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Survey of the Attelabidae of Wisconsin (Coleoptera: Curculionoidea)

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Abstract. A statewide survey of Wisconsin's Attelabidae (Coleoptera: Curculionoidea) was conducted over one full (2012) and two partial (2011, 2013) field seasons. Specimens were collected using a variety of techniques. Fourteen species of Attelabidae in nine genera placed in two subfamilies are now recorded from Wisconsin, with five new state species records and 117 new Wisconsin county records. Generic and species-level keys for Wisconsin attelabid species are provided along with generic and species diagnoses. Species treatments also include a synonymy, a description, and information on natural history, phenology, distribution and collecting methods. Dorsal and lateral habitus images are also provided for each species.

Key words. Primitive weevils, faunal survey.

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Introduction

Faunal surveys establish a baseline knowledge of the geographical and phenological distributions, diversity and natural history of organisms. This contribution is the first to target the Wisconsin or western Great Lakes fauna of the primitive weevil family Attelabidae and follows the survey of Nemonychidae and Anthribidae (Janicki and Young 2017). It establishes a list of species in Wisconsin, a state with a diversity of habitat types and natural communities.

Attelabidae belongs to the superfamily Curculionoidea: one of the largest superfamilies of Coleoptera with around 62,000 described species worldwide (Oberprieler et al. 2007). It constitutes 12.8% of the entire North American beetle fauna (Marske and Ivie 2003). Attelabidae is comprised of around 2,500 species in 150 genera worldwide (Oberprieler et al. 2007), 362 species in the New World, and 51 species in 11 genera in North America north of Mexico (Hamilton 2002).

Primitive weevils (Nemonychidae, Anthribidae, Belidae, Caridae, Attelabidae, and Brentidae) share the common characteristic of having straight, as opposed to geniculate, antennae (except for Nanophyinae of Brentidae, which independently acquired that character state). The primitive weevil families have existed as extant lineages for at least 140 million years (Kuschel 2003) and are phylogenetically basal to Curculionidae (e.g., Marvaldi et al. 2002; McKenna et al. 2009; Shin et al. 2018). The earliest fossil records of Attelabidae are from the late Lower Crustaceous (Gratshev and Zherikhin 2003) to Middle Crustaceous (Kuschel 1994).

Attelabids have the gular sutures fused, forming a single median line (Bright 1993), which distinguishes them from the nemonychids and anthribids, but not the rest of the primitive weevil families. The short and muzzle-like rostrum that widens beyond the antennal insertions along with the four-segmented maxillary palpi and connate tarsal claws (Hamilton 2002) can together distinguish attelabids from other families within Curculionoidea.

Materials and Methods

An initial literature search yielded nine published species records from Wisconsin, only four of which were provided with county or more specific distributional data. To expand the provisional species list, these records were augmented by material from the following museums and private collections: University of Wisconsin Insect Research Collection (WIRC), Wisconsin Department of Natural Resources (WDNR), Milwaukee Public Museum (MPMC), University of Wisconsin Oshkosh Insect Collection (UWOC), and University of Wisconsin Eau Claire Insect Collection (UWEC). Additional sites were identified based on habitat types and associated plants to conduct fieldwork over one full (April–September 2012) and two partial (July–September 2011, April–August 2013) field seasons to improve the number and distribution of survey sites. Natural history data, including plant associations, habitat associations, and flight period, were recorded from personal observations, existing literature and label data.

Field collected specimens contributing to this survey were obtained using a variety of collecting techniques. Available natural history information suggested that oak barrens and hardwood forests would be the best habitats to explore. The most fruitful collecting techniques included beating foliage of trees and shrubs, sweeping understory vegetation, as well as hand collecting. Sorting bulk trap residue samples (primarily Lindgren funnel, Malaise, and flight intercept traps), some of which are from the University of Wisconsin Insect Research Collection (hereafter, WIRC), provided a good source of material from additional locations.

All new material collected during this survey is deposited in the WIRC. Collection event data from all specimens (historical collections, personal collections, specimens from fieldwork) were entered into a relational database, Specify.

Results

This survey yielded over 550 attelabid specimens from fieldwork, personal collections, and institutional collections, totaling 14 species in the following genera: *Synolabus* Jekel, 1860, *Himatolabus* Jekel, 1860, *Homeolabus* Jekel, 1860, *Eugnamptus* Schoenherr, 1839, *Haplorhynchites* Voss, 1924, *Merhynchites* Sharp, 1889, *Temnocerus* Thunberg, 1815, *Auletobius* Desbrochers, 1869, and *Pterocolus* Say, 1831. The generic and species names we followed are based primarily on the works of Hamilton (1969, 1971, 1974, 1983b, 1985, 1990, 1992).

Our survey results represent an increase of five species, a 55.6% increase in species richness, from previously published literature. There was also a considerable increase in county records for most species, with 117 new county records, the average increase in county records per species of 8.36.

Family Attelabidae Billberg 1820

Attelabidae includes two subfamilies: Attelabinae (the leaf-rolling weevils) and Rhynchitinae (the toothnose snout weevils), each with about the same number of described species worldwide. This study follows the classification of Marvaldi et al. (2002) which does not consider Pterocolinae (the thief weevils) a subfamily, though many other authors still recognize it. Attelabidae has a cosmopolitan distribution, with most species occurring in the Orient, the Afrotropics and the Neotropics, but they do not occur in New Zealand or the Hawaiian Islands (Legalov 2003).

Marvaldi et al. (2002) recovered a monophyletic Attelabidae, but found ambiguous results regarding the placement of the genus *Auletobius* according to molecular data alone. However, until further resolved, *Auletobius* is treated as a genus of Attelabidae. They also predicted that, based on the phylogenetic placement of Attelabidae, older fossils may be present beyond the late Lower to Middle Cretaceous (Kuschel 1994).

Synapomorphies of the family include the epicranium that bears a hyaline posterior extension in the larvae (May 1993), the 8th sternite that is fused or articulated with the 9th sternite on each side beyond the arms in adult males (Kuschel 1995), and the advanced nerve cord with the abdominal ganglia fused into one conglomerate in adults of both sexes (Calder 1989).

Attelabids are predominantly associated with plant parts of angiosperms such as flowers and foliage, though the larvae develop on plant tissues that may be infected with fungi (Oberprieler et al. 2007).

Members of Attelabinae are the true leaf rollers. Individual females cut slits into a leaf and perforate it slowly in order to make a nidus, or leaf-roll, into which they deposit a single egg, and in which, the larva feeds and develops (Bright 1993). Adults of this subfamily can be distinguished by the short, stout rostrum that widens beyond antennal insertions, by the mandibles that are not toothed on the outer edge, by the connate and simple claws of each pretarsus, and by the oval, glabrous body (Hamilton 2002). Adults of Rhynchitinae feed on foliage, while the larvae feed in flower buds or fruits, terminal shoots, or leaf mines. Adults are easily distinguished by their exodont mandibles and by the free, appendiculate or toothed claws of each pretarsus. The "thief weevil," *Pterocolus ovatus* (Fabricius), is an egg predator and nidus kleptoparasite of species of Attelabinae, especially *Homeolabus analis* (Illiger). The adult female usually enters the nidus, destroys the egg(s) of the leaf-rolling weevil, and oviposits (Kissinger 1964). They have also been found ovipositing on young buds of trees, young fruit, or feed on blossoms or foliage of *Quercus* Linnaeus, *Prunus* Linnaeus, and *Vitis* Linnaeus species (Bright 1993). This species can be easily distinguished from other attelabids by its unique body shape and bright metallic blue or green color (Bright 1993).

Family diagnosis. In the Great Lakes region, adult attelabids can be distinguished from adult nemonychids and anthribids by the fused clypeus and labrum and by the single gular suture. They can be distinguished from adult brentids by their maxillary palpi that are usually 4-segmented, and when 3-segmented, by the irregularly punctured elytra, the setaceous or pilose body, and the metallic or brightly colored cuticle.

