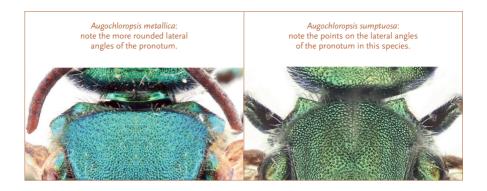
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Augochloropsis sumptuosa is the only other Augochloropsis that extends to the West. On the sides of the pronotum of A. sumptuosa are wide projections, which are very distinctive. Also, on the head, the vertex bulges, rising up above the ocelli noticeably when viewed straight on at the face.

#### **AGAPOSTEMON**

- SUBFAMILY: Halictinae
- TRIBE: Halictini

**OVERVIEW:** Small to medium-sized bees commonly seen from mid-spring through late fall. All *Agapostemon* species nest in the ground. May nest solitarily, communally with many females using one hole, or in dense aggregations. May even nest among aggregations of other bees, including *Halictus, Nomia*, and *Andrena*. Nests can be in lawns, vertical banks, or shallowly sloped hills. *Agapostemon* are generalists, found on a variety of flowers. Males sometimes swarm around larger blooming shrubs, especially in the fall. Many species are bivoltine or multivoltine. Fertilized females overwinter, emerging in early spring. After foraging and nesting, they die. Their offspring are the late-summer/fall generation, with females of this generation

emerging first, and males emerging in early fall to mate with the females that will overwinter again, fertilized.

IN THE WORLD: Agapostemon are found only in North, Central, and South America. There are 14 species north of Mexico. Eleven occur in western states. CLEPTOPARASITES: Nomada and Sphecodes.

**IDENTIFYING FEATURES:** Agapostemon all have a brilliant green head and thorax. **HEAD:** Green in both sexes, but lower half

All Agapostemon have a strong ridge around the perimeter of the propodeum.



of clypeus yellow in males. No indentation along the inner margins of the compound eyes. **THORAX**: The perimeter of the propodeum is carinate, separating this genus from other metallic green Halictidae (see Augochlorini). **WINGS**: Basal vein is strongly curved. **LEGS**: The hind tibiae are very long—at least as long as all the tarsal segments of the hind leg together. Males have four tarsal segments on the hind legs, instead of the more typical five tarsal segments. **ABDOMEN**: In females the abdomen is usually green (but see *A. virescens*). Male individuals can be identified by the yellow-and-brown or black stripes running across the abdomen.

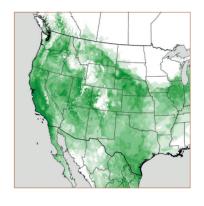
#### — Agapostemon texanus

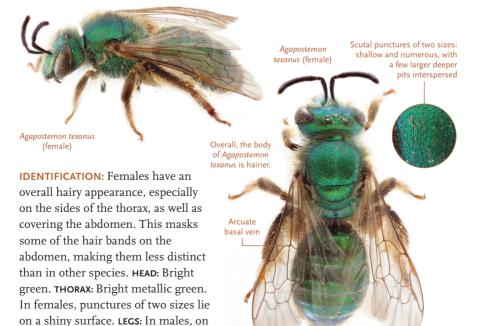
SIZE: Small to medium; 9—II mm.

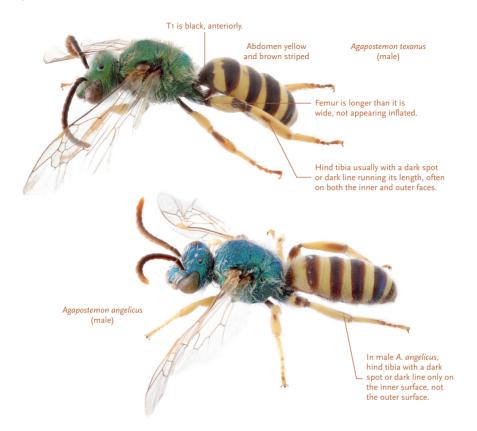
PHENOLOGY: April through October;
multivoltine. FLORAL HOSTS: Polylectic.

RANGE: Extremely widespread, occurring from southern Canada south through Costa Rica and from coast to coast. Nesting: Solitary; may be communal in some cases. Nests in a variety of soil types, and may be in flat areas, or vertical banks. Can occur in aggregations with other individuals, or even with other bee species (i.e., Halictus species).

the hind leg, the inner face of the tibia







has a dark stripe or spot running from the femur to the basitarsus; often a mark on the outer face as well. ABDOMEN: In females, abdomen is green. In males, the yellow-and-black-striped abdomen may appear lightly metallic, especially laterally, and  $S_5$  and  $S_6$  are yellow.

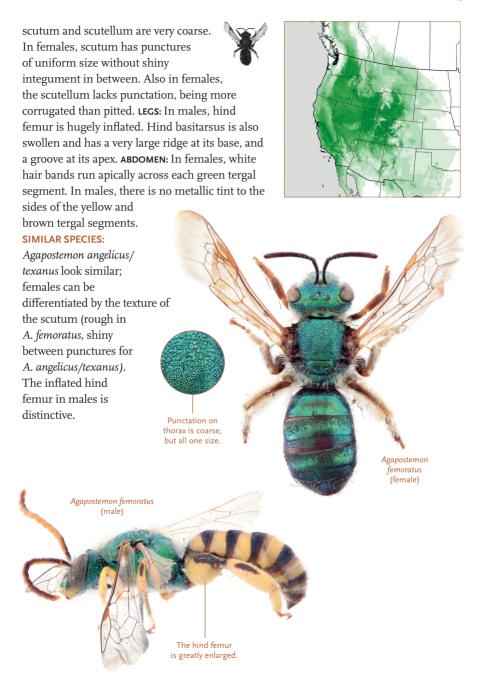
**SIMILAR SPECIES:** In the western U.S., females of *Agapostemon angelicus* and females of *A. texanus* are indistinguishable. The shiny thorax, due to sparse punctation and polished integument, is characteristic. In males, the hind tibia of *A. angelicus* has black or brown markings on the inner surface (facing the abdomen), but not on the outer surface.

# — Agapostemon femoratus

**SIZE:** Small to medium; 9–II mm. **PHENOLOGY:** March through November. **FLORAL HOSTS:** Broad generalist. **RANGE:** Southern Canada to Mexico, California to the Rocky Mountains. Found from sea level to more than 10,000 feet. **NESTING:** Nests are deep, often in compacted soil.

