Honey Bees Versus Native Bees

Most people are familiar with the nonnative European honey bee, *Apis mellifera,* introduced to the U.S. in the 1600s and valued to this day for the ability to make honey and pollinate many important agricultural crops. Among bees, honey bees are unusual for a variety of reasons: they live in highly organized social colonies, communicate by "dancing" in front of their sisters, and survive the winter as adults in nests they construct themselves from wax secreted from their body.

But did you know…

- Of the approximately 20,000 bee species described worldwide (4,000 described in North America), the vast majority are solitary and live underground.
- Unlike honeybees, most bees specialize on closely related flowers.
- Bees have an incredible diversity of sizes and colors, from a few millimeters to several centimeters, with metallic blues and greens, completely black, or the more familiar yellow tones.
- Bees are the most important pollinators, and native bees are essential for the survival of native plants.
- Even though honey bees are of high economic value to the agricultural industry, they are viewed as invasive pests in areas where they compete with native bees.
- Native bees supplement European honey bees as pollinators of agricultural crops and their value will increase as European honey bee populations become compromised.
- You can make simple changes in your yard to help native bees!

How to Help Native Bees in Your Back Yard

About 70% of native bee species make nests underground, which means it is essential for them to have access to the soil. Provide bare or partially vegetated ground to allow female bees to excavate tunnels and lay eggs in brood cells. The soil should be gently compacted, well drained, and in a sunny place.

About 30% of native bees prefer to nest in wood or stems. Some have the ability to chew the tunnels themselves, but most prefer to use existing tunnels. Provide a block of wood or a log with holes drilled into it. Vary the hole sizes from ¼" diameter and 6" deep to smaller diameters and depths. Different sized bees will choose appropriately sized holes.

Similar to drilled wood, provide hollowed-out stem or tube bundles of varying sizes.

Choose a variety of native plants for your yard or garden to help native bees thrive. A list of native plants for this area can be found on the Theodore Payne Foundation website.

Reduce or eliminate the use of pesticides in your garden.

Resources

Danforth, B.N., S. Cardinal, C. Praz, E.A.B. Almeida & D. Michez. 2013. The impact of molecular data on our understanding of bee phylogeny and evolution. *Annual Review of Entomology* 58: 57–78.

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Michener, C.D. 2000. *Bees of the World*. Johns Hopkins University Press, Baltimore.

The Xerces Society for Invertebrate Conservation. http://www.xerces.org

The Theodore Payne Foundation for Wildflowers and Native Plants, Inc. http://www.theodorepayne.org

SOUTHERN CALIFORNIA'S NATIVE BEES
BEE DAZZLING BIODIVERSITY

INSECT ORDERS

PTERYGOTA

NEOPTERA

- Diptera (flies)
- Mecoptera (scorpionflies, hangingflies)
- Siphonaptera (fleas)
- Trichoptera (caddisflies)
- Lepidoptera (moths and butterflies)
- Hymenoptera (wasps, ants, sawflies, and bees)
- Strepsiptera (twisted-wing parasites)
- Megaloptera (alderflies, dobsonflies, and fishflies)
- Raphidioptera (snakeflies)
- Neuroptera (lacewings, antlions, owlflies)
- Coleoptera (beetles)
- Psocoptera (barklice and booklice)
- Thysanoptera (thrips)
- Hemiptera (bugs, cicadas, whiteflies, aphids)
- Plecoptera (stoneflies)
- Embioptera (web-spinners)
- Phasmida (timema, stick and leaf insects)
- Orthoptera (grasshoppers, crickets, katydids)
- Mantophasmatodea (African rock crawlers)
- Zoraptera
- Isoptera (termites)
- Mantodea (mantids)
- Blattodea (cockroaches)
- Dermaptera (earwigs)
- Grylloblattodea (ice bugs, rock crawlers)
- Odonata (dragonflies and damselflies)
- Ephemeroptera (mayflies)
- Thysanura (silverfish and firebrats)
- Archaeognatha (bristletails)

Long-tongued bees

? **Melittidae**

200 species worldwide

Semixeric, Mediterranean, temperate Old and New World; absent from South America, Australia, and Antarctica

Host plant specialists, oil collecting

Apidae

5,700 species worldwide (includes honeybee *Apis mellifera*)

Worldwide; greatest diversity in Neotropical and Asian regions

Solitary, ground nesting, wood nesting, eusocial, kleptoparasitic, social parasites, oil-collecting

Megachilidae

4,000 species worldwide

Arid habitats through tropical forests

All are solitary or communal

Andrenidae

2,900 species worldwide

Greatest diversity in arid western North America, South America, and Palearctic; none in Australia

All are solitary and ground nesting, some host plant specific

Halictidae

4,300 species worldwide

All continents except Antarctica

Host plant generalists, kleptoparasitic, social parasites, solitary, communal, semisocial, eusocial

Stenotritidae

21 species worldwide

Australia only

Ground nesting, solitary

Colletidae

2,500 species worldwide

Highest diversity in southern continents

NATURAL HISTORY MUSEUM
LOS ANGELES COUNTY

Phylogenetic tree from: Danforth, B.N., S. Cardinal, C. Praz, E.A.B. Almeida & D. Michez. 2013. The impact of molecular data on our understanding of bee phylogeny and evolution. Annual Review of Entomology 58: 57–78.

Photo credits: Phyllis Sun, Natural History Museum of Los Angeles County.