Emerald Ash Borer

Agrilus planipennis Fairmaire
(Coleoptera: Buprestidae)

A guide to identification and comparison to similar species

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NPDN National Plant Diagnostic Network

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Introduction

The adult stage of the Emerald Ash Borer (EAB) is fairly distinctive and usually easy to tell apart from most similarly colored and shaped buprestids and other insects by a trained taxonomist. However, many researchers and field workers currently sampling for EAB are not trained taxonomists, and might confuse some other similarly shaped or colored insects with EAB. The species included in this guide were chosen because of their relative commonness, similarity in size, shape and/or coloration to the EAB, and because specimens were available for photography in the A.J. Cook Arthropod Research Collection, at Michigan State University. Additional species, not included here, may be present in other parts of North America that could also potentially be confused with the EAB.

How to Use This Guide

This guide is intended to assist insect diagnosticians and others who have some familiarity in identifying insects. It's use will be easier if the user has at least a basic knowledge of insect morphology and terminology and a basic familiarity with insect orders, families, and genera.

The main purpose of this guide is to assist with sight identification of adult specimens that have been field collected or reared. It will be somewhat easier to verify the identity of beetles reared from known hosts, however host data is not necessary to use this simple guide.

Many trapping methods for EAB utilize Tanglefoot®, Pest-Stick® or some other kind of sticky material. To be able to properly identify specimens, all residues of this sticky material must be removed with a suitable cleaning agent. Soaking beetles in 95% ethanol will dissolve Tanglefoot, and Histoclear® will dissolve Pest-Stick. It may take several days of soaking and frequent transfers to clean solvent to remove all traces of the sticky material. In addition, specimens in alcohol usually do not appear their true color or show setae and setal patterns while wet. Ideally, specimens should be cleaned and allowed to air dry. Specimens mounted on pins or points will usually be much easier to manipulate under a dissecting microscope, which is usually needed for best examination of these small beetles. The bright lighting typically used with microscopy will best reflect the coloration of these beetles for comparison to the pictures used in the guide.

Note the similarity in color among the beetles in the photos to the left that were removed from sticky traps and pinned without any cleaning. The photos to the right are the same beetles after cleaning for only a few seconds with hexane used as a solvent. While still not perfectly clean, sufficient color and patterns now are evident to allow these to be identified to species.

Agrilus anxius

Agrilus bilineatus

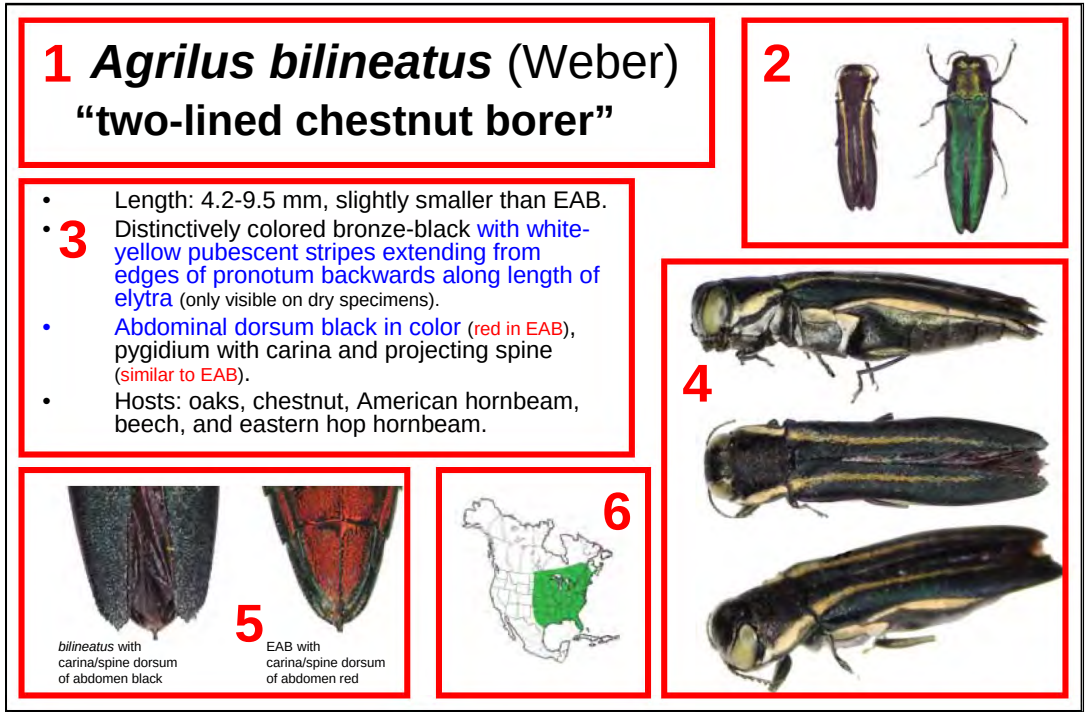
Agrilus cyanescens

The initial pages of this guide describe the general characteristics for identification of the emerald ash borer. These are followed by pages showing some additional species of *Agrilus*, other Buprestidae, and a few other beetles that have similar color and/or shape to the EAB, and which could potentially be confused with it.

These pages can be used for basic sight comparison and possible identification of some of the more common species in question. This guide uses coloration differences and a few distinctive, morphological characters for comparisons. Those using this guide should not expect to be able to identify any given specimen with absolute certainty to the species level. There are 171 species of *Agrilus* in North America, and only a few representatives are shown here. Many of the smaller species are very similar to each other, and most can only be reliably identified with keys. There are a few keys for North American *Agrilus* (Fisher 1928, Bright 1987, Downie & Arnett 1996 for eastern species) and other Buprestidae that can be used for identification of difficult specimens. However, it may still be necessary to send difficult specimens to an expert with familiarity in this group of insects. There are currently no revised keys available to North American *Agrilus* or other Buprestidae that include the EAB.

An example of a species comparison to EAB as used in this guide

1. Scientific and common name (if available) of the species being compared to EAB.
2. Side-by-side comparison of the species to EAB at the same size scale.
3. Text box listing size range, description of color and shape, similarities and differences to EAB, and known host plants.
4. Side, top and oblique views of the species showing color and shape characteristics.
5. Photos of the most diagnostic characteristics that will aid in separation of the species from EAB.
6. Range map of the species.



Source of morphological characteristics, host records and distributional data primarily from Bright 1987, Downie & Arnett 1996, and Fisher 1928.

Family: Buprestidae "metallic wood-boring beetles"

The genus *Agrilus* is one of 53 genera of Buprestidae found in North America. Fortunately, species in the genus *Agrilus* have a very distinctive shape that will easily separate them from most of the other common genera of Buprestidae. *Agrilus* in general are more linear and cylindrical than other genera of Buprestidae and the base of the prothorax is produced backward as a lobe, which is lacking or less obvious in most other genera (except *Brachys* and *Chrysobothris*).

Agrilus (EAB)

Pronotum in *Agrilus* produced backward as lobe

Agrilus are more elongate and cylindrical than other Buprestidae

Note: specimens are not all to the same size scale

Acmaeodera

Anthaxia

Brachys

Buprestis

Chalcophora

Chrysobothris

Chrysophana

Cypriacis

Dicerca

Melanophila/ Phaenops

Identification of the Emerald Ash Borer

Agrilus planipennis Fairmaire "emerald ash borer" (EAB)

dorsal view ventral view

- Typical specimens are a **bright, metallic, emerald green color overall**, with the **elytra usually appearing somewhat duller and slightly darker green**. The overall greenish coloration may also have variable amounts of **brassy, coppery or reddish reflections**, especially on the pronotum and ventral surfaces.
- A few rare specimens of EAB are entirely coppery-red, entirely bluish-green, or green with bluish elytra.
- Length: <10.0–13.0 mm
- EAB in general is somewhat larger in size and more brightly metallic green than most other U.S. *Agrilus* species.

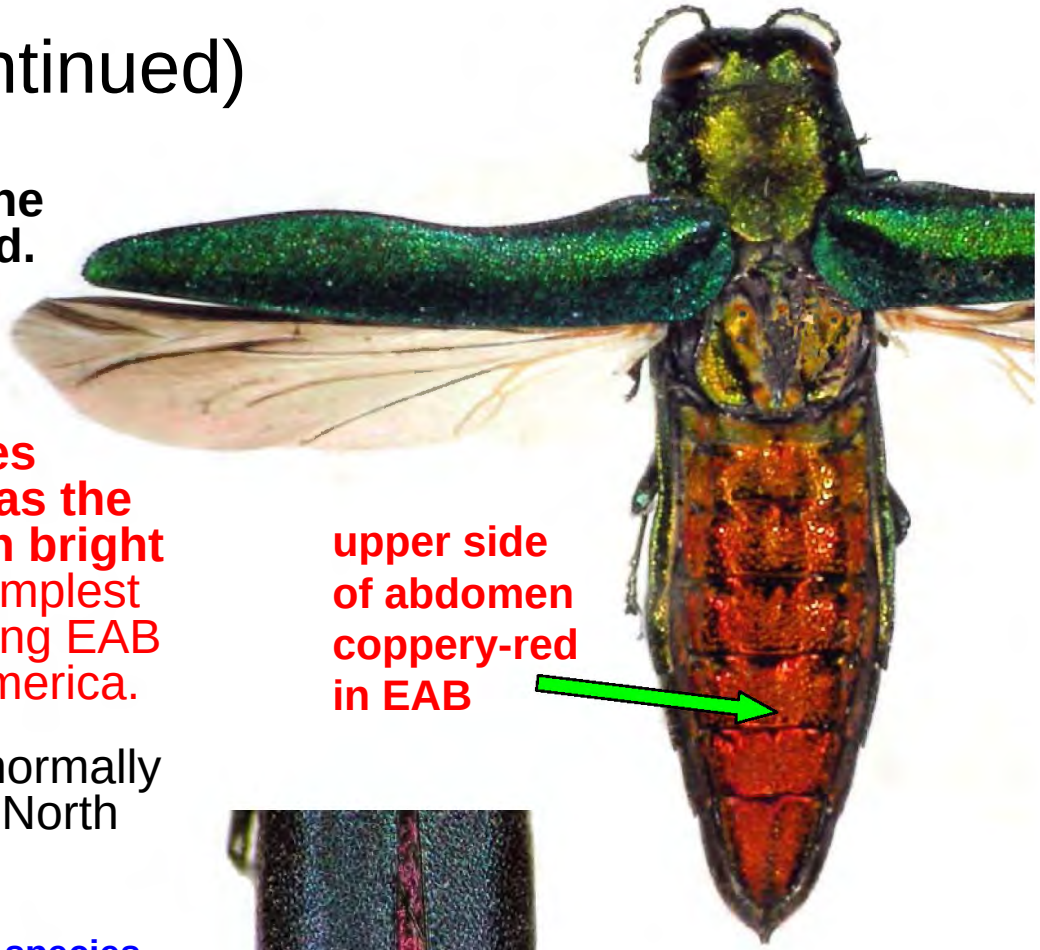
emerald ash borer (continued)

- **In EAB the dorsal surface of the abdomen is bright coppery-red.** This may only be visible if the elytra and wings are raised.

- **EAB is the only *Agrilus* species found in North America that has the dorsal surface of the abdomen bright metallic red.** This may be the simplest diagnostic character for separating EAB from all other *Agrilus* in North America.

- The dorsum of the abdomen is normally black, green or blue on all other North American species of *Agrilus* .

