

Order Coleoptera: Beetles, Weevils, Grubs, & Borers

The name Coleoptera, derived from the Greek words “koleos” meaning sheath and “ptera” wings, refers to the front wings which are hardened and serve as protective covers for the membranous hind wings.



Cottonwood beetle adult (Gerald J. Lenhard, Louisiana State University, Bugwood.org).



Cottonwood beetle larva (Gerald L. Lenhard, Louisiana State University, Bugwood.org).

Classification: Two suborders

Suborder Aedephaga - the first abdominal sternum is divided by the hind coxae; carabid ground beetles, tiger beetles, aquatic beetles

Suborder Polyphaga - the first abdominal sternum is undivided; leaf beetles, lady, weevils, borers

Morphology

Adults:

1. mouthparts: chewing; arising from front of head; mandibles and maxillae: slicing surfaces
2. antennae: many forms, carabid ground beetles: filiform; Scarabaeidae (white grubs): lamellate
3. legs: cursorial
4. body segments: three body segment, head, thorax, abdomen
5. tarsi: tarsi 2 or 5 segmented
6. wings: front wings hardened and cover membranous hind wings

Immatures: larvae or grubs

1. Larval stages called instars
2. Feed in same habitat
3. Feed on same food as adults

Development: Complete metamorphosis (egg, larva, pupa, adult)

Life History

Habitats: Adapted to a broad range of habitats: terrestrial, aquatic and semi aquatic.

Feeding: Terrestrial species are herbivores and predators; aquatic species are predators. Terrestrial species feed on roots, stems, leaves, or flowers. Many species excavate tunnels in wood or under bark. Many beetles are predators and live in the soil or on vegetation and attack a wide variety of invertebrate hosts. Lady beetles are predators on leaves and feed upon small, soft bodied insects such as aphids, mites, and scales. Some beetles are scavengers, feeding primarily on carrion, fecal material, decaying wood, or other dead organic matter.

Importance in landscapes: Leaf beetles, Japanese beetles, and weevils are important pests of trees and shrubs. They may cause localized defoliation, they may weaken plants by feeding under the bark and making galleries, and they may also transmit plant pathogens. Predatory species are regarded as beneficial insects.

Families

Rove beetles (Family Staphylinidae) scavengers and herbivores; elytra are characteristically shorter than the abdomen

Weevils, snout beetles (Family Curculionidae) herbivores; many species are pests of agricultural crops and stored grains. Chewing mouthparts are at the tip of a proboscis

Ground beetles (Family Carabidae) predators; many beneficial species including the fiery hunter, *Calosoma*, that attacks gypsy moth.

Leaf beetles (Family Chrysomelidae) are herbivores of trees and agricultural crops, such as elm leaf beetle, cottonwood leaf beetle, viburnum beetle, ninebark beetle, Colorado potato beetle

May/June beetles, Japanese beetle, white grubs in turf (Family Scarabaeidae) are herbivores. Adults have distinctive lamellate antennae. Larvae or grubs live in the soil and feed on plant roots

Darkling beetles (Family Tenebrionidae) are herbivores; found in flowers, rotting wood, and occasionally as pests of stored grain. Most abundant in arid climates.

Longhorned beetles (Family Cerambycidae) are herbivores; larvae are known as roundheaded wood borers; adults as longhorned beetles. Many species are pests of trees.

Click beetles (Family Elateridae) are herbivores; larvae are called wireworms, since they make small, meandering channels in wood. Some species feed destructively on the roots of crop plants. Adults can snap (click) the head and abdomen against the substrate to jump away.

Metallic wood borers (Family Buprestidae) are herbivores; larvae are known as flatheaded wood borers; adults as metallic wood boring beetles. Many species are pests of trees.

Lady beetles (Family Coccinellidae) are predators of aphids and scale insects, but one species is a pest of agricultural crops, the Mexican bean beetle.

