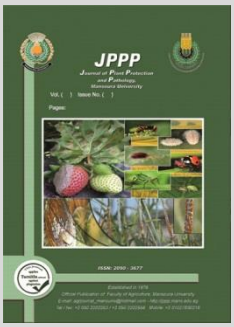
Journal of Plant Protection and Pathology

Journal homepage: www.jppp.mans.edu.eg
Available online at: www. jppp.journals.ekb.eg

Biological Studies on some Aspects of the Astigmatid Mite, *Caloglyphus berlesei* (Michael) fed on Different Diets and Different Temperatures Degrees

Enas M. K. Kassem*

Plant Prot. Res. Inst., Agric. Res. Center, A.R.C. Dokki, Giza, Egypt



ABSTRACT

Biology of astigmatid mite, *Caloglyphus berlesi* (Michael) fed on stored food diets was studied at 20 a days but took 13.14 and 16.47 days on wheat and maize flour, respectively, and female lasted 14.6, 18.8 and 22.0 days when reared on wheat, maize flour and wheat bran respectively. Male adulthood at 20ºC durated 11.7, 17.6 and 1.6 days, but female averaged 14.5, 19.5 and 26.4 days, on wheat, maize flour and wheat bran, respectively. Male and female longevity took 10.68, 16.27 and 18.34 & 16.7, 18.42 and 24.36 days when fed on same foods, respectively at 30ºC. Diets affected on deposited eggs number at 20ºC. Therefore, feeding on wheat flour increased number (233.0 eggs), as, wheat bran decreased (165.5 eggs) at 20ºC., at 30ºC, eggs deposited was 259.3, 221.2 and 175.4, when females fed on wheat flour, maize flour and wheat bran, respectively. Wheat bran recorded highest protein content, followed by wheat and maize flour. Carbohydrates recorded highest for wheat, maize flour and wheat bran. Wheat flour was most suitable for rearing where highest number of deposited eggs recorded on wheat flour (233.0 at 20ºC) and (259.3 at 30ºC),

Keywords: Astigmatid mite; *Caloglyphus berlesi*; wheat flour; maize flour; wheat bran and stored food

INTRODUCTION

Up-to-date dramatically increase in the population in the world requires an efficient modern human food and animal production industry and the manufacture of good quality feeds and food. Good postharvest management to reduce postharvest losses that affect both the quantity and quality of food, can positively influence the main components of food and nutrition security. A stored grain bulk; constitutes a biological system with limited energy and is influenced by several abiotic and biotic factors. Mites form an important group among biotic factors and although, they are very small in size, cause considerable damage in stored grain with high moisture contents. Damage by insects, mites, fungi and sprouting causes hundreds of millions of dollars of economic losses to grain producers, merchandisers, and processors each year (Harein and Meronuck 1995).Stored product mites are important pests of stored food commodities and animal feed in areas with humid climates (Sanchez-Ramos and Castanera 2003).These pests negatively influence the quality of stored commodities, cause allergic reaction (Kondreddi *et al*., 2006).The amount of damage caused by stored product mites has been determined by Cunnington (1976) to be roughly proportional to the size of their population. the growth of the mite population is directly related with the biological as well as physical factors operating the ecosystem. Abou El-Atta *et al*. (2014) investigated the effects of temperature on the development, reproduction, and food consumption of *Caloglyphus berlesei* fed egg masses of root-knot nematodes, *Meloidogyne* spp., an important group of agricultural pests. *C. berlesei* females showed a higher rate of food consumption than males.

MATERIALS AND METHODS

The astigmatid mite *C. berlesi* individuals were collected from broad bean and maize grains at Ashmoun District, El-Menoufia Governorate. Samples of these grains were randomized obtained from different animal's stockades and put in polyethylene bags, then transferred to laboratory for extraction. The collected samples were transferred to the Cotton and Field Crops Acarology Department of Plant Protection Research Institute, Agricultural Research Center, Egypt. At the same day of collection, the collected samples were separated using a Berlese funnels and collected under stereomicroscope. For preparing pure culture of tested mite, One adult female and male of *C. berlesi* were placed in the prepared cup, supplied with food and drops of water added to maintain suitable relative humidity and kept in an incubator at 25 ºC. For individual rearing, ten newly deposited eggs were transferred from the mother culture singly one to every rearing plastic cell (1.5 cm high x 2.5 cm in diameter). Each newly hatched larva was supplied with food keep till reaching maturity. Daily observations were made to record the periods of incubation, immature stages, life cycle, longevity of adult females and males and also fecundity of adult females.

