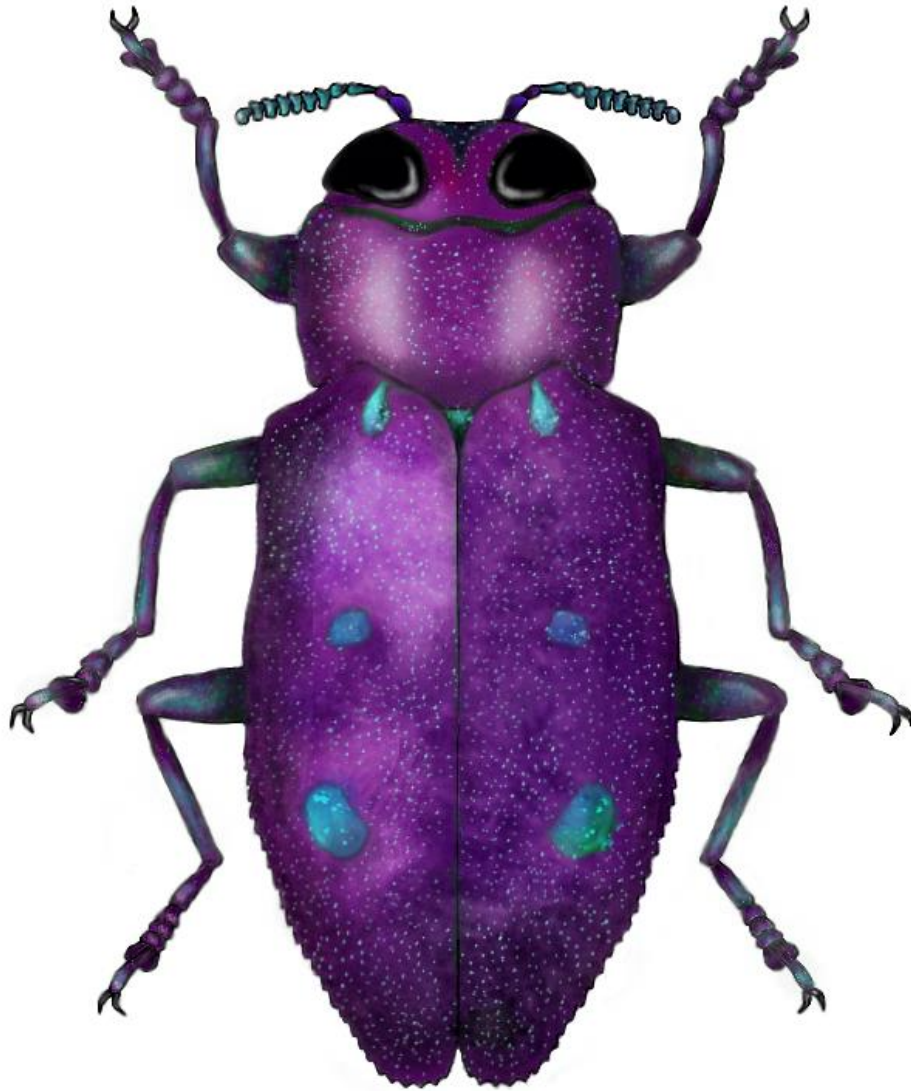


The Jewel Beetles of Minnesota

Marie J. Hallinen, Jacob T. Wittman, Wayne P. Steffens,
Jennifer L. Schultz, Brian H. Aukema



UNIVERSITY OF MINNESOTA

Department of Entomology

College of Food, Agricultural and
Natural Resource Sciences

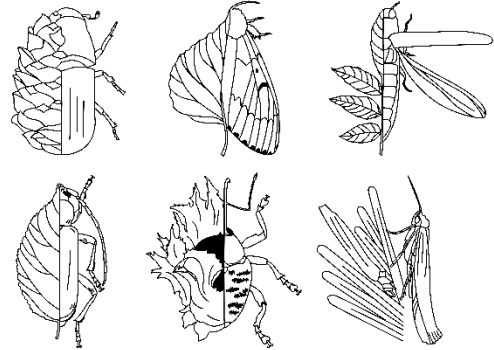
Printed March 2021

Author Contact Information

Marie J. Hallinen
Department of Entomology, University of Minnesota
1980 Folwell Ave., 432 Hodson Hall
St. Paul, MN 55108, USA
halli154@umn.edu

Wayne P. Steffens
1992 Holm Road, Two Harbors, MN 55616, USA
biogeo@nmsu.edu, wsteffens@fastmail.fm

Jacob T. Wittman, Jennifer L. Schultz, and Brian H. Aukema
Department of Entomology, University of Minnesota
1980 Folwell Ave., 432 Hodson Hall
St. Paul, MN 55108, USA
wittm094@umn.edu, schultzj@umn.edu, BrianAukema@umn.edu



FOREST ENTOMOLOGY
University of Minnesota

Acknowledgements

We thank Robin Thompson at the Minnesota Department of Entomology Insect Collection for providing access to the collection. Norman Woodley (USDA ARS Systematic Entomology Lab, Beltsville, MD, ret.), T. C. MacRae (Bayer Crop Science, Chesterfield, MO), S. G. Wellso (Texas A&M University, College Station, TX), and R. L. Westcott (Oregon Department of Agriculture, Salem, OR) assisted with buprestid identification. Wasp Watchers volunteers collected many beetles, and lab technicians including Elgin Lee, Joe Ure, Bade Turgut, Piper Haynes, Mara Short, Tenzin Dothar, Kristine Jecha, and Chelsea Zblewski (UMN) helped collect and barcode beetles. Aubree Kees (UMN) assisted with document editing and photo compilation. Lastly, thanks to the many photographers who provided photos for this work.

Funding for this booklet was provided by an appropriation from the MN Environmental and Natural Resources Trust Fund of the Legislative Citizens Commission on Minnesota Resources, project M.L. 2017 Chpt. 96 Subd. 06-06b, and an MGK fellowship to MJH.

Cover art: *Chrysobothris azurea*, illustration by Marie Hallinen, 2021

Table of Contents

Introduction	3
Using this guide	4
Additional resources	5
Jewel Beetle Genera	
<i>Acmaeodera</i>	6
<i>Actenodes</i>	7
<i>Agrilus</i>	9
<i>Anthaxia</i>	49
<i>Brachys</i>	55
<i>Buprestis</i>	58
<i>Chalcophora</i>	67
<i>Chrysobothris</i>	70
<i>Dicerca</i>	89
<i>Eupristocerus</i>	100
<i>Melanophila</i>	101
<i>Pachyschelus</i>	102
<i>Phaenops</i>	105
<i>Poecilonota</i>	109
<i>Ptosima</i>	112
<i>Spectralia</i>	113
<i>Taphrocerus</i>	114
References	117

Introduction

Beetles are an enormously diverse order and potentially the most species rich of all animals, with species counts estimated at 350,000 (New 2007). One of the largest groups of beetles is the buprestid family, commonly called jewel beetles, with around 15,000 species worldwide (Bellamy and Nelson 2002). The word “buprestid” comes from two Greek words, “bous” for “cattle,” and “prethein,” meaning “to blow up.” Bright (1987) speculates that buprestids were originally thought to be poisonous to cattle, and possibly confused with the more explosive blister beetles. The common name “jewel beetle” originates from the beautiful iridescence and sometimes vibrant coloration of these beetles. Buprestids greatly vary in appearance by genera, with pronounced differences in size and shape. In some cultures large buprestids are a food source, and in others (and at many entomology conferences) you can find buprestid elytra (wing coverings) repurposed as jewelry. In Western Australia all jewel beetles were listed as protected fauna under the 1978 Wildlife Conservation Act, likely due to their popularity amongst collectors (New 2007).

In North America, the most well known buprestids are pest species, such as the infamous emerald ash borer (*Agrilus planipennis*), an invasive beetle currently decimating species of North American ash (*Fraxinus* spp.). Several other native buprestids occasionally act as pests, such as the two-lined chestnut borer (*A. bilineatus*) and the flatheaded apple borer (*Chrysobothris femorata*). Under certain conditions, such as during droughts or after windstorms or when trees are colonized by other insects that reduce vigor, populations of buprestids may build up and outbreak, girdling trees or causing degradation in wood products (Solomon 1995). However, buprestids are generally considered secondary pests as most prefer to attack trees or branches that are already dead or dying. Most species provide ecological benefits, helping break down slow-to-decay woody material and returning nutrients such as nitrogen, carbon, phosphorus, among others, back to the soil (Hammond et al. 2001).

While some species of buprestids are leaf miners, gallmakers, or twig pruners (Solomon 1995), most feed in the branches or bole of trees. Buprestids generally lay their eggs either on the bark surface, in bark crevices, or around wounds. Larvae hatch and then bore into the wood, feeding from just under the bark to the heartwood and leaving winding and sometimes spiral-shaped mines. All woodboring buprestids require at least one summer to develop. Larvae often pupate and overwinter in the heartwood as adults, although some overwinter as larvae or pupae within the gallery. The leaf miners (*Taphrocerus*) develop significantly faster (4-5 weeks) and disperse as adults to overwintering sites (Bright 1987). Buprestid larvae are called “flatheaded,” referring to the enlargement of the first (and sometimes second and third) thoracic segments, which distinguishes them from other larvae found within trees (Solomon 1995). Buprestid exit

holes often appear “D” shaped, differentiating them from exit holes left by other families of borers, such as the round exit holes of the Cerambycidae.

Adult jewel beetles are most active on sunny days, where they can be found ovipositing on bark or feeding on foliage, flowers, or fungus. They may “play dead” when touched, tucking in their legs and ceasing movement. The purpose of their iridescence is unknown, although it is likely related to mate-seeking behavior, as buprestids likely depend on visual cues to find mates, alongside contact or short-range pheromones (Lelito et al. 2007, Silk et al. 2011).

Using this guide

This guide is based on specimens housed in the University of Minnesota Insect Collection (UMSP), including buprestids collected from *Cerceris fumipennis* nest monitoring from 2014 to 2018. *Cerceris fumipennis* is a native ground nesting wasp that hunts for buprestid beetles during the summer months. Monitoring *C. fumipennis* nests provides a collecting alternative to methods such as sticky traps, which may not effectively catch some buprestid species. Other methods of collecting buprestids include vegetation beating, sweep netting, and rearing (see Paiero et al. 2012). Rearing beetles from plant material at the end of the summer after eggs are laid is time-intensive, but offers host-specificity and may procure beetles rarely collected by other methods.

While this guide contains general notes on size and color of species, it does not contain specialized taxonomic information and is not intended as an identification guide for buprestids. Rather, it is meant to be a starting point for the nonspecialist to find information about buprestid species known to occur in Minnesota, including information on hosts, seasonal occurrence, biology, and range. Buprestids are notably difficult to identify, with several species groups still in need of revision. Traits such as color and size may be inconsistent within and between species. Many species are polyphagous, so even when a host is known the identity of the species can still remain enigmatic. Oftentimes the shape of male genitalia for a particular species is useful in differentiating it from a closely related species, while females may be impossible to distinguish without additional information.

Genera and species in this guide are listed alphabetically. Maps depict the number of beetles found per Minnesota county, as well as the latest year beetles were found, ranging from the 1880s to the 2010s. Seasonal occurrences are given as the earliest and latest collection dates for a given species. In addition to date range, Minnesota larval and adult host information and collecting methods are noted in this list, with host information reported from collection labels

and Nelson et al. (2008). Potential hosts from Nelson et al. (2008) were narrowed to species occurring in Minnesota using the U.S. Department of Agriculture Plants Database (USDA 2019) and the Minnesota Department of Natural Resources' MNTaxa State of Minnesota Vascular Plant Checklist (MDA 2013). Larval hosts are considered more important for this family than adult hosts, as damage to hosts is caused in the larval stage and adults may be collected while resting on non-hosts. Nelson et al. (2008) provided a basis for range information as well. Synonyms, beetle lengths, and some aspects of the beetle descriptions found in this guide were adapted from Paiero et al. (2012). All specimen data, including recent state records for Minnesota are available online (see Hallinen et al. 2020 and 2021), and all specimens are currently housed in the UMSP.

Additional resources

For a broader guide to the buprestids of northeastern North America, see the excellent guide by Paiero et al. 2012, freely available online ([http://www.biodiversityinfocus.com/pdfs/Jewel Beetle Field Guide English.pdf](http://www.biodiversityinfocus.com/pdfs/Jewel_Beetle_Field_Guide_English.pdf)). It contains a key to buprestid genera found in this part of the country, along with notes on collecting buprestids, preparing specimens, and clear photos of beetles from many different angles (including beetle face and genitalia, which are often important identification characteristics). The identification notes may help narrow a specimen down to a certain group within a genus. If a definite identification is required, it may be best to consult with an expert in buprestid identification.

For those interested in tackling buprestid identification themselves, Bright's 1987 publication of the buprestids of Canada and Alaska contains taxonomic keys and host and ecological information for many of the species included in this book, although some of the species have since been revised and not all species shown here are included. Wellso et al. (1976) provides a key to the buprestids of Michigan, which we found useful when identifying Minnesota buprestids for this project. In addition to these, Downie and Arnett (1996) provide keys for the majority of beetles known to occur in the northeast, and Maier and Ivie (2013) provide updated descriptions and a key for the genus *Chalcophora*. See Wellso and Manley (2007) and [Hansen et al.](#) for methods of differentiating between species related to *Chrysobothris femorata*, a problematic group. If interested in hosts beyond those found in Minnesota, Jendek and Poláková (2014) provides host plant records of *Agilus* species found worldwide.

Acmaeodera pulchella (Herbst, 1801)

Synonym(s): *Acmaeodera flavosignata* Gory

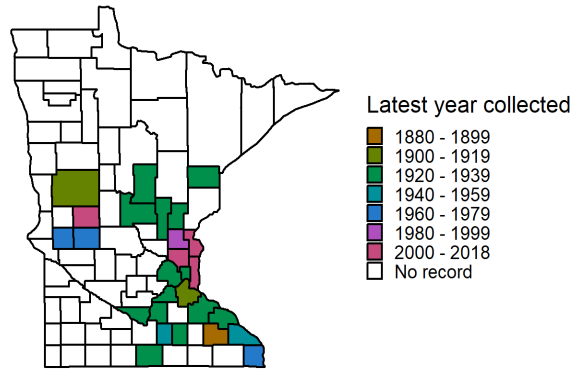
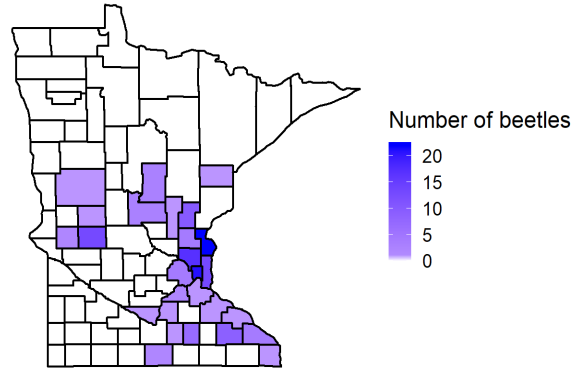
Common Name: Flat-headed bald cypress sapwood borer

Total in collection: 147

MN occurrence: June 13 – September 12



"CNC COLEO 00108319" by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under [CC BY-NC-SA 3.0](https://creativecommons.org/licenses/by-nc-sa/3.0/)



Range: Throughout eastern and central US and CA: Quebec to Florida and Manitoba to Louisiana

Larval MN host: *Crataegus* spp. and *Gleditsia triacanthos* L.

Adult MN host: Prairie flowers: *Achillea millefolium* var. *lanulosa*, *Coreopsis palmata*, *Echinacea angustifolia*, *Heliopsis Helianthoides*, *Rudbeckia hirta*. Additionally *Acer saccharinum* L. and *Quercus alba* L.

Collection method: Hand collected on prairie flowers, malaise traps, and collected at *Cerceris fumipennis* nesting sites

Appearance: 5-10 mm long. Yellow markings are variable.

Comments: Although there are 145 species of *Acmaeodera* in North America, most are southwestern and *A. pulchella* is the only species recorded in MN. Beetles in this genus are thought to be wasp-mimics due to their striped coloration and method of flight. Unlike most beetles, which hold their elytra out to the side when they fly, *Acmaeodera* fly with their hindwings alone and hold their patterned elytra against the abdomen (Silberglied & Eisner 1969).

Actenodes acornis (Say, 1833)

Synonym(s): *Chrysobothris rugulosus* Gory, *C. punctatus* Melsheimer, *Belionota californicus* Motschulsky

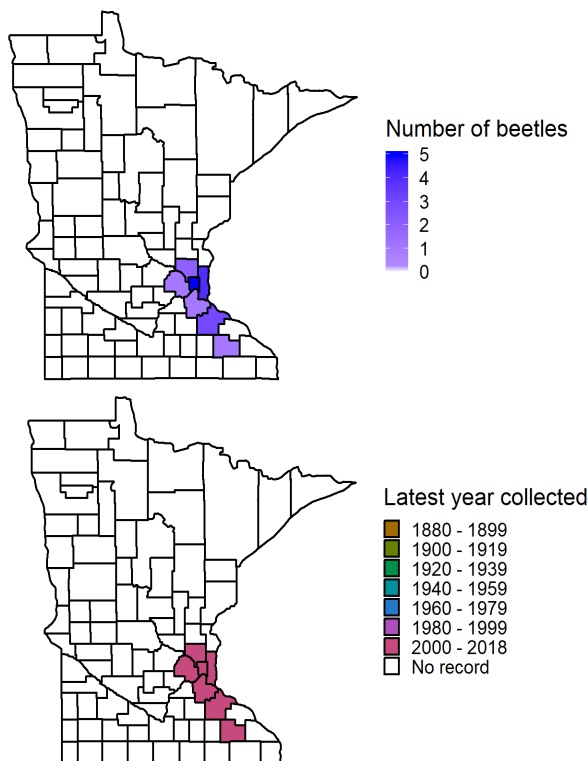
Common Name: N/A

Total in collection: 17

MN occurrence: June 6 – August 4



Photo by Hannah Royals, [Museum Collections: Coleoptera](#), USDA
APHIS PPQ is licensed under [CC BY-NC 3.0](#)



Range: Throughout eastern and central US and CA: Ontario to Florida and Minnesota to Texas

Larval MN host: *Acer rubrum* L., *A. saccharum* Marsh., *Betula nigra* L., *Carya ovata* (Mill.) K. Koch, *Fagus grandifolia* Ehrh., and *Quercus velutina* Lam.

Adult MN host: Additionally *Q. prinoides* Willd.

Collection method: Collected at *Cerceris fumipennis* nesting sites

Appearance: 9-15 mm long. Dark green. Male face metallic green. Can differentiate from *Actnodes simi* based on antennae: antennal segments 5-10 wider than long.

Comments: There are nine species of *Actenodes* in North America, with two occurring in MN. Rarely collected but reported to be a common prey item of *C. fumipennis* (Paiero et al. 2012). Reported in dead wood (Knull 1922), most commonly in association with *Acer* and *Carya* sp. (MacRae 2006).

Actenodes simi Fisher, 1940

Synonym(s): N/A

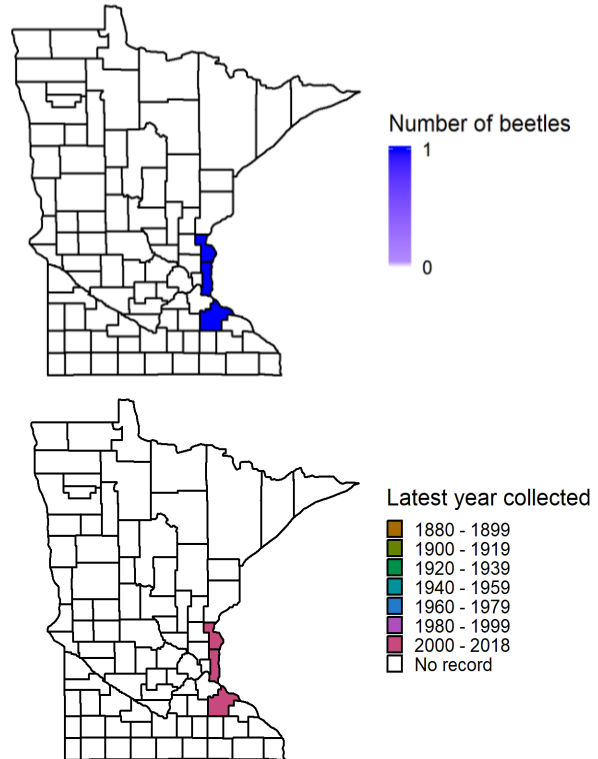
Common Name: N/A

Total in collection: 3

MN occurrence: June 17 – July 22



Photo by Hannah Royals, [Museum Collections: Coleoptera](#), USDA
APHIS PPQ is licensed under [CC BY-NC 3.0](#)



Range: Throughout eastern and central US and CA: New Hampshire to Pennsylvania and Ontario to Texas

Larval MN host: *Acer saccharinum* L. and *Quercus alba* L.

Adult MN host: Additionally *Q. velutina* Lam.

Collection method: Hand collected on prairie flowers, malaise traps, and collected at *Cerceris fumipennis* nesting sites

Appearance: 9-15 mm long. Dark green. Can differentiate from *Actenodes acornis* based on antennae: antennal segments 5-10 as wide as long.

Comments: There are nine species of *Actenodes* in North America, with two occurring in MN. Rarely collected but reported to be a common prey item of *C. fumipennis* (Paiero et al. 2012).

Agrilus acutipennis Mannerheim 1837

Synonym(s): *Agrilus latebrus* Gory and Laporte

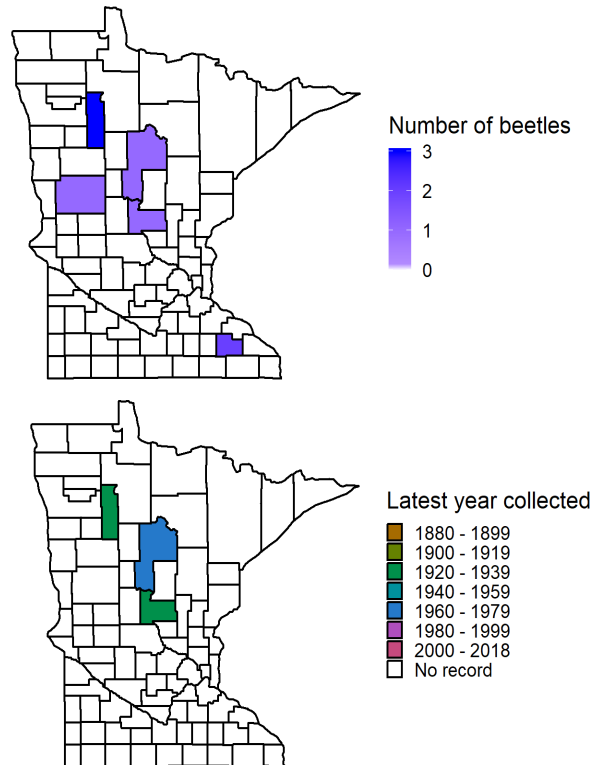
Common Name: Spotworm borer

Total in collection: 8

MN occurrence: June 6 – July 26



Photo by Mike Quinn is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern and central US and CA: Newfoundland to Florida and Ontario to Colorado/Texas

Larval MN host: *Quercus alba* L.

Adult MN host: Additionally *Amelanchier arborea* (Michx. F.) Fern., *Betula* sp., *Carya cordiformis* (Wangenh.) K. Koch, *Corylus americana* Walt., *Juglans nigra* L., *Populus* sp., *Quercus macrocarpa* Michx., and *Q. velutina* Lam.

Collection method: Sweeping *Corylus* sp.

Appearance: 7-10 mm long. Dark blue.

Comments: Occasionally causes notable damage in oaks. Larval galleries can be observed by cutting away the bark of infested saplings, as larvae tunnel in the outermost growth ring of the sapwood. Lumber with stains from *A. acutipennis* is said to have “grease spots” or “worm spots” and is reduced in value (Solomon 1995).

Agrilus anxius Gory, 1841

Synonym(s): *Agrilus gravis* LeConte, *A. torpidus* LeConte

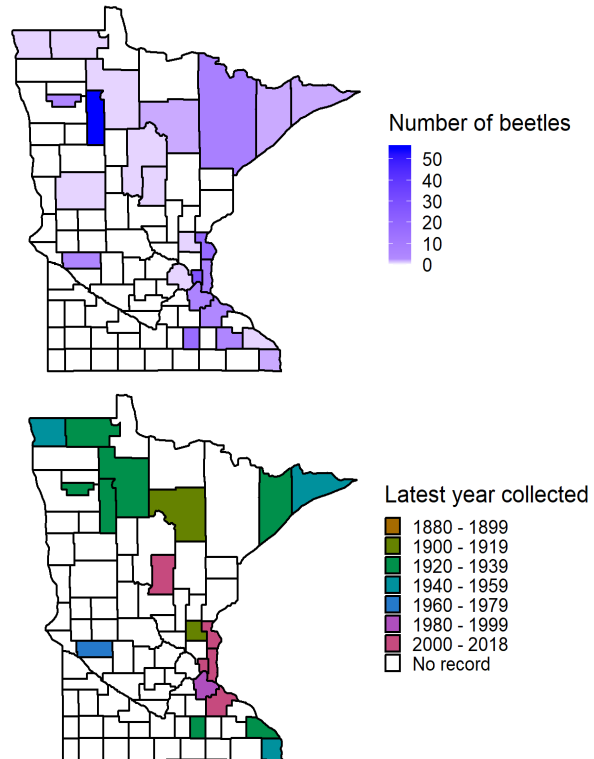
Common Name: Bronze birch borer

Total in collection: 175

MN occurrence: April 3 – August 22



Photo by Steven Valley, Oregon Department of Agriculture is licensed under CC BY-NC 3.0



Range: Throughout most of US and CA: New Brunswick/Quebec to Georgia and British Columbia to Arizona

Larval MN host: *Betula alleghaniensis* Britt., *B. papyrifera* Marsh, *Populus balsamifera* L., *P. deltoides* Bartr. ex Marsh, *P. grandidentata* Michx., and *P. tremuloides* Michx., although reports of *Populus* as a larval host likely indicate misidentification of the similar looking *Agrilus granulatus liragus* (Jendek and Poláková 2014).

Adult MN host: *Betula* sp. and *Populus* sp.

Collection method: Reared from *B. papyrifera* Marsh, collected on *Betula* and *Populus* logs, and as *Cerceris fumipennis* prey

Appearance: 5-13 mm long. Bronze pronotum and black elytra. Several similar looking beetles make up the *Agrilus anxius* species group.

Comments: Considered a secondary pest of *Betula* trees, but may outbreak and cause significant mortality in conditions of injury, drought, or high temperatures (Solomon 1995). Eurasian birch species are more susceptible than more resistant North American species (Muilenburg and Herms 2012). The related *Agrilus granulatus liragus* attacks aspen. Both are common *C. fumipennis* prey items in MN.

Agrilus arcuatus (Say, 1825)

Synonym(s): *Agrilus obliquus* LeConte

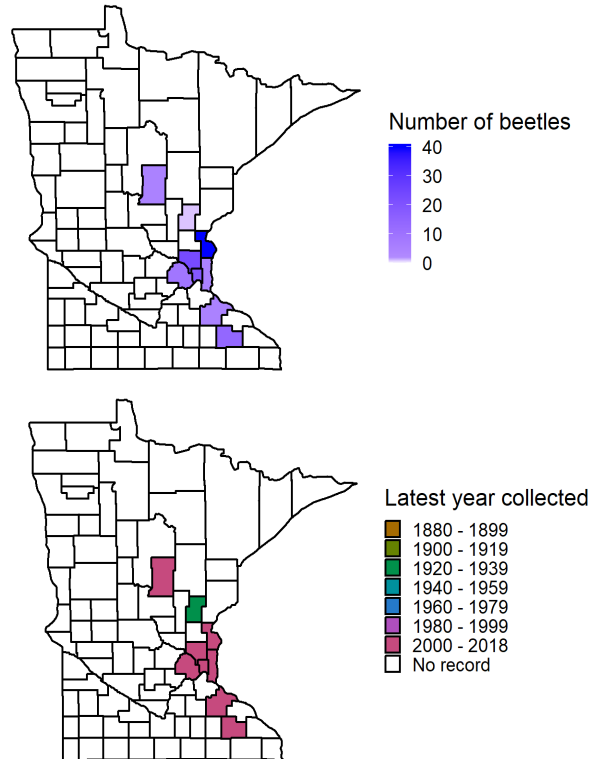
Common Name: N/A

Total in collection: 121

MN occurrence: June 16 – August 19



Photo by Hannah Royals, [Screening Aids](#). USDA APHIS PPQ is licensed under CC BY-NC 3.0



Range: Throughout eastern and central US and CA: Quebec to Florida and Ontario to Oklahoma. Additionally Montana

Larval MN host: *Fagus grandifolia* Ehrh., *Quercus alba* L., and *Q. velutina* Lam

Adult MN host: Additionally *Carya* sp. and *Juglans nigra* L.

Collection method: Collected at light and as *Cerceris fumipennis* prey

Appearance: 5-9 mm long. Bronze-red or green thorax with black elytra. Similar in appearance to other species of the *A. arcuatus* group.

Comments: A common species sometimes confused with the related *A. torquatus*, a pest in hickories and pecans. In the past other members of the *A. arcuatus* species group have been treated as subspecies (Bright 1987). A common prey item of *C. fumipennis* in MN.

Agrilus audax Horn, 1891

Synonym(s): N/A

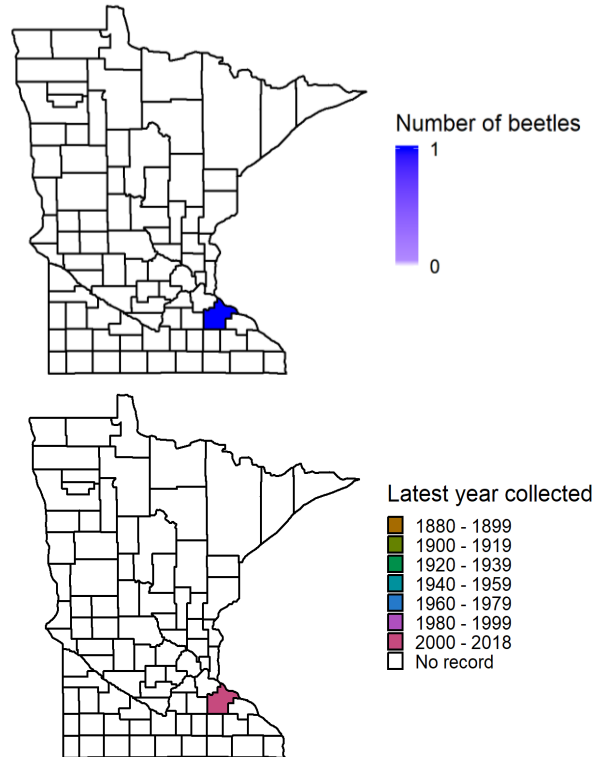
Common Name: N/A

Total in collection: 2

MN occurrence: July 7 – July 29



Photo © 2010 Kyle Schnepf



Range: Central US: Illinois, Minnesota, Missouri, Oklahoma, Texas

Larval MN host: *Ulmus fulva* Muhl.

Adult MN host: Additionally *Quercus macrocarpa* Michx.

Collection method: *Cerceris fumipennis* prey

Appearance: 8-10 mm long. Head, pronotum, and underside gold-red with orange patterns on the face and pronotum. Similar in appearance to the more common *Agrilus vittaticollis*.

Comments: Considered rare. Minnesota represents a significant range expansion for this species. Reported breeding in living branches of slippery elm (Knull 1934), although this single larval host record has yet to be confirmed (Jendek and Poláková 2014).

Agrilus bilineatus (Weber, 1801)

Synonym(s): *Agrilus bivittatus* Kirby, *A. flavolineatus* Mannerheim, *A. aurolineatus* Gory

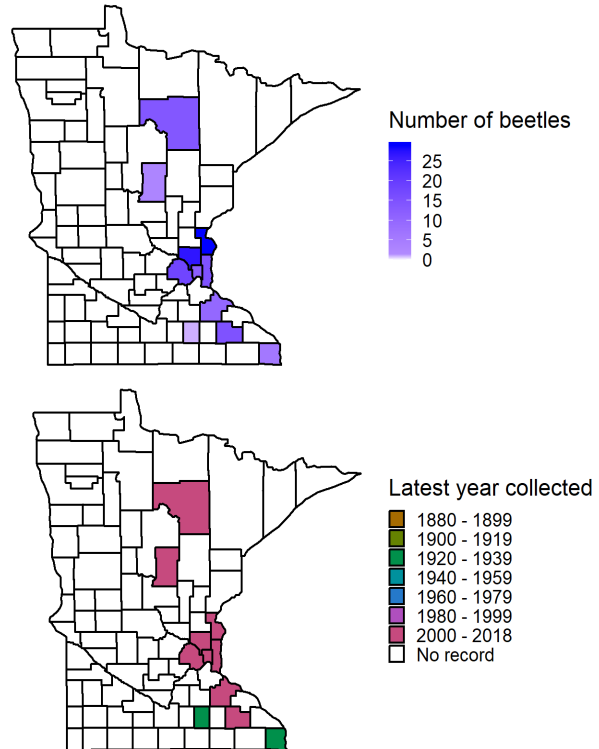
Common Name: Two-lined chestnut borer

Total in collection: 150

MN occurrence: May 27 – August 10



Photo by Mike Quinn is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern and central US and CA: Quebec to Florida and Manitoba to Texas

Larval MN host: *Quercus alba* L., *Q. macrocarpa* Michx., *Q. muehlenbergii* Engelm., *Q. rubra* L., and *Q. velutina* Lam.

Adult MN host: Additionally *Abies* sp., *Quercus* sp.

Collection method: Reared from *Q. macrocarpa* Michx and *Q. rubra* L., window traps in damaged *Quercus* sp., bait traps, rotary traps, and as *Cerceris fumipennis* prey

Appearance: 4-10 mm long. Black with yellow or white stripes running down the middle of the elytra. The closely related *A. carpini* is similar in appearance, but has a dark blue elytra and attacks hornbeam and hophornbeam.

Comments: Causes mortality in oaks already weakened by drought, defoliation by other pests such as gypsy moth, fungi, and other factors. At high densities can additionally kill healthy trees. In some cases, up to 75% of infested trees may die (Solomon 1995).

Agrilus carpini Knull, 1923

Synonym(s): *Agrilus bilineatus azureus* Knull

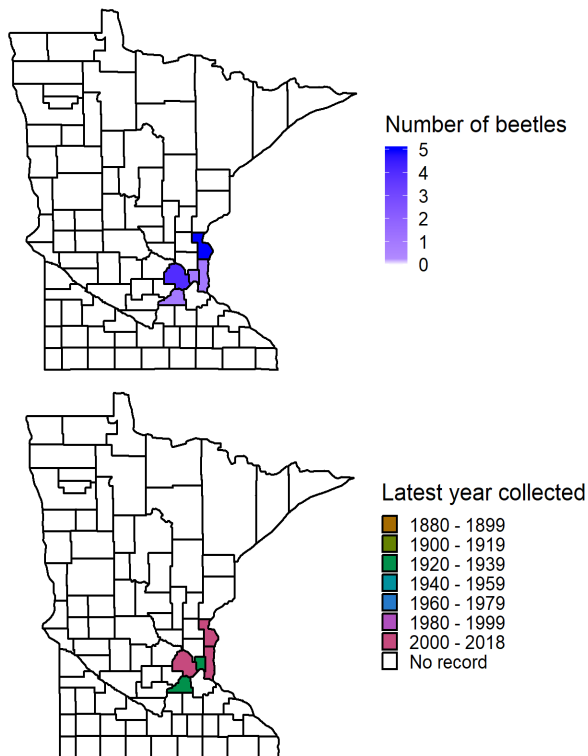
Common Name: N/A

Total in collection: 12

MN occurrence: June 11 – August 11



"CNC COLEO 00106827" by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under [CC BY-NC-SA 3.0](https://creativecommons.org/licenses/by-nc-sa/3.0/)



Range: Throughout eastern US and CA: Quebec to South Carolina and Ontario to Arkansas

Larval MN host: *Carpinus caroliniana* Walt., *Fagus grandifolia* Ehrh., and *Ostrya virginiana* (Mill.) K. Koch.

Adult MN host: Unknown

Collection method: *Cerceris fumipennis* prey

Appearance: 4 – 10 mm long. Similar in appearance to *A. bilineatus*, but with dark blue elytra, fainter stripes, and different host preferences.

Comments: Previously considered a subspecies of *A. bilineatus*.

Agrilus celti Knull, 1920

Synonym(s): N/A

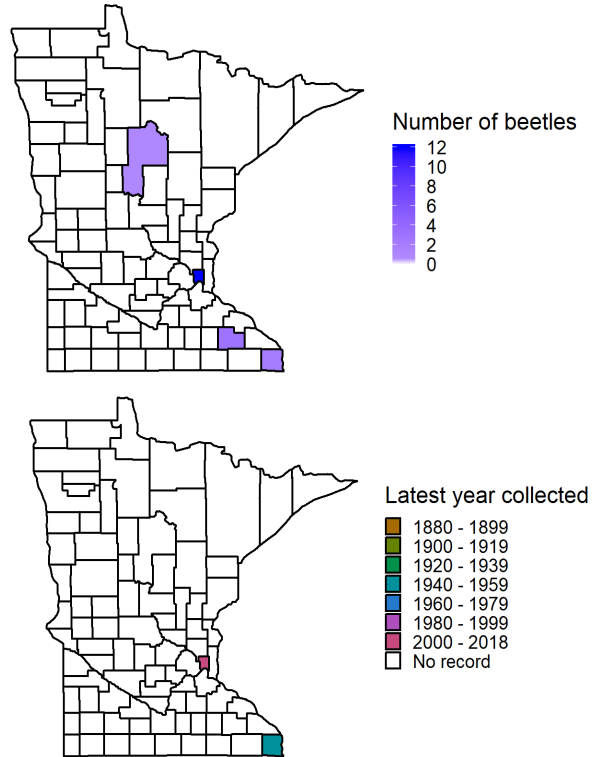
Common Name: N/A

Total in collection: 12

MN occurrence: May 30 – July 25



Photo by Mike Quinn is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern and central US and CA: New Hampshire to Georgia and Ontario/North Dakota to Texas

Larval MN host: *Celtis occidentalis* L.

Adult MN host: Unknown

Collection method: Collected at light and as *Cerceris fumipennis* prey

Appearance: 3-6 mm long. Bronze.