**IDENTIFICATION:** Medium-sized green bee. Males with yellow-and-black-striped abdomen. **HEAD:** Green. In males, with a yellow band across the lower portion of the clypeus. Also in males, antenna yellow dorsally and darker brown ventrally. **THORAX:** The



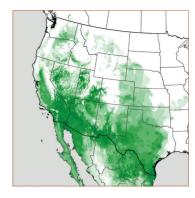


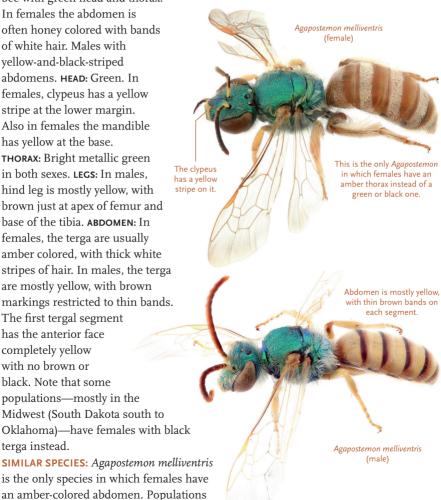
## - Agapostemon melliventris

SIZE: Small to medium; 9-11 mm. PHENOLOGY: March through December, FLORAL HOSTS: Broad generalist. RANGE: Mexico north to Idaho, Oregon, and southern Washington. West to California and (rarely) east to the Mississippi River. Most common in the southwestern deserts. **NESTING**: Nests in the ground in relatively deep nests.

IDENTIFICATION: Medium-sized bee with green head and thorax. In females the abdomen is often honey colored with bands of white hair. Males with yellow-and-black-striped abdomens. HEAD: Green. In females, clypeus has a vellow stripe at the lower margin. Also in females the mandible has vellow at the base. THORAX: Bright metallic green in both sexes. LEGS: In males. hind leg is mostly yellow, with brown just at apex of femur and base of the tibia. ABDOMEN: In females, the terga are usually amber colored, with thick white stripes of hair. In males, the terga are mostly yellow, with brown markings restricted to thin bands. The first tergal segment has the anterior face completely vellow with no brown or black. Note that some populations—mostly in the

Midwest (South Dakota south to Oklahoma)—have females with black terga instead. **SIMILAR SPECIES:** Agapostemon melliventris is the only species in which females have

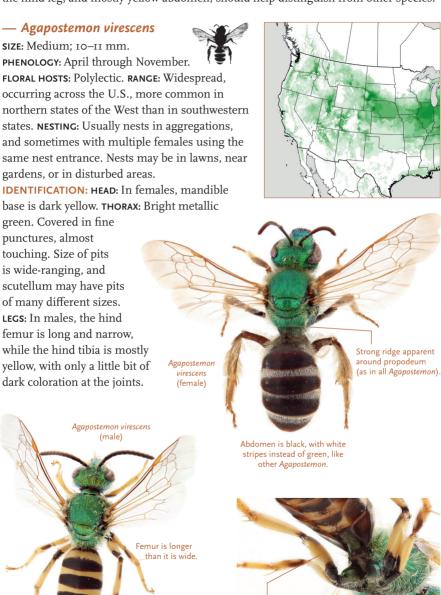




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AGAPOSTEMON 4

with a black-and-white abdomen resemble *A. virescens*, though the yellow lower rim of the clypeus in *A. melliventris* females is distinct. In males, the lack of maculations on the hind leg, and mostly yellow abdomen, should help distinguish from other species.



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Abdomen is yellow with brown stripes (or brown with yellow stripes?).

Femur is longer than it is wide, not looking inflated.

**ABDOMEN:** In females, the abdomen is black, with white hair bands. There are no yellow markings on the sterna of males, though the tergal segments are yellow with brown stripes. Also in males, on S6 there is an oval-shaped depression with a ridge in the middle.

**SIMILAR SPECIES:** There are three western species in which the abdomen of females is black. *Agapostemon virescens* is a predominantly eastern species that continues into northern states in the Midwest and West. *Agapostemon coloradinus* is more widespread throughout the West. More common in southern states, and can be difficult to distinguish from *A. virescens*. On the mandible, the base is dark brown to black in *A. coloradinus*. *Agapostemon tyleri* is rarer, occurring mostly in the Southwest. It differs from *A. virescens* in the pits on the scutellum, which are in two sizes only in *A. tyleri*, but are highly variable in *A. virescens*.

#### **HALICTUS**

- SUBFAMILY: Halictinae
- TRIBE: Halictini

**OVERVIEW:** Small to medium, incredibly abundant brown to black bees. All *Halictus* nest in the ground, and many exhibit varying levels of sociality, even within the same species depending on the length of the flowering season. Because of their social lifestyles, *Halictus* species are often seen for a long period of the flowering season, rather than for a short window in the spring or summer. As such, they are all generalists. *Halictus* are one of a few bees that will land on humans and "lick" the salty sweat from their skin. **IN THE WORLD:** Found on all continents except Australia. Most common in Northern Hemisphere. Nearly 300 species are known. In western North America there are eight species.

**CLEPTOPARASITES:** *Sphecodes* are common parasitic bees of *Halictus*. **IDENTIFYING FEATURES:** Some species may have light metallic green or copper hues, but the majority are matte black/brown. Males are long and slender, with long antennae





Each tergal segment ends with a band of white hair.

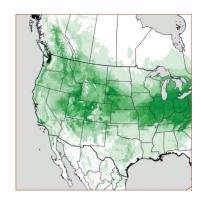
that reach to the back of the thorax. HEAD: The gena is usually thick, giving the head a bulky appearance. Male faces include yellow markings on the clypeus, and the legs may be yellow (or red) as well. WINGS: Halictus have the arcuate basal vein that is characteristic of many Halictidae. Veins that define the first, second, and third submarginal cells are strongly developed. ABDOMEN: The hair bands are apical, running across the end of each tergal segment. In worn specimens this may be less visible in the center, but the hair is usually still present on the sides.

We cover characteristics for identifying the five most common species here. SIMILAR GENERA: Halictus look superficially similar to Lasioglossum. Though some Halictus species may exhibit lightly metallic colorations, they are never as prominently metallic as Lasioglossum subgenus Dialictus. The heads of Halictus individuals are thicker than those of Lasioglossum. The wings of Lasioglossum often have weak veins separating the submarginal cells, which is not the case with Halictus. And tergal hair bands in Halictus are apical, while in Lasioglossum, if present, they are basal. Andrena and Colletes may also bear some resemblance. The arcuate basal vein is useful in separating Halictus from these two.

## — Halictus confusus

SIZE: Small; 7 mm. PHENOLOGY: March through October. FLORAL HOSTS: Polylectic.
RANGE: Across the U.S. and Canada, as far north as northern Quebec, and northern Alberta. Also found in northern Europe and northern Asia. NESTING: Ground-nesting bee, often gregarious. Interconnected nests may have multiple entrances. LIFE HISTORY: Eusocial bee with annual colonies. One generation of mated queens (foundresses) overwinter, emerging between March and May and digging a new nest in the ground. They produce a brood of workers and some males that are mature by midsummer.

Some of these females retain the ability to make their own offspring, but some are sterile. All females nest together, with many passively provisioning nest cells for the queen's eggs, while others are bullied by the larger queen into helping with her offspring. If the queen dies, one of these reproductively mature daughters will take over egg-laying. In the fall, males and the next year's queens are produced. Therefore, this bee exhibits both univoltine and bivoltine life histories.



