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Research Article

Effect of different prey species on the biological parameters of *Chrysoperla carnea* Stephens. (Neuroptera: Chrysopidae) in laboratory conditions

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Abstract: The prey suitability for generalist predators is an important feature for efficient mass rearing and IPM. The green lacewing, *Chrysoperla carnea* (Stephens) is a polyphagous predator attacking several pests on various crops. This experiment was conducted under laboratory conditions at 25 ± 2 °C, 60 ± 5% R. H. and a photoperiod of 16L: 8D, at Kerman Shahid Bahonar University. The effects of different prey species were investigated on the pre-imaginal development, survival, adult longevity and fecundity of the green lacewing. The results indicated that duration of each pre-imaginal stage development and total development time in *C. carnea* were significantly affected by species of prey tested. The total developmental period was 19.63 ± 0.125, 20.63 ± 0.180, 22.06 ± 0.183, 22.35 ± 0.120, and 23.81 ± 0.356 days on *Aphis gossypii*(*Glover), Myzus persicae*(*Sulzer), Aphis punicae*(Passerini), *Aphis fabae*(Scopoli) and *Aphis craccivora*(Koch), respectively. The maximum mean fecundity per female of *C. carnea* was 478.50 ± 8.38 eggs recorded when fed as larvae on *M. persicae* followed by 409.33 ± 8.16 eggs on *A. gossypii*, whereas, the minimum of 242.78 ± 7.37 eggs was recorded when fed on *A. craccivora* nymphs. The longest female longevity was recorded for *C. carnea* fed on *M. persicae*. There was significant difference in adult longevity due to feeding on different preys. However, nymphs of *M. persicae* and *A. gossypii* were the best of the prey species tested, in that when fed on these species the pre-imaginal developmental period of *C. carnea* was shorter and its adult longevity, fecundity and percentage survival was greater than those fed on the other preys. These findings could be useful in defining more optimum conditions for the mass rearing of *C. carnea* in IPM programs.

Keywords: *Chrysoperla carnea*, green lacewing, development, fecundity, longevity

Introduction

Chrysopidae has been amongst the useful insects of agricultural ecosystems which is very effective and applicable in biological control programs against agricultural pests (Canard *et al.*, 1984). This family included more than 1800 well-known species which their predatory behavior always attracted the entomologists' intention in biological control programs (Brook & Barnard, 1990). So far, it has been reported 193 lacewings species in Iran of which 46 species are members of Chrysopidae family (Farahi *et al.*, 2009). The green lacewing *Chrysoperla carnea* is amongst the predators of

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aphids, mealy bugs and some other pest species (Hesami *et al*., 2011). The green lacewing is a cosmopolitan polyphagus predator, commonly found in agricultural systems.

It is estimated that possibly up to one third of the successful biological insect pest control programs are attributable to the introduction of *C. carnea* and release of insect predators (Williamson and Smith, 1994). Larvae of *C. carnea* are voracious and efficient biological control agents for various phytophagous arthropods (McEwen *et al*., 2001).

It is important for the successful development of pest management programs that utilize *C. carnea* as a biocontrol agent to identify alternative high quality prey/food. There are not many studies on the effect of different prey species on the biology, life table parameters, fecundity and adult longevity of *C.carnea*, despite its importance as a predator of aphid pests. The importance of the nutritional quality of the prey for this predator is also unknown. Fathipour *et al* (2004) have studied the population growth parameters of green lacewing on *creontiades pallidus* Ramber.

The aim of the present study was to evaluate five species of aphid (*Aphis fabae*, *Aphis gossypii*, *Myzus persicae*, *Aphis punicae*, and *Aphis craccivora*) as food for *C. carnea* in terms of survival, development and reproduction under laboratory conditions. Such information would be helpful for optimizing the mass rearing of *C. carnea*. The results may also help in designing integrated pest management (IPM) programs involving the use of *C. carnea* as a biocontrol agent of pests on various crops.

