

POCKET GUIDE

Beneficial Insects **on NYC Farms**

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On the cover: This pinkspotted lady beetle is eating dandelion pollen, but will also happily munch on aphids and other insect pests.



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Introduction

This guide provides information on beneficial insects commonly found on New York City farms as well as how to recognize and identify them.

Beneficial insects in this guide refers to natural enemies of pests as well as pollinator insects, like bees.

Throughout the guide, quickly determine where you would expect to see each insect using this key:



in the AIR



on the PLANT



on the GROUND

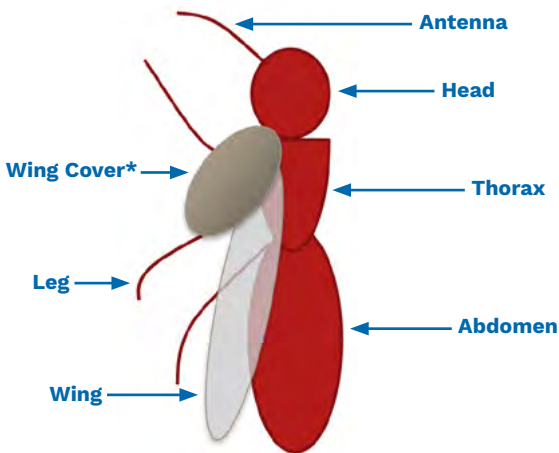
Text under the common name of each insect is part of the scientific name of that insect.

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Insect Parts

Below is a diagram of the basic parts of an insect's body. These body parts will be referred to in the coming pages.



* Not all insects have wing covers, but for those that do, the wing covers are often folded over the wings.



Ground Beetles

Carabidae

Common Prey

caterpillars,
grasshoppers,
beetles, aphids, flies,
snails, slugs, and
more



Physical Characteristics

- 0.04 to 2.4 inches
- Most are dark brown or black, shiny or metallic
- Uniformly thin antennae, not clubbed or branched
- Prominent trochanters (bumps on hind legs)
- Have hard wing covers that cover their entire abdomen



uniformly
thin antenna



trochanter





Rove Beetles

Staphylinidae

Common Prey

insect eggs, small larvae, slugs, and mites

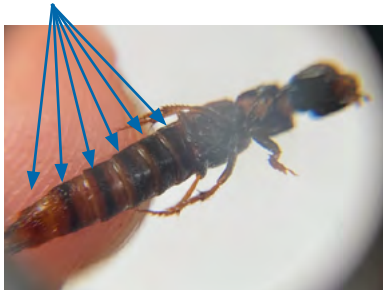
Physical Characteristics

- 0.03 to 0.9 inches
- 6-7 segments on the abdomen (gives the abdomen a striped pattern)
- Wing covers do not cover full length of abdomen



short wing covers

abdomen segments





Soldier Beetles

Cantharidae

Common Prey

insect eggs and larvae, aphids, snails, slugs

Physical Characteristics

- 0.07 to 0.7 inches
- Usually black with red or orange markings
- Long and thin bodies
- Long antennae





Lady Beetles

ladybugs, lady bird beetles

Coccinellidae

Common Prey

aphids, mites, caterpillars, insect eggs

Physical Characteristics of Adult Beetles

- 0.06 to 0.4 inches
- Typically red or pink colored with black spots, but some can be yellow or dark brown and/or with no spots or white spots
- Wing covers that cover entire abdomen

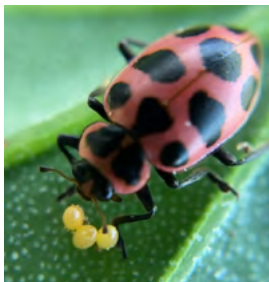


Photo by Caitlin Tucker



Lady Beetles - immature

ladybugs, lady bird beetles

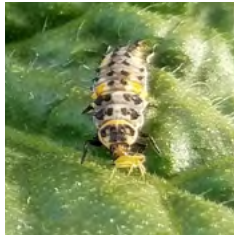
Coccinellidae

Physical Characteristics of Larvae

- Larvae have elongated, flattened alligator-like bodies and are usually dark colored with bright spots.
- Pupae are usually orange and black and do not move.



