Ground Nesting Bees

MaLisa Spring

Pollinator Specialization Course

Outline: (45 minutes)

- Bee Review
- Ground versus cavity nesting bees
  - Andrenidae
  - Apidae
  - Colletidae
  - Halictidae
  - Megachilidae
- Collecting and identifying specimens
- iNaturalist

Bee Review:

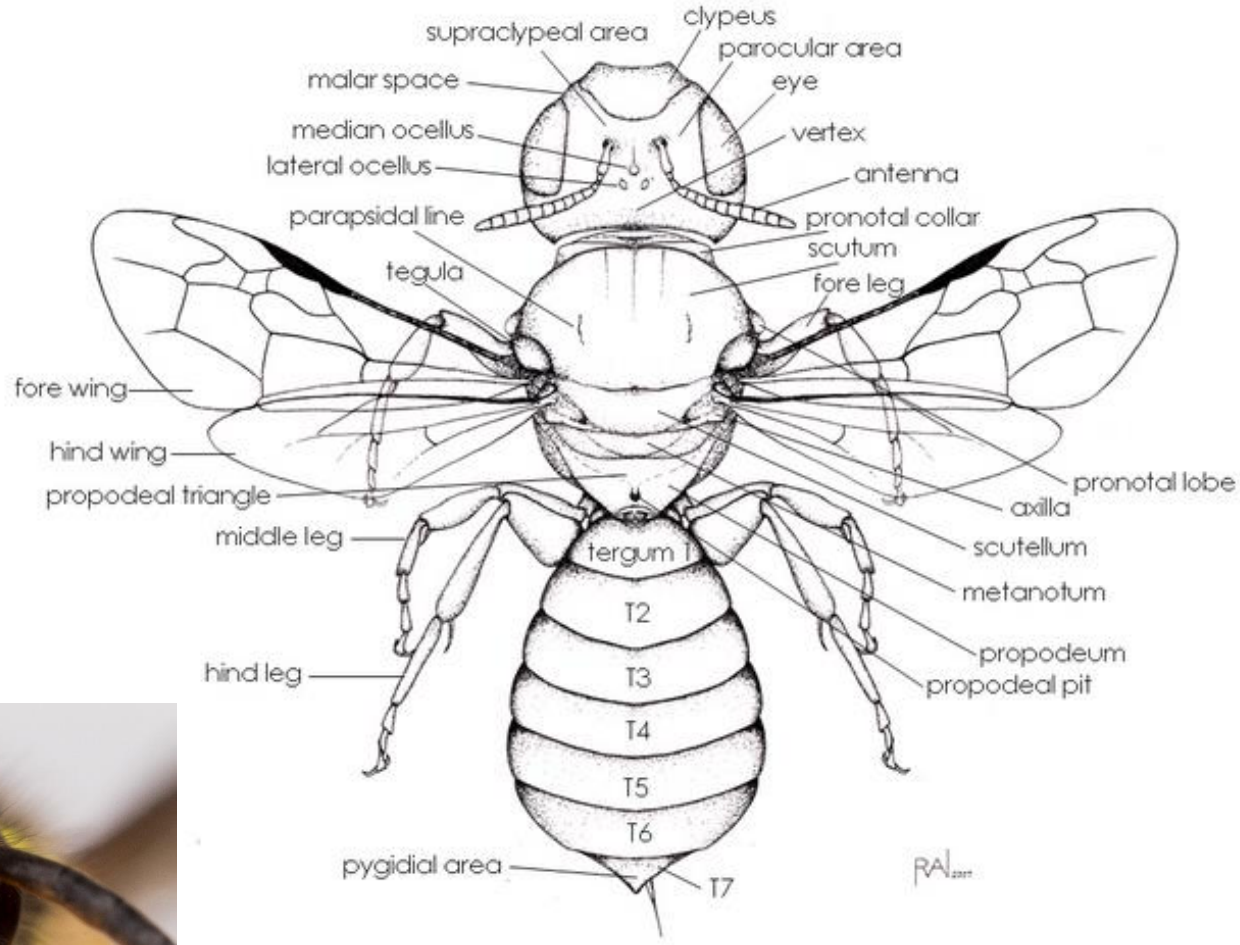
Bee Basic body plan:

2 pairs of wings

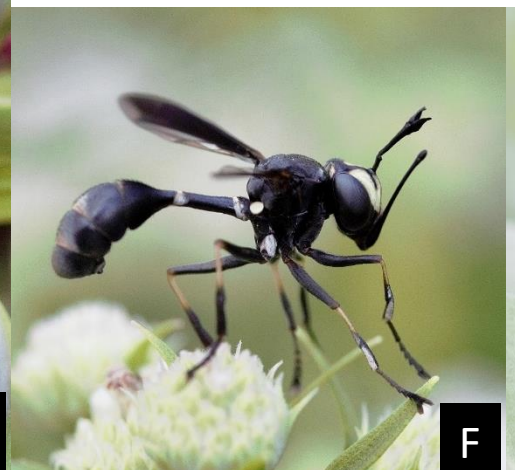
Restricted (thin) waist

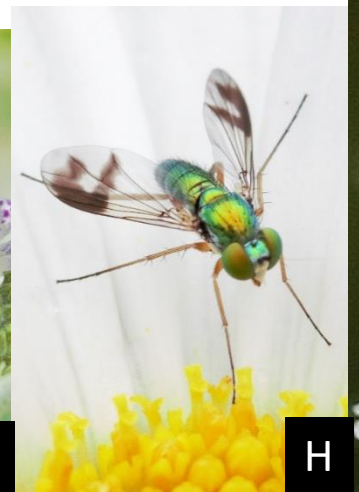
Fuzzy, branched hairs

More robust and hairy (generally)



Am I a bee?





Bee Review

- Ohio has ~400 species of bees!
  (US has ~4,000 species)
- A majority are solitary

