

# Bees of Ohio: A Field Guide

North American Native Bee Collaborative



The Bees of Ohio: A Field Guide (Version 1.1.1 , 5/2020) was developed based on [Bees of Maryland: A Field Guide](#), authored by the North American Native Bee Collaborative

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Where to Download or Order the Maryland version:

PDF and original MS Word files can be downloaded from:  
<http://bio2.elmira.edu/fieldbio/handybeemanual.html>.

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The Ohio version of this guide was led by Amy Schnebelin with editing by MaLisa Spring, Denise Ellsworth. Images are attributed directly to the photographers in their description.

# Preface

Because bees are small and the characters used to discriminate among them even smaller, we believe that using a close-focusing (butterfly) binocular is required to effectively identify bees in the wild. This version only separates bees to genus. This book is purposefully designed to be reused. As such, you can download the original MS Word files for the Maryland version and use them to re-create your own custom field guide or a field guide to a different part of the continent. Feel free to modify the text, add/replace pictures/graphics/formatting and add/delete sections as you see fit. While it would be nice to acknowledge our contributions, even that is not a requirement. It is completely public domain and you need not contact us for permission to use any of it. See the previous copyright page for the locations of the original files and the address of the corresponding member of the Collaborative. We encourage you to report all errors and suggest changes to improve this book.

Enjoy your time in the field.  
The Collaborative

The Ohio edition - ditto to the above. If you use any images shared here, we ask that you credit the appropriate photographer. Images that lack attribution are from the original Maryland guide.

# Introduction

This book is designed to be used in the field. It contains information on how to identify bee genera of Ohio using binoculars. We hope this will be widely useful in all states east of the Mississippi River as well as the eastern Canadian provinces given that the common bee genera of Ohio are relatively uniformly distributed throughout the East.

The study of bees comes with built-in advantages over other groups. In some ways they are the most observable of our animal fauna. During the warm seasons, bees are usually numerous, foraging and resting primarily on flowers, either planted or wild, where they remain relatively undisturbed by an observer standing nearby. In contrast, birds are often sparsely distributed, shy, hidden by foliage, and generally much more difficult to find. Numerically, bees are also more common and species rich than butterflies.

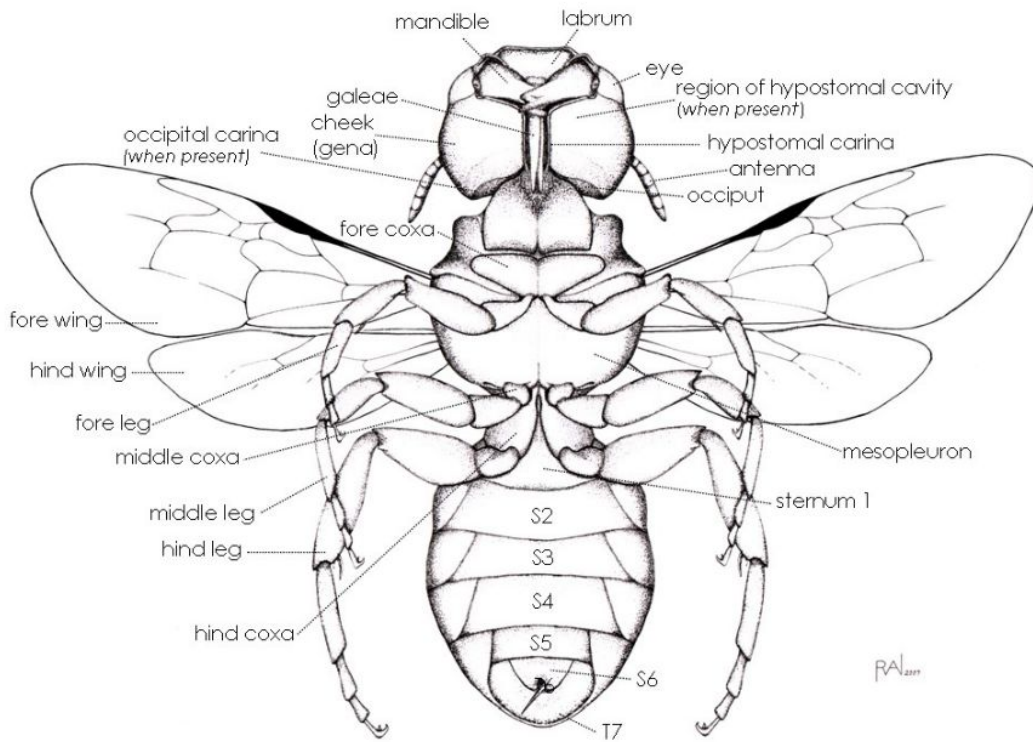
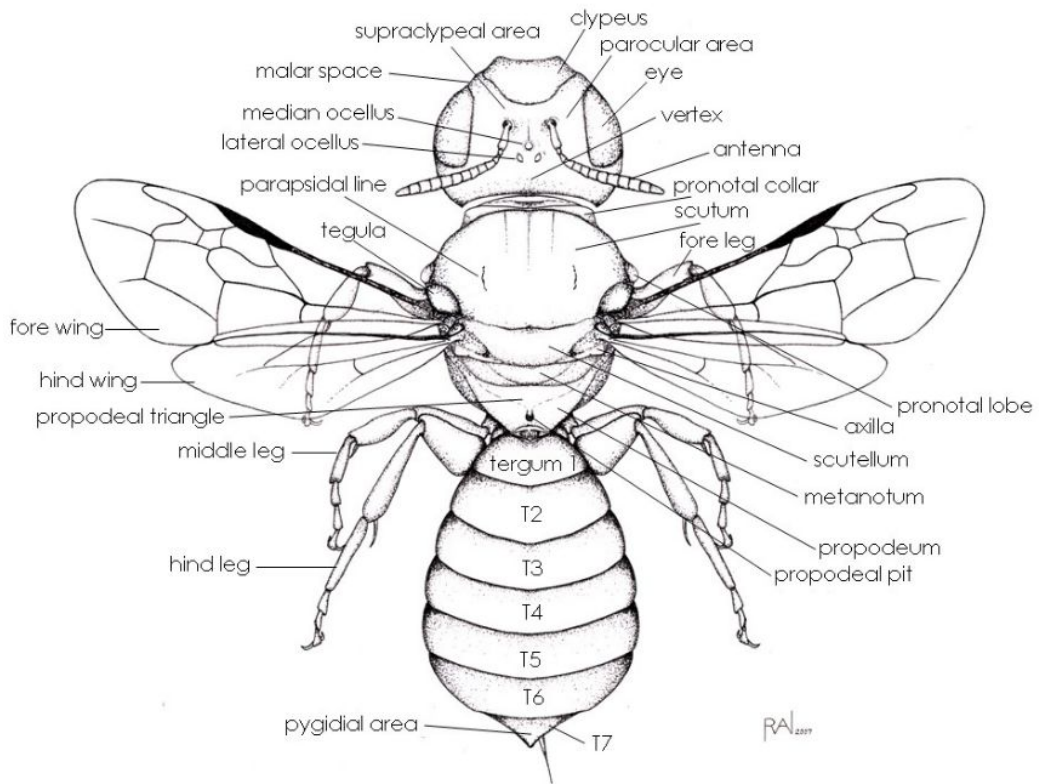
Finally, the impetus for this field guide is to attempt to lure naturalists into taking a serious interest in bee observation. Compared to both birds and butterflies, relatively little is known about bees. Much of their distribution, life history, habitat, and status remains for you to discover. Throughout the continent, new species are regularly described and there is much to learn and the world really needs your help with this.

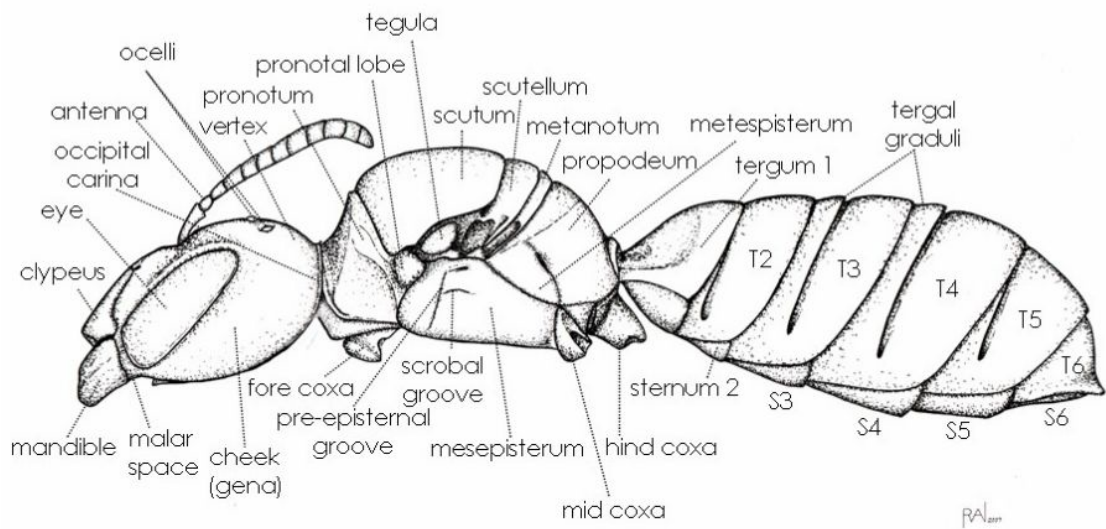
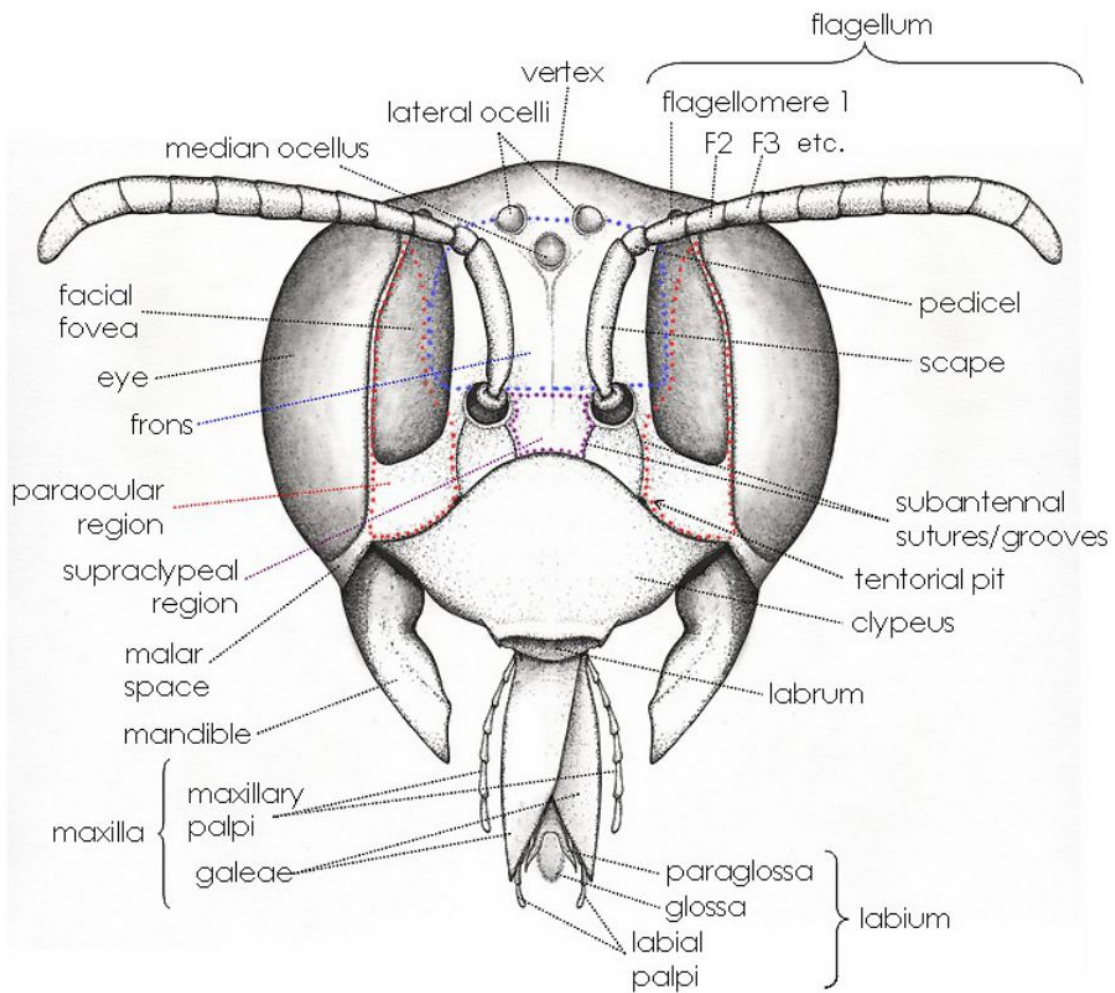
## Using this Guide

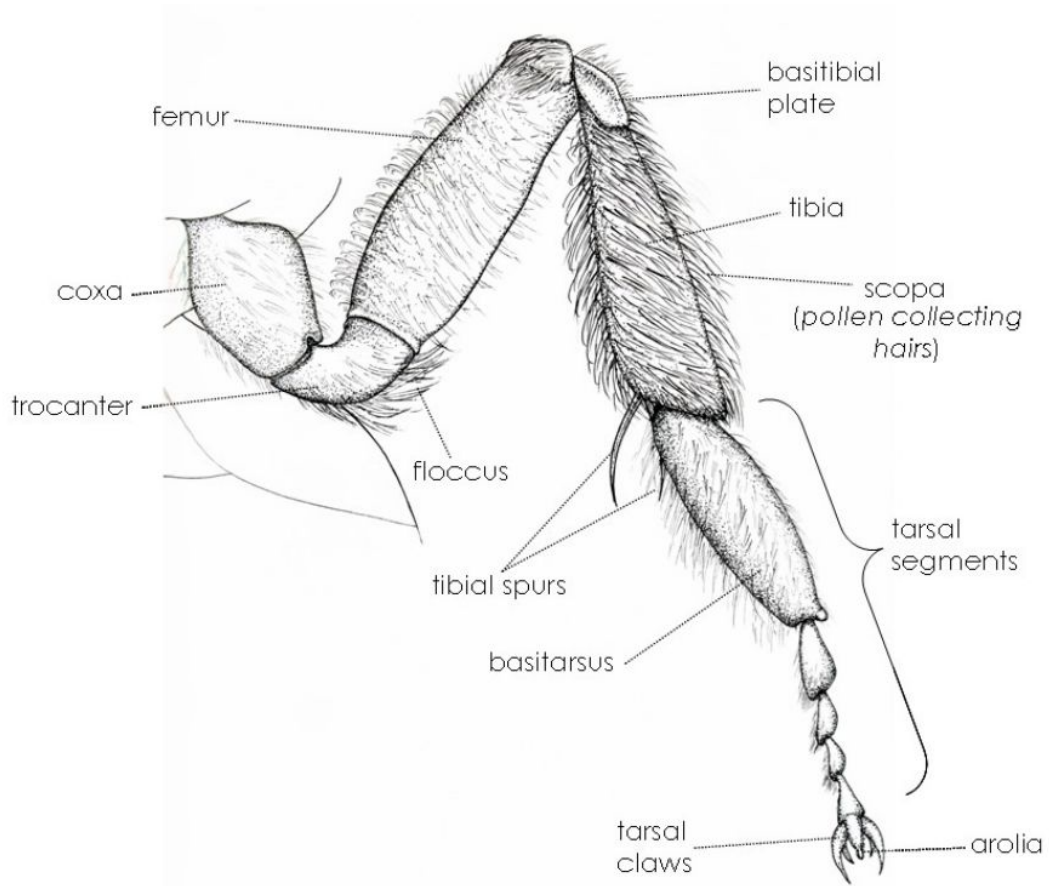
At the top of each genus page, a group name has been created for sets of similar genera. In square brackets the number of confirmed species in Ohio is provided along with the total number of records in the USGS database (as of April 2017). A file is available from Sam Droege ([sdroege@usgs.gov](mailto:sdroege@usgs.gov)) that lists all of the confirmed species for the state and documents the counties they can be found in.

**Phenological Graphs:** Flight times are noted by month, where darker months have more of that genus reported.

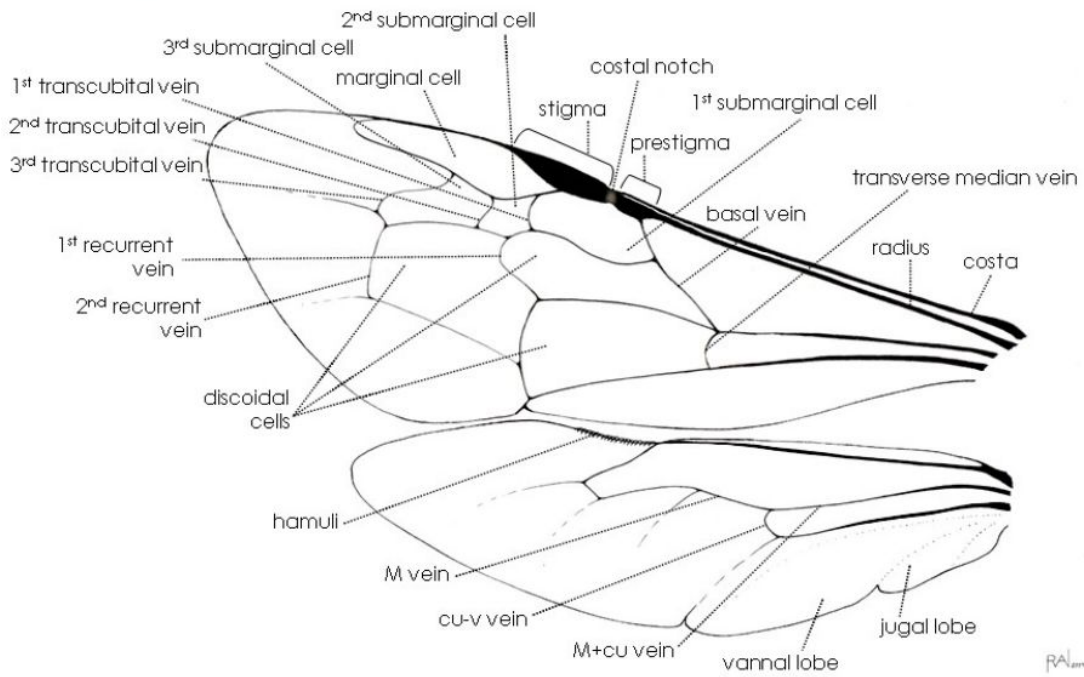
**Bee Terminology:** The format for this guide is relatively self-explanatory, however the architecture of bees requires some special terminology and line drawings are provided on the next few pages to guide you. As you can see from the photographs in this guide, bees come in many shapes, so realize that the line drawings are generic and expect shapes of these body parts to vary in interesting and informative ways across species. Figures were drawn by Rebecca Nelson with more detail than you need to use this book, but they are useful if you go further into bee study, as we suspect you will.







RAI<sub>2007</sub>



RAI<sub>2007</sub>



# References

Below are some possibly useful references and websites.

Anonymous. 2015. The Very Handy Manual: How to Catch and Identify Bees and Manage a Collection. <https://www.pwrc.usgs.gov/nativebees/> or <http://bio2.elmira.edu/fieldbio/handybeemanual.html>. A general manual for the advanced study of bees. Contains handy things such as pronunciation guides to bee genera names, lists of introduced bees, capture techniques, and how to create a collection.

[BugGuide.net](http://bugguide.net). Created by Iowa State University and contains thousands of pictures of bees along with snippets of life history information and references. You can submit your bee pictures here for identification.

Colla, S., L. Richardson, and P. Williams. 2011. Bumble Bees of the Eastern United States. <https://www.fs.fed.us/wildflowers/pollinators/documents/BumbleBeeGuideEast2011.pdf>

Discover Life Global Mapper.

[http://www.discoverlife.org/mp/20m?act=make\\_map](http://www.discoverlife.org/mp/20m?act=make_map). Allows you to map individual species/groups of species/ zoom into localities, and clicking on the dots pulls up the record with all the details the record owner wished to provide.

Fowler, J., and S. Droege. 2016. Specialist Bees of the Mid-Atlantic and Northeastern United States. [http://jarrodflower.com/specialist\\_bees.html](http://jarrodflower.com/specialist_bees.html). Useful information regarding bee species that collect pollen from a restricted set of plants. Names of bees and plants are given and can help with locating certain species.

