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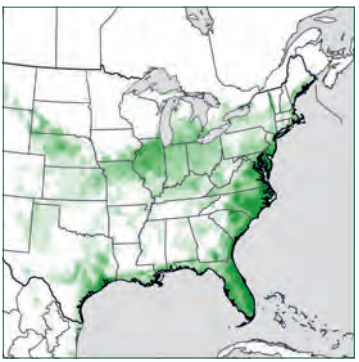
S6 lacks any raised ridge at its center. In females, the abdomen is bright metallic green, with white hair bands across each segment (may be thinner in older specimens).

SIMILAR SPECIES: *A. texanus* females are similar, but the thorax has two distinct sizes of punctures. In males of *A. texanus,* the abdomen maintains a metallic tinge especially near the sides, even with the yellow and black markings.

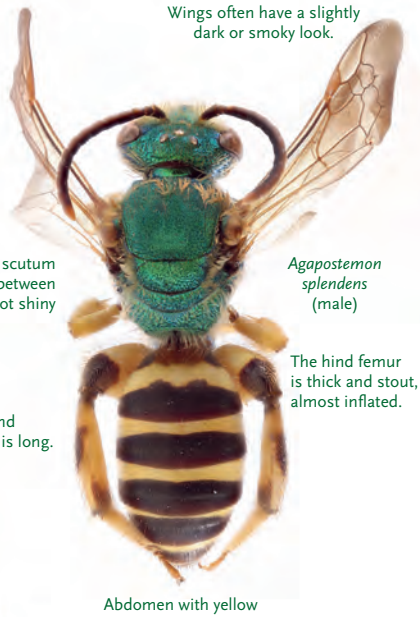
— *Agapostemon splendens*

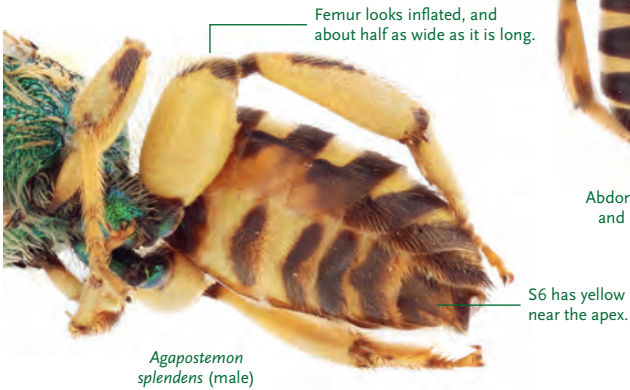


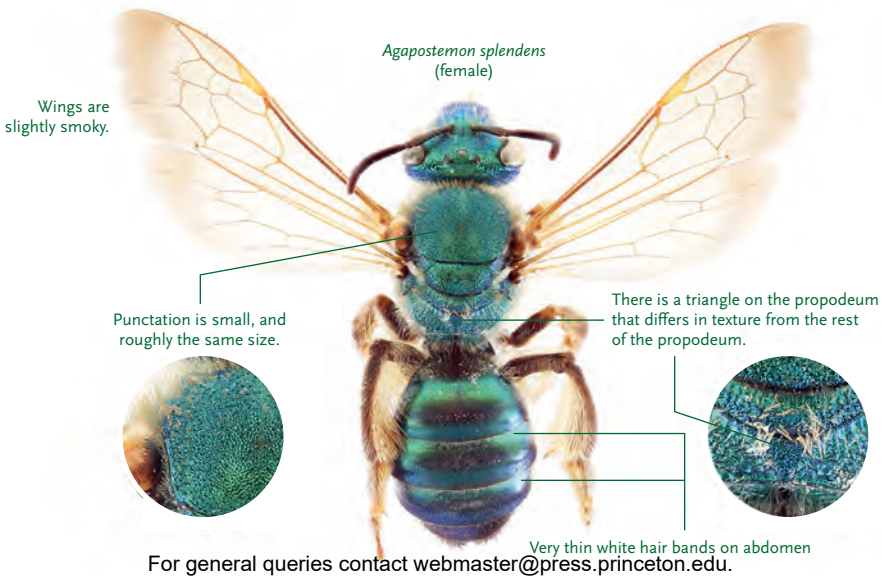
SIZE: Medium; 10–11 mm. **PHENOLOGY:** April through October, with sightings in February through November in the South. **FLORAL HOSTS:** Broadly polylectic. **RANGE:** Maine to Florida, west to Texas and North Dakota. Most common *Agapostemon* in the southeastern U.S. and into the Gulf. Prefers lower elevations. **NESTING:** Solitary; communal nests have not been seen. May nest in sparse aggregations, usually in bare areas, and appears to nest mainly in sand. Sometimes found in vertical banks.

IDENTIFICATION: THORAX: Punctures are small, roughly uniform in size. In females, there is a distinct central wedge of longitudinal ridges on the dorsal section of the

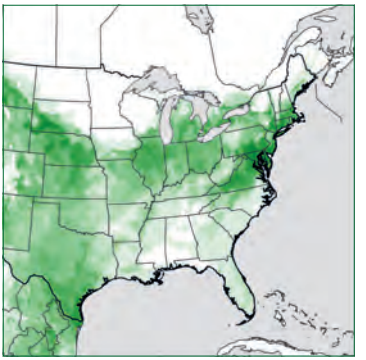
propodeum. **WINGS:** Wings smoky. **LEGS:** In males, on the hind leg, the femur is very thick and stout, approximately half as wide as it is long. **ABDOMEN:** In females, thin white hair bands run across the green to blue-green abdomen, though the bands are often hard to see. Abdomens of males are yellow and matte-black striped. **SIMILAR SPECIES:** *A. sericeus* females have broader hair bands on abdomen; punctures on thorax are larger.







— *Agapostemon texanus*

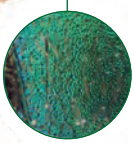


SIZE: Small to medium; 9–11 mm. **PHENOLOGY:** Roughly April through October; multivoltine. **FLORAL HOSTS:** Polylectic. **RANGE:** Extremely widespread, occurring from southern Canada south through Costa Rica and from coast to coast. In the East, it is more common in the mid-Atlantic states than further south. **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*).

IDENTIFICATION: Females have an overall hairy appearance, especially on the sides of the thorax, as well as covering the abdomen. This makes some of the hair bands on the abdomen less distinct than in other species. **THORAX:** In females, punctures of two sizes lie on a shiny surface. **LEGS:** In males, on 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 surface as well. **ABDOMEN:** In males, the yellow-and-black striped abdomen may appear lightly metallic, especially laterally, and S5 and S6 are yellc In females, abdomen is green.

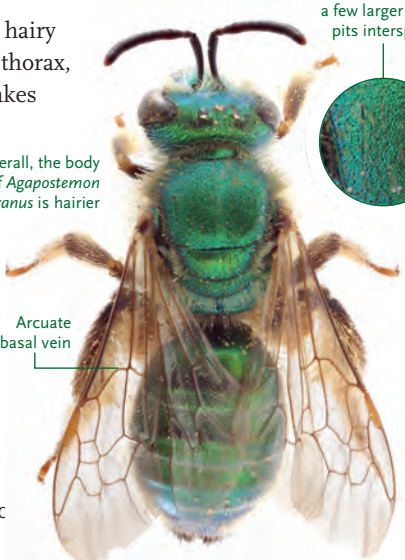
SIMILAR SPECIES: In the western U.S., females of *Agapostemon angelicus* and females of *A. texanus* are indistinguishable.

Scutal punctures of two sizes: shallow and numerous, with a few larger deeper pits interspersed.