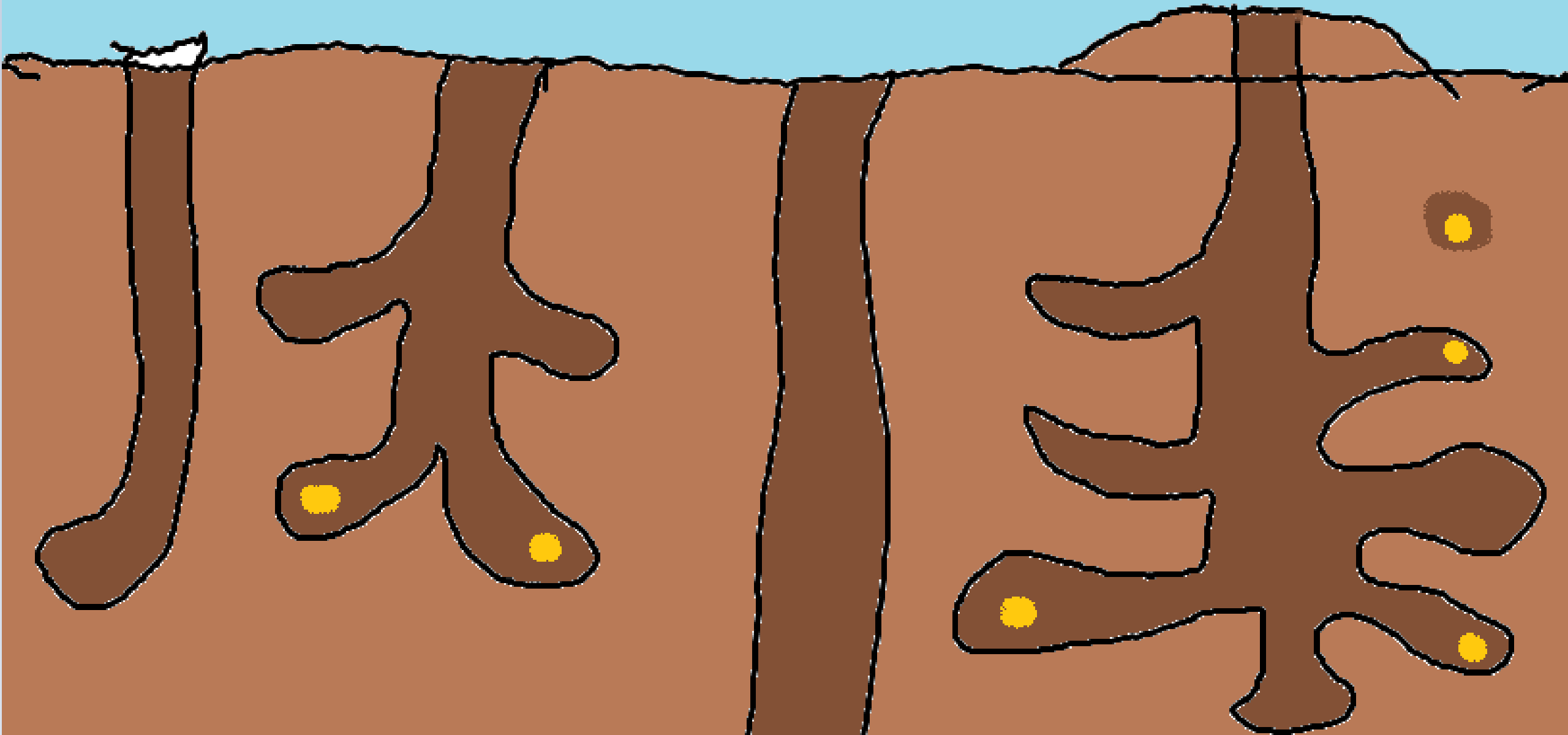
NOTE: Wasps are not bees

Bees = vegetarians
vs
Wasps = carnivores

~30% are cavity nesters

~70% of all bee species nest in the soil

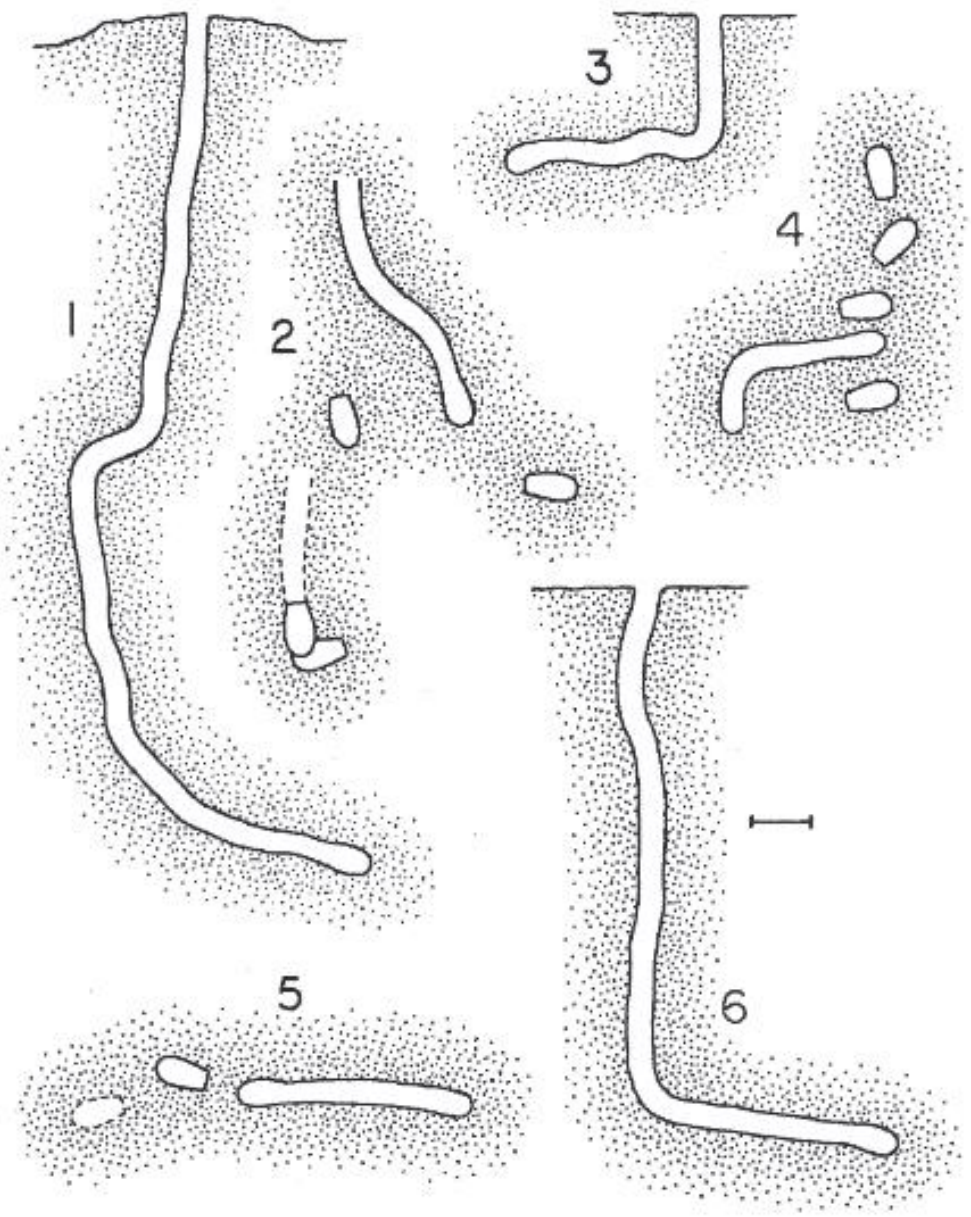
Types of Ground Nests



JOURNAL OF THE KANSAS ENTOMOLOGICAL SOCIETY
81(2), 2008, pp. 110–121

Observations on the Nesting Biology of *Andrena* (*Plastandrena*) *prunorum* Cockerell in Washington State (Hymenoptera: Andrenidae)

EUGENE MILICZKY
Yakima Agricultural Research Laboratory USDA-ARS,
5230 Konnowac Pass Road, Wapato, Washington, USA 98951
e-mail: Gene.miliczky@ars.usda.gov



Andrenidae – mining bees

- *Andrena* (116 species in Eastern NA)
  - Facial fovea
  - Armpit hair
  - Many (not all) pollen specialists

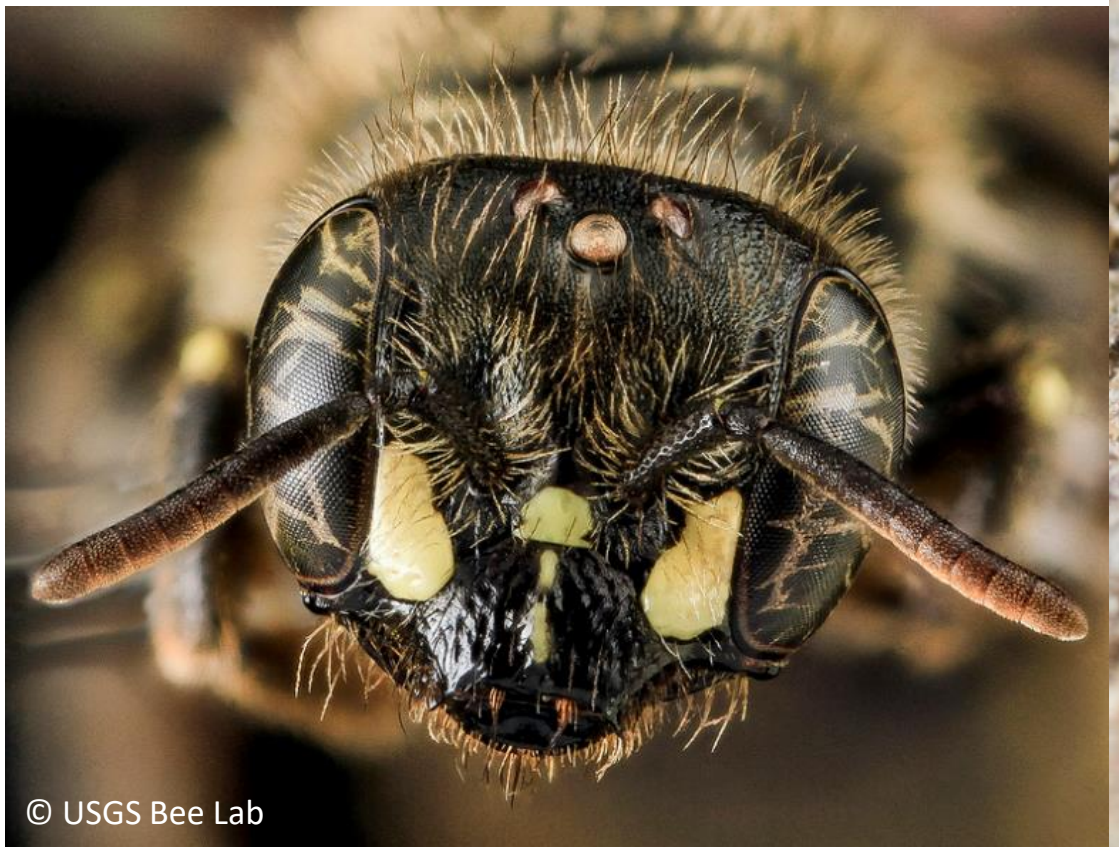

Andrena eriginae
Specialist of *Claytonia virginica*
© MaLisa Spring


Andrena hirticincta
© James Hung


Andrena nubecula
© James Hung

Andrenidae – mining bees

- *Calliopsis andreniformis*
- *Sand lovers*



Apidae:
Peponapis pruinosa

Squash bee
Soil nesting
Visits curcurbits

Males sleep in flowers overnight!

Avoid deep tilling so as to not disturb overwintering nests

Squash bee nests

- https://www.youtube.com/watch?v=WobQObH4oDE
- https://www.youtube.com/watch?feature=youtu.be&v=N5bHA6FbTvo&app=deskt

VOL. 41, NO. 2, APRIL, 1968 255

NEST CONSTRUCTION AND LIFE HISTORY OF THE EASTERN CUCURBIT BEE, *PEPONAPIS PRUINOSA* (Hymenoptera: Apoidea)[1]

JOHN A. MATHEWSON
Department of Plant Pathology-Entomology, University of Rhode Island, Kingston, Rhode Island 02881

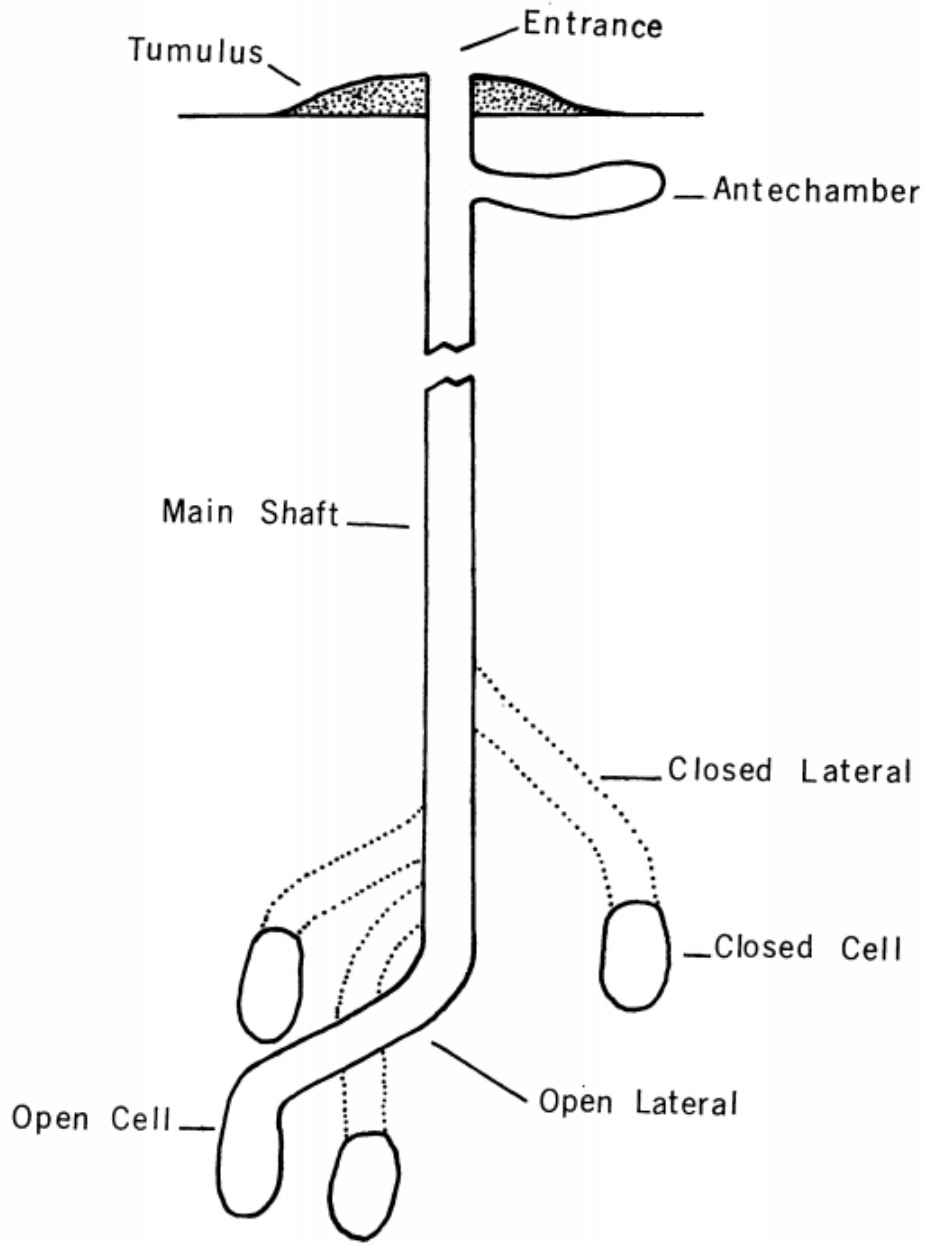


FIG. 1. *Peponapis pruinosa*. Structure of nest (diagrammatic).

