

**STUDIES ON THE OCCURENCE OF BROODS IN THE
SUGARCANE TOP BORER, *Scirpophaga Excerptalis*
FABRICIUS (LEPIDOPTERA : PYRALLIDAE)**

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SUMMARY

With a view to ascertaining the number of broods of the top borer, *Scirpophagaga excerptails* Fab., on sugarcane fields and presumable time of peak emergence of moths, studies were made by observing the larval and populations. The affected canes were sampled and the number of larvae, pupa lpupae and empty shoots were recorded. The data obtained were plotted on a graph and they indicate that there can be 5 peak periods of population of this borer and these were in the months of February, April, June, August and October. As the period succeeding the maximum emergence of the moth will have severe infestation, it is possible to use the natural enemies and other means of control at the pre-pupal and egg stages by using them at the above mentioned periods.

INTRODUCTION

Sugarcane crop is affected by many insect pests but the major portion of the damage is caused by top borer, *Scirpophaga excerptalis* Fab. Alam, 1967; Gupta, 1959; Gupta, 1962; Rahman, 1976; Rao and Chandy, 1957; Venkatraman, 1961). Its larvae bore into the top shoot causing a characteristic 'deadheart' and making a tunnel through in which they feed on the internal tissue of the growing portion of the sugarcane and remain there for a considerable period till maturity of the adult (Fletcher and Ghosh, 1920; Hazelhoff 1932; Patel, 1963). Thus it causes a major loss in yield in tonnage and sugar recovery percentage by (i) killing the young tillers, (ii) by the stunted growth- (iii) by deteriorating the quality of the sugarcane, and (iv) by causing the favourable conditions for the pathogens (Gupta et. al., 1965; Kalra and Chaudhury, 1964; Rajani, 1961; Siddiqi, 1961).

The studies on the broods of the sugarcane top borer were carried out in India by Gupta, (1959), Husain (1955), Haque and Agarwala (1955), Patel and Bagal (1957), Kalra and Sidhu (1965) and Venkatraman (1963). In Bangladesh, Rahman (1970) observed the number of generations by studying the adult moths and egg laying of this pest in the northern districts.

The trial for controlling the pests needs the information regarding the broods to evolve an effective method of insecticidal control of the borer in the initial stages by right timing and frequency of the application, as the failure of an otherwise efficient insecticide may be entirely due to faults in the timing or the frequency of its application. So, an experiment was conducted to study the broods of the sugarcane top borer, *S. excerptalis* on the basis of the determination of the populations of the larvae and pupae in the fields.

MATERIALS AND METHODS

Among the three techniques to determine the number of broods of a borer pest as mentioned by Patel and Bagal (1957), the 3rd technique i.e. by determination of the relative proportion of larvae to pupae in randomised samples of populations was followed in the present investigation.

The samples of the top borer infested canes were taken from the sugarcane plots of the Rajshahi University Rural and Agricultural Development Project. The infested shoots were identified by their characteristic 'dead-hearts'. 20 sizeable samples were collected in a month (for 10 plots at 15 days intervals) and were carried to the laboratory. They were then cleaned and split open with a sharp knife for examination and the number of larvae, pupae and empty shoots were noted. Such examinations of infested shoots were made from December, 1977 to December, 1978. In January and February, there were no plants in the fields because old plants were harvested by them and young plants did not contain much infestation. So, the sampling in those two months was avoided.

RESULTS AND DISCUSSION

The number of infested canes, number of larvae, pupae and the number of empty shoots found are shown in Table-I. The percentage of larvae and pupae found at different months are also shown in figure-1.

It was found that in newly grown sugarcane plants, percentage of larvae was higher than pupae in the month of March. In April, percentage of pupae increased and it became higher than that of larvae and a further fall was noticed in May with a rise again in June. There was also a fall in July and it rose in August, again a fall was observed in September. The population became higher in October but declined in November.

The pupal population observed in December was very low as compared with the number of larvae. This is explainable as the larvae during this month went into hibernation, which also was observed by Patel (1963), Kalra and Kalra and Sidhu (1965), and Patel and Bagal (1957). Therefore, it seems, from the experiment that there was another peak of pupal population during the months of January and February. Because in March, the number of pupae was very low in comparison with the number of larvae observed in the month of December of the previous year.

The number of broods of *S. excerptails* recorded by different workers varied from 3 to 7 with the variation of the locality. Venkatraman (1963) observed 3 broods in Madras of India, but in Bihar, it was recorded 5 broods by Huque and Agarwala (1955) and 5 to 7 broods at different states of India by Gupta (1959). Kalra and Sidhu (1965) observed 5 generations of top borer in the Punjab and Patel (1963) studied 6 generations in laboratory while 5 generations in fields at South Gujarat. Patel and Bagal (1957) studied 5 peaks of pupal populations at Walchandnagar in India.

