

Two Caterpillars Destructive to Stored Products in Kerala

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DURING 1957 TO '59, WHILE RECORDING insect pests of stored products in Kerala, the authors noted two destructive caterpillars, *Setomorpha rutella* Zell. and *Erechthias zebrina* Butler, found along the common beetle pests, *Sitophilus oryzae* Linn., *Rhizopertha dominica* Fab., and *Araecerus fasciculatus* De Geer. A brief account of these is given below:-

Setomorpha *rutella* Zell. (Tineidae)

Gater (1925) found *S. rutella* in a consignment of Brazil nuts in Malaya, while Diakonoff (1938) observed it causing damage to cured tobacco leaves in Netherlands Indies, Sumatra and Java during World War I, and Lever (1939) noted it occurring as a pest of guava in Fiji. In India, Lefroy (1909) found it attacking blankets in Calcutta. In Kerala, it is now noted as a pest of stored rice, sago, coriander, gingelly, tapioca, pulses, pepper, coffee beans, and garlic.

Biological Studies.

These studies were conducted in the laboratory at a temperature ranging from 76° F to 84° F and a relative humidity of 50 to 90 percent.

Moth (Plate I, Fig. 1)

Forewings drab gray, with several irregular dark spots; hind wings edged with long fringes. Wing expanse of male, 10 to 14 mm; female, 15 to 19 mm. The moths prefer to hide in dark places and when disturbed, fly up in search of crevices along the walls of the store-houses. Preoviposition period, two days; longevity, one week.

Egg.

Eggs are laid singly or in batches in crevices on the walls of the store houses or are gummed on the grain by a long ovipositor. Maximum number of eggs laid by a single moth was 220, during the course of three days. Egg is broadly oval, and measures 0.63 mm. in length and 0.48 mm. in width. Chorion smooth and semitransparent. When freshly laid, egg is dirty white in colour but assumes a yellowish-white tint by the fourth day. Incubation period, 6 to 7 days.

Larva (Plate I, Fig. 2).

Freshly hatched larva is pale white, slender and cylindrical. Head, light brown; body sparsely clothed with short hairs. It starts feeding and spins a loosely woven

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Explanation of plates

- Plate I, a. *Eupterote cardamomi* (sp. nov.)
b. do.
c. Single egg.
d. Full grown caterpillar.
e. Cocoon.
f. Pupa removed from cocoon.
- Plate II, a. *Eupterote canarica* M.
b. } Single
b' { egg.
b'' egg mass.
c. Full grown caterpillar.
d. Pupa removed from cocoon.
- Plate III, a. *Eupterote testacea* Wlk.
b. do.
c. Single egg.
d. Full grown caterpillar.
e. Cocoon.
f. Pupa removed from cocoon.
- Plate IV, a. *Eupterote fabia* Cram.
b. Full grown caterpillar.
c. Pupa removed from cocoon.
d. Cocoon.
e. *Sturmia sericariae* (tachnid).
- Plate V, a. *Lenodora vittata* Wlk.
b. Single egg.
c. Full grown caterpillar.
d. Pupa.
- Plate VI, a. Genitalia of *Eupterote cardamomi*
b. „ *E. testacea*
c. „ *E. fabia*.
d. *E. canaricia*.

gallery and continues to feed from within. On stored rice, larval stage lasts 35 to 53 days in November-February. Fullgrown caterpillar measures an average 17 mm in length, and 1.9 mm in breadth. Head, glossy brown; posterior portion partly withdrawn into the prothorax. Anterior region of prothoracic segment, semi-transparent. Prothoracic shield, pale brownish; posterior margin, dark brown. A pale brown speck is present on each side of the prothoracic segment, the spiracle being placed on this speck. Rest of the body is dirty white, and sparsely covered with hairs rising from very minute tubercles. Thoracic legs are glossy and pale yellow, with brownish tipped claws. Five pairs of short prolegs; crochets arranged in biordinal uniserial circle; the anal prolegs are different and the crochets are not arranged in a complete circle. Spiracles small, oval and dark brown; anal plate yellow and slightly chitinized.

