

Original Research Article

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Survey on the Incidence of *Chilo partellus* (Swinhoe) in Krishna and Guntur Districts of Andhra Pradesh, India

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ABSTRACT

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A roving survey in maize growing mandals in Krishna and Guntur districts during *kharif* 2017-18, *kharif* 2018-19 to record the incidence and damage per cent of *Chilo partellus* (swinhoe) in the farmer fields. In Krishna district, the maximum leaf infestation was observed in Musunuru mandal in 2017-18 (20.33%) and 2018-19 (24.99) and lowest infestation is recorded in Veerullapadu mandal in 2017-18 (8.59%) and 2018-19 (11.92). In Guntur district, the maximum leaf infestation was observed in Pedanandipadu mandal in 2017-18 (22.68%) and 2018-19 (24.11) and lowest infestation is recorded in Narsaraopet mandal and in 2017-18 (9.84%) and 2018-19 (14.91). However, overall mean infestation was high in Guntur district in *kharif* 2017-18 (16.68%), 2018-19 (21.56%) than in Krishna district in *kharif* 2017-18 (13.03%) and 2018-19 (17.76%). The per cent dead hearts, stem tunneling, no of larvae, no of pupae and exit holes also followed the same trend.

Introduction

Maize is an important cereal crop which plays a prominent role in the Indian economy and used as food, feed and industrial crop globally. At present, out of the total maize produced, 55 per cent is used for human food, about 14 per cent for livestock, 18 per cent for poultry feed, 12 per cent for starch and one per cent as seed purpose (Singh *et al.*, 2011). Being versatile crop, maize can be grown in all seasons *viz*; *kharif* (monsoon), post monsoon, *Rabi* (winter) and spring. The

predominant maize growing states that contributes more than 80% of the total maize production are Andhra Pradesh (20.9%), Karnataka (16.5%), Rajasthan (9.9%), Maharashtra (9.2%), Bihar (8.9%), Uttar Pradesh (6.4%), Madhya Pradesh (5.2%), Himachal Pradesh (4.4 %). Hence, the maize has emerged as important crop in the peninsular India like the state of Andhra Pradesh which ranks 5th in area (0.79 m ha) has recorded the highest production (4.14 m t) and productivity (5.26 t ha⁻¹) in the country although the productivity in some of the

districts of Andhra Pradesh is more or equal to the USA (10.57 t ha⁻¹). *C. partellus*, is the key pest playing havoc role all over the world and reported to cause losses ranging between 5.14 to 91.22 per cent (Singh and Sajjan, 1982). The infestation occurs when the seedlings are two weeks old up to cob formation stage.

Identification

Eggs

Eggs are white colored, scale like eggs in overlapping rows laid usually on underside of the leaves.

Larvae

The young larvae are small, spotted and yellowish with brown head, while fully grown larvae are 20 to 25 mm long with colored stripes along the back of the body.

Adult

The adult is straw-colored or yellowish brown colored and grown up to 15 mm long.

Materials and Methods

The survey was conducted in two consecutive years during *kharif*, 2017-18 and 2018-19, in maize growing fields of Krishna and Guntur districts of Andhra Pradesh, at two different stages of the crop (vegetative and harvesting stages). The survey was done to ascertain the infestation of *C. partellus* in the surveying districts. In each mandal, of a district the maize growing villages were selected and in each village four fields were selected at random. In each field 20 plants from four corners leaving the boarder rows and another 20 plants at centre were selected to record the infestation of *C. partellus*. Simultaneously the natural enemies in maize ecosystem were also

recorded and the farmers were also interviewed to record the history of the crop.

The per cent plant infestation and per cent dead hearts were calculated by using the formula:

$$\text{Per cent leaf infestation} = \left(\frac{\text{No. of leaves infested}}{\text{Total No. of plants}} \right) \times 100$$

$$\text{Per cent dead hearts} = \left(\frac{\text{No. of Dead hearts}}{\text{Total No. of plants}} \right) \times 100$$

At the time of harvest the stems were split opened to count the number of larvae, pupae, exit holes and stem tunneling of the larva was measured and the percentage tunneling was calculated using the formula:

$$\text{Per cent Tunneling} = \frac{\text{Length of tunneling (cm)}}{\text{Length of stem up to cob height (cm)}} \times 100$$

Results and Discussion

During *kharif*, the survey was made in four randomly selected farmer fields in four maize growing villages during 2017-18 and 2018-19 (Table 1). The survey results showed that in Guntur district the range of deadhearts percentage is from 4.16 to 21.87 per cent, with leaf infestation of 9.84 to 24.11 per cent and tunnel length ranging from 1.6 to 3.53.

