



Rayat Shikshan Sanstha's

D.P. Bhosale College, Koregaon

Department of Zoology

NOTICE

2022-23

Date:- 15/08/2022

All the students of B. Sc. I are here by informed that Department of Zoology has organized Wall paper on “**Amazing World of Honey Bee**” on Saturday, 20/08/2022 at 12.30 pm for celebration of National Honey Bee day. All students should remain present at Zoology department on time. It may clearly noted that fine will be collected from absent students.

B. Kamble
Incharge

Guarawade

Head,

Department of Zoology

THE AMAZING WORLD OF HONEY BEES



Department of Zoology
D. P. Bhosale College, Koregaon



INTRODUCTION

Honeybees are social insects and live together in nests or hives. As they forage, bees perform the critical act of pollination. As a bee enters a flower to feed on nectar and gather pollen, some of the pollen sticks to the bee's body. When the bee flies on, it deposits some of that pollen on the next flower it visits, resulting in fertilization, allowing the plant to reproduce and to generate the fruits and seeds so many other wildlife species rely on as a food source. In fact, bees pollinate a staggering 80 percent of all flowering plants, including approximately 75 percent of the fruits, nuts, and vegetables.

SCIENTIFIC CLASSIFICATION

Kingdom: Animalia

Phylum Arthropoda

Class: Insecta

Order: Hymenoptera

Family: Apidae

Genus: Apis

SPECIES OF HONEY BEE

- 1. The Indian hive bee, *Apis cerana indica* (Apidae)**
- 2. The little bee, *Apis florea* (Apidae)**
- 3. The European or Italian bee, *Apis mellifera* (Apidae)**
- 4. Dammerbee, *Melipona irridipennis* (Meliporidae)**

Rock bee (*Apis dorsata*)

They are giant bees found all over India in sub-mountainous regions up to an altitude of 2700 m. They construct single comb in open about 6 feet long and 3 feet deep. They produce about 36 Kg honey per comb per year. These bees are the largest among the bees described.

Little bee (*Apis florea*)

They build single vertical combs. They also construct comb in open of the size of palm in branches of bushes, hedges, buildings, caves, empty cases etc. They produce about half a kilo of honey per year per hive.

Indian hive bee / Asian bee (*Apis cerana indica*)

They are the domesticated species, which construct multiple parallel combs with an average honey yield of

6-8 kg per colony per year. These bees are larger than *Apis florea* but smaller than *Apis mellifera*. They are more prone to swarming and absconding.

European bee / Italian bee (*Apis mellifera*)

They are also similar in habits to Indian bees, which build parallel combs. They are bigger than all other honeybees except *Apis dorsata*. The average production per colony is 25-40 kg.

Dammer Bee

Besides true honey bees, two species of stingless or dammer bees, viz. *Melipona* and *Trigona* occur in our country in abundance. The stingless bees have the importance in the pollination of various food crops. They bite their enemies or intruders. It can be domesticated. But the honey yield per hive per year is only 100 gms.

LIFE CYCLE OF HONEY BEE

The 4 key stages are of the honey bee life cycle are:

1. Egg
2. Larva
3. Pupa
4. Adult

Egg

An egg is laid by the honey bee queen in a wax, hexagonal egg cell. The egg is about the size of a grain of rice and initially stands upright in the cell, but falls onto its side by the third day. The honey bee queen may lay up to 2000 or 3000 eggs per day.

Larva

After 3 days, the egg develops into a larva, which looks like a small white grub. It has no legs and is blind. Initially, all the larvae of worker bees are fed jelly for 3 - 4 days, after which, workers are fed on a slightly different jelly containing less protein

Whereas adult worker bees will feed on pollen and honey, a larva destined to be a queen is fed only on royal jelly and will continue to be fed on royal jelly throughout her life.

Pupa

Inside the sealed egg cell, the larva begins to spin a cocoon around itself and pupate. During this phase, the larva develops into a recognisable bee, with wings, legs, head, thorax and abdomen.

