

Chapter 8

COTTAGE INDUSTRIES

8.1 APICULTURE

مکھیا بانی

Practice of keeping bees for honey production is called apiculture.

8.1.1 Types of honey bees

Following four types of honey bees species are found in Pakistan

Apis dorsata (Apidae; Hymenoptera)

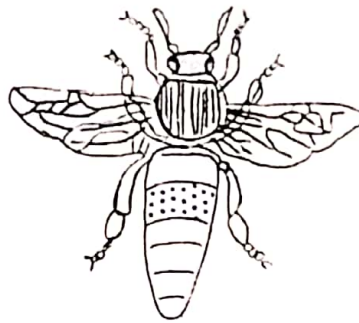
Apis florea (Apidae; Hymenoptera)

Apis cerana (Apidae; Hymenoptera)

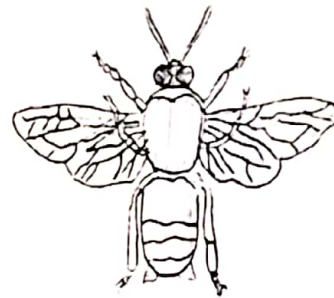
Apis mellifera (Apidae; Hymenoptera)



Worker bee



Queen bee



Drone

1. *Apis dorsata*

Rock or wild bee. Common names is “doomna makhi”. They live in colonies in single combs at rock bases or big trees etc. Comb may extends to 5x2 feet and is always in an open place, never in darkness. Very good honey yielder i.e. 80 lbs from a single comb. It is very ferocious. Sting is very painful. When enraged, they follow victim for miles even in water. Extraction of combs can be done by smoking or burning.

2. *Apis florea*

Common names are “little bee”/ “choti makhi. Single comb is built in bushes, branches or in houses. Known as stingless but it has sting. These are not economical because yield is only few lbs. Its honey is praised for chemical properties.

3. *Apis cerana*

Common name is "hill bee" also called "domestic bee". They live in hives in close covers, crevices of rocks, walls and trees. They build several combs side by side, parallel to each other. In modern hives average yield is 20 lbs. Commonly found in Murree Hills, hilly tracts of Peshawar, Chitral and D. I. Khan.

4. *Apis mellifera*

European or Australian bee. Habits like *Apis cerana*. They are less prone to swarming. Good honey yielder and average yield is 10-30 lbs. Prefer to live in concealed environment, so can easily be domesticated.

8.1.2 Biology of honey bees: Honey bees are social insects and live in colonies. Colony consists of Queen, Drone bees and worker bees.

A. Queen

One queen is present in a colony, with large abdomen and well developed sting which is used to kill other queens before emergence in a colony. Queen may live from 2 to 3 years. She lays 15,000 eggs/day during active season. The fertilized eggs produce workers or queens. Unfertilized eggs produce drones.

Queen leaves colony only for mating, swarming or absconding. Larva, from which queen is to be reared, is placed in a special cell and fed on a richer, more nourishing food called **Royal Jelly**.

B. Drones

A number of male drones are always present in a colony. They have no sting and fed by workers. Their function is to mate with virgin queen. Their life is nearly 2 months.

C. Workers

Main strength of the colony is its workers, which are 5,000 or more, depending upon the species and colony strength. They are imperfectly developed females, don't lay eggs. They attend to the work for first three weeks, after emergence work indoors as nurses, hive cleaners, wax makers, honey makers, guards and stores of pollen and nectar. Afterwards outdoor work of bringing nectar, pollen and water are also done by workers. The life of workers is nearly 6 weeks. In winter, they may live up to 6 months. Bees can produce 1 lb wax foundation by consuming 8-12 lbs of honey. To avoid this honey consumption, we supply artificial comb foundations in frames and bees start work on

these frames.

Cycle of the year: Bees remain active throughout the year. During winter, bees neither do much work nor rear any brood; they sit together in the hive and eat honey to create heat. In spring, queen starts laying eggs and brood rearing begins, colony becomes strong during mid March to mid April. Nest is crowded and these bees prepare for swarming. At this time queen cells are built along the bottom and sides of combs. When the new queen is ready to emerge, the old queen accompanied by a large number of workers, who have filled their stomachs with honey, leaves the colony in a warm day to start a new colony. They settle on a nearby tree, bush or some other suitable object. Scouts search a new place and the whole swarm settles there within 2-48 hours of leaving the parent colony.

