



HOME & GARDEN

Japanese Beetle

no. 5.601

by W. Cranshaw¹

Quick Facts...

Adult Japanese beetles cause serious injury to leaves and flowers of many ornamentals, fruits, and vegetables. Among the plants most commonly damaged are rose, grape, crabapple, and beans.

There are many insects in Colorado that may be mistaken for Japanese beetle.

To identify Japanese beetle consider differences in size, shape and patterning.

The Japanese beetle, *Popillia japonica*, can be a very damaging insect in both the adult and larval stages. Larvae chew roots of turfgrasses and it is the most important white grub pest of turfgrass in much of the northeastern quadrant of the United States. Adults also cause serious injuries as they feed on the leaves and flowers of many ornamentals, fruits, and vegetables. Among the plants most commonly damaged are rose, grape, crabapple, and beans.



Figure 1. Japanese beetle. *Photo courtesy of David Cappaert.*

Japanese beetle is also a regulated insect subject to internal quarantines in the United States. The presence of established Japanese beetle populations in Colorado restricts trade. Nursery products originating from Japanese beetle-infested states require special treatment or are outright banned from shipment to areas where this insect does not occur.

Current Distribution of the Japanese Beetle

From its original introduction in New Jersey in 1919, Japanese beetle has greatly expanded its range. It is now generally distributed throughout the country, excluding the extreme southeast. It is also found in parts of Ontario, Canada.

Japanese beetle is most commonly transported to new locations with soil surrounding nursery plants. Eggs are sometimes laid in the soil of container stock and balled/burlap nursery materials, so the root feeding larvae are carried with the plants.

Adults that fly and incidentally land on freight or vehicles also may be transported. Adult Japanese beetles are often detected around airports, presumably carried among air cargo or on planes.

Japanese beetle has likely been introduced into Colorado on several occasions. However, historically these almost always failed to result in reproducing, established populations in the state. Unfortunately, this situation has recently changed as at least two populations are now known. The first population began in 2003 in the Palisade area on the West Slope. Efforts to eradicate it have been unsuccessful. More recently, Japanese beetle has been discovered around the Cherry Hills Golf course in the southern Denver Metro area.

Appearance and Detection

The Japanese beetle is often considered an attractive insect. It is generally metallic green with coppery-brown wing covers, which do not quite

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Figure 2. False Japanese beetle (sandhill chafer).



Figure 3. *Anomala ludoviciana*.



Figure 4. Bumble flower beetles (and western yellowjacket).



Figure 5. *Paracotalpa granicollis*.

cover the tip of the abdomen. Along the sides are five patches of whitish hairs. The adult beetle has an oval form and ranges from 8 to 12 mm in length. Typical of other scarab beetles, the antennae are clubbed at the end and may spread to a fan-like form.

Adults feed on leaves and flowers of many plants including rose, bean, grape, and crabapple. Feeding injuries to leaves usually result in conspicuous ‘skeletonizing injuries’ where larger veins are avoided leaving a lacy “skeleton” of the leaf.

There are very effective traps for Japanese beetle. These typically involve yellow-colored vanes above a collecting bag. A floral based lure (methyl eugenol, geraniol) is highly attractive to both sexes. Some traps also include the female sex attractant (Japonilure) which may increase numbers of male insects coming to traps.

In western Colorado, Japanese beetle has been observed to first emerge in mid-June. Peak numbers of the adults are present during July then decline, with small numbers persisting into mid-September.

Colorado Insects That Resemble Japanese Beetle Adults

There are many insects in Colorado that may be mistaken for Japanese beetle. Usually this occurs with various kinds of metallic colored beetles, but sometimes even metallic colored bees and flies are mistaken for this insect. Fortunately all of these can be readily distinguished based on differences in size, shape, and patterning. Some of the insects in Colorado that are most likely to cause accidental misidentifications are covered below.

