

## CHAPTER 1

### SIGNIFICANCE OF INSECTS

#### 1.1 Insect

A tracheal arthropod, belongs to class insecta whose body is divided into head (contains mouth parts, a pair of compound eyes and antennae), thorax (three pair of legs and usually two pair of wings) and abdomen.

#### 1.2 Entomology

The branch of biology which deals with the systematic study of insects is called entomology.

#### 1.3 Applied Entomology

Application of basic knowledge of entomology for the benefit of human being is called applied entomology.

#### 1.4 Pest

Any organism that interferes with human interest and cause the economic loss is called a pest.

#### 1.5 Insect pest

Any insect that interferes with human interest and cause the economic loss is called an insect pest.

### 1.6 ECONOMIC IMPORTANCE OF INSECTS

Insects affect our life in certain ways. Sometimes they benefit us and sometimes create problems for us. Both aspects are discussed as under:

#### 1.6.1 Harmful Aspects

- I. Insects damage crops, fruits, vegetables.
  - They chew and bore the roots, stem, branches, bark, leaves, flowers, fruits and seeds etc.
  - They suck the cell sap from various parts of the plant which ultimately weaken the plants.

- They make galls/ tunnels/ mines on various parts of plants especially on leaves which reduce photosynthesis.
  - They spread many diseases in plant e.g. viral diseases (CLCV in cotton), bacterial diseases (citrus canker), fungal diseases etc.
  - Certain insects damage the plants/ fruits by ovipositor at the time of egg laying e.g. fruit fly etc.
2. Insects injure and annoy all animals including man.
    - Their bad smell, unwanted buzzing sound, presence on the edible items irritates us.
    - Insects inject venom or poisonous secretions into bodies of animals with the help of their stings, mouthparts and poisonous hairs/setae.
    - Insects act as external and internal parasites e.g. lice, fleas, bed bug and maggots.
    - Insects spread many diseases in animals and human beings like dengue fever, malaria, etc.
  3. Insects damage and destroy the stored products.
    - They damage and destroy all food articles, clothes, paper, medicines, wood, timber, furniture, leather, etc.
    - They destroy insects and plants used for experimental purposes.

### 1.6.2 Useful Aspects

Insects are useful to man in the following ways:

1. Insects produce some useful and valuable secretions:
  - A true commercial silk is produced by silk worm larvae.
  - Honey and wax are produced by the honey bees.
  - Lac is produced by the lac insects.
  - Cochineal is also produced by some insects which are used in dyes.
  - Cantharidin, a pharmaceutical product is produced by "Spanish fly".
  - Insects produce galls which are used for obtaining tannic acid. This substance is used for dyeing the animal skins for leather or fur.
2. Insects pollinate crops, fruits, vegetables for the increase in their yield e.g. honey bees, bumble bees, etc.
3. Insects serve as food for other animals, e.g. fish, poultry birds, frogs, lizards, snakes, birds etc. feed on different insects.

4. Many insects destroy other harmful insects. Different insect parasites and the predators feed on other insect pests which attack on crops, fruits, vegetable, stored grains, clothes buildings and animals etc.
5. Fireflies produce light which is used for illumination and increase the aesthetic look.
6. Soil living insects improve the physical condition of the soil e.g. ground beetles
7. Insects act as scavengers by feeding on dung and dead bodies of animals & plants e.g. scavenger beetles.
8. Insects destroy harmful weeds e.g., AK grasshoppers feed on AK weed.
9. Some insects are useful in scientific research e.g. genetic research has been conducted on fruit fly (*Drosophila melanogaster*)
10. Insects have aesthetic and entertaining value:
  - Different colours and patterns of insects (especially moths and butterflies) serve as models for artists and decorators.
  - The colour patterns of insects are also used in trays, rings, necklaces and other jewellery items.
  - Sometimes the buzzing sound of insects is very interesting.
  - Crickets are trained for fighting and gambling.
11. Insects are used in medicine and surgery:
  - Maggots are greatly used for the treatment of wounds.
  - Sting of honey bees are used for the pain of rheumatism and arthritis.
  - Cockroaches and honey bees are used in medicines.