Holm, H.N. 2017. Bees: An Identification and Native Plant Forage Guide. Pollinator Press. Another book for the library. Loads of pictures, identification information, and information about foraging preference applicable from the Midwest to the Mid-Atlantic north.

Michener, C.D. 2007. The Bees of the World (Second Edition). The Johns Hopkins University Press. Michener's lifetime work. The very best technical guide to all the bees of the world. Useful if you are very serious about bees, but also filled with fascinating (but highly technical) information about the bees broken down by taxa to genus.

Wilson, J.S., and O.M. Carril. 2016. The Bees in Your Backyard: A Guide to North America's Bees. Princeton University Press. An excellent overview of the life history and identification of bees for North America.

# Andrena

## Mining Bee Group

(~98 species expected in Ohio)

Common and, at times, dominant bees, that occur in all habitats, but reach their peak abundance in the spring with a few species emerging in the fall and a very few species out in mid-summer.



*Andrena* sp. - Female

Photo: MaLisa Spring

## Field Marks

### Both Sexes

- Thorax and abdomen integument entirely black, with varying shades of white, grey or brown hair (usually dense and long on thorax).

### Female ♀

- Face, **shallow depression (facial fovea - sometimes referred as vertical eyebrows)** lined with minute hairs that reflect a white color (rarely chocolate brown) making the fovea relatively visible in the field
- Fovea roughly oval, though shapes vary, and runs from the top of the head between the ocelli and the eye down and usually narrows beyond the gap between the antennal socket and eye
  - Note that the foveae are usually surrounded by longer hairs
- Note: 2 very rare summer/fall females have yellow patches on their lower faces all other species have black

### Male ♂

- Face, with long pale hairs
- Hair usually particularly dense below antennae and overhanging, **beard-like**, the clypeus rim
- Face, **clypeus (and at times to the sides of clypeus) with bright yellow marks** in some species
- Body and head relatively wide compared to similar genera
- A few species with reddish/orangish lower legs

<b>Flight Season</b>	Abundant in the spring, nearly absent in summer, regular in the fall
<b>Size Relative to Honey Bee</b>	0.5 – 1.5X
<b>Position of Wings Feeding on Flowers</b>	Held slightly to sides or completely overlapping on back, though the less common fall species regularly hold their wings out to the side.
<b>Location of Pollen Carrying Hairs</b>	Hind femur, trochanter, tibia, back sides of thorax (propodeal corbicula), the joint between legs and thorax, in particular
<b>Nest</b>	Ground, often in open bare soil, but can be underneath leaves/leaf litter.
<b>Flowers</b>	Almost any flower. Many species are specialists on individual plant genera.

## Similar Genera

- Note: Large hair-filled foveae are unique to *Andrena*.
- *Halictus* - Abdomen, segments, rim with crisp, thin, narrow bands of small, prone, white, hairs along the rim of the abdominal segments; *Andrena* species can also have hair bands, but they are usually fluffier, often missing in the middle of the segment, and not on every segment. ♂Head longer than wide, yellow in patches on legs.
- *Colletes* - Eyes strongly converge from top to the bottom of the head, giving them a heart-shaped face. Second recurrent vein curved, forming an S-shape.



Females have **facial fovea**, depressions along the inner eye margins filled with dense, short hairs.



Males have **long, pale hairs** on their face that are dense below the antennae and overhanging the clypeus rim, giving them a "**beard**". Some species also have **yellow markings** on their face.



Photo: Bill Stitt

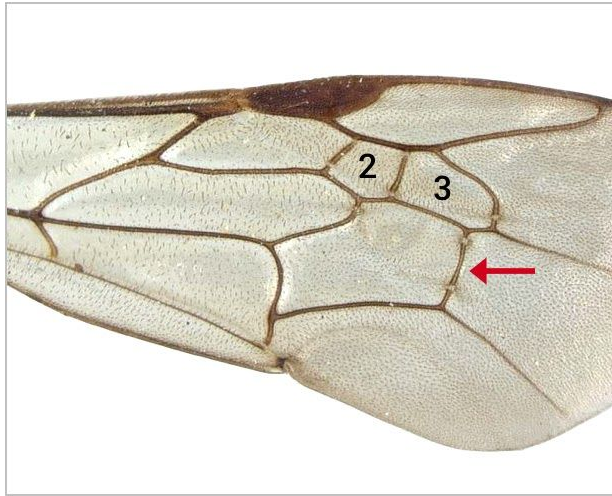
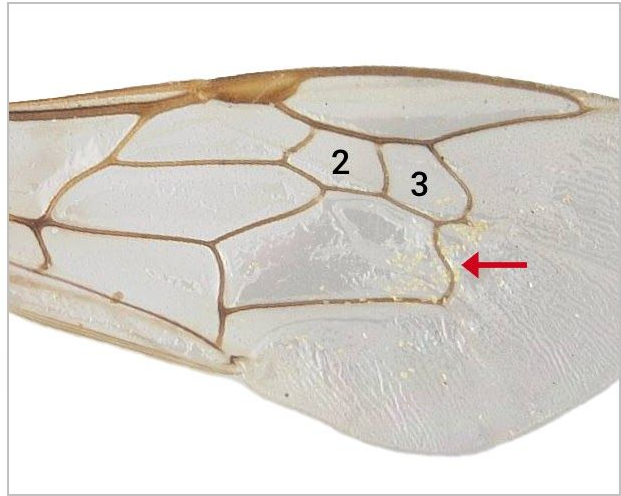


Photo: MaLisa Spring

Females carry pollen on their hind legs and the back side of their thorax. They have long hairs (floculus) on their trochanters that give them hairy "armpits."



*Andrena* and *Colletes* can often look similar, but a good way to tell them apart is by looking at their wings. *Andrena* wings have a **straight 2nd recurrent vein**, whereas it is curved and almost S-shaped in *Colletes*. *Andrena* also have a **short 2nd submarginal cell** in comparison to the 3rd. In *Colletes*, the 2nd and 3rd submarginal cells are about the same width.

***Andrena*****Compare with *Colletes***

Photos: Smithsonian Institution



*Andrena wilkella* - Female

Photo: Amy Schnebelin



*Andrena aliciae* - Male

Photo: MaLisa Spring



*Andrena asteris* - Female



*Andrena asteris* nest aggregation

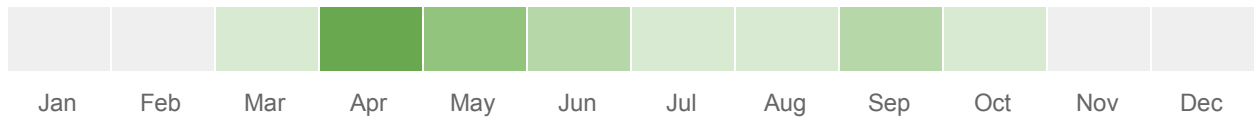


*Andrena carlini* - Female



*Andrena dunningi* - Female

### Flight Season



# Calliopsis

## Little Black Bee Group

(1 confirmed species in Ohio, 2 others possible)

Commonly found in urban and other heavily used landscapes. Attracted to the hard-packed open soil of playing fields, road edges, construction sites, lake margins, and borrow pits. Common and usually forages close to the ground, where it collects pollen and nectar from weedy legumes and vervains.



*Calliopsis andreniformis* - Female

## Field Marks

### Both Sexes

- Face, clearly wider than long, **clypeus jutting/mounded outward**, particularly noticeable in profile
- Abdomen, edge of segments (tergites) with **narrow band of pale hair**
- Eyes unusually light colored

### Female ♀

- Face, below the level of the antennae, has 3 parallel and linear white markings (looks like **3 white-stripes**); two stripes along the inside of the compound eyes and one down the center

### Male ♂

- Face (from about one-third of the way down) and **legs entirely bright fluorescent yellow**

<b>Flight Season</b>	Active from about May to October
<b>Size Relative to Honey Bee</b>	0.5X
<b>Position of Wings Feeding on Flowers</b>	Completely overlapping
<b>Location of Pollen Carrying Hairs</b>	Tibia
<b>Nest</b>	Ground, open bare soil, fond of piles of construction dirt
<b>Flowers</b>	Mostly clover, sweet clover, verbena
<b>Similar Genera</b>	<p>Markings and shape of face are unique</p> <ul style="list-style-type: none"> <li>• <i>Hylaeus</i> - Body thinner overall. ♀Face, yellow/white markings between eye and clypeus. Carries no external pollen. ♂Face, entire lower face often yellow/pale-white.</li> </ul>





*Calliopsis* females have **3 sets of parallel and linear white markings** on their face.



*Calliopsis* males have a **bright yellow face and legs**.

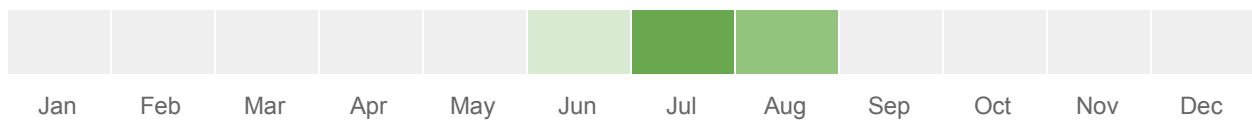


*Calliopsis andreniformis* - Female



*Calliopsis andreniformis* - Female

### Flight Season



# Panurginus

## Little Black Bee Group

(~2 species in Ohio)

Small, overlooked, and rarely detected spring species; but likely more commonly detected if people looked for nest sites and observed bees at each species' favorite food plants.



*Panurginus atramontensis* - Female

## Field Marks

### Both Sexes

- **Small size**
- Hair, largely absent
- Face, wider than long
- Wings, while often difficult to see, these species have only 2 submarginal cells
- Abdomen, **no pale hair bands**/patches or pale markings of any kind

### Female ♀

- Integument, including face, **entirely black**
- Note: face has narrow slits (foveae) above antennae parallel to compound eye, but these are difficult to see without a microscope or high-res photograph

### Male ♂

- **Clypeus bright yellow** or mostly bright yellow, remainder of bee all black, with the exception of the ends of the legs (tarsal segments) and portions of front tibia with pale markings

<b>Flight Season</b>	Spring
<b>Size Relative to Honey Bee</b>	0.5X
<b>Position of Wings Feeding on Flowers</b>	Completely overlapping
<b>Location of Pollen Carrying Hairs</b>	Hind tibia and basitarsus
<b>Nest</b>	Ground, flat, open bare soil. <i>P. potentillae</i> is known to aggregate at its nests.
<b>Flowers</b>	Forbs and low shrubs

## Similar Genera

- *Hylaeus* - ♀ Face, yellow/white markings between eye and clypeus. Carries no external pollen. ♂ Face, entire lower face often yellow/pale-white.
- *Calliopsis* - Markings quite different.
- *Pseudopanurgus* and *Perdita* - Flight periods do not overlap, both out only in the fall.
- Most of the other genera that are Small Black Bees - Have 3 submarginal cells and noticeable, though possibly restricted, patches/bands of pale hairs.



*Panurginus* females are **entirely black** and have **no abdominal hair bands**.

*Panurginus* males have a **bright yellow clypeus**.



*Panurginus potentilla* - Male

# *Perdita*

## Little Black Bee Group

(~8 species expected in Ohio)

Tiny and rare. However in the right sandy habitats, with the right native composites; particularly dune areas, sand mines, or other sparse areas of deep sand, some sand *Perdita* species might occur in high numbers. Note: *P. gerardiae*, a very rare species, is not associated with deep sand.



*Perdita octomaculata* - Female

## Field Marks

### Both Sexes

- **Tiny size**, body hairs very sparse (except for *P. bequaerti*, which is only moderately hairy)
- **Hairs never forming bands** or dense enough to be noticeable in the field
- Wings, 2 submarginal cells
- Face, usually, wider than long (one rare exception)
- Wing, **marginal cell super short** (its length along the edge of the wing is equal to or less than the length of the adjacent dark stigma) with the end clearly squared off rather than pointed

### Female ♀

- Integument black to slightly metallic blue or green, almost always with some light-colored markings on face
- Abdomen markings vary from none to stripes, often forming small blotches on the sides. **Markings tending to be white to light yellow** not bright yellow
- Clypeus, scape (large antennal segment next to head), and area to the sides of clypeus almost always with light-colored markings dissected by dark areas
- Hind legs, **pollen carrying hairs sparse and hardly noticeable** (all species except *P. bequaerti*) thus the females often appear male-like

### Male ♂

- **Face below antennae, all or primarily white to light yellow** in most species
- Face noticeably wider-than-long and squarish
- **Antennae short**, not noticeably longer than female

<b>Flight Season</b>	Late summer/fall for sandy soil species
<b>Size Relative to Honey Bee</b>	0.3 – 0.5X
<b>Position of Wings Feeding on Flowers</b>	Completely overlapping



<b>Location of Pollen Carrying Hairs</b>	Hind tibia and basitarsus
<b>Nest</b>	Ground, open bare sandy soil
<b>Flowers</b>	Nearly all are pollen specialists: <i>Monarda</i> ( <i>P. gerhardi</i> ), <i>Physalis</i> ( <i>P. halictoides</i> ), <i>Salix</i> ( <i>P. maculigera</i> ), Asteraceae, e.g. <i>Helianthus</i> (multiple species).
<b>Similar Genera</b>	<ul style="list-style-type: none"> <li>• <i>Hylaeus</i> - ♀ Has yellow/white markings on face only between eye and clypeus, carries no external pollen. ♂ Entire lower face often yellow/pale-white, but body dark black and legs with some yellow/white markings on them.</li> <li>• <i>Calliopsis</i> - Face, markings quite different, has pale hair bands on abdomen.</li> <li>• <i>Panurginus</i> - Flight periods do not overlap, spring species.</li> <li>• <i>Pseudopanurgus</i> - ♂ Clypeus bright yellow. Body black. Legs with yellow markings. Head less wide, less square. ♀ Entirely dark black.</li> <li>• Most of the Other Genera that are Small Black Bees - 3 submarginal cells. Hair, patches/bands of pale hair. ♂ Longer antennae</li> </ul>



*Perdita bequaerti* – Female



*Perdita halictoides* – Male



*Perdita halictoides* – Male



*Perdita octomaculata* - Female



*Perdita octomaculata* - Female



*Perdita octomaculata* - Female

# *Pseudopanurgus*

## Little Black Bee Group

(~14 species expected in Ohio)

Small, overlooked, and rarely detected primarily fall species.



*Pseudopanurgus labrosiformis* - Female

## Field Marks

### Both Sexes

- **Tiny size**, without noticeable body hair
- Face, wider than long
- Wings, 2 submarginal cells
- Abdomen with no noticeable pale hair bands/patches or pale markings of any kind

### Female ♀

- Body, including face, **entirely black**

### Male ♂

- **Clypeus bright yellow** or mostly bright yellow, remainder of bee all black with the exceptions a **dot of yellow on the pronotal lobe** on the thorax near the head and yellow on the ends of legs, which often extends to parts of the tibia

<b>Flight Season</b>	Fall
<b>Size Relative to Honey Bee</b>	0.5X
<b>Position of Wings Feeding on Flowers</b>	Completely overlapping
<b>Location of Pollen Carrying Hairs</b>	Hind tibia and basitarsus
<b>Nest</b>	Ground, flat, open bare soil
<b>Flowers</b>	Most species are composite specialists



## Similar Genera

- *Hylaeus* - ♀ Has yellow/white markings on face between eye and clypeus; carries no external pollen. ♂ Entire lower face often yellow/off-white.
- *Calliopsis* - Markings quite different.
- *Perdita* - Most common species are restricted to sandy locations and contain light-colored marks on the abdomen.
- *Panurginus* - Spring species, flight period does not overlap.
- Most of the other genera that are Small Black Bees - Have 3 submarginal cells and noticeable, though possibly restricted, patches/bands of pale hairs.

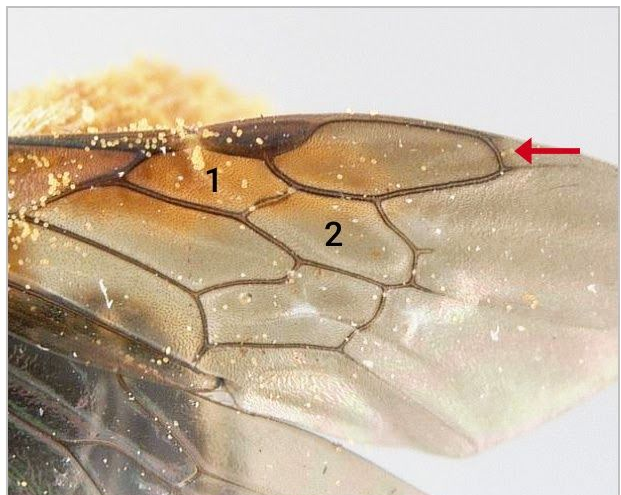


*Pseudopanurgus* females are **entirely black** and have **no abdominal hair bands**.



*Pseudopanurgus* males are black with yellow markings on their face, pronotal lobes and legs.

Photos: Katja Schulz & Smithsonian Institution



*Pseudopanurgus* wings have a truncated marginal cell and 2 submarginal cells.

Photo: Smithsonian Institution

# Apis

## Honey Bees

(1 species in Ohio - *Apis mellifera*)

A radically different bee from our native species. No close relatives inhabit the Western Hemisphere. Lifestyle unique and not mirrored by any native species. Morphology is equally unique.



*Apis mellifera* - Female

## Field Marks

### Both Sexes

- **Long hairs emerging from eyes**
- Abdomen has variable transverse bands of amber and dark brown integument and pale hair. Abdomen, amber bands primarily on the first two segments transitioning to all dark segments at tip (note, it is not uncommon to find bees with NO amber in abdomen). Abdomen, pale hair bands largely on segments 3–5, note hair bands located on base of segments not rims like most other bees
- **Wings held above back**, edges touching but rarely overlapping

### Female ♀

- **Hind legs broadened**, tibia and basitarsus flat and very wide, tibia with no hairs in the shiny central portion

### Male ♂

- Almost never seen, feeds only in hive on honey, does not visit flowers, leaves only to mate and immediately perish. Only Ohio bee where eyes meet at the top of its head.

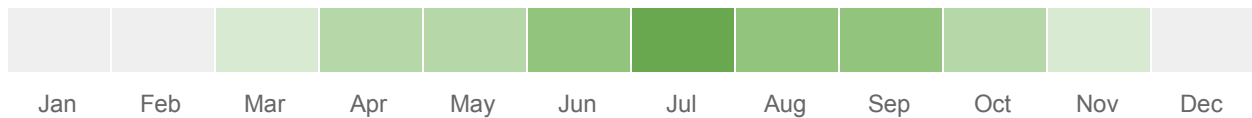
<b>Flight Season</b>	Throughout
<b>Size Relative to Honey Bee</b>	1X
<b>Position of Wings Feeding on Flowers</b>	Held parallel to one another over back, often touching but overlapping little
<b>Location of Pollen Carrying Hairs</b>	Carries pollen as a mix of pollen and nectar in a ball on the outside of hind tibia
<b>Nest</b>	Hives in hollow trees, building cavities, and hives
<b>Flowers</b>	Visits a wide variety of flowers

## Similar Genera

- *Colletes* - The Spring Group of *Colletes* are about the same size as honey bees, similarly visit blooming trees and shrubs, and are roughly the same tan/brown coloration of darker honey bees. Lacks the hairy eyes, wide bare hind tibia/basitarsus, and lap their wings over their back. Face with long hair, abdomen often with bands of pale hair on rim.
- *Peponapis* - Similar brown color, but legs are entirely hairy (lacks corbicula), wider thorax, and has more distinct hair bands on abdomen.

*Apis mellifera* - Female*Apis mellifera* - Male

## Flight Season



# Anthophora

## Digger Bee Group

(~5 species expected in Ohio)

Relatively uncommon, though can be locally abundant at some sites. The three most commonly reported species for Ohio are the Orange-tipped Wood-digger bee (*A. terminalis*), Abrupt Digger bee (*A. abrupta*), and Bumble-bee mimic Digger beer (*A. bomboides*). Both the Abrupt Digger bee and the Bumble-bee mimic bee are regularly confused with bumblebees.