Lady beetle larva



Lady beetle larva eating an aphid



Lady beetle pupa



Tiny Wasps

Many tiny wasps are parasitoids of other insects, meaning that they lay eggs on or in the insects, and their young kill the insect host while they develop. Each tiny wasp species may parasitize only specific pests; hosts include eggs, larvae, and adults of aphids, whiteflies, caterpillars, flies, beetles, leafhoppers and more.

Physical Characteristics

- 1/8 inch or less
- 2 pairs of wings (4 wings total)
- Large, oval-shaped eyes
- Thin waists
- Usually black, dark-blue or green, and often metallic





Tiny Wasps continued

Tiny wasp adults may be difficult to see in the field, but you can also watch for parasitized host insects.



Cocoons (pupae) of Braconid wasps that have parasitized a tomato hornworm.



Parasitized aphid "mummy"



Predatory Large Wasps

Wasps that live in colonies (social wasps, like yellowjackets and hornets) can pose a stinging hazard, but wasps that live alone are very unlikely to sting you.

Common Prey
caterpillars and grasshoppers

Physical Characteristics

- 0.4 to 1.25 inches
- 2 pairs of wings
- Thin waists
- Black or brown bodies
- Tend to have white, yellow, red, or orange markings



Example of a social wasp



◆ *Examples of solitary wasps*





Parasitoid Large Wasps

Common Prey

aphids, beetles, bugs, caterpillars, flea beetles, flies, eggs and larvae of other insects

Physical Characteristics

- 0.06 to 0.8 inches
- 2 pairs of wings
- Slender bodies with narrow waists
- Adult female wasps find hosts and deposit one or several eggs in, on, or near the host. Wasp larvae feed on host and eventually kill it.
- Not always easy to distinguish parasitoid from predatory wasps. Females may have a long, stinger-like appendage used to deposit eggs.



long, stinger-like appendage



Hover Flies

Syrphidae

Common Prey

aphids, mealybugs, spider mites, thrips

Physical Characteristics

- 0.3 to 0.8 inches
- 1 pair of wings (2 wings total)
- Adults tend to have black/yellow stripes on abdomen
- Large eyes
- Many have flat bodies
- Adults resemble bees or wasps but have only 2 wings instead of 4
- Often seen hovering around flowers
- Pollinators as adults and predatory as maggot-like larvae



Adult hover fly



Adult hover fly



Hover fly larva



Robber Flies

Asilidae

Common Prey

wasps, grasshoppers, other flies

Physical Characteristics

- Up to 3 inches
- Larger in size compared to hoverflies and most other flies
- Bristles on legs and around mouth
- Usually brown, grey, or black colored





Spiders/ Harvestmen

Araneae/Opiliones

Technically, not insects; beneficial to farms as they are predators that eat insects.

Common Prey

Many insects, including beetles, caterpillars, leafhoppers, and aphids; also non-pests like bees and butterflies.

Physical Characteristics

- 0.1 to 1.25 inches
- 4 pairs of legs (8 total) – best distinguishing factor
- Have between 6 and 8 eyes
- Spiders have two body segments with a prominent waist; harvestmen appear to have a single body segment



Spider



Harvestman (often referred to as “daddy longlegs”)



