

# Lecture 3: Insect Pests of Cucurbits and their Management

## Learning Objectives

### ● Distribution, biology, nature and symptoms of damage and management strategies of

- I. Fruit flies
- II. Hadda beetles
- III. Red pumpkin beetle, *Aulacophora foveicollis* (Chrysomelidae: Coleoptera)
- IV. Blister beetles

### I. Fruit flies

#### **Important species:**

- *Bactroceracucurbitae*
- *B. tau*

**Family:** Tephritidae

**Order:** Diptera

#### **Distribution:**

India, Pakistan, Myanmar, Malaysia, China, Formosa, Japan, East Africa, Australia, Mauritius, Bangladesh, Sri-Lanka, Indonesia, Thailand, Philippines, Taiwan etc.

#### **Host plants:**

Melons, gourds, tomato, chillies, guava, citrus, pear, fig, cauliflower, cotton, sunflower, lettuce and other cucurbits.

#### **Damage:**

- The larvae feed inside the fruits
- Fruits become unfit for consumption and drop prematurely
- The young fruits can be destroyed in a few days,
- Older fruits show less symptoms, but on split opening, a mass of maggots in pulp is found
- In melons the infestation sometimes reaches up to 100 per cent
- Infested fruits are also attacked by microbes

#### **Identification**

- The maggots are apodous, dirty white
- Full grown maggot measures 9-10 mm in length and 2 mm in breadth

- The adult flies are reddish brown with lemon yellow marking on the thorax
- Fuscous areas on the outer margins of their wings

### **Life cycle**

- Adult longevity is 14-54 days
- Each female on an average lays 58-95 eggs
- The incubation period is 1-9 days
- Larval period extends from 3 days in summer to 21 days in winter
- Pupal period is 5-9 days in summer and may be extended upto 30 days in cold weather
- Total life cycle is completed in 12-34 days
- There are several generations in a year

### **Management**

- Collection and destruction of infested fallen fruits regularly
- Frequent raking of the soil under the vine
- Ploughing the infested field after the crop is harvested
- Bait spray or bait stations
- Attractants/ lures

## **II. Hadda beetles**

### **Important species:**

- *Henosepilachna vigintioctopunctata*
- *H. duodecastigma*
- *H. demurili*

**Family:** Coccinellidae

**Order:** Coleoptera

**Distribution:** India, south-east Asia

### **Host range:**

*H. vigintioctopunctata* and *H. duodecastigma* attack solanaceous and cucurbitaceous crops, while *H. demurili* attack only cucurbitaceous vegetables only.

### **Damage:**

- The damage is caused by the beetles and the grubs
- The leaves are damaged by feeding on the chlorophyll tissue between veins
- Leaves are skeletonized

### **Identification:**

- The grubs are about 6mm, yellow, with six rows branched spines.
- Beetles measure about 8 to 9 mm in length and 5 to 6mm in breadth.
- *H. vigintioctopunctata* beetles are deep copper coloured having 14 black spots on each

- elytron whose tip is somewhat pointed
- Beetles of *H. duodecastigma* are deep copper coloured with 6 black spots on each elytron whose tip is more rounded.
- *H. demurili* beetles are dull in appearance and light copper coloured with each elytron bearing 6 black spots surrounded by yellow margins.



#### Life cycle:

- The incubation period is 2- 3days
- Larval period is 14-18 days
- Pre-pupal period is 1-2 days
- Pupal period 4-5 days .
- Pre-oviposition period is 5-6 days
- Oviposition period is about 40-50 days
- Post-oviposition period is 10 days
- Adult longevity is 60-65 days (male) and 65-70 days (female)
- Several generations from March to October.

