



# Pollinator Identification

PSC 2024

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**POLLINATOR  
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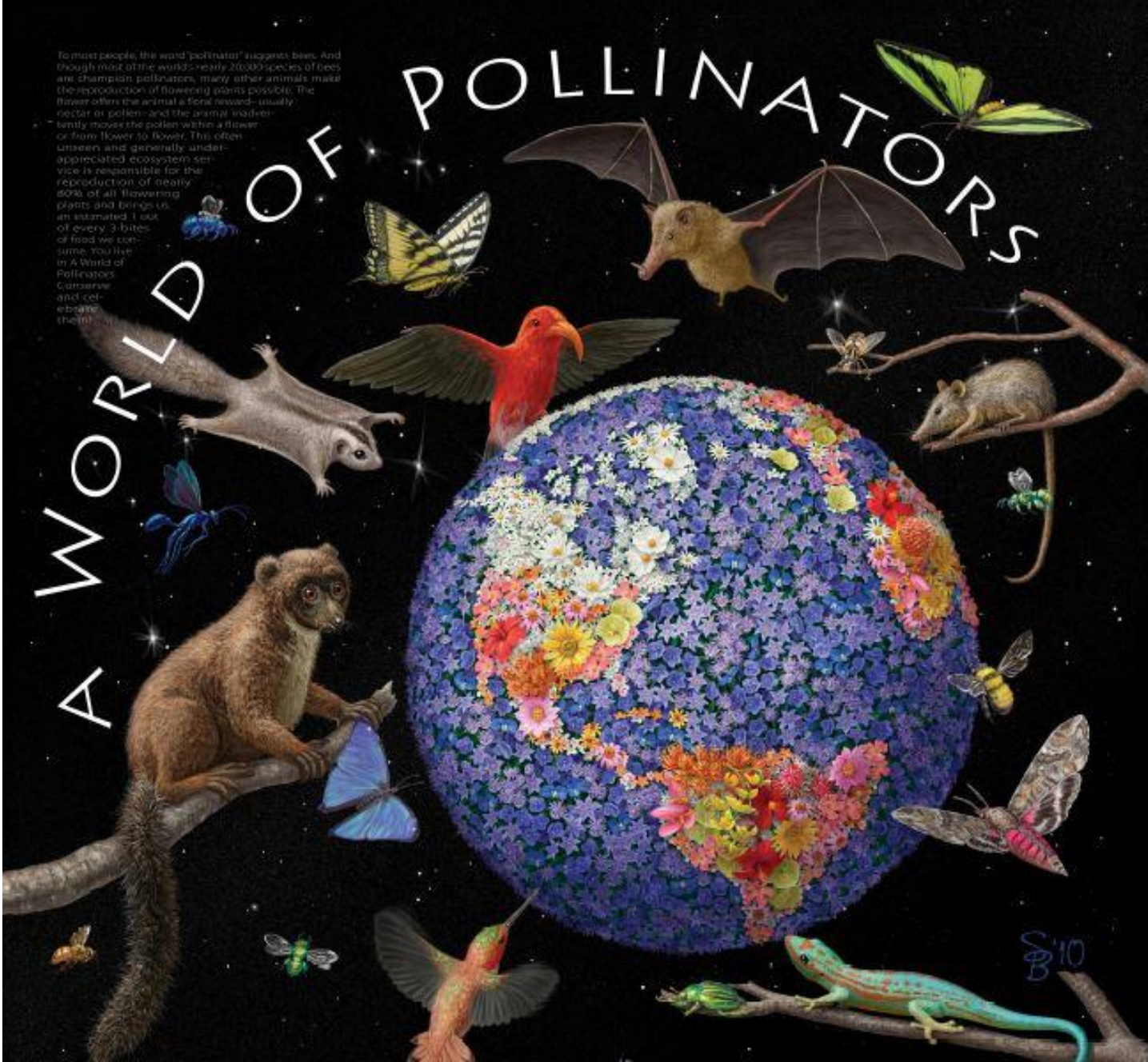
# Pollinator ID and Monitoring (~40min)

- Distinguishing major groups
- Bee families
- Bee groups for monitoring
- Bee ID resources

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To most people, the word "pollinator" suggests bees. And though most of the world's nearly 20,000 species of bees are champion pollinators, many other animals make the reproduction of flowering plants possible. The flowers offer the animal a food reward—usually nectar or pollen—and the animal inadvertently moves the pollen within a flower or from flower to flower. This often unseen and generally underappreciated ecosystem service is responsible for the reproduction of nearly 80% of all flowering plants and brings us an estimated 1 out of every 3 bites of food we consume. You live in A World of Pollinators. Conserve and celebrate them!



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A Bee or Not a Bee  
That's easy!

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A group of approximately ten people are shown in silhouette against a light, hazy sky. They are in various dynamic poses of celebration, including jumping, running, and raising their arms. The overall mood is one of triumph and joy.

# Results!

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# Why are there WannaBees?

Batesian mimicry

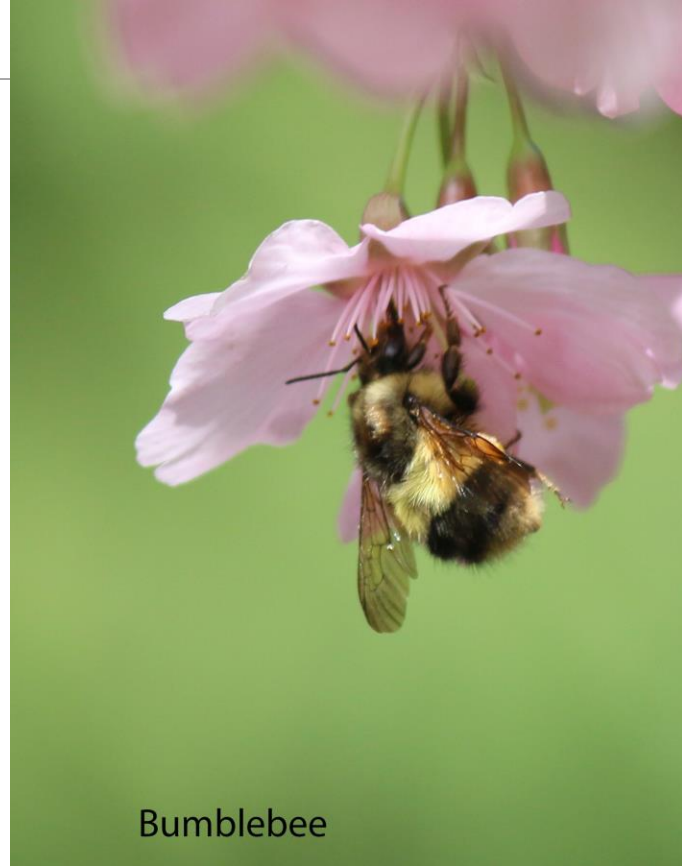




# Batesian mimicry

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- A harmless species that evolved to imitate the warning signals of a harmful species
- Named after the naturalist Henry Walter Bates worked on butterflies in Brazil



