

BEES



While many insects are considered pests, bees are an exception, being among the most crucial for pollinating agricultural crops and wildflowers. With over 16,000 species in 7 families worldwide and some 4,000 across North America, bees are represented by over 750 species in the Mojave Desert.

Bees share many features in common with their close cousins: wasps, ants, and sawflies. First, in most species, females possess an ovipositor modified into a stinger. The structure is barbed in honey bees, thus can only be employed once, after which the individual dies. In others, such as bumble bees, the stinger lacks the barbed end, allowing the bee to defend itself or the hive by stinging repeatedly multiple times without killing the user. Secondly, the young develop from wormlike larva, progress to a pupal stage, then mature into adults. Thirdly, all hymenopterans have membranous wings.

Bees perceive their world with five eyes (a trait shared with grasshoppers, dragonflies, and others): three small "ocelli" for navigation and orientation; two large compound eyes used for detecting shapes and colors. Most bees are diurnal, though some (particularly tropical species) are crepuscular or nocturnal. While many are social (e.g. honey bees and bumble bees live in small to large colonies), the majority (over ninety percent) are solitary.

Family **APIDAE** (Bees)

Western Honey Bee (*Apis mellifera*)

Measurements:

Average Length: .6" Wing Span: ~.5"

Distinguishing Field Characteristics:

brown, hairy thorax; abdomen **orange-brown** with **dark bands**, pointed; short translucent dusky wings; 2 large black compound eyes, 3 smaller eyes (ocelli)

Notes:

very common, perennial colonies composed of a queen, female workers, male drones; eusocial; cosmopolitan, found on every continent, except Antarctica; one of the first domesticated insects; 31 subspecies; aka **European Honey Bee**; collects pollen and nectar to produce honey that the colony survives on through winter months; queen is the only fertile female; males produced from unfertilized eggs (**haplodiploidy**), females from fertilized eggs (90% of colony female); stinger is a modified ovipositor, barbed on workers (unique to this species); critical pollinator; lifespan of workers up to 4 months, about 5 for queens

Mojave presence: year-round; naturalized

Comments:

Originally from Eurasia, honey bees are now a ubiquitous visitor that every gardener around the world recognizes! Of course, these pollinating workhorses are not restricted to urban flora. The busy collector on the left works a **Rabbitbush** in Dolan Springs, AZ, (Sept. 2021); the one on the right does the same to a **New Mexico Thistle** at Red Spring in the **Red Rock Canyon NCA** (July 2017).

The **Sacred Datura**, aka **Jimson Weed** (*Datura wrightii*), a member of the Nightshade family, is one of the most toxic plants in the Mojave Desert. Apparently, that doesn't faze this industrious forager investigating the bounty of the large, inviting flowers growing at Corn Creek in the **Desert Nation Wildlife Refuge** in NV (Sept. 2020).



Lake Albert; Florida



Lake Albert; Florida



Bird Viewing Preserve; NV



Red Rock Cyn NCA; NV



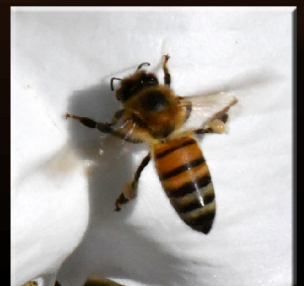
September



July



September



September

Family **APIDAE** (Bees)

Western Carpenter Bee (*Xylocopa californica*)

Measurements:

Average: Length: 1" Wing Span: 1.5"

Distinguishing Field Characteristics:

sparsely pubescent (some hairs on head, abdomen); shiny **black overall** with bluish cast; black eyes and antennae; iridescent black/purple/brown (depending on angle of light) transparent wings; **(m)** narrower head than females; yellowish to **tan bands of hair** on thorax and abdomen; **(f)** larger, wider head than males; **black body hairs**; dense pollen brush hairs on hindlegs

Notes:

common; solitary; docile, rarely stinging; found in a variety of low-elevation habitats, including deserts, in w NA from the Pacific coast east to NM, and OR south to nw MEX (rarely recorded elsewhere); aka **California Carpenter Bee**; 3 subspecies; builds nest in wood; only females have a stinger; active spring through end of summer; important pollinator of crops and native plants; collects pollen and nectar, but produces little honey

Mojave presence: native

Comments:

While common in many locations throughout the Mojave Desert and adjacent areas, these bumble bees can still be a challenge to get good pics of as they constantly flit from flower to flower in search of nectar. The individual at left offered a good photo op as she was preoccupied with a **Desert Rue**, aka **Turpentine-Broom**, (*Thamnosma montana*) in Dolan Springs, AZ, in March of 2022.