Adult

All in all, from the time the egg was laid, it takes new honey bee queens about 16 days to emerge from the egg cell, whereas worker bees require between 18 and 22 days to fully develop, and drones need 24 days.



CASTES OF HONEY BEE:

Queen

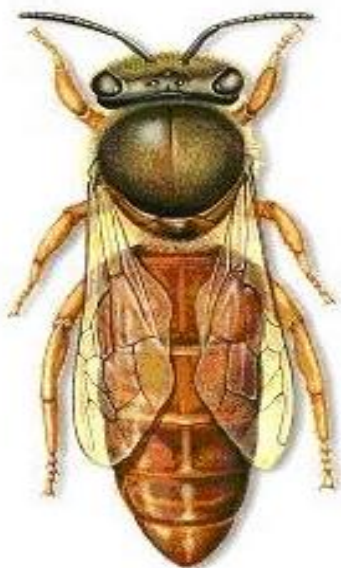
It is a diploid, fertile female. The presence of queen in a colony is a must. The queen lays about 1000 to 1500 eggs every day and lives a life of two three years. Queen lays both fertilized eggs (from which females develop) and unfertilized eggs (from which males develop).

Worker

It is a diploid, sterile female. Their function is to collect honey, to look after young ones to clean the comb, to defend the hive and to maintain the temperature of the hive. The life span of a worker bee is 4-5 months but during hard working days they persist for five to six weeks only.

Drone

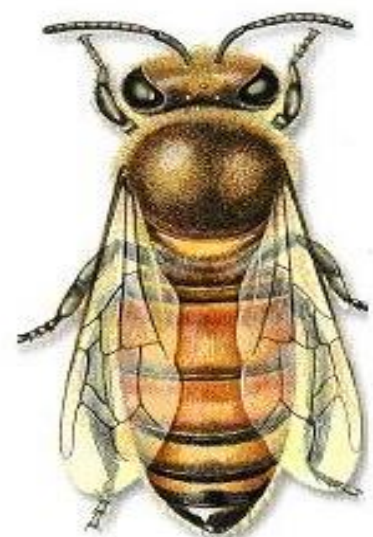
It is haploid, fertile male. The males are larger than workers and are quite noisy. They are unable to gather food, but eat voraciously. The number of drones in a colony varies from 200-300, but during bad season they are driven out.



