

DEPARTMENT OF ZOOLOGY

B.N. COLLEGE BHAGALPUR

T.M. BHAGALPUR UNIVERSITY,
BHAGALPUR- 812007



Dr. Rajesh Kumar
Assistant Professor

Phone- 7677189610 (M)
7004072016 (R)
Email id- raju.km1987@gmail.com

B.Sc. Zoology Part I

IMPORTANT WHEAT PESTS THEIR LIFE HISTORY AND CONTROL

- Wheat (*Triticum sativum*) is the main rabi crop of India. It is attacked by several insect pests. Some important ones among them are following:-

1. *Odontotermes obesus* (Wheat termite):-

Systematic position

Phylum: Arthropoda
Class: Insecta
Order: Isoptera
Family: Termitidae
Genus: *Odontotermes*
Species: *obesus*

Life cycle:-

- The life cycle of the termite begins with a mating flight, wherein **swarming** winged reproductive males and females leave established **colonies** and procreate.
- After fertilization, winged termites land and shed their wings, going on to form new colonies.
- These insects then become the king or queen termites of their newly established colonies.
- The **queen** and **king termites** are at the center of the termite life cycle and are responsible for reproduction.

Eggs

- After the fertilized queen lays her **eggs**, they hatch into pale white larvae.
- Eggs hatch into larvae and molt to develop into **workers**, **soldiers**, and primary or secondary **reproductive**.

Nymphs

- A nymph is a young termite that is going through molts, a process of shedding its exoskeleton, to become a reproductive.

- First, a termite develops a soft exoskeleton under its current, hard exoskeleton.
- Then, once the termite has reached maturity, its outermost skeleton splits open, and the new exoskeleton enlarges and hardens.
- This molting process continues throughout a termite's life cycle based on the colony's needs.

Larvae

- Over the course of several molts, these larvae grow to assume a role in one of the three termite colony castes: workers, soldiers, and reproductive termites, also known as alates.

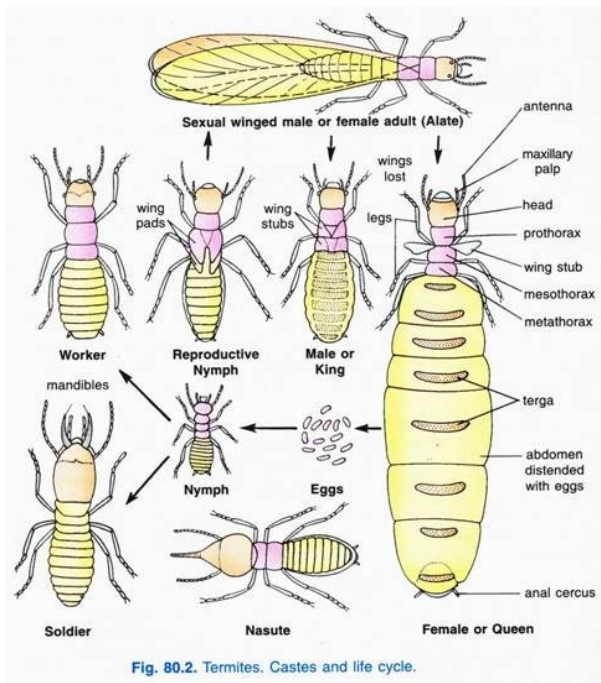


Fig. 80.2. Termites. Castes and life cycle.

Damages:-

- It attacks roots and stems of the plants below the soil. Plants die out due to infestation. The infestation is more severe under unirrigated conditions.

Control:

- Pre-treatment of soil with 5% Aldrin dust at the time of sowing.
- Spraying of Aldrin in standing crop.

2. *Sesamia inferens* (Stem borer):-

Systematic position

Phylum: Arthropoda
 Class: Insecta
 Order: Lepidoptera
 Family: Noctuidae
 Genus: *Sesamia*
 Species: *Inferens*

Life Cycle:

- Life cycle is completed in about 40-70 days, depending upon the climatic conditions.
- There are 4-6 generations in a year.
- The eggs are laid in clusters in several rows within the cover of the leave sheath. The eggs are rounded, pale and yellowish green in colour.
- The larvae after hatching bore into the stem and feed upon the tissues of the stem.
- A fully grown caterpillar is cylindrical with its head red-brown in colour and measures 20-25 mm in length. It pupates inside the stem itself.
- The egg stage lasts for about 7-10 days, larvae for 20-30 days and pupal stage for 8-10 days.