#### **IDENTIFICATION:** Very common bee, especially

abundant from June through October. In the early spring, individuals seen are likely queens that have overwintered—they appear worn with ragged wings and worn-down mandibles. Smaller individuals that appear around the summer solstice are usually this year's workers. Often confused with <code>Lasioglossum</code> (<code>Dialictus</code>). In both sexes, bees are moderately metallic blue or green; not matte black. <code>HEAD</code>: In females, the clypeus is not metallic, so appears darker than the rest of the face and protrudes slightly. The supraclypeal area is rectangular, with the subantennal sutures longer than the epistomal suture

so that the face is longer than broad. In males, the face is oval-shaped—much longer than broad, and the underside of the antennae is light yellow. **THORAX**: The dorsal surface of the propodeum is finely and unevenly striated. **WINGS**: The wings are clear



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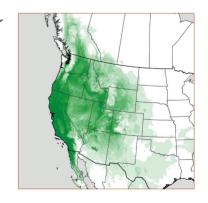
*tripartitus* is significantly more common than *H. confusus* in western states. Between the two, the face of *H. confusus* is longer in females. In males, the color of the antennae and the foretrochanters is yellower in *H. confusus* than in *H. tripartitus*. Additionally, the striations on the propodeum are finer in *H. confusus*.

# — Halictus farinosus

SIZE: Medium; 12 mm. PHENOLOGY: April through October. FLORAL HOSTS: Broad generalist. RANGE: Widespread.

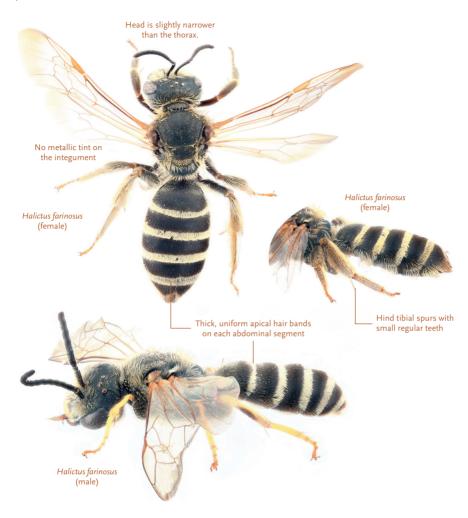
New Mexico north to southern Canada, west to the Pacific Ocean. **NESTING**: Primitively eusocial, nest in the ground. **LIFE HISTORY**: Very similar to *H. confusus*; see above.

**IDENTIFICATION:** Large *Halictus* species with no metallic tints. **HEAD:** In females, the head is narrower than thorax. No genal tooth protrudes from the posterior portion of the head.



**THORAX**: No metallic tint. **LEGS**: Hind tibial spurs with small regular teeth. **ABDOMEN**: In females, tergal segments have thick, uniform apical hair bands. In males, there are short, flattened hairs on the fourth sternal segment.

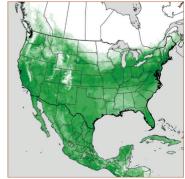
**SIMILAR SPECIES:** Similar to *H. rubicundus*; in females, hair bands in *H. rubicundus* are narrow at the center. Hind tibial spur in *H. rubicundus* has large irregular teeth. In males of *H. rubicundus* there are no appressed hairs on S4, as there are in *H. farinosus*.

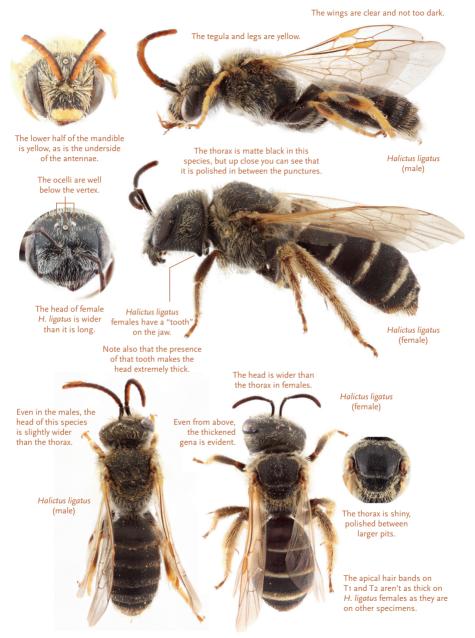


# — Halictus ligatus

SIZE: Small; 7—10 mm. PHENOLOGY: March through October in northern states, year-round in Florida. FLORAL HOSTS: Polylectic. RANGE: Widespread across North America, with records as far north as southern Canada. NESTING: Ground-nesting bee, often in large colonies, in nests that have multiple entrances. LIFE HISTORY: Very similar to *H. confusus*; see above.

**IDENTIFICATION:** Very common summer bee. Body is matte black, without a metallic sheen, though the surface of the thorax is polished





between punctures, which are small and close together. HEAD: In females, the head is large, wider than thorax, and also thick, with a protuberance (tooth) occurring at the posterior ventral corner of the gena (near the back lower margin). This is stronger or weaker depending on the specimen but is always present. In instances where the lower

part of the face isn't visible, the thicker genal area is still evident, being much wider than the width of the compound eye. From the front, the face is wider than long, and the ocelli are well below the vertex. In males, the lower half of the clypeus is yellow, as are the mandibles, the underside of the antennae, and the tegulae. The face is relatively round, and the wings are clear (not brown or dusky). THORAX: Punctures on scutum are fine, but deep and distinct. LEGS: In males, the tibiae are reddish, with a yellow stripe, and the tarsi are yellow. ABDOMEN: In females, apical hair bands on T1 and T2 are narrow, almost inconspicuous. In males, S2 and S3 have long hairs that stand up. SIMILAR SPECIES: No western *Halictus* species has the toothed gena seen in females of this bee. *Halictus ligatus* and *H. parallelus* males look similar. *Halictus parallelus* is rare in western areas, seen mostly in eastern or plains states. The wings of *H. parallelus* are darker, and the thorax is not as polished as in *H. ligatus*. The face of male *H. ligatus* is much wider than long, with the ocelli set well below the vertex, compared with other western *Halictus* species.

#### — Halictus rubicundus

SIZE: Medium; 10–11 mm. PHENOLOGY:
March through November. FLORAL HOSTS:

Polylectic. RANGE: Widespread across North America, occurring throughout Canada and into Alaska. Also found in Europe. **NESTING**: Ground-nesting bee, nesting in a variety of soil types but appearing to prefer loosely packed earth. LIFE HISTORY: Eusocial or solitary bee depending on the climate. In cooler climates (Alaska, northern Canada, northern Europe), the bees are solitary. In warmer climates, the bees are eusocial, with foundresses emerging earlier in the spring than solitary individuals farther north, to start their own nests. After rearing a single brood, the female (gyne) remains in the nest rearing a second brood, while the majority of her daughters commence gathering pollen for their mother's next batch of offspring. In the fall, next year's foundresses mate, and hibernate for the winter. **IDENTIFICATION:** Medium-sized matte-black summer bee; larger than most Halictus. HEAD: In males, the eyes are angled inward, nearly converging, and the clypeus sticks out noticeably from the head; the bottom half of it is bright yellow. The mandible is nearly all black at the apex. LEGS: In

females, on the hind tibia, the hindmost





of the two spurs has large irregularly shaped teeth. Female legs are light red in color. In males, the femur and the tibia are yellow to orange, though the femur has a dark spot on it. ABDOMEN: In females, the apical hair bands are narrow, especially near the center. In males, S4 has a brush of hair along the apex and the margin of S5 is concave. Also in males, the final tergal segment does not have a band of hair. SIMILAR SPECIES: The black antennae of the males, and dark black body, combined with thin (nearly absent on older specimens) apical hair bands, are distinctive features on this bee. In the Midwest it looks most similar to *H. parallelus*, but the redder legs and larger body size of that bee should help to distinguish between the two.

