The Bumble Bees of Colorado

A Pictorial Identification and Information Guide



Abigail Wright, Crystal L. Boyd,
M. Deane Bowers, and Virginia L. Scott

Cover photos taken by Diane Wilson. Species from left to right are *Bombus pensylvanicus*, *Bombus flavifrons*, *Bombus balteatus*.

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A Pictorial Identification and Information Guide

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Acknowledgments

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Introduction

Bumble bees have long fascinated humankind, at least since Carl Linneaus described six species in 1758 (Integrated Taxonomic Information System). Bumble bees are effective pollinators in urban, natural, and agricultural systems (Kearns and Thomson, 2001).The genus *Bombus* includes 250 bumble bee species worldwide, with 46 species present in North America, north of Mexico (Williams et al., 2014). Half of these—24 species total—occur in Colorado (Scott et al., 2011).

While there is a good deal of information on bumble bees available, Colorado is positioned in such a way that very few of the guides cover all the species that occur here. Also, many bumble bees vary in coloration across their entire range, so color patterns that do not occur in Colorado are in guides and can be confusing.

The goal of this guide is to provide a resource for those looking to learn more about Colorado's bumble bees. This work is intended as a primer to engage a broad, general audience so that students, naturalists, gardeners, conservation managers, and field biologists can gain a basic understanding of Colorado's bumble bee fauna. It is not intended as a technical guide, since Williams et al. (2014) provides that, but rather as a local guide to the state's bumble bees. In our guide, identification is based on color pattern, which is not always enough to ensure accurate species level identification, however, you will generally be able to narrow down your identification to one or a very few species. We recommend you start with the color plates on pages 60-63 or the handy guide for quick separation of species on page 59. From there, if you look up the information on the species account pages, paying close attention to county maps, elevations, and the similar species sections, you will likely come up with the correct species.

When you wish to move beyond this guide, other materials you may find useful are (these range from user-friendly to technical):

For eastern Colorado – The bumblebees of Nebraska (LaBerge and Webb, 1962), A guide to identifying Nebraska Bumble bee species (Golick and Ellis, 2000) and Bumble bees of the eastern United States (Colla et al., 2011), though the maps in this guide do not include Colorado

For high elevation and westerrn Colorado – Bumble bees of western America (Stephen, 1957), Bumble bees and cuckoo bumble bees of California (Thorp et al., 1983), and Bumble bees of the western United States (Koch et al., 2012), which does not include several of the eastern plains species.

All of Colorado – On the Ecology and systematics of Coloradan Bumblebees (Byron, 1980), Bumble bees of North America (Williams et al., 2014).

Life History

Bumble bees are large, charismatic insects, but to understand them, one must know about their natural history. All bumble bees, like butterflies have four life stages: egg, larva, pupa, and adult. They also live in colonies. Most are social, but a few species are social parasites.

In the social species, each newly reared future queen overwinters by burrowing into soft ground or other safe place such as in compost piles. In the early spring, this young queen seeks out a place to establish a nest. She will build wax pots, collect pollen and nectar to feed to her offspring, and start laying eggs. When her daughters emerge, they will be the worker caste that continues to forage for pollen and rear offspring. The queen will stay in the hive and lay eggs. Later in the summer, the colony will start producing new queens for next summer and males. In the fall, all but the newly emerged and mated queens will die. The following year, the cycle will repeat.

There is an alternative life history in some bumble bee species, including four species that occur in Colorado; these are the social parasites. Rather than founding their own colony and producing a worker caste, the females of these bumble bee species sneak into established colonies of other bumble bees and replace the queen. The workers of the host colony then spend their time raising the parasite species offspring, all reproductive females or males, as the social parasite species have no worker caste. While parasites often get a bad rap, diversity is a good thing.

Like other bees, bumble bees visit flowers for pollen and nectar. Nectar serves as a food source for both the adults (males and females including queens and workers) and their offspring. Pollen is collected by females as a protein source for their offspring. Pollination occurs in the process, but is not the goal of the bee. While all bumble bees have fairly long tongues, some also have elongated faces that allow them to gather nectar from flowers with long corolla tubes, such as delphiniums. Bumble bees are also known to buzz pollinate certain types of flowers including tomatoes and blueberries. After landing on these flowers, they buzz their wings at a frequency that shakes the pollen out of the anthers. Unlike drone honey bees, male bumble bees are not restricted to their colonies and are often observed on flowers. Incidentally, only the female (queen and worker) bees can sting.

Nesting sites are often abandoned rodent burrows in the ground, but they may be a matted grass hummock, or even a hole in a tree trunk, eave, or bird house. Just as some people opt to put out bird houses on their property, it is possible to construct “houses” for bumble bees. They are not colonized with great success, but they can still be fun. There are many instructions for bumble bee nesting boxes on the internet, including designs for one-room or two-room wooden boxes, inverted flower pot designs, and modified PVC pipe “chickadee” houses. Some unbleached cotton, wool, or moss in the house seems to help increase the odds of nesting.

Bumble bees:
Climate Change and Conservation

Each and every one of us lives in a changing climate. Ninety-seven percent of scientists agree that the Earth is warming due to human actions, and that there will be noticeable differences in our climate in the coming years (Anonymous, 2014). This will affect all walks of life, from microscopic communities to megafauna, plants, and bumble bees.

Climate change will not only disrupt the lives of bumble bees, but it will also endanger the livelihood of many of their food sources. In a broad sense, warmer temperatures and drier soil have led to a decline in alpine plant species (Kopp and Cleland, 2013). Bumble bees have coevolved with many flowers; the bees are dependent on the flowers for nutrition, and the flowers depend on the bees for pollination. Seed production and abundance of flowers in the Rocky Mountains will be affected by climate change, so much so that the pollination behavior of bumble bees will have to change (Inouye et al., 2002).

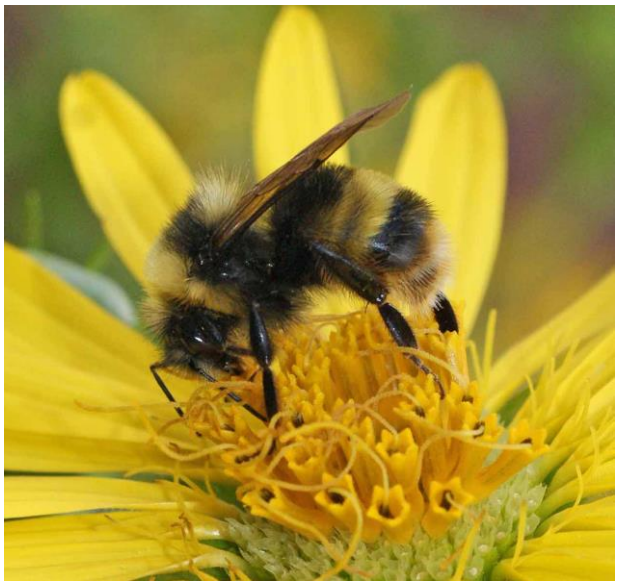
Additionally, bumble bees will suffer declines due to "narrower climatic niches" (Potts et al., 2010). This most obviously affects bumble bees that are specialized, such as those with very long tongues. A study conducted by Miller-Struttmann et al. (2015) found a rapid evolution of shorter tongues in two high elevation Colorado bumble bees, *B. balteatus* and *B. sylvicola*. Bumble bees with long tongues are adapted to extract nectar from flowers with long floral tubes.

As mentioned before, many alpine plant species will be negatively affected by climate change (Miller-Struttmann et al., 2015). The Optimal Foraging Theory suggests that in response to lowered floral density, pollinators must expand their niche (Essenberg, 2012). For bumble bees with long tongues, this means extracting nectar from shallower flowers. Climate change is encouraging an evolutionary shift from specialization to generalization (Miller-Struttmann et al., 2015).

In addition to climate change, many bumble bees are experiencing habitat loss due to agriculture. The increase in monoculture has led to an overall decrease in floral resources suitable for bumble bees (Goulson et al., 2008). The nesting behavior of bumble bees is also threatened, as farming practice can destroy both above-ground nests and the rodents that build areas for below-ground nests (Goulson et al., 2008). Pesticides are well known to cause honey bee declines, but similar effects will occur with bumble bees (Goulson et al., 2008).

From an anthropogenic viewpoint, bumble bees are important because their pollination abilities affect human welfare, crop production, and ecosystem stability, and their pollination efforts are worth billions of dollars (Potts et al., 2010). How do we go about conserving these important species? Bumble bees' needs are addressed in six key points: population size, dispersal abilities, foraging range, foraging use, the value of agri-environment schemes, and urban areas (Goulson et al., 2011). Our conservation strategies must reflect thought put into each of these needs.

We can help Colorado bumble bees, and it is imperative that we do, because they are such an important part of our surrounding ecosystem. First, it is important to increase public awareness of the plight of bumble bees, as this strategy has proven to be effective (Williams and Osborne, 2009). Encouraging sustainable agriculture and implementing smart land management strategies could also greatly help (Williams and Osborne, 2009). Planting pollinator "boxes" and flowers provides food for bumble bees. Lastly, donating towards research efforts to understand bumble bees declines will allow researchers to directly address the problems.



Bombus occidentalis, a once common bumble bee in the western U.S. has received much publicity because of the sharp decline in its populations across much of its range.

Bombus variabilis, is arguably the rarest bumble bee in Colorado. Its parasitic life-style and apparent link to only one host species (which may be in decline), makes it extremely vulnerable.

Species Accounts

The following pages consolidate and illustrate information for Colorado's 24 bumble bees. Much of these data are from Boyd (2011). For each species we include:

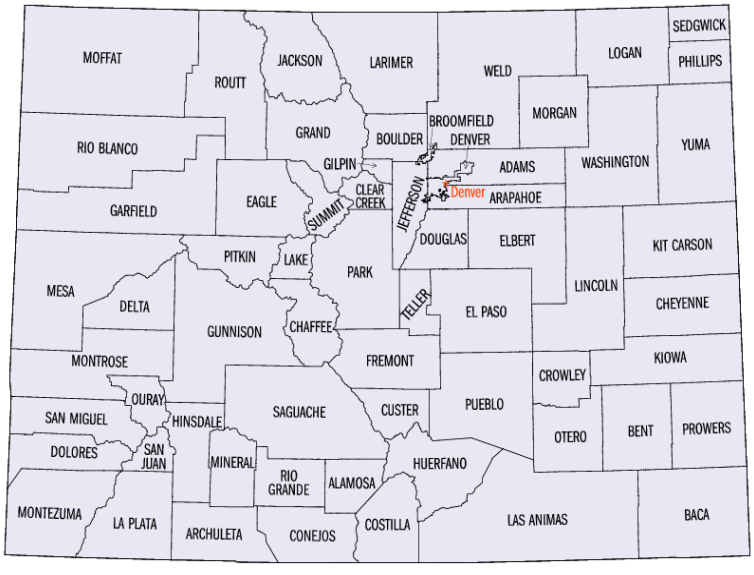
Species Name, Author, and Publication Date – Each species account starts with the species name: genus (subgenus) species epithet, author (the scientist who named the species), and the year the species description was published. An author name in parentheses indicates that the species was described in a genus other than *Bombus*.

Photograph – A photograph of a bee in the wild (or a museum specimen when a live bee photo was unavailable) is shown. Among other things, these photos provide details on the texture of the hairs.

Color Diagram(s) – One or more diagrams indicating the color pattern(s) of the hairs as seen in Colorado bumble bee specimens are shown. Some species vary a lot, while others are quite consistent throughout the state. The size range is listed next to each sex. Female size ranges include both the queen and worker castes.

Species Account – A brief discussion or several "fun facts" are listed for each species.

County Map – Each species has a map that shows where specimens have been collected shaded in purple. Some areas of Colorado are well collected (Boulder and Larimer Counties) while other parts of the state tend to be less well studied (eastern plains). With this in mind, the maps offer a coarse understanding of species ranges within the state. A map showing Colorado county names is below.



Elevation Range– The elevation figure for each species provides information about the elevations in Colorado where the species is known to occur (shaded in green).

Floral Associations – A list of floral records is presented for each species. These floral records were compiled from label data from museum specimens (all castes: queens, workers and males) and are organized alphabetically by family. Genera are organized alphabetically within each family, as are the species within each genus. Family names are underlined. If a floral record was recorded only to family, it is listed under the family name as "unknown species" (Ex: Cucurbitaceae: unknown species). If a floral record was recorded to genus alongside a color, it was recorded as "(*Genus*) *sp.* (color)" (Ex: *Astragalus sp.* (white)).

Flight Periods – For each species, a list of flight periods, by caste, are given for all elevations combined. These are based on label data for specimens collected in Colorado.

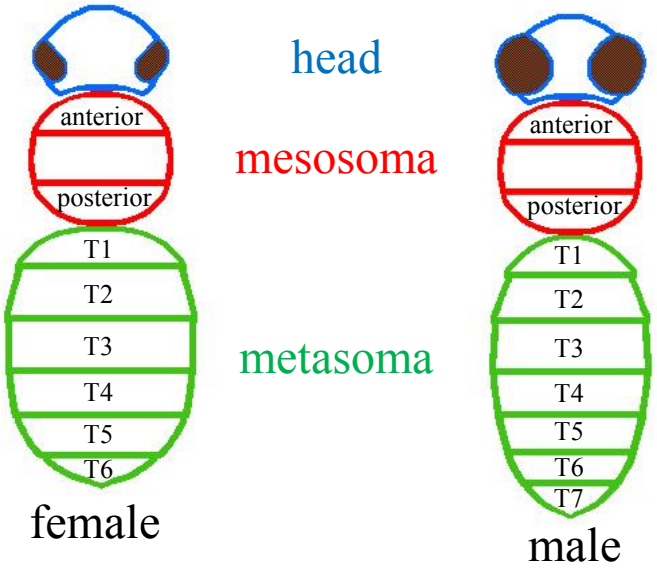
Nesting Habits – A brief description of where the species is known to nest is noted.

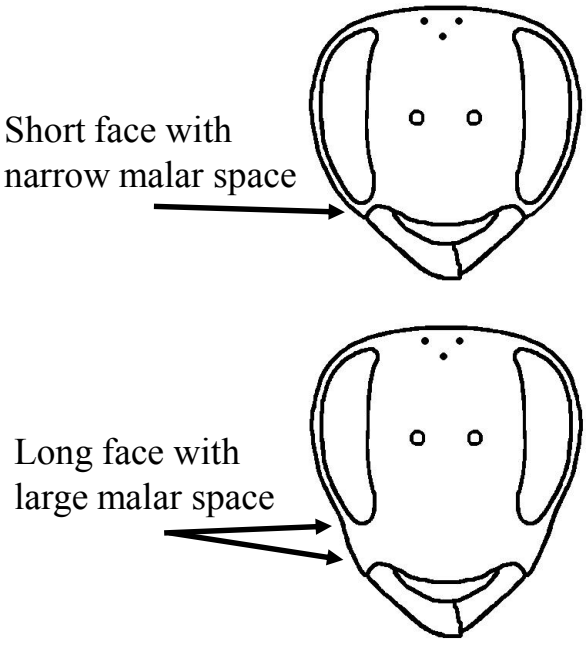
Similar Species – For each species account, similar species are listed with hints as to how to distinguish them.

We have tried to keep the use of technical terms to a minimum, however a few terms are necessary in order to identify bumblebees. See figures below. There are 3 body part, the **head**, **mesosoma**, and **metasoma**. (In bees and wasps the first true abdominal segment is fused to the thorax, so we use the terms mesosoma and metasoma instead of thorax and abdomen.)

- **Females** have pollen collecting baskets on their hind legs, except for the parasitic species. They have a somewhat rounder metasoma with 6 visible segments (numbered T1-T6), and comparatively shorter antennae. They also possess a sting.
- **Males** have no pollen collecting baskets on their hind legs, longer metasoma with 7 visible segments (numbered T1-T7), and comparably longer antennae. The males of six Colorado species have large, bulgy compound eyes; the rest have regular-sized eyes. Males do not sting.

Some species have a short, round head, as viewed looking toward the front of the face. This is because the malar space, between the compound eye and base of the mandible is rather narrow. Long-faced species have a large malar space. Species with an intermediate length malar space occur also.

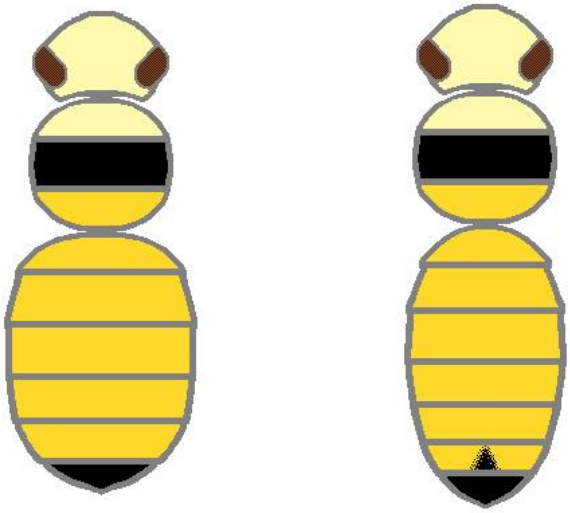




Bombus (*Subterraneobombus*) *appositus*
Cresson, 1878

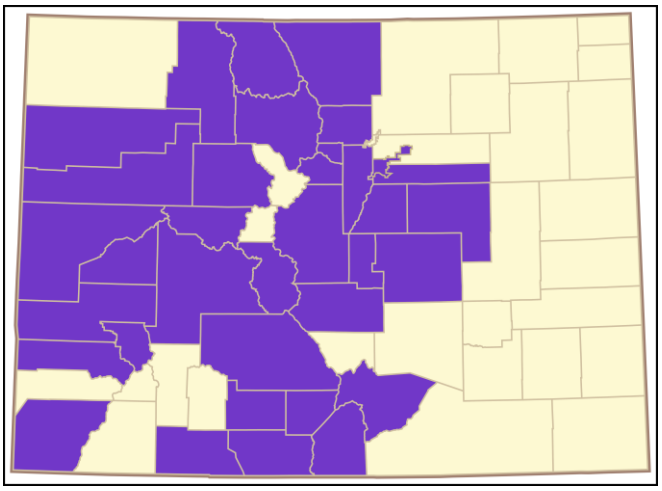
A female *Bombus appositus* (photo by Diane Wilson).

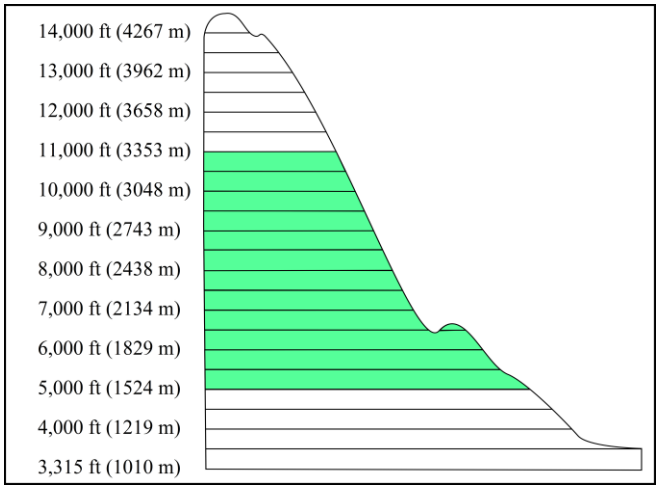
Female
Bombus
appositus
11-24 mm



Male
Bombus
appositus
10-16 mm

Bombus appositus is a fairly common and easily recognized bumble bee found throughout central and western Colorado. It is a relatively large species with a long face. The head and anterior portion of the mesosoma are distinctly paler yellow than the darker, golden, yellow of the metasoma that covers T1-T5 in females and T1- most of T6 in males.





County Map for *B. appositus*: Alamosa, Arapahoe, Archuleta, Boulder, Chaffee, Clear Creek, Conejos, Costilla, Delta, Denver, Douglas, Eagle, El Paso, Elbert, Fremont, Garfield, Gilpin, Grand, Gunnison, Huerfano, Jackson, Jefferson, Larimer, Mesa, Montezuma, Montrose, Ouray, Park, Pitkin, Rio Blanco, Rio Grande, Routt, Saguache, San Miguel, and Teller Counties.

Elevation Range for *B. appositus*: 5,000 to 11,000 feet (1524 to 3353 meters).

Floral Associations for *B. appositus*: Asteraceae: *Carduus nutans, Carduus* sp., *Chrysothamnus* sp., *Cirsium arvense, C. canescens, Cirsium* sp., *Grindelia squarrosa, Grindelia* sp., *Liatris punctata, Taraxacum* sp.; Boraginaceae: *Onosmodium bejariense* var. *occidentale*; Brassicaceae: *Barbarea* sp.; Capparaceae: *Cleome serrulata*; Cucurbitaceae: *Cucurbita pepo*; Fabaceae: *Astragalus bisulcatus, A. laxmannii* var. *robustior, Astragalus* sp., *Oxytropis lambertii, Oxytropis* sp., *Thermopsis montana, Thermopsis* sp., *Trifolium nanum, Trifolium* sp., *Vicia* sp.; Lamiaceae: *Monarda fistulosa, Monarda* sp.; Orobanchaceae: *Castilleja* sp., *Pedicularis bracteosa*; Papaveraceae: *Papaver nudicaule*; Plantaginaceae: *Linaria dalmatica, Linaria vulgaris, Linaria* sp., *Penstemon degeneri, P. griffinii, P. secundiflorus, Penstemon* sp., blue *Penstemon* sp.; Poaceae: *Bromus* sp.; Ranunculaceae: *Delphinium barbeyi, D. nelsonii, D. robustum, Delphinium* sp.; Rosaceae: *Dasiphora fruticosa* ssp. *floribunda, Prunus* sp.; Salicaceae: *Salix* sp.