Comments: Reared from dead hackberry branches (Fisher 1928).

Agrilus cephalicus LeConte, 1860

Synonym(s): N/A

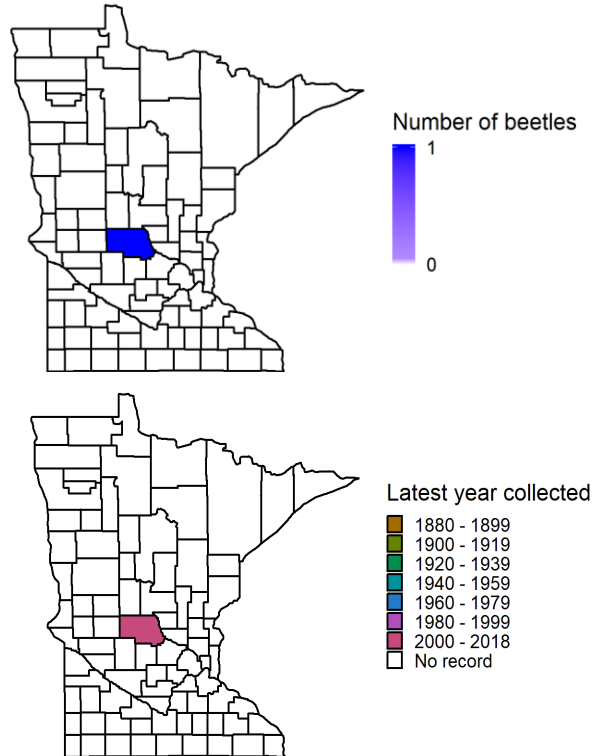
Common Name: Dogwood agrilus

Total in collection: 1

MN occurrence: June 22



Photo by Mike Quinn is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern and central US and CA: Nova Scotia to Florida and Manitoba to Texas. Additionally Alberta

Larval MN host: *Cornus* sp.

Adult MN host: *Cornus racemosa* Lam. and *Juglans nigra* L.

Collection method: Collected in trap during bark beetle survey

Appearance: 4-6 mm long. Gold-red.

Comments: Infested dogwood can be identified by wet spots on the surface of the bark (sap stains) in addition to the presence of D-shaped exit holes. May cause considerable damage and mortality in weakened trees (Solomon 1995).

Agrilus cliftoni Knull, 1941

Synonym(s): N/A

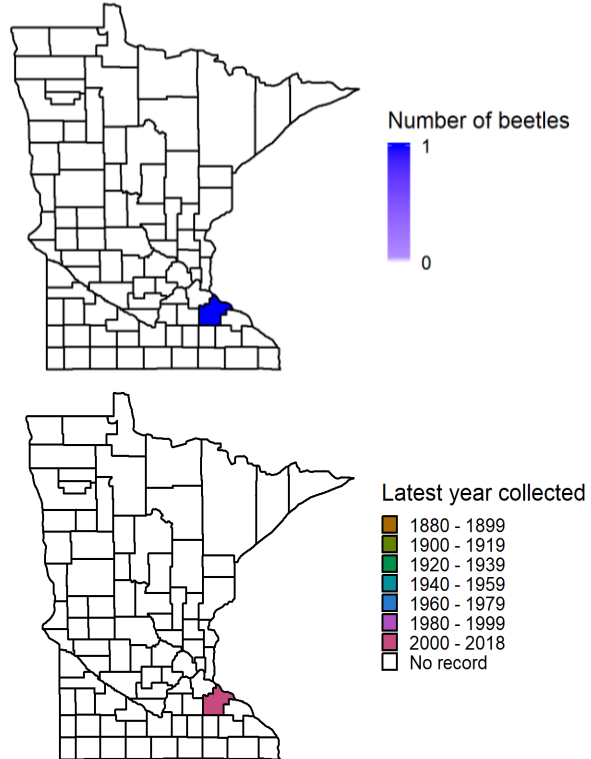
Common Name: N/A

Total in collection: 1

MN occurrence: July 14



Photo © 2011 Robert Otto



Range: Throughout eastern and central US: New York to Georgia and Minnesota to Texas

Larval MN host: *Juglans nigra* L.

Adult MN host: Additionally *Carya cordiformis* (Wangenh.) K. Koch and *Cornus* sp.

Collection method: *Cerceris fumipennis* prey

Appearance: 5-9 mm long. Head and pronotum gold-green, elytra black with gold reflections. Similar in appearance to other members of the *A. otiosus* species group.

Comments: Females of this species group are not easily separated in the absence of males or host information.

Agrilus crataegi Frost, 1912

Synonym(s): N/A

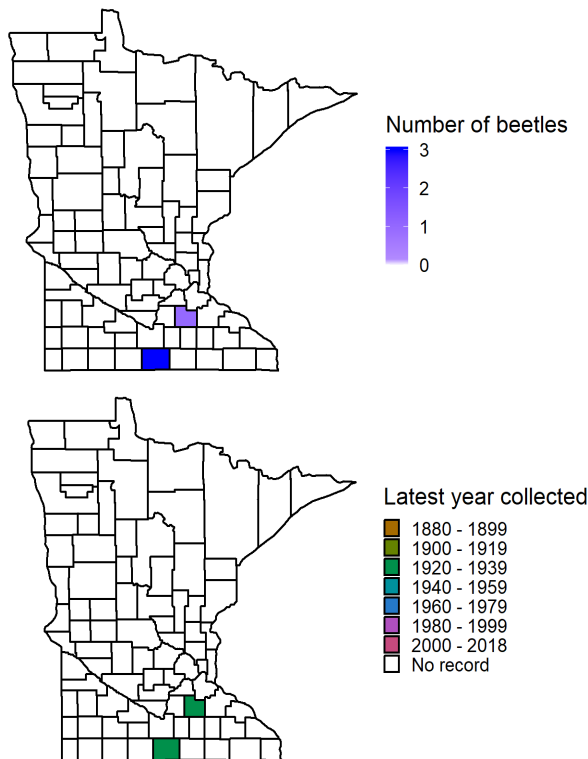
Common Name: Hawthorn agrilus

Total in collection: 4

MN occurrence: June 12 – June 20



Photo by Hannah Royals, [Screening Aids](#). USDA APHIS PPQ is licensed under CC BY-NC 3.0



Range: Throughout eastern and central US and CA: Quebec to Florida and Ontario to Oklahoma. Additionally Alberta

Larval MN host: *Amelanchier alnifolia* (Nutt.) Nutt. and *Crataegus* sp.

Adult MN host: Additionally *C. douglasii* Lindl., *C. crus-galli* L., and *Juglans nigra* L.

Collection method: Unspecified

Appearance: 6-8 mm long. Gold-red or gold-green.

Comments: Larval galleries cause bark to swell and split, forming long vertical scars. While control of this species has not typically been needed, large infestations can kill trees (Solomon 1995).

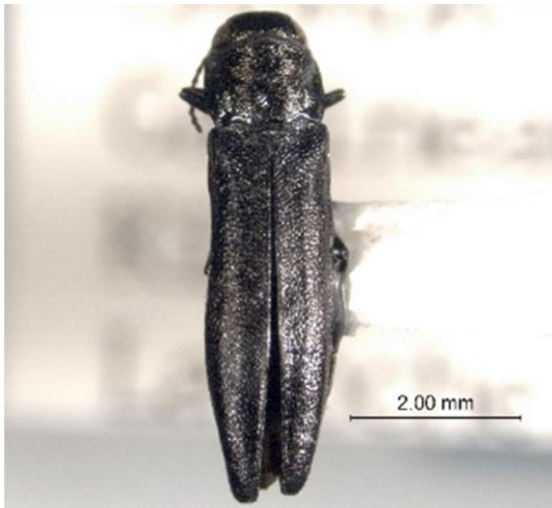
Agrilus crinicornis Horn, 1891

Synonym(s): N/A

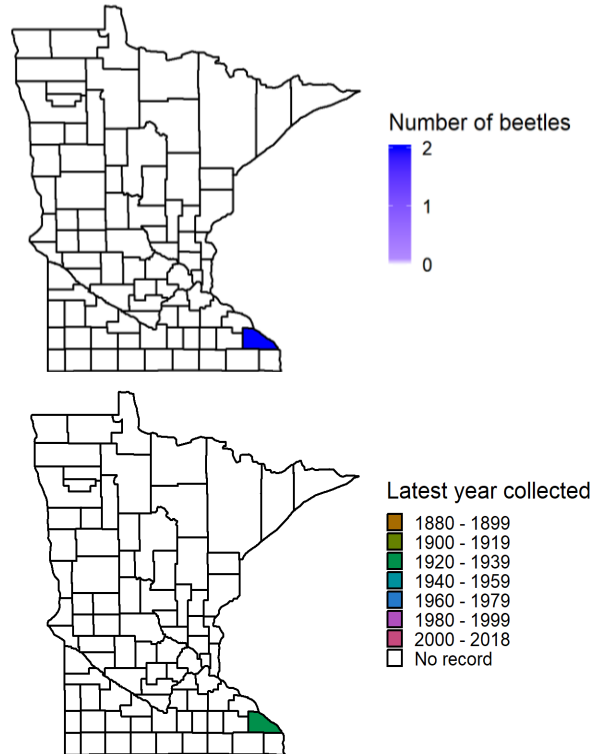
Common Name: N/A

Total in collection: 2

MN occurrence: June 30



"CNC COLEO 00156901" by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under CC BY-NC-SA 3.0



Range: Throughout northeastern and central US and CA: Quebec to Virginia and Ontario to Kansas

Larval MN host: *Fagus grandifolia* Ehrh., *Gleditsia triacanthos* L., and *Quercus alba* L.

Adult MN host: Additionally *Juglans nigra* L.

Collection method: Unspecified

Appearance: 4-6 mm long. Pronotum gold with green sides, elytra black with gold reflections. Males with long hairs on antennal segments 4-11. Similar in appearance to other members of the *A. otiosus* species group.

Comments: Females of this species group are not easily separated in the absence of males or host information.

Agrilus cuprescens (Ménétries, 1832)

Synonym(s): *Agrilus aurichalceus* Redtenbacher, *A. chrysoderes* var. *rubicola* Abeille

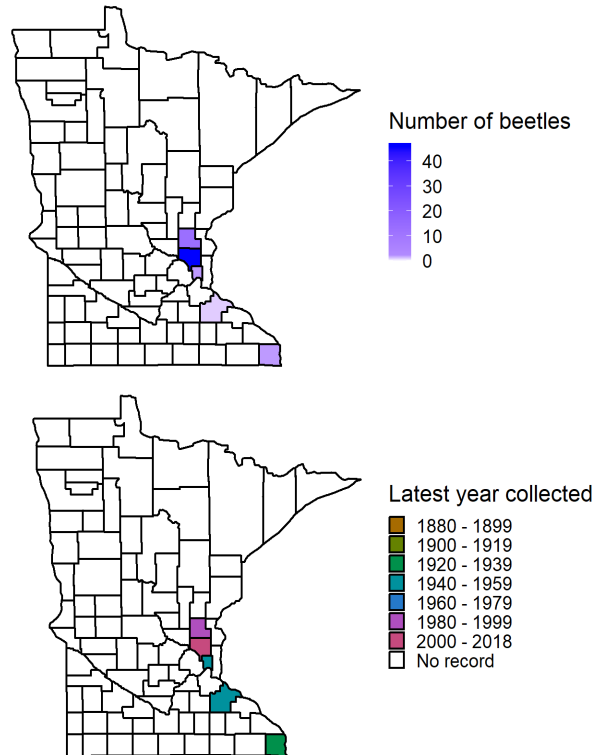
Common Name: Rose stem girdler

Total in collection: 64

MN occurrence: May 15 – August 21



Photo by Hannah Royals, [Screening Aids](#). USDA APHIS PPQ is licensed under CC BY-NC 3.0



Range: Throughout northern and central US and CA: Quebec/New Brunswick to West Virginia and Idaho to Utah

Larval MN host: *Rosa woodsii* Lindl. var. *ultramontana* (S. Wats.) Jeps and *Rubus idaeus* L. (Westcott *et al.*, 2015).

Adult MN host: Additionally *Rosa blanda* Ait., *R. carolina* L., *R. multiflora* Thunb. ex Murr., and *R. rugose* Thunb.

Collection method: Unspecified

Appearance: 4-7 mm long. Gold or gold-green. Almost identical in appearance to the closely related *A. ribesi*, these species can be separated by differences in pronotal angles, head shape, and host information (see Jendek *et al.* 2015).

Comments: Arrived and established in North America as early as the 1870s. Considered a significant pest in raspberries, blackberries, and cultivated roses (Westcott *et al.* 2015). Causes gall-like swelling in stems, which may be dissected to reveal larval galleries (Solomon 1995). Often confused in collections with another introduced species, *A. ribesi*, which attacks currant (*Ribes* sp.) (Jendek *et al.* 2015).

Agrilus cyanescens Ratzeburg, 1837

Synonym(s): *Agrilus caeruleus* Rossi, *A. amabilia* Gory and Laporte, *A. sulcaticeps* Abeille de Perrin, *A. acuticornis* Abeille de Perrin, *A. teriolensis* Obenberger

Common Name: N/A

Total in collection: 2

MN occurrence: June 3

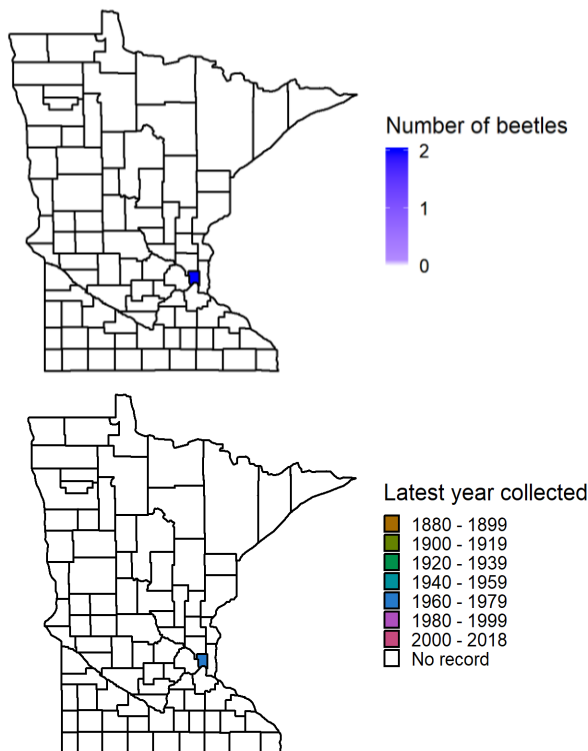


Photo by Hannah Royals, [Screening Aids](#). USDA APHIS PPQ is licensed under [CC BY-NC 3.0](#)

Range: Throughout northern and central US and CA: Quebec/New Brunswick to West Virginia and Idaho to Utah

Larval MN host: *Lonicera* L. sp and *Rhamnus* sp. (Jendek and Poláková 2014, Westcott et al. 2019)

Adult MN host: Additionally *Symphoricarpos orbiculatus* Moench. and *Viburnum* sp. Recorded in Europe in association with *Alnus*, *Betula*, *Crataegus*, *Eryngium*, *Fagus*, *Quercus*, *Rosa*, and *Rubus* sp.

Collection method: Unspecified

Appearance: 7-11 mm long. Blue to blue-green.

Comments: A Eurasian species first reported in North America in 1922 (Jendek and Grebennikov 2009). Recently reported in Oregon (Westcott et al. 2019), suggesting it is widespread throughout the US, although not considered a damaging pest.

Agrilus defectus LeConte, 1860

Synonym(s): N/A

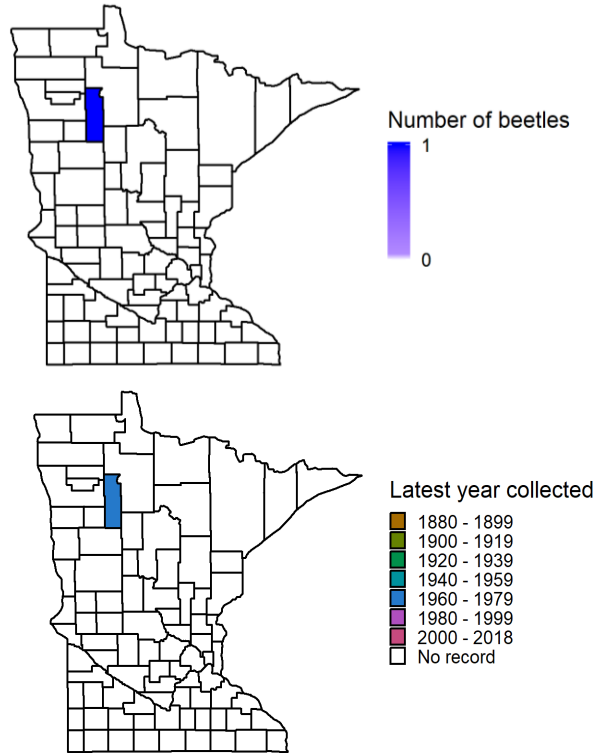
Common Name: N/A

Total in collection: Literature record only
(Hansen et al. 2011)

MN occurrence: June 18



Photo by Tom Murray is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern and central US and CA: Quebec to Georgia and Ontario to Texas

Larval MN host: *Quercus alba* L. and *Q. muehlenbergii* Englem.

Adult MN host: Additionally on *Aesculus glabra* Willd., *Carya ovata* (Mill.) K. Koch, *Celtis occidentalis* L., *Crataegus* sp., *Gymnocladus dioicus* (L.) K. Koch, *Quercus macrocarpa* Michx., and *Q. velutina* Lam.

Collection method: Unspecified

Appearance: 3-5 mm long. Black with a dark gold head and pronotum. Similar in appearance to other members of the *Agrilus otiosus* species group.

Comments: Reared from dead branches of white oak (Fisher 1928). Females of this species group are not easily separated in the absence of males or host information.

Agrilus difficilis Gory, 1841

Synonym(s): *Agrilus occidentalis* Uhler

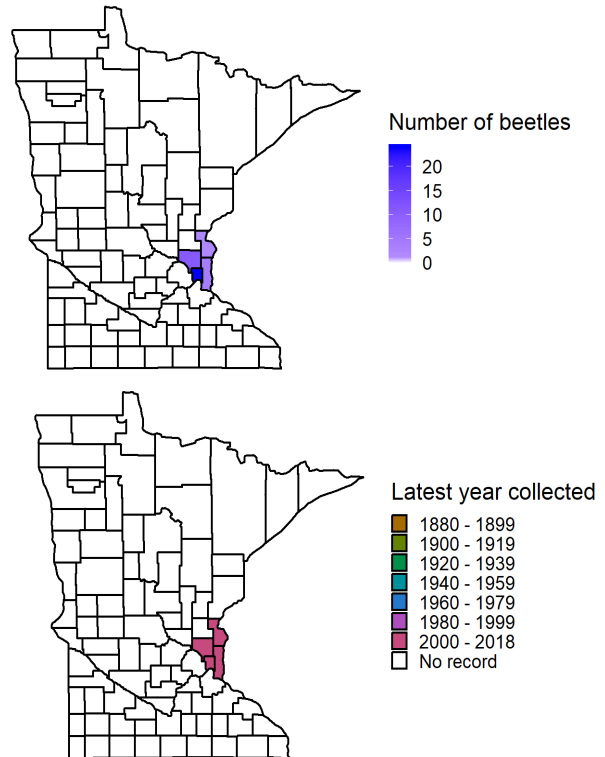
Common Name: Honeylocust agrilus

Total in collection: 41

MN occurrence: July 18 – August 2



Photo by Hannah Royals, [Screening Aids](#). USDA APHIS PPQ is licensed under [CC BY-NC 3.0](#)



Range: Throughout eastern and central US: New Jersey to Georgia and South Dakota to Texas. Additionally Colorado and Utah

Larval MN host: *Gleditsia triacanthos* L.

Adult MN host: Unknown

Collection method: *Cerceris fumipennis* prey

Appearance: 7-13 mm long. Black with purple or green reflections. Two rows of distinct white or yellow spots on the upper abdomen.

Comments: First detected in Minnesota in 2014 at *C. fumipennis* nesting sites. Attacks and girdles honeylocusts stressed by drought, mechanical injuries, and other stressors. Sap-stains on bark can indicate infestation (Akers et al. 1986, Solomon 1995). Most commonly attacks large branches and trunks (Herms et al. 1987).

Agrilus egeniformis Champlain and Knull, 1923

Synonym(s): N/A

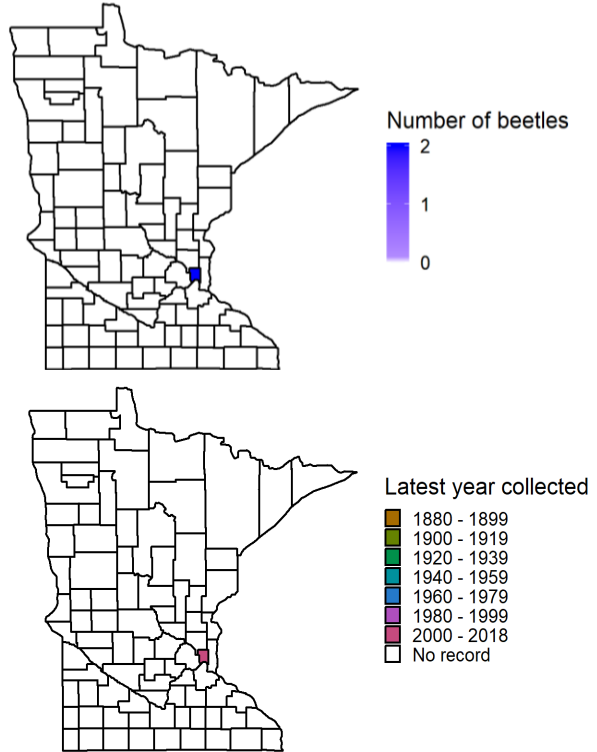
Common Name: N/A

Total in collection: 2

MN occurrence: July 20 – July 27



Photo by Mike Quinn is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern and central US: Pennsylvania to South Carolina and South Dakota to New Mexico/Texas

Larval MN host: *Gleditsia triacanthos* L.

Adult MN host: Additionally *Celtis occidentalis* L. and *Robinia pseudoacacia* L.

Collection method: *Cerceris fumipennis* prey

Appearance: 4-6 mm long. Dark gold-green with three pairs of white spots on elytra.

Comments: Prefers branches 4-32 mm in diameter (Hespenheide 1976).

Agrilus egenus Gory, 1841

Synonym(s): N/A

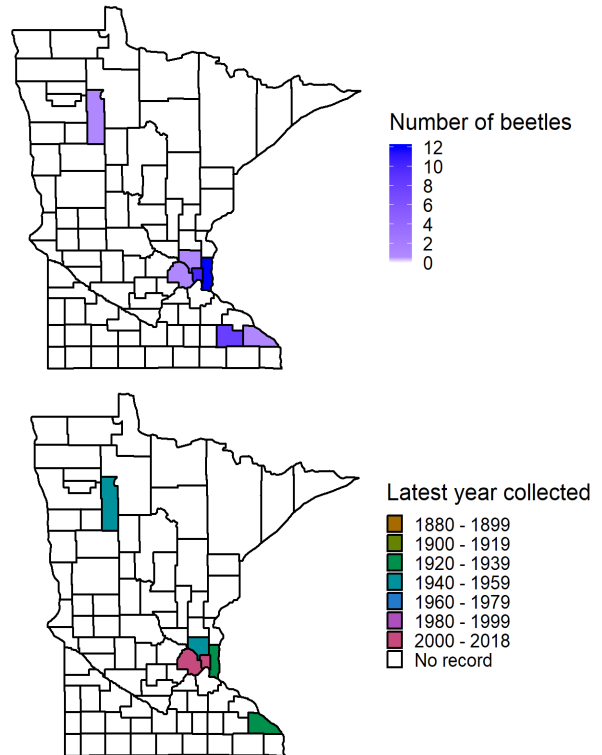
Common Name: N/A

Total in collection: 34

MN occurrence: June 4 – July 31



Photo by Mike Quinn is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern and central US and CA: Quebec to Georgia and Ontario to New Mexico/Texas

Larval MN host: *Robinia pseudoacacia* L.

Adult MN host: Unknown

Collection method: *Cerceris fumipennis* prey

Appearance: 3-6 mm long. Dark gold-green. Similar in appearance to *A. egeniformis*, but without distinct elytral spots.

Comments: Often confused in collections for similar looking species, especially *A. otiosus*, although differences in antennal structure make these two species easy to differentiate (Fisher 1928). Female *A. celti* and *A. egenus* cannot be easily separated in the absence of males or host information.

Agrilus frosti Knull, 1920

Synonym(s): N/A

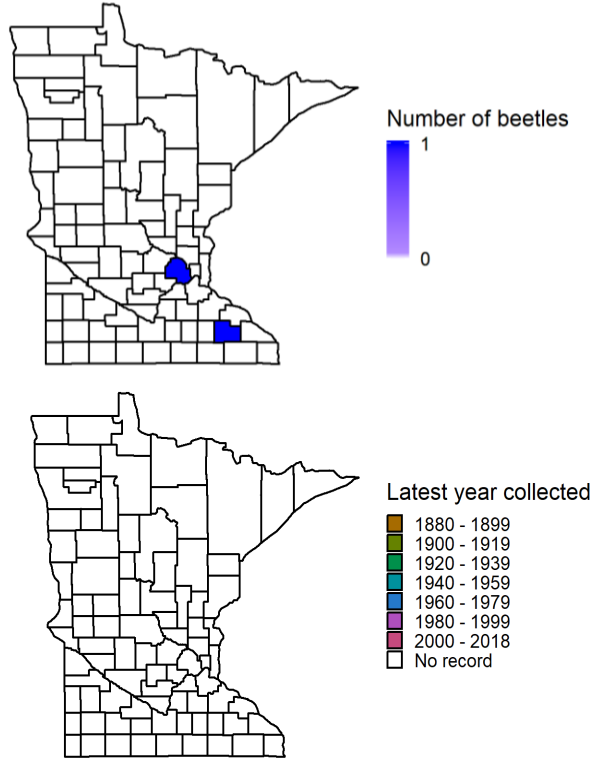
Common Name: N/A

Total in collection: 2

MN occurrence: Unknown



Photo by Don Griffiths, courtesy of the Spencer Entomological Collection, Beaty Biodiversity Museum, UBC



Range: Throughout eastern and central US and CA: Quebec/Nova Scotia to North Carolina and Ontario to Missouri. Additionally Mexico

Larval MN host: *Quercus* sp.

Adult MN host: Unknown

Collection method: Unspecified

Appearance: 3-6 mm long. Black with green or gold reflections on sides of pronotum. Similar in appearance to other members of the *A. otiosus* species group.

Comments: Females of this species group are not easily separated in the absence of males or host information.

Agrilus fulgens LeConte, 1860

Synonym(s): N/A

Common Name: N/A

Total in collection: Literature record only (Fisher 1928)

MN occurrence: Unknown, “No definite locality.”



[Photo](#) by Museum of Comparative Zoology, Harvard University is licensed under [CC BY-NC-SA 3.0](#)

Range: Throughout eastern and central US and CA: Ontario to South Carolina and Minnesota to Arkansas

Larval MN host: *Corylus americana* Walt.

Adult MN host: Unknown

Collection method: Unspecified

Appearance: 6-8 mm long. Sexually dimorphic: males with red pronotum and black elytra, females red. Similar in appearance to other members of the *A. arcuatus* species group.

Comments: Previously considered a subspecies of *A. arcuatus* (Fisher 1928, Bright 1987). Kills twigs of American hazel, making this beetle a potential pest in eastern hazelnut production (Fisher 1928). However, the majority of US hazelnut production currently occurs in the northwestern US.

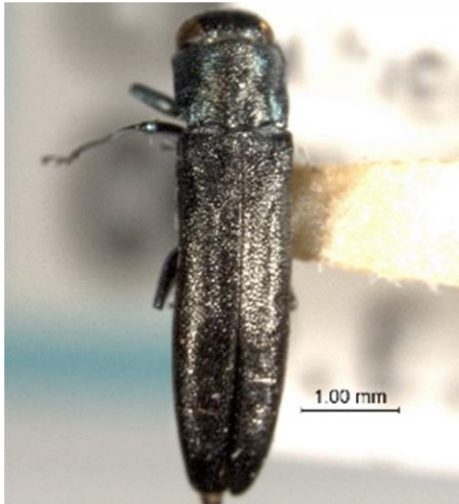
Agrilus geminatus (Say, 1823)

Synonym(s): N/A

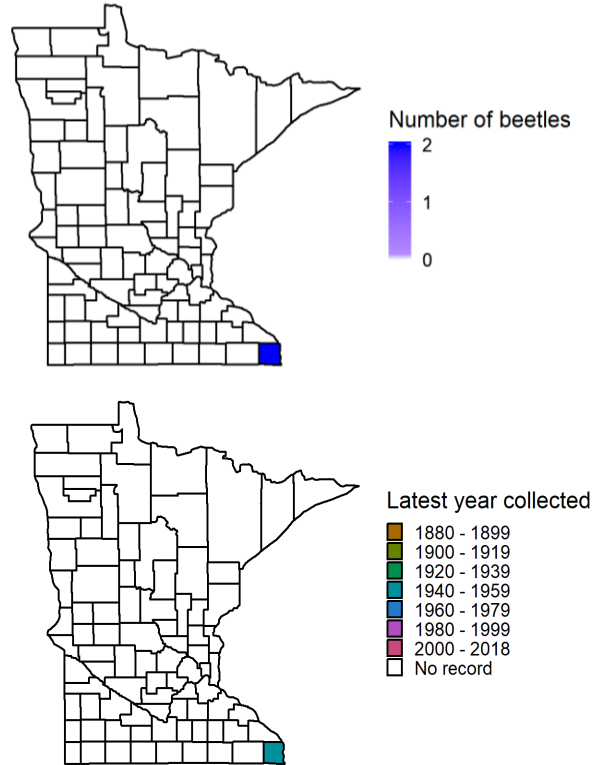
Common Name: N/A

Total in collection: 2

MN occurrence: June 1



"CNC COLEO 00107010" by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under CC BY-NC-SA 3.0



Range: Throughout eastern and central US and CA: Quebec to Florida and Ontario to Texas

Larval MN host: *Quercus velutina* Lam.

Adult MN host: Additionally *Gymnocladus dioicus* (L.) K. Kochl, *Juglans nigra* L., and *Quercus alba* L.

Collection method: Unspecified

Appearance: 3-5 mm long. Head and sides of pronotum green or blue-green, elytra black (sometimes with blue reflections). Similar in appearance to other members of the *A. otiosus* species group.

Comments: While males may be distinguished from similar species by differences in genitalia, females are very difficult to separate.

Agrilus granulatus (Say, 1823)

Synonym(s): N/A

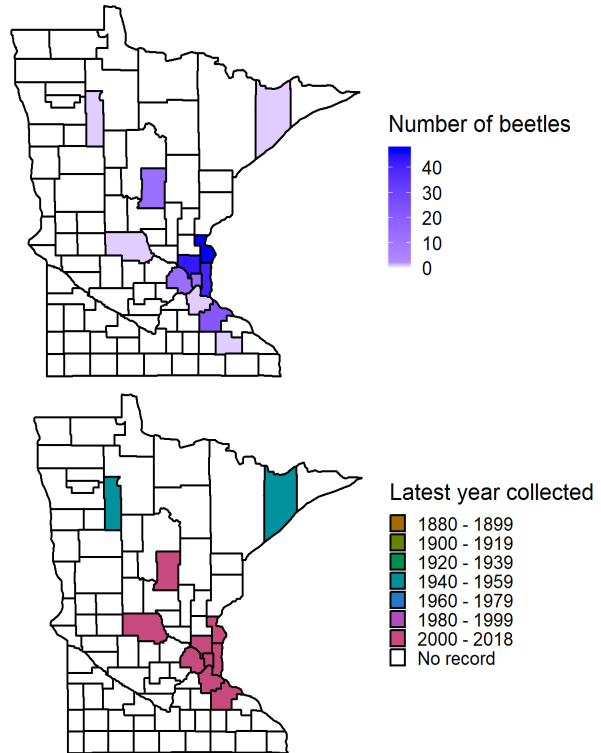
Common Name: Granulate poplar borer

Total in collection: 194

MN occurrence: June 28 – August 16



Left Photo by Mike Quinn is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/), Right Photo by Don Griffiths, courtesy of the Spencer Entomological Collection, Beaty Biodiversity Museum, UBC



Range: *A. granulatus granulatus* throughout US: New York to Alabama and Montana to California. *A. granulatus liragus* throughout northeastern and western US and CA: Quebec/New Brunswick to New Hampshire and British Columbia to California

Larval MN host: *Betula* sp., *Populus deltoides* Marsh., *P. deltoides* ssp. *monilifera* (Ait.) Eckenwalder, *P. nigra* L., and *P. tremuloides* Michx.

Adult MN host: Unknown

Collection method: *Cerceris fumipennis* prey

Appearance: 7-11 mm long. Black with 3 white spots (may be very pale or absent in *A. granulatus liragus*). A member of the *A. anxius* species group. *A. granulatus liragus* can be difficult to separate from *A. anxius*.

Comments: Two subspecies are recognized for this species, *A. granulatus granulatus* (left photo) and *A. granulatus liragus* (right photo). The first is rarely documented in Minnesota, while the latter is common. *A. granulatus liragus* regularly reaches outbreak levels in association with drought and defoliation (Haack and Petrice 2019).

Agrilus imbellis Crotch, 1873

Synonym(s): N/A

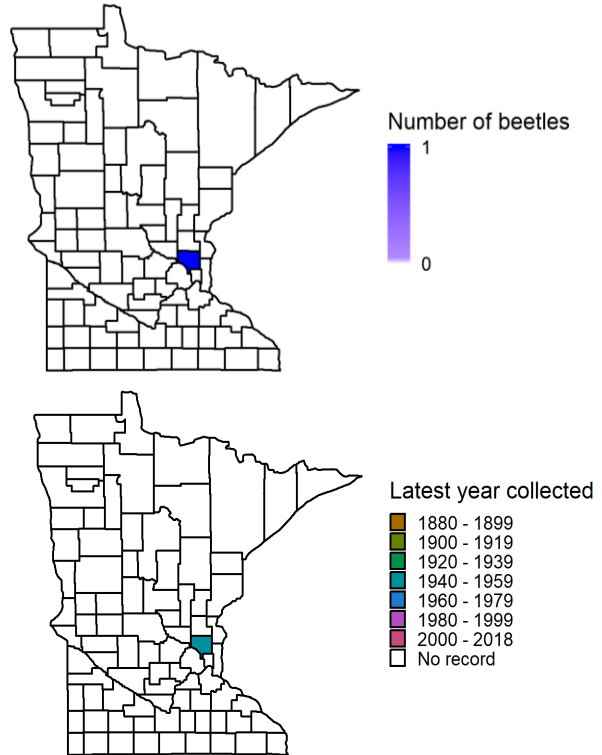
Common Name: N/A

Total in collection: 1

MN occurrence: July 20



Photo by Mike Quinn is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern and central US and CA: New Hampshire to Florida and Ontario to Texas

Larval MN host: Unknown

Adult MN host: *Helianthemum canadense* (L.) Michx. and *Rudbeckia* sp.

Collection method: Unspecified

Appearance: 3-6 mm long. Black with gold reflections.

Comments: *Helianthemum* is likely the larval host for this species (Jendek and Poláková 2014).

Agrilus impexus Horn, 1891

Synonym(s): N/A

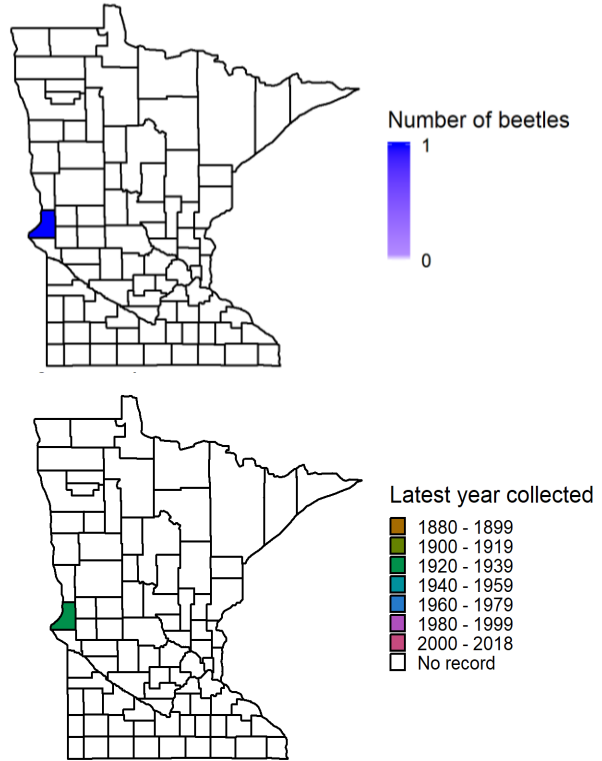
Common Name: N/A

Total in collection: 1

MN occurrence: August 4



Photo courtesy of Kristine Jecha



Range: Throughout central US: Minnesota to Mississippi and Wyoming to Arizona

Larval MN host: Unknown

Adult MN host: Unknown

Collection method: Unspecified

Appearance: 6-8 mm long. Bronze-green with three pairs of pale spots.

Comments: A similar looking species, *A. paraimpexus*, is found from the southwest US (New Mexico, Arizona, California) to Costa Rica. It was commonly misidentified as *A. impexus* until recently, when it was recognized as a separate species (Hespenheide 2007).

Agrilus juglandis Knull, 1920

Synonym(s): N/A

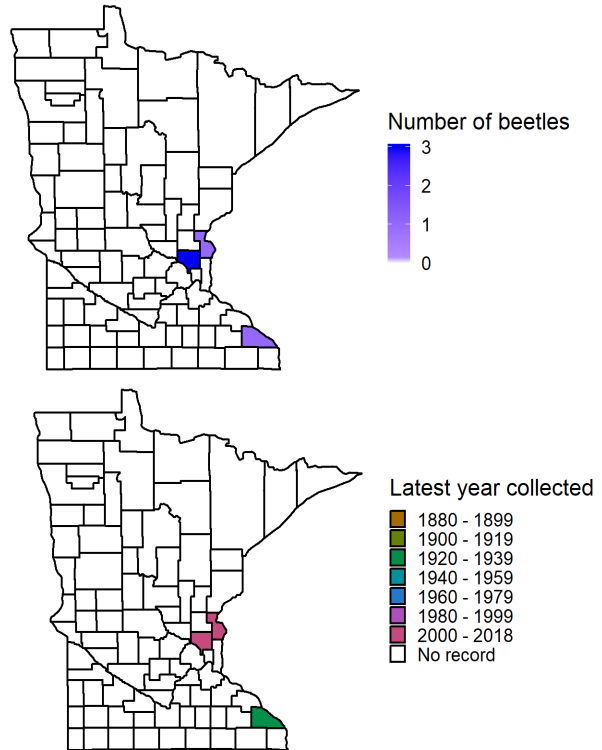
Common Name: Butternut agrilus

Total in collection: 5

MN occurrence: June 30 - July 11



Photo © 2011 Robert Otto



Range: Throughout eastern US and CA: Quebec to Virginia and Ontario to Arkansas

Larval MN host: *Juglans cinerea* L.

