

MEET OUR PRIME POLLINATORS

Bees do far more than just make honey. Globally, the 25,000 or so bee species play a crucial part in crop production and in promoting biodiversity. By **Julie Gould**.

TYPES OF BEE

The honeybee (*Apis mellifera*) is the most widely studied bee, yet the approximately 10 species of honeybee comprise less than 0.05% of all known bee species.

Apidae family: 5,811 species

Includes honeybees, bumblebees, stingless bees, orchid bees, carpenter bees and many cuckoo bees.

Halictidae: 4,401 species

Includes many primitively social species as well as sweat bees, which suck perspiration from the skin of humans and animals.

Megachilidae: 4,111 species

Solitary bees, including leaf-cutter and mason bees (the females of which collect pollen with their abdomen instead of their legs).

Andrenidae: 2,952 species

Mining bees that are particularly common in temperate climates.

Colletidae: 2,595 species

Mining and cavity-nesting bees, including plasterer and yellow-faced bees.

Melittidae: 201 species

A small family of mining bees, most of which visit particular flowers.

Stenotritidae: 21 species

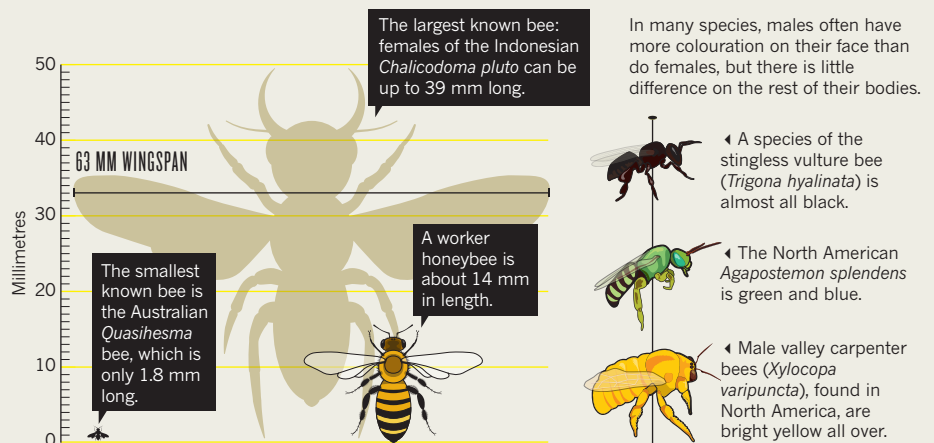
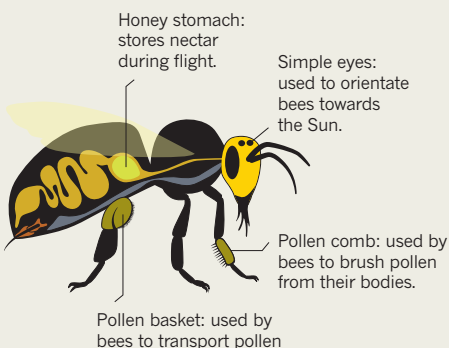
A small family of mining bees endemic to Australia.

5,000

Estimated number of unknown, undescribed bee species. The total number of species is thought to be about 25,000.

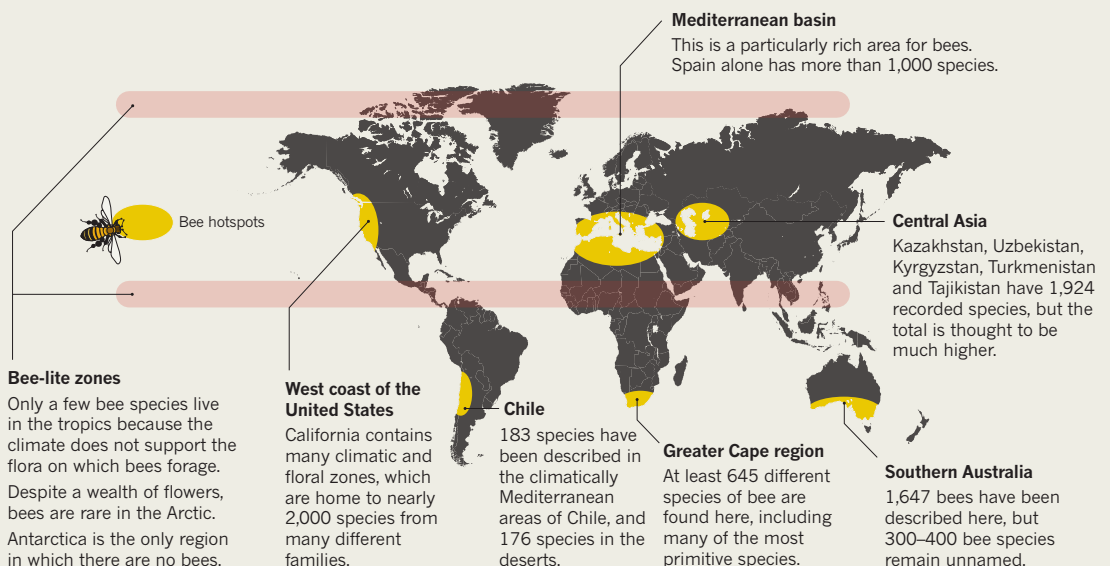
BIOLOGY

Bees, a major group in the order Hymenoptera, evolved from wasps and have adapted to take advantage of the energy available from feeding on pollen and nectar.