- **Note: The hind wings on many *Agrilus* species often have a reddish or pinkish iridescence that may be visible on the folded wings if the elytra are not completely closed. This may give the impression of a reddish abdomen when in fact it is only the hind wings that reflect this color. The only reliable way to determine the dorsal abdominal color is by spreading apart the elytra and hind wings to view the dorsum of the abdomen from above.**

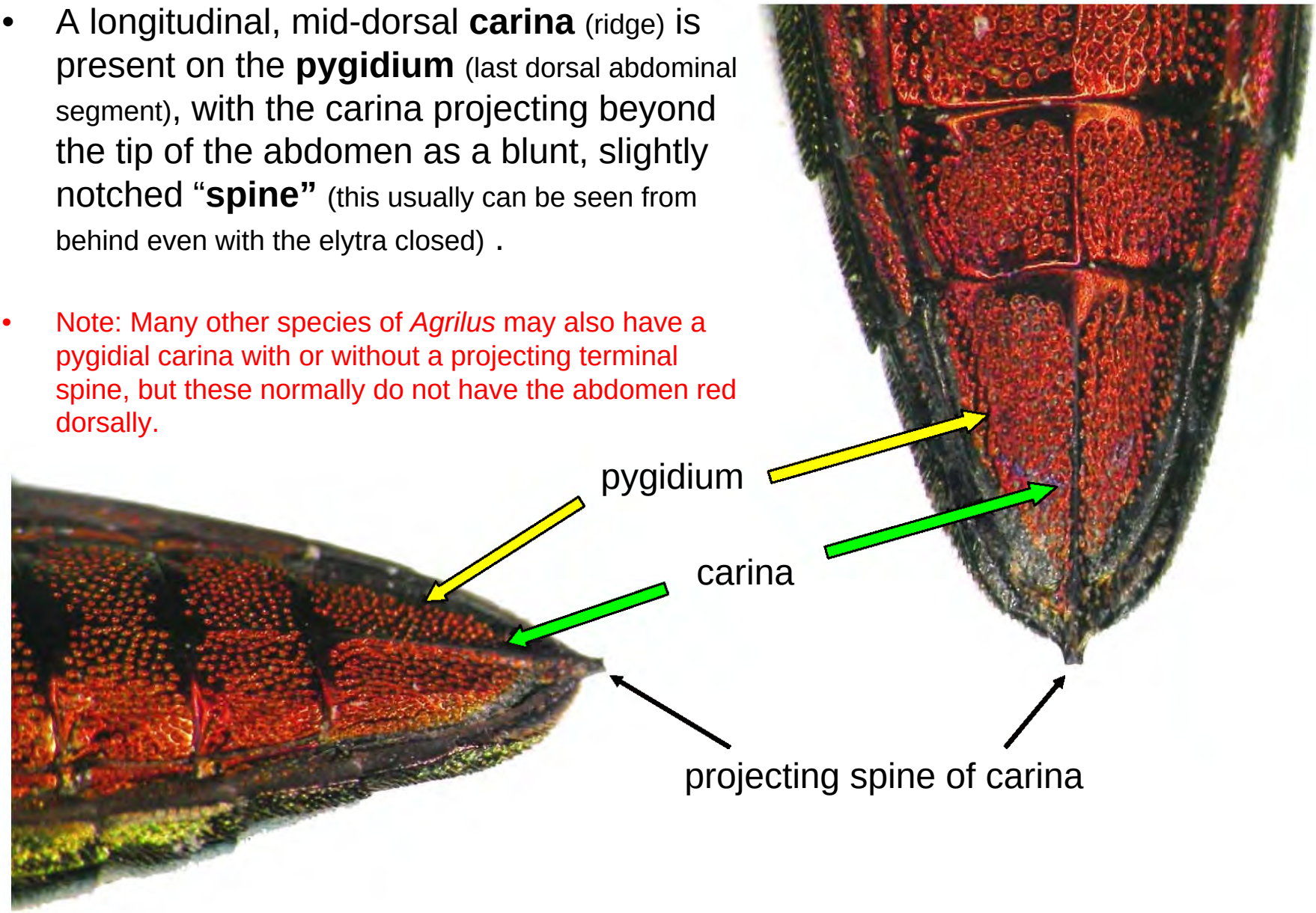


Agrilus bilineatus – the dorsum of the abdomen is actually black in this species, but the folded hind wings show a reddish iridescence which makes it appear that the abdomen beneath the wings is reddish.

emerald ash borer (continued)

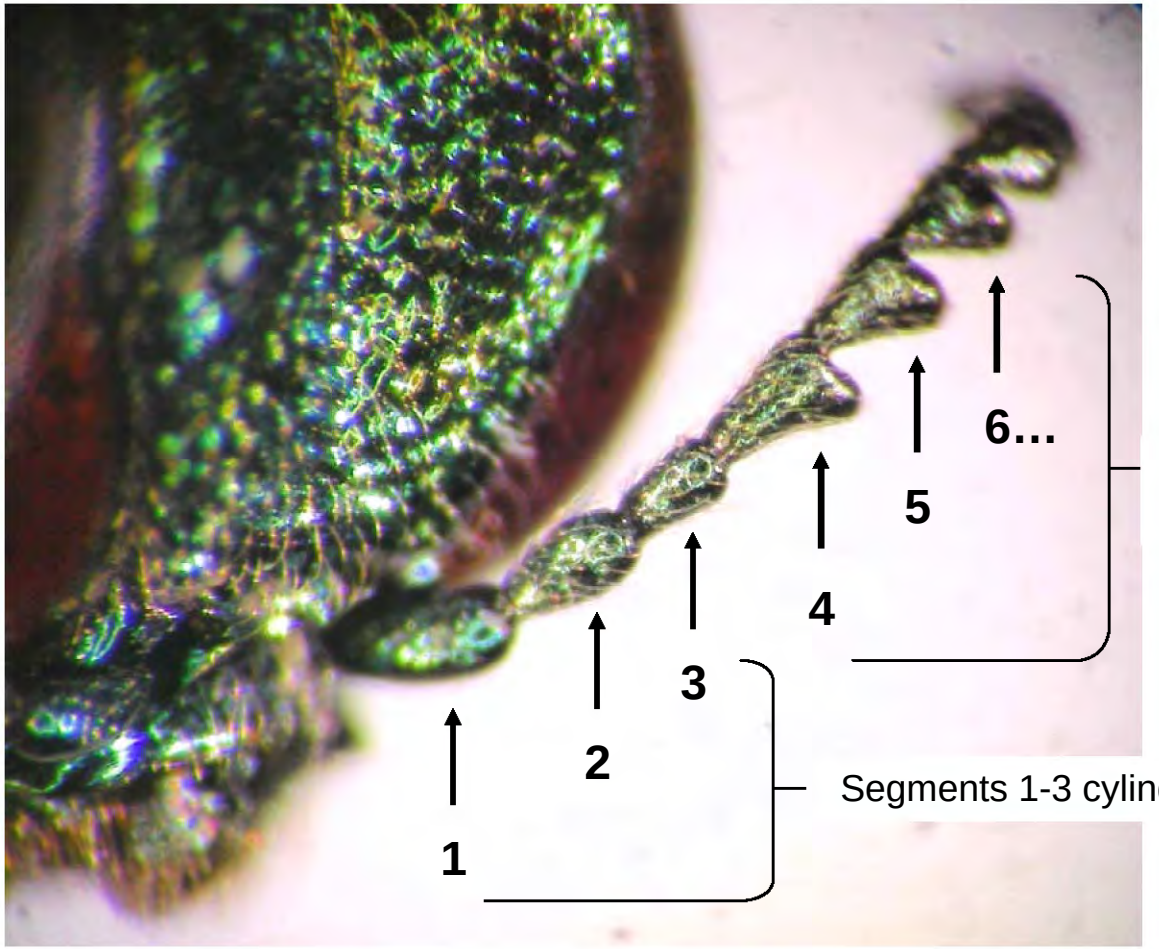
- A longitudinal, mid-dorsal **carina** (ridge) is present on the **pygidium** (last dorsal abdominal segment), with the carina projecting beyond the tip of the abdomen as a blunt, slightly notched "**spine"** (this usually can be seen from behind even with the elytra closed) .

- Note: Many other species of *Agrilus* may also have a pygidial carina with or without a projecting terminal spine, but these normally do not have the abdomen red dorsally.



emerald ash borer (continued)

- In EAB the antennal segments are serrate beginning with segment 4.
  (segments 1-3 cylindrical, segments 4-11 are triangular or “saw-like”).
- Note: Many species of *Agrilus* have the antennae serrate beginning with segment 4. However, in some species the antennae are serrate beginning with segment 5 (1-4 cylindrical).



Segments 4-11 serrate
(triangular, saw-like)

Segments 1-3 cylindrical

emerald ash borer (continued)

Almost all *Agrilus* species exhibit some degree of natural variation in size and coloration. This is especially so with metallic colored species.

The specimens below show some of the size range and color variation seen in the more typical specimens of EAB.

It should be noted that “metallic” coloration can be influenced by light intensity, light direction, and light quality. As you move metallic specimens around under a light, you can see them apparently change or shift color. Therefore, it is possible that individual specimens in hand may not exactly match the photos used in this guide. The individual species descriptions in this guide try to describe some of the color variations but odd variants often occur. As noted earlier, specimens in alcohol or covered in sticky trap material will seldom reflect their true colors and should be cleaned and dried before comparison to the photos in this guide.

emerald ash borer (continued)

Some examples of non-typically colored EAB adults.

green with bluish elytra

entirely bluish

(Note: dorsal surface of abdomen of some bluish specimens is brassy-green with only a slight reddish tinge)

