



Natural Enemies: Nature's Pest Controls

Present in every garden, landscape, forest or field, 'natural enemies' help regulate populations of destructive insects and other organisms. Learning to recognize some of these beneficial creatures is the first step towards conserving and encouraging their helpful presence.

Ladybird Beetles (*Ladybugs*): Ladybird beetles are small, oval, convex and often brightly colored red or yellow insects with black markings (**Figure 1.**). Most are predaceous both as larvae and adults and feed chiefly on aphids, although some also consume mealybugs, scales or mites. The larvae vary in color and do not resemble the adults, but are often black with red or orange spots (**Figure 2.**). Adult beetles overwinter in protected areas under leaves or bark. The most common species, the multicolored Asian ladybeetle, varies from yellowish to orange or red with many to few (or no) black spots. It is occasionally a nuisance as it attempts to enter houses to overwinter in fall. Ladybeetles collected during winter hibernation and purchased in spring typically disperse soon after they are released.

Lacewings: Aptly named for their delicate wings, lacewings may be either bright green or brown (**Figure 3.**) with golden eyes. The larva, or aphid lion, (**Figure 4.**) is usually grayish brown banded with white bearing sharp curved jaws. It feeds on aphids, scales, whiteflies, mealybugs, thrips, mites, small caterpillars and insect eggs. As it reaches full size it can consume 100 or more insects or mites per day.

Ground Beetles: There are hundreds of species of ground beetles, or carabids, and both larvae and adults of many are considered beneficial predators or parasitoids of other insects. Generally they are a dark brown or black (**Figure 5**) and active at night, hiding under debris, stones or logs during the day. Some are metallic or brightly colored (**Figure 6.**) and active during the day. They feed on larvae of other beetles (such as Colorado potato and asparagus beetles), caterpillars and root maggot eggs and larvae.

Braconid and Other Wasps: Many groups of small, inconspicuous wasps including braconids, aphidiids, ichneumonids (**Figure 7.**) and trichogrammatids parasitize insects or their eggs. Small, white cocoons of one braconid are often seen attached to the body of hornworms in home gardens. Hosts for other species include various caterpillars, tarnished plant bugs, aphids, whiteflies, leafminers, and beetle and fly larvae or pupae. Paper wasps, yellow jackets, mud-daubers, cicada-killers and other wasps are predators of different caterpillars, cicadas, spiders and other organisms. Ants tending aphids for honeydew sometimes defend them against parasitoid wasps and predators.

Praying Mantids: These predators (**Figure 8.**) feed on a variety of insects, ambushing them with upraised front legs, for which they are named. The foamy brown egg cases (**Figure 9.**) are attached to twigs or stems in fall, which can be cut and tied to plants in the garden. The larvae look like small, brown versions of the adults and are cannibalistic, so only a few survive. Mantids are the only insects that can turn their head to look behind. They are not protected, contrary to common folklore, and their beneficial role may be overemphasized, since they feed indiscriminately on both pests and non-destructive organisms such as bees.



Figure 1. A convergent lady beetle, (Bob Moul, www.pbase.com/rcm1840)



Figure 2. Larva of multi-colored Asian lady beetle (Tom Murray, www.pbase.com/tmurray74)

Dragonflies: Often seen darting and soaring over ponds and streams that are home to the predaceous nymphs, they may even travel some distance away to forage in home gardens and landscapes. These skillful flyers (**Figure 10.**) catch and devour prey on the wing. Mosquitoes and other flies make up a large part of their diet.

Syrphid Flies: Sometimes also called flower or hover flies, they resemble brightly colored wasps (**Figure 11.**) and bees (**Figure 12.**) as they hover over flowers. They do not sting and feed on pollen and nectar, while the larvae, which may resemble small green or pinkish maggots, are predators of aphids or young termites, ants or bees.