Adult MN host: Additionally *J. nigra* L.

Collection method: *Cerceris fumipennis* prey

Appearance: 4-6 mm long. Black with gold reflections. Similar in appearance to other members of the *A. otiosus* species group.

Comments: Larvae tunnel in the outer bark of butternut and are difficult to detect (Solomon 1995). Investigated as a potential vector for butternut canker, but larval galleries do not penetrate to the phloem where butternut canker sporulates (Katovich and Ostry 1998). Females of this species group are not easily separated in the absence of males or host information.

Agrilus lecontei lecontei Saunders, 1871

Synonym(s): *Agrilus subfasciatus* LeConte

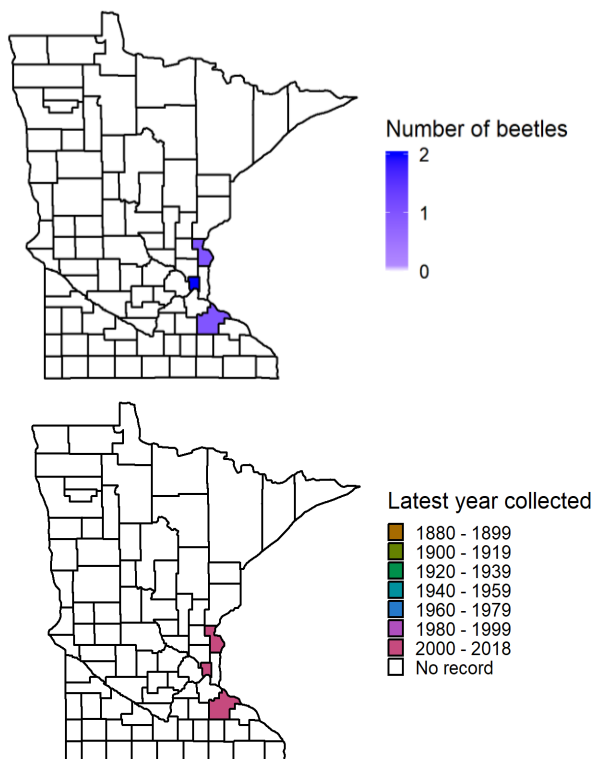
Common Name: N/A

Total in collection: 4

MN occurrence: July 7 – July 27



Photo © 2014 Antonio Liberta.



Range: Throughout eastern and central US and CA: Quebec to Florida and Ontario to Oklahoma

Larval MN host: *Celtis occidentalis* L.

Adult MN host: Unknown

Collection method: *Cerceris fumipennis* prey

Appearance: 4-7 mm long. Black with gold reflections and a distinct “E” shaped white pattern on each elytron.

Comments: One of two subspecies. The other, *A. lecontei celticola* Fisher, occurs in the southern US. Reported in “larger” hackberry branches, with galleries found deep in the wood around annual rings (Hespenheide 1976).

Agrilus masculinus Horn, 1981

Synonym(s): N/A

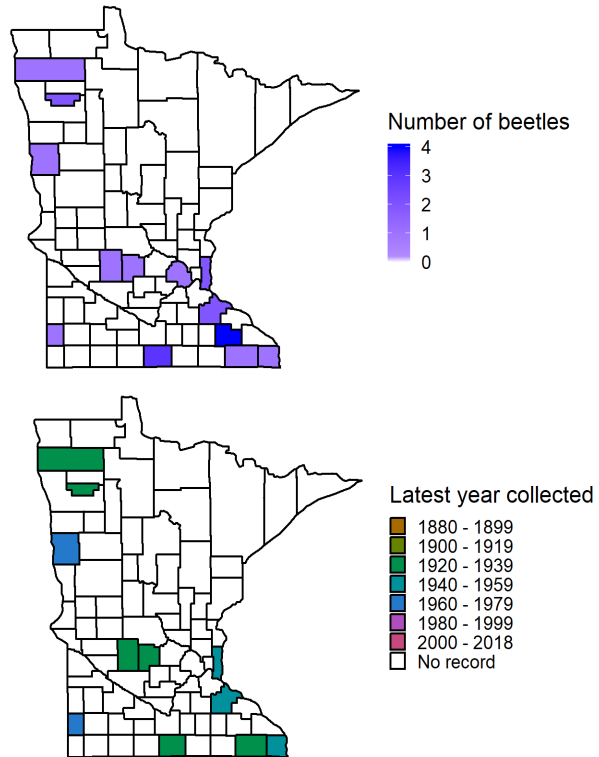
Common Name: N/A

Total in collection: 21

MN occurrence: May 9 – August 7



Photo by Hannah Royals, [Screening Aids](#). USDA APHIS PPQ is licensed under CC BY-NC 3.0



Range: Throughout eastern and central US and CA: Quebec to Georgia and Saskatchewan to Texas

Larval MN host: *Acer negundo* L., *A. platanoides* L., *A. rubrum* L., *A. saccharum* Marsh., *Aesculus glabra* Willd., and *Gleditsia triacanthos* L.

Adult MN host: Additionally *Gymnocladus dioica* (L.) K. Koch., *Rhus aromatic* Ait., and *Quercus velutina* Lam.

Collection method: Malaise trap

Appearance: 4-7 mm long. Black with a green or bronze pronotum.

Comments: A recently introduced species in the eastern US, *Agrilus smaragdifrons*, will key out to *A. masculinus* using the key in Fisher (1928). However, they can be easily distinguished by the bright green face of *A. smaragdifrons* (Hoebeke et al. 2017). Additionally, *A. smaragdifrons* is a specialist on tree of heaven, which is not commonly found in MN. *Agrilus masculinus* tends to attack weakened, wounded or dying maples, preferring branches 16 to 32 mm in diameter (Hespenheide 1969, Solomon 1995).

Agrilus nigricans Gory, 1841

Synonym(s): *Agrilus auricomus* Frost

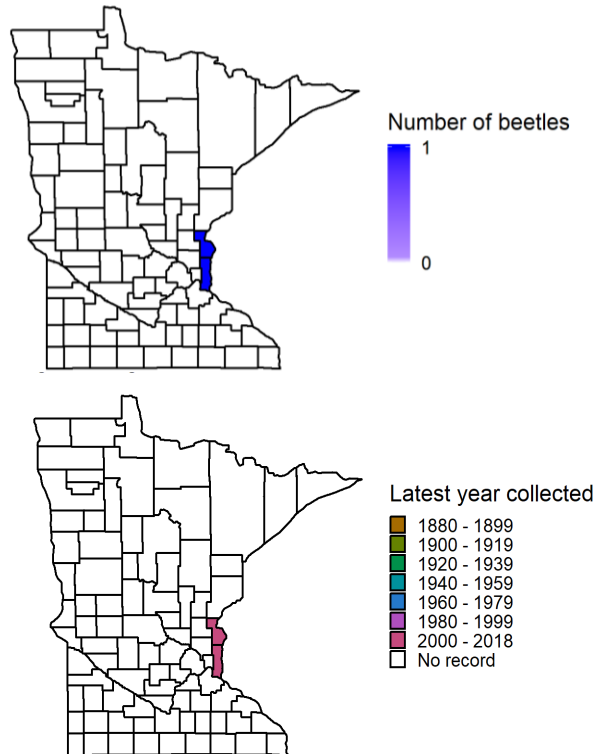
Common Name: N/A

Total in collection: 2

MN occurrence: July 22 – August 2



Photo courtesy of Kristine Jecha



Range: Throughout eastern and central US and CA: Massachusetts to Pennsylvania and Ontario to Oklahoma

Larval MN host: Unknown

Adult MN host: *Quercus rubra* L.

Collection method: *C. fumipennis* prey

Appearance: 6-12 mm long. Elytra black, sometimes with gold reflections. Pronotum gold or gold-green.

Comments: Considered a synonym of *A. obsoletoguttatus* by some authors (Paiero et al. 2012). While adults have been observed on red oak, no larval hosts have been confirmed (Jendek and Poláková 2014).

Agrilus obsoletoguttatus Gory, 1841

Synonym(s): *Agrilus interruptus* LeConte

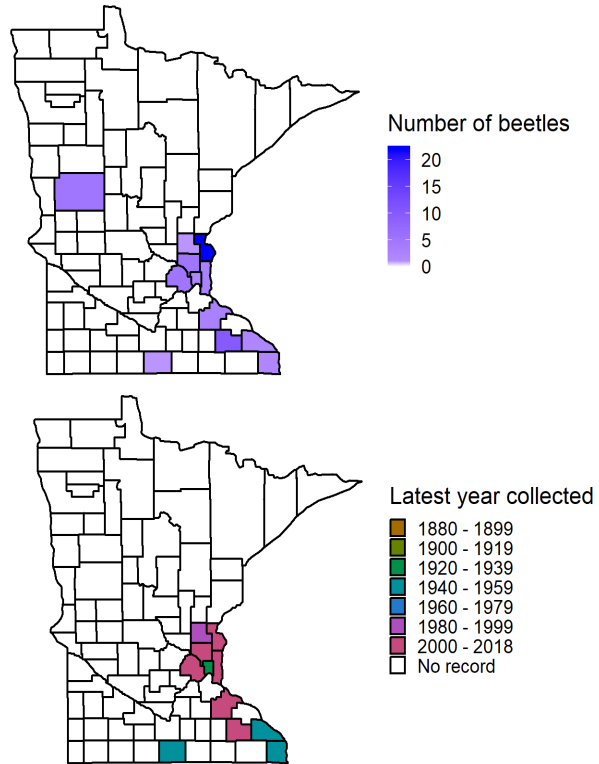
Common Name: N/A

Total in collection: 61

MN occurrence: May 20 – August 1



Photo by Hannah Royals, [Screening Aids](#), USDA APHIS PPQ is licensed under [CC BY-NC 3.0](#)



Range: Throughout eastern and central US and CA: Quebec/New Brunswick to Florida and Ontario to New Mexico/Texas

Larval MN host: *Aesculus glabra* Willd., *Carpinus caroliniana* Walt., *Carya* sp., *Gleditsia triacanthos* L., *Ostrya virginiana* (Mill.) K. Koch, *Quercus prinoides* Willd., and *Q. rubra*

Adult MN host: Potatoes, many different trees

Collection method: Adult collected on potatoes and many different trees, in bait trap, and as *Cerceris fumipennis* prey

Appearance: 4-8 mm long. Black with a line of white along the sides of the pronotum, a white dot near the top of each elytron, a white line along the midlength, and a white dot near the bottom of each elytron.

Comments: Reported from many different trees, including dead branches of honeylocust (MacRae 2006). A common *C. fumipennis* prey item in MN.

Agrilus osburni Knull, 1937

Synonym(s): N/A

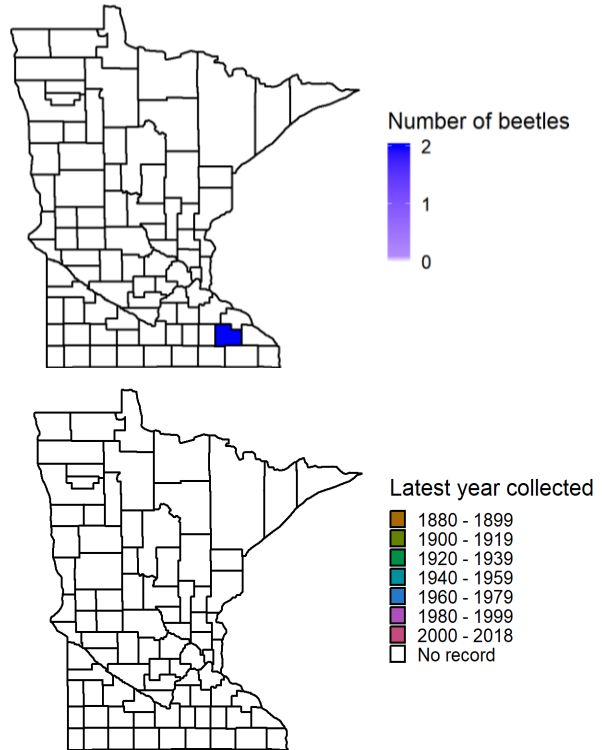
Common Name: N/A

Total in collection: 16

MN occurrence: Unknown



Mike Quinn, bugguide.net, CC BY-ND-NC 1.0



Range: Throughout eastern and central US and CA: Connecticut to Georgia and Ontario to Missouri

Larval MN host: Unknown

Adult MN host: *Ostrya virginiana* (Mill.) K. Koch

Collection method: Unspecified

Appearance: 4-6 mm long. Black. Male with green reflections on the head and sides of pronotum. Similar in appearance to other members of the *A. otiosus* species group.

Comments: Females of this species group are not easily separated in the absence of males or host information.

Agrilus otiosus Say, 1833

Synonym(s): *Agrilus virens* Gory

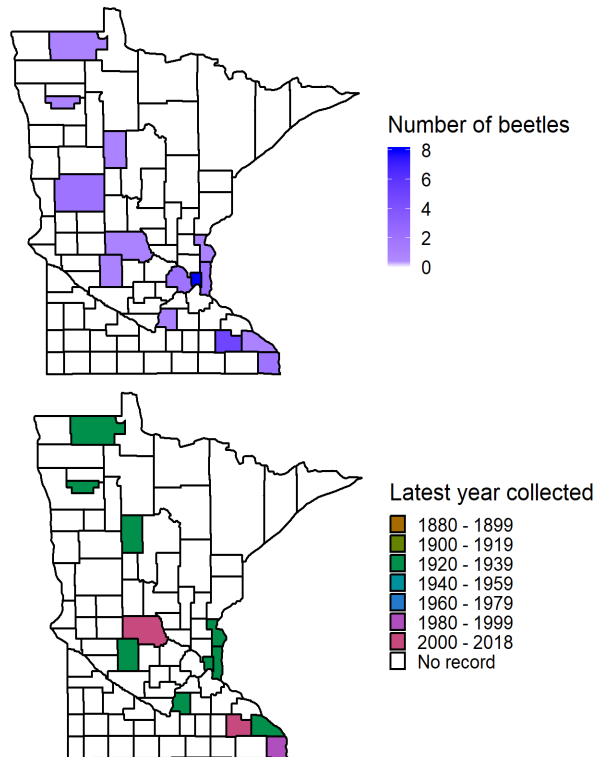
Common Name: Hickory agrilus

Total in collection: 16

MN occurrence: May 27 – July 28



Photo © 2008 Stephen Luk



Range: Throughout eastern and central US and CA: Quebec to Georgia and Manitoba to Kansas. Additionally Mexico

Larval MN host: *Carya cordiformis* (Wangenh.) K. Koch, *C. ovata* (Mill.) K. Koch, *Juglans cinerea* L., and *J. nigra* L.

Adult MN host: Unknown

Collection method: In bark beetle trap and as *Cerceris fumipennis* prey

Appearance: 4-8 mm long. Black with gold or gold-green reflections on the head and sides of pronotum. Similar in appearance to other members of the *A. otiosus* species group.

Comments: Causes spiral swelling in hickory bark that appears after beetle development is complete. Damages the wood, but usually does not kill the tree. Water hickory and young pecan plantings in the southern US are particularly susceptible to infestation (Solomon 1995). Females of this species group are not easily separated in the absence of males or host information.

Agrilus parvus parvus Saunders, 1870

Synonym(s): *Agrilus pusillus* Say

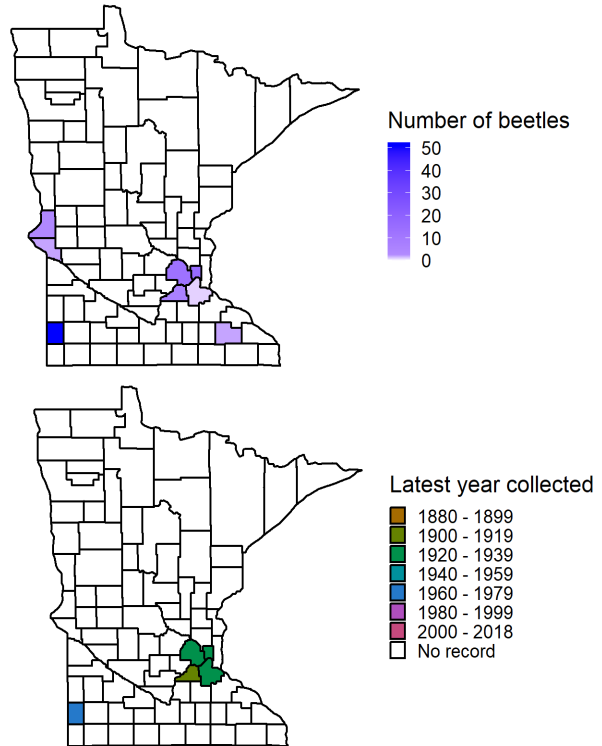
Common Name: N/A

Total in collection: 96

MN occurrence: June 6 – August 1



Photo by Tom Murray is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern and central US and CA: New Hampshire to Florida and Manitoba to Texas

Larval MN host: Unknown

Adult MN host: *Amorpha fruticosa* L.

Collection method: Malaise trap

Appearance: 3-5 mm long. Black with green or gold reflections on the head and pronotum.

Comments: No larval records exist, although *A. fruticosa* is likely the larval host (Jendek and Poláková 2014).

Agrilus pensus Horn, 1891

Synonym(s): *Agrilus betulae* Fisher

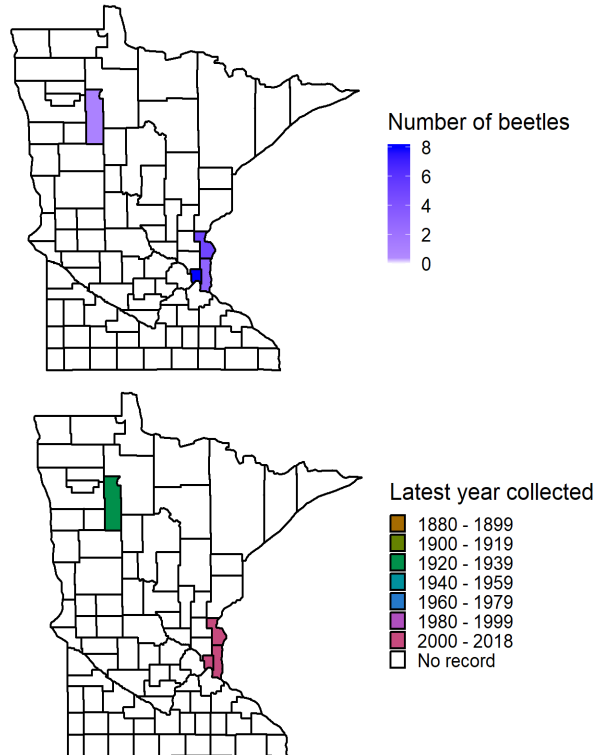
Common Name: Alder-birch borer

Total in collection: 17

MN occurrence: June 14 – July 30



"CNC COLEO 00107511" by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under CC BY-NC-SA 3.0



Range: Throughout eastern and central US and CA: Nova Scotia to Virginia and Alberta to Missouri

Larval MN host: *Betula nigra* L.

Adult MN host: Additionally *Alnus incana* (L.) Moench, *A. viridis* (Chaix) DC. ssp. *crispa* (Ait.) Turrill, and *Ostrya virginiana* (Mill.) K. Koch.

Collection method: *Cerceris fumipennis* prey

Appearance: 7-10 mm long. Male with gold head/pronotum and black elytra with purple reflections; female is entirely gold-red. Similar in appearance to *Agrilus anxius*.

Comments: Tends to attack stressed trees, but known to attack healthier trees than other *Agrilus* species. Woodpeckers play an important role in control, preying primarily in winter months (Carlson and Knight 1969). Recent molecular evidence suggests difficulties in separating this species from *A. anxius* (Jendek et al. 2019).

Agrilus planipennis Fairmaire, 1888

Synonym(s): *Agrilus marcopoli* Obenberger, *A. feretrius* Obenberger, *A. ulmi* Kurosawa.

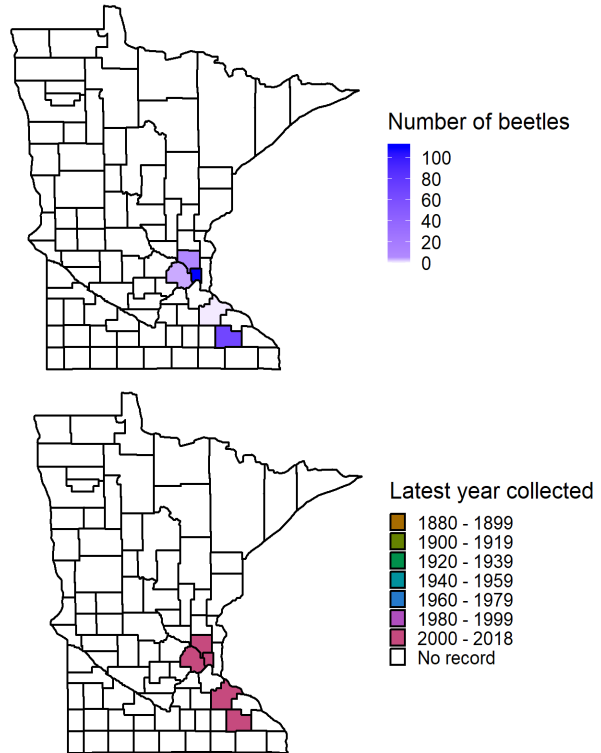
Common Name: Emerald ash borer

Total in collection: 191

MN occurrence: June 23 – July 31



Photo by Mike Quinn is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern and central US and CA: Nova Scotia to Georgia and Manitoba to Colorado/Texas. Continues to spread throughout the US and CA.

Larval MN host: *Fraxinus pennsylvanica* Marsh, additionally *F. americana* L., and *F. nigra* Marsh

Adult MN host: *Fraxinus* sp.

Collection method: Reared from cut *Fraxinus pennsylvanica* and as *Cerceris fumipennis* prey

Appearance: 8-14 mm long. Bright metallic green with a violet abdomen. Similar in size to a handful of MN *Agrilus* species such as *A. difficilis* and some large individuals in the *A. anxius* species group; however, *A. planipennis* can be differentiated by its unique coloration in combination with its size.

Comments: Introduced to the US from eastern Asia in the 1990s, but not discovered until 2002 (Siegert et al. 2007). Has since killed millions of ash trees throughout North America (Herms and McCullough 2014). Emerald ash borer presents a major threat to the estimated one billion ash trees in MN, including ecologically important stands of black ash in northern MN and large numbers of city trees throughout the state (DNR 2020).

Agrilus politus (Say, 1825)

Synonym(s): *Agrilus plumbeus* LeConte, *A. cupreolus* LeConte, *A. desertus* LeConte, *A. solitarius* Harold, *A. canadensis* Obenberger

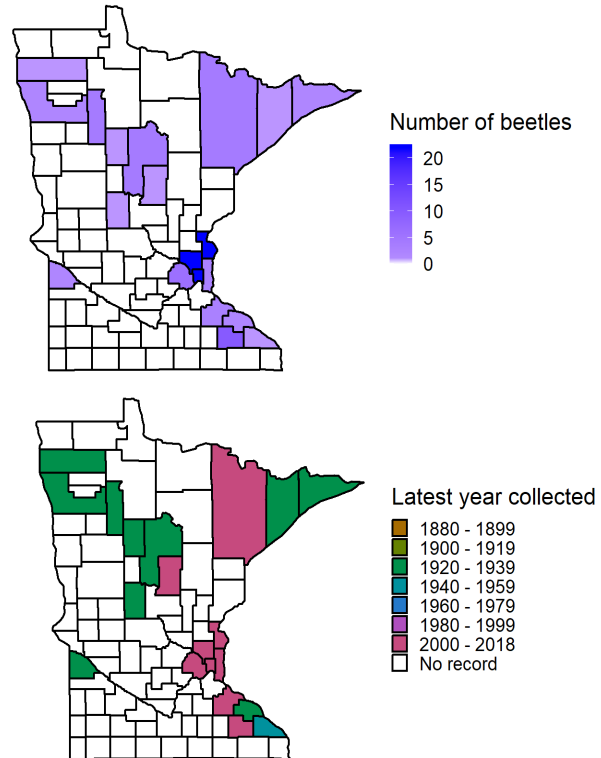
Common Name: Willow gall limb borer

Total in collection: 114

MN occurrence: May 7 – August 21



Photo (left), Photo (right) by Hannah Royals, [Screening Aids](#), USDA
APHIS PPQ is licensed under [CC BY-NC 3.0](#)



Range: Throughout North America: Nova Scotia to Georgia and Yukon Territories to California. Additionally Mexico

Larval MN host: *Alnus incana* (L.) Moench ssp. *rugosa* (Du Roi) Clausen, additionally *Acer pensylvanicum* L. and *Salix lucida* Muhl. ssp. *lasiandra* (Benth.) E. Murr.

Adult MN host: Additionally *Picea* sp. and *Thuja occidentalis* L.

Collection method: Reared from small branches of *Alnus incana* (L.) Moench ssp. *rugosa* (Du Roi) Clausen, by heating *Salix*, in bait trap, and as *Cerceris fumipennis* prey

Appearance: 4-9 mm long. Gold, green-gold, red-gold, or blue-gold. Pronotum wider than long, and elytra widest at mid-length.

Comments: Larval galleries girdle branches and cause gall formation and swelling, eventually killing the branch (Solomon 1995). A common prey item of *C. fumipennis* in MN.

Agrilus pseudocoryli Fisher, 1928

Synonym(s): N/A

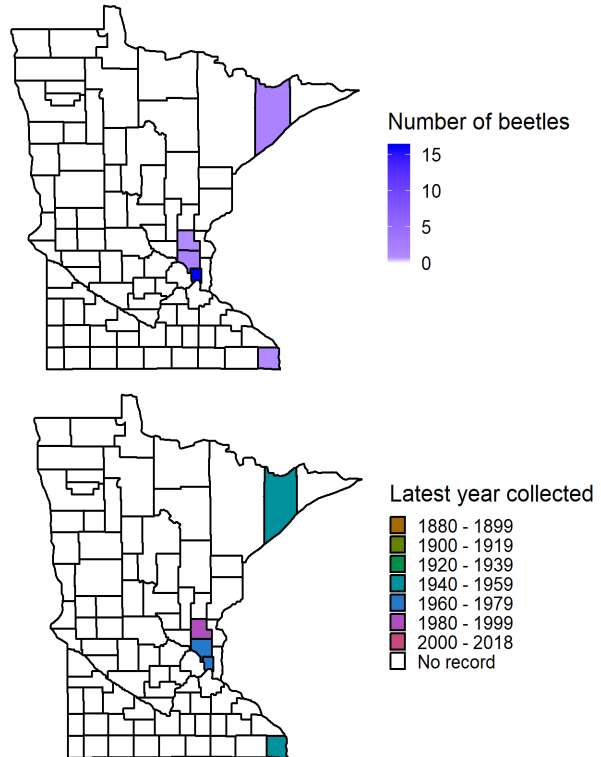
Common Name: N/A

Total in collection: 22

MN occurrence: May 25 – July 14



Photo by Tom Murray is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern and central US and CA: Quebec/New Brunswick to Georgia and Manitoba to Kansas

Larval MN host: *Corylus* hybrid, additionally *C. americana* Walt. and *C. cornuta* Marsh

Adult MN host: Additionally *Abies* sp.

Collection method: Reared from *Corylus* sp.

Appearance: 4-9 mm long. Gold, gold-green, or gold-red. Similar in appearance to the more commonly collected *Agrilus politus*.

Comments: Has been considered by some authors as a subspecies of *A. politus*. While *A. politus* males are more likely to have green faces, some *A. pseudocoryli* males may have a green face as well (Paiero et al. 2012). Recent molecular evidence suggests difficulties in separating this species from *A. politus* (Jendek et al. 2019).

Agrilus quadriguttatus quadriguttatus Gory, 1841

Synonym(s): N/A

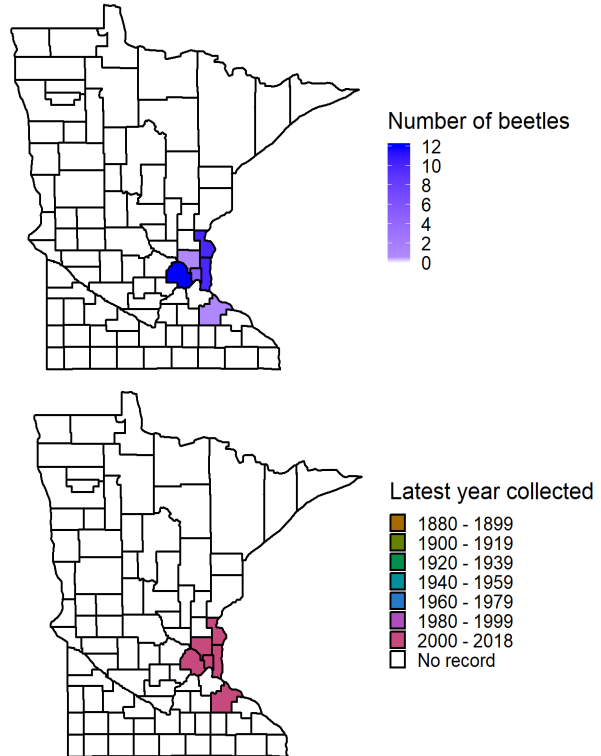
Common Name: N/A

Total in collection: 41

MN occurrence: July 12 – August 12



Photo © 2011 Robert Otto



Range: Throughout eastern and central US and CA: Ontario to Florida and Montana to Texas

Larval MN host: *Salix nigra* Marsh.

Adult MN host: Additionally *Populus nigra* L. and *S. interior* Rowlee

Collection method: *Cerceris fumipennis* prey

Appearance: 7-11 mm long. Black with green reflections. Elytra with three pairs of white spots, but may be indistinct or absent. Additional white spots along the underside of the abdomen. Similar in appearance to *Agrilus granulatus liragus* and other members of the *A. anxius* species group.

Comments: Reared from the sapwood of dead willow and from a dead branch of black willow (Fisher 1928, MacRae 2006). Confused in collections with *A. granulatus*, the species can be separated by subtle differences in shape and levels of pubescence. Subspecies *A. quadriguttatus fulminans* and *A. quadriguttatus niveiventris* occur in the western and southwestern US, respectively.

Agrilus ribesi Schaefer, 1946

Synonym(s): N/A

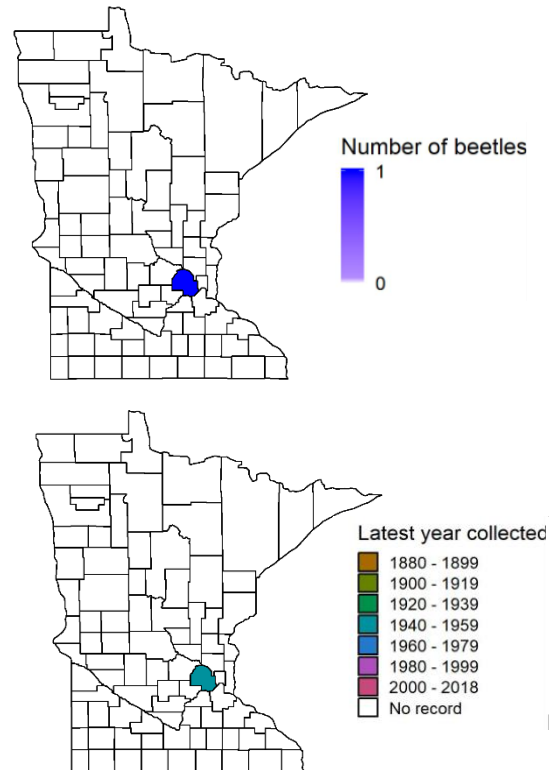
Common Name: N/A

Total in collection: Literature record only
(Jendek et al. 2015)

MN occurrence: June 23



[Photo](#) by SNSB, Zoologische Staatssammlung Muenchen is licensed under [CC BY-NC 3.0](#)



Range: In CA: New Brunswick, Ontario, and Quebec. In US: Minnesota

Larval MN host: *Ribes nigrum* L., *R. rubrum* L., and *R. uva-crispa* L.

Adult MN host: Additionally *R. aureum* Pursh (Jendek and Poláková 2014).

Collection method: Unspecified

Appearance: 4-7 mm long. Gold or gold-green. Almost identical in appearance to the closely related *A. cuprescens*, these species can be separated by differences in pronotal angles, head shape, and host information (see Jendek et al. 2015).

Comments: This Eurasian species has been present in North America at least as early as 1940 (Garlick 1940), although it was not positively identified until 2015 (Jendek et al. 2015). Before then, it was misidentified in collections as the similar appearing *A. cuprescens*, a different Eurasian species that attacks *Rosa* and *Rubus* sp. *Agrilus ribesi* is likely still misidentified as *C. cuprescens* or *A. politus* in many collections. Larvae cause spiral swelling in currant sprouts > 4 mm in diameter, with reports of economically significant damage in cultivated *Ribes* (Jendek et al. 2015).

Agrilus ruficollis (Fabricius, 1787)

Synonym(s): *Agrilus cupricollis* Gory, *Agrilus impressiceps* Pic

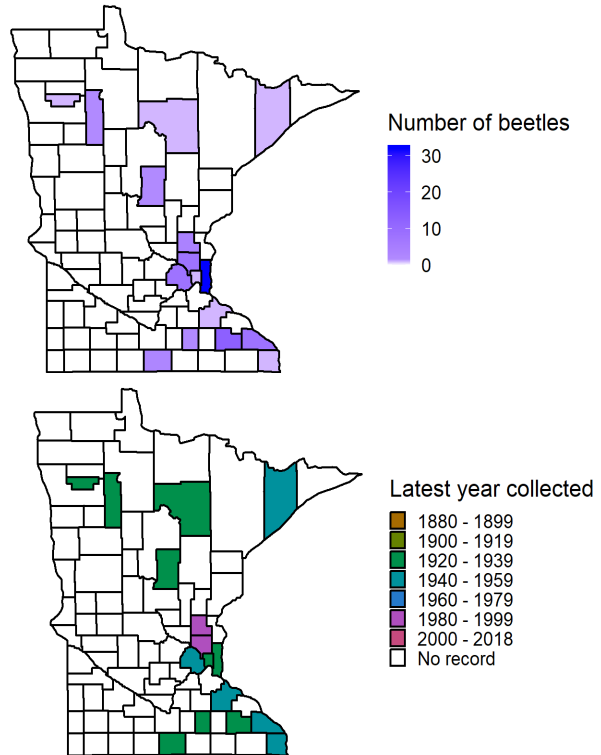
Common Name: Red-necked cane borer

Total in collection: 88

MN occurrence: May 26 – August 17



Photo by Hannah Royals, [Screening Aids](#). USDA APHIS PPQ is licensed under CC BY-NC 3.0



Range: Throughout eastern and central US and CA: Quebec/New Brunswick to Florida and Manitoba to Texas. Additionally California

Larval MN host: Domestic and wild *Rubus* sp.

Adult MN host: Unknown

Collection method: Unspecified

Appearance: 4-7 mm long. Black with gold-red or gold-green head and pronotum.

Comments: Gets its name from its red pronotum (“neck”). Larvae feed in a spiral pattern upward or downward in blackberries and raspberries. This tunneling causes galls and swelling, especially in the lower stems and branches, resulting in poorly developed fruits and weakened plants (Solomon 1995). Control methods include burning galled canes, pruning canes that emerge during the egg laying period, or application of insecticide (imidacloprid) after flowering (Kim et al. 2016).

Agrilus transimpressus Fall, 1925

Synonym(s): N/A

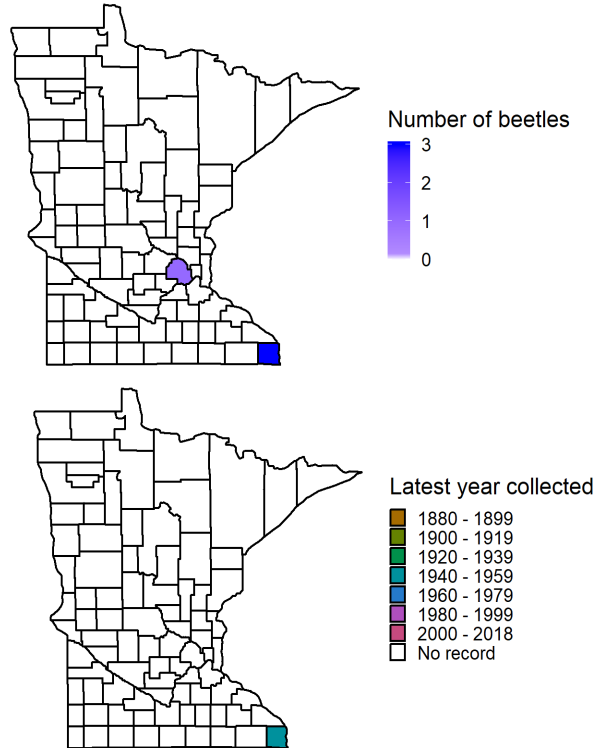
Common Name: N/A

Total in collection: 4

MN occurrence: May 22 – June 1



Photo © 2011 Robert Otto



Range: Throughout eastern and central US: New Jersey to South Carolina and Minnesota to Mississippi

Larval MN host: *Juglans nigra* L.

Adult MN host: Additionally *Carya* sp.

Collection method: Unspecified

Appearance: 4-5 mm long. Black with gold or green reflections on the head and pronotum. Similar in appearance to other members of the *Agrilus otiosus* species group.

Comments: Females of this species group are not easily separated in the absence of males or host information. Reported emerging from dead limbs of black walnut (MacRae 1991).