#### Salient features:

- Beetles resume their activity during March-April
- Hibernate as an adult in heaps of dry plants or in cracks and crevice in soil.
- Yellow cigar shaped eggs are laid mostly on the under surface of the leaves in clusters of
- 5 to 55 each.
- A single female can lay 200 to 700 eggs

#### Management:

- Collection and destruction of various stages of the pest.
- Larval parasitoids such as *Pediobius foveolatus* and *Uga menoni* are active in nature.
- The pest can be controlled by spraying the crop with malathion (0.05%)

### **III. Red pumpkin beetle, *Aulacophora foveicollis* (Chrysomelidae: Coleoptera)**

**Distribution:** Tropical, sub-tropical and temperate regions of the world

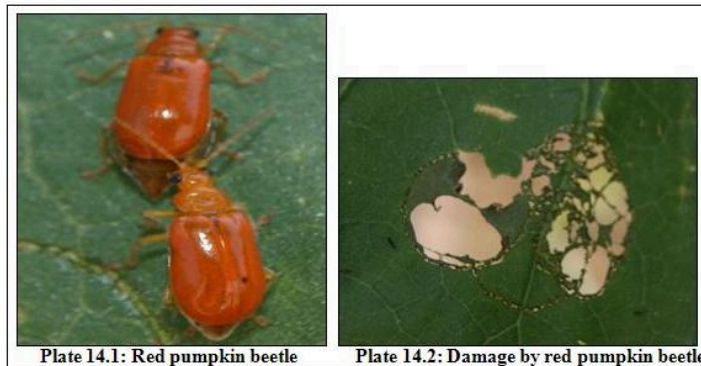
**Hosts:** Cucurbits.

**Damage:**

- Both grubs and beetles are damaging
- Grubs feed on underground plant parts
- Beetles damage cotyledons, flowers and tender leaves
- Adults are very destructive particularly during the initial stage of crop growth
- Some times resowing is required

**Identification:**

- Adults are orange coloured, 6-8 mm long with black ventral surface clothed with hairs.



**Life cycle**

- Each female can lay 150-300 eggs
- The egg, larval and pupal period varies from 6-15, 13-25 and 7-17 days, respectively
- Total life cycle is completed in 1-2 months
- There are 3-4 generations in a year

**Salient features**

- Lay eggs, singly or in clusters of 8-9, in moist soil around the base of the plants
- Pupation takes place in oval, water proof earthen cells in the soil.
- Adults hibernate during winter in the soil
- Beetles resume activity during March and remain in the field till October
- Peak activity is in April-June
- September onwards, the population starts declining.

**Management:**

- After the crop is over, plough the field deep to kill the grubs present in the soil.
- Collection and destruction of adult beetles reduces the population.
- Spray of carbaryl 0.1% or malathion 0.05%.

**V. Blister beetles, *Mylabris* spp. (Meloidae: Coleoptera)**

**Distribution:** Africa and south-east Asia.

**Hosts:** Cururbits, okra, cotton, carnation, rose, groundnut, beans, millet etc.

**Damage:**

- Caused by the adults only
- Feed on the floral buds and flowers
- Attacked flowers become brownish and unattractive
- Larvae are beneficial
- Grubs feed on the eggs of various grass hoppers and locusts found in the soil



Plates 14.3 & 14.4: Blister beetles on okra

**Identification**

- Full grown grubs are coarctate and form pseudopupae, which become pupae later
- Beetles have three black and three yellowish orange bands running transversely and alternatively on elytra.
- Among different species, *M. pustulata* are the biggest (22-26 mm), *M. phalerata* are slightly smaller (20-24 mm) and has its yellowish red bands narrower than black bands.
- Beetles of *M. mecilenta* and *M. tiflensis* are relatively smaller in size than the earlier two species.

**Management**

- Hand picking and destroying the beetles during morning hours when they are less active is effective.
- During severe infestation the crop can be sprayed with deltamethrin (0.0028%) or carbaryl (0.1%) at 10 days interval.

### **Study Questions**

1. Write down the distribution, biology, nature and symptoms of damage and management strategies of pests of cucurbits?