

Honey Bees

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Order- *Hymenoptera*

Family- *Apidae*

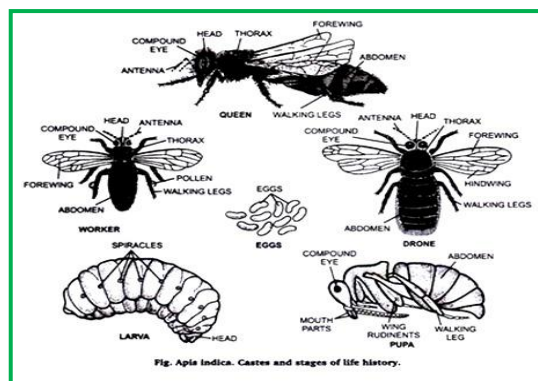
The following four type of honey bees are found of India

1. *Apis dorsata*, *Fab.*
2. *Apis indica*, *Fab.*
3. *Apis florea*, *Fab.*
4. *Melipona*, *spp.*

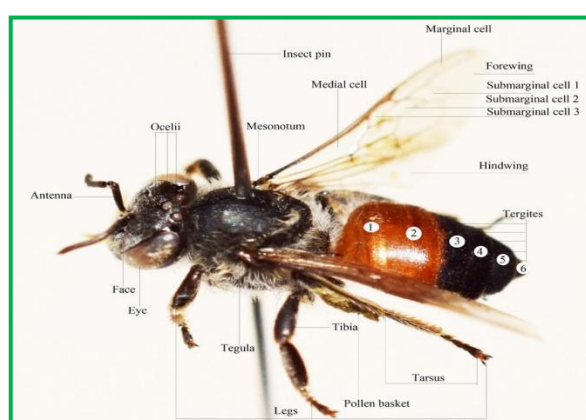
1. ***Apis dorsata* (Rock bee)**- It is found in all part of India in big in size to another bees measuring 20mm in length. It is very good honey gather. It builds a single huge comb at the face of a rock, on branches of big trees and sometimes on walls and buildings. On disturbance it attacks to human being and domestic animal and some time even death may occur. They are migratory in nature. In winter they migrate to hills and come back to plains during summer. The comb is always built in open place that's why the bees could not be domesticated up to now. The comb measures some times 1 meter across and each colony of bee is capable of storing 20 to 40 kg honey.



2. ***Apis Indica* (Indian bee)**-This bee is also found everywhere in India and its nature is quite different from rock bee being mild in temperament and can be domesticated easily. It is about 15mm in length. They like to live to dark places, therefore, establish their comb is closed covered place such as hollowed tree trunks, burrows in the ground, hollowed places in walls, unused boxes etc. They build several combs side by side and parallel to each other but are smaller than rock bee. On an average 3-4kg honey is found from a comb annually. Tow type of Indian bee viz. plains type and hills type are found.

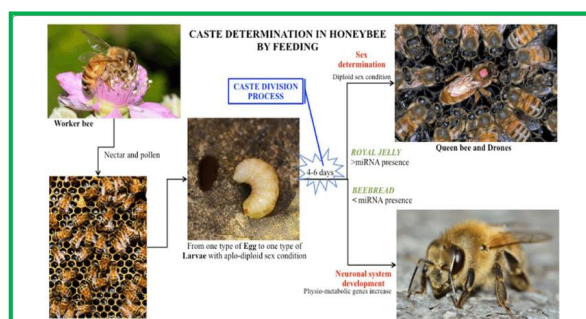


3. *Apis florea* (little bee)-This is smaller than the Indian bee and found everywhere in India. It does not like darkness, therefore, form its comb in the open place e.g., in the bushes, corner of roof. It build a single comb which is very small and only 250gm honey is obtained at a time.



4. *Melipona spp.* (Dammar bee)-This is the smallest species and differs from the other bees in its external appearance as well as in habits. They do not have sting. Generally they built their comb in hollow walls or tree trunks. They construct their combs with a mixture of earth, gums and resinous substances collected from plants as they do not secrete wax to build the combs. Economically, it is not desirable to domesticate them.

In some part of the hills, the European honey bee (*Apis mellifera*) are domesticated. They built their comb like Indian honey bee and produce 9-10 times more honey than these. They are similar in size and structure but most industrious and peaceful than the Indian honey bee.



Economic Importance

The honey bees are very useful to mankind and following are the direct and indirect advantages from them:

Honey-The honey bee color less to light brown color viscous fluid produced by honey bees. It contains 78% sugar (glucose and fructose) 17% water and 7% enzyme and mineral matters. To produce honey, honey bees suck the nectar from the flowers with the help of their proboscis and glossa and collect in comb. During sucking process some saliva is also get mixed to the nectar. This collected material is filled in the honey chamber and dried with the help of fanning the wing. It is estimated that the annual production of honey in India is about 34,01,925 kg from which the foreign money is obtained in millions of rupees.