Flight Periods for *B. appositus*: Queens: Fly early May through late August but most abundantly in late May, late June, and all of July. Males: Fly early July through late August but most abundantly throughout late July and all of August. Workers (females): Fly early June through early September but most abundantly in late July and all of August.

Nesting Habits for *B. appositus*: On the surface of the ground.

Similar Species:

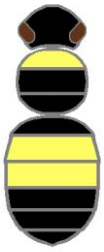
Bombus fervidus is more evenly lemon yellow throughout with more black at the tip of the metasoma (T5 and T6 on female; all but the center of T6 and all of T7 on male). *B. fervidus* is somewhat smaller and may or may not have a black band on the mesosoma. *B. fervidus* tends to be found at lower elevations.

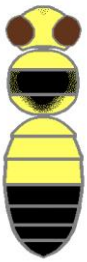
Bombus rufocinctus females are much smaller, rounder, and have a shorter, darker face. Rarely are our female *B. rufocinctus* this evenly golden yellow over T1-5, and male *B. rufocinctus* have large eyes.

Bombus (*Bombias*) *auricomus*
(Robertson, 1903)

A female *Bombus auricomus* (photo by Roland Barth, permission by Heidi B. Curtis).

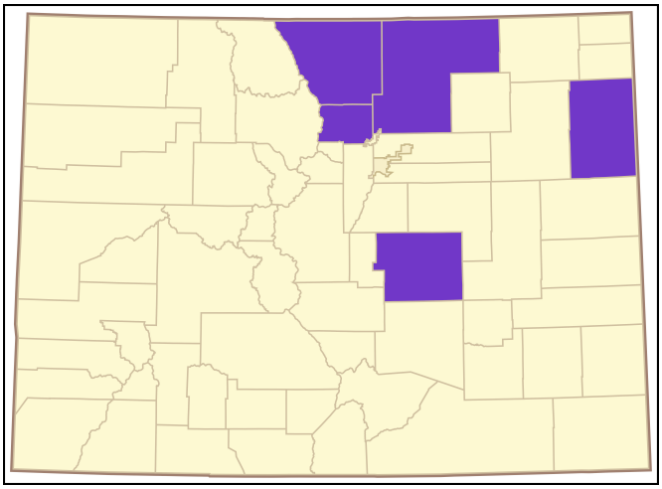
Female
Bombus
auricomus
16-26 mm

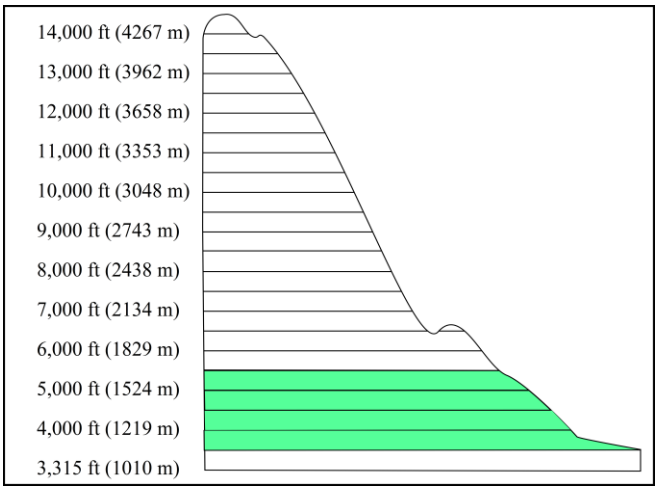




Male
Bombus
auricomus
13-21 mm

***Bombus auricomus*:** is an eastern U.S. species that barely reaches eastern Colorado. Only six records for this species have been found for Colorado. This is one of the species with big-eyed males. Some references list this as a subspecies of *Bombus nevadensis*.





County Map for *B. auricomus*: Boulder, El Paso, Larimer, Weld, and Yuma Counties.

Elevation Range for *B. auricomus*: 3500 to 5500 feet (1067 to 1676 meters).

Floral Associations for *B. auricomus*: Asteraceae: *Helianthus annuus;* Grossulariaceae: *Ribes* sp.

Flight Periods for *B. auricomus*: Queens: Fly in spring, early summer, and fall, but the sample size is too small to determine when they are most abundant. Males: No male specimens from Colorado were located. Workers (females): No worker specimens from Colorado were located.

Nesting Habits for *B. auricomus*: On the surface of the ground.

Similar Species:

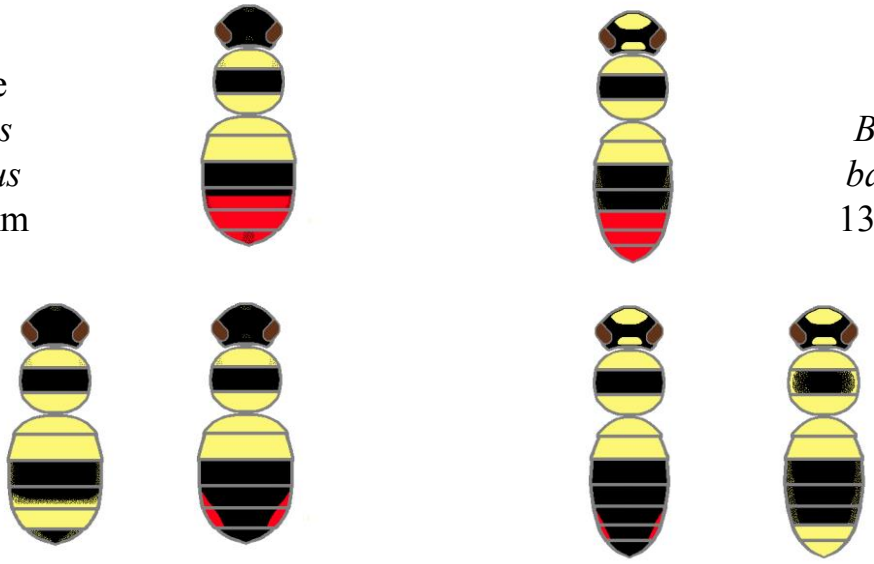
Bombus pensylvanicus females have essentially the same color pattern as *B. auricomus* and are only distinguishable via microscopic characters, although the much more common *B. pensylvanicus* tend to be a lighter shade of yellow as compared to the slightly golden colored *B. auricomus*.

Bombus nevadensis males have more yellow across all of their mesosoma, particularly the posterior third.

Bombus (*Alpinobombus*) *balteatus*
Dahlbom, 1832

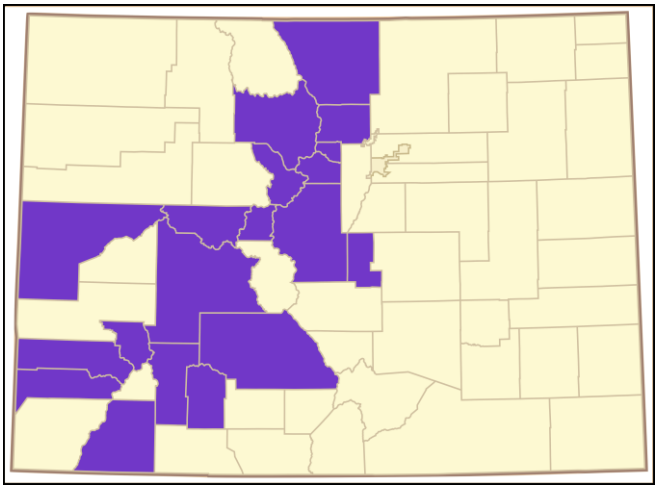
A female *Bombus balteatus* (photo by Diane Wilson).

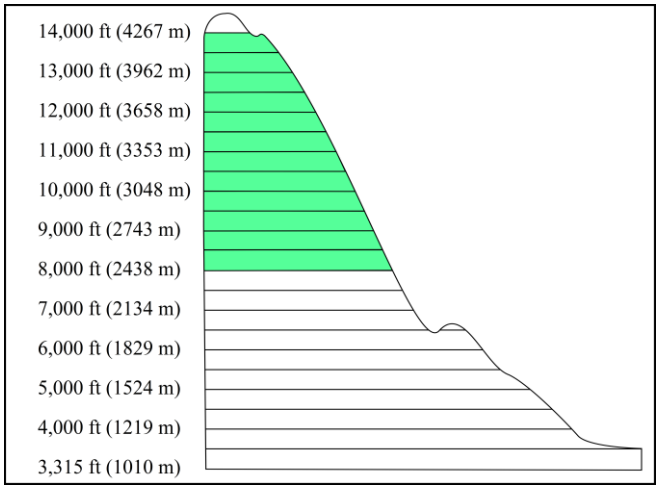
Female
Bombus
balteatus
11-21 mm



Male
Bombus
balteatus
13-17 mm

Bombus balteatus is found at high elevations in Colorado. It is a large species with a very long face. The apical tip of the metasoma is usually red (or sometimes pale yellow or mostly black).





County Map for *B. balteatus*: Boulder, Clear Creek, Dolores, Gilpin, Grand, Gunnison, Hinsdale, La Plata, Lake, Larimer, Mesa, Mineral, Ouray, Park, Pitkin, Saguache, San Miguel, Summit, and Teller Counties.

Elevation Range for *B. balteatus*: 8,000 to 14,000 feet (2438 to 4267 meters).

Floral Associations for *B. balteatus:* Asteraceae: *Achillea millefolium, Aconitum* sp.*, Arnica mollis, Cirsium scariosum, C. scopulorum, Cirsium* sp.*, Gutierrezia* sp.*, Solidago* sp.*, Taraxacum* sp.; Brassicaceae: *Erysimum* sp.; Boraginaceae: *Mertensia* sp.; Crassulaceae: *Sedum lanceolatum, Sedum* sp.; Fabaceae: *Trifolium nanum, Trifolium* sp.: Gentianaceae: *Gentiana* sp.; Liliaceae: *Muscari* sp.; Orobanchaceae: *Castilleja occidentalis, C. rhexiifolia, C. sulphurea, Castilleja* sp.*, Orthocarpus* sp.; Plantaginaceae: *Penstemon whippleanus, Penstemon* sp.; Polemoniaceae: *Phlox* sp.; Primulaceae: *Primula parryi*; Ranunculaceae: *Aconitum columbianum, Aconitum* sp.*, Delphinium barbeyi, Delphinium* sp.; Rosaceae: *Rubus* sp.; Salicaceae: *Salix nivalis, Salix* sp.

Flight Periods for *B. balteatus* : Queens: Fly late June through late August but most abundantly in late June, late July, and early August. Males: Fly late July through late August. Workers (females): Fly early July through early September but most abundantly in late July and all of August.

Nesting Habits for *B. balteatus*: Underground

Similar Species:

Bombus frigidus has a medium-length face and is generally smaller. Queen *B. frigidus* are comparable in size to worker *B. balteatus*.

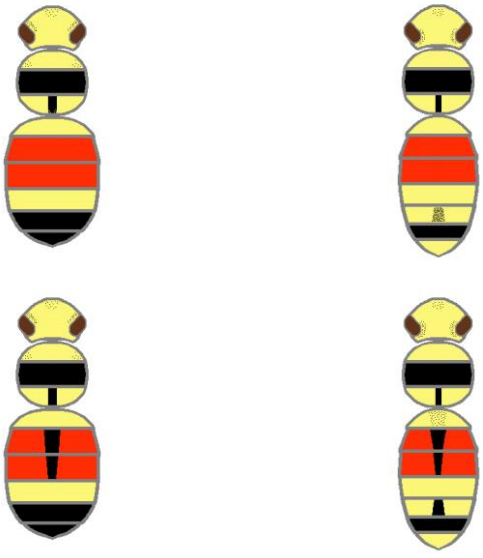
Bombus mixtus has a medium-length face and is generally smaller. B. mixtus has black hairs mixed into the anterior third of the mesosoma.

Bombus occidentalis has a slightly shorter than medium-length face. The hairs on T5-6 of females and T5-7 of males are usually white in *B. occidentalis* as opposed to pale yellow (or red) in *B. balteatus*.

Bombus (*Pyrobombus*) *bifarius*
Cresson, 1878

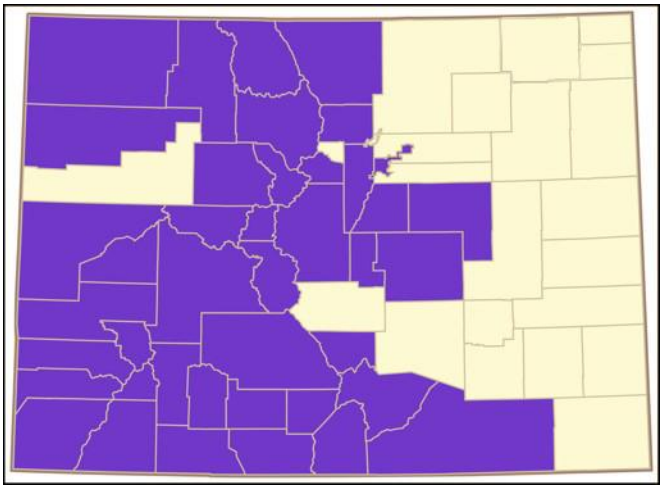
A female *Bombus bifarius* (photo by Diane Wilson).

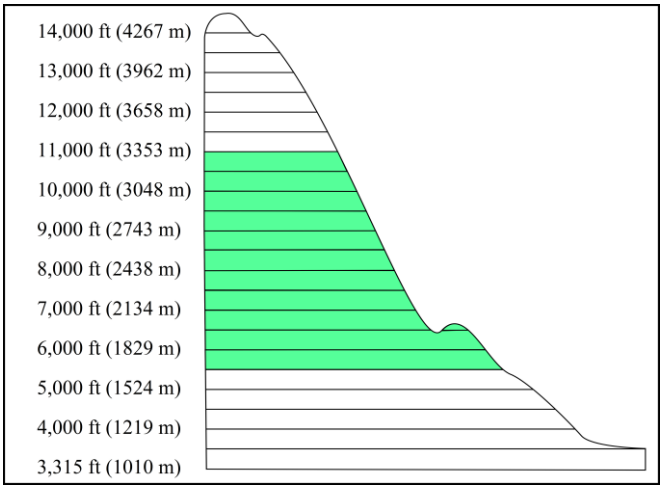
Female
Bombus
bifarius
7-15 mm



Male
Bombus
bifarius
8-13 mm

Bombus bifarius is a relatively small species; the smallest *Bombus* specimens seen in Colorado are workers of this species. The black "T" that reaches the posterior edge of the mesosoma is a key character in identifying this species. This mid-elevation species occurs over central and western Colorado.





County Map for *B. bifarius*: Alamosa, Archuleta, Boulder, Chaffee, Clear Creek, Conejos, Costilla, Custer, Delta, Denver, Dolores, Douglas, Eagle, El Paso, Elbert, Fremont, Garfield, Gilpin, Grand, Gunnison, Hinsdale, Huerfano, Jackson, Jefferson, La Plata, Lake, Larimer, Las Animas, Logan, Mesa, Mineral, Moffat, Montezuma, Montrose, Ouray, Park, Pitkin, Rio Blanco, Rio Grande, Routt, Saguache, San Juan, San Miguel, Summit, and Teller Counties.

Elevation Range for *B. bifarius*: Below 5,500 to 11,000 feet (1676 to 3353 meters).

Floral Associations for *B. bifarius*: Asteraceae: *Achillea millefolium, Aster* sp., *Carduus* sp., *Centaurea* sp., *Chrysothamnus* sp., *Cirsium arvense, Cirsium* sp., *Dracopis amplexicaulis, Erigeron* sp., *Grindelia squarrosa, Grindelia* sp., *Helianthella quinquenervis, Helianthus annuus, Machaeranthera* sp., *Rudbeckia laciniata, Sencio* sp., *Solidago* sp., *Viguiera* sp., *Wyethia amplexicaulis;* Boraginaceae: *Mertensia* sp.; Cactaceae: *Opuntia engelmannii*; Crassulaceae: *Sedum lanceolatum, Sedum* sp.; Cyperaceae: *Carex rosea*; Fabaceae: *Lupinus argenteus, Melilotus officinalis, Melilotus* sp., *Oxytropis lambertii, Thermopsis montana, Trifolium repens, Trifolium* sp., *Vicia* sp.; Gentianaceae: *Frasera* sp.; Geraniaceae: *Gereanium caespitosum, Geranium richardsonii, Geranium sp.*; Hydrophyllaceae: *Hydrophyllum sp.*; Lamiaceae: *Monarda fistulosa*; Linaceae: *Linum lewisii*; Loasaceae: *Mentzelia speciosa*; Onagraceae: *Chamerion angustifolium*; Plantaginaceae: *Penstemon degeneri*; Polygonaceae: *Eriogonum umbellatum, Eriogonum* sp.; Portulacaceae: *Claytonia megarhiza*; Rosaceae: *Rubus deliciosus*; Salicaceae: *Salix* sp.; Veronicaceae: *Besseya plantaginea.*

Flight Periods for *B. bifarius*: Queens: Fly late April through late June and presumably in the fall, although the UCMC collection does not have any queen specimens from the fall. Adult Males: Fly late July through late September but most abundantly throughout all of August and early September. Workers (females): Fly early June through late September but most abundantly from early July to early September.

Nesting Habits for *B. bifarius*: Underground or on the surface of the ground.

Similar Species:

B. sylvicola has a black "V" on the posterior third of the mesosoma, but is bordered by yellow on the posterior edge rather than the black "T" of *B. bifarius* that reaches all the way to the metasoma. *B. sylvico*la has longer, silkier hairs on the metasoma as compared to *B. bifarius.*

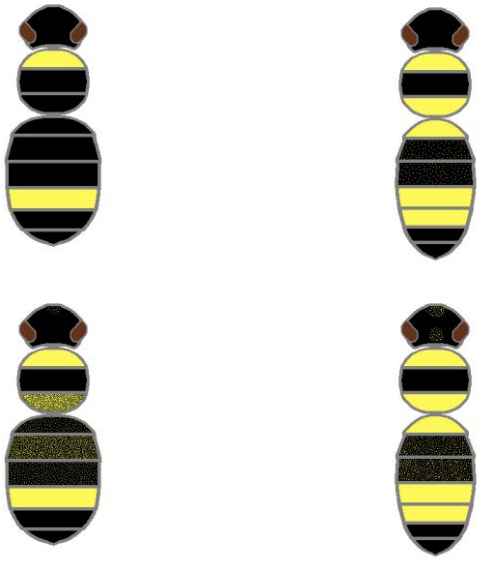
B. huntii has all yellow on the posterior third of the mesosoma, no black "T".

B. melanopygus has black hairs mixed into the yellow on the anterior third of the mesosoma.

Bombus (*Thoracobombus*) *californicus*
Smith, 1854

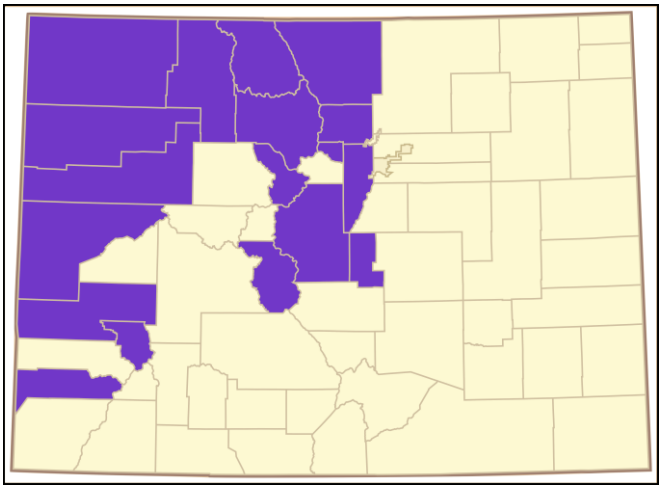
A female *Bombus californicus* (photo by Diane Wilson).

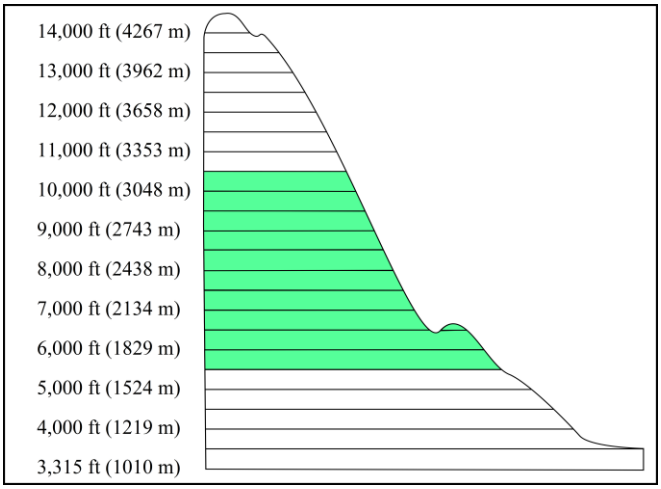
Female
Bombus californicus
11-21 mm



Male
Bombus californicus
13-16 mm

Bombus californicus is considered to be conspecific with *Bombus fervidus* by Williams et al. (2014), but we are choosing to follow Ascher and Pickering (2016) for this guide because, in Colorado, the two show little in the way of intermediate forms, and are somewhat separated in range and elevation. This species has a long dark face.