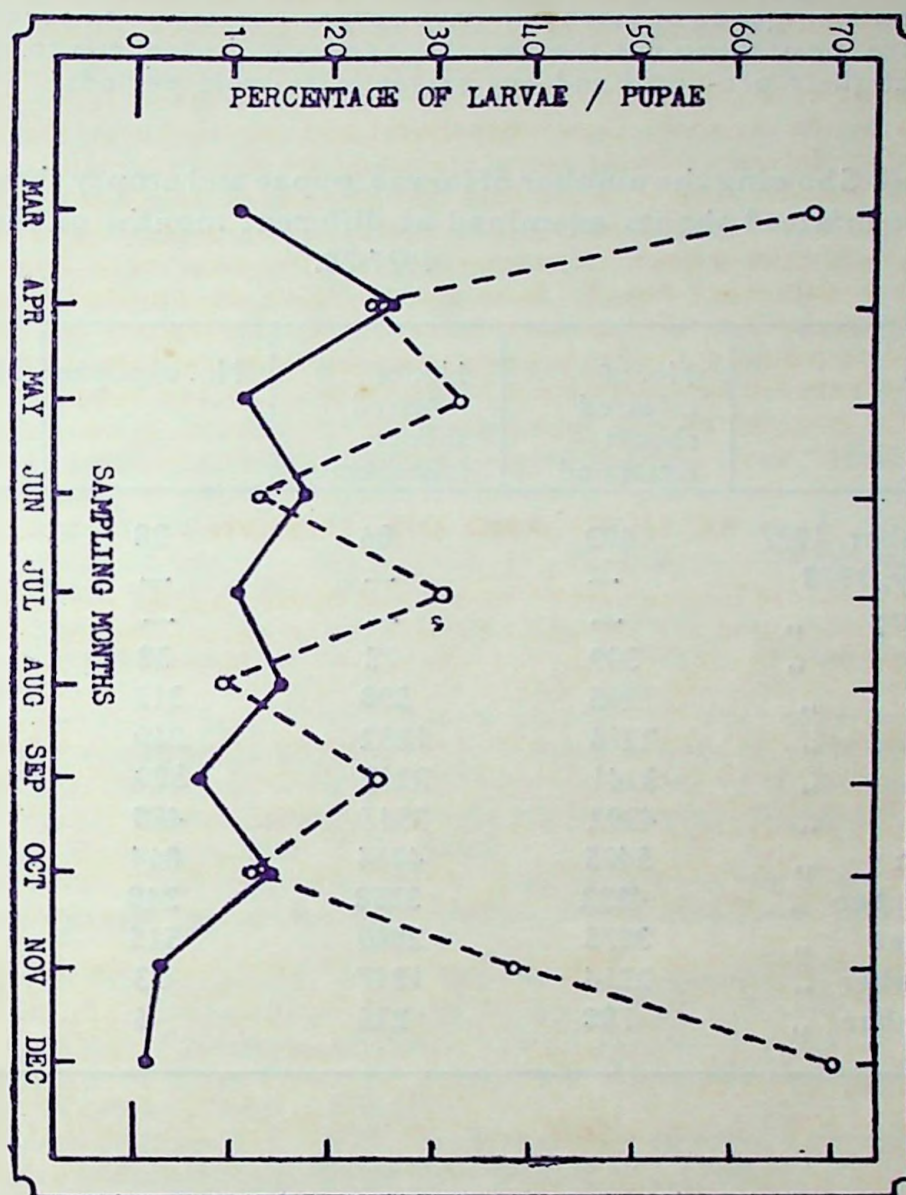


Figure-1 Showing the percentages of larvae (broken line) and pupae (solid line) of *S. nivella* among the infested shoots examined at different months of the year 1978.

The present findings are similar with the observations made by Rahman (1970) as there were 5 generations of *S. excerptalis* in Bangladesh. Thus it is evident that there would be at the most 5 peaks of emergence of moths corresponding to rises of pupal abundance. As the period succeeding the maximum emergence of moth will have severe infestation to sugarcane, it is therefore, possible to use the natural enemies and chemicals to control top borer at their pre-pupal and egg stages at suitable periods.

Table-I Showing the number of larvae, pupae and empty shoots among the infested shoots examined at different months of the year 1977-78.

Months	No. of infested shoots examined	No. of infested shoots found emty	No. of pupae	No. of larvae
December, 1977	603	86	28	489
January, 1978	—	—	—	—
February „	—	—	—	—
March „	349	73	38	238
April „	1205	598	317	290
May „	2216	1232	260	724
June „	3241	2219	580	442
July „	4392	2547	468	1377
August „	5405	4014	864	527
September „	4832	3258	348	1226
October „	3875	2810	515	550
November „	2314	1347	73	894
December „	788	226	6	556

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