

# UC Santa Barbara

## Educational Materials

### Title

Bee Dichotomous Key

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## BEE IMAGES AND DICHOTOMOUS KEY

### 5 likely

*Bombus* sp. (bumblebee) [image: *Bombus crotchii*, UCSB-IZC00033148]



Bumblebees (genus *Bombus*) are the most easily seen bees after European honeybees, mostly due to their larger size.

There are over 250 known species worldwide that can mostly be identified by the black hair with different patterns of yellow, orange, or white stripes. In the Santa Barbara area, there are at least six species of bumblebee including one species, Crotch's bumblebee (*Bombus crotchii*), that is listed as endangered.

Most bumblebees are social insects that form small colonies with a single queen.

*Xylocopa* sp. (carpenter bee) [image: *Xylocopa tabaniformis orpifex*, UCSB-IZC00012184]

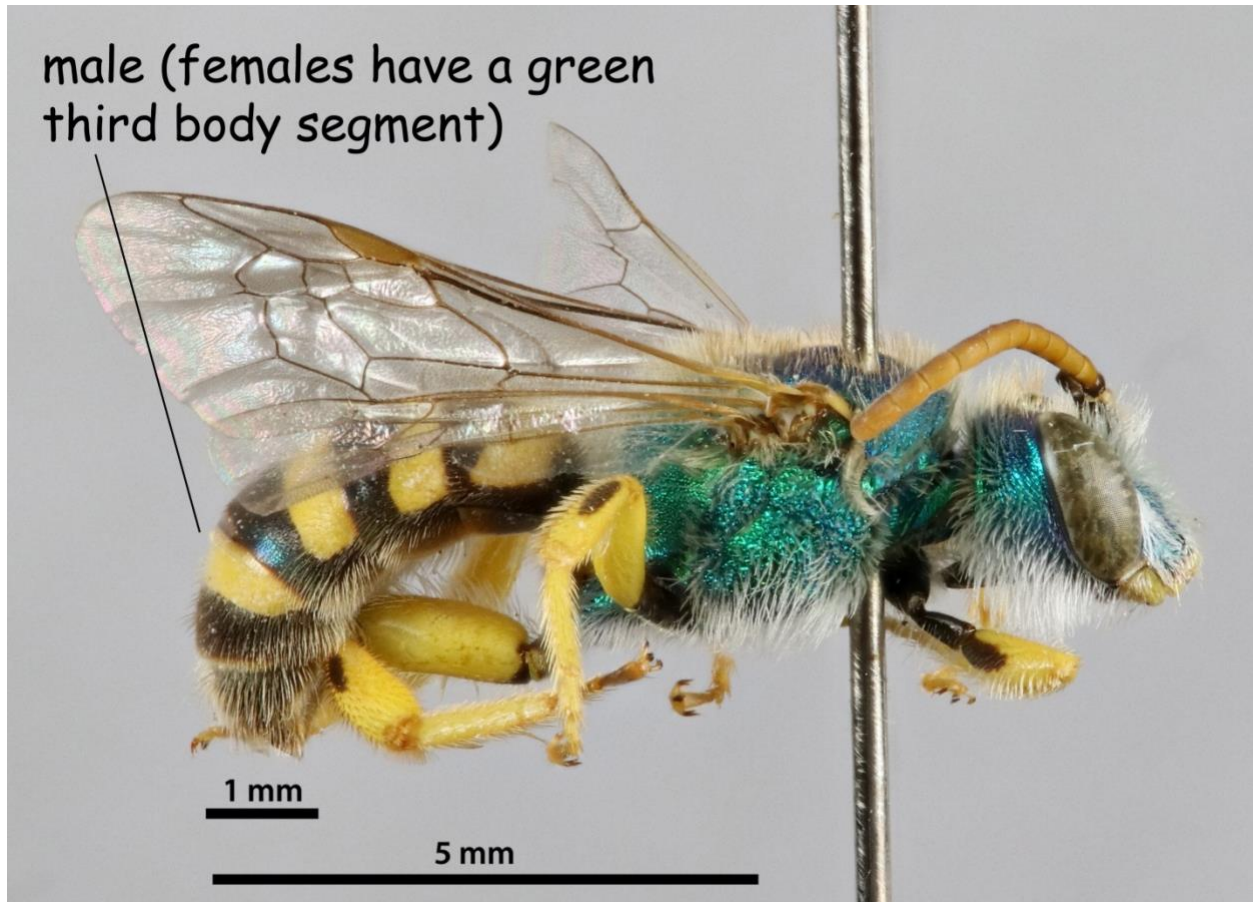


Carpenter bees (genus *Xylocopa*) get their name from their behavior of burrowing into hard plant material, such as wooden planks or bamboo.