- **Determination of total carbohydrates**: Total carbohydrates were estimated in acid extract of sample by the phenol-sulphuric acid reaction (Dubois *et al*., 1956). Total carbohydrates were extracted and prepared for assay according to Crompton and Bit (1967
- **Determination of total proteins:** Total proteins were determined by the method of Bradford (1976).
- **The statistical analysis** (ANOVA) of the obtained results were performed using SAS program (SAS Institute, 1988).

RESULTS AND DISCUSION

In this study the experiments were carried out under laboratory conditions of 20, and 30+2 ºC and 75+5 % R.H., when mites fed on three different diets (wheat flour, maize flour and wheat bran).All the selected diets have already been found suitable to some extent for mite survival and development.

Habitat and behavior: The mite, *C. berlesei* has isolated from samples of broad bean and maize grains at Ashmoun

* **Corresponding author.**
E-mail address: Enas_mkm@yahoo.com
DOI: 10.21608/jppp.2020.109726

District, El-Menoufia Governorate. *C. berlesei* is known as an important pest infesting stored products as well as stored seeds and grains; it is found on damp moldy wheat and maize. The mite individuals pass through egg, larva, protonymph and Tritonymph before reaching maturity. Between protonymph and tritonymph there is a non-feeding Hypopus stage may occur. Hypopus specimens are especially adapted for the spreading and survival of some acarid mites under unfavorable conditions which occur in nature. In the present experiment, Hypopus occurred fairly often in mass cultures, but they were observed rather rarely in experiments on the development cycle of single individuals isolated and placed into separated rearing cells. New resulted males were of two types, homomorphic and hetromorphic of the later ones varied from 8-12 %, and this finding is similar to obtained by Hughes (1976) and Eraky and Osman (2008).

Mating: mating is necessary for mite *C. berlesei* for other acarid miters, as, females not deposited their eggs without it. The mating process is occurs immediately after emergence of adult female. The male had ability to copulate with several females, while the female accepted copulation more than once during its life span.The male attaches female and climb its back from behind in an opposite position in a way, thus, where the bursa copulatrix situated then, mating required between 17-23 minutes

Hatching

Female deposited its eggs randomly in clarks of rearing cells singly under some substrate particles and food. Eggs of this mite are whitish and slightly longitudinal. During hatching, the egg rapture longitudinally and the larvae crawled out with its hind legs at first. The hatching process lasted about 25-30 minutes. The hatched larvae stayed inactive for a short time and then began to search the food.

Molting: When immature stages, larva, protonymph, and tritonymph full grown enter in the quiescent stage in which it seeks a dark hole or clark in the substrate of rearing chamber, ceases feeding and moving completely. The body swelled and enlarged which made the cuticle highly stretched. The legs become shrinked and contracted under the body surface. The quiescent individual never responds to and disturbance. The old skin ruptured along transversal line between dorsal and ventral surface, the hind legs appear from the old skin at the first, then the new developmental stage crawls backward coming out of the old skin for a short time, then started to move actively searching its food.

A- The biological aspects at 20 ºC.

Incubation period: As shown in Table (1), the obtained data cleared that there were slightly differences for influence of different kinds of food on egg incubation period of the mites. *C. berlesei*, thus, this period ranged from 3.5 to 4.8 days when the male and female fed on wheat flour and wheat bran, respectively, with L.S.D. at 0.05 = 0.33.

Postembryonic development: The duration of larval, protonymphal and tritonymphal stages was shortest on wheat flour and averaged 11.4 and 12.2 days and was the longest on wheat bran as, it averaged 14.83 and 19.2 days for males and females, respectively.