I found the individual at right hanging out at the Bright Angel Lodge in the **Grand Canyon National Park** in August, 2019. It provided me with some fine shots as it explored a **Western Whorled Milkweed** (*Asclepias subverticillata*) before darting off to another prospective location.



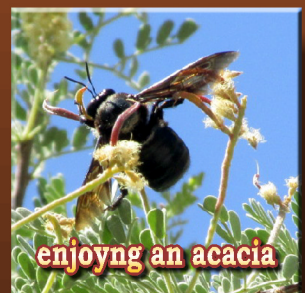
Clark Co. Wetlands Pk; NV



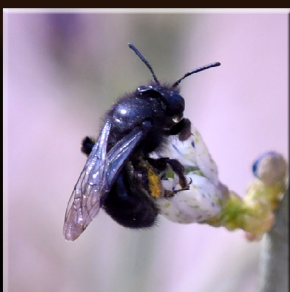
Red Rock Cyn NCA; NV



Clark Co. Wetlands Pk; NV



Willow Sprg; RRCNCA; NV



Be3

Family APIDAE

(Bumble Bees)

Hunt's Bumble Bee (*Bombus huntii*)

Measurements:

Average: Length: .6" Wing Span: 1.5"

Distinguishing Field Characteristics:

pubescent (furry) overall; yellow thorax with simple black central band; abdomen yellow with central orange dorsal band ("belt") and black tip; black head and eyes with yellow facial hairs; transparent blackish wings

Notes:

uncommon; eusocial; found mainly in high-elevation open areas (fields, meadows, etc.) in western NA from CAN south to MEX; aka **Hunt Bumble Bee**; nests underground; important pollinator; flies summer and fall; feeds on nectar from variety of plants, such as rabbirbrush and sunflowers; produces a small amount of honey

Mojave presence: native



Lee Cyn; SMNRA; NV



Lee Cyn; SMNRA; NV



Lee Cyn; SMNRA; NV



Lee Cyn; SMNRA; NV

Comments:

The specimen shown here enjoying what appears to be a type of arnica in Lee Canyon in the **Spring Mountains National Recreation Area** in August of 2021 is the only member of the species I have encountered in the Mojave region (or anywhere else for that matter). These bees are typically found in the higher elevations of the Mojave (such as the Springs Mountains and Sheep Range in southern Nevada), rather than in the desert itself.

The conspicuous orange "belt" is attractive and quite distinctive, distinguishing it from most other bumble bee species found in the Mojave, with a couple exceptions. The **Orange-Belted Bumble Bee** (*B. ternarius*) differs in having black--rather than yellow--facial hairs, but its range is mostly farther north into Canada and in the northeastern region of the US (though occasional visitors have been recorded in the Mojave area); the **Great Basin Bumble Bee** (*B. centralis*) is also quite similar and shares an overlapping range, but has somewhat longer hair and light brown wings, and generally frequents lower elevations. Regardless, these individual features are difficult to determine in the field, so it is necessary to take plenty of photos and study them closely to more accurately determine the species.

Family **APIDAE** (Bumble Bees)

Golden Northern Bumble Bee (*Bombus fervidas*)

Measurements:

Average: Length: .6" Wing Span: 1.6"

Distinguishing Field Characteristics:

pubescent (furry) overall; **queens** yellow thorax with single black medial band, and yellow abdomen with black tip; black head, eyes, legs; translucent, dark gray wings; **workers** (f) similar to queens, but slightly smaller and with more yellow on abdomen; **drones** (m) black overall

Notes:

common, though considered **VULNERABLE**; females social, usually in small colonies (males, solitary); found primarily in open habitats (grasslands, farms, etc.) and urban areas throughout most of temperate NA (less common in se US); aka **Yellow Bumblebee**; nests mainly below ground, though sometimes above (only young, mated queens survive winter; lifespan about 1 year); important pollinator; flies spring to fall collecting pollen and nectar from a large variety of plants; feeds on honey produced by workers in small quantities

Mojave presence: native

Comments:

The color pattern of this species is somewhat variable, which can lead to it being confused with other similar species where ranges overlap, such as the **California Bumble Bee** (*Bombus californicus*). However, the pattern is usually typical enough to make positive identification easy. Nevertheless, though still relatively common through most of its range (where appropriate habitats have not been overly affected by developmental and agricultural encroachment), the queen shown above at the **Henderson Bird Viewing Preserve** in September of 2022 is the only one that I can confidently claim to have encountered in the Mojave region.



