# Pollinator Identification and Monitoring

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# Pollinator ID and Monitoring (~60min)

- Distinguishing major groups
- Bee families
- Bee groups for monitoring
- Bee ID resources
- Monitoring with Anthony

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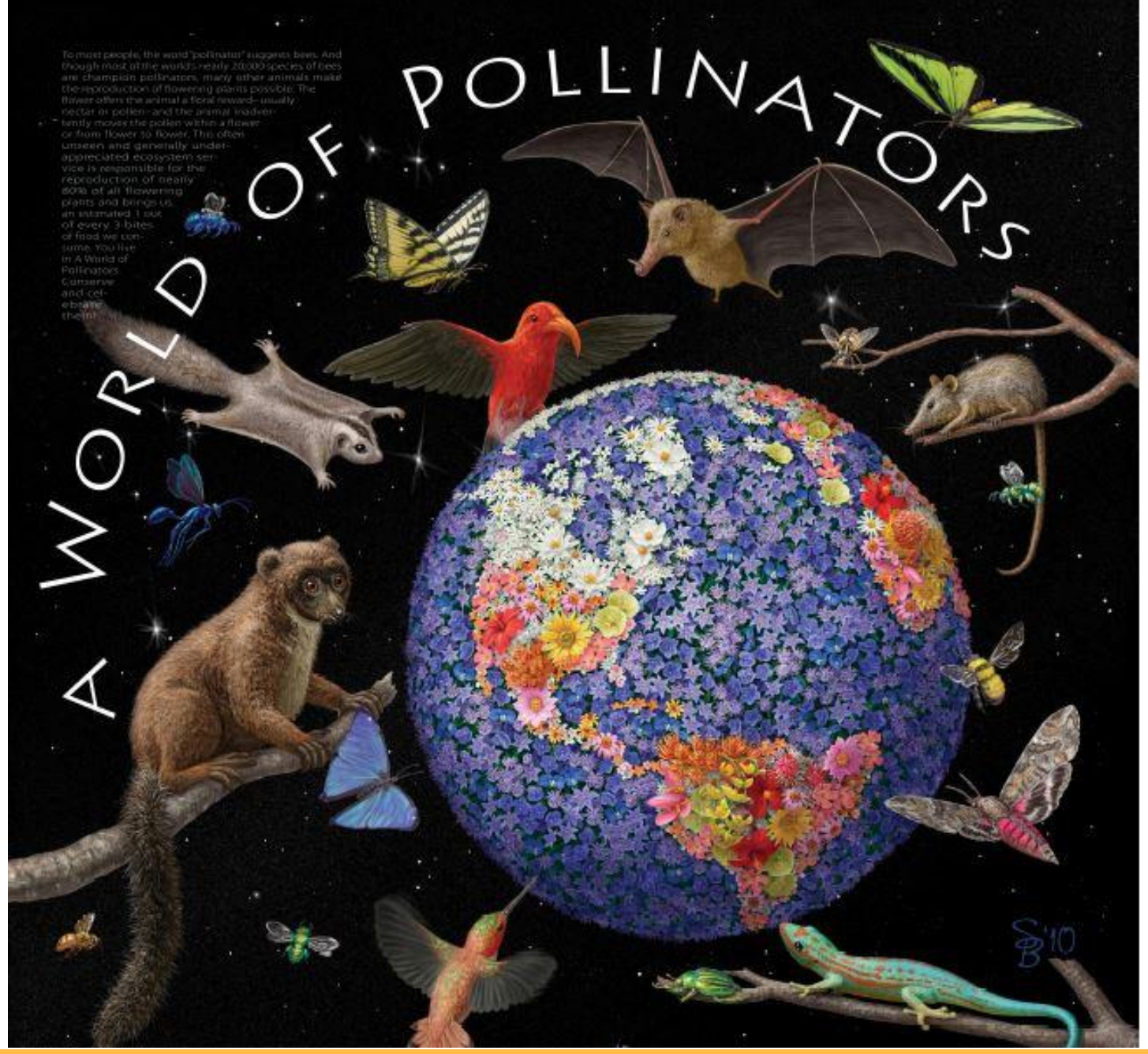


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# A Bee or Not a Bee
# That’s easy!

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# Results!

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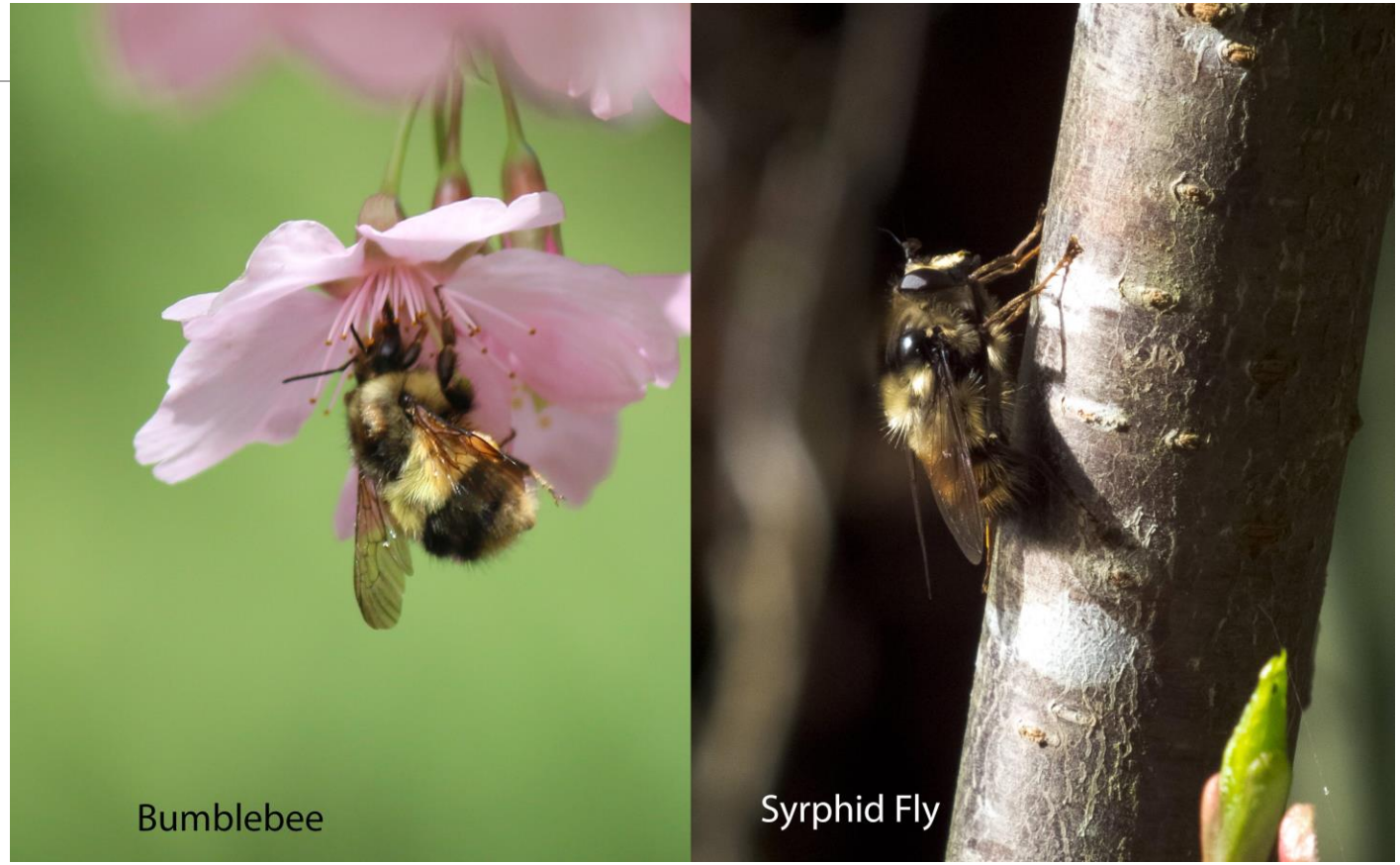
# Why are there WannaBees?

