

Bee Diversity and Basic Ecology



Photo: Mace Vaughan

Bee Diversity and Ecology

Bee Common Characteristics

- Pollen and nectar make up 100% of diet (habitat!)
- Actively gather pollen to feed offspring (pollination!)

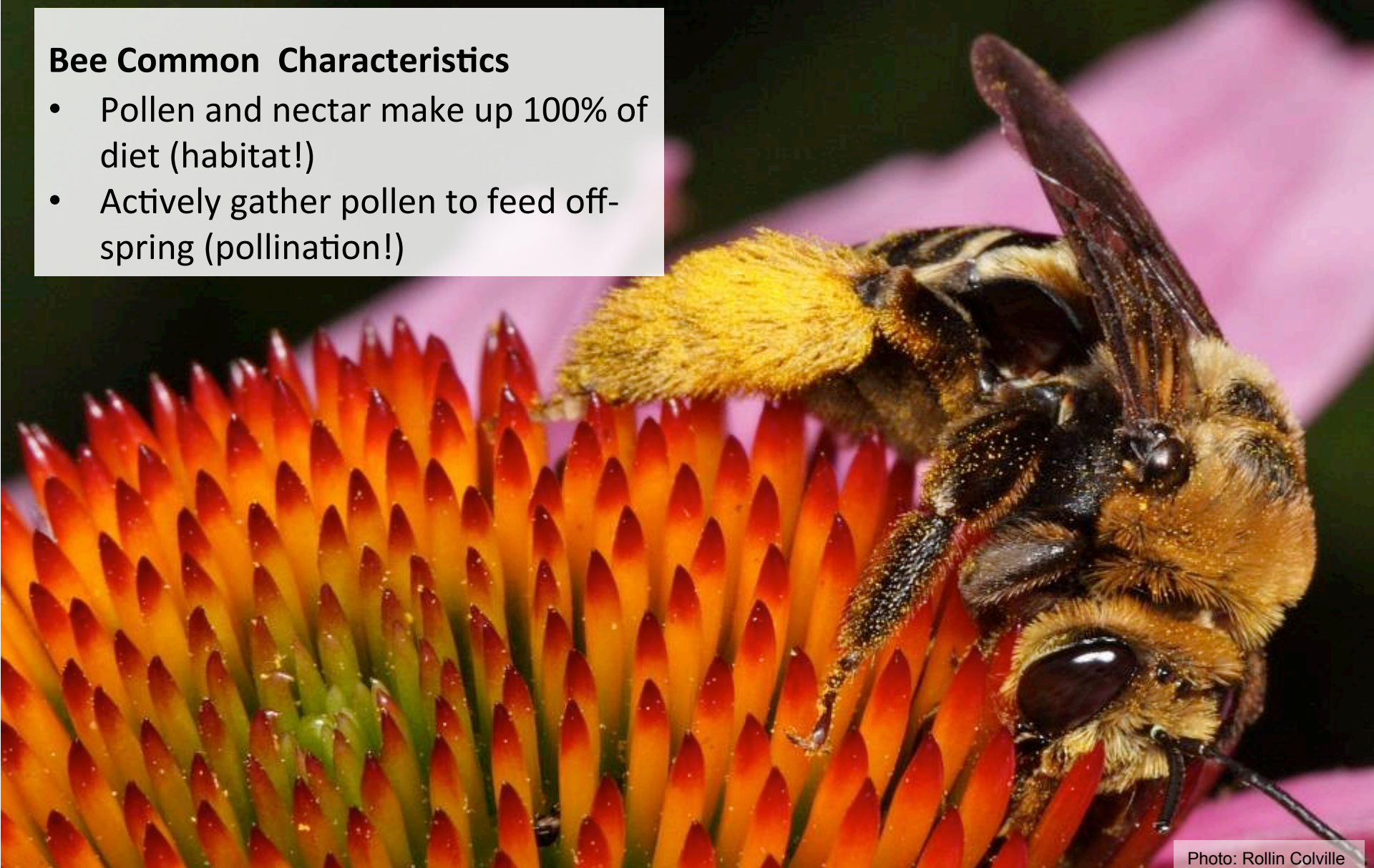
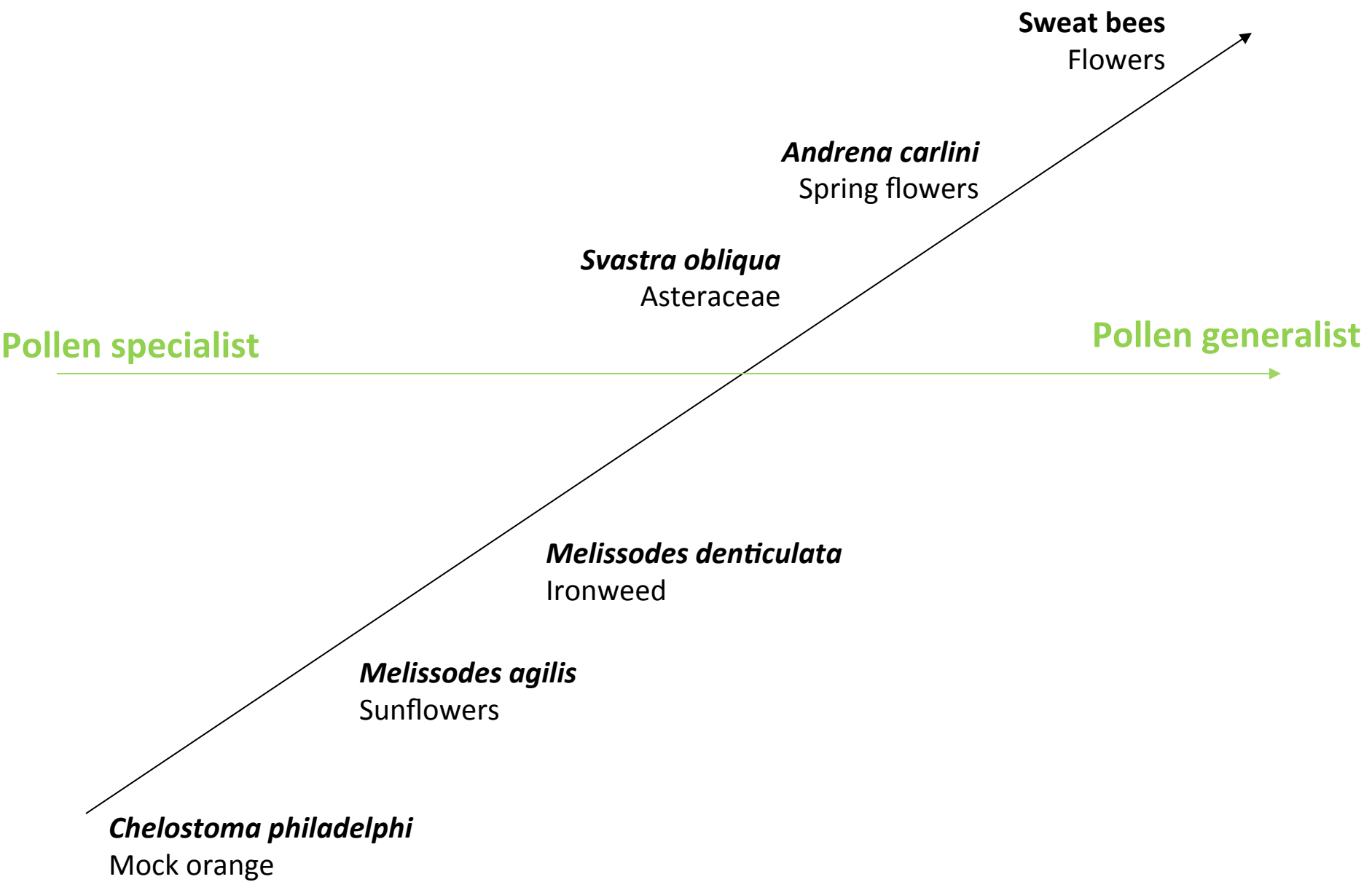


