



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.

Agapostemon texanus

Ultra 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.



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

Left: Females of *Agapostemon texanus* at nest entrance with penny for scale.



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



Pollen Transport: On hind legs. Rather messy collectors.

Size and Shape: Medium to small. Slender-bodied.

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



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.

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.



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.



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

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.



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

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 fulgidus
Polyester Bee



Bombus spp. Bumble Bees

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

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.



Top Left: *Bombus melanopygus* workers at entrance to nest in a birdhouse.
Top Right: Exposed *Bombus melanopygus* nest.
Left: *Bombus vosnesenskii* workers at entrance to underground nest.



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*.



Pollen Transport: Transported as moistened pellets on hind legs.
Size and Shape: Medium to very large. Stout-bodied. 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 (*Anthophora* spp. and *Xylocopa* spp.). Robber flies and syrphid flies.



Male *Xylocopa tabaniformis orpifex*
Carpenter Bee



Anthophora bombooides
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). Multi-generational.

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

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*.



Top Left: Female *Ceratina* sp. visiting wild rose. Note pollen collected on legs.

Top Right: Female *Ceratina acantha* on thumb for scale.

Left: Shield-shaped tip of abdomen.

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



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

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



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

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. on an anther. Notes the pollen on the hind leg and base of abdomen.



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.

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.

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.



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

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.

Similar Looking Insects: Some *Diadasia* spp.



Diadasia spp.
Mallow-Loving Digger Bee



Diadasia nigrifrons
Mallow-Loving Digger Bee



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.



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, leaner, and have longer antennae. Males often have dense moustache-like patches of white hair on their faces and rounder abdomens.

Similar Looking Insects: Some *Hoplitis* spp.



Hoplitis albifrons
Hairy Belly Bee



Hoplitis fulgida
Hairy Belly Bee



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.

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 : *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.



Above: Size comparison of different bees. Left to right: *Xylocopa varipuncta*, *Bombus vosnesenskii* (worker), *Apis mellifera*, and *Halictus tripartitus*.
Left: Female *X. varipuncta* nectar-robbing an *Abutilon* flower. Note she is all black with dark wings.

Pollen Transport: On hind legs.
Size and Shape: Large and stout-bodied.
Color: Females are black. Males are golden-brown, 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