Key to the Wisconsin genera of Attelabidae

1. Pretarsus with claws appendiculate; mandibles depressed, toothed on inner and outer margin; prothoracic legs subequal to meso- and metathoracic legs or meso- and metathoracic femora larger than prothoracic femora; tibial apices unarmed or with small spurs or mucros (Subfamily Rhynchitinae) **2**

— Pretarsus with claws connate; mandibles robust, not toothed on outer margin; prothoracic legs enlarged, distinctly larger than meso- and metathoracic legs, prothoracic femora distinctly swollen; tibial apices uni-unciate (male) or bi-unciate (female) (Subfamily Attelabinae) **7**

2(1). Prothorax with distinct lateral carina, prothoracic pleura strongly excavated beneath carina; body small, metallic blueish-green to blueish-black . . . . . ***Pterocolus* Say**

— Prothorax not laterally carinate, prothoracic pleura not strongly excavated; body size, shape and color variable **3**

3(2). Scutellary striole present **4**

— Scutellary striole absent **6**

4(3). Pygidium completely covered or almost completely covered by elytra; elytra with some erect setae; males with one tooth on outer edge of mandibles and females with two . . . . . ***Eugnamptus* Schoenherr**

— Pygidium mainly exposed; elytra without erect setae; mandibular teeth similar in both sexes **5**

5(4). Elytral striae distinct, more-or-less quadrate, moderately to deeply impressed; elytral interstriae narrower than width of striae, convex and smooth; setae more-or-less appressed; body dark-colored, in some feebly bronze or blue, less than 4mm in length . . . . . ***Temnocerus* Thunberg**

— Elytral striae more-or-less indistinct, weakly impressed especially posteriorly; elytral interstriae wider than striae, more-or-less flat, in some minutely rugose; setae fine, semi-erect; body variable reddish-orange (in Wisconsin), greater than 4mm in length . . . . . ***Merhynchites* Sharp**

6(3). Elytral striae distinctly rowed (except for *H. aeneus*); elytral interstriae distinct, with punctures more-or-less smaller than striae, punctures not masked by setae . . . . . ***Haplorhynchites* Voss**

— Elytral striae not distinctly rowed (except for *A. ater*); elytral interstriae indistinct, punctures as large or nearly as large as striae; punctures in some masked by setae . . . . . ***Auletobius* Desbrochers**

7(1). Dorsal surface with appressed setae . . . . . ***Himatolabus* Jekel**

— Dorsal surface without appressed setae, glabrous except for a few scattered fine erect setae **8**

8(7). Prothoracic femora unarmed in both sexes; submentum of males with a pair of ventrally-projecting acuminate spines; ventral rostral apex without median conical prominence . . . . . ***Homeolabus* Jekel**

— Prothoracic femora (inner distal end) in males armed with one or two blunt spine-like projections, in females unarmed or armed with a single peg-like projection; submentum in males without pair of projecting acuminate spines; ventral rostral apex in lateral view with median conical prominence (more pronounced in females) ..... ***Synolabus* Jekel**

Subfamily Attelabinae Billberg

Tribe Attelabini Billberg

Genus *Synolabus* Jekel

Type species. *Curculio nitens* Scopoli, 1763, subsequent designation by Voss (1925).

Generic diagnosis. *Synolabus* can be recognized by the glabrous dorsal surface. They can be further distinguished from *Homeolabus analis*, which also has a glabrous dorsal surface, by the prothoracic femora that are armed with 1–2 blunt spine-like projections in males and unarmed or armed with a peg-like projection in females (not armed in *H. analis*), by the submentum in males that is lacking a pair of projecting acuminate spines (present in *H. analis*), and by the ventral rostral apex with a median conical prominence in lateral view (absent in *H. analis*). Finally, the two North American species tend to be smaller in size than *H. analis.*

Key to Wisconsin species of adult *Synolabus*

1. Dorsal surface of elytra black with reddish markings extending from humeri to middle .... ***S. bipustulatus* (Fabricius)**

— Dorsal surface of elytra red .....***S. nigripes* (LeConte)**

Synolabus bipustulatus (Fabricius)

(Fig. 1–2)

Diagnosis. *Synolabus bipustulatus* can be distinguished by the black integument with red markings extending from the base to the middle of the elytra.

Description. Length 2.2–4.5mm. Body glabrous, ventral surface with few scattered setae. Integument black, elytra black with reddish orange rectangular markings, these extending from base to middle of elytra, laterally to interstria 2 or 3. Head arcuate laterally from base to eyes; surface smooth, with few very small, widely separated, shallow, minute punctures and with 2 deeply impressed, arcuate grooves along each eye; median area impressed from antennal insertion to above upper level of eyes. Rostrum distinctly shorter than head; surface densely punctured, rugose; lateral angles lacking conspicuous tooth apically; submental area in males with conspicuous median tooth, in females with swelling. Antennae inserted dorsolaterally near base of rostrum. Pronotal width 1.4× length, widest at base; arcuate laterally, converging to recurved apical margin; disc evenly convex, with numerous minute, impressed punctures, interpuncture space smooth and shining. Elytral width at base 1.3–1.4× pronotal width, broadly rounded apically; striae not impressed, with large, shallowly impressed punctures in regular rows; interstriae 3.0–4.0× strial width, with scattered, very minute punctures. Prothoracic femora of male armed with 1–2 blunt spine-like projections, of female unarmed or armed with 1 peg-like projection.

Natural history. This species has been recorded from oak (*Quercus* spp.), alder (*Alnus* Ehrhart spp.), hop hornbeam (*Ostrya* Scopoli spp.), musclewood (*Carpinus caroliniana* Walter), shagbark hickory (*Carya ovata* (Miller) K. Koch), black locust (*Robinia pseudoacacia* Linnaeus), as well as goldenrod (*Solidago* Linnaeus spp.) and *Rubus* Linnaeus species in Wisconsin. Murtfeldt (1872) and Girault (1904) provided further details on this species.

Phenology. In Wisconsin, adults of this species have been collected from May to August, with a peak in June and July.

Collecting methods. The 25 specimens examined during this study were most often collected by hand from scrub oak or by beating other oak species. Several specimens were collected from *Quercus ellipsoidalis* E. J. Hill. Other specimens were collected from Malaise traps, flight intercept traps, Lindgren funnel traps and yellow van traps.

Distribution. *United States.* AL, AR, CT, DC, FL, GA, IL, IN, KY, LA, MA, MD, ME, MI, MO, NC, NH, NJ, NY, OH, OK, PA, RI, SC, TN, TX, VA, WI, WV. *Canada.* NS, ON, PQ.

Wisconsin county records. This species has previously been recorded from Wisconsin (Blatchley and Leng 1916; O'Brien and Wibmer 1982; Downie and Arnett 1996). Adams, Columbia, Jackson, Marquette, Monroe, Sauk, Shawano, Waupaca, Waushara, Wood.

2.0mm 1

2.0mm 2

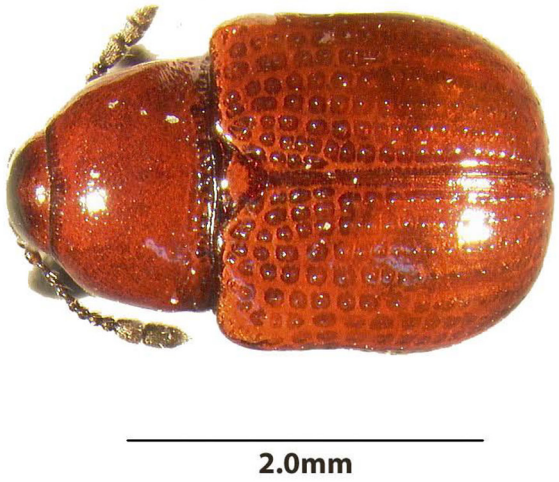
Figures 1–2. *Synolabus bipustulatus* (Fabricius). **1)** Habitus, dorsal view. **2)** Habitus, lateral view.

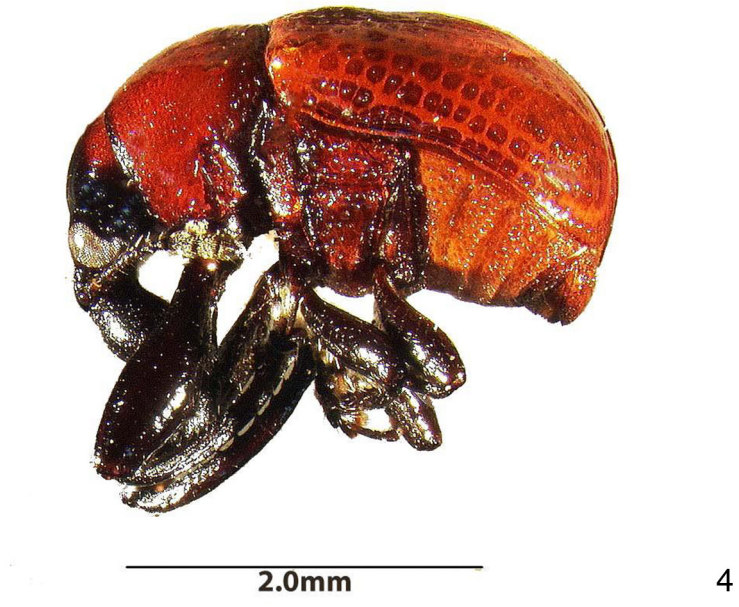
Synolabus nigripes (LeConte)

(Fig. 3–4)

Diagnosis. *Synolabus nigripes* can be recognized by the red dorsum and by the prothoracic femora that are toothed ventrally. It can be distinguished from *S. bipustulatus* by the red dorsum and by the rostrum that is only a little shorter than the pronotum and that is constricted at the antennal insertion. It can be distinguished from *Homeolabus analis* by the generally smaller size, by the red thoracic sterna (black in *H. analis*), and by the submental area in males that has a conspicuous median tooth and in females a swelling (a pair of projecting acuminate spines in *H. analis*).