County Map for *B. californicus*: Boulder, Chaffee, Dolores, Garfield, Gilpin, Grand, Jackson, Jefferson, Larimer, Mesa, Moffat, Montrose, Ouray, Park, Rio Blanco, Routt, Summit, and Teller Counties.

Elevation Range for *B. californicus*: 5,500 to 10,500 feet (1676 to 3200 meters).

Floral Associations for *B. californicus*: Asteraceae: *Arnica mollis, Aster sp.* (yellow)*, Cirsium sp., Gutierrezia sp., Heterotheca sp., Taraxacum sp.*; Fabaceae: *Lupinus sp.* (blue)*, Oxytropis lambertii, O. sericea, Thermopsis montana, Thermopsis sp., Trifolium sp.*; Hydrophyllaceae: *Phacelia sp.*; Iridaceae: *Iris missouriensis*; Lamiaceae: *Monarda fistulosa*; Plantaginaceae: *Penstemon sp., Penstemon sp.* (blue); Polemoniaceae: *Phlox sp.*; Ranunculaceae: *Delphinium nelsonii, Delphinium sp.*

Flight Periods for *B. californicus*: Queens: Fly late May through early August but most abundantly in late May and all of June. Males: Fly late July through early September but most abundantly throughout all of August. Workers (females): Fly early July through early September but most abundantly in all of July and early August.

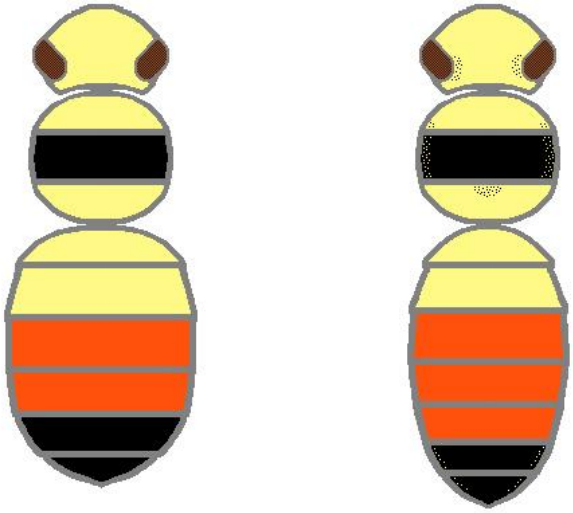
Nesting Habits for *B. californicus*: On surface of ground, above ground, or underground.

Similar Species:
B. rufocinctus has a shorter face and some yellow on T1.
B. occidentalis has a shorter face and white on T5-T6 of females and T5-T7 of males.
B. fervidus has yellow on T1-T4 of females and T1- some of T6 of males.

Bombus (*Pyrobombus*) *centralis*
Cresson, 1864

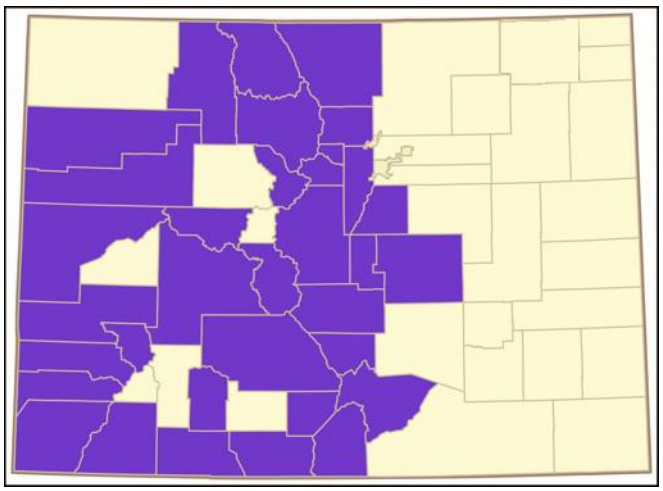
A female *Bombus centralis* (photo by Diane Wilson).

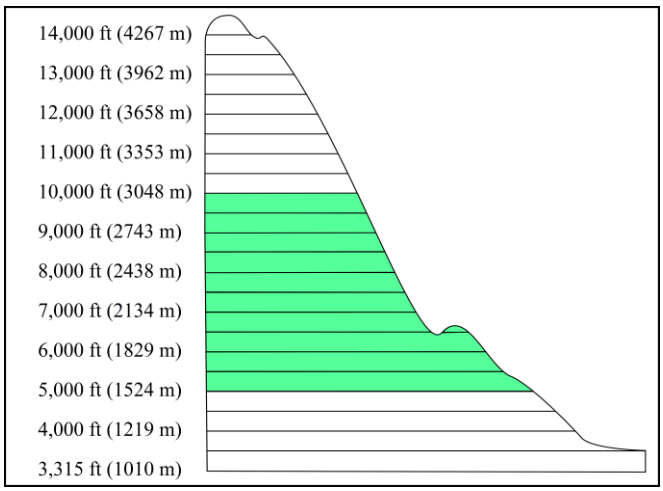
Female
Bombus
centralis
10-18 mm



Male
Bombus
centralis
12-14 mm

Bombus centralis is one of two species in Colorado with this color pattern, but has pure yellow anterior to an obvious black stripe on the mesosoma. This species is rarely found above 9000 ft.





County Map for *B. centralis*: Alamosa, Archuleta, Boulder, Chaffee, Clear Creek, Conejos, Costilla, Custer, Dolores, Douglas, El Paso, Fremont, Garfield, Gilpin, Grand, Gunnison, Huerfano, Jackson, Jefferson, La Plata, Larimer, Logan, Mesa, Mineral, Montezuma, Montrose, Ouray, Park, Pitkin, Rio Blanco, Routt, Saguache, San Miguel, Summit, and Teller Counties.

Elevation Range for *B. centralis*: 5,000 to 10,000 feet (1524 to 3048 meters).

Floral Associations for *B. centralis*: Asteraceae: *Aster* sp. (yellow), *Carduus nutans, Carduus* sp., *Chrysothamnus* sp., *Cirsium arvense, C. scariosum, Cirsium* sp., *Erigeron* sp., *Gaillardia* sp., *Grindelia squarrosa, Helianthella* sp., *Helianthus annuus, Helianthus* sp., *Liatris punctata, Ratibida* sp., *Taraxacum* sp.; Capparaceae: *Cleome serrulata, Cleome* sp.; Caprifoliaceae: *Symphoricarpos* sp.; Crassulaceae: *Sedum* sp.; Cucurbitaceae: *Cucurbita pepo*; Fabaceae: *Astragalus laxmannii* var. *robustior, Dalea* sp., *Lotus corniculatus, Lupinus argenteus, Lupinus* sp., *Lupinus* sp. (blue), *Melilotus* sp., *Thermopsis montana, Thermopsis* sp., *Trifolium repens*; Geraniaceae: *Geranium caespitosum, G. richardsonii*; Grossulariaceae: *Ribes leptanthum, Ribes* sp.; Hydrophyllaceae: *Hydrophyllum* sp., *Phacelia heterophylla, Phacelia* sp.; Lamiaceae: *Monarda fistulosa, Monarda* sp., *Nepeta cataria*; Liliaceae: *Allium* sp.; Loasaceae: *Mentzelia speciosa*; Plantaginaceae: *Linaria vulgaris, Penstemon degeneri, P. griffinii, P. secundiflorus, Penstemon* sp., *Penstemon* sp. (blue); Primulaceae: *Primula parryi*. Ranunculaceae: *Delphinium* sp.; Rhamnaceae: *Ceanothus* sp.; Rosaceae: *Rosa acicularis, Rosa* sp., *Rubus deliciosus*; Salicaceae: *Populus* sp., *Salix* sp.

Flight Periods for *B. centralis*: Queens: Fly early April through early July but most abundantly throughout all of May. Males: Fly late June through early September but most abundantly through all of July and August. Workers (females): Fly late May through early September but most abundantly throughout all of July and early August.

Nesting Habits for *B. centralis*: Underground.

Similar sepcies:

Bombus flavifrons has essentially same color pattern, however *B. flavifrons* has some black hairs mixed into the yellow hairs on the front 1/3 of the mesosoma. Males are particularly difficult to separate. *B. flavifrons* is generally found at higher elevations than *B. centralis*.

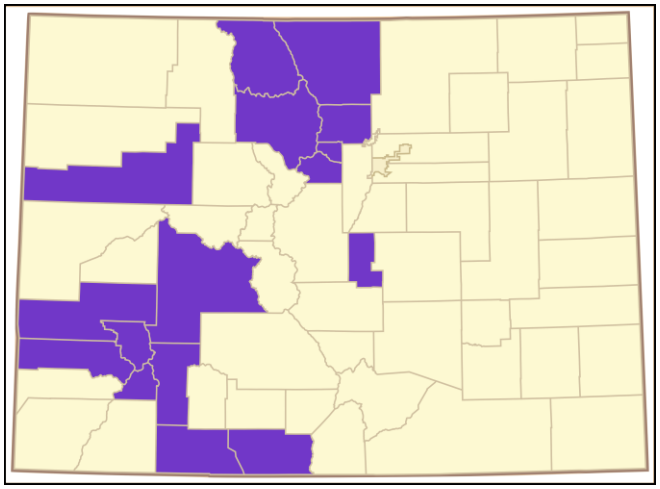
Bombus (*Psithyrus*) *fernaldae*
(Franklin, 1911)

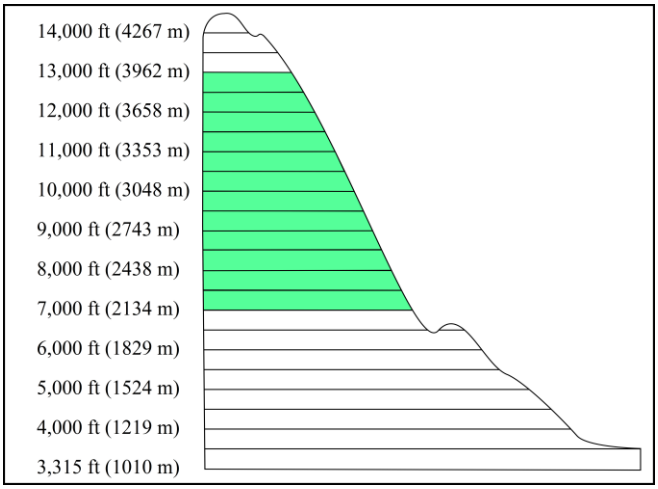
A male *Bombus fernaldae* (photo by Diane Wilson).

Female
Bombus
fernaldae
17-18 mm

Male
Bombus
fernaldae
11-15 mm

Bombus fernaldae is one of Colorado's four parasitic species, the only one that sometimes has red hairs. Williams et al. (2014) considers this species to be the same as *Bombus flavidus* in the Old World, but we are choosing to follow Ascher and Pickering (2016) for this guide.





County Map for *B. fernaldae*: Archuleta, Boulder, Clear Creek, Conejos, Garfield, Gilpin, Grand, Gunnison, Hinsdale, Jackson, Larimer, Montrose, Ouray, San Juan, San Miguel, and Teller Counties.

Elevation Range for *B. fernaldae*: 7,000 to 13,000 feet (2134 to 3962 meters).

Floral Associations for *B. fernaldae*: Asteraceae: *Cirsium* sp., *Taraxacum officinale, Wyethia amplexicaulis*; Fabaceae: *Lupinus alpestris, Melilotus officinalis.*

Flight Periods for *B. fernaldae*: Queens: Fly late June and throughout July but this small sample size may not fully represent the true flight period. Males: Fly in early August but this small sample size may not fully represent the true flight period. Workers (females): There are no workers in this parasitic species (subgenus *Psithyrus)*.

Nesting Habits for *B. fernaldae*: This species is one of the social parasites. It has been found in nests of species in the subgenus *Pyrobombus*, as well as *B. appositus*, *B. occidentalis*, and *B. rufocinctus*.

Similar Species:

B. insularis females never have red hairs, but species level identifications often require microscopic characters to separate them, while males have no red on T6-T7.

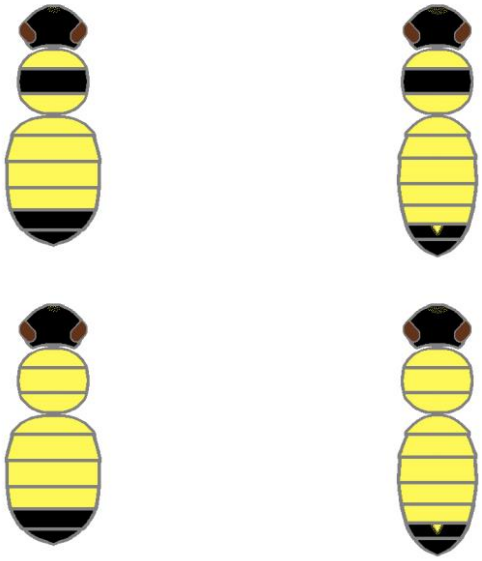
B. suckleyi females have only black hairs on the top of their head and males have no red on T6-T7.

B. pensylvanicus males have yellow on T1-T5.

Bombus (*Thoracobombus*) *fervidus*
(Fabricius, 1798)

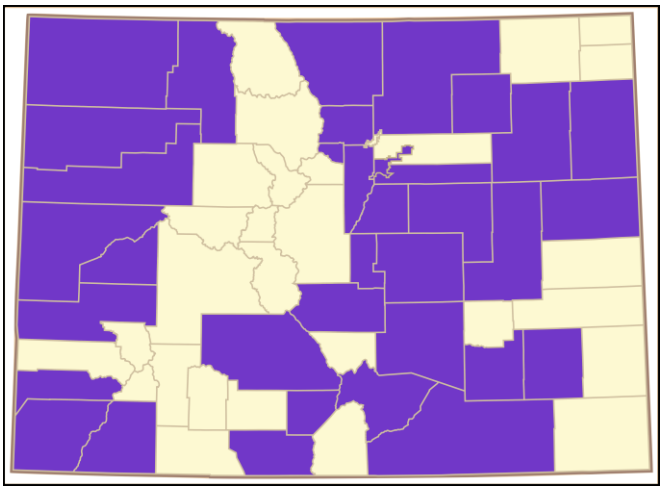
A male *Bombus fervidus* (photo by Diane Wilson).

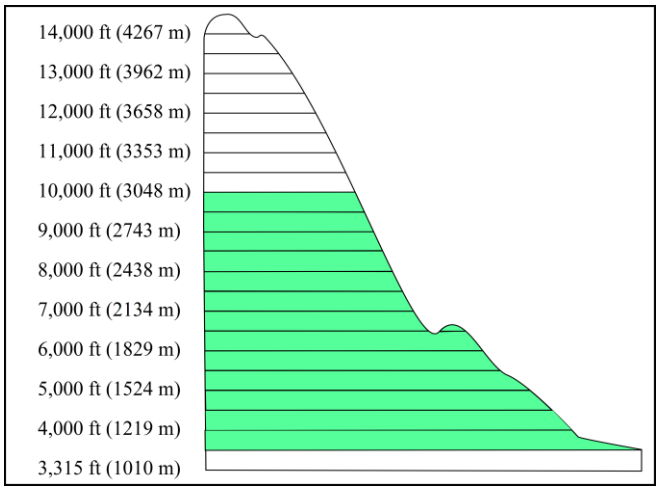
Female
Bombus
fervidus
11-21 mm



Male
Bombus
fervidus
13-16 mm

Bombus fervidus is a bright lemon yellow bee of mid to low elevations across Colorado. This species has a long face. The amount of black across the middle of the mesosoma is quite variable. Williams et al. (2014) considers *B. californicus* to be part of *B. fervidus*.





County Map for *B. fervidus*: Alamosa, Arapahoe, Bent, Boulder, Conejos, Delta, Denver, Dolores, Douglas, El Paso, Elbert, Fremont, Garfield, Gilpin, Huerfano, Jefferson, Kit Carson, La Plata, Las Animas, Larimer, Lincoln, Mesa, Moffat, Montezuma, Montrose, Morgan, Otero, Pueblo, Rio Blanco, Routt, Saguache, Teller, Washington, Weld, and Yuma Counties.

Elevation Range for *B. fervidus*: 3,500 to 10,000 feet (1067 to 3048 meters).

Floral Associations for *B. fervidus*: Asclepiadaceae: *Asclepias* sp.; Asteraceae: *Artemisia* sp., *Carduus nutans, Carduus* sp., *Chrysothamnus* sp., *Cirsium arvense, C. canescens, C. ochrocentum, C. undulatum, Cirsium* sp., *Ericameria nauseosa, Helianthus petiolaris, Helianthus* sp., *Liatris punctata, Ratibida* sp., *Senecio spartoides, Solidago* sp., *Taraxacum officinale, Taraxacum* sp.; Boraginaceae: *Lithospermum* sp., *Onosmodium bejariense* var. *occidentale*; Convolvulaceae: unknown species; Capparaceae: *Cleome serrulata*; Clusiaceae: *Hypericum* sp.; Crassulaceae: *Sedum lanceolatum*; Cucurbitaceae: unknown species; Dipsacaceae: *Dipsacus fullonum*; Fabaceae: *Astragalus bisulcatus, A. pectinatus, Astragalus* sp., *Astragalus* sp. (white), *Dalea candidus, Glycyrrhiza lepidota, Glycyrrhiza* sp., *Lathyrus* sp., *Lupinus argenteus, L. sericeus, Lupinus* sp. (blue), *Medicago sativa, Medicago* sp., *Melilotus officinalis, Melilotus* sp., *Oxytropis sericea, Oxytropis* sp., *Psoralidium tenuiflorum, Thermopsis* sp.; Fumariaceae: *Corydalis* sp.; Geraniaceae: *Geranium caespitosum*; Grossulariaceae: *Ribes* sp., *Ribes* sp. (yellow); Lamiaceae: *Monarda fistulosa, Monarda* sp., *Salvia* sp., *Scutellaria brittonii*; Loasaceae: *Mentzelia nuda, Mentzelia* sp., *Mentzelia speciosa*; Malvaceae: *Hibiscus cannabinus*; Plantaginaceae: *Penstemon degeneri, Penstemon* sp.; Polygonaceae: *Eriogonum effusum*; Ranunculaceae: *Delphinium* sp.; Rosaceae: *Potentilla* sp., *Prunus* sp.; Solanaceae: *Solanum rostratum.*

Flight Periods: Queens: Fly late April through late September but most abundantly throughout all of May and all of June. Males: Fly early July through late September (with two specimens caught in early November) but most abundantly throughout August and September. Workers (females): Fly late May through early October but most abundantly from late June through early September.

Nesting Habits: On the surface of the ground, above ground, or underground.

Similar Species:

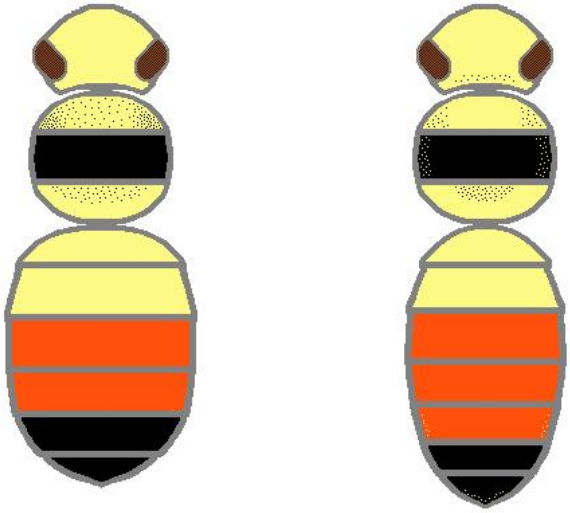
B. appositus females have golden yellow on T1-T5 and males have golden yellow on T1-most of T6. Both sexes always have a black band across the middle of their mesosoma.

B. rufocinctus females are smaller, with a rounder face, and rarely have such even yellow across their metasoma, while male *B. rufocinctus* are easily separated by their big eyes.

Bombus (*Pyrobombus*) *flavifrons*
Cresson, 1863

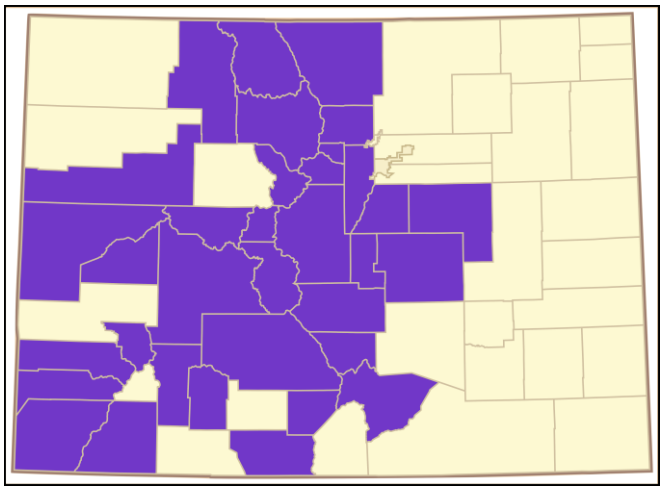
A female *Bombus flavifrons* (photo by Diane Wilson).