In the Santa Barbara area there are three known species of carpenter bee, all of them with entirely black-haired females and lighter-haired males. One species, the valley carpenter bee (*Xylocopa varipuncta*), has entirely golden-haired males that are also known as the teddy bear carpenter bee.

Carpenter bees are mostly solitary bees, but some species live in a simple nest with their daughters and sisters.

*Agapostemon texanus* (ultra-green sweat bee) [image: UCSB-IZC00028349]



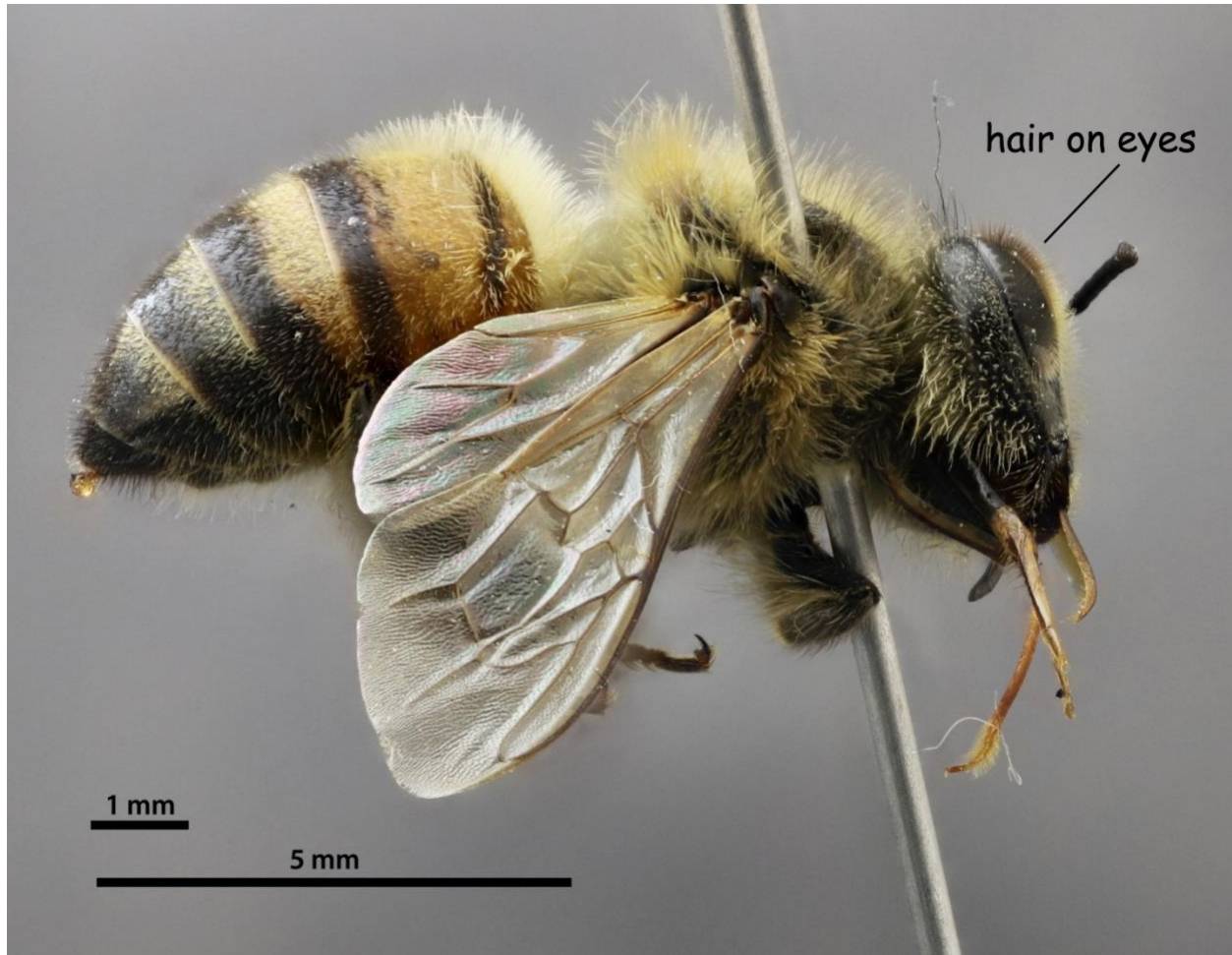
Sweat bees (family Halictidae) get their name from coming to and drinking human sweat to get salt for nutrition.

