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common name: Solitary Bees

scientific name: *Andrena* spp.
Panurginus spp.

phylum: Arthropoda
class: Insecta
order: Hymenoptera
family: Andrenidae

habitat: grasslands and vernal pools

size: 6-15 mm long

description

These are small bees, often mistaken for a fly if not observed closely. They are black or dark gray, sometimes with gray hairs on the face and head. Solitary Bees have hairs at the middle joint of their hind legs which form baskets in which they carry pollen.

life cycle

Solitary Bees emerge in the spring when their host flowers are blooming. After mating, the female Solitary Bee digs a nest. The nest begins with a tunnel straight down into the ground for a few inches. From the main entrance tunnel, she digs a side tunnel which ends in a chamber. This brood chamber is about 1 cm wide and 2 cm tall. The inside of the chamber is polished by the bee and coated with a waxy substance.

Once the brood chamber is complete, the female bee begins to collect pollen and nectar from the host flowers. These are brought to the brood chamber and slowly formed into a ball about 6-8 mm across. The female solitary bee deposits a single egg on the pollen ball. Then she seals up the brood chamber and proceeds to dig another side tunnel and new brood chamber. A single female may dig 8-10 chambers.

The egg hatches pretty quickly and the bee larva proceeds to eat all of the pollen ball. It then rests for a while. In the autumn, the larva changes into an adult. The adult bee then spends the winter just sitting in its chamber. It emerges the following spring when its host plant is again in flower.

The male Solitary Bee hangs out at the flowers hoping to mate with more females and does not help with digging the nest or collecting pollen.

fun facts

In years of drought vernal pools might not fill with rainwater and flowers do not bloom. Do the Solitary Bee species die out because they cannot reproduce without their host plants? Researchers at the University of California at Davis have discovered that vernal pool Solitary Bees can remain underground for up to four years, waiting for the 2-3 weeks when their host plant is in bloom. How they know when the flowers are blooming, when they are still sealed in their underground brood chambers, is yet another mystery of the vernal pools.

ecology

Solitary Bees generally visit only a single species or closely related plants in the same genus. At Mather Field, several groups of flowers are visited by Solitary Bees including Goldfields, Meadowfoam, and Downingia. The bees that visit Goldfields are a different species than those that visit Meadowfoam or Downingia. In addition to gathering pollen and nectar for their offspring, the Solitary Bees help to pollinate the flowers that they visit. Solitary Bees are eaten by spiders and other insects.

conservation

Solitary Bees dig their nests in the upland soils next to vernal pools. They also rely on the vernal pool plants to provide the pollen and nectar to feed their young. When we protect vernal pools in order to conserve their plant and animal species, we need to also protect the nearby grasslands for species like Solitary Bees.

investigate

Solitary Bees can be seen flying over masses of flowers. When you spot some, try to tell which flowers they are visiting by the color of the pollen in their pollen baskets.

What are Bees?

When most people mention "bees" they are referring to the Honey Bees. Honey Bees were introduced from the Old World to produce honey and pollinate crops. There are over 1,000 species of native bees in California. Like wasps, most of these are solitary and dig nests in the ground. Only Honey Bees and bumble bees are social and live together in hives. All bees collect pollen to feed their larvae.