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-Short Communication

POPULATION DYNAMICS OF MAIZE STEM BORER, *CHILO PARTELLUS* SWINHOE IN UPPER HIMALAYAS OF JAMMU REGION

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In India maize crop is being attacked by about 139 species of insect pests with varying degree of damage. However, only about a dozen are quite serious (Sarup *et al.* 1987, Siddiqui and Marwaha 1993). Among them some important lepidopteran stem borers seriously limit potentially attainable maize yields by infesting the crop throughout its growth, from seedling stage to maturity. Seventeen species in two families (Pyralidae and Noctuidae) have been found to attack maize in various parts of Africa. However, *Chilo partellus* (Swinhoe), *Chilo orichalcociliellus* Strand*, Busseola fusca* Fuller, *Sesamia calamistis* Hampson, and *Eldana saccharina* Walker are of great importance. The yield losses caused by stem borers to maize vary widely in different regions and range from 25-40% according to the pest population density and phenological stage of the crop at infestation (Khan *et al*. 1997).

Among them maize stem borer, *C. partellus* is most dominant contributing 90-95 per cent of the total damage in *kharif* season (Jalali and Singh 2002). Despite of, intensive work done in India on *C. partellus* yet, the work in Jammu region is lacking. As this pest is becoming a major problem in sub mountainous region of Jammu, yet distribution and intensity of infestation of this pest has not been studied therefore; it is imperative to study population patterns and natural enemies associated to this pest.

To achieve this objective, a multi directional light trap was operated from 1800 to 0600 hours daily. The collections were made weekly throughout the crop seasons of 2006 and 2007. Infestation of stem borer was determined by counting the total number of dead hearts and the leaf damage in each selected plot at weekly interval. Total number of healthy and infested plants was counted in each plot during each week and means of three selected locations were calculated.

It was evident that stem borer appeared in the light trap in 21st week (6 adults), when the mean maximum and minimum temperature (25.70 and 14.95ºC) with relative humidity (63.50 %) (Table 1). Maximum traps (47 adults / trap) were observed in 29th week, when average maximum and minimum temperature (29.25 and 16.45ºC) with relative humidity 82.6%. After 35th standard week, number of adults decreased gradually to 3 moths/ trap in 41th standard week when the maximum and minimum temperature (23.34 and 12.54ºC) with relative humidity of 67.61%. Thereafter no catch was observed. The adult population was positively correlated with weather parameters *viz.* relative humidity ($r=0.908$, $P<0.01$) maximum ($r=0.501$, $P<0.05$)and minimum ($r=0.484$, $P<0.05$) temperatures.

Results clearly indicate that initially adult population tends to increase in summer months and decreases further till onset of winter season. Such results might be attributed due to hibernation of larvae into the stubbles and maize stalks. These findings are supported by Kumar (1984), Singh *et al.* (1985) and Kfir (1988) who found that overwintering larvae causing infestation hibernate into the stubble and stalk of maize.

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Similarly Muhammad and Khawja (2002) reported 18.7 − 29.1% hibernating larval population from higher reaches of Pak occupied Kashmir.

Table 1. Mean seasonal incidence of *C. partellus* during *kharif* 2006 and 2007.

Standard week	No. of adults / trap	Mean infestation (dead heart + leaf infestation)	Meteorological observations			
			Mean temperature (^{0}C)		Mean relative humidity (%)	Rainy days
			Maximum	Minimum		
21	6.00	0.00	25.70	14.95	63.50	1.5
22	7.00	0.00	26.30	15.65	62.15	1.0
23	6.00	0.00	27.60	16.20	62.50	2.0
24	7.00	0.33	31.10	17.70	64.90	1.0
25	13.00	1.50	31.30	18.30	63.60	1.0
26	21.50	3.66	33.10	19.40	63.00	-
27	26.50	5.33	29.70	17.40	70.00	1.0
28	36.50	8.66	31.40	17.65	72.00	1.0
29	47.00	10.66	29.25	16.45	82.60	2.0
30	46.00	11.66	32.15	19.10	77.50	1.0
31	39.50	12.83	31.20	17.10	77.60	1.5
32	38.00	13.83	28.30	16.70	81.05	1.0
33	42.00	15.83	27.00	15.30	83.50	2.0
34	30.50	17.16	25.80	15.30	72.50	-
35	28.00	17.49	26.50	15.50	71.00	1.0
36	16.50	18.83	26.40	14.95	69.90	1.0
37	13.50	18.99	25.80	14.70	65.60	-
38	12.50	20.66	25.45	13.50	64.10	1.0
39	8.00	22.66	24.65	13.25	64.00	1.0
40	7.00	22.83	23.83	13.05	63.35	-
41	3.00	23.16	23.34	12.54	67.61	-
Mean	21.66 ± 3.27	11.72 ± 1.83	27.90 ± 0.63	15.94 ± 0.42	69.62 ± 1.54	1.19 ± 0.11

References

Kfir R (1988) Hybernation by the lepidopterous stalk borer *Busseola fusca* and *Chilo partellus* on grain sorghum. *Entomol. Expt. Appl.* **48**:31-36

Khan Z R, Overholt W A and Hassana A (1997) Utilization of agricultural biodiversity for management of cereal stem borers and striga weed in maize-based cropping systems in Africa -a case study. *http://www.cbd.int/doc/case-studies/agr/cs-agr-cereal-stemborers.pdf*

Kumar R (1984) Insect Pest Control with special reference of African Agriculture, Edward Arnold, London. 298p.

Muhammad A and Khawaja F A (2002) Overwintering Population of Maize Stem Borer *Chilo partellus* (Swinhoe) at high altitudes of Kashmir. *J. Biol. Sci.* **2** (1): 1-4.

Sarup P, Siddiqui K H and Marwaha K K (1987) Trends in maize pest management research in India together with bibliography. *J. Entomol. Res.* **11**(1): 19-68.

Siddiqui K H and Marwaha K K (1993) The Vistas of Maize Entomology in India. *Kalyani Publishers*, Ludhiana.

Singh U C, Mirsa U S, Dhamdhere S V and Dwivedi U S (1985) Carry over of stalk borer *Chilo parteelus* (Swin.) in off season in diff. Crops. *J. Entomol. Res.* **9**: 170- 173.