Photo: Rollin Colville



Bee Diversity and Ecology



Native Bee Nesting Characteristics

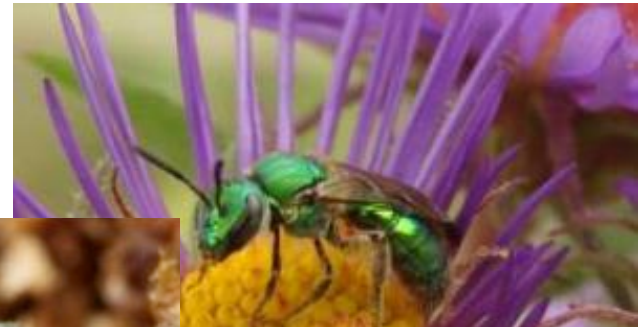
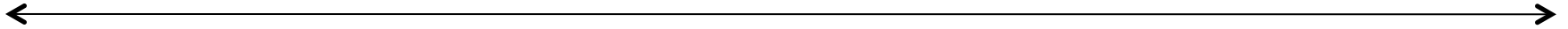
Solitary

Gregarious

Communal

Semi-Social

Social

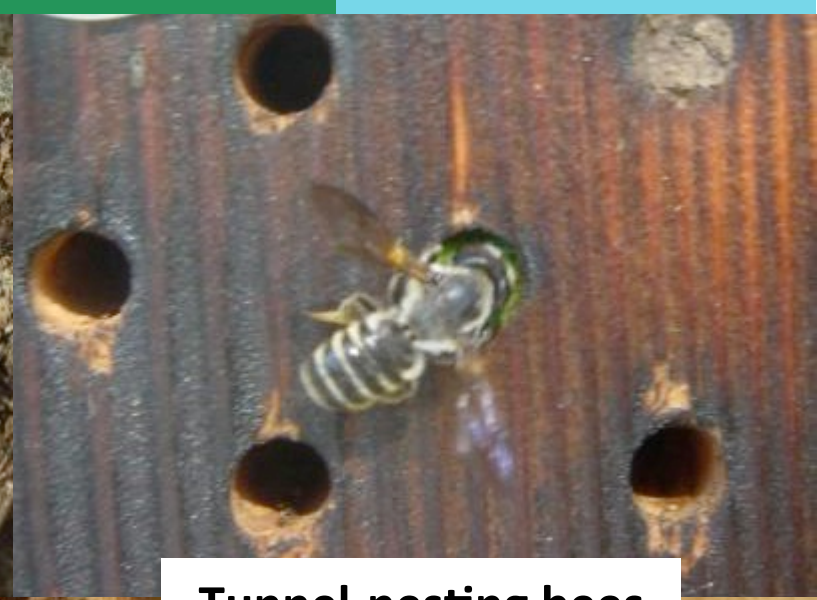


Native Bee Nesting Characteristics



Ground-nesting bees

- Primarily solitary



Tunnel-nesting bees

- Primarily solitary



Bumble bees

- social



Native Bee Nesting Characteristics

70% of native bees nest underground

- Resemble ant-nests above-ground
- Intricate chambers below
- Prefer bare or semi-bare, loose soil



Native Bee Nesting Characteristics

70% of native bees nest underground

- Many nest chambers are lined with waxy glandular secretions
- Nests often resist flooding (*Nomia*)
- Provide nesting habitat by creating or conserving bare or semi-bare undisturbed soil



Native Bee Nesting Characteristics

~30% of native bees nest in cavities

- Hollow or pithy plant stems, old beetle borer holes, man-made cavities, snail shells...
- Use mud, leaf pieces, or sawdust in construction of their nest
- Provide nesting habitat by conserving snags and brush piles and by planting pithy-stemmed plants.



Managed Tunnel-Nesting Bees

Managed cavity-nesting bees:

- Mason bees (*Osmia lignaria*)
- Leafcutter bees (*Megachile rotundata*)



Life Cycle of a Solitary Bee



Mining bee (*Andrena* sp.): a year in its underground nest as egg, larva, and pupa before emerging to spend a few weeks as an adult.



