



Bees

Why are bees important?

In broad terms it is their ability to pollinate plants that make them so important. Some sources suggest that every third mouthful of food that we eat depends on the unmanaged pollination services of bees. However it is important to remember that other families of insect are pollinators as well. Albert Einstein estimated that if all the bees were destroyed man would follow in four years.

What crops do bees pollinate?

Flowering crops such as apples, pears, cherries, soft fruits, beans, oil seed rape and tomatoes. The need for bee pollination varies with the crop ranging from 8% for Oil seed rape to 100% for almond trees. Crops such as wheat and barley are wind pollinated and do not require the services of bees or other insects.

Where do bees fit into the animal order?

Bees are members of the family of insects 'Hymenoptera' (Membrane wings) also including ants and wasps. In the majority of cases these insects have two pairs of clear wings and many of these species have a social organisation, which makes them particularly interesting to many scientists and naturalists. The majority of 'aculeate' insects fall into this order. I.e. Insects that sting. The honeybee in particular must be the most studied insect in the world, along with wasps, silk moths and cockroaches.

How did bees evolve?

In the evolutionary scale bees are hunter-gatherer wasps that have become vegetarian. All members of the bee group feed their larvae and themselves on pollen and nectar that they collect from flowers and trees. Members of the wasp family feed their larvae on meat. Bees are usually hairy insects so that pollen catches onto the hairs and they can carry pollen back to their nest site. This pollen can be groomed from the hairs by the bee using its fore legs. Many bee hairs are feathery in order to hold pollen more effectively. Many species will collect the pollen together in a certain area of particularly dense hairs known as the scopa. This is found on the belly of leafcutter and mason bees and on the hind legs of mining bees. In certain species e.g. honeybees and bumblebees, the hind leg of the bee is equipped with a row of curved and flexible hairs down each side. These can be closed to contain collected pollen and are known as 'pollen baskets'. When pollen has been collected these baskets are clearly visible on bees foraging flowers. There are some species of 'cuckoo bee', which have developed further and use other bee species to rear their young. These bees do not need to collect pollen so have fewer hairs.

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Why do bees visit flowers?

Bees visit flowers to collect nectar and pollen as food for themselves and their young or the colony from which they originated. Nectar contains sugar, a carbohydrate, and pollen is a protein. Nectar is converted to honey by honeybees to form a stable food for winter. Other species of bee do not need to do this, as their lifecycle does not require a winter food source.

How do bees collect nectar?

In order to suck up nectar from flowers bees have specially adapted tongues that are particularly efficient at sucking up nectar. In bumblebees and honeybees it can be stored in a 'pre-stomach' and regurgitated for storing in the communal nest. Different species of bees have different length tongues, which are suited to certain flowers. Bees that work deep flowers can feed on shallower varieties whereas the reverse is not the case, however generally they work their own group of flowers. As a rule the more primitive species have short tongues. Sometimes they can be lazy which is well illustrated by bumblebees working 'comfrey'. To save entering the flower they will pierce a hole at the base of the flower and take nectar from the side.

How do bees pollinate flowers?

Bees enter flowers to suck up nectar which is secreted and either specifically collect pollen, produced by the anthers (male), or become covered in pollen on entering the flower, so when they move to the next flower they transfer pollen from previous flowers to the stigma (female) of the flower thus giving the opportunity for fertilisation.

What do bees see?

We humans are used to seeing wonderfully coloured flowers but bees do not recognise red, seeing it as black, and can see ultra violet so flower markings take on a different appearance and can be likened to airport runway lights guiding a plane in for landing!

How many species of wild bee are there?

In this country there are 268 species of wild bees, 25% of which are red data listed. They can be divided into two basic groups. Solitary Mining Excavate holes in the ground to nest. Mason Nest in pre-existing cavities. Leaf cutter Nest in pre-existing cavities. Eusocial Bumblebees Build nests in mouse holes, etc. (25 species) Highly eusocial Honeybees Nests in aerial cavities. (1 species)

Are honeybees wild?

Whether honeybees *Apis mellifera* spp., are a wild species is debatable. Some take the view that they arrived in Great Britain by the hand of man so it would not then be a wild species, however archaeological evidence shows that they were present long before the Romans and probably arrived here of their own accord. The honeybee that was present was a black British race *A. m. mellifera* which following a disease epidemic between 1904 and 1920 was virtually wiped out. Italian bees *A. m. ligustica* were imported into this country in vast numbers at this time to replenish stocks. Groups of beekeepers are endeavouring to recover the old British species and are using measurement of the cubital index of the veins in bees' wings. This is the most important reference in distinguishing races of *A. mellifera* without using DNA testing.

Where do honeybees nest in the wild?

Honeybees build nests in aerial cavities. Cavities in trees are the most common but chimneys and spaces in building roofs are common alternatives.

What is 'eusocial'?

Eusocial means 'exhibiting co-operation in reproduction and the division of labour with an overlap of generations'. The term 'highly eusocial' is often used in respect of honeybees as the nest and generations continue through time. Bumblebees for example have a cyclic nest with an hibernation period each year.

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