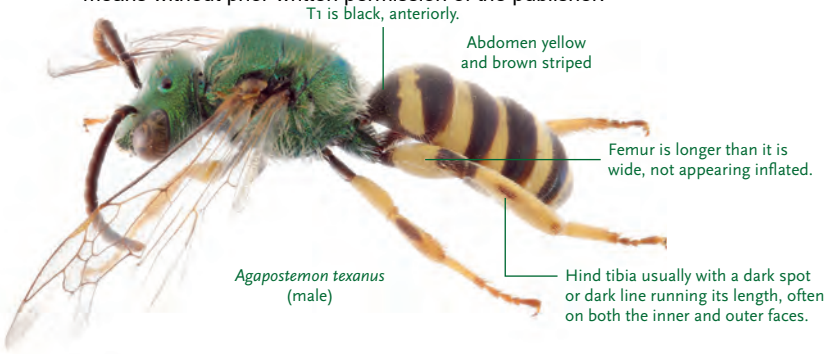
Overall, the body of *Agapostemon texanus* is hairier

Arcuate basal vein



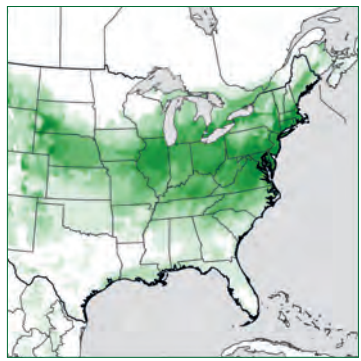
Agapostemon texanus (female)

Agapostemon texanus (female)

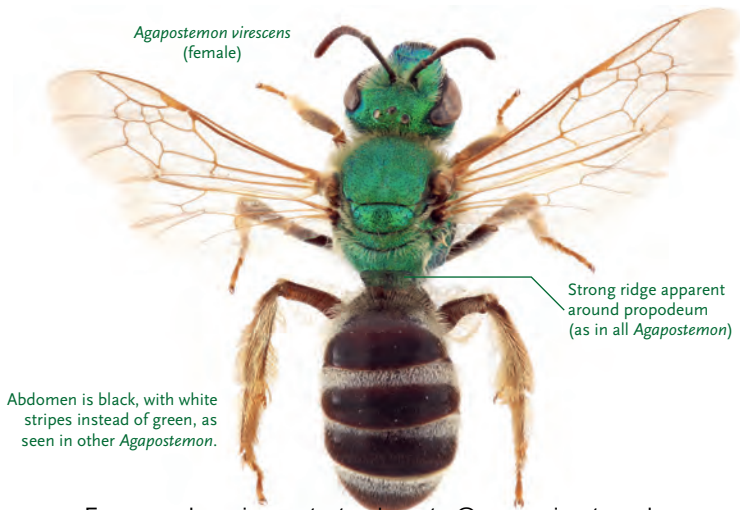


— *Agapostemon virescens*

SIZE: Medium; 10–11 mm. **PHENOLOGY:** April through November. **FLORAL HOSTS:** Polylectic. **RANGE:** Widespread, occurring across the U.S., rare in the Gulf Coast states. **NESTING:** Usually nests in aggregations, and sometimes with multiple females using the same nest entrance. Nests may be in lawns, near gardens, or in disturbed areas.



IDENTIFICATION: THORAX: Covered in fine punctures, almost touching. **LEGS:** In males, the hind femur is long and narrow. The hind tibia is mostly yellow, with only small amounts of dark coloration at the joints. **ABDOMEN:** There are no yellow sterna in 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. In females, the abdomen is black, with white hair bands. This is the only eastern *Agapostemon* in which the female does not have a green abdomen.

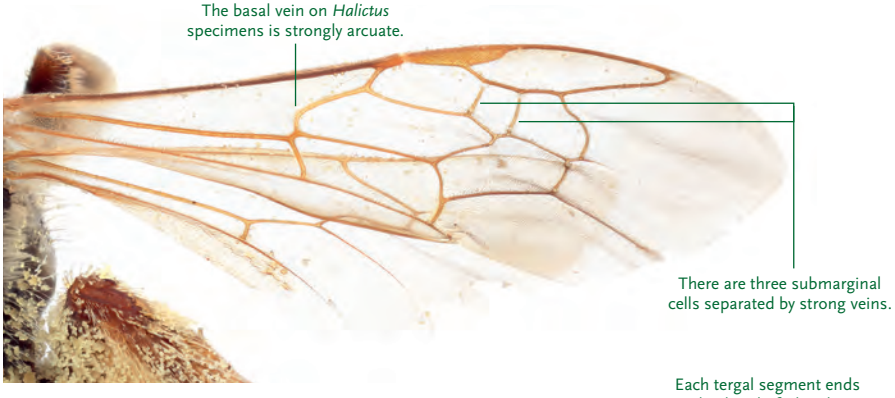
SIMILAR SPECIES: Female *A. virescens* are a unique combination of green thorax and black-and-white abdomen; they are hard to confuse with other bees. Males may be confused with *A. texanus*. The difference in coloration of the hind tibia should distinguish.

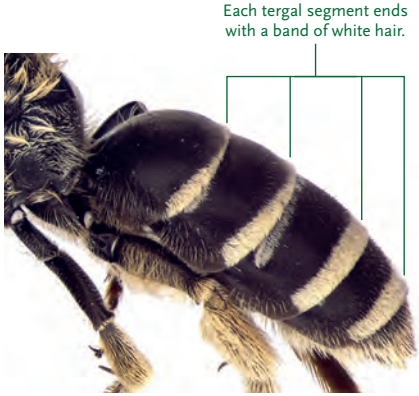
HALICTUS

— **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 eastern North America there are 8 species.





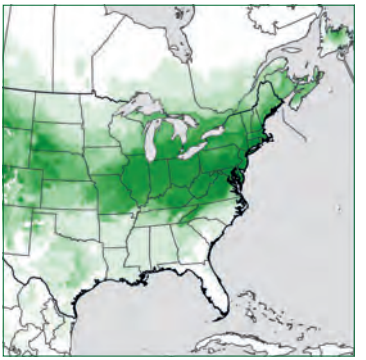
CLEPTOPARASITES: *Sphecodes*.

IDENTIFYING FEATURES: Species may have light metallic green or copper hues, but the majority are matte-black/brown. Males are long and slender, with long antennae 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 (*Halictus poeyi* is embedded in *Halictus ligatus*). Species not covered: *Halictus farinosus*, mostly a western species, uncommonly seen in the East and Midwest, and *Halictus tectus*, a recent invasive from southern Europe, currently known only from Washington, D.C., Maryland, and Philadelphia.

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:** Primitively eusocial 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.

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. Smallest of the *Halictus* species in the East, and the one most likely confused with *Lasioglossum (Dialictus)*. In both sexes, bees are moderately metallic blue or green, not matte-black. **HEAD:** In females, the clypeus is not metallic, so appears darker than the rest of the face and protrudes slightly.

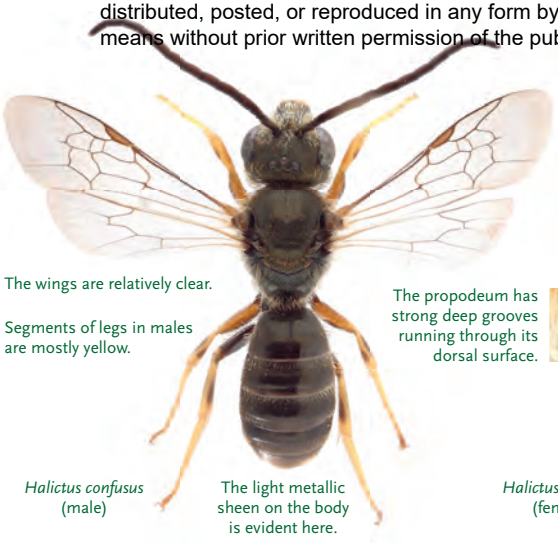
Halictus confusus (male)

The eyes slightly converge ventrally, and the supraclypeal area is elongated so that the whole face is longer than it is wide.

The clypeus appears slightly darker than the rest of the face, though in males, the lower margin is yellow.

Hair bands on T3 and T4 are strong, even in the middle.

Halictus confusus (female)

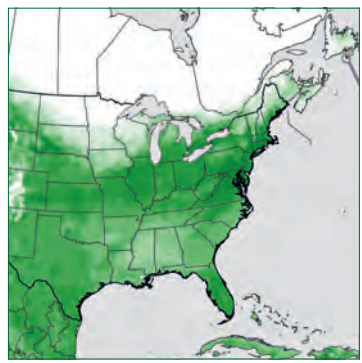


The supraclypeal area is rectangular, with the subantennal sutures longer than the epistomal suture so that the face is longer than broad. In males, the face is oval-shaped and the underside of the antennae and lower margin of the clypeus are light yellow. **THORAX:** The dorsal surface of the propodeum is finely and unevenly striated. **LEGS:** In males, the trochanter and the femur on the forelegs are yellow. **WINGS:** The wings are clear with no smoky coloration. **ABDOMEN:** In females, apical hair bands across T3 and T4 are broad throughout, not narrowing in the middle (in older specimens this may be hard to see).

