

## The larval parasitization by *Campoletis chlorideae* Uchida (Hymenoptera: Ichneumonidae) of *Helicoverpa armigera* (Hübner) in pure chickpea crop at Pantnagar

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**ABSTRACT:** Extent of natural larval parasitization by *Campoletis chlorideae* on *Helicoverpa armigera* varied from 5 to 41 per cent during 1999-2000 and 3 to 40 per cent during 2000-2001 on standard week basis. Parasitization recorded during 1999-2000 was 33 per cent, 37.3 per cent and 9 per cent during February, March and April, respectively. During 2000-2001 it was 36 and 5 percent in March and April, respectively.

**KEY WORDS:** *Campoletis chlorideae*, gram pod borer, larval parasitization

Chickpea (*Cicer arietinum* L.) is an important pulse crop of Rabi season of our country occupying about 7.6 million hectares, with average productivity of 0.9q per hectare (Anonymous, 2000). Of various insect pests of chickpea, the gram podborer, *Helicoverpa armigera* (Hübner) poses a major problem for chickpea growers and is a limiting factor in its production. A reduction in yield ranging from 40-50 per cent has been reported and may cause even total loss to the crop. For effective management of this pest, greater emphasis is now being laid on integrated pest management (IPM). Among the different parasitoids and predators recorded, *Campoletis chlorideae* Uchida has been reported as a widely distributed and potential larval parasitoid of *H. armigera* damaging chickpea crop (Nikam and Gaikwad, 1989; Patnaik *et al.*, 1991; Yadav *et al.*, 1991; Ahmed and Khan, 1995). However, detailed information on its degree of parasitization during the crop period in Pantnagar

area is not available. Hence, present studies were undertaken on the seasonal occurrence and extent of parasitization.

First to third instar larvae of *H. armigera* were collected at weekly interval from the chickpea field (which was in pod formation stage) at Pantnagar, during Rabi season of 1999-2000 (Feb-April) and 2000-2001 (March-April). The field was not subjected to insecticidal application. The larvae were collected during morning hours and further reared in the laboratory on chickpea. To avoid cannibalism each larva was kept in separate vial. The vials were cleaned and fresh chickpea leaves were provided at 24 hour interval. Observations were recorded regularly on extent of parasitization. Correlation analysis was done between per cent parasitism and abiotic factors.

The maximum parasitization of 82 per cent was recorded during 4<sup>th</sup> week of March in 1999-

2000 and 80 percent during the 4<sup>th</sup> week of the same month in 2000-2001. It was lowest during 1<sup>st</sup> week of April 1999-2000 (10 %) and during 2<sup>nd</sup> week of the same month in 2000-2001 (6%). In both the years, higher parasitization was recorded during the month of February and March. During the year 1999-2000 level of adult emergence in different months was 26.7 per cent, 33 per cent and 3.9 per cent during February, March and April, respectively while during the year 2000-2001, it was 33 per cent and 4.3 per cent in March and April, respectively (Table 1).

Sachan and Bhaumik (1998) reported 51.04, 65.14, 63.39, 21.46 and 5.85 per cent natural larval parasitization of *H. armigera* by *C. chloridae* on

chickpea in the month of November, December, January, February, March and April, respectively.

There was significant negative correlation between maximum temperature and mean per cent larval parasitization was found (-0.675\*) during *Rabi*, 1999-2000. Significant negative correlation coefficient (-0.901\*\*) was found between per cent larval parasitization and minimum temperature during 2000-2001.

Significant positive correlation was observed between larval parasitization and relative humidity (0.958\*\*). These results are in confirmity with earlier finding that when temperature is low and crop is in early stage there is high level of parasitization (Sachan and Bhaumik, 1998).

**Table 1. Parasitization of *H. armigera* on chickpea by *C. chloridae* and adult emergence**

Period	Parasitization (%)		Adult emergence (%)	
	1999-2000	2000-01	1999-2000	2000-01
<b>February</b>				
1 <sup>st</sup> week	60.0	-	18.6	-
2 <sup>nd</sup> week	72.0	-	31.7	-
3 <sup>rd</sup> week	19.0	-	29.7	-
Mean	66.0	-	26.7	-
<b>March</b>				
1 <sup>st</sup> week	74.0	-	34.0	-
2 <sup>nd</sup> week	70.0	-	31.5	-
3 <sup>rd</sup> week	78.0	74.0	35.5	34.8
4 <sup>th</sup> week	82.0	80.0	41.0	36.8
5 <sup>th</sup> week	56.0	62.0	23.5	27.3
Mean	72.0	72.0	33.0	33.0
<b>April</b>				
1 <sup>st</sup> week	10.0	14.0	2.0	5.9
2 <sup>nd</sup> week	28.0	6.0	5.7	2.6
Mean	19.0	10.0	3.9	4.3

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