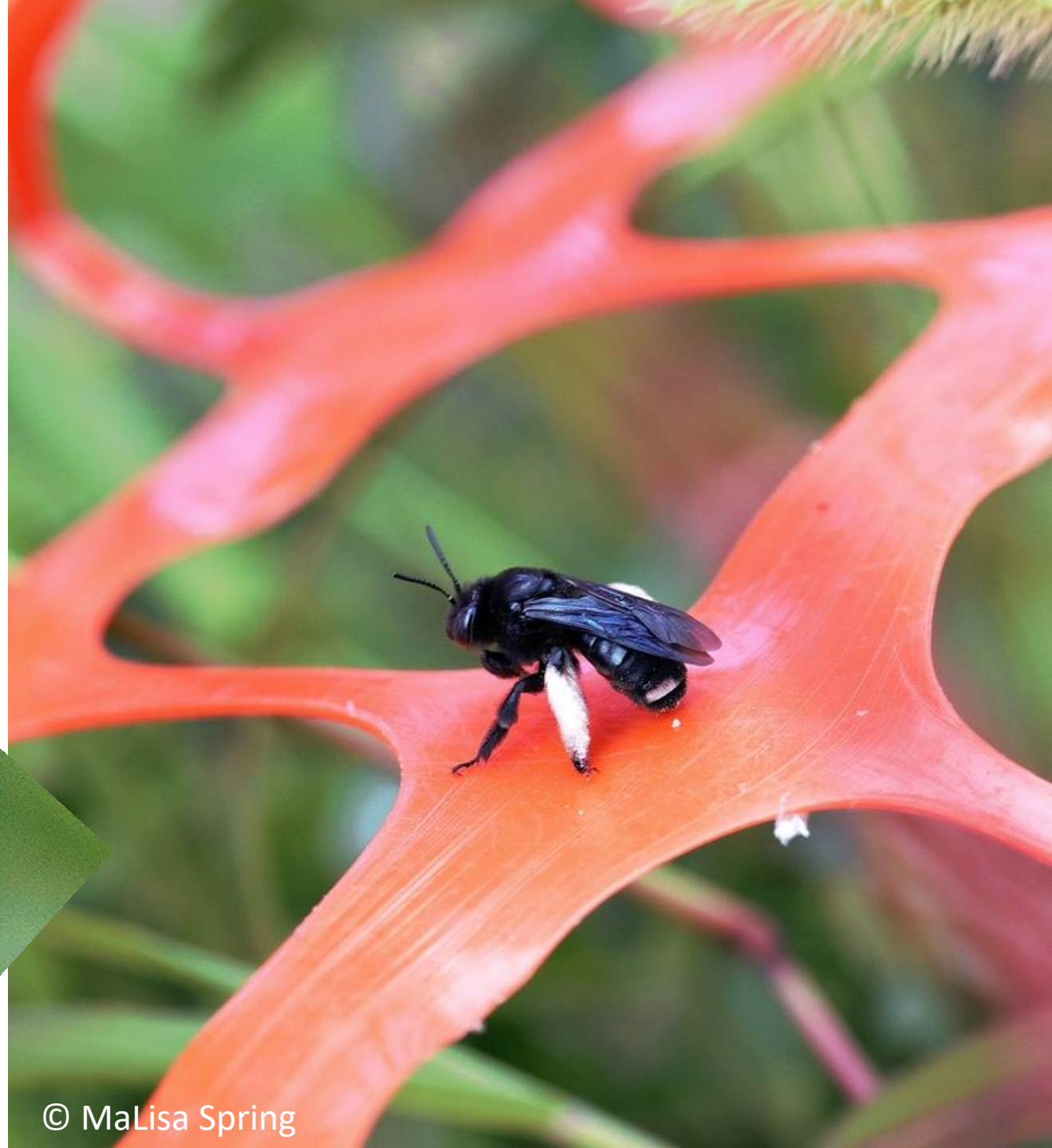
Anthorphora spp. and turrets

Apidae: *Melissodes sp.*
Longhorn bee

Melissodes sp.
Longhorn bee

Melissodes bimaculatus

Two-spotted Longhorn bee



Melitoma

- Clay slopes with chimneys
- *Ipomoea* and similar

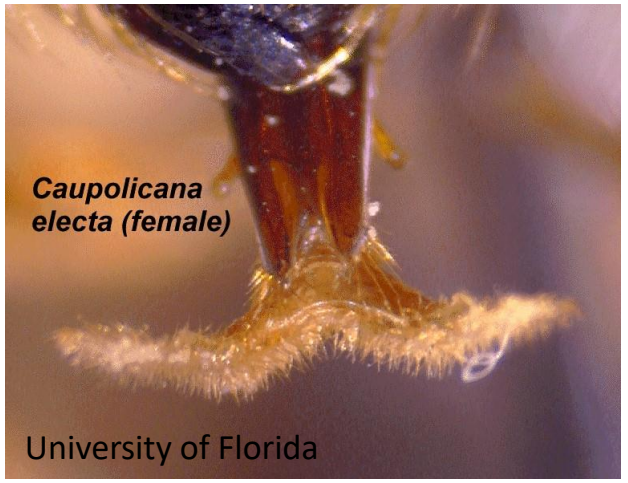
Holcopasites calliopsidis

Parasitic bees

Apidae: *Nomada* sp.

Colletidae – Polyester bees

- Named for nest types
- 2 common genera
  - *Colletes*
  - *Hylaeus*



Colletidae – Polyester bees

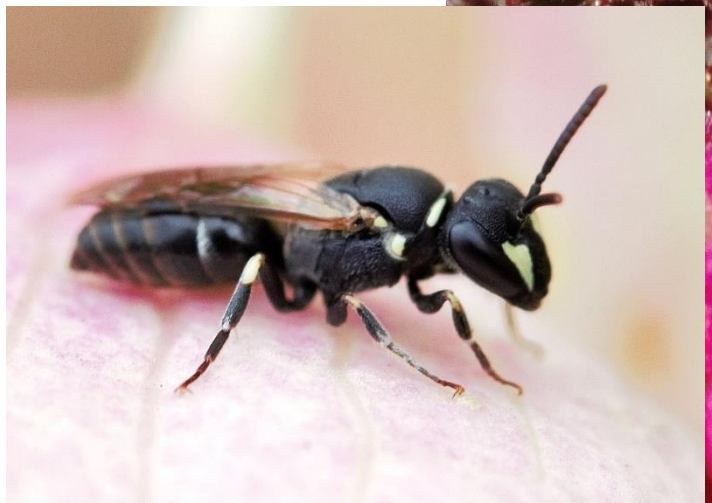
- *Colletes* (24 species in Ohio)
  - Similar to Andrena, but lack facial fovea
  - Wing venation
  - Hair banding

Colletidae – Polyester bees

- *Colletes*
  - Similar size to Honey bee
  - Heart shaped face
  - No facial fovea!
  - Distinct wing venation

Colletidae – Polyester bees

- *Hylaeus (24 species in Eastern NA)*
  - Small – TINY
  - Collect pollen in stomach
  - Male v female
  - Lots on Queen Anne's Lace
- STEM/CAVITY NESTERS!!



Halictidae – “Sweat” bees

7 genera easily identifiable

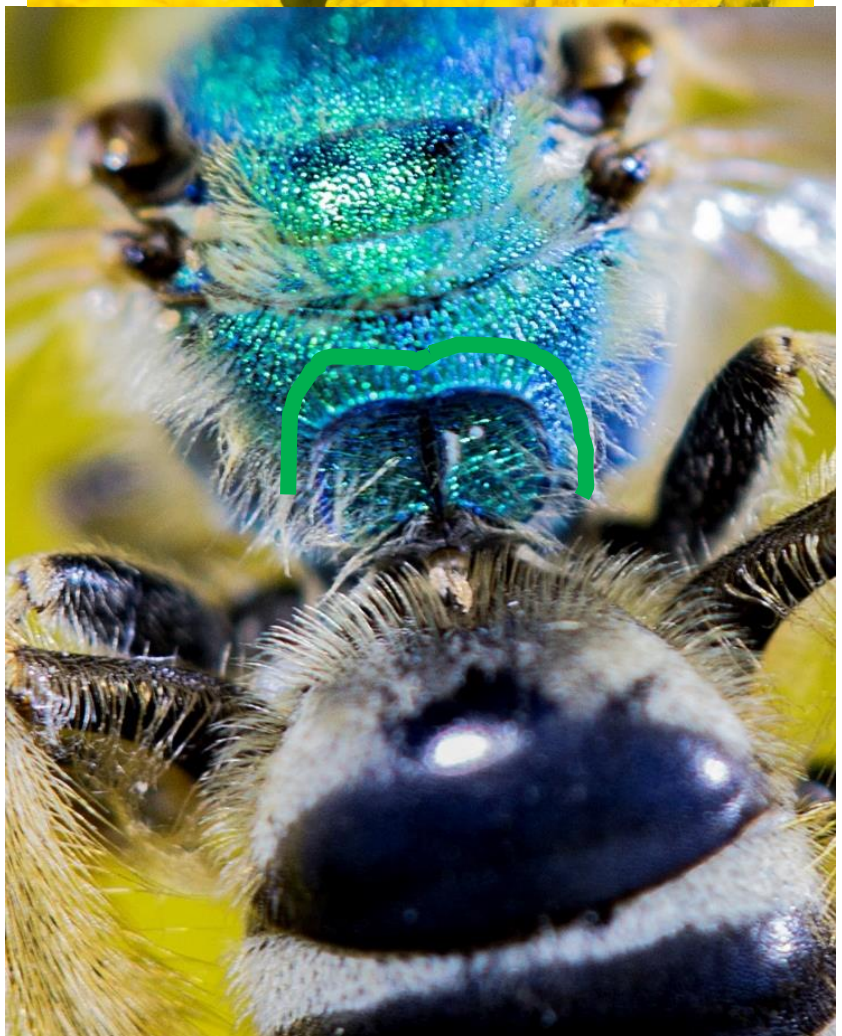
Racecar green bees

Dull green sweat bees

Cuckoo bees

Racecar Green Sweat bees

- *Agapostemon*
  - Largest racecar green bee
  - Raised carina (Peace ridge)
  - Black abdomen (sometimes)
  - Males – alternating black and yellow