SIMILAR SPECIES: Other species of *Halictus* in the East may look similar at first, but only *Halictus tripartitus* (which overlaps with *H. confusus* only in prairie states) is also dull green. Between the two, the face of *H. confusus* is longer in females. In males, the color of the antennae and the foretrochanters are yellower in *H. confusus* than in *H. tripartitus*. Additionally, the striations on the propodeum are finer in *H. confusus*.

— *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: One of the most common summer bees in the eastern United States.

The lower half of the clypeus is yellow, as are the undersides of the antennae.

The wings are clear.

The tegulae and legs are yellow.

Halictus ligatus (male)

The thorax is matte-black in this species, but up close you can see that it is polished in between the punctures.

The ocelli are well below the vertex.

The head of female *H. ligatus* is wider than it is long.

Halictus ligatus females have a "tooth" on the gena.

Note also that the presence of that tooth makes the head extremely thick.

Halictus ligatus (female)

The head is wider than the thorax in females.

Halictus ligatus (female)

Even from above, the thickened gena is evident.

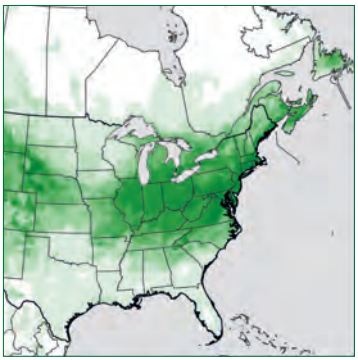
The thorax is shiny, polished between larger pits.

The apical hair bands on T1 and T2 aren't as thick on *H. ligatus* females as they are on other specimens.

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 the 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: Most similar to *Halictus ligatus* is *H. poeyi*, a cryptic "sister" species that is best identified by its distinct genetic profile. More practically, in the southeastern U.S. (Florida, Georgia, South Carolina, Louisiana, Alabama, and Mississippi), *Halictus poeyi* is the more common of the two. *Halictus ligatus* and *H. parallelus* males also look similar. 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 all other eastern *Halictus* species.

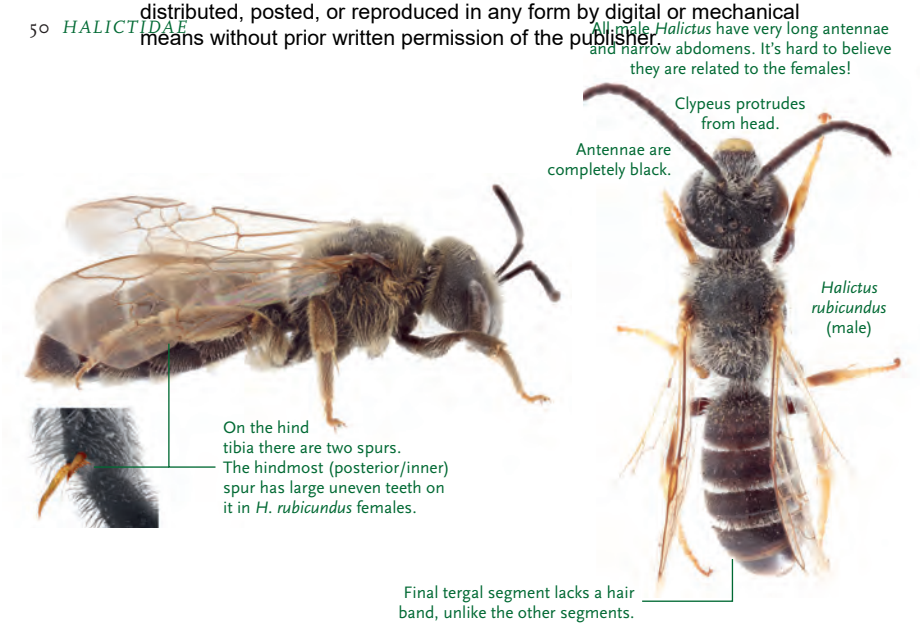
— *Halictus rubicundus*



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:** Primitively 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. Also in males, the antennae are entirely black; the only eastern species to have entirely black antennae. **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.

Halictus rubicundus (female)

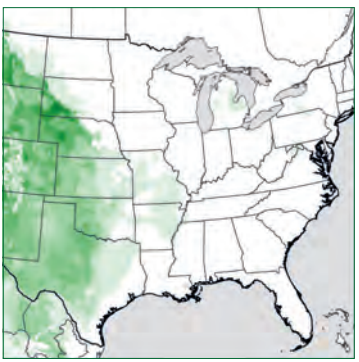
Narow hair bands that get even narrower near the center



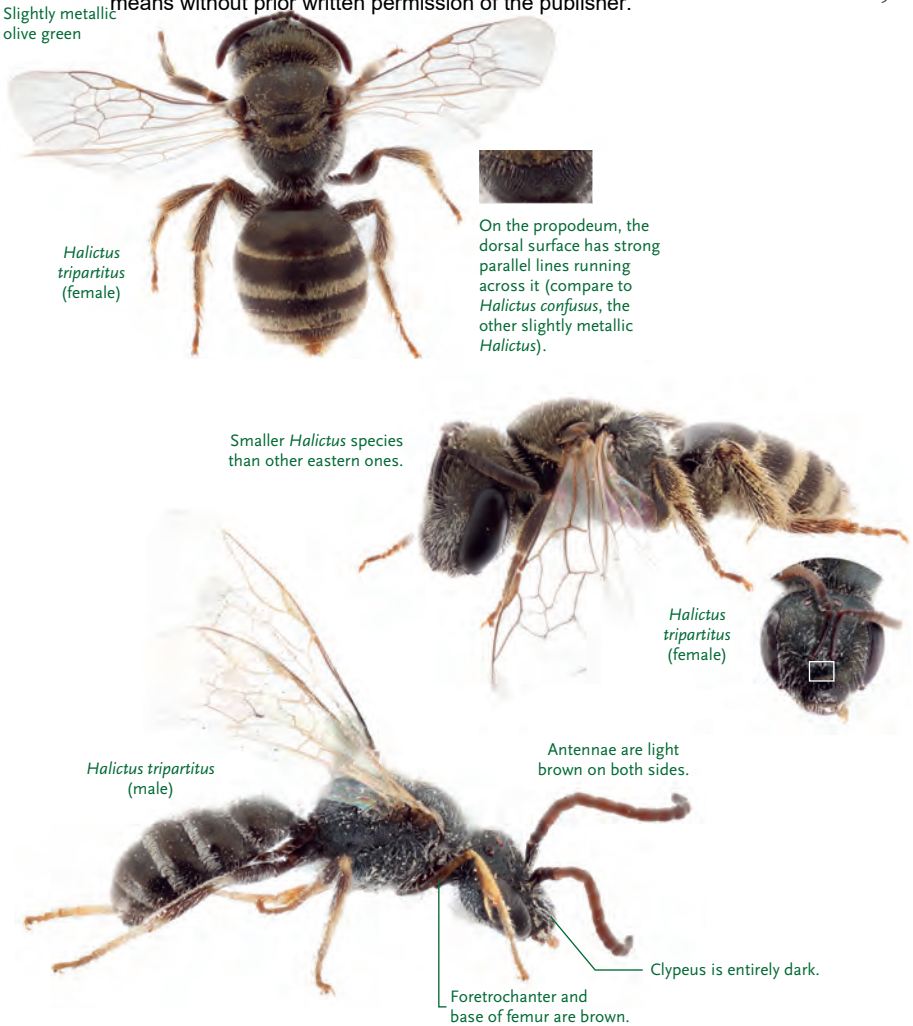
ABDOMEN: In females, the apical hair bands are narrow, especially near the center. In males, S4 has a brush of hair along the apex and the margin of S5 is concave. Also in males, the final tergal segment does not have a band of hair.