Life cycle: Concerning life cycle at 20 ºC, significant results due to type of introduces food to the tested acarid mite were observed. Male *C. berlesei* life cycle averaged 14.64, 17.18 and 18.43 days when the individuals fed on wheat flour, maize flour and wheat bran, respectively. On the other hand, this period lasted 16.5, 21.2 and 24.0 days, for female individuals, respectively. The statistical analysis of data showed that L.S.D. at 0.05 level for life cycle period = 0.654.

Longevity:

Life span: The life span of the adult male and female varied considerably for different food types. Obtained datad as shown in Table (1) revealed that there were significant differences between diets in case on acarid mite, *C. berlesei* at 20 ºC. Male life span durated 26.34, 34.78 and 38.03 days when fed on wheat flour, maize flour and wheat bran, respectively. The life span of female lasted 30.9, 40.7 and 50.4 days, respectively at the same conditions of experiment.

Fecundity: The different kinds of diets affect the number of deposited eggs by female of the acarid mite, *C. berlesei* at 20 ºC, Table (1). Therefore, feeding on wheat flour increased the number of deposited eggs (233.0 eggs), as, the wheat bran decreased the number of deposited eggs (165.5 eggs).The L.S.D. at 0.05 level= 3.254

Adult longevity: As shown in Table (1), male adulthood period of *C. berlesei* at 20 ºC durated 11.7, 17.6 and 19.6 days and the female adulthood period averaged 14.5, 19.5 and 26.4 days, when the different mite members fed on wheat flour, maize flour and wheat bran, respectively. The analysis of obtained data indicated that L.S.D. at 0.05 = 1.75

Table 1. Effect of different diets on the biological aspects of the astigmatid mite, *Caloglyphus berlesei* at 20 ºC

Stage		Males			Females		
		Wheat flour	Maize flour	Wheat bran	Wheat flour	Maize flour	Wheat bran
Incubation period		3.5±0.11	3.7±0.12	3.6±0.25	4.3±0.16	4.7±0.2	4.8±0.14
larva	A	2.4±0.21	3.3±0.26	3.7±0.19	2.7±0.31	3.8±0.24	4.6±0.27
	Q	1.29±0.19	1.24±0.24	1.5±0.24	1.3±0.11	1.9±0.29	1.7±0.17
Protonymph	A	2.49±0.31	2.98±0.27	2.96±0.26	2.7±0.22	3.5±0.25	3.9±0.31
	Q	1.26±0.09	1.49±0.16	1.67±0.41	1.5±0.19	1.8±0.24	2.1±0.34
Tritonymph	A	2.5±0.19	2.78±0.31	3.1±0.22	2.6±0.21	3.4±0.17	4.3+0.36
	Q	1.2±0.12	1.69+0.15	1.9+0.23	1.4±0.24	2.1±0.17	2.6±0.31
Total immature		11.14±0.34	13.48±0.38	14.83±0.26	12.2±0.35	16.5±0.43	19.2±0.62
Life cycle		14.64±0.41	17.18+0.43	18.43±0.28	16.5±0.35	21.2±0.51	24.0±0.67
Generation period		-	-	-	19.0±0.64	24.4±0.54	27.6±0.65
Longevity		11.7±0.88	17.6±0.67	19.6±0.81	14.5±0.59	19.5±0.51	26.4±0.44
Preoviposition period		-	-	-	2.5±0.14	3.2±0.15	3.6±0.16
Oviposition period		-	-	-	8.7±0.26	12.3±0.41	20.6±0.65
Postoviposition period		-	-	-	3.3±0.33	4.0±0.33	5.2±0.41
Life span		26.34±1.94	34.78±2.1	38.03±1.78	30.9±1.98	40.7±2.2	50.4±2.3
Fecundity		-	-	-	233.0±6.54	215.0± 8.8	165.5±11.0

L.S.D. at 0.05 for incubation period = 0.33, Life cycle period = 0.654, Fecundity =3.254, Longevity = 1.75

B- The biological aspects at 30 ºC.