*Anthophora terminalis* - Female

## Field Marks

### Both Sexes

- Robust, **bumble bee-shaped**, often seen hovering in one place in front of flowers
- Some species hair patterns match bumble bees, others with more extensive pale hairs
- Wings, clear, not darkened
- Head, **top of head, more or less flattened**

### Female ♀

- **Pollen carrying hairs of moderate length** on tibia and basitarsus. Hairs longer on the hind tibia than the basitarsus

### Male ♂

- **Extensive yellow/white/pale integument on the face**, below the level of the antennae, including areas to either side of the clypeus and adjacent to the eyes
- Most species with **pale mark on first antennal segment** (scape)
- **Antennae short**, not extending much past the base of wings if held backwards

<b>Flight Season</b>	Spring to fall, primarily summer
<b>Size Relative to Honey Bee</b>	1.5 – 2X
<b>Position of Wings Feeding on Flowers</b>	Slightly to the sides or overlapped
<b>Location of Pollen Carrying Hairs</b>	Hind tibia and basitarsus
<b>Nest</b>	Usually clay soil, often aggregating together uses upturned tree roots, cliff faces, chinking in old log cabins, under decks
<b>Flowers</b>	Nectars at a variety of flowers

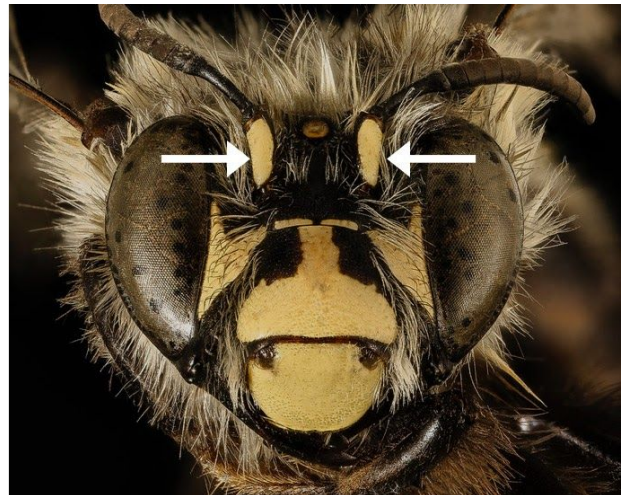


## Similar Genera

- *Bombus* - ♀Hind tibia, wide, shiny, and bare in center, often carry large, noticeable mixed masses of pollen/nectar (rare species are parasitic and look like males); does not hover. *Anthophora* never have large moist masses of pollen on their legs, pollen usually hidden between hairs and carried dry. ♂Face entirely black though may have yellow hairs.
- *Habropoda* - *A. abrupta* and *H. laboriosa* are very similar looking. *A. abrupta* is out later (late May to June) vs. mostly April to early May. ♀Mostly on blueberry (*Vaccinium* spp.) and Eastern Redbud (*Cercis canadensis*) ♂Face, white marks between clypeus and eye only a very narrow vertical line, *A. abrupta* with most of that region filled by white. Face, antenna, first antennal segment black. In *A. abrupta*, first segment of antenna with prominent white mark on outside face.
- *Ptilothrix* - Legs much longer in both sexes. Wings held across back. Overall narrower. Mostly feeds on rosemallow (*Hibiscus* spp.). Hair on thorax dense, pale and short. ♂No white on face.
- *Xylocopa* - Larger, wings smoky to dark brown, held out at 45° angle.
- Eucerini (Long-horned Bee Group) - ♀Hind tibia and basitarsus have overall longer and more copious hair; hair of two segments equally long with no apparent break between the two. ♂Clypeus yellow (rarely white); no pale markings between clypeus and eye; no pale mark on scape. Antennae long, extending well past base of wings when pulled back.

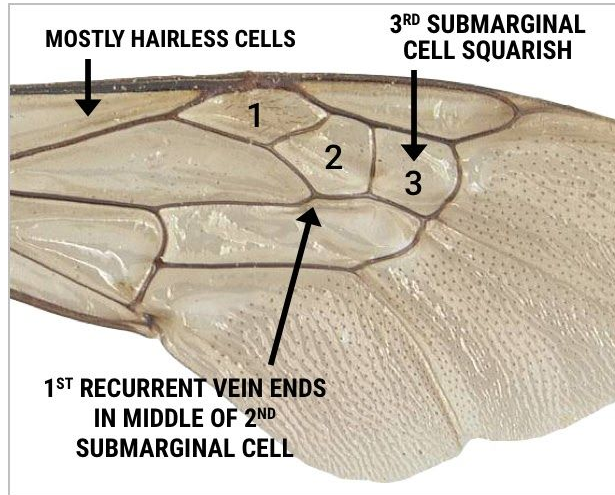


*Anthophora* are robust, hairy bees. Females have long, dense pollen carrying hairs on their hind legs. *Anthophora ursina* female pictured above.



Male *Anthophora* have extensive yellow markings on their face, and many have a yellow mark on the underside of their scape (the first antennal segment). *Anthophora ursina* male pictured above.

***Anthophora***



**Compare with *Melissodes***



In *Anthophora*, the closed cells of the forewing are mostly hairless. *Anthophora* wings also have a 3rd submarginal cell that's squarish, and the 1st recurrent vein runs into the middle of the 2nd submarginal cell. Compare this with most Eucerine genera, like *Melissodes* above.

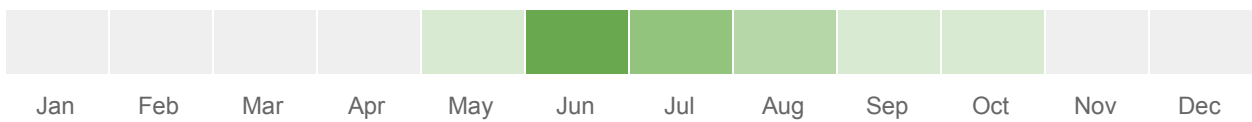


*Anthophora terminalis* - Female



*Anthophora terminalis* - Male

**Flight Season**





# Habropoda

## Digger Bee Group

(1 species expected in Ohio - *Habropoda laboriosa*)

Has not been reported in Ohio recently, though it is expected to occur here. Thought to be rare in Ohio, though nearby states boast healthy populations at sites with blueberries (*Vaccinium* spp.)



*Habropoda laboriosa* - Female

## Field Marks

### Both Sexes

- Robust, **bumble bee-like** in shape and color
- Clypeus **inflated**, from side, it is as wide as eyes
- Wings clear, not darkened
- Head, top, flattened between compound eyes
- Abdomen, long hair sparse and shiny black **integument visible**

### Female ♀

- Hind tibia and basitarsus with pollen carrying hairs of moderate length. Hairs longer on the hind tibia than the basitarsus and **jet black**
- Forages mostly on blueberry and Eastern Redbud (*Cercis canadensis*)

### Male ♂

- Antennae short, not extending much past the base of the wings if held backwards. Antennae all black
- Clypeus **bright white**. Area between clypeus and eye with white marks, but the marks hug the edge of eye and appears as an uneven, narrow, vertical line

<b>Flight Season</b>	Early spring
<b>Size Relative to Honey Bee</b>	1.5X
<b>Position of Wings Feeding on Flowers</b>	Holds parallel to abdomen with flat side facing upwards, wings do not overlap
<b>Location of Pollen Carrying Hairs</b>	Hind tibia and basitarsus
<b>Nest</b>	Ground
<b>Flowers</b>	Blueberry (primarily) and sometimes Eastern Redbud

## Similar Genera

- *Bombus* - During flight season, only queens are flying and these are much larger than *Habropoda*. ♀ Hind tibia, flattened, wide and bare in center; carry large, noticeable mixed balls of pollen/nectar (rare species are parasitic and look like males). *Habropoda* never have large moist masses of pollen on their legs, pollen often hidden between hairs and carried dry. ♂ Face entirely black though may have yellow hairs.
- *Ptilothrix* - No overlap in flight seasons.
- *Xylocopa* - Larger, wings smoky to dark brown, held out at 45° angle.
- *Anthophora* - ♂ Head, area between clypeus and eye with more extensive yellow/white/pale integument. Antennae, first antennal segment (scape), most species with pale mark on outer face. *A. abrupta* and *H. laboriosa* are very similar looking. *A. abrupta* is out later (late May to June) vs. (mostly April to early May).
- Eucerini (Long-horned Bee Group) - ♀♂ Only *Eucera* overlaps in flight season. Hind tibia and basitarsus have longer hair and hair of two segments equally long with no apparent break between the two. ♂ Clypeus pale yellow to white with no pale markings between clypeus and eye. Antennal scape with no pale mark. Antennae very long extending well past base of hind wings when pulled back.



*Habropoda* are bumble bee-like in shape and color. Females have long, black scopal hairs on their hind legs.



*Habropoda* have an inflated clypeus that's as wide as their eyes when viewed from the side.



*Habropoda laboriosa* primarily forages on *Vaccinium* spp., like the male above that's visiting blueberry flowers. Males of this species have a bright white clypeus.

Photos: Judy Gallagher

# Melecta

## Digger Bee Group

(1 species in Ohio - *Melecta pacifica*)

Rare parasitic bee that has only been reported once, but likely present in Ohio in low numbers.



*Melecta pacifica* - Female

## Field Marks

### Both Sexes

- **Humpbacked** appearance. Head appears slightly smaller than and lower on thorax
- Thorax, top with dense pale white to orangish moderately long hairs
- Head, top, sometimes with some light hairs
- Abdomen, first segment usually with light hairs present. Remainder of bee with **black** hairs and integument
- Abdomen **pointed**, tapers to end more rapidly than other species

<b>Flight Season</b>	May/June
<b>Size Relative to Honey Bee</b>	1X
<b>Position of Wings Feeding on Flowers</b>	Appears to mostly hold wings crossed on back
<b>Location of Pollen Carrying Hairs</b>	None, nest parasite
<b>Nest</b>	Nest parasite of <i>Anthophora</i>
<b>Flowers</b>	Nectars on a variety of flowers
<b>Similar Genera</b>	<ul style="list-style-type: none"> <li>• <i>Anthophora</i> and <i>Habropoda</i> - ♀♂<i>A. abrupta</i> and <i>H. laboriosa</i> very close in hair color, other species quite different. ♂Lower face with extensive yellow/white integument. ♀Hind legs with long stiff pollen carrying hairs.</li> <li>• Eucerine genera - Most come out later in the season, the few that are close in hair pattern have the same characteristics listed for <i>Anthophora/Habropoda</i> and the males have much longer antennae.</li> <li>• <i>Bombus</i> - Larger. Abdomen does not taper as greatly. Abdomen completely haired; integument usually completely obscured. Female parasitic <i>B. citrinus</i> and male <i>B. impatiens</i> are close in hair color; other <i>Bombus</i> species have at least some yellow hair on abdominal segments 2–5. ♀Hind tibia of pollen carrying species with expanded/bare outer face.</li> </ul>



*Melecta pacifica* – Female



*Melecta pacifica* – Female



*Melecta pacifica* – Female

# Bombus

## Bumble Bee Group

(~16 species in Ohio, 10 commonly seen)

Most people recognize bumble bees (our only native eusocial bee), but few realize that there are about 10 species commonly seen in Ohio. Bumble bees overwinter as mated queens; queens become active in early spring as they search for nesting sites and visit early flowers including bulbs, wildflowers and trees like maple and willow.



*Bombus impatiens* - Female

## Field Marks

### Both Sexes

- Integument completely black
- Hair, combinations of **dense yellow/off-white and black** hair completely covering thorax and abdomen. Thorax normally have extensive yellow/pale hairs, with the exception of some uncommon parasitic bumblebee species (See *Bombus citrinus*).
- Wings can be nearly black or clear

### Female ♀

- Hind leg, **tibia flattened** with outer face bare except for fringe around edges, often filled with a dense ball of pollen and nectar; rare parasitic females without this character
- **Clypeus bare** of hair and shiny

### Male ♂

- Face, **mustached**, with long hair on clypeus hanging over mandibles
- Hind legs without bare area, antennae relatively **short**, not reaching the base of wings when extended to the back

<b>Flight Season</b>	Spring to fall, populations build up in summer
<b>Size Relative to Honey Bee</b>	1 (rarely) – 2X
<b>Position of Wings Feeding on Flowers</b>	Held to side of abdomen or overlapping
<b>Location of Pollen Carrying Hairs</b>	Hind tibia (none in three rare nest parasites)



<b>Nest</b>	Colonial nester, queen overwinters, uses rodent (rarely chickadee) nest to make nest and colony of workers created over several months. Queens and males produced in late summer/fall, they nectar briefly, mate, the males die off, and the potential queens then overwinter underground.
<b>Flowers</b>	Wide variety of flowers
<b>Similar Genera</b>	<ul style="list-style-type: none"> <li>• <i>Ptilothrix</i> - Hair pattern similar. Legs much longer/thinner. Wings held across back. Body overall narrower. Forages mostly on rosemallow (<i>Hibiscus</i> spp.). Face rounder. Head, top, particularly round. Abdomen almost completely black; may have noticeable yellowish/pale hairs on first abdominal segment. ♀ Without bare, expanded hind tibia.</li> <li>• <i>Xylocopa</i> - All are the size of a queen bumble bee. Wings darkened and held out at 45° angle. Hair on abdomen dark except for pale hairs on first abdominal segment. Abdomen hairs thin compared to <i>Bombus</i>; slightly metallic integument almost always visible beneath sparse hairs.</li> <li>• <i>Anthophora</i> and <i>Habropoda</i> - Uncommon, restricted to certain plants. Compare wing venation and shape of head.</li> <li>• Eucerini (Long-horned Bee Group) - ♀ Hind legs with very long dense hair and no bare patches. Hair patterns variable, but abdomen usually with narrow bands of white hair; yellowish, reddish, or brown, hairs often present; no species that closely mimics any of the bumble bees. ♂ Always with at least some pale integument below antennae. Long antennae extends past base of wings.</li> </ul>



Females carry pollen, which is moistened with nectar, in a **corbicula** - a flattened, bare area on the hind tibiae with fringes of hair on the edges.



Males have **yellow hair on their face**. Males of a few species have very large eyes, like *Bombus griseocollis* above.



*Bombus impatiens* - Female



*Bombus impatiens* - Male



*Bombus griseocollis* - Female



*Bombus griseocollis* - Male



*Bombus bimaculatus* - Male

Photo: Amy Schnebelin



*Bombus fervidus* - Male & Female

Photo: MaLisa Spring



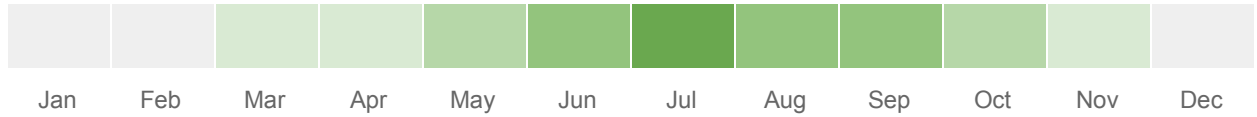


*Bombus vagans* - Female  
Photo: Amy Schnebelin



*Bombus auricomus* - Female  
Photo: Bill Stitt

### Flight Season



# Cemolobus

## Squash Bee Group

(1 species in Ohio - *Cemolobus ipomoeae*)

Very rare large bee specialist on morning glory flowers (*Ipomoea* spp). Flies only at dawn and perhaps at dusk and unlikely to ever be seen away from the blooms of this plant.



*Cemolobus ipomoeae* - Male

## Field Marks

### Both Sexes

- Clypeus, **rim, shape distinct** to this species; rim with wide central rectangular projecting lobe and one large triangular tooth to either side
- Abdomen with broad frosted bands of short silvery/white hairs transecting the segments with some brown/tan hairs towards the basal segments; black integument visible between the bands
- Restricted to foraging early in the **morning/evening** on native species of Morning Glory, but be aware that *Peponapis* and *Bombus* also forage on these plants at those times

### Female ♀

- Hind tibia, pollen carrying hairs, **dark** and relatively sparse and short compared to similar genera

### Male ♂

- Antennae relatively short, not extending to base of wings when swept backwards. Clypeus, yellow restricted to **lower half**

<b>Flight Season</b>	Summer
<b>Size Relative to Honey Bee</b>	1.5X
<b>Position of Wings Feeding on Flowers</b>	Probably held across back
<b>Location of Pollen Carrying Hairs</b>	Hind tibia and basitarsus
<b>Nest</b>	Likely in the ground
<b>Flowers</b>	Native <i>Ipomoea</i>

## Similar Genera

- *Peponapis* - Common, slightly smaller, but very similar in general coloration and aspect, also out early in the morning, but mostly on squash/pumpkin, but does visit Man-of-the-Earth too. Clypeus, rim, normal, straight no lobes/teeth. ♀Hind leg pollen hairs orange/tan. ♂Clypeus, yellow restricted to a central, smudgy roughly circular area.
- *Xenoglossa* - Rare, only a few records. Looks similar to *Peponapis*. Visits squash relatives. Has noticeable yellow marks on the base of the mandible. ♂Clypeus, all yellow except for a short section of black near the top of the segment.



*Cemolobus ipomoeae* have broad bands of short silvery hair on their abdominal tergum.



*Cemolobus ipomoeae* have a distinctively-shaped clypeal rim that has three lobes.



# Peponapis

## Squash Bee Group

(1 species in Ohio - *Peponapis pruinosa*)

Common wherever pumpkins and squash (*Cucurbita* spp.) grow. Flies when the sky first lightens until the squash flowers close mid-morning. Note that some consider *Peponapis* to now be a subgenus of *Eucera*.



MaLisa Spring

Female *P. pruinosa* in a *Cucurbita* flower

## Field Marks

### Both Sexes

- Flies only early in the **morning** when squash/pumpkins are blooming. Males and females zip quickly from blossom to blossom.
- **Clypeus projects** outward; from the side, its height is approximately equal to the width of the eye
- Thorax, top, hairs usually slightly **dark orange**

### Female ♀

- Hind leg pollen hairs orange/tan, long, but a bit **sparser** than other Eucerines

### Male ♂

- Clypeus, **yellow restricted** to a central, smudgy roughly circular area

<b>Flight Season</b>	Summer
<b>Size Relative to Honey Bee</b>	1–1.2X
<b>Position of Wings Feeding on Flowers</b>	Crossed over back
<b>Location of Pollen Carrying Hairs</b>	Hind tibia and basitarsus
<b>Nest</b>	Ground
<b>Flowers</b>	Planted squash and pumpkins

## Similar Genera

- *Apis* - Superficially looks similar and does occur in squash/pumpkin plants. Long hairs coming out of eyes. ♀Hind tibia, widened with bare central area.
- *Xenoglossa* - Rare, only a few records. Also visits squash relatives. Mandible with noticeable yellow marks on the base. ♀ usually with a smudge of yellow on end of clypeus. ♂Mandible, base with more extensive yellow than female. Clypeus, yellow with short section of the upper part black.
- *Cemolobus* - Clypeus, rim distinct to this species, with a wide central rectangular projecting lobe, and two more triangular teeth to either side. Restricted to foraging early in the morning on native Morning Glories (*Ipomoea spp.*). ♀Hind tibia, pollen carrying hairs dark and relatively sparse and short compared to similar genera. ♂Antennae relatively short not extending to base of wings when swept backwards. Clypeus, yellow restricted to lower half.

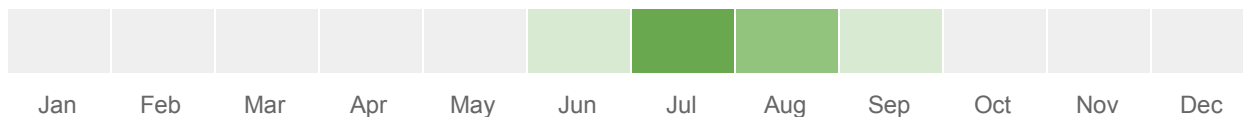


*Peponapis* females have **long, sparse scopal hairs** on their hind legs. They also have **black mandibles** and a **black clypeus**, in contrast to similar-looking *Xenoglossa* females, which have black mandibles with a yellow base and a black clypeus with a yellow lower margin.



*Peponapis* males have **black mandibles** and a **yellow spot** on their clypeus. Contrast this with similar-looking *Xenoglossa* males, which have black mandibles with a yellow base and a yellow clypeus with a black upper margin.

## Flight Season



# *Xenoglossa*

## Squash Bee Group

(1 species in Ohio - *Xenoglossa strenua*)

Rare, only a handful of records. Like the common *Peponapis pruinosa* this species only visits agricultural squash and pumpkins (*Cucurbita* spp.).