Batesian mimicry

# Batesian mimicry

- 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




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

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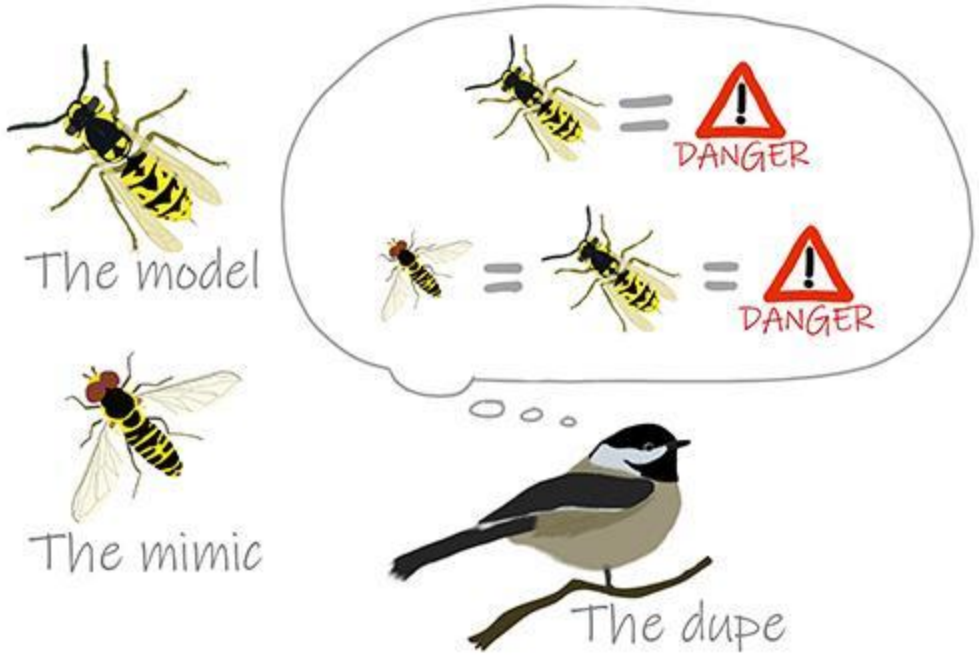


https://m.espacepourlavie.ca/blogue/en/a-sheep-wolf-s-clothing-batesian-mimicry-insects



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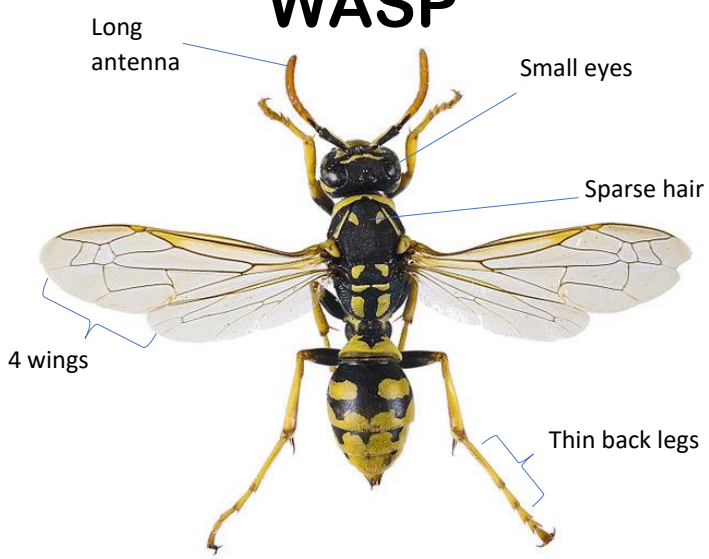
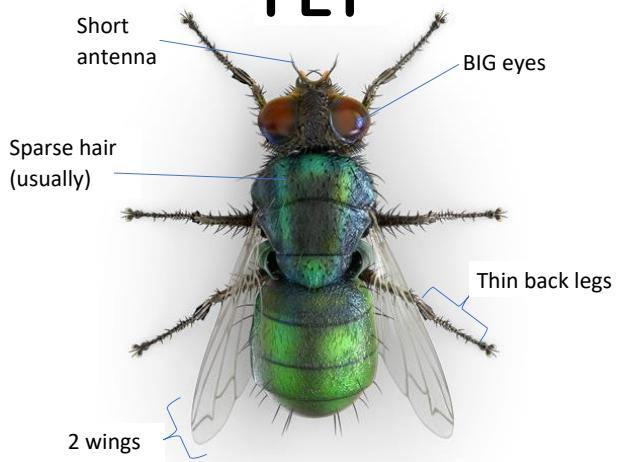
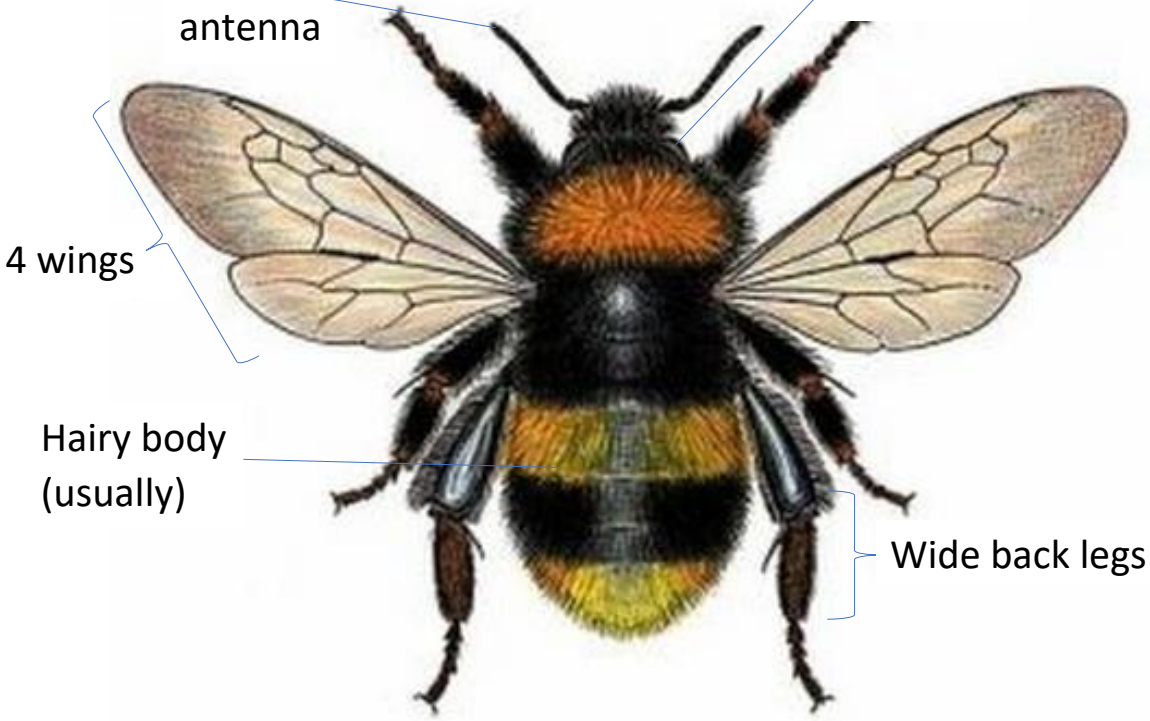
# WASP