Native Bee Nesting Characteristics

- 45 Species in US
- Bumble bees nest in existing cavities such as old rodent holes, in overgrown areas, or under brush piles.
- Provide nesting habitat by planting bunch grasses and low growing shrubs or by creating brush piles.



Bumble Bees: Excellent Crop Pollinators

Bumble bees buzz pollinate

- Clover, tomato, pepper, etc.
- More efficient than honey bees for blueberry, cranberry, melons, etc.

Active in cool, wet, and windy weather



Life Cycle of a Bumble Bee Colony

Winter: Hibernating queen

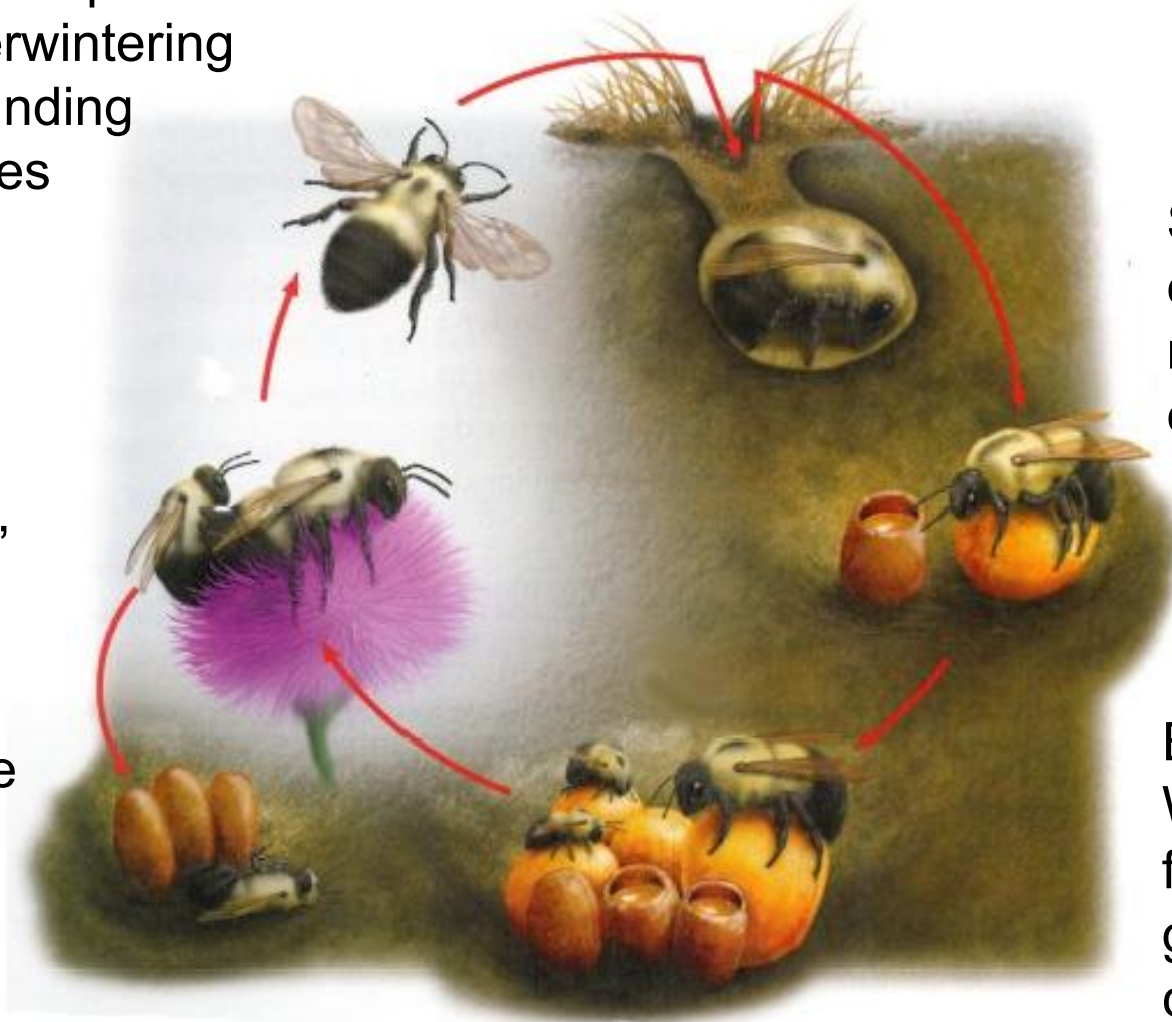
Fall: Mated queens seek overwintering sites, founding queen dies