Agrilus vittaticollis (Randall, 1838)

Synonym(s): *Agrilus frenatus* Gory

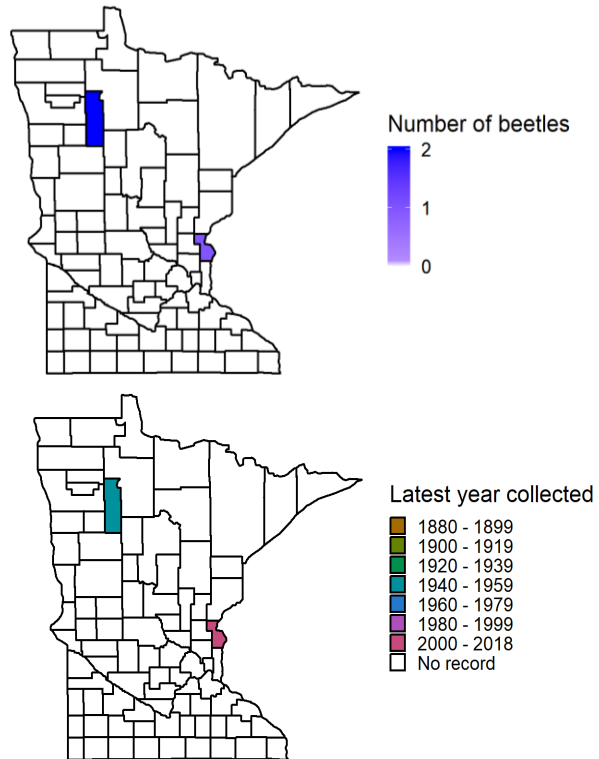
Common Name: Apple/hawthorn root borer

Total in collection: 2

MN occurrence: July 10



Photo by Hannah Royals, [Screening Aids](#). USDA APHIS PPQ is licensed under [CC BY-NC 3.0](#)



Range: Throughout most of US and CA: Quebec to Florida and British Columbia to California

Larval MN host: *Crataegus* sp. and *Malus* sp.

Adult MN host: Additionally *Amelanchier arborea* (Michx. f.) Fern.

Collection method: Unspecified

Appearance: 8-10 mm long. Head, pronotum, and underside gold-red with orange patterns on the face and pronotum. Similar in appearance to the less common *Agrilus audax*.

Comments: Recorded abundant in apple, pear, and serviceberry in Appalachia in the early 1900s (Brooks 1914). Can kill roots and weaken trees in heavy infestations. Moisture may enter through exit holes and cause decay in heartwood, further contributing to mortality in attacked trees (Solomon 1995). The most effective control is mechanical prevention of oviposition by wrapping the basal 1 m of the tree with cloth in the spring (Solomon 1995).

Anthaxia cyanella Gory, 1841

Synonym(s): *Anthaxia scoriacea* Melsheimer, *A. kaszabiana* Pochon

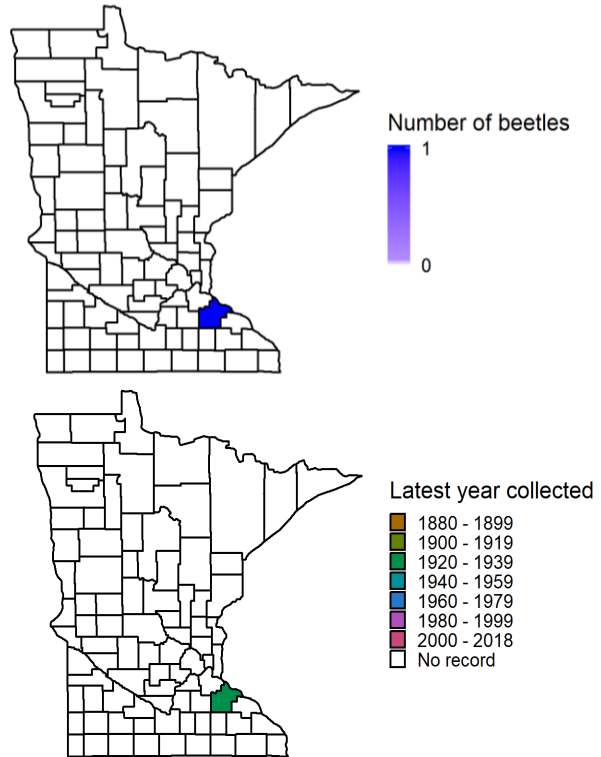
Common Name: N/A

Total in collection: 1

MN occurrence: June 30



Photo © 2011 Joshua P. Basham



Range: Throughout eastern and central US and CA: Ontario to Florida and Minnesota to Oklahoma/Louisiana. Additionally Idaho

Larval MN host: *Amelanchier arborea* (Michx. f.) Fern., *Betula nigra* L., *Gleditsia triacanthos* L., and *Vitis* sp.

Adult MN host: Additionally *Crataegus* sp., *Ostrya virginiana* (Mill.) K. Koch, *Prunus americana* Marsh., *Rhus aromatica* Ait., and *Ulmus rubra* Muhl.

Collection method: Unspecified

Appearance: 4-5 mm long. Male face green. Two color forms for each sex: male pronotum and elytra ranging from black with gold-green markings on the base and sides to completely blue-green. Female dark gold to dark blue with green-blue reflections on lower face. For notes on color variation and differentiation from *Anthaxia quercata* see MacRae 2006.

Comments: Reared from a fallen dead branch of honeylocust. Larger beetles have been reared from river birch, suggesting this may be the preferred host (MacRae 2006).

Anthaxia fisheri Obenberger, 1928

Synonym(s): N/A

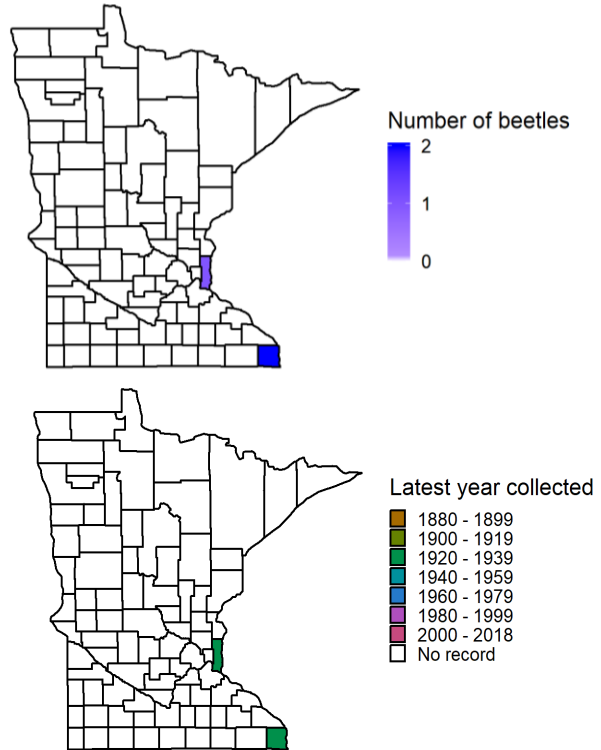
Common Name: N/A

Total in collection: 3

MN occurrence: May 27 – June 14



["CNC COLEO.00152534"](#) by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under [CC BY-NC-SA 3.0](#)



Range: Throughout eastern and central US and CA: New Hampshire to Florida and Ontario to Oklahoma/Louisiana

Larval MN host: *Prunus americana* Marsh. and *P. serotina* Ehrh.

Adult MN host: Additionally *Acer* sp. and *Gleditsia triacanthos* L.

Collection method: Unspecified

Appearance: 4-6 mm long. Either dark purple or gold-green. Green males with metallic green face, and green females with green or yellow reflections on face.

Comments: The purple form is larger than the green form, but both forms have similar genitalia and are often collected together on American plum (Wellso et al. 1976).

Anthaxia inornata (Randall, 1838)

Synonym(s): N/A

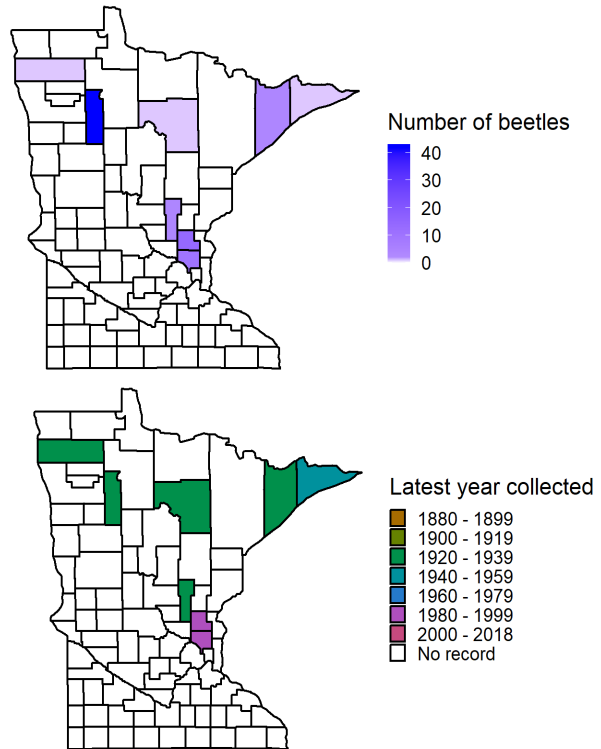
Common Name: N/A

Total in collection: 77

MN occurrence: April 25 – July 25



Photo by Steven Valley, Oregon Department of Agriculture is licensed under CC BY-NC 3.0



Range: Throughout northern and western US and southern CA: Quebec to Ohio and British Columbia to California

Larval MN host: *Larix laricina* (Du Roi) K. Koch

Adult MN host: *Angelica* sp.; *Heterotheca villosa* (Pursh) Skinnners, *Ranunculus acris* L., *Rosa* sp., *Pinus* sp., and *Tragopogon pratensis* L.

Collection method: Collected from dying *L. laricina* (Du Roi) K. Koch, along Mille Lacs lake shore, and sweeping in woods

Appearance: 4-8 mm long. Black. Head and pronotum may have gold reflections. End of elytra rounded (not narrowed as in the similar appearing *Melanophila acuminata*).

Comments: This species belongs to the *A. aeneogaster* species group, which is in need of revision (Bílý and Kubán 2010). A common species in a pure black spruce stand in boreal Canada (Saint-Germain et al. 2009).

Anthaxia quercata (Fabricius, 1801)

Synonym(s): N/A

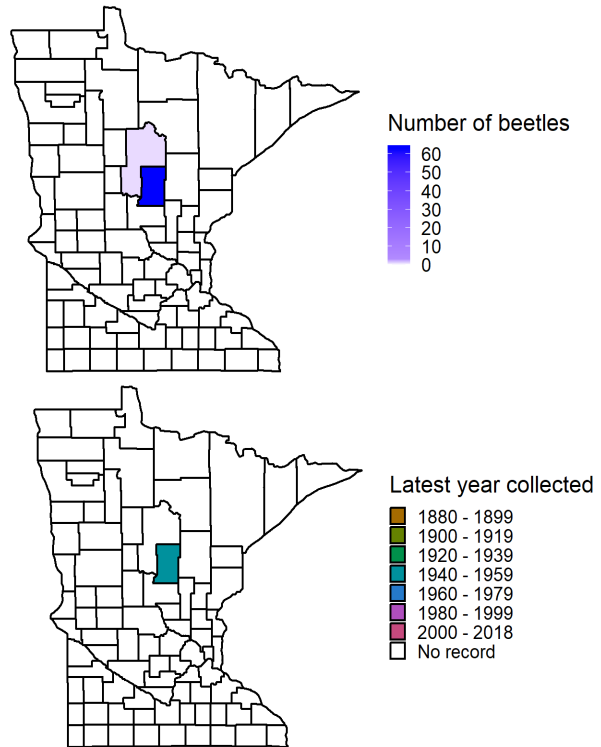
Common Name: N/A

Total in collection: 64

MN occurrence: July 1



Photo by Hannah Royals, [Museum Collections: Coleoptera](#), USDA
APHIS PPO is licensed under [CC BY-NC 3.0](#)



Range: Throughout eastern and central US and CA: Newfoundland to Florida and Ontario to Texas

Larval MN host: *Crataegus chrysoarpa* Ashe, *Larix laricina* (DuRoi) K. Koch, *Picea mariana* B.S.P., *Pinus rigida* Mill., and *P. strobus* L.

Adult MN host: Additionally *Corylus americana* Walt., *Prunus americana* Marsh., *Quercus rubra* L., and *Q. velutina* Lam.

Collection method: Unspecified

Appearance: 3-6 mm long. Male black with face, pronotum, and two stripes along each elytron metallic green. Female darker in color with pronotal and elytral markings reduced or absent.

Comments: Two size forms: larger males greener, and smaller males blue-green. Size forms have similar genitalia, although they are found at different localities (Wellso et al. 1976). Adults almost always occur on oaks or other broad-leaved plants, even though oaks are not a larval host (Hespenheide 1973). Recent larval associations have been limited to the family Pinaceae, with the *Crataegus* observation possibly referring to *A. cyanella* (MacRae 2006).

Anthaxia viridicornis (Say, 1823)

Synonym(s): N/A

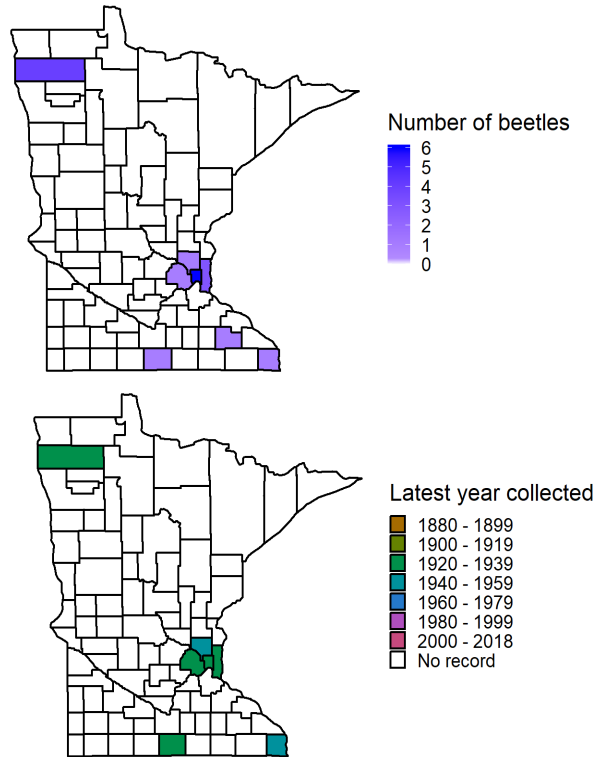
Common Name: N/A

Total in collection: 18

MN occurrence: May 5 – June 25



Photo by Hannah Royals, [Museum Collections: Coleoptera](#), USDA
APHIS PPQ is licensed under [CC BY-NC 3.0](#)



Range: Throughout eastern and central US and CA: Quebec to Florida and Manitoba to Texas

Larval MN host: *Quercus* sp. and *Salix nigra* Marsh.

Adult MN host: *Ulmus americana* L., additionally *Abies* sp. and *Populus* sp.

Collection method: *U. americana* and in breeding cages

Appearance: 4-6 mm long. Black with gold or green pronotal margins. Male face metallic green.

Comments: Previously considered synonymous with *Anthaxia viridifrons*, but recent authors have treated them as separate species based on differences in coloration, male genitalia, and host preferences (MacRae 2006). Reported in dead and dying willow (Knull 1922).

Anthaxia viridifrons Gory, 1841

Synonym(s): *Anthaxia subaenea* LeConte

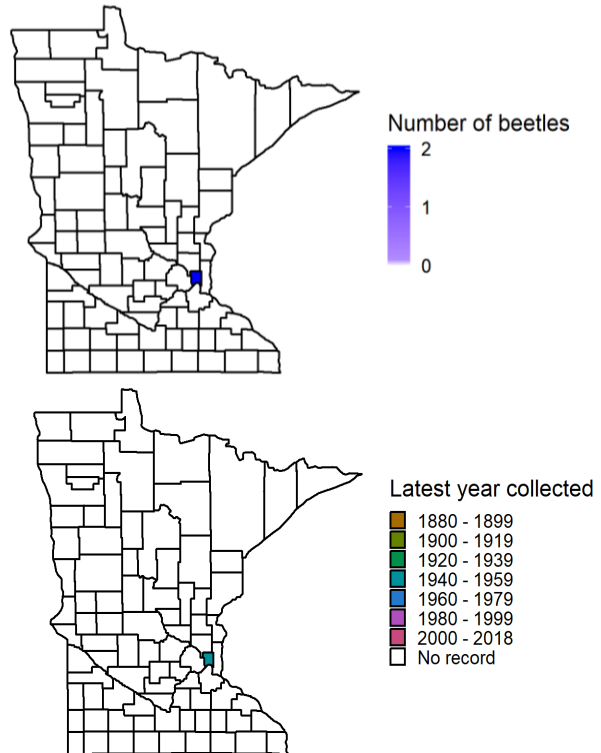
Common Name: N/A

Total in collection: Literature record only
(MacRae and Basham 2013)

MN occurrence: Unknown



Photo © 2011 Joshua P. Basham



Range: Throughout eastern and central US and CA: Quebec to Florida and Manitoba to Texas

Larval MN host: *Amelanchier arborea* (Michx. F.) Fern., *Carya ovata* (Mill.) K. Koch, *Morus* sp., and *Ulmus rubra* Muhl

Adult MN host: *U. americana*, additionally *Acer saccharum* Michx., *Carya cordiformis* (Wangenh.) K. Koch, *Celtis occidentalis* L., *Cornus racemosa* Lam., *Crataegus* sp., *Fraxinus americana* L., *Gleditsia triacanthos* L., *Juglans nigra* L., *Malus* sp., *Quercus alba* L., *Q. rubra* L., *Rubus* sp., and *Salix* sp.

Collection method: Collected from *U. americana*

Appearance: 4-6 mm long. Black with gold or green or gold markings on the pronotum that extend down the elytra, narrowing to a point. Male face metallic green.

Comments: Previously considered synonymous with *Anthaxia viridicornis*, but recent authors have treated them as separate species based on differences in coloration, male genitalia, and host preferences. Reared from the dead branches of several tree genera (MacRae 2006).

Brachys aerosus (Melsheimer, 1845)

Synonym(s): *Brachys rufescens* Nicolay & Weiss

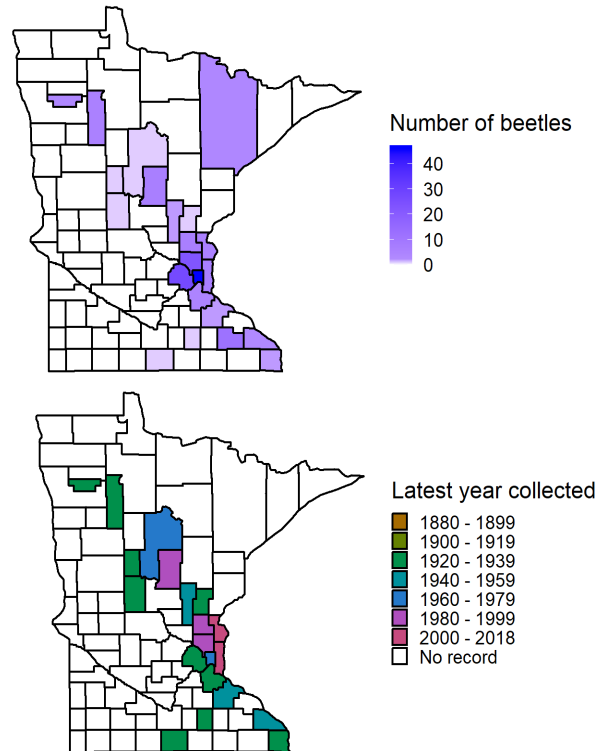
Common Name: N/A

Total in collection: 170

MN occurrence: May 10 – August 2



Photo by Don Griffiths, courtesy of the Spencer Entomological Collection, Beaty Biodiversity Museum, UBC



Range: Throughout most of US and CA: Nova Scotia to Florida and British Columbia to Arizona

Larval MN host: *Quercus rubra* L. var. *ambigua* (Gray) Fern.

Adult MN host: *Fraxinus americana* L. and *Ulmus* sp., additionally *Acer* sp., *Corylus cornuta* Marsh., *Crataegus douglasii* Lindl., *C. punctata* Jacq., *Pinus banksiana* Lamb., *Populus termuloides* Michx., *Q. alba* L., *Q. macrocarpa* Michx., *Q. rubra* L., *Q. velutina* Lam., *Ulmus americana* L., and *U. rubra* Muhl.

Collection method: MI specimen collected on *Ostrya* sp. Collected on *F. americana* L., on *Ulmus* leaves, and in bait trap

Appearance: 3-5 mm long. Black with gold reflections and a pattern of yellow and white hairs on the head, pronotum, and elytra.

Comments: Leaf miners. Larvae feed on the upper leaf surface, mining along large veins and resulting in irregular dead spots around leaf edges (Weiss and Nicolay 1919).

Brachys aeruginosus Gory, 1841

Synonym(s): N/A

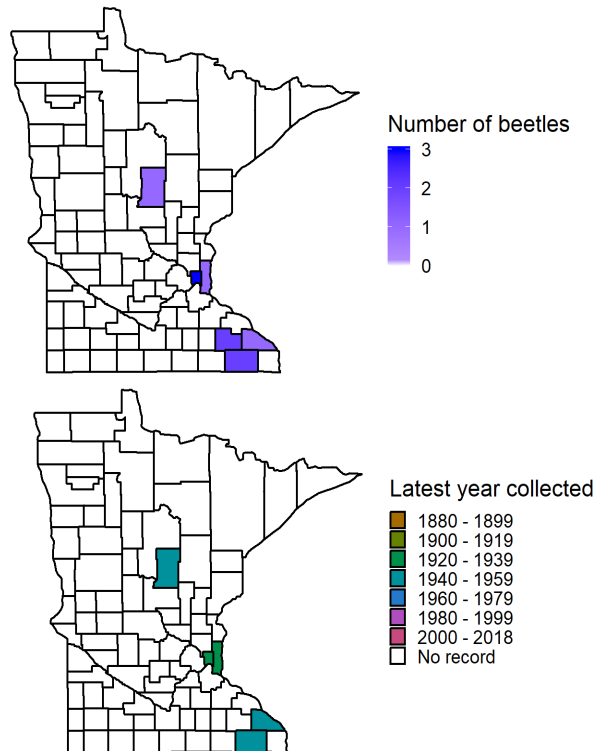
Common Name: N/A

Total in collection: 11

MN occurrence: May 24 – July 10



"CNC COLEO 00156998" by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under [CC BY-NC-SA 3.0](https://creativecommons.org/licenses/by-nc-sa/3.0/)



Range: Throughout eastern and central US and CA: Quebec to Florida and Manitoba to Oklahoma

Larval MN host: Unknown

Adult MN host: *Carya* sp., *Quercus alba* L., and *Q. velutina* Lam.

Collection method: Unspecified

Appearance: 3-4 mm long. Black with gold reflections and a pattern of yellow hairs on the head, pronotum, and elytra.

Comments: Leaf miners. Not as common as the other two *Brachys* species in MN, but adults can be found alongside them on oak in the early summer (Nicolay and Weiss 1923).

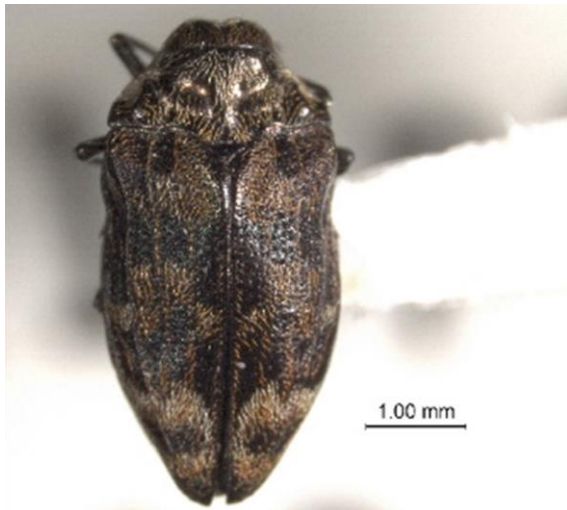
Brachys ovatus (Weber, 1801)

Synonym(s): *Trachys aurulenta* Kirby, *Brachys terminans* Gory & Laporte, *B. molestus* Gory, *B. laevicauda* LeConte, *B. horni* Kerremans

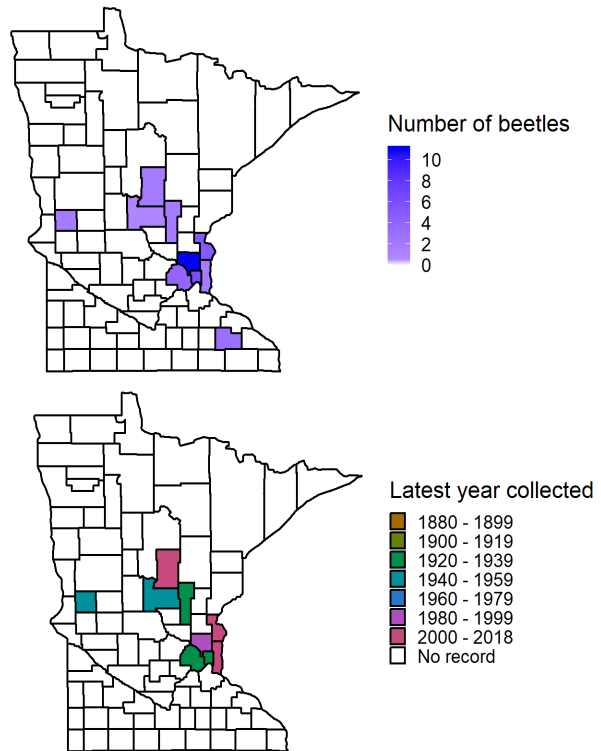
Common Name: N/A

Total in collection: 38

MN occurrence: May 19 – July 29



"CNC COLEO 00157006" by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under [CC BY-NC-SA 3.0](https://creativecommons.org/licenses/by-nc-sa/3.0/)



Range: Throughout North America: Quebec to Florida and Montana to Arizona. Additionally Mexico

Larval MN host: *Quercus rubra* L. var. *ambigua* (Gray) Fern

Adult MN host: Additionally *Q. alba* L., *Q. rubra* L., and *Q. velutina* Lam.

Collection method: In bait trap and as *Cerceris fumipennis* prey

Appearance: 4-7 mm long. Black with gold reflections on the head and pronotum, and dark blue reflections on the elytra. Pattern of yellow and white hairs on the head, pronotum, and elytra. Can be differentiated from other *Brachys* species by the long fringe of hairs present at the end of the bottom-most abdominal sternite.

Comments: Leaf miners. Larvae feed on the upper leaf surface, mining along large veins and resulting in irregular dead spots around leaf edges (Weiss and Nicolay 1919). While some sources report a heavily skewed female:male sex ratio, it appears to be close to 1:1 (Lawson et al. 2001).

Buprestis aurulenta Linnaeus, 1767

Synonym(s): N/A

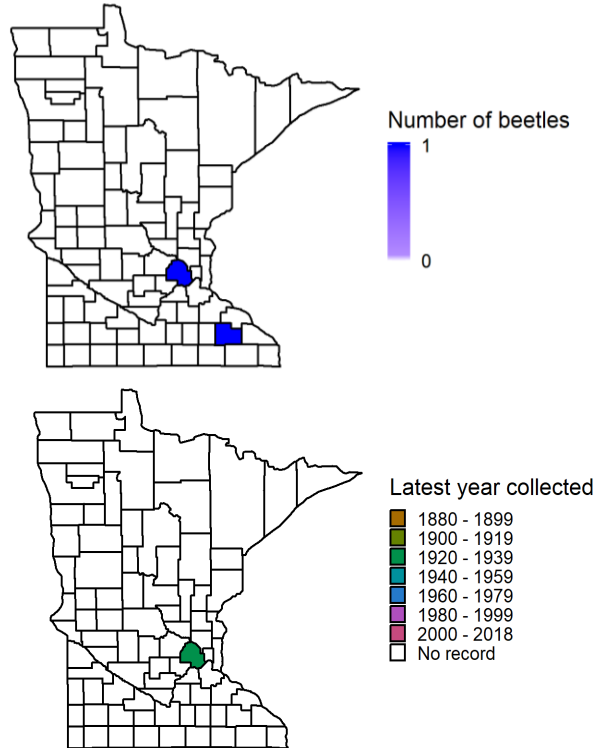
Common Name: N/A

Total in collection: 2

MN occurrence: March 1



Photo by Jim Moore is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Primarily western North America: Manitoba to New Mexico and Alberta to California. Additionally Mexico

Collection method: Unknown and collected on window sill of heated “porch” inside house

Appearance: 14-19 mm long. Green with gold, blue, and red reflections. Four upraised ridges on each elytron. Similar in appearance to *B. striata*, but ridges are more raised in *B. aurulenta*.

Comments: As this species has a western distribution, these two MN specimens most likely represent emergence from imported wood. *B. aurulenta* is known to emerge from furniture and lumber several years after eggs are laid, potentially up to 50 or 60 years (Spencer 1930, 1963). This species is likely not present in MN and is excluded from the checklist of MN species (Hallinen et al. 2021).

Buprestis confluenta Say, 1823

Synonym(s): N/A

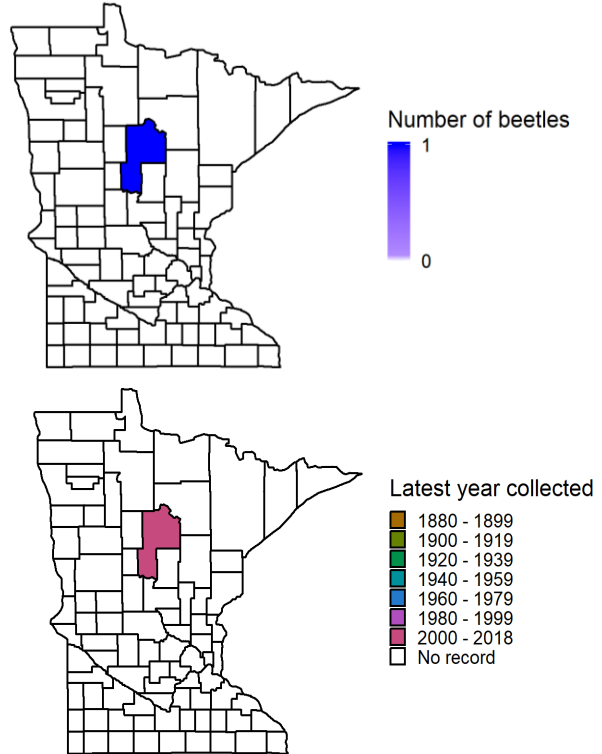
Common Name: N/A

Total in collection: 1

MN occurrence: July 23



[Photo](#) by Whitney Cranshaw, Colorado State University is licensed under [CC BY 3.0](#)



Range: Throughout western and central US and CA: Quebec to Texas and British Columbia to California

Larval MN host: *Populus deltoides* Marsh and *P. tremuloides* Michx.

Adult MN host: Unknown

Collection method: Unspecified

Appearance: 13-17 mm long. Metallic green with many yellow spots on the elytra.

Comments: The unique coloration of this species makes it easy to identify. Attacks stressed or dead cottonwood and aspen from July to September (Nicolay and Weiss 1918).

Buprestis consularis Gory, 1840

Synonym(s): *Buprestis flavopicta* Casey

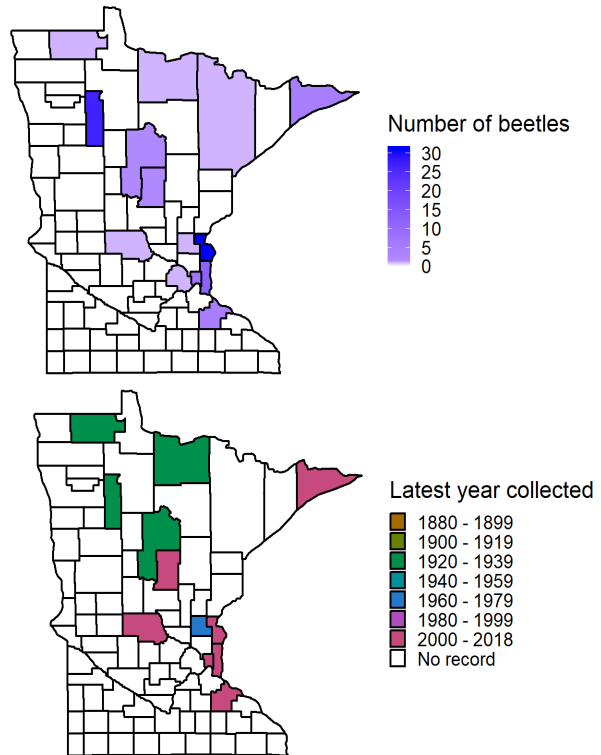
Common Name: N/A

Total in collection: 104

MN occurrence: June 1 – August 26



Photo © 2009 Joshua P. Basham



Range: Throughout eastern and central US and CA: Quebec to Florida and South Dakota to Arizona

Larval MN host: *Picea glauca* (Moench) Voss., *Pinus resinosa* Ait., and *P. rigida* Mill.

Adult MN host: *Larix laricina* (Du Roi) K. Koch

Collection method: Adults collected from “dry” *L. laricina* and logs of the same genus, collected at light, in Lindgren funnel trap on *Pinus banksiana* Lamb. baited with alpha-pinene and bark beetle pheromones, and as *Cerceris fumipennis* prey

Appearance: 12-21 mm long. Black with gold reflections and paired yellow markings on abdominal sternites and elytra.

Comments: Previously treated by some authors as a subspecies of the western *B. nutalli*, but now generally considered a separate species based on differences in genitalia, thoracic coloration, and DNA evidence (Knull 1947, Lewis 2015). Reported breeding in dead pine (Knull 1922) and adult observed ovipositing on a pine trunk (Howden and Vogt 1951). A common prey item of *C. fumipennis* in MN.

Buprestis fasciata Fabricius, 1787

Synonym(s): *Buprestis sexmaculata* Hausmann, *Ancylochira sexplagiata* LeConte, *A. Iherminieri* Chevrolat, *B. fulgens* Casey

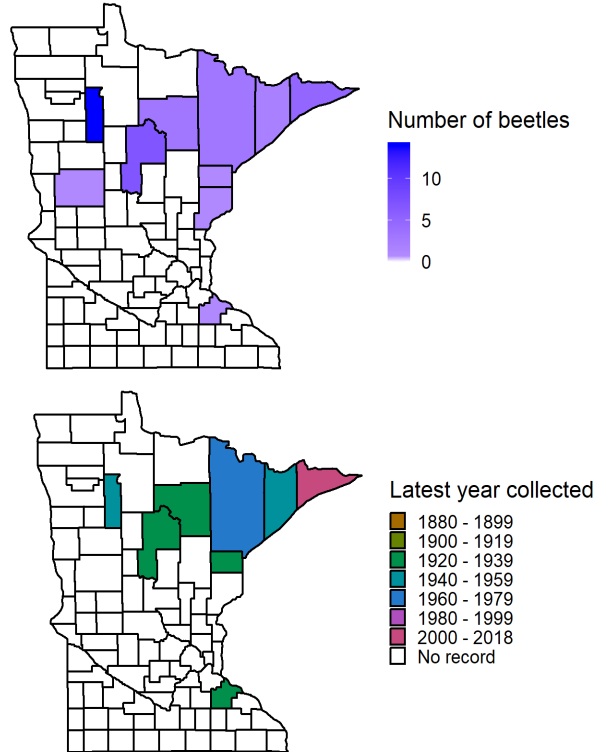
Common Name: N/A

Total in collection: 39

MN occurrence: April 26 – September 7



Photo by Hannah Royals, [Museum Collections: Coleoptera](#), USDA
APHIS PPQ is licensed under [CC BY-NC 3.0](#)



Range: Throughout eastern and central US and CA: Nova Scotia to Georgia and Manitoba to Mississippi. Additionally Saskatchewan

Larval MN host: Unknown

Adult MN host: *Larix laricina* (Du Roi) K. Koch; additionally *Abies* sp., *Picea* sp., and *Quercus* sp.

Collection method: Adults collected from dying *L. laricina*, collected at light, in flight, and in Lindgren funnel trap on *Pinus banksiana* Lamb. baited with alpha-pinene and bark beetle pheromones

Appearance: 11-18 mm long. Metallic green with three pairs of yellow spots on elytra (first spot is sometimes reduced or absent).

Comments: No larval hosts currently known, although reported in association with firs, poplars, and freshly cut or dead pine (Nicolay and Weiss 1918, Knull 1920, Van Dyke 1921, Helfer 1941).

Buprestis maculativentris Say, 1824

Synonym(s): *Buprestis paganorum* Kirby, *B. rusticorum* Kirby,
B. sexnotata Laporte & Gory, *B. maculiventris* Gemminger & Harold

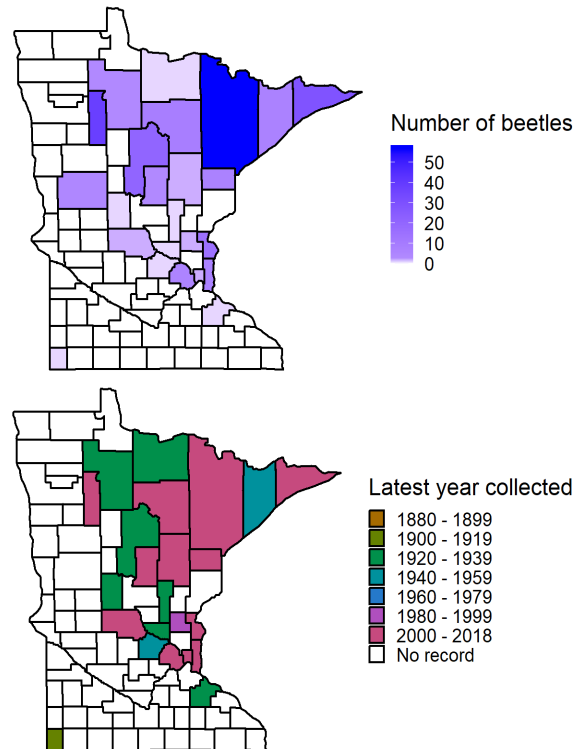
Common Name: Ventrally-spotted buprestid

Total in collection: 224

MN occurrence: June 3 – September 30



"BIOUG09885-H05" by CBG Photography Group is licensed under CC BY-NC-SA 4.0



Range: Throughout northeastern and central US and most of CA: Newfoundland to Pennsylvania and British Columbia to New Mexico

Larval MN host: *Picea* sp., *Pinus resinosa* Ait., and *P. strobus* L.