Racecar Green Sweat bees

- *Agapostemon*
  - Largest racecar green bee
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  - Males – alternating black and yellow

A. virescens

Insectes Sociaux
June 1981, Volume 28, Issue 2, pp 105–116 | Cite as

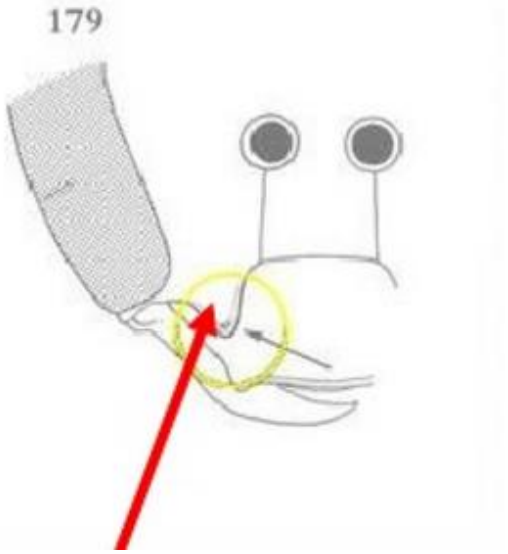
Nest switching and guarding by the communal sweat bee*Agapostemon virescens* (Hymenoptera, Halictidae)

Authors | Authors and affiliations

Judith Abrams, George C. Eickwort

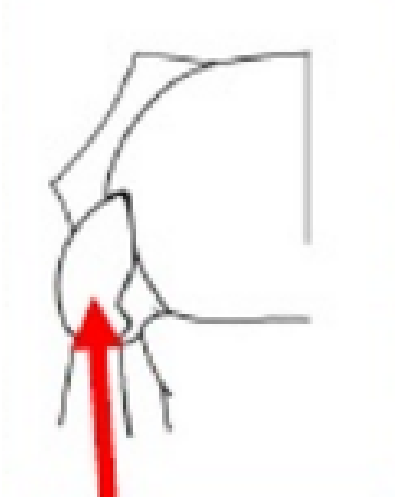
Racecar Green Sweat bees

- *Augochlora* – nests in decaying logs
- *Augochlorella*
- *Augochlorposis*



Racecar Green Sweat bees

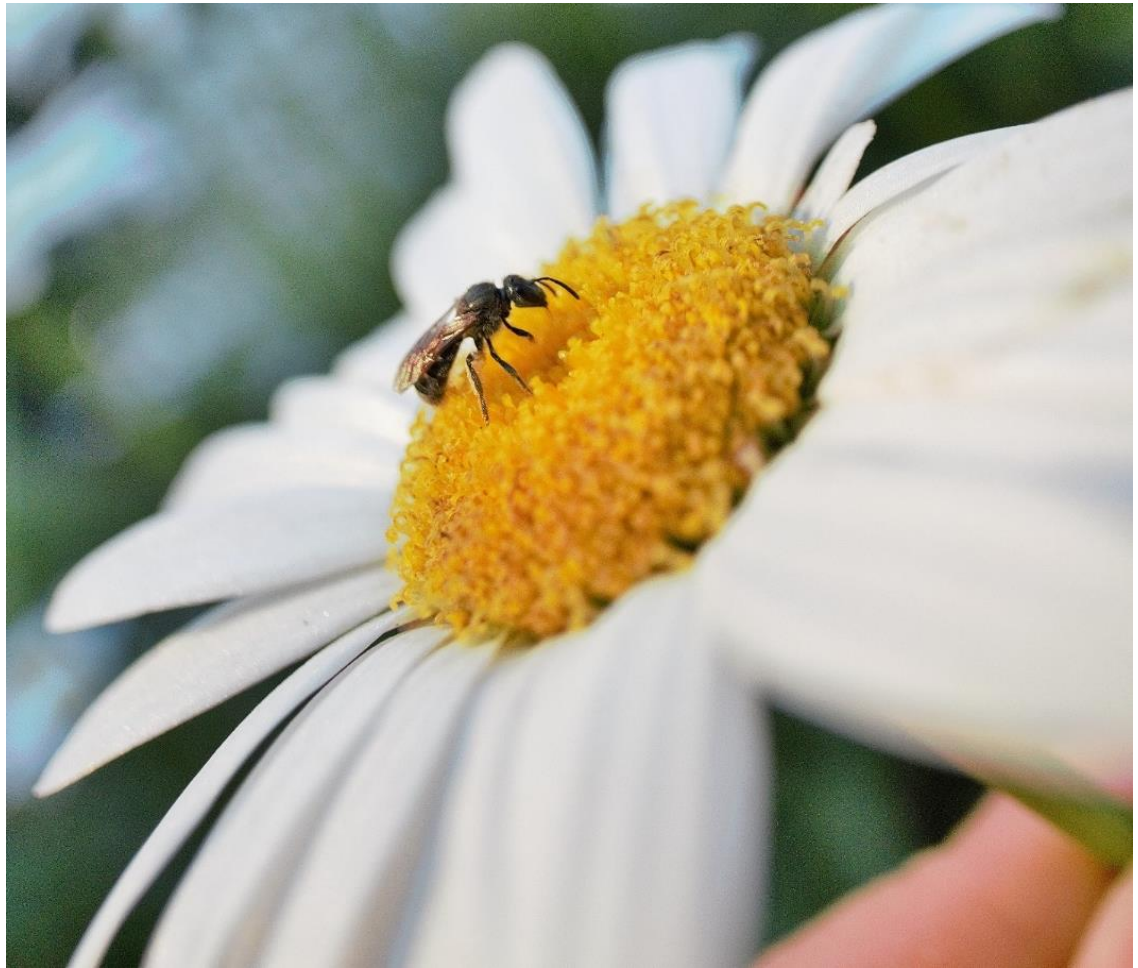
- *Augochloropsis*
  - Least common bright green bee
  - Non-oval tegula



Dull Green Sweat bees

- *Halictus*

- *Lasioglossum*

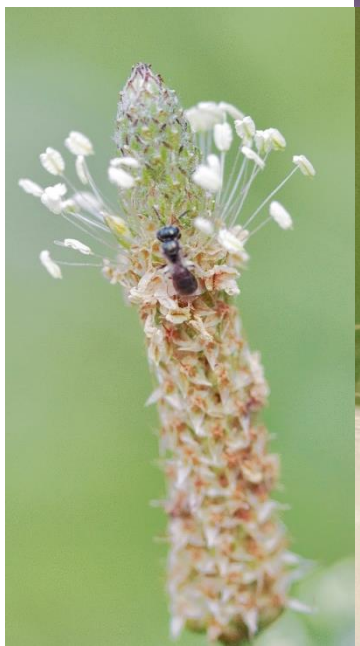


Dull Green Sweat bees

- *Halictus*
  - *H. ligatus* with distinct chin projections
  - *H. rubicundus*
  - *H. parallelus*
  - *H. confusus* looks like *Lasioglossum*

Dull Green Sweat bees

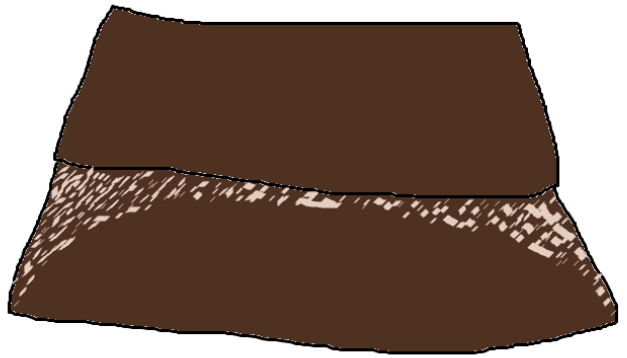
- *Lasioglossum*
  - Most common!
  - Super small – small
  - Wing venation + Hair banding
  - Species ID = Hardest.



Dull Green Sweat bees

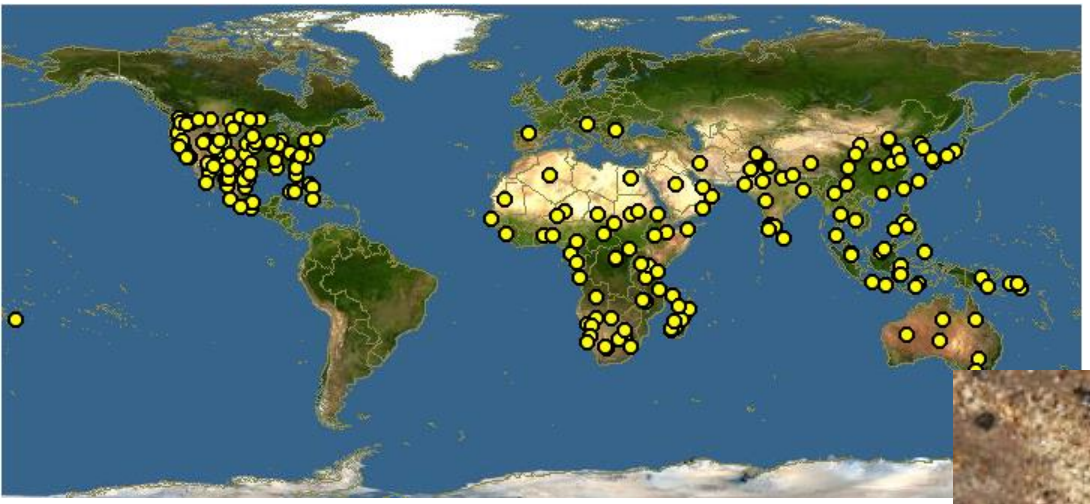
- *Lasioglossum*

Basal hairs (Base) = *Lasioglossum*
Apical hairs (away) ~= *Halictus*
(compare *Andrena* and *Colletes*)



Other sweat bees?

