



## **Bees**



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### **Origin of bees**

**B**ees belong to the order of insects known as Hymenoptera literally “membrane wings”, comprising some 100,000 species including wasps, ants, ichneumons and sawflies. Of the 21,000 recognized as bees most are solitary bees which lay their eggs in tunnels providing a supply of honey and pollen for the larvae, but there is no progressive feeding of the larvae by the adult bees.

### **Taxonomy**

All bees belong to the Kingdom: Animalia Phylum: Arthropoda; Class: Insecta; Order: Hymenoptera; Superfamily: Apoidea. The Apoidea comprises two groups: the Anthophila (bees) and the Spheciformes (sphecid wasps). The Anthophila has six families in the Afrotropical Region: Colletidae, Andrenidae, Halictidae, Melittidae, Megachilidae and Apidae. The Apidae comprising the common honey bees, stingless bees, carpenter bees, orchid bees, cuckoo bees, bumblebees, and various other tribes and groups. Many are valuable pollinators in natural habitats and for agricultural crops. Apidae has three Subfamilies: Apinae, Nomadinae and Xylocopinae.

## Description of honeybees

Honeybees belong to the family of social bees including bumble bees and the tropical stingless bees of the genus *Meliponinae*. Social bees nest in colonies headed by a single fertile female, the queen bee, which is generally the only egg layer. Foraging for nectar and other tasks such as feeding the larvae and queen, cleaning brood cells, comb building, and other tasks are performed by a caste of females, the workers. Honey and pollen are stored and larvae are reared in cells made from wax secreted by the workers. Colony size varies from a few dozen as in the bumble bee to tens of thousands and persist for several years like the honey bees and species of *Meliponinae*, bumble bees are annual.



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*Stingless bees Meliponinae*

Honey bees comprise a single genus *Apis* which is characterized by the building of vertical combs of hexagonal cells, constructed bi-laterally from a midrib using wax secreted by workers. Cells are used for rearing brood and storing honey and pollen used repeatedly. Progressive feeding of the larvae is carried out by the young bees with secretion from glands in the head using pollen and honey.

There are several types of honeybees. Beekeepers choose the type they want to raise according to specific traits that suit their needs. Some bees are better honey producers, while others are more resistant to disease and hardier for winter survival. Two attributes of honey bees have been essential to their evolution and biology (1) clustering behaviour (2) their ability to cool the nest by evaporation of water thus enabling it to colonise a wide variety of environments. Another behavioural characteristic is the communication of info about food sources and recruitment of foragers, leading to efficient exploitation of food sources.

## Stages of Honeybee Development

The Honeybee development comprises 3 stages:

### Egg

The queen lays one egg per cell. Knowing what the colony needs to survive, the worker bees have built appropriate cells for the queen. In most of the cells, she lays a fertilized egg that will develop into a worker bee. In cells that are slightly larger than the worker cells, she lays unfertilized eggs that will grow into drones. The egg stage of development lasts only three days.



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*The queen lays an egg in each honeycomb cell*

## Larva

After three days, the egg hatches into a worm-like form called a larva. The worker bees feed the larva with royal jelly for the first few days and then switch to honey and pollen. An exception to this is a future queen: this larva continues its diet of royal jelly. A larva eats almost constantly and grows quickly. Within just five days, it grows 1 500 times larger than its original size. At this point, worker bees cap the cell with wax and the larva spins a cocoon around itself. The larval stage lasts about six days. It's shorter for the queen, longer for the worker bees and longest for the drones.



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The eggs hatch and turn into larvae



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The eggs larvae are sealed into the cells to pupate

## Pupa

In the pupa stage, the tiny organism hidden under the capping is starting to look like an adult bee. Its legs, eyes and wings develop and, finally, the little hairs that cover its body grow. After seven to fourteen days in this stage, depending on the type of bee, the now adult bee chews its way out of the cell. This stage is shorter for the queen, longer for the worker bees and longest for the drones.