The ultra-green sweat bee (*Agapostemon texanus*) is the most common species of Western Hemisphere sweat bees, and the only one known to be in the Santa Barbara area. There are four subspecies in California, with some that are more violet-blue than green.

Ultra-green sweat bees nest in the ground, sometimes in groups, but without division of labor such as single queens and workers.

*Apis mellifera* (European honeybee) [image: UCSB-IZC00009350]

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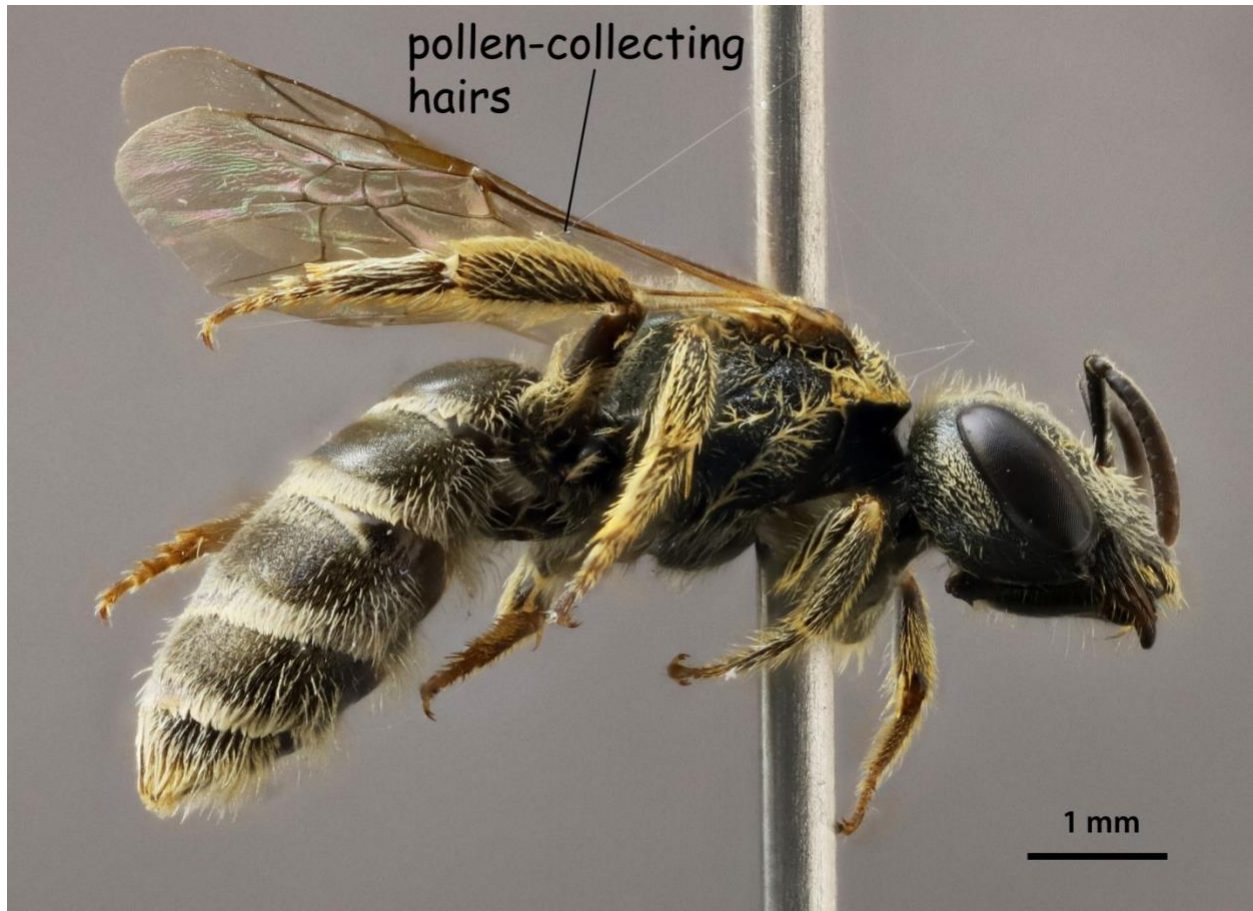


European honeybees (*Apis mellifera*), also known as western honeybees or just as honeybees, are the most well-known bee species around the world. They are native to the Eastern Hemisphere, but were domesticated and brought all over the world by people to be used in pollinating farmers' crops.

Honeybees are the only species in the genus *Apis* that are present in California. The Africanized honeybee is a more aggressive hybrid of multiple subspecies of the European honeybee.

Honeybees have the most recognizable social insect system, with a single queen commanding up to thousands of her daughters as workers in the colony.