- Not common, but do exist
- *Nomia* (aka Alkali bee)



© James Cane

Megachilidae – mostly cavity nesters

- Leafcutting, Mason, and Wool Carder bees
  - Scopa on abdomen (Hairy stomach)
  - Boops flowers with hairs
- Leafcutting + Mason bees: triangular abdomen

Megachilidae – mostly cavity nesters

FORUM

Substrates and Materials Used for Nesting by North American *Osmia* Bees (Hymenoptera: Apiformes: Megachilidae)

JAMES H. CANE,[1] TERRY GRISWOLD, AND FRANK D. PARKER

USDA–ARS Bee Biology and Systematics Laboratory, Utah State University, Logan, UT 84322-5310

ECOLOGY AND POPULATION BIOLOGY

Pollination, Foraging, and Nesting Ecology of the Leaf-Cutting Bee *Megachile* (*Delomegachile*) *addenda* (Hymenoptera: Megachilidae) on Cranberry Beds

JAMES H. CANE, DANIEL SCHIFFHAUER,[1] AND LINDA J. KERVIN

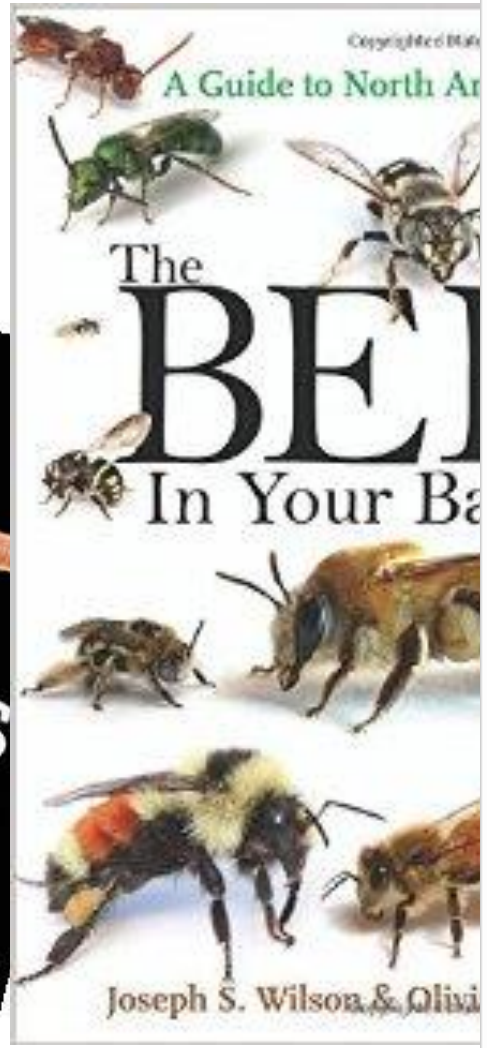
Department of Entomology and Alabama Agricultural Experiment Station, Auburn University, Auburn, AL 36849–5413

Bonus family! Melittidae

- *Macropis nuda* – oil collecting bee
- Need Yellow Loosestrife and sandy/loamy soil
- Solitary ground nesters
- Identification:
  - moderate sized
  - Two submarginal cells!
  - Apical hair bands

Resources?


Copyrighted Material
Bees
AN UP-CLOSE LOOK AT POLLINATORS AROUND THE WORLD
SAM DROEGE
LAURENCE PACKER
Copyrighted Material

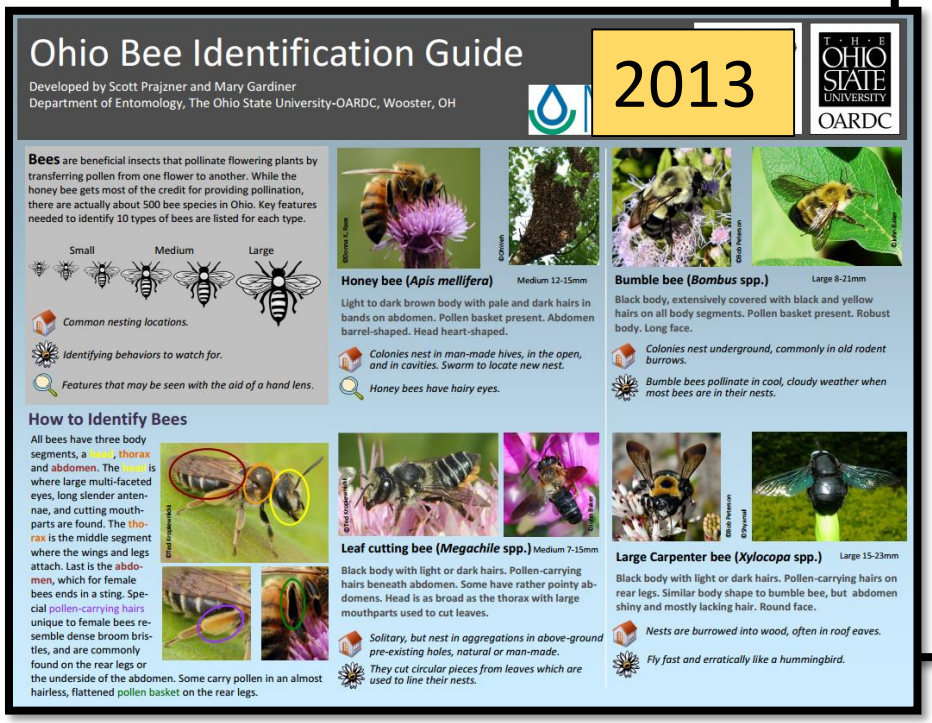

A Guide to North Ar
The BE
In Your Ba
Joseph S. Wilson & Olivi

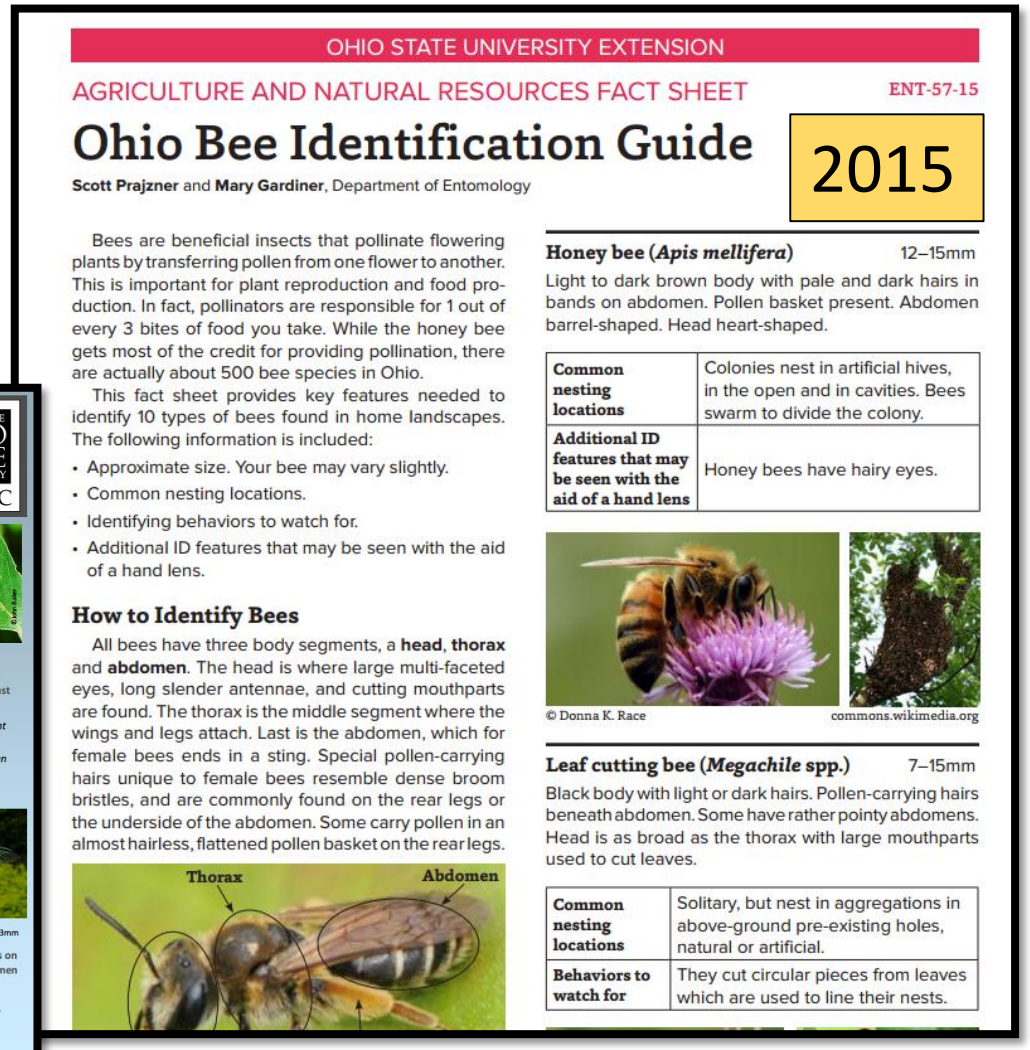

BACKYARD BEES OF NORTH AMERICA

Ohio Bee ID guide

Extension fact sheet

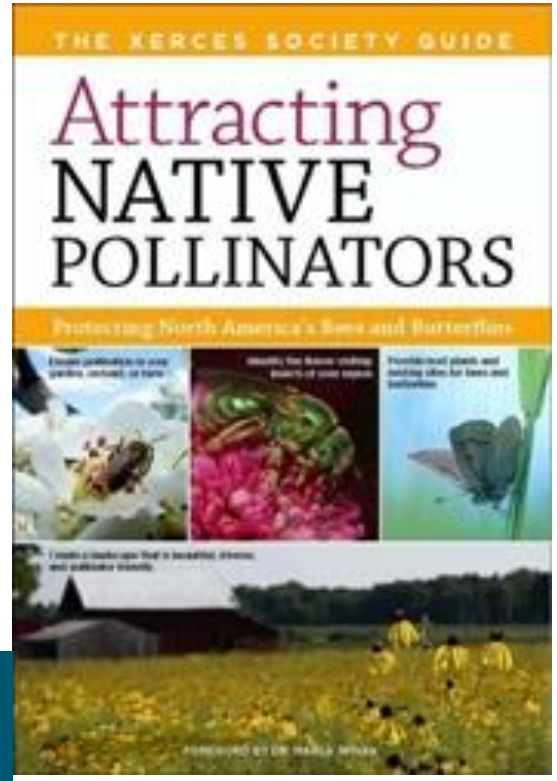
Various versions online

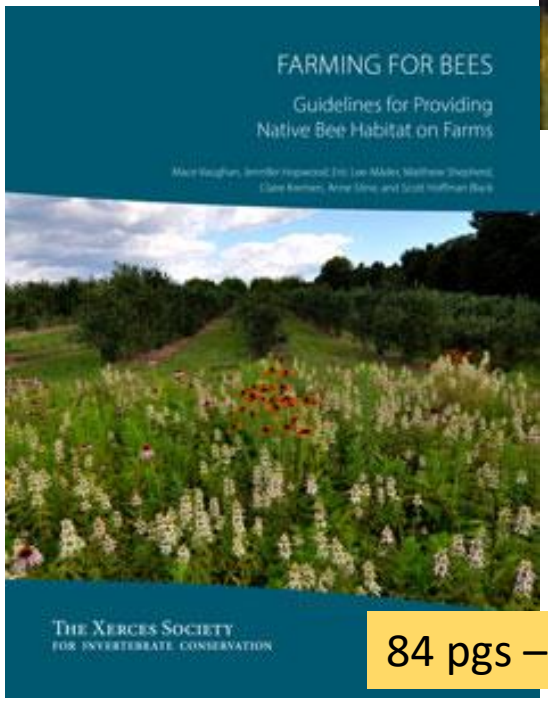




Xerces Society (Xerces.org)

- Pollinator Plant Lists
- Pollinator Conservation
- Pollinators and Agriculture
- Managing Pesticides to protect bees





84 pgs – free online!