Pupa (Plate 1. Fig. 3)

Pupation takes place in a thin papery silken cocoon inside the galleries overlaid with frass and particles of grain. Pupa is about 7 mm long and 2 mm broad; yellowish brown; wing cases reaching anterior margin of sixth abdominal segment; cases of antennae reaching middle of seventh segment; second to sixth abdominal segments dorsally with transverse ridges of small spines anteriorly in double line and sub-posteriorly single line; anal segment with larger almost circular series of spines; spiracles on second to seventh abdominal segments, distinct with circular brownish border. Pupal period lasts for 10 to 12 days. One generation is completed in 50 to 70 days in December to February on stored rice.

Economic Importance

Heavy infestation usually occurs and whole grain and grain products are comple-

tely reduced to a mass of webbing of frass and excreta. The insect breeds all the year round but infestation is more severe in the months June to August. In point of damage caused, this insect may be rated as a major pest of stored rice pulses and tapioca in Kerala.

Erechthias zebrina Butler (Lyonetiidae)

Fletcher (1919) records the distribution of this insect in India and Ceylon, but expresses doubt about the larva as a refuse feeder. In Kerala, the authors noted the insect infesting stored gingelly, rice, dhal, sago, coriander, pepper, tapioca flour, cummin seeds and dried fruits of *Terminalia belerica*, and *Tamarindus indica*. The insect is now recorded for the first time as a pest of stored products in India.

Biological Studies

Moth

Wing expanse 8-12 mm. It resembles the angoumois grain moth in size, but is readily distinguished from the latter by its colour. The forewings are banded and mottled with pale yellowish gray and black (vide fig. 1, pl. II). The pale greyish hind wings are edged with long fringes. The moths are quick fliers and like dark corners. Eggs are laid singly or in batches and are gummed on the grain particles or walls of store houses. The maximum number of eggs laid by a single moth was 120 during three days.

Egg

The egg is dull white, broadly oval, and measures about 0.5 mm in length and 0.33 mm in width. Incubation period is 8 to 9 days.