DISTRIBUTION

Six global hotspots, all of which have a Mediterranean-style climate, are home to the greatest variety of bee species.



FROM THE BEGINNING ...

For their first few days, all larvae feed on royal jelly (a substance made in glands on the heads of worker bees). Future queens continue to be fed royal jelly; worker bees and drones consume bee bread, which is a mixture of honey, pollen and water.



Eggs hatch after 3 days.

Queens pupate for 12 days; drones and workers for around 7.

In two to three weeks, bees metamorphose.



1 DAY

4 DAYS

8 DAYS

2-3 WEEKS

HATCHING

Young bees emerge every year during the spring.

The number of eggs laid per lifetime varies from eight (or fewer) for some solitary species to more than one million for queens of some social species.

Honeybees are social insects with defined castes: workers (sterile females), drones (fertile males) and queens (fertile females).



DEATH

In a colony, 1-2% of honeybees specialize in removing dead bees, which keeps the colony clean and healthy within the enclosed nests.



8 YEARS

The age of the oldest reported honeybees.

BEE LIFE STORY

The domesticated honeybee is the archetypal bee. Here, we outline the honeybee's life history and highlight some other species of wild bee.

DECLINE

Reliable data are scarce — but they point to a bleak future for many bees worldwide.

300% The global increase in agriculture that depends on animal pollination in the past 50 years¹.

25% The decrease² in domesticated honeybee colonies in central Europe between 1985 and 2005.

60% The decrease in domesticated honeybee colonies between 1947 and 2005 in the United States².

50% The proportion of wild bee species that became extinct over a 120-year period to 2010 in Chicago, Illinois³.

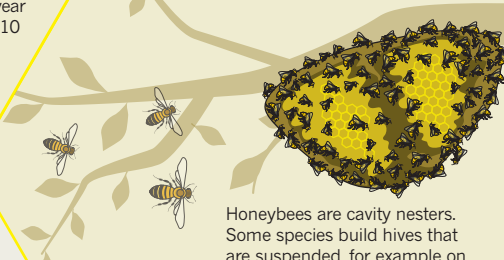
US\$70 billion The estimated global economic value of bee pollination to agriculture per year⁴.

Honeybee workers live on average for three to six weeks between spring and summer. Queen bees can live for up to five years, hibernating through the winters.



NESTING

Hives are not the only homes for bees.



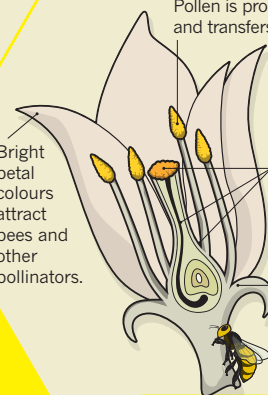
Honeybees are cavity nesters. Some species build hives that are suspended, for example on tree branches or gutters. Other wild honeybee species build nests in hollow spaces such as holes in fallen logs.



Cuckoo bees behave in the same way as cuckoo birds and put their eggs into the nests of other bees.

Pollen is produced on the anther and transfers to bees.

Bright petal colours attract bees and other pollinators.

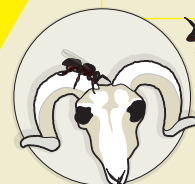


Bees rub pollen from other flowers onto the female part of the flower to facilitate reproduction.

Some plants have oil-producing glands called elaiophores, and specialized bees have evolved to collect oil instead of pollen.

FORAGING

Flowers are the main source of food for bees.

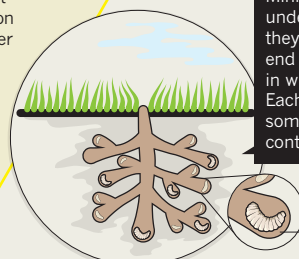


Three species of the stingless *Trigona*, which live in South America, obtain protein from rotting meat.

Most species of bee are vegetarian. Bees rely on pollen for protein, and on nectar for sugar.

Some bees, such as the *Macropis*, collect oils from the plants to line the cells in their nests and make food for the larvae. Adult bees rarely ingest the oils.

Mining bees lay eggs in underground tunnels that they dig themselves. At the end of each tunnel is a cell in which the eggs are laid. Each cell hosts one egg, but some species have nests containing up to 60 cells.



Mining-bee cell