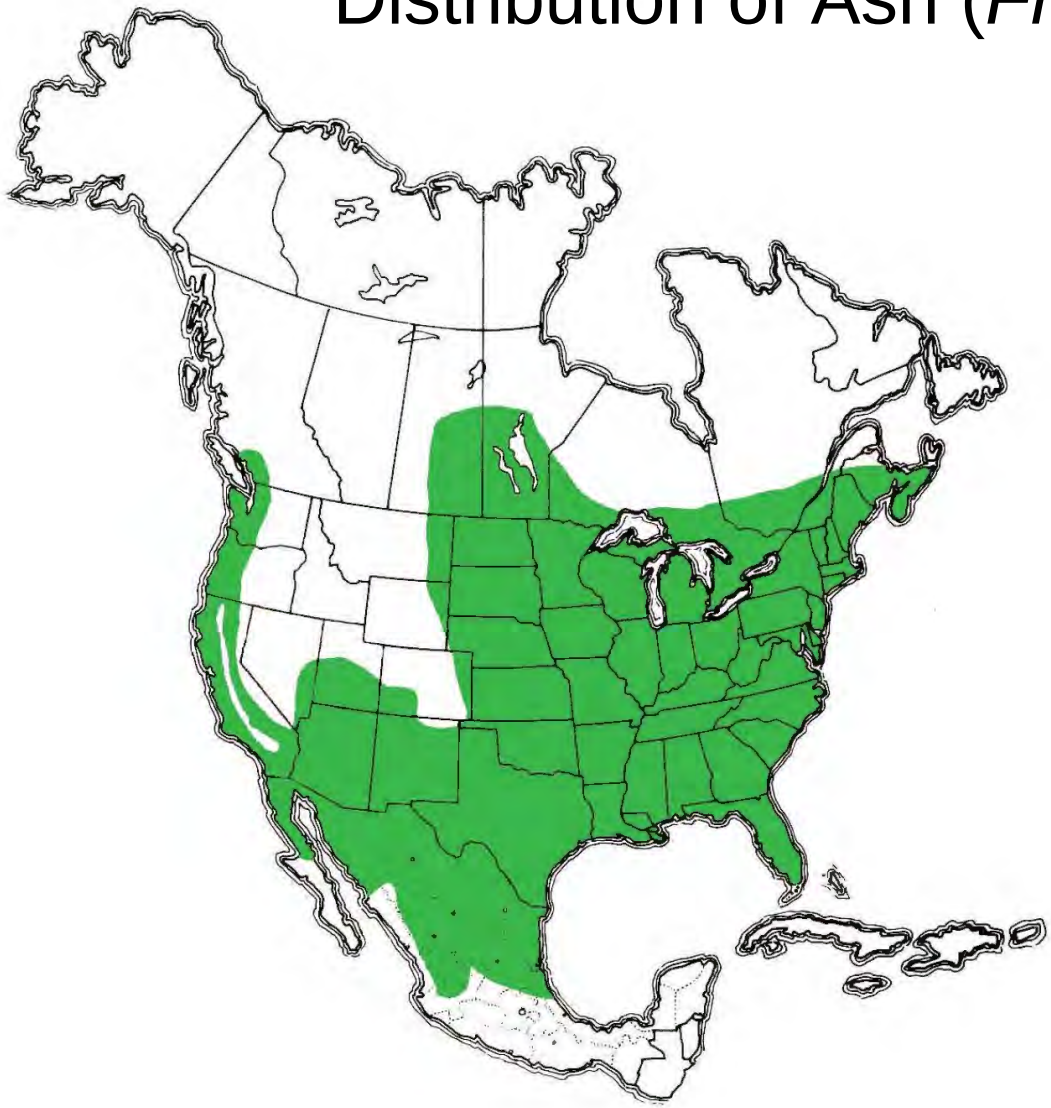
entirely red, purplish-red or coppery-red

Although these color varieties are very rare, they might easily be confused for some of our native species which are similarly colored.

emerald ash borer (continued)

EAB was accidentally introduced into southeastern Michigan sometime in the 1990's in wood packing material imported from eastern Asia. It wasn't until 2002 that EAB was first recognized as being the source of ash tree deaths and its identity confirmed, by which time it had apparently become well established. Since then, EAB has been found in many parts of Michigan and most nearby states and Canada. The beetles are easily transported in dead ash logs and firewood, and despite quarantines on wood movement, this method of dispersal seems partly or mostly responsible for their rapid spread. It is possible EAB might eventually spread to anywhere in North America where suitable ash hosts are found. Research is being conducted to find effective chemical and biological control methods, but even then, it is unlikely that EAB can be completely eradicated, and it will likely continue invading some other parts of North America. Go to http//:www.emeraldashborer.info for current distributions and other up-to-date information on the EAB.

Distribution of Ash (*Fraxinus* spp.)



Approximate distribution of *Fraxinus* species in North America

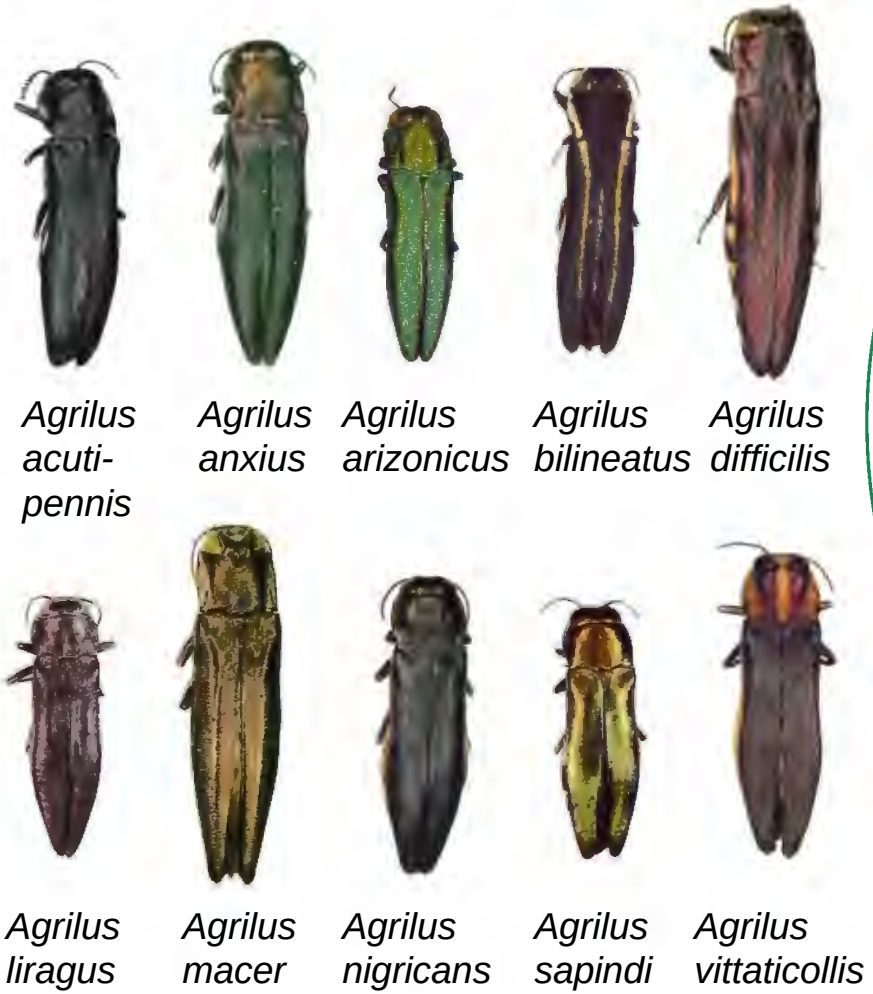
As many as 21 species of ash (*Fraxinus* spp.) are distributed throughout much of the United States. EAB is known to feed on the 4 major ash species found in the northeast U.S., but whether it will feed on other ash species or be able to adapt to other areas in the U.S. is not well known at this time. However, this guide does include some beetle species from the western and southeastern U.S. for comparison purposes in case it eventually invades those areas.

Other species of *Agrilus*

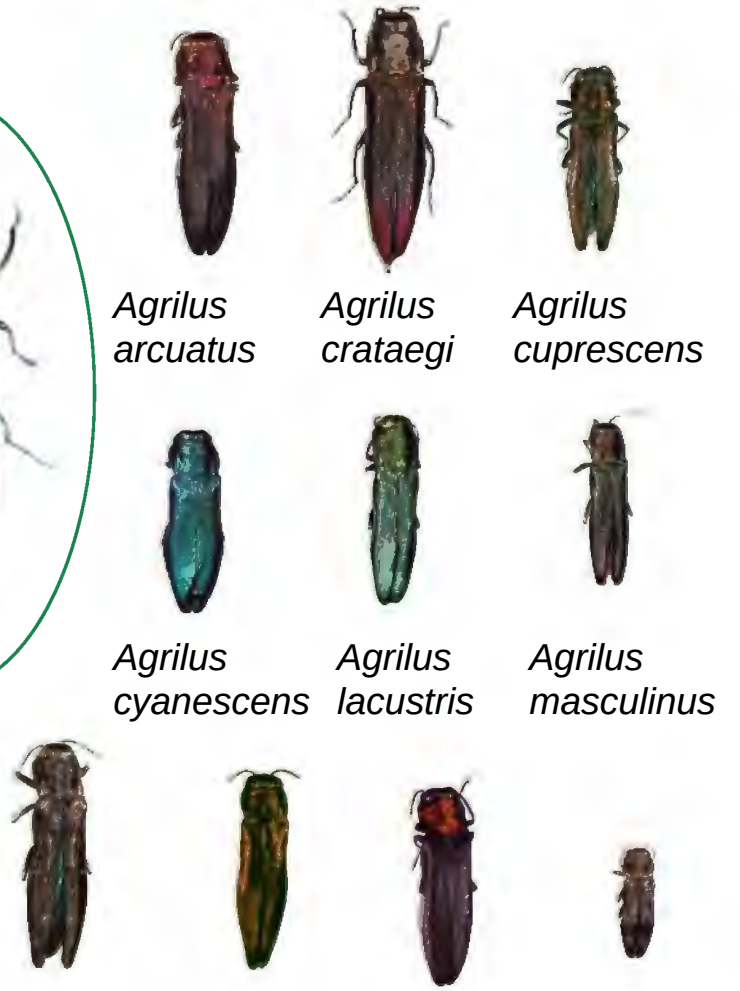
Following are 20 species of *Agrilus* that are common in eastern and midwestern North America, with a few from the southwestern U.S. Many of these species have already been collected on the various types of traps being used for monitoring EAB. Only one other species of *Agrilus*, *A*. *subcinctus*, has previously been recorded as attacking ash (*Fraxinus* spp.) in North America. It is a very small species that most likely only attacks small dead twigs and is distinctly different in appearance from EAB. While other native species of *Agrilus* have not been recorded as attacking living or dead ash, for some species the hosts are poorly known or unknown. It is also possible that many other *Agrilus* species might be found incidentally resting on ash foliage or trunks, or emerging from undetermined species of dead trees, logs and firewood that might be monitored for EAB. In the following pages, some of these additional *Agrilus* species are compared to EAB, with some simple features highlighted that can be used to distinguish them from EAB. Many of these *Agrilus* species are usually considerably smaller than EAB and should be distinguishable on size alone. Those species that fall within the size range of EAB can usually be distinguished on coloration differences.

Agrilus species compared to EAB in this guide

Species similar in size to EAB (> 8.5 mm)



Species usually smaller than EAB (< 8.5 mm)



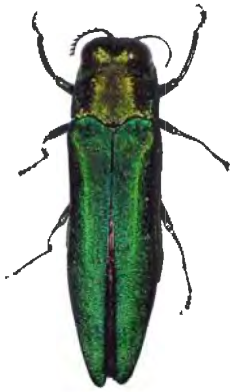
Note: all specimens are to same size scale

Agrilus species similar in size to EAB (> 8.5 mm.)

Some species included here may have a size range which includes individuals whose size is less than 8.5 mm, but in which the largest individuals approach the size of EAB. The size range of EAB is listed as 10.0-13.0 mm, but individuals of EAB reared from cut logs can be highly variable in size and it is expected that some rare individuals might be smaller or even larger.

