

RESEARCH NOTE

***Plutella xylostella* (L.) density requirement for maximum progeny production of *Diadegma insulare* (Cameron)**

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ABSTRACT : *Diadegma insulare* (Cameron) (Ichneumonidae : Hymenoptera) is an internal larval parasitoid of *Plutella xylostella* (L.) (Plutellidae : Lepidoptera), a pest of cabbage and cauliflower in India. Density dependent factor plays a very crucial role in mass rearing of parasitoids and further their release in the field for pest control strategies. Therefore, present work was objected to find out the optimum host density for maximum progeny production of the parasitoid. Optimum density for maximum progeny production of *D. insulare* was 100, which yielded highest number of progeny production (38.50 %). Host densities 5, 25, 50, 150 and 200 were tried in the laboratory (24±1°C, 65±2 per cent R.H., 12 hr photoperiod) and the per cent production of progeny was 22.00, 37.00, 38.00, 37.50 and 38.00, respectively.

Key words : Host Density, Progeny production, Parasitoid, Biological control

How to cite this article - Sathe, T.V. and Bhosale, A.M. (2011). *Plutella xylostella* (L.) density requirement for maximum progeny production of *Diadegma insulare* (Cameron). *Asian J. Animal Sci.*, 6(2): 212-214.

Article chronicle - Received : 5.9.2011; **Accepted :** 11.10.2011

The searching and selection of host density by parasitoid counts the success of biocontrol programme of any pest species. Host density parasitoid models suggest the number of parasitoids to be released in the field for control of pests. Therefore, the purpose of the study was to investigate the optimum host density of *Plutella xylostella* (L.) for maximum production of *Diadegma insulare* (Cameron) for hoping mass rearing of the parasitoid for its use in biological control of *P. xylostella*.

Perusal of literature indicates that Leong and Oatman (1968), Nikam and Basarkar (1981), Sathe and Nikam (1985), Sathe (1990), Sathe and Shanthakumar (1989), Sathe and Bhoje (1998), etc. attempted host parasitoid density relationship in Ichneumonid parasitoids.

Four day old *P. xylostella* larvae were exposed in densities 5, 25, 50, 100, 150 and 200 to each mated female of *D. insulare* for 24 hr in oviposition cage 25cm x 25cm x 25cm (LxWxH). After exposure, the host larvae were reared into plastic containers for further development and adult emergence. The parasitoids were fed with 50 per cent honey and hosts with cabbage bulbs. The experiments were replicated for 5 times and conducted at 25±1°C, 65±2 per cent R.H., 12 hr photoperiod.

The results are presented in Table 1 and Fig. 1. Optimum density of *P. xylostella* required for maximum progeny production of *D. insulare* was 100, on which parasitoid produced 38.50 per cent progeny production. The mean percentage of progeny production was also high with host densities 25, 50, 150 and 200, which produced 37.00 per cent, 38.00per cent, 37.50per cent and 38.00 per cent progeny production, respectively. However, host density 5 yielded lowest progeny production of 22.00 per cent.

In *Campoplex haywardi* Blanchard, an ichneumonid parasitoid of *Pthorimaera operculella*, Zeller the optimum host density was 75 larvae per tuber for maximum progeny production (Leong and Oatman, 1968). The observations of Leong and Oatman (1968) indicate that there was great variation between replicates at the same larval densities and they further observed that mean emergence at higher densities was from 3 per cent to 15 per cent less than at 75 host density. In the present study, there was no much difference in progeny production in each replicate.

Nikam and Basarkar (1981) studied the reproductive potential of *Campoplex chlorideae* (Uchida), an internal larval parasitoid of *Helicoverpa (Heliothis) armigera* (Hubn.) (Noctuidae : Lepidoptera) and reported 40 host