Bumblebee



Syrphid Fly

Anthony Westkamper  
<https://m.northcoastjournal.com/NewsBlog/archives/2015/04/05/humbug-mimics>

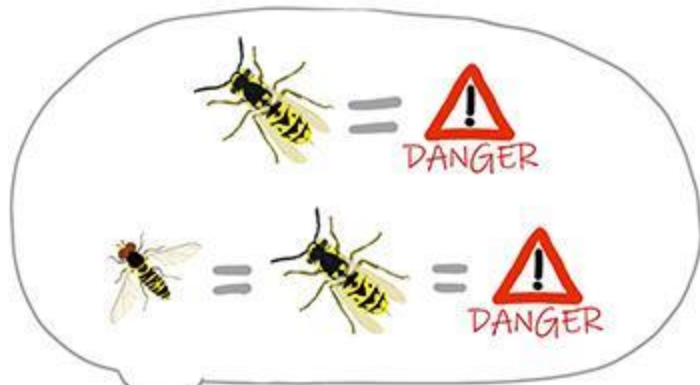
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The model



The mimic



The dupe



coral snake

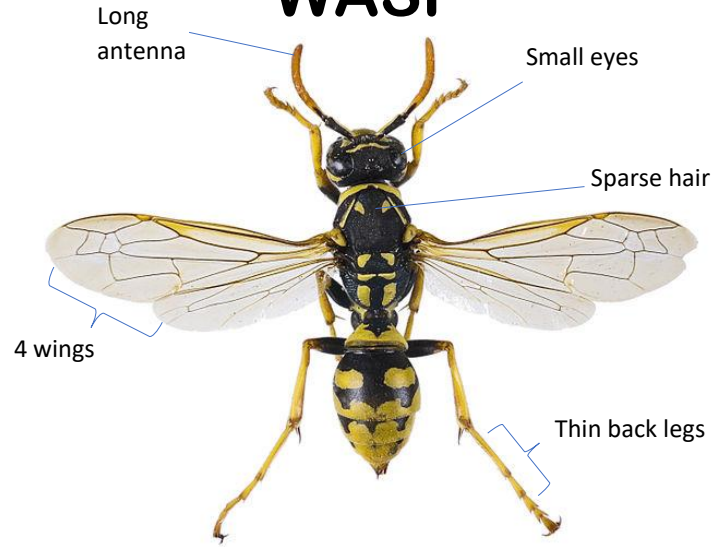


king snake

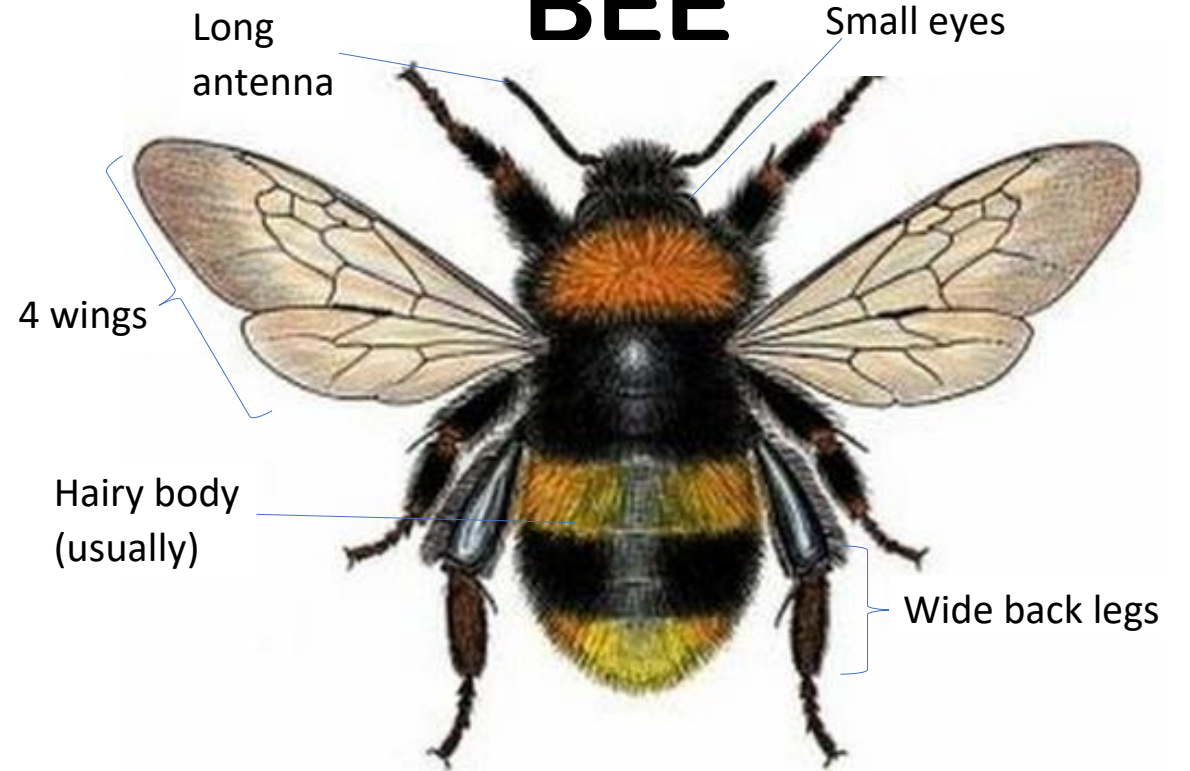


<https://m.espacepurlavie.ca/blogue/en/a-sheep-wolf-s-clothing-batesian-mimicry-insects>