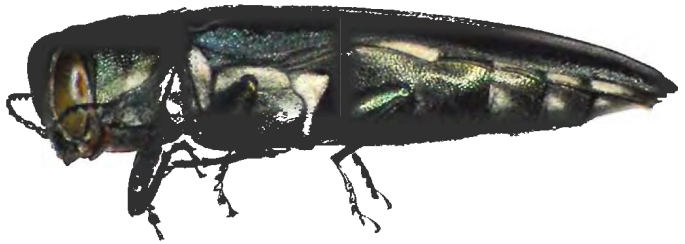
Agrilus acutipennis Mannerheim

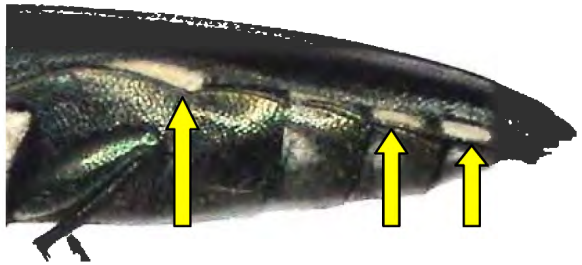
acutipennis



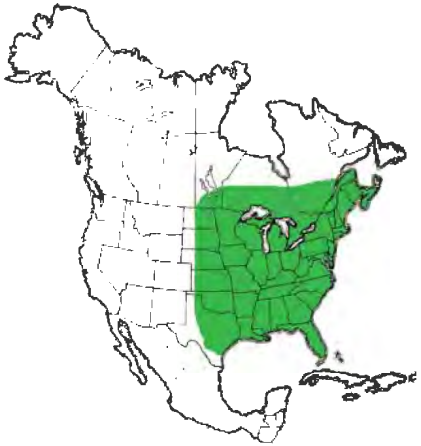
EAB

- Length: 7.5-10.0 mm, silghtly smaller than EAB
- Color black with faint bluish or greenish reflections, sometimes brilliant blue.
- Sides of abdomen and thorax often with patches of whitish setae (ABSENT in EAB).
- Abdominal dorsum black in color (RED in EAB).
- Pygidium with carina and projecting terminal spine (similar to EAB).
- Hosts: larval host unknown. Adults have been collected on oak (*Quercus* spp.), birch (*Betula* spp.), poplar (*Populus* spp.), and American hazel (*Corylus americana*).





acutipennis with white setose patches on side of abdomen



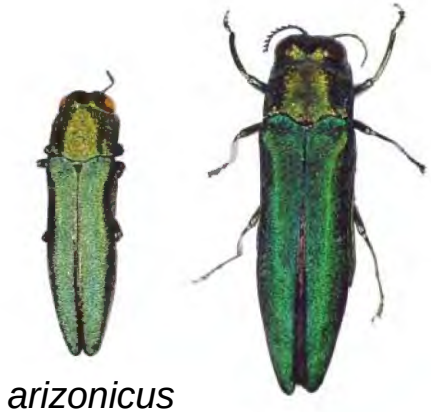
Agrilus anxius Gory
"bronze birch borer"

anxius EAB

- Length: 5.5-13.0 mm, similar in size to EAB.
- Color bronze-black with faint reddish, greenish, or purplish reflections.
- Abdominal dorsum bronze-black in color (RED in EAB).
- Pygidium with carina and projecting terminal spine (similar to EAB).
- Pronotum with distinct prehumeral carina (ABSENT in EAB).
- Hosts: birch (*Betula* spp.), often attacking and damaging living trees.

anxius with distinct prehumeral carina on pronotum

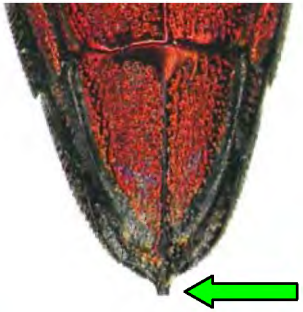
Agrilus arizonicus Obenberger



arizonicus EAB

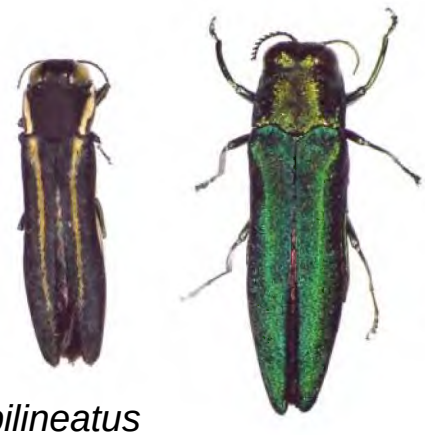
- Length: 9.0 mm, slightly smaller in size than EAB.
- Color bright green, with brassy reflections, **extremely similar in coloration to the EAB**.
- Abdominal dorsum greenish-black in color (RED in EAB).
- Pygidium with faint carina but without projecting terminal spine (PROJECTING in EAB).
- Antennae serrate beginning with segment 5 (vs. segment 4 in EAB).
- Hosts: unknown

arizonicus pygidium **without** projecting spine, dorsum of abdomen black



EAB pygidium **with** projecting spine, dorsum of abdomen red

Agrilus bilineatus (Weber)
"two-lined chestnut borer"

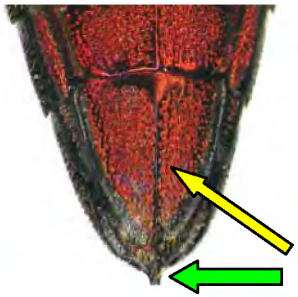


bilineatus EAB

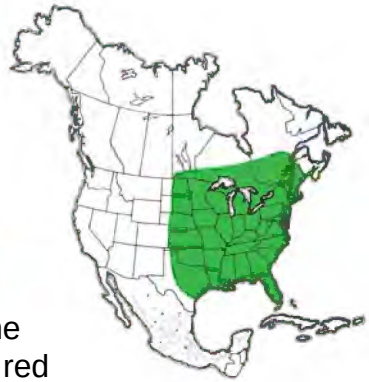
- Length: 4.2-9.5 mm, slightly smaller then EAB.
- Distinctively colored bronze-black with white-yellow pubescent stripes extending from edges of pronotum backwards along length of elytra (only visible on dry specimens – ABSENT in EAB).
- Abdominal dorsum bronze-black in color (RED in EAB).
- Pygidium with carina and projecting terminal spine (similar to EAB).
- Hosts: oaks (*Quercus* spp.), chestnut (*Castanea dentata*), American hornbeam (*Carpinus caroliniana*), beech (*Fagus* spp.), and eastern hop hornbeam (*Ostrya virginiana*).

bilineatus with dorsal pubescent stripes

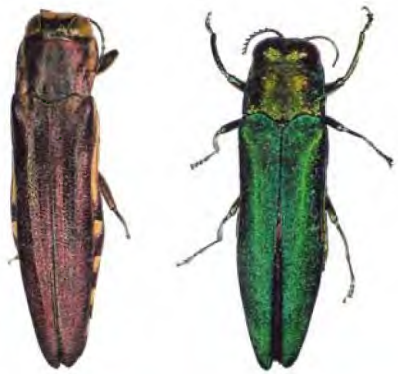
bilineatus with carina/spine dorsum of abdomen black



EAB with carina/spine dorsum of abdomen red

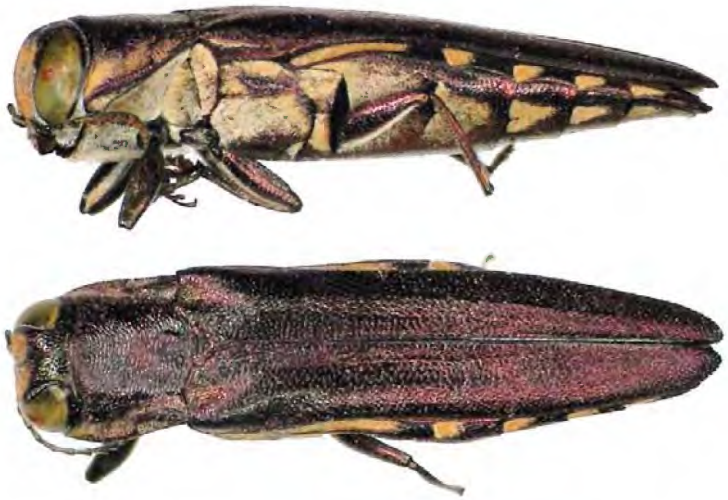


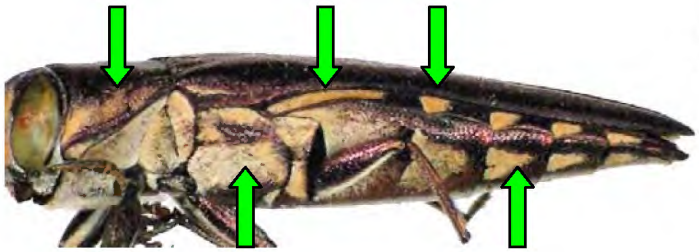
Agrilus difficilis Gory



difficilis EAB

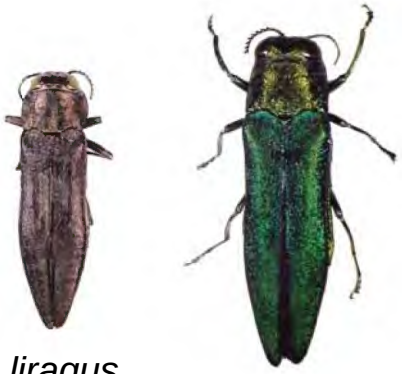
- Length: 7.0-13.0 mm, equal in size to EAB.
- Color greenish-black with a purplish reflection, coppery below with dense yellow setose patches laterally on metathorax and abdominal segments (ABSENT in EAB).
- Abdominal dorsum coppery-black in color (RED in EAB).
- Pygidium with carina but without projecting terminal spine (PROJECTING in EAB).
- Pronotum with arcuate, obtusely rounded prehumeral carina (ABSENT in EAB).
- Hosts: honeylocust (*Gleditsia triacanthos*) and southern prickly ash (*Zanthoxylum clavaherculis*). Adults collected from willow (*Salix* spp.).





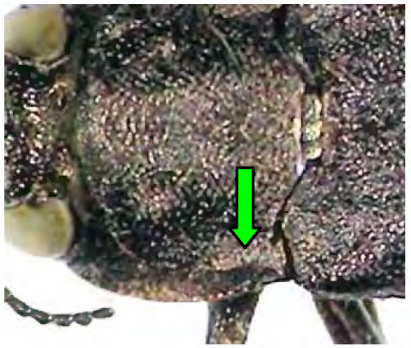
difficilis with dense yellow setose patches laterally

Agrilus liragus Barter & Brown
"bronze poplar borer"



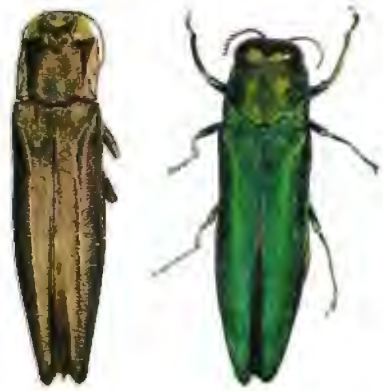
liragus EAB

- Length: 7.0-11.0 mm, slightly smaller than EAB (Note: *liragus* is very similar to *A. anxius* and difficult to separate from that species except by hosts).
- Color bronze-black with faint coppery, greenish, or purplish reflections.
- Abdominal dorsum bronze-black in color (RED in EAB).
- Pygidium with carina and projecting terminal spine (similar to EAB).
- Pronotum with obtusely rounded prehumeral carina (ABSENT in EAB).
- Hosts: poplar and aspen (*Populus* spp.)



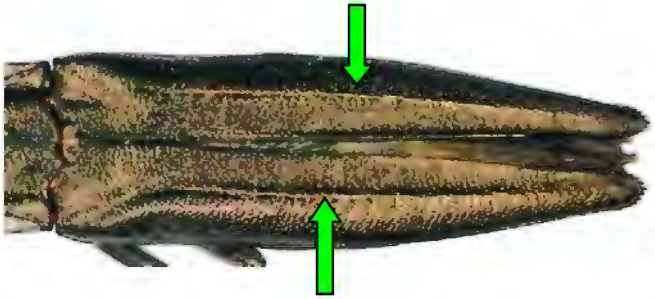
liragus with distinct prehumeral carina on pronotum

Agrilus macer LeConte



macer EAB

- Length: 8.5-16 mm, equal or larger in size to EAB.
- Color coppery-brown with faint bronze or olive-green reflections. Dense yellow setose patches on front of head, sides of pronotum and abdomen.
- Abdominal dorsum brownish-black in color (RED in EAB).
- Pygidium with carina and projecting terminal spine (similar to EAB).
- Pronotum with distinct prehumeral carina (ABSENT in EAB) (see *Agrilus anxius* for photo).
- Each elytron with a distinct longitudinal carina (ABSENT in EAB).
- Hosts: hackberry (*Celtis* spp.).