Materials and Methods

Adults of *C. carnea* were collected from the alfalfa field at Shahid Bahonar University of Kerman and maintained in the laboratory condition (25 ± 2 °C, 60 ± 5% R. H. and a photoperiod of 16L: 8D). Before the experiment four generations of *C. carnea* were reared in the laboratory. The *C. carnea* adults for experiment were obtained from this colony. Adults were maintained in cylindrical glass jars (18 cm in diameter and 25 cm high). They had access to water and were fed a 1:1:1 artificial diet of honey, yeast and distilled water that was provided twice daily in droplet on paper strips whit help of fine camel brush. Larvae were reared in Petri dishes (9 cm diameter, 1 cm high) on *A. fabae*, which were reared on soybean plants (steel variety) grown hydroponically. Rearing conditions for stock cultures of chrysopids were 25 ± 2 °C, 60 ± 5% R. H. and a photoperiod of 16 L: 8D.

Five aphid species (*A. fabae*, *A. gossypii*, *A. punicae*, *M. persicae and A. craccivora*) were provided as prey for *C. carnea*. In this experiment, the 3rd and 4th instars of aphids were used and mature aphids were removed due to parthenogenesis.

The some biological parameters including egg incubation, larval and pupal period (days), pupal and adult survival, longevity of female (days), and fecundity per female with hatch rate were recorded daily. To avoid cannibalism, newly hatched (2 h old) larva was kept individually in Petri dishes.

To calculate the hatch rate, eggs on cylindrical jars and lace cloth of caps were harvested by a razor from pike place and separated along with black muslin cloth, counted and kept for hatching.

To investigate the suitability of prey as food for the pre-imaginal development of *C. carnea*, Approximately 400 eggs were collected from the mass-reared laboratory culture and kept in small tubes (1 cm diameter and 4 cm long). Eggs were checked every 3–4 h and also record the time from egg laying to hatching, in order to calculate the incubation period, the newly emerged larvae were transferred singly with a camel hair brush to a plastic Petri dish (9 cm diameter, 1.5 cm high). To maintain adequate ventilation inside the Petri dish, a 3-cm-diameter hole in the lid was covered with screen cleaning cloth. To investigate the larval development time and pupal period, were used 16 larvae of newly emerged larvae to feed of any prey species (total 80 larvae) and to determine the pre-imaginal survival rate, 50 larvae to feed any preys (total 250 larvae)were selected and examined. Third and fourth instars nymphs of each aphid species were supplied daily to the chrysopid larvae (ad libitum 20-15o aphids according to larval age) throughout their larval development. The larvae were fed with nymphs in Petri dishes till pupation and emerged the adults. The survival and development of the lacewing larvae were recorded twice a day at 09:00 and 18:00. All the experiments were conducted at 25 ± 2 °C, relative humidity (RH) of 65 ± 5% and a photoperiod of 16L: 8D. In each treatment, 50 newly hatched larvae were tested.

A total 90 Adults of *C. carnea* (18 female obtained from each of pupa that fed with different preys) were examined under a dissecting microscope on the day of emergence and sorted according to sex. Single pairs were confined in cylindrical glass jars (18 cm in diameter and 25 cm high) and supplied with the artificial diet for colony maintenance. One end of the cylindrical glass jar was covered with absorbent cloth. Due to the height of the glass jars, cotton wool wrapped in absorbent cloth was placed at the bottom of each of the jars in order to facilitate the collection of eggs from the bottom of the jar. In case of death of male insects in jars immediately were replaced a male insect from colony. The number of eggs lay during their oviposition period and longevity was recorded daily.

Egg viability was monitored by collecting 10 eggs per female per day throughout a female's life and keeping them in a tube (1 cm diameter, 4 cm long). The ends of the tubes were closed with cotton wool. These eggs were kept at the same temperature and photoperiod as the adults. The number of hatched and unhatched eggs was recorded every day.

Data collected on fecundity, fertility, incubation, larval instars, pupal period and other various aspects of predator biology were subjected to analysis of variance (ANOVA) and the treatment means were compared using Duncan's Multiple Range Test (DMRT) with the help of SAS computer software as analyzing tool (SAS Institute, 2003).