Larva

The newly hatched larva is creamwhite, with a light brownish head and measures

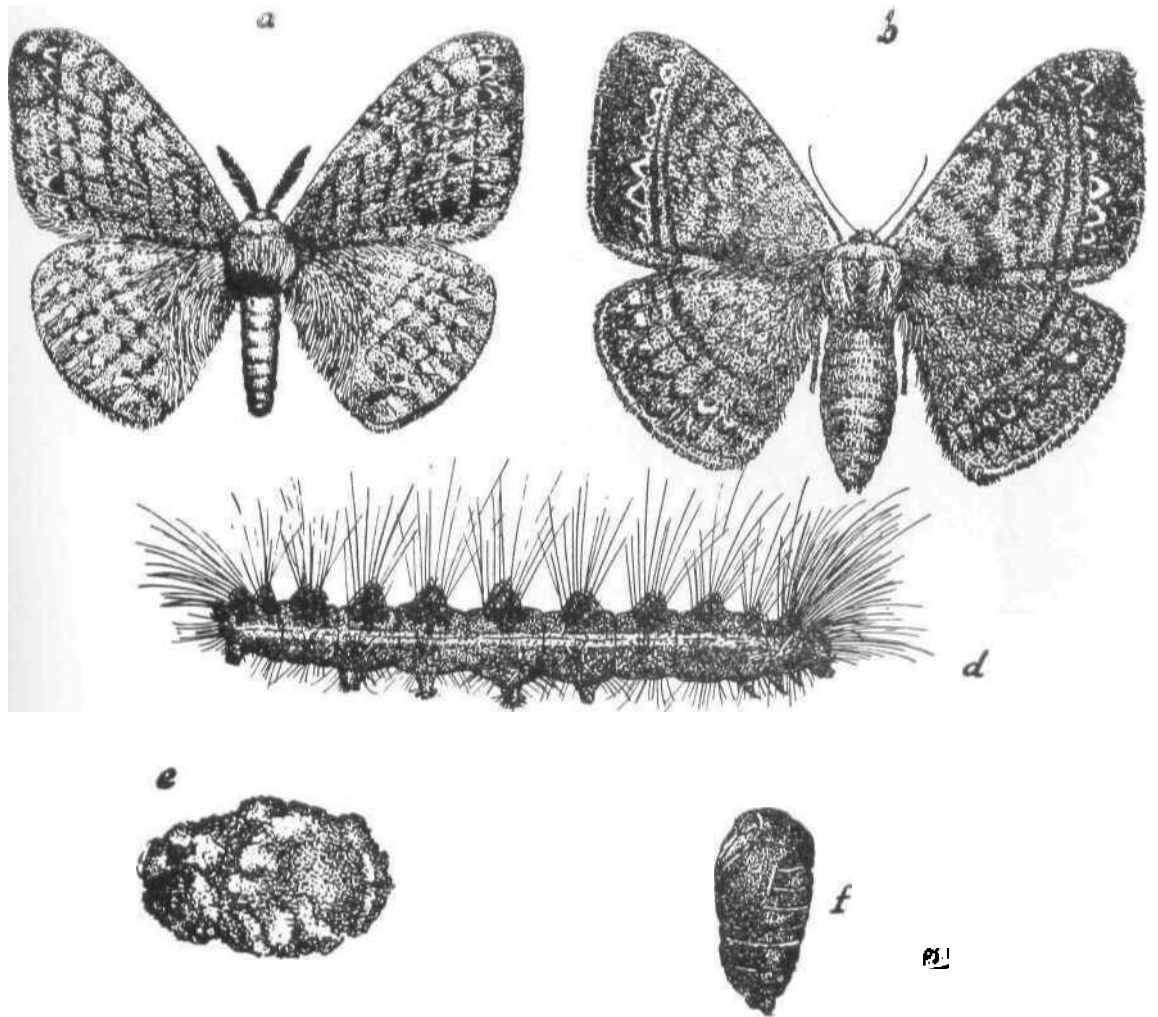


PLATE I

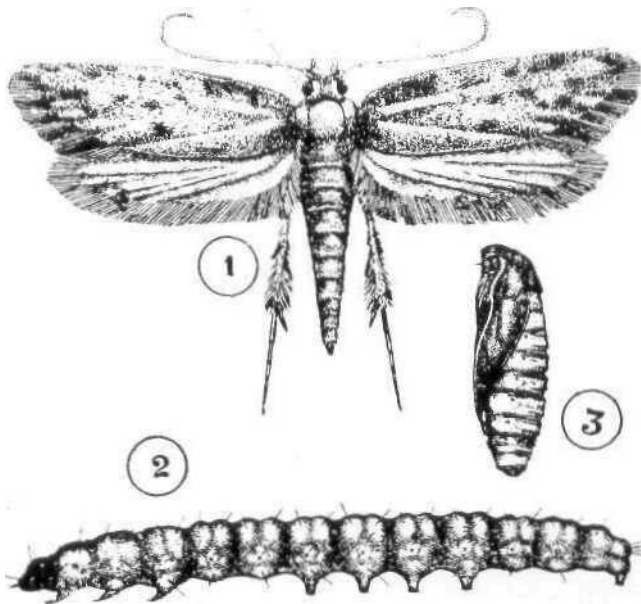


PLATE I

1. *Setomorpha rutella* Zell. (Moth)
2. do (Larva)
3. do (Pupa)