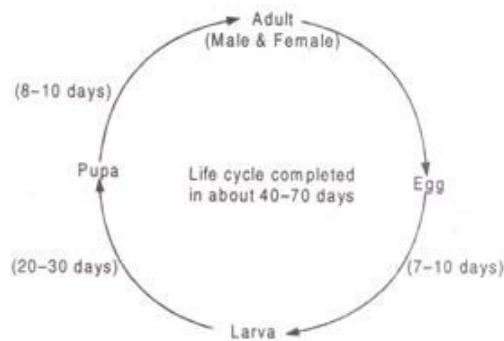
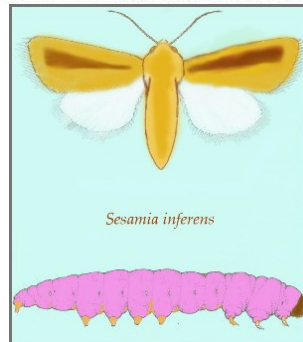


Fig. 56. Life cycle of *Sesamia inferens*.



Adult and Larva (*Sesamia inferens*)

Damages:-

- It is a major pest of wheat. Its young caterpillars bore into the stem, feed on the tissues inside and cause dead hearts. As a result, the entire stem withers and dies out.

Control:

- Destroy the dead hearts.
- Dusting of 5% B.H.C. dust.
- Spraying of 0.1% Phosphamid on or 0.07% Diazinon or 0.075% Bidrin.

3. *Agrotis ipsilon* (Cut worm):-

Systematic position

| | |
|----------|----------------|
| Phylum: | Arthropoda |
| Class: | Insecta |
| Order: | Lepidoptera |
| Family: | Noctuidae |
| Genus: | <i>Agrotis</i> |
| Species: | <i>ipsilon</i> |

Life cycle:-

The life cycle from egg to adult is completed in 32-67 days. In temperate regions, the larvae overwinter and pupate in the late spring.

Eggs

- The creamy white eggs are globular with a ribbed surface and are approximately 1/5 inch in diameter.
- They are laid singly or in small clusters, primarily on leaves, and hatch in 2 - 9 days.
- They are often found on plants in low spots of the field or in fields that have been subjected to flooding.

Larva

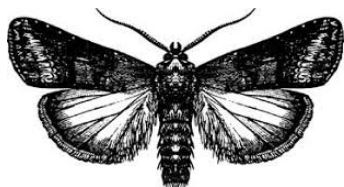
- Newly hatched caterpillars are 1/25 inch long and mature larvae are nearly 2 inches long.
- The larvae are thin, cylindrical and dark brown to greasy gray in color with faint lighter stripes running laterally on each side of the body.
- The head is dark brown with two white spots.

Pupa

- Larval development takes from 28-34 days.
- Mature larvae burrow several inches into the soil where they form a pupation cell.
- Pupae are dark brown and are about 3/4 inch in length.
- Pupal development is completed in 10-30 days.

Adult

- Adults have a wingspan of 1-5/8 to 2 inches.
- Forewings are gray with dark brownish or black markings.
- Hind wings are almost white except for a dark fringe at the tips and are folded under the forewing when the adult is inactive.
- The body is gray.



Adult



larva

Damages:-

- Larvae (caterpillars) cut seedlings at the soil level.

Control:

- (i) Treatment of soil with 10% B.H.C. dust.
- (ii) Heptachlor dust 34 kg ai/ha.
- (iii) Aldrin 1.7 kg ai/ha.

4. *Mythimna unipuncta* (Army worm):-

Systematic position

| | |
|----------|----------------------------------|
| Phylum: | Arthropoda |
| Class: | Insecta |
| Order: | Lepidoptera |
| Family: | Noctuidae |
| Genus: | <i>Mythimna</i> |
| Species: | <i>unipuncta</i> (Armyworm Moth) |

Life cycle:-

In a given year, there can be two to three generations, each generation requiring 30–50 days to complete.

