

Arizona Bee Identification Guide

**POLLINATOR
PARTNERSHIP**



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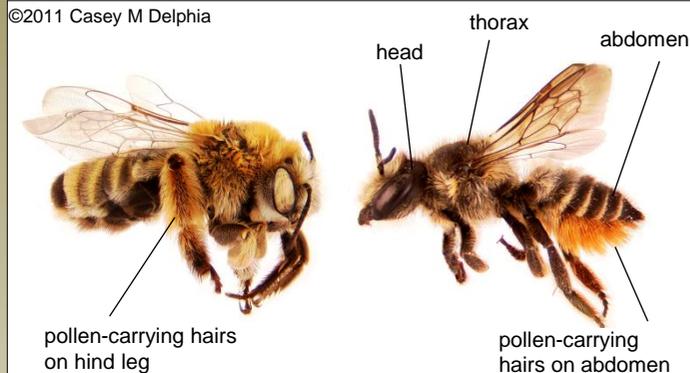
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Bees provide essential ecosystem services in natural and agricultural landscapes as pollinators of three-quarters of flowering plants and as soil-builders. For people, this means every third bite of food along with fibers, nutrients and beverages is the result of pollination. Plants rely on pollinators to reproduce and set seed. Honey bees pollinate crops, but native bees also have a role in agriculture and they are essential for pollination in natural landscapes. There are 1,300 native species of ground-nesting, twig-nesting and parasitic bees found within Arizona. This guide gives information for identifying 10 major groups of bees commonly observed in Arizona including key characters, sizes (in mm), nesting habits, floral preferences, and distinctive behaviors.

Bee Identification

Bees, like other Hymenoptera, have three body segments; a **head**, **thorax**, and **abdomen**. The **head** has the compound and simple eyes, segmented paired antennae, and mouthparts including mandibles for biting, and the proboscis for drinking nectar. The **thorax** bears the legs and four wings (two forewings and two hind-wings coupled by tiny hooks). The **abdomen** contains digestive organs and the sting in females.

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Female bees have special pollen-carrying hairs (scopa) usually on the legs, or in the case of leafcutters, under the abdomen. Honey bees and bumble bees carry pollen packed tightly into a ball on pollen baskets (corbiculae), concave areas on their hind legs.



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Leafcutter and Mason bees (*Megachile* and *Osmia* spp.)

Family: Megachilidae. Head as broad as thorax; large mandibles; black body with pale bands on abdomen (metallic green or blue for *Osmia*); scopa under abdomen; 7 - 20 mm. Solitary, nest in beetle holes or wood nesting blocks, some in soil. Female *Megachile* cut circular pieces from leaf margins to form larval cells. Other species collect mud (*Osmia*) or resin as nesting materials.



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Bumble bees (*Bombus* and *Psithyrus* spp.)

Family: Apidae. Robust, hairy colorful bees; black body covered with black, yellow, orange or whitish hair bands; pollen baskets on hind legs; 10 - 28 mm.

Bumble Bees live in social colonies; nesting underground, under boards or rodent burrows. They buzz pollinate flowers like tomatoes, which have pored anthers.

Honey bees (*Apis mellifera*)

Family: Apidae. Triangular - shaped head; black eyes and dark legs, golden brown hairs; orange abdomen with black stripes; concave areas, pollen baskets on hind legs; 15 - 19 mm.



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Large social colonies, 30,000 or more; live in man-made hives, tree hollows or rock outcrops. If you use a hand lens and look closely, honey bees actually have hairy eyes.



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Sweat bees (*Agapostemon*, *Augochlorella*, and *Halictus* spp.)

Family Halictidae. Diverse group including small brown or black bees with abdominal bands to vividly colorful metallic green and yellow. Pollen-carrying hairs on hind legs; 3 - 12 mm. Parasitic forms often have red abdomens and lack pollen carrying hairs. Solitary, communal and semisocial soil nesters; some are attracted to salt in your sweat.



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Mining bees (*Andrena and Perdita* spp.)

Family: Andrenidae. Black or dull metallic body often with brown or reddish hairs; usually elongate; scopa on upper regions of legs; 6 - 15 mm. *Perdita* diverse genus, bright yellow, black and whitish bees; 2 - 7 mm. Solitary or communal (some *Macrotera* spp.), nest in sand soils. Females have depressions (fovea) along their eyes that glisten due to short velvety hairs.



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Long-horned bees (*Melissodes, Svastra, and Synhalonia* spp.)

Family: Apidae. Usually robust and very hairy, dark body often with pale hair bands on abdomen; dense scopa on hind legs; males have very long antennae, as long as body; 7 - 20 mm. Solitary to communal ground nesting bees. Some genera and species are especially attracted to asters, sunflowers and mallows.



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Squash bees (*Peponapis and Xenoglossa* spp.)

Family: Apidae. Honey bee-sized (*Peponapis*) brownish bees with light spot on face; often long sharp mandibles; males with long antennae. They specialize on pollen and nectar of wild gourds and cultivated pumpkins; 14 - 18 mm. Solitary; ground-nesting often in pumpkin fields. Coarse dense scopa on hind legs.



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Carpenter bees (*Xylocopa* spp.)

Family: Apidae. Shiny dark black bees (golden green-eyed males in one species); sparse hairs on abdomen; robust with massive jaws; scopa on hind legs; 20 - 28 mm. Solitary to communal nest in dead tree trunks, Agave, Yucca and Sotol stalks. Other than bumble bee queens, the largest bees in AZ.



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Yellow-faced or masked bees (*Hylaeus* spp.)

Family: Colletidae. Slender; almost hairless black bees with scattered yellow markings. Bright facial stripes; no scopa as they carry pollen internally in the crop, sometimes called the honey stomach; 5 - 7 mm. Other bees in this family (*Colletes* spp.) are larger, fuzzy gray with distinctive heart-shaped heads. Solitary bees; nesting in dead twigs and stems and beetle burrows.



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Cuckoo bees (*Nomada and Triepeolus* spp.)

Family: Apidae. Slender and wasp-like; often with few hairs (will be branched hairs); red or black or yellow body, banded abdomens; *Triepeolus* is black and white with red legs; relatively thick antennae; no scopa; 5 - 18 mm. Males and females visit flowers for nectar but do not collect pollen. Females are cleptoparasites of other bees, laying their eggs in another bee's nest. At least 10% of all Arizona bees are parasitic.

A Bee or Not a Bee?

There are two kinds of insects that are often confused with bees -- flies and wasps. Many flower-visiting flies (e.g. the Syrphidae) are bee and wasp mimics in color, form and actions. By mimicking bees and wasps in appearance, they gain protection from predators. So, how do you tell these pollinators apart?

Fly Identification: Flies have only one pair of wings, while bees have four wings. Flies usually have short, stubby antennae with single hairs, or feathery antennae. They have piercing/sucking or sponging mouthparts. Many flies have huge eyes that meet at the top of their heads.

Wasp Identification: Wasps have four wings, chewing mouthparts, a sting in females, and long antennae. One hair character sets bees apart from wasps. When magnified, bee hairs are branched (plumose) not simple and straight like those on wasps. Bees are also usually hairier and more robust than wasps. Think of a "wasp waist" a constriction in the petiole than many wasps have. Wasps never have pollen-carrying hairs (although masarid wasps feed on pollen). Wasps are carnivorous predators or parasites.

Now that you know how to tell the difference between bees, wasps and flies, try identifying the insects in the photos below. Answers are at the bottom.



Bombus



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Alves Gaspar



Tony Willis



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