Adult MN host: Additionally *Larix laricina* (Du Roi) K. Koch

Collection method: Adults collected on *Larix laricina* logs, *Picea* sp., and *Pinus resinosa* Ait, in Lindgren funnel trap on *Pinus banksiana* Lamb. baited with alpha-pinene and bark beetle pheromones, and as *Cerceris fumipennis* prey

Appearance: 13-20 mm long. Black with gold reflections and yellow-orange markings on the face and abdominal sternites.

Comments: While the color can vary considerably from gold to greenish brown, the orange markings underneath are relatively constant (Bright 1987). Has been reported emerging from the floorboards of an old house (Nelson et al. 1981). A common prey item of *C. fumipennis* in MN.

Buprestis maculipennis Gory, 1840

Synonym(s): *Buprestis inconstans* Melsheimer, *B. leporine* Casey, *B. reducta* Casey

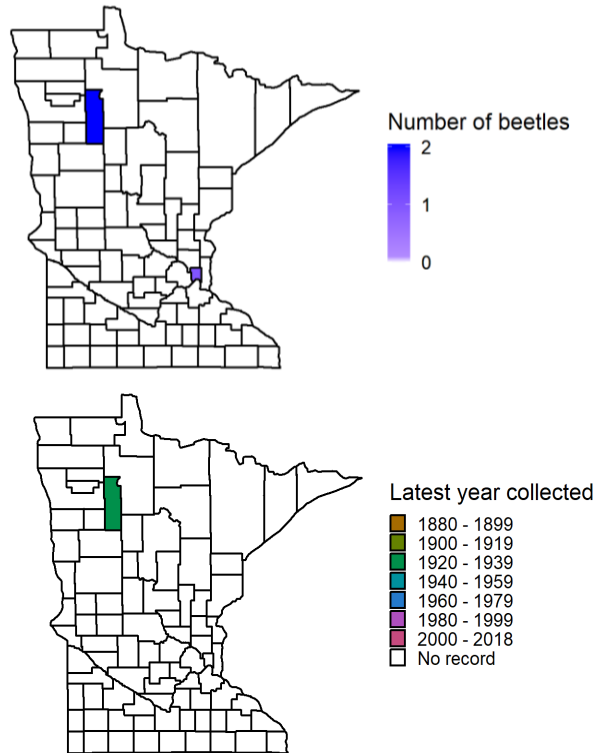
Common Name: N/A

Total in collection: 3

MN occurrence: June 17 – June 21



Photo by Mike Quinn is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern and central US and CA: Nova Scotia to Florida and Saskatchewan to Texas

Larval MN host: *Tsuga canadensis* (L.) Carrière.

Adult MN host: Unknown

Collection method: Unspecified

Appearance: 9-15 mm long. Black with gold reflections and paired yellow or red markings on the face, sides of pronotum, elytra, underside of thorax, and bottom-most abdominal sternite.

Comments: Reported breeding in dead limbs and branches (Knull 1922). Likely occurs in pines as well (Knull 1922, Bright 1987).

Buprestis salisburyensis Herbst, 1801

Synonym(s): *Buprestis ultramarina* Say

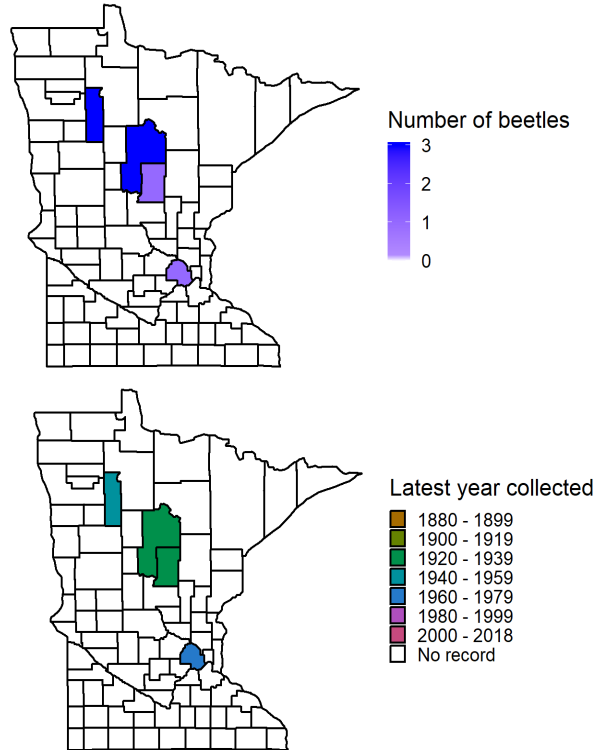
Common Name: N/A

Total in collection: 8

MN occurrence: May 11 – July 18



Photo by Hannah Royals, [Museum Collections: Coleoptera](#), USDA
APHIS PPQ is licensed under [CC BY-NC 3.0](#)



Range: Throughout eastern and central US and CA: Massachusetts to Georgia and Ontario to Oklahoma

Larval MN host: *Pinus rigida* Mill.

Adult MN host: Unknown

Collection method: Unspecified

Appearance: 10-15 mm long. Black with bronze, green, blue, and red reflections. Elytra without distinct raised ridges like the otherwise similar looking *Buprestis striata*.

Comments: Known to emerge relatively early in the year; reported from its southeastern range as early as March or April (Nicolay and Weiss 1918, Bright 1987).

Buprestis striata Fabricius, 1775

Synonym(s): *Buprestis striata* Obenberger, *B. impedita* Say, *B. canadensis* Casey, *B. obscura* Casey

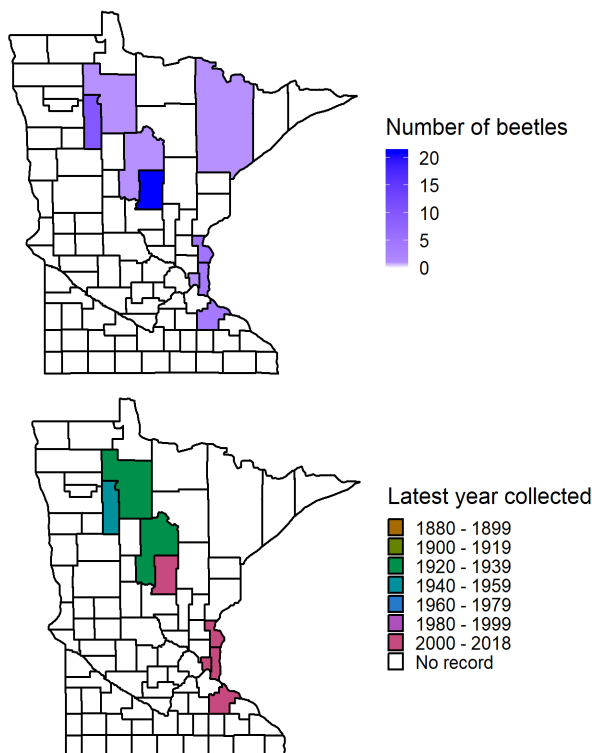
Common Name: N/A

Total in collection: 58

MN occurrence: June 2 – July 30



"CNC COLEO 00156848" by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under CC BY-NC-SA 3.0



Range: Throughout eastern and central US and CA: Nova Scotia to Florida and Ontario to Texas

Larval MN host: *Picea* sp., *Pinus rigida* Mill., *P. strobus* L., and *Tsuga canadensis* (L.) Carr.

Adult MN host: *Larix laricina* (Du Roi) K. Koch.

Collection method: Collected on dying *L. laricina*, in Lindgren funnel trap on *P. banksiana* baited with alpha-pinene and bark beetle pheromones, and as *Cerceris fumipennis* prey.

Appearance: 13-20 mm long. Black with bronze, green, blue, and red reflections. Elytra with distinct raised ridges unlike the otherwise similar looking *Buprestis salisburyensis*.

Comments: A common prey item of *C. fumipennis* in MN. Prefers oviposition in dead and decaying pines, including logs and stumps (Bright 1987). One specimen was reported chewing eight holes through "heavy woolen pantaloons," after having most likely emerged from lumber (Nicolay and Weiss 1918).

Buprestis sulcicollis (LeConte, 1860)

Synonym(s): *Buprestis lateralis* Casey

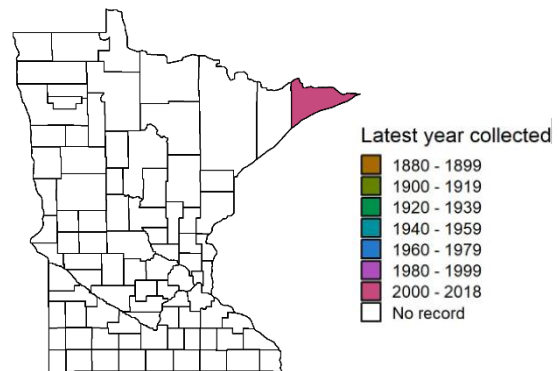
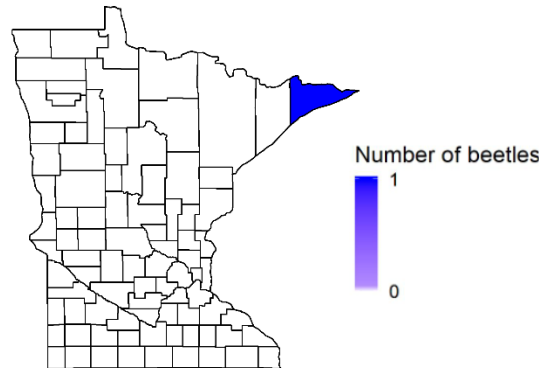
Common Name: N/A

Total in collection: 1

MN occurrence: July 5 – August 2
(trap interval)



"CCDB-28930-C07" by CBG Photography Group, Centre for Biodiversity Genomics is licensed under [CC BY-NC-SA 4.0](https://creativecommons.org/licenses/by-nc-sa/4.0/)



Range: Northeastern US and most of CA: Nova Scotia to Pennsylvania and Northwest Territories to Minnesota

Larval MN host: *Pinus rigida* Mill. and *P. strobus* L.

Adult MN host: Unknown

Collection method: Lindgren funnel trap on *P. banksiana* Lamb.

Appearance: 11-16 mm long. Black with bronze and green reflections. Similar in appearance to *B. striata*, but typically darker in color and with more raised elytral ridges.

Comments: Relatively uncommon. Occurs from the Great Lake states to the Atlantic (Bright 1987).

Chalcophora fortis LeConte, 1860

Synonym(s): *Chalcophora laurentica* Casey, *C. cupreola* Casey.

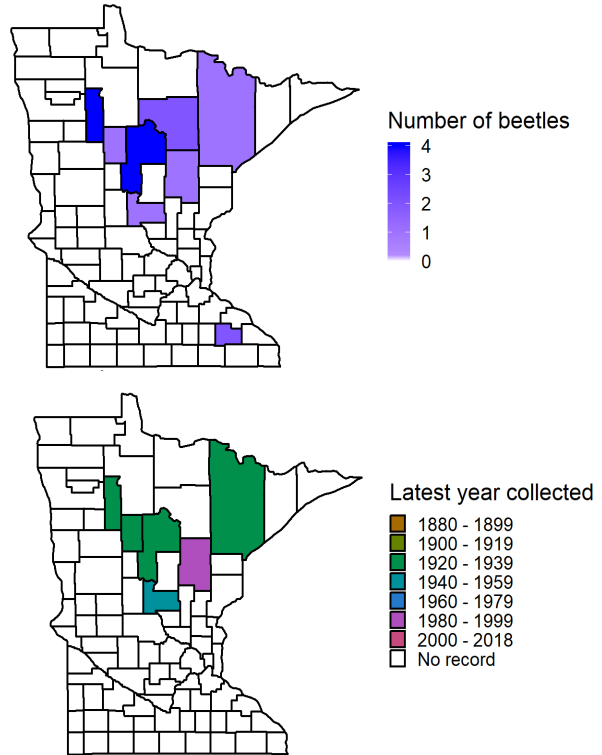
Common Name: N/A

Total in collection: 16

MN occurrence: June 10 – August 29



["CNC COLEO.00156689"](#) by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under [CC BY-NC-SA 3.0](#)



Range: Throughout northeastern and central US and CA: Quebec/New Brunswick to New Jersey and Manitoba to Kansas

Larval MN host: *Pinus strobus* L.

Adult MN host: Unknown

Collection method: Unspecified

Appearance: 26-33 mm long. Coppery green with raised green-black or black ridges.

Comments: The largest of the North American *Chalcophora* (Maier and Ivie 2013), and the largest buprestid occurring in MN.

Chalcophora liberta (Germar, 1824)

Synonym(s): *Buprestis borealis* Laporte & Gory, *Chalcophora parviceps* Casey

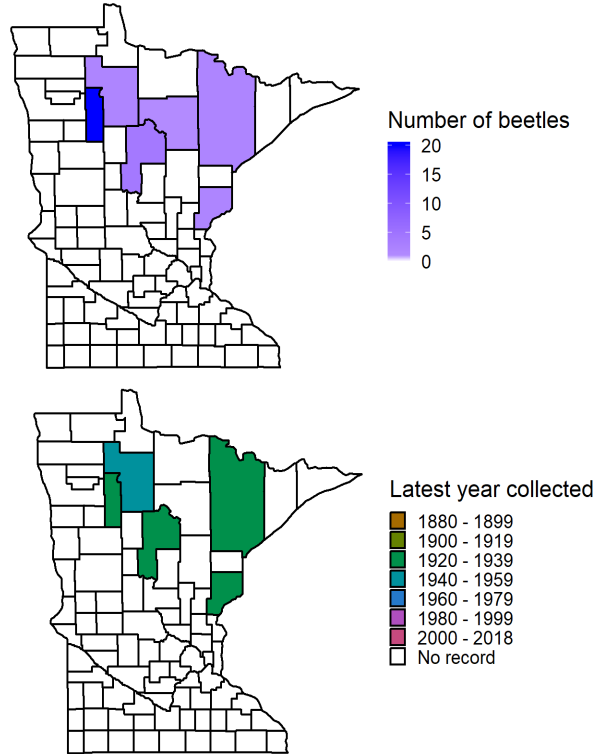
Common Name: N/A

Total in collection: 31

MN occurrence: May 20 – September 12



Photo by Don Griffiths, courtesy of the Spencer Entomological Collection, Beaty Biodiversity Museum, UBC



Range: Throughout eastern US and CA: Quebec to Florida and Manitoba to Minnesota

Larval MN host: *Pinus resinosa* Ait. and *P. strobus* L.

Adult MN host: *P. banksiana* Lamb

Collection method: Collected on *P. banksiana* foliage

Appearance: 15-25 mm long. Gold or grey with raised black ridges. Similar in appearance to *C. virginensis* but with complete sutural striae and rounded elytral ends.

Comments: The smallest of the North American *Chalcophora* (Maier and Ivie 2013).

Chalcophora virginiensis (Drury, 1770)

Synonym(s): *Buprestis cupreomaculata* Goeze, *B. virginica* Gmelin, *Chalcophora novaeboracensis* Fitch, *C. lacustris* LeConte, *C. obliterated* Casey, *C. brevicollis* Casey, *C. melanotum* Muttkowski, *C. fi ligrana* Obenberger, *C. mariana fi ligrana* Obenberger.

Common Name: Sculptured pine borer

Total in collection: 143

MN occurrence: May 16 – October 5

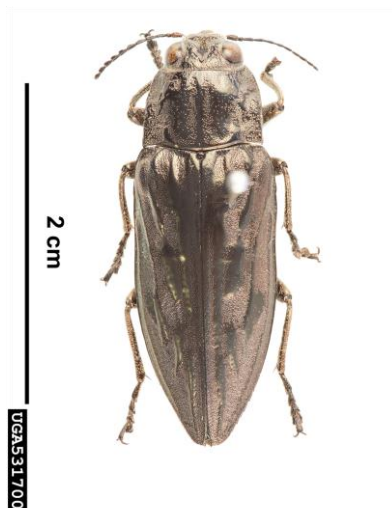
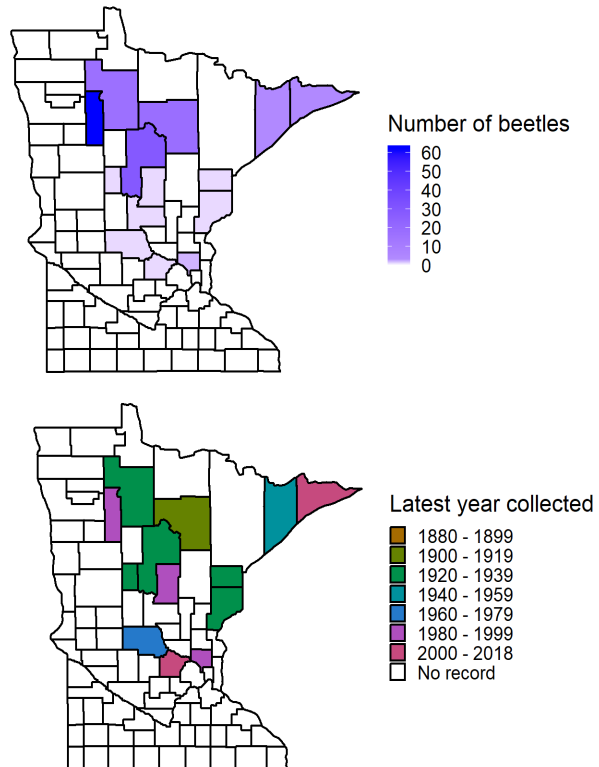


Photo by Pest and Diseases Image Library is licensed under CC BY-NC 3.0



Range: Throughout eastern and central US and CA: Nova Scotia to Florida and Manitoba to Texas. Additionally Mexico and Central America

Larval MN host: *Pinus rigida* Mill. and *P. strobus* L.

Adult MN host: Additionally *Larix laricina* (Du Roi) K. Koch. and *P. resinosa* Ait.

Collection method: On *L. laricina*, on *Pinus* sp., and in Lindgren funnel trap on *P. banksiana* Lamb. baited with alpha-pinene and bark beetle pheromones

Appearance: 18-30 mm long. Gold or grey with raised black ridges. Similar in appearance to *C. liberta* but with incomplete sutural striae and serrate elytral edges.

Comments: Various authors have taken this species in and out of synonymy with the western *C. angulicollis*. Morphological differences provide evidence in favor of separating these species (Maier and Ivie 2013). Adults lay eggs around scars in living trees or in decaying logs, stumps or trunks. Living trees or logs left in wooded areas may be heavily damaged by larval galleries (Bright 1987).

Chrysobothris adelpha Harold, 1869

Synonym(s): *Chrysobothris soror* LeConte

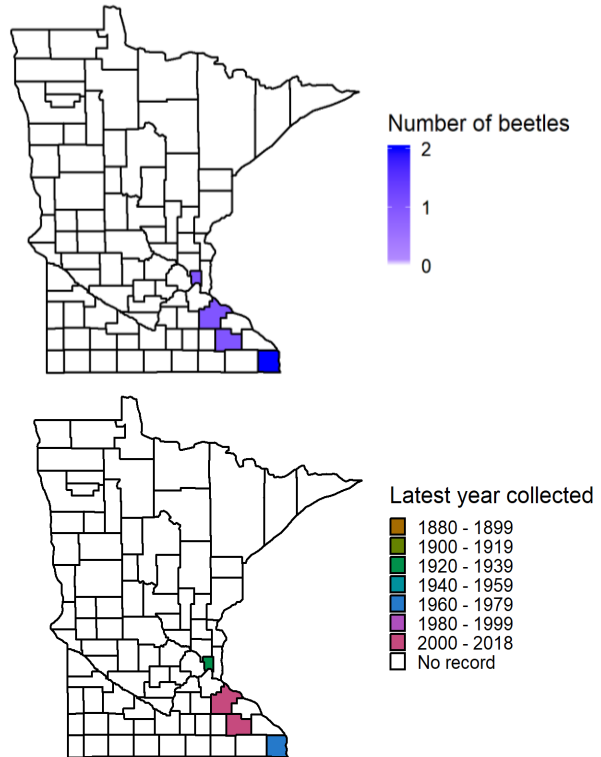
Common Name: N/A

Total in collection: 5

MN occurrence: May 23 – July 11



"CNC COLEO.00156788" by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under CC BY-NC-SA 3.0



Range: Throughout eastern and central US and CA: Quebec to Florida and Ontario to Texas. Additionally Mexico

Larval MN host: *Amelanchier arborea* (Michx. f.) Fern. and *Carya ovata* (Mill.) K. Koch

Adult MN host: Additionally *Acer platanoides* L., *Fraxinus pennsylvanica* Marsh., and *Quercus* sp.

Collection method: Malaise trap and as *Cerceris fumipennis* prey

Appearance: 9-15 mm long. Black with gold reflections. Elytra with three pairs of gold depressions. Male face metallic green. Similar in appearance to other members of the *Chrysobothris femorata* species group.

Comments: Reared from dead wood of *Carya* sp. (MacRae 2006).

Chrysobothris azurea LeConte, 1857

Synonym(s): *Chrysobothris ultramarina* Gory & Laporte

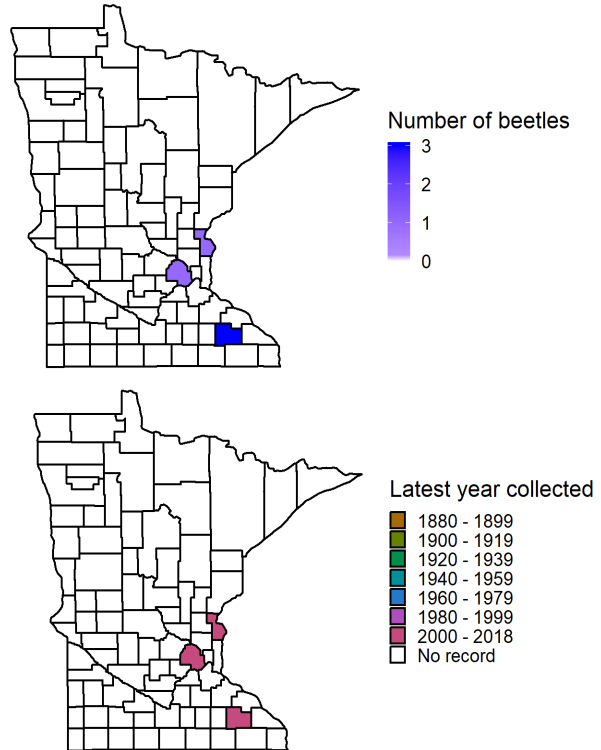
Common Name: N/A

Total in collection: 5

MN occurrence: July 3 – July 24



Photo by Mike Quinn is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout most of US and CA: Quebec to Florida and British Columbia to Idaho/Texas

Larval MN host: *Acer* sp., *Alnus incana* (L.) Moench ssp. *rugosa* (Du Roi) Clausen, *Amelanchier arborea* (Michx. f.) Fern., *Celastrus scandens* L., *Juglans nigra* L., *Pinus* sp., *Prunus virginiana* L., *Quercus bicolor* Willd., *Rhus glabra* L., and *Vitis* sp.

Adult MN host: Additionally *Acer saccharum* Marsh., *A. platanoides* L., *Cornus racemosa* Lam., *Crataegus* sp., *Fraxinus americana* L., *F. pennsylvanica* Marsh., *Gleditsia triacanthos* L., *Pinus strobus* L., *Populus tremuloides* Michx., and *Quercus velutina* Lam.

Collection method: *Cerceris fumipennis* prey. NJ specimens recorded on *Ulmus* sp.

Appearance: 5-9 mm long. Blue, green, or purple. Elytra with three pairs of blue-green depressions. Male face metallic green.

Comments: Reported from the sapwood of dead alder and swamp white oak (Knull 1920) and dead downy serviceberry (Nelson et al. 1981). The record of this species breeding in pine is likely erroneous (MacRae 2006).

Chrysobothris cribraria Mannerheim, 1837

Synonym(s): N/A

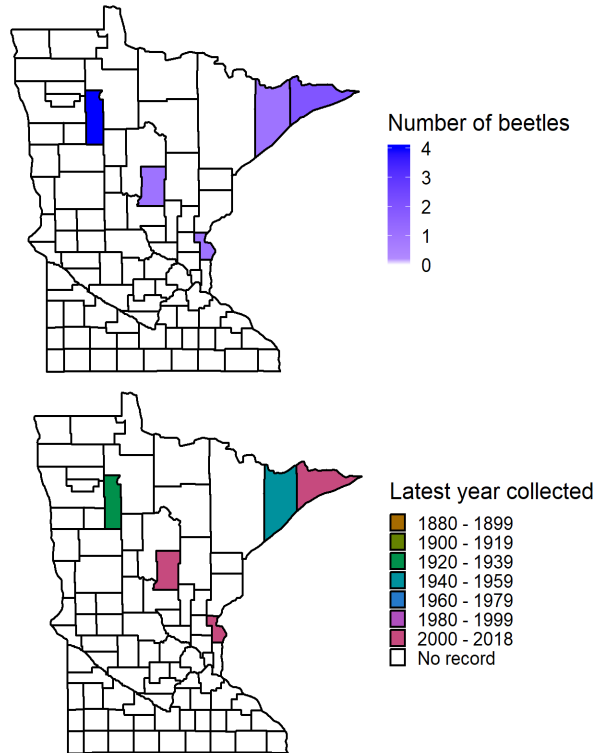
Common Name: N/A

Total in collection: 10

MN occurrence: May 25 – August 26



Photo by Luke Tembrock, [Museum Collections: Coleoptera](#), USDA
APHIS PPO is licensed under [CC BY-NC 3.0](#)



Range: Throughout eastern and central US and CA: Quebec to Florida and Northwest Territories to Texas

Larval MN host: *Pinus resinosa* Ait., *P. rigida* Mill., *P. strobus* L., and *P. sylvestris* L.

Adult MN host: Unknown

Collection method: In Lindgren funnel trap on *P. banksiana* Lamb.

Appearance: 7-14 mm long. Black with gold reflections. Elytra with two pairs of gold depressions, including a small round one near the mid-length and a larger irregular one after. Male face metallic green.

Comments: Reared from the trunk of a dead red pine, among other pine species (MacRae 2006).

Chrysobothris dentipes (Germar, 1824)

Synonym(s): *Chrysobothris characteristica* Harris, *C. planata* Gory & Laporte, *C. posticalis* Gory & Laporte.

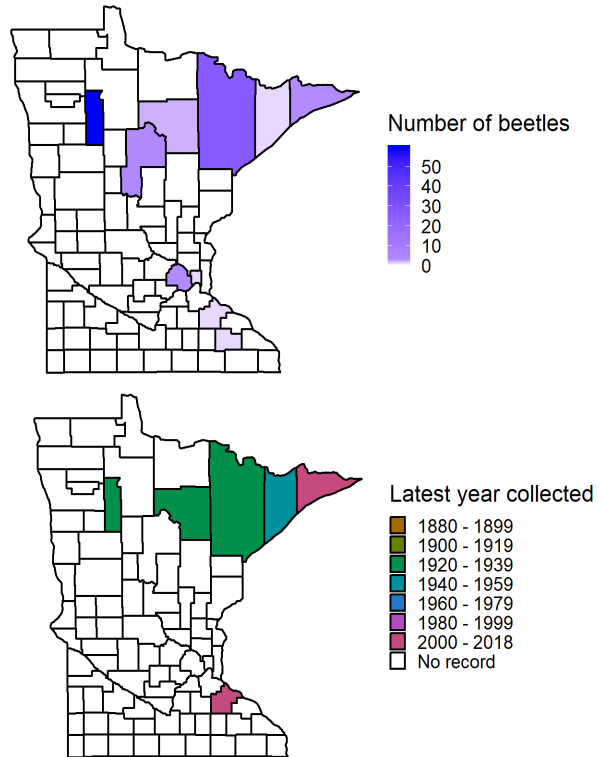
Common Name: N/A

Total in collection: 103

MN occurrence: May 28 – August 26



"CNC COLEO 00156809" by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under [CC BY-NC-SA 3.0](https://creativecommons.org/licenses/by-nc-sa/3.0/)



Range: According to Nelson et al (2008) in pine regions of US, CA, and MX. Widely distributed throughout North America

Larval MN host: *Abies balsamea* (L.) Mill., *Larix laricina* (Du Roi) K. Koch., and *Pinus strobus* L.

Adult MN host: *L. laricina* and *P. strobus*.

Collection method: Adults collected on *L. laricina* logs and *P. strobus*, in Lindgren funnel trap on *P. banksiana* Lamb., and as *Cerceris fumipennis* prey

Appearance: 12-18 mm long. Black with gold reflections; tips of antennae bright orange. Elytra with two pairs of gold depressions.

Comments: Despite its wide distribution, adults show little variation in appearance (Horn 1886).

Chrysobothris femorata (Olivier, 1790)

Synonym(s): *Chrysobothris dissimilis* Gory, *Buprestis insculpta* Herbst, *C. nigritula* Gory & Laporte, *C. obscura* LeConte

Common Name: Flat-headed appletree borer

Total in collection: 204

MN occurrence: May 5 – August 19

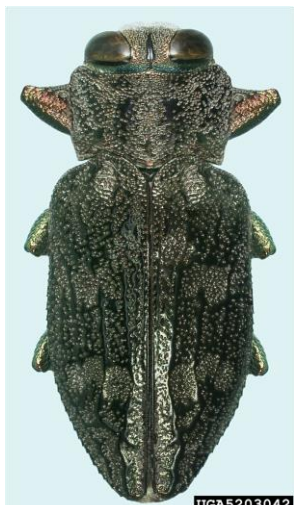
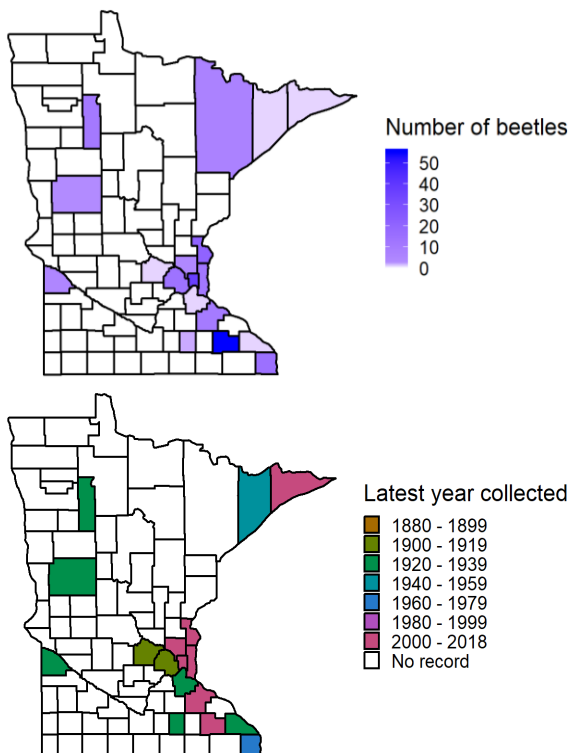


Photo by Natasha Wright, Cook's Pest Control is licensed under CC BY 3.0



Range: Throughout North America: Quebec/New Brunswick to British Columbia and all US continental states. Additionally Mexico

Larval MN host: *Acer negundo* L., *A. rubrum* L., *A. saccharinum* L., *Amelanchier arborea* (Michx. f.) Fern., *Carpinus caroliniana* Walt., *Celtis occidentalis* L., *Crataegus* sp., *Fraxinus pennsylvanica* Marsh., *Juglans cinerea* L., *J. nigra* L., *Malus* sp., *Populus tremuloides* Michx., *Prunus domestica* L., *Quercus alba* L., *Sorbus americana* Marsh., *Tilia americana* L. var. *americana*, and *Ulmus americana* L.

Adult MN host: Additionally *Larix laricina* (Du Roi) K. Koch.

Collection method: Collected from dying *L. laricina*, from window traps in damaged *Quercus* sp., in bait trap, breeding cages, at light, Malaise trap, in Lindgren funnel trap on *Pinus banksiana* Lamb., and as *Cerceris fumipennis* prey

Appearance: 7-16 mm long. Black with gold reflections. Elytra with three pairs of gold depressions. Male face metallic green.

Comments: A common prey item of *C. fumipennis*. Several members of this group, including *Chrysobothris quadriimpressa*, *C. rugosiceps*, and *C. shawnee*, may be conspecific with *C. femorata* (Hansen et al. 2015). A pest in many deciduous trees throughout North America, infestations can be detected by white, frothy sap emerging from cracks in bark, usually in wounded or drought-stressed trees (Solomon 1995).

Chrysobothris harrisi (Hentz, 1827)

Synonym(s): N/A

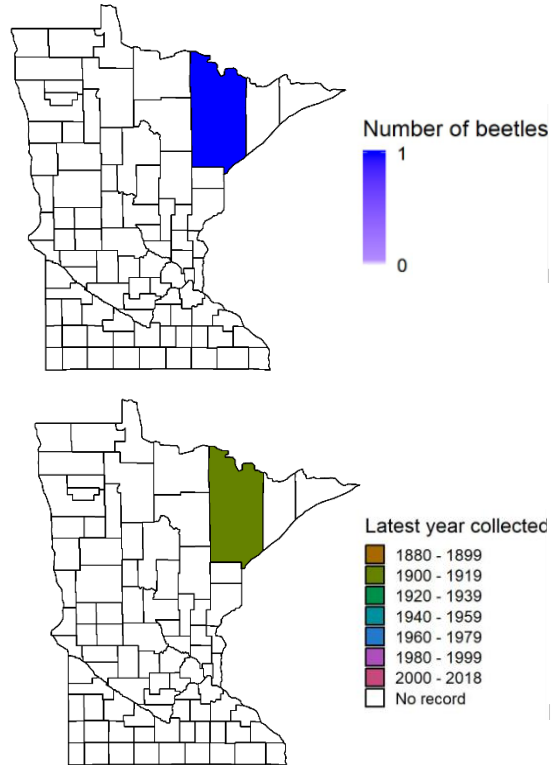
Common Name: N/A

Total in collection: Literature record only
(Westcott 2005)

MN occurrence: July 16



[Photo](#) © 2010 Frank Guarnieri,



Range: Throughout eastern and central US and CA: Nova Scotia to Florida and British Columbia to South Dakota

Larval MN host: *Picea glauca* (Moench) Voss and *Pinus strobus* L.

Adult MN host: Unknown

Collection method: Unknown

Appearance: 6-9 mm long. Metallic green or blue-green.

Comments: Reported in dead pine (Knull 1922) and small branches of white pine (Fisher 1942).

Chrysobothris mali Horn, 1886

Synonym(s): N/A

Common Name: Pacific flatheaded borer

Total in collection: Literature record only (Chamberlin 1926)

MN occurrence: Unknown



[Photo](#) by Tom Murray is licensed under [CC BY-NC-ND 1.0](#)

Range: Throughout western and central US and CA: Manitoba to Texas and British Columbia to California

Collection method: Unknown

Appearance: 6-12 mm long. Dark gold to red. Elytra with three pairs of gold depressions.

Comments: This species is known to have a primarily western U.S. distribution. The MN record is likely erroneous and this species is excluded from the checklist of MN species (Hallinen et al. 2021). Larvae occasionally girdle small trees and are especially damaging in nursery stock, damaging or disfiguring many kinds of shade, fruit, and nut trees (Solomon 1995).

Chrysobothris neopusilla Fisher, 1942

Synonym(s): N/A

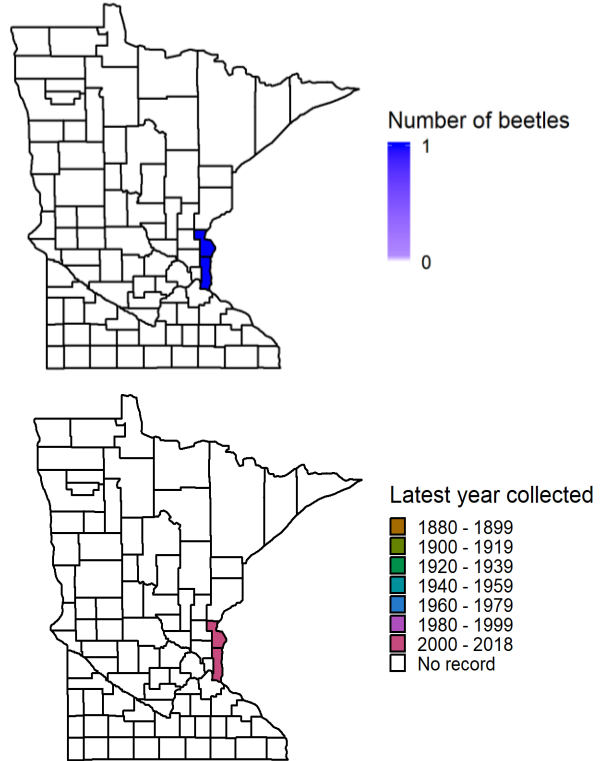
Common Name: N/A

Total in collection: 2

MN occurrence: June 30 – July 17



Photo © 2019 Frank Guarnieri



Range: Throughout eastern US and CA: Quebec to Georgia and Manitoba to Minnesota

Larval MN host: *Picea mariana* B.S.P.

Adult MN host: Additionally *P. glauca* (Moench) Voss.

Collection method: *Cerceris fumipennis* prey

Appearance: 6-8 mm long. Black with gold reflections. Elytra with three pairs of gold depressions. Male face metallic green.

Comments: 10 of the original 14 type specimens were collected from wasp cells in 1879 in Virginia (Fisher 1942).

Chrysobothris orono Frost, 1920

Synonym(s): N/A

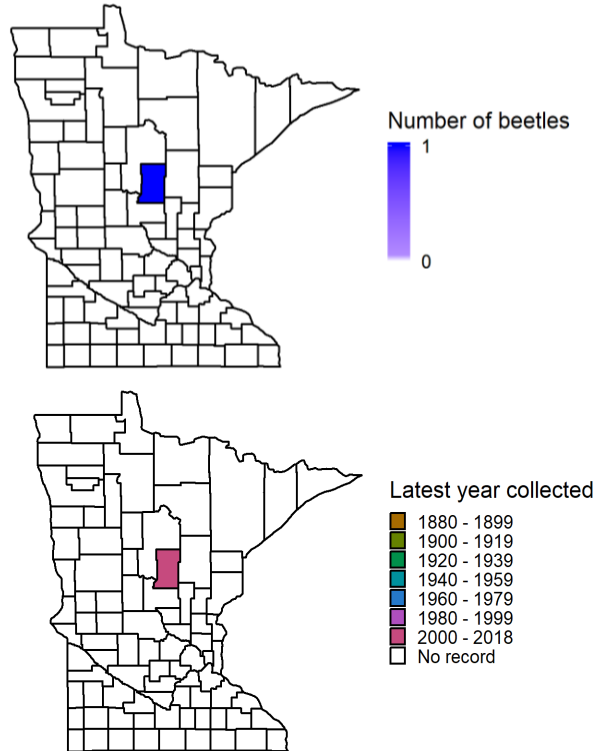
Common Name: N/A

Total in collection: 1

MN occurrence: July 13



Photo by Jennifer Forman Orth, is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern US and CA: Maine to Georgia and Manitoba to Minnesota

Larval MN host: *Pinus banksiana* Lamb. and *P. resinosa* Ait.

