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Preliminary Observations on the Egg Parasitoids of Rice Stem Borer (*Scirpophaga incertulas* Walker) under Hot Weather Condition in Gujarat

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Yellow rice stem borer *Scirpophaga incretulas* Walker is most common and destructive pest of paddy crop which often cause heavy losses. In India it has been reported as serious pest from Andhra Pradesh (Venugopal Rao, *et al.*, 1980; Prasad Rao *et al.*, 1984), Uttar Pradesh (Pandey, *et al.*, 1984), Kerala (Pillai and Nair 1983). and Gujarat (Purohit *et al.*, 1987). Due to double cropping of rice crop (kharif and hot weather), particularly in Ukai and Kakrapar command area it has attained a status of serious pest in hot weather condition i. e. March-May in Gujarat. Egg parasites are considered to be the most important natural enemies. Uptil now no information was available on egg parasitoids in hot weather conditions in this area. Therefore study was undertaken at Navsari during suummer 1985 and 1986 to find out the intensity of indigenous egg parasitoids and possibility of controlling rice stem borer by using this parasitoids.

Surveys were carried out in stem borer infested rice fields in Gujarat Agricultural University Research Farm and it's surrounding area. Egg masses were randomly collected on alternate days from March to June 1985 and 1986 and brought to the laboratory for collection of emerging parasitoids. The per cent egg parasitism and their period of activity are given in Table 1. To study the impact of the naturally occuring egg parasitoids on stem borer infestation, the infestation were recorded at fortnightly interval from 25 spots each consisting of 5 hills.

From the studies made, it is observed that the egg masses were parasitised by two hymenopterous parasitoids, *Telenomus dignus* Gahan and *Tetrastichus schoenobi* Ferr. Total parasitism ranged from 23% in May. Among two species *Telenomus* was predominant. It was active in April-May both during 1985 and 1986. The percentage parasitism varies from 0 to 73% and 0 to 85.7% in 1985 and 1986, respectively. *Tetrastichus* was found active only during May and parasitism varied from 0 to 91.7% considerable number of egg masses were partially parasitised by both the species as observed during 1986. Both the parasitoids were active simultaneously in the field and multiple parasitism occured. About twenty per cent of the egg masses were parasitised by a combination of two species (Table 2). Multiple parasitism by two species viz., *T. dignus* and *T. schoenobii* was reported in Sri Lanka (Fernando 1970) in Philippines (Kim and Heinrichs, 1985) in India (Rai and Gowda, 1980).

The study on effectiveness of natural check against rice stem borer indicated that parasitoids were quite active during last week of May, parasitising as many as 96% and 83% egg masses during 1985 and 1986, respectively. It has permitted only 2.29% stem borer damage (Table 3). Maximum damage was only 9.45% in third week of May. Many

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TABLE 1

Percentage of egg mass parasitisation by *Telenomus dignus* and *Tetrastichus schoenobii*.

Month	Week	Per cent egg mass parasitised by					
		Summer-1985			Summer-1986		
		T. dignus	*T. schenobii*	Total	*T. dignus*	*T. schoenobii*	Total
March	3rd	00.00	00.00	00.00	00.00	00.00	00.00
April	2nd	23.50	00.00	23.50	00.00 (57.14)	00.00	57.14
April	3rd	38.75	00.00	38.75	45.45 (27.27)	00.00	45.45
April	4th	50.42	00.00	50.42	64.51 (51.61)	00.00	64.51
April	5th	65.68	00.00	65.68	68.75 (31.25)	00.00	68.75
May	1st	60.70	02.12	62.82	85.71 (38.09)	00.00	85.71
May	2nd	70.82	08.13	78.95	64.28 (21.42)	07.14	71.42
May	3rd	68.43	10.32	78.75	56.75 (32.43)	08.10	64.86
May	4th	73.22	23.29	96.51	47.22 (19.44)	36.11	83.33
May	5th	30.28	15.30	45.58	28.57	46.42	75.00
June	1st	---	---	---	---	91.66	91.67

Figures in parenthesis partially parasitised egg mass.

TABLE 2

Multiple parasitism of egg mass by Telenomus and *Tetrastichus* Sp. during summer 1986.

Period		*Multiple parasitsim of egg masses (%)*
April	4th week	3.22
May	2nd wqeek	3.57
May	3rd week	5.40
May	4th week	16.66
May	5th week	14.28

TABLE 3

Percentage of stem borer damage in presence of it's egg parasitoids during summer 1986.

Period of observation		*Egg masses parasitised (%)*	*Stem borer damage (%)*
March	2nd week	0	1.65
March	4th week	0	0.72
April	2nd week	57.14	1.96
April	4th week	64.52	4.32
May	2nd week	71.43	7.27
May	3rd week	64.86	9.45
May	4th week	83.33	2.29

workers reported not less than 60% parasitism by *Telenomus* and *Tetrasitchus* Sp. (Rao *et al.*, 1968; Rothschid, 1970; Kim and Heinrich, 1985). Hikim (1979) reported that the parasitoid activity of *T. schoenobii* and *Telenomus* sp. might not be dependent on the density of egg masses in the field however, our studies showed that parasitoids activities were dependent on the density of egg mass in the field and it had afforded very effective natural check of the pest. Thus these studies indicated the potentiality of egg parasitoids as biocontrol agent of stem borer and suggest to study methods of how to conserve or encourage the natural enemies of rice stem borer.

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REFERENCES

Fernando, H. E., 1970. Natural enemies of rice stem borers and feasibility of chemical and biological control of these pests in Ceylone. *Mushi*, **44** : 43-47.

Hikim, I. S. 1979. Egg parasites of the yellow stem borer in West Bengal. IRRN **4** (6) : 13.

Kim, H. S. and Heinrichs E. A. 1985. Parasitisation of YSB *Schirpophaga incertulas* eggs. IRRN, **10** (4) p. 14.

Pandey, V. S. and Sachan J. N. 1983. Relative efficacy of selected insecticides against different species of rice stem borers at Jharnapani. *Pesticides*, **17** (5) : 23-24.

Pillai, K. S., Nair M. R. G. K. 1984. Use of insecticides applied as granules in soil for control of the major Lepidopterous pests of rice. *Entomon*. **9** (4) : 275-278.

Prasad Rao, V. L. V., Krishna Murthy Rao, B. H. : Satyanarayan

Reddy, P., and Venugopal Rao, N. 1984. *Indian J. agric Sci.* **54** (3) : 209-213.

Purohit, M. S. Shah, A. H. and Raman, S. 1987. Five granular and 4 sprayable insecticides evaluated for yellow stem borer (YSB) control. IRRN. **12** (1) : 20.

Rai, P. S., and Gowda G., 1980. Parasitisation of *Tryporyza incertulas* egg masses in Karnataka, India. International Rice Commission News letter. **26** (1) : 35-36.

Rao, V. P. Basu, A. N., Phalake, V. R., Chacko, M. J. and Dinesh Rao, H. 1968. Some new records of parasite of rice stem borers in India. *Proc. Indian Acad. Sci.* **68** (2) B : 91-110.

Rothschild, G. H. L. 1970. Parasites of rice stem borers in sarawak. *Entomophaga*, **15** (1) : 21-51.