

## Field parasitisation of the maize stem borer, *Chilo partellus* (Swinhoe) (Lepidoptera: Pyralidae) in Bangalore

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**ABSTRACT:** *Chilo partellus* (Swinhoe) larvae were found to be parasitised by *Cotesia flavipes* Cameron and pupae by *Tetrastichus howardi* (Oliff) and *Xanthopimpla stemmator* (Thunberg) in Bangalore during February to May, 2001. The extent of larval parasitisation by *C. flavipes* varied from 3.3 to 24.5 per cent. Pupal parasitisation due to *T. howardi* and *X. stemmator* varied from 2.5 to 9.5 and 0 to 10 per cent, respectively.

**KEY WORDS:** *Chilo partellus*, field parasitisation, parasitoids, maize

The maize stem borer, *Chilo partellus* (Swinhoe) (Lepidoptera: Pyralidae) is an important pest of maize and is parasitised by both larval and pupal parasitoids (Sharma *et al.*, 1966). The larval parasitoid, *Cotesia flavipes* Cameron (Hymenoptera: Braconidae) is important under field conditions and parasitisation between 2 and 50 per cent has been reported (Mohan *et al.*, 1991; Nirmala Devi and Raj, 1996). Important parasitoids recorded on pupae were *Tetrastichus howardi* (Olliff) and *Xanthopimpla stemmator* (Thunberg) (Jalali, 1998; Moore and Kfir, 1995, 1996) and overall pupal parasitism ranged between 20.6 and 28.7 per cent (Jalali, 1998). Estimating field parasitisation by a guild of natural enemies is important and helps in understanding the natural field mortality due to different natural enemies. In the present study we recorded natural

parasitisation of *C. partellus* in maize fields in and around Bangalore during February to May, 2001.

Larvae and pupae were collected during random field surveys of maize fields in and around Bangalore (total eight collections consisting of five from National Dairy Research Institute (NDRI) farm, Audugodi, one each from Chikkaballapur, Devanahalli and Rajankunte areas) from February to May 2001. Collections were made every month during the five-month sampling from Audugodi while from Chikkaballapur in February and Devanahalli and Rajankunte in March. During this period mean minimum and maximum temperatures were 19.5 and 33.5°C, respectively. Mean maximum relative humidity was 86 per cent and mean minimum was 37 per cent.

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Twenty larvae and twenty pupae from each collection were observed separately to record parasitisation. Each larva was reared in separate tubes (3x2.5cm) on artificial diet and each pupa was kept in separate tubes (10x2.5cm) till the parasitoids emerged from them or the next stage was formed/emerged. Extent of parasitisation of each species was estimated. Parasitoid individuals from each larva or pupa were counted and sex ratio estimated for that brood.

Average larval parasitisation by *C. flavipes* was 15 per cent. Pupal parasitisation by *T. howardi* and *X. stemmator* was 6.5 and 4 per cent, respectively (Table 1). The ranges, which indicate the extent of parasitisation from all locations for all samples show that *C. flavipes* and *T. howardi* were present at all locations during this period. Parasitisation due to *Cotesia flavipes* was 13.5 per cent (range 3.3- 23.5%) in Audugodi during February to May, 22 per cent in Chickaballapur during February, 20.5 per cent in Devanahalli during March and 10 per cent in Rajankunte during March. Mean parasitisation due to *T. howardi* was recorded to the extent of 6.2 per cent (range 2.5-9.5 %) in Audugodi, 8 per cent in Chickaballapur, 5 per cent in Devanahalli and 8 per cent in Rajankunte. *Xanthopimpla stemmator* was recorded parasitising 4.6 per cent of the pupae (range 2-10%) in Audugodi, 6 per cent in Chickaballapur, 3 per cent in Devanahalli and was recorded nil from Rajankunte. Thus, *C. flavipes*

and *T. howardi* were recorded from all eight samples from all locations while *X. stemmator* was recorded in seven samples but not recorded in the sample collected from Rajankunte in March. On average 15 per cent parasitisation due to the larval parasitoid and 9.5 per cent due to both the pupal parasitoids has been recorded during the sampling period. However, Jalali (1998) recorded an overall pupal parasitism ranging from 20.6 to 28.7 per cent throughout the year.

The major parasitoid on *C. partellus* found during the study was *C. flavipes* and was reported as the major parasitoid by Mohan *et al.* (1991) and Nirmala Devi and Raj (1996). Mohan *et al.* (1991) reported *C. flavipes* parasitising to the extent of 2 to 33.2 per cent of *C. partellus* larvae on sorghum. Nirmala Devi and Raj (1996) studied the extent of *C. partellus* parasitisation on maize by *Apanteles* sp. and found that the extent of parasitisation varied from 35 to 50 per cent in the mid hill zone of Himachal Pradesh. Parasitisation was studied from February-May and peak activity of the parasitoid was found during the months of February (21.5%) and March (23.5%) during the present study. Parasitisation recorded during April was 12.5 per cent and it reached a low level of 4 per cent during May.

The sex ratio for all parasitoids was found to be female biased, being higher in *C. flavipes* (1:3.4) than in other parasitoids (Table 1). Omega

Table 1. Extent of field parasitisation of *C. partellus* larvae and pupae during February-May, 2001

Natural enemy	Per cent parasitisation		Sex ratio (Male: Female)
	Range*	Mean $\pm$ SD	
<i>Cotesia flavipes</i> (larva)	3.3 - 24.5	15.0 $\pm$ 8.06	1: 3.4
<i>Tetrastichus howardi</i> (pupal)	2.5 - 9.5	6.5 $\pm$ 2.20	1:2.3
<i>Xanthopimpla stemmator</i> (pupal)	0 - 10.0	4.0 $\pm$ 3.07	1:1.2

\* Represents per cent parasitisation from eight samples

and Overholt (1997) also reported females up to 86 per cent in field populations of *C. flavipes* in Kenya, which was almost similar to the 82 per cent females, found in the present study.

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