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 East 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*



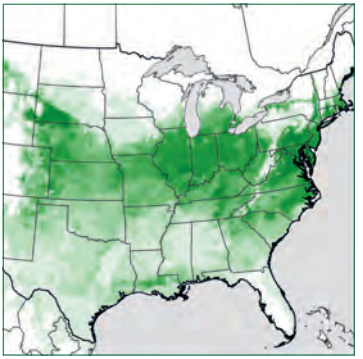
SIZE: Small; 5–8 mm. **PHENOLOGY:** March through October. **FLORAL HOSTS:** Polylectic. **RANGE:** Mostly a western bee, but can be found throughout the prairie states, as far east as Missouri and southern Illinois. **NESTING:** Ground-nesting bee; appears to prefer packed earth. Nests are often connected in the ground even though they have separate nest entrances. **LIFE HISTORY:** Primitively 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. **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



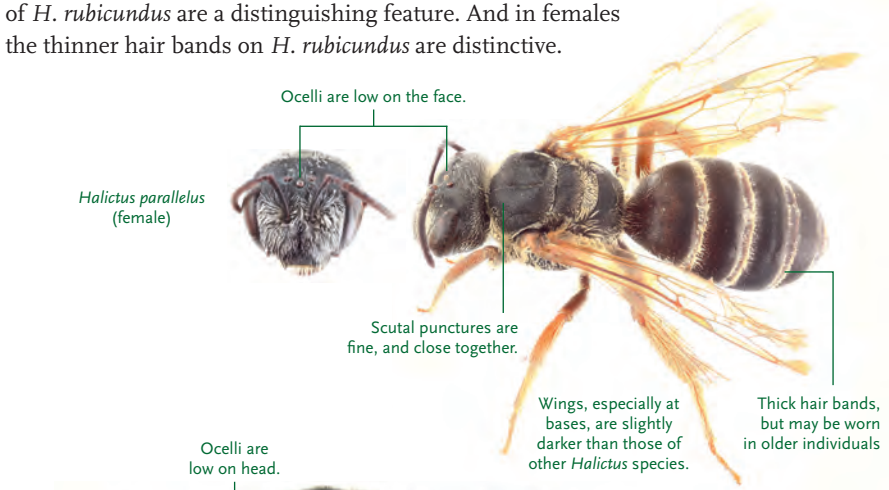
in shape. The malar space is short, giving the head a very round appearance. In males, the antennae are brown, only slightly lighter on the bottom than the top. Also in males, the clypeus is entirely dark. **THORAX:** The pits on the scutum are small but distinct. The propodeum has deep, parallel striations. **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 East, a metallic *Halictus* specimen is *Halictus confusus*. In the Midwest, where both species occur, the shape of the faces of the 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.

— *Halictus parallelus*



SIZE: Medium; 10–13 mm.
PHENOLOGY: March through August.
FLORAL HOSTS: Broadly polylectic, visiting a very large array of plants.
RANGE: United States, mainly east of the Rocky Mountains. Likely also in southern Canada.
NESTING: Ground-nesting bee.
IDENTIFICATION: A larger *Halictus* with dark wings. **HEAD:** In females, the vertex is elongated, with the ocelli set far down on the face and not near the top of the head. In males, the clypeus is mostly yellow, and the undersides of the flagellar segments on the antennae are light rusty red. In both sexes the eyes converge toward the bottom; this is more prominent in males. **THORAX:** The scutum is dull between fine, close-together punctures. **LEGS:** In males, legs are often rusty red. In females, the inner hind tibial spur has minute evenly spaced teeth. **ABDOMEN:** Hair bands are thick, narrowing slightly at the center.
SIMILAR SPECIES: The red legs and large size of this bee can be diagnostic, but it can be confused with *Halictus rubicundus*. The black antennae on the males of *H. rubicundus* are a distinguishing feature. And in females the thinner hair bands on *H. rubicundus* are distinctive.



LASIOGLOSSUM

— **SUBFAMILY: Halictinae**
— **TRIBE: Halictini**

OVERVIEW: Petite, 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 100 species in the eastern United States and Canada.

CLEPTOPARASITES: *Sphecodes*.

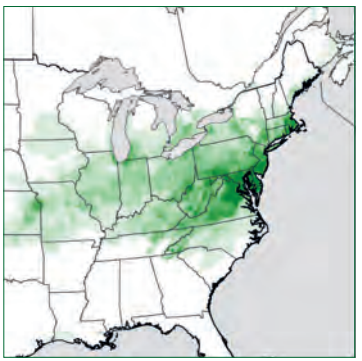
IDENTIFYING FEATURES: *Lasioglossum* are considered one of the most difficult groups to identify with confidence. Among the many hundreds of species, the distinguishing characteristics are minute, and, in many cases, grade into each other. *Lasioglossum*, in the broad sense, consists of four subgenera that differ markedly in their appearance. Most common are *Lasioglossum (Dialictus)*. Though not as common as *L. (Dialictus)*, the subgenera *L. (Lasioglossum)*, *L. (Hemihalictus)*, and *L. (Sphecodogastra)* are also found throughout the East. The characteristics defining these subgenera bleed together. With few unique characters to identify subgenera, often a combination of many characters are required 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 *Lasioglossum* subgenus *Dialictus, focusing on the females*. Note that other *Lasioglossum* occur in the East that may have similar features to the ones included here. *Lasioglossum (Hemihalictus)* is not included here, though some species in this genus can be locally abundant. With few exceptions, *Lasioglossum* are challenging to identify and require multiple keys (see references) and a microscope. Many males are indistinguishable from each other.

— *Lasioglossum (Dialectus)*

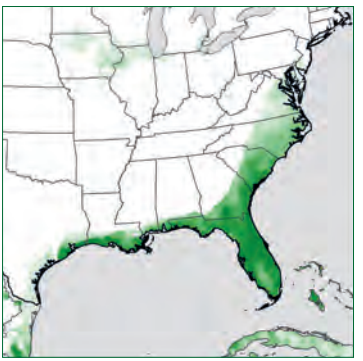
SIZE: Small; 4–10 mm. **PHENOLOGY:** April through October, with peak abundance during July and August. **FLORAL HOSTS:** Polylectic. **RANGE:** Widespread across eastern North America. **NESTING:** Ground nester.

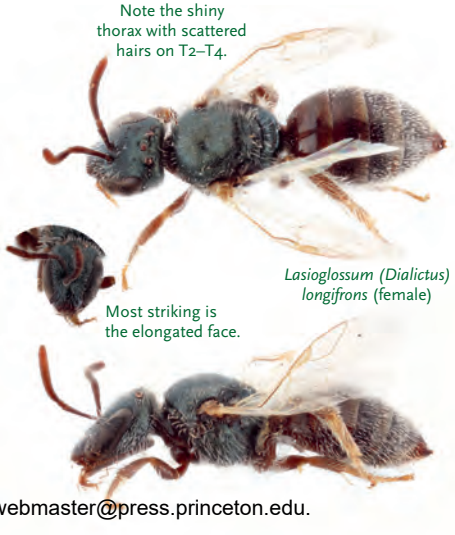
IDENTIFICATION: Often incredibly abundant, though the small size and diminutive habit make them easy to overlook. The head and thorax are a light aquamarine, olive green, or deep gunmetal blue color. This subgenus is unique among *Lasioglossum* in that the integument of the thorax has a metallic reflection. Some species have entirely red abdomens, or abdomens with one or two red tergal segments. Features used to distinguish between species include the size and distance between puncture marks on the thorax, the degree to which the scutum is polished, the texture of the propodeal rim, the density and depth of grooves underneath the head, the pattern of the hair on the anterior face of T1, and the shape of the tegula.

— *Lasioglossum coeruleum*

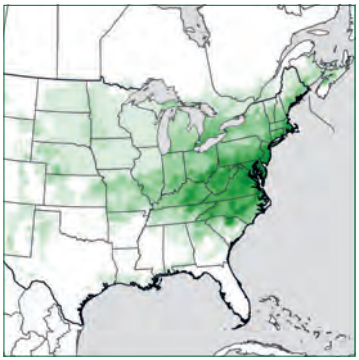


— *Lasioglossum longifrons*

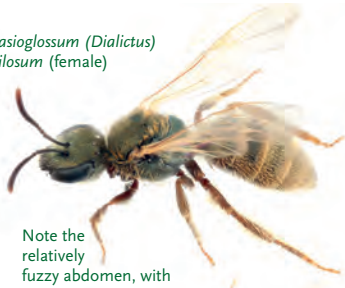




— *Lasioglossum pilosum*



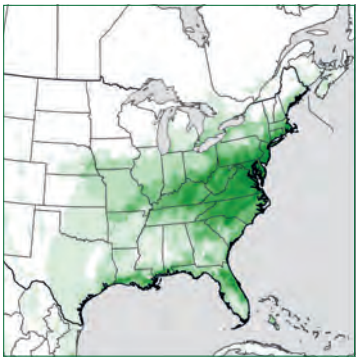
Lasioglossum (Dialictus) pilosum (female)



Note the relatively fuzzy abdomen, with many flattened hairs obscuring the surface.

Also, the edge of the dorsal rim of the propodeum is polished.

