

**EFFECT OF MILD FUMIGATION ON THE PATTERN OF EGG LAYING AND
ADULT EMERGENCE IN THE RICE MOTH, *CORCYRA CEPHALONICA*
(STANTON) (LEPIDOPTERA).**

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ABSTRACT

Observations on the effect of mild fumigation on the gravid females during egg laying and on the eggs produced by the fumigated females of the rice moth, *Corcyra cephalonica* (Stainton) are noted. Seven to ten percent of the emerging adults displayed deformities in the nature of atrophied or curled wing and underdevelopment of its antennae and limbs.

The Rice moth, *Corcyra cephalonica* (Stainton) was first described in 1866. Chittenden (1919) mentioned that as regards work and injury the moth resembles *Ephes-
ta cautella* Walk., its related species and *Plodia interpunctella* Hbn. It was observed that the caterpillars of *Corcyra*, which feed and live mainly in and around dried-vegetable products, are by far most destructive. The species is present at times in practically all the warehouses where grains, seeds and dry fruits are handled or stored.

Information concerning different aspects of the species has been published from time to time. Mukherjee (1971) recorded *Reduvius* sp. as predatory to *C. cephalonica*, which could share in the biological control of the latter. Joshi (1976) while working on the moth noted that the larvae had a special liking to feed from towards the plane surface of the pulse-halves.

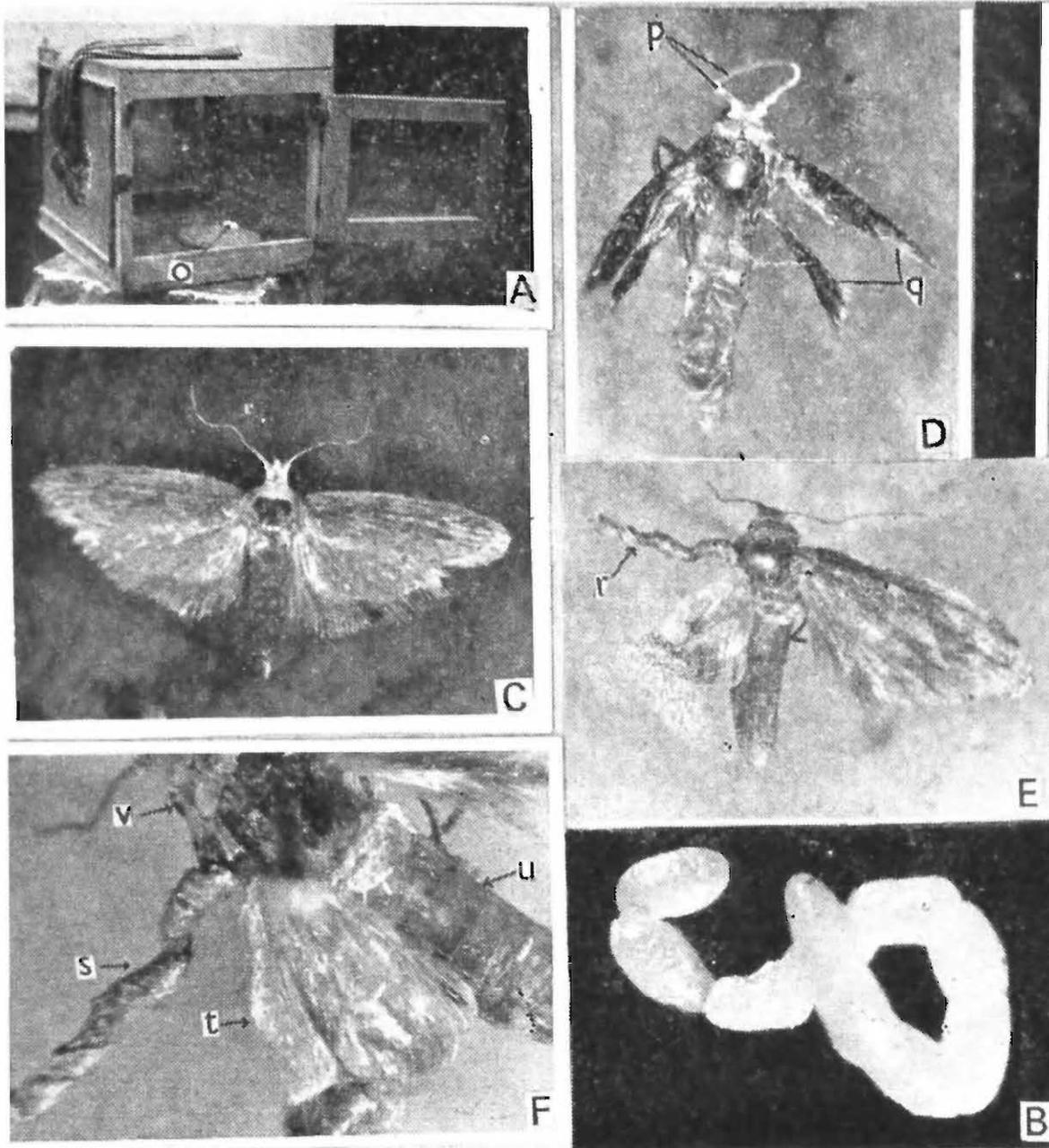
fumigatory effect on gravid females during egg deposition and also on the eggs produced in consequence.