# FLY




# BEE

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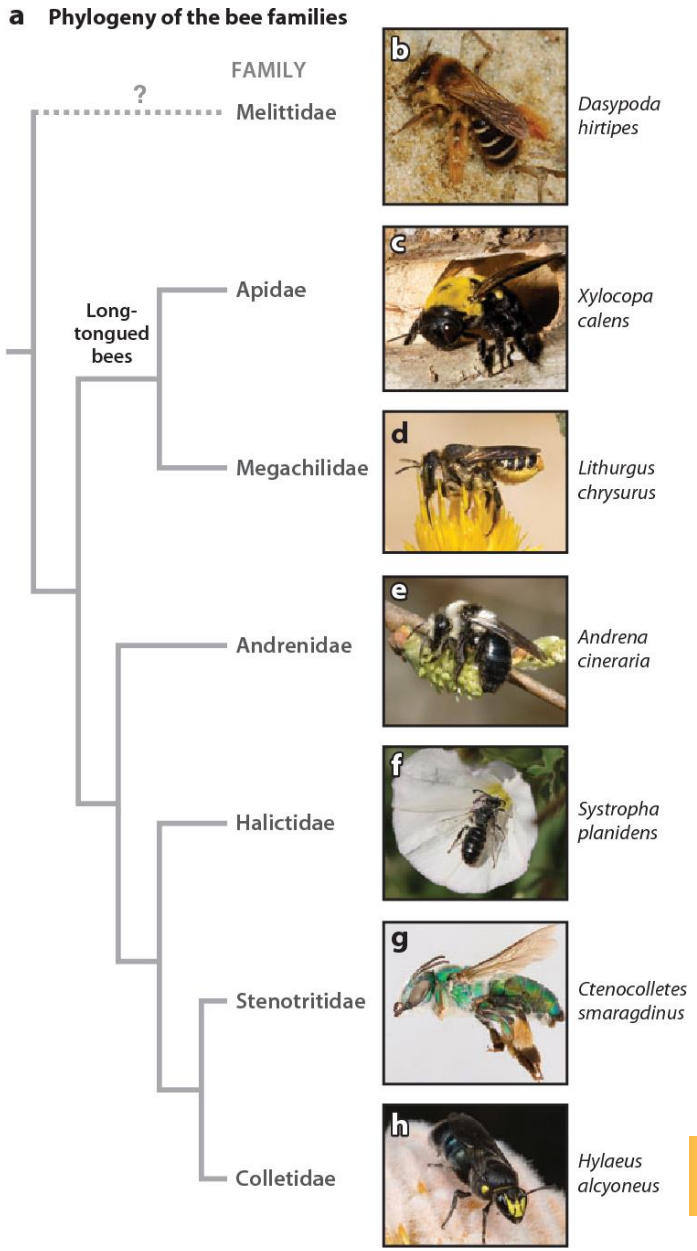


Melittidae, oil bees

Bumbles, honeys, stingless, carpenter, digger, nomad etc

Mason bees, leafcutter bees, carder bees, pebble bees

Miner bees

Sweat bees

Plasterer/cellophane, yellow faced bees

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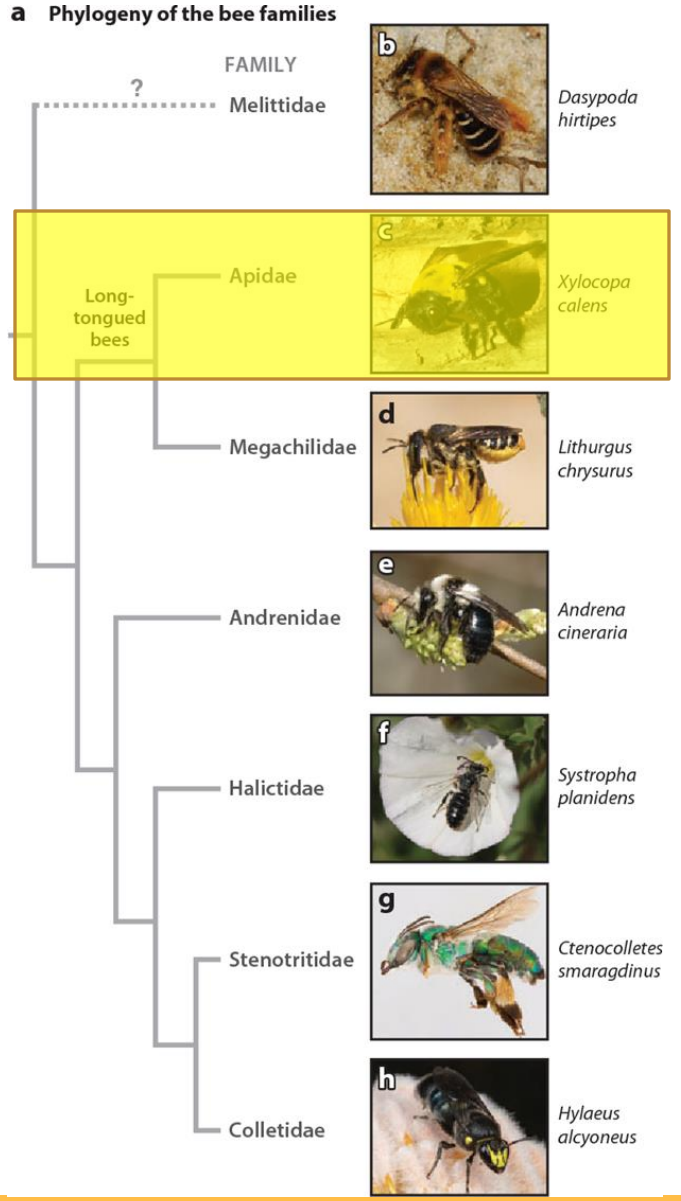
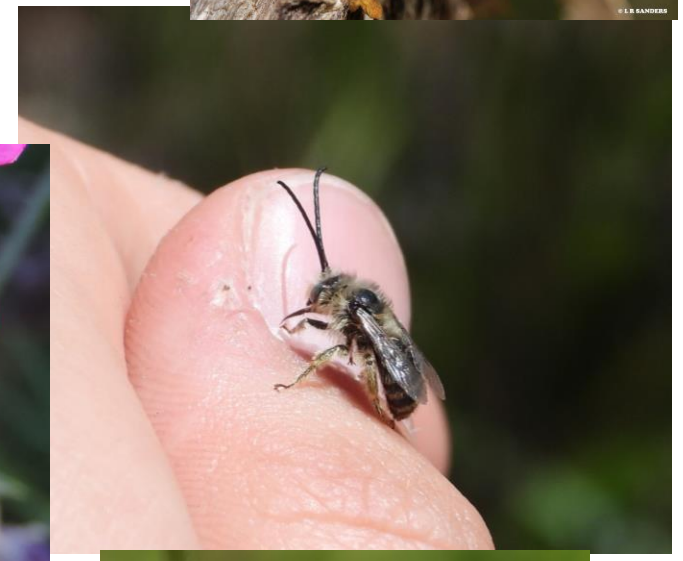
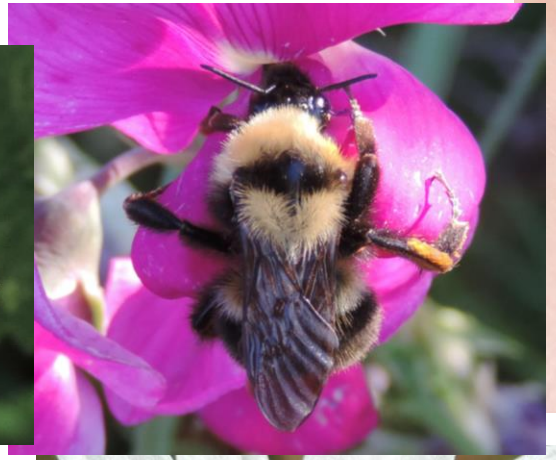
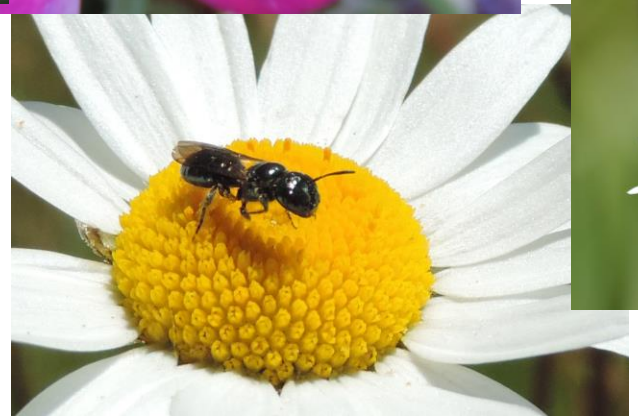