*Xenoglossa strenua* - Female

## Field Marks

### Both Sexes

- Flies only **early in the morning** when squash/pumpkins are blooming
- Mandibles, have noticeable bright **yellow marks at the base**
- Clypeus **projects outward** and when viewing from the side, the clypeus height is approximately equal to the width of the eye
- Thorax, top, hairs usually slightly **dark orange**

### Female ♀

- Hind leg pollen hairs orange/tan, long, but a bit **sparser** than most Eucerines
- Usually with a **smudge of yellow** on end of clypeus

### Male ♂

- Has more extensive yellow on mandible than female
- Clypeus, yellow, with a short section of the **upper part of the clypeus black**

<b>Flight Season</b>	Summer
<b>Size Relative to Honey Bee</b>	1 – 1.2X
<b>Position of Wings Feeding on Flowers</b>	Crossed over back
<b>Location of Pollen Carrying Hairs</b>	Hind tibia and basitarsus
<b>Nest</b>	Ground
<b>Flowers</b>	Planted squash and pumpkins

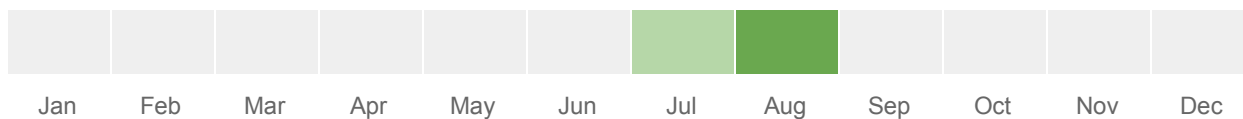
## Similar Genera

- *Peponapis* - Super similar, but much more common. Mandibles all black in both sexes. ♂Clypeus, yellow restricted to a central, smudgy roughly circular area.
- *Apis* - Superficially looks similar and does forage on squash/pumpkin plants. Hairy eyes. ♀Hind tibia, widened with bare central area.
- *Cemolobus* - Equally rare, rim of clypeus distinct to this species, with a wide central rectangular projecting lobe and two triangular teeth to either side. Restricted to foraging early in the morning on native Morning Glories (*Ipomoea spp.*). ♀Hind tibia, pollen carrying hairs dark, sparser and short. ♂Antennae relatively short not extending to base of wings when swept backwards. Clypeus, yellow restricted to lower half.



*Xenoglossa strenua* looks similar to the other squash bee in Ohio, *Peponapis pruinosa*. One way to tell the two apart is by looking at the base of the mandibles. *Xenoglossa strenua* **mandibles have yellow at the base**, while *Peponapis* mandibles are all black. The yellow is dull in the female specimen pictured above, but it's noticeably not black.

## Flight Season





# *Xylocopa*

## Large Carpenter Bee

(1 species in Ohio - *Xylocopa virginica*)

Familiar to many people for their habit of nesting in the soft woods of houses, benches, decks, and outbuildings, but often confused with bumble bees.



*Xylocopa virginica* - Female

### Field Marks

#### Both Sexes

- Uniformly large, bumble bee-like
- Face with only dark hairs
- Thorax covered in dense off-white hairs
- Abdomen, first segment with narrow fringe of pale hairs at the base, rest with sparse, short dark hairs
- Abdomen shiny because dark hairs are generally sparse enough that glossy, weakly bluish, integument shows beneath
- Face round, equally wide or wider than length
- Unique, but difficult to see in the field, the marginal cell is 7X long as wide
- Wings dark, but not opaque

#### Female ♀

- Face, between the antennae, has a small, but sometimes noticeable, projecting semicircular mound like the edge of a buried Frisbee

#### Male ♂

- Face, below antennae almost entirely creamy white
- Eyes large compared to those of female and most bee species, nearly meeting together at top of head

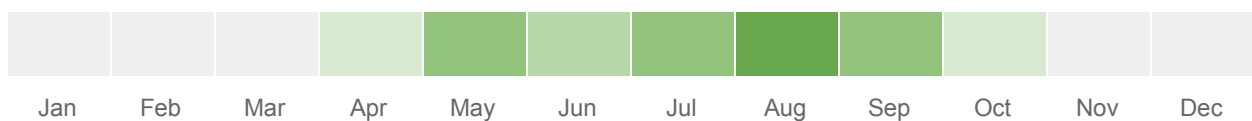
<b>Flight Season</b>	Throughout
<b>Size Relative to Honey Bee</b>	1.5X
<b>Position of Wings Feeding on Flowers</b>	Held at 45° to body
<b>Location of Pollen Carrying Hairs</b>	Hind femur, tibia, basitarsus
<b>Nest</b>	Excavates short tunnels in soft wood, often in man-made structures
<b>Flowers</b>	Uses a variety of large, tall forbs and woody plants

## Similar Genera

- *Bombus* - Holds wings to its sides or across its back. Abdomen, hairs, except in old individuals, dense, hiding surface; many species have extensive yellow/pale hair beyond the first segments. Face long, longer than wide. Workers smaller than *Xylocopa*. ♀ Hind tibia, wide and bare in center, carry large, noticeable mixed masses of pollen/nectar (rare species are parasitic and look like males), *Xylocopa* never have large masses of pollen on their legs, pollen usually hidden among hairs. ♂ Face entirely black though may have yellow hairs. *B. griseocollis*/*B. auricomus* has round face/ large eyes similar to *Xylocopa* but no white on face.
- *Ptilothrix* - Legs much longer. Wings held across back. Overall narrower. Feeds mostly on rosemallow (*Hibiscus* spp.). Hair on thorax lacks central bare spot of *Xylocopa*. ♂ No white on face.
- *Anthophora* - Smaller. Uncommon. Abdomen often with extensive pale hair. Wings held folded over back. ♀ Head, top, flattened, evenly rounded in *Xylocopa*. ♂ Eyes not larger than females and do not nearly meet at top of head. Abdomen, pale hairs more extensive.
- Some *Andrena* - generally smaller and thinner. Most of the confusing species are found in the early spring. Compare wing color and venation.

*Xylocopa virginica* – Female*Xylocopa virginica* – Male*Xylocopa virginica* – Female*Xylocopa virginica* – Female*Xylocopa virginica* – Female

## Flight Season



# Ceratina

## Small Carpenter Bee

(~4 species in Ohio)

These are very small bees, only half the size of a honey bee. They are far more abundant than *Xylocopa* carpenter bees; but unlike the huge *Xylocopa*, they cannot chew into wood and do not inhabit wooden structures, although they do inhabit pithy stems.

Consequently, they are much less visible to the average person, but if you look closely, you will find them on many flowers.



*Ceratina dupla* - Female

## Field Marks

### Both Sexes

- Dull **metallic blue or greenish-blue** with pale marks on the clypeus (rarely absent in female *C. calcarata*)
- No hairs on body obvious to the naked eye and abdomen with no pale markings or hair bands
- Abdomen, parallel and **ridged** like a water bottle; abdomen comes to a tiny **projecting point** or flange.
- In living specimens, a yellow “neck” (gap between head and thorax) is often visible

### Female ♀

- Clypeus with longitudinal **white stripe** or dot (rarely absent)
- Hind legs, sparse pollen hairs
- Abdomen end comes to a blunt end and contains a short obtuse spike/projection

### Male ♂

- Clypeus with inverted white **T-shaped mark** covering rim with stem of “T” running up the center
- Abdomen comes to a blunt end with a wide to narrow projecting flange/plate at the very end

<b>Flight Season</b>	Throughout
<b>Size Relative to Honey Bee</b>	0.5X
<b>Position of Wings Feeding on Flowers</b>	Held over the back
<b>Location of Pollen Carrying Hairs</b>	Hind tibia primarily
<b>Nest</b>	Pith of cut/browsed stems of shrubs, brambles, and forbs
<b>Flowers</b>	Nectars on a variety of flowers
<b>Similar Genera</b>	<ul style="list-style-type: none"> <li>• <i>Lasioglossum</i> - Most often confused with the <i>Dialictus</i> subgenus. Tend to be duller metallic color, have curved basal vein, “neck” not yellow in living specimens.</li> </ul>



*Ceratina mikmaqi* – Female



*Ceratina mikmaqi* – Female

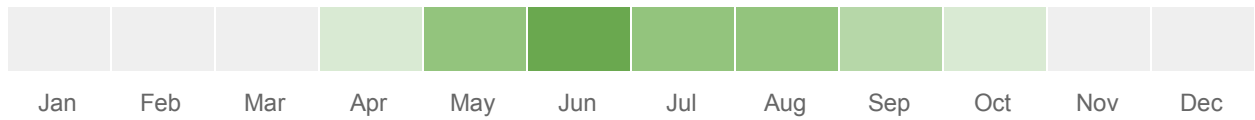


*Ceratina mikmaqi* – Female



*Ceratina strenua* – Female

### Flight Season





# *Triepeolus*

## Variegated Cuckoo Bee Group

(~16 species expected in Ohio)

Nest parasite of primarily Eucerine bees. Densely arrayed in short flattened and prone hairs creating bold patterns of black and white bands and islands.



*Triepeolus lunatus* - Female

## Field Marks

### Both Sexes

- Lacks long hair
- Integument black except the legs are often red or reddish, rarely with red on antennae, head, and thorax
- Visible **hair all short**, flattened, and prone
- Abdomen with **striking bands** of black and white hairs, particularly noticeable on first abdominal segment
- Thorax, upper surface, sides of rear edge with two small **triangular projections** (axillae)
- Thorax, upper side, pattern of hair often, but not always, appears like the classic “smiley face”

### Female ♀

- Hind legs with same short hair length as other legs

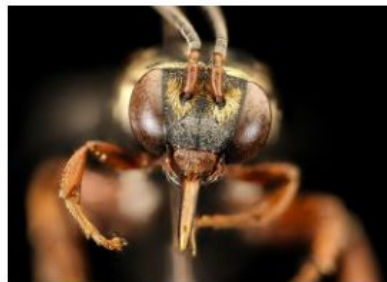
### Male ♂

- With small, narrow, parallel-sided, bare plate (pygidial plate) with a rounded end at the very tip of its abdomen, often difficult to see in the field

<b>Flight Season</b>	Summer and fall
<b>Size Relative to Honey Bee</b>	0.5 – 0.75X
<b>Position of Wings Feeding on Flowers</b>	Most of the time up and out at about 45° to the body
<b>Location of Pollen Carrying Hairs</b>	None, nest parasite
<b>Nest</b>	Nest parasite of Eucerines
<b>Flowers</b>	Nectars at a variety of flowers

## Similar Genera

- *Epeolus* - On average, smaller, but lots of overlap between the two genera and almost impossible to tell apart in the field. However, within the two groups, a few have species-specific unique characters that can be used for identification. Thorax, upper side, can also have a “smiley face.”

*Triepeolus concavus**Triepeolus concavus**Triepeolus concavus**Triepeolus distinctus**Triepeolus distinctus**Triepeolus donates* – Female*Triepeolus donates**Triepeolus lunatus**Triepeolus lunatus*



*Triepeolus lunatus*

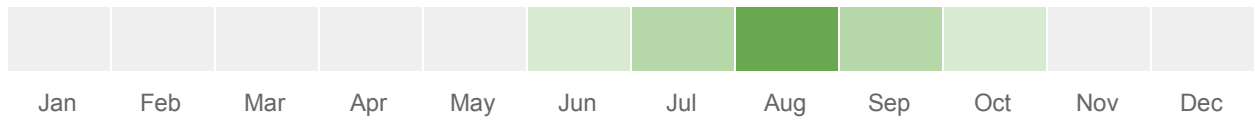


*Triepeolus lunatus* – Female



*Triepeolus pectoralis* – Female

### Flight Season



# *Epeolus*

## Variegated Cuckoo Bee Group

(~9 species expected in Ohio)

Uncommon nest parasite of summer and fall *Colletes* bees. Generally smallish and densely arrayed in short flattened and prone hairs creating bold patterns of black and white bands and islands.



*Epeolus autumnalis* - Male

### Field Marks

#### Both Sexes

- Lacks long hair
- Integument black except legs often red or reddish, rarely with red on base of antennae, head, and thorax (Most noticeable in *E. bifasciatus*)
- **All visible hair short**, flattened, and prone
- Abdomen with **striking bands** of black and white hairs, particularly noticeable on first abdominal segment
- Thorax, upper surface, sides of rear edge with two small **triangular projections** (axillae)
- Thorax, upper side, pattern of hair often, but not always appears like the classic “smiley face”

#### Female ♀

- Hind legs with same short hair length as other legs

#### Male ♂

- With small, narrow, parallel-sided, bare plate (pygidial plate) with a rounded end at the very tip of its abdomen

<b>Flight Season</b>	Summer and fall
<b>Size Relative to Honey Bee</b>	0.5 – 0.75X
<b>Position of Wings Feeding on Flowers</b>	Most of the time up and out at about 45° to the body; appearing narrow-winged as hind and fore wings overlap, sometimes closes wings across back if staying in one place for a time.
<b>Location of Pollen Carrying Hairs</b>	None, nest parasite
<b>Nest</b>	Nest parasite of <i>Colletes</i>
<b>Flowers</b>	Nectars at a variety of flowers

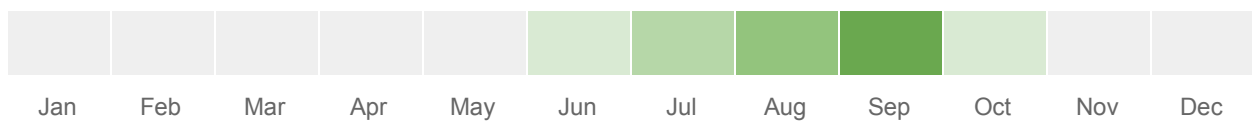


## Similar Genera

- *Triepeolus* - On average, larger, more common, but lots of overlap between the two genera and almost impossible to tell apart in the field. However, within the two groups a few have species-specific unique characters that can be used for separation.

*Epeolus bifasciatus**Epeolus bifasciatus**Epeolus lectoides**Epeolus lectoides**Epeolus lectoides**Epeolus scutellaris*

## Flight Season



# *Epeoloides*

## Oil Cuckoo Bee Group

(1 species expected in Ohio - *Epeoloides pilosulus*)

This is an extremely rare nest parasite of *Macropis*! Possibly extirpated, as our population of *Macropis* is disjunct and difficult to find. If you know of a site with a viable population of native Loosestrifes and *Macropis*, keep an eye out for this rare bee.



*Epeoloides pilosulus* - Male

## Field Marks

### Both Sexes

- **Humpbacked** appearance; top of thorax is unusually raised above level of head
- Sparse hair
- Shiny black-brown integument
- Long legs
- Abdomen end more **pointed** (rather than blunt) than most other genera
- Head, top, clearly and evenly **rounded**

### Female ♀

- Hind legs, hair as sparse as other legs

### Male ♂

- Middle and hind legs, femur, unusually **expanded/wide**
- Eyes, distance between inner edges **narrows** towards top of head

<b>Flight Season</b>	Summer
<b>Size Relative to Honey Bee</b>	0.66X
<b>Position of Wings Feeding on Flowers</b>	Unknown
<b>Location of Pollen Carrying Hairs</b>	None, nest parasite
<b>Nest</b>	Nest parasite of <i>Macropis</i>
<b>Flowers</b>	Nectars on a variety of flowers
<b>Similar Genera</b>	None



*Epeoloides pilosulus* – Male



*Epeoloides pilosulus* – Male



*Epeoloides pilosulus* – Male

# *Eucera*

## Long-Horned Bee Group

(~5 species expected in Ohio)

Large, regularly occurring, but uncommon spring bees. Usually found in higher quality field/meadow environments.



*Eucera dubitata* - Female

### Field Marks

#### Both Sexes

- Clypeus **protruding** like a great mound from the face, viewed from side it protrudes the same distance as the width of the eye
- Moderate sized, flat, bare, triangular or oblong plate (pygidial plate) on the very last abdominal segment (often hard to see or retracted)

#### Female ♀

- Hind legs with **long, bushy** pollen carrying hairs

#### Male ♂

- Clypeus **entirely yellow/off-white**
- Antennae **extremely long**, arcing well past the base of the wings
- Flight, **very fast**, zipping blurrily between flowers, looking for females, where they hesitate slightly before going to the next flower

<b>Flight Season</b>	Spring through June
<b>Size Relative to Honey Bee</b>	1 – 1.5X
<b>Position of Wings Feeding on Flowers</b>	Along sides or crossed on back
<b>Location of Pollen Carrying Hairs</b>	Hind tibia and basitarsus
<b>Nest</b>	Ground nester
<b>Flowers</b>	Nectars from a variety of flowers



## Similar Genera

- *Habropoda* and *Anthophora* - Clypeus also protruding. ♀ Chubbier, more *Bombus*-like. Hind legs, hair on basitarsus clearly shorter than on tibia. ♂ Face, area between clypeus and eye with at least some white/yellow integument (all black in *Eucera*).
- Other Eucerini (Long-horned Bee Group) - Clypeus flatter and/or out later in the year, with minor overlap with other long-horned bees in the month of June.

*Eucera dubitata* – Male*Eucera dubitata* – Male*Eucera dubitata* – Male*Eucera dubitata* – Female*Eucera dubitata* – Female*Eucera dubitata* – Female*Eucera dubitata* – Female*Eucera rosae* – Female*Eucera rosae* – Female

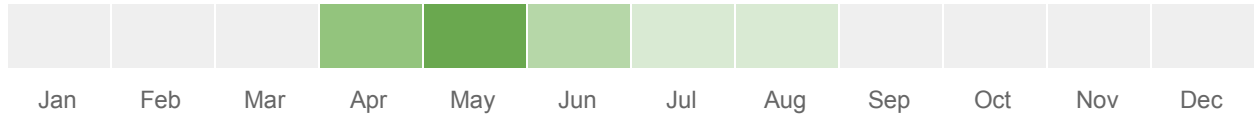


*Eucera rosae* – Female



*Eucera rosae* – Female

### Flight Season



# Florilegus

## Long-Horned Bee Group

(1 species in Ohio - *Florilegus condignus*)

An uncommon bee overall, but where it occurs in pickerelweed (*Pontederia cordata*) beds (its sole source of pollen for its babies).



*Florilegus condignus* - Female

### Field Marks

#### Both Sexes

- Almost exclusively found on **pickerelweed**
- Abdominal hair pattern distinctive
- Abdomen with thin bands of bright white hair on the base of the 2nd and 3rd segments; 4th and 5th segments with **large patches/bands of white hair** separated in the middle by black hairs or no hairs

#### Female ♀

- Hind leg hairs off-white

#### Male ♂

- Clypeus **all yellow**
- Antennae **long** and when pulled back surpass the base of the wings
- Males extremely fast flying and usually only seen as a blur until they hesitate at a Pickerelweed blossom for the tiniest moment. Females are more deliberate as they forage for pollen and nectar.

<b>Flight Season</b>	Summer
<b>Size Relative to Honey Bee</b>	1X
<b>Position of Wings Feeding on Flowers</b>	Unknown but probably on sides or crossed on back
<b>Location of Pollen Carrying Hairs</b>	Hind tarsus and basitarsus, hair not quite as long as other Eucerines
<b>Nest</b>	Ground nester
<b>Flowers</b>	Nectars from a variety of flowers

**Similar Genera**

No other genus has the distinct abdominal hair pattern with broad white hair bands on the 4th and 5th segment separated by black, this can be seen from quite a distance. Be aware that several *Melissodes* species visit pickerelweed and will behave similarly, but don't have the unique hair pattern on the abdomen.



*Florilegus condignus* – Male



*Florilegus condignus* – Male



*Florilegus condignus* – Male



*Florilegus condignus* – Female



*Florilegus condignus* – Female



# Melissodes

## Long-Horned Bee Group

(~20 species expected in Ohio)

Common in the summer, particularly on tall groups of composites, where they move blindingly quickly among the flowers, particularly the males.



*Melissodes denticulatus* - Male

## Field Marks

### Both Sexes

- Light colored hairs on head and thorax (all black on *M. bimaculatus*)
- Abdomen, most species with thin, **transverse bands of white hairs**, often set back from the rim
- Tibia, hairs (at least outward facing side), tan to white

### Male ♂

- Clypeus **all yellow**
- **Antennae long** and when pulled back surpass the base of the wings and extend to rear of thorax
- Males extremely **fast** flying and usually only seen as a blur until they hesitate at a blossom for the tiniest moment but more easily found late in the afternoon and early evening when they are stationary on the flowers for the night. Females also fast but spend more time foraging on flowers for pollen

<b>Flight Season</b>	Summer and fall
<b>Size Relative to Honey Bee</b>	1 – 1.5X
<b>Position of Wings Feeding on Flowers</b>	Crossed on back
<b>Location of Pollen Carrying Hairs</b>	Hind tarsus and basitarsus
<b>Nest</b>	Ground
<b>Flowers</b>	Almost entirely composites with specialists on sunflower ( <i>Helianthus</i> spp.), thistle ( <i>Cirsium</i> spp.), ironweed ( <i>Vernonia</i> spp.) and one rare pickerelweed ( <i>Pontederia cordata</i> ) specialist ( <i>M. apicatus</i> )

## Similar Genera

- *Eucera* - Has a primarily spring flight season with some overlap in June. Clypeus, strongly projecting, viewed from side clypeus is as tall, or taller, than the eye is wide, only moderately so in *Melissodes*.
- *Florilegus* - Abdomen, with broad white hair bands on the 4th and 5th segment separated by black, this pattern can be seen from quite a distance.
- *Svastra* - Larger (approaching carpenter bees in size, most *Melissodes* approach honey bees in size), comparatively flatter clypeus, less common. ♀ One species has all black hairs on hind tibia (*S. atripes*), one species with extensive black hair on body (*S. obliqua*) with hind tibia hairs orange to burnt orange and basitarsus hairs black to brown, remaining species (*S. compta*), rare, likely to only be seen on evening primrose (*Oenothera* spp.) early in the morning or in the evening but otherwise indistinguishable other than by size. ♂ Antennae not quite as long, reaching to only about the base of the wings.
- Other Eucerines (Squash Bee Group) - On the larger end of the range of *Melissodes* species. All are specialists, restrict their foraging almost entirely to squash (*Cucurbita* spp.) or morning-glories (*Ipomoea* spp.), and forage only very early morning, males with restricted yellow on clypeus and antennae that only reach wing bases.