QUEEN



DRONE



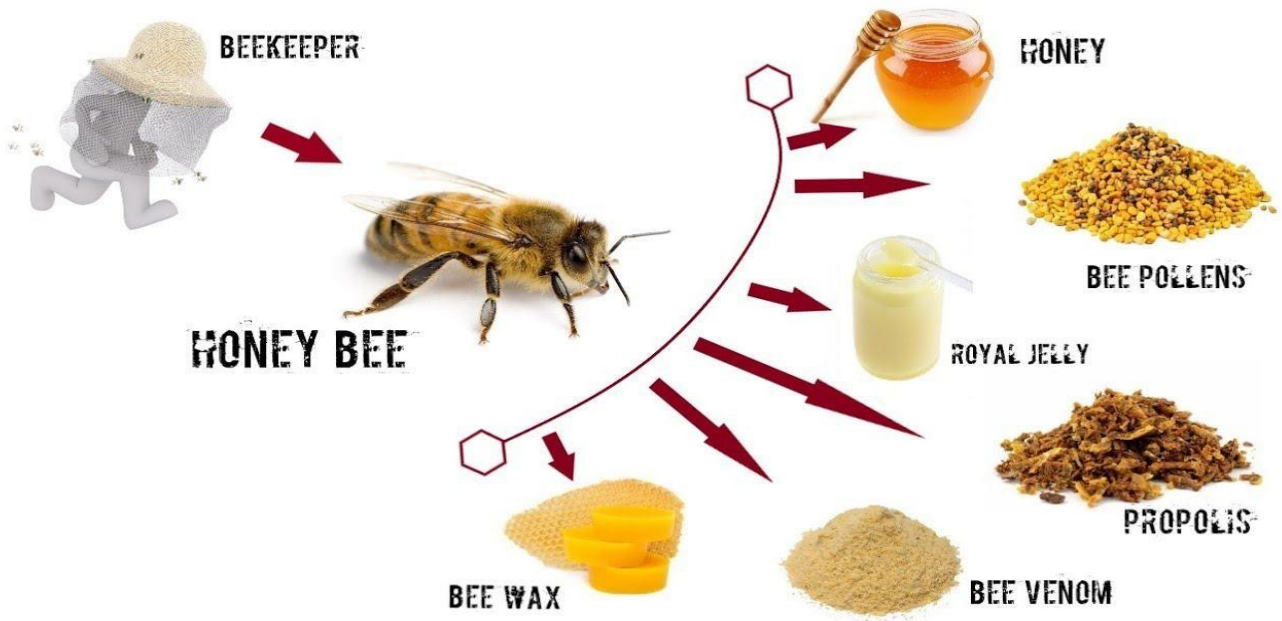
WORKER

BEE HIVE

The highest degree of nest construction among insects is found in bees. Comb hangs vertically downward, while cells are horizontal in position. The cells of the comb are of various types. The “Storage cells”, which contains honey and pollen are generally built on the margin and at the top of the comb. The “brood cells”, which contains the young stages, are built in the centre and the lower part of the comb. Brood chamber is further divided into three types, namely Worker-chamber, where developing workers are reared; Drone-chamber, where developing drones are reared and the Queen-chamber, which is larger than other and where the larvae developing into queens are reared.



BEE PRODUCTS AND THEIR USES



HONEY

Honey is a natural food made by the bee with nectar, pollen and other substances. It is considered nature's most completely nourishing food as it contains nearly all nutrients required by humans. Proteins, free amino acids, vitamin B complex and folic acids are some of the major nutrients found in honey.



BEES WAX

The bees sweat wax out of four pairs of glands on the underside of their abdomens. The development of the wax glands depends on the pollen eaten by the young bees after they emerge from the cells. While producing and building with wax, the bees eat and digest a lot of honey.



BEE POLLEN

Honey bees collect pollen from the stamens of flowers. Pollen contains lipids, essential oils, vitamin E (tocopherol), carbohydrates, peptides, short proteins or oligopeptides, amino acids, pantothenic acid, anthocyanins, carotenoids, flavonoids, ferulic acids and enzymes as well as many minerals such as iron, manganese, zinc elements.



ROYAL JELLY

The young bees add secretions from glands on their heads to the ingested bee bread to make bee milk or royal jelly. The larvae of worker bees, drones and the egg-laying female (the queen) eat these products, which make them grow. It is secreted from the glands in the hypopharynx of nurse bees, and fed to all larvae in the colony, regardless of sex or caste