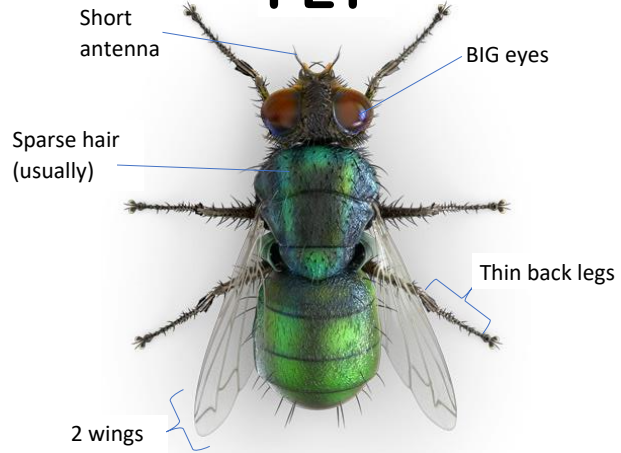
# WASP



# BEE



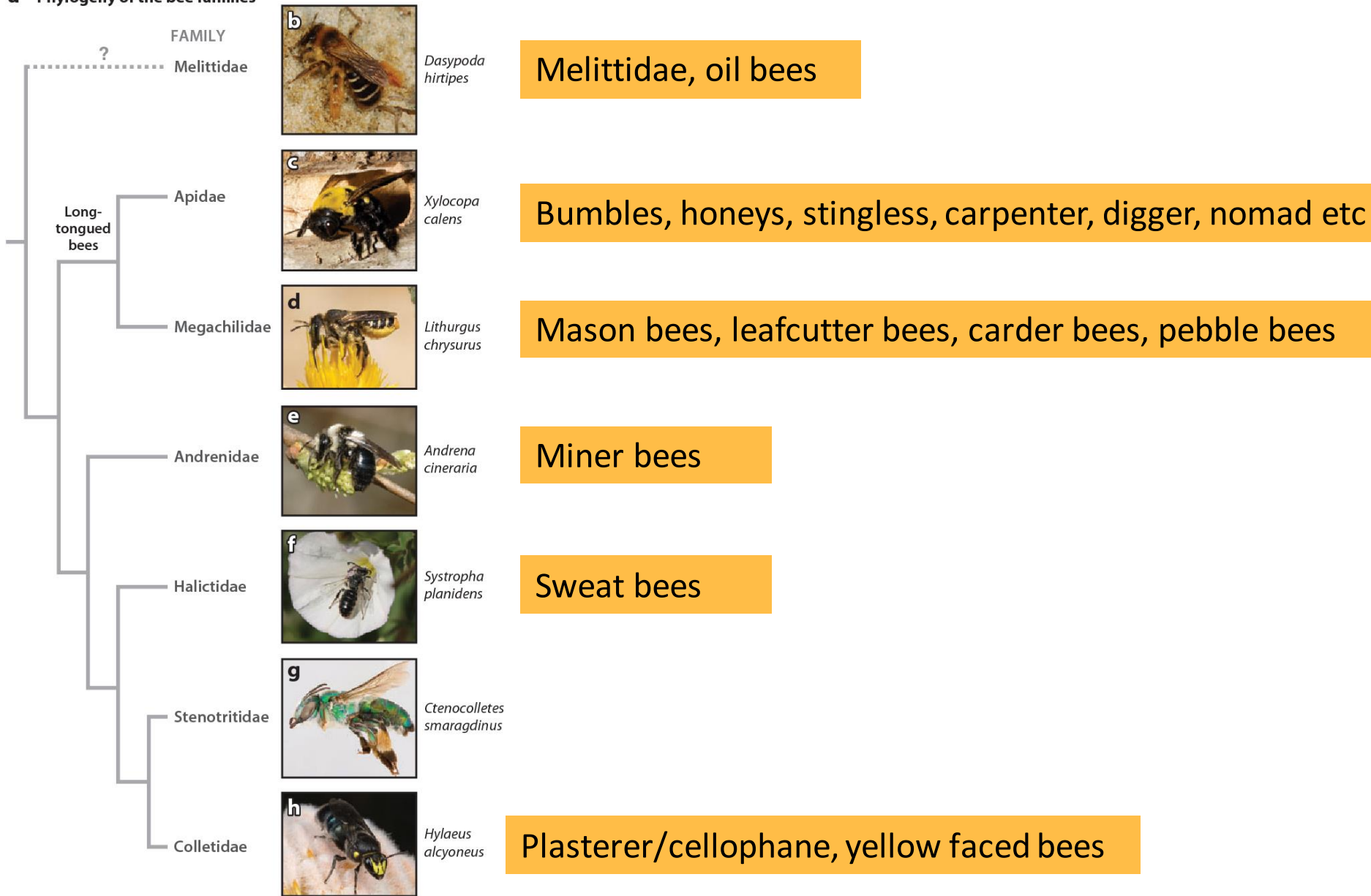
# FLY



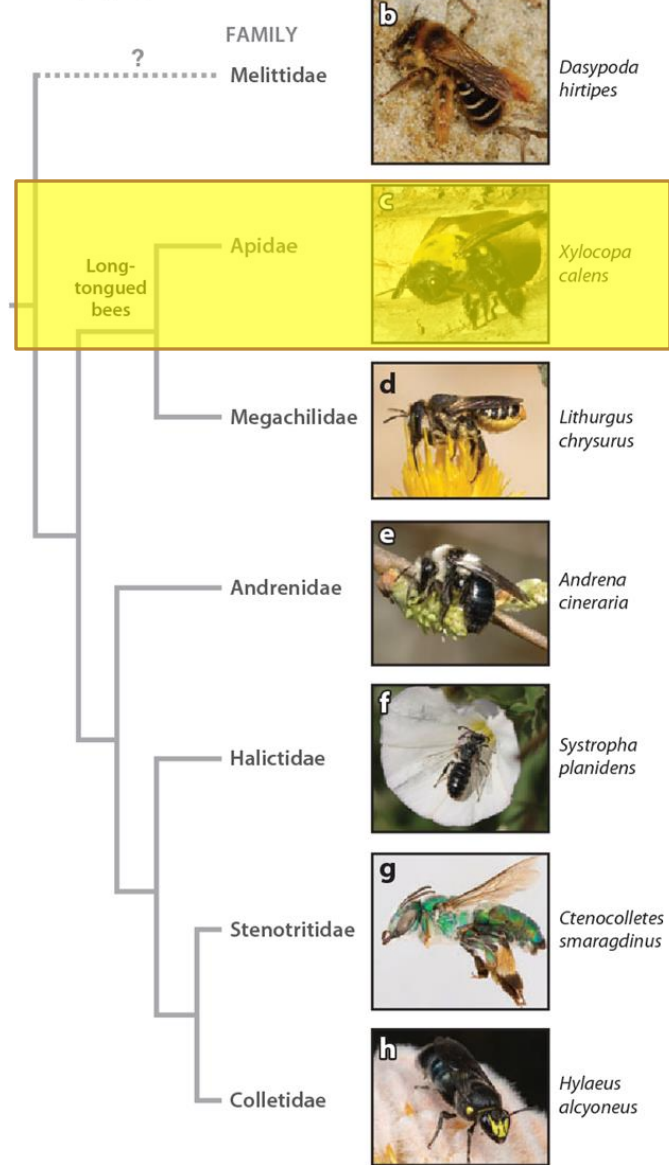




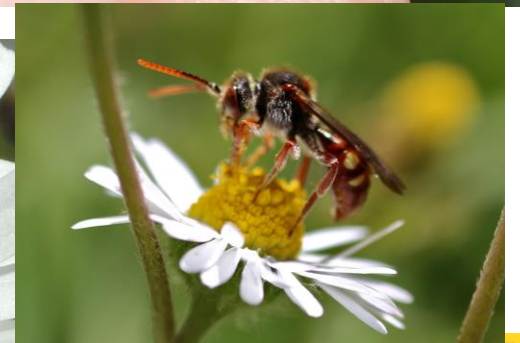
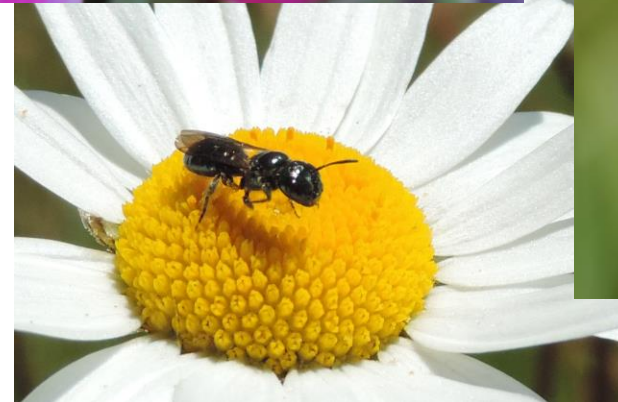
**a Phylogeny of the bee families**



**a** Phylogeny of the bee families

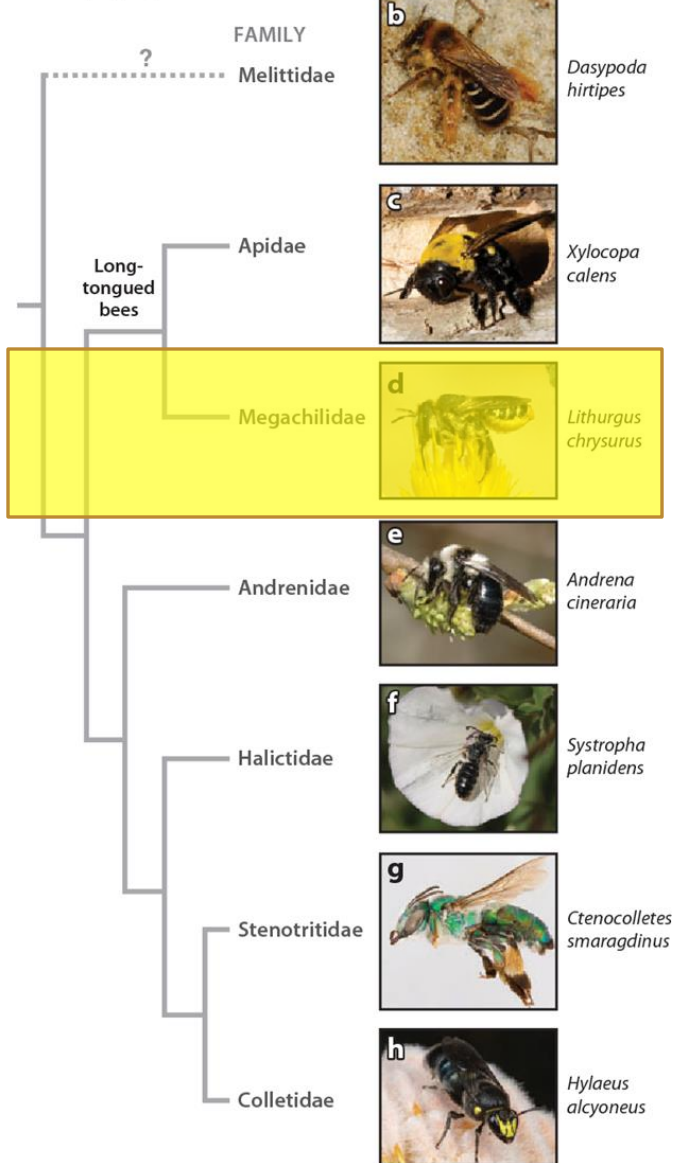


- ~5700 species
