

Laboratory Rearing of *Geocoris ochropterus* Fieber (Hemiptera : Lygaeidae) on the Pupae of *Trichogramma chilonis* Ishii (Hymenoptera : Trichogrammatidae)*

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ABSTRACT

Laboratory study was conducted during 1997 at the Biological Control Research Laboratory, Anand, Gujarat Agricultural University to test the suitability of three different prey species for rearing of *Geocoris ochropterus* Fieber an important predator associated with cotton crop. The results revealed that 92 and 96 per cent of nymphs completed their development in 30 and 31 days when reared on fresh as well as cold stored pupae of *Trichogramma chilonis* Ishii, an egg parasitoid of lepidopterans, respectively. *T. chilonis* fed females lived longer and laid greater number of eggs and their oviposition period was also longer.

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INTRODUCTION

Geocoris ochropterus known to occur only in the Indian subcontinent is predacious on number of pests (Rangarajan *et al.*, 1964; Suba Rao *et al.*, 1965; and Mukhopadhyay, 1988). In spite of its potential as biological control agent it could not be utilized in pest suppression for want of its mass rearing techniques. However, a few attempts have been made to mass rear another Geocorine, *Geocoris punctipes* (Say) on artificial diets with 14-59 per cent success by Cohen (1981). Recently Mukhopadhyay and Sannigrahi (1992) reared *G. ochropterus* on cold preserved pupae of an ant, *Oecophylla smaragdina* Fabr. These studies have shown that *Geocoris* spp. can be reared on unnatural prey without adversely affecting its biological traits. However, longer

nymphal duration and cannibalistic nature of the predator was found to be major limitations. While working on this predator, we found it preying on the pupae of *T. chilonis*, an egg parasitoid of lepidopterans commonly produced by several laboratories and also commercially available. Therefore, studies were made on the suitability of fresh as well as cold stored pupae of *T. chilonis* and cotton aphid, *Aphis gossypii* Glover. Results obtained are presented in this paper.

MATERIALS AND METHODS

Maintenance of *G. ochropterus* colonies in the laboratory

The adults of *G. ochropterus* were collected from cotton fields with the help of plastic tubes. They were held in one liter transparent plastic jar

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having lid fitted with wire screen and fed with field collected *A. gossypii* daily. A fresh leaf of cotton Hybrid-6 was also kept, as phytophagy is common in this predator. Adult holding jars were stacked in wooden rack at laboratory temperatures of 24.2-32.0 °C, 33.0-96.0 per cent RH and 8 hours photoperiod. Eggs laid by the predator on leaves, wire screen, sides of plastic lid were removed daily with wet camel hair brush and placed in glass vial (10 X 2.5 cm). Dead adults were removed and fresh adults were kept in the plastic jar periodically to meet the demand of study. This procedure was continued until the studies were completed.

Availability of preys

Aphis gossypii colonies were collected from the insecticide free cotton fields, while pupae of *T. chilonis* were obtained from Biocontrol Research Laboratory, Anand.

Suitability of different preys

Nymphal developments : Twenty-five freshly hatched nymphs were held individually in glass vials (10 X 2.5 cm) using fine camel hair brush. Each nymph was fed with five different preys till the nymph became adult. The prey used were fresh pupae of *T. chilonis*, cold stored pupae (at 7±1°C) of *T. chilonis* and cotton aphid, *A. gossypii*.

Adult longevity and fecundity : Eight freshly formed pairs, reared on different preys were individually held in a transparent plastic containers (6.5 X 7.0 cm) and fed with different prey. Observations were recorded on nymphal duration, prey consumption by the nymphs and adults, fecundity, longevity, pre-oviposition, oviposition and post-oviposition periods of the predator when reared on different prey species. The experiment was conducted in completely Randomized Design.

RESULTS AND DISCUSSION

The results presented in Table 1 revealed that the nymphs of *G. ochropterus* when reared on

fresh as well as cold stored pupae of *T. chilonis* successfully completed the development and 92 and 96 per cent of them transformed into adults, respectively. Both nymphs and adults consumed greater number of stored pupae (3634.89) than fresh ones (2526.32). The females laid greater number of eggs (344.69) when reared on fresh pupae than those reared on one-month old stored pupae (308.99) suggesting better nutritive value of fresh pupae. The nymphs when reared on *A. gossypii*, only 60 per cent completed their development in 33.40 days and female laid fewer eggs (45.36) than those reared on *T. chilonis* pupae. The results also revealed that *T. chilonis* fed (both fresh as well as cold stored pupae) females lived longer and laid eggs for much longer period (37.76 and 44.24 days) than those reared on *A. gossypii* (19.0 days). During the course of study the predator was observed to feed on the adults of *T. chilonis* also. Mukhopadhyay and Sannigrahi (1992) reared *G. ochropterus* on the pupae of ant, *Oecophylla smaragdina*. In their studies the nymphs completed their development in 31.03 days. The female laid 277.0 eggs. Kapadia and Puri (1991) reported slightly shorter duration of 29.1 days when *G. ochropterus* nymphs were reared on *Bemisia tabaci* (Gennadius).

Thus, information generated will be useful in developing mass production technology of the predator and its supplemental releases in the field. The industries involved in the *Trichogramma* production can now use unsold stocks of the parasitoid for producing *G. ochropterus* or its conservation.

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TABLE 1

Biological traits of *G. ochropterus* when reared on different preys.

Sr. No.	Prey	Nymphal duration (days)	Prey consumption by nymphs	Prey consumption by adults	Fecundity	Longevity	Pre-oviposition period (days)	Oviposition period (days)	Post-oviposition period (days)
1.	Fresh pupae of <i>T. chilonis</i>	31.33	18.082 (327.62)	49.465 (2526.32)	18.457* (344.69)	6.629* (44.63)	1.866* (3.50)	6.252* (39.76)	1.310** (1.47)
2.	One month old cold stored pupae of <i>T. chilonis</i>	30.00	25.748 (665.73)	59.627 (3634.89)	17.460 (308.99)	7.131 (51.53)	1.933 (3.76)	6.594 (44.24)	1.972 (3.65)
3.	Cotton aphid, <i>Aphis gossypii</i>	33.40	15.917 (256.14)	17.765 (395.10)	6.420 (45.36)	5.053 (26.22)	2.062 (4.12)	4.376 (19.81)	1.609 (2.35)
	Mean	31.58	19.916 (415.52)	42.286 (2185.11)	41.111 (233.01)	6.271 (40.79)	1.942 (3.79)	5.738 (34.64)	1.630 (2.49)
	S. Em. $\pm$	0.267	0.431	3.153	0.720	0.293	0.051	0.308	0.180
	CD ($P=0.05$)	0.763	1.231	9.274	2.118	0.863	-	0.907	-
	CV%	3.28	8.38	21.09	14.43	13023	7.36	15.20	31.31

*x Transformed values.

** x+0.5 transformed values.

Number in the parentheses are re-transformed values.

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