HBVP; Henderson, NV



HBVP; Henderson, NV



HBVP; Henderson, NV



HBVP; Henderson, NV

Family **APIIDAE** (Bumble Bees)

Morrison's Bumble Bee (*Bombus fervidas*)

Measurements:

Average: Length: .75" Wing Span: 1.25"

Distinguishing Field Characteristics:

pubescent (furry) **yellow overall**; tip of abdomen black; black eyes, antennae, legs, wings; genders similar, though female larger

Notes:

common, though listed as **VULNERABLE** in some areas; social in small colonies (males, solitary); found in open areas (fields, meadows, scrublands, etc.) in western montane NA from BC, CAN, south through CA east of the Sierra Nevada mountains, east to CO/w TX; aka **Morrison Bumblebee**; nests underground and sometimes above (only young, mated queens survive winter); important pollinator, especially of alfalfa; females fly March to September (males, July to October), feeding on nectar and collecting pollen from variety of plants, such as rabbitbrush, vetches, thistles, etc.

Mojave presence: native; rare

Comments:

This bumble bee is becoming quite uncommon, declining, and listed as **VULNERABLE** in some parts of its range. The females shown here foraging on **Fernbush** (*Chamaebatiaria millefolium*) (left), **Horsetail Milkweed** (*Asclepias subverticillata*) (upper right), and **White Horehound** (*Marrubium vulgare*) (bottom right) near the Bright Angel Lodge in Grand Canyon Village along the South Rim of **Grand Canyon National Park** in July of 2017 are the only ones I have seen and photographed, as far as I'm aware of. Being almost completely covered in yellow hairs with no other markings is easily discernable in the field.



Grand Cyn Village; GCNP



Grand Cyn Village; GCNP



Grand Cyn Village; GCNP



Grand Cyn Village; GCNP

Family HALICTIDAE

(Sweat Bees)

Texas Striped Sweat Bee (*Agapostemon texanus*)

Measurements:

Average: Length: .5" Wing Span: .75"

Distinguishing Field Characteristics:

furry, **metallic green head and thorax**; green eyes, paler than body color; dark antennae; **(m) yellow abdomen** with 4-5 black/brown bands; yellow legs with little to no longitudinal dark markings on legs; **(f) metallic green abdomen**; dark legs

Notes:

common; solitary; found in densely flowered habitats throughout w NA generally west of the Mississippi River from s CAN south to Central America; aka **Ultra Green Sweat Bee**; nests underground; 1-2 generations per year; important pollinator of crops and wildflowers; flies from March to October; feeds on nectar from flowers and aphids

Mojave presence: native

Comments:

Sweat bees in general derive their name from their predilection for human sweat, which is a good source of nutritious salts. While such behavior can be annoying and perhaps even alarming to the host, this species is not aggressive, and rarely stings unless severely provoked. Even then the sting is relatively harmless aside from any allergic reaction one may be prone to experience.

The male above, not interested in sweat, was photographed collecting nectar from a **Mojave Thistle** (*Cirsium mohavense*) at the Corn Creek ranger station in the **Desert National Wildlife Refuge** in Clark County, NV, in August of 2020.



Corn Crk; Desert NWR; NV



Corn Crk; Desert NWR; NV



Family HALICTIDAE

(Sweat Bees)

Angeles Striped Sweat Bee (*Agapostemon angelicus*)



Corn Crk; Desert NWR; NV



Corn Crk; Desert NWR; NV

Measurements:

Average: Length: .6" Wing Span: .8"

Distinguishing Field Characteristics:

furry, **metallic green head and thorax**; green eyes, paler than body color; dark antennae; **(m) yellow abdomen** with 4-5 black/brown bands; yellow legs with little to no markings on legs; **(f) green abdomen** with paler bands; dark legs; slightly larger than male

Notes:

common; mostly solitary; found mainly in w NA from CAN south to MEX, especially desert regions of sw US; 2 subspecies; easily confused with *A. texanus* (page 5); nests underground; 1-2 generations per year; feeds on nectar, but does not produce honey; an important pollinator

Mojave presence: native

Comments:

This species is not aggressive; in fact these bees are quite docile. Only females have a stinger, albeit a small one, which inflicts a relatively mild sting. Like their relatives, these small bees are attracted to human sweat for its nutritious salt content, which is obtained by harmless licking. Apparently, this activity is preferred by females rather than the males.