Results

Larval and pupal period

The effects of feeding on different prey by *C. carnea* on its development time are shown in Table 1. The results indicated that duration of each larval development and total duration in *C. carnea* was significantly affected by species of prey tested (1^{st} instar larva: F = 10.51; Df = 4, 75; P < 0.001; 2^{nd} instar larva: F = 6.38; Df = 4, 75; P < 0.001; 3^{rd} instar larva: F = 6.10; Df = 4, 75; P < 0.001; respectively). But duration of pupal development period was not significantly different between the various prey (F = 2.15; Df = 4, 75; P < 0.08).

The shortest and the longest larval development time of *C. carnea* were recorded at 1^{st} instar on *A.gossypii* and *A. craccivora*, and at 2^{nd} instar on *A. gossypii* and *A. craccivora* and at 3^{rd} instar on *A gossypii* and *A. craccivora*, respectively.

The minimum to the maximum complete larval developmental period on different insect prey species was in the order of *A. gossypii* < *M. persicae* < *A.fabae* < *A. punicae* < *A.craccivora*.

The pupal developmental period was not significantly different between the various preys.

The total developmental period of pre-imaginal stages was 19.63, 20.63, 22.06, 22.35, and 23.81 days on *A. gossypii*, *M. persicae*, *A. punicae*, *A. fabae* and *A. craccivora* respectively and was significantly different on various preys (F = 58.42; DF = 4, 75; P < 0.001).

The incubation period of eggs of *C. carnea* feeding on different preys were 2.23, 2.29, 2.34, 2.26 and 2.38 days on *A gossypii*, *A. craccivora*, *A.faba*, *M. persicae* and *A. punicae* respectively. There were no significant differences between treatments.

Pre-imaginal survival

The results showed (Table 2) that the maximum survival rate of pre-imaginal was recorded when *C. carnea* was feeding on nymphs of *A. gossypii* (78%) followed by nymphs of *M. persicae* (76%) and the minimum survival was recorded when *C. carnea* was feeding on nymphs of *A. craccivora* (62%).

Fecundity and longevity

Feeding of different prey to larvae of *C. carnea* (Table 2), significantly affected its fecundity ($F = 118.75$; $DF = 4, 85$; $P < 0.001$). The maximum mean fecundity per female of *C. carnea* was recorded when fed as larvae on *M. persicae* followed by number of eggs on *A. gossypii*, whereas, the minimum number of eggs was recorded when fed on *A. craccivora* nymphs.

The percentage of eggs hatched was high and in the range of approximately 88–95% and the maximum mean hatchability was 95.12% on *A. gossypii* and minimum mean hatchability was 88.95% on *A. fabae.*

There was significant ($F = 54.31$; $DF = 4, 85$; $P < 0.001$) variation in adult longevity due to feeding on different preys. The maximum female longevity of *C. carnea* feeding on *M. persicae* was 52.78 days and followed by *A. gossypii* that was 52.61 days and the minimum was 45.94 days feeding on *A. craccivora*. The maximum to the minimum longevity was in the order of *M. persicae* > *A. gossypyii* > *A. punicae* > *A. fabae* > *A. craccivora.*

Table 1 Mean developmental time of pre-imaginal developmental stages of *Chrysoperla carnea* reared on different s prey species.

Prey	N_0[1]	Developmental times (days)				
		1st	2nd	3rd	pupa	Total
A. panicae	16	5.06 ± 0.193 a	3.32 ± 0.12 bc	3.62 ± 0.125 ab	10.06 ± 0.193 ab	22.06 ± 0.183 b
M. persicae	16	4.13 ± 0.18 b	3.00 ± 0.183 c	3.19 ± 0.12 b	10.19 ± 0.164 ab	20.63 ± 0.180 c
A. craccivora	16	5.25 ± 0.194 a	4.06 ± 0.224 a	4.13 ± 0.202 a	10.44 ± 0.182 a	23.81 ± 0.356 a
A. gossypii	16	3.85 ± 0.171 b	2.94 ± 0.213 c	3.13 ± 0.202 b	9.75 ± 0.194 b	19.63 ± 0.125 d
A. fabae	16	4.31 ± 0.198 b	3.75 ± 0.194 ab	3.94 ± 0.193 a	10.31 ± 0.198 ab	22.35 ± 0.120 b

Notes: [1]n = number of individuals tested; [2] means in the same column followed by different letters are significantly different (Dun- can's multiple range test, $P < 0.05$). The values are means ± SE.

