

Agapostemon texanusUltra Green Sweat Bee

Flight Season: March-October; peak activity May-September.

Lifestyle: Solitary nesters. Most likely has two adult generations per year.

Nesting Habitat: Soil nesters. Prefer flat, bare ground.



Left and Below: Females of Agapostemon texanus. Note the messy pollen collection on hind legs and abdomen.





Above Left: Female *Agapostemon texanus.* Note metallic green coloring of all parts of the body.

Above Right: Male *Agapostemon texanus*. Note the yellow and black striped abdomen.





Above:

Females of Agapostemon texanus entering and exiting nest entrance. **Left:** Females of

Agapostemon texanus at nest entrance with penny for scale.

Pollen Transport: On hind legs. Rather messy collectors.

Size and Shape: Medium to small. Slenderbodied.

Color: Metallic green. Females are entirely green. Males have green heads and thoraces but yellow-and-dark-striped abdomens.

Similar Looking Insects: Other metallic bees and wasps.



Augoclorella sp. Sweat Bee



Osmia granulosa Mason Bee



Hoplitis fulgida Hairy Belly Bee



Chrysidid Cuckoo Wasp



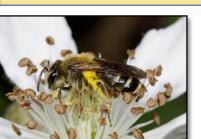
Andrena spp. Mining Bees

Flight Season: February-June. Peak activity

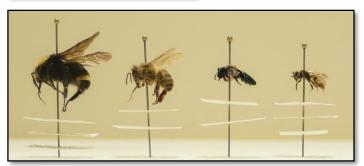
March-May.

Lifestyle: Solitary.

Nesting Habitat: Nest in flat, bare ground. Nest entrances often surrounded by mounds of excavated soil.



Left: Female *Andrena* angustitarsata on *Rubus* flower. Note pollen on outer part of hind leg and lateral hair stripes on abdomen.



Above: Size comparison of different bees. Left to right: *Bombus vosnesenskii* (worker), *Apis mellifera*, *Andrena sola*, and *Andrena miserabilis*.



Above Left: Female *Andrena angustitarsata* on *Ceanothus* 'Julia Phelps'.

Above Right: Female *Andrena nigrocaerulea* on *Gilia capitata*. Note two different types of pollen on thorax and legs.



Above: Entrance to *Andrena* nest. Note the mound of excavated soil.



Above: Female *Andrena subtilis* entering nest. Note the pollen on the outer parts of her legs.

Pollen Transport: On outer parts of hind legs.

Size and Shape: Large to small. Elongate, slender bodies. Females are larger than males.

Color: Often have pale hair on thorax and pale stripes on abdomen. Body may have a metallic sheen.

Notable Features: Males usually have dense moustache-like hairs on lower face. Females usually have dense, velvety patches of hairs between compound eyes and antennae.

Similar Looking Insects: Some sweat bees (*Halictus* and *Lasioglossum* spp.) and *Colletes* spp.



Halictus tripartitus Sweat Bee



Halictus tripartitus Sweat Bee



Lasioglossum kincaidii Sweat Bee



*Colletes fulgid*us Polyester Bee



Bombus spp. **Bumble Bees**

Flight Season: Late winter to Fall.

Lifestyle: Social with annual colonies.

Nesting Habitat: Typically under ground in abandoned rodent burrows and tufts of grass. Bombus melanopygus have been documented using bird houses.



Left: Bombus vosnesenskii worker. Note the moistened pollen pellets on hind legs. Below: Size comparison of different bees. Left to right: Xylocopa varipuncta, Bombus vosnesenskii (worker), Apis mellifera, and Halictus tripartitus.





Above Left: Bombus vosnesenskii worker visiting Salvia greggi. Above Right: Bombus melanopygus worker visiting Cercis occidentalis.







Pollen Transport: Transported as moistened pellets on hind legs.

Size and Shape: Medium to very large. Stoutbodied. Queens are largest; workers vary in size but are usually larger than honey bees.

Color: Mostly black with contrasting yellow, red, and/or white hair bands or patches.

Similar Looking Insects: Other large bees (*Anothophora* spp. and *Xylocopa* spp.). Robber flies and syrphid flies.



Male Xylocopa tabaniformis orpifex Carpenter Bee



Anthophora bomboides Digger Bee



Laphria sackeni Robber Fly



Volucella bombylans Syrphid Fly



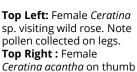
Ceratina **spp.**Small Carpenter Bee

Flight Season: Spring-Fall; peaks between April-August

Lifestyle: Solitary nesters (usually). Multigenerational.