*Halictus* sp. (furrow bee) [image: *Halictus tripartitus*, UCSB-IZC00037432]

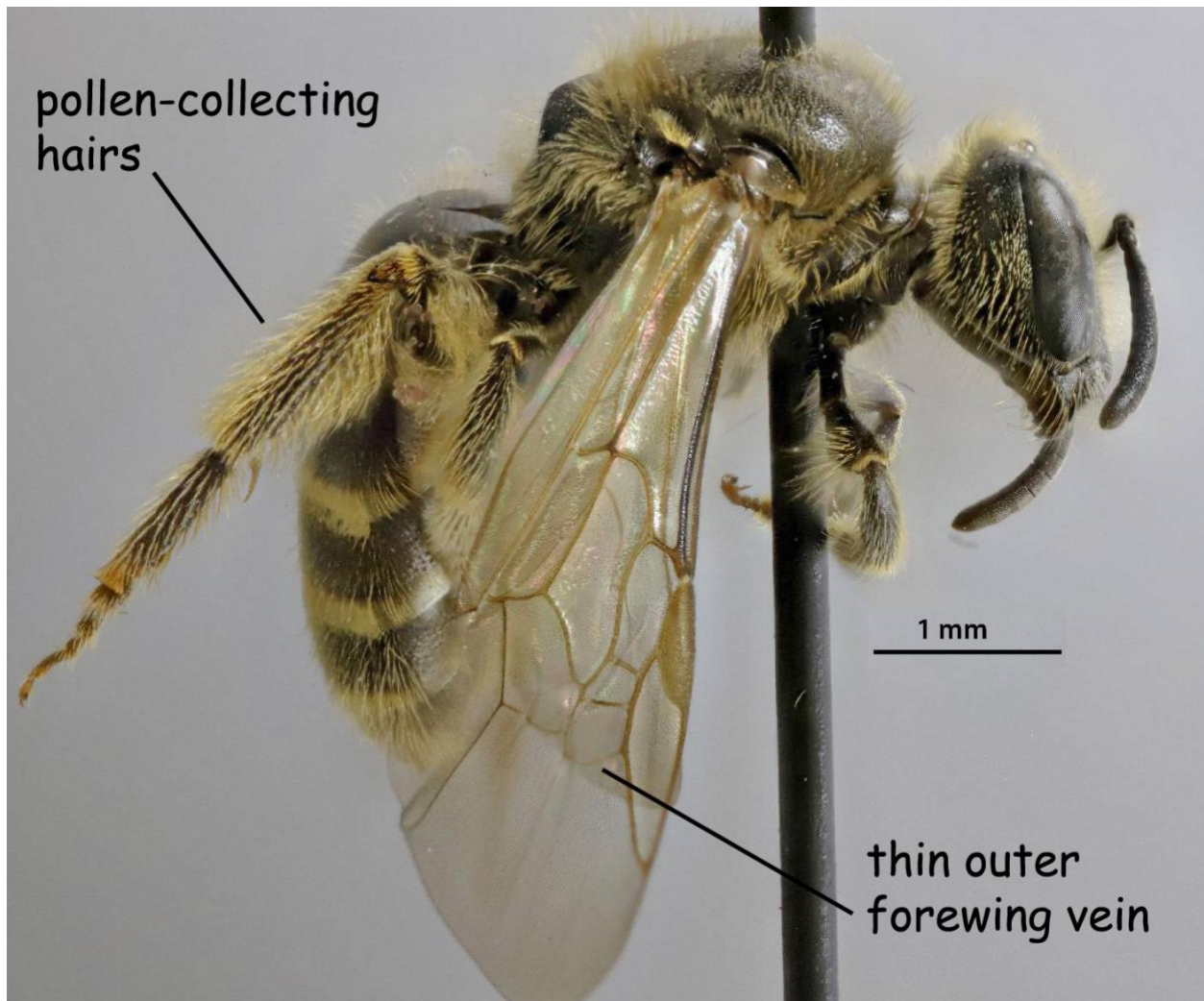


Furrow bees (genus *Halictus*) are a genus in the family of sweat bees (family Halictidae). They do not produce honey but they are important pollinators.

There are over 200 species of furrow bees worldwide. At least four species are known from the Santa Barbara area, the most common being *Halictus tripartitus*.

Many furrow bees are social insects, with colony sizes from two to two hundred individuals.