False Japanese Beetle. An insect known as the false Japanese beetle or ‘sandhill chafer’ (*Strigoderma arboricola*) is common in northeastern Colorado. It closely resembles the Japanese beetle in size and shape. Its overall coloration is brown and it is somewhat metallic, but other patterning differs. The false Japanese beetle is found in areas of sandy soil in eastern Colorado. Adults are attracted to the traps used for Japanese beetle and to the color white. It is commonly seen on prickly poppy flowers.

***Anomala* spp. scarabs.** Several scarab beetles in the genus *Anomala* generally resemble Japanese beetle in shape and some have metallic coloration. *Anomala ludoviciana* is found in the extreme southeastern part of the state and somewhat resembles Japanese beetle. However, it is small (8 to 10 mm), lacks the shiny green coloration and has a dark U-shaped band on its thorax. *Anomala marginata* more closely resembles Japanese beetle in size and coloration but is not known in Colorado, although it is present in Oklahoma. Larvae of these insects feed on roots of grasses.

Bumble Flower Beetle. The bumble flower beetle (*Euphoria inda*) is a common scarab that visits flowers and plant ooze. It has the same general shape as the Japanese beetle but is slightly larger, generally brown with mottling and no metallic coloration. Larvae are common white grubs found in compost, organic mulches, and manure.

***Paracotalpa granicollis*.** This beetle has a metallic green thorax and reddish-brown wing covers. However, it is much larger and has a generally fuzzy appearance due to hairs around all sides of the body. It is found in western Colorado, apparently in association with juniper.

***Chrysochus auratus*.** This very shiny metallic colored beetle is somewhat similar in size (8 to 10 mm) to the Japanese beetle. The wing covers



Figure 6. *Chrysochus auratus*.



Figure 7. Apple flea beetle on crabapple.



Figure 8. *Gastrophysa cyanea*.



Figure 10. A tiger beetle, *Cicindela purpurea*. Photo courtesy of David Leatherman.



Figure 11. Skeletonizing injury produced by Japanese beetle.

rounded over the body, are smooth and generally metallic green. Blue-green and somewhat purplish tints may also occur. Antennae are not clubbed but more filament-like. This insect is fairly common in eastern Colorado where it feeds on dogbane (*Apocyum*).

Apple Flea Beetle. The apple flea beetle (*Altica foliaceae*) is a bright metallic-green beetle. It is about 5 to 6 mm, considerably smaller than the Japanese beetle. When disturbed they jump readily and/or fly from plants. Larvae develop on evening primrose (*Oenothera*); adults disperse to feed on a wide range of plants including *Epilobium*, *Gaura*, *Zauschneria*, grape, crabapple, and willow. In recent years, several outbreaks of this insect have occurred throughout Colorado and it is probably the insect most commonly mistaken for Japanese beetle in the state.

***Gastrophysa* leaf beetles.** There are three species of *Gastrophysa* spp. leaf beetles that have shiny metallic coloration and may be mistaken for Japanese beetle. All are small, about 4 to 5 mm, and have a generally rounded body form. *Gastrophysa cyanea* is found throughout the state and develops on dock (*Rumex*). *Gastrophysa dissimilis* tends to be more bluish and develops on dock and knotweed (*Polygonum*). *Gastrophysa formosa* also occurs in Colorado and feeds on dock.

***Brachynoea tristis*.** This is a small (3 to 4 mm) leaf beetle with a generally round body form and shiny metallic green coloration. It is a common species of the Eastern Plains region of the state. It has a wide host range that includes maples and carrots.

***Cicindela purpurea*.** This is a bright, metallically colored tiger beetle. Although it shares some similar coloration this is a much more elongate beetle and is extremely active.



Figure 9. *Brachynoea tristis*.

Appearance of Larval (Grub-stage) Japanese Beetle

All white grubs, including those of the Japanese beetle, are white, C-shaped, and will have six legs. In total length, the larva of a Japanese beetle will range in size up to about 2.5 cm (1 inch), making it a moderate-sized species. They can be distinguished from other white larvae by the pattern of hair on the hind end of the abdomen (rastral pattern) which forms a distinctive V-shape (Figures 12 and 13).