Description. Length 3.5–4.5mm. Body robust. Integument bright red to black; elytra, thorax, base of head, prothoracic sternum, and abdomen bright red; legs, rostrum and antennae black. Head arcuate laterally from base to eyes; surface smooth, with few very small, widely separated, shallow, minute punctures and with two deeply impressed arcuate grooves along each eye; median area impressed from antennal insertion to above upper





Figures 3–4. *Synolabus nigripes* (LeConte). **3)** Habitus, dorsal view. **4)** Habitus, lateral view.

level of eyes. Rostrum a little shorter than head, constricted at antennal insertion; surface densely punctured, rugose; submental area in males with conspicuous median tooth, in females with swelling. Antennae inserted dorsolaterally near base of rostrum. Pronotum width about 1.5× length, widest at base; arcuate laterally, converging to recurved apex; disc evenly convex, with minute, impressed punctures, interpuncture space smooth and shining. Elytra width at base about 1.3–1.4× pronotal width, broadly rounded apically; striae not impressed, with large, shallowly impressed punctures in regular rows; interstriae about 3.0× strial width. Prothoracic femora of male armed with 1–2 blunt spine-like projections, of female unarmed or armed with 1 peg- like projection.

Natural history. This species has been recorded on winged sumac (*Rhus copallina* Linnaeus), poison ivy (*Toxicodendron radicans* (Linnaeus) Kuntze) and related plants. In Wisconsin, this species has been recorded feeding on leaves of staghorn sumac (*Rhus typhina* Linnaeus). Specimens have also been reported from little bluestem (*Schizachyrium scoparium* (Michaux) Nash), sideoats grama (*Bouteloua curtipendula* (Michaux) Torrey) and prairie dropseed (*Sporobolus heterolepis* Gray). *Synolabus nigripes* is most often collected in prairies (dry, dry hill, sand, bluff) and savannas, as well as in oak barrens.

Phenology. In Wisconsin, adults have been collected in May, June, July, August and October.

Collecting methods. The 50 Wisconsin specimens examined during this study from 12 counties represent a **new state record** (Appendix 1). A series of specimens was collected on sumac (*Rhus* Linnaeus spp.), others were on flowers in general, some were collected by sweeping and one was collected in a Malaise trap.

Distribution. *United States.* AR, AZ, CO, CT, DC, DE, FL, GA, IA, IL, IN, KS, MA, MD, MN, MO, NC, NE, NJ, NM, NY, OH, PA, RI, SC, TN, TX, VA, WI, WV.

Wisconsin county records. Burnett, Crawford, Dane, Dunn, Grant, Iowa, La Crosse, Manitowoc, Monroe, Polk, Sauk, Vernon.

Genus *Himatolabus* Jekel

Type species. *Attelabus vestitus* Gyllenhal, 1839, designated by Voss (1925).

Himatolabus was once considered a subgenus of *Attelabus* until Voss (1925) elevated it to the generic level. Hamilton (1992) revised this genus and provided a key to species. *Himatolabus* belongs to the genus group *Attelabina*, which also includes *Attelabus* Linnaeus, *Homeolabus* Jekel, *Xestolabus* Jekel, *Omolabus* Jekel, *Temnocerus* Thungberg, and *Phyletobius* Voss.

Generic diagnosis. *Himatolabus* can be recognized by the conspicuous pubescence, the compact body, and for the most part, the reddish-brown integument (*H. axillaris* is black with distinct reddish orange maculae on the elytral base). The only other genus whose species possess abundant pubescence is *Pilolabus* Jekel, but it is found only in Central America.

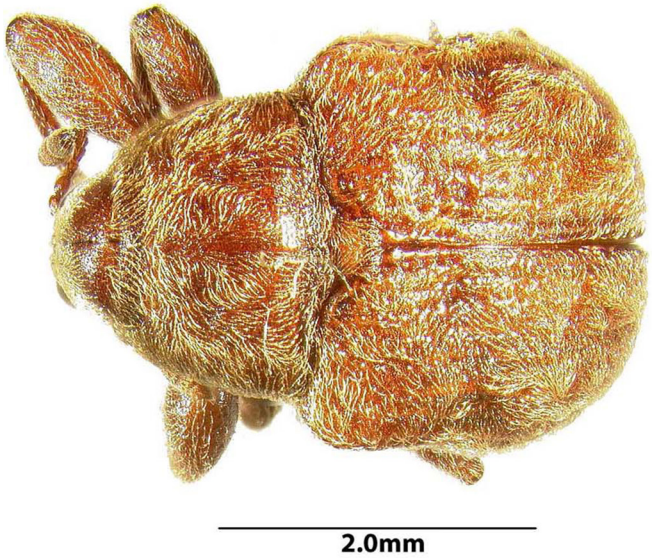
Himatolabus pubescens (Say)

(Fig. 5–6)

Diagnosis. *Himatolabus pubescens* can be recognized in general by its conspicuous pubescence that consists of abundant white and yellow setae. It can be distinguished from other species of *Himatolabus* by the pubescence that is irregularly distributed dorsally and by the lack of distinct postocular lobes.

Description. Length 4.0–6.8 mm. Integument reddish brown. Vestiture consisting of abundant, white to pale yellow setae; on elytra setae abundant, short, recumbent and curved. Head slightly narrowed from base to eyes; median carina slightly elevated, longitudinal, extending from vertex to middle of eye; surface of head strongly punctured below median carina. Rostrum shorter than head, constricted at antennal insertion; broadly expanded apically, about 2.0× width of frons; lateral apical angles with a blunt tooth. Antennae inserted dorsolaterally at basal ⅓ of rostrum. Pronotum width 1.3× length, widest at base; strongly arcuate laterally, converging to recurved apex; disc convex, with distinct, round impressions on median lateral area, surface with large, dense, moderately deep punctures. Elytra as long as wide, width at base 1.3–1.4× pronotal width; apex broadly rounded; striae shallowly impressed, inconspicuous, with moderately large and moderately deeply impressed punctures; interstriae rugose, weakly elevated, with scattered, fine punctures.

Natural history. This species exhibits considerable variation over its range in terms of color, size and pubescence, and is the most widespread species of *Himatolabus* in North America (Hamilton 1992). Adults have been recorded on hazelnut (*Corylus americana* Walter), speckled alder (*Alnus rugosa* (DuRoi) Sprengel), gray alder (*Alnus incana* (Linnaeus) Moench), oak (*Quercus* spp.), and common yarrow (*Achillea millefolium* Linnaeus). However, it is most commonly associated with oak. The thief weevil, *Pterocolis ovatus*, is documented to be a nidus-kleptoparasite of *H. pubescens* when they use oak as their host plant (Hamilton 1992).



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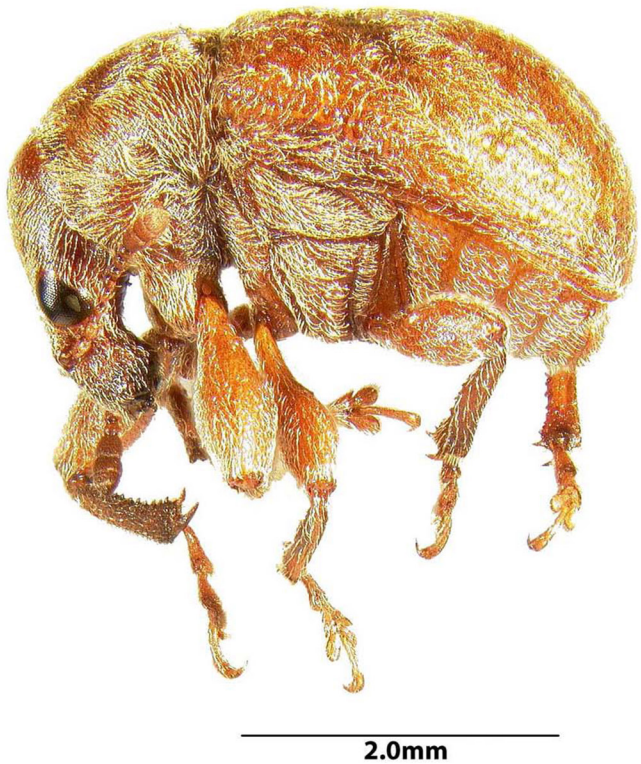

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Figures 5–6. *Himatolabus pubescens* (Say). **5)** Habitus, dorsal view. **6)** Habitus, lateral view.

Phenology. In Wisconsin, adults have been collected from May to July.

Collection Methods. Twenty-five Wisconsin specimens were examined during this study from five counties. One specimen was swept from foliage in an oak-pine forest.

Distribution. *United States.* AZ, CO, CT, IA, IL, IN, KS, KY, MA, ME, MI, MN, MO, NE, NJ, NH, NM, NY, OH, PA, RI, TN, TX, VA, VT, WI. *Canada.* MB, NS, PQ, ON.