Wax- it is secreted by the worker honey bees. Previously it is was thought that the honey wax is produced by the nectar of the flower, but now it is known that the some is produced by the wax gland situated in the ventral side of the abdomen of worker honey bees.

The honey wax it is also use full the man. From this cream, polish, carbon paper and various models are prepared. It is also used electric insulator and lithography. It has been estimated that about 1, 17,933 kg of bee wax is produced annually from which lot of foreign money is earned.

Pollination- it is known to everybody that honey bees play very important role in the pollination and the gardens which are not visited by bees bear comparatively less fruits. 80-90% pollination is done by the bees in the plant.

Social life, identification and life history

The honey bees are social insects and live in colonies with a highly organized system of division of labor. A family consists of 30,000-50,000 members which includes a queen, 200-300 drones and workers.

Queen – Every colony has a queen which is the mother and only sexually development female. A well developed queen is generally two or three times bigger than worker measuring 15-20mm in length. She lays 2-2,000 eggs per day and about 15 lakh eggs are laid in her life time. A queen lives for 2-5 years and when it is weak or unable to lay eggs it is replaced by one of the daughter queens.

Drone-The drone is the male bee, the main function of which is to mate with queen.

Worker-They are under development females which are produced from the fertilised eggs but remain sterile due to non availability of royal jelly.

Following are the main characteristics of a worker bee.

- It is smaller in size than queen and has a sting on the terminal end of abdomen.
- On ventral side of abdomen, wax glands are found.
- Hand legs are modified for pollen collection.

They are responsible for all the work necessary for the maintenance and welfare of colony such as:

1. Building of comb with wax and its maintenance.
2. To collect honey, pollen and water for the use of the colony.
3. To guard the colony against enemies.
4. To take care of the queen and feeding of royal-jelly.

Life history

As stated earlier the eggs are laid by queen and when a colony wants to produce a new queen, the special cells are constructed at the lower border of the brood comb. On these cells, single egg is laid by the queen in each cell which hatches after 3 days. The newly hatched grubs are provided with royal jelly. The grub is fully developed in 5 or 6 days and then queen cell is capped where grub changes into pupa and after a week adult come out by biting the cap of queen cell.

Grub-From the fertilized eggs, queen and workers and from the unfertilized eggs drones are born. The grubs are cylindrical and light yellow in colour. They are fed with royal jelly for 2-3 days after that they are provided honey and nectar etc. The grub period lasts for 5-6 days.

Pupa-Full grown grub forms a cocoon and pupates inside the cell. The pupa period lasts 7-14 days depending upon the type of adult to be Produce. The time required for different types of adult in different stages is

Given below:

Adult	Egg	Grub	Pupa	Total
Queen	3days	5-5.5	7-7.5days	15-16days
Worker	3days	5-6days	10-10.5days	18-28days
Drone	3days	6-6.5days	14-14.5days	23-24days

Natural enemies of bees

Honey bees suffer from a number of diseases and have several enemies.

Diseases

Noesema diseases- It is caused by protozoan, noesema apis which attack lining of stomach causing dysentery. The spor pathogen are passed out with face of the infected bees and eaten up by the worker bees during cleaning of the comb. The disease is particularly severe during winter and spring.

Amoebic diseases- It is caused by another protozoan, malphighamoeba mellificae which infests the malphighian tubules. The cysted amoebae are passed into the intestine whence to the exterior along with the face to infect other bees as they clean the faces from the comb. It also produces dysentery.

Control- Provide running water and full sunlight. Keep colonies packed and strong in winter and avoid winter brood rearing. Sterilize the brood boxes and frame hive with 40% formalin fume only after the queen and bees have been transferred to new foundation comb.

Fungus diseases-

- Aspergillus flavus is responsible for causing stone brood diseases.

Control – The combs and equipment should be sterilized with formaldehyde fumes.

- Pericystis apis causes chalk brood diseases.

Control – usually, the bees themselves are able to keep this diseases under control.

Bee enemies

- Wax moth
- Spinged moth (acherontia styx)
- Black ant (componotus compressus)
- Wasp (vespa spp)
- Birds

Protection measures

Following measures may be adopted to protect the bees-

- The entrance door should be small so that Acheronita Styx may not enter.
- The following mixture may be used in case of bees suffering from acarine-
 - Safral oil 1 part
 - Nitrobenzene 2part
 - Petrol 3parts