- Bumble bees, honey bees, stingless bees, carpenter bees, digger bees, nomad bees
- Many important for crop pollination



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**a** Phylogeny of the bee families



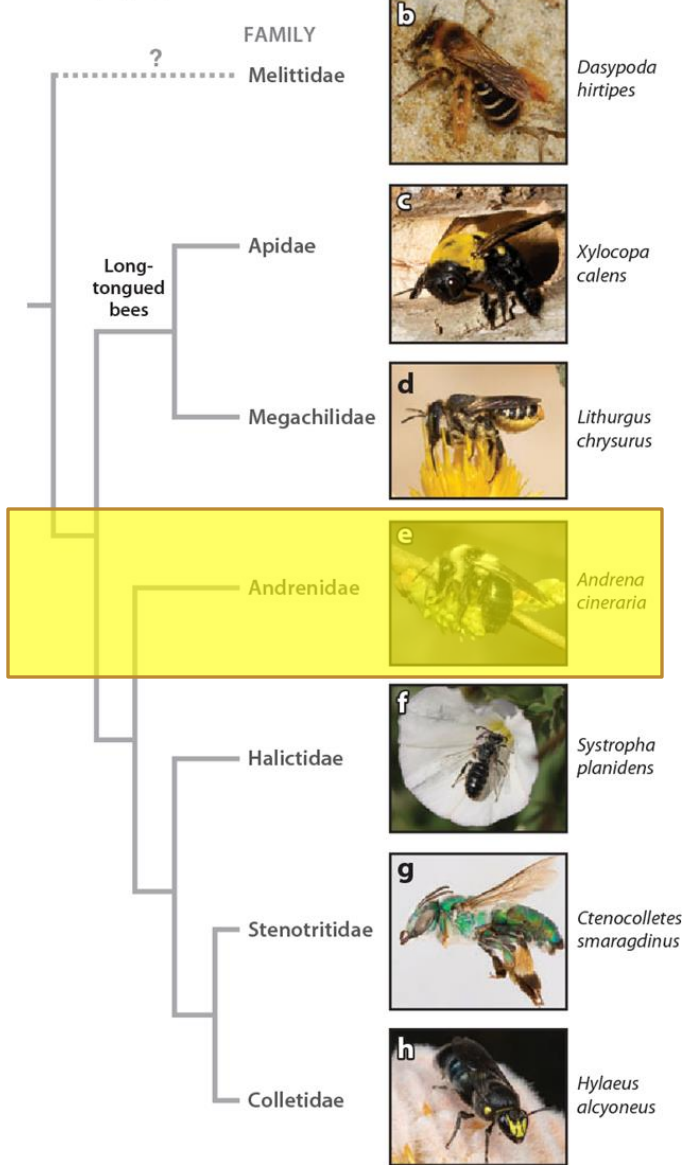
- ~4000 species identified
- Orchard mason bees, leaf cutter bees, wool-carder bees
- Most above ground nesters, all solitary



