

ATTRACTION OF MALE *EMMALOCERA DEPRESSELLA* MOTHS IN TRAPS BAITED WITH VIRGIN FEMALES

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Investigations were made on the time and duration of pheromone emission by the females of *Emmalocera depressella* (Swinh.) and attraction of male moths to female baited traps under field conditions. The females emitted sex pheromone soon after emergence and were most attractive during the first two nights. The activity of moths in the field was maximum between 9-11 p.m. The number of baited females was found to have a significant effect on the catches of male moths in the traps.

Key words: Sex pheromone, Sugarcane borer, *Emmalocera depressella*.

INTRODUCTION

The potential use of sex pheromones has been advocated in the control programme of many insect pests of economic importance. These chemicals are species specific, non-polluting and safe to handle. Sex pheromones have been identified for a number of Lepidopterous pests including pink bollworm of cotton, *Pectinophora gossypiella* (Saunders) (1); tobacco budworm, *Heliothis virescens* (F.) (2); purple stem borer, *Sesamia inferens* (Wlk.) (3); spotted stalk borer, *Chilo partellus* (Swinh.) (4); spiny bollworm, *Earias insulana* (Boisd.) (5); sugarcane borer, *Chilo sacchariphagus* (Bojer) (6) and yellow stem borer, *Scirpophaga incertulas* Wlk. (7).

No such chemical has so far been searched for sugarcane root borer, *Emmalocera depressella* (Swinh.), which is one of the serious pests of sugarcane in Pakistan. The present studies were conducted to determine the time and duration of emission of pheromone by the females of *E. depressella* and attraction of male moths to female baited traps under field conditions.

MATERIALS AND METHODS

The hibernating larvae of sugarcane root borer were collected from sugarcane stubbles and kept in the laboratory incubator (tem. 27 ± 1 , photoperiod 12 hours/day) until pupation. The pupae were sexed into males and females and placed singly in glass vials for adult emergence. The emergent females were used as bait in aluminium cylindrical traps (length 22.5 cm and dia 15 cm) open at both ends and lined with stikem on the inner surface. Virgin female moths were placed in a wire gauze cage (5 x 3.5 cm) and suspended by a hook inside the trap. The

females were provided with 10 % sucrose solution on a cotton wick. The traps were hung in the sugarcane fields at experimental farm of Atomic Energy Agricultural Research Centre, Tando Jam with wooden sticks close to the cane and below crop level. This experiment was conducted during March-April, 1985 in autumn sown crop of sugarcane. The traps were positioned 40-50 m apart in the direction of the wind which usually blows from south west to north east. The male moths captured in each trap were counted and removed every morning. The coating of stikem inside the trap was renewed when necessary. The control traps were similar in nature but without females. For the study of moth activity in the field, inspection of traps was made during the night at hourly intervals from dusk onwards. A torch, the beam of which was subdued by means of a red filter over the lens, was used for observations.

EXPERIMENTAL RESULTS

Adult emergence. Laboratory observations on 226 adults of sugarcane root borer showed that moth emergence started at dusk and continued till midnight. A maximum of 88.9 % adults emerged between 7 and 8 p.m.

Time and duration of attractiveness. The females of sugarcane root borer emitted pheromone immediately after emergence and were most attractive during the first two nights. The freshly emerged females when baited in the traps captured equal number ($P \geq 0.01$) of male moths on the night of emergence and the following night. The attractiveness decreased with the age of the females (Table 1). When one (0-1-hour old) virgin female was baited in the trap, it attracted an average number of 12.0, 9.2, 1.8 and 0.2 male moths/ trap on the first, second, third and fourth night of emergence respectively. Generally the females

lived for 2-4 days.

Adult activity in the field. Hourly observations from sunset onwards on the catches of male moths in the traps baited with virgin females indicated that moths were active in the field soon after dusk and were captured in the traps upto 2 a.m. Out of 610 males caught, 9.2 % were attracted to the female baited traps between 8-9 p.m. 31.9% between 9-10 p.m., 45.4 % between 10-11 p.m., 8% between 11-12 p.m., 5.2 % between 12 p.m.-1 a.m. and 0.3 % between 1-2 a.m. No male was captured in the control traps without virgin females.

Effect of female number on the attraction of male moths. The number of baited females was found to have a significant effect on the catches of male moths in the traps. The average number of males captured/trap increased as the baited females/trap increased (Table 2). When 1, 3 and 6 females/trap were baited, they attracted significantly ($P \geq 0.01$) different number of males/trap i.e. 23.2, 39.8 and 59.2 respectively during their entire life span.

DISCUSSION

The females of sugarcane root borer were found to emit maximum pheromone on the night of emergence and the following night. The attractiveness of the females decreased significantly on the third night. The activity of moths in the field coincided with the emergence time of the adults. After the peak adult emergence (88.9 %) between 7-8 p.m., maximum males (77.3 %) were caught in the traps between 9-11 p.m. Perez and Long (8) reported that virgin females of *Diatraea saccharalis* (F.) emitted pheromone soon after emergence and were most attractive during the first 3 days of life. The adults were sexually active between 1-4 a.m. Hammond (9) demonstrated that virgin females could be used to obtain significant reductions in *D. saccharalis* damage to sugarcane crop when sticky

Table 1. Catches of male moths of sugarcane root borer in traps baited with virgin female at different age levels.

Age of female (hours)	*Mean male catch/trap	% of total males captured
0-1 (First night)	12.0 a	51.7
24 (Second night)	9.2 a	39.6
48 (Third night)	1.8 b	7.8
72 (Fourth night)	0.2 b	0.9

*Average of 5 replicates. Means followed by the same letter are not significantly different from each other at 1 % level.

Table 2. Catches of male moths of sugarcane root borer in traps baited with different number of virgin females

Number of females baited/trap.	*Mean male catch/trap	% of total males captured
1	23.2 a	19.0
3	39.8 b	32.6
6	59.2 c	48.4

*Average of 5 replicates. Means followed by the same letter are not significantly different from each other at 1 % level.

traps, each baited with one female, were continuously maintained in plots at a rate of 400-800 traps/acre. Patrick and Hensley (10) found no significant difference in the number of males recaptured when releases were made upto 320 ft. from a virgin female trap.

The virgin females of sugarcane root borer can be effectively used as a bait for attraction of male moths in the field traps. The attraction of males to the traps significantly increased with the increase of baited females per trap. The identification of chemical sex attractant and formulation of a synthetic compound would be useful in monitoring populations and control of sugarcane root borer.

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