J. Biol. Control, 13: 125-128, 1999

Research Note

Effect of different prey insects on the reproductive potential of *Chrysoperla carnea* (Stephens) (Neuroptera: Chrysopidae)

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ABSTRACT: Studies conducted on the effect of different prey insects on reproductive potential of *Chrysoperla carnea* (Stephens) revealed that there is no correlation between the fecundity and ovipositional period. The highest fecundity (467.2 eggs /female) was obtained on sterilised eggs of *Corcyra cephlonica* (Stainton) while the highest ovipositional period (51.75 days) was observed on neonates of *Helicoverpa armigera* (Hubner). Among prey insects tested, sterilised eggs of *C. cephalonica* have been found ideal for production of *C. carnea*.

KEY WORDS: *Aphis gossypii, Chrysoperla carnea, Corcyra cephaonica, Helicoverpa armigera, Uroleucon compositae,* reproductive potential

Integrated pest management envisages the use of natural enemies as one of the important components. Among a very complex group of bio-agents, the green lacewing, *Chrysoperla carnea* (Stephens) is one of the dominant species and utilised for the management of crop pests such as aphids, whiteflies and bollworms. The influence of prey on the development of insect predator has been found for several predatory species (Tauber and Tauber, 1987). It was observed that the larval diet of *C. carnea* exerted a significant effect on fecundity of adult female (Osman and Selman, 1996). From this point of view, an experiment was conducted to examine the suitability of six prey species and their effects on the reproductive potential of *C. carnea* adult female.

The studies were undertaken in the DBT laboratory of Department of Entomology, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, during the year 1997-98. The mass rearing of *C. carnea* was carried out as per the procedure

developed by Singh (1994). The experiment was conducted with six treatments replicated four times under completely randomised design (CRD). Each replication contained ten samples. The prey treatments included fresh sterilised and unsterilised eggs of *Corcyra cephalonica*, eggs and neonates of *Helicoverpa armigera*, nymphs of *Aphis gossypii* and *Uroleucon compositae* (Theobald).

Culture of prey insects, namely, eggs of *C. cephalonica* and *H. armigera* were maintained as per the method developed by Navarajan Paul (1973) and Nagarkatti and Sattyaparkash (1974), respectively.

The other prey insects, namely, *A. gossypii* and *U. compositae* were collected from untreated cotton and safflower fields.

The eggs of *C. carnea* obtained after mass rearing were collected by destalking and placed in plastic vials (4 X 4cm). The larvae were grown to adults by providing them with adequate number of fresh insects daily as prey. Fresh unsterilised eggs of *C. cephalonica* were provided daily and by removing previous day old eggs to avoid the risk of hatching. The adults were paired and released inside the chamber for mating and oviposition. They were supplied with diet consisting of protinex (0.2g), honey (0.5g), powdered yeast (0.2g) dissolved in 6.0 ml of distilled water. A black paper sheet was wrapped inside the mating chamber as a substrate for oviposition. The observations on the numbers of eggs laid and ovipositional period of the females were recorded on different prey insects and analysed for their statistical significance. The results presented in Table 1 revealed that there has been no correlation between the fecundity and ovipositional period. The highest fecundity was observed in the females developed on sterilised eggs of *C. cephalonica* (467.2 eggs/female) during the ovipositional period of 40.75 days. However, females reared on unsterilised eggs laid 428.65 eggs within the lowest ovipositional period of 34.75 days. Contradictory to the results, Verma and Shenhmar (1983) reported that a female laid 51.9 ±14.8 eggs in her ovipositional period of 31.5 days on *C. cephalonica* eggs. While Kapadia and Puri (1992) and Mishra *et al.* (1994) observed the fecundity in the range of 16 to 117 eggs per female on nymphs of *A. gossypii*. Among the natural prey insects used, nymphs of *A. gossypii* was encouraging as laboratory diet for this predator since the fecundity of 402.15 eggs per female was obtained during the reasonable period of 38.6 days. The lowest fecundity (288.9 eggs / female) was recorded due to the treatment of nymphs of *U. compositae* during the period of 37days. Comparing the eggs and neonates of *H. armigera* as prey, more eggs per female were obtained on eggs (348.2) over neonates (339.05) during the ovipositional period of 43.75 and 51.75 days, respectively.

Thus, it can be concluded that the eggs of *C. cephalonica* (both sterilised and unsterilised) are ideal food under laboratory condition, but due to the risk of getting hatched, unsterilised eggs should not be preferred. In the absence of *A. gossypii* nymphs, eggs and neonates of *H. armigera*

could also be explored. However, nymphs of *U. compositae* are the least preferred food material for laboratory rearing of *C. carnea*.

Table 1. Effect of different prey insects on the reproductive potential of *C. carnea*

Prey insects	Ovipositional period (days)	Fecundity (eggs/female)	
Sterilised eggs of *C. cephalonica*	40.75	467.20	(21.61)*
Unsterilised eggs of *C. cephalonica*	34.75	428.65	(20.76)
Eggs of *H. armigera*	43.75	348.20	(18.65)
Neonates of *H. armigera*	51.75	339.05	(18.41)
Nymphs of *A. gossypii*	38.60	402.15	(20.05)
Nymphs of *U. compositae*	37.00	288.90	(17.61)
SE M ±	1.88		0.30
CD (P=0.05)	5.61		0.87
CV (P=0.01)	9.21		3.14

* Figures in parentheses are square root values.

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