*Melissodes* sp. - Female

Photo: Amy Schnebelin

*Melissodes bimaculatus* - Female

Photo: MaLisa Spring



*Melissodes* sp. - Male

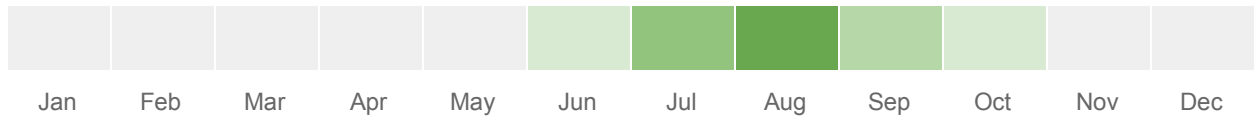
Photo: Amy Schnebelin



*Melissodes druriellus* - Male

Photo: MaLisa Spring

### Flight Season



# Svastra

## Long-Horned Bee Group

(~4 species expected in Ohio)

A late summer group of bees associated with high quality natural meadows with diverse native flowering plants, planted or wild.



*Svastra atripes* - Female

## Field Marks

### Both Sexes

- Large, approaching carpenter bees in size, comparatively flatter clypeus and less common than other Eucerines

### Female ♀

- One species with all black hairs on hind tibia (*S. atripes*), the most common species has extensive black hair on body (*S. obliqua*) with hind tibia hairs orange to burnt orange and hind basitarsus hairs at least partially black to brown. Another species (*S. compta*), rare, likely to only be seen on evening primrose (*Oenothera* spp.) early in the morning or in the evening but otherwise indistinguishable with the naked eye from *Melissodes* other than by size.

### Male ♂

- Antennae not quite as long as other Eucerines, reaching to only about the base of the hind wings perhaps a bit more

<b>Flight Season</b>	Summer and fall
<b>Size Relative to Honey Bee</b>	1.5X
<b>Position of Wings Feeding on Flowers</b>	Crossed on back
<b>Location of Pollen Carrying Hairs</b>	Hind tarsus and basitarsus
<b>Nest</b>	Ground, may aggregate nests in one location
<b>Flowers</b>	Composites and <i>S. compta</i> is an evening primrose ( <i>Oenothera</i> spp.) specialist



## Similar Genera

- *Melissodes* - Smaller, +/- Honey Bee size. Clypeus more protruding. Abdomen, most species with thin, transverse bands of white hairs. Hairs on tibia (at least outward-facing side) tan to white. ♂ Antennae long and when pulled back surpass the base of the wings and extend to rear of thorax.
- *Eucera* - Spring flight season, not overlapping.
- *Florilegus* - Abdomen, with distinct broad white hair bands on the 4th and 5th segment separated by black, this pattern can be seen from quite a distance. Primarily found on Pickerelweed (*Pontederia cordata*).
- Squash Bee Group - Smaller. All are specialists, restrict their foraging almost entirely to squash (*Cucurbita* spp.) or morning-glories (*Ipomoea* spp.), and forage only very early morning. ♂ Clypeus with restricted yellow and antennae that also only reach wing bases.

*Svastra atripes* – Female*Svastra atripes* – Female*Svastra atripes* – Female*Svastra atripes* – Female*Svastra obliqua* – Male*Svastra obliqua*



*Svastra obliqua* – Female



*Svastra obliqua* – Female

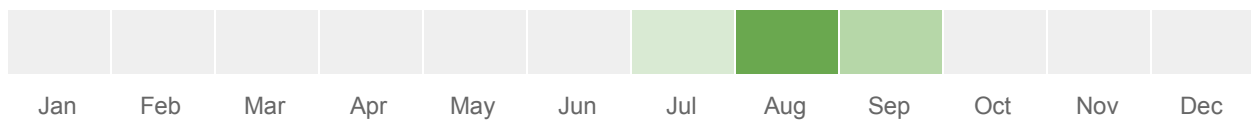


*Svastra obliqua* – Male



*Svastra obliqua* – Female

### Flight Season



# Nomada

## Colorful Cuckoo Bee Group

(~40 species expected in Ohio)

Common in the spring, these waspish bees, usually arrayed in yellow and red, are often found flying low over the ground looking for bee nests to lay their eggs in. Mostly parasitize *Andrena*, though some rarer fall species parasitize some *Agapostemon*.



*Nomada maculata* - Male

## Field Marks

### Both Sexes

- **Wasp-like.** Hair present but **sparse**, white, and often overlooked
- Abdomen **color very variable**, but integument base color either red or black, a few females are entirely red (including head/thorax) with no yellow/black markings whatsoever, but most species have extensive yellow stripes/dots on the abdomen and very commonly on the face/thorax
- Wings for most species with a dusky, partially **opaque band** bordering the tips
- Abdomen held rigidly straight back or tilted slightly upward
- Abdomen long, strongly tapered towards tip; look very similar to crabronid wasps
- Thorax, viewed from side, rear face with a **slope angle** approximately 45° to the surface of thorax, other genera closer to 90°
- Late season species have red restricted primarily to legs, black integument elsewhere with yellow markings. Holds their **wings out** and up when resting.
- Spring species are more variable in color, many females have a basal red-colored integument, with yellow markings, but others, particularly the larger ones are extensively yellow with a black background

### Female ♀

- Abdomen with a short silver/white latitudinal **hair patch** at the end of last visible segment

### Male ♂

- Abdomen with a usually prominent (sometimes retracted) **thin plate** (pygidial plate) at the end, with end of plate notched or rounded over

<b>Flight Season</b>	Throughout
<b>Size Relative to Honey Bee</b>	0.5 – 1X
<b>Position of Wings Feeding on Flowers</b>	Spring species almost always cross wings over their back. Late season species (uncommonly found) primarily hold their wings up and out at a 45° angle.
<b>Location of Pollen Carrying Hairs</b>	None, nest parasite

<b>Nest</b>	Nest parasite on <i>Andrena</i> and <i>Agapostemon</i> , and rarely, <i>Eucera</i>
<b>Flowers</b>	Nectars on a variety of flowers
<b>Similar Genera</b>	No other genera/species in our area have similar patterns of colors and form

*Nomada affabilis* – Male*Nomada annulata* – Male*Nomada annulata* – Male*Nomada australis* – Female*Nomada australis* – Male*Nomada bidentate* group*Nomada denticulata* – Male*Nomada luteola* – Male*Nomada maculata* – Male





*Nomada rubicunda* – Female

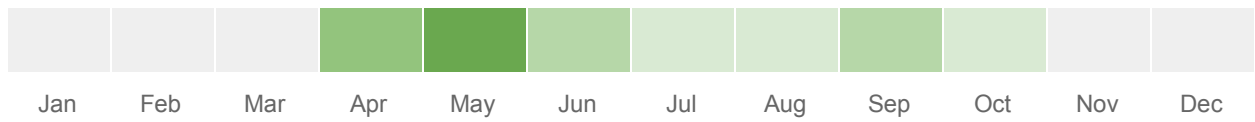


*Nomada superba* – Male



*Nomada tiftonensis* – Female

### Flight Season



# *Holcopasites*

## Colorful Cuckoo Bee Group

(~2 species expected in Ohio)

An uncommon, tiny wasp-like nest parasite of *Calliopsis*.



*Holcopasites calliopsidis* - Male

## Field Marks

### Both Sexes

- **Very tiny**
- Antennae **short** and set low on the face
- **Wasp-like**, seemingly hairless (similar to crabronid wasps)
- Integument color a **unique combination** of black on the head and thorax with the abdomen bright red with central black bands on the segments with dots or short lines of bright white, prone, short, hairs.
- The only species most people will detect is *H. calliopsidis* which has a very obvious paired set of **white dots** composed of flattened hairs marking each abdominal segment. Unique in **holding its wings under its abdomen** at rest. Sometimes found resting parallel on a blade of grass with mandibles grasping the blade.

<b>Flight Season</b>	Summer to fall
<b>Size Relative to Honey Bee</b>	0.3X
<b>Position of Wings Feeding on Flowers</b>	Unique...tuck their wings UNDER their abdomen to the inside of their hind legs. May at times hold them tight to the sides rather than completely under.
<b>Location of Pollen Carrying Hairs</b>	None, nest parasite
<b>Nest</b>	Nest cleptoparasite of <i>Calliopsis</i>
<b>Flowers</b>	Nectars on a variety of flowers
<b>Similar Genera</b>	None



*Holcopasites calliopsidis* – Male

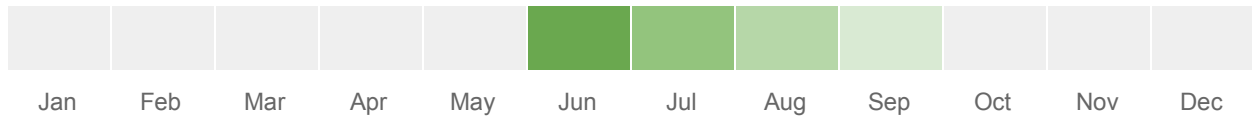


*Holcopasites calliopsidis* – Male



*Holcopasites calliopsidis* – Male

### Flight Season



# Melitoma

## Round-Headed Bee Group

(1 species in Ohio - *Melitoma taurea*)

Forages for pollen primarily on both native and introduced morning-glories in the genus *Ipomoea* and occurs throughout both rural and urban areas.



*Melitoma taurea* - Male

## Field Marks

### Both Sexes

- Thorax, top, **uniquely divided longitudinally** by 1–3 white bands of hair lines (one always splitting the center) separated by black hairs. Pale hairs often taking on a **gray** aspect
- Head, crown, uniformly rounded
- Tongue **extremely long**; folded up under head it extends to the abdomen
- Abdomen, segment rims, **completely lined** with a band of prone, short, white hairs
- Claws, **long**, curved
- Flies unbelievably quickly between flowers

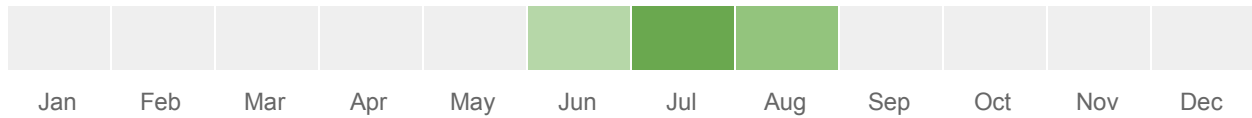
### Female ♀

- Hind legs with long but sparse, loosely plumose **black pollen collecting hairs**

<b>Flight Season</b>	Summer
<b>Size Relative to Honey Bee</b>	1X
<b>Position of Wings Feeding on Flowers</b>	Crossed over back
<b>Location of Pollen Carrying Hairs</b>	Hind tibia and basitarsus
<b>Nest</b>	In the ground, usually in open clay banks along roads, ditches, streams, and overturned root masses. Usually protected by a projecting turret made of dried balls of earth.
<b>Flowers</b>	A specialist on morning-glories, but can be found nectaring on other species

**Similar Genera**

Hair pattern on thorax is unique in our area as is the extremely long tongue, if visible. Note that *Melissodes* and other Eucerines along with *Bombus*/*Ptilothrix* will also commonly feed on morning-glories.

*Melitoma taurea* – Male*Melitoma taurea* – Male*Melitoma taurea* – Male**Flight Season**



# *Ptilothrix*

## Round-Headed Bee Group

(1 species in Ohio - *Ptilothrix bombiformis*)

Bumble bee-like, forages for pollen (often with bumble bees!) primarily on native and introduced plants in the Mallow Family, particularly native *Hibiscus*. Occurs commonly on the edge of wetlands and on plantings in urban areas.



*Ptilothrix bombiformis* - Male

## Field Marks

### Both Sexes

- **Bumble bee** in general coloration (*B. impatiens* and *B. citrinus* specifically)
- Head, top, evenly rounded over
- Thorax, top, sides, hairs dense, tan to off-white, never yellow, **no central dark spot** or black hairs present
- Abdomen hairs black except for some light pale/ochre hairs at the very base
- **Legs long**, last segment and claws particularly **long and curved**

### Female ♀

- Hind legs, **pollen hairs, black**, sparse, much longer on **basitarsus** than tarsus

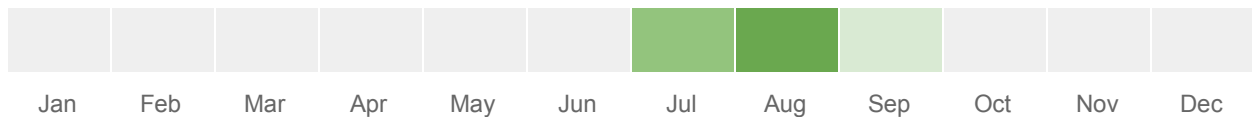
<b>Flight Season</b>	Summer
<b>Size Relative to Honey Bee</b>	1.2 – 1.5X
<b>Position of Wings Feeding on Flowers</b>	Crossed over back
<b>Location of Pollen Carrying Hairs</b>	Hind tibia and basitarsus
<b>Nest</b>	In the ground, usually in compacted open clay with no vegetation. Will make short turrets of clay around nest hole. Often found in paths and dirt access roads.
<b>Flowers</b>	A specialist on mallow family (Malvaceae) plants, in particular native <i>Hibiscus</i> plants near wetlands, but can be found nectaring on other wetland species like Buttonbush ( <i>Cephalanthus occidentalis</i> ).

## Similar Genera

- *Bombus* - Light hairs mostly with a yellow caste to them. Thorax, top, hairs usually not completely pale, some black hairs in center. Abdomen of most species with more extensive pale/yellow hairs throughout. Face longer. Head, top, flattened. Legs generally shorter and body generally wider. ♀Rear legs, tibia in *B. impatiens* flattened and bare in center. Will also forage on rosemallow (*Hibiscus* spp.) with *Ptilothrix*.
- Eucerines (Long-horned Group) - ♀Hind legs, almost all have at least some pale hairs. ♂Antennae much longer, projecting at least to the base of the wings when pushed backwards. Head, clypeus, always at least partially yellow.

*Ptilothrix bombiformis* – Male*Ptilothrix bombiformis* – Male*Ptilothrix bombiformis* – Male

## Flight Season



# Colletes

## Cellophane Bee Group

(~24 species expected in Ohio)

There are two main groups of *Colletes*. The Spring Group often nests in huge aggregations in open soils or cliff faces, noticeable because of the males swarming over the aggregations waiting for emerging females. Remaining Fall Group members are primarily specialists (using pollen from only a small number of plants), smaller, uncommon, and summer to fall species.



*Colletes validus* - Male

## Field Marks

### Both Sexes

- Eyes, distance between two inner borders, decreases travelling from top of head towards mandibles, making the bee look “cute,” giving the head a heart-shaped look
- Most common species **hairy**, with thick pale hair throughout the thorax and head, and an unbroken **thick band of short, prone, pale hair** along the rims of the abdominal segments
- Note: Wings provide definitive character, but usually difficult/impossible to see in the field; one of outer veins of the wing (right side, dorsal view) is s-shaped rather than straight or uniformly curved (second recurrent vein); this is sometimes clear when photographs are taken

### Female ♀

- Head, **covered with hair** throughout except clypeus (most species)
- Abdomen, cone-shaped, tapering uniformly to the end

### Male ♂

- Head, completely covered in hairs, including clypeus

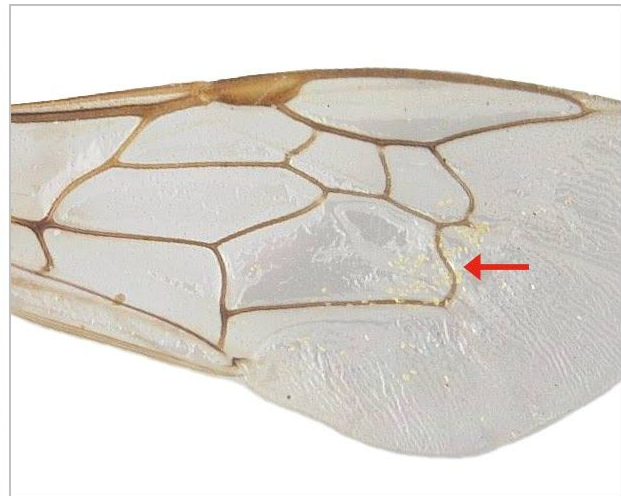
<b>Flight Season</b>	Spring to Fall
<b>Size Relative to Honey Bee</b>	0.75 – 1X
<b>Position of Wings Feeding on Flowers</b>	Overlapping
<b>Location of Pollen Carrying Hairs</b>	Hind femur and tibia, but can also include side of thorax and underside of abdomen
<b>Nest</b>	Ground (Spring Group in aggregations)
<b>Flowers</b>	Spring Group forage primarily on trees and shrubs. Members of the Fall Group each primarily gather pollen from a single genus of plant, most of which are perennial forbs.

## Similar Genera

- *Nomia* - (very rare group) has a similar “cute” face. Abdomen rims bare with glowing band of pearlescent white color.
- *Halictus* - Eyes, inner edges do not converge. Thorax and head with only sparse covering of short upright hairs; integument clearly visible throughout. ♀ Abdomen, apex, with noticeable longitudinal trough-like slit down the center.
- *Andrena* - Eyes, inner edges do not converge. Face can be hairy but top of thorax only rarely with thick long hair. ♀ Face, shiny areas of white or slightly brown hairs along inner border of eyes.
- *Apis* - Eyes, hairy. Female, hind tibia, broad, flattened and bare in center.



*Colletes* have eyes that strongly converge from the top to the bottom of the head, giving them a heart-shaped face.



In *Colletes*, the 2nd recurrent vein is curved and almost S-shaped. Contrast this with similar-looking *Andrena*, which have a straight 2nd recurrent vein.

Photo: Smithsonian Institution

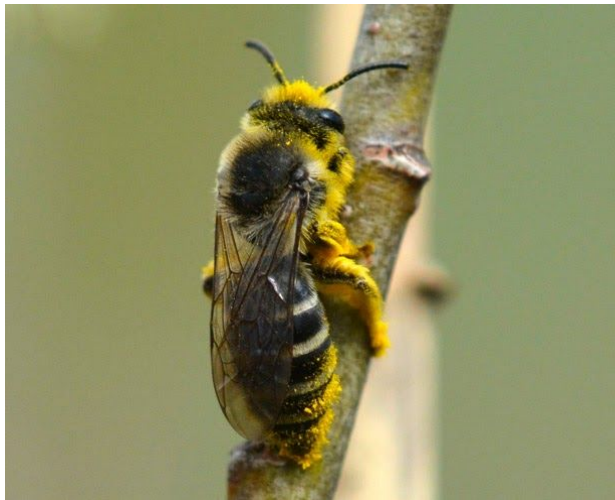


*Colletes inaequalis* - Female

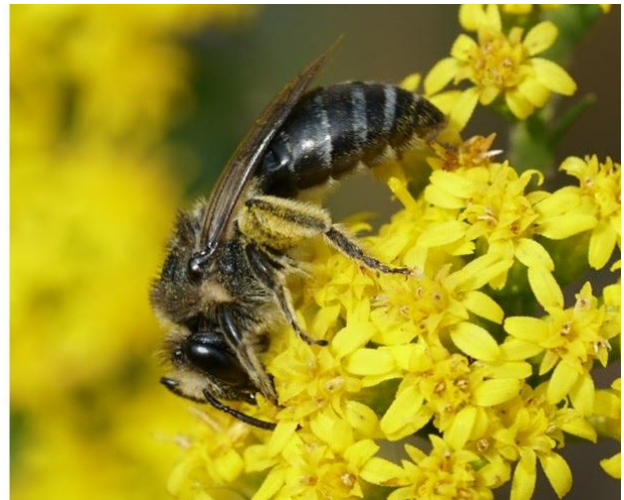




*Colletes brevicornis* - Male

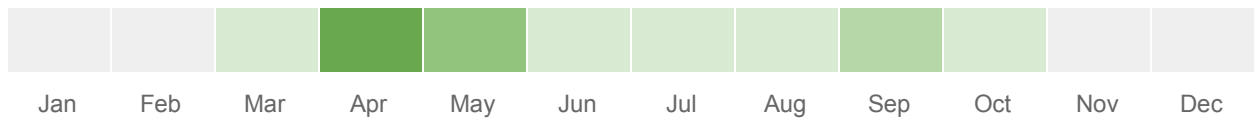


*Colletes inaequalis* - Female  
Photo: Bill Stitt



*Colletes simulans* - Female  
Photo: Amy Schnebelin

### Flight Season





# Hylaeus

## Masked Bee Group

(~16 species expected in Ohio)

The new observer will mistake these for wasps as they are small, thin, black, nearly hairless, and carry pollen internally. Look for them on flat-topped flowers like Queen Anne's Lace and daisy-like flowers with easy access to pollen and nectar. There are several new invasive species of *Hylaeus* too, so documenting these underappreciated bees will help track the spread. So far, Ohio has the earliest known record of *H. pictipes* in North America, with a specimen found in Cleveland in 2011.