Lacewings

Neuroptera

Common Prey

aphids, small caterpillars, beetles, thrips, mites, whiteflies, mealybugs

Physical Characteristics

- 0.3 to 1 inch
- Long, slender bodies
- Either green or brown
- Long antennae
- Two pairs of net-veined wings
- Lacewing larvae have alligator-like bodies and long, sickle-shaped jaws
- White eggs laid on long stalks on leaves



net-veined wings



Photo by Caitlin Tucker

larvae have long, sickle-shaped jaws





Predatory Stink Bugs

Pentatomidae

Common Prey

caterpillars, beetle larvae, specifically Colorado potato beetle larvae

Physical Characteristics

- 0.2 to 1 inch
- Shield-shaped bodies
- Common species are brown, but predatory stink bugs come in many colors.
- Pointy shoulders
- Predatory stink bugs have a beak that is thick at the base, whereas pest stink bugs have beaks that are slender at the base
- Beak is tucked under the insect when not feeding



pointy shoulders



Brown marmorated stink bug is a pest.



Minute Pirate Bugs

Orius

Common Prey

thrips, mites, aphids, caterpillars, beetle larvae

Physical Characteristics

- 0.1 to 0.2 inches
- Oval-shaped
- Triangular black head
- Black and white wing patches
- Also feed on pollen and nectar
- Nymph pirate bugs are brown or bright orange



Adult minute pirate bug



Minute pirate bug nymph (bottom) pursuing a thrips (top).



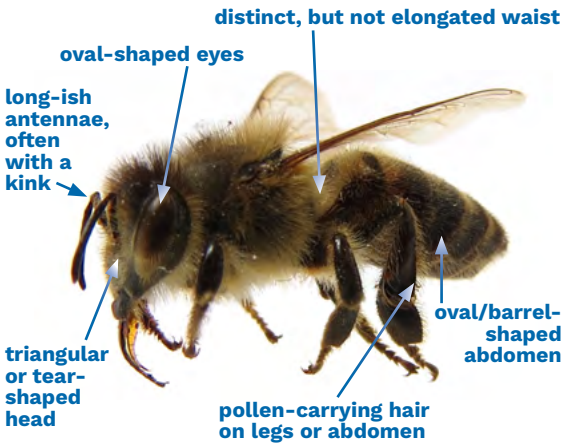
Bees

Anthophila

Bees come in a variety of colors, shapes, and sizes.

Common Physical Characteristics

- 2 pairs of wings (harder to see in this picture) – often look like a single pair of wings because they are linked together





Bee Types

Bumble Bees

(*Bombus*)

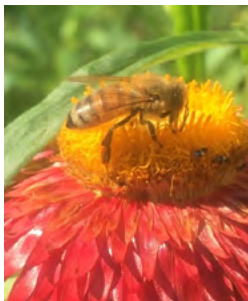
- 0.6 to 1 inch
- Fuzzy abdomen
- Large eyes
- Thicker body than other bees
- Yellow, orange, and black
- Tip of abdomen is rounded



Honey Bees

(*Apis*)

- 0.5 to 0.7 inches
- Yellow and black-striped abdomens
- More slender and less hairy than bumble bees
- Tip of abdomen is pointy



Large Carpenter Bees

(*Xylocopa*)

- 0.5 to 1 inch
- Abdomen is smooth and shiny (not fuzzy)
- Black and yellow in color

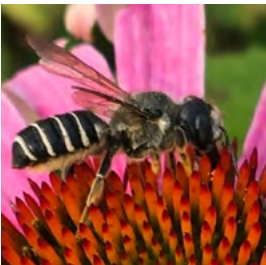




Bee Types

Other Wild Bees

Wild bees may be quite small. Here are some examples:



Notes

Notes

Notes

More Information

For more information on beneficial insects and what habitats they prefer, visit the New York State Integrated Pest Management Biocontrol webpage.



nysipm.cornell.edu/environment/biocontrol/

Biocontrol Bytes is a blog about biological control created by the New York State Integrated Pest Management Program to help New Yorkers who are trying to control pests.



blogs.cornell.edu/biocontrolbytes/

NYC Market Growers Update is an occasional email publication focused on production-oriented resources for NYC urban farmers who are growing for market or growing at a similar scale (e.g. nonprofit farms growing for food banks).



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