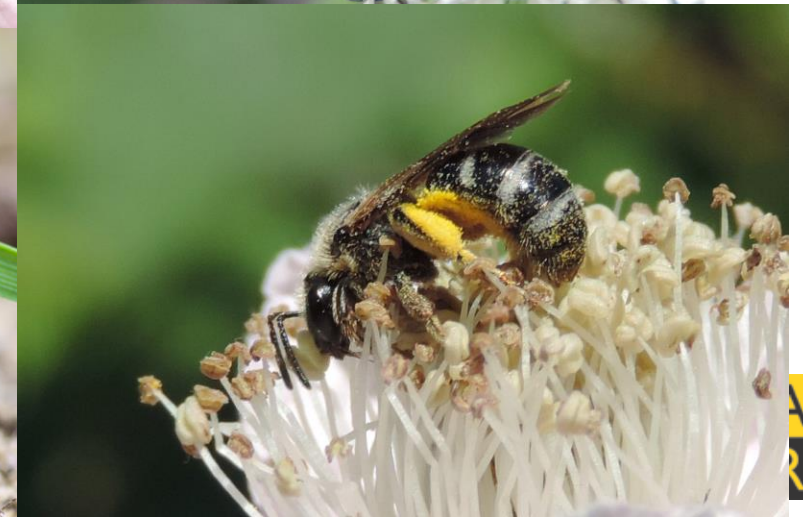
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**a** Phylogeny of the bee families

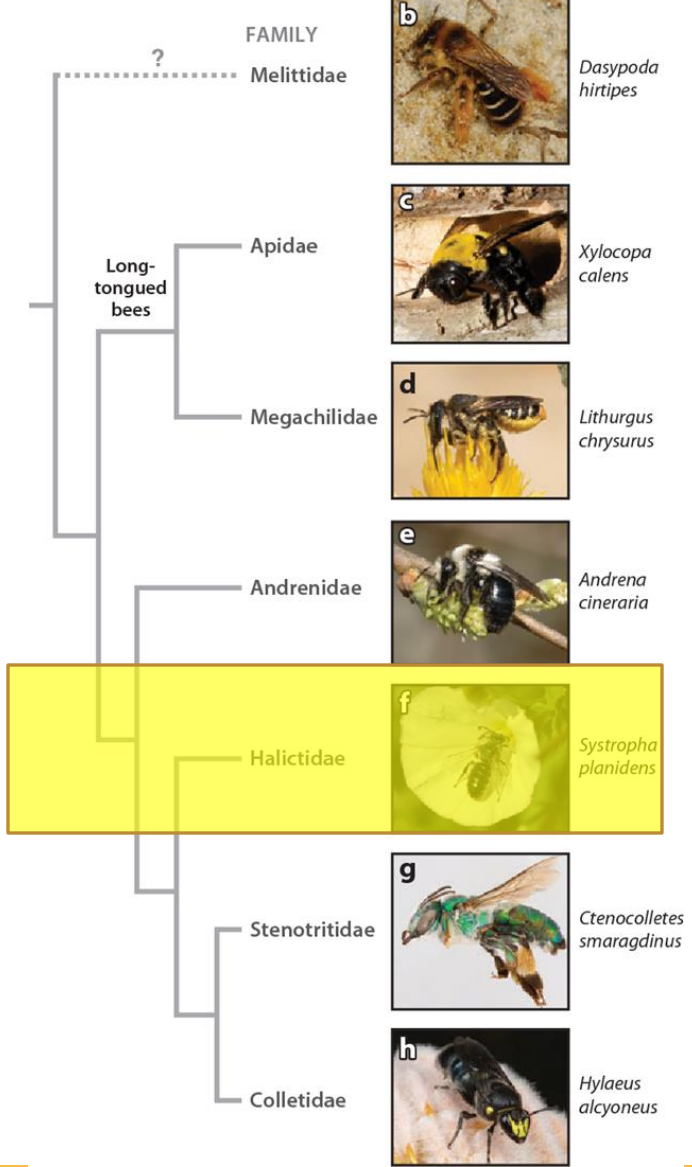


- ~3000 species identified
- Mining bees: dig nests in ground
- Many are specialists, reduced stinger



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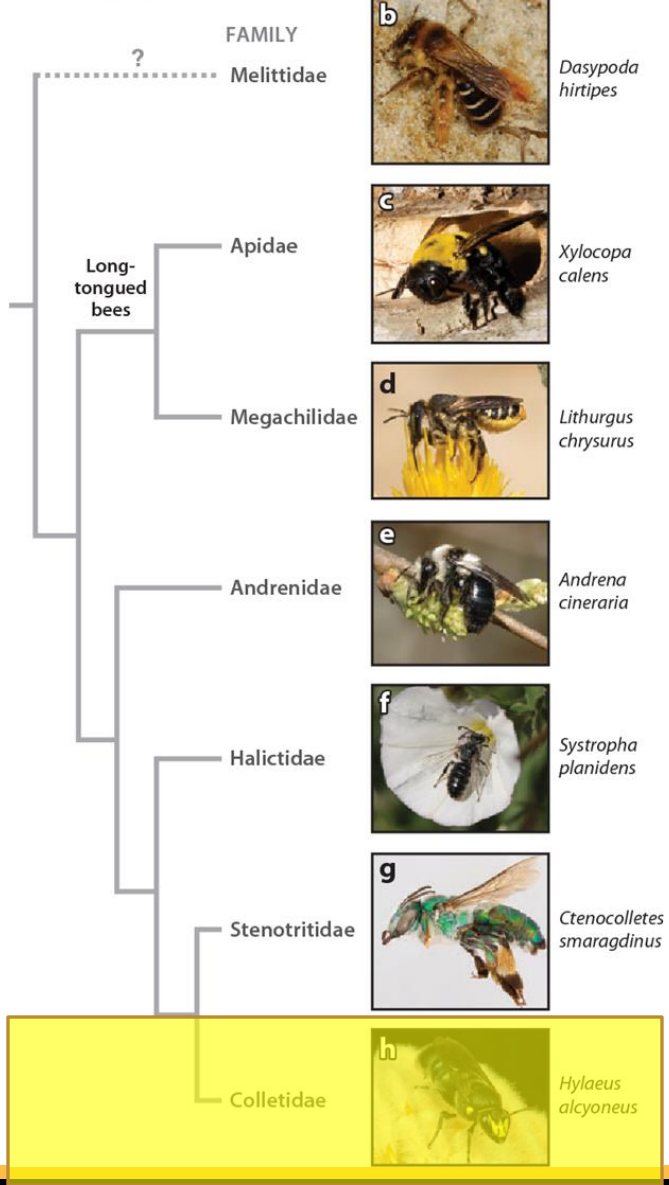
**a** Phylogeny of the bee families