Incubation period: The obtained data in Table (2) proved that the incubation period of the astigmatid mite, *C.berlesei* was affected by different types of introduced food, whereas, male incubation period lasted 2.7, 3.4 and 3.8 days when reared on wheat flour, maize flour and wheat bran at 30 ºC, respectively.

These periods averaged 3.5, 4.0 and 4.7 days, respectively for feeding of female individuals on the same kinds of food at the same laboratory conditions. The statistical analysis of data indicated that L.S.D. at 0.05 = 0.289.

Life cycle: As shown in Table (2), the male life cycle period of the acarid mite. *C. berlesei* lived longer on wheat bran and lasted 17.92 days but took 13.14 and 16.47 days when fed on wheat flour and maize flour at 30 ºC, respectively. But the female individuals lasted 14.6, 18.8 and 22.0 days when reared on wheat flour, maize flour and wheat bran, respectively at the same laboratory conditions, respectively. L.S.D. at 0.05 = 0.714.

Longevity: The obtained data in Table (2) cleared that the longevity period of male and female individuals of *C. berlesi* averaged 10.68, 16.27 and 18.34 & 16.7, 18.42 and 24.36 days when fed on the same order of different types of food mentioned before for males and females, respectively 30 ºC.

Table 2. Effect of different diets on the biological aspects of the astigmatid mite, *Caloglyphus berlesei* at 30ºC

Stage		Males			Females		
		Wheat flour	Maize flour	Wheat bran	Wheat flour	Maize flour	Wheat bran
Incubation period		2.7±0.26	3.4±0.32	3.8±0.31	3.5±0.28	4.0±0.37	4.7±0.32
larva	A	2.2±0.24	3.1±0.29	3.5±0.31	2.4±0.25	3.5±0.11	4.2±0.26
	Q	1.25±0.19	1.22±0.24	1.42±0.14	1.1±0.11	1.4±0.12	1.5±0.27
Protonymph	A	2.46±0.31	2.91±0.27	2.91±0.24	2.5±0.12	3.2±0.21	3.6±036
	Q	1.21±0.09	1.46±0.16	1.64±0.11	1.3±0.08	1.6±0.1	1.9±0.11
Tritonymph	A	2.3±0.17	2.74±0.37	2.94±0.34	2.5±0.12	3.2±0.31	4.0±0.34
	Q	1.02±0.09	1.64±0.08	1.71±0.16	1.3±0.11	1.9±0.27	2.1±0.26
Total immature		10.44±0.54	13.07±0.65	14.12+0.34	11.1±0.34	14.8±0.35	17.3±0.54
Life cycle		13.14±0.64	16.47±0.61	17.92±0.57	14.6±0.42	18.8±0.57	22.0±0.67
Generation period		-	-	-	16.8±0.74	21.6±0.47	25.41±0.64
Longevity		10.68±0.67	16.27±0.67	18.34±0.91	16.7±0.54	18.42±0.49	24.36±0.38
Preoviposition period		-	-	-	2.2±0.11	2.8±0.09	3.4±0.12
Oviposition period		-	-	-	11.5±0.34	11.92±0.46	16.36±0.61
Postoviposition period		-	-	-	3.0±0.29	3.7±0.31	4.6±0.27
Life span		23.82±0.72	32.74±0.64	36.26±0.61	31.3±0.58	37.22±0.64	46.36±0.74
Fecundity		-	-	-	259.3±10.8	221.2± 10.9	175.4±12.5

L.S.D. at 0.05 level for incubation period = 0.289, life cycle = 0.714. pre-oviposition period = 0.114, oviposition period = 2.2, fecundity = 4.215

Life span: Accordingly, the male and female life span periods were highly affected by feeding on different types of introduced food, Table (2). The male life span of *C. berlesi* at 30 ºC, lasted 23.82, 32.74 and 36.74 days and females recorded 31.3, 37.22 and 46.36 days when the individuals fed on wheat flour, maize flour and wheat bran, respectively.

Fecundity: The different kinds of introduced diets affected the number of deposited eggs by females of *C. berlesi*, Table (2). The number of deposited eggs was 259.3, 221.2 and 175.4 eggs when the females fed on wheat flour, maize flour and wheat bran 30 ºC, respectively.