In the parent colony two things may happen:

a) The first queen emerging after primary swarming may kill the queens in other cells and establishes herself as queen mother.

b) She may fly away in a swarm (3-4 swarms may follow) until strength of colony is considerably depleted; the queen emerging last holding the parent colony.

After the swarming fever is over, the bees in the parent colony settle down to normal work.

8.1.3 SEASONAL MANAGEMENT

1. Spring management:

Spring is important period for honey bees because bees increase in population and weak colonies perish. In spring open the colony on a sunny day and study:

- a) The conditions of queen, quantity of brood and the amount of honey present.
- b) Clean the hive.
- c) Give more comb space if required.

Swarming: The process of division of a colony on its own accord is called swarming. It is a natural instinct. Swarming takes place during spring period. Reasons for swarming are as follows:

- i. Overcrowding.
- ii. Lack of ventilation.
- iii. Lack of space for storing honey.

- iv. Lack of field work for workers.

Control of Swarming:

1. Relieve congestion.
2. Clip wings of old queen.
3. Provide abundant comb space and ventilation.
4. Search and destroy queen cells regularly.
5. If necessary, transfer brood frames to a queen excluder and give new frames with comb foundation in the brood chamber.
6. Place wire entrance guard so that queen is not able to go out.

How to increase the number of colonies: Swarming period is the best time when strong colonies should be divided. It is done as follows:

1. To divide a colony into two colonies

- a. Place a new hive with comb foundation at the site of old hive.
- b. Open the old colony. Take out two frames of honey and two with brood together with old queen on it.
- c. Place these four frames alternatively with empty frames in the new box.
- d. Place the new hive 50 yards away.
- e. Examine the old and new hives after 10-14 days to see the new queen.
- f. In old colony, destroy all queens cells while in new colony leave one queen cell only.

2. To make one colony from 3-4 colonies

- a. Place a new hive with comb foundation at the site of old hives.
- b. Place one brood frame and one frame with honey and some bees in new hive from three old colonies.
- g. Place the new hive 50 yards away.
- h. Examine the new colony after 10-14 days, destroy all queens cells leaving one queen cell only.

Honey flow: There is a honey flow period during April-May in different localities of Pakistan. So, make an ample space for honey store and provide comb foundations well in time. Honey should be extracted leaving some honey in each hive for the bees to pass summer.

Honey extraction: When honey flow has stopped and 1/2 to 3/4 cells are capped; take

out frames and remove the bees. Uncap combs with a hot uncapping knife and put frames in extractor and revolve. Honey will come out by centrifugal force. Allow the honey to settle down for few hours and then bottle it.

2. **Summer management:** In this period, bees abscond and colonies become weak due to

- a. Adverse climate
- b. Attack of wax moth
- c. Lack of bee flora

So control absconding by uniting bee colonies, providing better ventilation, ample honey stores and watching bee enemies.

3. **Winter management:** Colonies should be protected

- a. By packing 3 inches grass or dry leaves and place in wind protected place.
- b. Keep colonies strong with plenty of honey and good queen.
- c. Unite weak colonies with strong ones.

Feeding of honey bees: During scarcity period, bees have to be fed on honey or sugar syrup. Prepare sugar syrup by mixing two parts of sugar and one part of water, otherwise 50:50. Put solution in dishes with few straws floating on surface to avoid drowning of bees.

8.1.4 Bee enemies:

1. **Wax moth:** feed on the comb wax. After its attack, bees leave the hive.
2. **Hornets:** destroy bees at hive entrance and in the fields. Search their nests in the vicinity and fumigate to kill them.
3. **Black ants:** take honey, pollen and nectar and also fight with bees. Bees may abscond, after their attack.
4. **Varroa mites:** are the parasites of bees, feed on them make them weak.

8.2 SERICULTURE

The act of rearing silk moths for silk production is called sericulture. Silk is produced by a number of species of insects belonging to family Bombycidae, but silk produced by species other than *Bombyx mori* is of inferior quality and those species are attacked by a number of pests, hence do not give satisfactory results.