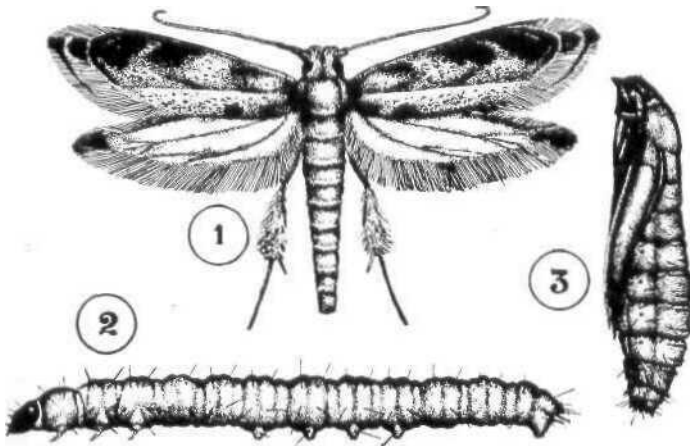
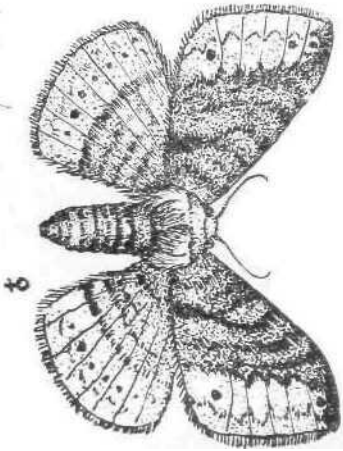
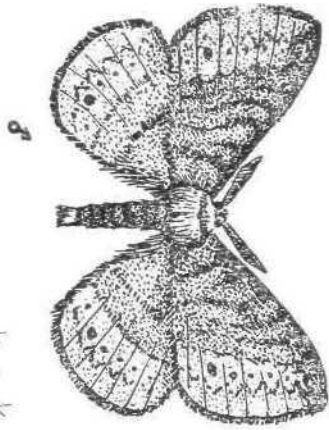
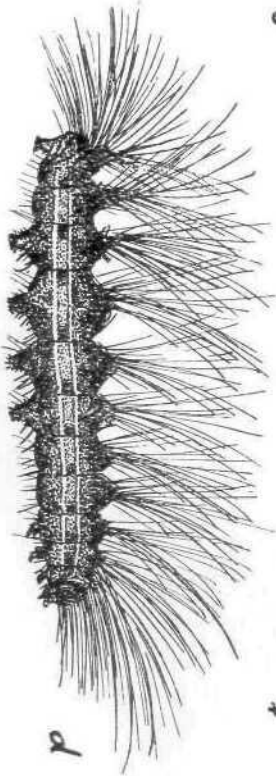
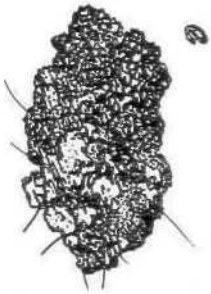


PLATE II

1. *Erechthias zebrina* Butler. (Moth)
2. do (Larva)
3. do (Pupa)