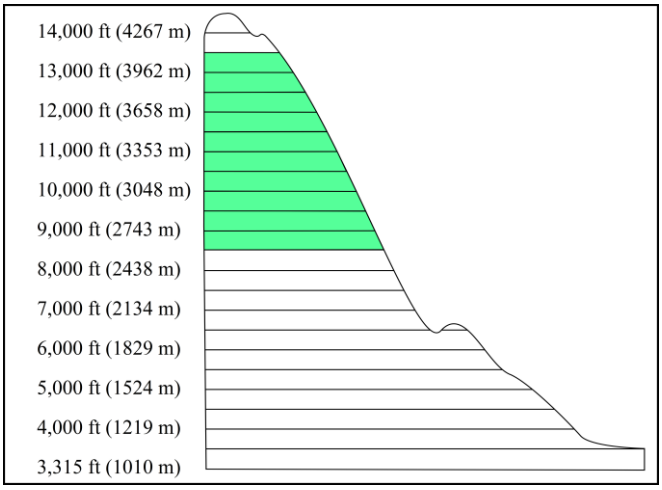
Female
Bombus
flavifrons
10-18 mm



Male
Bombus
flavifrons
10-14 mm

Bombus flavifrons is one of two similarly marked species, however, this species has black mixed into anterior and posterior portions of the mesosoma, sometimes making black band on mesosoma less obvious. Generally, this species is found at higher elevations, usually over 9000 ft.





County-Level Map for *B. flavifrons*. Alamosa, Boulder, Chaffee, Clear Creek, Conejos, Custer, Delta, Dolores, Douglas, El Paso, Elbert, Fremont, Garfield, Gilpin, Grand, Gunnison, Hinsdale, Huerfano, Jackson, Jefferson, La Plata, Lake, Larimer, Mesa, Mineral, Montezuma, Montrose, Ouray, Park, Pitkin, Routt, San Miguel, Saguache, Summit, and Teller Counties.

Elevation Range for *B. flavifrons*. 8,500 to 13,500 feet (2591 to 4115 meters).

Floral Associations for *Bombus flavirons:* This bumble bee has been found on the following flowers: Asteraceae: *Arnica mollis, Arnica sp., Carduus sp., Chrysothamnus sp., Cirsium canescens, C. scariosum, C. scopulorum, Cirsium sp., Helianthus sp., Rudbeckia laciniata, Saussurea weberi, Solidago sp., Taraxacum sp.*; Boraginaceae: *Mertensia ciliata, Mertensia sp.*; Crassulaceae: *Rhodiola rhodantha*; Fabaceae: *Dalea sp., Lathyrus sp., Thermopsis sp., Trifolium repens, Trifolium sp.*; Geraniaceae: *Gernium caespitosum, G. richardsonii, Geranium sp.*; Hydrophyllaceae: *Hydrophyllum sp., Phacelia sp.*; Lamiaceae: *Monarda fistulosa, M. fistulosa* ssp. *fistulosa* var. *menthifolia*; Onagraceae: *Chamerion angustifolium, Epilobium sp.*; Orobanchaceae: *Castilleja sp.*; Plantaginaceae: *Penstemon degeneri, P. glaber, P. griffinii, Penstemon sp.*; Ranunculaceae: *Aconitum columbianum, Aconitum sp., Aquilegia sp., Delphinium barbeyi, D. nelsonii*; Salicaceae: *Salix sp.*

Flight Periods: Queens: Fly late May to late August but most abundantly from late June to late July. Males: Fly early July through late September but most abundantly throughout late July and all of August. Workers (females): Fly early June through early September but most abundantly in all of July and all of August.

Nesting Habits: Underground or on the surface of the ground.

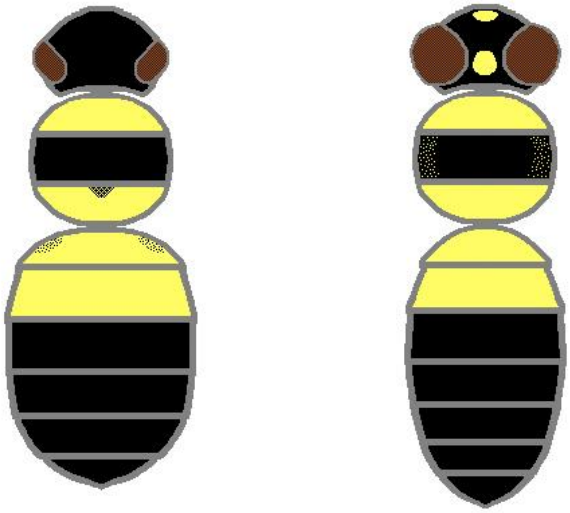
Similar Species:

Bombus centralis has only yellow hairs on the anterior third of the mesosoma. Males of *B. centralis* and *B. flavifrons* can be very difficult to separate.

Bombus (*Cullumanobombus*) *fraternus*
(Smith, 1854)

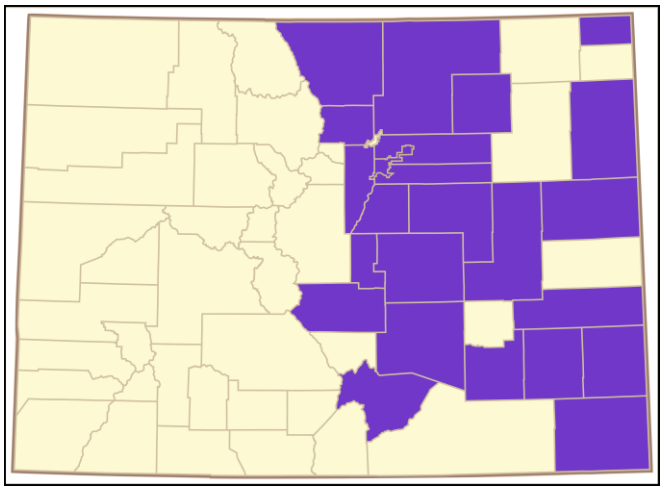
A female *Bombus fraternus* (photo by Diane Wilson).

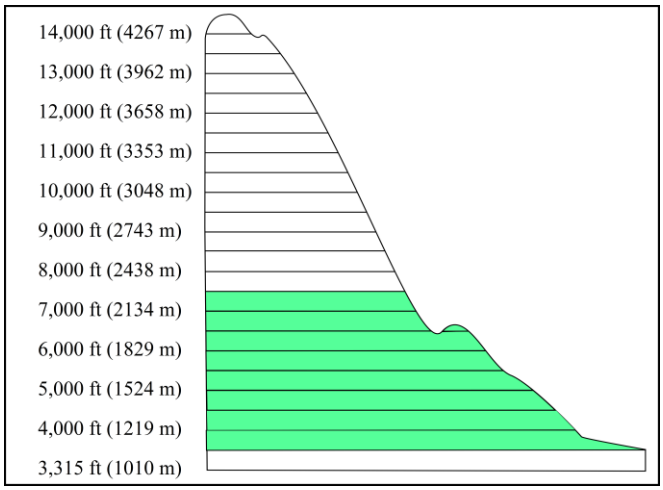
Female
Bombus
fraternus
15-27 mm



Male
Bombus
fraternus
22-25 mm

Bombus fraternus is a large black and yellow bee of the plains. Hairs are short and mat, with the metasoma seeming particularly pointy. Males have big eyes, and both sexes have short faces, with a distinct black band across the middle of the mesosoma. Colorado is the western edge of this eastern North American species' range.





County Map for *B. fraternus*: Adams, Arapahoe, Baca, Bent, Boulder, Denver, Douglas, El Paso, Elbert, Fremont, Huerfano, Jefferson, Kiowa, Kit Carson, Larimer, Lincoln, Morgan, Otero, Prowers, Pueblo, Sedgwick, Teller, Weld, and Yuma Counties.

Elevation Range for *B. fraternus*: 3,500 to 7,500 feet (1067 to 2286 meters).

Floral Associations for *B. fraternus*: Asclepiadaceae: *Asclepias* sp.; Asteraceae: *Chrysothamnus* sp., *Helianthus annuus, Helianthus* sp., *Oligoneuron rigidum*; Capparaceae: *Cleome serrulata, Cleome* sp.; Fabaceae: *Astragalus bisulcatus, A. sericoleucus, Melilotus* sp.; Lamiaceae: *Salvia* sp.; Loasaceae: *Mentzelia* sp.; Rosaceae: *Prunus virginiana, Rosa arkansana*; Solanaceae: *Solanum* sp.

Flight Periods for *B. fraternus*: Queens: Fly early May through early July (and presumably in the fall) but most abundantly throughout all of June. Males: Fly early August to early October, but this small sample size may not reflect the true abundance. Workers (females): Fly early June through early September but most abundantly from late July through early September.

Nesting Habits for *B. fraternus*: Underground.

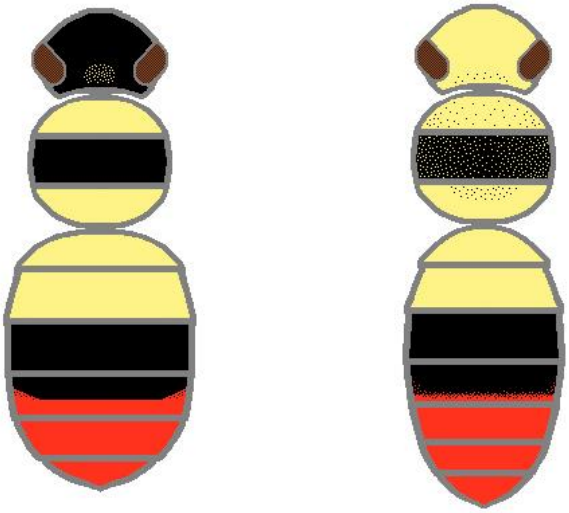
Similar Species:

B. griseocollis does not have a black band across the mesosoma. Also, in eastern Colorado where *B. fraternus* is found, *B. griseocollis* has some black on T2 and usually some brown in addition to yellow.

Bombus (*Pyrobombus*) *frigidus*
Smith, 1854

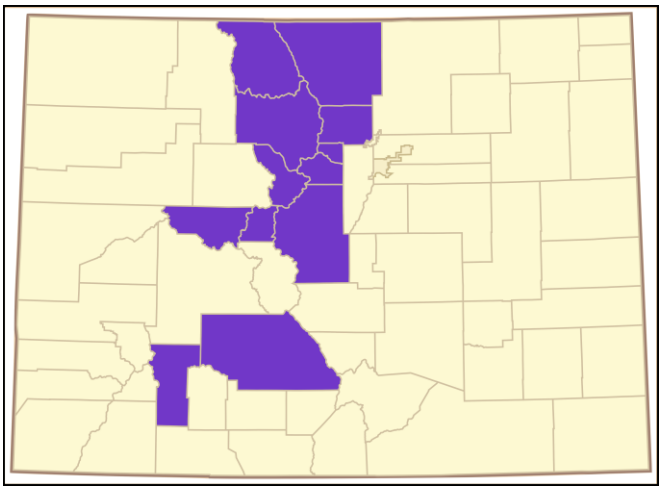
A male *Bombus frigidus* (photo by Diane Wilson).

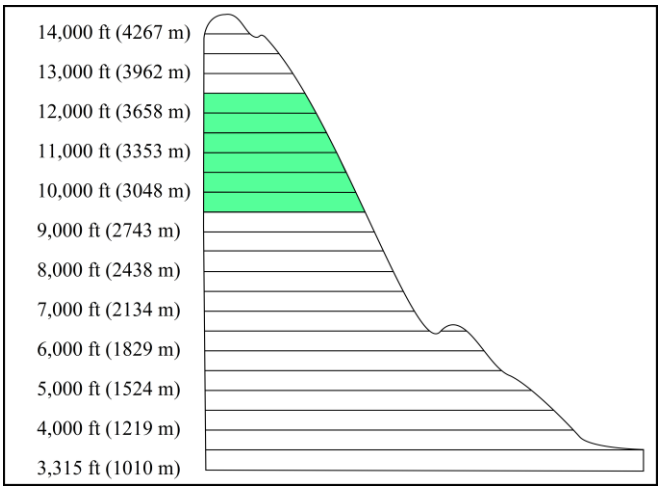
Female
Bombus
frigidus
8-19 mm



Male
Bombus
frigidus
10-15 mm

Bombus frigidus is a small to medium sized bee found at high elevation bee in Colorado. In fact, Colorado is at the southern end of this species range. It is one of several Colorado species with a red tipped metasoma.





County Map for *B. frigidus*: Boulder, Clear Creek, Gilpin, Grand, Hinsdale, Jackson, Lake, Larimer, Park, Pitkin, Saguache, and Summit Counties.

Elevation Range for *B. frigidus*: 9,500 to 12,500 feet (2896 to 3810 meters).

Floral Associations for *B. frigidus*: Asteraceae: *Arnica* sp., *Erigeron* sp., *Saussurea weberi, Solidago* sp., *Taraxacum* sp.; Brassicaceae: *Cardamine* sp.; Campanulaceae: *Campanula rotundifolia*; Crassulaceae: *Sedum* sp.; Fabaceae: *Trifolium repens*; Onagraceae: *Chamerion angustifolium*; Plantaginaceae: *Penstemon whippleanus, Penstemon* sp.; Rosaceae: *Dryas octopetala*; Salicaceae: *Salix* sp.

Flight Periods for *B. frigidus*: Queens: Fly early June through late July but most abundantly in late June and all of July. Males: Fly late June to late August, but this small sample size may not fully represent the true flight period. Workers (females): Fly late June through late August but most abundantly in late July and all of August.

Nesting Habits for *B. frigidus*: Above ground or underground.

Similar Species:

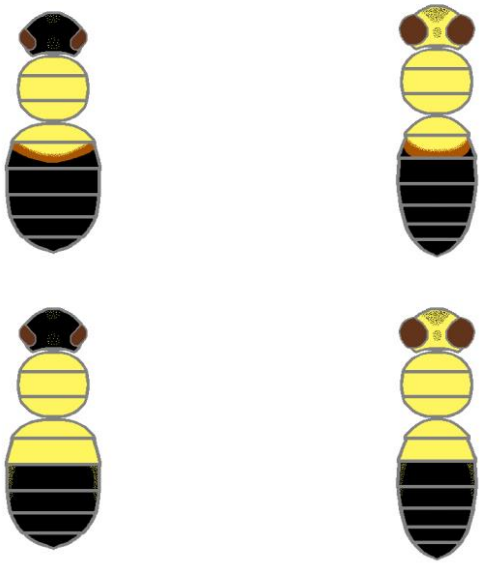
B. mixtus has black hairs mixed into the yellow on the anterior portion of the mesosoma.

B. balteatus is a much larger species with a longer face. Female *B. balteatus* have more yellow on their head/face.

Bombus (*Cullumanobombus*) *griseocollis*
(DeGeer, 1773)

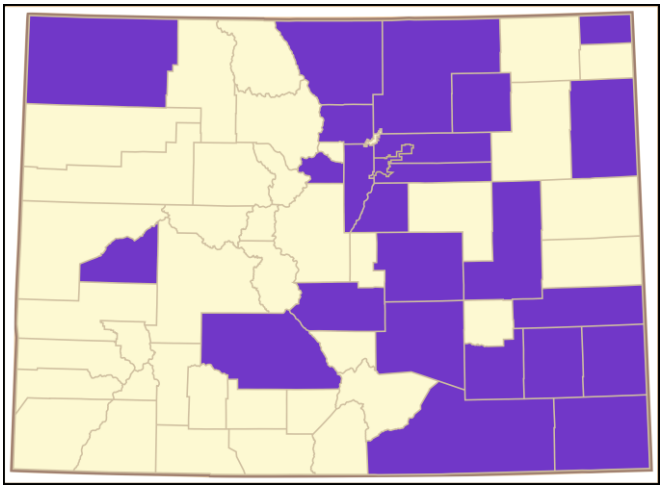
A female *Bombus griseocollis* (photo by Diane Wilson).

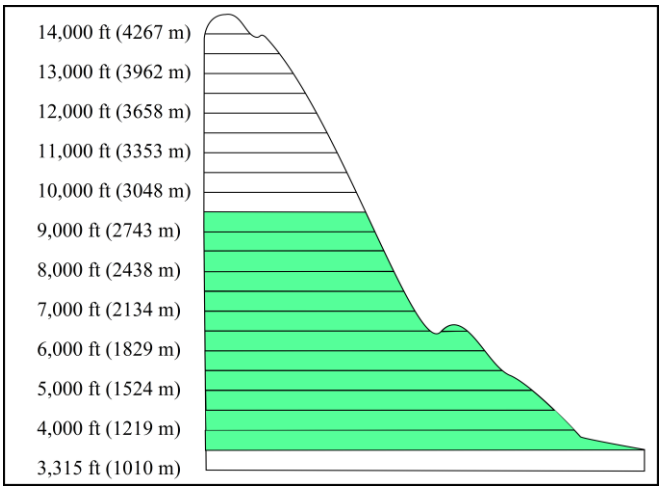
Female
Bombus
griseocollis
10-23 mm



Male
Bombus
griseocollis
12-18 mm

Bombus griseocollis is a lower elevation bee in Colorado. Most of our *B. griseocollis* have T2 with a brown belt and black along the sides. Along the western edge of Colorado, T2 is often fully covered in yellow. This species has a short face, no black band on the mesosoma, and the males have big eyes. It appears this species is becoming more common in Colorado.





County Map for *B. griseocollis*: Adams, Arapahoe, Baca, Bent, Boulder, Clear Creek, Delta, Denver, Douglas, El Paso, Fremont, Jefferson, Kiowa, Las Animas, Larimer, Lincoln, Moffat, Morgan, Otero, Prowers, Pueblo, Saguache, Sedgwick, Weld, and Yuma Counties.

Elevation Range for *B. griseocollis*: 3,500 to 9,500 feet (1067 to 2896 meters).

Floral Associations for *B. griseocollis*: Asclepiadeaceae: *Asclepias speciosa, A. viridiflora*; Asteraceae: *Carduus nutans, Chrysothamnus* sp.*, Helianthus* sp.*, Liatris punctata, Verbesina* sp.; Boraginaceae: *Onosmodium bejariense* var. *occidentale*; Chenopodiaceae: *Bassia scoparia*; Cucurbitaceae: *Cucumis sativa, Cucurbita pepo*; Fabaceae: *Astragalus bisulcatus, Dalea* sp.*, Melilotus officinalis, Melilotus* sp.*, Securigera varia, Vicia* sp.; Loasaceae: *Mentzelia chrysantha, Mentzelia sp.*; Pinaceae: *Pinus ponderosa*; Rosaceae: *Rosa arkansana*; Plantaginaceae: *Penstemon degeneri*; Solanaceae: *Solanum rostratum,* unknown species.

Flight Periods for *B. griseocollis*: Queens: Fly early May through early August but most abundantly in early June. Males: Fly early August through early October but most abundantly in all of August and early September. Workers (females): Fly early June through late September but most abundantly in all of June, early July, and early August.

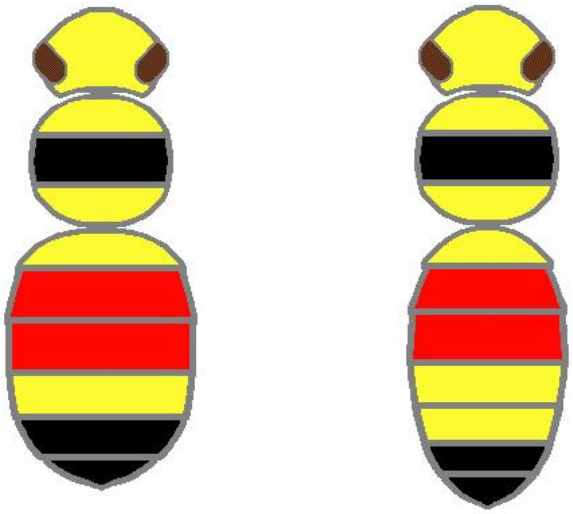
Nesting Habits for *B. griseocollis*: Underground or on the surface of the ground.

Similar Species:
B. fraternus has a black band on the mesosoma and no black on the edges of T2.

Bombus (*Pyrobombus*) *huntii*
Greene, 1860

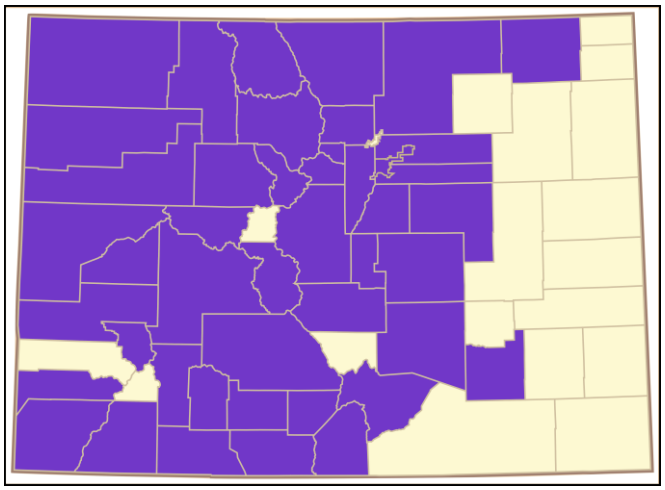
A male *Bombus huntii* (photo by Diane Wilson).