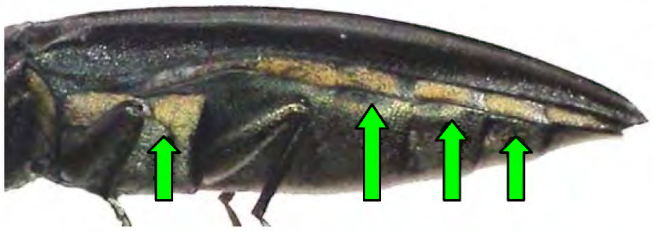


macer with longitudinal carina on each elytron

Agrilus nigricans Gory

- Length: 7.7-12.0 mm, equal in size to EAB.
- Color black or brown with a vague greenish reflection, green or brassy below with sparse yellow setose patches laterally on the prothorax, metathorax and abdominal segments.
- Abdominal dorsum black in color (RED in EAB).
- Pygidium with carina and projecting terminal spine (similar to EAB).
- Pronotum without prehumeral carina (also absent in EAB).
- Hosts: larval host unknown. Adults collected on red oak (*Quercus rubra*).

nigricans EAB



nigricans with sparse yellow setose patches laterally

Agrilus vittaticollis (Randall)

vittaticollis EAB

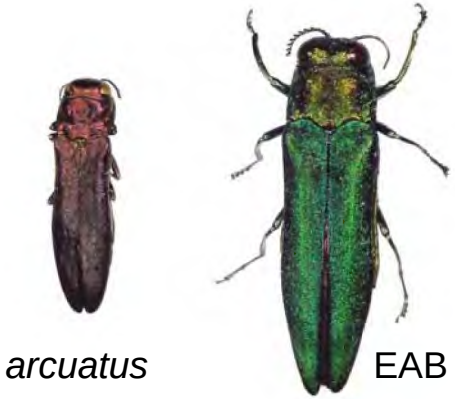
- Length: 8.0-9.7 mm, slightly smaller then EAB.
- Distinctively colored, head and pronotum purplish-red, with brassy tinge and two dark longitudinal stripes, elytra black. Head, pronotum and sides of abdomen with dense recumbent, golden-yellow setae.
- Abdominal dorsum black in color (RED in EAB).
- Pygidium with carina and projecting terminal spine (similar to EAB).
- Hosts: serviceberry (*Amelanchier canadensis*), hawthorn (*Crataegus* spp.), apple, pear, wild cherry (*Pyrus* spp. and *Malus* spp.), and chokecherry (*Prunus virginiana*).

distinctive coloration of *vittaticollis* separates it from most other *Agrilus*

Agrilus species much smaller than EAB (< 8.5 mm.)

Most of the species included here will normally be much smaller than any known EAB individuals. In most cases they should be distinguishable from EAB on size alone.

Agrilus arcuatus (Say)

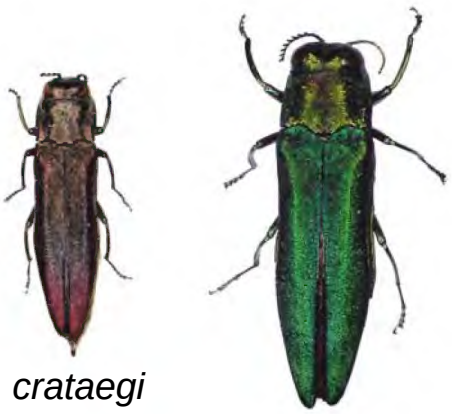


- Length: 6.0-7.5 mm, much smaller than EAB.
- Color of head and pronotum coppery-brown to bronzy-green, elytra blackish with coppery or brassy reflection.
- Abdominal dorsum black in color (RED in EAB).
- Pygidium with dorsal carina but without projecting terminal spine (PROJECTING in EAB).
- Pronotum with distinct prehumeral carina (ABSENT in EAB) (see *Agrilus anxius* for photo).
- Hosts: black oak (*Quercus velutina*), white oak (*Q. alba*), beech (*Fagus americana*), American chestnut (*Castanea dentata*), American hazel (*Corylus americana*), and hickory (*Carya* spp.).

arcuatus color and size variation

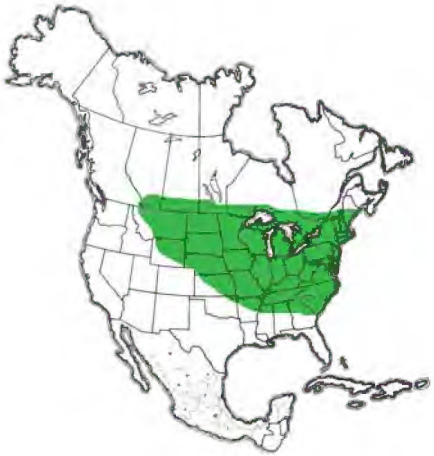
Agrilus crataegi Frost

- Length: 6.0-8.0 mm, much smaller than EAB.
- Color greenish-bronze with coppery reflection, elytra more distinctly coppery-red on apical third, appearing bicolored.
- Abdominal dorsum black in color (RED in EAB).
- Pygidium with faint dorsal carina but without projecting terminal spine (PROJECTING in EAB).
- Pronotum with distinct prehumeral carina (ABSENT in EAB) (see *Agrilus anxius* for photo).
- Host: hawthorn (*Crataegus* spp.)

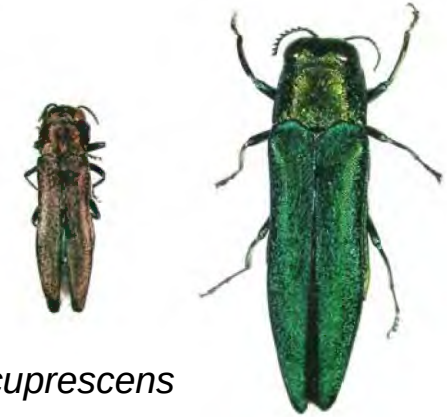


crataegi EAB

crataegi elytra "bi-colored" with apical third more brightly coppery-red



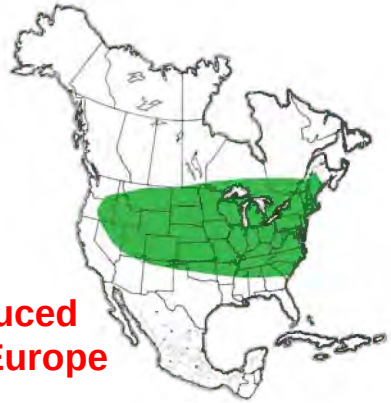
Agrilus cuprescens (Menetries)
"rose stem girdler"



cuprescens EAB

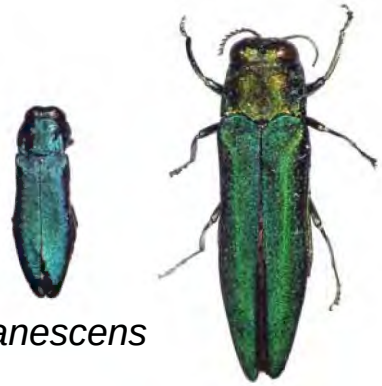
- Length: 4.0-6.3 mm, much smaller than EAB.
- Color greenish-bronze with coppery-red to brassy-green reflections.
- Abdominal dorsum bronze-black in color (RED in EAB).
- Pygidium with faint dorsal carina but without projecting terminal spine (PROJECTING in EAB).
- Pronotum with distinct prehumeral carina (ABSENT in EAB) (see *Agrilus anxius* for photo).
- Hosts: rose (*Rosa* spp.), current (*Ribes* spp.), raspberry and blackberry (*Rubus* spp.).

cuprescens
brassy-green color form



Introduced from Europe

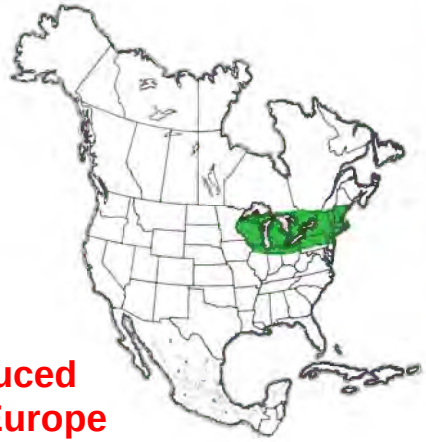
Agrilus cyanescens (Ratzeburg)



cyanescens EAB

- Length: 5.5-6.25 mm, much smaller than EAB.
- Color uniformly dark blue to greenish-blue above, ventrally black to bluish-black.
- Abdominal dorsum bluish-black in color (RED in EAB).
- Pygidium with dorsal carina but without projecting terminal spine (PROJECTING in EAB).
- Pronotum with elongate, obtuse prehumeral elevation instead of a carina (ABSENT in EAB).
- Hosts: honeysuckle (*Lonicera* spp.). In Europe, also reported from oak (*Quercus* spp.), birch (*Betula* spp.), beech (*Fagus* spp.) , alder (*Alnus* spp.) and rose (*Rosa* spp.) .

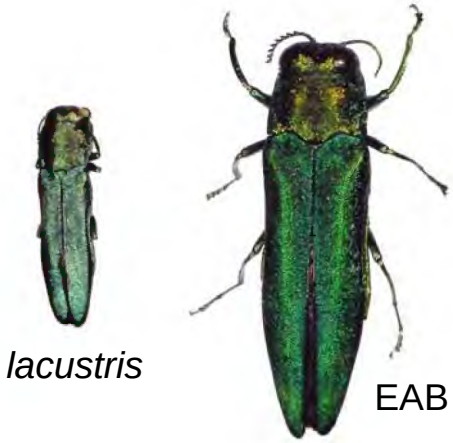
cyanescens with prehumeral obtuse elevation



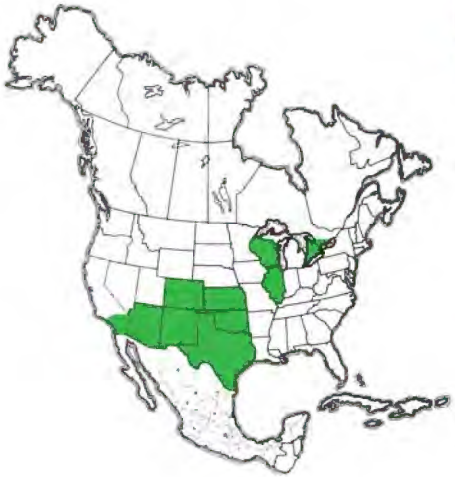
Introduced from Europe

Agrilus lacustris LeConte

- Length: 4.0-7.5 mm, much smaller than EAB.
- Color uniformly dark bronzy-brown to greenish-bronze or bluish-bronze.
- Abdominal dorsum bluish-black in color (RED in EAB).
- Pygidium with faint dorsal carina but without projecting terminal spine (PROJECTING in EAB).
- Pronotum with weak or indistinct prehumeral carina (ABSENT in EAB).
- Host: croton (*Croton* spp.).

