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# SOME STUDIES ON THE BIOLOGY AND CONTROL OF *ACIGONA STENIELLUS* (HAMPSON)

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Investigations on the biology of Gurdaspur borer of sugarcane, *Acigona steniellus* (Hampson), carried out in the field cages under semi-natural conditions, indicated that the incubation period occupied, on an average, 5.93 days and the hatching percentage of eggs was 75.32%. The larval and pupal stages occupied, on an average, 22 and 8.53 days, respectively. The life span of adult male and female was, on an average 2.07 and 2.76 days, respectively. The duration of copulation varied from 10 to 60 minutes. The total number of eggs laid by a female ranged from 2 to 69. The sex ratio was found to be 1:2.

A week after application, Dieldrin, Heptachlor, Thiodan and Methyl Parathion(applied with irrigation water to the freshly harvested sugarcane field) gave 54.64, 58.63, 46.34 and 52.08% larval mortality, respectively as against 36.18% mortality where kerosene oil was applied.

## INTRODUCTION

Sugarcane is attacked by a number of insect pests of which sugarcane borers are very important. The *Acigona steniellus* which, 3 to 4 decades back, used to occur in Gurdaspur District, India, has now spread in many districts of Punjab. The attack of this pest occurs at a stage when the crop is pretty grown up and it becomes very difficult to control by the application of insecticides. Delayed crushing in mill zones and ratooning practice make the condition even more conducive for continuous increase in the spread of this insect pest in the areas of its non-occurrence. Studies on the biology and control of this insect pest carried out in past (Younas & Hussain, 1973 and Irshad *et al.*, 1982) indicate that very little work has been done in Pakistan.

In the present project, an attempt has been made to carry out investigations on the biology and control of this important pest of sugarcane.

## MATERIALS AND METHODS

*Acigona steniellus* (Hampson) larvae were collected from the infested sugarcane fields and reared in the field cages (5 x 5 feet) during the period from July to October. The emerging adults were allowed to pair in the cages. The potted sugarcane plants where fertile females laid eggs were tagged showing the date of egg laying. The pots were placed in separate cages for the study of eggs, larval and pupal stages. Observations on the emergence of moths from the pupae were recorded once each during day as well as night.

For chemical control of hibernating larvae of *Acigona steniellus,* insecticides were applied to the harvested field of sugarcane alongwith the irrigation water. In all there were six treatments including a check which were replicated thrice. Each plot measured 15' x 30'. The detail of treatments applied is as under:

| Control | Insecticide |
|---|---|
| Dieldrin | @ 1.0 litre a.i./acre |
| Heptachlor | @ 1.5 litre a.i./acre |
| Thiodan | @ 2.0 litres a.i./acre |
| Methyl parathion | @ 2.5 litres a.i./acre |
| Kerosene oil | @ 3.0 litres a.i./acre |

The observations on the larval mortality were recorded a week after the application of different treatments.

## RESULTS AND DISCUSSION

The data (Table 1) revealed that the number of eggs laid by a female ranged from 2 to 69 and the incubation period lasted for 5 to 8 days. Similar investigations were carried out by Kapoor (1957) and Kalra (1963) who reported that the number of eggs per female ranged from 94 to 300 and 30 to 60, respectively. It has, further, been observed that the female laid eggs near

**Table 1. Number of eggs laid and life stages of *Acigona steniellus* (Hampson)**

| | No. of eggs laid | Incubation period (days) | Egg hatching (%) | Duration of life stages (days) Larva | Pupa | Adult | |
|---|---|---|---|---|---|---|---|
| | | | | | | Male | Female |
| | 02 | 5 | 100.00 | 23 | 7 | - | 2 |
| | 29 | 6 | 79.31 | 21 | 7 | 3 | 3 |
| | 14 | 7 | 57.14 | 20 | 8 | 3 | 4 |
| | 69 | 5 | 79.81 | 22 | 9 | 2 | 3 |
| | 36 | 5 | 69.44 | 23 | 7 | 3 | 4 |
| | 06 | 8 | 66.66 | 22 | 10 | 3 | 3 |
| | 02 | 7 | 100.00 | 24 | 11 | 3 | - |
| | 06 | 6 | 100.00 | 22 | 10 | 1 | 3 |
| | 58 | 5 | 77.58 | 22 | 08 | 2 | 3 |
| | 15 | 6 | 53.33 | 22 | 09 | 2 | 2 |
| | 23 | 5 | 82.60 | 23 | 07 | 2 | 2 |
| | 46 | 5 | 69.56 | 22 | 08 | 3 | 3 |
| | 03 | 7 | 66.66 | 20 | 10 | - | 4 |
| | 18 | 6 | 61.11 | - | - | - | - |
| | 12 | 6 | 66.66 | - | - | - | - |
| Average | 22.6 | 5.93 | 75.32 | 22 | 8.53 | 2.42 | 3.00 |

the mid-rib, preferably on the upper surface of green sugarcane leaves. The colour of eggs when fresh was creamy white and transparent which changed to light brown near hatching. Egg hatching, on an average, was 75.32%. The larval stage ranged from 20 to 24 days.

**Table 2: Mortality of Gurdaspur borer**

| Insecticide | Mortality (%) | | | |
|---|---|---|---|---|
| | R1 | R2 | R3 | Average |
| Dieldrin | 56.25 | 64.82 | 42.85 | 54.64a |
| Heptachlor | 68.75 | 50.00 | 57.14 | 58.63a |
| Thiodan | 40.15 | 60.00 | 38.88 | 46.34ab |
| Methyl parathion | 50.00 | 50.00 | 56.25 | 52.08a |
| Kerosene oil | 38.88 | 33.33 | 33.33 | 35.18b |
| Control | 00.00 | 00.00 | 00.00 | 00.00 |

These observations are similar to those of Kapoor (1957) who observed similar duration of 22 days but at variance with those of Rehman (1940) and Kalra (1963) who reported 48 to 64 and 28 to 42 days, respectively. The pupal period was found to range between 7 and 11 days with an average of 8.53 days. These observations tally with those of Kapoor (1957) who observed this stage to last for 8 days. Moths emerged from the pupae after sunset and at night but some moths emerged during day time also. Copulation in various pairs lasted for 10 to 60 minutes.

Male and female lived for 1 to 3 days and 2 to 4 days, respectively. The male:female ratio was 1:2.

Dieldrin, Heptachlor, Methyl parathion and Thiodan applied @ 1.0, 1.5, 2.5 and 2.0 litres a.i. per acre did not differ significantly from one another (Table 2). The latter insecticide also did not differ significantly from kerosene oil applied @ 3 litres per acre.

The highest mortality of 58.63% was observed in case of Heptachlor followed by 54.64, 52.08 and 46.34% with Dieldrin, Methyl parathion and thiodan, respectively. The lowest mortality of 35.18% was recorded where kerosene oil was applied. No mortality was observed in the untreated check.

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