- ~5700 species
- Bumble bees, honey bees, stingless bees, carpenter bees, digger bees, nomad bees
- Many important for crop pollination







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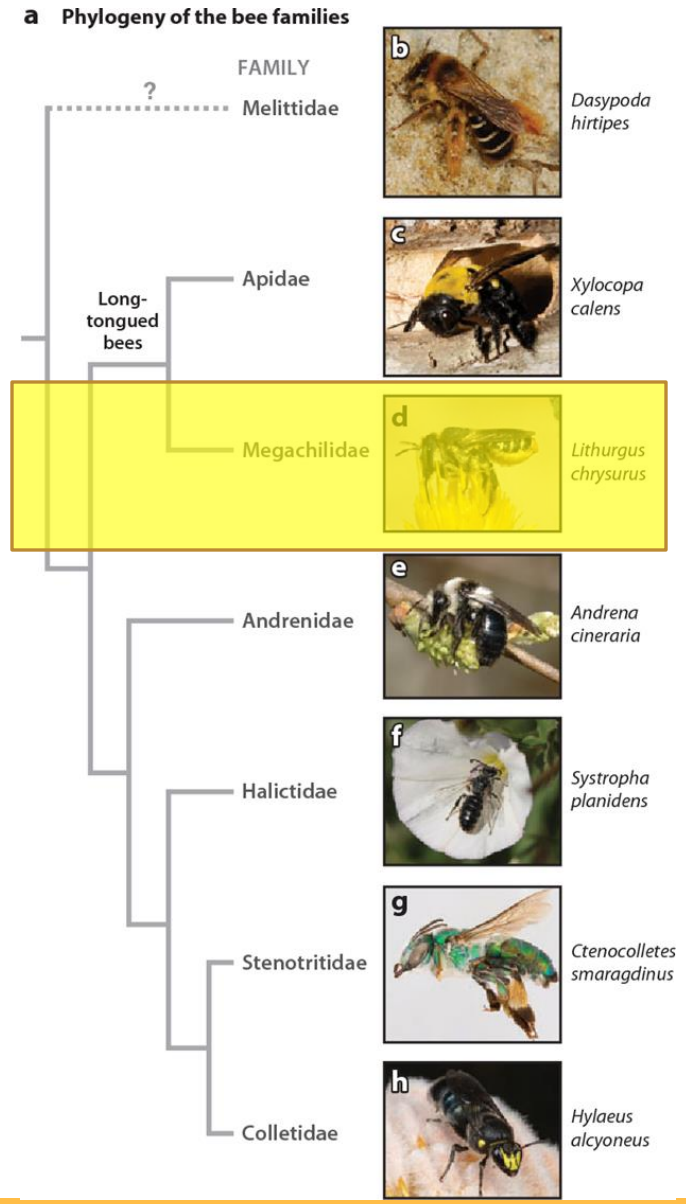
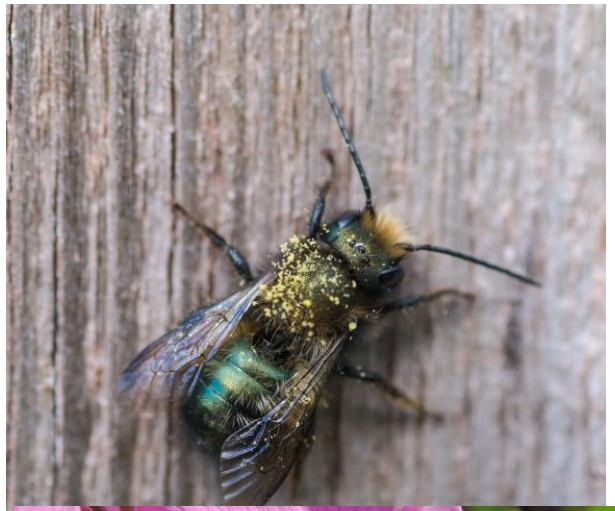



- ~4000 species identified
- Orchard mason bees, leaf cutter bees, wool-carder bees
- Most above ground nesters, all solitary