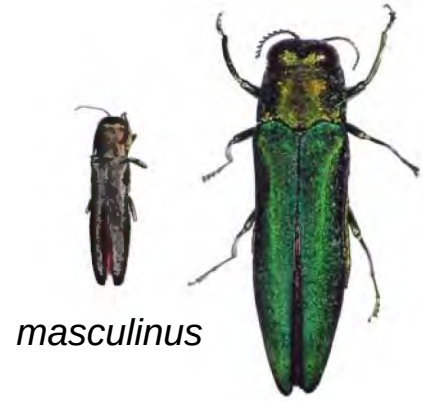


lacustris color and size variation, similar in color to EAB but much smaller



Agrilus masculinus Horn

- Length: 4.0-6.5 mm, much smaller than EAB.
- Color bronzy-green, elytra black with bronzy reflection.
- Abdominal dorsum greenish-black in color (RED in EAB).
- Pygidium with faint dorsal carina but without projecting terminal spine (PROJECTING in EAB).
- Pronotum with distinct prehumeral carina (ABSENT in EAB).
- Hosts: boxelder (*Acer negundo*), red maple (*Acer rubrum*), and Ohio buckeye (*Aesculus glabra*).



masculinus

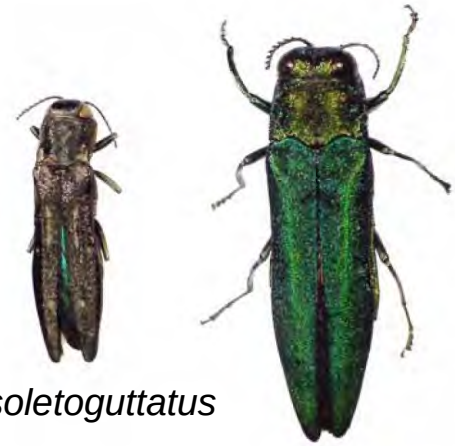
EAB

Note: red under elytra in photo above is reflection from hind wing, not abdomen

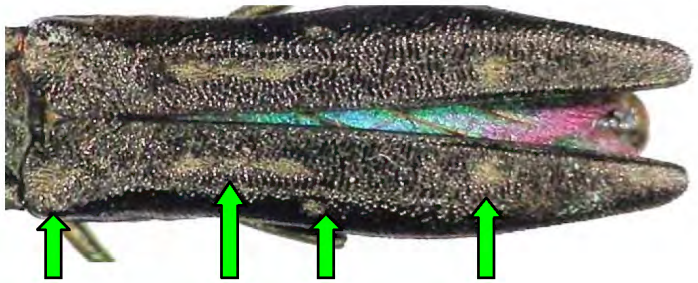
masculinus with prehumeral carina on pronotum

Agrilus obsoletoguttatus Gory

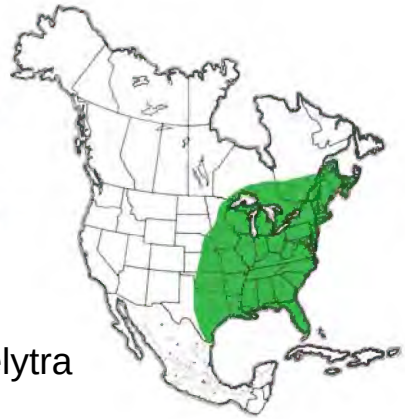
- Length: 4.7-8.0 mm, much smaller than EAB.
- Color bronzy-black to greenish-brown, sometimes with weak purplish reflections, 3-4 patches of sparse, recumbent, yellow setae on elytra and sides of abdomen (ABSENT in EAB).
- Abdominal dorsum black in color (RED in EAB).
- Pygidium with faint dorsal carina but without projecting terminal spine (PROJECTING in EAB).
- Pronotum with distinct prehumeral carina (ABSENT in EAB).
- Hosts: American beech (*Fagus grandifolia*) , American hornbeam (*Carpinus caroliniana*), eastern hop hornbeam (*Ostrya virginiana*), red oak (*Quercus rubra*), hickory (*Hickoria* spp.) and birch (*Betula* spp.)



obsoletoguttatus EAB

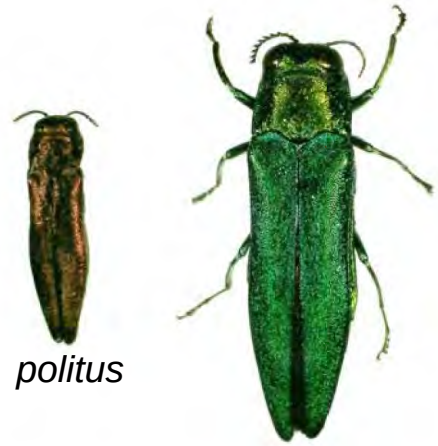


obsoletoguttatus with setose patches on elytra

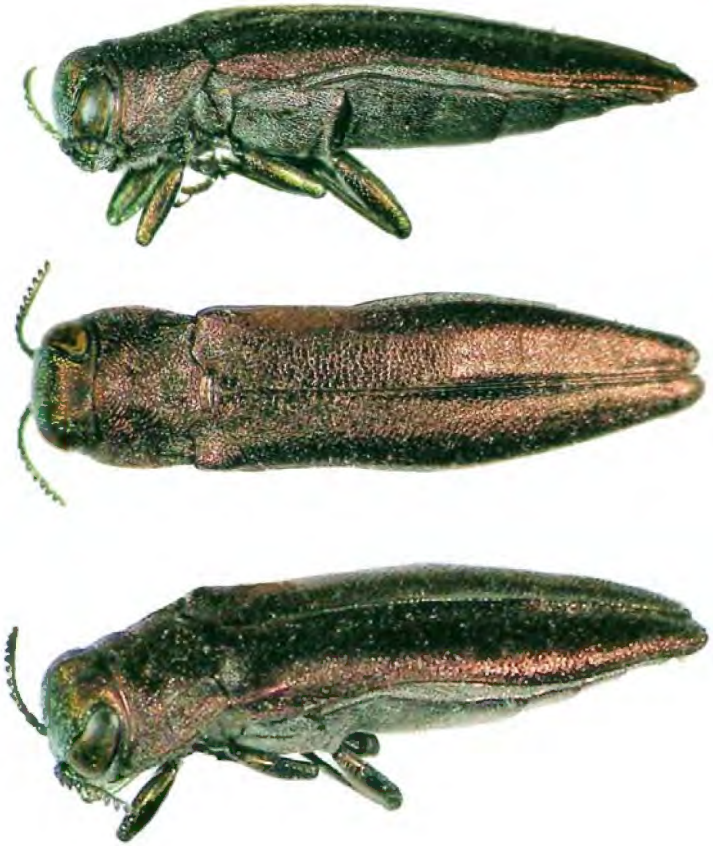


Agrilus politus (Say)

- Length: 4.7-8.5 mm, much smaller than EAB.
- Color coppery-red or green to bluish-green or leaden.
- Abdominal dorsum black in color (RED in EAB).
- Pygidium with faint dorsal carina but without projecting terminal spine (PRESENT in EAB).
- Pronotum with distinct prehumeral carina (ABSENT in EAB) (see *Agrilus anxius* for photo).
- Hosts: maple (*Acer* spp.), and willow (*Salix* spp.).



politus with faint pygidial carina but without projecting spine, dorsum of abdomen black



Agrilus ruficollis (Fabricius)
"raspberry cane borer"

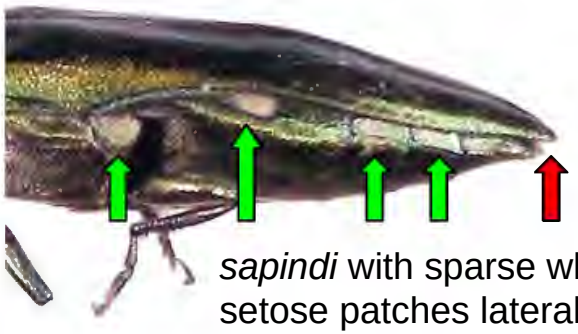
- Length: 4.0-7.0 mm, much smaller than EAB.
- Distinctly bi-colored, color of head and pronotum coppery or brassy, elytra and ventral surfaces black.
- Abdominal dorsum black in color (RED in EAB).
- Pygidium with dorsal carina and projecting terminal spine (similar to EAB).
- Pronotum without distinct prehumeral carina (also absent in EAB)
- Hosts: raspberry and blackberry (*Rubus* spp.).

ruficollis distinctly bi-colored

Agrilus sapindi Knull

- Length: 8.5, slightly smaller than EAB.
- Color brassy or bronzy-green, with white setose patches along sides of abdomen.
- Abdominal dorsum black in color (RED in EAB).
- Pygidium with faint dorsal carina but without projecting terminal spine (PROJECTING in EAB).
- Pronotum without prehumeral carina (also absent in EAB).
- Hosts: unknown.

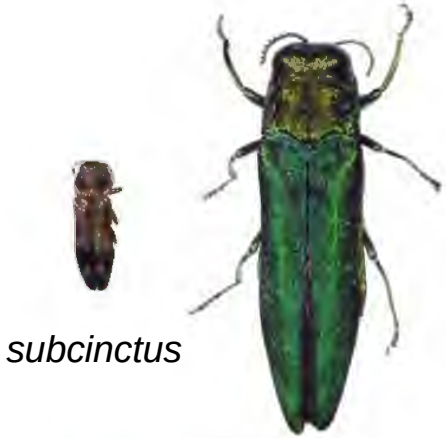
sapindi EAB



sapindi with sparse white setose patches laterally, no terminal spine

Agrilus subcinctus Gory

- Length: 3.5-4.5 mm, very much smaller than EAB.
- Color black with strong brassy or coppery reflections, elytra ornamented with whitish pubescent designs.
- Abdominal dorsum black in color (RED in EAB)
- Pygidium without dorsal carina or projecting terminal spine (PRESENT in EAB).
- Hosts: breeds in ash (*Fraxinus pennsylvanicus* var. *lanceolata*); recorded from privet (*Ligustrum* spp.) and foliage of poison ivy (*Toxicodendron* spp.).
- This is the only native species of *Agrilus* recorded as breeding in ash.



subcinctus with white pubescent patches forming patterns on elytra

Some additional species compared to EAB in this guide

Chrysobothris harrisii
(BUPRESTIDAE)

Chrysophana placida
(BUPRESTIDAE)

EAB

Cypriacis aurulenta & C. striata
(BUPRESTIDAE)

Cypriacis fasciatus
(BUPRESTIDAE)

Cypriacis langii
(BUPRESTIDAE)

Anthaxia deleta
(BUPRESTIDAE)

Anthaxia quercata
(BUPRESTIDAE)

Buprestis salisburyensis
(BUPRESTIDAE)

Ctenicera resplendens
(ELATERIDAE)

Temnoscheila virescens
(TROGOSSITIDAE)

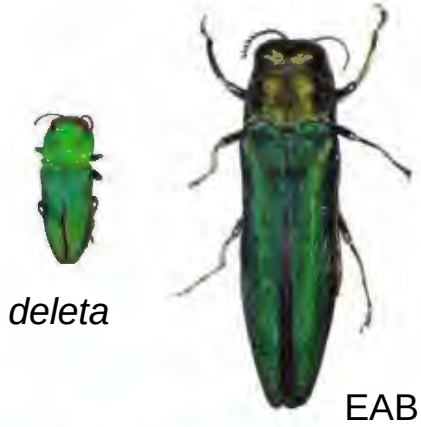
Note: all specimens are to same size scale

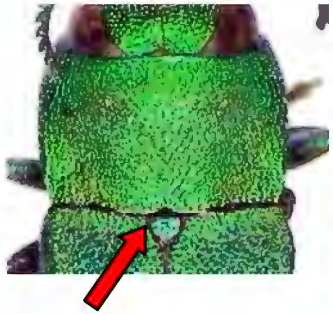
Other Genera of Buprestidae

Many species included in other genera of Buprestidae in North America are colored bright green. They can usually be separated easily from EAB by size and shape, being much flatter, wider and much larger or smaller in size than the EAB and other *Agrilus* species. Only a few of the most commonly seen green-colored species are included in this guide.