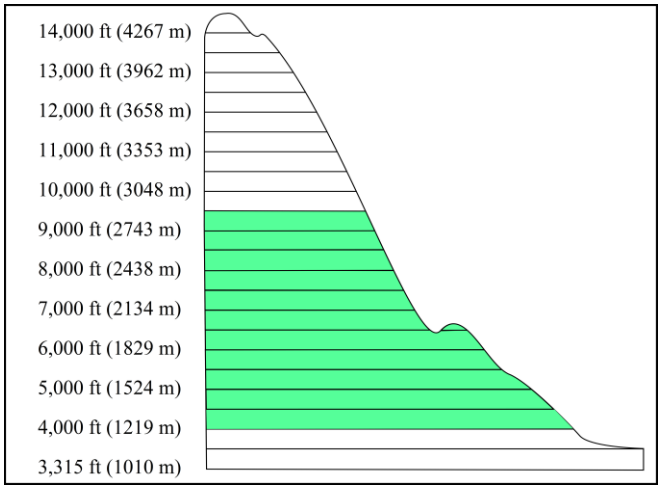
Female
Bombus
huntii
11-20 mm



Male
Bombus
huntii
9-13 mm

Bombus huntii is a striking species, consistently marked with deep colors except in faded individuals. It is found across much of Colorado except the eastern plains.





County Map for *B. huntii*: Adams, Alamosa, Arapahoe, Archuleta, Boulder, Chaffee, Clear Creek, Conejos, Costilla, Delta, Denver, Dolores, Douglas, Eagle, El Paso, Elbert, Fremont, Garfield, Gilpin, Grand, Gunnison, Hinsdale, Huerfano, Jackson, Jefferson, La Plata, Larimer, Logan, Mesa, Mineral, Moffat, Montezuma, Montrose, Otero, Ouray, Park, Pitkin, Pueblo, Rio Blanco, Rio Grande, Routt, Saguache, Summit, Teller, and Weld Counties.

Elevation Range for *B. huntii*: 4,000 to 9,500 feet (1219 to 2896 meters).

Floral Associations for *B. huntii*: Asteraceae: *Arnica fulgens, Aster* sp., *Aster* sp. (white), *Chrysothamnus greenei, Chrysothamnus* sp., *Cichorium intybus, Cirsium arvense, C. canescens, C. vulgare, Cirsium* sp., *Grindelia squarrosa, Gutierrezia* sp., *Helianthus annuus, H. petiolaris, H. pumilus, Helianthus* sp., *Liatris punctata, Liatris* sp., *Senecio spartoides, Senecio* sp., *Solidago nana, Solidago* sp., *Taraxacum* sp.; Berberidaceae: *Berberis* sp.; Boraginaceae: *Cryptantha virgata*; Brassicaceae: *Erysimum* sp., *Physaria alpina, P. vitulifera*; Capparaceae: *Cleome serrulata*; Cucurbitaceae: *Cucumis sativa, Cucurbita pepo*; Crassulaceae: *Sedum lanceolatum*; Dipsacaceae: *Dipsacus fullonum*; Fabaceae: *Astragalus bisulcatus, A. pectinatus, Astragalus* sp., *Lotus corniculatus, Lotus* sp., *Lupinus argenteus, L. jonesii, Lupinus* sp., *Melilotus officinalis, Melilotus* sp., *Oxytropis* sp., *Securigera varia, Sophora nuttalliana, Thermopsis* sp.; Geraniaceae: *Geranium caespitosum, Geranium* sp.; Grossulariaceae: *Ribes cereum, Ribes* sp.; Hydrangeaceae: *Fendlera* sp.; Hydrophyllaceae: *Phacelia heterophylla*; Lamiaceae: *Monarda* sp., *Nepeta cataria,* unknown species; Liliaceae: *Allium cernuum, Allium* sp.; Loasaceae: *Mentzelia densa, M. speciosa, Mentzelia* sp.; Plantaginaceae: *Linaria vulgaris, Penstemon degeneri, Penstemon* sp.; Rosaceae: *Malus pumila, Malus* sp., *Prunus americana, P. virginiana, Prunus* sp., *Rosa arkansana, Rosa* sp., *Rubus* sp.; Salicaceae: *Salix* sp.

Flight Periods for *B. huntii*: Queens: Fly early April through late October but most abundantly throughout all of May and early June. Males: Fly early July through late October (with 1 specimen caught in late March and 2 in early November) but most abundantly from early August to early October. Workers (females): Fly early May to early October but most abundantly from early July to early September.

Nesting Habits for B. huntii: Underground.

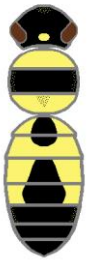
Similar Species:

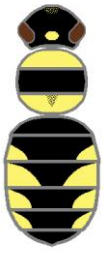
B rufocinctus female have shorter, dark-haired faces, while males have big eyes.
B. bifarius has a black "T" on the posterior portion of the mesosoma.
B. melanopygus has a darker head and anterior portion of the mesosoma with some black hairs.
B. sylvicola often has dark hairs on the posterior portion of their mesosoma and have longer, silkier hairs that make them appear more fluffy.

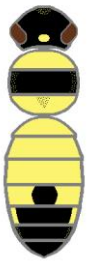
Bombus (*Psithyrus*) *insularis*
(Smith, 1861)

A female *Bombus insularis* (photo by Diane Wilson).

Female
Bombus
insularis
16-20 mm

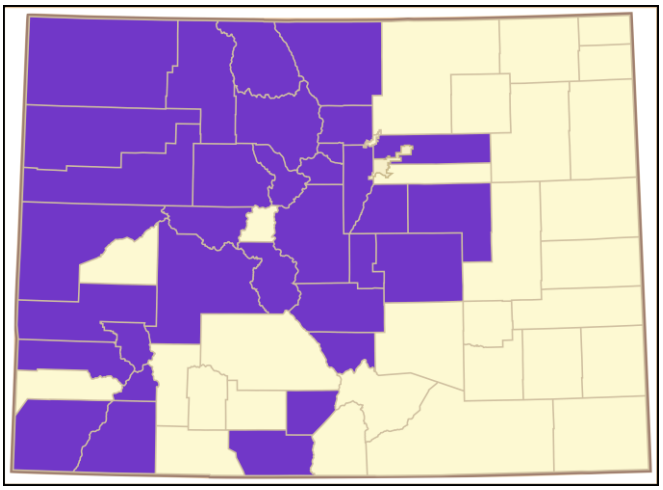


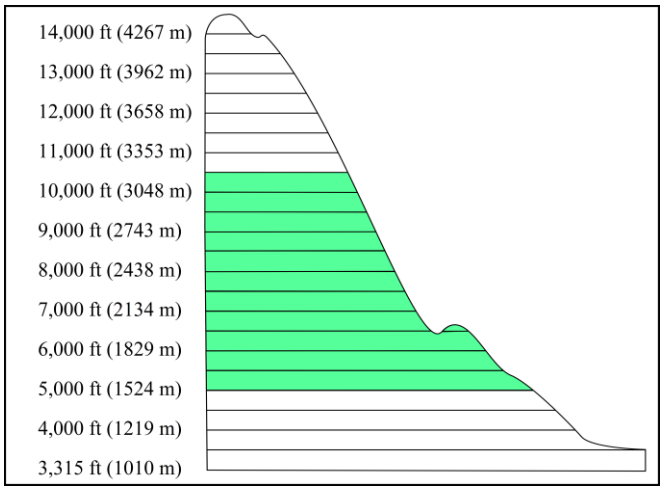




Male
Bombus
insularis
11-16 mm

Bombus insularis is the most common of our parasitic species and is reported from nests of many different *Bombus* species. It occurs throughout mid-elevations in central and western Colorado.





County Map for *B. insularis*: Adams, Alamosa, Boulder, Chaffee, Clear Creek, Conejos, Custer, Douglas, Eagle, El Paso, Elbert, Fremont, Garfield, Gilpin, Grand, Gunnison, Jackson, Jefferson, La Plata, Larimer, Mesa, Moffat, Montezuma, Montrose, Ouray, Park, Pitkin, Rio Blanco, Routt, San Juan, San Miguel, Summit, and Teller Counties.

Elevation Range for *B. insularis*: 5,000 to 10,500 feet (1524 to 3200 meters).

Floral Associations for *B. insularis*: Asteraceae: *Aster* sp., *Aster* sp. (yellow), *Carduus* sp., *Chrysothamnus* sp., *Cirsium canescens, Erigeron* sp., *Gaillardia* sp., *Grindelia* sp., *Rudbeckia laciniata, Senecio* sp., *Solidago* sp., *Taraxacum* sp., *Verbesina* sp., *Viguiera* sp., *Wyethia* sp.; Boraginaceae: *Mertensia* sp.; Brassicaceae: *Barbarea* sp.; Fabaceae: *Astragalus* sp., *Melilotus officinalis, Trifolium* sp.; Gentianaceae: *Frasera* sp.; Geraniaceae: *Geranium* sp.; Lamiaceae: *Nepeta cataria*; Liliaceae: *Muscari* sp.; Rosaceae: *Prunus virginiana*.

Flight Periods: Queens: Fly late April through early August but most abundantly in late June. Males: Fly early July through late September but most abundantly from late July through early September. Workers (females): There are no workers in this parasitic species (subgenus *Psithyrus)*.

Nesting Habits: This parasitic species is reported from nests of *B. appositus*, *B. californicus*, *B. fervidus*, *B. flavifrons*, *B. nevadensis*, *B. pensylvanicus*, *B. occidentalis*, and *B. rufocinctus.*

Similar Species:

Bombus suckleyi females have no yellow on the top of their head, males require microscopic examination to separate.

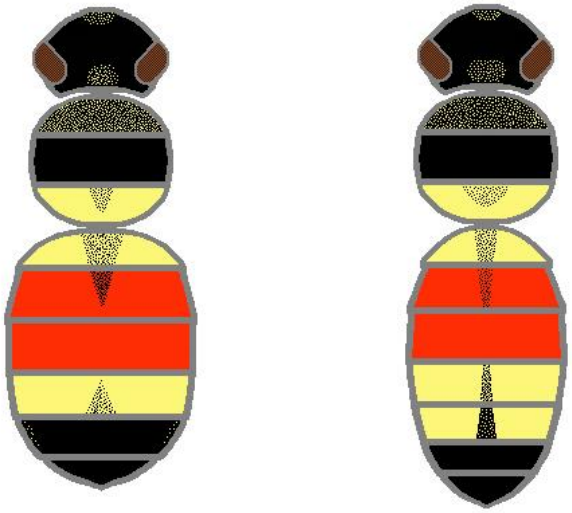
Bombus fernaldae may have some red hairs on metasoma, otherwise require microscopic examination.

Bombus pensylvanicus males are separated from the parasitic species by genetalic characters.

Bombus (*Pyrobombus*) *melanopygus*
Nylander, 1848

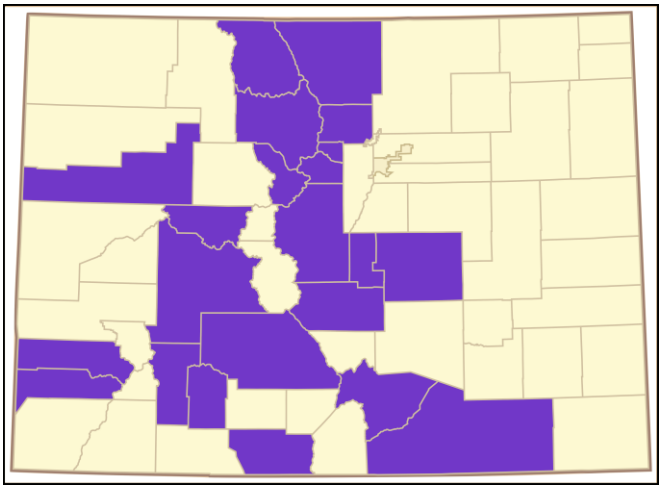
A female *Bombus melanopygus* (photo by Bob Hammon).

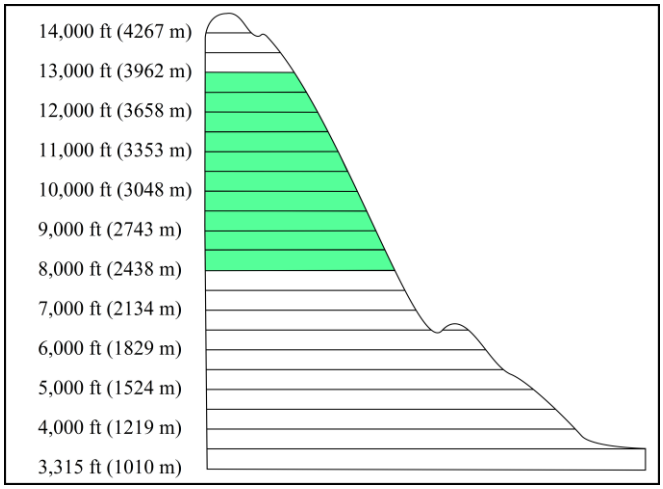
Female
Bombus
melanopygus
10-19 mm



Male
Bombus
melanopygus
11-14 mm

Bombus melanopygus is a mountain bee (higher elevation species) with a dark head, dark anterior portion of the mesosoma and red band on T2-T3. Colorado is at the eastern edge of this species range in the U.S.





County Map for *B. melanopygus*. Boulder, Clear Creek, Conejos, Dolores, El Paso, Fremont, Garfield, Gilpin, Grand, Gunnison, Hinsdale, Huerfano, Jackson, Larimer, Las Animas, Mineral, Park, Pitkin, San Miguel, Saguache, Summit, and Teller Counties.

Elevation Range for *B. melanopygus*. 8,000 to 13,000 feet (2438 to 3962 meters).

Floral Associations for *B. melanopygus*: Asteraceae: *Arnica mollis, Cirsium* sp.*, Senecio fremontii, Senecio* sp.*, Taraxacum* sp.; Boraginaceae: *Mertensia alpina*; Caryophyllaceae: *Arenaria fendleri*; Fabaceae: *Astragalus* sp.*, Melilotus* sp.*, Trifolium dasyphyllum, T. repens*; Liliaceae: *Lloydia serotina*; Orobanchaceae: *Pedicularis parryi*; Plantaginaceae: *Penstemon degeneri, P. whippleanus, Penstemon* sp.; Rosaceae: *Dasiphora* sp.*, Potentilla diversifolia, Rosa acicularis*; Salicaceae: *Salix* sp.

Flight Periods for *B. melanopygus*: Queens: Fly early May through early July, but this small sample size may not fully represent the true flight period. Males: Fly early July through late August, but the small sample size may not fully represent the true flight period. Workers (females): Fly early June through late August but most abundantly in late July and early August.

Nesting Habits for *B. melanopygus*: Underground or above ground.

Similar Species:

Bombus rufocinctus lacks the black hairs mixed into the anterior portion of the mesosoma.

Bombus bifarius lacks the black hairs mixed into the anterior portion of the mesosoma, has a yellow head, and has the black "T" that reaches the posterior edge of the mesosoma.

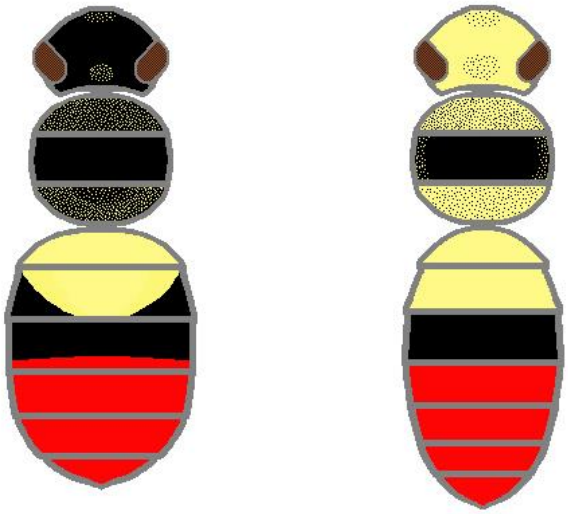
Bombus sylvicola lacks the black hairs mixed into the anterior portion of the mesosoma , has a yellow head, and has a black "V" that does not reach the posterior edge of the mesosoma.

Bombus huntii lacks the black hairs mixed into the anterior portion of the mesosoma and the head is covered in yellow hairs.

Bombus (*Pyrobombus*) *mixtus*
Cresson, 1878

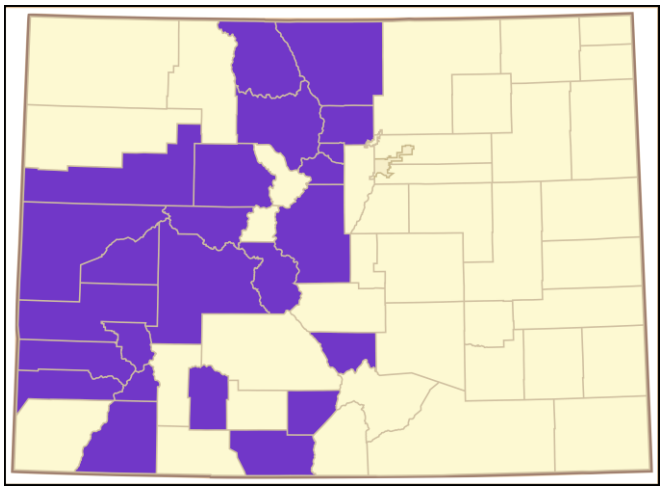
A male *Bombus mixtus* (photo by Lynn and Gene Monroe, Granite Ridge Nature Institute).

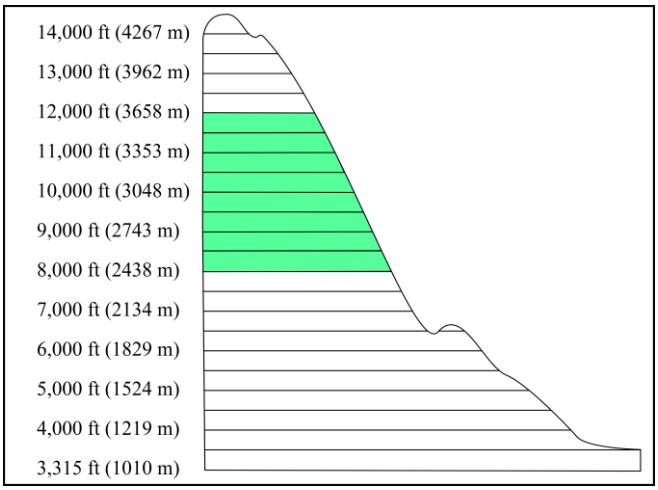
Female
Bombus
mixtus
10-17 mm



Male
Bombus
mixtus
11-14 mm

Bombus mixtus is a medium to small bee found at moderately high elevations in Colorado. It is the only Colorado species with a red tip on the metasoma that also has a substantial amount of black hairs mixed into the anterior portion of the mesosoma.





County Map for *B. mixtus*. Alamosa, Boulder, Chaffee, Clear Creek, Conejos, Custer, Delta, Dolores, Eagle, Garfield, Gilpin, Grand, Gunnison, Jackson, La Plata, Larimer, Mesa, Mineral, Montrose, Ouray, Park, Pitkin, San Juan, and San Miguel Counties.

Elevation Range for *B. mixtus*. 8,000 to 12,000 feet (2438 to 3658 meters).

Floral Associations for *B. mixtus*: Asteraceae: *Arnica mollis, Arnica* sp.*, Solidago* sp.*, Taraxacum officinale, Taraxacum* sp.; Boraginaceae: *Mertensia* sp.; Campanulaceae: *Campanula rotundifolia*; Fabaceae: *Lupinus argenteus, Trifolium repens*; Gentianaceae: *Frasera* sp.; Geraniaceae: *Geranium caespitosum*; Hydrophyllaceae: *Hydrophyllum* sp.; Lamiaceae: *Monarda* sp.; Onagraceae: *Chamerion angustifolium, Epilobium* sp.; Plantaginaceae: *Penstemon whippleanus*; Ranunculaceae: *Aquilegia* sp.*, Delphinium barbeyi*; Saxifragaceae: *Heuchera bracteata*.

Flight Periods for *B. mixtus*: Queens: Fly late June through late August but most abundantly from late June to late July. Males: Fly late July through early September but most abundantly in late July and all of August. Workers (females): Fly late June through early September but most abundantly in all of July and early August.

Nesting Habits for *B. mixtus*: On surface of ground, above ground, or underground.

Similar Species:

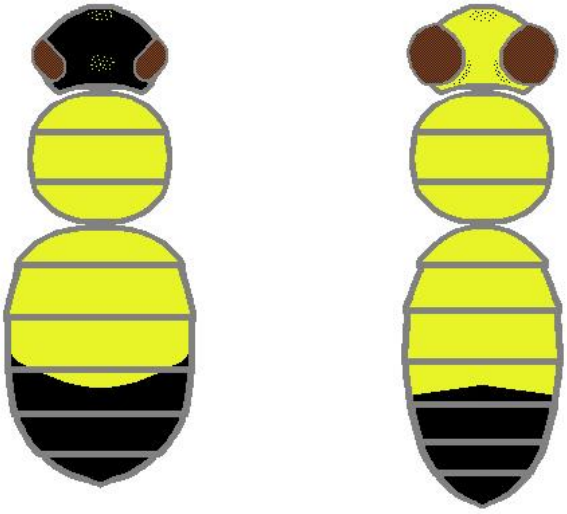
Bombus frigidus has much less in the way of black hairs intermixed into the anterior and posterior portions of the mesosoma.