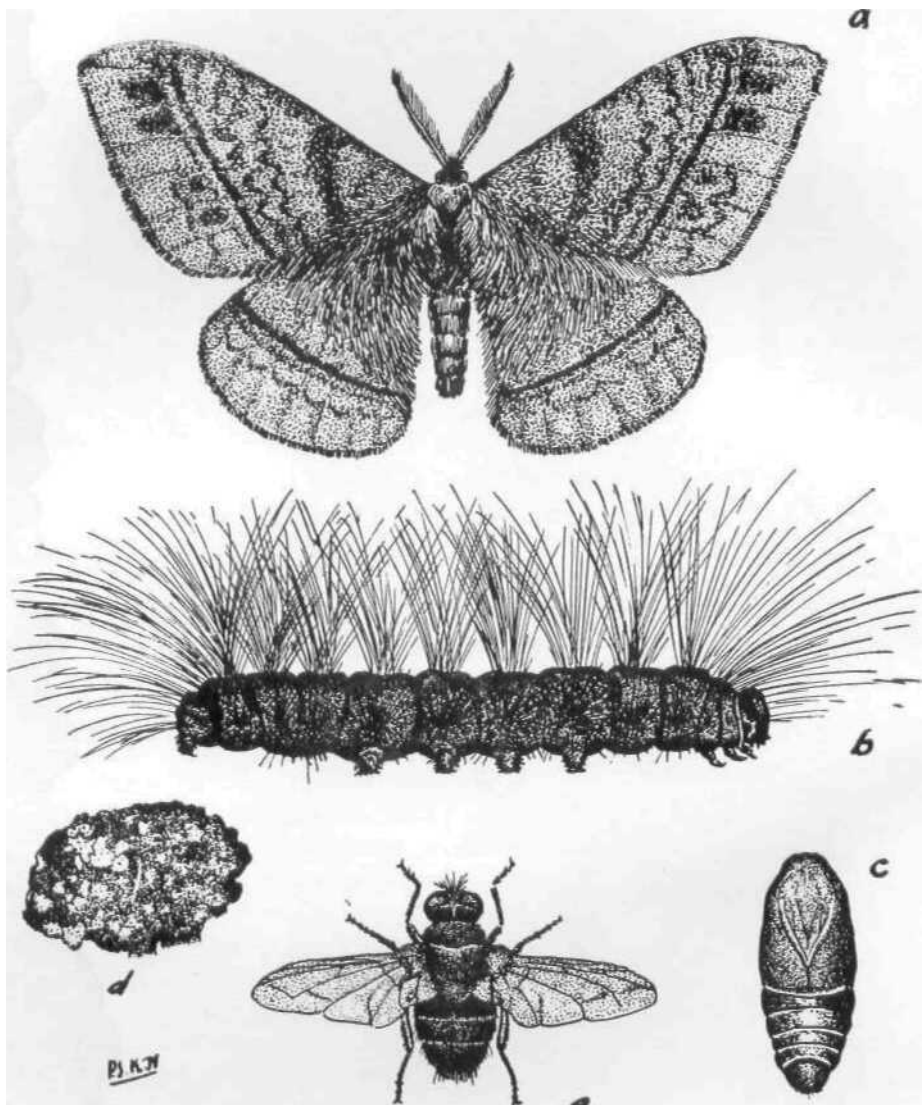


PLATE IV

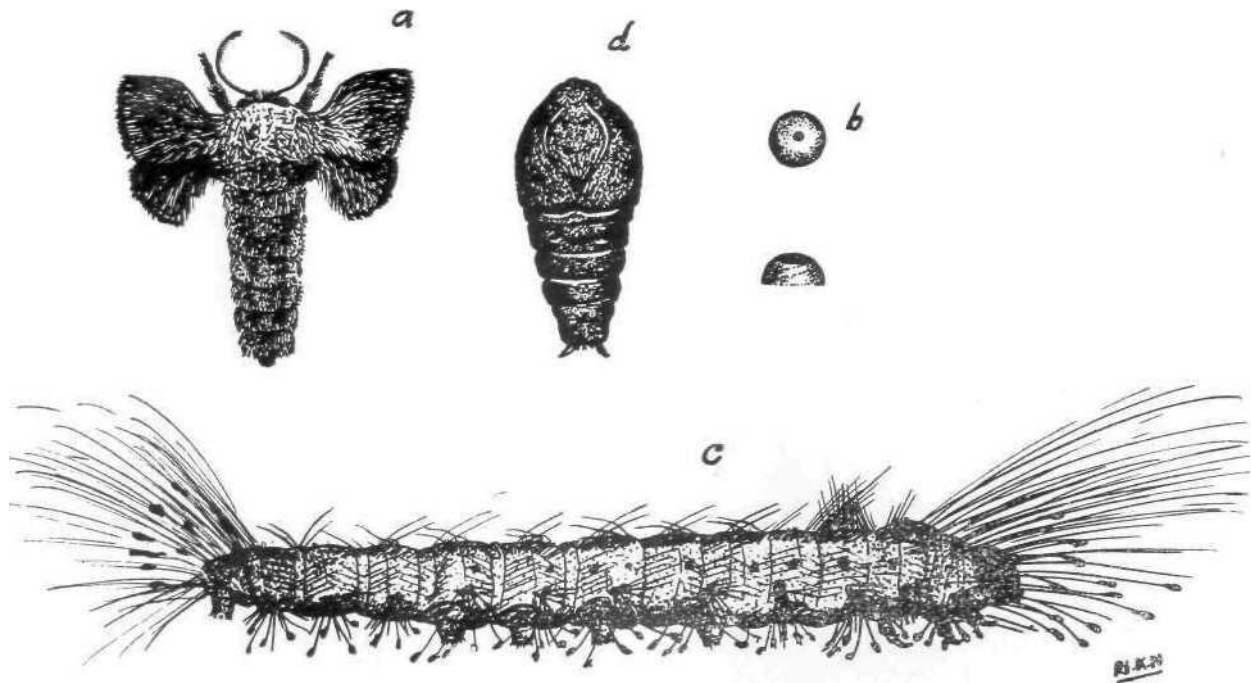
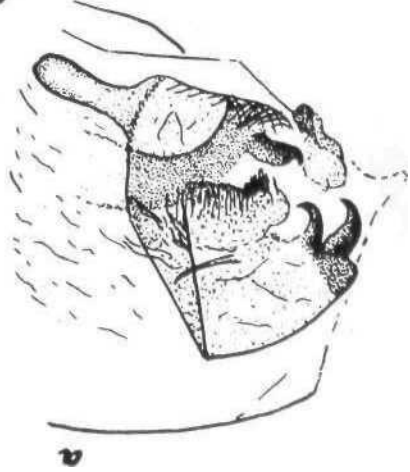