Antlions: The predaceous larvae of an insect related to lacewings, sometimes called doodlebugs, antlions are equipped with large, sickle-like jaws (**Figure 13.**). Certain species construct conical pitfall traps especially in dry, sandy sites and wait concealed at the bottom for prey to tumble in. The adults resemble damselflies and are sometimes attracted to lights at night.

Lightning Bugs: The adults (**Figure 14.**) fly during early summer evenings and are more conspicuous by their blinking yellow light. The larvae (**Figure 15.**) of most species, which feed on various smaller insects and snails, are luminescent and given the name ‘glowworms.’

Spiders and Predatory Mites: Spiders (**Figure 16.**) are common natural enemies in landscapes and gardens. Some kinds build webs to catch prey, while others ambush or pursue it. Although their ‘benefits’ are debatable, they are part of the larger complex of predators and other organisms that help regulate insect populations. Predatory mites are rarely observed due to their small size. Different kinds feed on other mites and mite eggs, nematodes and other small organisms and live in soil, litter or on foliage. Certain kinds can survive on pollen or honeydew when prey are scarce. They can be critically important in maintaining pest mites at low levels.

Insect Pathogens: Insects and other pests are susceptible to a variety of pathogens, or disease-causing organisms, including fungi, viruses and bacteria. Flies affected by a fungal disease are often observed clinging to leaves or shoot tips, wings extended and abdomen expanded. Some kinds of insect pathogens cause chronic effects, such as reduced reproduction or slower growth, or may be active only under certain conditions such as wet weather or dense populations. They tend to be rather specific to particular insect groups and none are toxic to other wildlife or humans. Certain ones or their derivatives have been commercialized, including the bacterium *Bacillus thuringiensis kurstaki* for caterpillars and the fungus *Beauveria bassiana* for aphids, whiteflies and other pests.

Insect-Parasitic Nematodes: While some nematodes, or tiny roundworms, attack plants or fungi, certain ones are specific to insects. They enter their insect host, usually an immature larval or pupal stage, and release certain bacteria. The bacteria produce a toxin which actually kills the insect. The nematodes reproduce and leave to search for new hosts. Grubs, caterpillars and maggots are among the groups which can be affected by nematodes.

While a variety of pest predators, parasitoids and pathogens are available for sale, home gardener should not expect releases to quickly



Figure 3. Adult lacewing (Alton N. Sparks, University of Georgia).



Figure 4. Lacewing larva (Bradley Higbee, Paramount Farming, www.insectimages.com)



Figure 5. A ground beetle (Tom Murray, www.pbbase.com/tmurray74)



Figure 6. Metallic colored ground beetle (Tom Murray, www.pbbase.com/tmurray74)

solve serious infestations or all insect problems. Gardeners will be well-served by conserving the natural enemies already present through the judicious use of pesticides and the recognition of various beneficial organisms including their different life stages.

Prepared by: Carolyn Klass, Senior Extension Associate & Warren T. Johnson, Dept. of Entomology - Cornell Univ. 5/72. Reviewed 9/95.

Revised by: Dan Gilrein, Extension Entomologist, Cornell Cooperative Extension - Suffolk County, 3/99

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Figure 8. Chinese mantid (Bob Moul, www.pbase.com/rcm1840)



Figure 9. A mantid egg case (Bob Moul, www.pbase.com/rcm1840)



Figure 7. An ichneumon wasp (Bob Moul, www.pbase.com/rcm1840)



Figure 10. Adult dragonfly (Tom Murray, www.pbase.com/tmurray74)



Figure 11. A syrphid fly (Tom Murray, www.pbase.com/tmurray74)



Figure 15. A lightning bug larva (Tom Murray, www.pbase.com/tmurray74)



Figure 13. An antlion (Joseph Berger, www.insectimages.com)



Figure 14. An adult lightning bug (Tom Murray, www.pbase.com/tmurray74)



Figure 12. A syrphid fly (Tom Murray, www.pbase.com/tmurray74)