

Seasonal Activity of Natural Enemies of *Heliothis armigera* Hubner in Coimbatore, Tamilnadu

P.R. SRINIVAS* and S. JAYARAJ

Department of Entomology, Tamilnadu Agricultural University, Coimbatore - 641 003

ABSTRACT

The important natural enemies contributing to the reduction of *Heliothis armigera* on pigeonpea, field bean and chickpea were *Campoletis chloridae* Uchida, *Eriborus* Sp., *Carcelia* Sp., *Bracon hebetor* Say, and *Apanteles* Sp. The activity of the parasitoids was more during the months of November and January. The maximum per cent parasitism recorded by *B. hebetor*, *C. chloridae*, *Eriborus* Sp. and *Carcelia* Sp. were 35.50, 10.74, 10.24 and 38.95 respectively.

Key words : *Heliothis armigera*, *Campoletis chloridae*, *Eriborus* sp., *Carcelia* sp., *Bracon hebetor*, *Apanteles* sp.

In recent years, the problem of the gram pod borer *Heliothis armigera* has been aggravated by indiscriminate use of pesticides. The high cost of plant protection with chemical pesticides resulted in a growing interest in the use of natural enemies for controlling the pest. The availability and proper exploitation of native natural enemies will reduce the pesticide pressure on the pest. Keeping this in view, a study was conducted in Coimbatore on the occurrence of natural enemies of *H. armigera* and their influence in pest suppression.

MATERIALS AND METHODS

A field study was conducted under unprotected conditions at the Tamil Nadu Agricultural University Farm in Coimbatore, Tamil Nadu in which fortnightly observations were made on the larval population of *H. armigera* on pigeonpea (*Cajanus cajan*(Linn.) MillSp.), field bean (*Lablab purpureus* (Linn.) Sweet) and Chickpea (*Cicer arietinum* Linn.). The area under each crop was about 25 cents and approximately 100 larvae were collected from plants of pigeonpea, field bean and chickpea, and brought and reared individually in the laboratory for emergence of parasitoids.

RESULTS AND DISCUSSION

The important parasitoids recovered from *H. armigera* were *Campoletis chloridae* Uchida and *Eriborus* sp. on pigeonpea, field bean and chickpea, *Bracon hebetor* Say on field bean, *Carcelia* sp. and *Apanteles* sp. on field bean and pigeonpea. The activity of *Apanteles* sp. was found to be more

during December and January. Similarly, *Eriborus* sp. and *C. chloridae* were active from October to January. *Eriborus* sp. and *C. chloridae* were found to prefer early instars whereas, *B. hebetor* preferred later instars and similar observations were also made by Rao (1968), Bilapate (1981) and Omkar *et al.* (1984).

Apanteles sp. has been found to be effective against *H. armigera* in many countries (Rustamova 1981; Michael *et al.*, 1984) recording 15-65 per cent parasitism (Greathead and Girling, 1982). In the present investigations, we could observe many cocoons on the plants and the number of cocoons on pigeonpea plants were more during December 1983 than in January, 1984. Similarly, on lablab, it was high during November and December 1983

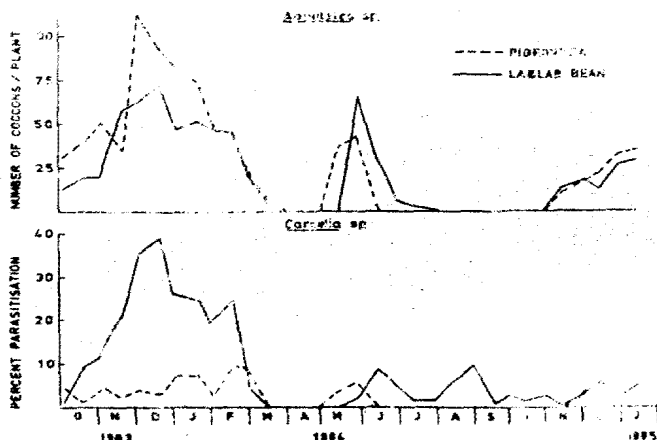


Fig. 1 Fluctuations in the natural enemy activity on *Heliothis armigera* at Coimbatore