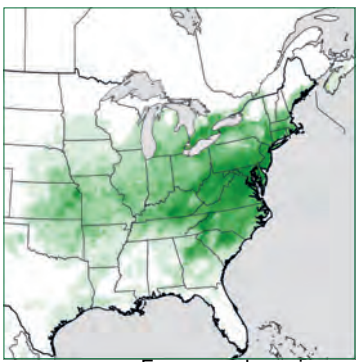
— *Lasioglossum tegulare*



Lasioglossum (Dialictus) tegulare (female)

The most notable feature here is the tegula, which is hooked along the posterior edge.

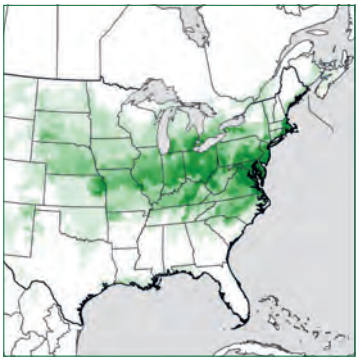
— *Lasioglossum imitatum*



This bee is often extremely abundant when it occurs. T3 and T4 have flattened, evenly spaced hairs.

Lasioglossum (Dialictus) imitatum (female)

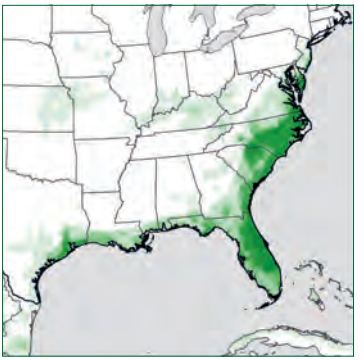
— *Lasioglossum zephyrum*



Lasioglossum (Dialictus) zephyrum (female)

A common bee, with light metallic reflections on abdomen. Punctation consists of very tiny marks on a roughened thorax.

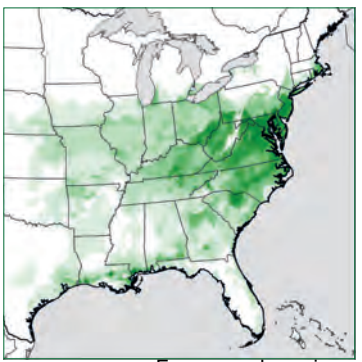
— *Lasioglossum nymphale*



One of a handful of *Lasioglossum (Dialictus)* species that have a red abdomen.

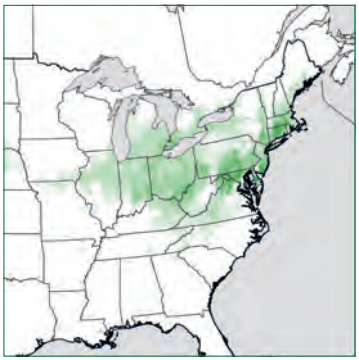
Lasioglossum (Dialictus) nymphale (female)

— *Lasioglossum illinoense*



Lasioglossum (Dialictus) illinoense (female)

— *Lasioglossum albipene*



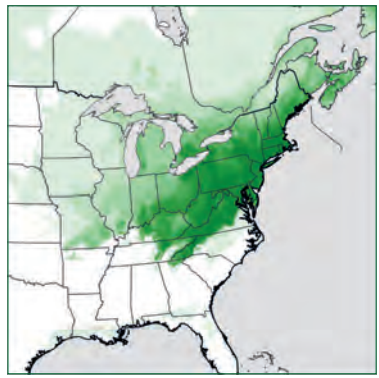
Lasioglossum (Dialictus) albipene (female)

Note the white hair on T3–T5 and the large punctations on the thorax. The veins in the wings are white.

— *Lasioglossum (Sphecodogastra) quebecense*

SIZE: Small; 7–8 mm. **PHENOLOGY:** March through May. **FLORAL HOSTS:** Generalist. **RANGE:** Mostly northern species: Newfoundland, Nova Scotia, and northern Quebec west to Alberta and the Northwest Territories. South through Minnesota, Michigan, Tennessee, and Georgia at higher elevations. **HABITAT:** Common in woodlands and bottomlands.

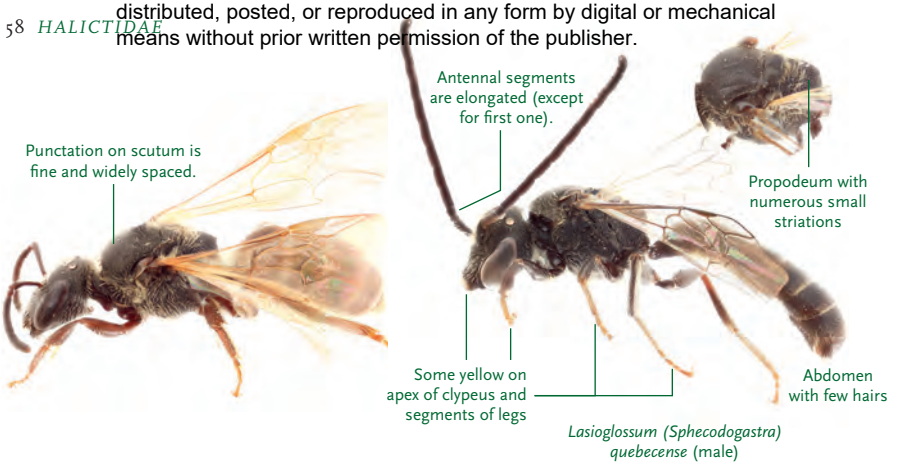
IDENTIFICATION: Relatively large for a *Lasioglossum*. **HEAD:** Dark, about as long as wide, clypeus projecting slightly from face. In females, clypeus and supraclypeus with few punctations. In males, lower half of clypeus yellow, eyes converging strongly toward lower portion of face, antennal segments elongated. **THORAX:** In females, scutum is roughened, with fine, shallow, widely spaced punctations. Posterior face of propodeum is delineated laterally by two strong carinae that run all the way to the dorsal face of the propodeum. In males, scutum is dull with denser punctation. The propodeum is marked by raised ridges running up its



Carina outlines the edge of the posterior face of the propodeum.

Lasioglossum (Sphecodogastra) quebecense

Very fine apical hair bands run across at least the first three tergal segments.



posterior face, and across the dorsal face. **LEGS:** In males, legs are yellow. **ABDOMEN:** In females, thin hair bands run across the *apical* edge of each tergal segment (rare in *Lasioglossum*). In males, abdomen may include red tergal segments. The abdomen in males is also polished and with few hairs.

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 Halictidae family.
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 United States and Canada there are more than 70 species, with around half of them occurring in the East.
CLEPTOPARASITES: *Sphecodes* are cleptoparasites; typical hosts include *Halictus*, *Lasioglossum*, *Andrena*, and *Colletes* (all of which are ground nesters).
IDENTIFYING FEATURES: Small to medium-sized bees; easy to overlook at first glance though the bright-red abdomen is eye-catching. **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, T5 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 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. *Sphecodes* have wider heads

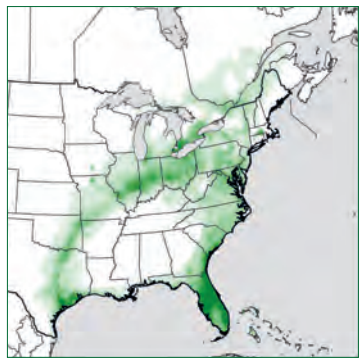
Sphecodes have oval heads, much wider than long.

than *Lasioglossum*. *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 exoskeleton, the wider face, and the shorter antennae should distinguish the two.

Sphecodes are difficult to identify to species. Of the roughly 35 eastern species, we highlight here one that is common and uniquely distinctive. For other species, positive identification is best done with a microscope and taxonomic keys (see references).

— *Sphecodes heraclei*

SIZE: Small; 7–11 mm. **PHENOLOGY:** Spring through late summer. **RANGE:** From Kansas to New Hampshire south to Florida. **HOSTS:** Likely *Andrena, Halictus, Lasioglossum*. **IDENTIFICATION:** Smaller *Sphecodes* that may be locally abundant. **HEAD:** A large "goose egg" behind the ocelli is evident as a polished, raised bump. Antennae are thick, with each segment constricted, giving a ridged look. Face often covered in thick white hair. **THORAX:** The scutal punctures are widely spaced, of large diameter, and deep. **ABDOMEN:** Ranges from blood red to matte-black; typically T1–T3 are red. **SIMILAR SPECIES:** There are two subspecies of *S. heraclei*. In Florida, *S. heraclei ignitus* is more common, and the thorax of that subspecies is marked by red patches on the thorax in addition to the abdomen. More common is *S. heraclei heraclei*, which occurs throughout eastern North America and is black on the thorax. Also, *S. heraclei* is the only eastern species of *Sphecodes* with a raised, polished protrusion behind the ocelli.