Wisconsin county records. This species has previously been recorded from Wisconsin (O'Brien and Wibmer 1982, Downie and Arnett 1996). Dane, Dodge, Door, Jackson, Polk.

Genus *Homeolabus* Jekel

Type species. *Attelabus analis* Illiger, 1794, by monotypy.

This genus contains one species, *Homeolabus analis*, which is common in the eastern part of the United States and Canada.

Generic diagnosis. *Homeolabus* can be recognized by the entirely reddish orange dorsum, the prothoracic femora that are not toothed, and the submental area that have two teeth present in males that are absent in females.

Homeolabus analis (Illiger)

(Fig. 7–8)

Diagnosis. *Homeolabus analis* can be distinguished from *Synolabus* species by the larger size and by the untoothed prothoracic femora. It is most similar superficially to *S. nigripes* given the occasional overlap in size (between the range 4.0–4.5mm) and the red dorsum, but can be distinguished by the black thoracic sterna (red in *S. nigripes*). This species can be distinguished from *H. pubescens* by the glabrous body.

Description. Length 3.2–6.7mm. Integument black to reddish black; pronotum, elytra, abdomen, and sometimes base of head reddish orange, varying from yellow orange to dark reddish brown. Vestiture evident on head and lateral areas of elytra, rest of surface glabrous. Head with sides parallel from base to eyes; surface densely punctured, with median groove flanked on each side by 1 impressed groove, grooves extending from areas near antennal insertions to above eyes, areas between grooves elevated into 2 divergent carinae. Rostrum about half as long as head, constricted at antennal insertion; apex expanded and inflated, width about 1.7–1.8× width of frons; submentum of male with 2 blunt teeth, of female without teeth. Antennae inserted dorsolaterally on basal ⅓ of rostrum. Pronotum width 1.3× length, widest at base; weakly arcuate laterally, strongly converging to sinuate apex; disc evenly convex, not impressed; surface shining, smooth, with widely scattered, very minute punctures. Elytra width at base 1.2× pronotal width, broadly rounded apically; striae not impressed, with large, shallowly impressed, widely separated punctures in nearly regular rows; interstriae smooth, shining, with obscure, fine, minute punctures and lines.

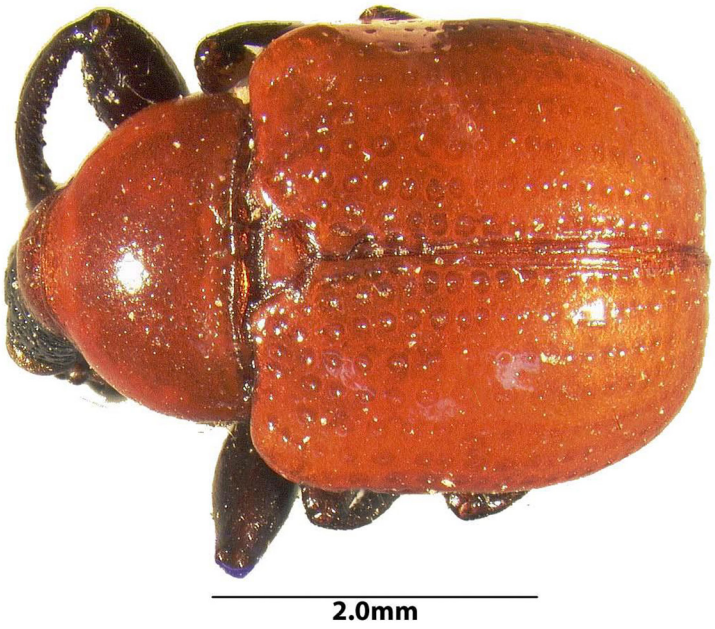
Natural history. This species is generally associated with oak (*Quercus* spp.). Further natural history and behavioral information can be found in Hall and Buss (2007).

Phenology. In Wisconsin, adults have been collected in June and July.

Collection methods. Sixty-seven Wisconsin specimens were examined during this study from 14 counties. One specimen was collected on the leaf of a 2–feet tall oak scrub, others were hand collected from scrub oak, oak leaves, or oak trees in general.

Distribution. *United States.* AL, AR, CT, DC, FL, GA, IA, IL, IN, KS, MA, MD, ME, MI, MO, MS, NC, NH, NJ, NY, OH, OK, PA, RI, SC, TN, TX, VA, WI, WV. *Canada.* MB, ON.

Wisconsin county records. This species has previously been recorded from Wisconsin (O'Brien and Wibmer 1982; Downie and Arnett 1996). Adams, Crawford, Dane, Dodge, Grant, Iowa, Jackson, Marquette, Monroe, Richland, Sauk, Waukesha, Waushara, Wood.



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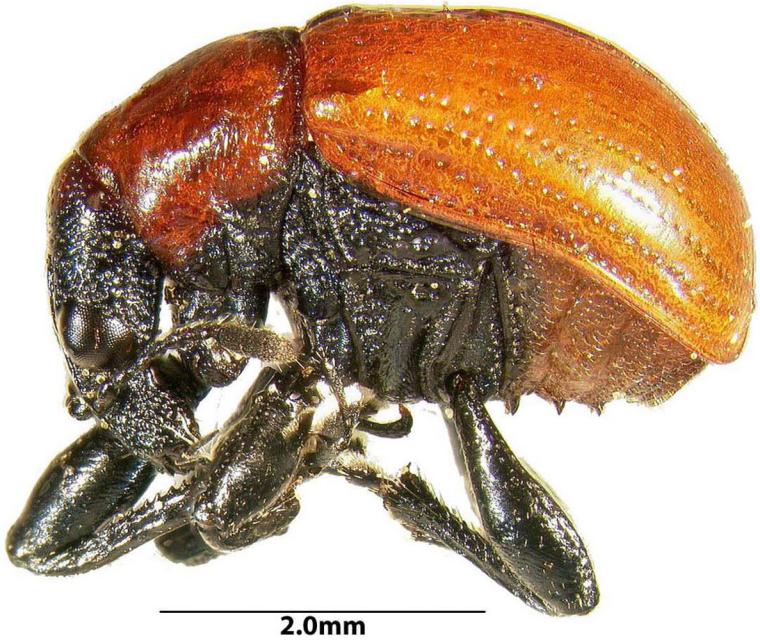

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Figures 7–8. *Homeolabus analis* (Illiger). **7)** Habitus, dorsal view. **8)** Habitus, lateral view.

Subfamily Rhynchitinae Gistel

Tribe Rhynchitini Gistel

Genus *Eugnamptus* Schoenherr

Type species. *Anthribus collaris* Fabricius, 1801, by monotypy.

Generic diagnosis. *Eugnamptus* can be recognized by the presence of the scutellary striole, by the pygidium that is completely or almost completely covered by the elytra, by the semi-erect setae on the elytra, and by the males that have one tooth on the outer margin of the mandible and the females that have two.

Key to Wisconsin species of adult *Eugnamptus*

1. Color uniformly brownish yellow; punctures on head dense; eyes in females and males of similar size . . . . . ***E. puncticeps* LeConte**

— Color varies (4 different morphs), but elytra always dark; punctures of head sparse; eyes in males much larger and closer together . . . . . ***E. angustatus* (Herbst)**

Eugnamptus angustatus (Herbst)

(Fig. 9–12)

Diagnosis. *Eugnamptus angustatus* exhibits great color variation, which has caused early taxonomic confusion and resulted in the description of a number of synonyms (Hamilton 1990). Four different morphs exist within this species; the color variation can be recognized as: the typical form (42%) (Fig.9–12), the dark-colored form (33%, only females), the pale-legged-color form (20%) and the red-headed-color form (5%). Pierce (1913) proposed these various morphs to be different species, however they are now recognized as synonyms. *Eugnamptus angustatus* can be recognized by the elytral integument that is always dark, by the punctures of the interstriae that are much smaller than those of the striae, and by the head with small and widely spaced setigerous punctures.

Description. Length 2.5–4.4mm (head excluded). Integument reddish brown to black; pronotum sometimes light red or reddish brown; legs light brown or reddish; elytra always dark. Head convex at upper level of eyes; surface with very small, weakly impressed, widely separated punctures. Rostrum arcuate, in male shorter than pronotum, in female as long as pronotum; sides in dorsal view parallel from eyes to antennal insertion. Pronotum length 1.1× width, widest at middle, moderately arcuate laterally, converging to truncate apex; disc with fairly large, shallow, round punctures, interpuncture space smooth, shining. Elytra length 1.8× width, width about 2.0× pronotal width; striae distinct, not impressed, with round, moderate, impressed punctures; interstriae much wider than striae, flat; strial and interstrial punctures each with 1 long, erect seta.