## Stingless bee richness in Africa

On the continent we have 6 genera (Cleptotrigona, Dactylurina, Meliponula, Plebeina, Hypotrigona and Liotrigon) and twenty species (Cleptotrigona cubiceps, Dactylurina staudingeri, Dactylurina schmidti, Plebeina hildebrandti, Meliponula bocandei, Meliponula ferruginea, Meliponula cameroonensis, Meliponula beccarii, Meliponula ogouensis, Meliponula roubiki, Meliponula nebulata, Meliponula lendliana, Meliponula griswoldorum, Hypotrigona gribodoi, Hypotrigona araujoi, Hypotrigona ruspolii, Hypotrigona penna, Liotrigona bottegoi and Liotrigona parvula).



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Hypotrigona Stingless bees Meliponinae

## The Importance of Bees: Pollination

The most important thing that bees do is pollinate. Pollination is needed for plants to reproduce, and so many plants depend on bees or other insects as pollinators. When a bee collects nectar and pollen from the flower of a plant, some pollen from the stamens, the male reproductive organ of the flower, sticks to the hairs of her body. When she visits the next flower, some of this pollen is rubbed off onto the stigma, or tip of the pistil, the female reproductive organ of the flower. When this happens, fertilization is possible, and a fruit, carrying seeds, can develop.



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Mangoes trees pollination in Ghana

## How Do Plants Attract Bees?

Plants rely on bees and other insects to reproduce and so they have adapted, over time, to become more attractive to them. Bees are drawn to plants with open or flat tubular flowers with lots of pollen and nectar. A flower's scent can have particular appeal to bees, and its bright colours may lure the bees in.

### **Which Foods Depend on Bees?**

Many of the foods and crops we rely on need or, at the very least, benefit from bee pollination. Here's a list of some of those crops: Alfalfa, Almonds, Apples, Asparagus, Beans, Beets, Blackberries, Blueberries, Brussels sprouts, Buckwheat, Cabbage, Cantaloupe, Cauliflower, Celery, Cherries, Chestnuts, Chives, Clover, Cranberries, Cucumber, Currants, Eggplant, Flax, folders, Garlic, Gooseberries, Grapes, Horseradish, Kale, Lettuce, Mustard, Onions, Parsley, Peaches, Pears, Plums, Pumpkins, Radishes, Raspberries, Rhubarb, Squash, Strawberries, Sunflowers, Sweet potatoes, Turnip, Watermelon.



Oranges trees pollination in Algeria

### **Effects of Bees on Fruit**

Flowers that are visited more often by bees will produce larger and more uniform fruit than those visited less often. This beneficial effect of pollination is most obvious in tree fruit.

### **Quick Facts**

- A honeybee makes 0.8 g (1/10 teaspoon) of honey over the course of her lifetime.
- Bees help to produce not only more but also larger fruit and vegetables.
- A honeybee flies up to 24 km/h or 15 mph, and its wings beat 200 times per second or 12 000 beats per minute.
- Honey colour and flavour depend on the flower source.
- The average life of a honeybee during the working season is about six weeks.
- At the pic a colony of honeybees has 50 000 to 60 000 bees.
- Bees have four wings.
- Native pollinators are disappearing rapidly and each year we become more dependent on honeybees for many of our daily foods.
- Honeybees visit about 4 million flowers to make 1 kg of honey.
- Each honeycomb cell has six sides.
- Bees have been producing honey from flowering plants for 10 to 20 million years.
- Drones have big eyes to help them spot the queen bee.
- On any given search for food, a honeybee visits fifty to a hundred flowers.
- Wine made from fermented honey is called mead.
- It takes one colony of honeybees to pollinate an acre of fruit trees.

### **Conclusion**

It's an urgency to protect Africa's bees for world food security; because seventy-one out of the top 100 major food crops, supplying about 90 percent of the world's food, are pollinated by bees.

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