Table 2 Larval survival, female longevity and mean total fecundity of *Chrysoperla carnea* reared on different prey species.

prey	N[1]	pre-imaginal survival%	No. of female	Female longevity (days)	Fecundity (egg/female)	Hatchability %
A. panicae	50	68	18	51.67 ± 0.380 a	312.89 ± 9.66 c	89.15
M. persicae	50	76	18	52.78 ± 0.263 a	478.5 ± 8.38 a	91.22
A. craccivora	50	62	18	45.95 ± 0.501 c	242.78 ± 7.73 d	90.65
A. gossypii	50	78	18	52.61 ± 0.244 a	409.33 ± 8.16 b	95.12
A. fabae	50	64	18	49.89 ± 0.301 b	294.06 ± 9.44 c	88.95

Notes: [1]n = initial number of newly hatched larvae tested; [2] pre-imaginal survival = 100 × (total number of emerging adults)/(initial number of newly hatched larvae tested); [3] number of females tested; [4] means in a column followed by different letters are significantly different (Duncan's multiple range test, $P < 0.05$). The values are means ± SE.

Discussion

It is widely reported that unsuitable food can extend the pre-imaginal development of chrysopids and decrease the survival, fecundity and longevity of the adults (Principi & Canard, 1984; Obrycki *et al.*, 1989; Zheng *et al.*, 1993). In this study we evaluated the pre-imaginal developmental period as well as adult longevity and fecundity of *C. carnea* provided with different species of prey. Generally, the *C. carnea* larvae that were reared on various aphids had different pre-imaginal developmental periods, longevity and fecundity per females. This indicates that the species of prey is of paramount importance as part of a balanced source of food (Evans *et al.*, 1999).

Larval food significantly affected the length of development time. The shortest development time was recorded on *A. gossypii* nymphs (19.63 days), while the longest on *A. craccivora* nymphs (23.81 days). Mannan *et al.* (1997) studied biology of *C. carnea* on *A. gossypii* and *M. persicae* and observed that larval duration was long when fed on *M. persicae*. Saminathan *et al*. (1999) and Bansod and Sarode (2000) studied biology and feeding potential of *C. carnea* on different preys and noted developmental period of *C. carnea* ranged from 18.6 days on *Aphis cracivora* to 22.7 days on *Helicoverpa armigera* (*Hb.)* neonate larvae. Balasubramani and Swamiappan (1994) studied the development of *C. carnea* on different preys in laboratory and found that larval development was rapid on eggs of *Corcyra cephalonica* (8.20 days) and was the longest on neonates of *H. armigera* (11.10 days). Fathipour and Jafari (2004) studied biology of *C. carnea* on *Creontiades pallidus* and observed that the incubation period was 4.15, the larval period 8.25, and the pupal period 8.10 days. Sattar *et al*. (2011) studied the effect of different preys on biology of *C. carnea* in laboratory and observed that larval duration was long when fed on *Helicoverpa armigera* eggs. The duration of development of *C. carnea* was significantly different on three aphid species. It was the shortest when larvae fed on *A. gossypii* followed by *M. persicae* and *Lipaphis erysimi Kalt.* (Liu and Chen, 2001). Khuhro *et al.* (2012) investigated effect of different prey species on life history parameters of *C. sinica* and observed that the eggs of *Coreyra cephalonica* and nymphs of *M. persicae* and *A. glycines* were the best of the prey species tested, in that when fed on these species the pre-imaginal developmental period of *C. sinica* was shorter and its adult longevity, fecundity and percentage survival greater than when fed on the other species of prey. In contrast, when fed nymphs of *A. craccivora* the pre-imaginal development period was longer, adult longevity shorter and fecundity lower than when fed on the other species of prey.

