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Host plant preference of *Senometopia illota* (Curran) (Diptera: Tachinidae) to *Helicoverpa armigera* (Hübner) (Lepidoptera: Noctuidae) on pigeonpea and chickpea

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ABSTRACT: *Senometopia illota* (Curran) (Diptera: Tachinidae) is a larval-pupal parasitoid on *Helicoverpa armigera* (Hübner). Host plant preference of *S. illota* was studied by comparing the percentages of parasitism on pigeonpea and chickpea. The average per cent parasitism was recorded for the months of December and January from 1993 to 1996. It was found that *S. illota* gives more preference to *H. armigera* on pigeonpea (17.39%) than chickpea (7.74%).

KEY WORDS: *Helicoverpa armigera,* host plant preference, *Senometopia illota*

The natural enemies present in a particular cropping system virtually guide the extent of biotic pressure given to the pest. These vary from crop to crop depending on the physical nature, kairomonal influences and the nutritional status of these crops. The importance of host plants in the interaction between herbivorous insects and their insect parasitoids has received much attention (Price *et al.*, 1980). Bhatnagar *et al.* (1982) found that most parasitoid recovered from *H. armigera* larvae on sorghum were hymenopteran while those collected from larvae on pigeonpea were predominantly dipteran. *Eucelatoria bryani* (Sabrosky), in field cage release experiment, parasitized *H. armigera* larvae feeding on pigeonpea more readily than those on chickpea (Bhatnagar *et al.*, 1982).

The present study was undertaken to determine the host plant preference of the tachinid parasitoid *Senometopia illota* to control *H. armigera* on pigeonpea and chickpea.

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MATERIAL AND METHODS

For studying host plant preference by *Senometopia illota*, *Helicoverpa armigera* larvae (IV, V, & VI instar) were collected from pigeonpea and chickpea fields during the months of December and January, 1993 to 1996 at Mahatma Phule Krishi Vidyapeeth, Rahuri where there was frequent use of insecticides. Both, pigeonpea and chickpea, were cultivated in the same area and the larvae collected on these crops were reared separately in plastic containers of 5 x 3cm size until the emergence of parasitoid, if any. The larvae collected from pigeonpea were provided with pigeonpea pods and those collected from chickpea were fed on chickpea pods. After about eight days of formation of host pupae, the parasitoid puparia (emerged from host pupae) were collected and per cent parasitism on each crop was recorded, separately. The rearing was done at 27 ± 1°C and 65-75 per cent relative humidity in the laboratory.

RESULTS AND DISCUSSION

In the present study of host plant preference by *S. illota*, it has been observed that per cent parasitism ranged between 7.2 and 35.77 on pigeonpea where as on chickpea it varied from 2.73 to 15.95 per cent. Mean per cent parasitism was recorded 17.39 on pigeonpea and 7.74 on chickpea. Although, there was variation in per cent parasitism from year to year, within the crop, the overall results indicated that *H. armigera* on pigeonpea was more preferred than chickpea by *S. illota*.

Bhatnagar *et al.* (1982) reported that *H. armigera* larvae feeding on pigeonpea were more readily parasitized by *Eucelatoria bryani* than those feeding on chickpea. Similar observation with *S. illota* was recorded in the present study.

Table 1.. Host plant preference of *Senometopia illota* for parasitization of *Helicoverpa armigera*

Collection period	Host plant	Per cent parasitism
December 7, 1993 to January 15, 1994	Pigeonpea Chickpea	9.60 15.95
December 7, 1994 to January 21, 1995	Pigeonpea Chickpea	7.20 2.73
December 1, 1995 to January 21, 1996	Pigeonpea Chickpea	35.77 4.55

Parasitoids have their preferences for crops besides their host insect. This has been observed not only with sole crops but also with intercrops. Bhatnagar and Davies

(1979) observed that parasitoids did not move with *H. armigera* from sorghum to pigeonpea in the sorghum/pigeonpea intercrop, but each crop exhibited its own parasitoid complex. Egg parasitism of *H. armigera* by *Trichogramma chilonis* Ishii was up to 33.2 per cent on sorghum, 10.5 per cent on pearl millet, 14.8 per cent on groundnut and 0.3 per cent on pigeonpea. No egg parasitism was recorded on chickpea (Pawar *et al.*, 1986). Among larval parasitoids, *Campoletis chlorideae* Uchida contributes predominantly to the mortality of I-III instars and *S. illota* much to the mortality of IV-VI instar larvae on all crops except groundnut.

The average per cent parasitism by *S. illota* on *H. armigera* at ICRISAT centre from 1977-85 was 8.1per cent and 5.7per cent on pigeonpea and chickpea, respectively. In the present study, except first observation in 1993-94, it has been observed that pigeonpea was more preferred than chickpea. On an average, per cent parasitism was 17.39 and 7.74 on pigeonpea and chickpea, respectively. Pigeonpea is more preferred than chickpea and this may be because of plant volatiles. The crop morphology and physiology may have influence on host finding ability of the parasitoid. In the first observation, there was more parasitism on chickpea (15.95%) and this may be because of some climatic factors. Yadav (1980) stated that tachinids, *Goniophthalmus halli* Mesnil and *Palexorista (=Drino) imberbis* (Wiedemann) exhibited some host plant specificity, as they were invariably reared from *Heliothis* larvae infesting lucerne. Sithanantham (1981) stated that the parasitoid *E. bryani* preferred to attack the larvae of *H. armigera* on pigeonpea regardless of their dietary history. In the present study, the tachinid parasitoid, *S. illota* has shown some host plant preference in the selection of *H. armigera* on pigeonpea over chickpea.

REFERENCES

Bhatnagar, V. S. and Davies, J. C. 1979. Pest management in intercrop subsistence farming. *Proceedings of the International Workshop on Intercropping*, ICRISAT, Patancheru, AP, pp. 249-257.

Bhatnagar, V. S., Lateef, S. S., Sithanantham, S., Pawar, C. S. and Reed, W. 1982. Research on *Heliothis* at ICRISAT. *Proceedings of the International Workshop on Heliothis Management*, pp. 385-395.

Pawar, C. S., Bhatnagar, V. S. and Jadhav, D. R. 1986. *Heliothis* species and their natural enemies, with their potential for biological control. *Proceedings of the Indian Academy of Science (Animal Science)*, **95** (6): 695-703.

Price, P. W., Bonton, C. E., Gross, P., Mc Pheron, B. A., Thompson, J. N. and Weis, A. E. 1980. Interactions among three trophic levels, influence of plants on interactions between insect herbivorous and natural enemies. *Annual Review of Ecology*, **11**: 41-65.

Sithanantham, S. 1981. *Eucelatoria* sp. parasitoid of *Heliothis* on pigeonpea. *International pigeonpea Newsletter*, **1**: 32

Yadav, D. N. 1980. Studies on the natural enemies of *Heliothis armigera* (Hübner) and its biological control using an egg parasite, *Trichogramma australicum* Girault. (Hymenoptera: Trichogrammatidae). *Gujarat Agricultural University Research Journal*, **6** (1): 62-63.