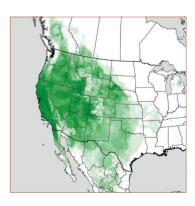
## — Halictus tripartitus

SIZE: Small; 5–8 mm. PHENOLOGY:

March through October. FLORAL HOSTS:

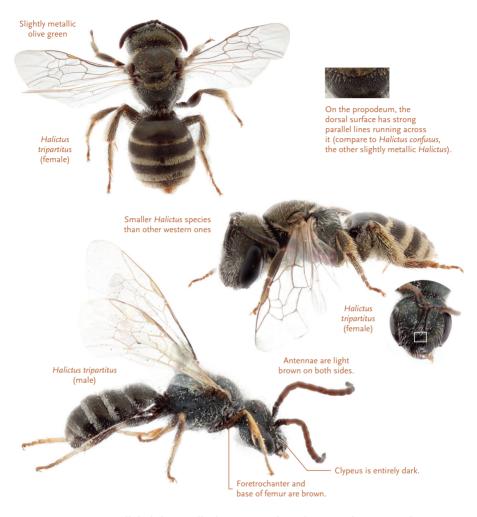
Polylectic. RANGE: Super-abundant widespread species found throughout the West in large numbers. Ranges as far east as Missouri, north to British Columbia, and south to Mexico.

NESTING: Ground-nesting bee, appears to prefer packed earth. Nests are often connected in the ground even though they have separate nest entrances. LIFE HISTORY: Eusocial with annual colonies. Select females (gynes) are mated in



the fall and overwinter in a hole in the ground. In the spring these foundresses begin new nests and forage for pollen until their first generation of sterile daughters are mature. These smaller workers forage for pollen for a second, late-summer generation, which includes males, and next year's gynes.

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**IDENTIFICATION:** Small, lightly metallic bee. **HEAD:** The subantennal suture is short, about half the length of the epistomal suture, so that the supraclypeal area is square in shape. The malar space is short, giving the head a very round appearance. In males, the antennae are brown, only slightly lighter on the bottom than the top. Also in males, the clypeus is entirely dark. **THORAX:** The pits on the scutum are small but distinct. The propodeum has deep, parallel striations. **LEGS:** In males, the trochanter and base of the femur on the foreleg are brown, while the apical two-thirds of the femur are light yellow. **SIMILAR SPECIES:** For most of the West, a metallic *Halictus* specimen is *H. tripartitus*. In the Midwest, *H. tripartitus* and *H. confusus* overlap; the shape of the faces of females differs, with *H. confusus* females, and males to a lesser degree, having longer faces. Other differences include the color of the foretrochanters and antennae in males, and the striations on the propodeum.

— TRIBE: Halictini

OVERVIEW: Petite or small, generally metallic bees. Though their small size makes them less noticeable, by midsummer these are the dominant bees in many environments. Species range from being solitary to completely eusocial. Most nest in the ground, but some nest in rotting wood. IN THE WORLD: Worldwide there are more than 600 species. In North America there are roughly 300 species, with more than 200 species in the western U.S. and Canada.

**CLEPTOPARASITES:** Sphecodes.

IDENTIFYING FEATURES: Lasioglossum are considered one of the most difficult groups to identify with confidence. Among the many hundreds of species, the distinguishing

characteristics are minute and, in many cases, grade into each other. *Lasioglossum*, in the broad sense, consists of four subgenera that differ markedly in their appearance. Most common are *Lasioglossum* (*Dialictus*). Though not as



In Lasioglossum species that have hair bands, the band is basal, at the beginning of each tergal segment instead of the end.

common as *L.* (*Dialictus*), the subgenera *L.* (*Lasioglossum*), *L.* (*Hemihalictus*), and *L.* (*Sphecodogastra*) are also frequently seen. The characteristics defining these groups bleed together. With few unique characters to identify subgenera, often combinations of many characters are required together to separate them. All are united under the genus *Lasioglossum* by the following: First, as with many species within the family Halictidae, the wing has a distinct arcuate basal vein, often visible in photographs taken at the correct angle. There are two or three submarginal cells (usually three), and the veins separating them are often weak. *Lasioglossum* specimens are usually petite, small to medium-sized bees. All subgenera of *Lasioglossum* have basal hair bands (i.e., at the beginning of the tergal segment). These are strongest across the first two or three tergal segments. Many specimens are shiny and may (as in the case of subgenus *Dialictus*) or may not (most other subgenera) have a light metallic sheen to the body. A few species have red abdomens. We include representatives from the subgenera *Dialictus*, *Hemihalictus*, *Lasioglossum*, and *Sphecodogastra*, focusing on the females.

Note that many *Lasioglossum* occur in the West that may have similar features to the bees included here. With few exceptions, *Lasioglossum* are challenging to identify and require multiple keys (see references) and a microscope. Moreover, many species have not been named or described. And many males are indistinguishable from each other.

#### LASIOGLOSSUM (DIALICTUS)

**SIZE**: Petite to small; 4–10 mm. **PHENOLOGY**: April through October, with peak abundance during July and August. **FLORAL HOSTS**: Polylectic. **RANGE**: Widespread across western North America. **NESTING**: Ground nester.

**IDENTIFICATION:** Often incredibly abundant, though the small size and diminutive habit make them easy to overlook. The head and thorax are a light aquamarine, olive green, or deep gunmetal blue color. This subgenus is unique among *Lasioglossum* in that the integument of the thorax always has a metallic reflection. Some species have entirely red abdomens, or abdomens with one or two red tergal segments.

Features used to distinguish between species include the presence, size, and distance between puncture marks on the thorax, the degree to which the scutum is polished, the texture and ridges of the propodeal rim, the density and depth of grooves underneath the head, the pattern of the hair on the anterior face of Tr, and the shape of the tegula. Many western species have not been described. Males can be especially difficult.

#### — Lasioglossum (Dialictus) cressonii

SIZE: Small; 5–7 mm. PHENOLOGY: March through November. FLORAL HOSTS: Broad generalist. RANGE: Pacific Northwest to the Northeast, absent from the deserts of the Southwest and the Great Basin. NESTING: Nests in old rotten wood.