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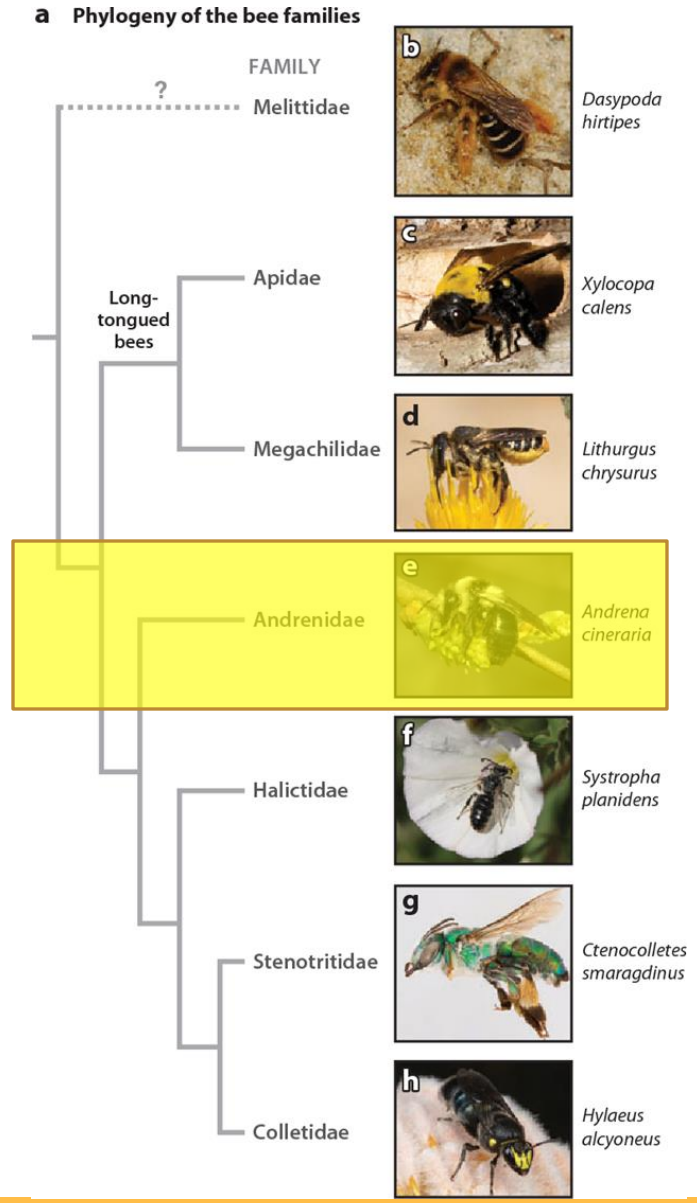
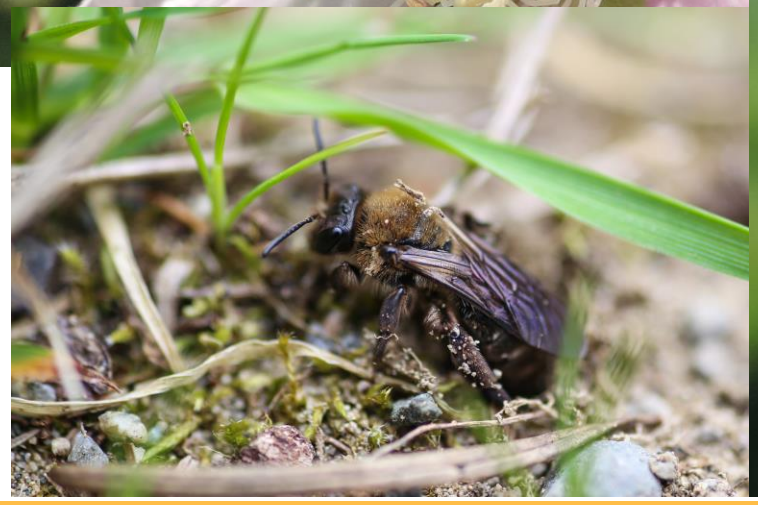
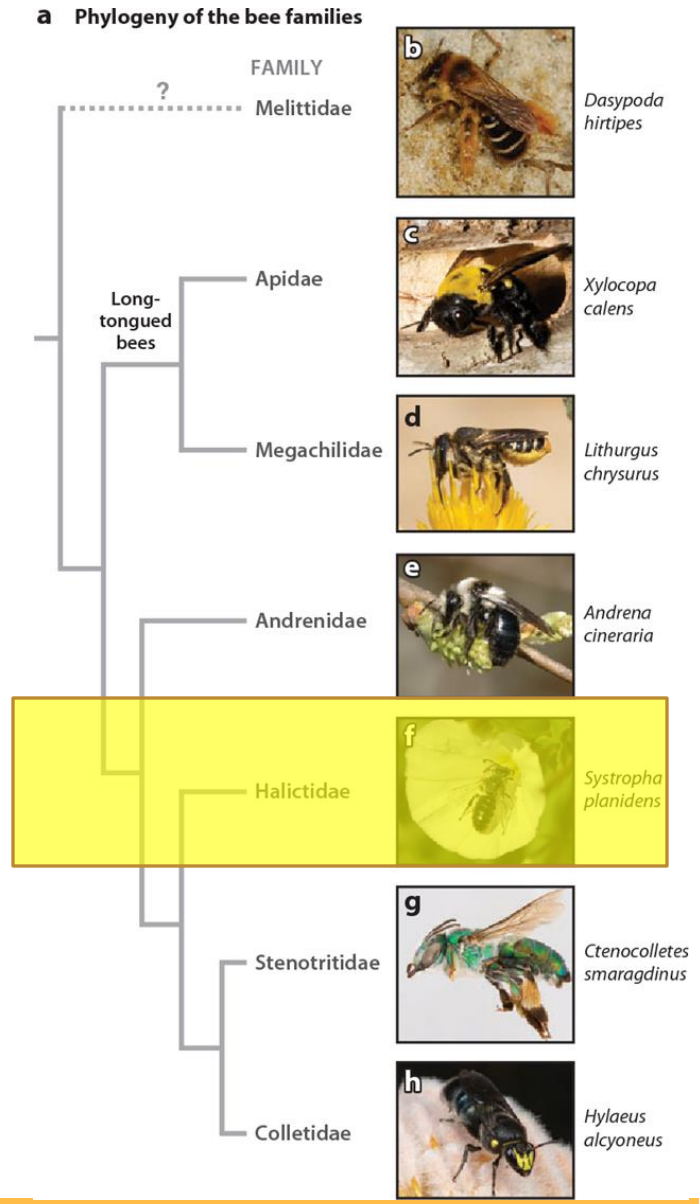
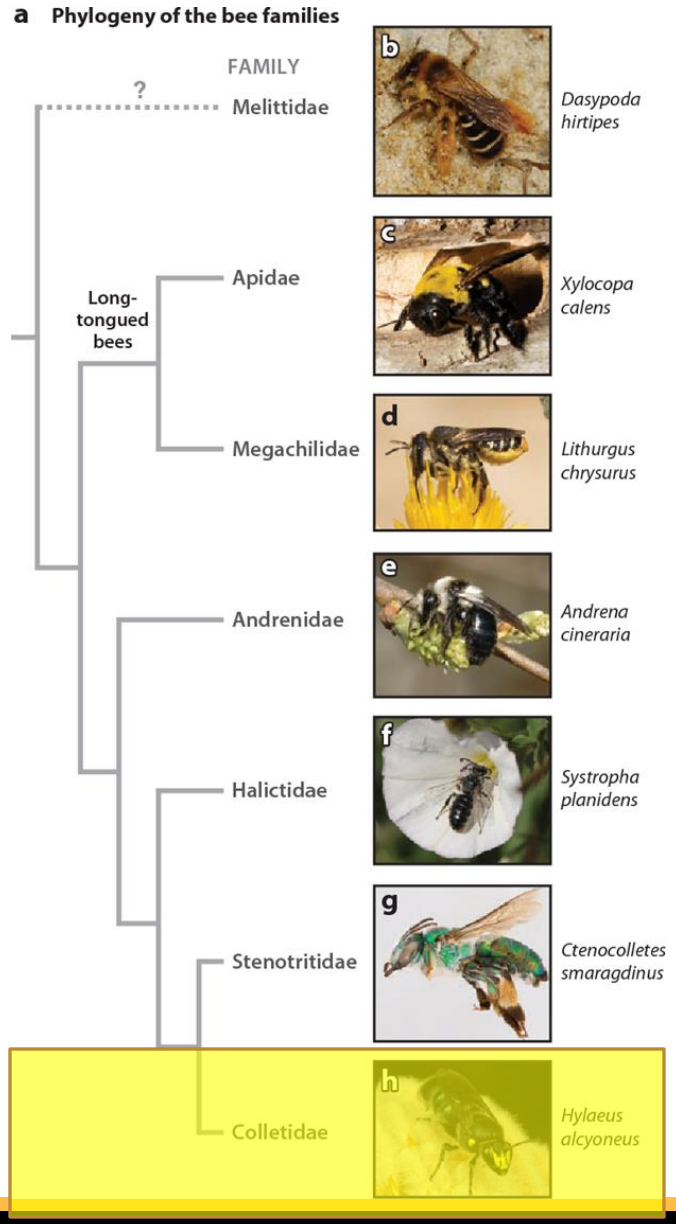