Documenting Species

You can help!

- Photo submissions
- Physical collections

iNaturalist

Creating a voucher collection

- What is the goal of your collection?
  - Scientific vouchers
  - Outreach
  - Art displays

Example Label

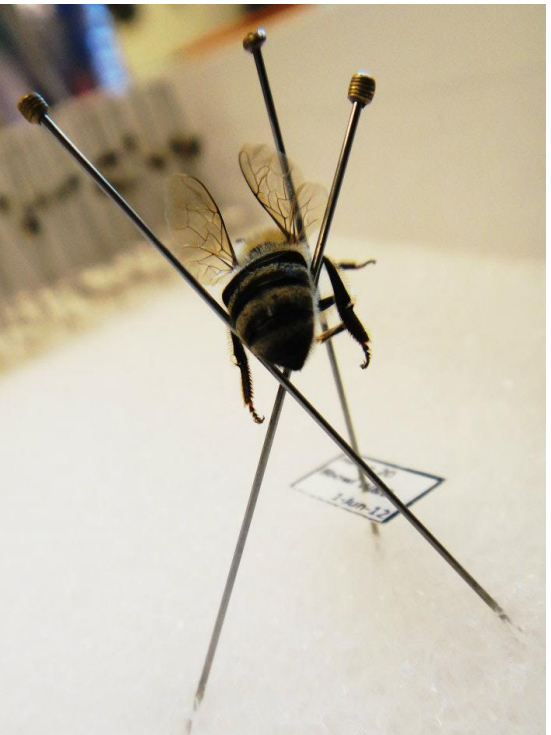
- Data Matters!
- Other info to include
  - Collection method
  - County
  - Project or Specimen #

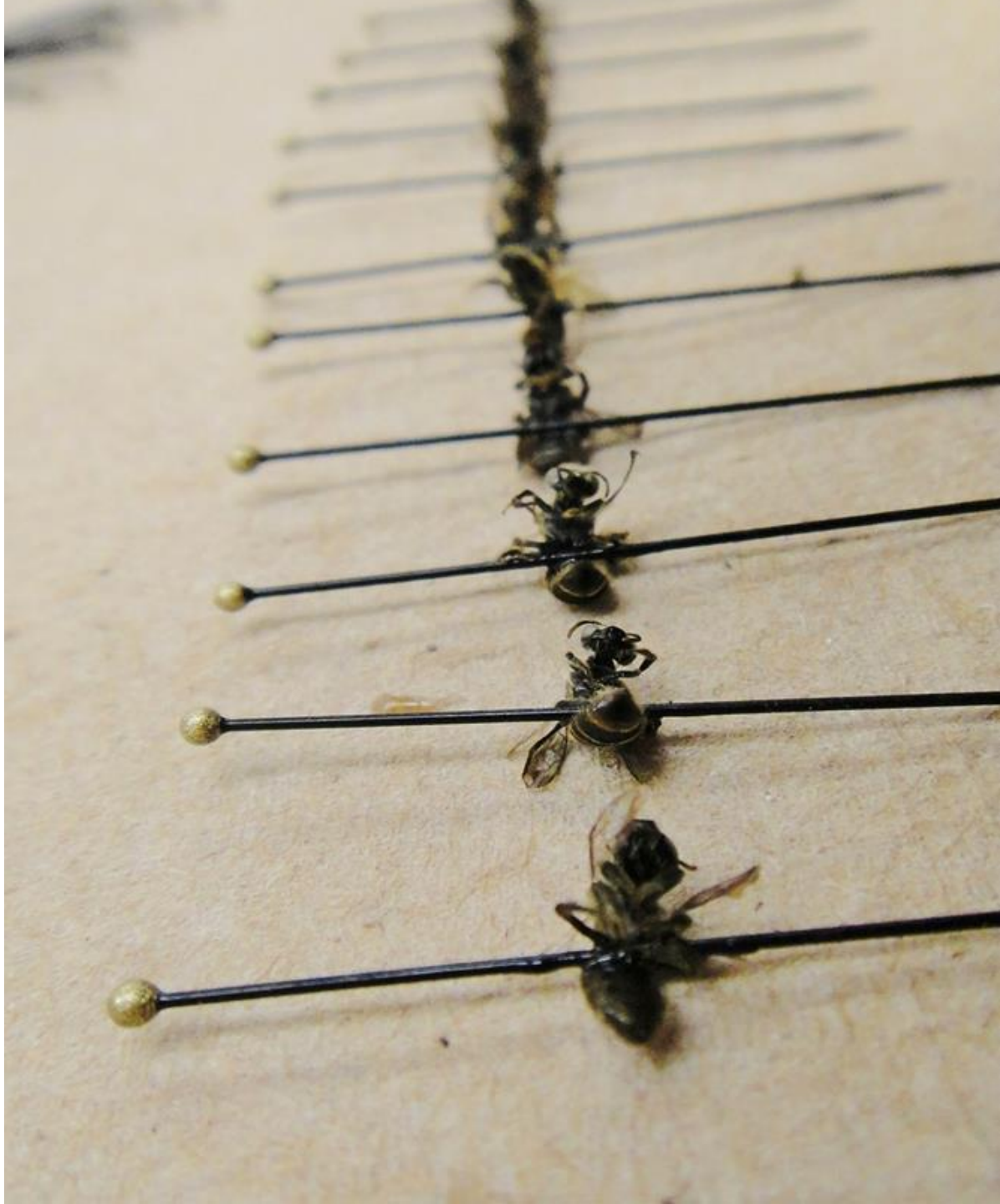
Columbus, Ohio: USA
Franklin Park Conservatory
39.96488, -82.95409
April 26, 2018
Collected on *Narcissus* sp. By
MaLisa Spring

Pinning Bees – pin by date/location

Pinning Bees

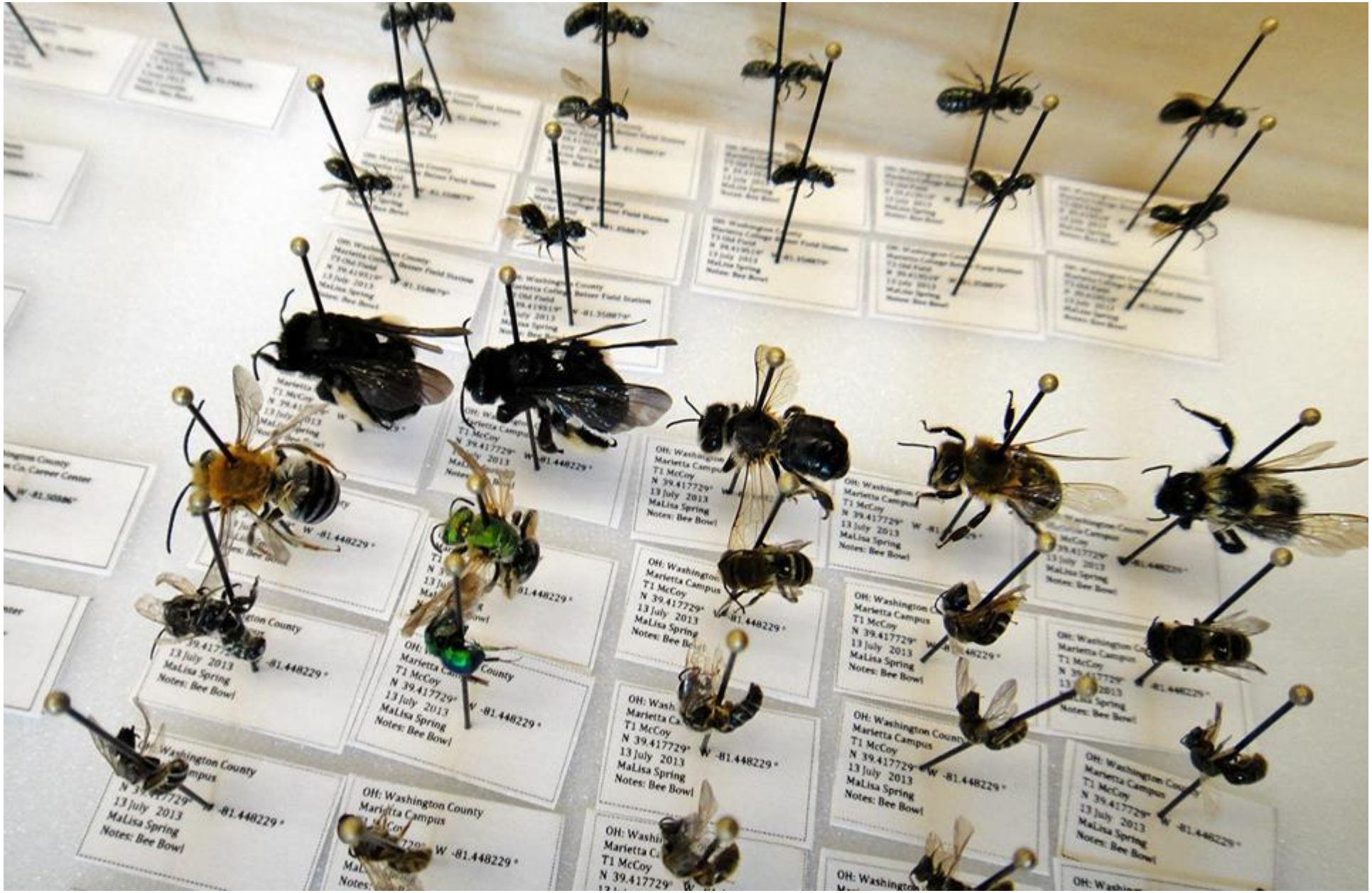
- Other tips:
  - If matted hairs (from bee bowls), do a gentle wash
  - Extra small bees can be glued to pins
    - Insect Repair Adhesive
    - Elmers Glue