**IDENTIFICATION:** Green small bee, common in the summertime. **HEAD:** Green head in both males and females, with light gold or blue reflections. In females, the head is relatively round, not significantly longer than it is wide. In males, the antennae are elongate, with each antennal segment more than one and a half

times as long as wide. THORAX: The thorax is also gold/green, with dense pits on the scutum. Below the wing, there are no pits, though the surface is heavily corrugated. The propodeum is outlined by a strong carina that is broken right at the dorsal center; thus, the propodeum looks like it is outlined by a heart. WINGS: The wings are slightly darkened. LEGS: In males, the tarsi are yellow. ABDOMEN: The abdomen is brown. In females there are dense flattened

hairs on T2-T4.



Lasioglossum (Dialictus) hudsoniellum (female)

**SIMILAR SPECIES:** Most similar in appearance to *L. albipenne* and *L. oceanicum*. The wings of L. albipenne are lighter, and the punctation on the scutum is sparser. It appears slightly bluer. Lasioglossum oceanicum, mostly eastern, also appears more blue than green, and the propodeal carina is not interrupted in the middle.

## — Lasioglossum (Dialictus) hudsoniellum

SIZE: Petite to small; 4-6 mm. PHENOLOGY: May through August. FLORAL HOSTS: Generalist, though commonly found on creosote bush (Larrea tridentata) and rabbitbrush or chamisa (Ericameria). RANGE: Alberta south to Arizona, New Mexico east to Colorado. Texas: rare in northern portions of its range. NESTING: Ground nester.

**IDENTIFICATION:** Small bee with green thorax and red abdomen. HEAD: The head is a blue to

gold green. In females, the lower half of the clypeus is rusty brown. The paraocular area (next to the compound eyes, beside the clypeus) has dense white hairs. In males, the clypeus (the lower half of which is yellow) and the areas around it are covered in dense

white hair. THORAX: The tegulae are pale yellow. In females, the scutum is covered in dense. very tiny pits. The sides of the thorax are heavily corrugated, but with deep punctures as well. The propodeum has no carina running around it. In males, the thorax is polished, with deep, sparse pits. ABDOMEN: In both

sexes, the abdomen is rusty red. In females, T3-T4 are covered in thick, appressed white hair. The anterior

surface of T<sub>I</sub> is polished, with only a few appressed hairs.

SIMILAR SPECIES: Lasioglossum hudsoniellum is by far the most common Lasioglossum (Dialictus) species with a red abdomen, but there are other "red-tailed" Lasioglossum. Lasioglossum arenisaltans shares many of the same characters but is a sand-dune specialist and not as common as L. hudsoniellum. Lasioglossum spivakae also appears similar, but it is a smaller bee, with dark bands running across the otherwise red Tı-T3. Lasioglossum spivakae is most common in Nevada and Utah. It should also be noted that L. hudsoniellum is a widespread species that varies in some of its characters; specimens from the Great Plains may have a black abdomen. Those from western deserts often have paler wing venation.

# — Lasioglossum (Dialictus) imitatum

SIZE: Petite to small; 3–5 mm. PHENOLOGY:
Mid-May through August. FLORAL HOSTS:
Broad generalist. RANGE: Southern Canada
south through Arizona and Florida. Absent only
from far western states (Oregon, Washington,
Nevada, and California), becoming increasingly
common as one moves east. NESTING: Ground
nester. Eusocial species, with colonies restarted
every year by inseminated females that
overwinter in the nest in which they

were born. Queens and workers exist, but are not as sharply defined as in honey bees and bumble bees.

IDENTIFICATION: Very small

Lasioglossum with blue thorax and brown abdomen. HEAD: Head is a pale green. In females, the gena is wider than the eye, and the head is very round. The clypeus is dark on the lower half.

**THORAX:** Scutum is covered with fine pits. The sides of the thorax, below the wings,

are roughened, with no distinct pits.

**ABDOMEN:** The abdomen is brown. On T<sub>3</sub> and T<sub>4</sub> there are stout, widely spaced flattened hairs.

SIMILAR SPECIES: Numerous unnamed western species

look similar, especially in the Midwest. Comparing to reference material is likely needed to verify this species. It is similar in size to the small *L. (Dialictus) microlepoides*, but that species does not have flattened hairs on T<sub>3</sub> and T<sub>4</sub> in females.



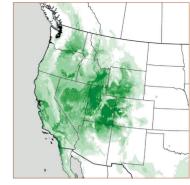
SIZE: Small; 5–7 mm. PHENOLOGY: May through August. FLORAL HOSTS: Broad generalist. RANGE: Pacific Northwest; northern California into British Columbia and east to Alberta. NESTING: Ground nester.

**IDENTIFICATION:** Larger green-gold *Lasioglossum* with abundant white hair. **HEAD:** Gold/green with white hair so thick it almost covers integument. In females, head round; males with slightly longer heads. Also in females, gena with long hairs that appear like a beard, lower portion of clypeus brown. **THORAX:** Gold/green with widely spaced deep pits. Thick white hair covers the surface. **ABDOMEN:** Gold/green, like the thorax, and polished. The forward face of T1 has a thick fan of appressed white hairs. All tergal segments covered in additional white hair. The dorsal surface of the



propodeum outlined with a polished, rounded rim.

**SIMILAR SPECIES:** Lasioglossum hyalinum appears similar to *L. albohirtum* in that it has abundant white hair and widely spaced pits on the scutum. It is more common in the Great Basin: both males and females have bluer metallic tints on the head and thorax, and a brown abdomen. There are two undescribed species in the West that appear similar to *L. albohirtum* and are more widespread. In one, females have yellow on the lower portion of the clypeus instead of brown. In the other, there is less hair, and the scutum has smaller, shallower pits.



Lasioglossum (Dialictus)

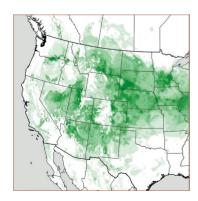
albohirtum (female)

# — Lasioglossum (Dialictus) pruinosum

SIZE: Small; 5-7 mm. PHENOLOGY: May through August. FLORAL **HOSTS:** Broad generalist. **RANGE:** Widespread in the Midwest, and the Sonoran and Chihuahuan

deserts. Absent from Nevada, California, and most of Oregon and Washington. NESTING: Ground nester.

IDENTIFICATION: Larger Lasioglossum. HEAD: Light blue-green head. In females, slightly longer than it is wide, with apex of clypeus dark. In males, head is especially long and covered in thick white hair, which is yellow at the apex. THORAX: The scutum has dense pits, but near the center they are widely spaced. WINGS: The veins on the wing are light colored, with the stigma appearing almost pure





white. With magnification, tiny bright white hairs can be seen. ABDOMEN: Steel blue, with abundant white hair.

**SIMILAR SPECIES:** *Lasioglossum succinipenne* and *L. pilosum* appear similar in that the abdomen is the same color and the face is also elongated. The pterostigma is a darker brown in these two species than in L. pruinosum, and the hair is yellower, instead of bright white. The two overlap with L. pruinosum only in north-central Canada and northern Midwest states.