Percentage of pre-imaginal survival to adult stage of *C. carnea* was affected due to feeding on different preys. The maximum survival to adult stage were recorded when *C. carnea* were reared on *A. gossypii* nymphs (78%), while minimum survival to adult stage were found for insects feeding on *A. craccivora* nymphs (62%). The survival rate of *C. carnea* larvae feeding on *A. cracivora*, the larvae of *Drosophila melanogaster* and *C. cephalonica* were 51.8, 80.9 and 86.7%, respectively (Tesfaye and Gautam, 2002).

The maximum female longevity of *C. carnea* feeding on *M. persicae* was 52.78 days and the minimum 45.95 days after feeding on *A. craccivora*. The female longevity of *C. carnea* on *C. pallidus* was found 47.32 days (Fathipour and Jafari, 2004).

The maximum fecundity per female of *C. carnea* was 478.50 eggs/female recorded when fed as larvae on *M. persicae*, whereas, the minimum of 242.78 eggs/female was recorded when fed on *A. craccivora* nymphs. While, Tesfaye and Gautam, (2002) observed that *C. carnea* laid 1079, 582 and 172.8 eggs/female when reared on *C. cephalonica*, *D. melanogaster* and *A. cracivora*, respectively.

Liu and Chen (2001) determined the development, survival and predation of *C. carnea* on three aphid species, *A. gossypii*, *M. persicae* and *L. erysimi*. Survival was significantly different on aphid species; when larvae were fed on *A. gossypii* and *M. persicae*, 94.4 and 87.6% individuals developed to adult stage, respectively; whereas, only 14.9% when fed *L. erysimi*. Duration of development was significantly short (19.8 days) when fed *on A. gossypii* followed by *M. persicae* (22.8 days) and *L. erysimi* (25.5 days).

Osman and Selman (1993) investigated the influence of different aphid species on larval development and fecundity of *C. carnea*. *M. persicae* and *A. pisum* were suitable, while *A. fabae* was most unsuitable prey causing high juvenile mortality. *C. carnea* larvae fed on this aphid and *Macrosiphum albifrons* had reduced fecundity. Finally this study indicated that among all aphids tested, *A. gossypii* and *M. persicae* were more suitable food for mass rearing of *C. carnea* than other species.

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References

Balasubramani, V. and Swamiappan, M. 1994. Development and feeding potential of the green lacewing *Chrysoperla carnea* (Stephens) (Neuroptera: Chrysopidae) on different insect pests of cotton. *Anz. Schardlingsk. Pflaanzensch. (Germany)*, 67: 165-167.

Bansod, R. S. and Sarode, S. V. 2000. Influence of different prey species on biology of *Chrysoperla carnea* (Stephens). *Shashpa*, **7**: 21-24.

Brook, S. S. and Barnard, P. C. 1990. The *Green Lacewing of World: A Generic Review (Neu. Chrysopidae).* Bulletin of British Museum (Natural History), London, England.

Canard, M. Semeria, Y. and New, T. R. 1984. *Biology of Chrysopidae*. D. R. W. Junk Publishers.

Evans, E. W., STEVENSON A. T. and Richard D. R. 1999. Essential versus alternative foods of insect predators: benefit of mixed diets. Oecologia, 121: 107-112.

Farahi S, Sadeghi, H. and Whittington, A. E. 2009. Lacewings (Neu.: Chrysopidae & Hemerobiidae) from north Eastern & East Provinces of Iran. *Munis Entomology & Zoology*, 4 (2): 501-509.

Fathipour, Y., Jafari, A. and Hosseini, S. M. 2004. Population growth statistics of *Creontiades pallidus* (Het., Miridae) and its predators *Nabis capsiformis* (Het., Nabidae) and *Chrysoperla carnea* (Neu., Chrysopidae). Journal of Entomological Society of Iran, 23 (2): 15-31.

