

Lecture -1-

INTRODUCTION TO BEEKEEPING:-

Honey bees are social insects, which mean that they live together in large, well-organized family groups. Social insects are highly evolved insects that engage in a variety of complex tasks not practiced by solitary insects. Communication, complex nest construction, environmental control, defense, and division of the works are just some of the behaviors that honey bees have developed to exist successfully in social colonies. These fascinating behaviors make social insects in general, and honey bees in particular, among the most fascinating creatures on earth. There are various types of bees which include the stingless bees, solitary bees and honey bees.

What are the honey bees?

Honey bees are social insects that live in colonies of 10,000 to 60,000 bees. A colony consists of a queen (fertile female), a few hundred drones (males) and thousands of workers (sterile females).

Apiculture (Beekeeping): - Is the management and study of honey bees, derived from the honey bee Latin name *Apis mellifera*, meaning honey gatherer (collector) rearing bees in a box called (bee hive).

Colony: - In beekeeping refers to a group of honeybees with one queen bee who is the female parent of the colony, a few hundred drone bees and thousands of worker bees.

Beekeeper: - Beekeeper is a person who keeps and takes care of bees' commercial (e.g., honey and wax production) or agricultural purpose (e.g. pollination of flowers).

Beehive – Beehive is a box with movable frames, used for housing a colony of bees.

Brood – Immature stages of bees not yet emerged from their cells; the stages are egg, larvae, pupae.

BRIEF HISTORY OF BEEKEEPING AND DEVELOPMENT IN THE WORLD:

- Primitive man used to rob bee colonies found in the cavities of hollow trees or on rocks and in traditional mud houses and this is still being followed by some tribes.
- Thousands of years ago, Egyptians were well acquainted with bee keeping before the Christian Era.
- Inhabitants of the African jungles (forestry) were heading to the places where bees lived so as to take honey on hearing the sounds of some birds that liked bees and gathered around their nests. Such birds were called indicator birds or bee guides.
- There was no development in beekeeping until 16th century.
- Proper beekeeping started only when man started giving protection to colonies found in the nature.
- Idea to keep bees in log hives has been reported to come from the fallen trees which were nested by the cavity nesting bees.
- Development of modern beekeeping has its origin between 1500 and 1851 when many attempts were made to domesticate bees in different types of hives but were not successful because bees attached their combs together as well as to the walls of hive and combs required had to be cut for honey.
- The discovery of the principle of bee space in 1851-1852 by father of American beekeeping and scientist Lorenzo Lorraine Langstroth 1810- 1895 resulted in first truly movable frame hive. This bee space was 9.5 mm for *Apis mellifera*.
- This discovery was followed by subsequent innovations like wax foundation in (1857), honey extractor in (1865), bee smoker in (1870), etc., which helped in the development of modern beekeeping we see today.

SOCIAL BEHAVIOUR OF HONEY BEES:

Among different insect orders, only 8 orders have been recognized by insect taxonomists who have some communal life. Out of these 8 orders only two orders, Isoptera and Hymenoptera have well developed social organization. Even in Hymenoptera, only two families Halictidae and Apidae of superfamily Apoidea contain fully social species. Most of other bees live solitary life.

Social Behaviour:

Honey bees are among the fully social insects with many generations in the same nest. The colony is a well-organized social group having division of work in terms of laying eggs, nursing, comb building, guarding, food collection and its storage. They have well-developed communication system through different types of dances as well as trophallaxis.

Biological Communication:

It can be defined as an action on the part of one organism that alters the probability pattern of behavior in another organism in an adaptive fashion. Adaptive means that the signaling or the response or both which have been genetically programmed to some extent by natural selection.

Trophallaxis or Feeder:

It is the food transmission (exchange of food) which is common between workers and also from workers to queen and drones. It is a sort of communication regarding availability of food and water and also a medium for transfer of pheromone.

The importance of Beekeeping:

Beekeeping is the science and art of keeping bees using best practices. Beekeeping is very important, for the production of honey, beeswax, propolis, pollen (bee bread), royal jelly and bee venom; for food, medicine and income. Beekeeping is also important for pollination and recreational activities. There are various reasons for keeping bees.

1. As source of food. Honey is delicious and nutritious. It is an important food for many people in the world. It is consumed whole or mixed with other foods as supplement. Bee brood (larvae and pupae) have high nutritional value and are fed to malnourished children. Royal jelly and pollen are consumed for their high protein value.

2. Pollination. The honeybees provide pollination services, thereby playing a vital role in food production and overall agricultural productivity. Over 75% of all the crops in the world benefit from pollination. Bees are considered the most efficient pollinators because they have hairy bodies which easily pick up pollen grains as they move about in flowers. During a single day one bee may visit several hundred flowers. So bees are important to farmers.

3. As source of medicine. Bee products such as bee venom, honey and propolis are used for treatment of many conditions following the antibiotic nature of the products. The conditions/diseases treated using bee products include stomach upsets, diarrhea, vomiting, wounds, burns, cough, measles, false teeth, toothaches and fungal infections. It also helps to boost the immunity of people living with HIV/AIDS.

4. Income generation. The honeybee products can be marketed locally or abroad to get money, with or without value addition. These include bee keepers, pharmaceutical industry, food industry, beverage industry, honey dealers and others.

5. Conservation or protection of natural resources. Beekeeping is a non-destructive activity that could be used in the protection of biodiversity in protected areas. Farmers realizing that vegetation is a source of forage

for bees will guard against the destruction and be encouraged to plant more plants for supplying pollen and nectar. In the process many plants are conserved and protected from destruction.

6. Hobby. Other people keep bees as a hobby.

7. Cultural purposes. Honey is used for beverage brewing and occasionally served at important cultural ceremonies such as weddings. The Maji Maji rebellion used bees as a weapon to defend themselves against the colonialists. Honey was used in Egypt as cosmetics and also for embalming the Egyptians dead pharaohs.

8. Api-Tourism and research. Establishment of bee reserves for purposes of tourist attraction and research holds a big potential for the future.

9. Api-therapy. Bee products are used in the treatment of many human ailments. For example, bee venom is an important remedy for many ailments such as Arthritis, Parkinson disease and other diseases related to the nervous system. The venom can be obtained through bee stings.