#### — Lasioglossum (Dialictus) semicaeruleum

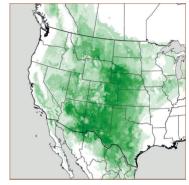
SIZE: Small; 5–8 mm. PHENOLOGY: Late May through August. FLORAL HOSTS: Broad generalist. RANGE: Widespread in the Midwest, and the Sonoran and Chihuahuan deserts but missing from the Columbia basin, the Pacific Northwest. and California. NESTING: Ground nester.

**IDENTIFICATION:** Larger bright metallic

Lasioglossum. HEAD: In females, slightly wider than it is long. In males, the antennal segments are about one and a half times as long as wide, and yellow on the side that faces the face. THORAX: Coarse punctation on the scutum. On the sides of the thorax, below the wings, there are coarse

punctures. On the propodeum, the portion that faces up has sinuous ridges, but there is no strong carina separating the dorsal and posterior faces. WINGS: With light pale veins. ABDOMEN: The tergal segments are blue to green. On T<sub>I</sub> there is a strong fan of appressed hairs on the anterior

hairs cover the surface.





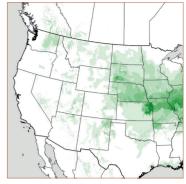
**SIMILAR SPECIES:** Similar to *L.* (*Dialictus*) albohirtum, but that species has finer shallow pits on the thorax, and on the tergal segments, and a narrower head.

#### Lasioglossum (Dialictus) zephyrum

SIZE: Small; 5–8 mm. PHENOLOGY: Mid-April through August. FLORAL HOSTS: Broad generalist. RANGE: Occurs throughout the upper Midwest and into Utah, Wyoming, and Idaho, then east through to the northeastern states. NESTING: Ground nester, sometimes in aggregations with other Lasioglossum (Dialictus). Eusocial species,

inseminated females that overwinter in the nest in which they were born. Queens and workers exist but are not as sharply defined as in honey bees and bumble bees. **IDENTIFICATION:** Relatively large Lasioglossum (Dialictus). HEAD: Light green, with dense hair in the paraocular region. In females the head is close to round, and the gena is just wider than the eye; in males the head is slightly elongate. In males, the clypeus is brown, and yellow at the apex in some individuals. Also in males, antennae are bright yellow. THORAX: Scutum highly polished, with fine sparse pits. The sides of the thorax have small fine pits that can be hard to see. The dorsal to posterior surface of the propodeum (sometimes called the metapostnotum in taxonomic keys) is gently rounded, and polished. ABDOMEN: On TI, there is a fan of white hair, pressed flat against the surface. Polished, brown with a light metallic tint and fine sparse pits. SIMILAR SPECIES: Similar to L. kunzei and L. semibrunneum. Neither of those species has

with colonies restarted every year by





## LASIOGLOSSUM (LASIOGLOSSUM)

SIZE: Small to medium; 7–12 mm. PHENOLOGY: Most common in the summer months of June through August. FLORAL HOSTS: Polylectic to oligolectic. RANGE: Widespread across western North America. NESTING: Ground nester.

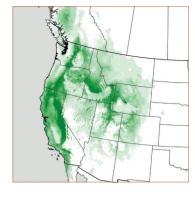
of TI, as L. zephyrum does. Also, both of those species occur farther south and west; overlap is most common in the Midwest and North.

IDENTIFICATION: Larger, in general, than other Lasioglossum subgenera. The head and thorax are a dark matte black, and usually with relatively few pits. Lasioglossum (Lasioglossum) species have the middle (second) submarginal cell crossvein weakened. In males, the antennae, while long, are not as elongated as in other subgenera.

#### Lasioglossum (Lasioglossum) anhypops

SIZE: Small to medium; 7-10 mm. PHENOLOGY: May through October; most common in June and July. FLORAL HOSTS: Generalist. RANGE: Southern California north to southern British Columbia. East to Colorado and Montana, but absent from Nevada, Arizona, and New Mexico. NESTING: Ground nester, sometimes in dense aggregations.

IDENTIFICATION: Medium-sized dark Lasioglossum. HEAD: In females, the head is slightly elongated, to rounded. The clypeus hangs down significantly below the lower margin of the compound eyes, and there is a shallow indentation that runs from the top to the bottom of the clypeus. In males, the clypeus is entirely black, and flat against the face. THORAX: Scutum densely pitted, only moderately shiny. The portion of the propodeum that faces dorsally is strongly ridged, but there are no strong carinae separating the dorsal,



lateral, or posterior surfaces. **ABDOMEN**: In females, the anterior face of T1 has erect hairs that extend across the entire surface, not being interrupted at the center (no acarinarium—hairless area at the center and base of T1). Tergites 2 through T5 are strongly pitted, on a roughened integument. On the second tergal segment, there is a sharp notch at the sides.

Many Lasioglossum participate in an interesting mutualism.



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**SIMILAR SPECIES:** *Lasioglossum trizonatum* looks similar, and even has a strong notch on the lateral edges of T2, but it has a bare area at the center of the anterior face of T1, which is not the case for *L. anhypops. Lasioglossum coriaceum* also has a similar notch on T2, but that species is found in the East, and has an acarinarium on T1.

# Lasioglossum (Lasioglossum) sisymbrii

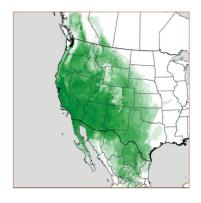
SIZE: Small to medium; 7–10 mm.

PHENOLOGY: March through September.

FLORAL HOSTS: Generalist. RANGE: Widespread throughout the western U.S., as far east as Nebraska, Oklahoma, and eastern Texas. South through Mexico and north into southern Canada.

NESTING: Ground nester, often in aggregations.

IDENTIFICATION: Abundant and common bee species found throughout the West. HEAD: Dark in both sexes. Clypeus projects down below the



level of the compound eyes notably. In females, the first flagellar segment is about as long as the second. Also in females, the head is about as wide as long, lightly polished. In males, the head is longer than it is wide. THORAX: Black. Tegulae pale yellow, and see-through. Scutum shiny with uniform, dense pits, separated by slightly less than their width. ABDOMEN: There is a strong basal hair band that runs across Tr in both sexes. This segment is shiny, with fine shallow pits, and some elongate hairs scattered over the surface facing the thorax.



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**SIMILAR SPECIES:** The complete basal hair band running across T<sub>I</sub> can distinguish this species from all other *Lasioglossum* species in North America. If the hair band is rubbed off from age, the pale, see-through tegulae are also unique.

#### LASIOGLOSSUM (SPHECODOGASTRA)

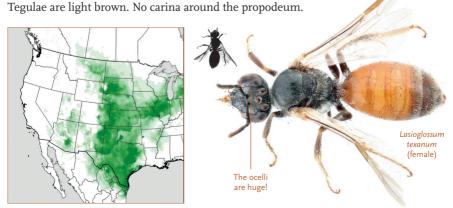
**SIZE:** Small; 6–9 mm. **PHENOLOGY:** Peak abundance is July and August. **FLORAL HOSTS:** Several species are specialists on Onagraceae, and many species are generalists. **RANGE:** Widespread across North America; not uncommon at higher latitudes and elevations. **NESTING:** Ground nester.