- ~3000 species identified
- Mining bees: dig nests in ground
- Many are specialists, reduced stinger






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




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

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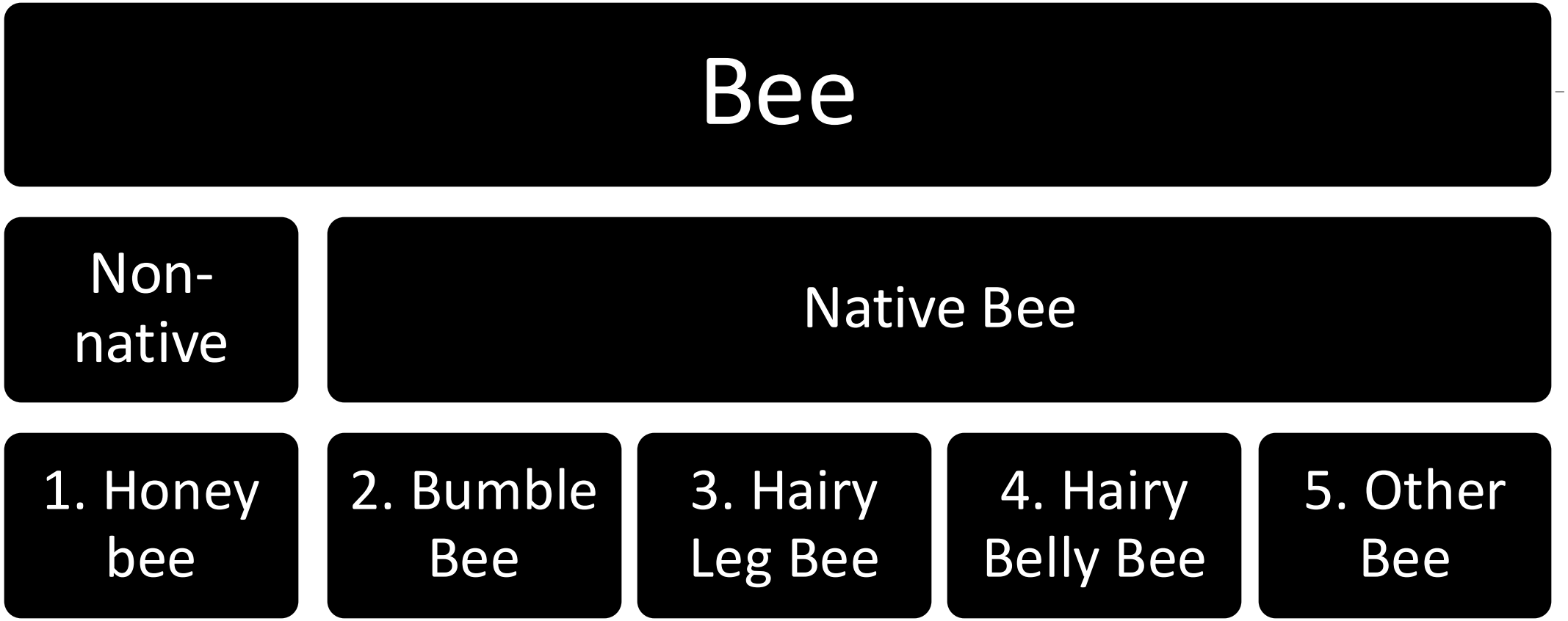


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# 1. Honey bees

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Pollen Basket

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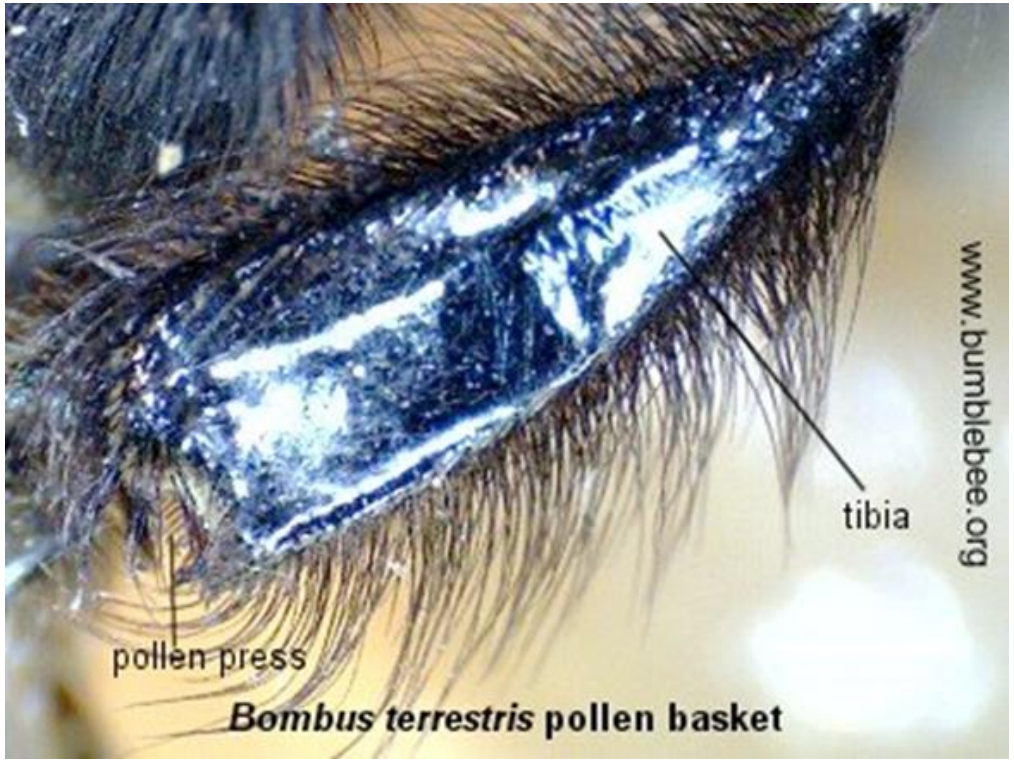