Behind the ocelli on the top of the head, *S. heraclei* has a polished bump that is very distinctive.

Sphecodes heraclei (female)

In Florida, the subspecies *S. h. ignitus* has red on the thorax as well as the abdomen.

Female cleptoparasitic bees have no scopal hairs.

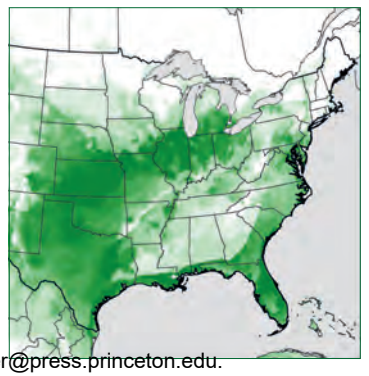
DIEUNOMIA

— SUBFAMILY: Nomiinae

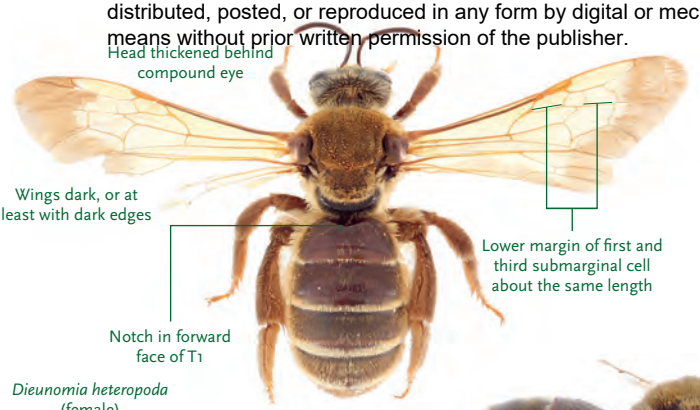
OVERVIEW: Large dark bees; easy to spot when they occur, but neither widespread nor abundant. Most are seen in the late summer and fall when Asteraceae bloom; they are all specialists on this plant family. Often nest in large aggregations, with nests deep enough that they can survive in plowed fields. 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; three are in eastern North America.
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 face of T1, 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 T1 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*.

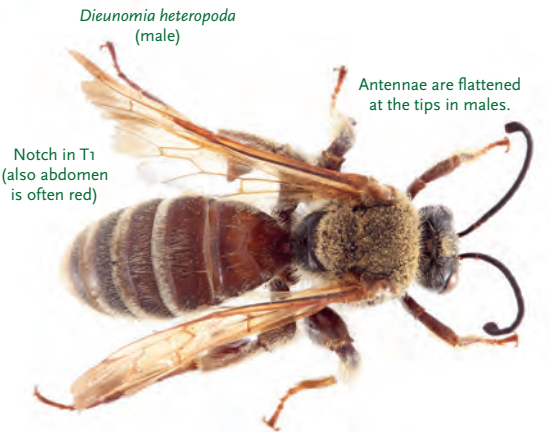
— *Dieunomia heteropoda*

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: Ground-nesting 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 in 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. **THORAX:** Wings





are brownish, with the tips especially dark. See identifying features for the genus for other characters. **BEHAVIOR:** Females bob their abdomens up and down as they gather pollen from disk flowers.

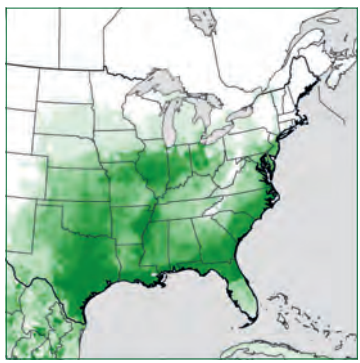
SIMILAR SPECIES: *D. triangulifera* is slightly smaller, and without smoky or dark wings (though may be clouded at the very tips). *D. nevadensis* is much smaller (about half the size), with a thinner face and clear wings.

NOMIA

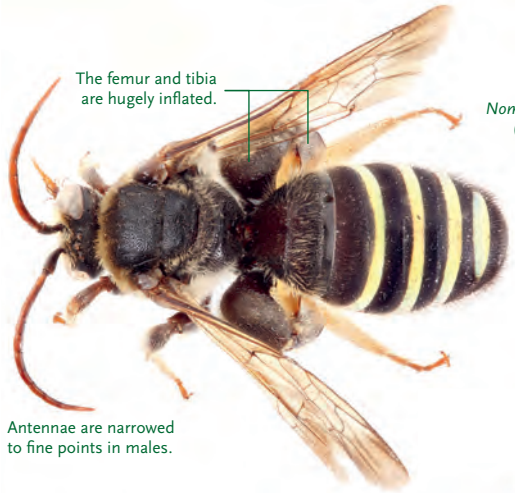
— SUBFAMILY: Nomiinae

OVERVIEW: Medium to large dark bees with light pearlescent bands on their abdomen. A few species specialize, but the majority are generalists. Often nest in large aggregations with more than 1,000 nests in a few square meters. Sometimes multiple females will share one entrance, though inside the nest each female digs and provisions her own nest cells. Includes *Nomia melanderi*, the alkali bee, widely used in the West for pollinating alfalfa.
IN THE WORLD: More than 130 species are found worldwide; 9 of these can be found in North America (north of Mexico), with only 2 occurring in eastern North America.
CLEPTOPARASITES: *Nomia* is seldom parasitized by other bees; a few scattered reports of *Nomada* entering *Nomia* nests are all that have been observed.
IDENTIFYING FEATURES: Medium-sized bees with pearlescent hair bands on abdomen; stunning bee, but seldom seen. **HEAD:** Face is round, about as wide as long, but tapering slightly as inner eye margins converge. Face may be covered with dense white hairs. **THORAX:** Deep black, with widely spaced, distinctive pits. **WINGS:** Basal vein is not as distinctly arcuate as in many other Halictidae. **LEGS:** In females, scopal hairs are thick and stout on the femur and tibia. **ABDOMEN:** Wide, unpitted shiny ivory-colored bands take up the apical quarter to third portion of each tergal segment.
SIMILAR GENERA: This genus is alone in having ivory bands on the tergal segments. Should these not be visible, the converging compound eye margins are somewhat similar to the eye margins of *Colletes*. Wing venation should be distinguishing (see *Colletes*), in addition to the slenderer body of *Colletes*.

— *Nomia nortoni*



SIZE: Large; 16–18 mm. **PHENOLOGY:** July through November. **FLORAL HOSTS:** Polylectic with some preference for Asteraceae. **RANGE:** Rare in Maryland south through Florida, becoming more common west toward Texas. **NESTING:** Ground-nesting bee. Though solitary, multiple females have been observed to use the same nest entrance. Often nest in aggregations.
IDENTIFICATION: Large black bee with pearl-white or ivory integumental stripes at the apex of each tergal segment. Bands are sometimes tinged with a blue or green sheen. **HEAD:** In males, the antennae are narrowed to points toward the apex. **THORAX:** Large deep pits occur laterally against a shiny black surface. **WINGS:** Brownish, darkening toward the tips. **LEGS:** In males, the femur and tibia are inflated and much enlarged. See genus identification for more characteristics.



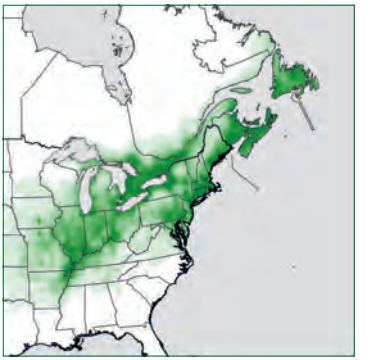
SIMILAR SPECIES: Only one other *Nomia* occurs in the eastern U.S., *N. maneei,* and it is more common than *N. nortoni* near the coast. Overall, *N. nortoni* is larger, with denser pits on T1–T3.