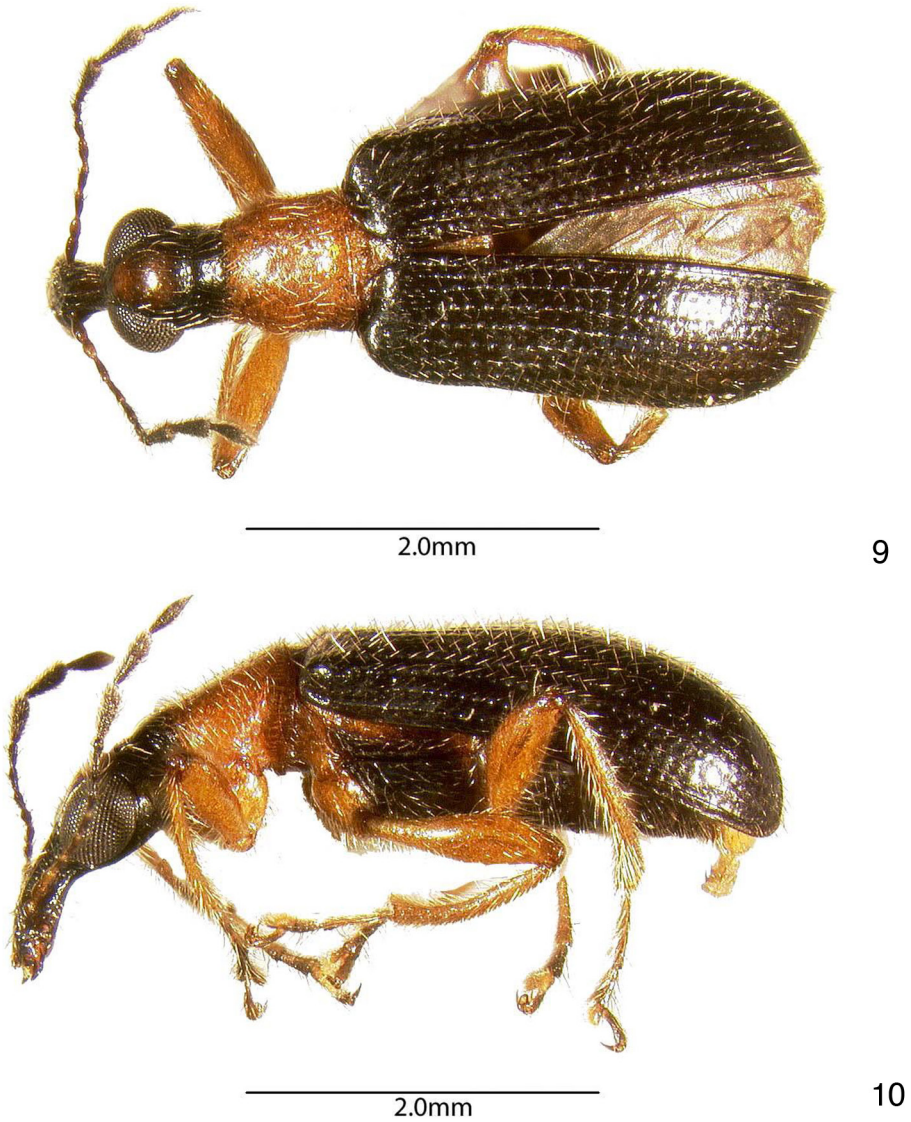
Natural history. This species is often collected from oak (*Quercus* Linnaeus spp.) and is known to mine dead oak leaves. They have also been recorded on walnut (*Juglans* Linnaeus spp.), dogwood (*Cornus* Linnaeus spp.), hickory (*Carya* Nuttall spp.), sassafras (*Sassafras* Boehmer spp.), black gum (*Nyssa* Linnaeus spp.), and the common persimmon (*Diospyros virginiana* Linnaeus). Hamilton (1980) recorded the life history of this species in northern Ohio on sassafras (*Sassafras albidum* (Nuttall) Nees von Essenbeck). The adults emerge in late May to early June and mate on mature sassafras trees, feeding preferentially on young developing leaves. After mating, the females will relocate to the ground to oviposit in dead leaves from the previous fall leaf drop. Larvae develop within the leaf as full depth leaf miners and reach the 4th instar in 3–4 months; once they mature, they leave the mines to pupate in the soil and overwinter. In the lab, females have been observed to oviposit in the leaves of oak (*Quercus* spp.) and sweetfern (*Comptonia peregrina* (Linnaeus) Coulter).

Phenology. In Wisconsin, adults have been collected from June to September.

Collecting methods. Thirty-one Wisconsin specimens were examined during this study from 11 new counties, totaling 13 county records, as noted below. Specimens were collected by sweeping forest understory, beating oak or other hardwood trees, in pan traps and Malaise traps, as well as hand collected from hazelnut (*Corylus* Linnaeus spp.) and on wilted oak (*Quercus* spp.).

Distribution. *United States.* AL, AR, CT, DC, DE, FL, GA, IA, IL, IN, KS, KY, LA, MA, MD, MI, MN, MO, MS, NC, NE, NJ, NY, OH, OK, PA, RI, SC, SD, TN, TX, VA, VT, WI, WV. *Canada.* ON, SK.

Wisconsin county records. This species has previously been recorded from Monroe and Washburn counties (O'Brien and Wibmer 1982; Hamilton 1990; Downie and Arnett 1996). Columbia, Dane, Grant, Lafayette, Pierce, Rock, Sauk, St. Croix, Vernon, Waukesha, Wood.



Figures 9–10. *Eugnamptus angustatus* (Herbst) (M). **9)** Habitus, dorsal view. **10)** Habitus, lateral view.

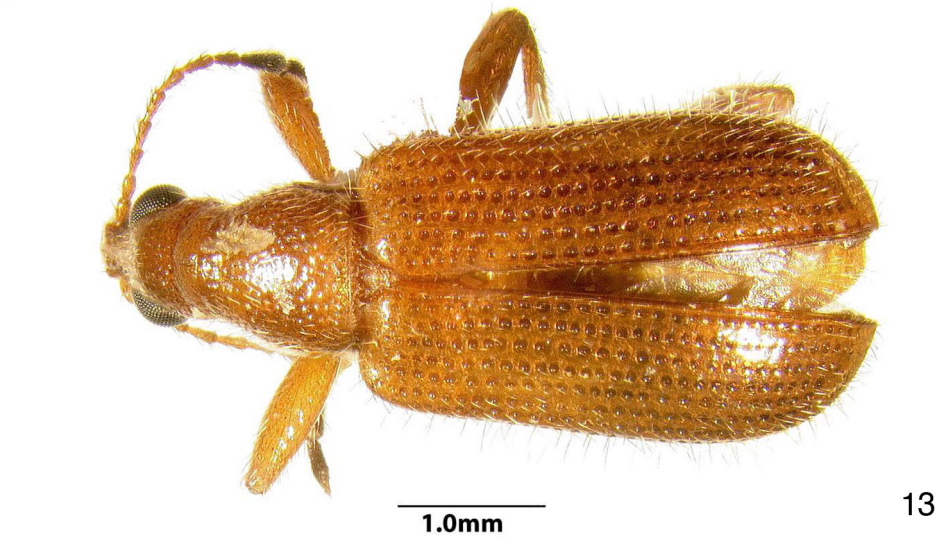
Figures 11–12. *Eugnamptus angustatus* (Herbst) (F). **11)** Habitus, dorsal view. 1**2)** Habitus, lateral view.

Eugnamptus puncticeps LeConte

(Fig. 13–14)

Diagnosis. *Eugnamptus puncticeps* can be recognized by the head with numerous, dense setigerous punctures, by the elytra that are never dark, and by the males and females that are of approximately the same size, a character that distinguishes this species from the rest of the genus. According to LeConte (1876), the antennae are also stouter than those of *E. angustatus*.

Description. Length 3.0–4.0mm (head excluded). Integument reddish brown to yellowish to brown throughout, with variable dark areas on the rostrum and the distal part of the appendages. Head slightly longer than wide, with numerous, rather dense setigerous punctures. Rostrum length 1.25× length of head, slightly wider than frons apically. Frons slightly convex, sometimes with weak median linear impression, wider than rostral base.



Figures 13–14. *Eugnamptus puncticens* LeConte. **13)** Habitus, dorsal view. **14)** Habitus, lateral view.

Antennae inserted slightly behind middle of rostrum; club short, much shorter than funicle, apical segment slightly longer than penultimate segment. Pronotum as wide as long, slightly wider than distance across eyes, with dense, setigerous punctures subequal to those of head; nearly parallel-sided, narrowed only slightly basally and apically, dorsal surface weakly flattened, sometimes with weak, mid-dorsal impression behind middle. Elytral length about 3.0× pronotal length, width <2.0× pronotal width at base, widening only slightly near apical ⅔; striae round to quadrate, moderately impressed; interstriae weakly convex, as wide as or slightly wider than striae, punctures very small, <0.25× those of striae. Sexual dimorphism present, exhibiting all sexual dimorphism of the genus except eyes of males and females are approximately the same size.