MATERIALS, METHODS AND RESULTS

A sample of pulse-halves of *Cajanus indicus* Sprengl. which was infested by the rice moth, was collected from the local Kidderpore market, from a retailer. The inedible product comprised of larvae, their faecal granules, cocoons with pupae and dead adults. A rich pure culture of the moths was prepared by 'inoculating' forty-one active and healthy larvae to some fresh, dry and uninfested pulse-halves of *C. indicus*. The implanting of small larvae to the food was made through and on cotton-wool. The entire rearing was brought in the specifically designed, wooden sleeve cage (Pl. II A).

This paper is intended to account for the

The fumigant chosen for these trials was



A. Wooden sheave cage, o-Cotton wool ; B. Eggs (10) 'beaded' in a string ; C. Well-built and symmetrical 'female moth that laid eggs ; D. p-Antennae reduced, q-Wings strophied ; E. r-Forewing in permanent torsion ; F. Spreading of hind wing (t) is repressed by the twisting of the forewing (s). u-Abdomen, v—Eye.

a mixture of benzene and toluene in a quantitative relation of 1.5 : 1 (v/v), respectively. It may be mentioned that the selection of the fumigant was rather arbitrary and was to acquire knowledge about the cumulative after-effects, if any, of the two compounds.

Twenty three egg bearing females which had just started egg laying, were tried at different occasions depending upon the availability of such females.

These moths were confined in covered petri dishes (diameter 12.5 cm), one at a time, and were exposed to the fumigant from five to twenty five seconds, sometimes more to make sure that they fall unconscious sans apparent movement. Data on the dosage of the fumigant, applied as only droplets could not be taken. Loss of sensibility was almost always immediate followed after a feeble to strong flutter of wings. Fresh air was immediately provided to the moths and all the traces of the fumigant were withdrawn from the bounded enclosure. The moths regained a semi-conscious state, steadily, in degrees except in three instances, when they died. The live moths were turned ventral side upwards in their petri dishes to observe the egg laying which was little or more symbolic or distinctly clear in all the cases. The females appeared spasmodic and the egg production subnormal, simultaneous to frequent abdominal pulsating gestures. Perfect incoherence from standard pattern of egg laying was observed a number of times when the eggs came out in the form of a

continuous string, joined end to end and made moniliform. Conforming to type, otherwise the eggs are laid singly, in isolation with inermittent pauses. The strings, as noted, were straight in the beginning but with the addition of eggs they became looped and twisted, and in one of the instances it looked like an incomplete '8' (Pl. IIB). The fumigated females could seldom release the eggs approximating to the three-quarters of their total fecundity and died. This was made certain by the abdomens of a number of dead females, where stranded eggs were evident.