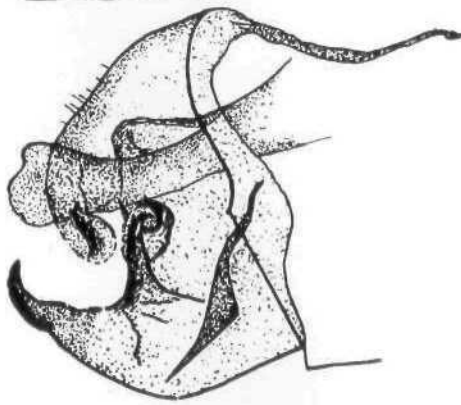
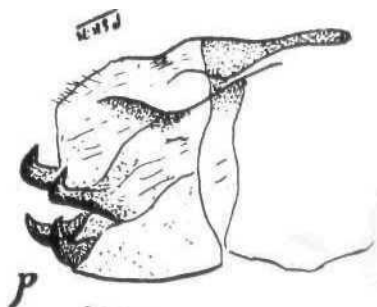
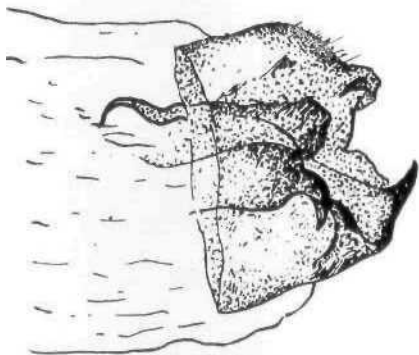