Early Fall: Males leave nest, then new queens leave to find a mate

Spring: Queen establishes nest and lays eggs

Early Summer: Worker females help grow the colony

Summer: Colony peak



Recognizing Bee Look-Alikes



Recognizing Bee Look-Alikes: Flies

Flies vs. Bees

Short, thick antennae

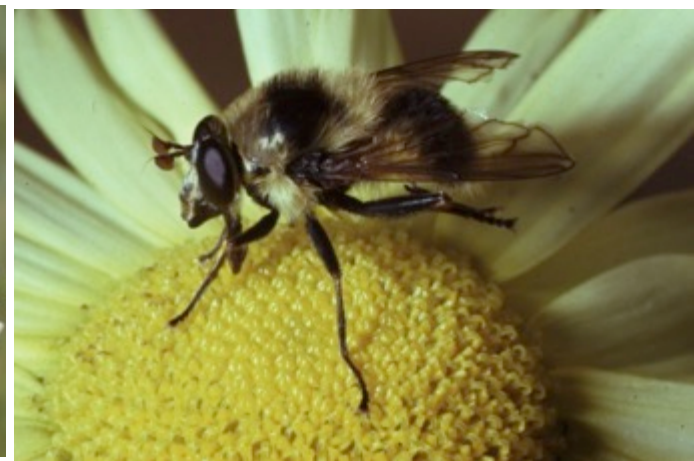
Large bulging eyes
near front of head

Little or no pollen,
skinny legs



2 wings

Usually not very hairy



Recognizing Bee Look-Alikes: Wasps

Wasps vs. Bees

Look tough: narrower bodies, pinched abdomen



Little or no pollen

Not very hairy

Colored patterns on exoskeleton

4 wings (sometimes folded)



Key Characteristics of Bees

Bees

4 wings

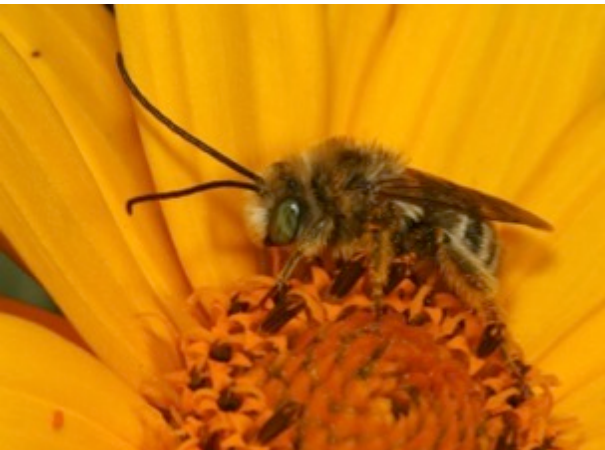
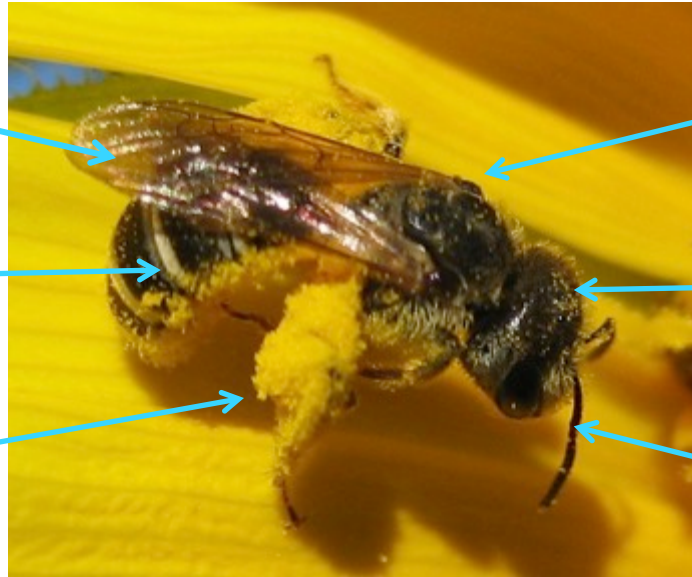
Rounder bodies