# 2. Bumble Bees

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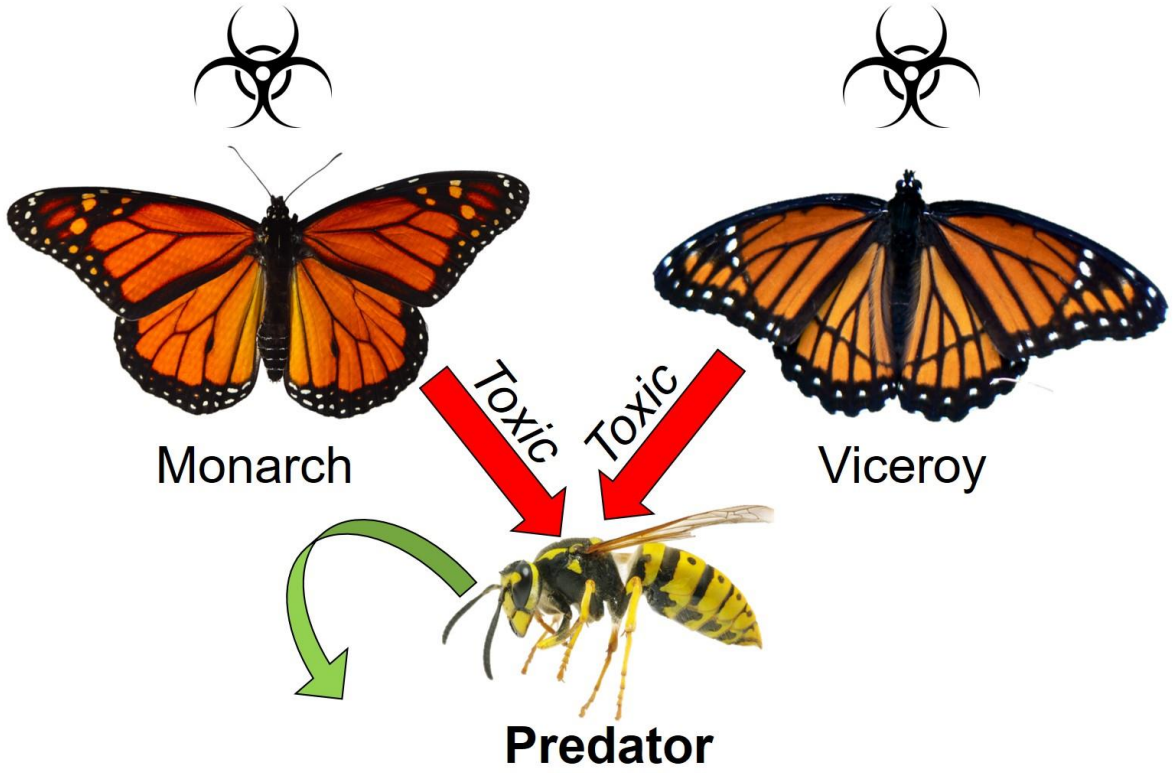
# Müllerian mimicry

- 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/

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

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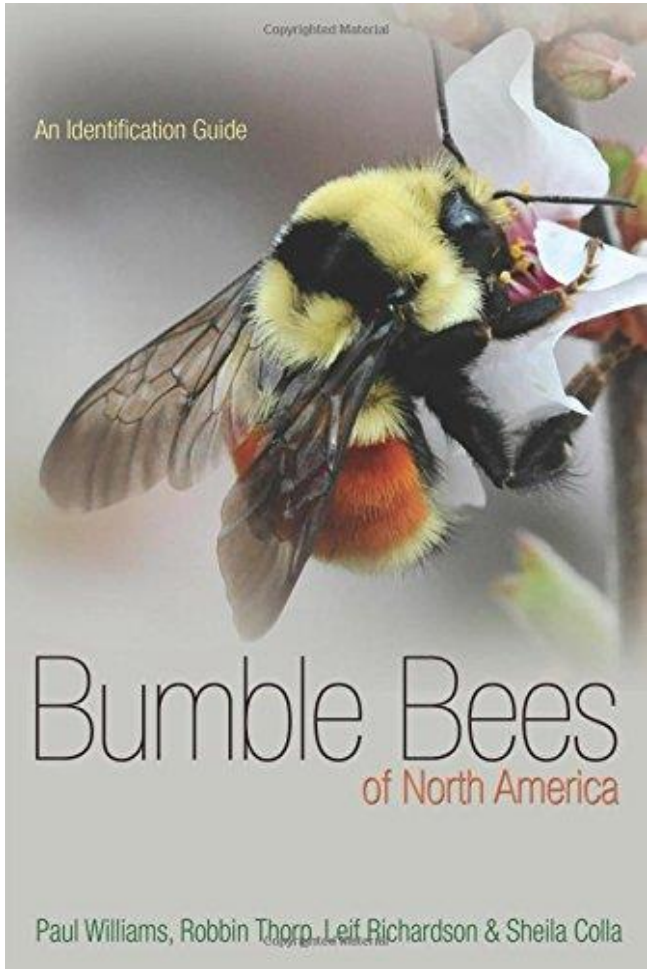


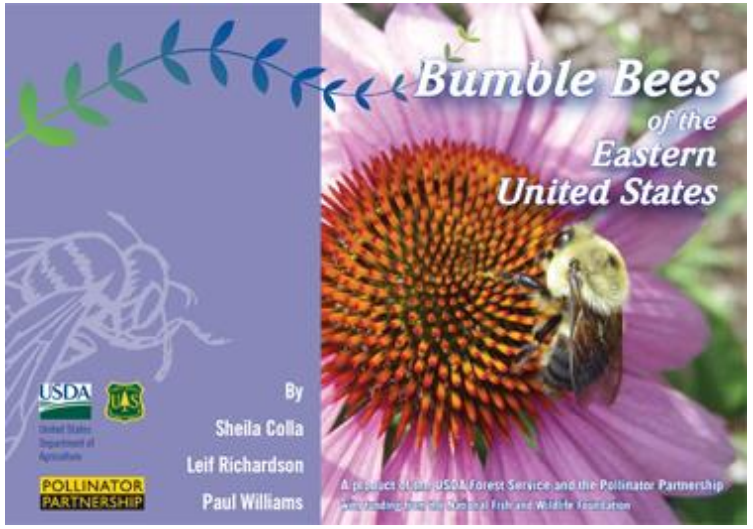


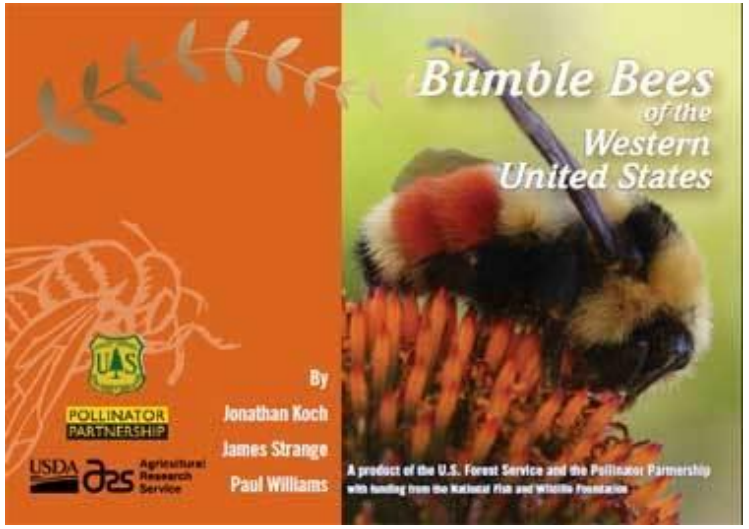


https://www.pollinator.org/shop/books

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# 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)