Anthaxia deleta LeConte

- Length: 4.0-6.3 mm, much smaller than EAB.
- Color bright metallic green with faint bluish reflections on elytra.
- Body wider and flatter than EAB. Pronotum not produced backward as lobe (LOBED in EAB).
- Hosts: willow (*Salix* spp.), water birch (*Betula occidentalis*), dogwood (*Cornus* spp.), and alder (*Alnus* spp.). Also reported from various conifers.



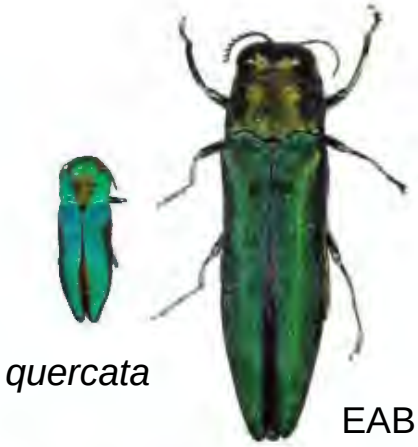


Anthaxia pronotum NOT lobed behind

EAB pronotum lobed behind

Anthaxia quercata (Fabricius)

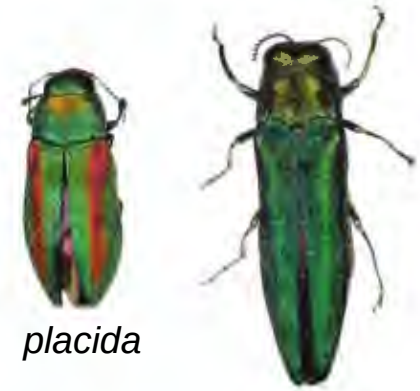
- Length: 3.8-5.3 mm, much smaller than EAB.
- Color bright green or bluish, with a bronze spot centrally on the pronotum and bronze stripes laterally on the margin of each elytron.
- Body broader and flatter than EAB. Pronotum not produced backward as lobe (LOBED in EAB)
- Hosts: redbud (*Cerceris* spp.), hawthorn (*Crataegus* spp.), hickory (*Carya* spp.), plum (*Prunus* spp.) oak (*Quercus* spp.), grape (*Vitis* spp.), tamarack (*Larix laricina*) , and pine (*Pinus* spp.). Probably many other hardwoods and conifers.



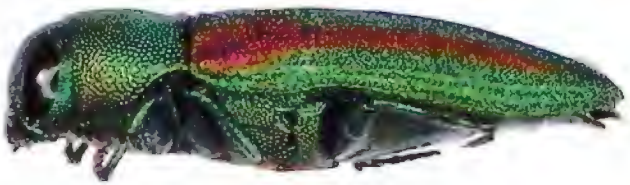
Anthaxia pronotum NOT lobed behind

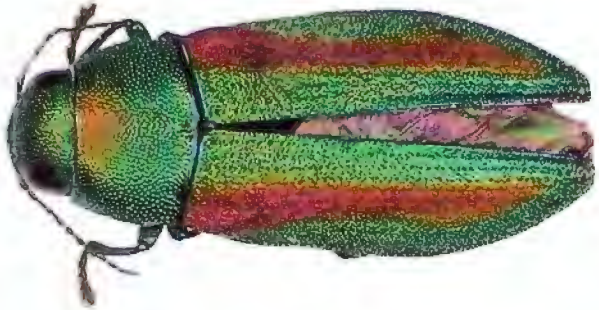
EAB pronotum lobed behind

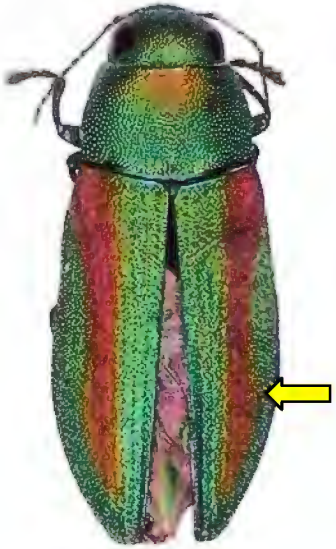
Chrysophana placida (LeConte)



- Length: 6.0-10.5 mm, usually smaller than EAB.
- Color bluish or greenish, pronotum with a coppery spot at middle front, each elytron with a broad, coppery-red, longitudinal stripe.
- Body broader and flatter than EAB. Pronotum not produced backward as lobe (lobed in EAB).
- Hosts: pine (Pinus spp.), hemlock (*Tsuga* spp.), fir (*Abies* spp.), Douglas-fir (Pseudotsuga menziesii), and western red cedar (Thuja plicata).

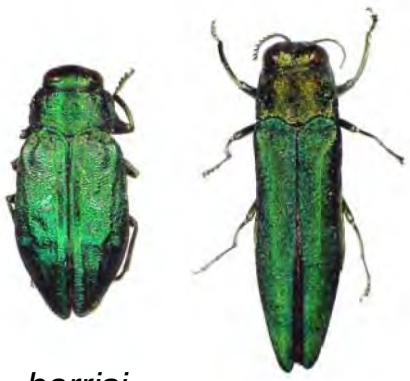






placida with red stripes on broad elytra

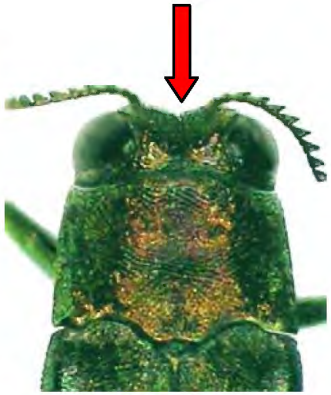
Chrysobothris harrisi (Hentz)



harrisi EAB

- Length: 6.5-9.0 mm, slightly smaller than EAB.
- Color dark green, with bluish reflections.
- Body much broader and flatter than EAB.
  Pronotum produced backward as lobe
  (similar to EAB).
- Head with longitudinal carina on vertex
  (vertex of EAB sunken).
- Hosts: pine (*Pinus* spp.).

Chrysobothris with carina on vertex of head



EAB vertex of head sunken

Buprestis salisburyensis Herbst

- Length: 10-15 mm, slightly larger than EAB.
- Color bluish-green with the lateral margins of the pronotum and lateral and sutural margins of the elytra bright coppery red. Ventral surface bright coppery.
- Body broader and flatter than EAB. Pronotum not produced backward as lobe (LOBED in EAB).
- Elytra with distinct rows of large puncture (NO large punctures in EAB).
- Hosts: pine (*Pinus* spp.).

salisburyensis

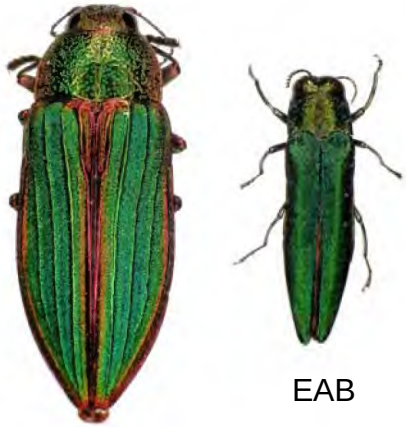
EAB

salisburyensis elytra with rows of large punctures

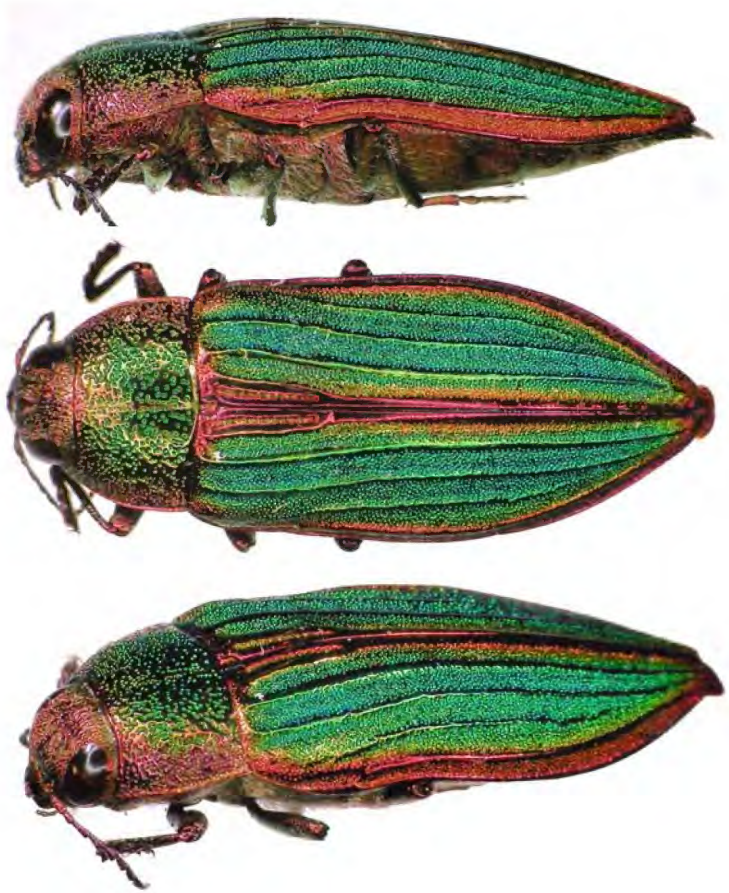
EAB elytra without large punctures

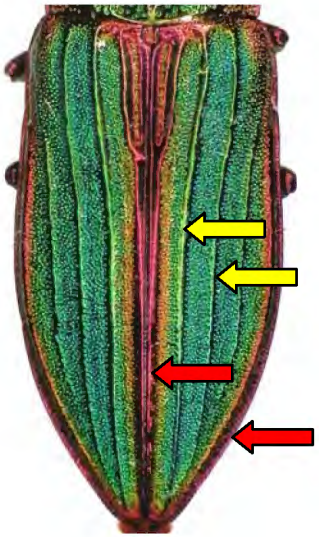
Cypriacis aurulenta (Linnaeus)

- Length: 13-22 mm, much larger than EAB.
- Color bright green with brassy and bluish reflections; head, lateral margins of pronotum, sutural and lateral margins of elytra coppery-red.
- Body broader and flatter than EAB. Pronotum not produced backward as lobe (LOBED in EAB).
- Disc of each elytron with 5 strongly elevated, smooth costae (NO costae in EAB).
- Hosts: fir (*Abies* spp.), pine (*Pinus* spp.), Douglas-fir (*Pseudotsuga menziesii*) and western redcedar (*Thuja plicata*).