* Directorate of Rice Research, ICAR Rajendranagar, Hyderabad - 500 030

and the incidence was less or almost negligible during July and September (Fig.1). Parasitism by *Eriborus* sp. was high during December 1983 and January 1985 on pigeonpea and extremely low and low during 1983-84 and 1984-85 respectively, whereas, it was low on chickpea during both the years (Fig.2). Bilapate *et al.* (1979) reported that *C. chlorideae* was responsible in reducing the population of *H. armigera* during November - December in chickpea and the parasitism was up to 50 percent (Bilapate, 1981). In the present observation, the activity of *C. chlorideae* during the cooler months was between 5.48 and 4.29 per cent in pigeonpea, 1.96 to 5.26 and 2.91 to 6.15 per cent in chickpea, 1.04 to 2.14 and 4.24 to 10.74 per cent in field bean during the year 1983-84 and 1984-85 respectively (Fig.2).

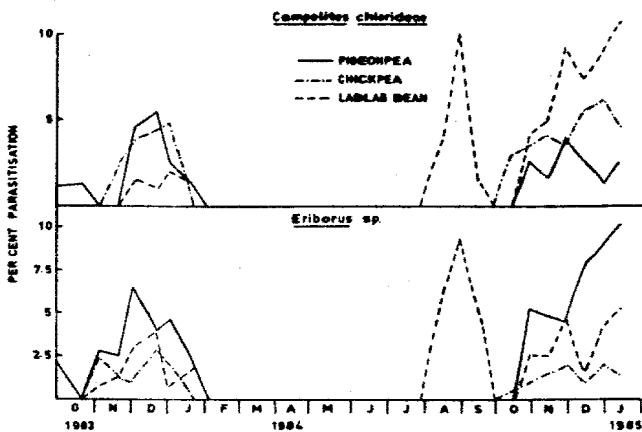


Fig. 2 Seasonal fluctuation in natural enemies of *Heliothis armigera* at Coimbatore

The activity of the tachinid parasitoid *Carcelia* sp. though observed on both pigeonpea and field bean, it was more on field bean, the maximum percentage parasitism being 38.95. The activity of *B. hebetor* was observed almost throughout the year in varying levels. The parasitoid activity was at its peak during November - December with a range of 31.04 to 35.05 per cent and negligible during April-May (Fig.3). Similar results were obtained by Bilapate (1981).

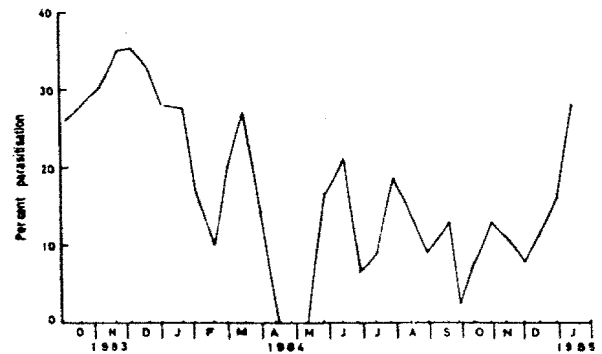


Fig. 3 Parasitisation of *Heliothis armigera* on Lablab Bean by *Bracon hebetor* during different months

The present results show that these parasites were responsible for reducing the pest population and conform to the reports by Swaminathan and Raman (1981) on *Eupatorium adenophorum*, Diwakar and Pawar (1987) on *B. hebetor* in tomato, Bilapate (1981) on *C. chlorideae* and *Carcelia* sp. in chickpea and Gulab Singh *et al.* (1983) on *Apanteles* sp.

It can be envisaged that the crop played a vital role in the parasite activity and behaviour, as the parasitism was recorded throughout the year in varying levels except for a few months and this depended on the availability of the suitable host crop for the pest. The conservation and augmentation of these natural enemies would contribute much for the integrated management of *H. armigera*.

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