Fathipour, Y.and Jafari, A. 2004. Biology of *Chrysoperla carnea* (Neu., Chrysopidae) on *Creontiades pallidus* (Het., Miridae). Iranian Journal of Agricultural Sciences, 35 (3):721-729.Hagen, K. S. and Tassan, R. L. 1970. The influence of food wheast and related Saccharomyces fragilis yeast products on the fecundity of *Chrysopa carnea* (Neuroptera: Chrysopidae). Canadian Entomologist. 102: 806-811.

Hesami, S., Farahi, S. and Gheibi, M. 2011. Effect of different host plants of normal wheat aphid (*Sitobion avenae*) on the feeding and longevity of green lacewing (*Chrysoperla carnea*), International Conference on Asia Agriculture and Animal IPCBEE vol. 13 (2011) © (2011) IACSIT Press, Singapoore.

Khuhro, N. H., Chen, H., Zhang, Y., Zhang, L. and Wang, M. 2012. Effect of different prey species on the life history parameters of *Chrysoperla sinica* (Neuroptera: Chrysopidae). European Journal of Entomology 109: 175-180.

Liu, T. and Chen, T. 2001. Effects of three aphid species (Homoptera: Aphididae) on development, survival and predation of *Chrysoperla carnea* (Neuroptera: Chrysopidae). *Applied Entomology* and *Zoology*, 36: 361-366.

Mannan, V. D., Varma, G. C. and Barar, K. S. 1997. Biology of *Chrysoperla carnea*

(Stephens) on *Aphis gossypii* (Glover) and *Myzus perisicae* (Sulzer). *Journal Of Insect Science*, 10: 143-145.

McEwen, P. K., New, T. R. R. and Whittington, A. 2001. Lacewings in the crop management. Cambridge University Press. Pp. 546

Muzammil, S., Ghulam Hussain, A. and Tajwar Sultana, S. 2011. Effect of Different Hosts on Biology of *Chrysoperla carnea* (Stephens) (Neuroptera: Chrysopidae) in Laboratory Conditions. Pakistan Journal of Zoology, vol. 43 (6) 1049-1054.

Obrycki, J. J., Hamid, M. N., Sajap, A. S. and Lewis, L. C. 1989. Suitability of corn insect pest for development and survival of *Chrysoperla carnea* and *Chrysoperla oculata* (Neuroptera: Chrysopidae). Environmental Entomology 18: 1126-1130.

Osman, M. Z. and Selman, B. J. 1993. Suitability of different aphid species to the predator, *Chrysoperla carnea* (Stephens) (Neuroptera: Chrysopidae). *University Journal of Zoology*, *Rajshahi University*, 12: 101-105.

Principi, M. M. and Canard, M. 1984. Feeding habits in Canard M., Semeria Y. & New T. R. (Eds.),: Biology of Chrysopidae. Dr W. Junk, The Hague, pp. 76-92.

Saminathan, V. S., Muralibaskaran, R. K. and Mahadevan, N. R. 1999. Biology and predatory potential of green lacewing, *Chrysoperla carnea* (Steph.) (Neuroptera: Chrysopidae) on different insect hosts. Indian Journal Of agricultural Sciences, 69: 502-505.

SAS Institute. 2003. *A Guide to Statistical and Data Analysis, version 9.1*. SAS Institute.

Sattar, M. and Abro, G. H. 2011 Mass Rearing of Chrysoperla carnea (Stephens) (Neuroptera: Chrysopidae) Adults for Integrated Pest Management Programmes. Pakistan Journal of Zoology Vol. 43 (3) 483-487

Tauber, M. J., Tauber, C. A., Daane, K. M. and Hagen, K. S. 2000. Commercialization of predators: recent lessons from green lacewings (Neuroptera: Chrysopidae: Chrysoperla). American Entomologist 26: 26-38.