*Lasioglossum* sp. (small sweat bee) [image: *Lasioglossum* (*Evylaeus*), UCSB-IZC00035588]



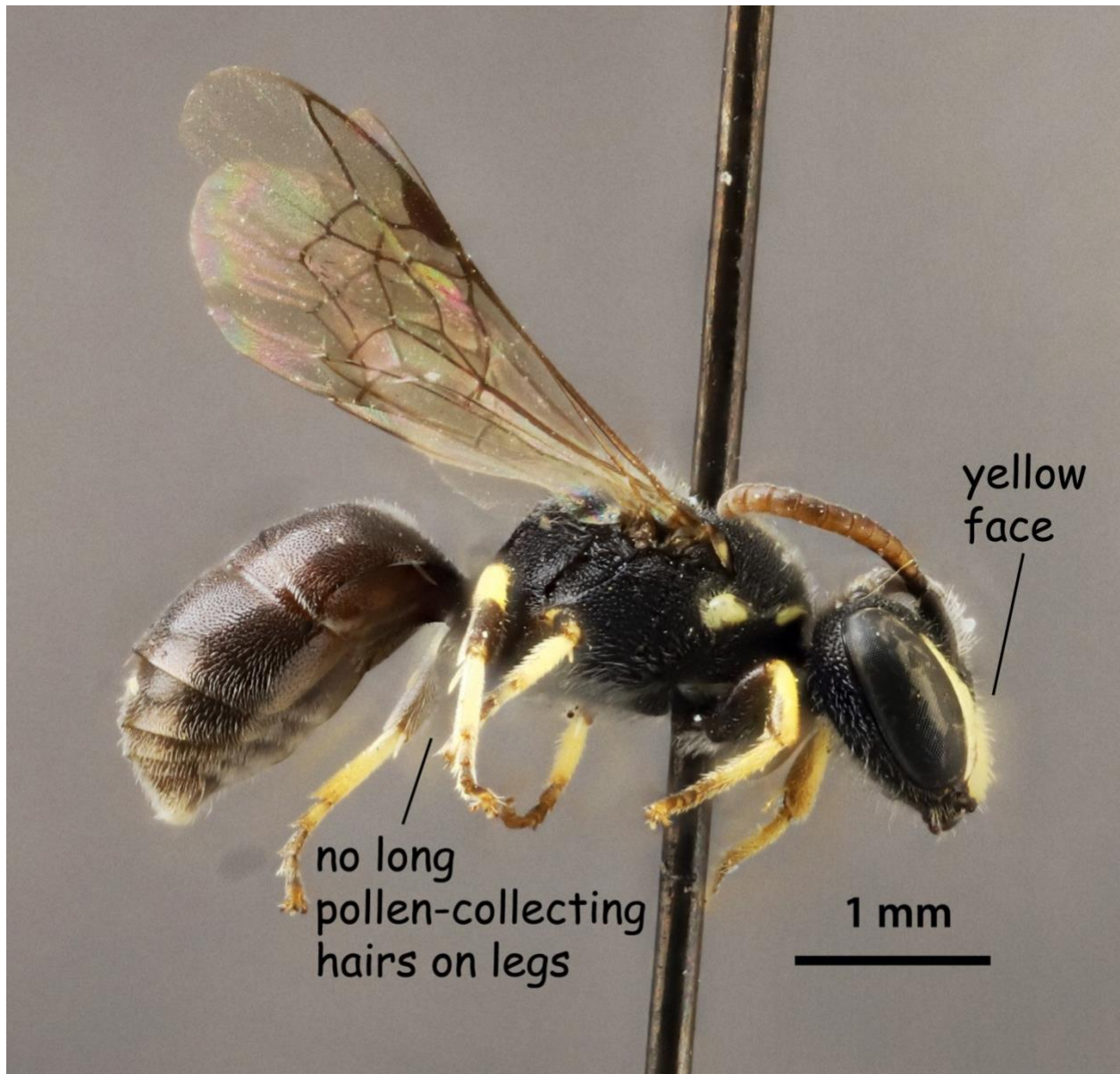
Small sweat bees of the genus *Lasioglossum* are important and diverse native pollinators.

The genus *Lasioglossum* is the largest bee genus with over 1,700 species worldwide. At least ten species have been found in Santa Barbara, but there are likely many more species that have not been described yet due to having very small differences.

Sweat bees of this genus can be solitary or social depending on the species. The largest colonies have hundreds of workers.