- ~4,500 species identified
- ‘Sweat bees’
- Many solitary, mostly ground nesting, some social



**a** Phylogeny of the bee families



- ~2000 species identified
- Plasterer/Polyester bees
- Various nesting locations ground/above ground



# Bee

Non-  
native

Native Bee

1. Honey  
bee

2. Bumble  
Bee

3. Hairy  
Leg Bee

4. Hairy  
Belly Bee

5. Other  
Bee



29

# 1. Honey bees



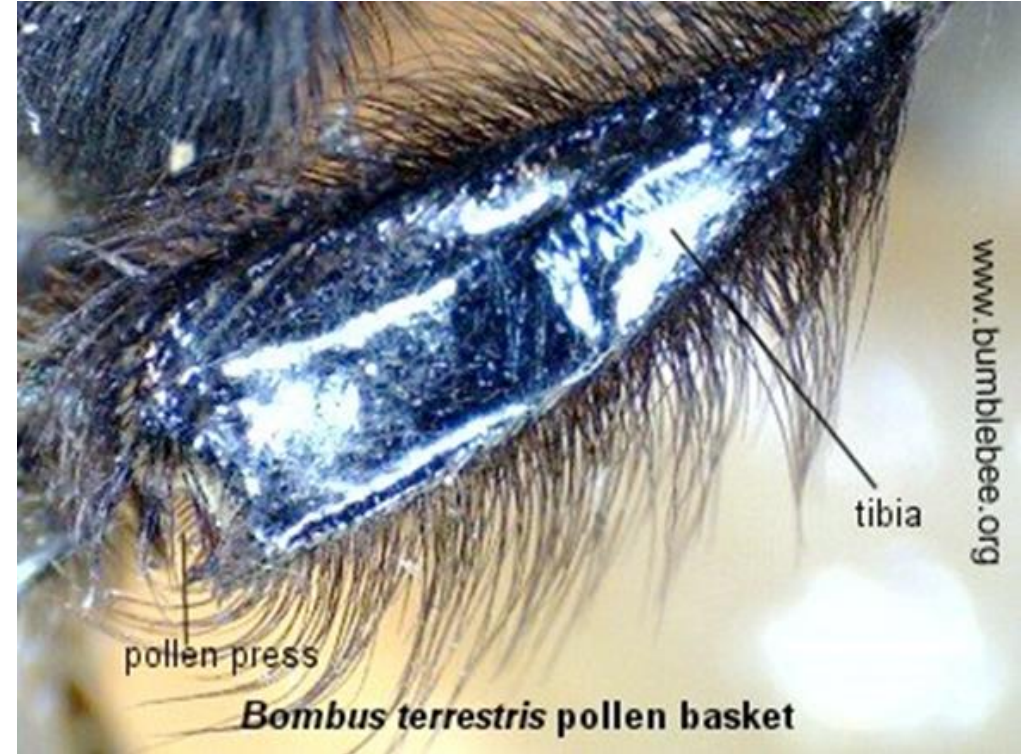
Pollen Basket





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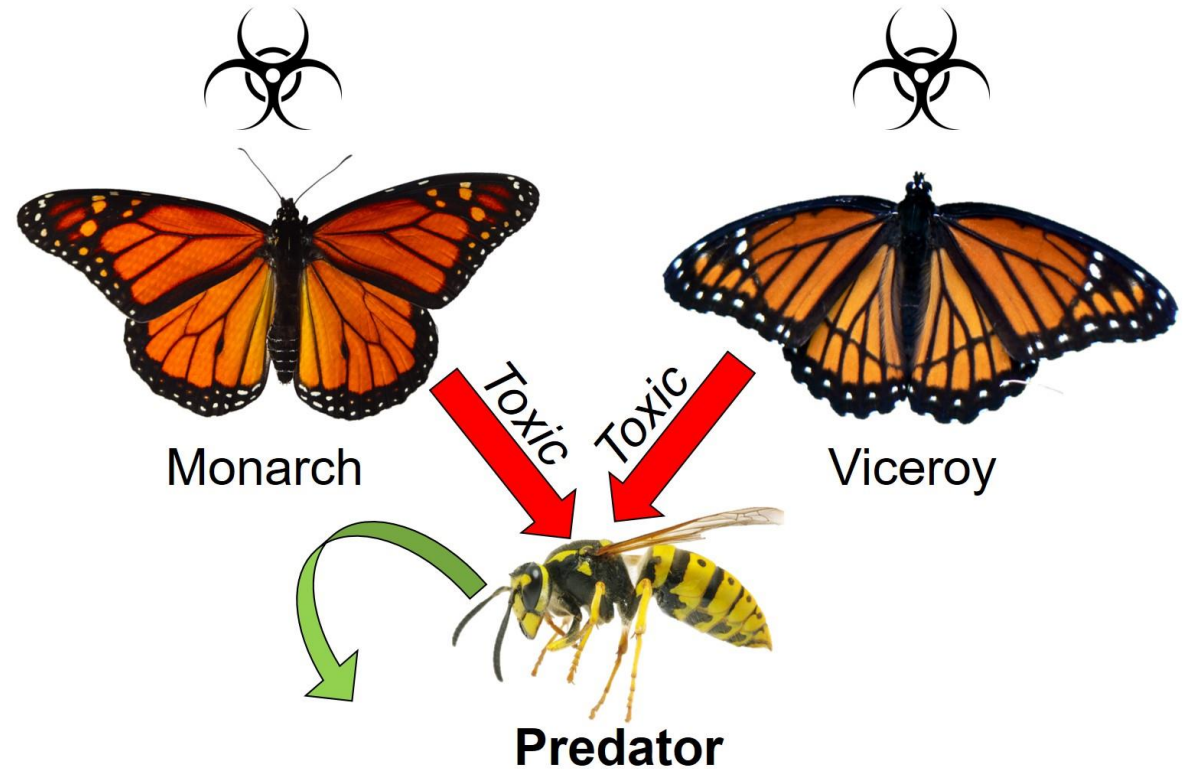




## 2. Bumble Bees

# Müllerian mimicry

- Both are toxic/unpalatable and have evolved to look like each other
- boost the potential for the signal to be learnt by predators
- Co-evolutionary relationship between the two species