The effect of diets components on the biological aspects of the acarid mite, *Caloglyphus berlesi*

The obtained data in Table (3) showed that average mean value of protein content in wheat flour, maize flour and wheat bran was 144.0, 113.67 and 170.67 mg/ gm of the cude tested duets materials, respectively. On the other hand, the average content of carbohydrate recorded 691.33, 647.67 and 610.33 mg/ gm of wheat flour, maize flour and wheat bran, respectively. The results indicated that the highest protein contents were recorded for wheat bran at followed by wheat flour and maize flour. On the other hand, the highest ratio of carbohydrates was recorded for wheat flour followed by maize flour and then wheat bran. These results clearly indicated that wheat flour was the most suitable diet for rearing the acarid mite, *C. berlesi* where the highest number of deposited eggs by females was recorded on wheat flour (233.0 eggs at 20 ºC) and (259.3 eggs at 30 ºC), Tables (1 and 2).

Table 3. Chemical analysis of protein and carbohydrates in different food types

Food type	Total protein (mg/gm)	Total carbohydrates (mg/gm)
Wheat flour	144.0±9.6	691.33±17.18
Maize flour	113.67±7.4	647.67±16.5
Wheat bran	170.67±8.2	610.33+15.32

***= R1, R2, R3 = three replicates were used**
****= 20 gm of food types was used in each replicate**

As in the other acarid mites, both sexes of the astigmatid mite, *C. berlesei* pass through egg, larva, protonymph and tritonymph before reaching adult and these findings are coincided with of Woodring (1969), Hughes (1976), Eraky and Osman (2008). The obtained results and other works indicated he differences in the duration of the different biological aspects and fecundity of the mites female this might be due the differences in the differences in the components of different introduced food. Chemical analysis of infested and fully matured date fruits with mites showed that in infested dates, water soluble substances as sugar are less (Hussain, 1974). Also, there was a significant negative correlation between infestation with *Oligonychus afrasiaticus* and carbohydrate content of date fruits (amounts of sucrose, glucose, fructose, fats and ash). However, significant positive correlation was found between infestation and proteins content, Ali and Aldosari (2007). The obtained results support the findings of Taha (2014) who noticed significant differences for influence of temperatures and food types on the different biological aspects of the astigmatid mite, *C. berlesei* when food on dry yeast, crushed wheat and crushed maize. Also, Taha *et al.* (2010) reported that the labidophorid mite, *Gohieria fusca* was influence by the kind of food types. The obtained results and other works indicated he differences in the duration of the different biological aspcts and fecundity of the mites female this might be dure the differences in the differences in the component of different introduced food. The biology and life table of three acarid mite, *Caloglyphus manure* Eraky & Osman, *Sancassania (Caloglyphus) berlesei* (Michael) and *Tyrophagus putrescentiae* (Schrank) fed on the egg masses of root-knot nematode *Meloidogyn. incognita* (Kofoid and White),at 25ºC ±1 and R.H 70±10%, Abu El-Atta *et al.* (2017). Life cycle durated 13.52, 7.92 and 12.6 days for female and 13.17, 7.31 and 11.29 for male of *C. manure, S. berlesei* and *T. putrescentiae*, respectively .Female life span averaged 32.72,28.47 and 36.75 days while these of male

averaged 19.23, 25.7 and 31.29 days. Taha *et al*. (2019) studied the effect of dry yeast granules, crushed wheat, crushed rice as a kind of food on biological aspects, fecundity and life table parameters, of the grain mite, *C. lactis*. The obtained data showed that the ability of mite *C. lactis* to feed and develop on the above mentioned diets as a sole food sources. The average of total immature stages lasted (13.4 &11.6), (16.5 &15.1) and (20.0 &18.6) days for female and male reared on the same diets, respectively. Female longevity durated 15.1, 18.5 and 19.5 days, while male adulthood averaged 19.3, 24.8 and 25.8 days, when mite fed on the above mentioned diets. Female oviposition period stayed 11.3, 12.9 and 13.6 days and the average number of deposited eggs/female was136.8, 113.9 and 70.5 eggs with a daily mean 12.1, 8.8 and 5.2 eggs on the same tested diets. The life table parameters of C. lactis were affected by different types of food whereas, the mean generation (T) was 20.7, 22.8 and 28.8, while the intrinsic rate of natural increase (rm) values were 0.39, 0.32 and 0.24 when mite fed on the same tested diets at the same pattern.