## 5 unlikely

*Hylaeus* sp. (yellow-faced bee) [image: *Hylaeus polifolii*, UCSB-IZC00035468]



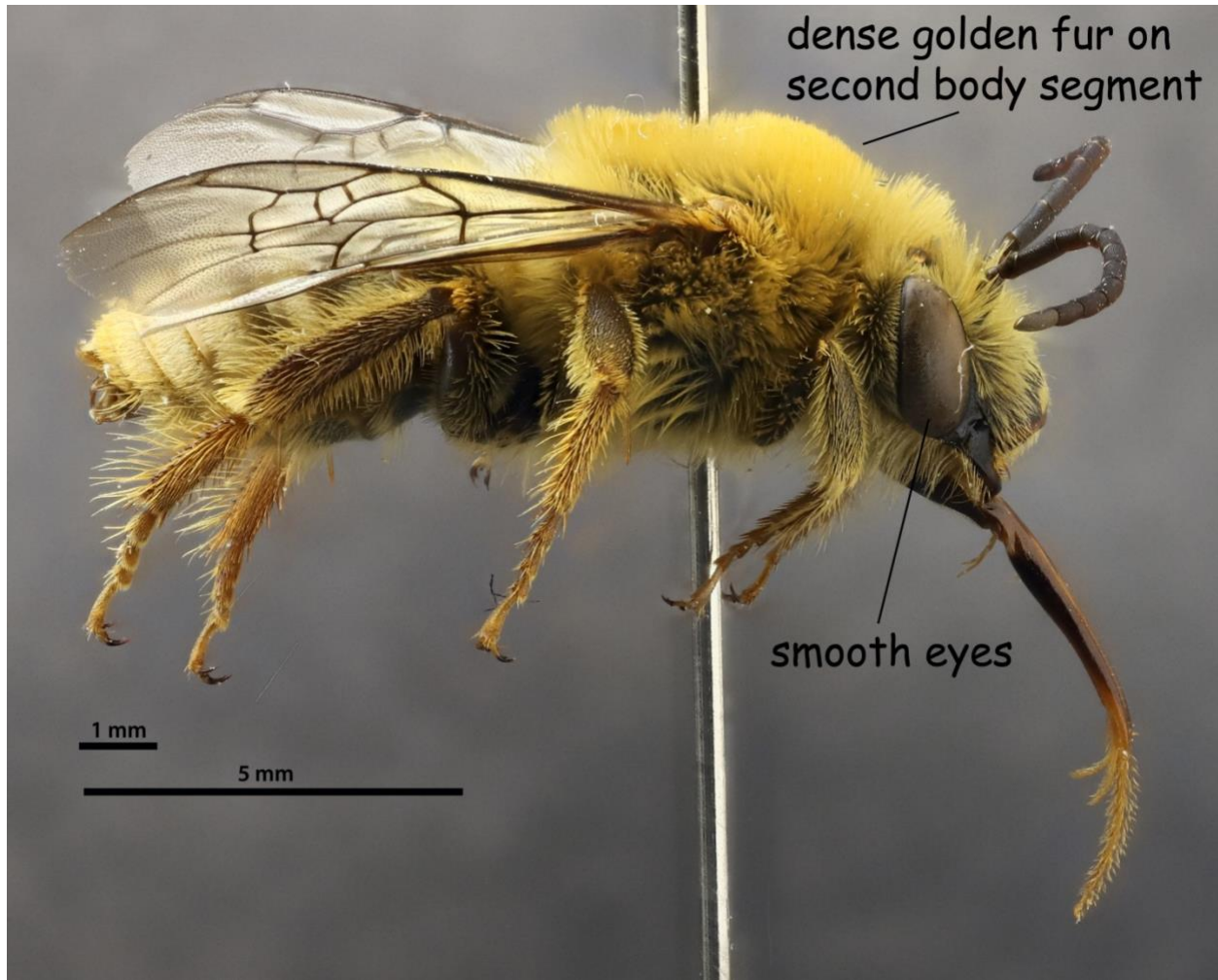
The yellow-faced bees (genus *Hylaeus*) are very small wasp-like bees. They still gather pollen from plants, but they store it inside their body in a crop instead of on their legs or third body segment like other bees.

There are more than 500 species of yellow-faced bees worldwide, with three species in Santa Barbara. The most common yellow-faced bee species in the area is the buckwheat masked bee (*Hylaeus polifolii*).

Yellow-faced bees are solitary insects that nest in twigs, hollow grass stems, and other natural cavities.