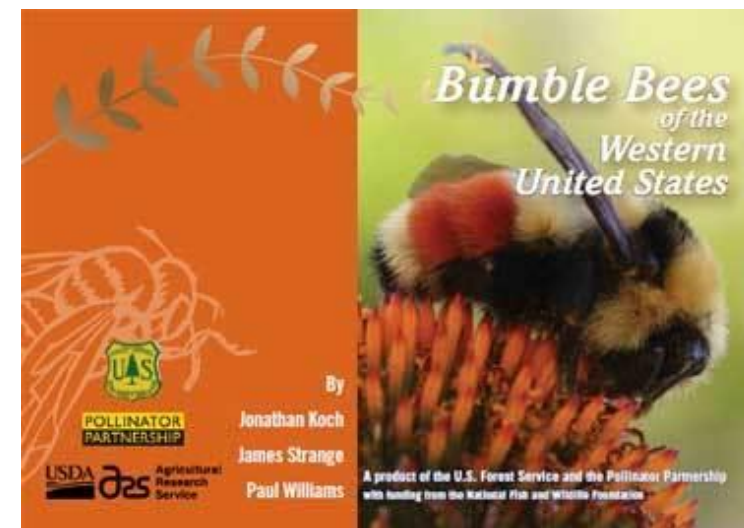
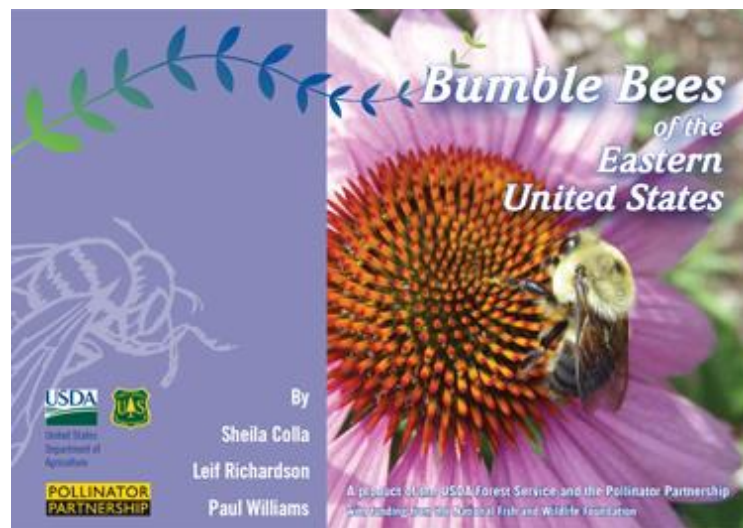
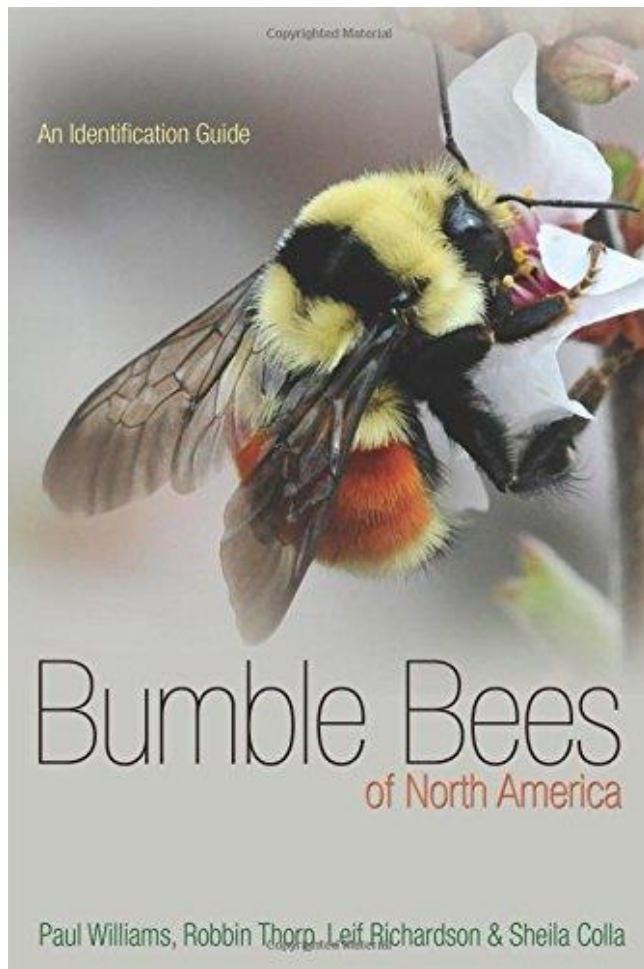


<https://theg-cat.com/tag/mullerian-mimicry/>



Photo: Joseph Wilson/USU  
<https://www.nature.com/articles/s41598-022-22402-x#Abs1>

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<https://www.pollinator.org/shop/books>





### 3. Hairy Leg Bees (Sweat bees, carpenter bees, miner bees, etc)

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4. Hairy Belly Bees (mainly mason bees and leafcutter bees)

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## 5. Other Bees (Yellow face, parasitic)

# Bee

Non-  
native

Native Bee

1. Honey  
bee

2. Bumble  
Bee

3. Hairy  
Leg Bee

4. Hairy  
Belly Bee

5. Other  
Bee

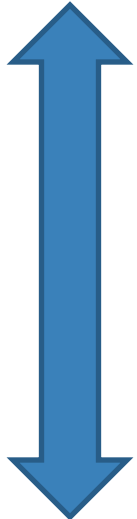


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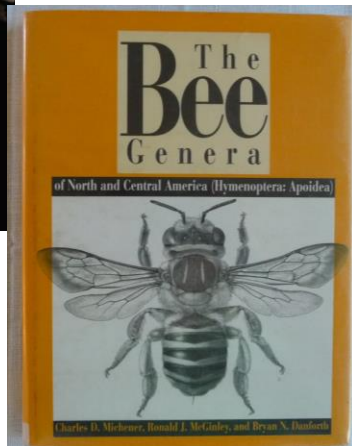
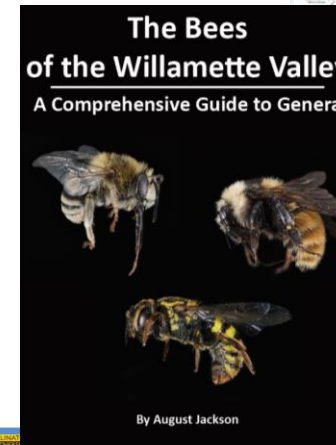
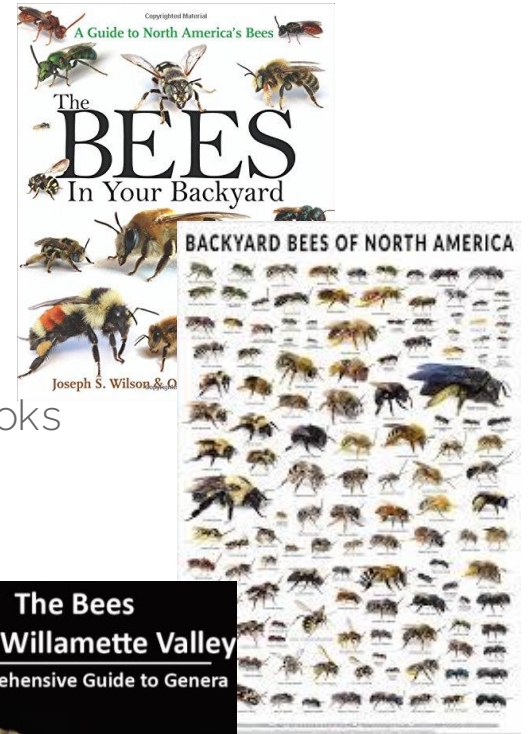
# Bee ID Resources