Bombus balteatus is much larger with a very long face.

Bombus (*Cullumanobombus*) *morrisoni*
Cresson, 1878

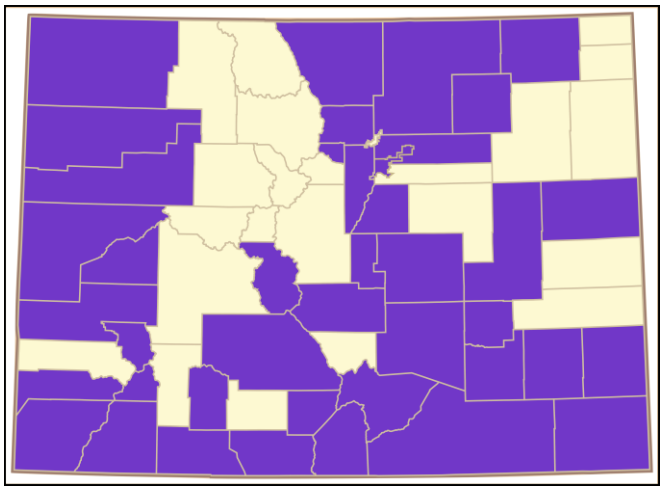
A female *Bombus morrisoni* (photo by Bob Hammon).

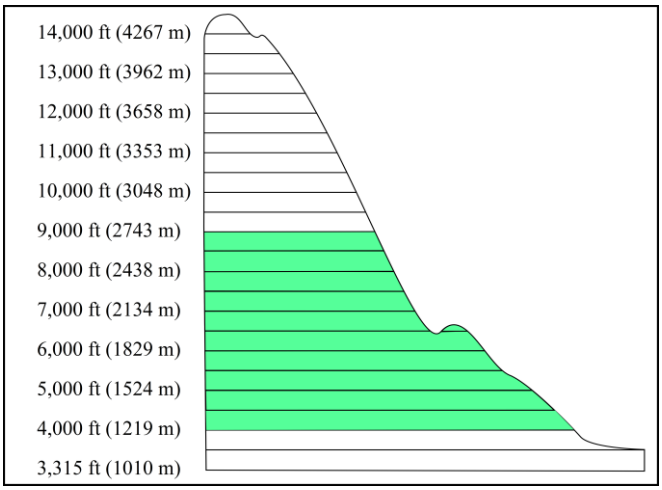
Female
Bombus
morrisoni
12-26 mm



Male
Bombus
morrisoni
15-20 mm

Bombus morrisoni is a beautiful species is covered in short hairs which boarder on greenish-yellow and jet black. Males have big eyes, and neither sex has a black spot or band on the mesosoma. It occurs across lower elevations of Colorado, but it no longer seem to be as common as it previously was in Colorado.





County Map for *B. morrisoni*: Adams, Alamosa, Archuleta, Baca, Bent, Boulder, Chaffee, Conejos, Costilla, Crowley, Delta, Denver, Dolores, Douglas, El Paso, Fremont, Garfield, Gilpin, Huerfano, Jefferson, Kit Carson, La Plata, Las Animas, Larimer, Lincoln, Logan, Mesa, Mineral, Moffat, Montezuma, Montrose, Morgan, Otero, Ouray, Prowers, Pueblo, Rio Blanco, Saguache, San Juan, Teller, and Weld Counties.

Elevation Range for *B. morrisoni*: 4,000 to 9,000 feet (1219 to 2743 meters).

Floral Associations for *B. morrisoni*: Asclepiadeaceae: *Asclepias subverticillata, Asclepias* sp.; Asteraceae: *Aster* sp., *Aster* sp. (purple), *Carduus* sp., *Chrysothamnus* sp., *Cirsium arvense, Cirsium* sp., *Helianthus* sp., *Machaeranthera* sp., *Taraxacum* sp.; Brassicaceae: *Erysimum* sp., *Stanleya pinnata, Stanleya sp.*; Capparaceae: *Cleome serrulata, Cleome sp.*; Fabaceae: *Astragalus laxmannii* var. *robustior, Astragalus* sp., *Lupinus* sp., *Melilotus officinalis, Melilotus* sp., *Oxytropis* sp., *Thermopsis* sp., *Trifolium dasyphyllum*; Hydrangeaceae: *Fendlera* sp.; Lamiaceae: *Monarda* sp., *Salvia* sp.; Loasaceae: *Mentzelia chrysantha, M. speciosa, Mentzelia* sp.; Plantaginaceae: *Penstemon degeneri, Penstemon* sp.; Rosaceae: *Amelanchier* sp., *Prunus virginiana*; Salicaceae: *Salix* sp.; Tamaricaceae: *Tamarix* sp.

Flight Periods for *B. morrisoni*: Queens: Fly late April through early July (with 1 specimen collected in late October) but most abundantly in all of May and early June. Males: Fly early August through early October (with 1 specimens collected in early November) but most abundantly in late August and all of September. Workers (females): Fly late May through late September (with one specimen collected in late October) but most abundantly in early July plus all of August and early September.

Nesting Habits for *B. morrisoni*: Underground.

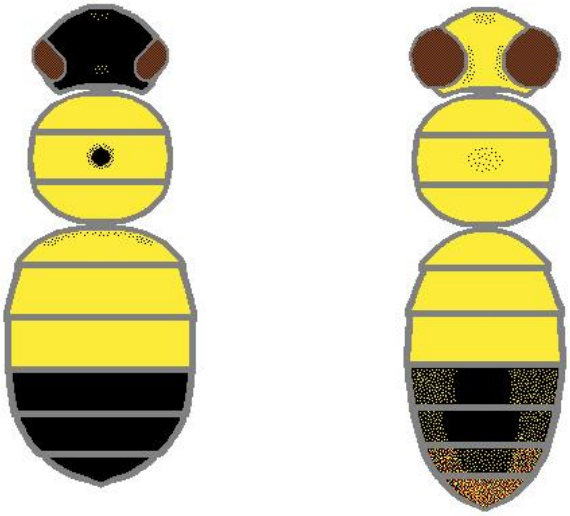
Similar Species:

Bombus nevadensis has a longer face, no (females) or little (males) in the way of golden-yellow hairs on T4, and usually some black hairs on the center of the mesosoma.

Bombus (*Bombias*) *nevadensis*
Cresson, 1874

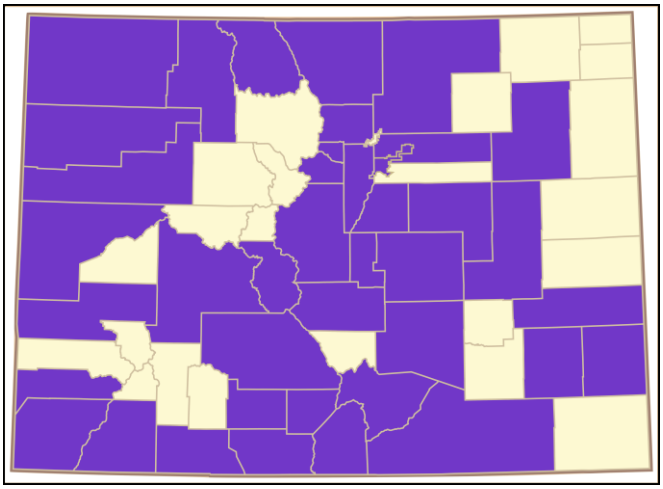
A female *Bombus nevadensis* (photo by Diane Wilson).

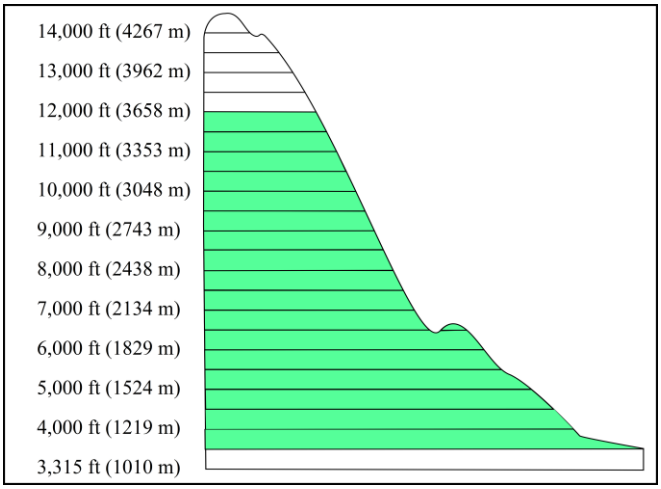
Female
Bombus
nevadensis
15-25 mm



Male
Bombus
nevadensis
16-19 mm

Bombus nevadensis is one of the largest bumble bee species in Colorado and occurs across much of the state. They are generally a golden-yellow with dark wings. The males have big eyes and both sexes have long faces.





County Map for *B. nevadensis*: Adams, Alamosa, Archuleta, Bent, Boulder, Chaffee, Clear Creek, Conejos, Costilla, Denver, Dolores, Douglas, El Paso, Elbert, Fremont, Garfield, Gilpin, Gunnison, Huerfano, Jackson, Jefferson, Kiowa, La Plata, Las Animas, Larimer, Lincoln, Mesa, Moffat, Montezuma, Montrose, Park, Prowers, Pueblo, Rio Blanco, Rio Grande, Routt, Saguache, Teller, Washington, and Weld Counties.

Elevation Range for *B. nevadensis*: 3,500 to 12,000 feet (1067 to 3658 meters).

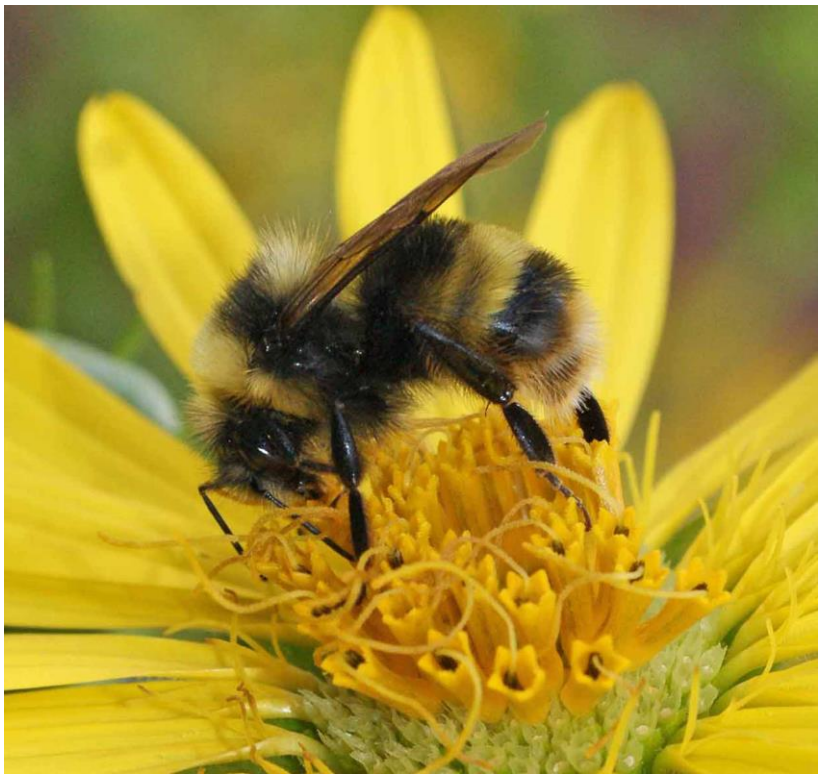
Floral Associations for *B. nevadensis*: Apiaceae: *Daucus carota*; Asclepiadeaceae: *Asclepias* sp.; Asteraceae: *Achillea millefolium, Carduus nutans, Carduus* sp., *Chrysothamnus* sp, *Cichorium intybus, Cirsium canescens, Helianthus* sp., *Liatris punctata, Oligoneuron rigidum, Ratibida* sp., *Taraxacum* sp., *Wyethia amplexicaulis*; Boraginaceae: *Onosmodium* sp.; Brassicaceae: *Stanleya* sp.; Capparaceae: *Cleome* sp.; Caryophyllaceae: *Gypsophila* sp.; Cucurbitaceae: *Cucurbita pepo*; Euphorbiaceae: *Euphorbia marginata*; Fabaceae: *Astragalus bisulcatus, A. laxmannii* var. *robustior, Astragalus* sp., *Glycyrrhiza lepidota, Lupinus sp., Lupinus sp.* (blue), *Oxytropis lambertii, O. sericea, Oxytropis* sp., *Securigera varia, Thermopsis* sp., *Trifolium dasyphyllum*; Hydrophyllaceae: *Phacelia sp.*; Lamiaceae: *Monarda fistulosa, Scutellaria brittonii*; Plantaginaceae: *Linaria vulgaris, Penstemon degeneri, Penstemon* sp.; Polygonaceae: *Eriogonum umbellatum*; Ranunculaceae: *Delphinium barbeyi, D. nelsonii, Delphinium* sp.; Rosaceae: *Prunus* sp.; Salicaceae: *Salix* sp.

Flight Periods for *B. nevadensis*: Queens: Fly early April through early September but most abundantly in late May, all of June, and early July. Males: Fly late June through late August (with 1 specimen collected in early October) but most abundantly in late July and early August. Workers (females): Fly late May through late August but most abundantly in all of June and all of July.

Nesting Habits for *B. nevadensis*: Underground or on the surface of the ground.

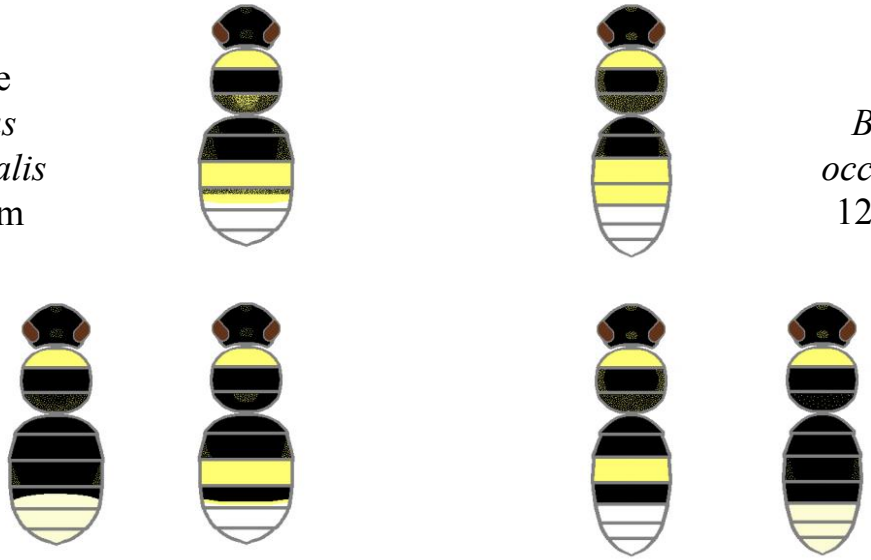
Similar Species:
B. auricomus has more black across the middle and posterior portions of the mesosoma.
B. morrisoni has a shorter face, no black on the mesosoma, and greenish-yellow on T4.

Bombus (*Bombus*) *occidentalis*
Greene, 1858



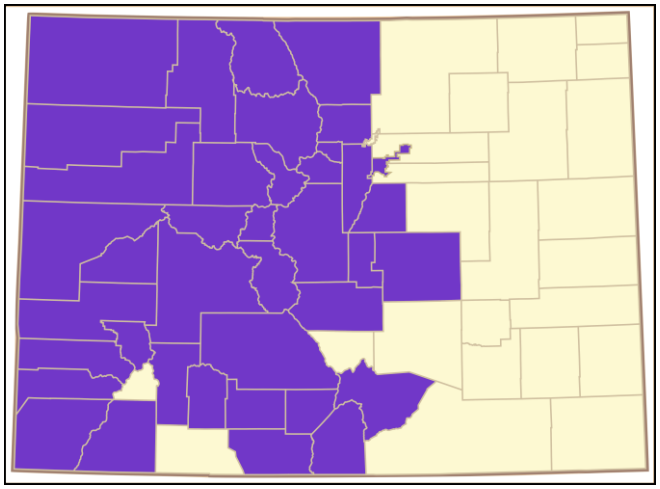
A female *Bombus occidentalis* (photo by Diane Wilson).

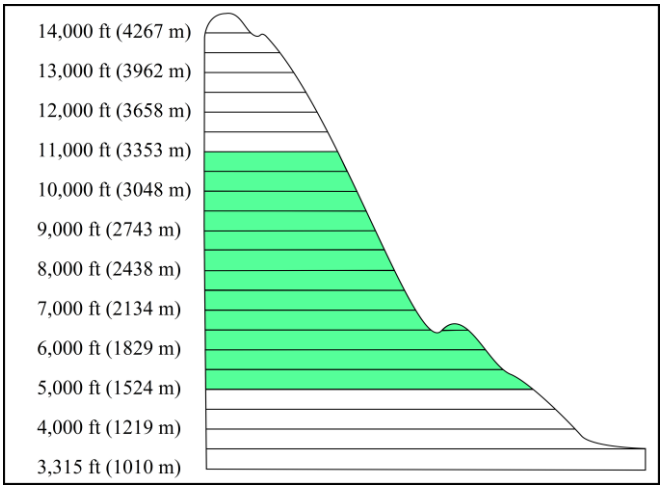
Female
Bombus
occidentalis
9-21 mm



Male
Bombus
occidentalis
12-16 mm

Bombus occidentalis is our only Colorado bumble bee that has a white tip on the metasoma. The amount of yellow on T3-T4 is highly variable. This species in severe decline across North America, and while it is definitely less common than it had once been in Colorado, it does still occur here.





County Map for *B. occidentalis*: Alamosa, Boulder, Chaffee, Clear Creek, Conejos, Costilla, Delta, Denver, Dolores, Douglas, El Paso, Eagle, Fremont, Garfield, Gilpin, Grand, Gunnison, Hinsdale, Huerfano, Jackson, Jefferson, La Plata, Lake, Larimer, Mesa, Mineral, Moffat, Montezuma, Montrose, Ouray, Park, Pitkin, Rio Blanco, Rio Grande, Routt, San Miguel, Sagauche, Summit and Teller Counties.

Elevation Range for *B. occidentalis*: 5,000 to 11,000 feet (1524 to 3353 meters).

Floral Associations for *B. occidentalis*: Apiaceae: *Heracleum* sp.; Asteraceae: *Arnica mollis, Aster* sp., *Chrysothamnus* sp., *Cirsium arvense, Cirsium* sp., *Erigeron* sp., *Grindelia* sp., *Rudbeckia lanciniata, Rudbeckia* sp., *Senecio* sp., *Solidago* sp., *Taraxacum* sp.; Capparaceae: *Cleome serrulata, Cleome* sp.; Fabaceae: *Astragalus laxmannii* var. *robustior, Lupinus argenteus, Melilotus officinalis, Oxytropis* sp., *Trifolium* sp.; Geraniaceae: *Geranium caespitosum*; Lamiaceae: *Monarda fistulosa* ssp. *fistulosa* var. *menthifolia, Monarda* sp.; Onagraceae: *Chamerion angustifolium*; Orobanchaceae: *Pedicularis racemosa*; Plantaginaceae: *Penstemon debilis, Penstemon* sp.; Rosaceae: *Potentilla* sp., *Rubus parviflorus, Rubus* sp.; Salicaceae: *Salix* sp.

Flight Periods for *B. occidentalis*: Queens: Fly late April through early July (with one specimen caught in early October and on specimen caught in late November) but the small sample size may skew the abundance. Males: Fly early August to late September but most abundantly in all of August and early September. Workers (females): Fly late June through early September but most abundantly in early July plus late August and early September.

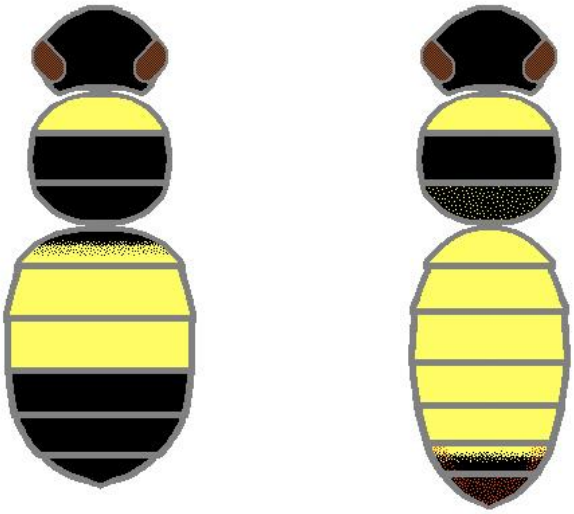
Nesting Habits for *B. occidentalis*: Underground.

Similar Species:
Bombus rufocinctus usually has T1 with yellow hairs and T6 (females) or T7 (males) with black hairs.
Bombus balteatus is much larger with a much longer face. Tip of metasoma usually red or pale yellow, not white.