*Hylaeus modestus* - Male

## Field Marks

### Both Sexes

- Thin, **wasp-like**, nearly hairless
- **All black** integument except for light markings on face and thorax collar, and usually 0.5 or more of tibia (except for *H. nelumbonis*, which has dark red on first sections of abdomen)
- Distance between inner edges of eyes strongly narrowing/**converging** towards mandibles

### Female ♀

- With narrow triangular to **linear pale markings** centered on each side in the small area between the eye, antennae, and clypeus

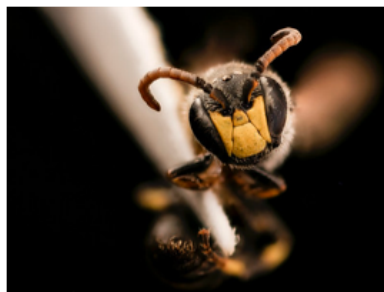
### Male ♂

- Similar to female except that pale markings usually completely to nearly completely **cover face** below antennae, markings in some species extend as short peninsulas above the antennae

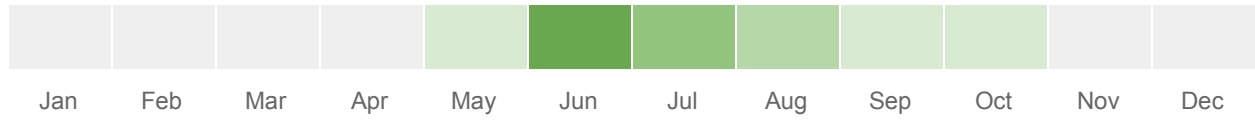
<b>Flight Season</b>	Late spring to fall, primarily summer
<b>Size Relative to Honey Bee</b>	0.5X
<b>Position of Wings Feeding on Flowers</b>	Overlapping
<b>Location of Pollen Carrying Hairs</b>	None, pollen carried internally
<b>Nest</b>	Pith in the cut ends of forbs as well as small beetle galleries in wood
<b>Flowers</b>	<i>Hylaeus</i> have very short tongues and forage on Queen Anne's Lace, daisy-like flowers and other open access blooms, often in the company of wasps.

## Similar Genera

- Most likely to be identified as a wasp in the field (Search “tiphiid wasps” on BugGuide.net).
- Little Black Bee group in Andrenidae is similar in that they are dark and small, but are not as elongate, tend to have wider faces and the inner edges of their eyes are parallel or nearly so, not/little converging towards mandibles. ♀Lack any light markings on body. Have noticeable pollen carrying hair on their hind legs. ♂Face, pale markings, generally less extensive, except for some *Pseudopanurgus*.

*Hylaeus leptocephalus* – Male*Hylaeus leptocephalus* – Female*Hylaeus leptocephalus* – Female*Hylaeus annulatus* – Female*Hylaeus annulatus* – Female*Hylaeus annulatus* – Female*Hylaeus sparsus* – Male*Hylaeus annulatus* – Male*Hylaeus sparsus* – Female

### Flight Season



# Augochlora

## Green Bee Group

(1 species in Ohio - *Augochlora pura*)

Only one species present in Ohio (*A. pura*) and strongly associated with woodland habitats/landscapes, though commonly found in open fields near to woodlands.



*Augochlora pura*. - Female

Photo: MaLisa Spring

## Field Marks

### Both Sexes

- Thorax and head shiny, metallic **race-car green** often with gold overtones, but never with blue overtones, no noticeable hair bands or hairiness other than on the hind legs
- Thorax, rear face is **smooth** and does not have a ridge/line encircling its face like *Agapostemon*

### Female ♀

- Scutum (top of thorax) with **NO noticeable gradient** in surface texture from back to front, relatively smooth and heavily pitted

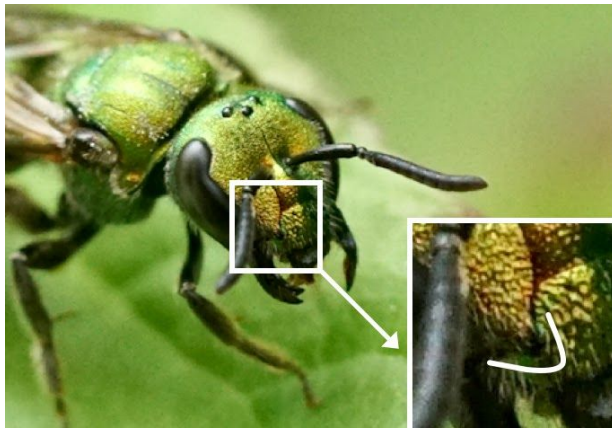
### Male ♂

- Almost impossible to tell in the field from *Augochlorella* males

<b>Flight Season</b>	Throughout
<b>Size Relative to Honey Bee</b>	0.66X
<b>Position of Wings Feeding on Flowers</b>	Overlapping
<b>Location of Pollen Carrying Hairs</b>	Hind femur and tibia
<b>Nest</b>	Under loose bark of rotting logs
<b>Flowers</b>	Generalist

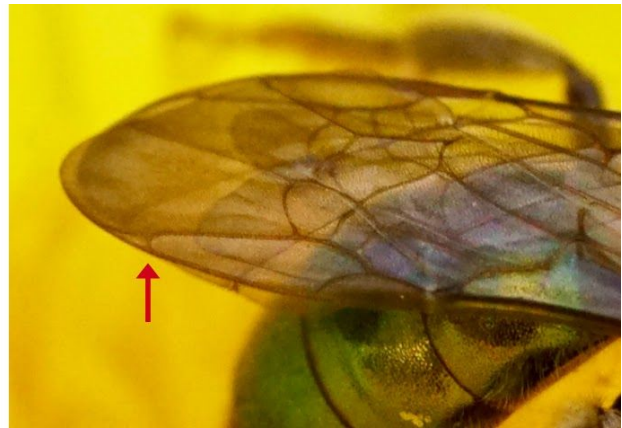
## Similar Genera

- *Agapostemon* - ♀♂ Larger, has raised line/ridge encircling rear face of propodeum. ♂ Has boldly yellow and black striped abdomen.
- *Augochlorella* - ♀ Scutum subtly changes in surface texture and reflectivity, trending towards slightly rougher near the head. ♂ Not separable in field.
- *Augochloropsis* - ♀♂ With tegula (small shield-like plate covering the base of the wing) metallic green or blue and strongly flattened to slightly concave along its inside edge. Some species with noticeable border of comb-like white hairs on the rim of at least the second abdominal segment. Some species with relatively strong metallic blue reflections along with the usual metallic green.



*Augochlora paraocular* lobes form **acute, but rounded angles** that project into the clypeus.

Photo: Amy Schnebelin



*Augochlora* have a **truncated marginal cell**, often followed by a thin vein that extends to the edge of the wing.

Photo: Amy Schnebelin



*Augochlora pura* - Female



*Augochlora pura* - Male





*Augochlora pura* - Female

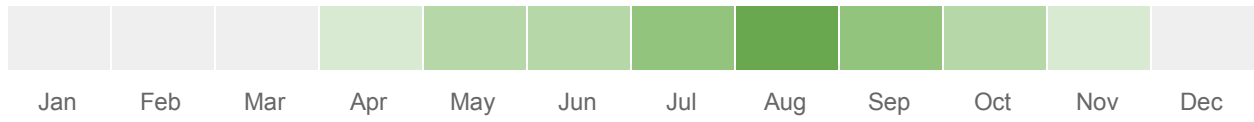
Photo: Amy Schnebelin



*Augochlora pura* - Female

Photo: MaLisa Spring

### Flight Season



# *Augochlorella*

## Green Bee Group

(~2 species in Ohio)

One of the 4 bright race car green bee genera members of this species are often found in abundance in fields and gardens.



*Augochlorella aurata* - Female

## Field Marks

### Both Sexes

- Entire body shiny, metallic **race-car green**, often with gold highlights, no noticeable hair bands or hairiness other than on the legs
- Thorax, rear face is **smooth** and does not have a ridge/line encircling its face like *Agapostemon*

### Female ♀

- Scutum (top of thorax) with a subtle but noticeable gradient in surface texture from smooth near the rear to **slightly roughened** towards the front

### Male ♂

- Almost impossible to tell in the field from *Augochlora* males, though a good picture can reveal subtle wing and facial differences

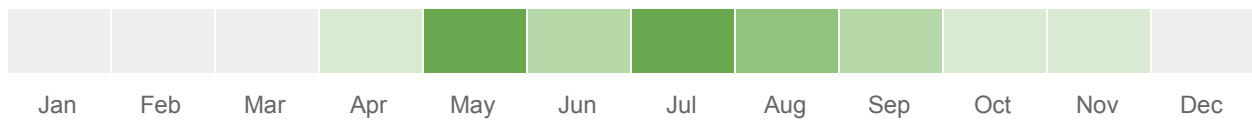
<b>Flight Season</b>	Throughout the flight season
<b>Size Relative to Honey Bee</b>	0.66X
<b>Position of Wings Feeding on Flowers</b>	Overlapping
<b>Location of Pollen Carrying Hairs</b>	Hind femur and tibia
<b>Nest</b>	Ground
<b>Flowers</b>	Generalist

## Similar Genera

- *Agapostemon* - ♀♂ Larger, has raised line/ridge encircling rear face of propodeum. ♂ Abdomen boldly yellow and black striped. Hind femur bright yellow and expanded.
- *Augochlora* - ♀ Scutum uniformly smooth reflecting light in the same way throughout. ♂ Not separable in field.
- *Augochloropsis* - ♀♂ Tegula (small shield like plate covering the base of the wing) strongly flattened to slightly concave along its inside edge. Some species with noticeable comb-like border of parallel, thickened, uniformly spaced white/tan hairs on the rim of at least the second abdominal segment. Some individuals with strong metallic blue reflections along with the usual metallic green base color.

*Augochlorella aurata* – Female*Augochlorella aurata* – Female*Augochlorella aurata* – Female

## Flight Season



# *Augochloropsis*

## Green Bee Group

(~2 species in Ohio)

The least common of the 4 bright metallic green bee genera in Ohio, but still regularly occurring and to be expected in small numbers in almost any open garden/field habitats.



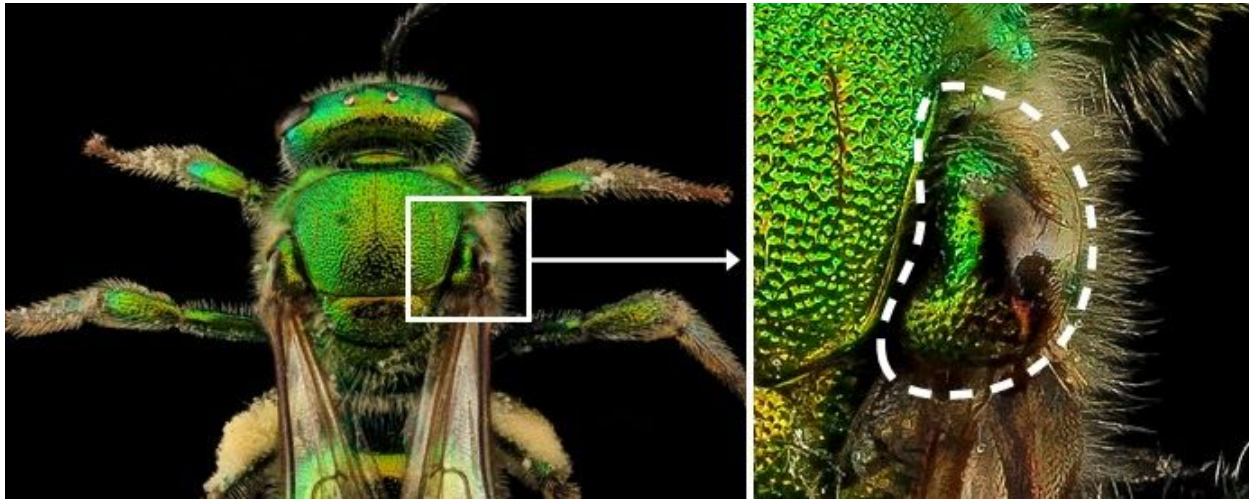
*Augochloropsis* sp. - Female

## Field Marks

### Both Sexes

- Entirely bright **metallic green**, with many individuals with strong metallic blue highlights, mixed in
- Tegula (small shield like cover to the base of the wings), interior edge, straight to slightly concave **NOT oval** like other species and tegula mostly metallic green/blue not brown like other species

<b>Flight Season</b>	Throughout
<b>Size Relative to Honey Bee</b>	0.66X
<b>Position of Wings Feeding on Flowers</b>	Overlapping
<b>Location of Pollen Carrying Hairs</b>	Hind femur and tibia
<b>Nest</b>	Ground
<b>Flowers</b>	Generalist
<b>Similar Genera</b>	All the other bright green genera of bees have oval tegula similar to the majority of all bee species. Visually, <i>Augochlora</i> and <i>Augochlorella</i> look almost exactly the same as <i>Augochloropsis</i> . In addition to having an oval tegula <i>Agapostemon</i> is larger and has a raised line/ridge encircling rear face of propodeum. ♂Abdomen, boldly yellow and black striped abdomen.



*Augochloropsis* have **metallic green or blue, D-shaped tegulae**. All other genera of green bees have oval tegulae.

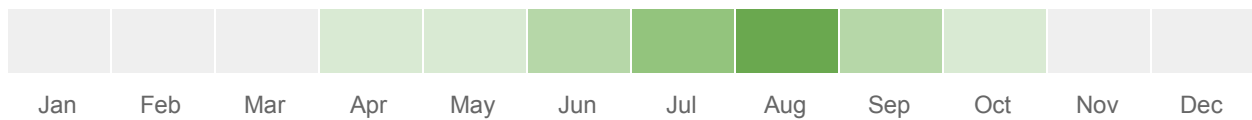


*Augochloropsis metallica* - Female



*Augochloropsis metallica* - Female

### Flight Season





# Agapostemon

## Green Bee Group

(~4 species in Ohio)

Of the 4 bright metallic green bee genera, *Agapostemon* species are the largest in size. Common and sometimes abundant, they are mostly field species that can be seen from spring to fall.



*Agapostemon virescens* - Male

## Field Marks

### Both Sexes

- Thorax and head shiny, metallic, **race-car green**
  - Note: ♀ *A. splendens* and to lesser extent *A. sericeus* can show some hints of metallic blue/purple in their abdomen
- Thorax, rear face is completely encircled around its outer edge with a clearly **elevated ridge/line**, though this can be difficult to see in the field
- **Larger** than other green species

### Female ♀

- **Entirely green**, including abdomen, except for the unique and common *A. virescens* which has a black abdomen with white bands of short hair

### Male ♂

- Abdomen, **banded** yellow and black
- Legs mostly **bright yellow**
- Hind femur very wide/expanded/**inflated**

<b>Flight Season</b>	Throughout the flight season
<b>Size Relative to Honey Bee</b>	0.75X
<b>Position of Wings Feeding on Flowers</b>	Overlapping
<b>Location of Pollen Carrying Hairs</b>	Hind femur and tibia
<b>Nest</b>	Open to sparsely vegetated ground. Entrance usually surrounded by a low mound/turret of excavated soil
<b>Flowers</b>	Generalist

**Similar Genera**

There are 3 other bright green genera of bees. All are smaller and have no raised line on the thorax. All are completely green, including the abdomen. ♂ Little to no yellow on femur and tibia, though tarsal segments usually with yellow; legs, hind femur thin, not expanded. *Augochloropsis* - ♀♂ Tegula with metallic green/blue not all brown as in *Agapostemon* and other green bees.



FEMALE



MALE

Female *Agapostemon* have a green head and thorax. Three of the Ohio species have a green abdomen, sometimes with faint white stripes. The fourth species, *A. virescens*, has a black abdomen with white stripes.

Male *Agapostemon* have a green head and thorax and an abdomen with black and yellow bands. They also have mostly yellow legs.



FEMALE

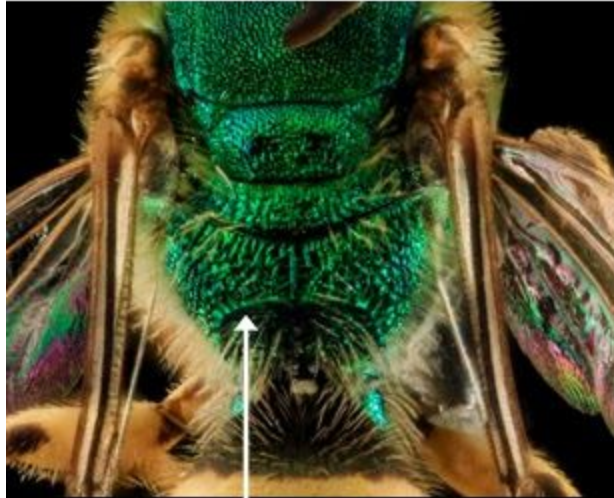
*Agapostemon sericeus*



MALE

*Agapostemon virescens*

*Agapostemon*



Propodeal Ridge

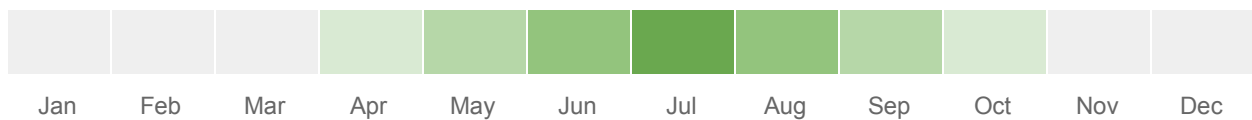


Compare with Augochlorini



*Agapostemon* can be distinguished from other green bee genera in Augochlorini by the presence of a ridge on the back of the thorax (propodeum).

Flight Season





# Halictus

## Sweat Bee Group

(~4 species in Ohio)

Common to abundant in fields and gardens, these are generalists with often multiple generations a year, individuals are primarily eusocial nesters.



*Halictus ligatus* - Female

### Field Marks

#### Both Sexes

- Body uniformly dark brown or a dark/dull metallic green (*H. confusus*)
- Abdomen, segments, rim with a complete but thin **band of tiny prone white hairs**, otherwise bees without much hair

#### Male ♂

- Antennae **relatively long** compared to males of the Panurgines; underside in all but one species (*H. rubicundus*) **noticeably yellowish**
- Clypeus, lower third parallel to rim a **bar of smudgy yellow**
- Legs noticeably yellow with a distinct **elongate brown mark** centered on the outside face of the hind tibia

<b>Flight Season</b>	Throughout
<b>Size Relative to Honey Bee</b>	0.5 – 1X
<b>Position of Wings Feeding on Flowers</b>	Overlapping
<b>Location of Pollen Carrying Hairs</b>	Hind femur and tibia
<b>Nest</b>	Ground
<b>Flowers</b>	Generalist

**Similar Genera**

*Lasioglossum* - ♀♂ Variable in size, but many are smaller than any *Halictus*. Abdomen segments with no pale hair bands on rims, some species with white hair band at the BASE of the abdominal segment, patches/bands of short pale white tiny abdominal hair may be absent to completely covering the abdomen. Color varies from slightly metallic to black. ♂ There are exceptions but: antennae usually all dark; legs usually dark or yellow restricted to ends of legs; black species can have white/off-white but not yellow smudges on clypeus; some common small dull metallic species have yellow on clypeus, but the bulk do not.