Natural history. According to Hamilton (1990), this species has only been collected on dwarf sumac (*R. copallina*), mostly in June, July and August. Among the Wisconsin specimens, a series of this species was reported on smooth sumac (*Rhus glabra* Linnaeus): "very active, on tips of leaflets of *Rhus glabra*, excavating lower surface, leaving circular scars visible above and below, upper epidermis undamaged, limy hill prairie, 5 pm, cloudy, 74F" (label data from vouchered specimen series in WIRC; A. Williams collector). A specimen was collected by "sweeping bluff prairie", and another by "sweeping prairie/savannah". This species is wide ranging but apparently not locally abundant (Hamilton 1990).

Phenology. In Wisconsin, adults have been collected in July and August.

Collecting methods. The nine Wisconsin specimens examined during this study from four counties represent a **new state record** (Appendix 1). This species can be most readily collected by hand from smooth sumac (*R. glabra*) or dwarf sumac (*R. copallina*) or by sweeping prairie habitats where its plant associations are found. It has can also be collected at UV light.

Distribution. *United States.* AL, CT, DC, FL, GA, IA, IL, IN, KS, LA, MA, MD, MO, MS, NC, NE, NJ, PA, SC, TN, TX, VA, WI.

Wisconsin county records. Crawford, Grant, Iowa, Vernon.

Genus *Haplorhynchites* Voss

Type species. *Rhynchites aeneus* Boheman, 1829, subsequent designation by Hamilton (1974).

Haplorhynchites was once a subgenus of *Rhynchites* until Hamilton (1974) revised the group and elevated it to the generic level.

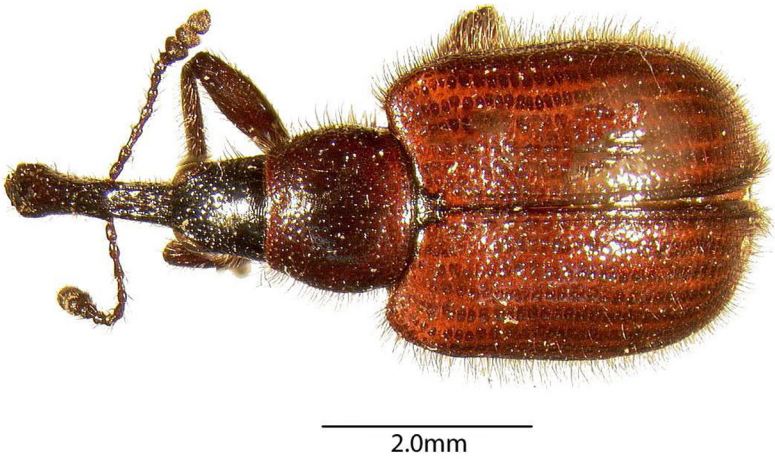
Generic diagnosis. *Haplorhynchites* can be recognized by the absence of the scutellary striole, by the pygidium that is exposed beyond the elytra, by the distinctly rowed elytral striae (except in *Haplorhynchites aeneus*) and by the distinct elytral interstriae with punctures that are more-or-less smaller than those of the striae.

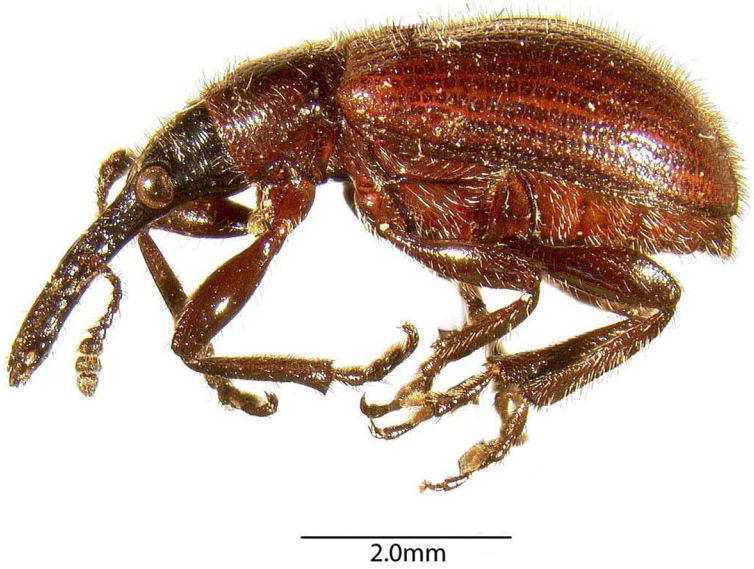
Haplorhynchites aeneus (Boheman)

(Fig. 15–16)

Diagnosis. *Haplorhynchites aeneus* can be recognized by the abundant erect pubescence, by the generally larger size, and by the black integument. It can be distinguished from other *Haplorhynchites* species by the dense, random punctures on the elytra. It may also be confused with *Auletobius ater*, but it can be distinguished by the antennae that are inserted in or just in front of the basal ⅓ of the rostrum, which is inserted near the middle of the rostrum in *A. ater*.

Description. Length 3.9–6.6mm. Integument black, venter and tip of rostrum with faint greenish luster. Vestiture consisting of abundant, erect setae. Head conical, with moderate punctures; interpuncture space forming irregular longitudinal ridges. Rostrum slightly arcuate, in male only 1.3× pronotal length, in female as long as head + pronotum; sides in dorsal view expanded in apical ⅕, width at apex about 1.25× width of frons. Antennae inserted at or just in front of basal ⅓ of rostrum. Pronotal width about 1.2× length, widest behind middle; distinctly arcuate laterally; disc with shallow, close punctures, interpuncture space shining, smooth, with coarse, erect, brown setae. Elytral length about 1.2× width, width 2.0× pronotal width; surface randomly punctured, the punctures close and deep, bearing coarse, erect setae; straie and interstriae inconspicuous. Sexual dimorphism present in length of rostrum.





Figures 15–16. *Haplorhynchites aeneus* (Boheman), teneral specimen. **15)** Habitus, dorsal view. **16)** Habitus, lateral view.

Natural history. This species has been recorded from the eastern part of the US, westward to the continental divide, but is most numerous in the Midwest. It is the most common *Haplorhynchites* species in North America and is associated with many species in the sunflower tribe Heliantheae. Male and female adults are usually found together on uncut flower heads shortly after their appearance in July, copulation then occurs on these heads; after or during copulation the females would cut the stems below the flower heads incompletely so the heads are still attached. Eggs are found in the disc-flower bases of cut heads, and eclose in about a week. After reaching maturity the larvae leave the cut heads and enter the soil. The larvae overwinter and emerge the following July (Hamilton 1973).

This species is generally associated with sunflowers (*Helianthus* Linnaeus spp.), including woodland sunflower (*Helianthus divaricatus* Linnaeus), sawtooth sunflower (*Helianthus grosseserratus* Martens), common sunflower (*Helianthus annuus* Linnaeus), stiff sunflower (*Helianthus pauciflorus* Nuttall), and few-leaf sunflower (*Helianthus occidentalis* Riddell). It has also been recorded from rosinweeds (*Silphium* Linnaeus spp.), including compassplant (*Silphium laciniatum* Linnaeus), wholelead rosinweed (*Silphium integrifolium* Michaux) and prairie rosinweed (*Silphium terebinthinaceum* Jacquin), as well as scruf pea (*Psoralea* Linnaeus spp.), oxeye (*Heliopsis*

Persoon spp.), tickseed (*Coreopsis* Linnaeus spp.), and prairie goldenrod (*Solidago ptarmicoides* (Torrey & A. Gray) B. Boivin).

In Wisconsin, they have been found on disc flowers of stiff sunflower, few-leaf sunflower, and prairie goldenrod, as well as swept from blazing star (*Liatris* Schreber spp.), rosinweeds (*Silphium* spp.), bergamot (*Monarda* Linnaeus spp.) and dogbane (*Apocynum* Linnaeus spp.). Hamilton (1973) provided detailed information on its biology.

Phenology. In Wisconsin, adults have been collected from July to September, with a peak in July and August.

Collecting methods. Thirty-two Wisconsin specimens were examined during this study from four counties. This species can be readily collected by hand from disc flowers of sunflower species. It can also be collected by sweeping prairies where its plant associations are present.

Distribution. *United States.* AL, AR, CA, CO, FL, GA, IA, IL, IN, KS, MA, MD, MI, MN, MO, MS, MT, NC, ND, NE, NJ, NM, NY, OH, OK, PA, SC, SD, TN, TX, VA, WI, WV. *Canada.* MB, SK.

Wisconsin county records. This species has previously been recorded from Wisconsin (Blatchley and Leng 1916; O'Brien and Wibmer 1982; Downie and Arnett 1996). Burnett, Grant, Kenosha, Milwaukee.

Genus *Merhynchites* Sharp

Type species. *Curculio bicolor* Fabricius, 1775, subsequent designation by Pierce (1913).

