period was 55-65 days with an average of 60±3.32 days at 29.5±1.87^{0}C and 48.5±6.49% R.H. As presented in (Table 5), the -nymphal stage lasted 49-54 days with a mean of 51.5±1.87 days under semi field conditions of 28±2.16^{o}C and 53±7.53%. R.H. The adult female started egg laying on the second week of October and continued until the first week of January. The pre-oviposition period lasted 12.4±3 days at 25.8±1^{o}C and 63.4±4% R.H, while the oviposition period averaged up to 73.6±13 days at 23.7±3.9^{o}C and 57.7±11.5% RH. and post-oviposition period averaged to 12.2±2.2 days at 17.2±0.4^{0}C & 70.7±4.2% R.H. (Table 6).

The adult longevity reached 91.4±13.6 days in females and 76.4±9 days in males at 21.5±3.61^{0}C & 68±6.20% R.H. The number of deposited eggs ranged from 143 to150 eggs with an average of 146.5±2.45 eggs/female. The life span average was 164±9.09 days at 25.5±7.76^{0}C and 58.5±12.26 % relative humidity (Table 6). The generation period ranged from 135 to 155 days with an average of 145±6.20 days at 26.5±0.71^{0}C and 56±2.16 % relative humidity (Table 5).

Table 5: Biological aspects of *Ommatissus lybicus* DE BERG under semi field conditions in 2009 (autumn generation):-

Generation	Autumn generation		
Insect stages	Average duration / day +S.E	Climatic factors	
		Average T c˚+S.E	Average H %+S.E
Incubation period	60±3.32 (55-65)	29.5±1.87	48.5±6.49
Nymphal stsge:			
1st nymphal instar	8±1 (7-9)	29±1	59.5±3.60
2nd nymphal instar	8.5±1.29 (7-10)	28.5±1.29	55.5±1.87
3rd nymphal instar	12±1 (11-13)	28±1	55.5±3.02
4th nymphal instar	13±1 (12-14)	29±1.58	50±5.62
5th nymphal instar	13.5±1.29 (12-15)	26.5±1.29	57±2.16
Total nymphal period	51.5±1.87 (49-54)	28±2.16	53±7.35
Pre-oviposition	12.4±3 (9-16)	25.8±1	63.4±4
Generation period	145±6.20 (135-155)	26.5±0.71	56±2.16

Adult stage	Duration average	Climatic factors

		Average T c°+ S.E	Average H %+ S.E
Oviposition	73.6±13 (55-88)	23.7±3.9	57.7±11.5
Post-oviposition	12.2±2.2 (9-14)	17.2±0.4	70.7±4.2
Adult female longevity	91.4±13.6 (75-110)	21.5±3.61	68±6.20
Adult male longevity	76±9 (65-87)	22±3.32	62.5±3.03
Numbers of eggs/female	146.5±2.45 (143-150)	-	-
Life span	164±9.09 (149-179)	25.5±7.76	58.5±12.26

Table 6: Some biological aspects of *Ommatissus lybicus* adults under semi field conditions (autumn generation):

Statistical analysis showed that there were significant differences between developmental time means of eggs and adults for both generations, while there were no significant differences between nymphal development times for both generations. Results also showed that there were significant differences between spring and autumn life span periods (229.2±11.5, 193.4±9.3days, respectively) (Table 7).

Nymphal stages of dubas bug showed five developmental nymphal instars with five moulting, with significant differences observed among means of developmental periods and nymphal instars (8.5±1.29, 10.5±1.29, 13±1, 11.5±1.29, 14±1 and 8±1, 8.5±1.29, 12±1, 13±1, 13.5±1.29 days) for spring and autumn generations, respectively (Table 8).

The results showed significant differences between male and female longevities for both generations. The average male longevity was 33.5±6 and 76±9 days for spring and autumn generations, respectively. Where as average female longevity were 63±5.6 and 91.4±13.6 days, respectively (Table 7).

Results also showed that there were no significant differences between females fecundity for the two generations. The average number of eggs laid was 146±5 eggs/female for spring and 146.5±2.45 eggs/female for the autumn generation.

These results agree with (Al-Shamsi, 2003) but disagree with (Elwan and Al-Tamiemi, 1998**)** because their results were carried out under laboratory conditions.

The larvae and adults of lacewing *Ch. carnea* were watched in the place of study.

Table 7: Statistical analysis of some biological aspects of *Ommatis sus lybicus:*

Generations	Incubation period	Total nymphal period	Adult longevity		Generation period	Life span
			Male	female		
	Range+ M±S.E	Range+ M±S.E	Range+ M±S.E	Range+ M±S.E	Range+ M±S.E	Range+ M±S.E
Spring	117±1.87 (115-120) a	53.5±1.87 (51-56) A	33.5±6 (25-40) b	63±5.6 (55-70) b	166.5±12.85 (145-188) a	235.5±16.30 (208-263) a
Autamn	60±3.32 (55-65) b	51.5±1.87 (49-54) A	76±9 (65-87) a	91.4±13.6 (75-110) a	145±6.20 (135-155) b	164±9.09 (149-179) b

Means in each columns followed by different letters are significantly different from each other at p < 0.05.

Table 8: Statistical analysis of different nymphal instars of *Ommatissus lybicus:*

Generations	Nymphal instars				
	1st	2nd	3rd	4th	5th
Spring	8.5±1.29 (7-10) a	10.5±1.29 (9-12) A	13±1 (12-14) a	11.5±1.29 (10-13) b	14±1 (13-15) a
Autamn	8±1 (7-9) a	8.5±1.29 (7-10) b	12±1 (11-13) a	13±1 (12-14) a	13.5±1.29 (12-15) a

Means in each columns followed by different letters are significantly different from each other at p < 0.05.