REFERENCES

Abou El Atta; D.A. Mariam G. Habashy; Amira E. Mesbah; Alyaa A. Tawfik 2017. Life History of *Caloglyphus manure*, *Sancassania* (*Caloglyphus*) berlesei and *Tyrophagus putrescentiae* (Acari: Acaridae) Feeding on Root-Knot Nematodes, *Meloidogyn incognita* . Journal of Plant Protection and Pathology, 8 (2): 69-72.

Abou El-Atta DA1, Ghazy NA, Osman MA. 2014. Effects of temperature on the life-history traits of *Sancassania (Caloglyphus) berlesei* (Acari: Astigmata: Acaridae) feeding on root-knot nematodes, *Meloidogyn* spp. (Nematoda: Meloidogynidae).

Ali, A.G. and Aldosari, S.A. 2007. Susceptibility of date palm fruit cultivars to the natural infestation by *Oligonychus afrasiaticus* (McG.) (Acari: Tetranychidae) in relation to their chemical composition. Ass. Univ. Bull. Environ. Res., 10 (2):1-7.

Bradford, M. M. 1976. A rapid and sensitive method for the quantitation of microgram quantities of proteins utilizing the principle of protein-dye binding. Anal. Biochem., 72:248-254

Crompton, M. and Birt, L. M. (1967): Changes in the amounts of carbohydrates, phosphagen and related compound during the metamorphosis of the blowfly, *Luciliacuprina*. J. Insect physiol., 13:1575-1595.

Cunnington, A. M. 1976.The effect of physical conditions on the development and increase of some important storage mites. Ann. Appl. Biol., 82: 175-178.

Dubios, M.: Gilles, K. A.; Hamilton, J.K..; Rebers, P.A. and Smith, F. 1956. Colorimetric method for determination of sugars and related substance. Analyt.Chem .,28: 350 – 356

Eraky, S and Osman, M.A. 2008.Some biological aspects and life table parameters of *Caloglyphus manure* Eraky & Osman (Acaridida: Acaridae) fed on different kinds of food. Acaraines. 2, 48:45-48.

Harein, P. and Meronuck, R. 1995.Stored grain losses due to insects and molds and the importance of proper grain management, *In* Krischik, G. Cuperus & D. Galliart, pp 29-31., E-912.CES.Div. Agric. Sci. Nat. Res. OSU.USDA. FGIS.ES. EPHIS. 242 pp.

Hughes, A.M. 1976.The mites of stored products and houses. In. Agric. Fish and Food.Tech Bull., 400 pp.

Hussain, A.A., (1974): Date palms and dates with their pests in Iraq. pp. 166. Mosul University Press

Kondreddi, P.K., Elder, B.L.; Vyszenski,M. and Arian, L.G. 2006. Importance of sensitization to *Tyrophagus putrescentiae* in the United Stats.Ann. Allergy Asthma Immunolqa. 96 (1): 12pp.

Sanchez-Ramos, I. and Castanera, P. 2003. Laboratory evaluation of selective pesticides against the storage mite *Tyrophagus putrescentiae* (Acari: Acaridae). J. Med. Entomol., 40: 475-481.

SAS institute, 1988. SAS/Stat users guide, 6.03, ed. SAS Institute, Cary, NC.

Taha, H.A.; Mahmoud, H.I.; Hassan, M.I.; Omar, N.R. sand Nasr, H.M.2010. Effect of different food types on the biology, fecundity, and life table parameters of the stored grain mite, *Gohieria fusca* (Oud.) (Acari: Astigmata: Lapidophoridae) Egypt J. Agric., Res., 88 (1): 133-142.

Taha, H.A.A., Hanna, I. Mahmoud; Mostafa I. Hassan, Nahed, R. Omar and Heba M. Nasr (2019): Biological studies on the stored grain mite, Caloglyphus lactis (Linn.) (Acari: Astigmata: Carboglyphidae) .Egyptian J. of Agricultural Research, 97 (1): 167-177.