Females carry large loads of pollen

Are hairy (usually)

Eyes at sides of head

Long antenna



Important: Honey Bee vs. Native Bee



Photo: Sarah Greenleaf



Honey Bee vs. Native Bee

European honey bee (*Apis mellifera*)

- Most honey bees come from managed hives
- Honey bee numbers depend on the location of honey bee hives nearby
- Wild / native bee numbers give information about the quality of the habitat

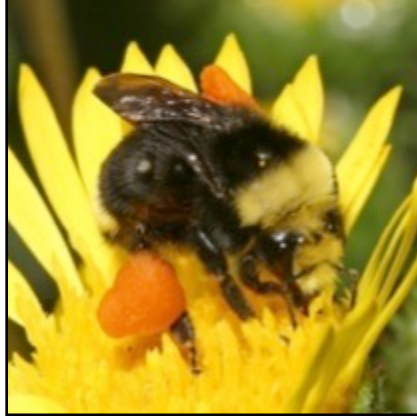


Photo: Rollin Coville



Key Characteristics of Bees: Pollen

Where? Wet or Dry?



Key Characteristics of Honey Bees

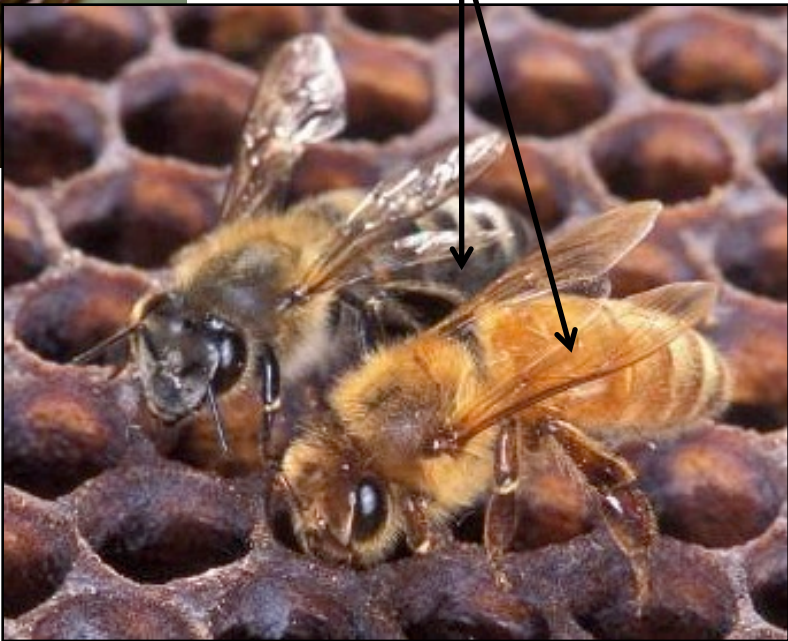
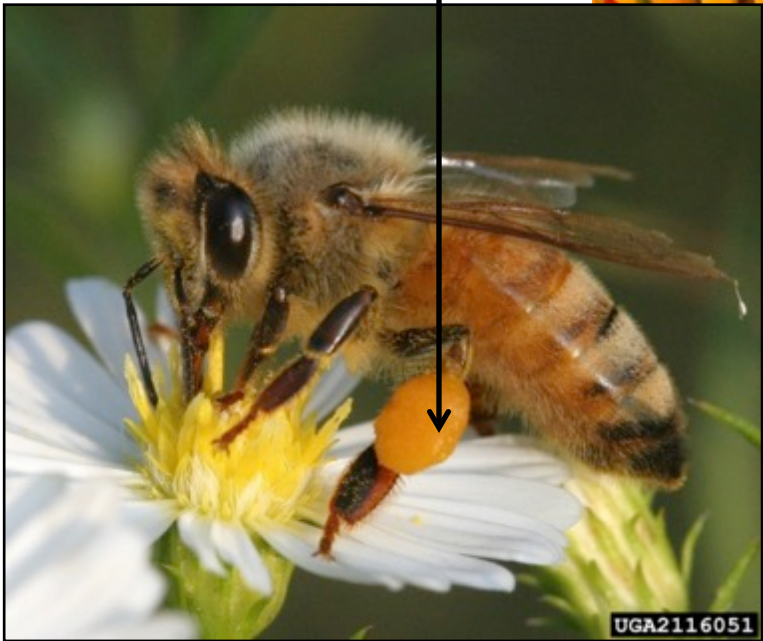
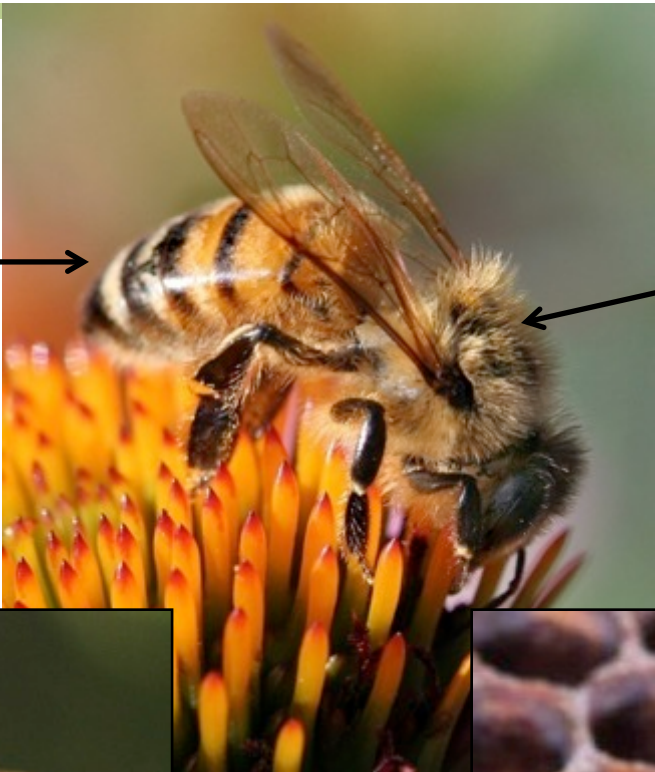
Medium size

Torpedo-shaped,
striped abdomen

Females carry moist
pollen mass on hind
legs (pollen basket or
corbicula)

Hairy thorax

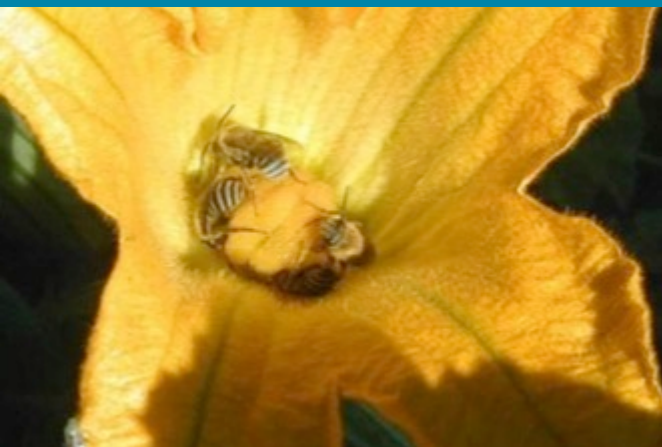
Orange-brown
stripes, variable



Bee Diversity and Ecology



3,600 Different Species of Bees Native to United States.



Photos: Doug Walsh, Bob Hammond, Mace Vaughan, Eric Lee-Mader, Nancy Lee Adamson

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