Generic diagnosis. *Merhynchites* can be recognized by the larger size (greater than 4 mm), by the more-or-less indistinct elytral striae (more distinct in *Merhynchites bicolor*) that are weakly impressed especially basally, by the flat and sometimes rugose interstriae that is twice as wide as striae, and by the fine, semi-erect setae.

Merhynchites bicolor (Fabricius)

(Fig. 17–18)

Diagnosis. *Merhynchites bicolor* can be distinguished by the red prothorax, elytra and base of head, and by the larger size. It is very similar to *M. wickhami*, the western rose curculio, which has a more western distribution and is not known from Wisconsin. *Merhynchites bicolor* can be recognized by the base of the head that is red as opposed to black, by the elytral strial punctures that are larger than the interstrial punctures, by the wider eyes (0.12–0.14 mm wide as opposed to 0.07–0.10 mm in *M. wickhami*), by the straighter rostrum, by the smooth elytral interstriae, and by the spiculum gastrale with the lateral margin bearing an acute, tooth-like process, which is absent in *M. wickhami.*

Description. Length 4.5–5.5 mm (head excluded). Integument black; prothorax, elytra and base of head red or reddish brown to light yellow. Head dull or shining, base of head red, apex usually black; surface with elongate punctures between eyes, interpuncture space weakly elevated, carinate at base of rostrum. Rostrum straight (more so in female), distinctly punctured, with 1 weakly elevated, longitudinal median ridge; longitudinally impressed basally in front of eyes. Eyes strongly convex. Pronotal width 1.1× length, widest at middle; broadly arcuate laterally, strongly converging to broadly rounded apex; disc distinctly convex, with moderate, impressed punctures, interpuncture spaces moderately shining, smooth. Elytral length 1.3× width, width at base 1.5–1.6× pronotal width; striae with large punctures; interstriae 1.5–2.0× strial width, smooth, with fine, erect, scattered setae. Pygidium densely punctured. Sexual dimorphism present in rostrum and legs: prothoracic coxae of male with round to oval, densely setose pits apically.

Natural history. This species is commonly known as the rose curculio or the rose weevil as it is most often found on roses (*Rosa* Linnaeus spp.) as well as species of *Rubus*; it can be an occasional pest of cultivated roses, blackberries, and raspberries. Larvae are recorded to develop in the hips of these plants and feed on the achenes. In Wisconsin, it has been reared from hips of Carolina rose (*Rosa carolina* Linnaeus), smooth rose (*Rosa blanda* Aiton) and wild prairie rose (*Rosa arkansana* Porter). It has also been found on rugosa rose (*Rosa rugosa* Thunberg).

There is much published on this species: Chittenden (1901) reported on pest species including *M. bicolor* that are found on ornamental plants; Cooley (1903) reported that *M. bicolor* is an insect pest; Lovett (1915) reported that *M. bicolor* injures blackberry buds; Robertson (1923) investigated *M. bicolor* in Manitoba and how

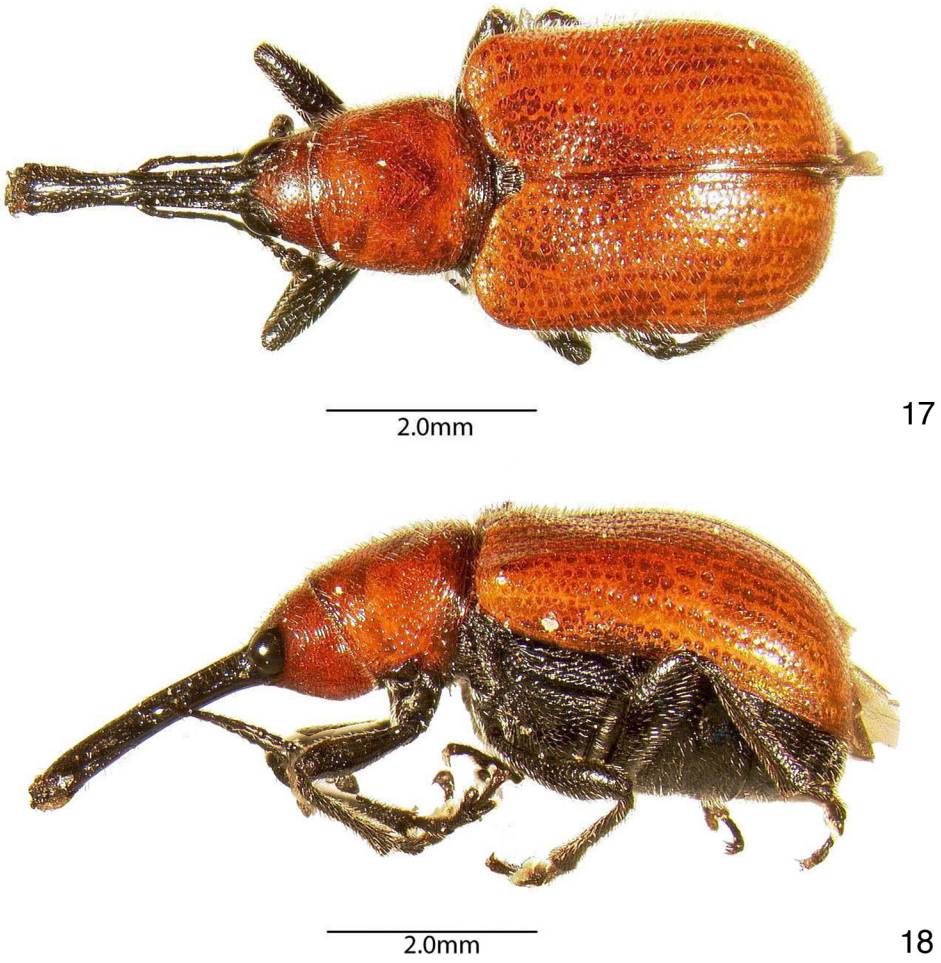
it affected roses; Balduf (1959) reported on insects including *M. bicolor* that are associated with rose hips; finally, Hamilton and Kuritsky (1981) described the larva and pupa of *M. bicolor*.

Phenology. In Wisconsin, adults have been collected from April to August, with a peak in June and July.

Collecting methods. During this study, 239 Wisconsin specimens were examined from 27 counties, forming a total of 28 county records. This species is most commonly hand-collected from wild roses. It is also often collected by sweeping roses, sweeping fields where roses are present, or by rearing from hips of various rose species.

Distribution. *United States.* AB, AZ, CA, CO, CT, DC, IA, ID, IL, IN, KS, KY, MA, MD, ME, MI, MO, MT, ND, NE, NH, NJ, NV, NY, OH, OR, PA, RI, SC, SD, UT, VA, WA, WI, WV, WY. *Canada.* BC, MB, NF, SK.

Wisconsin county records. This species was previously recorded from Barron, Crawford, and Kenosha counties (O'Brien and Wibmer 1982, Downie and Arnett 1996). Ashland, Barron, Brown, Burnett, Crawford, Dane, Dodge, Douglas, Grant, Green, Iowa, Jackson, Jefferson, Kenosha, Manitowoc, Marathon, Marinette, Marquette, Milwaukee, Monroe, Polk, Portage, Racine, Richland, Sauk, St. Croix, Waukesha, Waushara, Winnebago, Wood.



Figures 17–18. *Merhynchites bicolor* (Fabricius). **17)** Habitus, dorsal view. **189)** Habitus, lateral view.

Genus *Temnocerus* Thunberg

Type species. *Curculio nanus* Paykull, 1792, subsequent designation by Voss, 1932.

Hamilton (1969) elevated what was once considered a subgenus of *Rhynchites*, *Pselaphorhynchites* Schilsky, to the generic level and clarified that the current concept of *Rhynchites* contains only the species *R. velatus*. However, Alonso-Zarazaga and Lyal (1999) listed *Pselaphorhynchites* as a synonym of *Temnocerus* Thunberg, 1815; accordingly, *Temnocerus* is currently recognized.

Generic diagnosis. *Temnocerus* can be recognized by the presence of the scutellary striole, by the distinct elytral striae that are more-or-less quadrate, and by the narrow, convex and smooth interstriae.

Key to Wisconsin species of adult *Temnocerus* species

1. Pydigium largely covered by elytra, with apex exposed, more-or-less obliquely oriented; 2.3–3.5 mm . . . . . ***T. cyanellus* (LeConte)**

— Pydigium almost entirely exposed by elytra, more-or-less vertically oriented; 1.7–2.8 mm **2**

2(1). Rostrum distinctly widening from antennal insertions toward apex, narrowest at antennal insertions; color shining black, without blueish sheen . . . . . ***T. perplexus* (Blatchley)**

— Rostrum more-or-less parallel-sided from antennal insertion towards apex, narrowest between antennal insertion and apex; color black with blue to purple sheen, to the naked eye bronze to reddish or greenish bronze . . . . . ***T. aeratus* (Say)**

Temnocerus aeratus (Say)

(Fig. 19–20)

Diagnosis. *Temnocerus aeratus* can be recognized by the frons that lacks a median impression, and by the rostrum that is distinctly angulate and apically flattened in apical view and that is more-or-less parallel-sided from antennal insertion towards apex.