Adult MN host: Unknown

Collection method: *Cerceris fumipennis* prey

Appearance: 14-17 mm long. Black with gold reflections in elytral depressions. Male face metallic green.

Comments: Has a two-year life cycle in living red pines in Michigan (see Wilson 1969). The first three instars feed under the bark, cutting to the cambium and partially girdling the tree. Larvae then bore into the xylem to overwinter as fifth instars. While *Chrysobothris orono* attacks living trees, it mainly attacks trees already under stress due to other insect attacks or poor site conditions. It generally has a small population and does little damage (Wilson 1969).

Chrysobothris pusilla Gory and Laporte, 1837

Synonym(s): *Chrysobothris strangulata* Melsheimer

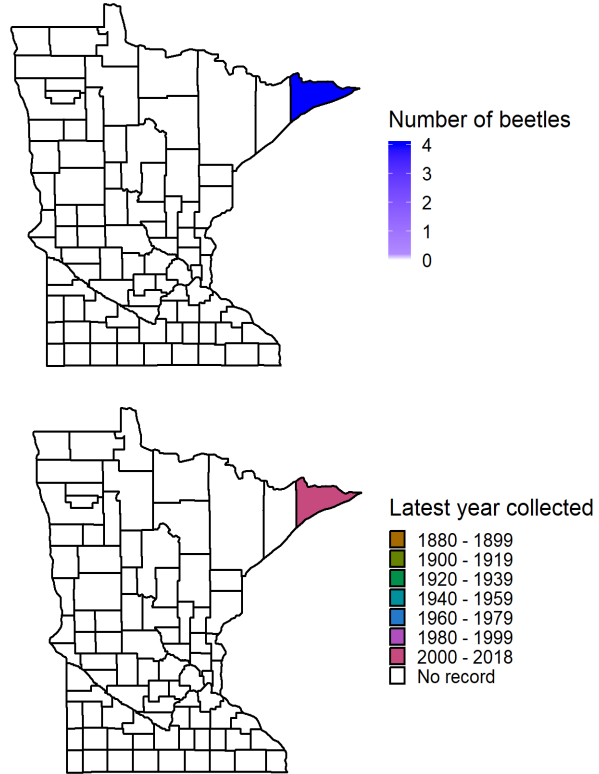
Common Name: N/A

Total in collection: 4

MN occurrence: August 12 – 27
(trap interval)



["CNC COLEO 00156833"](#) by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under [CC BY-NC-SA 3.0](#)



Range: Throughout eastern and central US and CA: Nova Scotia to Florida and Manitoba to Louisiana

Larval MN host: *Pinus rigida* Mill. and *Tsuga canadensis* (L.) Carr.

Adult MN host: Additionally *P. banksiana* Lamb. and *P. strobus* L.

Collection method: Collected in Lindgren funnel trap on *P. banksiana*.

Appearance: 6-8 mm long. Black with gold reflections. Elytra with three pairs of gold depressions. Similar in appearance to *Chrysobothris neopusilla*, but lacking metallic green face in male.

Comments: Recorded breeding in dead branches of pitch pine and eastern hemlock (Fisher 1942).

Chrysobothris quadriimpressa Gory and Laporte, 1837

Synonym(s): N/A

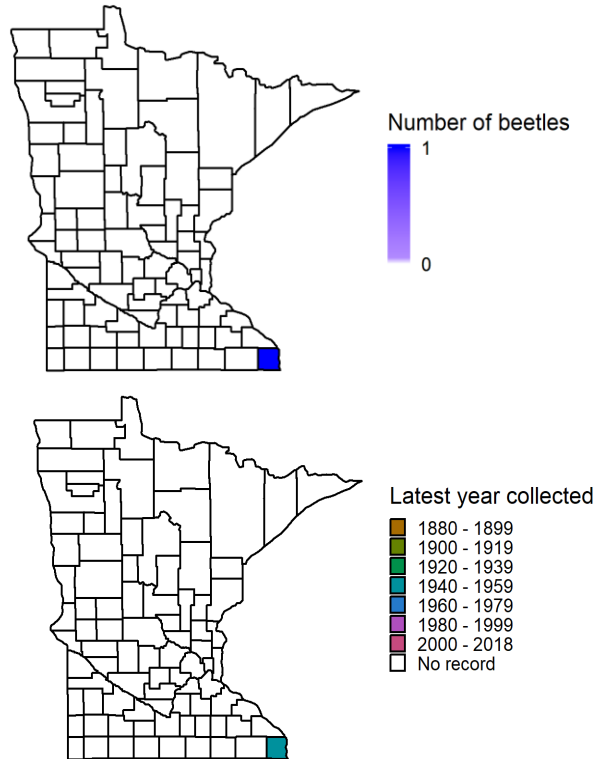
Common Name: N/A

Total in collection: 1

MN occurrence: May 31



Photo by Hannah Royals, [Museum Collections: Coleoptera](#), USDA
APHIS PPQ is licensed under [CC BY-NC 3.0](#)



Range: Throughout most of US: Maine to Florida and Oregon to Arizona/Texas

Larval MN host: *Juglans nigra* L., *Quercus alba* L., and *Q. rubra* L.

Adult MN host: Unknown

Collection method: Unspecified

Appearance: 7-16 mm long. Black with gold reflections. Elytra with three pairs of gold depressions. A member of the *Chrysobothris femorata* species group and difficult to differentiate from other members.

Comments: Molecular data suggest this species may be hybridizing with or a synonym for *C. femorata* (Hansen et al. 2015). Known as a common oak inhabiting species, 12 potential specimens were reared from the bark of a large dead butternut (*J. cinerea*) tree in Michigan, although these may represent a separate species (Wellso and Manley 2007). Prefers branches 4 in or less in diameter (Wellso and Manley 2007).

Chrysobothris rotundicollis Gory and Laporte, 1837

Synonym(s): *Chrysobothris blanchardi* Horn, *C. columbiana* Barr

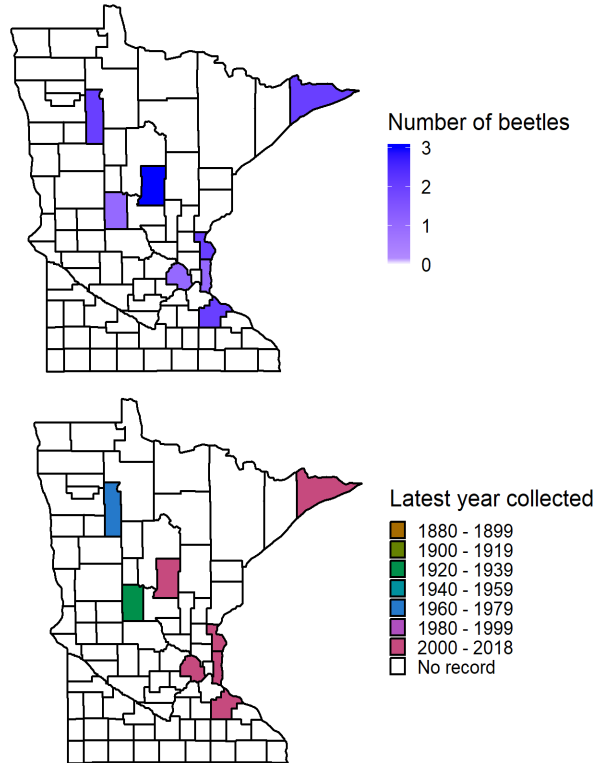
Common Name: N/A

Total in collection: 14

MN occurrence: June 28 – August 12



Photo by Mike Quinn is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout most of US and CA: Quebec/ New Brunswick to Florida and British Columbia to Arizona/Texas

Larval MN host: *Larix laricina* (Du Roi) K. Koch., *Pinus rigida* Mill., and *P. strobus* L.

Adult MN host: *P. banksiana* Lamb.

Collection method: Collected on *P. banksiana* log, in Lindgren funnel trap on *P. banksiana*, and as *Cerceris fumipennis* prey

Appearance: 10-14 mm long. Black with gold reflections. Elytra with punctured surface and larger indistinct gold depressions.

Comments: Reared from the bark of dead pines and tamarack (Fisher 1942).

Chrysobothris rugosiceps Melsheimer, 1845

Synonym(s): *Chrysobothris alabamae* Gory

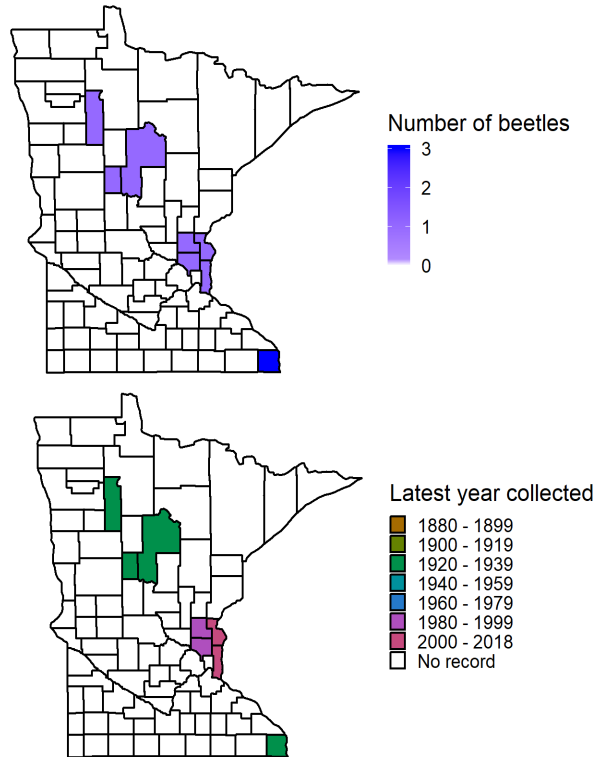
Common Name: N/A

Total in collection: 10

MN occurrence: May 13 – July 29



"CNC COLEO.00152523" by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under CC BY-NC-SA 3.0



Range: Throughout eastern and central US and CA: Quebec to Florida and Manitoba to Texas

Larval MN host: *Quercus alba* L., *Q. macrocarpa* Michx. and *Q. velutina* Lam.

Adult MN host: Additionally *Carya ovata* (Mill.) K. Koch.

Collection method: *Cerceris fumipennis* prey

Appearance: 9-16 mm long. Black with gold reflections. Elytra with three pairs of gold or green depressions. Male face metallic green. A member of the *Chrysobothris femorata* species group and difficult to differentiate from other members.

Comments: Molecular data suggest this species may be hybridizing with or a synonym for *C. femorata* (Hansen et al. 2015). Reared from dead oak (Nelson et al. 1996). Often collected on oaks alongside *C. quadriimpressa* and *C. shawnee*, preferring larger branches or trunks (Wellso and Manley 2007).

Chrysobothris scabripennis Gory and Laporte, 1837

Synonym(s): *Chrysobothris proxima* Kirby, *C. scabra* Gory

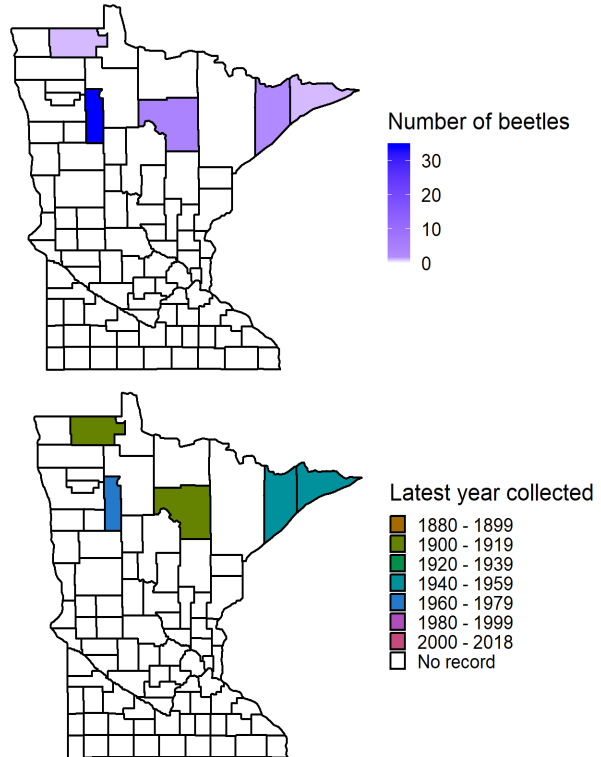
Common Name: N/A

Total in collection: 42

MN occurrence: May 5 – August 21



"CNC COLEO 00156836" by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under CC BY-NC-SA 3.0



Range: Eastern US and most of CA: Nova Scotia to Georgia and British Columbia to Minnesota

Larval MN host: *Picea galuca* (Moench) Voss, *Pinus strobus* L., and *Tsuga canadensis* (L.) Carr.

Adult MN host: *Larix laricina* (Du Roi) K. Koch.

Collection method: Collected from dying *L. laricina* and *L. laricina* logs

Appearance: 9-13 mm long. Black with gold reflections on head and elytra, and green reflections on antenna and legs. Elytra with three pairs of gold depressions, but often indistinct or broken. Male face metallic green.

Comments: Reported in dead white pine and hemlock (Knull 1922).

Chrysobothris sexsignata Say, 1839

Synonym(s): *Chrysobothris sexguttata* Say, *C. germari* Gory & Laporte, *C. ignipes* Gory & Laporte

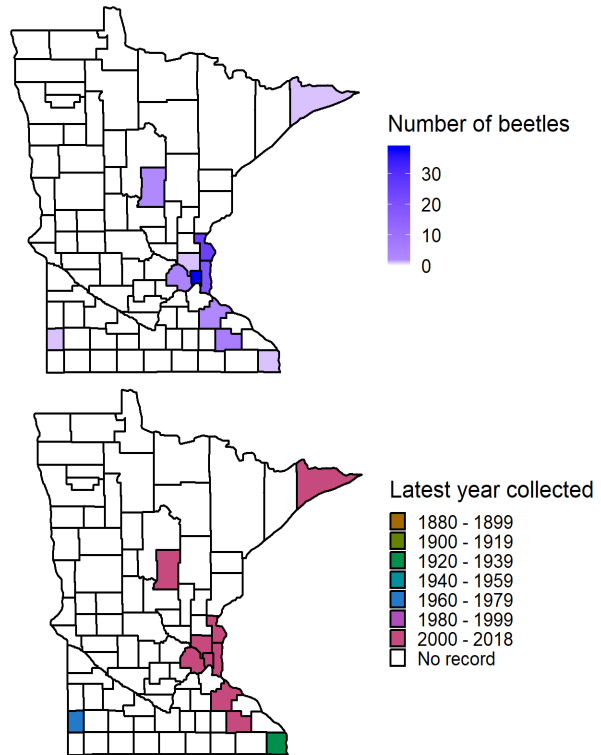
Common Name: N/A

Total in collection: 102

MN occurrence: May 24 – August 11



Photo © 2018 Frank Guarnieri.



Range: Throughout eastern and central US and CA: Nova Scotia to Florida and Ontario to Texas

Larval MN host: *Acer rubrum* L., *A. saccharum* Marsh., *Amelanchier arborea* (Michx. f.) Fern., *Betula alleghaniensis* Britt., *B. nigra* L., *Carya ovata* (Mill.) K. Koch, *Celtis occidentalis* L., *Fagus* sp., *Fraxinus americana* L., *F. nigra* Marsh., *F. pennsylvanica* Marsh., *F. quadrangulata* Michx., *Gleditsia tricanthos* L., *Juglans cinerea* L., *J. nigra* L., *Larix laricina* (Du Roi) K. Koch, *Picea mariana* (Mill.) B.S.P., *Pinus rigida* Engelm., *Quercus alba* L., *Q. bicolor* Willd., *Q. macrocarpa* Michx., *Q. muehlenbergii* Engelm., *Tsuga canadensis* (L.) Carr., *Ulmus rubra* Muhl., and *Vitis* sp.

Adult MN host: Additionally *Acer saccharinum* L. and *Sorbus aucuparia* L.

Collection method: Collected at light, Malaise trap, in Lindgren funnel trap on *Pinus banksiana* Lamb., and as *C. fumipennis* prey

Appearance: 6-13 mm long. Black with gold reflections. Male face metallic green. Elytra with three distinct pairs of red, gold, or green depressions.

Comments: A common prey item of *C. fumipennis* in MN. Reported emerging from dead branches in many kinds of trees, this species has at least three dozen reported larval hosts (MacRae 2006).

Chrysobothris shawnee Wellso and Manley, 2007

Synonym(s): N/A

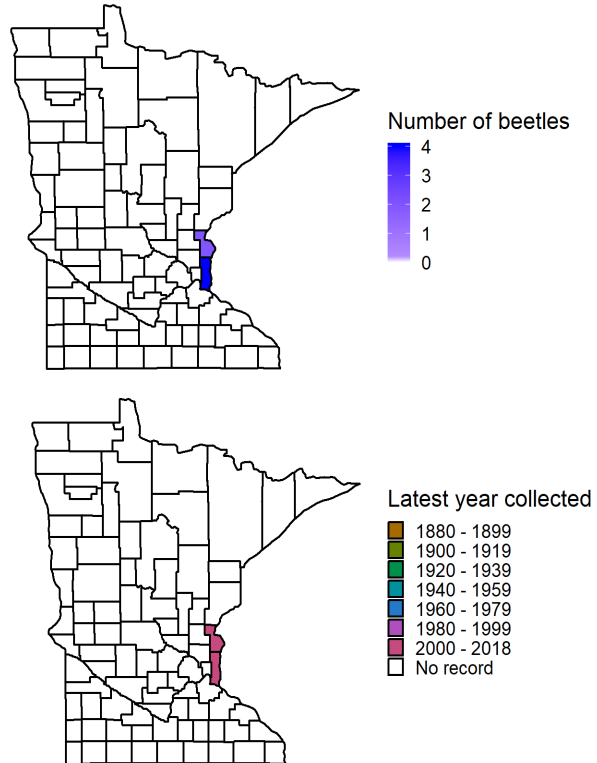
Common Name: N/A

Total in collection: 6

MN occurrence: July 16 – August 8



Photo by Seastone, L. and B. Parks, [Museum Collections](#):
Coleoptera, USDA APHIS PPQ is licensed under CC BY-NC 3.0



Range: Throughout eastern and central US: New Hampshire to Florida and Minnesota to Colorado/Texas

Larval MN host: *Quercus* sp.

Adult MN host: Additionally *Fraxinus pennsylvanica* Marsh., *Quercus alba* L., *Q. bicolor* Willd., *Q. rubra* L., and *Q. velutina* Lam.

Collection method: All collected as *Cerceris fumipennis* prey

Appearance: 7-16 mm long. Black with gold reflections. Elytra with three pairs of gold depressions. A member of the *Chrysobothris femorata* species group and difficult to differentiate from other members.

Comments: Molecular data suggest this species may be hybridizing with or a synonym for *C. femorata* (Hansen et al. 2015). Often collected on oaks alongside *C. quadriimpressa* and *C. rugosiceps*, preferring larger branches or trunks (Wellso and Manley 2007).

Chrysobothris trinervia Kirby, 1837

Synonym(s): *Chrysobothris cicatricosa* Motschulsky

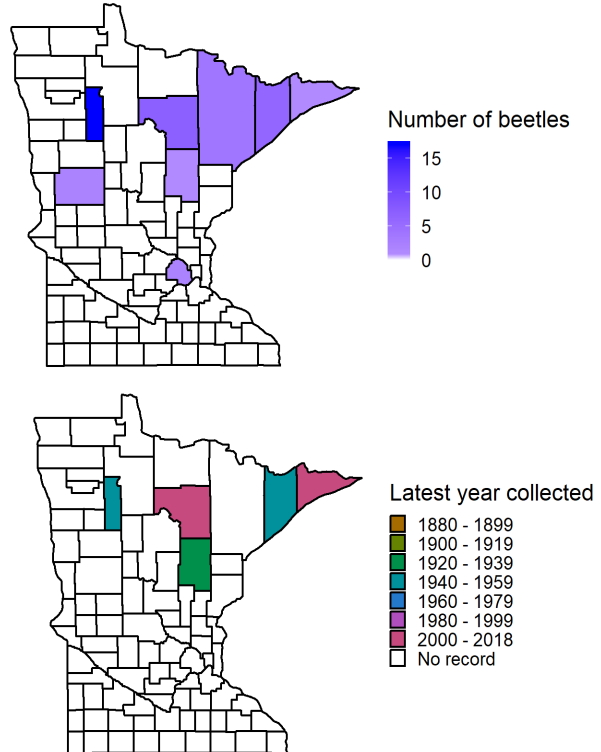
Common Name: N/A

Total in collection: 40

MN occurrence: May 28 – August 17



"JSYKB-156" by CNC/BIO Photography Group, Centre for Biodiversity
Genomics is in the Public Domain, CC0



Range: Throughout northern and western US and most of CA: Nova Scotia to Pennsylvania and Alaska to California/New Mexico

Larval MN host: *Larix laricina* (Du Roi) K. Koch, *Picea* sp., and *Pseudotsuga menziesii* (Mirb.) Franco.

Adult MN host: Additionally *Abies* sp., *Pinus banksiana* Lamb., and *P. strobus* L.

Collection method: Collected from dying *L. laricina* and *L. laricina* logs and in Lindgren funnel trap on *P. banksiana*

Appearance: 10-13 mm long. Black with gold reflections. Elytra with three pairs of depressions, but often interrupted by interconnecting ridges.

Comments: Reported mining the bark and sapwood of dead and dying pines (Burke 1918). Additionally, reported killing ponderosa pine saplings in the Black Hills, South Dakota in the early 1900s by girdling them close to the ground (Burke 1918).

Chrysobothris verdigripennis Frost, 1910

Synonym(s): N/A

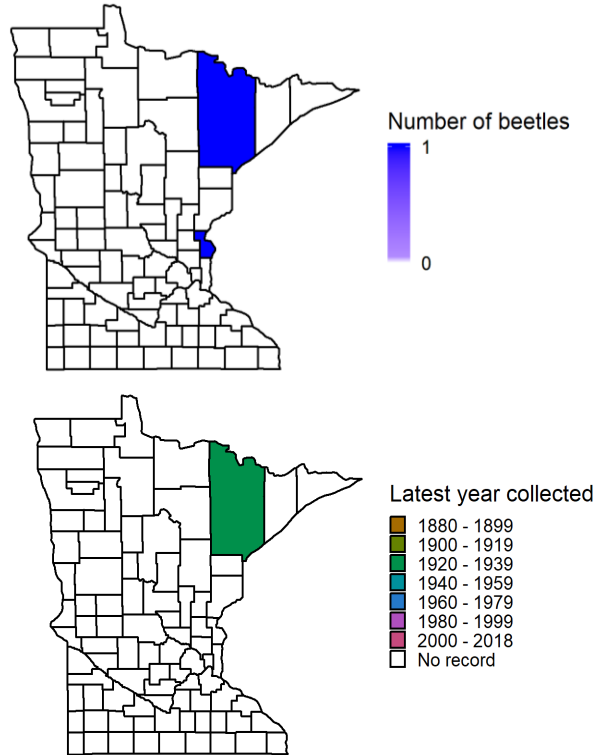
Common Name: N/A

Total in collection: 2

MN occurrence: June 15



"CNC COLEO 00156839" by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under [CC BY-NC-SA 3.0](https://creativecommons.org/licenses/by-nc-sa/3.0/)



Range: Throughout eastern US and most of CA: Nova Scotia to South Carolina and Northwest Territories to Minnesota

Larval MN host: *Picea abies* (L.) Karst and *Tsuga canadensis* (L.) Carr.

Adult MN host: Additionally *Abies balsamea* (L.) Mill., *Fagus grandifolia* Ehrh., *P. glauca* (Moench) Voss, and *Pinus* sp.

Collection method: Unspecified

Appearance: 12-16 mm long. Black with gold or green reflections. Elytra with three pairs of depressions, but often interrupted by interconnecting ridges. Yellow markings on male antennomeres.

Comments: Reported in injuries and scars in living hemlock, pupating in the sapwood (Knull 1922).

Chrysobothris viridiceps Melsheimer, 1845

Synonym(s): *Chrysobothris lesueuri* Gory & Laporte

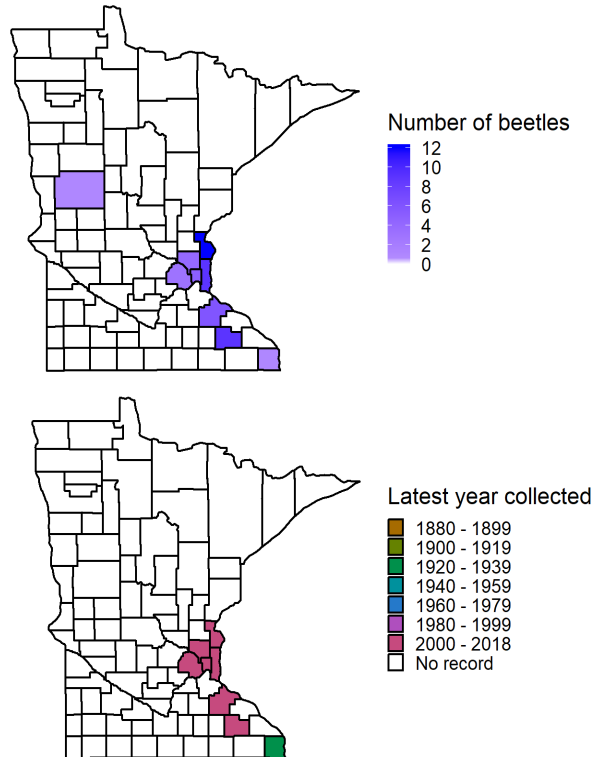
Common Name: N/A

Total in collection: 50

MN occurrence: May 29 – July 29



Photo by Mike Quinn is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern and central US and CA: New Hampshire to Florida and Manitoba to New Mexico/Texas

Larval MN host: *Acer rubrum* L., *Pinus* sp., *Quercus alba* L., *Q. macrocarpa* Michx., and *Quercus* sp.

Adult MN host: Additionally *A. saccharinum* L., *Carya ovata* (Mill.) K. Koch, *Quercus bicolor* Willd., *Q. velutina* Lam., and *Ulmus americana* L.

Collection method: *Cerceris fumipennis* prey

Appearance: 8-13 mm long. Black with gold reflections. Male face metallic green and male antennomeres with yellow margins. Elytra with three pairs of gold depressions. A member of the *Chrysobothris femorata* species group and difficult to differentiate from other members.

Comments: Reported emerging from dead *Quercus* sp. (MacRae 1991).

Dicerca asperata (Laporte and Gory, 1837)

Synonym(s): *Dicerca molitor* Melsheimer

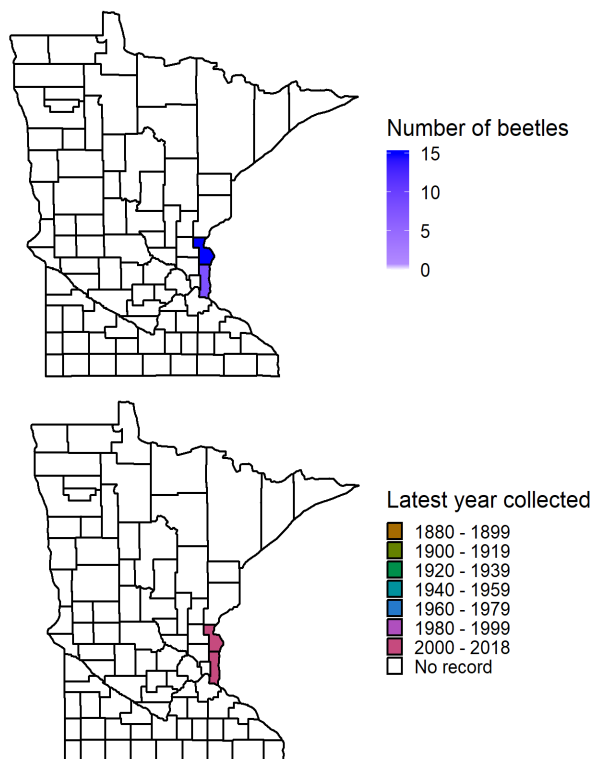
Common Name: N/A

Total in collection: 23

MN occurrence: May 5 – August 11



Photo by Mike Quinn is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern and central US and CA: Quebec to Florida and Ontario to Texas

Larval MN host: *Quercus* sp.

Adult MN host: *Quercus* sp.

Collection method: Collected from beating *Quercus* sp. and as *Cerceris fumipennis* prey

Appearance: 10-23 mm long. Gold to black. Well-developed channel in center of the pronotum. Elytra with distinct raised areas and with indentations at tips. Some specimens have a powdered appearance on the head, thorax, and elytra due to fine white hairs.

Comments: Museum specimens may lose the powdery appearance compared to freshly caught beetles (Nelson 1975).

Dicerca callosa callosa Casey, 1909

Synonym(s): *Dicerca rigida* Casey, *D. tetrica* Casey

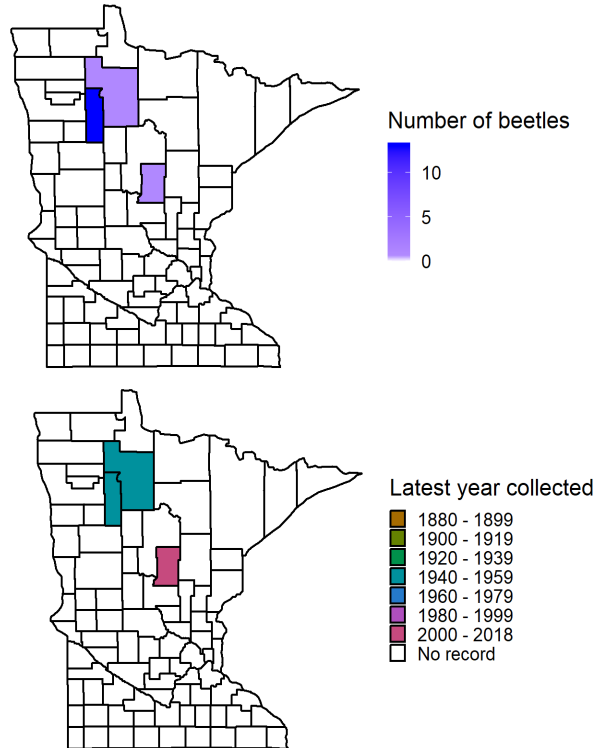
Common Name: N/A

Total in collection: 15

MN occurrence: June 14 – August 9



"UAM:Ento:24297" by Derek Sikes, University of Alaska Museum is licensed under [CC BY-NC 3.0](https://creativecommons.org/licenses/by-nc/3.0/)



Range: Throughout northern US and most of CA: Quebec to New York and Alaska to Colorado

Larval MN host: Unknown

Adult MN host: *Betula* sp., *Populus tremuloides* Michx., and *Salix* sp.

Collection method: Adults collected on weeds and as *Cerceris fumipennis* prey

Appearance: 12-20 mm long. Gold to black. Pronotum with round edges (widest at mid-length), and well-developed central channel.

Comments: One of two subspecies. The other, *D. callosa frosti* Nelson, occurs in the western US as far east as CO. There are no known larval hosts for this species, although it is most often collected on quaking aspen (Nelson 1975).

Dicerca caudata LeConte, 1860

Synonym(s): *Dicerca abrupta* Casey, *D. biangulata* Casey, *D. inflatula* Casey, *D. pisciformis* Casey, *D. cupreola* Casey

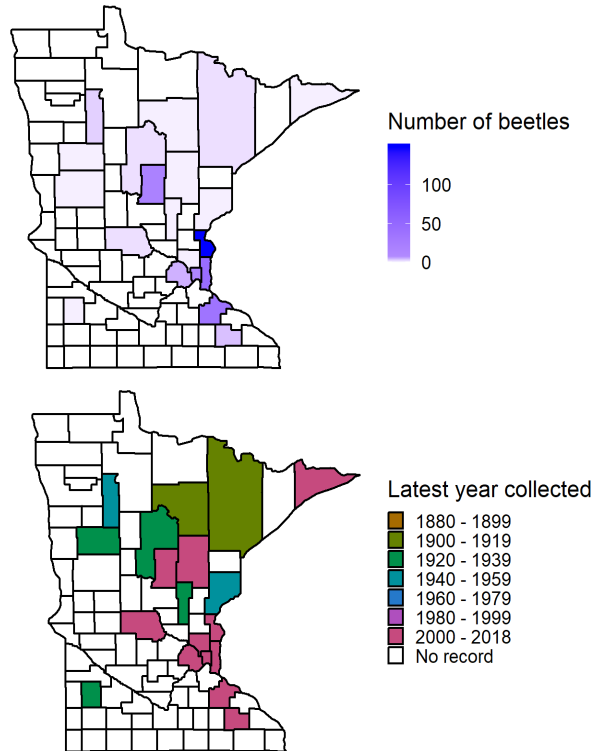
Common Name: N/A

Total in collection: 290

MN occurrence: May 3 – August 13



"10PCCOL-0691" by CBG Photography Group, Centre for Biodiversity Genomics is in the Public Domain, CC0



Range: Throughout most of US and CA: Nova Scotia to North Carolina and Alaska to Arizona

Larval MN host: *Alnus* sp. and *Betula nigra* L.

Adult MN host: *Larix laricina* (Du Roi) K. Koch., additionally *Alnus incana* (L.) Moench, *Crataegus* sp., and *Prunus virginiana* L.

Collection method: *Cerceris fumipennis* prey

Appearance: 12-19 mm long. Gold to black. Pronotum widest at base. Channel in center of pronotum present, but interrupted medially.

Comments: A common prey item of *C. fumipennis* in MN. Easily confused with *D. divaricata*, but can be differentiated based on the shape of the pronotum.

Dicerca divaricata (Say, 1823)

Synonym(s): *Dicerca aurichalcea* Melsheimer, *D. dubia* Melsheimer, *D. parumpunctata* Melsheimer, *D. subaequalis* Casey, *D. nigra* Casey, *D. aestiva* Casey, *D. rustica* Casey, *D. vancouveri* Casey, *D. angusticauda* Casey

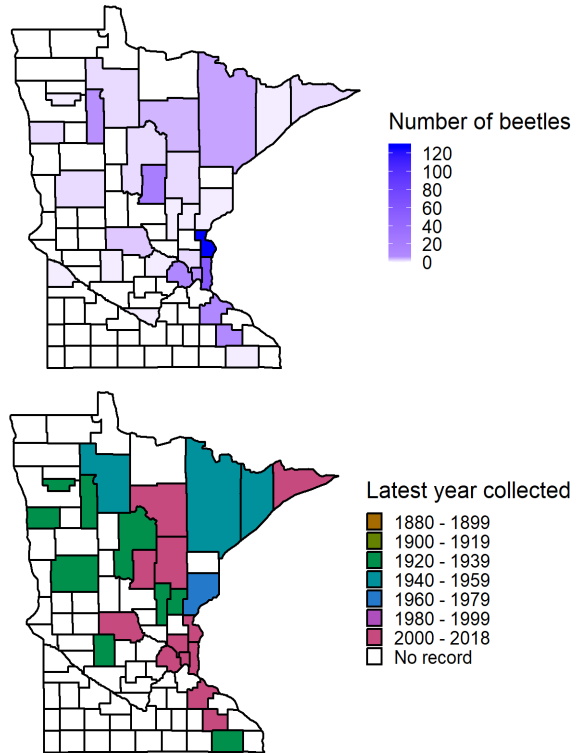
Common Name: Flat-headed hardwood borer

Total in collection: 281

MN occurrence: May 4 – October 21



Photo © 2013 Joshua P. Basham



Range: Throughout eastern and central US and CA: Nova Scotia to Florida and Alberta to Utah/Texas

Larval MN host: *Acer pennsylvanicum* L., *A. saccharum* Marsh., *Betula lenta* L., *Fraxinus americana* L., *F. nigra* Marsh., *Ostrya virginiana* (Mill.) K. Koch., *Quercus alba* L., *Q. rubra* L., and *Ulmus americana* L.

Adult MN host: Additionally *Abies* sp., *Acer negundo* L., *A. rubrum* L., *Betula alleghaniensis* Britt., *Fagus grandifolia* Ehrh., *Larix laricina* (Du Roi) K. Koch, *Pinus* sp., *Populus balsamifera* L., and *Prunus* sp.

Collection method: Collected from *L. laricina* logs, in Lindgren funnel trap on *Pinus banksiana* Lamb., and as *Cerceris fumipennis* prey

Appearance: 15-22 mm long. Gold, sometimes with green reflections. Pronotum widest at mid-length, with center channel faintly present.

Comments: Reared from the dead wood of many different kinds of trees (Knull 1920). A common prey item of *C. fumipennis* in MN.

Dicerca lepida LeConte, 1857

Synonym(s): N/A

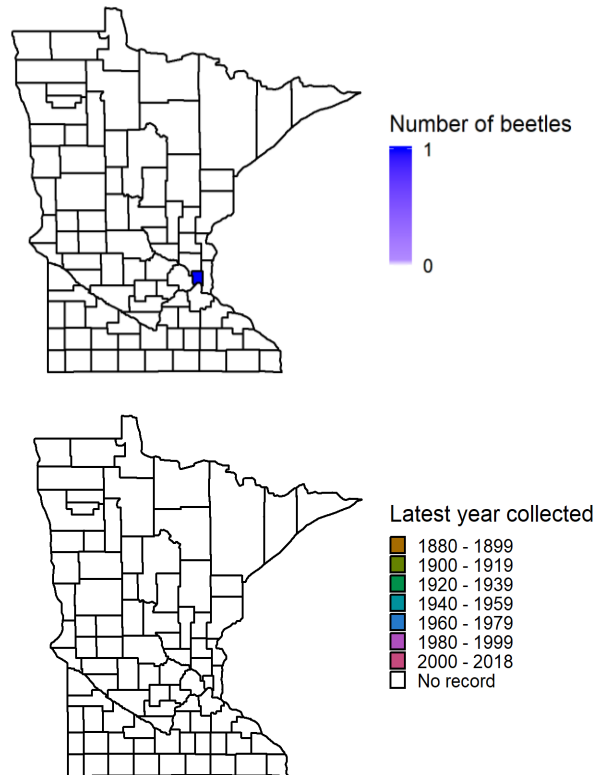
Common Name: Embossed hawthorn buprestid

Total in collection: 1

MN occurrence: Unspecified



Photo © 2011 Joshua P. Basham



Range: Throughout eastern and central US and CA: New York to Alabama and Ontario to New Mexico/Texas. Primarily southern in distribution

Larval MN host: *Crataegus chrysocarpa* Ashe var. *chrysocarpa* and *Ostrya virginiana* (Mill.) K. Koch.