Bombus (*Thoracobombus*) *pensylvanicus*
(DeGeer, 1773)

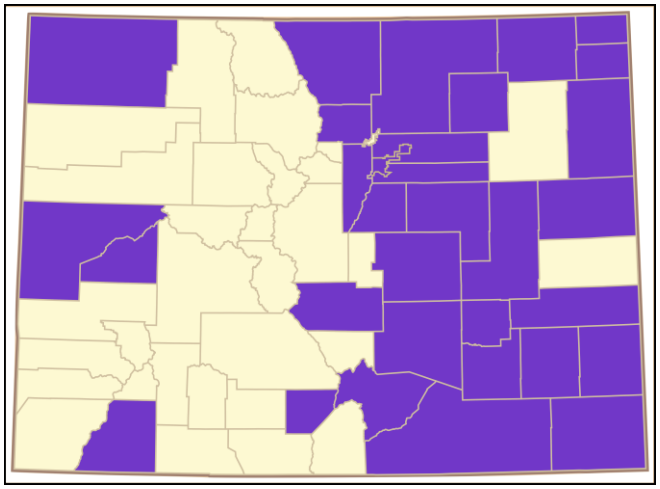
A male *Bombus pensylvanicus* (photo by Diane Wilson).

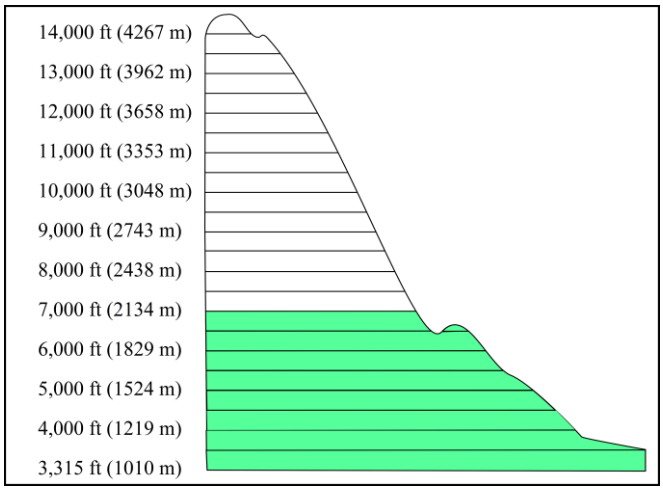
Female
Bombus
pensylvanicus
13-26 mm



Male
Bombus
pensylvanicus
15-21 mm

Bombus pensylvanicus is a large, lower elevation species with black and yellow hairs. It is considered to be in decline across some parts of its North American range, but it still seems common on the eastern plains of Colorado.





County Map for *B. pensylvanicus*: Adams, Alamosa, Arapahoe, Baca, Bent, Boulder, Crowley, Delta, Denver, Douglas, El Paso, Elbert, Fremont, Huerfano, Jefferson, Kiowa, Kit Carson, La Plata, Larimer, Las Animas, Lincoln, Logan, Mesa, Moffat, Morgan, Otero, Phillips, Prowers, Pueblo, Sedgwick, Weld, and Yuma Counties.

Elevation Range for *B. pensylvanicus*: 3,315 to 7,000 feet (1010 to 2134 meters).

Floral Associations for *B. pensylvanicus*: Asclepiadeaceae: *Asclepias* sp.; Asteraceae: *Centaurea diffusa, Chrysothamnus nauseosus, Chrysothamnus* sp., *Cirsium undulatum, Ericameria nauseosa, Grindelia* sp., *Helianthus annuus, H. pumilus, Helianthus* sp., *Liatris punctata, Liatris* sp., *Senecio spartioides, Solidago* sp., *Taraxacum* sp., *Verbesina* sp.; Boraginaceae: *Lithospermum* sp., *Onosmodium bejariense* var. *occidentale*; Cactaceae: *Cylindropuntia imbricata, Opuntia* sp.; Campanulaceae: *Lobelia siphilitica*; Capparaceae: *Cleome serrulata, Cleome* sp.; Caprifoliaceae: *Symphoricarpos occidentalis*; Cucurbitaceae: *Cucurbita pepo,* unknown species; Dipsacaceae: *Dipsacus fullonum*; Fabaceae: *Astragalus bisulcatus, Astragalus* sp., *Astragalus* sp. (white), *Dalea candida, Lathyrus* sp., *Melilotus officinalis, Melilotus* sp., *Oxytropis sericea, Thermopsis* sp., unknown species; Grossulariaceae: *Ribes* sp., *Ribes* sp. (yellow); Lamiaceae: *Salvia* sp., *Salvia* sp. (blue); Loasaceae: *Mentzelia* sp.; Malvaceae: *Hibiscus cannabinus*; Onagraceae: *Oenothera* sp.; Plantaginaceae: *Penstemon secundiflorus, Penstemon* sp.; Rosaceae: *Prunus* sp., *Rubus* sp.; Solanaceae: *Solanum rostratum, Solanum* sp.

Flight Periods for *B. pensylvanicus*: Queens: Fly late April through late September but most abundantly in all of May and early June. Males: Fly early August to early October but most abundantly in early August plus early September, late September, and early October. Workers (females): Fly late June through early October but most abundantly in all of August and early September.

Nesting Habits for *B. pensylvanicus*: On the surface of the ground or underground.

Similar Species:

Bombus auricomus females have essentially the same color pattern. Distinguishing characters are microscopic. *B. auricomus* does tend to be more golden yellow as opposed to the lemony yellow of *B. pensylvanicus*. Male *B. auricomus* have big eyes.

Bombus insularis males are distinguished by genetalic characters.

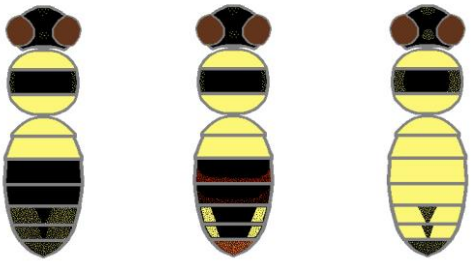
Bombus rufocinctus males have big eyes.

Bombus (*Cullumanobombus*) *rufocintus*
Cresson, 1863

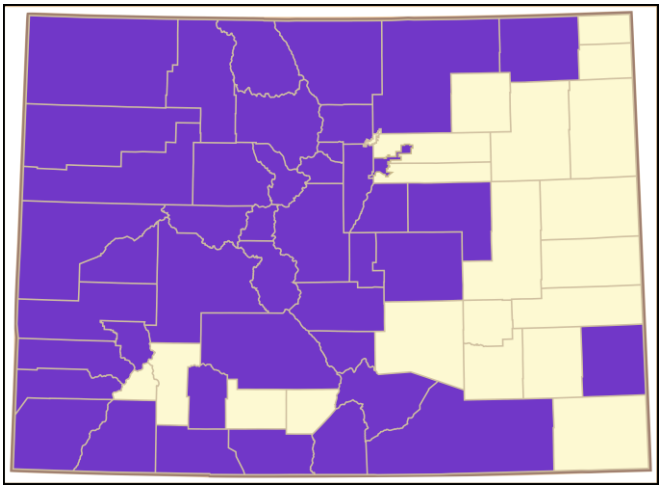
A female *Bombus rufocintus* (photo by Diane Wilson).

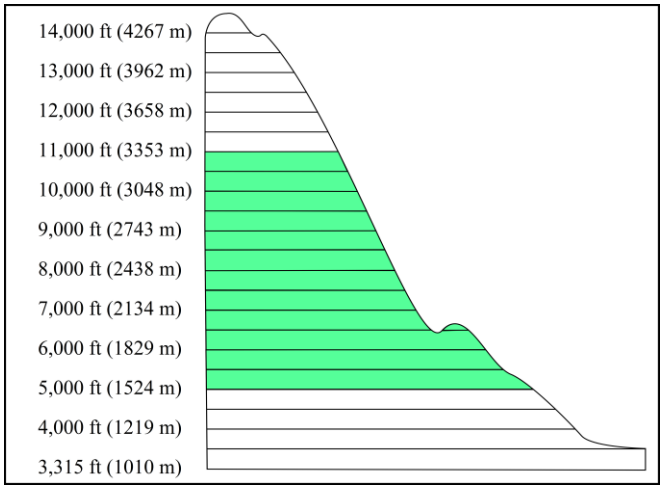
Female
Bombus
rufocintus
9-18 mm

Male
Bombus
rufocintus
11-15 mm



Bombus rufocinctus is the most variable in color of any species of bumble bee in Colorado. This small to medium sized species varies from yellow, to black, red, or any combination. The males have big eyes. It occurs at mid-elevation across Colorado, though much less commonly in the eastern part of the state.





County Map for *B. rufocinctus*: Archuleta, Boulder, Chaffee, Clear Creek, Conejos, Costilla, Custer, Delta, Denver, Dolores, Douglas, El Paso, Eagle, Elbert, Fremont, Garfield, Gilpin, Grand, Gunnison, Huerfano, Jackson, Jefferson, La Plata, Lake, Larimer, Las Animas, Logan, Mesa, Mineral, Moffat, Montezuma, Montrose, Ouray, Park, Pitkin, Prowers, Rio Blanco, Routt, San Miguel, Saguache, Summit, Teller, and Weld Counties.

Elevation Range for *B. rufocinctus*: 5,000 to 11,000 feet (1524 to 3353 meters).

Floral Associations for *B. rufocinctus*: Asteraceae: *Aster* sp., *Aster* sp. (purple), *Carduus nutans, Carduus* sp., *Chrysothamnus* sp., *Cirsium arvense, Cirsium* sp., *Cosmos* sp., *Ericamerica nauseosa, Erigeron speciosus, Erigeron* sp., *Gaillardia* sp., *Grindelia* sp., *Helianthella quinquenervis, Helianthus* sp., *Heterotheca* sp., *Liatris punctata, Oligoneuron rigidum, Ratibida* sp., *Rudbeckia* sp., *Senecio* sp., *Solidago* sp., *Taraxacum* sp., *Viguiera* sp., *Wyethia amplexicaulis*; Boraginaceae: *Cynoglossum officinale, Onosmodium bejariense* var. *occidentale*; Brassicaceae: *Barbarea* sp., *Stanleya* sp.; Campanulaceae: *Campanula rotundifolia*; Caprifoliaceae: *Symphoricarpos occidentalis*; Crassulaceae: *Sedum lanceolatum*; Cucurbitaceae: *Cucurbita pepo*; Fabaceae: *Astragalus bisulcatus, A. laxmannii* var. *robustior, Astragalus* sp., *Dalea compacta* var. *compacta, Glycyrrhiza lepidota, Lupinus* sp. (blue), *Melilotus officinalis, Melilotus* sp., *Oxytropis* sp., *Thermopsis* sp., *Trifolium* sp.; Geraniaceae: *Geranium caespitosum, Geranium caespitosum* var. *parryi*; Hydrophyllaceae: *Phacelia heterophylla, Phacelia* sp.; Iridaceae: *Iris missouriensis*; Malvaceae: *Sidalcea neomexicana*; Plantaginaceae: *Penstemon degeneri, Penstemon* sp.; Polemoniaceae: *Polemonium* sp.; Polygonaceae: *Eriogonum* sp.; Ranunculaceae: *Aquilegia* sp.; Rosaceae: *Crataegus* sp., *Dasiphora fruticosa* ssp. *floribunda, Potentilla* sp., *Rosa* sp., *Rubus deliciosus*.

Flight Periods for *B. rufocinctus*: Queens: Fly early May through late September but most abundantly in late June and early July. Males: Fly late July through late September but most abundantly in all of August and early September. Workers (females): Fly late June through late September but most abundantly in all of July, all of August, and early September.

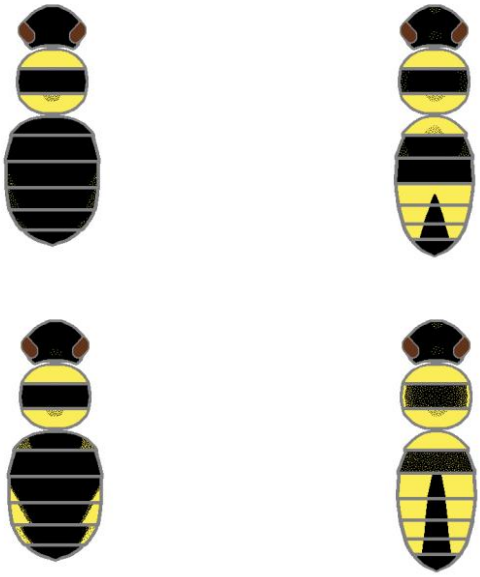
Nesting Habits for *B. rufocinctus*: On surface of the ground or above ground.

Similar Species:
This is such a variable species that individuals can resemble just about every other species of bumble bee in Colorado. Unfortunately the characters for identifying it to species with confidence require a microscope, but check out the species accounts for any bumble bee that you think looks similar to yours, and, hopefully, there are some useful hints for separating them.

Bombus (*Psithyrus*) *suckleyi*
Greene, 1860

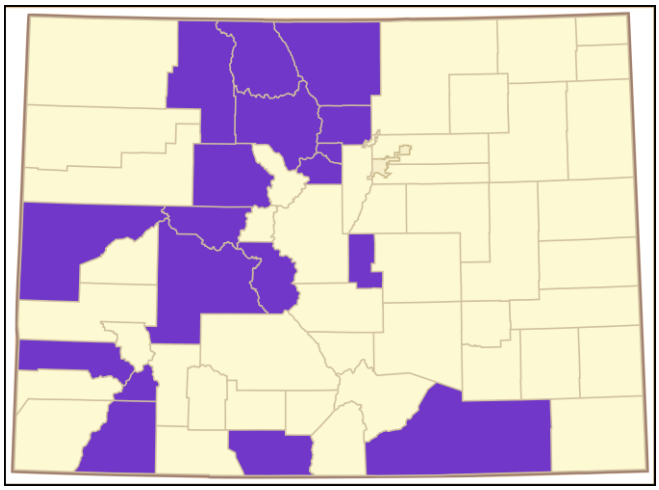
A female *Bombus suckleyi* (photo by Nicole Neu-Yagle, University of Colorado Museum of Natural History).

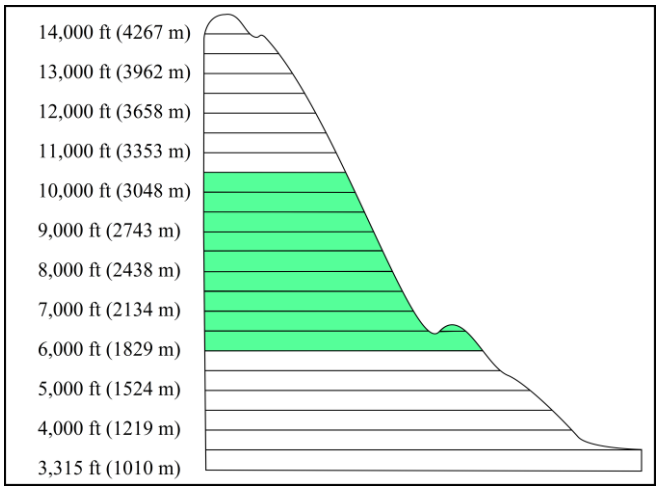
Female
Bombus
suckleyi
18-23 mm



Male
Bombus
suckleyi
13-16 mm

Bombus suckleyi is the second most common parasitic species of bumble bee in Colorado. This black-headed species is found at mid-elevation. It is thought to be in decline across parts of its range.





County Map for *B. suckleyi*: Boulder, Chaffee, Clear Creek, Conejos, Eagle, Gilpin, Grand, Gunnison, Jackson, La Plata, Las Animas, Larimer, Mesa, Pitkin, Routt, San Juan, San Miguel, and Teller Counties.

Elevation Range for *B. suckleyi*: 6,000 to 10,500 feet (1829 to 3200 meters).

Floral Associations for *B. suckleyi*: Asteraceae: *Chrysothamnus sp., Rudbeckia laciniata, Solidago sp.*; Boraginaceae: *Mertensia lanceolata*; Fabaceae: *Lupinus sp.* (blue)*, Trifolium pratense.*

Flight Periods for *B. suckleyi*: Queens: Fly late May through early July, but this small sample size may not fully represent the true flight period.. Males: Fly early August through early September but this small sample size may not fully represent the true flight period. Workers (females): There are no workers in this parasitic species (subgenus *Psithyrus)*.

Nesting Habits for *B. suckleyi*: This parasitic species has been recorded in nests of *B. appositus*, *B. californicus*, *B. fervidus*, *B. nevadensis*, *B. rufocinctus*, and *B. occidentalis*.

Similar Species:

Bombus fernaldae may have red on metasoma, or females have yellow on their head, males only distinguishable using microscopic characters.

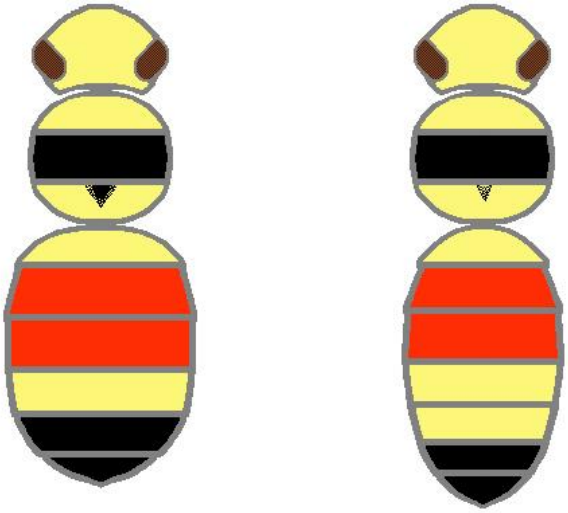
Bombus insularis females have yellow on their head, males are only distinguishable using microscopic characters.

Bombus variabilis has a yellow spot on their head.

Bombus (*Pyrobombus*) *sylvicola*
Kirby, 1837

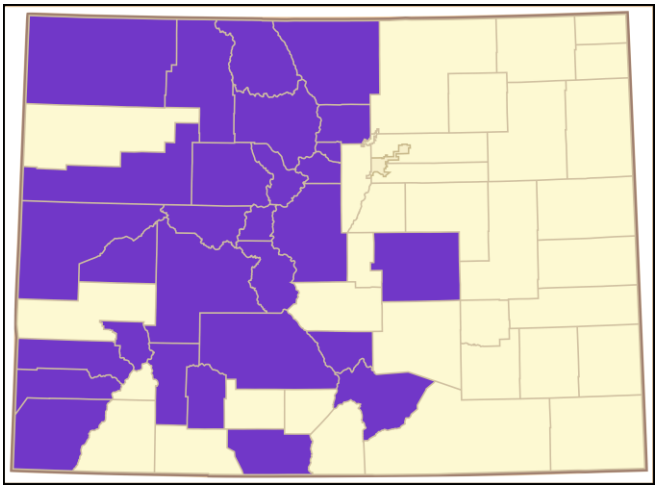
A female *Bombus sylvicola* (photo by Diane Wilson).

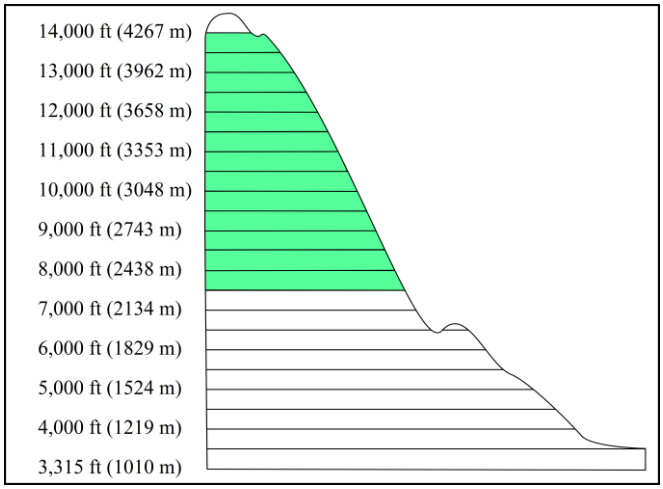
Female
Bombus
sylvicola
10-17 mm



Male
Bombus
sylvicola
11-14 mm

Bombus sylvicola has long silky hairs which gives this species a rather fluffy appearance. It is a higher elevation species, occurring throughout the mountains of Colorado. This is the southeastern edge of its range in North America.





County Map for *B. sylvicola*: Boulder, Chaffee, Clear Creek, Conejos, Custer, Delta, Dolores, El Paso, Eagle, Garfield, Gilpin, Grand, Gunnison, Hinsdale, Huerfano, Jackson, Lake, Larimer, Mesa, Mineral, Moffat, Montezuma, Ouray, Park, Pitkin, Routt, San Miguel, Saguache, and Summit Counties.

Elevation Range for *B. sylvicola*: 7,500 to 14,000 feet (2286 to 4267 meters).

Floral Associations for *B. sylvicola*: Asteraceae: *Achillea millefolium, Arnica mollis, Arnica* sp., *Chrysothamnus* sp., *Cirsium arvense, C. scariosum, Cirsium* sp., *Erigeron melanocephalus, Grindelia* sp., *Heterotheca* sp., *Saussurea weberi, Senecio fremontii, S. integerrimus, Senecio* sp., *Solidago* sp., *Taraxacum officinale, Taraxacum* sp.; Crassulaceae: *Sedum lanceolatum, Sedum* sp.; Ericaceae: *Arctostaphylos uva-ursi, Vaccinium* sp.; Fabaceae: *Melilotus officinalis, Trifolium dasyphyllum, T. nanum, Trifolium* sp.; Gentianaceae: *Gentiana parryi, Gentiana* sp.; Hydrophyllaceae: *Phacelia* sp.; Onagraceae: *Chamerion angustifolium*; Orobanchaceae: *Pedicularis groenlandica*; Plantaginaceae: *Penstemon* sp. (blue); Polygonaceae: *Polygonum bistortoides*; Primulaceae: *Primula parryi*; Ranunculaceae: *Delphinium barbeyi*; Rosaceae: *Dryas octopetala, Potentilla* sp.; Salicaceae: *Salix arctica, S. planifolia, Salix* sp.