The egg-strings and the isolated eggs which were successfully laid were transferred by means of soft and fine brushes to small covered petri dishes (diameter 8cm), lined with round, smooth and glossy-black papers. Here the eggs were mildly treated with the fumigant for a short time (30 seconds max.) depending upon the number of eggs. Immediately after, all the fumigant traces were removed once again and the eggs transferred to clean, covered petri dishes of the same size. Care was taken that only fumes should come in contact with the living stages (females and the eggs) in both the treatments.

Regular observations were made on the eggs which were in good shape, with entire and wrinkle-free margins. Hatching was restricted to nearly 70% of the eggs and the rest got crumpled and finally decayed. The newly hatched larvae were provided with fresh, uninfested pulse-halves as food. Perio-

* (a) Benzene (Crystallizable)	
Boiling range (95%)	79-81°C
Freezing point	4-6°C
Wt./ml. at 20°C	0.875-0.879 gm.
Non-volatile matter	0.002% max.
(b) Toluene	
Boiling range	110-111°C
Non-volatile matter	0.0025%

dical observations were made on the immature stages.

The larvae moulted and pupated almost as scheduled, as usual but the pigment of just moulted larvae and pupae was seemingly chalky white at different occasions, instead of being pale. The emerging adults were collected in spacious glass jars and were permitted unrestricted flights. It was here that some structural discrepancy in 7 to 10% moths as against their proportionate and balanced parents (Pl. I1C) was noticed in the form of atrophied or curled wings and in the underdevelopment of antennae and limbs (Pl. I1D & E). In four specimens the curling of the forewing effected the stretching of the hind wing of the same side (Pl. I1F). Such ill-formed moths could not fly for obvious reasons but in general, undertook short leaps and / or moves to bring about locomotion.

Nevertheless, they were observed to mate with their healthy counterparts, lay fertile eggs and add to their colony.

ACKNOWLEDGEMENT

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**DISTRIBUTION AND POPULATION OF TWO PESTIFEROUS LAND SNAILS,
ACHATINA FULICA BOWDICH AND *MACROCHLAMYS INDICA*
GODWIN-AUSTEN, IN WEST BENGAL**

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ABSTRACT

Studies on the distribution and population status of *Achatina fulica* Bowdich and *Macrochlamys indica* Godwin-Austen have been made from West Bengal. Population density of the snails was estimated by counting the snails from five different square metre areas of the infested pocket and the mean was considered for actual population per square metre area. The snails are found abundant in the districts of lower and North Bengal. In West Bengal, *A. fulica* predominates except in Calcutta and Coochbihar districts where density of *A. fulica* and *M. indica* is nearly equal. In heavily infested pockets 18-32 *A. fulica* and 22-34 *M. indica* has been recorded. Of the sixteen districts Purulia is free from both the species of snail. Bioecological factors in relation to distribution and population density have been discussed. The variation in the size of snail population in different districts is directly related with the climatic conditions of the areas.

INTRODUCTION

Since its introduction in 1847 in Calcutta, West Bengal, no study on the distribution and population of the giant African land snail *Achatina fulica* Bowdich has yet been made. *Macrochlamys indica* Godwin-Austen, a native of India has also registered its name as an agri-horticultural pest but no report is available on its status and distribution. Both the species of snails are a menace to agri-horticulture in West Bengal as well as in other States of the Indian Union.

In West Bengal there are six well defined

seasons—summer (from the middle of April to the middle of June), rainy (from the middle of June to the middle of August), autumn (from the middle of August to the middle of October), dewy (from the middle of October to the middle of December), winter (from the middle of December to the middle of February) and spring (from the middle of February to the middle of April). However, each season may overlap to some extent with the other.

MATERIALS AND METHODS

While surveying the distribution and present status of *A. fulica* and *M. indica* in West