*Colletes* - larger overall, face heart shaped, lack curved basal vein in the wing

*Andrena* - distinct facial fovea, most species are abundant in early spring before *Halictus* emerges



The white hair bands of *Halictus* run along the **apical** end (the "bottom") of each abdominal tergum.



*Halictus* wings have a strongly **arched basal vein**, like other genera in the family Halictidae.

Photo: Smithsonian Institution



*Halictus ligatus* - Female

Photo: Bill Stitt



*Halictus rubicundus* - Male

Photo: Bill Stitt



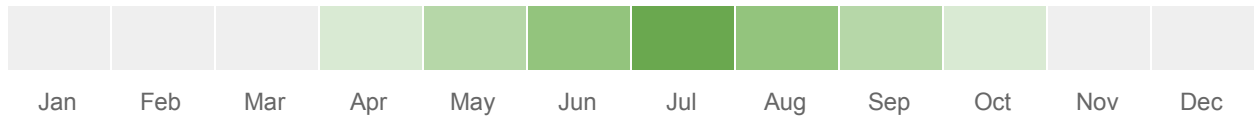


*Halictus confusus* - Female



*Halictus ligatus* - Male

### Flight Season



# Lasioglossum

## Sweat Bee Group

(~93 species expected in Ohio)

A species rich group of moderate to extremely small species. In total numbers they dominate many environments, particularly in summer and fall, but their small size and habit of staying near the ground make them less observed than other species who are larger and use taller flowers.



*Lasioglossum coriaceum* - Female

## Field Marks

### Both Sexes

- Both all black and dull/dark metallic green/blue species exist, with a few having orangish on the abdomen
- **3 submarginal cells**; 2 rare species with only 2 submarginal cells
- No long hair but some have noticeable **patches/bands of pale, short, matted, hairs** on the abdomen. Matted pale hair bands/patches on abdomen vary from none to almost completely covered
- Note: Several rarely seen species are parasitic and have no pollen carrying hairs on legs. 3 uncommon to very rare dune/deep sand specialists exist that have reddish abdomens and 2 very rare species have only 2 submarginal cells. Head of male of some large black species and female parasitic species noticeably broad, with wide cheeks, and mandibles saber-like, extra-long, thin, pointed, without an extra tooth at the end

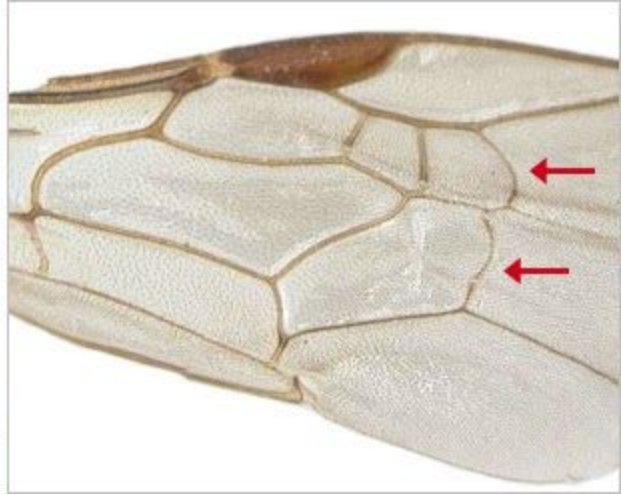
### Male ♂

- **Antennae long** (goes to middle of thorax) compared to the female; usually all black
- **Legs, black** in most species or yellowish restricted to ends of legs only (tarsal segments and end of tibia)
- Clypeus of black species usually with pale white/off-white smudges in the center towards the rim. Clypeus on most of the smaller dark metallic green/blue species without light patches, but there are several exceptions

<b>Flight Season</b>	Throughout
<b>Size Relative to Honey Bee</b>	0.3 – 0.75X
<b>Position of Wings Feeding on Flowers</b>	Overlapping
<b>Location of Pollen Carrying Hairs</b>	Hind femur and tibia
<b>Nest</b>	Ground, with a few in rotting wood, including wood mulch
<b>Flowers</b>	Generalist

**Similar Genera**

*Halictus* - ♀♂ Usually larger, abdomen segments with thin, crisp, dense bands of small white hairs along rim. ♂ Antennae of most species with bright to dull yellow undersides, outside face of hind legs largely yellow tibia with large, long, oval brown section in the middle.



Many *Lasioglossum* have sparse abdominal hairs, but some have pale stripes or patches of short, matted hairs. These hairs are located on the **basal end** (the "top") of each abdominal tergum.

*Lasioglossum* (particularly females) have weakened outer wing veins, specifically the third, and sometimes second submarginal crossvein, and the second recurrent vein (compare with *Halictus*).

Photo: Smithsonian Institution



*Lasioglossum floridanum* – Female



*Lasioglossum forbesii* – Female



*Lasioglossum foxii* – Male



*Lasioglossum lineatulum* – Female



*Lasioglossum marinum* – Female



*Lasioglossum quebecense* – Female



*Lasioglossum rozeni* – Female

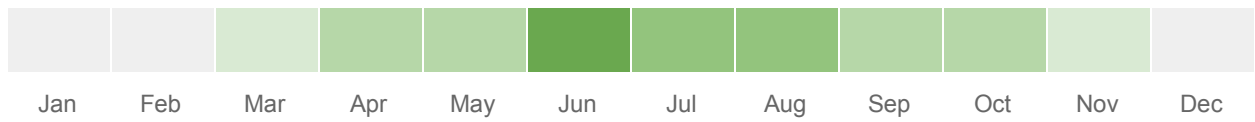


*Lasioglossum truncatum* – Male



*Lasioglossum truncatum* – Male

### Flight Season



# Sphecodes

## Sweat Bee Group

(~15 species expected in Ohio)

A group of nest parasites, regionally their hosts primarily come from other members of the Family Halictidae. Regularly occurring but sparsely distributed at any individual location, they can be found nectaring at flowers or cruising low over, or walking upon, bare areas looking for host nests.



*Sphecodes* Species - Female

### Field Marks

#### Both Sexes

- Head and thorax **jet black**, no long hair, and shorter hair generally sparser than in most bees
- Sides of thorax on most species not smooth, rough, like **textured drywall**

#### Female ♀

- Abdomen, **all red**
- Hind legs with no pollen carrying hairs
- Body size/shape **narrow**, closer to that of males than pollen carrying species

#### Male ♂

- Abdomen usually all red, but commonly **with extensive black** at either end of abdomen, rarely all black
- Antennae **all black**, longer than female, some species with strong concave areas on the underside of segments

<b>Flight Season</b>	Throughout
<b>Size Relative to Honey Bee</b>	0.5 – 0.75X
<b>Position of Wings Feeding on Flowers</b>	Overlapping
<b>Location of Pollen Carrying Hairs</b>	None, nest parasite
<b>Nest</b>	Parasitizes ground nesting bees, primarily from Halictidae, but other groups of bees are possible hosts, more observations needed
<b>Flowers</b>	Nectars on many plants



**Similar Genera**

- Bright red abdomen is unique to *Sphecodes* and female *Nomada* with a few small exceptions.
- *Nomada* - ♀ Can have all red abdomen, but in most cases there are yellow dots/markings at least on the sides of the abdomen, and, in all cases if the abdomen is plain red, the thorax is either marked with yellow or is also all red.
- *Lasioglossum* – A few sand specialists (coastal plain/dunes only) have a reddish/orangish abdomen that is not as brightly colored as *Sphecodes* and dark head/thorax, but body is not as roughened as *Sphecodes*.



*Sphecodes* species

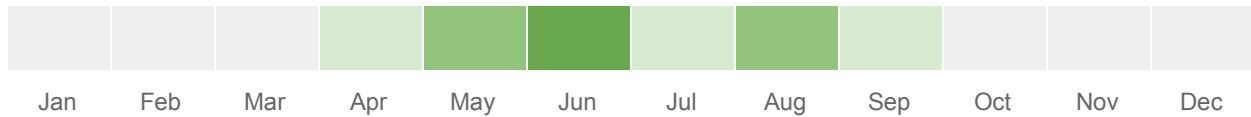


*Sphecodes* species



*Sphecodes* species

**Flight Season**



# Dieunomia

## Thick-Legged Group

(1 species in Ohio - *Dieunomia heteropoda*)

Composite specialists, particularly yellow ones, they distinctly waggle their large abdomens up and down as they parse the flower disks gathering pollen.



*Dieunomia heteropoda*

Photo: Derek Hennen

## Field Marks

### Both Sexes

- Large
- **Wings skinny, long, dark**, ends black, remainder dark smoky brown
- When foraging wings held out and up at **45°** with fore and hind wing overlapping making the wing base appear particularly narrow
- Integument all black
- Thorax, hair, dense, fur-like, **black to gold-brown**, often heavily dusted with light colored pollen
- Abdomen, has indistinct latitudinal bands resulting from dark brown hair and segment rims contrasting with underlying dark black integument
- Wing base covers (tegulae) **not oval** but asymmetrical, elongated, with a projecting lobe along the rear interior edge

### Female ♀

- Abdomen wide, sometimes with enough pollen on the underside to appear like *Megachile*
- Hind femur, tibia, basitarsus covered in long dense, **black**, multi-branched pollen carrying hairs
- Abdomen, underside often also carrying pollen

### Male ♂

- **Wasp-like**, legs very long, thin but on hind and mid tibia with huge triangular **flattened flanges** projecting outward
- Last segment of the antennae **expanded** to about 2x wider than the other segments

<b>Flight Season</b>	Late summer to early fall
<b>Size Relative to Honey Bee</b>	1.5X
<b>Position of Wings Feeding on Flowers</b>	When foraging wings held 45° away and up from body, hind and front wings completely lapping rather than slightly fanned, as in most other genera, making wings appear “skinny.”

<b>Location of Pollen Carrying Hairs</b>	Hind femur, tibia, basitarsus as well as under the abdomen
<b>Nest</b>	Ground, often in aggregations
<b>Flowers</b>	Composites, particularly yellow, daisy-like ones
<b>Similar Genera</b>	<ul style="list-style-type: none"> <li>• All Other bees - ♂ Antenna ends not inflated, legs lack flanges (Except <i>Nomia</i>).</li> <li>• Long-horned bees - ♀♂ Faster fliers, <i>Dieunomia</i> fly more slowly, like bumble bees; long-horned bees, particularly the males, fly so fast that they are only a blur. Tegula not obviously elongate or deformed from an oval. Hairs, at least some light-colored, though some primarily black with only small amounts of pale hairs. Wings primarily held overlapping across the back.</li> <li>• Other bumble bee sized bees – All have pale hairs on their thorax, and usually the first abdominal segment.</li> </ul>

*Dieunomia heteropoda* – Female*Dieunomia heteropoda* – Female*Dieunomia heteropoda* – Male*Dieunomia heteropoda* – Female*Dieunomia heteropoda* – Male*Dieunomia heteropoda* – Female

# *Nomia*

## Thick-Legged Group

(1 species expected in Ohio - *Nomia nortoni*)

Sand specialist, so has not been reported in Ohio for a while.



*Nomia nortoni* - Male

Photo: Sam Kieschnick

## Field Marks

### Both Sexes

- Abdomen with highly visible pale **pearlescent bands** along rims of segments, unique among all Ohio bees
- Eyes, interior distance between two inner borders narrows from top of head towards mandibles, making bee look “cute”

### Male ♂

- Hind femur and tibia greatly inflated, thicker and wider than most other species

<b>Flight Season</b>	Late summer to fall
<b>Size Relative to Honey Bee</b>	1.5X
<b>Position of Wings Feeding on Flowers</b>	Overlapping
<b>Location of Pollen Carrying Hairs</b>	Hind femur and tibia
<b>Nest</b>	Ground (possibly in aggregations)
<b>Flowers</b>	Noted on a variety of forbs, but may favor things in the pea family
<b>Similar Genera</b>	No other group has the pearlescent bands on the abdomen. <i>Colletes</i> can have a similar “cute” face look from their also converging eyes.

# Anthidium

## Wool Carder Bees

(~2 species in Ohio)

Two common, but non-native, *Anthidium* species occur in Ohio. These colorful introduced species are associated with gardens and weedy fields.



*Anthidium manicatum* - Female

## Field Marks

### Both Sexes

- **Stout**, wide, short body, rounded end to abdomen
- Integument black, marked with **bright yellow stripes and markings** throughout body and legs
- Head, top, back, edge with yellow markings that vary from simple dots above the eyes to teardrop shaped oblongs; **marks never meet in the middle** of the top of the head
- Abdomen with bold yellow marks starting with 1 or 2 dots or oblongs on the sides of the basal segments and progress to a nearly complete stripe on segments near the abdomen end; stripes **never connect** in the middle

### Female ♀

- Mandibles primarily yellow with **multiple small teeth** (though these are often hard to see)

### Male ♂

- With dramatic projecting anchor or **trident** shaped structures at the very end of the abdomen and are usually larger than females in *A. manicatum*

<b>Flight Season</b>	Late spring to fall, primarily summer
<b>Size Relative to Honey Bee</b>	0.5 – 0.75X
<b>Position of Wings Feeding on Flowers</b>	Held at 45° to body
<b>Location of Pollen Carrying Hairs</b>	Underside of abdomen
<b>Nest</b>	Nests in holes in wood and other cavities with partitions/swaddling made of minute plant hairs that can completely enclose the cocoons, at least in <i>A. manicatum</i> . Nest can be closed with other materials including wood pulp.
<b>Flowers</b>	Commonly found on mints and plants in the pea family, but will visit many plant species



**Similar Genera**

- Note: *A. manicatum* males are larger than all other Anthidiine species.
- *Paranthidium* - Has strap-like yellow markings that follow the inner edge of the eyes extending to the top of the eye and a broken yellow line borders most of the top of the thorax near the head.
- Other Anthidini - Have different patterns to the yellow markings of the face and abdomen or the markings are white not yellow.



*Anthidium manicatum* – Female



*Anthidium manicatum* – Female



*Anthidium manicatum* – Male



*Anthidium manicatum* – Male

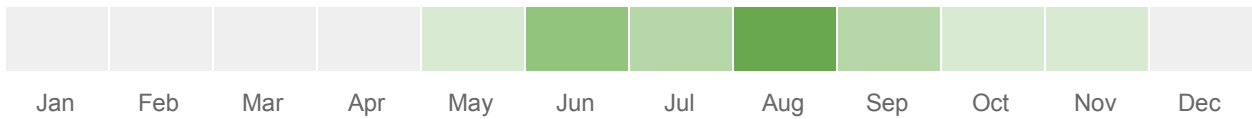


*Anthidium manicatum* – Male



*Anthidium manicatum* – Male

**Flight Season**



# *Anthidiellum*

## Yellow Block Group

(1 species in Ohio - *Anthidiellum notatum*)

Small, speedy, uncommonly detected in gardens and only rarely found elsewhere. Where found it often can be seen zipping around from flower to flower.



*Anthidiellum notatum* - Male

## Field Marks

### Both Sexes

- Robust but small and **compact**
- Wings nearly **black**
- Body black with bold bright yellow markings throughout
- Head, top, back edge with a yellow stripe/line **running uniformly** along the edge starting behind the eyes
- Abdomen, first segment with large round/oblong/blockish yellow mark on the far sides; second segment with two yellow stripes that cross the segment but don't quite meet in the middle; 3rd-5th segments with two large roughly square/rectangular marks to either side of the centerline, creating a set of **6 dots/squares** that are easy to see in the field
- Abdomen, top, rear edge, close inspection will show that the top of the thorax projects rearward creating a thin overhanging shelf, unique among all the genera

<b>Flight Season</b>	Late spring to fall, primarily summer
<b>Size Relative to Honey Bee</b>	0.5X
<b>Position of Wings Feeding on Flowers</b>	Held at 45° to body
<b>Location of Pollen Carrying Hairs</b>	Underside of abdomen
<b>Nest</b>	Glued externally to plant stems using resin and often incorporating small pebbles.
<b>Flowers</b>	Very fond of plants in the pea and mint families
<b>Similar Genera</b>	Other Yellow Block Genera - Do not have the same pattern of distinct abdominal markings <i>A. notatum</i> has.



*Anthidiellum notatum* – Male



*Anthidiellum notatum* – Female



*Anthidiellum notatum* – Female



*Anthidiellum notatum* – Male



*Anthidiellum notatum* – Male



*Anthidiellum notatum* – Male

# Paranthidium

## Yellow Block Group

(1 species expected in Ohio - *Paranthidium jugatorium*)

This is a rare group that specializes on woodland asters like *Helianthus*, *Rudbeckia*, *Silphium*, etc. Likely more common in southeasteastern Ohio, but not well documented.



*Paranthidium jugatorium* - Male

## Field Marks

### Both Sexes

- **Stout, black integument with** bold, bright yellow markings throughout body and legs
- Head, top, back edge varies from no yellow markings to the presence of some obscure linear ones in the center and some oblong ones on the far side
- Abdominal segments with large **transverse yellow stripes/marks** which are widely separated in the center of the segment on basal segments, but the gap between the stripes narrowing on segments towards the abdomen tip often with a complete stripe on the last two segments
- Face with linear, **strap-like, yellow markings** that run up the inside of the eyes to about the top of the eyes

<b>Flight Season</b>	Summer
<b>Size Relative to Honey Bee</b>	0.75X
<b>Position of Wings Feeding on Flowers</b>	Held at 45° to body
<b>Location of Pollen Carrying Hairs</b>	Underside of abdomen
<b>Nest</b>	Nests in the ground, has been known to use the old/unused holes of other ground nesting species such as <i>Melitoma</i>
<b>Flowers</b>	Specialist on Woodland Sunflowers
<b>Similar Genera</b>	<ul style="list-style-type: none"> <li>• <i>Anthidium</i> - Thorax may or may not have some small yellow oblong markings towards the rear, but thorax generally lacks the clear thin band of yellow that surrounds much of the top of the top of the thorax on <i>Paranthidium</i>.</li> <li>• Other Anthidiini - Abdomen with quite different pattern of markings, either a series of widely separated dots (<i>Anthidiellum</i>) or complete linear stripes (<i>Stelis</i>, Yellow Group)</li> </ul>



*Paranthidium jugatorium* – Male



*Paranthidium jugatorium* – Male

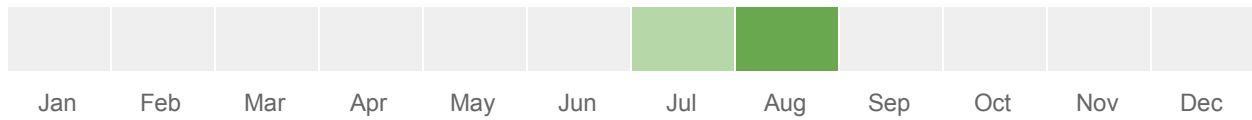


*Paranthidium jugatorium* – Male



*Paranthidium jugatorium* – Male

### Flight Season





# Stelis

## Yellow Block Group

(~7 species expected in Ohio)

Uncommon nest parasites of *Hoplitis*, *Osmia*, and *Megachile*.

There are two distinct groups. Yellow Group has markings similar to the other Anthidiine groups (*S. louisae*), White Group has no markings on the head/thorax and markings on abdomen are clearly white.



*Stelis louisae* - Female

## Field Marks

### Both Sexes

- Robust, black integument
- Yellow Group with **bright yellow markings** throughout body and legs
  - Head, top, back edge with no yellow markings or a single yellow mark in the center.
  - Abdomen with completely traversing, thin, variable in width, yellow or **yellowish stripes** on at least segments 1,3,4 and with large oblong/circular markings on the sides of 2
  - Face with linear, **strap-like**, yellow markings that run up the inside of the eyes to about the top of the eyes
- White Group with **no markings** at all on head/thorax
  - Abdomen with **traversing white stripes** in the super rare *S. nitida*
  - The more regularly occurring, very small species, *S. lateralis* may have **white circular** to widely separate linear markings on segments 1-3 and a series of up to 6 white dots or more extensive transverse lines on the 4th and 5th segments

### Female ♀

- Abdomen, underside, lacks pollen carrying hairs

<b>Flight Season</b>	Late spring to fall, primarily summer
<b>Size Relative to Honey Bee</b>	¾ – 0.5X
<b>Position of Wings Feeding on Flowers</b>	Held at 45° to body
<b>Location of Pollen Carrying Hairs</b>	Underside of abdomen
<b>Nest</b>	None, nest parasite
<b>Flowers</b>	Nectars on a variety of flowers

## Similar Genera

- Yellow Group can be told from other Anthidiini by the linear rather than broken transverse yellow stripes on abdominal segments 1,3,4.
- White Group - Shape similar to *Osmia*, *Hoplitis* and *Megachile* but neither of those genera have any white markings on the abdomen. Note that shape of the tip of the abdomen is flattened more than similar genera.