The stem borer infestation was noticed in all the surveyed villages during *kharif*, 2017-18 and 2018-19. In Krishna district the deadhearts percentage range is from 3.48 to 21.46 with the leaf infestation of 8.59 to 24.99 and the tunnel length was observed ranging from 1.5 to 3.05 cm during *kharif*, 2018-19. In Krishna district, the maximum leaf infestation was observed in Musunuru mandal in 2017-18 (20.33%) and 2018-19 (24.99) and

lowest infestation is recorded in Veerullapadu mandal in 2017-18 (8.59%) and 2018-19 (11.92). In Guntur district, the maximum leaf infestation was observed in Pedanandipadu mandal in 2017-18 (22.68%) and 2018-19 (24.11) and lowest infestation is recorded in Narsaraopet mandal and in 2017-18 (9.84%) and 2018-19 (14.91). However, overall mean infestation was high in Guntur district in

kharif 2017-18 (16.68%), 2018-19 (21.56%) than in Krishna district in *kharif* 2017-18 (13.03%) and 2018-19 (17.76%). The per cent dead hearts, stem tunneling, no of larve, no of pupae and exit holes were also followed the same trend (Table 2). During the survey some other minor insect pests like Aphids, grasshoppers, green plant bugs, ash weevils *etc* were also observed.

Table.1 Survey on *C. partellus* infestation during *Kharif* 2017-18 and 2018-19 in Krishna and Guntur districts of Andhra Pradesh

S. No.	Name of the Mandal	<i>C. partellus</i> infestation (Mean data of 4 fields in four villages and 40 samples in a field)					
		Leaf infestation (%)		Deadhearts (%)		Tunnel length (cm)	
		2017-18	2018-19	2017-18	2018-19	2017-18	2018-19
Krishna District							
1.	G konduru	9.13	15.01	4.75	14.04	1.85	2.21
2	Mylavaram	14.10	19.12	12.25	17.12	1.82	2.68
3	Musunuru	20.33	24.99	18.86	21.46	2.96	3.05
4	Veerullapadu	8.59	11.92	3.48	9.86	1.50	2.25
	Mean	13.03	17.76	9.83	15.62	2.03	2.54
Guntur District							
1.	Narsaraopet	9.84	14.91	4.16	13.12	1.62	2.05
2.	Pedanandipadu	22.68	24.11	22.50	20.62	3.53	3.13
3.	Ponnuru	17.61	22.04	21.87	19.37	2.97	4.23
4.	Bhattiprolu	16.61	21.56	15	20	1.93	2.80
	Mean	16.68	21.56	15.88	18.27	2.51	3.05

Table.2 *C. partellus* infestation during *Kharif* 2017-18 and 2018-19 in Krishna and Guntur districts

S. No.	Name of the Mandal	(Mean data of 4 villages and 40 samples in a field)					
		No of larvae		No of pupae		Exit hole	
		2017-18	2018-19	2017-18	2018-19	2017-18	2018-19
Krishna District							
1.	G konduru	0.19	0.36	0.10	0.16	0.20	0.32
2	Mylavaram	0.26	0.40	0.14	0.22	0.28	0.46
3	Musunuru	0.36	0.49	0.17	0.28	0.47	0.49
4	Veerullapadu	0.17	0.32	0.9	0.12	0.18	0.28
Guntur District							
1.	Narsaraopet	0.23	0.41	0.14	0.21	0.26	0.41
2.	Pedanandipadu	0.46	0.53	0.25	0.34	0.59	0.58
3.	Ponnuru	0.37	0.47	0.16	0.23	0.55	0.43
4.	Bhattiprolu	0.31	0.50	0.17	0.30	0.39	0.54

Table.3 Mandal wise survey on natural enemies fauna during *kharif* 2017-18 and 2018-19 in Krishna and Guntur districts

S. No.	Name of the Mandal	Spiders		Coccinellids	
		2017-18	2018-19	2017-18	2018-19
Krishna District					
1	G konduru	1.2	2.6	3.5	6.4
2	Mylavaram	2.2	2.8	5.8	6.8
3	Musunuru	3.4	3.66	7.2	7.46
4	Veerullapadu	1.16	1.65	3.24	4.12
Guntur District					
1	Narsaraopet	1.12	2.05	3.20	4.44
2	Pedanandipadu	2.8	3.12	6.62	7.56
3	Ponnuru	2.23	2.89	4.82	5.86
4	Bhattiprolu	2.46	3.12	4.75	5.12

Natural enemies like spiders and coccinellids were also recorded during survey and their results showed that in Krishna district spiders and coccinellids fauna are more in Musunuru mandal in *kharif* 2017-18 (3.4; 7.2) and 2018-19 (3.66; 7.46). In Guntur district, they are more in Pedanandipadu mandal in *kharif* 2017-18 (2.8; 6.62) and 2018-19 (3.12; 7.56). From the two consecutive years of study, results showed that *C. partellus* infestation and natural enemies are higher in Guntur than

in Krishna district. The present results are in agreement with Albert *et al.*, (2006) who reported stem borer damage incidence ranging from 10-15 per cent and also recorded some other pests like, grasshopper, red legged grasshopper, black beetles and two spotted spider mite.

The results were also in conformity with Jyothi, (2016) who recorded high per cent of dead hearts in Guntur district *i.e.*, in Ponnuru

(21.9%), Bhattiprolu (20.9) and also recorded more spiders and coccinellids in the Guntur district.

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