Lecture 1

Principles of Applied Entomology

The field of entomology may be divided into 2 major aspects.

1. Fundamental Entomology or General Entomology
2. Applied Entomology or Economic Entomology

Fundamental Entomology deals with the basic or academic aspects of the Science of Entomology. It includes morphology, anatomy, physiology and taxonomy of the insects. In this case we study the subject for gaining knowledge on Entomology irrespective of whether it is useful or harmful.

Applied Entomology or Economic Entomology deals with the usefulness of the Science of Entomology for the benefit of mankind. Applied entomology covers the study of insects which are either beneficial or harmful to human beings. It deals with the ways in which beneficial insects like predators, parasitoids, pollinators or productive insects like honey bees, silkworm and lac insect can be best exploited for our welfare. Applied entomology also studies the methods in which harmful insects or pests can be managed without causing significant damage or loss to us.

In fundamental entomology insects are classified based on their structure into families and orders etc. in applied entomology insects can be classified based on their economic importance i.e. whether they are useful or harmful.

Economic classification of insects

Insects can be classified as follows based on their economic importance.

This classification us according to TVR Ayyar.

Insects of no economic importance:-

There are many insects found in forests, and agricultural lands which neither cause harm nor benefit us. They are classified under this category. Human beings came into existence 1 million years ago. Insects which constitute 70-90% of all animals present in this world came into existence 250 - 500 million years ago.

Insects of economic importance

A. Injurious insects

a) Pests of cultivated plants (crop pests)

Each cultivated plant hatbours many insects pests which feed on them reduce the yield of the3 crop. Field crops and horticultural crops are attacked by many insect species. (eg) cotton bollworm, Rice stem bores.

b) Storage pests

Insects feed on stored products and cause economic loss. (eg) Rice wewil, Pulse beetle.

c) Pest attacking cattle and domestic animals

Cattle are affected by pests like Horse fly, Fleshfly, Flese and Lice. They suck blood and sometimes eat the flash.

d) House hold and disease carrying insects

House hold pests include cockroach, ants, etc,. Disease carrying insects are mosquitoes, houseflies, bed bugs, fleas etc.

B. Beneficial insects

a) Productive insects

Silk worm:- The silk worm filament secreted from the salivary gland of the larva helps us in producing silk.

Honey bee:- Provides us with honey and many other byproducts like bees wax and royal jelly.

Lac insects:- The secretion from the body of these scale insects is called lac. Useful in making vanishes and polishes.

Insects useful as drugs, food, ornaments etc,

As medicine eg. Sting of honey bees- remedy for rhenmatism and arthritis

Eanthoridin - extracted from blister beetle –useful as hair tonic.

As food - for animals and human being.

For animals- aquatic insects used as fish food.

Grass hoppers, termites, pupac of moths.

They have been used as food by human beings in different parts of the world.

Ornaments, entertainers

-Artists and designers copy colour of butterflies.

- Beetles worm as necklace.
- Insect collection is an hobby

(d) **Scientific research**

Drosophila and mosquitoes are useful in genetic and toxicological studies respectively.

Helpful insects

Parasites: These are small insects which feed and live on harmful insects by completing their life cycle in a host and kill the host insect.

Eg egg, larval and pupal parasitoids

Predators: These are large insects which capture and devour harmful insects.

Eg Coccimellids, Preying matritids.

Pollinators: Many cross pollinated plants depend on insects for pollination and fruit set.

Eg Honey bees, aid in pollination of sunflower crop.

Weed killers: Insects which feed on weeds, kill them thereby killers. Eg Parthenium beetle eats on parthenium. Cochneal insect feeds in Opuntia dillenii.

Soil builders: soil insects such as ants, beetles, larval of cutworms, cri kets, collun bola, make tunrels in soil and facilitate aeration in soil. They become good manure after death and enrish soil.

Scavengers: Insects which feed on dead and decaying matter are called scavengers. They important for maintaining hygine in the surroundings.

Eg Carrion bettles, Rove beetles feed on deade animals and plants.

House hold and disease carrying insects

i) Pests which cause damage to belongings of human being like furniture, wool, paper etc. Eg. Cockroaches, furniture beetle, sliver fish etc.

ii) Pests which cause painful bite, inject venoms. Eg. Wasps, bees sting us. Hairy caterpillar nettling hairs are poisonous. Mosquitoes, bugs bite, piece and suck blood from us.

iii) Disease causing Mosquito - Malaria, Filariasis, dengue fever. Housefly - Typhoid, Cholera, Leprosy, Anthrax