Biological control of dubas bug nemph by *Chrysoperla carnea* (Steph.) larvae:

The experiment include the release of one predator and a definite number of dubas bug nymphs (50 nymphs) on seedling palms planted in six plastic pots (5 replicates and 1 control). They were cage cover by muslin for ventilation and preventing any nymphs from escaping. The experiment examined after 24 hours to record the shortfall in numbers of dubas bug nymphs, which represents rate of food consumption by *Ch. carnea* larvae on Dubas Bug nymphs. Observations continued daily until the pupal stage of *Ch. carnea*.

The results showed that the *Ch. carnea* larvae can consume a number of dubas bug nymphs of the first instar (20, 8, 21, 10, 23 nymph for five replicates) with an average 16.4±6.9 nymphs during 24 hours. Only three of *Ch. carnea* larvae reached to the pupal stage (Table 9)

These results agree with Al-Shamsi, (2003), who reported that the *Ch.carnea* Larva has the ability to consume a number of nymphs of the first instar from dubas bug nymphs with an estimated average of 26.3 nymphs in 24 hours.

Table 9: Food consumption of *Chrysopa carnea* larvae from 1st nymph Dubas bug

R	NO. of dubas nymphs 1st day	NO. of *chrysoperla carnea* larvae	R	NO. of Dubas nymphs 2nd day	NO. of *chrysoperla carnea* larvae	R	Food consumption in 24 hours	Rate of food consumption	Emergence of *chrysoperla carnea* adult
1	50	1	**1**	30	1	**1**	20	40%	1
2	50	1	**2**	42	1	**2**	8	16%	
3	50	1	**3**	29	1	**3**	21	42%	1
4	50	1	**4**	40	1	**4**	10	20%	
5	50	1	**5**	27	1	**5**	23	46%	1
C	50	-	**C**	50	-	**C**	-	-	-
M+S. Er	-	-	**-**	-	-	**-**	16.4±6.9	32.8%	-

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تذبذب التعداد، والخواص البيولوجية لحشرة دوباس النخيل التى تصيب أشجار نخيل التمر، ومكافحتها بيولوجيا عن طريق يرقات العدو الحيوى أسد المن

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تهاجم شجرة النخيل بالعديد من الآفات الحشرية من أهمها حشرة دوباس النخيل. وقد تم دراسة تذبذب تعداد هذه الآفة فى جامعة حلوان بمحافظة القاهرة على أشجار نخيل البلح مع دراسة الاعداء الحيوية المصاحبة لها. وقد نفذت الدراسات الحقلية خلال موسمين متعاقبين (2012/2011 – 2011/2010) عن طريق زيارات نصف شهرية لاختبار سعف النخيل الذى تم اختياره. وقد أوضحت النتائج أن هناك للحشرة جيلين فى السنة (الجيل الربيعى والجيل الخريفى) على أشجار نخيل البلح. وقد وجد أن هناك ارتباط سلبى غير معنوى بين كل من درجة الحرارة والرطوبة وتعداد الحشرة. كما لا يوجد فروق معنوية بين التعداد فى الموسمين. وكان أكثر الأعداء الحيوية المصاحبة للحشرة أسد المن وأبو العيد وفرس النبى.

من ناحية أخرى نفذت الدراسات البيولوجية لحشرة دوباس النخيل خلال عام 2009م. وأظهرت النتائج أن للحشرة جيلين فى العام (جيل ربيعى وجيل خريفى). وقد مرت الحشرة الكاملة خلال خمس أعمار حورية قبل النضج. استغرق الجيل الربيعى 166.5±12.85 يوماً بينما استغرق الجيل الخريفى 145±6.20 يوماً. وقد استمر الطور الحورى 53±1.87 يوماً فى الجيل الربيعى و 51.5±1.87 يوماً فى الجيل الخريفى. وقد عاشت الاناث اليافعة 63±5,6 و

91.4±13,6 يوماً فى الجيلين الربيعى والخريفى على التوالى. وكذلك عاشت الذكور اليافعة 33.5±6 و 76±9 للجيلين الربيعى والخريفى على التوالى. وبلغ عدد البيض الذى وضعته الانثى البالغة 146±8.23 و 146.5±2.45 بيضة فى كل من الجيلين الربيعى و الخريفى على التوالى. وكانت فترة حضانة البيض 117.5±1.87 و 60±3.32 يوماً لكل من الجيلين الربيعى والخريفى على التوالى. وقد أظهرت التحاليل الاحصائية أن هناك فروقاً معنويةً بين فترات حضانة البيض وكذلك بين أعمار الحشرات اليافعة فى كل من الجيلين. وهناك فروق معنوية بين فترات الحياة بين الجيلين الربيعى والخريفى (235,5±16,30 و 164±9,09 يوماً) على التوالى. بينما لا يوجد فروق معنوية بين فترات الطور الحورى فى الجيلين بالرغم من وجود فروق معنوية بين فترات الأعمار الحورية الخمسة التى تمر بها الحشرة (8.5±1.29، 10.5±1.29، 13±1، 11.5±1.29، 14±1 و 8±1، 8.5±1.29، 12±1، 13±1، 13.5±1.29) فى الجيلين الربيعى والخريفى على التوالى.

وعند دراسة المكافحة البيولوجية لحشرة دوباس النخيل عن طريق يرقات العدو الحيوى أسد المن وجد أن يرقات أسد المن (العمر الثانى) لها القدرة على استهلاك أعداد من حوريات العمر الأول لحشرة الدوباس بمتوسط 16.4±6.9 حورية فى 24 ساعة.

قام بتحكيم البحث

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