Flight Periods for *B. sylvicola*: Queens: Fly early June through early August but most abundantly in late June and late July. Males: Fly late July through late August but most abundantly in late July and early August. Workers (females): Fly early June through early September but most abundantly in late July and early August.

Nesting Habits for *B. sylvicola*: Underground or on the surface of the ground.

Similar Species:

Bombus bifarius has a black "T" on the posterior third of the mesosoma that reaches all the way to the posterior edge. Metasomal hairs are generally shorter.

Bombus rufocinctus females have a darker head and the metasomal hairs are generally shorter. Males have big eyes.

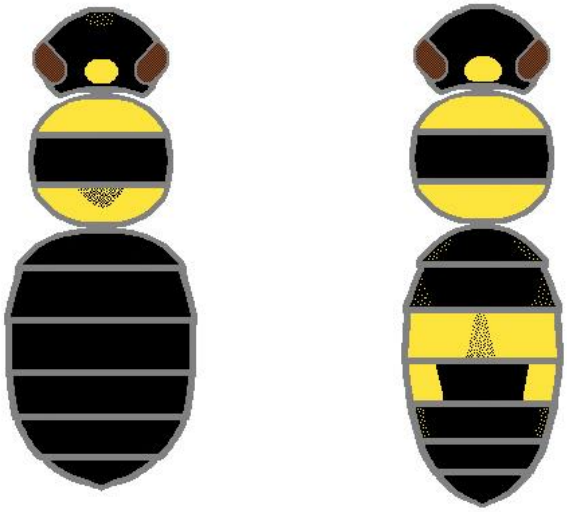
Bombus huntii has no black on the posterior third of the mesosoma and shorter metasomal hairs.

Bombus melanopygus has black hairs mixed into the anterior portion of the mesosoma.

Bombus (*Psithyrus*) *variabilis*
(Cresson, 1872)

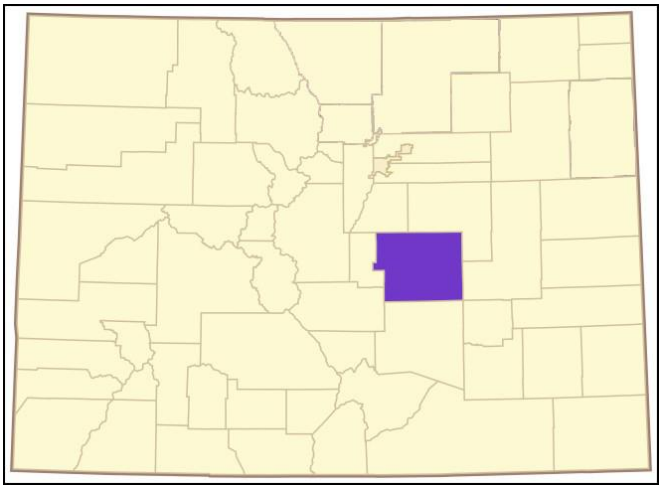
A male *Bombus variabilis* (photo by Nicole Neu-Yagle, University of Colorado Museum of Natural History).

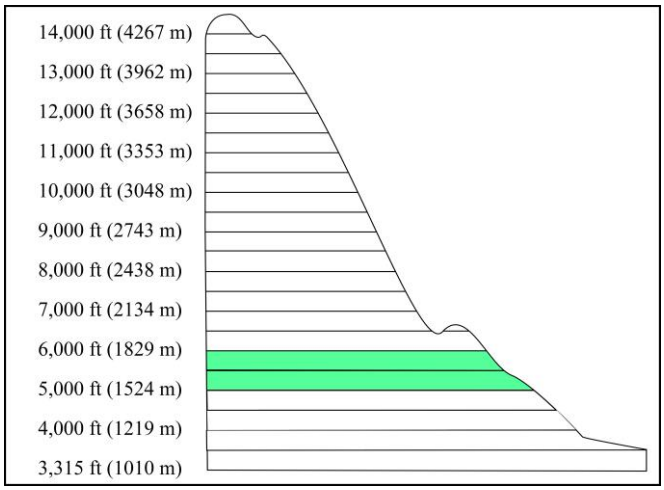
Female
Bombus
variabilis
18-22 mm



Male
Bombus
variabilis
15-17 mm

Bombus variabilis is the largest and rarest of our parasitic species. Only one Colorado record is known for this species, but it is a legitimate record for a parasitic species on the edge of its range, so we do not consider this an accidental occurrence.





County Map for *B. variabilis*: El Paso County.

Elevation Range for *B. variabilis*: 5700 feet (1737 meters).

Floral Associations for *B. variabilis*: no floral records for Colorado.

Flight Periods for *B. variabilis*: Males: Fly in September.

Nesting Habits for *B. variabilis*: Is a parasite of *B. pensylvanicus*.

Similar Species:

Bombus fernaldae may have red on the metasoma, female has some yellow or red on T1, male has yellow on T1.

Bombus insularis female has yellow on the sides of the mesosoma and some yellow on T3-T5, male has yellow on T1.

Bombus suckleyi has an all black head in both sexes and the male has T1 yellow.

Other Species

Below are three species for which there are Colorado records, but are due to accidental introductions or mislabeled specimens. These species are not currently considered to be part of Colorado's bumble bee fauna. See Williams et al. (2014) for illustrations.

Bombus (*Pyrobombus*) *impatiens* Cresson, 1863 – Several specimens of this eastern North American species were collected during September of 1931 in Fort Collins. This species is also commercially sold for use in greenhouse pollination. These boxed bees are known to sometimes escape and several specimen have been collected "in the wild" in Colorado in recent years. There are no indications that this species was ever or is currently part of the Colorado bumble bee fauna. These odd records are merely accidental occurrences.

Bombus (*Pyrobombus*) *vagans* Smith, 1854 – Four specimens of this species labeled "Boulder, Colo, 1922" exist in the collections of The American Museum of Natural History, however, these poorly labeled specimens are the only Colorado records for this species. We do not know whether these specimens were mislabeled or if they represent an accidental introduction, but this species is not an established member of the Colorado bumble bee fauna.

Bombus (*Pyrobombus*) *vosnesenskii* Radoszkowski, 1862 – Two worker specimens were collected one month apart in Longmont, Colorado during July-August of 2012. It is thought that a young queen may have been transported in nursery stock during the spring and established a colony. No specimens of this West Coast species have been seen in Colorado since, despite continued bee research in the area.

Quick Guide

Parasitic species, females without pollen carrying baskets on hind legs:

Bombus insularis, *B. fernalde*, *B. suckleyi*, *B. variabilis*.

Big-eyed males:

Bombus auricoms, *B. fraternus*, *B. griseocollis*, *B. morrisoni*, *B. nevadensis*, and *B. rufocinctus*.

Largely Yellow:

Bombus appositis, *B. fervidus*, *B. morrisoni*, *B. nevadensis, B. rufocinctus*.

Largely Black:

*B. balt*eatus, *B. californicus*, *B. fernalde*, *B. fraternus*, *B. griseocollis*, *B. insularis*, *B. occidentalis, B. rufocinctus*, *B. suckleyi*, *B. variabilis.*

Black and Yellow:

Bombus californicus, *B. fraternus*, *B. griseocollis*, *B. morrisoni*, *B. nevadensis, B. occidentalis, B. rufocinctus.*

Metasoma with Red at apical tip:

Bombus balteatus, *B. frigidus*, *B. mixtus.*

Females with metasomal T1 to T6 being Yellow, Yellow, Orange, Orange, Black, Black

Males with metasomal T1 to T7 being Yellow, Yellow, Orange, Orange, Orange, Black, Black:

Bombus centralis, *B. flavifrons*, *B. rufocinctus.*

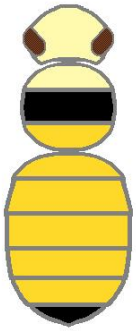
Females with metasomal T1 to T6 being Yellow, Orange, Orange, Yellow, Black, Black

Males with metasomal T1 to T7 being Yellow, Orange, Orange, Yellow, Yellow, Black, Black:

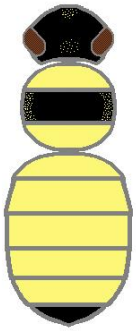
Bombus bifarius, *B. huntii*, *B. melanopygus*, *B. rufocinctius*, *B. sylvicola.*

Elevation Range	***B. auricomus***	***B. fraternus***	***B. pensylvanicus***	***B. griseocollis***	***B. fervidus***	***B. nevadensis***	***B. huntii***	***B. morrisoni***	***B. centralis***	***B. appositus***	***B. occidentalis***	***B. variabilis***	***B. californicus***	***B. insularis***	***B. bifarius***	***B. rufocinctus***	***B. suckleyi***	***B. fernaldae***	***B. melanopygus***	***B. mixtus***	***B. balteatus***	***B. sylvicola***	***B. flavifrons***	***B. frigidus***
> 13,500																					■	■		
12,500 - 13,499						■												■			■	■	■	
11,500 - 12,499						■					■					■		■	■	■	■	■	■	■
10,500 - 11,499						■				■	■				■	■	■	■	■	■	■	■	■	■
9,500 - 10,499					■	■			■	■	■		■	■	■	■	■	■	■	■	■	■	■	■
8,500 - 9,499				■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	
7,500 - 8,499				■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■		
6,500 - 7,499		■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■						
5,500 - 6,499		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
4,500 - 5,499	■	■	■	■	■	■	■	■	■	■	■													
< 4,500	■	■	■	■	■	■																		

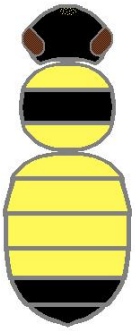
Plate of Females



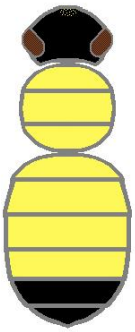
B. appositus



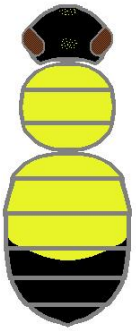
B. rufocinctus



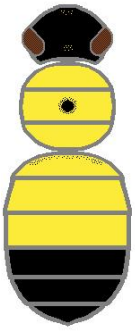
B. fervidus



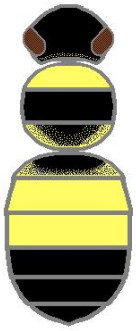
B. fervidus



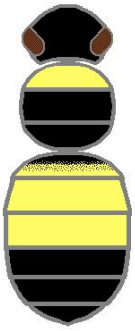
B. morrisoni



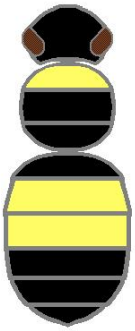
B. nevadensis



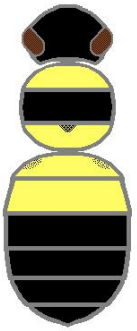
B. auricomus



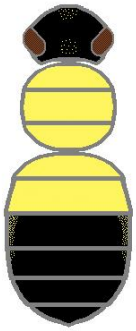
B. pensylvanicus



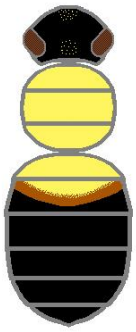
B. auricomus



B. fraternus



B. griseocollis



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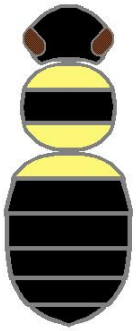
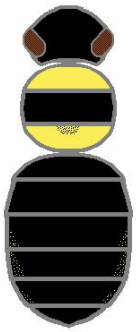
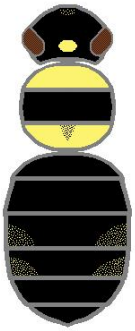


B. rufocinctus

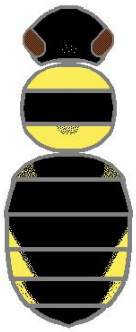
B. variabilis



B. suckleyi



B. insularis



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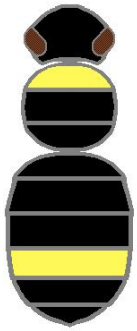
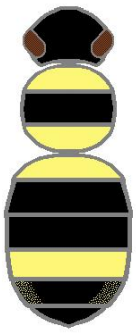


B. californicus



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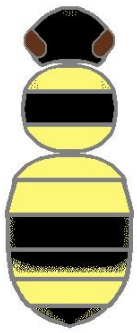
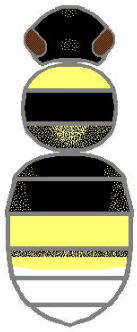
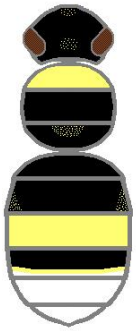


B. balteatus

Plate of Females

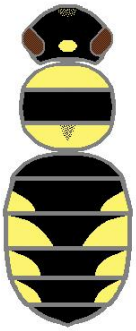


B. occidentalis



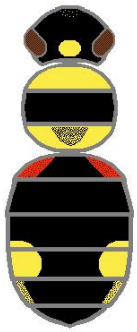
B. occidentalis

B. occidentalis

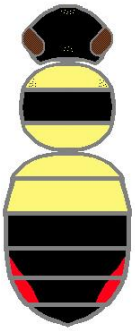


B. insularis

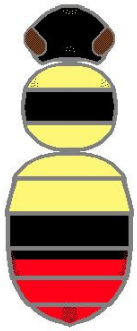
B. fernaldae



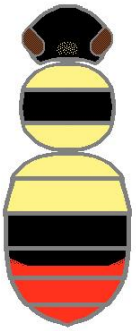
B. fernaldae



B. balteatus



B. balteatus



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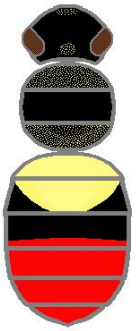
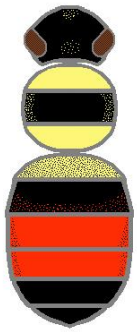


B. mixtus



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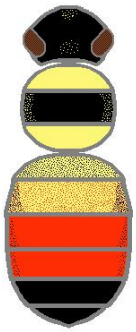
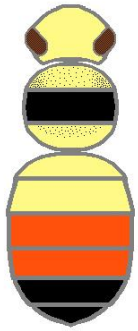
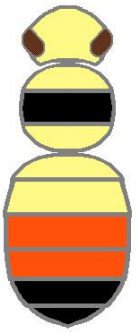


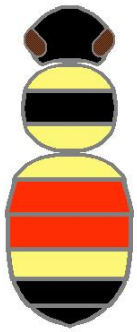
B. rufocinctus



B. flavifrons



B. centralis



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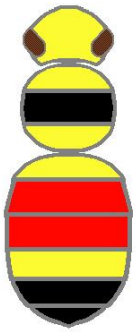
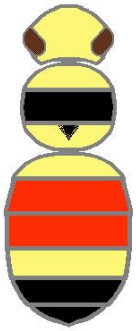


B. huntii



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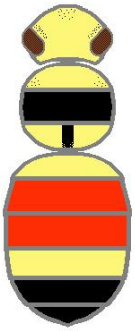
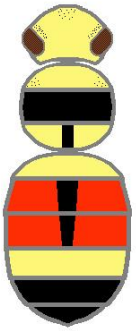
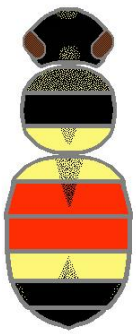


B. bifarius

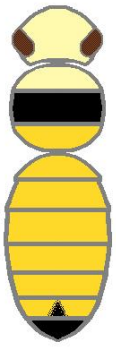


B. bifarius

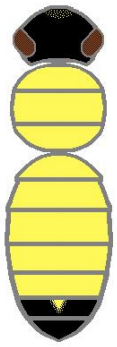


B. melanopygus

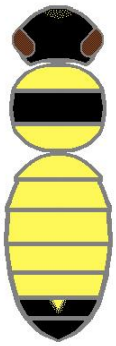
Plate of Males



B. appositus

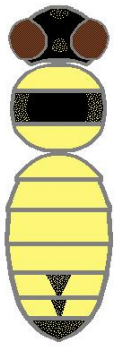


B. fervidus

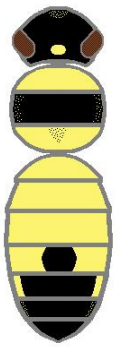


B. fervidus

B. pensylvanicus



B. rufocinctus



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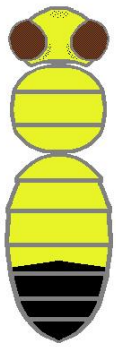

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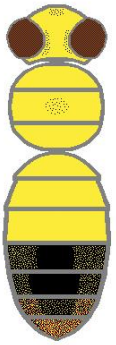
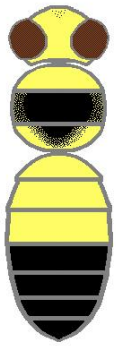


B. nevadensis



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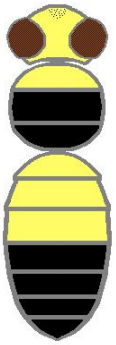

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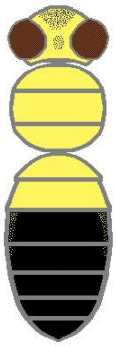

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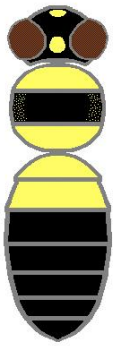

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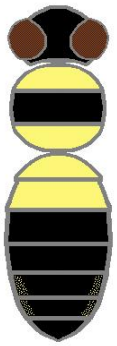

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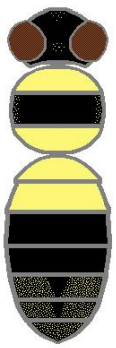

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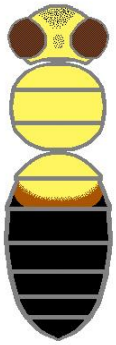

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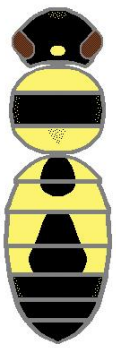

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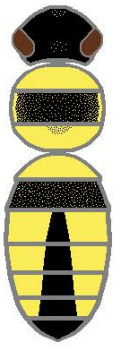

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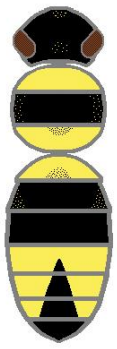

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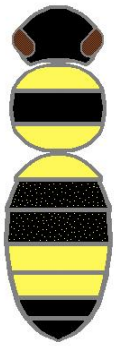

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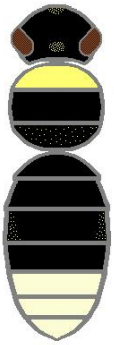
Plate of Males

B. occidentalis

B. occidentalis



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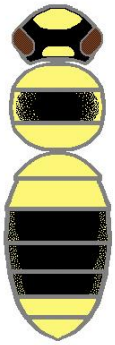

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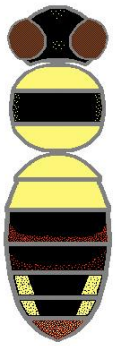

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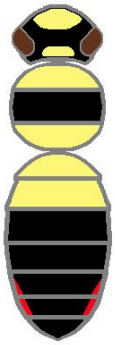

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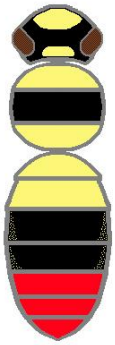
B. fernaldae

B. fernaldae



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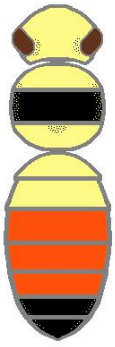
B. mixtus



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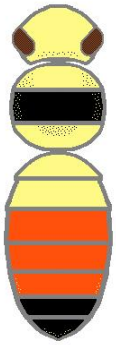

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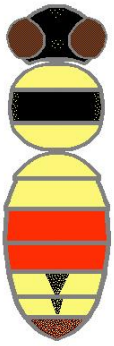

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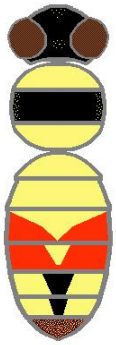

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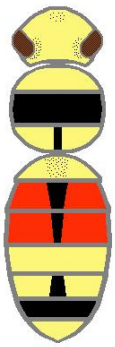

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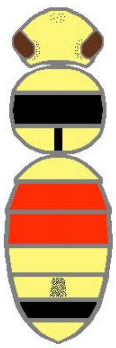

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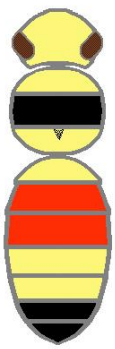

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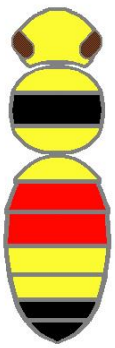

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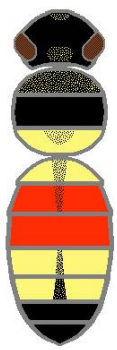

B. melanopygus

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