DUFOUREA

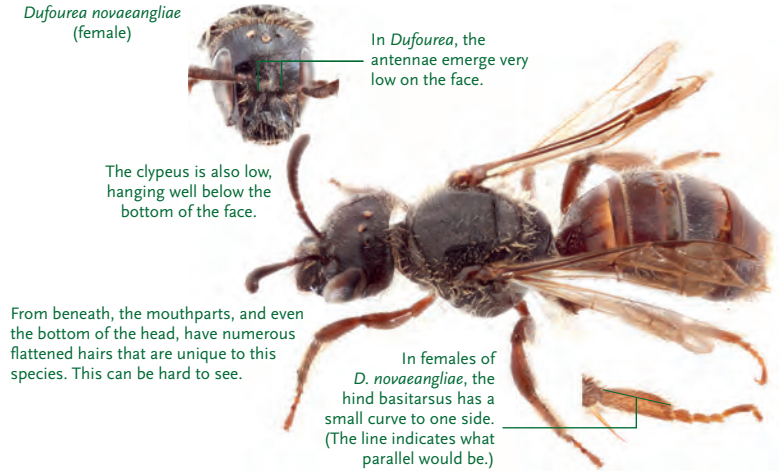
— **SUBFAMILY: Rophitinae**

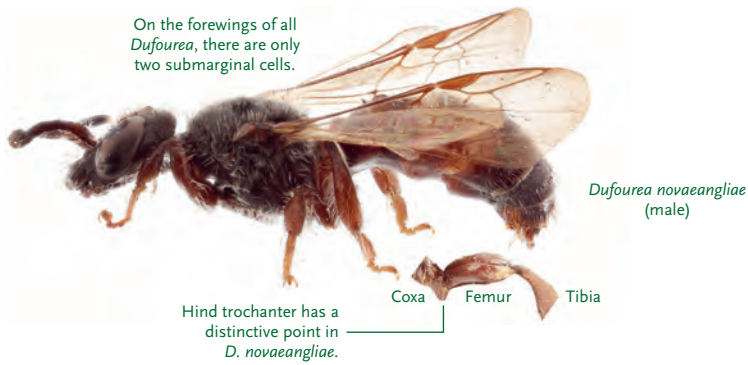
OVERVIEW: Small black bee, seldom seen, but may be locally abundant. The only genus in the Rophitinae subfamily to be found in eastern North America. *Dufourea* are all specialists, often on just one genus of flowering plant. Ground-nesting species.
IN THE WORLD: One hundred and seventy species total. Found throughout the Northern Hemisphere, but most common in the western United States. Around 70 species in North America, with 5 occurring in the East (though some are exceedingly rare).
CLEPTOPARASITES: Unknown in the eastern U.S.
IDENTIFYING FEATURES: **HEAD:** Antennae are very low on the face accompanied by a very short clypeus. Only one subantennal suture. **WINGS:** There are two submarginal cells; nearly all other Halictidae covered in this book have three. The basal vein is not arcuate, as it is in many other Halictidae. **LEGS:** Males often have modifications and projections on the hind legs.
SIMILAR GENERA: Across all *Dufourea,* there is some resemblance to smaller *Andrena,* but the shape of the face, with the low antennae, and single antennal suture should be distinctive. Small *Halictus* may also resemble *Dufourea*. Two versus three submarginal cells, and the low antennae should distinguish the two.

— *Dufourea novaeangliae*



SIZE: Small to medium; 9 mm. **PHENOLOGY:** July through August. **FLORAL HOSTS:** Specialist on *Pontederia* (pickerel weed). **RANGE:** Northeastern United States (Maine to Virginia, east to Missouri and Wisconsin) and southern Ontario. **NESTING:** Ground-nesting bee. Found only in the immediate vicinity of water (ponds, streams, etc.), where its host plant grows. Generally nests in sandy soils, in the shade, and may be found in aggregations. **IDENTIFICATION: HEAD:** Longer than wide. Clypeus sticks out from head appreciably. In females, the head has long, prominent, flattened hairs on tongue parts, though these are hard to see, even under a microscope. **LEGS:** Mid-basitarsus is rounded outward, so it is not parallel-sided. In males, the hind trochanter has a point on it, a distinct angle not found in other eastern *Dufourea*. **SIMILAR SPECIES:** Also found in the eastern U.S. and eastern Canada are *Dufourea marginata*, *D. monardae*, *D. harveyi*, and *D. maura*. The plant on which the female bee forages for pollen is the best indicator of which *Dufourea* species it is, as the distinguishing characters between species are challenging. *Dufourea monardae* can be locally abundant in the East; it visits only *Monarda fistulosa* for pollen. *Dufourea marginata* is a rare species, most abundant in Ontario, Wisconsin, and Illinois. It visits Asteraceae (especially *Helianthus*) for pollen. *Dufourea harvey*i is rarely collected in the East (specifically, only Michigan), occurring mostly west of Colorado, where it is a specialist on *Potentilla*. *Dufourea maura* is primarily a western species, occurring as far east as North Dakota and Nebraska, with isolated records at Isle Royale National Park in Michigan. It is a specialist on *Campanula rotundifolia*.

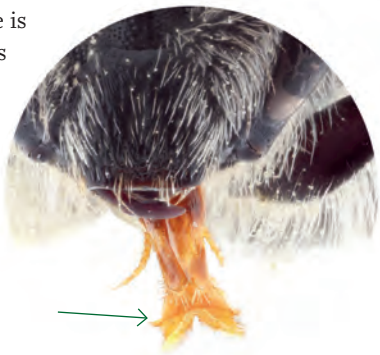




COLLETIDAE

Colletidae are widely distributed around the world, consisting of diverse genera that range in appearance from miniscule, hairless black bees to large fast-flying fuzzy bees. Despite the worldwide variety, in North America just two genera are common: *Colletes* and *Hylaeus*. All are solitary, though many species of *Colletes* nest in aggregations of several hundred. The family includes both ground and cavity nesters, and nests are lined with a cellophane-like secretion. Within Colletidae are bees that are narrow specialists, as well as bees that broadly generalize.

IDENTIFICATION: Identifying a bee as a Colletidae is often harder than identifying the bee at the genus level, as the generic characters are easier to see without a microscope. Memorizing the features that distinguish, especially, *Colletes* and *Hylaeus* will be most useful. Colletidae are united in that they all have a short glossa, which is generally thick (wider than long). At the end it is either abruptly truncated, or more often bilobed (forked). Note that unlike Andrenidae, Colletidae have one subantennal suture. Little else unites this family, morphologically. Behaviorally, all North American Colletidae line their nests with a cellophane-like material that is unique to this family, though some genera nest in the ground while others nest in hollow twigs.



Bees in Colletidae have unique "tongues," with a short glossa and often a bilobed, or forked, tip.

TAXONOMY: There are about 2,500 species of Colletidae, found on every continent (reaching peak diversity in South America and Australia), in 54 genera. In the U.S. there are five genera split into three subfamilies; in the eastern U.S. and Canada can be found three of those genera, two of which are covered here.

— SUBFAMILY COLLETINAE

In North America, there is just one genus, *Colletes*. A medium-sized bee, very common in the spring and fall (many specialize on early- and late-blooming flowers). Females resemble *Andrena* in body shape. On the wing, the second recurrent vein is strongly curved. The inner margins of the compound eyes converge toward the lower portions of the face.

— SUBFAMILY HYLAEINAE

There is just one genus in this subfamily in North America, *Hylaeus*. They are miniscule, black, hairless bees. Most species have yellow markings on the face. On the wing, there are two submarginal cells. There are no scopal hairs in females, as they ingest pollen and nectar and regurgitate both in nest cells.

— SUBFAMILY DIPHAGLOSSINAE

There are three relatively rare genera in this subfamily of large fuzzy bees in North America. All have pointed, bifid glossa. One of these rare genera is found in the eastern U.S. It is not pictured in this book.

— CAUPOLICANINI

There is one species of *Caupolicana* in the East, *C. electa*, found from North Carolina, west to Alabama, and south through Florida. *Caupolicana* differ from other Diphaglossinae by the extremely long first flagellar segment. The species *C. electa* is a large bee with a ruddy-tan thorax, as well as the first segment of the abdomen, the rest of which is black, with light white stripes. It is rarely seen, flying at dawn and dusk, and listed as Rare and Endangered in Florida. There is another genus, *Ptiloglossa*, found in this tribe as well. It occurs in western states.

Within the Colletidae genera there are 64 species.

COLLETES

— SUBFAMILY: Colletinae

OVERVIEW: Medium-sized bees, generally with white, gray, or brown hair on a black integument. All species are ground-nesting, and all line their nests with a clear membranous material that is waterproof. The membrane is formed by secretions from the Dufour's gland in the abdomen. Drops of the oily substance are secreted from the gland, and a female bee quickly ingests them, then regurgitates them onto the wall using her forked, paintbrush-like tongue. The membranous "envelope" contains mostly liquid provisions, heavy with floral nectar. Eggs are attached to the wall, so that they are suspended above the liquid. Cells are constructed at night.