Colorado Insects Mistaken for Japanese Beetle Larvae

Native Turfgrass White Grubs. Several species of white grubs native to Colorado cause damage to turfgrass. Most commonly encountered on the West Slope and Arkansas Valley is the southwestern masked chafer, *Cyclocephala hirta*. Various May/June beetles in the genera *Polyphylla* and *Phyllophaga* are particularly common in the eastern plains. In golf courses, the tiny black beetle known as the black turfgrass ataenius (*Ataenius spretulus*) is sometimes important. Although larvae of all these are similar to Japanese beetle larvae, all can be identified by the pattern of hairs (rastral pattern) on the hind end. Figure 13 shows the rastral pattern of these species.

Bumble Flower Beetle Larva. This is a common scarab beetle throughout much of the United States and widespread in Colorado. Eggs are often laid in animal manure compost and other decayed material. Sometimes these larvae are found in container-grown plants that contain high amounts of attractive organic materials. Larvae can be separated from Japanese beetle by

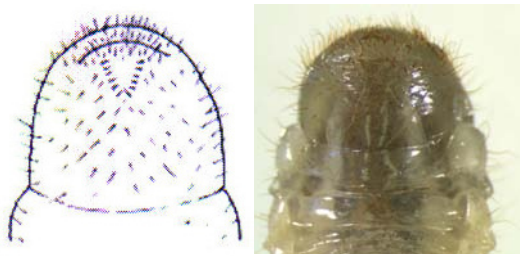


Figure 12. Rastral pattern on Japanese beetle.
Photo courtesy of Betsy Anderson and Mike Reding.

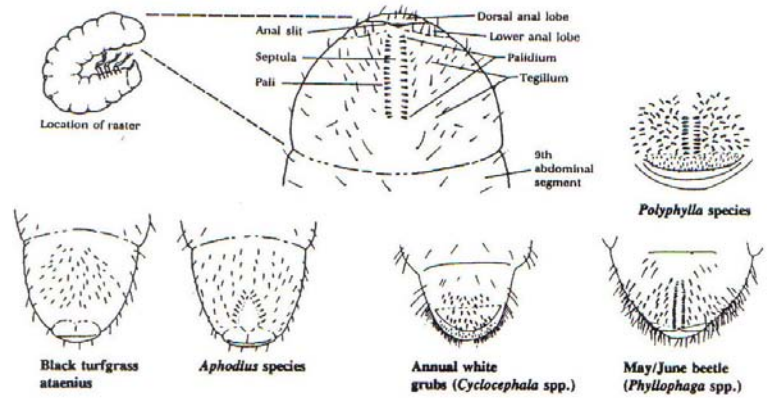


Figure 13. Rastral patterns of common turfgrass white grubs in Colorado.



Figure 14. White grubs of (L-R) Japanese beetle, European chafer, May-June beetle. Photo courtesy of David Cappaert.



Figure 15. Bumble flower beetle larvae in compost.



Figure 18. Japanese beetle trap.

having a relatively blunt and shiny hind end. Instead of the distinct V-pattern of hairs on the hind end of the Japanese beetle, larvae of the bumble flower beetle have hairs more randomly distributed in no obvious patterns.

Root Weevil Larvae. Root weevils (*Otiorhynchus* spp.) are root chewing insects associated with shrubs and perennial garden plants. At least four species occur in the state—black vine weevil, strawberry root weevil, rough strawberry root weevil, and lilac root weevil. Larvae of all are generally similar in appearance—white, legless grubs with a dark head. The absence of legs separates them from Japanese beetle and other scarab beetle larvae (white grubs).

Billbug Larvae. Billbugs are grass feeding weevils and larvae develop on grass roots. They can be distinguished from all white grubs by being legless, similar to black vine weevil larvae.



Figure 16. Black vine weevil larvae.
Photo courtesy of Betsy Anderson and Mike Reding.



Figure 17. Billbug larva.

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