

Predatory & Parasitoid Insects

Beneficial Garden Insects

Beneficial Insects

- Can be divided into two broad categories:
 - Parasitoids: larvae of parasitic wasps that target specific hosts
 - These are like the first responders – they are present before there is a large pest infestation.
 - Predators: large insects that eat smaller, pest insects.
 - These are like the national guard – when there is a large pest population, they show up to reduce their numbers.

Parasitic Wasps & Parasitoids

- **Parasitic Wasps (parasitoids) are the first check on insect pests.**
 - They are present *before* pests get out of hand and can help prevent pest populations from exploding.
 - Parasitic wasps are attracted to a specific species of insect – they find them by tracking pheromones or using visual cues.
 - They lay their eggs in, or on the host insect.
 - The larvae hatch and begin to feed on the host, weakening and eventually killing it

- **Parasitoids rarely attack mature insects, but they attack every stage of immature insect: egg, larval, & pupae.** Different parasitoids attack different stages
 - Parasitoids sometimes pierce the exoskeleton of a pest and sip hemolymph (bug blood) for proteins to fuel egg production. Later, after the eggs have formed, they'll return to deposit an egg in or on the same pest.
 - **Some parasitoid wasps use germ warfare.** They inject *polyDNAViruses* into the host, along with their eggs. The *polyDNAViruses* impair the host's immune system, allowing the parasitoid larvae to develop. Others paralyze the host, or take over its brain in order to force a specific behavior.
 - The parasitoid larvae devour non-essential organs and tissues first, waiting till just before pupating to eat the essential organs that kill the host.

<https://www.youtube.com/watch?v=qN2XMyxAs5o>

Aphid Wasps



- A female can lay 100 eggs in aphids or the eggs of caterpillars.
- These tiny, gnat-sized wasps have a wingspan of 1 mm—about the size of Lincoln's beard on a penny.
- Some have stingers that they use to sting the eggs of pest insects, and aphids. The stingers can't penetrate human skin.
- If you turn a leaf over and see aphids, you'll likely see some brown aphid "mummies", aphids that have been parasitized.
 - A parasitoid wasp is developing inside the husk of the aphid's exoskeleton.
 - If you see a hole at one end, the parasitoid has already emerged.

Tachinid Flies and Phorid Flies

- flies lay their eggs on the necks of ants, and the larvae form a ring-shaped parasite around the ant's neck, and draws ant hemolymph to fuel its growth.
- As it grows, it squeezes the ant's neck, eventually popping the head off. The larva then makes a meal of the ant's brain, and crawls inside the head capsule to pupate.
- **The flies limits the size of ant hills:** The further the ants range from the hive, the greater their exposure to the parasitoid. When flies are present, some ants have to watch the sky to defend the others, and when they're watching, they can't be gathering food for the hive.

<https://www.youtube.com/watch?v=UiJgsPUYahs>

Braconid Wasp



- Sting and lay eggs on and inside of aphids, bark beetles, and caterpillars.
 - The most noticeable of infestation is in the case of tomato horn worms.

<https://www.youtube.com/watch?v=nZZyJQNmOV8>

Predatory insects

- Predator insects include:
 - Beetles , Centipedes, Lacewings, Wasps, flies, Spiders, Dragonflies, & praying mantises.
 - **Predator populations rise in response to increases in prey populations**, so they're the cleanup crew when things get out of hand.

Most predators are not prey-specific—they eat anything smaller or slower than themselves—sometimes including smaller members of their own species. They will usually shift to whatever prey species is most abundant.

Green Lacewing

- Adults feed only on nectar, pollen, and aphid honeydew
- Larvae are voracious eaters of the eggs and immature stages of many soft bodied insect pests, including several species of aphids, spider mites (especially red mites), thrips, whitefly, leafhoppers, some beetle larvae, eggs and caterpillars of pest moths, and mealybugs.
- The larvae will eat for 2-3 weeks, spin a cocoon, and 10-14 days later, emerge as adults.



Praying Mantises

- highly predacious and feed on a variety of insects, including moths, crickets, grasshoppers and flies.
- They intently watch and stalk their prey, and lie in wait with the front legs in an upraised position.

<https://www.youtube.com/watch?v=6hGudllPcM>