For most species there is one generation per year, with most bees flying early in the spring or in the late fall. A few species have two generations per year, especially at the southern extent of their range.

IN THE WORLD: Worldwide there are more than 500 species, occurring on all continents except Australia. In North America there are approximately 100 species, ranging from Florida through Alaska. Thirty-seven species can be found in the East.

CLEPTOPARASITES: *Epeolus*.

IDENTIFYING FEATURES: **HEAD:** The compound eyes of *Colletes* slant toward each other, and are closer together at the bottom of the head than at the top. **THORAX:** The front

Note that the inner margin of the eyes slants inward, so that the eyes appear to converge.

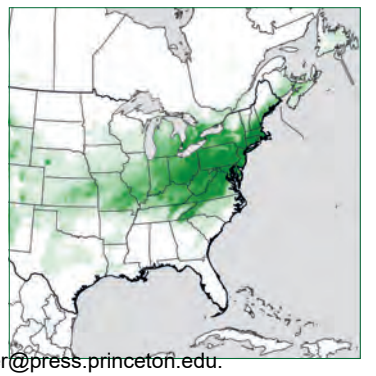
Colletes, like all Colletidae, have a short "tongue." In the case of *Colletes*, it is also forked.

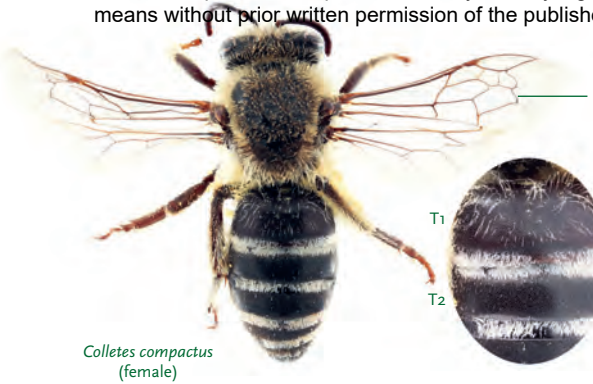
half of the thorax is usually very hairy. **WINGS:** The second recurrent vein is strongly curved. The stigma is relatively large. **LEGS:** Scopal hairs are on trochanters and femurs. **ABDOMEN:** The pygidial plate and basitibial plate are much reduced. Also, there is no pygidial nor prepygidial fimbria.

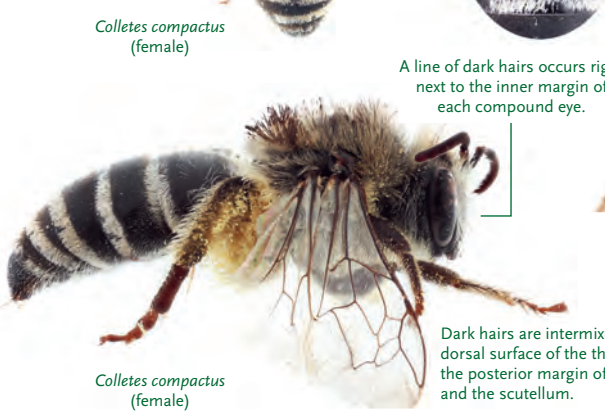
Distinguishing between the species of *Colletes* occurring in North America is difficult and requires a microscope. A handful of common *Colletes* are included here; note that the features associated with these species are not unique to them. Other species, not included here, may also share these characteristics; nonetheless, the characters are useful for distinguishing between the common bees included in this book. **SIMILAR SPECIES:** *Andrena* can superficially resemble *Colletes*. *Andrena* faces are more oval-shaped, with the inner margins of the eyes more or less parallel instead of converging, as in *Colletes*. *Andrena* have less hair on the front half of the thorax. *Colletes* carry pollen lower on their hind legs. And on the face of *Colletes*, there is no facial fovea near the compound eyes, nor are there two subantennal sutures. Larger species of *Halictus* may superficially resemble *Colletes*, but they have more robust heads, are usually smaller, and the wing venation is quite different.

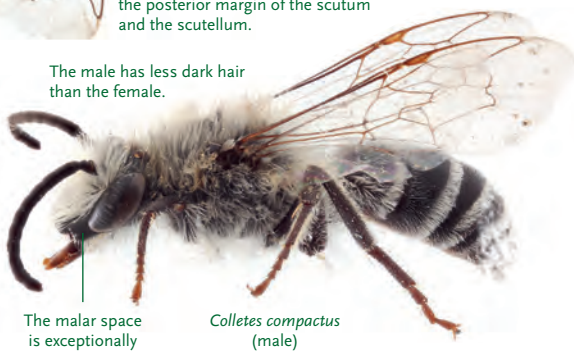
— *Colletes compactus*

SIZE: Small to medium; 9–13 mm. **PHENOLOGY:** Midsummer (July) through November; most common in the fall. **FLORAL HOSTS:** Appears to specialize on fall Asteraceae. **RANGE:** Occurs as far north as Newfoundland, south to Tennessee and North Carolina. **NESTING:** Ground-nesting, sometimes occurs in small aggregations of 10 or fewer.



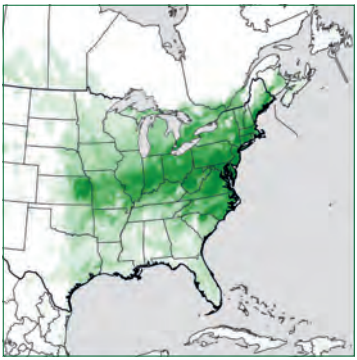






IDENTIFICATION: Robust bee with fuzzy gray head and thorax, black-and-white abdomen. **HEAD:** Black hair lines the edges of the compound eyes. In males, the malar space is long. In females it is about half as long as it is wide, but still longer than in many other *Colletes* species. In males, there is a depression in the middle of the clypeus, shining, and with few pits; this may be hidden by hair. In females, there is no depression, but the clypeus is bare. **THORAX:** Black hair lines the scutum and is common on the scutellum. In females, pits on the scutum are close together, but more sparse posteriorly. Integument in between is dull anteriorly. In males, the scutum is shiny with few pits. **ABDOMEN:** The pits on T2 are as dense as they are on T1, but not more dense. In females, S6 has two median parallel ridges running from the apex to the base of the segment. **SIMILAR SPECIES:** There are two subspecies of *Colletes compactus*. *Colletes compactus hesperius* is found from the Rocky Mountains west, while *C. compactus compactus* occurs east of the Rocky Mountains. This species can be hard to distinguish from other *Colletes* unless using a microscope.

— *Colletes inaequalis*



SIZE: Small to medium; 9–13 mm. **PHENOLOGY:** Early March through May—one of the earliest bees seen in the spring. **FLORAL HOSTS:** Polylectic, but appears to have a preference for early flowering trees, including apples (*Malus*) and maples (*Acer*). **RANGE:** Southern Canada south to Georgia, and west to Washington State. Typically seen in more forested regions. **NESTING:** Ground-nesting bee with a preference for sandy habitats. Nests may be in aggregations, with males hovering over them; they have been found with as many as five bees sharing a nest entrance.

Colletes inaequalis (female)

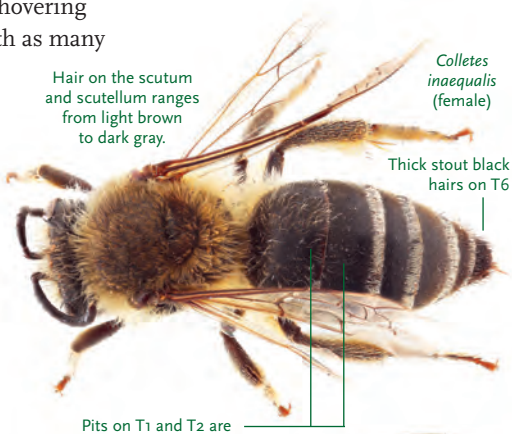
There is a shiny line down the middle of the clypeus.

The malar space here is small, twice as wide as it is long.

Colletes inaequalis (female)

Hair on the scutum and scutellum ranges from light brown to dark gray.

Thick stout black hairs on T6



Pits on T1 and T2 are deep and widely spaced.

Colletes inaequalis

Colletes inaequalis has a long and skinny hind basitarsus, while other *Colletes* have a thicker, broader hind basitarsus.

Colletes inaequalis (male)

Other *Colletes*

The propodeum is dull, and roughly sculptured.

Note the deep, widely spaced pits on T1.

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The pages in **bold** indicate a full species description.