aurulenta EAB

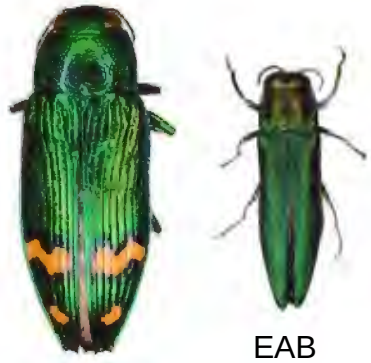


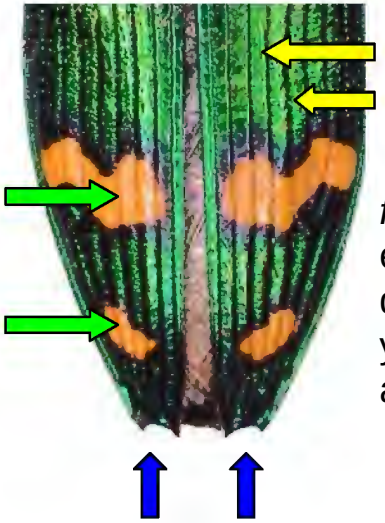


aurulenta elytra with distinct costae, sutural and lateral margins coppery-red

Cypriacis fasciatus (Fabricius)

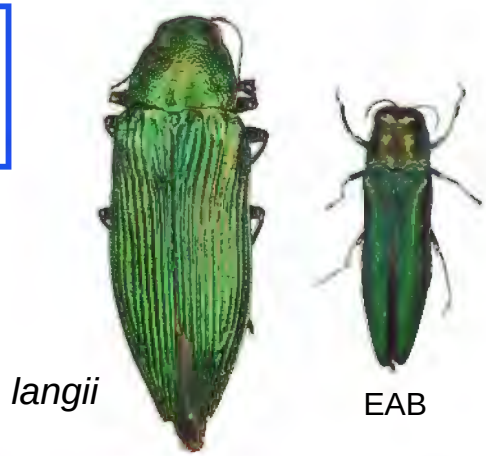
- Length: 11-18 mm, much larger than EAB.
- Color bright green to blackish-green with faint bluish reflections, elytra with distinct yellow markings near apex.
- Body broader and flatter than EAB. Pronotum not produced backward as lobe (LOBED in EAB).
- Elytra striate, with apices bidentate (NO striae in EAB, apices rounded).
- Hosts: uncertain records for pine (*Pinus spp.*), maple (*Acer* spp.), poplar (*Populus* spp.) and oak (*Quercus* spp.).



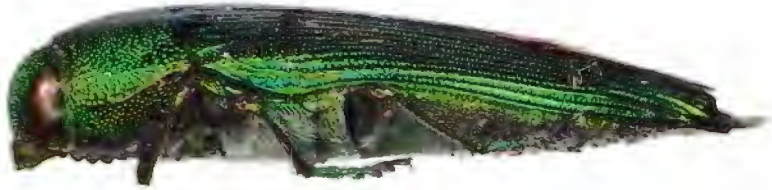


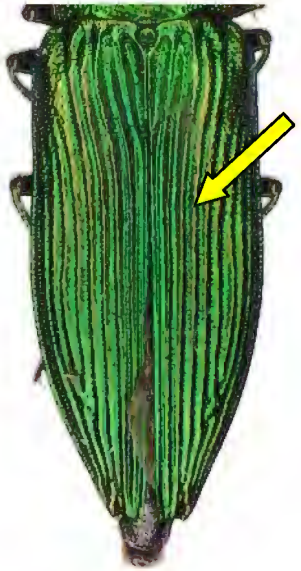
fasciatus elytra with distinct striae, yellow markings, apices bidentate

Cypriacis langii (Mannerheim)



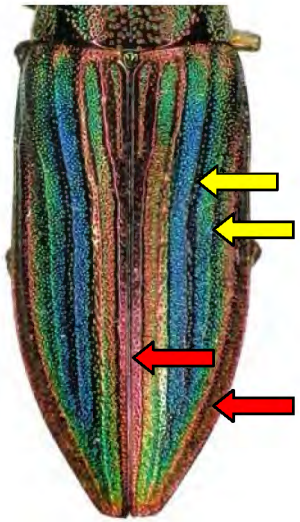
- Length: 13-21 mm, much larger than EAB.
- Color bright green or blue-green with faint brassy reflections. Some specimens with indistinct yellow to tan spots on the elytra.
- Body broader and flatter than EAB. Pronotum not produced backward as lobe (LOBED in EAB).
- Elytra distinctly costate (NO costae in EAB).
- Hosts: Douglas-fir (*Pseudotsuga menziesii*). Adults found on foliage of willow (*Salix* spp.) and alder (*Alnus* spp.).





Cypriacis striata (Fabricius)

- Length: 13-22 mm, much larger than EAB.
- Color bright green with coppery reflections, elytra bluish on discs; head, lateral margins of pronotum, sutural and lateral margins of elytra brilliant coppery (very similar to western *C. aurulenta*).
- Body broader and flatter than EAB. Pronotum not produced backward as lobe (LOBED in EAB).
- Disc of each elytron with 5 weakly elevated. punctate costae (NO costae in EAB).
- Hosts: pine (*Pinus* spp.), eastern hemlock (*Tsuga canadensis*), spruce (*Picea* spp.), and larch (*Larix spp.*).



striata elytra with weak costae, sutural and lateral margins coppery-red, disc bluish

Some other Families of beetles

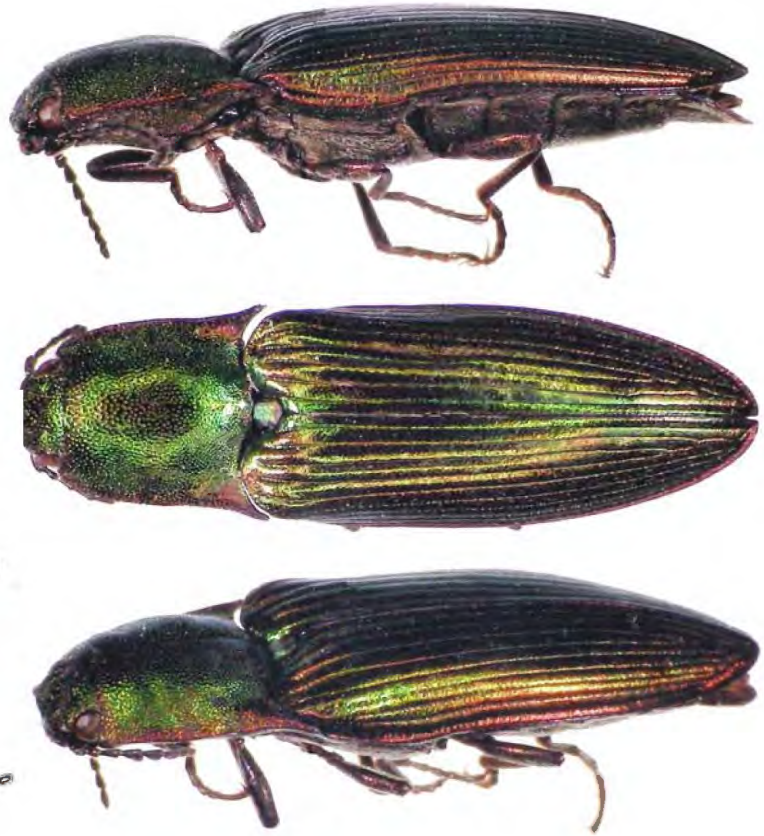
Many members of other families of beetles are also colored bright green. Green-colored species can be found in Carabidae, Cerambycidae, Chrysomelidae, Scarabaeidae, and others. These can usually be easily distinguished from EAB and other Buprestidae by size, shape and other characteristics. Most “click beetles” (Family: Elateridae) have the same general shape as Buprestidae, however, most are also dull colored. A single widely-distributed, metallic-colored species is included in this guide. “Bark-gnawing beetles” (Family: Trogossitidae) include many species that do not resemble Buprestidae. However, the common genus *Temnoscheila*, includes 5 species that are metallic green or blue, similarly shaped to EAB, and are commonly found under bark of decaying logs. The most common eastern species of this genus has also been included in this guide. While the difference between most of these other green beetles and EAB may seem obvious to diagnosticians and taxonomists, to many others “a bug is a bug” and to them, all these insects may look remarkably similar. This re-enforces the need to have all suspected sightings and reports confirmed by experts in identification.

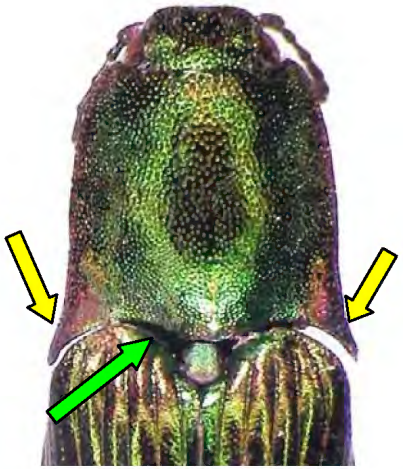
Family: Elateridae “click beetles”

Ctenicera resplendens (Eschscholtz)

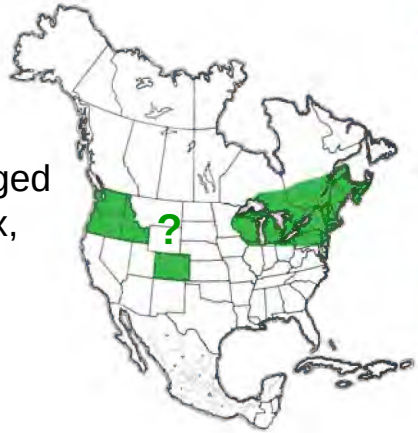
resplendens EAB

- Length: 10-15 mm, slightly larger than EAB.
- Color bright green with brassy and coppery reflections.
- Pronotum “hinged” to mesothorax with ventral click mechanism, and hind angles prolonged backward as sharp spines (all ABSENT in EAB).
- Hosts: unknown, but other elaterids feed on herbaceous plant roots, in rotting wood or are predators.





resplendens prothorax hinged to mesothorax, hind angles prolonged as spines



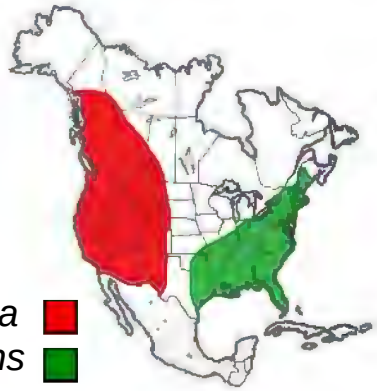
Family: Trogossitidae “bark-gnawing beetles”

Temnoscheila virescens (Fabricius)

virescens EAB

- Length: 8.6-17.8 mm, slightly larger than EAB.
- Color bright green or blue-green varying to almost dark purplish-blue, often with brassy reflections.
- Head large, prognathous, and more evident than in Buprestidae, and the connection of the pronotum to mesothorax is narrowed, waist-like.
- *T. virescens* occurs in the eastern U.S. with *T. chlorodia* (Mannerhiem), a very similar species, occurring in the western North America. Both species are predators found under the bark of dead trees where they feed on a variety of wood-boring beetles.

virescens pronotum connected to mesothorax by a narrow waist



T. chlorodia
T. virescens

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- All photos by Gary L. Parsons 2006, 2007, 2008