Other families include:

tiger beetles (Family Cicindelidae) predators

predacious diving beetles (Family Dytiscidae) large aquatic predators

whirligig beetles (Family Gyrinidae) aquatic predators

water scavenger beetles (Family Hydrophilidae) scavengers and predators

carrion beetles (Family Silphidae) scavengers

fireflies (Family Lampyridae) herbivores

carpet beetles (Family Dermestidae) scavengers and herbivores

sap beetles (Family Nitidulidae) scavengers and herbivores

blister beetles (Family Meloidae) larval parasites, adult herbivores

bark beetles (Family Scolytidae) herbivores

In textbook, *IPM of Midwest Landscapes Pests of Trees and Shrubs*

Order Coleoptera, Beetles

Family Buprestidae, Metallic wood-boring beetles

bronze birch borer, *Agrilus anxius*

flatheaded appletree borer, *Chrysobothris femorata*

twolined chestnut borer, *Agrilus bilineatus*

Family Cerambycidae, Long-horned beetles

Asian longhorned beetle, *Anoplophora glabripennis*

elm borer, *Saperda tridentata*

locust borer, *Megacyllene robiniae*

roundheaded appletree borer, *Saperda candida*

twig girdler, *Oncideres cingulate*

twig pruner, *Anelaphus villosus*

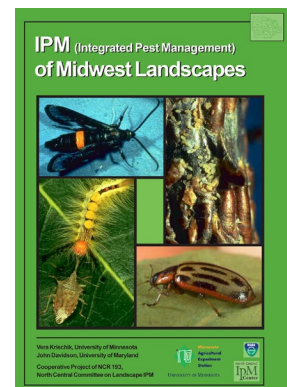
whitespotted sawyer, *Monochamus scutellatus*

Family Chrysomelidae, Leaf beetles

cottonwood leaf beetle, *Chrysomela scripta*

elm leaf beetle, *Pyrrhalta luteola*

imported willow leaf beetle, *Plagioderma versicolora*



Family Curculionidae, Snout beetles or weevils

black vine weevil, *Otiorhynchus sulcatus*
Pales weevil, *Hylobius pales*
pine root collar weevil, *Hylobius radices*
poplar-and-willow borer, *Cryptorhynchus lapathi*
strawberry root weevil, *Otiorhynchus ovatus*
white pine weevil, *Pissodes strobi*

Family Scarabaeidae, Scarab beetles

Japanese beetle, *Popillia japonica*

Family Scolytidae, Bark or engraver beetles

ambrosia bark beetle, *Xylosandrus germanus*
elm bark beetle, smaller European *Scolytus multistriatus*
elm bark beetle, native *Hylurgopinus rufipes*
pine bark engraver, *Ips pini*
pine shoot beetle, *Tomicus piniperda*

Pests of Turf

Order Coleoptera, Beetles, weevils

Family Curculionidae, Snout beetles or weevils

bluegrass billbug, *Sphenophorus parvulus*

Family Scarabaeidae, Scarab beetles

Aphodius beetle, *Aphodius granarius*

black turfgrass Ataenius, *Ataenius spretulus*
false Japanese beetle, *Strigoderma arvicola*
green June beetle, *Cotinis nitida*
Japanese beetle, *Popillia japonica*
May/June beetles, *Phyllophaga* spp.
Northern masked chafer, *Cyclocephala borealis*
Oriental beetle, *Anomala orientalis*
white grubs, several species

Beneficial Coleoptera: Predators

Family Cantharidae, Soldier beetles

soldier beetle, *Chaliognathus pennsylvanicus*

Family Carabidae, Ground beetles

caterpillar hunter, *Calosoma sycophanta*

Family Cicindelidae, Tiger beetles

tiger beetle, several species

Family Coccinellidae, Lady beetles

convergent lady beetle, *Hippodamia convergens*

mealybug destroyer, *Cryptolaemus montrouzieri*


multicolored Asian lady beetle, *Harmonia axyridis*

pink, or twelve-spotted, lady beetle, *Coleomegilla maculate*

spider mite destroyer, *Stethorus picipes*

twicestabbed lady beetle, *Chilocorus stigma*

two-spotted lady beetle, *Adalia bipunctata*

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Legislative Citizen Commission
on Minnesota Resources (LCCMR)
Conservation Biocontrol 2017 - 2020