

Meet the Beneficials: Natural Enemies of Pests

Natural enemies is the term used to describe the beneficial predators, parasites, and pathogens that can reduce pest numbers and the damage they cause to plants in fields, gardens, and landscapes. Natural enemies are key components of integrated pest management (IPM) programs. You can protect and attract natural enemies by limiting the use of broad-spectrum pesticides, providing habitat, and planting nectar and pollen producing plants.

Predators

Predators hunt, attack, and kill their prey. Some predators are generalists that feed on a variety of mites and soft-bodied insects such as aphids and whiteflies. Others are specialists that prefer feeding on specific pests.



Lady beetles, or lady bugs, and their larvae are commonly seen predators of aphids and other small insects. Shown here is the adult (left), larva (center), and cluster of eggs (right) of the convergent lady beetle.



Predaceous ground beetle adults (left) hunt soil-dwelling insects such as cutworms and root maggots. Some also feed on snails and slugs. Their **larvae** (right) live on soil and in litter, feeding on almost any invertebrate.



Green lacewing adults (left) feed on nectar and pollen, with only certain species also eating insects. Their **larvae** (center) feed on mites and soft-bodied insects, especially aphids. **Eggs** (right) are laid on slender stalks in groups or individually.



Syrphid fly (flower fly, hover fly) adults (left) eat pollen and nectar. Their **larvae** (right) mostly eat aphids but also other soft-bodied insects like psyllids.



Assassin bugs attack mostly small to medium-sized insects.



Damsel bugs feed on a wide variety of small insects.



Dragonflies eat other flying insects such as moths, midges, and mosquitoes, capturing them in mid-air.



Pirate bugs attack mites and any tiny insect, especially thrips.



Praying mantids eat anything they can catch, including pests and other natural enemies.



Predatory wasps, such as this paper wasp, prey on caterpillars and other insects.



Sixspotted thrips mostly feed on mites.



Soldier beetle adults mostly eat aphids. Their larvae are soil-dwelling and often feed on small insects.



Spiders, including this crab spider, attack all types of insects.



Western predatory mites attack pest mites.

Parasites and Parasitoids

A parasite is an organism that lives and feeds in or on a host. Unlike true parasites (fleas and ticks for example), parasitoids kill their hosts. Nearly all insect pests have at least one parasitoid that attacks them. Most parasitoids are wasps or flies and are often very small.



Stink bug egg parasitoid
Some parasitoids attack insect eggs, such as this *Trissolcus* wasp.

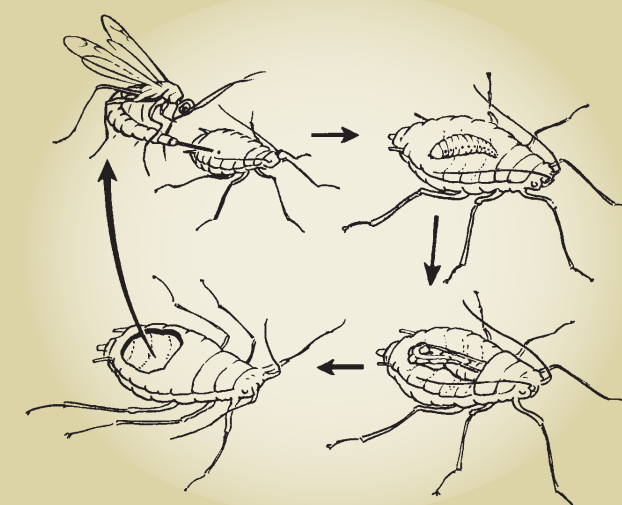


Parasitized scales on twig
The blackish scale insects on the twig at left are discolored because they have been parasitized, and wasp larvae are developing within.



Caterpillar parasitoid
Caterpillar parasitoids include the *Hyposoter exiguae* wasp.

Aphid parasitoid life cycle



The adult female wasp lays an egg inside an aphid; the egg hatches into a larva that feeds on the aphid from the inside. After killing the aphid, the wasp larva pupates then emerges as an adult wasp.



Mummy and healthy aphid
Parasitized aphids die and turn into crusty "mummies" that can be black or beige. The hole in the mummy at left indicates a parasitoid has emerged. The aphid in the middle is healthy.