Adult MN host: Additionally *Quercus* sp.

Collection method: Unspecified

Appearance: 13-18 mm long. Gold. Pronotum with parallel sides on bottom half. Channel in center of pronotum present, but interrupted medially. Elytra with moderately raised areas and indentations at tips.

Comments: Females lay eggs in dead branch stubs or wounded sites. Larvae burrow downward into living wood for 1-3 cm and then turn upward for another 1-3 cm, forming “cavelike” burrows with short extensions. Often recorded from dead trees, and usually not seriously damaging in living trees (Solomon 1995).

Dicerca lugubris LeConte, 1860

Synonym(s): *Dicerca lacustris* LeConte, *D. morio* Casey, *D. autera* Casey

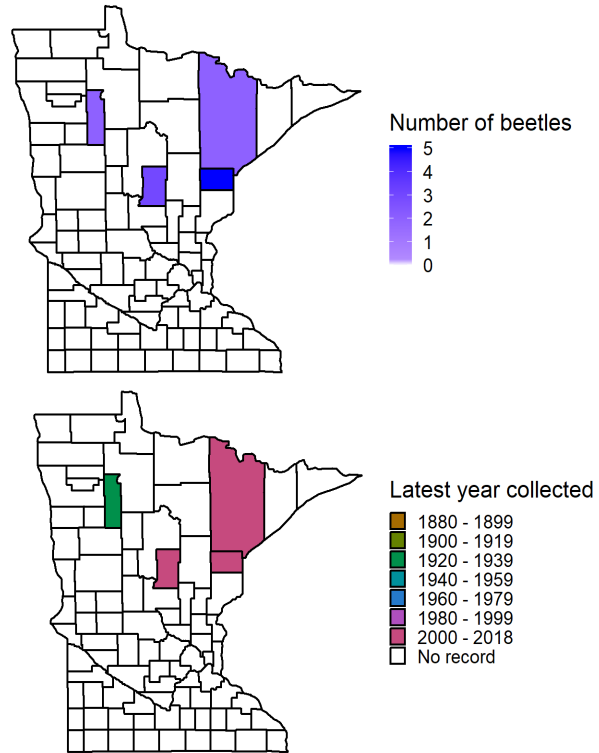
Common Name: N/A

Total in collection: 16

MN occurrence: May 31 – August 2



"CNC COLEO 00156705" by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under CC BY-NC-SA 3.0



Range: Throughout northeastern and central US and eastern and central CA: Quebec to Michigan and Northwest Territories to Nebraska

Larval MN host: Unknown

Adult MN host: *Pinus banksiana* Lamb.

Collection method: In Lindgren funnel trap on *P. banksiana* baited with alpha-pinene and bark beetle pheromones and as *Cerceris fumipennis* prey

Appearance: 11-18 mm long. Gold to black. Pronotum widest at mid-length. Some specimens have a powdered appearance on the head, thorax, and elytra due to fine white hairs.

Comments: While the larval host for this species is unknown, others in its group are known to attack conifers (Nelson 1975).

Dicerca lurida (Fabricius, 1775)

Synonym(s): *Buprestis pruinosa* Gory, *D. indistincta* Melsheimer, *D. indurata* Casey, *D. gracilis* Casey, *D. truncata* Casey, *D. innocua* Casey, *D. porcatula* Casey, *D. sagax* Casey, *D. fl oridae* Casey, *D. regularis* Casey, *D. soror* Casey, *D. gaudens* Casey, *D. levettei* Casey, *D. erosa* Casey, *D. seriata* Casey

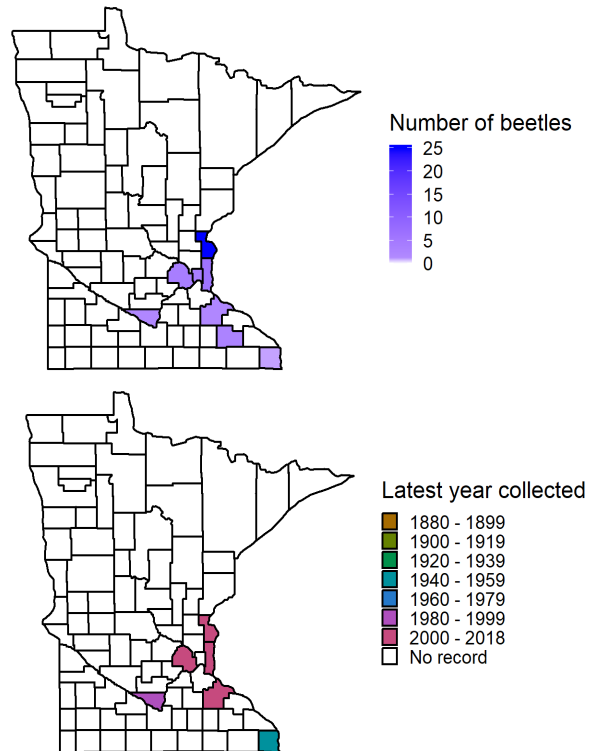
Common Name: N/A

Total in collection: 47

MN occurrence: May 15 – August 11



"CNC COLEO 00108336" by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under CC BY-NC-SA 3.0



Range: Throughout eastern and central US and CA: Quebec to Florida and Ontario to Texas

Larval MN host: *Alnus incana* (L.) Moench ssp. *rugosa* (DuRoi) Clausen, *Carpinus caroliniana* Walt., *Carya cordiformis* (Wangenh.) K. Koch, *Tilia americana* L.

Adult MN host: Additionally *Quercus alba* L. and *Q. velutina* Lam.

Collection method: *Cerceris fumipennis* prey

Appearance: 11-20 mm long. Gold. Pronotum with parallel sides on bottom half. Channel in center of pronotum indistinct. Elytra with indentations at tips.

Comments: Reported to breed in a variety of dead trees (Nelson 1920). Adults hibernate in the winter (Nelson 1975).

Dicerca pugionata (Germar, 1824)

Synonym(s): N/A

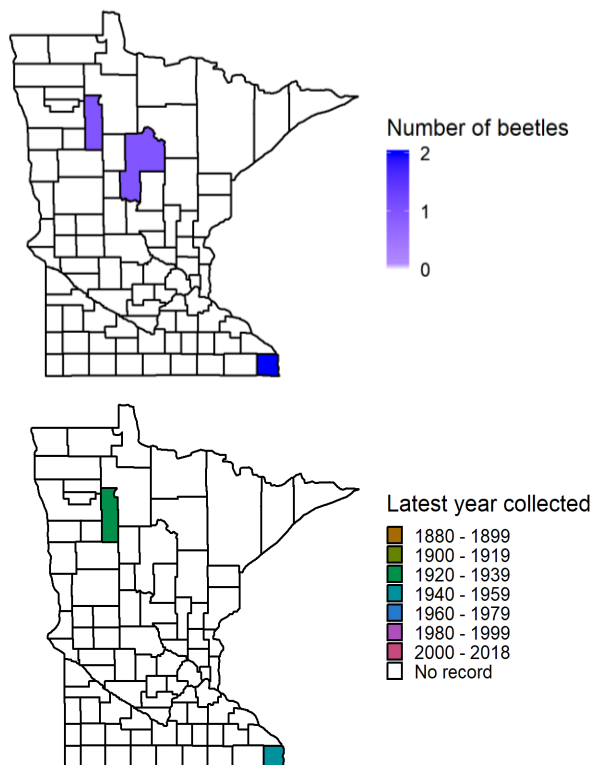
Common Name: Witch-hazel borer

Total in collection: 4

MN occurrence: May 27 – July 16



Photo © 2013 Frank Guarnieri.



Range: Throughout eastern and central US and CA: New Hampshire to Georgia and Ontario to Arkansas

Larval MN host: *Alnus incana* (L.) Moench, *Hamamelis virginiana* L., and *Physocarpus opulifolius* (L.) Maxim.

Adult MN host: Unknown

Collection method: Unspecified

Appearance: 11-15 mm long. Gold to black. Pronotum widest at base, with distinct central channel. Elytra with moderately raised areas and indentations at tips.

Comments: Unlike most *Dicerca* spp., reported to attack healthy trees (Nelson 1975). Can sometimes girdle and kill witch-hazel, but control for this species has not been needed (Solomon 1995).

Dicerca sexualis Crotch, 1873

Synonym(s): N/A

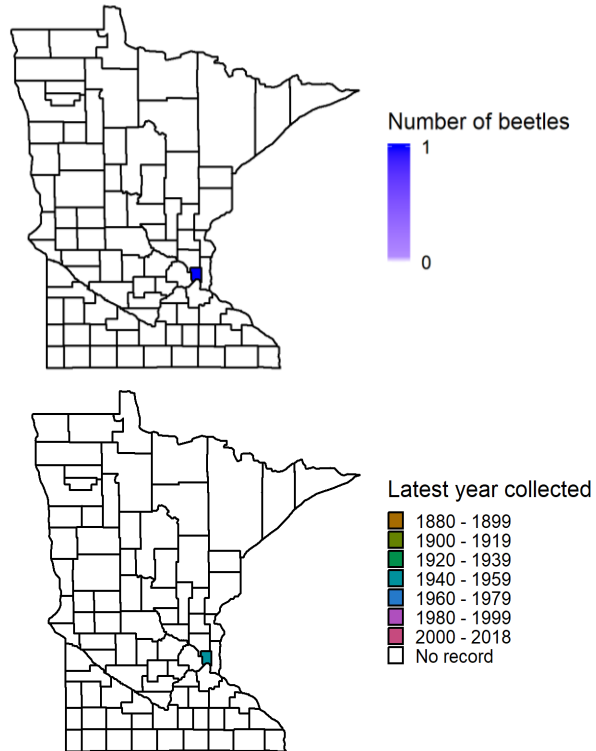
Common Name: N/A

Total in collection: 1

MN occurrence: May 16



Photo by Don Griffiths, courtesy of the Spencer Entomological Collection, Beaty Biodiversity Museum, UBC



Range: Throughout western US and CA: Montana to Nevada and British Columbia to California

Collection method: Unspecified

Appearance: Gold to black. Pronotum widest at mid-length, with well-developed central channel. Elytra with moderately raised areas.

Comments: This species, represented by a specimen in the UMSP collection identified by W. J. Chamberlin, is a western U.S. species recorded no further east than ID and NV. MN is significantly east of this range, so this specimen is likely mislabeled or emerged from imported lumber. This species is excluded from the checklist of MN species (Hallinen et al. 2021).

Dicerca tenebrica (Kirby, 1837)

Synonym(s): *Dicerca prolongata* LeConte, *D. subcuprea* Casey, *D. sulcatula* Casey, *D. subargentea* Casey, *D. severa* Casey

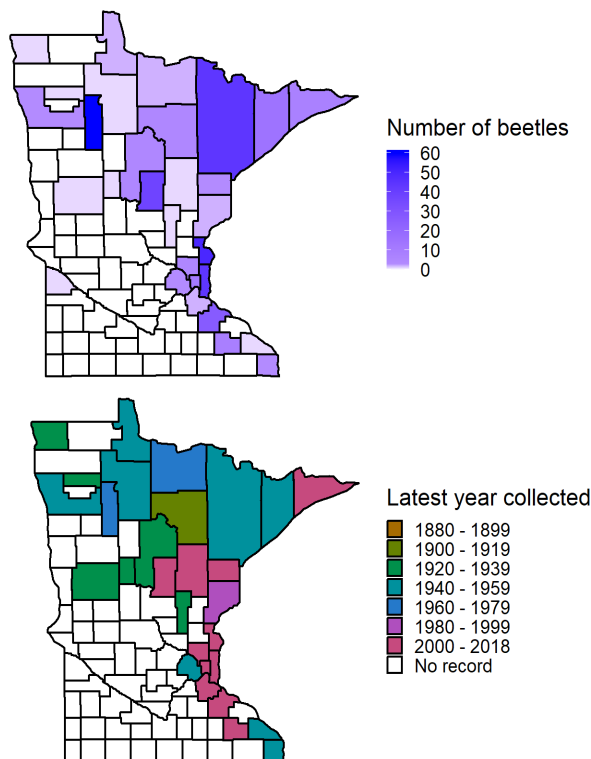
Common Name: Flat-headed poplar borer

Total in collection: 350

MN occurrence: April 26 – September 1



Photo by Steven Valley, Oregon Department of Agriculture is licensed under CC BY-NC 3.0



Range: Throughout most of US and CA: Quebec to Georgia and Yukon to California

Larval MN host: *Populus grandidentata* Michx.

Adult MN host: *Larix laricina* (Du Roi) K. Koch, *Pinus banksiana* Lamb., *Populus alba* L., *P. tremuloides* Michx., and flowers of *Sonchus arvensis* L.

Collection method: Adults collected on foliage and flowers, in Lindgren funnel trap on *Pinus banksiana* baited with alpha-pinene and bark beetle pheromones, washed ashore on Lake Superior, and as *Cerceris fumipennis* prey

Appearance: 14-26 mm long. Gold to black. Pronotum widest at mid-length, with well-developed central channel.

Comments: Females lay eggs on rough bark around poplar branches. Larval galleries appear elliptical in cross section, and adult emergence holes are large (Solomon 1995). This species is associated with the spread of hypoxylon canker, a leading cause of death in quaking aspen in the Great Lakes region (UMN Extension 2019). Risk of infestation can be mitigated through the removal of unhealthy branches and trees. A common prey item of *C. fumipennis* in MN.

Dicerca tenebrosa tenebrosa (Kirby, 1837)

Synonym(s): *Buprestis distinguenda* Laporte & Gory, *D. chrysea* (Melsheimer), *D. bifoveata* LeConte, *D. acerba* Casey, *D. montana* Casey, *D. stolidus* Casey, *D. wickhami* Casey

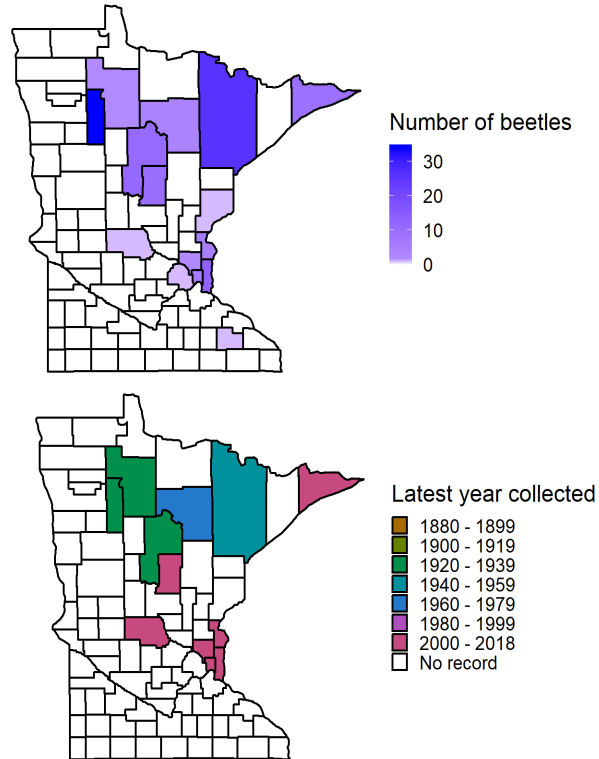
Common Name: Flat-headed conifer borer

Total in collection: 126

MN occurrence: May 18 – August 29



Photo by Don Griffiths, courtesy of the Spencer Entomological Collection, Beaty Biodiversity Museum, UBC



Range: Throughout western and northern US and most of CA: Quebec to Pennsylvania and Alaska to California

Larval MN host: Unknown

Adult MN host: *Abies balsamea* (L.) Mill., *Picea glauca* (Moench) Voss, *P. pungens* Engelm, *Pinus banksiana* Lamb., *P. resinosa* Ait., and *Pseudotsuga menziesii* (Mirb.) Franco

Collection method: Collected on *Picea pungens*, in Lindgren funnel trap on *Pinus banksiana*, washed ashore on Lake Superior, and as *Cerceris fumipennis* prey.

Appearance: 11-22 mm long. Gold to black. Pronotum widest at mid-length, with well-developed central channel. Elytra with moderately raised areas.

Comments: A common prey item of *C. fumipennis* in MN. One of two subspecies. The other, *D. tenebrosa knulli* Nelson, occurs in the southeast. Adult beetle observed ovipositing on a pine trunk (Howden and Vogt 1951).

Eupristocerus cogitans (Weber, 1801)

Synonym(s): *Buprestis ignarus* Fabricius, *B. rufi collis* Herbst

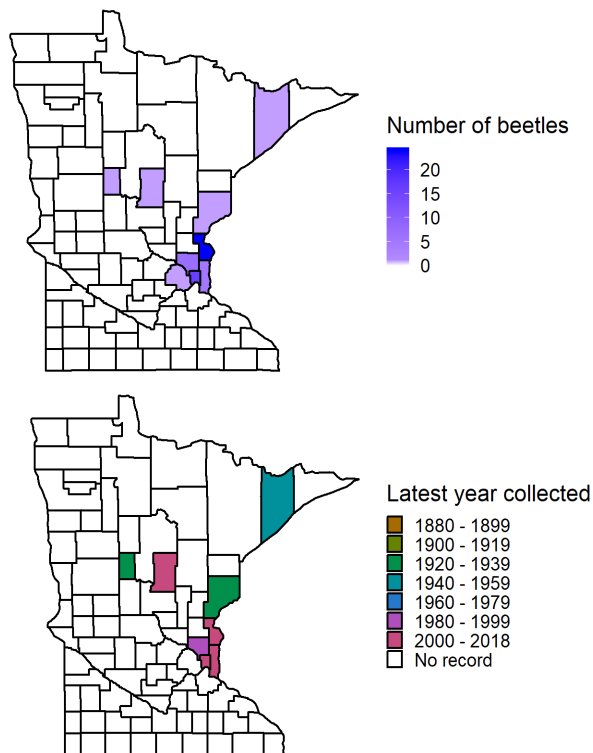
Common Name: Alder-gall buprestid

Total in collection: 57

MN occurrence: June 2 – August 18



"CNC COLEO 00157001" by CNC/BIO Photography Group, Centre for Biodiversity Genomics is licensed under [CC BY-NC-SA 3.0](https://creativecommons.org/licenses/by-nc-sa/3.0/)



Range: Throughout eastern US and CA: Quebec to Florida and Ontario to Mississippi

Larval MN host: *Alnus incana* (L.) Moench, *A. incana* ssp. *rugosa* (Du Roi) R.T. Clausen, and *Betula nigra* L.

Adult MN host: *Alnus* sp.

Collection method: Collected on *Alnus* sp. and as *Cerceris fumipennis* prey

Appearance: 6-8 mm long. Black with red head and pronotum. Two faint bands of white on the bottom of the elytra.

Comments: The only species in the genus *Eupristocerus* to occur in North America (Nelson et al. 2008). Larvae feed in alder stems, creating galls. Control for this species has not been necessary (Solomon 1995). Possibly a firefly mimic. A common prey item of *C. fumipennis* in MN.

Melanophila acuminata (DeGeer, 1774)

Synonym(s): *Buprestis acuta* Gmelin, *B. appendiculata* Fabricius, *B. morio* Fabricius, *B. longiceps* Say, *Melanophila immaculata* Mannerheim, *M. anthaxoides* Marquet, *M. opaca* LeConte, *M. obscurata* Lewis

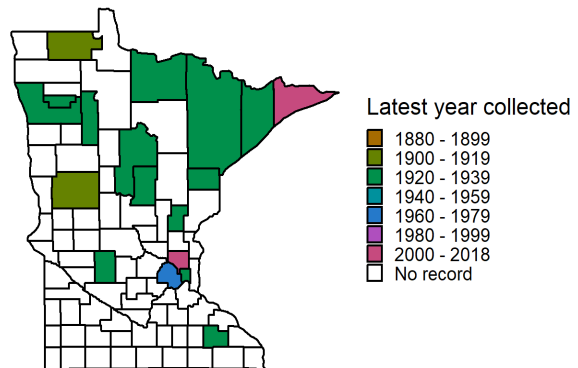
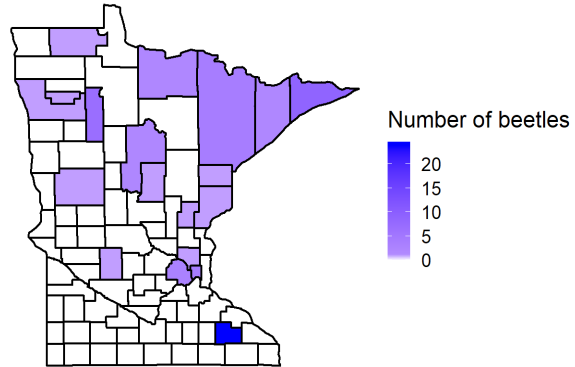
Common Name: Black fire beetle

Total in collection: 75

MN occurrence: May 27 – September 30



Photo by Steven Valley, Oregon Department of Agriculture is licensed under CC BY-NC 3.0



Range: Throughout US and CA: Quebec/Newfoundland to Florida and Alaska to California

Larval MN host: *Abies balsamea* (L.) Mill., *Betula alleghaniensis* Britt., *Picea glauca* (Moench) Voss., *Pinus resinosa* Ait., *P. strobus* L., and *Thuja occidentalis* L.

Adult MN host: Additionally *P. ponderosa* Laws.

Collection method: In Lindgren funnel trap on *P. banksiana* Lamb.

Appearance: 8-12 mm long. Black. End of elytra narrowed (not rounded like the similar looking *Anthaxia inornata*).

Comments: The only member of this genus known to occur in MN. The black fire beetle uses infrared-detecting metathoracic pit organs to sense forest fires, potentially at great distances (Evans 1964). It lays its eggs in burnt trees as soon as flames subside (Schmitz and Bleckmann 1998).

Pachyschelus confusus Wellso, Manley, and Jackman, 1976

Synonym(s): N/A

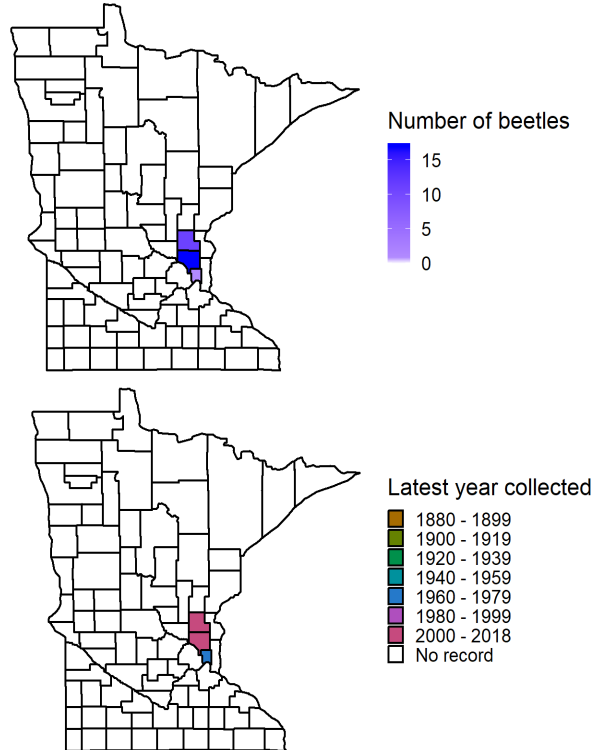
Common Name: N/A

Total in collection: 29

MN occurrence: May 30 – August 19



Photo © 2011 Joshua P. Basham



Range: Michigan, Minnesota, Ontario, and Wisconsin

Larval MN host: Unknown

Adult MN host: *Lespedeza capitata* Michx.

Collection method: Sweeping in mixed meadow

Appearance: 2-3 mm long. Black. Similar in appearance to *Pachyschelus laevigatus*.

Comments: Wellso et al. (1976) and Paiero et al. (2012) suggest this species can be most easily differentiated from *P. laevigatus* based on host plant and male genitalia, although according to Hespeneheide (2003) these species are sometimes indistinguishable and further study is needed. Larvae are leaf miners.

Pachyschelus laevigatus (Say, 1833)

Synonym(s): N/A

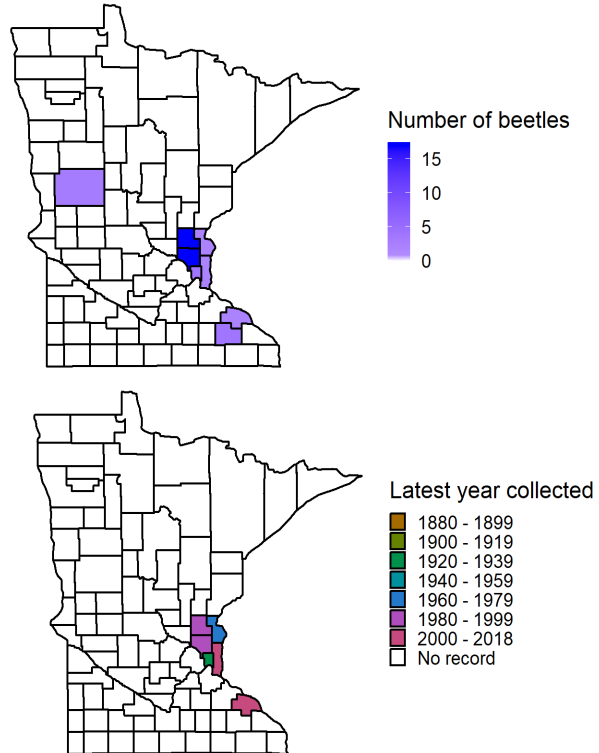
Common Name: N/A

Total in collection: 51

MN occurrence: June 4 – September 16



Photo © 2011 Joshua P. Basham



Range: Throughout eastern and central US and CA: Quebec to Florida and Ontario to Oklahoma

Larval MN host: *Desmodium canescens* (L.) DC., *Lespedeza* sp.

Adult MN host: *Lespedeza capitata* Michx. and *Centaurea stoebe* L., additionally *D. cuspidatum* (Muhl. ex Willd.) DC. ex Loud., and *D. glutinosum* (Muhl. ex Willd.) Wood.

Collection method: Collected on *L. capitata*, *C. stoebe*, and in pine plantation

Appearance: 2-3 mm long. Black. Similar in appearance to *Pachyschelus confusus*.

Comments: Wellso et al. (1976) and Paiero et al. (2012) suggest this species can be most easily differentiated from *P. confusus* based on host plant and male genitalia, although according to Hespenheide (2003) these species are sometimes indistinguishable and further study is needed. Larvae are leaf miners.

Pachyschelus purpureus purpureus (Say, 1833)

Synonym(s): N/A

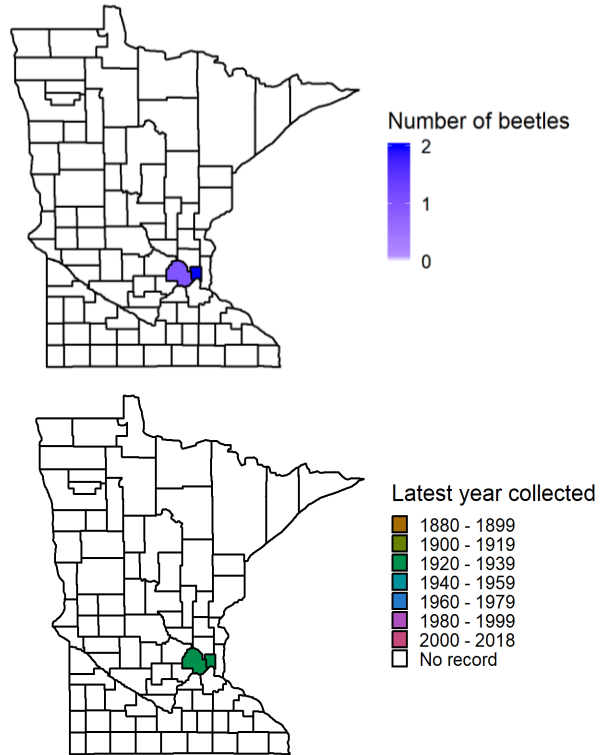
Common Name: N/A

Total in collection: 3

MN occurrence: May 20 – May 25



Photo by Hannah Royals, [Museum Collections: Coleoptera](#), USDA
APHIS PPQ is licensed under [CC BY-NC 3.0](#)



Range: Throughout central US and CA: Ontario to North Carolina and Alberta to Arizona

Larval MN host: *Geranium maculatum* L. and *Lespedeza* sp.

Adult MN host: Additionally *Carya* sp., *Fraxinus americana* L., and *Juglans nigra* L.

Collection method: Collected in poplar woods

Appearance: 3-4 mm long. Black with blue or purple reflections. Indistinct white spots or bands on the bottom third of the elytra.

Comments: One of two subspecies. The other, *Pachyschelus purpureus uvaldei* Knull, is only recorded in Texas. Larvae are leaf miners and adults are reportedly found in “marshy places” (Nicolay and Weiss 1920).

Phaenops abies (Champlain and Knull, 1923)

Synonym(s): N/A

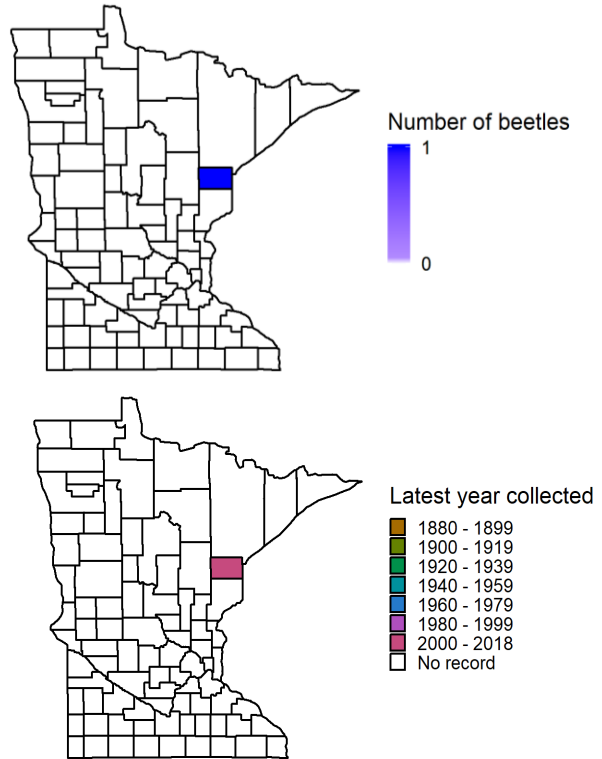
Common Name: N/A

Total in collection: 1

MN occurrence: June 22 – 29



Photo © 2011 Kyle Schnepf



Range: Throughout northeastern US and eastern CA: Quebec to New York and Ontario to Minnesota

Larval MN host: Unknown

Adult MN host: *Abies balsamea* Mill.

Collection method: Lindgren funnel trap baited with alpha-pinene and (+/-)-seudenol

Appearance: 8-12 mm long. Dark blue-green. Elytra with three pairs of yellow spots.

Comments: Originally described as a variety of *P. drummondi* (Champlain and Knull 1923), but distinguishable by its blue color.

Phaenops aeneola (Melsheimer, 1845)

Synonym(s): *Melanophila metallicus* Melsheimer

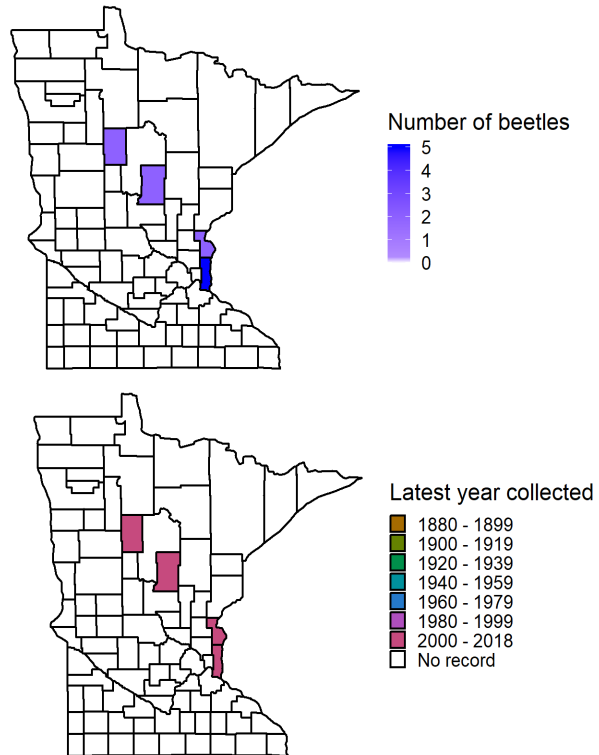
Common Name: N/A

Total in collection: 11

MN occurrence: July 3 – July 31



Photo by Mike Quinn is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern and central US and CA: Quebec to Florida and Ontario to Texas

Larval MN host: *Pinus resinosa* Ait.

Adult MN host: Additionally *Picea* sp. and *Pinus banksiana* Lamb

Collection method: Lindgren funnel trap baited with alpha-pinene and ethanol and as *Cerceris fumipennis* prey

Appearance: 5-7 mm long. Elytra black. Pronotum and head with green or gold reflections.

Comments: Reported in the inner bark and outer wood of dead and dying branches and trees (Burke 1919). Considered widely distributed but uncommon (Bright 1987).

Phaenops drummondi (Kirby, 1837)

Synonym(s): *Buprestis umbellatarum* Kirby, *Melanophila guttulatus* Mannerheim

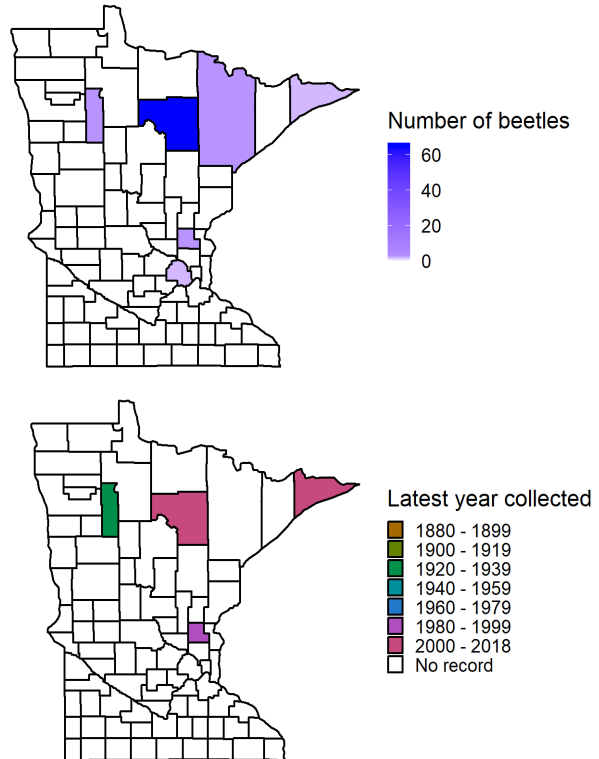
Common Name: Flat-headed fir borer

Total in collection: 78

MN occurrence: May 25 – August 26



Mike Quinn, bugguide.net, CC BY-ND-NC 1.0



Range: Throughout western US and CA: Alberta to New Mexico and Alaska to California. Additionally in the northeast: ME, MI, MN, NH, and NY

Larval MN host: *Abies* sp., *Picea* sp., and *Pseudotsuga* sp.

Adult MN host: *Larix laricina* (Du Roi) K. Koch

Collection method: Reared out of imported *L. occidentalis* Nutt., collected from *L. laricina*, and in Lindgren funnel trap on *Pinus banksiana* Lamb

Appearance: 8-12 mm long. Black. Elytra with three pairs of yellow spots and faint ridges.

Comments: Previously considered as two subspecies; *Phaenops drummondi nicolayi* (Obenberger, 1944) in the northeast and *P. drummondi drummondi* (Kirby, 1837) in the west. However, MacRae and Westcott (2012) argue *P. drummondi nicolayi* should not be considered a valid subspecies, as Obenberger did not originally classify it that way and it was mistakenly elevated to subspecies in later literature. Mostly attacks injured, dying, or recently felled or fire-killed trees, but reported to occasionally attack healthy trees (Bright 1987), and cause defects in timber (Burke 1919). Adults are attracted to acetone and a variety of chemicals associated with conifers (Holsten et al. 2009).

Phaenops fulvoguttata (Harris, 1829)

Synonym(s): *Apatura croceosignatus* Laporte & Gory, *A. decoloratus* Laporte & Gory, *A. octospilotus* Laporte & Gory

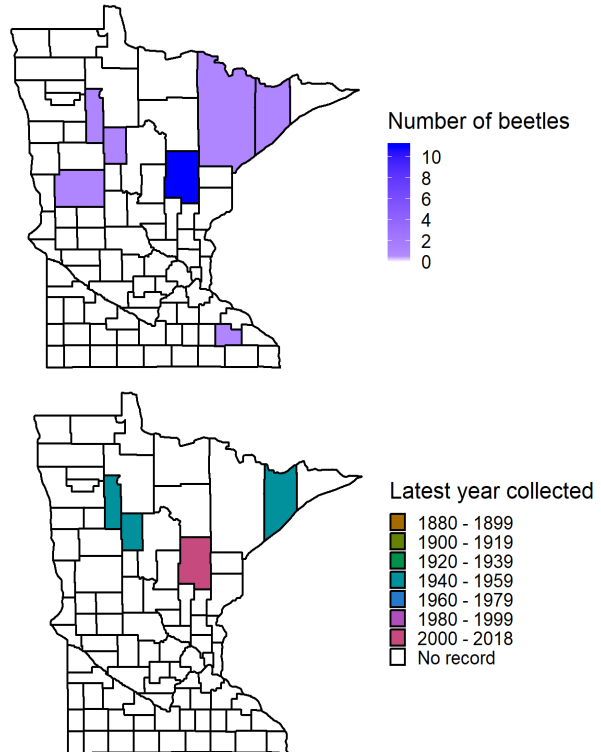
Common Name: Hemlock borer

Total in collection: 17

MN occurrence: June 18 – August 16



Photo by Don Griffiths, courtesy of the Spencer Entomological Collection, Beaty Biodiversity Museum, UBC



Range: Throughout eastern US and CA: Quebec to South Carolina and Manitoba to Minnesota

Larval MN host: *Abies balsamea* (L.) Mill., *Picea glauca* (Moench) Voss, *P. mariana* (Mill.) B.S.P., *Pinus strobus* L., and *Tsuga canadensis* Carr

Adult MN host: *Larix laricina* (Du Roi) K. Koch

Collection method: Collected from *L. laricina* in association with *Dendroctonus simplex*

Appearance: 8-11 mm long. Black. Elytra smooth, with three pairs of yellow spots.