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# 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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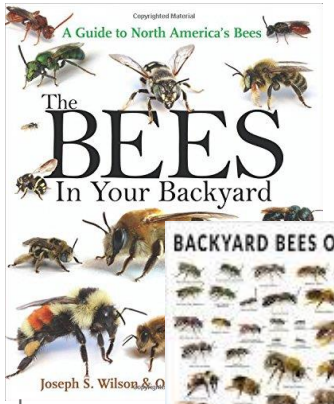
# Bee ID Resources

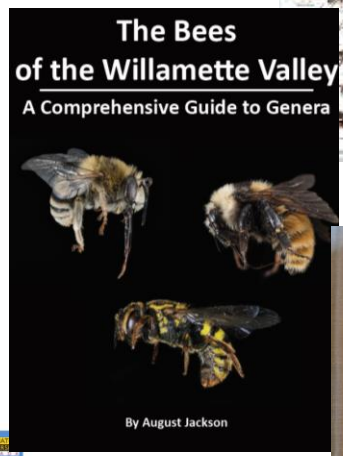
Less technical

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)
- 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)

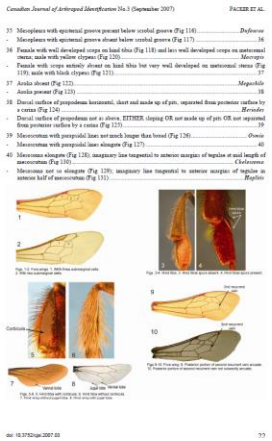


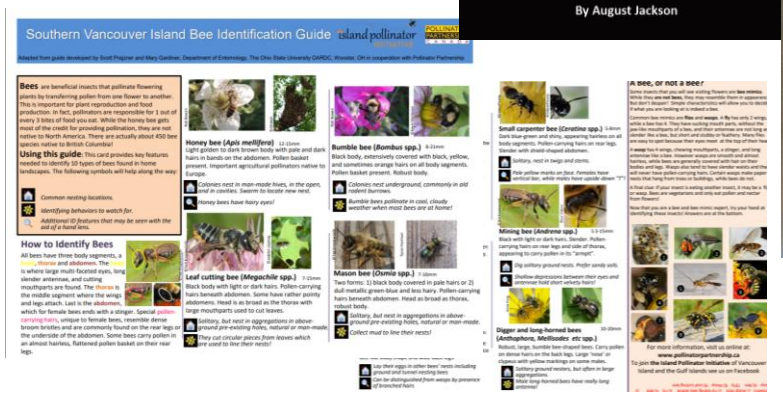


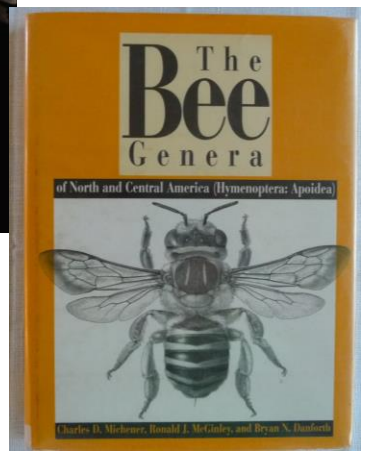




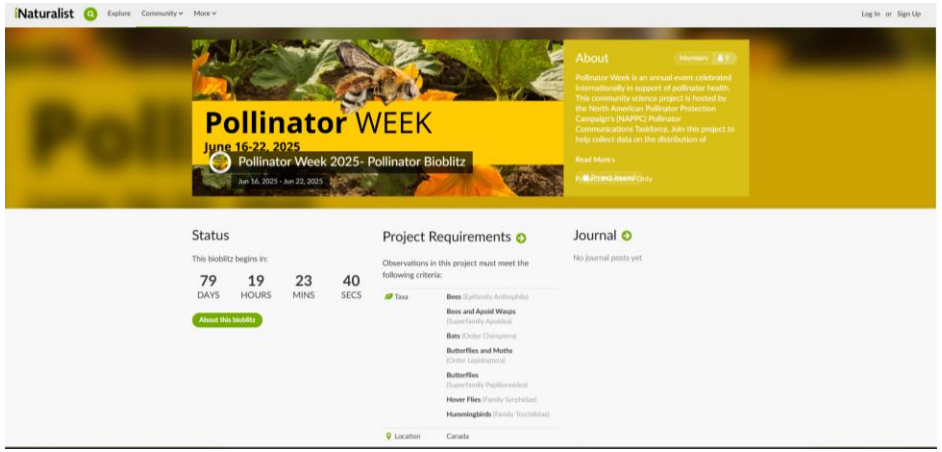


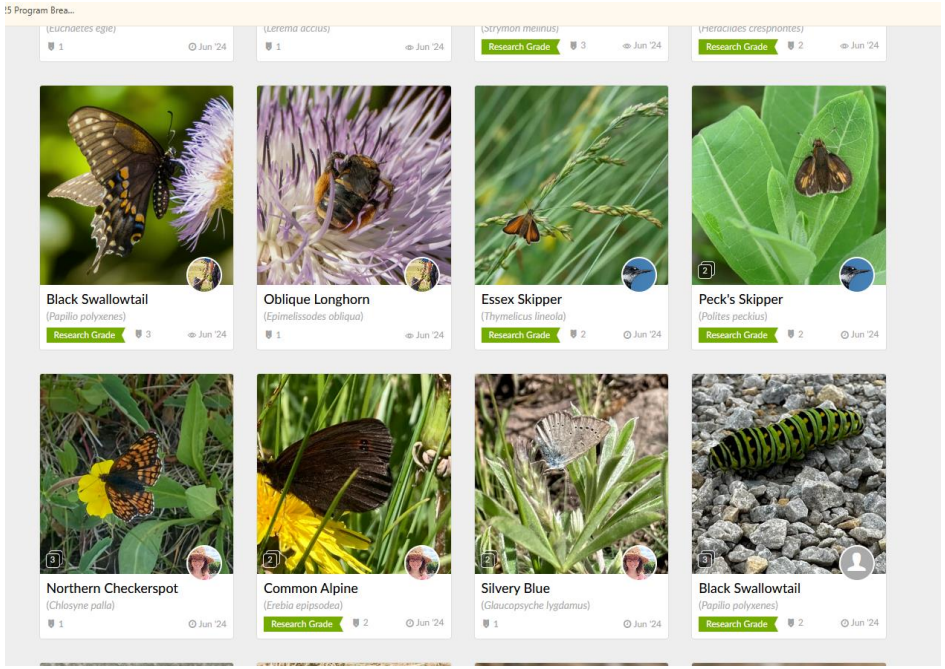




# iNaturalist

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# Pollinator Identification and Monitoring

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