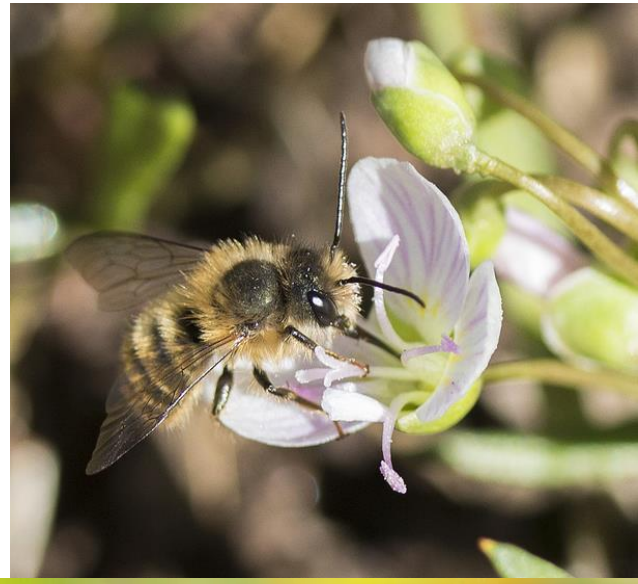


Pinning heights

Organization

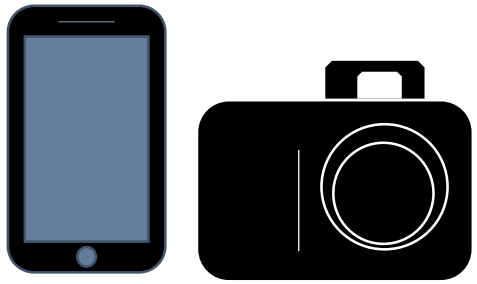

OH: Washington County
Marietta Campus
T1 McCoy
N 39.417729° W -81.448229°
13 July 2013
MaLisa Spring
Notes: Bee Bowl

iNaturalist – Photo Documentation



iNaturalist

- Phone app
- Computer



Ohio Dragonfly Survey (Ohio Odonata Survey)

Add observations to this project

Stats

Totals

12898 Observations »

140 Species »

405 People »

Most Observations


jimlem
1775 observations


smpvolunteer-jcannon
1166 observations


srmyers
979 observations


coachwhipbooks
712 observations


dmcshaffrey
577 observations

Most Species


ricknirschl
97 species


jimlem
89 species


smwhite
78 species


lgilbert
77 species


christopherswan
75 species

Most Observed Species

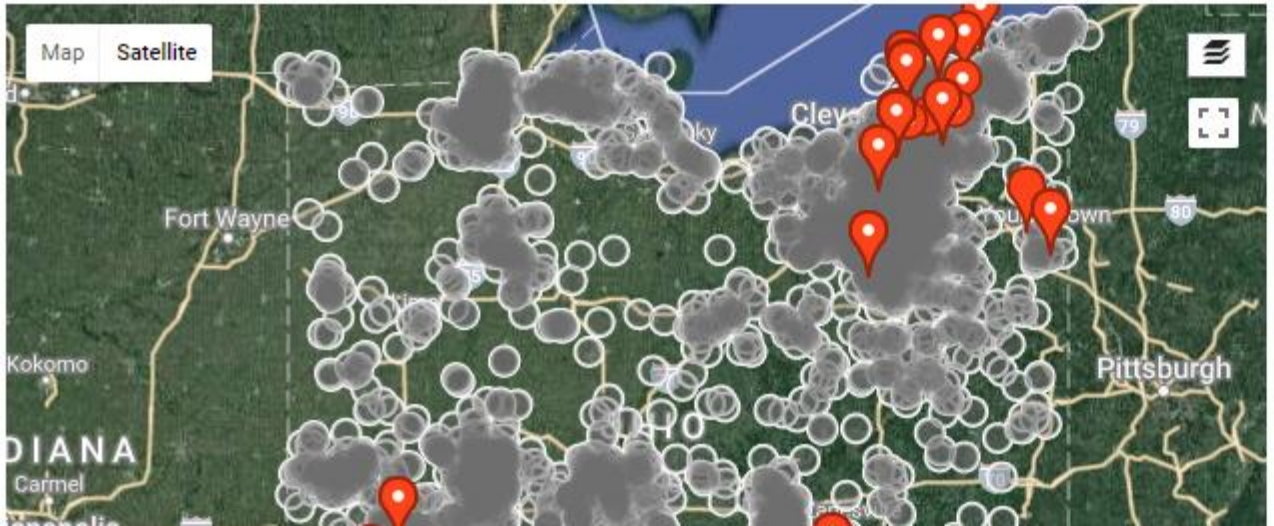

Eastern Pondhawk
866 observations


Blue Dasher
692 observations


Eastern Forktail
631 observations


Widow Skimmer
603 observations


Eastern Amberwing
516 observations



» Members 104 members

View all members »

» Your membership 313 observations

» Add from your observations

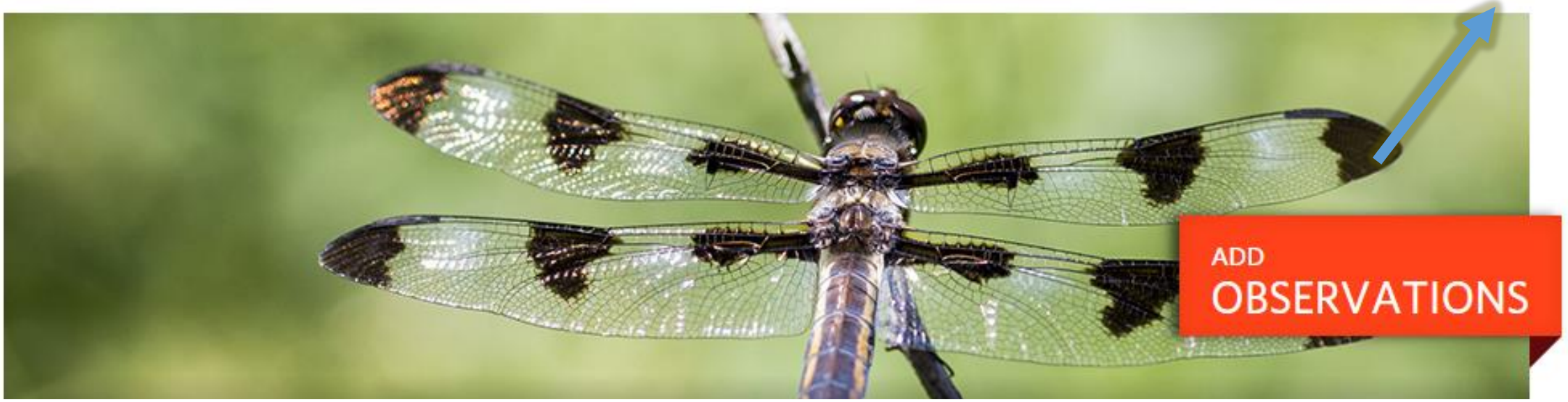
Download template for use in the bulk uploader

» Export observations

Atom / KML / CSV

« Projects

Terms & Rules | Join this project



Other

☑ Receive updates from this project

Receive updates about this project on your dashboard and in the daily updates email.

Do you want to make your private/obscured observation coordinates visible to the project curators?

◉ Yes, but only if I add the observation to the project myself.

○ Yes, no matter who adds the observation to the project.

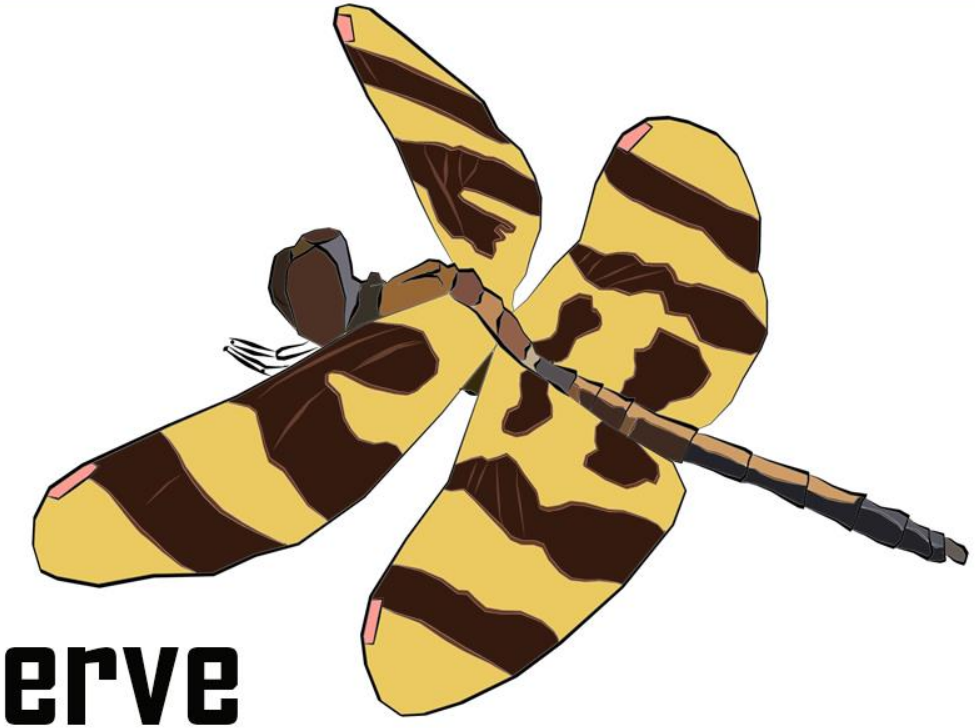
○ No.

Note: You can also choose to share the private coordinates of observations in this project on a case-by-case basis. These are just the defaults for new observations added to the project.

Yes, I want to join Cancel


ADD
OBSERVATIONS
Ohio Tiger Beetles (Cicindelidae)

Join us for Odo-Con-18!
June 22-24, 2018
in Hancock County, Ohio
at Oakwoods Nature Preserve



Register on the Ohio Dragonfly Survey webpage

Questions?

