



## SPECIES COMPOSITION OF SUGARCANE SHOOT BORERS IN SOUTH GUJARAT

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### ABSTRACT

**This study on species composition of sugarcane shoot borers was carried out in the South Gujarat Agroclimatic Zone II. The results revealed the infestation of two species of shoot borers viz., *Sesamia inferens* (Walker) and *Chilo sacchariphagus indicus* (Kapur) in the early stage of sugarcane. Maximum incidence of *S. inferens* (77.56, 88.24 and 88.72%) was observed compared to that of *C. sacchariphagus indicus* (22.44, 11.76 and 11.28%) during 2015-16, 2016-17 and 2017-18, respectively, indicating that *S. inferens* (84.84%) is dominant over *C. sacchariphagus indicus* (15.16%) in overall incidence.**

**Key words:** Sugarcane, *Chilo sacchariphagus indicus*, *Sesamia inferens*, species diversity, dominance, incidence, south Gujarat, seasonal variation, *Saccharium officinarum*

Sugarcane is one of the most important high value cash and industrial crops cultivated in India. Over 1,500 species of insects occur worldwide on sugarcane (Box, 1953) and 220 species in India (David et al., 1986). The sugarcane crop yield is affected by large number of insect pests and among them, early shoot borer *Chilo sacchariphagus indicus* (Kapur) damages the crop mainly at formative phase. The young larvae bore down the spindles as also upwards destroying the apical meristem, causing deadhearts; it can destroy mother shoots and tillers and cause a loss of 0.597 mt sugar/ ha (Krishnamurthy Rao, 1954; Doss, 1956 and Khan and Krishnamurthy Rao, 1956). The loss is up to 33% in cane yield, 12% in sugar recovery and 27% in jaggery (Patil and Hapse, 1981) and thus the losses are severe (Avasthy and Tiwari, 1986). Pink stem borer *Sesamia inferens* (Walker), usually a minor borer pest, infests the crop along with *Chilo infuscatellus*, and it has also been noticed in the world collection of sugarcane germplasm maintained at the Sugarcane Breeding Institute Research Centre, Kannur, Kerala (Mahesh et al., 2013). Newly hatched larvae takes shelter in between stem and leaf sheath and mines/ feed on epidermal layers of leaf sheath. Later third instar larvae bore and enter in the middle of the stalk. Borer larvae have rarely been observed in grown up canes (Gupta and Gupta, 1959). Damage by sugarcane shoot borers has long been recognized in Gujarat, but details on its species composition is lacking. The above ground borer species infesting sugarcane in Gujarat were simply referred as 'shoot borer', 'top borer' and 'stem borer'

based on the crop stage they attack and the colour and size of the larvae. No survey has been done on the species composition, and hence this study.

### MATERIALS AND METHODS

To study the species composition of sugarcane shoot borers, 10 farmer's fields were selected randomly in Tapi district of South Gujarat [South Gujarat Agroclimatic Zone II (AES V)] during 2015-16, 2016-17 and 2017-18. In each selected field, monitoring was done at 40 days after planting and five spots of 3 m row length (four spots from each corner and one spot from center) were selected and the tillers with symptoms of shoot borer damage viz., deadheart were collected and examined through dissection of the tillers in the laboratory. The species were identified based on larval stages, and their morphological characters; *S. inferens* larvae are pink and purplish on dorsal side and white at ventral side, with head capsule being orange; while *C. sacchariphagus indicus* larva has five violet stripes dorsally and dorsolaterally on its body and its head is brown. The species composition was computed in terms of % from total number observed. Field collected mature larvae (late instar) were reared in the laboratory for adult emergence to adults, and these were got identified by Dr C A Viraktamath, Department of Entomology, University of Agricultural Sciences, GKVK, Bangalore.

### RESULTS AND DISCUSSION

The yearwise data on species composition of

Table 1. Species composition of sugarcane shoot borers (2015-16 to 2017-18)

Observation period (month with fortnight)	Species composition (%)							
	2015-16		2016-17		2017-18		Pooled	
	S	C	S	C	S	C	S	C
December I	66.67	33.33	-	-	96.23	3.92	54.3	12.42
December II	76.92	23.08	-	-	90.91	10.00	55.94	11.03
January I	75.00	25.00	96.30	3.70	85.29	14.71	85.53	14.47
January II	63.46	36.54	78.13	21.88	72.73	27.27	71.44	28.56
February I	86.11	13.89	100	0.00	76.92	23.08	86.09	13.91
February II	92.11	7.89	100.00	0.00	0.00	0.00	64.04	2.63
Min	63.46	7.89	78.13	0.00	0.00	0.00	54.3	2.63
Max	92.11	36.54	100	21.88	96.23	27.27	86.09	28.56
Mean± SD	77.56± 11.00	22.44± 11.00	88.24± 10.46	11.76± 10.47	88.72 ± 35.53	11.28± 10.66	84.84± 14.00	15.16± 8.40

S = *Sesamia inferens*, C = *Chilo sacchariphagus indicus*

sugarcane shoot borer given in Table 1, confirm the infestation by *S. inferens* and *C. sacchariphagus indicus* at early stage; maximum incidence of *S. inferens* (77.56, 88.24 and 88.72%) was observed compared to that of *C. sacchariphagus indicus* (22.44, 11.76 and 11.28%) during 2015-16, 2016-17 and 2017-18, respectively. The pooled data revealed that maximum incidence of *S. inferens* (84.84%) compared to that of *C. sacchariphagus indicus* (15.16%). Mahesh et al. (2013) observed that *S. inferens* has attained pest status in recent years in the world collection of sugarcane germplasm maintained at the Sugarcane Breeding Institute Research Centre, Kannur, Kerala. Also, its pest status among sugarcane germplasm, particularly to *Saccharium officinarum* clones in the early stage is known (Anonymous, 2010). The present results also corroborate with those of Assefa et al. (2006) on the stem borer complex in sugarcane in Ethiopia which revealed the presence of *Busseola* sp., *Chilo partellus* and *Sesamia calamistis*.

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