Less technical



More technical

- Pollinator Partnership Bee ID sheet
- Bees in Your Backyard
- iNaturalist
- Pollinator Partnership-- bumble bee guides: <https://www.pollinator.org/shop/books>
- Bumble Bees of North America
- The Bees of the Willamette Valley (online pdf)
- Discover life ([https://www.discoverlife.org/mp/20q?guide=Bee\\_genera](https://www.discoverlife.org/mp/20q?guide=Bee_genera))
- CANPOLIN - Bee Course Key to Bee Genera in Canada
- The Bee Genera of Eastern Canada, Packer et. Al.
- The Bee Genera of North and Central America (book)



Discover Life | All living things | Bee genera

162 kinds match

1. Click here to choose the groups of genera to include in the guide (Easter)

101 ADMIN ONLY - ALL Caribbean islands, not including Trinidad/Tobago - Under development, use with caution - Click here for ALL genera found in the Caribbean

102 Eastern United States and Canada ONLY - Click here for the genera found East of the Mississippi - 201 Ireland and Great Britain - Under development but usable with caution

103 Mexico - Caution, this area is under development, some genera still need to be added and some unresolved groups may occur - Please report any discrepancies, as limited specimens were available for some groups - Click here for ALL genera found in Mexico

104 United States and Canada - Click here for ALL genera found in the entire US and Canada

Canadian Journal of Zoology 54(3) (September 2007) Packer et al.

33. Macropleura with apical process absent below axillary process (Fig. 114) ... *Dufourea*

34. Females with well-developed epinotal setae (Fig. 114) and no well-developed setae on mesonotal sternite, male with yellow clypeus (Fig. 120) ... *Megachile*

35. Females with long axillary setae in both striae but very well developed on mesonotal sternite (Fig. 119), male with black clypeus (Fig. 121) ... *Megachile*

37. Axilla absent (Fig. 122) ... *Megachile*

38. Axilla present (Fig. 123) ... *Megachile*

39. Dorsal setae of propodeum horizontal, distal end made up of pair, separated from petiole by a constriction (Fig. 124) ... *Megachile*

40. Dorsal setae of propodeum not as above, STP/STP' slightly OR not made up of pair OR not separated from petiole by a constriction (Fig. 125) ... *Megachile*

41. Mesonotal sternite (Fig. 126) ... *Megachile*

42. Mesonotal sternite (Fig. 126) ... *Megachile*

43. Mesonotal sternite (Fig. 126) ... *Megachile*

44. Mesonotal sternite (Fig. 126) ... *Megachile*

Southern Vancouver Island Bee Identification Guide | islandpollinator

Bees are beneficial insects that pollinate flowering plants by transferring pollen from one flower to another. This is important for plant reproduction and food production. In fact, pollinators are responsible for a third of every kind of food you eat. While the honey bee is the most well-known pollinator, there are many other species of bees that are important pollinators. They are also important for the health of our ecosystems. There are currently about 400 bee species in British Columbia.

Using this guide: This card provides key features needed to identify 37 types of bees found in home landscapes. The following symbols will help along the way:

Common nesting behaviors to watch for:

- Addressing behaviors that may be seen with that of a honey bee.
- Identifying behaviors to watch for.

How to identify Bees

All bees have three body segments, a head, thorax and abdomen. The head is usually large and rounded, with large compound eyes. The thorax is the middle segment where the wings and legs attach. Last is the abdomen, which is usually long and tapers to a point. The abdomen is where the female bee lays her eggs. Some bees have a stinger, called a sting, which is used to defend themselves. Some bees have a stinger, called a sting, which is used to defend themselves.

1. Honey bee (Apis mellifera) - 1.5 cm. Black body, extensively covered with black, yellow, and sometimes orange hairs on all body segments. Petiole absent. Petiole body.

2. Bumble bee (Bombus spp.) - 1.5 cm. Black body, extensively covered with black, yellow, and sometimes orange hairs on all body segments. Petiole absent. Petiole body.

3. Mason bee (Osmia spp.) - 1.5 cm. Two horns. 1) black body covered in pale hairs or 2) dull metallic green blue and less hairy. Petiole carrying hairs beneath abdomen. Head as broad as thorax, with body.

4. Leafcutter bee (Megachile spp.) - 1.5 cm. Black body with light or dark hairs. Subcarrying hairs beneath abdomen. Some have rather patchy abdomen. Head as broad as the thorax with large mouthparts used to cut leaves.

5. Digger and long-nosed bees (Anthophora, Melissodes etc spp.) - 1.5 cm. Black, single member has a long nose. Carrying pollen on the legs. Larger 'nose' or organ with yellow markings on the nose.

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## Pollinator WEEK

June 20 - 26, 2022

Pollinator Week 2022 - Pollinator Bioblitz

JUN 20, 2022 - JUN 28, 2022

[www.pollinator.org](http://www.pollinator.org)

### About

Members 388

Pollinator Week is an annual event celebrated internationally in support of pollinator health. This community science project is hosted by the North American Pollinator Protection Campaign's (NAPPC) Pollinator Communications Taskforce. Join this project to help collect data on the distribution of pollinators across the US, Canada.

[Read More >](#)

PROJECT MEMBERS ONLY [Project Journal](#)

Overview **3,860** OBSERVATIONS **953** SPECIES **485** IDENTIFIERS **225** OBSERVERS [Stats](#)

### Recent Observations [View All](#)

 <p><b>Metallic Sweat Bees</b> Subgenus <i>Dialictus</i> 17 months ago</p>	 <p><b>Masked Bees</b> Genus <i>Hylaeus</i> 17 months ago</p>	 <p><b>Rosy Maple Moth</b> <i>Dryocampa rubicanda</i> 27 months ago</p>	 <p><b>Rosy Maple Moth</b> <i>Dryocampa rubicanda</i> 27 months ago</p>
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