Nesting Habitat: Females excavate pithy or soft-core dead stems of plants like *Sambucus, Rubus, Brassica, Helianthus, Perovskia atriplicifolia,* and *Salvia mellifera.*





for scale.

Left: Shield-shaped tip of abdomen.



Above Left: Female *Ceratina acantha*. Note dark metallic green body color, sparse hairs on hind legs.

Above Right: Ceratina acantha female visiting Mimulus flower.







Clockwise from top left: Ceratina nest entrances in stems of Rubus, Perovskia atriplicifolia, and Salvia mellifera.

Pollen Transport: On legs.

Size and Shape: Small to tiny. Elongate body.

Color: Dark metallic gun-metal green. Often look metallic black.

Notable Features: Rather hairless. Distinctive shield-shaped, pointy abdomen.

Similar Looking Insects: Other small bees, like sweat bees (*Lassioglossum* spp.). Small metallic syrphid flies.



Lasioglossum (Dialictus) sp. Sweat Bee



Lasioglossum kincaidii Sweat Bee



Platycheirus sp. Syrphid Fly



Paragus haemorrhorus Syrphid Fly



Halictus **spp.**Sweat Bees

Flight Season: Spring through Fall. Females emerge in March and males in June.

Lifestyle: Primitively social with annual colonies.

Nesting Habitat: Nest in flat, bare ground. May be aggregated.



Above: Female *H. ligatus*. Note the pollen on the legs and abdomen.



Above:. Male *H. tripartitus*. Note the long antennae and markings on lower face.



Above: Size comparison of different bees. Left to right: *Xylocopa varipuncta, Bombus vosnesenskii* (worker), *Apis mellifera*, and *Halictus tripartitus*.



Above Left: Female *Halictus farinosa* on *Eschscholzia* flower. Note the pollen on legs and base of abdomen.

Above Right: Female *Halictus tripartitus* on *Eriogonum grande* var *rubescens* flower.







Above Left: Entrances to *H. tripartitus* nests. Note penny for scale.
Above Right: Female *H. tripartitus* exiting nest.
Left: Female *H. tripartitus* near nest entrance.

Pollen Transport: On outer parts of hind legs to sides of torso. Rather messy collectors.

Size and Shape: Medium to small. Elongate bodies. Females are larger.

Color: Dark with pale hair bands on abdomen.

Notable Features: Males usually have yellow markings on lower face and longer antennae.

Similar Looking Insects: Some small bees like *Lasioglossum* spp. and *Andrena* spp.



Lasioglossum mellipes Sweat Bee



Lasioglossum olympiae Sweat Bee



Andrena auricoma Mining Bee



Andrena angustitarsata Mining Bee



Lasioglossum spp. **Sweat Bees**

Flight Season: March-August.

Lifestyle: Solitary.

Nesting Habitat: Nest in flat, bare ground.

May be aggregated.





Left: Female *Lasioglossum* (Dialictus) sp. Collecting pollen from anthers of Phacelia campanularia.

Right: Phacelia campanularia plant shown for scale of Lasioglossum (left).

Right:

Male Lasioglossum (Dialictus) sp. Note the long antennae and sparse hairs on legs.





Above Left: Female Lasioglossum kincaidii visiting Erigeron glaucus. **Above Right:** Female *Lasioglossum mellipes*. Note the pollen grains on all parts of the body.



Left: Female Lasioglossum (Dialictus) sp. on an anther. Notes the pollen on the hind leg and base of abdomen.

Pollen Transport: On outer hind legs inward to sides of thorax.

Size and Shape: Medium to small. Elongate, slender bodies. Females are larger than males.

Color: Dark often with pale hairs on thorax and pale hair bands on abdomen.

Notable Features: Females have dark faces. Males usually have yellow marking on lower face.

Similar Looking Insects: Some small bees like Halictus, Andrena, Hylaeus, and Ceratina spp.



Halictus ligatus Sweat Bee



Lasioglossum olympiae Sweat Bee



Hylaeus punctatus Masked Bee



Ceratina acantha Small Carpenter Bee



Megachile spp.
Leafcutting Bees

Flight Season: May to September; peak

activity from June to August

Lifestyle: Solitary nesters.

Nesting Habitat: Mostly cavity nesters. Use neatly cut pieces of leaves or petals to construct brood cells.