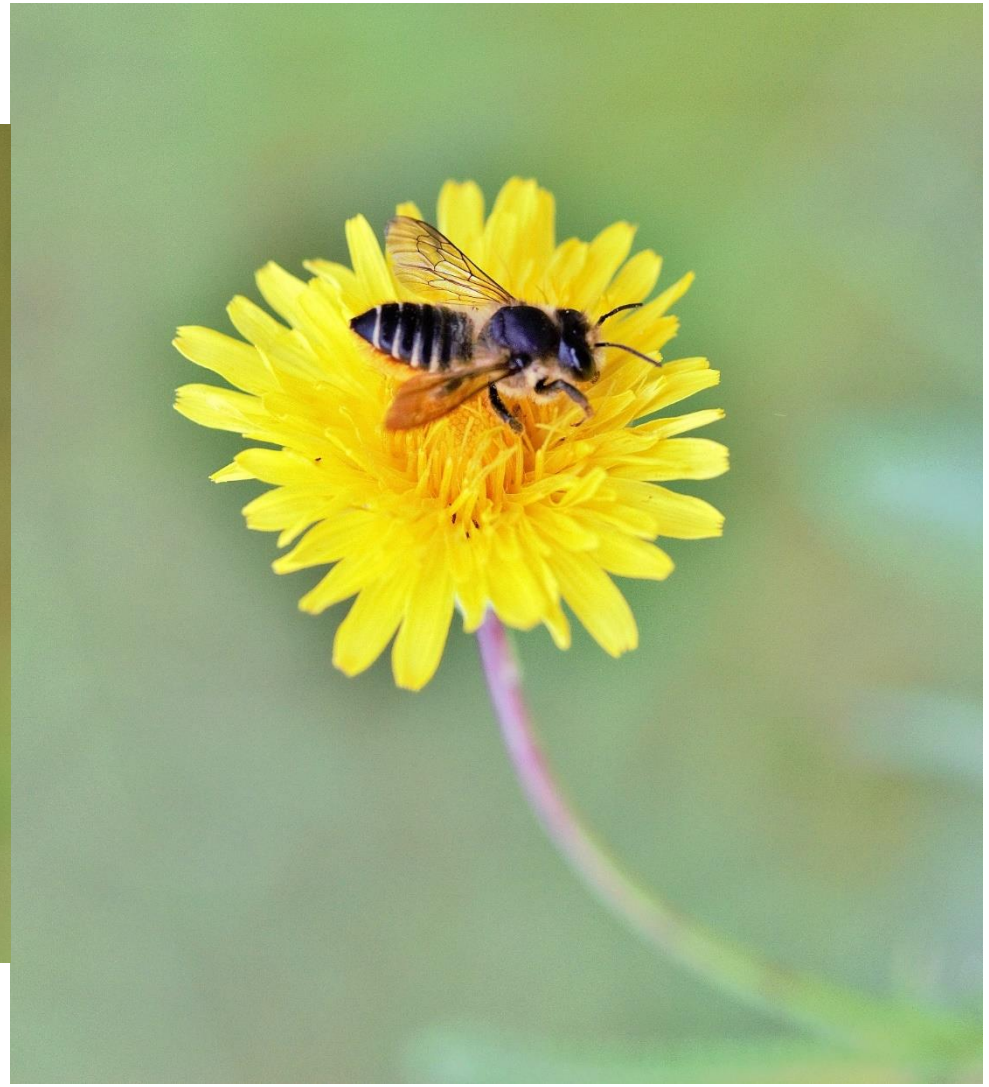
Contact:
MaLisa Spring
Spring.99@osu.edu
@EntoSpring

Non-Native Species

- Andrena wilkella
- Anthidium manicatum, oblongatum, and soon maybe florentinum
- Apis mellifera
- Hylaeus hyalinatus, leptocephalus, pictipes, and soon maybe communis
- Megachile apicalis, concinna, centuncularis, rotundata, and sculpturalis
- Osmia caerulescens and taurus
- Peponapis pruinosa
- Pseudoanthidium nanum
- Maybe Anthophora polumipes, and Lithurgus chrysurus soon

Extra slides of cavity nesters

Megachilidae: *Megachile* sp.



Megachilidae: *Osmia* spp.

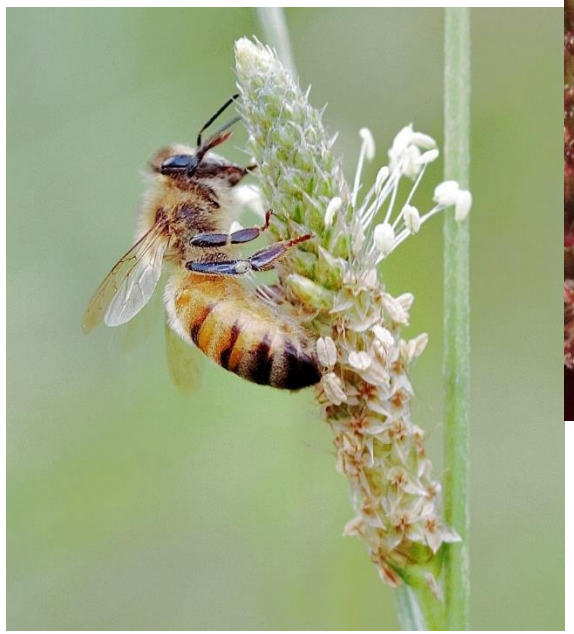
Orchard/Mason Bees

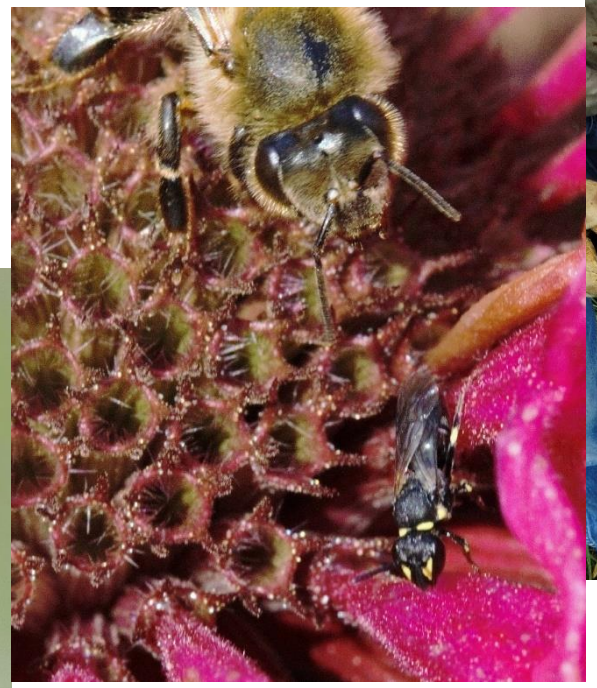
Live in cavities and stems

Small Carpenter Bees: *Ceratina*

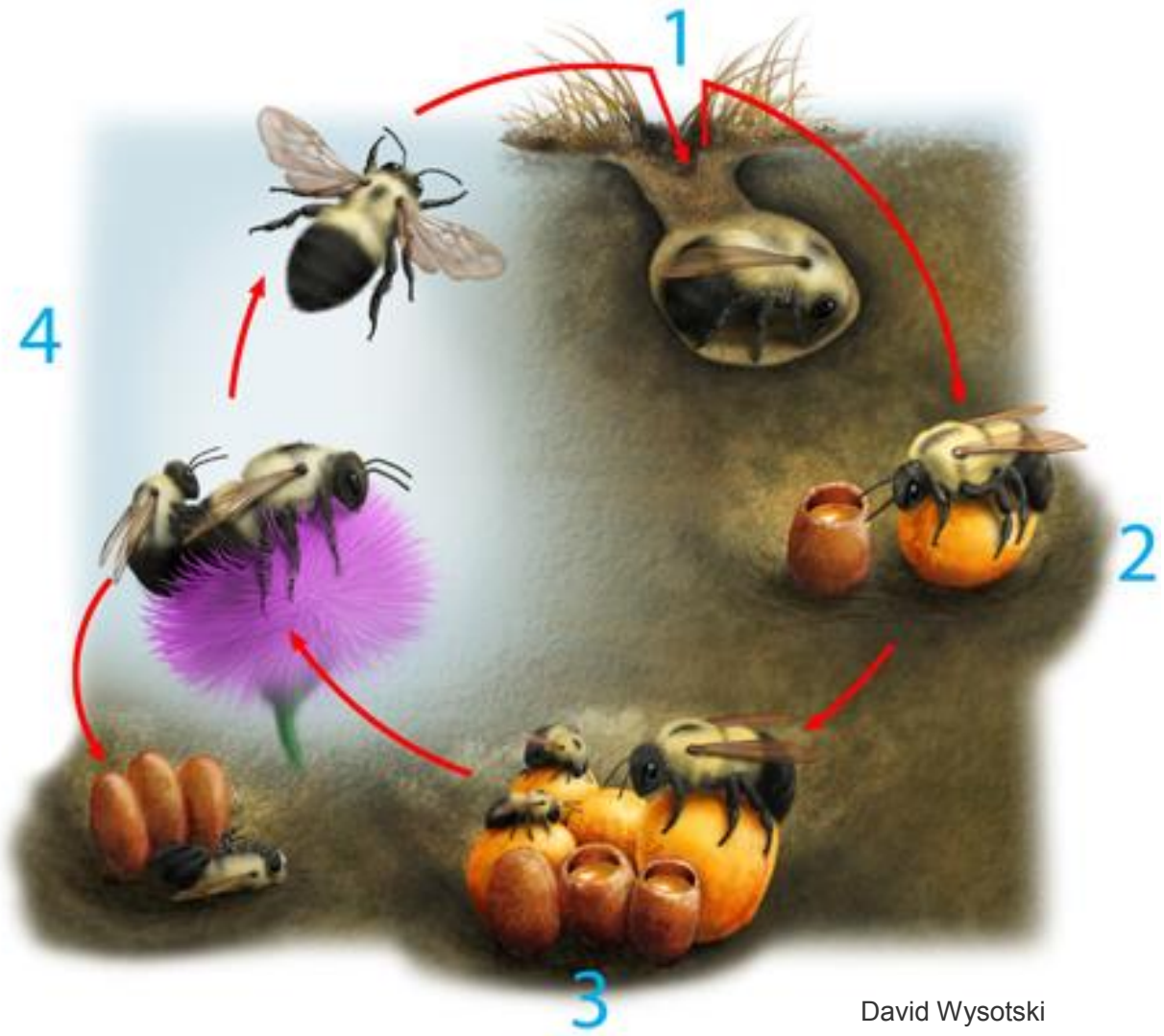
Honey bees – *Apis mellifera*

- Not native to the US!
- Managed by humans
  - Create honey
- Social in hives





Native Pollinators: Social Bees



David Wysotski

Carpenter Bees – *Xylocopa virginica*

- Bores into wood for nests
- Shiny black abdomen – (not a hairy butt like Bumble bees)

- Resin Bee