Comments: Considered a synonym of *Phaenops drummondi* by Bright (1987), although the two species can be separated by differences in elytral texture (MacRae and Westcott 2012). MacAloney (1967) reports the main host as eastern hemlock. Mainly a secondary mortality agent, although it may occasionally outbreak. It takes one or two years for adults to develop. Larvae overwinter in the bark, and require a winter diapause to mature. Infested trees may be identified by thinning of the upper foliage, a reddish appearance caused by the removal of the outer bark by woodpeckers, and galleries on the surface of the sapwood (MacAloney 1967).

Poecilonota cyanipes (Say, 1823)

Synonym(s): *Buprestis erecta* Gory, *Poecilonota debilis* LeConte, *P. cupripes* Casey, *P. parviceps* Casey, *P. apicilla* Obenberger, *P. collaris* Obenberger

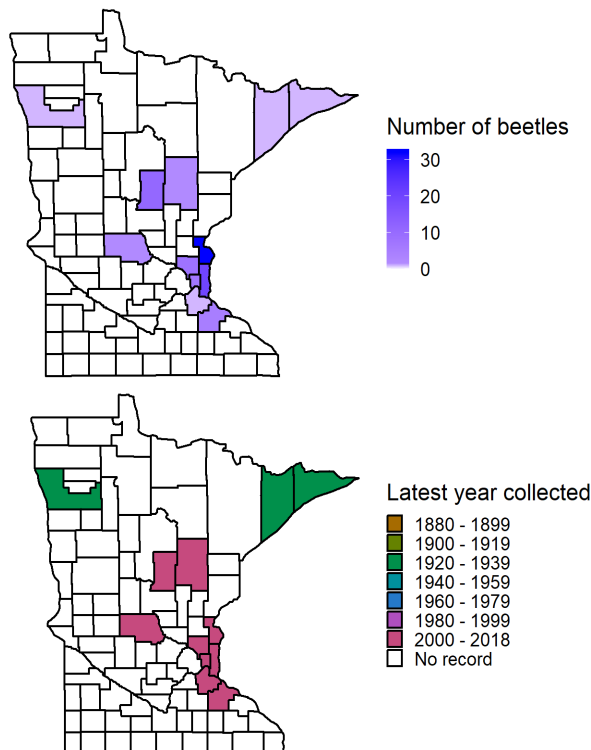
Common Name: Eastern poplar buprestid

Total in collection: 91

MN occurrence: June 12 – August 16



"CCDB-22964-E10" by CBG Photography Group, Centre for Biodiversity Genomics is licensed under CC BY-NC-SA 4.0



Range: Throughout central US and most of CA: Quebec to Massachusetts and Yukon to Arizona/Texas

Larval MN host: *Populus deltoides* Marsh., *P. grandidentata* Michx., *P. tremuloides* Michx., *Robinia pseudoacacia* L., and *Salix nigra* Marsh

Adult MN host: *Populus* sp.

Collection method: Collected from *Populus* sp. and as *Cerceris fumipennis* prey

Appearance: 10-18 mm long. Black to gold, sometimes with blue-green reflections. Elytral tips narrowed and slightly divergent, usually with red or purple reflections.

Comments: A common prey item of *C. fumipennis* in MN. Larvae excavate cavities just under the bark and tunnel to the pith of stems, then burrowing upwards in large stems. It can be detected by small stained spots on the bark. Usually attacks weakened or dying branches (such as lower, shaded out branches), so rarely considered an issue (Solomon 1995). Has been found in association with the galls of two poplar borers, *Saperda calcarata* Say and *S. concolor* LeConte (Evans 1957).

Poecilonota ferrea (Melsheimer, 1845)

Synonym(s): N/A

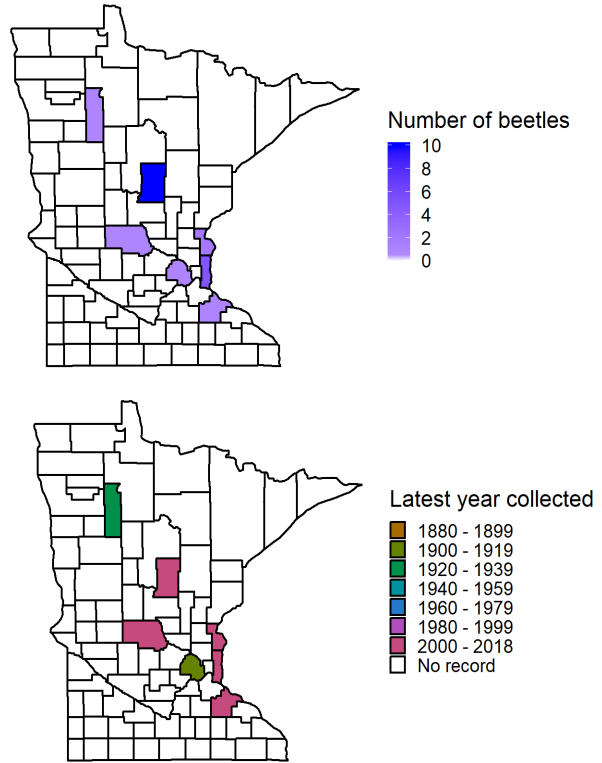
Common Name: N/A

Total in collection: 21

MN occurrence: June 16 – August 5



Photo courtesy of Wayne Steffens



Range: Throughout central US and CA: Quebec to Kentucky and British Columbia to Texas

Larval MN host: *Populus* sp.

Adult MN host: Unknown

Collection method: *Cerceris fumipennis* prey

Appearance: 12-19 mm long. Black. Pronotum widest at mid-length. Elytral tips square, with gold reflections.

Comments: Reported in the bark and wood of injured trees (Burke 1917).

Poecilonota thureura (Say, 1832)

Synonym(s): *Buprestis costicollis* Gory

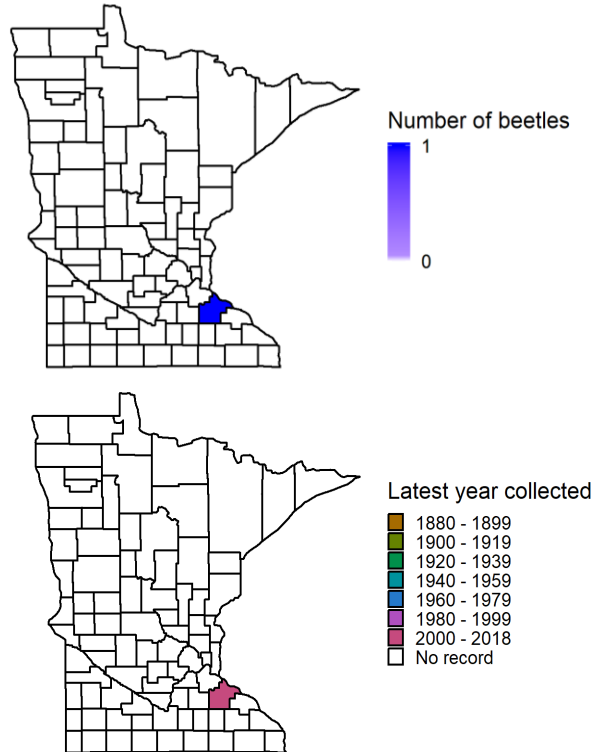
Common Name: Eastern willow buprestid

Total in collection: 1

MN occurrence: June 28



Photo © 2013 Joshua P. Basham



Range: Throughout eastern and central US and CA: Massachusetts to Florida and Manitoba to Texas

Larval MN host: *Salix nigra* Marsh. and *Salix* sp.

Adult MN host: Unknown

Collection method: *Cerceris fumipennis* prey

Appearance: 13-19 mm long. Either black with gold or green reflections or entirely metallic green. Pronotum widest at mid-length. Elytral tips square and not prolonged.

Comments: Reported in living willow and older poplar (Evans 1957). Larvae remain near where eggs were laid, not burrowing into the wood like *P. cyanipes*. Control for this species has not been needed (Solomon 1995).

Ptosima walshii LeConte, 1863

Synonym(s): N/A

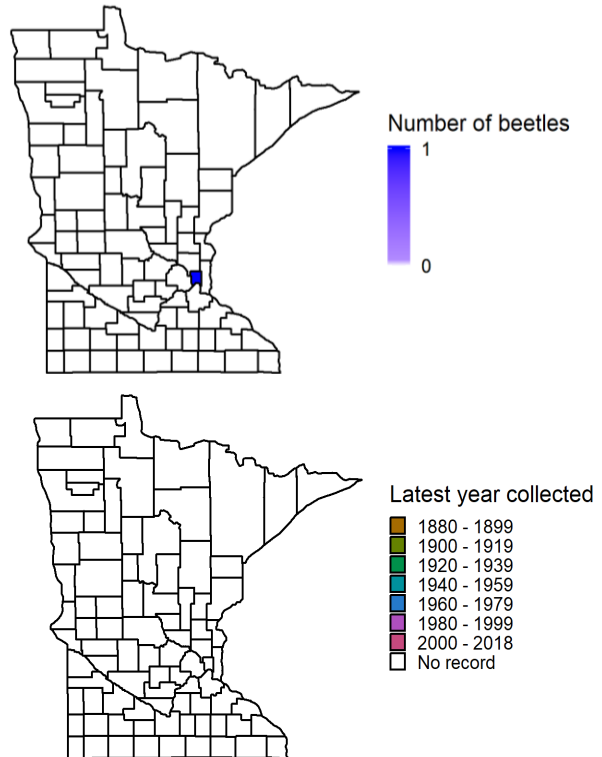
Common Name: N/A

Total in collection: 1

MN occurrence: May



Photo © 2009 Kyle Schnepf



Range: Throughout central US: Ohio to Mississippi and Minnesota to Texas

Larval MN host: *Quercus macrocarpa* Michx.

Adult MN host: Unknown

Collection method: Unspecified

Appearance: 5-8 mm long. Black with gold reflections. Body covered in pale hairs. Elytra with three to four pairs of yellow spots.

Comments: The only member of this genus known to occur in MN. Adults of this genus are reported to overwinter in the pupal cell and emerge in the spring (Nelson et al. 1981).

Spectralia gracilipes (Melsheimer, 1845)

Synonym(s): *Cinyra macilenta* Casey, *C. abbreviata* Casey, *C. ocularis* Casey

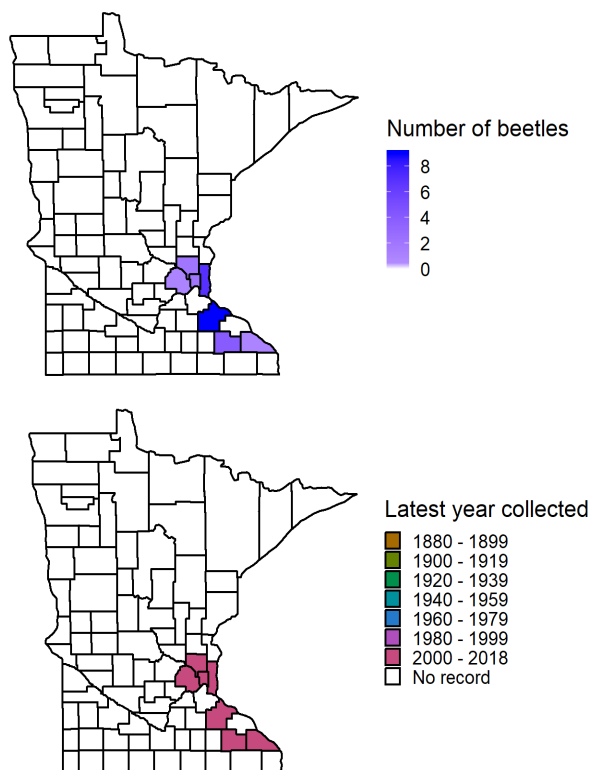
Common Name: N/A

Total in collection: 26

MN occurrence: June 14 – July 27



Photo by Mike Quinn is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern and central US and CA: New Hampshire to Florida and Ontario to Texas

Larval MN host: *Fraxinus* sp., *Ostrya virginiana* (Mill.) K. Koch, *Quercus alba* L., *Q. bicolor* Willd., and *Q. macrocarpa* Michx.

Adult MN host: Additionally *Celtis* sp., *Crataegus* sp., and *Solidago* sp.

Collection method: *Cerceris fumipennis* prey

Appearance: 10-15 mm long. Black with gold reflections and grey punctured areas. Elytra with indentations at tips. Similar in appearance to some *Dicerca* species, but with longer and skinnier antennae.

Comments: The only member of this genus known to occur in the northeastern US. Reported to breed in dead branches (Baker 1972).

Taphrocerus cylindricollis Kerremans, 1896

Synonym(s): *Taphrocerus albonotatus* Blatchley

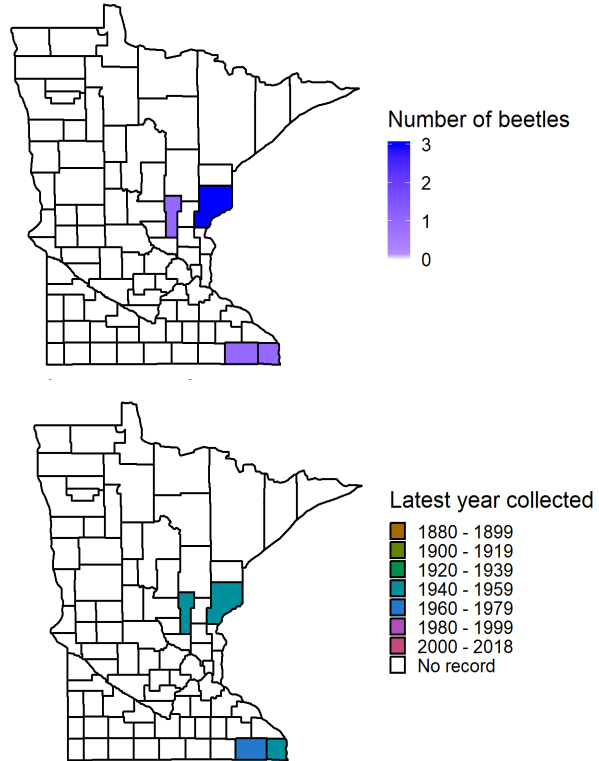
Common Name: N/A

Total in collection: 6

MN occurrence: May 3 – June 27



Photo © 2011 Joshua P. Basham



Range: Throughout southeastern and central US: New Jersey to Florida and Minnesota to Oklahoma

Larval MN host: Unknown

Adult MN host: Unknown

Collection method: Unspecified

Appearance: 3-5 mm long. Black. Pronotum widest at base. Elytra with three pairs of indistinct white spots.

Comments: Leaf miners. Currently there are no known hosts for this species.

Taphrocerus gracilis (Say, 1825)

Synonym(s): *Brachys alboguttatus* Mannerheim, *Taphrocerus grossus* Obenberger

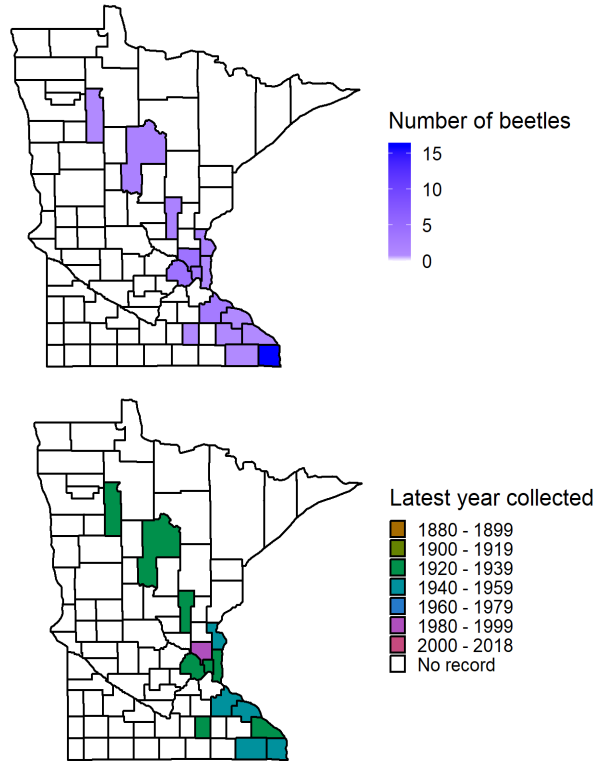
Common Name: N/A

Total in collection: 43

MN occurrence: April 22 – August 21



Photo by Tom Murray is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern and central US and CA: Quebec to Florida and Alberta to Arizona

Larval MN host: *Bolboschoenus fluviatilis* (Torr.) Soják.

Adult MN host: Additionally *Cephalanthus occidentalis* L. and *Rumex verticillatus* L.

Collection method: Collected in oak grove and tamarack swamp

Appearance: 3-5 mm long. Black with gold reflections on the head and thorax, and blue reflections on the elytra. Pronotum widest at base. Elytra with indistinct bands of white hairs.

Comments: Leaf miners of graminoids. Upon hatching, larvae bore into host leaves, creating blotch mines and feeding for at least three or four weeks. After pupating and emerging from the mine as an adult, beetles feed until early October. They are then said to go into hibernation, although overwintering sites are unknown (Chapman 1923, Bright 1987).

Taphrocerus schaefferi (Nicolay and Weiss, 1920)

Synonym(s): N/A

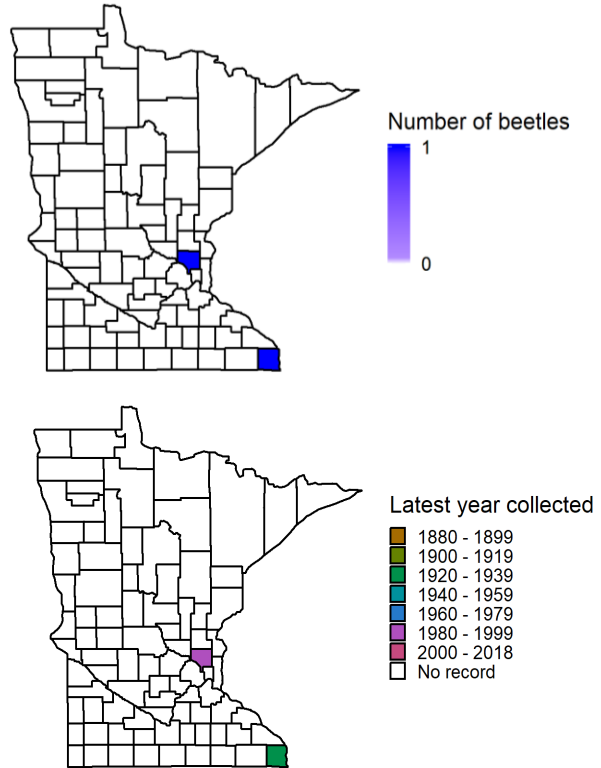
Common Name: N/A

Total in collection: 2

MN occurrence: May 21 – July 15



Photo by Mike Quinn is licensed under [CC BY-NC-ND 1.0](https://creativecommons.org/licenses/by-nc-nd/1.0/)



Range: Throughout eastern and central US and CA: Ontario to Florida and Alberta to Arizona

Larval MN host: *Cyperus* sp. and *C. esculentus* L.

Adult MN host: Additionally *Carex vulpinoidea* Michx.

Collection method: Unspecified

Appearance: 3-4 mm long. Black. Pronotum widest at base.

Comments: Leaf miners of graminoids. Larvae bore directly into the leaf upon hatching, usually following parallel venation and eventually consuming nearly all leaf tissue. Adults emerge in mid to late summer (Story et al. 1979, Bright 1987).

References

- Akers, R. C., D. A. Herms, and D. G. Nielsen. 1986.** Emergence and adult biology of *Agrilus difficilis* (Coleoptera: Buprestidae), a pest of honeylocust, *Gleditsia triacanthos*. *Gt. Lakes Entomol.* 19: 27–30.
- Baker, W. L. 1972.** Eastern forest insects, Misc. Publ. 1175.
- Bellamy, C. L., and G. H. Nelson. 2002.** Family 41. Buprestidae, pp. 98–112. *In* Arnett, R.H., Thomas, M.C., Skelley, P.E., Frank, J.H. (eds.), *Am. Beetles*, Vol. II Polyphaga Scarabaeoidea through Curculionoidea, Vol. 2. CRC Press, Boca Raton, FL.
- Bílý, S., and V. Kubáň. 2010.** A study on the Nearctic species of the genus *Anthaxia* (Coleoptera: Buprestidae: Buprestinae: Anthaxiini). Subgenus *Melanthaxia*. Part I. *Acta Entomol. Musei Natl. Pragae.* 50: 535–546.
- Bright, D. 1987.** The metallic wood-boring beetles of Canada and Alaska: Coleoptera: Buprestidae. *In* Balchin, S. V. (ed.), *Insects Arachn. Canada*, Part 15. Biosystematics Research Center, Ottawa.
- Brooks, F. E. 1914.** Apple root borer. *J. Agric. Res.* 3: 179–186.
- Burke, H. E. 1917.** Notes on some western Buprestidae. *J. Econ. Entomol.* 10: 325–332.
- Burke, H. E. 1918.** Notes on some southwestern Buprestidae. *J. Econ. Entomol.* 11: 209–211.
- Burke, H. E. 1919.** Biological notes on some flatheaded barkborers of the genus *Melanophila*. *J. Econ. Entomol.* 12: 105–108.
- Carlson, R. W., and F. B. Knight. 1969.** Biology, taxonomy, and evolution of four sympatric *Agrilus* beetles (Coleoptera: Buprestidae), *Am Entomol Inst Contrib.*
- Chamberlin, W. J. 1926.** The Buprestidae of North America: Exclusive of Mexico, a catalogue including synonymy, bibliography, distribution, type locality and hosts of each species. Oregon State University.
- Champlain, A. B., and J. N. Knull. 1923.** A new variety of *Melanophila drummondi* Kby. (Buprestidae, Coleoptera). *Can. Entomol.* 55: 105.
- Chapman, R. N. 1923.** Observations on the life history of *Taphrocerus Gracilis* (Say): beetle, family Buprestidae. Cornell University.
- Downie, N. M., and R. H. J. Arnett. 1996.** The Beetles of Northeastern North America. Vols I & II. The Sandhill Crane Press, Gainesville.
- Evans, D. 1957.** A revision of the genus *Poecilnota* in America north of Mexico (Coleoptera: Buprestidae). *Ann. Entomol. Soc. Am.* 50: 21–37.
- Evans, W. G. 1964.** Infra-red receptors in *Melanophila acuminata* DeGeer. *Nature.* 202: 211.
- Fisher, W. S. 1928.** A revision of the North American species of buprestid beetles belonging to the genus *Agrilus*. *United States Natl. Museum Bull.* 145: 1–347.
- Fisher, W. S. 1942.** A revision of the North American species of buprestid beetles belonging to the tribe Chrysobothrini, Misc. Publ. No. 470.
- Garlick, W. G. 1940.** Notes on the rose stem girdler, *Agrilus communis rubicola* AB. *Can. Entomol.* 72: 21–23.
- Haack, R. A., and T. R. Petrice. 2019.** Historical population increases and related inciting factors of *Agrilus anxius*, *Agrilus bilineatus*, and *Agrilus granulatus liragus* (Coleoptera: Buprestidae) in the lake states (Michigan, Minnesota, and Wisconsin). *Gt. Lakes Entomol.* 52: 21–33.
- Hallinen, M. J., W. P. Steffens, J. L. Schultz, and B. H. Aukema. 2021.** The Buprestidae (Coleoptera) of Minnesota, with a discussion of the emerald ash borer, *Agrilus planipennis* Fairmaire. *Coleopt. Bull.* 75: 1–18.
- Hallinen, M. J., J. T. Wittman, and B. H. Aukema. 2020.** Factors associated with diversity and distribution of buprestid prey captured by foraging *Cerceris fumipennis* (Hymenoptera: Crabronidae). *Environ. Entomol.* 49: 1363–1373.

- Hammond, H. E. J., D. W. Langor, and J. R. Spence. 2001.** Early colonization of *Populus* wood by saproxylic beetles (Coleoptera). *Can. J. For. Res.* 31: 1175–1183.
- Hansen, J. A., F. A. Hale, and W. E. Klingeman. n.d.** Identifying the flatheaded appletree borer (*Chrysobothris femorata*) and other buprestid beetle species in Tennessee, Univ. Tennessee Ext.
- Hansen, J. A., J. K. Moulton, W. E. Klingeman, J. B. Oliver, M. T. Windham, R. N. Trigiano, and M. E. Reding. 2015.** Molecular systematics of the *Chrysobothris femorata* species group (Coleoptera: Buprestidae). *Ann. Entomol. Soc. Am.* 108: 950–963.
- Hansen, J. A., T. R. Petrice, and R. A. Haack. 2011.** New state distribution and host records of North American Buprestidae (Coleoptera). *Gt. Lakes Entomol.* 44: 74–77.
- Helfer, J. R. 1941.** A revision of the genus *Buprestis* of North America north of Mexico (Coleoptera, Buprestidae). *Entomol. Am.* 21: 123–185.
- Herns, D. A., and D. G. McCullough. 2014.** Emerald ash borer invasion of North America: history, biology, ecology, impacts, and management. *Annu. Rev. Entomol.* 59: 13–30.
- Herns, D. A., D. G. Nielsen, and T. D. Sydnor. 1987.** Impact of honeylocust plant bug (Heteroptera: Miridae) on ornamental honeylocust and associated adult buprestids. *Environ. Entomol.* 16: 996–1000.
- Hespenheide, H. A. 1969.** Larval feeding site of species of *Agrilus* (Coleoptera) using a common host plant. *Oikos.* 20: 558–561.
- Hespenheide, H. A. 1976.** Patterns in the use of single plant hosts by wood-boring beetles. *Oikos.* 27: 161–164.
- Hespenheide, H. A. 1973.** Notes on the Ecology, Distribution, and Taxonomy of Certain Buprestidae. *Coleopt. Bull.* 27: 183–186.
- Hespenheide, H. A. 2003.** A reconsideration of *Pachyschelus schwarzi* Kerremans and a review of American *Pachyschelus* north of México (Coleoptera: Buprestidae). *Coleopt. Bull.* 57: 459–468.
- Hespenheide, H. A. 2007.** The identity of *Agrilus impexus* Horn, a new species, and taxonomic notes and records for other *Agrilus* Curtis species (Coleoptera: Buprestidae). *Zootaxa.* 1617: 57–66.
- Hoebeke, E. R., E. Jendek, J. E. Zablotny, R. Rieder, R. Yoo, V. V. Grebennikov, and L. Ren. 2017.** First North American records of the Eastasian metallic wood-boring beetle *Agrilus smaragdifrons* Ganglbauer (Coleoptera: Buprestidae: Agrilinae), a specialist on tree of heaven (*Ailanthus altissima*, Simaroubaceae). *Proc. Entomol. Soc. Washingt.* 119: 408–422.
- Holsten, E. H. 2009.** Insects and diseases of Alaskan forests. US Department of Agriculture, Forest Service, Alaska Region.
- Horn, G. H. 1886.** A monograph of the species of *Chrysobothris* inhabiting the United States. *Trans. Am. Entomol. Soc. Proc. Entomol. Sect. Acad. Nat. Sci.* 13: 65–124.
- Howden, H. F., and G. B. Vogt. 1951.** Insect communities of standing dead pine (*Pinus virginiana* Mill.). *Ann. Entomol. Soc. Am.* 44: 581–595.
- Jendek, E., and V. V. Grebennikov. 2009.** *Agrilus sulcicollis* (Coleoptera: Buprestidae), a new alien species in North America. *Can. Entomol.* 141: 236–245.
- Jendek, E., V. V. Grebennikov, and L. Bocak. 2015.** Undetected for a century: Palaearctic *Agrilus ribesi* Schaefer (coleoptera: Buprestidae) on currant in North America, with adult morphology, larval biology and DNA barcode. *Zootaxa.* 4034: 112–126.
- Jendek, E., and J. Poláková. 2014.** Host plants of world *Agrilus* (Coleoptera, Buprestidae): a critical review. Springer, New York.
- Katovich, S. A., and M. E. Ostry. 1998.** Insects associated with butternut and butternut canker in Minnesota and Wisconsin. *Gt. Lakes Entomol.* 31: 97–108.
- Kelnarova, I., E. Jendek, V. V. Grebennikov, and L. Bocak. 2019.** First molecular phylogeny of *Agrilus* (Coleoptera: Buprestidae), the largest genus on Earth, with DNA barcode database for forestry pest diagnostics. *Bull. Entomol. Res.* 109: 200–211.
- Kim, S. H. S., C. E. Trammel, B. A. Lewis, and D. T. Johnson. 2016.** Comparison of color attractiveness for *Agrilus ruficollis* (Coleoptera: Buprestidae): Potential for a simple trap. *J. Econ. Entomol.* 109: 1799–1806.

- Knoll, J. N. 1920.** Notes on Buprestidae with descriptions of new species (Coleop.). *Entomol. News.* 31: 4–12.
- Knoll, J. N. 1922.** Annotated list of the Buprestidae of Pennsylvania (Coleoptera). *Can. Entomol.* 54: 79–86.
- Knoll, J. N. 1934.** Notes on Coleoptera, No 4. *Entomol. News.* 45: 207–212.
- Knoll, J. 1947.** New Buprestidae with notes (Coleoptera). *Ohio J. Sci.* 47: 174–176.
- Koetter, R., and M. Grabowski. 2019.** Hypoxylon canker. Univ. Minnesota Ext. <https://extension.umn.edu/plant-diseases/hypoxylon-canker> (accessed 15 February 2021).
- Lawson, E. T., T. A. Mousseau, R. Klaper, M. D. Hunter, and J. H. Werren. 2001.** *Rickettsia* associated with male-killing in a buprestid beetle. *Heredity (Edinb).* 86: 497–505.
- Lelito, J. P., I. Fraser, V. C. Mastro, J. H. Tumlinson, K. Böröczky, and T. C. Baker. 2007.** Visually mediated ‘paratrooper copulations’ in the mating behavior of *Agrilus planipennis* (Coleoptera: Buprestidae), a highly destructive invasive pest of North American ash trees. *J. Insect Behav.* 20: 537–552.
- Lewis, J. H. 2015.** First record of *Buprestis consularis* (Coleoptera: Buprestidae) in New Brunswick and Atlantic Canada. *J. Acadian Entomol. Soc.* 11: 15–16.
- MacAloney, H. J. 1967.** The hemlock borer. *In* For. Pest Leaflet. US Department of Agriculture.
- MacRae, T. C. 1991.** The Buprestidae (Coleoptera) of Missouri. *Insecta mundi.* 5: 101–126.
- MacRae, T. C. 2006.** Distributional and biological notes on North American Buprestidae (Coleoptera), with comments on variation in *Anthaxia (Haplanthaxia) cyanella* Gory and *A. (H.) viridifrons* Gory. *Pan-Pac. Entomol.* 82: 166–199.
- MacRae, T. C., and J. P. Basham. 2013.** Distributional, biological, and nomenclatural notes on Buprestidae (Coleoptera) occurring in the U.S. and Canada. *Pan-Pac. Entomol.* 89: 125–142.
- MacRae, T. C., and R. L. Westcott. 2012.** Nomenclatural history of *Melanophila drummondi* ab. *nicolayi* Obenberger, 1944 (Coleoptera: Buprestidae), a change of authorship and synonymy under *Phaenops drummondi* (Kirby 1837), and a new distribution record and summary of larval hosts for the species. *Pan-Pac. Entomol.* 88: 87–91.
- Maier, C. A., and M. A. Ivie. 2013.** Reevaluation of *Chalcophora angulicollis* (LeConte) and *Chalcophora virginensis* (Drury) with a review and key to the North American species of *Chalcophora* Dejean (Coleoptera: Buprestidae). *Coleopt. Bull.* 67: 457–469.
- MDNA [Minnesota Department of Natural Resources]. 2013.** MNTaxa: The state of Minnesota vascular plant checklist. webapps15.dnr.state.mn.us/mntaxa/reports/index (accessed 10 August 2020).
- Mulenburg, V. L., and D. A. Herms. 2012.** A review of bronze birch borer (Coleoptera: Buprestidae) life history, ecology, and management. *Environ. Entomol.* 41: 1372–1385.
- Nelson, G. H. 1975.** A revision of the genus *Dicerca* in North America (Coleoptera: Buprestidae). *Entomol. Arb. aus dem Museum G. Frey.* 26: 87–180.
- Nelson, G. H., D. S. Verity, and R. L. Westcott. 1981.** Additional notes on the biology and distribution of Buprestidae (Coleoptera) of North America. *Coleopt. Bull.* 35: 129–152.
- Nelson, G. H., G. Walters Jr, R. D. Haines, and C. L. Bellamy. 2008.** A catalog and bibliography of the Buprestoidea of America north of Mexico. *Coleopterist’s Society Special Publication*, North Potomac, MD.
- Nelson, G. H., R. L. Westcott, and T. C. MacRae. 1996.** Miscellaneous notes on Buprestidae and Schizopodidae occurring in the United States and Canada, including descriptions of previously unknown sexes of six *Agrilus* Curtis (Coleoptera). *Coleopt. Bull.* 50: 183–191.
- New, T. 2007.** Beetles and Conservation, pp. 1–4. *In* New, T.R. (ed.), *Beetle Conserv.* Springer, Dordrecht, The Netherlands.
- Nicolay, A. S., and H. B. Weiss. 1918.** A review of the genus *Buprestis* in North America. *J. New York Entomol. Soc.* 26: 75–109.
- Nicolay, A. S., and H. B. Weiss. 1920.** The group Traches in North America. Part I. The genera *Pachyschelus* and *Taphrocerus*. *J. New York Entomol. Soc.* 28: 136–150.

- Nicolay, A. S., and H. B. Weiss. 1923.** The group *Traches* in North America. Part II. The genus *Brachys* (Coleoptera). J. New York Entomol. Soc. 31: 59–76.
- Paiero, S. M., M. D. Jackson, A. Jewiss-Gaines, T. Kimoto, B. D. Gill, and S. A. Marshall. 2012.** Field Guide to the Jewel Beetles (Coleoptera: Buprestidae) of Northeastern North America, 1st ed. Canadian Food Inspection Agency.
- Saint-Germain, M., P. Drapeau, and C. M. Buddle. 2007.** Host-use patterns of saproxylic phloeophagous and xylophagous Coleoptera adults and larvae along the decay gradient in standing dead black spruce and aspen. *Ecography (Cop.)*. 30: 737–748.
- Schmitz, H., and H. Bleckmann. 1998.** The photomechanic infrared receptor for the detection of forest fires in the beetle *Melanophila acuminata* (Coleoptera: Buprestidae). *J. Comp. Physiol. A*. 182: 647–657.
- Siegert, N., D. McCullough, A. Liebhold, and F. Telewski. 2007.** Resurrected from the ashes: A historical reconstruction of emerald ash borer dynamics through dendrochronological analysis. Morgantown, WV.
- Silberglied, R. E., and T. Eisner. 1969.** Mimicry of hymenoptera by beetles with unconventional flight. *Science*. 163: 486–488.
- Silk, P. J., K. Ryall, P. Mayo, M. A. Lemay, G. Grant, D. Crook, A. Cossé, I. Fraser, J. D. Sweeney, D. B. Lyons, D. Pitt, T. Scarr, and D. Magee. 2011.** Evidence for a volatile pheromone in *Agrilus planipennis* Fairmaire (Coleoptera: Buprestidae) that increases attraction to a host foliar volatile. *Environ. Entomol.* 40: 904–916.
- Solomon, J. D. 1995.** Guide to insect borers of North America broadleaf trees and shrubs. *Agric. Handbk.* 706: U.S. Department of Agriculture, Forest Service, Washington, D.C.
- Spencer, G. J. 1930.** Insects emerging from prepared timber in buildings. *J. Entomol. Soc. Br. Columbia*. 27: 6–10.
- Spencer, G. J. 1963.** Further records of delayed emergence of *Buprestis aurulenta* L. (Coleoptera: Buprestidae). *Proc. Entomol. Soc. Br. Columbia*. 60: 45–47.
- Story, R. N., and W. H. Robinson. 1979.** Biological control potential of *Taphrocerus schaefferi* (Coleoptera: Buprestidae), a leaf-miner of yellow nutsedge. *Environ. Entomol.* 8: 1088–1091.
- USDA [United States Department of Agriculture]. 2019.** Natural Resources Conservation Science PLANTS Database. www.plants.usda.gov (accessed 10 August 2020).
- Van Dyke, E. C. 1921.** Insects of Yosemite National Park, pp. 205–220. *In* Hall, A.F. (ed.), *Handb. Yosemite Natl. Park A Compend. Artic. Yosemite Reg. by Lead. Sci. Authorities.* G.P. Putnam's Sons, New York and London.
- Weiss, H. B., and A. S. Nicolay. 1919.** Notes on the life-history and early stages of *Brachys ovatus* Web., and *Brachys aerosus* Melsh. *Can. Entomol.* 51: 86–88.
- Wellso, S. G., and G. V. Manley. 2007.** A revision of the *Chrysobothris femorata* (Olivier, 1790) species group from North America, north of Mexico (Coleoptera: Buprestidae). *Zootaxa*. 1652: 1–26.
- Wellso, S. G., G. V. Manley, John A. Jackman, G. V. Manley, and J. A. Jackman. 1976.** Keys and Notes on the Buprestidae (Coleoptera) of Michigan. *Gt. Lakes Entomol.* 9: 1–22.
- Westcott, R. L. 2005.** A new species of *Chrysobothris* Eschscholtz from Oregon and Washington, with notes on other Buprestidae (Coleoptera) occurring in the United States and Canada. *Zootaxa*. 1044: 1–5.
- Westcott, R. L., C. Looney, and M. Asche. 2015.** *Agrilus cuprescens* (Ménétries) (Coleoptera: Buprestidae), the rose stem girdler, discovered in the state of Washington, with comments on host plant associations. *Coleopt. Bull.* 69: 275–279.
- Westcott, R. L., W. Williams, and A. Grotta. 2019.** The exotic *Agrilus cyanescens* (Ratzeburg) (Coleoptera: Buprestidae) is discovered in Oregon. *Insecta mundi*. 1–5.
- Wilson, L. F. 1969.** Life history, habits, and damage of *Chrysobothris orono* (Coleoptera: Buprestidae) on red pine in Michigan. *Can. Entomol.* 101: 291–298.