Common Beneficial Insects

Photo credit: Thelma Heidel-Baker
Beneficial Insect Diets:

Food for Natural Enemies

• Prey on and consume other insects

• Many beneficial insects rely on pollen or nectar at specific periods of their life cycle, or can use these floral resources to supplement their diets when insect prey are not available (habitat!)

Photos: Adam Varenhorst, Thelma Heidel-Baker
Common Beneficial Insects

Comprised of many insect groups: True bugs, beetles, flies, wasps, etc

- Insect Predators vs. Insect Parasitoids
  - Generalist vs. Specialists
- Non-insects
  Spiders, harvestmen, centipedes, mites, pseudoscorpions, nematodes, earthworms, soil microbes, entomopathogenic fungi
- Pollinators:
  Bees, flies, wasps, beetles, butterflies, moths

Photo credit: Alex Wild
Common Beneficial Insect Groups: Predators

Predators hunt, kill, and then consume

- Commonly generalists
  - Feed on a variety of prey
  - Can feed even when primary prey may not be present
- Ravenously feed
- Many supplement with pollen and / or nectar

Photo credit: Thelma Heidel-Baker

Spotted lady beetle on flowers
Common Beneficial Insect Groups: Predators

Predators: Syrphid Flies / Hover Flies

- Adults feed on pollen and nectar
- A single larvae can eat hundreds of aphids a week
- Bee mimics

Photo credits: Mario Ambrosino, Sarah Foltz Jordan
Common Beneficial Insect Groups: Predators

Predators: Beetles
Lady Beetles
• Predatory during all life stages
• Adults also feed on pollen and nectar
• Individuals may consume as many as 5,000 aphids in their lifetime

Photo credits: Thelma Heidel-Baker, Alex Wild
Common Beneficial Insect Groups: Predators

Predators: Beetles
Fireflies
- Actually are beetles!
- Prey on snails, slugs, caterpillars
- Moist habitats
- Some adults feed on nectar and pollen (native Asteraceae)

Photo credits: Sarah Foltz Jordan, Thelma Heidel-Baker, Katja Schulz (flickr-CC)
Predators: Beetles

Soldier Beetles

- Predatory as larvae and adults
- Adults need nectar and pollen (goldenrod!)
- Active at cooler temperatures than many insects
Common Beneficial Insect Groups: Predators

Predators: Beetles

Ground Beetles (Carabidae)
• Ground dwelling (under debris, bunch grass, logs, cracks in soil)
• Mainly nocturnal
• Prey on caterpillars, grasshoppers, other beetles
• Consume body weight in prey daily
• Some eat weed seeds

Photo credits: Tom Murray, MJ Hatfield, Sarah Foltz Jordan
Common Beneficial Insect Groups: Predators

Predators: True Bugs

Assassin Bugs and Ambush Bugs

- Large insects (some over 1 inch in length)
- Ambush bugs ‘camouflaged’
- Assassin bugs ‘beaks’
- Aggressive predators, often of larger pest insects

Photo credit: Tom Potterfield
Common Beneficial Insect Groups: Predators

Predators: True Bugs
Damsel Bugs

- Fast moving, small (1/2”)
- Enlarged forelegs, needlelike mouthparts
- Prey on any pests insects and eggs

Photo credit: Thelma Heidel-Baker
Common Beneficial Insect Groups: Predators

Predators: True Bugs

- Big-eyed Bugs and Minute Pirate Bugs
  - Small to Tiny (2-5 mm)
  - Adults and nymphs predaceous
  - Prey on many pests, can seek out prey at low densities

Photo credits: Alex Wild, David James, Thelma Heidel-Baker
Common Beneficial Insect Groups: Predators

Predators: Lacewings

- Larva can travel >100 ft. on foliage in search of prey
- As larvae, consume 400+ aphids per week
- More active in cool weather than other predators

Photo credits: Sarah Foltz Jordan, Sylvia Delfino, Thelma Heidel-Baker
Common Beneficial Insect Groups: Predators

Predators: Predatory Wasps

- Includes paper wasps and mud-daubers
- Females catch insects to feed larvae
- Adults feed on flower nectar
- Common prey includes caterpillars

Photo credit: Sarah Foltz Jordan
Common Beneficial Insect Groups: Predators

Predators: Mantids
- Mostly non-native
- Not very effective for pest control

Photo credit: Mace Vaughan
Common Beneficial Insect Groups: Parasitoids

Parasitoids

- Lay eggs on or in hosts or host eggs
- Larva feeds and eventually kills host
- Highly effective pest control
- Wasps and flies

Photo credits: Thelma Heidel-Baker, Matthew Roth, and Alex Wild
Common Beneficial Insect Groups: Parasitoids

- Most parasitoids are specialists; Prey are limited to a particular insect groups or species
- Persist in environments with low-levels of prey
- Adults are nectar-feeding

Tiny wasp parasitizing stink bug eggs

Photo credit: MJ Hatfield
Common Beneficial Insect Groups: Parasitoids

Parasitoid Wasps

• Often very tiny
• Individuals lay hundreds of eggs
• Many different species
• Can parasitize adult insects or insect eggs

Photo credit: Alex Wild
Common Beneficial Insect Groups: Parasitoids

Parasitoid Flies
• Stiff bristles on abdomen
• Parasitoids of many pests
• Some attracted to the mating signals of their prey

Photo credit: Bill Bouton
Common Beneficial Insect Groups: Parasitoids

Parasitoids: recognizing their damage easier than recognizing insect itself

- How to recognize a parasitized insect

Aphid mummies (parasitoid wasps developing inside)

Photo: David Cappaert, Bugwood.org