*Peponapis pruinosa* (pruinose squash bee) [image: UCSB-IZC0008718]

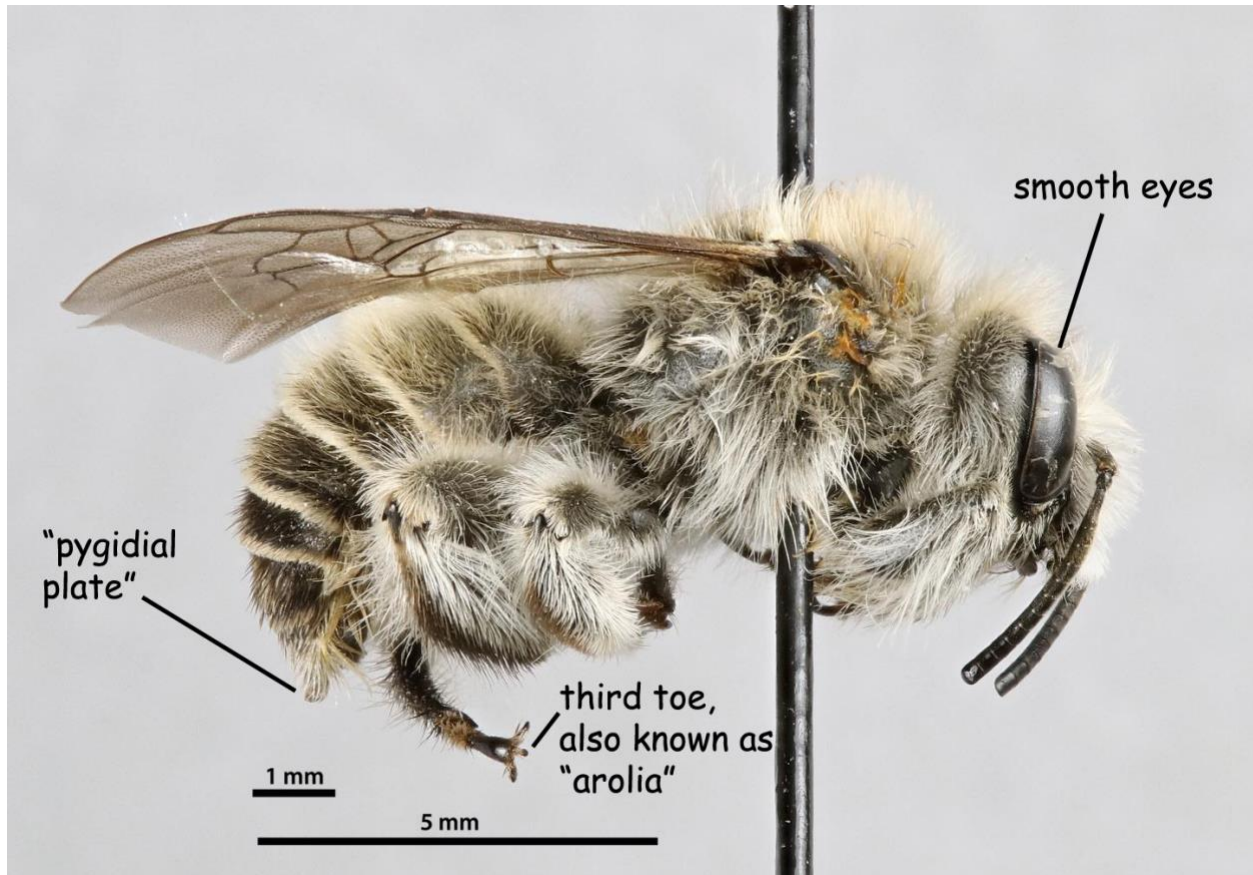


The pruinose squash bee (*Peponapis pruinosa*) are efficient and important pollinators of squash plants, especially in the plant genus *Cucurbita* which includes pumpkins.

This species of squash bee has spread throughout North America as humans grow more squash for food. It is the only species of its genus in California.

Pruinose squash bees are solitary bees that nest in the ground. Males wait inside squash flowers to mate with the females that visit.

*Diadasia bituberculata* (chimney bee) [image: UCSB-IZC00034398]