*Stelis lateralis* – Female*Stelis lateralis* – Female*Stelis lateralis* – Female*Stelis louisae**Stelis louisae**Stelis louisae**Stelis louisae**Stelis nitida**Stelis nitida*

# Coelioxys

## Leaf-Cutting Group

(~17 species expected in Ohio)

Nest parasites of *Megachile*. Females are easy to recognize with their long pointed abdomen and a close look at the multiple spikes at the hind end of the males also makes them similarly easy to identify.



*Coelioxys rufitarsis* - Female

## Field Marks

### Both Sexes

- Completely black integument except some species' legs reddish/orangish all or in part
- Abdomen with thin transverse band of prone, small, bright white hairs along the abdominal rims
- Thorax, top, rear edge, to either side are two small triangular pointed segments (axillae) that project slightly outward and are noticeable on close inspection
- Body gradually tapers from thorax to end of abdomen in width
- Our only other genus that has hairy eyes

### Female ♀

- Abdomen is unusually extended and comes to a distinct triangular point

### Male ♂

- Abdomen not as extended as female, but still tapers sharply and last segment is arrayed with 4 - 8 distinctive, rearward projecting point

<b>Flight Season</b>	Late spring to fall
<b>Size Relative to Honey Bee</b>	0.5X
<b>Position of Wings Feeding on Flowers</b>	Can be out 45° from the body when just landed or overlapping on the back
<b>Location of Pollen Carrying Hairs</b>	None, nest parasite
<b>Nest</b>	Parasitizes the nests of <i>Megachile</i>
<b>Flowers</b>	Visits a wide variety of plants for nectar, often seen on mints and composites

**Similar Genera**

*Megachile* - Visually the closest but lack the tapered body, triangular axillae, pointed end of the female or multiple spines at the end of the male.



*Coelioxys alternatus* – Male



*Coelioxys alternatus* – Female



*Coelioxys coturnix* – Female



*Coelioxys germana* – Male



*Coelioxys modestus* – Male



*Coelioxys octodentatus* – Male



*Coelioxys porterae* – Male

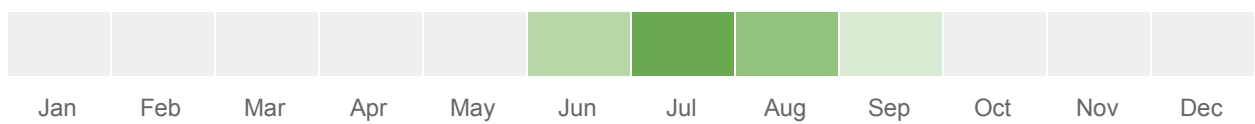


*Coelioxys sayi* – Female



*Coelioxys sayi* – Female

**Flight Season**



# Megachile

## Leaf Cutting Group

(~30 species expected in Ohio)

A complicated group. Primary flight season Summer and Fall, range from small to very large, colors, habits, morphological features equally diverse. Technical characters such as lack of toe pads or presence of cutting edges of mandibles are nearly impossible to see in the field. From a field perspective *Megachile* can be divided into a Wide-Bodied Group and a Narrow-bodied Group. The Narrow-bodied group overlaps greatly with the characteristics of *Hoplitis* but separation is possible most of the time.



*Megachile latimanus* - Female

## Field Marks

### Both Sexes

- Completely black integument (except in some males which can have pale front tarsi and tarsal segments, these usually immensely expanded in width)
- Hairs can be white, brown, tan, black, orangish, but most commonly off-white
- Compared to other black members of Megachilidae on average **larger, hairier, wider, mid- and hind-legs stouter, out later in the year, and much more common**
- **Abdomens held rigidly straight** behind them, does not sag downward; **females will often arch/curl their abdomens up/backwards** exposing pollen or pollen carrying hairs

### Female ♀

- **Mandibles wide**, stout, shear-like

### Male ♂

- Mandibles less massive than female but still prominent
- Some have greatly expanded pale front tarsal segments

<b>Flight Season</b>	Spring to fall, primarily summer
<b>Size Relative to Honey Bee</b>	0.5 – 1.5X
<b>Position of Wings Feeding on Flowers</b>	45° angle to body in Wide-Bodied Group but often overlapping in Narrow-Bodied Group
<b>Location of Pollen Carrying Hairs</b>	Underside of abdomen
<b>Nest</b>	Nests in holes in wood or in the ground. Nest partitions made of leaves, petals, mud, or resin



<p><b>Flowers</b></p>	<p>Wide range, numerous plant specialists</p>
<p><b>Similar Genera</b></p>	<ul style="list-style-type: none"> <li>• <i>Hoplitis</i> - All but <i>H. anthocopoides</i> are strictly spring flying species and not out after mid-June. Hairs always white. Most common species are smaller than almost all the <i>Megachile</i> species. Thorax and abdomen narrower than Wide-Bodied Group. ♂ Some males have antennae with hooked tips or antennae with middle segments wider than surrounding segments. Abdomen with pointed or shovel-shaped flange-like tips to abdomen; these are often difficult to see in the field. Abdomen, base of segments, never with a band of dense white hairs, but the Narrow-Bodied Group <i>Megachile</i> males do.</li> <li>• <i>Osmia</i> - All of the <i>Osmia</i> species have metallic blue-green glints to their integument to some extent, however some of the large species can appear essentially black in certain lights. Only in May and early June is there some overlap with dark <i>Osmia</i>. These dark <i>Osmia</i> are usually rusty to light tan in hair color (<i>O. taurus</i>, <i>O. cornifrons</i>) but there remains the large, dark <i>O. bucephala</i> which has thick white hair on the head and thorax and white hair on only the first part of the top of the abdomen. Only 2 <i>Megachile</i> have a pattern similar to <i>O. bucephala</i> (<i>M. gemula</i>, <i>M. mucida</i>) the males of which have distinct huge expanded front tarsal segments that are absent in all <i>Osmia</i>. Female <i>O. bucephala</i>, upon very close inspection, have a distinct thickened rim of the clypeus and less massive mandibles.</li> </ul>



*Megachile brevis* – Female



*Megachile campanulae* – Male



*Megachile exilis* – Male



*Megachile latimanus* – Male



*Megachile mendica* – Female



*Megachile mendica* – Female



*Megachile petulans* – Female



*Megachile pugnata* – Female



*Megachile pugnata* – Female



*Megachile rotundata* – Male

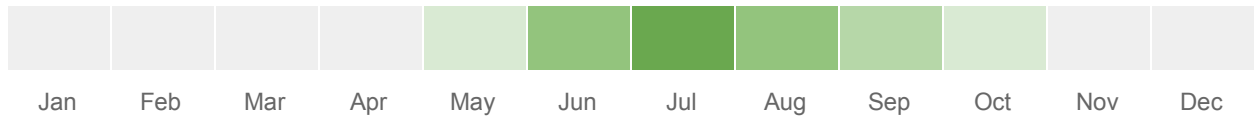


*Megachile sculpturalis* – Female



*Megachile xylocopoides* – Female

### Flight Season



# Chelostoma

## Thin Megachilidae Group

(~3 species expected in Ohio)

The extremely thin *Chelostoma* is predesigned to fit into narrow wood boring beetle holes.



*Chelostoma philadelphi*

Photo: MaLisa Spring

## Field Marks

### Both Sexes

- Completely **black**
- Size of a **grain of rice**; body **long and narrow**; head, thorax, abdomen all about the same width
- **Face unusually long**
- Mandibles long, robust
- Eyes long and inner edges parallel to one another

<b>Flight Season</b>	May
<b>Size Relative to Honey Bee</b>	0.5X
<b>Position of Wings Feeding on Flowers</b>	Overlapping
<b>Location of Pollen Carrying Hairs</b>	Underside of abdomen
<b>Nest</b>	Small beetle holes
<b>Flowers</b>	Possibly associated with Osage-Orange ( <i>Maclura pomifera</i> ), have unknown wild pollen sources.
<b>Similar Genera</b>	<ul style="list-style-type: none"> <li>• <i>Hylaeus</i> - About the same shape. Face and legs, and usually the thorax with yellow/white markings. Face shorter and inner edges of eyes strongly narrow towards mandible. ♀ Carries pollen internally.</li> <li>• <i>Heriades</i> and small <i>Hoplitis</i> - Comparatively stouter and shorter, but not by much, have clear, but narrow, bands of prone, small, bright white hairs on the rims of the abdominal segments. <i>Heriades</i> flight primarily after May</li> </ul>



*Chelostoma* are long, slender black bees with robust mandibles. Their face is also long, with inner eye margins that are parallel to one another.

### *Chelostoma*



### Compare with *Hoplitis*



*Chelostoma* have a long scutum compared to most bees. It's at least as long as it is wide.

### Flight Season





# *Heriades*

## Thin Group

(~3 species in Ohio)

Small cavity nesting bees that superficially look like small *Hoplitis*.



*Heriades leavitti* - Male

## Field Marks

### Both Sexes

- Completely black integument
- **Body relatively narrow**, slightly elongate but roughly **cylindrical** in shape
- Abdomen straight-sided; tapering to its end abruptly; with **narrow bands** of prone, bright white, short hairs along rims of abdominal segments
- Thorax and abdomen, pits throughout large, deep, and obvious
- Thorax, top, rear where segment falls off vertically towards joint with abdomen, close inspection will show a series of large, **squarish pits** along that border

### Male ♂

- Antennae unmodified

<b>Flight Season</b>	Late spring to fall, primarily summer
<b>Size Relative to Honey Bee</b>	0.5X
<b>Position of Wings Feeding on Flowers</b>	Overlapping
<b>Location of Pollen Carrying Hairs</b>	Underside of abdomen
<b>Nest</b>	Beetle holes in wood, pithy stems like Sumac
<b>Flowers</b>	Can be found on a wide variety of flowers



**Similar Genera**

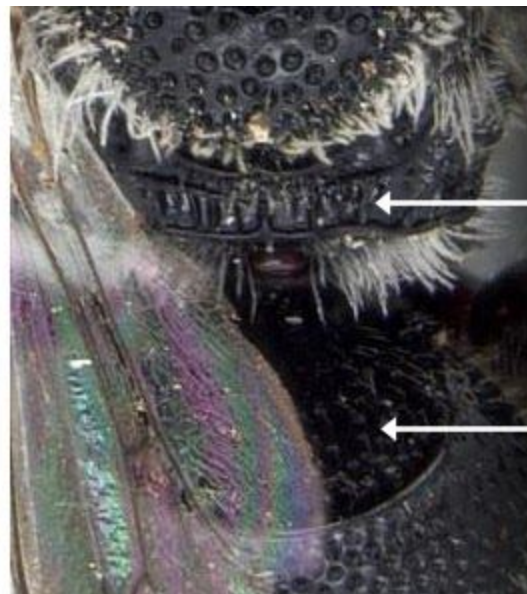
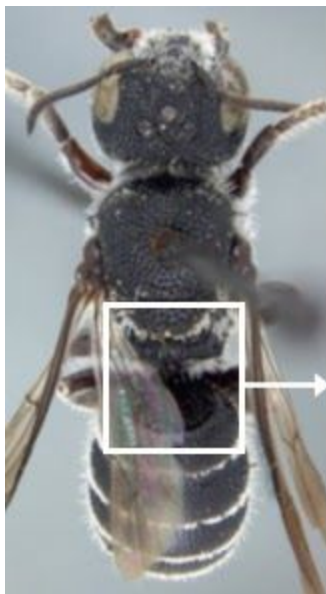
All the following lack the row of large squarish pits at the top rear of the thorax, but this character can be hard to see in the field.

- *Hoplitis* - Spring bee, flight times overlap with *Heriades* only in June (except for the introduced, uncommon, and larger *H. anthocopoides* which is out in July). Thorax, abdomen, pits noticeably smaller and less prominent everywhere. Body shape subtly wider and less cylindrical; abdomen tapers over a slightly longer interval towards the tip.
- *Megachile* - Far wider and all species at least a little bit larger. Wings usually carried to the sides when on flowers.
- *Chelostoma* - Much narrower. Abdomen lacks hair bands. Out only in May there are only a few *Heriades* records from late May.



*Heriades* have **narrow, elongate bodies** and **narrow bands of short, bright white hair** on their abdomens. *Heriades leavitti* male pictured above.

The thorax and abdomen have **large, deep pits**.



Dorsal surface of propodeum is a row of large, rectangular pits

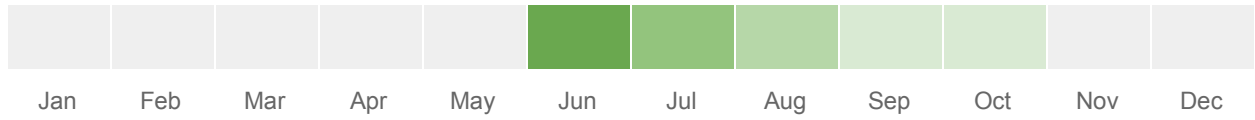
Anterior surface of T1 is strongly concave

Photo: Smithsonian Institution



*Heriades carinata* - Female

Flight Season



# Hoplitis

## Mason Bee Group

(~6 species expected in Ohio)

A nondescript blackish bee, *Hoplitis* are easily overlooked and not often reported in Ohio. They are an exciting find for Ohio bee enthusiasts who are used to seeing hundreds of *Lasioglossum*.



*Hoplitis spoliata* - Female

## Field Marks

### Both Sexes

- Completely black integument
- **Abdomen with thin transverse bands** of prone, short, white hairs along the rims
- No standout features

### Male ♂

- Have modified **flange-like last segments of abdomen** that can vary from pointed to shovel like, but often difficult to see in the field

<b>Flight Season</b>	Spring to early summer ( <i>H. anthocopoides</i> is found in mid-summer on Viper's Bugloss)
<b>Size Relative to Honey Bee</b>	0.5 – 0.75X
<b>Position of Wings Feeding on Flowers</b>	Completely overlapping
<b>Location of Pollen Carrying Hairs</b>	Underside of abdomen
<b>Nest</b>	In the soft pith of broken plant stems or in beetle holes in wood
<b>Flowers</b>	A wide range of herbaceous plants

## Similar Genera

- *Heriades* - Narrower; more cylindrical body. Abdomen straight-sided coming to a more abrupt point. Thorax and Abdomen pit size greater. Smaller than many *Hoplitis*. Flight season primarily after *Hoplitis* is finished.
- *Megachile* - ♀Wide-bodied Group, relatively wider, with a more compact body. Wings held out to sides at 45° angle. Abdomen of most species tapers uniformly and gradually toward the tip. Narrow-bodied Group, very similar in size, shape, and aspect to *Hoplitis* in the field. Summer species, flight season overlaps only in May/early June. ♂Tricky, can both hold their wings at a 45° or over their backs. Even the Wide-body group males are relatively narrow in body shape. Some males have greatly expanded pale front tarsi, brown/tan hairs or dense long hair on the top of thorax, none of which occur in *Hoplitis*. All species have relatively truncated abdomen ends, blunt in shape, never pointed.



The *Hoplitis* of Ohio are small, black, nonmetallic bees. They have thin bands of short, bright white hair on their abdomens. *Hoplitis pilosifrons* female pictured above.



The antennae of male *Hoplitis* are often modified. The last antennal segment of *H. truncata* (top) curves and tapers to a point. *H. spoliata* (bottom) has a greatly enlarged scape, widened segments in the middle of the antenna, and narrow segments towards the end.





*Hoplitis truncata* - Female



*Hoplitis truncata* - Male

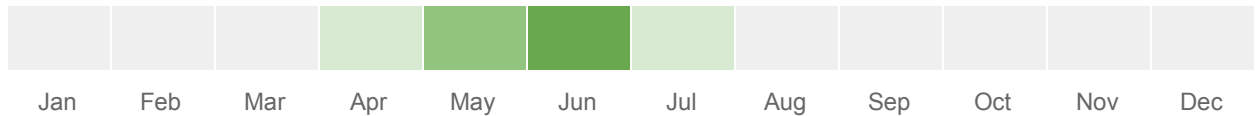


*Hoplitis spoliata* - Female



*Hoplitis spoliata* - Female

Flight Season





# Osmia

## Mason Bee Group

(~22 species expected in Ohio)

Common spring bees, found in woodlands to fields, and are regular visitors of gardens, and particularly noticeable on blooming trees and shrubs. There are two morpho-groups: Large Dark species and Metallic Blue species.



*Osmia atriventris* - Female

## Field Marks

### Both Sexes

- Short, relatively wide
- Metallic Blue Group has clear dark metallic **blue to blue-green reflections** (sometimes with bronze/green overtones) and have **no or only vague bands of white hair on the abdomen**
- Large Dark Group has metallic reflections too, but these reflections are subtle and often difficult to see leaving the basic integument looking black. **Head/thorax hair either rusty to tan** (*O. taurus*, *O. cornifrons*) or thick and white (*O. bucephala*, which also has white on first part of abdomen).

<b>Flight Season</b>	Spring to early summer (rare, large, native thistle species <i>O. texana</i> emerges in summer)
<b>Size Relative to Honey Bee</b>	0.5 – 0.75X
<b>Position of Wings Feeding on Flowers</b>	Completely overlapping, though members of the Large Dark Group can have wings slightly to their sides
<b>Location of Pollen Carrying Hairs</b>	Underside of abdomen
<b>Nest</b>	In cavities
<b>Flowers</b>	Varies, some specialists, some generalists

## Similar Genera

- *Hoplitis* - All black integument. Hairs always white. Abdomen, at least a narrow, complete to incomplete, transverse white bands of hair across the rims of the abdomen. Most common species are smaller than Large Dark Group of *Osmia*. ♂ Some males have antennae with hooked tips or antennae with middle segments wider than surrounding segments. All males have pointed or shovel-shaped flange-like tip to abdomen, though these are often difficult to see in the field.
- *Megachile* - Abdomen of most with prominent narrow, white, transverse, incomplete to complete, bands of hairs across the abdomen. These are summer species and only in May and early June is there a little overlap outside of the rare thistle *Osmia* species. *O. bucephala* has thick white hair on the head and thorax, white hair only the first part of the abdomen, only 2 *Megachile* have that pattern (*M. gemula*, *M. mucida*) and will be hard to tell apart but the *Megachile* will tend to hold their wings out and up at 45° and the *Osmia* will have longer antennae and possibly show some blue metallic reflections.



Some *Osmia* have a metallic blue to blue-green sheen, sometimes with bronze overtones (like *O. texana* above). These *Osmia* have no or only vague bands of abdominal hair.



Some *Osmia* are only slightly metallic, and look more black generally (like *O. bucephala* above). The hair on their head and thorax is tan or white.

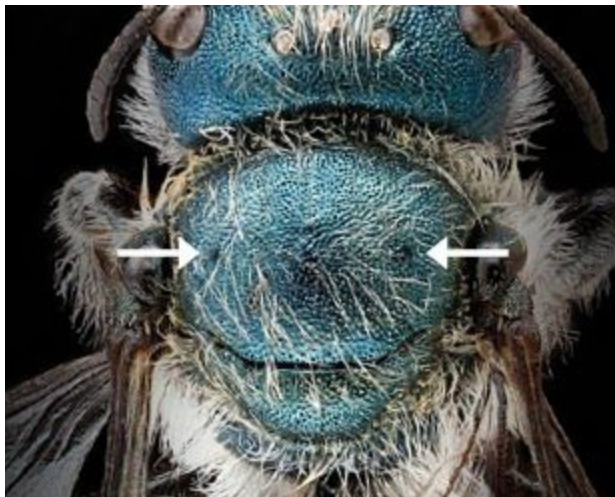


As with other Megachilidae, *Osmia* collect pollen under their abdomen. The color of pollen collecting hairs (scopa) is useful for some species determination.



Male *Osmia* have distinct mustaches that typically obscure their mandibles. The shape of the male forelegs are also a key character for lower level ID.

### *Osmia*



### Compare with *Hoplitis*



The **parapsidal lines** of *Osmia* are **small points or holes** instead of lines. While not easy to see, this feature distinguishes them from other genera in the Osmiini tribe, like *Hoplitis*.





*Osmia georgica* - Female



*Osmia lignaria* - Female



*Osmia bucephala* - Male

Photo: Amy Schnebelin



*Osmia cornifrons* - Male

Photo: Amy Schnebelin

### Flight Season