**IDENTIFICATION:** Rarer than other *Lasioglossum* subgenera, and some species are confined to flying during the evening or dawn. The head and thorax are black, with no metallic reflections. In some females, the ocelli are incredibly large. The second submarginal crossvein is weak. The inner midtibial spur has variable teeth, set in a row like a rake. The females have a carina that runs around the propodeum, separating the sides from the posterior face. And there are fine pits on the thorax and abdomen. A few species have no carina around the propodeum, but in these species, the scopa on the femur is sparse, with stout widely spaced hairs.

#### — Lasioglossum (Shecodogastra) texanum

SIZE: Small to medium; 7–II mm. PHENOLOGY: April through December, but most common May through July. FLORAL HOSTS: Specialist on *Oenothera*. RANGE: Intermountain west and Midwest, as far as Michigan. South to Arizona and New Mexico. NESTING: Nests in sandy areas.

**IDENTIFICATION:** A bee that flies at dusk, or dawn, and through the night when the moon is up (though, apparently, not as much during a full moon). **HEAD:** Extraordinarily large ocelli that look like droplets of water set on top of the head. In females, mandibles are not overly elongated. Head is round, to very slightly wider than long. Gena is narrower than the width of the compound eye. Antennae are orange brown. **THORAX:** Scutum dull, pits sparse and deep.



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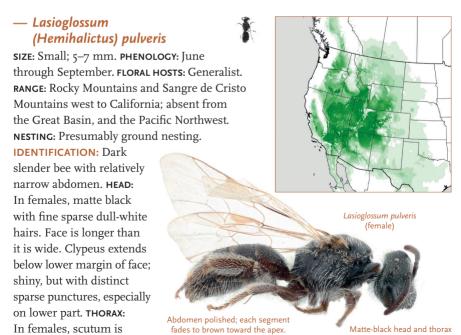
**LEGS:** In females, inner hind tibial spur has three or four short teeth. **ABDOMEN:** Bright red/orange, fading to light brown for T4–T5 (and maybe T3). The first tergal segment is shiny, and highly polished, with very fine sparse pits.

**SIMILAR SPECIES:** Similar in appearance to *L. noctivaga*, which also flies at dusk, has a red abdomen, and has enlarged ocelli. *Lasioglossum (Sphecodogastra) noctivaga* has very long mandibles (in females) that cross at the front of the face. Males of the two species are indistinguishable without seeing the genitalia.

#### Lasioglossum (Hemihalictus)

**SIZE:** Petite to small; 4–8 mm. **PHENOLOGY**: April through October, with peak abundance during July and August. **FLORAL HOSTS**: Polylectic. **RANGE**: Widespread across western North America. **NESTING**: Ground nester.

**IDENTIFICATION:** May be difficult to distinguish from other subgenera of *Lasioglossum*, especially *Lasioglossum* (*Lasioglossum*). In the U.S. and Canada, the head and thorax are black with no metallic reflections. The head may be wider than long or vice versa, but, in females, the clypeus usually hangs below the lower margins of the compound eyes significantly. The second submarginal crossvein is weakly defined, or even absent (compare with *Lasioglossum* [*Lasioglossum*] and [*Sphecodogastra*], where the second submarginal crossvein is very strong). Also, the angles on the propodeum are usually weakly defined, so that the sides, dorsal face, and the posterior face are not clearly separated. In a few species, there is a strong carina around the posterior face of the propodeum, but in those cases the thorax tends to be heavily pitted.



roughened, with small moderately spaced pits. Scutellum is also sparsely punctate, over a more polished integument. Tegula is partially translucent. The dorsal surface of the propodeum has a shining rim running around it. ABDOMEN: Polished dark integument, with lighter brown coloring at the apex of each segment. Sparse but consistent pits occur on the surface. No clear hair bands on any tergite.

SIMILAR SPECIES: Similar bees include Lasioglossum synthyridis. That species has dark tegulae, and a wider abdomen. Lasioglossum foxii has a shorter clypeus.

#### **SPHECODES**

- SUBFAMILY: Halictinae
- TRIBE: Halictini

**OVERVIEW:** *Sphecodes* are small to medium-sized cleptoparasitic bees. Females are usually black on the thorax, with a blood-red abdomen (sometimes with black stripes), while males are either red and black or all black. *Sphecodes* do not collect pollen. They parasitize ground-nesting bees, usually in the family Halictidae.

**IN THE WORLD:** Worldwide there are about 350 species, occurring on all continents, though rare in Australia. In the Americas, this genus ranges from southern Alaska south through Argentina. In the U.S. and Canada there are more than 70 species, more than half of them occurring in the West.

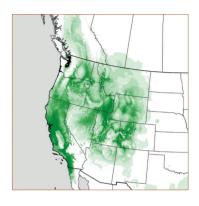
**CLEPTOPARASITES:** *Sphecodes* are cleptoparasites; typical hosts include *Halictus*, *Lasioglossum*, *Andrena*, and *Colletes* (all ground nesters).

**IDENTIFYING FEATURES:** Small to medium-sized bees; easy to overlook at first glance but warrant a double-take for the bright red abdomen. **HEAD**: Generally oval-shaped, wider than long with a short and broad clypeus. Antennae are entirely black. THORAX: Sculpturing is thick, with large indentations, and the integument in between is not polished. **WINGS**: The arcuate basal vein typical of many Halictidae is evident. LEGS: Females often have spines on their hind legs. ABDOMEN: In females, the fifth tergal segment usually has a white tuft of hair. The abdomen of females is almost always red; males are also often red, though they may have more extensive black markings. SIMILAR GENERA: Several bee genera have red-and-black abdomens like Sphecodes, and they may at first glance appear similar. A few Lasioglossum have a red abdomen, but the color on those bees is closer to orange, and the thorax is coppery. Ashmeadiella individuals with red abdomens may resemble female Sphecodes. Scopal hairs on the abdomen of female Ashmeadiella should distinguish them from Sphecodes; in addition, Ashmeadiella have two submarginal cells, while Sphecodes nearly always have three. Some Andrena also have red abdomens. The presence of pollen-collecting hairs on female Andrena should distinguish the two; Sphecodes also have much narrower, parallel-sided abdomens compared with Andrena, and Andrena lack an arcuate basal vein. Finally, Sphecodes males, with their red-and-black abdomens, may look similar to Halictus species—the unpolished integument, the wider face, and the shorter antennae should distinguish the two.

*Sphecodes* are difficult to identify to species. We have chosen just one of the numerous species to include here. For other species, positive identification is best done with a microscope and taxonomic keys (see references); no key exists that includes all western specimens.