PLATE V



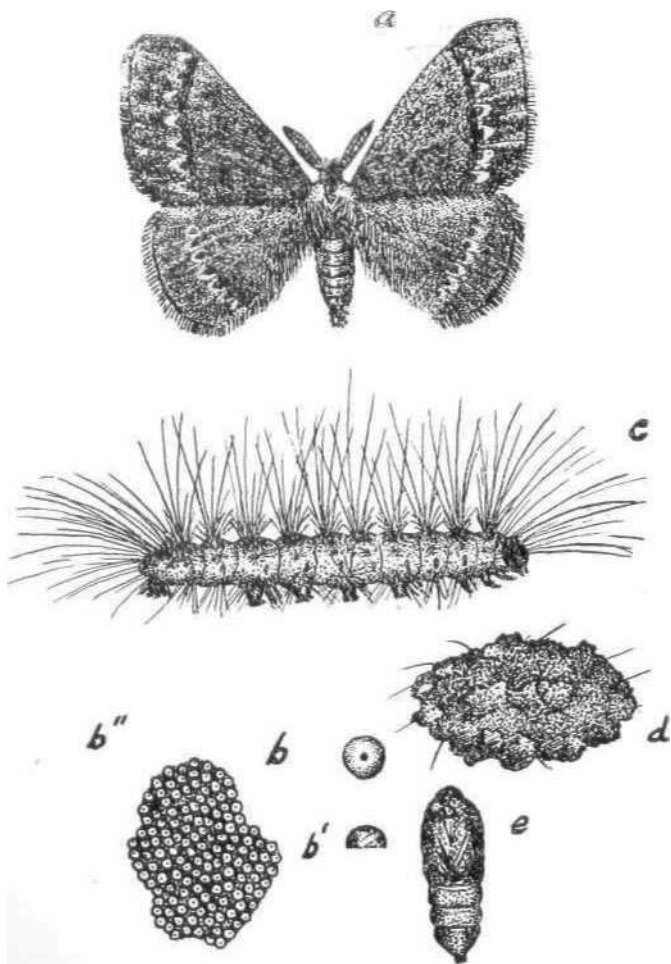


PLATE II

about 1 mm in length and 0.2 mm in width. It spins particles of grain with a silken thread and constructs a small tubular-gallery and feeds from within. Small tubular galleries overlaid with grain particles and frass are symptoms of attack by this pest. The larval period is 28 to 40 days in October to December. The full grown caterpillar is about 7 mm long and 1 mm broad (Plate IF, Fig. 2) slender, yellowish white or greenish-white; head yellowish brown; prothoracic shield light yellow. A thin longitudinal mid dorsal ridge present from the first to the ninth abdominal segment; thoracic legs cream white with whitish brown claws. Five pairs of prolegs, on which crochets are arranged in transverse uniserial bands; spiracles indistinct.

Pupa (Plate II, Fig. 3)

When about to pupate, the larva constructs a loose silken cocoon overlaid with particles of grain and frass inside the larval galleries. The pupa when newly formed is yellowish brown, subsequently turning deep brown with the wing cases black. Female and male pupa differ in size, measuring 5.1 x 1.3 mm and 3.6 x 0.9 mm respectively. Head with a minute pointed frontal prominence; wing pads of female reaching middle of sixth abdominal segment; wing cases of male reaching end of seventh abdominal segment, antenna cases a little extended beyond the anal segment. Third to sixth abdominal segments dorsally with transverse anterior and sub-posterior ridges of spines; seventh to ninth segments with single series of larger spines; anal segment with short triangular prominences. The rest of the surface sparsely clothed with short brownish hairs. Pupal period 13 to 14 days. Life cycle is 65 days on stored rice flour during October-December. There are five generations a year.

Economic importance.

The insect breeds on stored products throughout the year, but infestation is severest from June to October. In one of the store-houses at Kottayam, four bags of gingelly kept in storage for seven months were found to be severely damaged in 1959, and severe infestation was observed on sago and dried fruits *Terminalia bellerica* stored for one year in a Medicinal Herbs Store. In point of damage caused, this insect may be considered as a major pest of stored products in Kerala.

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