Taha, Reham, H.A. 2014. Biological studies on some Granivorous mites belongs to Sub-order Acaridida. M.Sc. Thesis, Fac. Sc., (Girls) Al-Azhar Univ., 159 pp.

Woodring, J.P. 1969. Observation on the biology of six species of acarid mites. Ann Ent. Soc. Amer., 62:102-108.

دراسات بيولوجية على بعض الخصائص البيولوجية للأكاروس عديم الثغر *Caloglyphus berlesei* عند التغذية على أنواع مختلفة من الغذاء على درجات حرارة مختلفة

إيناس مصطفى قطب قاسم*

معهد بحوث وقاية النباتات – مركز البحوث الزراعية – الدقى – الجيزة – مصر

استهدفت هذه الدراسة دراسة الصفات البيولوجية التى يمر بها الاكاروس *Caloglyphus berlesi* التابع لعائلة Acaridae والذى يعيش فى المواد المخزونة وخصوصا منتجات القمح وذلك عند تربيته على دقيق القمح – دقيق الذرة – ردة القمح كمصادر غذائية وذلك عند درجتى الحرارة 20 و 30 مº . اثبتت النتائج المتحصل عليها ان فترة حضانة البيض للاكاروس قد تاثرت بتنوع الغذاء المقدم للافراد حيث تراوحت بين 3.5 و 4.8 يوما للذكور والاناث عند التغذية على دقيق القمح وردة القمح على الترتيب عند 20 مº ولكن عند 30 مº استغرقت الافراد الذكور زمنا مقداره 2.7 و 3.4 و 3.8 يوما على دقيق القمح و ودقيق الذرة وردة القمح على الترتيب اما الاناث فقد استغرقت زمنا مقداره 3.5 و 4.0 و 4.7 يوما على الترتيب. كما تشير النتائج المتحصل عليها الى ايضا ان دورة الحياة للافراد Life cycle قد تاثرت بتغير درجة الحرارة ونوع الغذاء المقدم لها حيث استغرقت زمنا مقداره 14.64و 17.18 و 18.43 يوماعند تغذية الذكور و 16.5 و 21.2 و 24 يوما عند تغذية الاناث على نفس الاغذية سابقة الذكر عند20 º ومن ناحية اخرى وعند 30 مº استغرقت الذكور أعلى فترة 17.92 يوما على ردة القمح اما عند التغذية على دقيق القمح ودقيق الذرة فقد استغرقت الافراد وزمنا مقداره 13.14 و 16.47 يوما على الترتيب اما الافراد الاناث فقد اشتغرقت زمنا مقداره 14.6 و 18.8 و 22.0 يوما على الاغذية المختلفة على الترتيب. ومن النتائج المتحصل عليها ايضا وجد ان الافراد البالغة من الذكور استغرقت زمنا مقداره 11.7 و 17.6 و 19.6 يوما والاناث استغرقت زمنا مقداره 14.5 و 19.5 و 26.4 يوما عند التغذية على دقيق القمح و دقيق الذرة وردة القمح عند 20 مº . من ناحية اخرى فقد سجلت الافراد البالغة من الذكور والاناث 10.68 و 16.27 و 18.34 & 16.7 و 18.42 و 24.36 يوما على الاغذية المختلفة وذلك عند 30 مºعلى الترتيب. كما دلت الدراسة ايضا ان عدد البيض الموضوع بواسطة الافراد الاناث للاكاروس *C. berlesi* قد تاثر بنوع الغذاء المقدم لها ودرجة الحرارة حيث سجلت اعلى معدل لعدد البيض (233 بيضة) عند التغذية على دقيق القمح واقل عدد (165.5 بيضة) على ردة القمح وذلك عند 20 مº. اما عند 30 مº فقد وضعت الاناث عددا من البيض مقداره 259.3 و 221.2 و 175.4 بيضة عند التغذية على دقيق القمح ودقيق الذرة وردة الذرة على الترتيب.