The little lady above was photographed collecting nectar from a **Desert Marigold** (*Bailey multiradiata*) at the Corn Creek ranger station in the **Desert National Wildlife Refuge** in Clark County, NV, in October of 2018.

Family **HALICTIDAE** (Sweat Bees)

Cuckoo Sweat Bee (*Sphecodes arvensiformes*)



Dolan Springs, Arizona



Dolan Springs, Arizona

Measurements:

Average: Length: .7" Wing Span: 1"

Distinguishing Field Characteristics:

slender; sparsely pubescent; black head and thorax, segments bordered with some grayish hairs; orange-brown abdomen; black legs, eyes, antennae

Notes:

uncommon; solitary; found in open habitats (desert scrub, meadows, gardens, etc.) in the desert regions of the sw US; kleptoparasite; diet consists of nectar; active spring through summer, typically flying low to ground in search of nests of potential host bees

Mojave presence: native



Dolan Springs, Arizona



Dolan Springs, Arizona

Comments:

The name "cuckoo" bees is derived from a reproductive strategy that is similar to cuckoo birds, in that they parasitize the nests of other sweat bees by replacing host eggs with their own. As a consequent, they do not possess pollen baskets on their legs for gathering food for their offspring, nor do they need to waste their time and effort to build their own nest! They take no responsibility for raising their own offspring at all. Talk about lazy!

These bees can be very difficult to positively identify as to species by strictly visual methods. The female shown above crawling around on the ground in Dolan Springs, AZ, in September of 2022--presumably hunting for another cuckoo bee's nest to infiltrate and parasitize--is easy to distinguish from its metallic green cousins, but from others of its coloration...that's a different matter! Range could be a deciding factor, but not wholly reliable. However, *S. arvensiformes* is the likely candidate in this case since it is more abundant in the region than other similar species.

In this group of cuckoo bees, males, typified by the one above, have a red abdomen tipped with black, while females lack any black on the abdomen. As for the yellow on the female's shoulders...presumable that's just pollen.

Family MEGACHILIDAE

(Leafcutter Bees)

Leafcutter Bee (*Megachile alata*)

Measurements:

Average: Length: .5" Wing Span: .75"

Distinguishing Field Characteristics:

pubescence of grayish hairs on black thorax; wide, somewhat flattened and tapered, black abdomen with **bands of white setae**; black eyes, antennae; transparent wings; **(f) white scopal hairs** on underside of abdomen for collecting pollen; **(m)** smaller in size; lacks scopal hairs; generally furrier face

Notes:

common; solitary; inhabits the deserts of the sw US south into nw MEX; nests in soft wood, ground, etc.; adults consume nectar, larvae on pollen; does not produce honey; important pollinator of a variety of wildflowers and agricultural fruits and vegetables (e.g. berries, carrots, alfalfa, etc.)

Mojave presence: native

Comments:

These small bees are named for cutting circular to oval sections of leaves for use in lining their nests, which they build by tunneling into soft wood, the ground, or other suitable substrates.

They are easily distinguished from other types of bees by their shape, the bands of pale setae on a dark abdomen, and the way females carry pollen--on sticky hairs called **scopae** that cover the underside of the abdomen (males lack such hairs). However, the differences between species are so subtle that identification in the field is impractical, if not impossible, although knowing such details as the range of locally found specimens, and the kinds of plants they frequent, can be helpful. The specimens shown here are most likely **M. alata**, though not confirmed by more expert sources! Regardless, these bees are unaggressive, only stinging when handled; when they do, the pain is reported to be less painful than that from a honey bee.

The males above were photographed investigating **Narrowleaf Goldenbush** (*Ericameria linearifolia*) flowers at **Red Rock Canyon NCA** in Nevada in October and November of 2016. The female enjoyed a spring bloom of **Desert Marigold** (*Baileya multiradiata*) in **Christmas Tree Pass** near Spirit Mountain in Clark County, Nevada, in April, 2017.



Red Rock Cyn NCA; NV



Red Rock Cyn NCA; NV



Christmas Tree Pass; NV



Christmas Tree Pass; NV