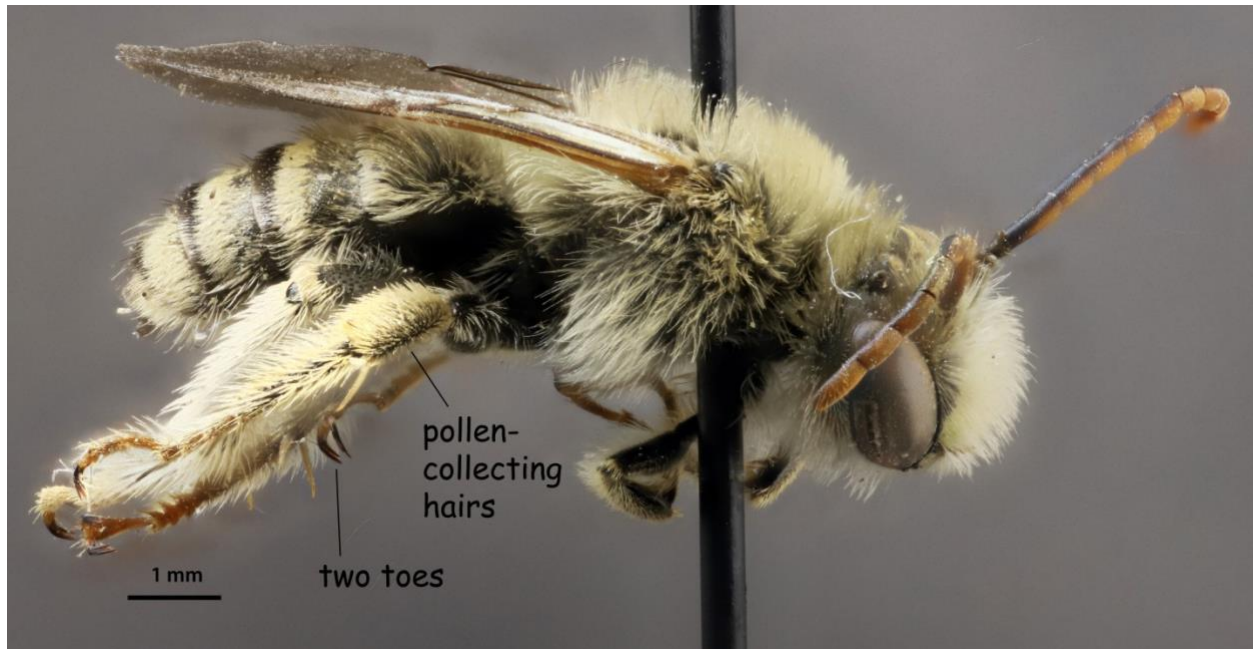


Chimney bees (tribe Emphorini) are named for the turret-shaped nests that some species make in the ground. Many species are pollen specialists.

The chimney bee species most common in Santa Barbara, *Diadasia bituberculata*, specializes in pollinating the trumpet-shaped flowers of bindweed and morning glory plants. There are at least five other species of the genus *Diadasia* in the area.

The chimney bees of Santa Barbara nest in groups, with many entrance holes in clusters on the ground.

*Melissodes tepida timberlakei* (long-horned bee) [image: UCSB-IZC00034457]



Long-horned bees of the genus *Melissodes* get their name from the males having long antennae.

There are at least 140 species worldwide in the genus *Melissodes*, with four species known in the Santa Barbara area. The most common species here is *Melissodes tepida* subspecies *tiberlakei*.

Long-horned bees are solitary bees. The females nest in the ground and the males sleep in or on flowers at night.

BEE DICHOTOMOUS KEY

Classification	If yes, go to	If no, go to
1. Is it a large, hairy bee (greater than 10 mm long)?	2	3
2. Is the bee's third body segment covered in long hair on the top surface?	Bombus sp. (bumblebee)	Xylocopa sp. (carpenter bee)
3. Is the bee shiny with few hairs?	4	7
4. Is it medium-sized (10 mm long) and metallic green, with males having a yellow third body segment?	Agapostemon texanus (ultra-green sweat bee)	5
5. Is it mostly black with yellow on its face and without long pollen-collecting hairs on its legs?	Hylaeus sp. (yellow-faced bee)	6 (Halictini)
6. Are the outer veins of the forewings (bigger wings) thinner and weaker than the other wing veins?	Lasioglossum sp. (small sweat-bee)	Halictus sp. (furrow bee)
7. Does the bee have long hairs on its eyes?	Apis mellifera (European honeybee)	8
8. Does the bee have a very furry and golden second body segment, with light bands of hair on the third body segment?	Peponapis pruinosa (pruinose squash bee)	9 (Apinae)
9. Does the bee have a third "toe" between the two claws at the end of the feet, and a finger-like plate sticking out from the end of its third body segment?	Diadasia bituberculata (chimney bee)	Melissodes sp. (long-horned bee)

## LIST OF BEES

*Bombus* sp. (bumblebee)

*Xylocopa* sp. (carpenter bee)

*Agapostemon texanus* (ultra-green sweat bee)

*Apis mellifera* (European honeybee)

*Halictus* sp. (furrow bee)

*Lasioglossum* sp. (metallic-sweat bee)

*Hylaeus* sp. (yellow-faced bee)

*Peponapis pruinosa* (pruinose squash bee)

*Diadasia bituberculata* (chimney bee)

*Melissodes tepida timberlakei* (long-horned bee)