Egg

- Adults oviposit in groups of 2 to 5 rows on dry leaves and grass, especially between the leaf sheath and blade.
- Females may deposit up to 80 eggs per cluster, leading to highly dense larvae populations.
- The eggs appear to be a white or yellowish color but change to a gray hue right before eclosion.

Larvae

- The true armyworm larval stage lasts at least six instars but may extend to nine.
- The caterpillar grows from 4 to 35 mm within this stage.
- The larval stage lasts about 20 days in warmer weather and 30 days in cooler weather.
- When the larvae hatch, they feed on the foliage on which they were laid, but if disrupted, larvae release silk and fall into the soil.
- The larvae are usually grayish green or grayish brown but have characteristic longitudinal stripes along the length of the body.

Pupa

- Pupation occurs underground in a silken case produced by the larvae.
- The pupa is usually 13–17 mm long and 5–6 mm wide.
- A pair of hooks protrude from the abdomen.
- The pupal stage lasts 7–14 days in warmer conditions and up to 40 days in cooler conditions.

- The color of the pupae is initially yellowish brown but changes to a mahogany-brown hue.

Adult

- The adult true armyworms are nocturnal insects.
- Life expectancy in warm conditions is 9 days in males and 10 days in females.
- Adults have a wingspan of approximately 4 cm.
- Black dots line the anterior edge of the forewings, making them look very pointed.
- There is a centrally located darker area that has several white dots as well.
- The hindwings have a more grayish tint.
- There is an outer row of dark dots on veins, joined by a dark streak from apex.
- The hindwings are fuscous grey, paler base wards, the veins dark.



Adult



Larva

Damages:-

- Its larvae feed on the leaves leaving the mid rib.

Control:-

- Dusting of 10% B.H.C.
- Spraying of 0.05% parathion.

5. *Tanymecus indicus* (Gujhea weevil):-

Systematic position

| | |
|----------|------------------|
| Phylum: | Arthropoda |
| Class: | Insecta |
| Order: | Coleptera |
| Family: | Curculionidae |
| Genus: | <i>Tanymecus</i> |
| Species: | <i>indicus</i> |

Life Cycle:

- Sexually matured males and females copulates and female lay eggs in the month of October-November.
- A female lay about 80-90 eggs.

- The eggs are laid singly under the clods of soil.
- The eggs remain dormant for few days due to which hatching is delayed.
- Hatching occurs within 20-50 days of egg laying, depending upon the environmental conditions.
- Full maturation of larvae takes place in about three months. Pupation takes place in March-April, which lasts for about 50-60 days.
- Adult weevils are formed during April-May and emergence of the adults from the soil takes place in the month of June-July along with the rain.

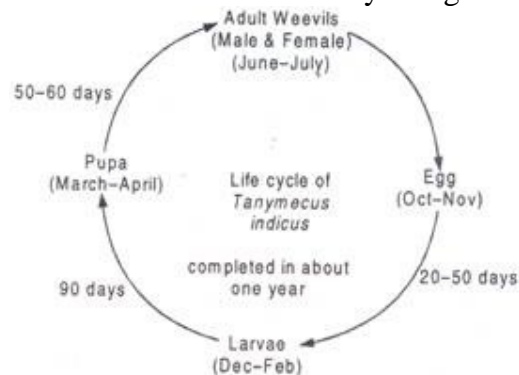
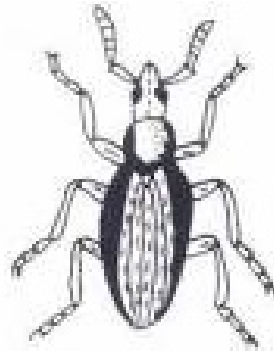


Fig. 61. Life cycle of *Tanymericus indicus*.



Adult (*Tanymericus indicus*)

Damages:-

- Both larva and adult damage roots of the plants. They cut the seeding at or below the soil surface.

Control:-

- (i) Resistant variety of wheat should be cultivated.
- (ii) Dusting by 5% DDT or 10% B.H.C. in the wheat fields.
- (iii) Spraying of 0.25% DDT or B.H.C. dust on the wheat plants.