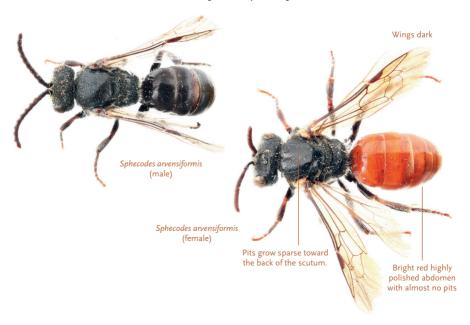
# — Sphecodes arvensiformis

SIZE: Medium; 10 mm. PHENOLOGY:
May through August. FLORAL HOSTS:
Cleptoparasite; no floral preferences. RANGE:
Primarily mountainous areas in the western
U.S.; largely absent from the Great Basin in
Nevada. NESTING: Cleptoparasite of Halictus.
IDENTIFICATION: Black bee with bright red
abdomen. HEAD: Wider than long, with dark
eyes. In females, mandibles black, with a dark
red spot just before the apex. THORAX: Dark
integument, polished. Pits on scutum are widely



spaced; less evenly spaced on the scutellum where integument is distinctly roughened. WINGS: Dark. Long, extending half the length of the abdomen. ABDOMEN: Highly polished, and almost entirely lacking pits. In females, the abdomen is completely red.

**SIMILAR SPECIES:** *Sphecodes* are notoriously difficult to tell apart, but the red spot on the mandible is distinctive and can help identify this species.



#### **DIEUNOMIA**

#### SUBFAMILY: Nomiinae

**OVERVIEW:** Large dark bees; easy to spot when they occur, but neither widespread nor abundant. Most are seen in the late summer and fall when Asteraceae bloom; they are all specialists on this plant family. Often nest in large aggregations, with nests deep enough that they can survive in plowed fields. Thus, many species in this genus are common in agricultural areas.

**IN THE WORLD:** Nine species total. All are restricted to the Americas. Most abundant in Central and South America. Eight occur north of the Mexican border; all can be found in the western U.S., and a few occur as far north as eastern Canada.

**CLEPTOPARASITES:** *Triepeolus* species, especially *T. distinctus*.

**IDENTIFYING FEATURES:** Sizable bees, usually with dark integument and auburn hair. **HEAD:** In males, the last segment of the antenna is flattened and broad. **WINGS:** Basal vein is not arcuate, as it is in many other Halictidae. **LEGS:** In females, scopal hairs occur thickly on the hind legs but also extend onto the underside of the abdomen (S2–S5), almost wrapping onto the terga. In males there are often protrusions and extra structures on the mid and hind legs that can be distinctive. **ABDOMEN:** In both sexes, when viewed from above, there is an indentation in the forward (anterior) face of the first tergal segment, causing it to appear like a V.

**SIMILAR GENERA:** *Andrena* species can look like *Dieunomia*, as both share a similar body shape (andreniform). The indentation on Tr is a key factor in telling the two apart, as is the facial fovea in female *Andrena*. Larger Apidae (e.g., *Xylocopa*) may also be confused with *Dieunomia*. Look for the distinct scopal hairs in females, and the flattened antennae in males, of *Dieunomia*.

#### Dieunomia heteropoda

SIZE: Large; 18 mm.

PHENOLOGY: July through

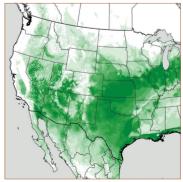
October. FLORAL HOSTS: Specialist

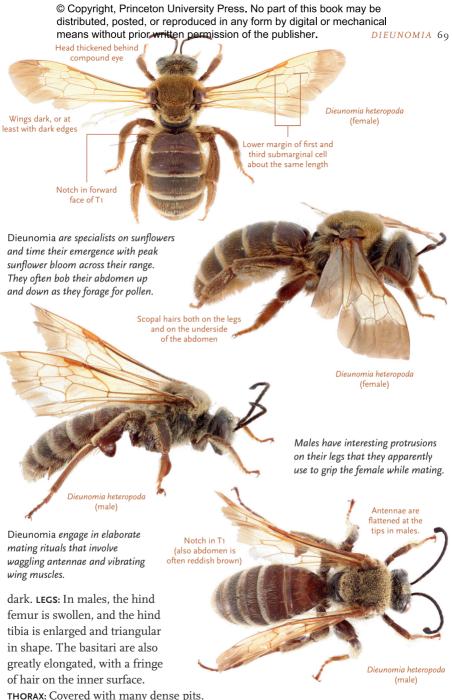
on plants in the Asteraceae, especially sunflowers (*Helianthus*). RANGE: Maine and Ontario south through Florida, west to Utah. NESTING: Groundnesting bee. Appear to be solitary, but multiple females have been observed to use the same nest entrance in some cases. Often nest in aggregations of a hundred to several hundred. Nests can be recognized by mound of dirt. often

aggregations of a hundred to several hundred.

Nests can be recognized by mound of dirt, often sandy areas, with nest entrance at the base of the mound.

**IDENTIFICATION:** Large dark bee with exceptionally long wings that are often held up and out from body in a distinctive fashion. **HEAD:** The gena is thick, at least as wide as the width of the compound eye. **WINGS:** Wings are brownish, with the tips especially





THORAX: Covered with many dense pits.

SIMILAR SPECIES: Dieunomia triangulifera is lightly smaller, and without smoky or dark wings (though may be clouded at the very tips). Dieunomia nevadensis is much smaller (about half the size), with a thinner face and clear wings.

Dieunomia

nevadensis (male)

#### — Dieunomia nevadensis

SIZE: Small to medium; 8–12 mm. PHENOLOGY: August through October.

FLORAL HOSTS: Specialist on Asteraceae.

**RANGE:** Oregon east across the Great Plains. Occasional in states further east. Wyoming south to Mexico. **NESTING:** Ground nester, often with several bees nesting in close proximity to each other.

**IDENTIFICATION:** Small species (males more petite than females), dark with long smoky wings. **HEAD:** Round, as wide as it is long in

both males and females. Integument dark.

but covered with dense short, slightly yellowish hair. In males, antennae are long, extending back as far as scutellum. THORAX: Tegulae pale yellow. In males, hair is thick. WINGS: Clear to orange, exceedingly long, with a dark

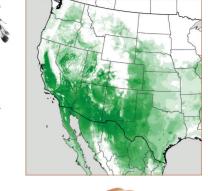
spot at the apex. LEGS: Red to

orange. In males, the hind basitarsus is broad and the femur appears swollen. On the apical half of the tibia there is a broad indentation. ABDOMEN: In females, tergal segments lined with thin hair bands. In males, TI and T2 have a deep indentation that runs across them. Integument may be dark, or may be red, depending on the subspecies.

**SIMILAR SPECIES:** There are five subspecies of *Dieunomia nevadensis*: *D. n. arizonensis*, *D. n. angelesia*, *D. n. nevadensis*,

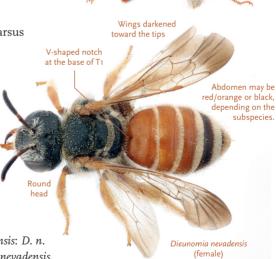
D. n. stellata, and D. n. bakeri. Dieunomia nevadensis

arizonensis usually has a red abdomen. *Dieunomia nevadensis nevadensis* has a yellowish-red abdomen, while *D. n. bakeri* is all black, and is the largest of the species.



Abdominal segments constrict at base making

the abdomen appear wavy.



(continued...)

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