Tesfaye, A. and Gautam, R. D. 2002. Biology and feeding potential of green lacewing, *Chrysoperla carnea* on non-rice moth prey. *Indian Journal of Entomology*, 64: 457-464.

Williamson, F. A. and Smith, A. 1994. Agrow report (DS 95) biopesticides in crop protection. PJB publication, 120 pp.

Zheng, Y., Hagen, K. S., Daane, K. M. andMittler, T. E. 1993. Influence of larval dietary supply on the food consumption, food utilization efficiency, growth and development of lacewing *Chrysoperla carnea*. Entomologia Experimentalis et Applicata 67: 1-7.

تأثیر طعمه‌های مختلف روی پارامترهای بیولوژیکی *Chrysoperla carnea* Stephens. (Neuroptera: Chrysopidae) در شرایط آزمایشگاهی

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چکیده: مناسب بودن طعمه برای شکارچی‌های عمومی، یکی از ویژگی‌های مهم برای پرورش انبوه کارآمد و مدیریت تلفیقی آفات است. بالتوری سبز *Chrysoperla carnea* (Stephens) یکی از شکارچی‌های چندخوار است که به میزبان‌های متعددی روی گیاهان مختلف حمله می‌کند. این آزمایش در شرایط آزمایشگاهی در دمای ۲ ± ۲۵ درجه سانتی گراد، رطوبت نسبی ۵ ± ۶۰ درصد و دوره نوری ۱۶ ساعت روشنایی و ۸ ساعت تاریکی در دانشگاه شهید باهنر کرمان انجام شد. اثرات گونه‌های مختلف طعمه بر روی رشد و نمو مرحله نابالغ، بقا، طول عمر حشرات کامل و میزان باروری بالتوری سبز مورد بررسی قرار گرفت.

نتایج نشان داد که طول دوره رشد و نمو هرکدام از مراحل نابالغ و مجموع کل دوره رشد و نمو این مراحل در بالتوری *C. carnea* به‌طور معنی‌داری تحت تأثیر گونه‌های طعمه مورد آزمایش قرار داشت. مجموع دوره رشد و نمو به‌ترتیب ۰/۱۲۵ ± ۱۹/۶۳، ۰/۱۸۰ ± ۲۰/۶۳، ۰/۱۸۳ ± ۲۲/۰۶، ۰/۱۲۰ ± ۲۲/۳۵ و ۰/۳۶۵ ± ۲۳/۸۱ روز روی طعمه‌های *Myzus persicae* (Sulzer)، *Aphis gossypii* (Glover)، *Aphis punicae* (Passerini)، *Aphis fabae* (Scopoli) و *Aphis craccivora* (Koch) بود. بیشترین میانگین باروری در هر حشره ماده با ۸/۳۸ ± ۴۷۸/۵۰ تخم، زمانی که لاروهای بالتوری سبز از شته *M. persicae* تغذیه شدند، ثبت شد و در پی آن با ۸/۱۶ ± ۴۰۹/۳۳ تخم روی *A. gossypii* دیده شد. بیشترین طول عمر حشرات ماده *C. carnea* زمان تغذیه روی *M. persicae* ثبت گردید. بین طول عمر حشرات ماده به‌خاطر تغذیه روی طعمه‌های مختلف اختلاف معنی‌دار مشاهده گردید. به هر حال پوره‌های *M. persicae* و *A. gossypii* به‌عنوان بهترین گونه‌های طعمه مشخص شدند، چرا که با پرورش و تغذیه *C. carnea* روی این گونه‌ها، دوره رشد و نمو مراحل نابالغ آن کوتاهتر، عمر حشرات بالغ طولانی‌تر، میزان باروری و درصد بقا، بیشتر از زمانی بود که با سایر گونه‌های طعمه مورد آزمایش تغذیه می‌شدند. این یافته‌ها می‌توانند جهت تعیین شرایط بهینه پرورش انبوه *C. carnea* در برنامه‌های مدیریت تلفیقی آفات مفید باشند.

واژگان کلیدی: *Chrysoperla carnea*، بالتوری سبز، رشد و نمو، باروری، طول عمر