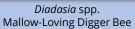




Clockwise from top left: Female *Megachile perihirta*; female *Megachile gemula*; female of non-native species *Megachile rotundata*; male of non-native species *Megachile rotundata*.

Similar Looking Insects: Some *Diadasia* spp.







Diadasia nigrifrons Mallow-Loving Digger Bee



Above Left: Female *Megachile cetuncularis* visiting African Blue Basil flower. Note the pollen on her head and abdomen. **Above Right:** Female *Megachile fidelis* on *Aster chilensis*.







Clockwise from top left: Female *Megachile* holding a cut leaf in her mandibles; *Megachile* brood cell with larvae; completed *Megachile* nest.

Pollen Transport: On underside of abdomen.

Size and Shape: Large to small. Stout-bodied. Females are larger than males.

Color: Usually have pale hair on thorax and pale stripes on abdomen. Some exceptions (e.g. *Megachile gemula*).

Notable Features: Females usually have a triangular or heart-shaped abdomen with pointy tip. Males have longer antennae and tips of their abdomens are blunt.



Osmia **spp.** Mason Bees

Flight Season: March-June. Lifestyle: Solitary nesters.

Nesting Habitat: Mostly cavity nesters. Some species, like *Osmia lignaria*, use mud for brood cell creation.



Above: Female *Osmia* sp. collecting pollen from a *Phacelia campanularia* flower.



Above: Female *Osmia lignaria* visiting an apple blossom for nectar. Note the pollen being deposited on her abdomen at the same time.



Above: Female *Osmia* atrocyanea. Note the dark metallic coloring.



Above: Osmia sp. visiting a *Phacelia* sp. Flower for nectar. Note the bright metallic green coloring.

Similar Looking Insects: Some Hoplitis spp.



Hoplitis albifrons Hairy Belly Bee



Hoplitis fulgida Hairy Belly Bee



Above Left: Female *Osmia coloradensis*. Note rounded body parts and pollen on abdomen.

Above Right: Female *Osmia lignaira* visiting Redbud flower. While she is visiting for nectar, pollen is being deposited on her abdomen.









Clockwise from top left: Female *Osmia* sp. Exiting her nest in a *Rubus* stem; Plugged *Osmia* nest in a *Rubus* stem; Female *Osmia lignaria* collecting mud; Females of *Osmia* sp. Collecting mud

Pollen Transport: On underside of abdomen.

Size and Shape: Large to small. Stout-bodied with rounded heads, thoraces, and abdomens which consecutively increase in size.

Color: Usually dark metallic blue. Some species are bright metallic green.

Notable Features: Females generally have dark faces. Males are smaller, leaners, and have longer antennae. Males often have dense moustache-like patches of white hair on their faces and rounder abdomens.



*Xylocopa varipuncta*Valley Carpenter Bee

Flight Season: Year-round. Peak activity from March-August.

Lifestyle: Solitary nesters. Often long-lived. Males and females overwinter in groups.

Nesting Habitat: Excavate nests into soft wood or large pithy stems.





Above: Size comparison of different bees. Left to right: *Xylocopa varipuncta, Bombus vosnesenskii* (worker), *Apis mellifera,* and *Halictus tripartitus*.

Left: Female *X. varipuncta* nectarrobbing an *Abutilon* flower. Note she is all black with dark wings.



Above Left: Female *Xylocopa varipuncta* visiting *Wisteria sinensis* flower for nectar. *Xylocopa* are one of the only bees large enough to access the nectaries of banner and keel flowers. **Above Right:** Male *Xylocopa varipuncta* visiting *Salvia* flower. Note his golden color, making him easily identifiable.



Above: *Xylocopa* nest in dried Yucca stem. Note the various stages of development: metamorphosis into adult (far left) and larval stages.

Right: Live male *X. varipuncta* (Teddy Bear Bee) being safely held, as male bees cannot sting.



Pollen Transport: On hind legs.

Size and Shape: Large and stout-bodied.

Color: Females are black. Males are goldenbrown, with yellow markings on face.

Notable Features: Sparse hair. Female have dark wings that have a violet metallic reflection. Males have green eyes.

Similar Looking Insects: Bumble bees and various flies (horse flies, cactus flies, and bee flies).



Bombus vosnesenskii Yellow-faced Bumble Bee



Bombus melanopygus Black-tailed Bumble Bee



Mallota bautias Syrphid Fly



Bombyliidae Bee Fly