BEE BROOD

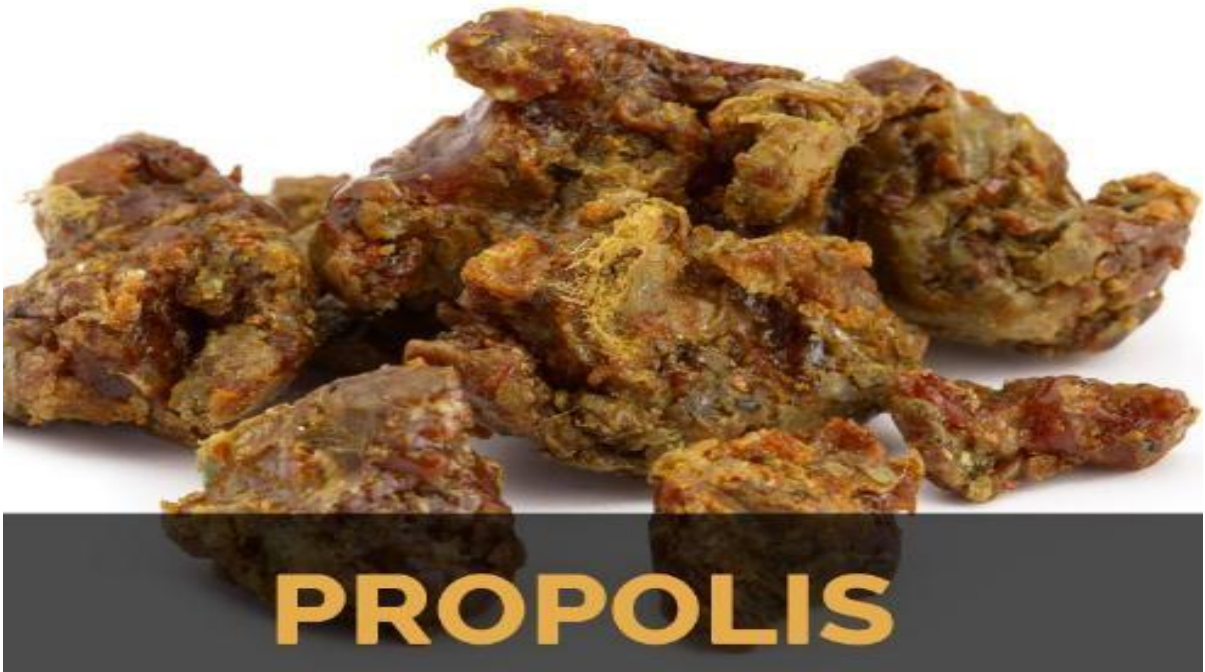
Bee brood is made up of eggs, larvae and pupae in the comb. The larvae and pupae are especially suited for consumption. Harvesting brood is bad for the development of the colony, so the larvae and pupae of drones are usually used because the colony is less dependent on them.



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PROPOLIS

Propolis is made by bees out of tree gums, glues, waxes and resins. The bees bring them on their hind legs, just like pollen, to the hive. They mix them with their own wax and saliva. It is sticky, brown and fragrant. The bees use it to fill undesired holes or cracks in the walls of the hive and they polish their cells as protection for the future brood.



BEE VENOM

The bee venom is made in the venom gland and is stored in a venom sac at the base of the stinger. Young bees have little venom. Their venom sac is not filled until their 15th to 20th day, when it contains about 0.3 mg of liquid venom. Bee venom dissolves in water but not in oil.



BEE BREAD

Bee Bread is actually the main source of food for most larvae and bees. It is fed to all larvae except those that are selected to become queens; the queen larvae are fed royal jelly instead. Bees make bee bread out of the pollen that they have collected. The collected pollens are pressed into pellets with a small amount of honey and saliva. This undergoes biochemical processes caused by enzymes added through the bees' saliva and stomach fluids.





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D.P. Bhosale College, Koregaon
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Celebration of National Honey Bee Day

Department of Zoology has celebrated National Honey Bee Day for the B.Sc. students of the Department. On 20th August 2022, Department of Zoology has displayed wallpaper on “**Amazing World of Honey Bees**” based on different species, life cycle and products of honey bees. This activity was organized to explore, encourage and imbibe the scientific attitude about Honey bees.

August 20, 2022 celebrated as National Honey Bee Day to create awareness about the insect responsible for more than 1/3 of the food we eat with beekeepers, beekeeping clubs and associations, and honey bee enthusiasts from all across the country. We take this opportunity to celebrate honey bees and recognize their contribution to our everyday lives as a means of protecting this critical species for future generations. It also helped students to think and work creatively for protecting life of Honey bee. The aim of this wallpaper was to increase awareness about importance of honey bee.

This wallpaper was inaugurated by the auspicious hands of Head, Department of Zoology Dr. Mrs. S. P. Nalawade. Miss N. A. Shaikh addressed students about importance of Honey in daily food.

Then all student visited to wallpaper and interact with each other. Students took the advantage of this wallpaper and participated enthusiastically. The committee is thankful to all the members who have directly or indirectly contributed to this work and made this event successful.



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