Description. Length of male 2.1–2.2 mm, of female 2.1–2.8 mm. Integument black, with brassy purple reflections; to the naked eye bronze to reddish or greenish bronze. Head quadrate, with rather widely and evenly spaced, round, setigerous punctures, distance between punctures about equal to the puncture size, more widely spaced in middle of frons and more crowded around eye, interspace with highly reflective dense bead-like granulations. Rostrum in male length <1.0× pronotal length, in female about 1.25× pronotal length; nearly parallel-sided for entire length, slightly widening apically, distinctly angulate just beyond antennal insertion, gradually and strongly flattened from middle to apex, with wide weak channel dorsomedially from between antennal insertion to base. Eyes large, oval, weakly conical, separation equal to or slightly greater than longest diameter; in male protuberant, in female moderately protuberant. Antennae in male inserted at basal ⅓ of rostrum, in female between basal ⅖ and ⅓ of rostrum. Pronotum as long as wide, more elongate in male, slightly narrowing apically, less so in male, widest behind middle, with round, dense setigerous punctures, those sometime fusing, interspace with highly reflective bead-like granulation. Elytral length >2.0× pronotal length, width 1.75× pronotal width; striae quadrate, moderately impressed; interstriae weakly convex, narrower than striae, with a row of small setigerous punctures. Sexual dimorphism present in size, rostrum, antennal insertion, eyes and pronotum.

Natural history. Adults have been collected from Virginia pine (*Pinus virginiana* Miller), catkins of willow (*Salix* Linnaeus spp.), sweetfern (*Comptonia peregrina*), white oak (*Quercus alba* Linnaeus), and oak in general (*Quercus* spp.). Vogt, in Kissinger (1964) stated that the larvae of this species develop in terminal buds of oak.

Phenology. In Wisconsin, adults have been collected in August and September.

Collecting methods. The 11 Wisconsin specimens examined during this study from six counties represent a **new state record** (Appendix 1). They have been collected from bur oak (*Quercus macrocarpa* Michaux) and white oak (*Q. alba*). Another specimen was collected by beating hardwood trees, and another was collected in a flight-intercept trap.

Distribution. *United States.* AR, AZ, CO, CT, DC, FL, GA, IA, IL, IN, MA, MD, ME, MI, MN, MO, MS, NC, NE, NJ, NM, NY, OH, PA, SC, TN, TX, UT, VA, WI, WV. *Canada.* ON. *Mexico.* BJ.

Wisconsin county records. Eau Claire, Florence, Marinette, Marquette, Portage, Waupaca.

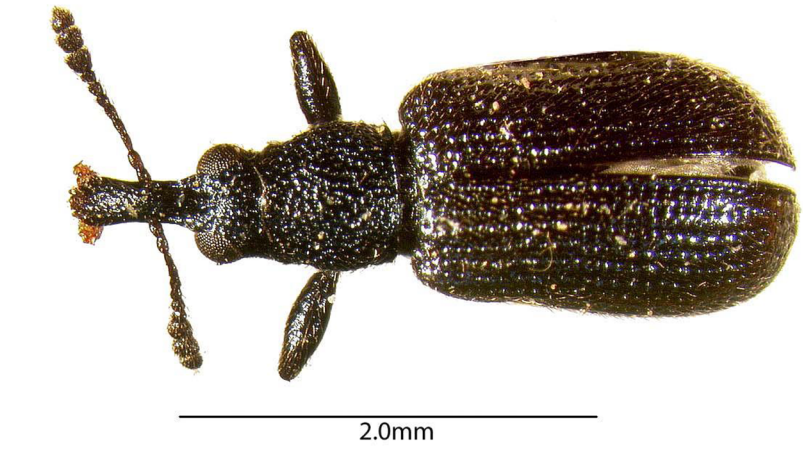
Temnocerus cyanellus (LeConte)

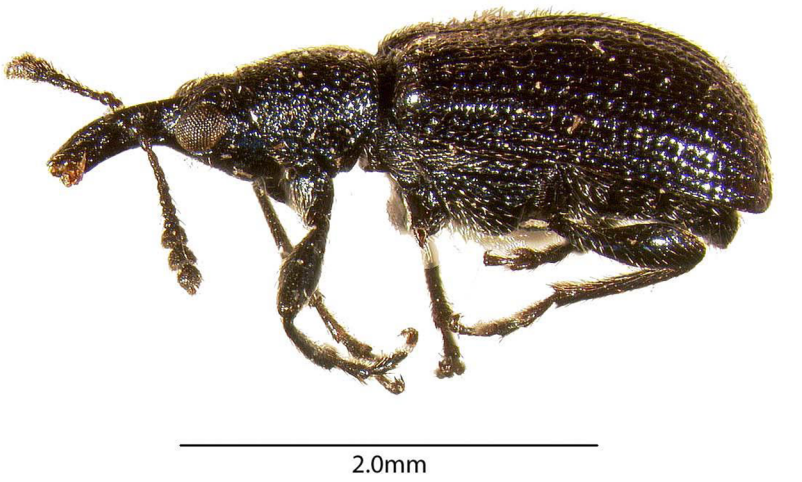
(Fig. 21–22)

Diagnosis. *Temnocerus cyanellus* can be recognized by the unexposed pygidium, by the rostrum that enlarges abruptly in the apical ¼, by the strongly protuberant eyes, and by the distinctly wider than long pronotum that narrows apically.

Figures 19–20. *Temnocerus aeratus* (Say). **19)** Habitus, dorsal view. **20)** Habitus, lateral view.

Description. Length of male 2.4–3.4 mm, of female 2.3–2.5 mm. Integument black with bluish, aeneus and purple reflections, antennae and extremities of legs somewhat paler. Head quadrate, with dense, round, setiferous punctures; interpuncture space minutely granulose, becoming longitudinally rugose in front. Rostrum enlarged rather abruptly in apical ¼ to a width subequal to frons; sides in dorsal view nearly parallel; slightly arcuate; in male length about 1.0× pronotal length, in female 1.6× pronotal length. Frons with interspaces minutely rugose. Eyes rather strongly protuberant. Antennae inserted further from rostral base, insertion to antennal margin of eye much greater than diameter of eye; in male inserted between basal ½ and ¼ of rostrum, in female inserted at basal ⅓ of rostrum. Pronotum distinctly wider than long, narrowed apically, widest behind middle; disc with round, shallow setiferous punctures, interpuncture space finely grooved. Elytral length 3.0× pronotal length, width 2.0× pronotal width; striae not impressed, with deep, quadrate to oval punctures; interstriae about 0.5× strial width, each interstria with 1 row of fine, round, setiferous punctures. Pygidium covered by elytra. Sexual dimorphism present in size, rostrum and antennal insertion.





Figures 21–22. *Temnocerus cyanellus* (LeConte). 2**1)** Habitus, dorsal view. 2**2)** Habitus, lateral view.

Natural history. This species has been collected from willow (*Salix* spp.), birch (*Betula* Linnaeus spp.) and oak (*Quercus* spp.).

Phenology. In Wisconsin, adults have been collected in May and June.

Collecting methods. Seven Wisconsin specimens were examined from four counties. This species has been collected by beating branches of hardwood trees.

Distribution. *United States.* AB, CO, CT, IA, IL, IN, MA, ME, MI, MN, MO, MT, NB, NE, NH, NJ, NY, OH, OR, PA, UT, WI. *Canada.* MB, NF, NS, ON, PE, PQ, SK.

Wisconsin county records. This species was previously recorded from Bayfield County (Hamilton 1971; O'Brien and Wibmer 1982; Downie and Arnett 1996). Bayfield, Dane, Dodge, Portage.

Temnocerus perplexus (Blatchley)

(Fig. 23–24)

Diagnosis. *Temnocerus perplexus* can be recognized by the almost completely visible pygidium, by the rostrum that gradually widens from antennal insertion to apex, by the pronotum that is slightly longer than wide with dense, setigerous punctures, and by the large punctures on the head.

Description. Length of male 1.7–2.6 mm, of female 2.0–2.7 mm. Integument black, shiny, with faint blue sheen or without bluish reflections; apex of rostrum, antennae and apex of legs somewhat paler. Head quadrate, slightly longer than wide, with round, evenly spaced, setiferous punctures; interpuncture spaces with dense, shining, minute granules. Rostral length 1.3× length of head + pronotum, in lateral view distinctly flattened apically; sides in dorsal view gradually widening from antennal insertion apically, narrower at apex than frons; distinctly arcuate and weakly flattened apically; punctures large. Antennae in male inserted just in front of basal 0.2 of rostrum, in female inserted near basal 0.2 of rostrum. Pronotum slightly longer than wide, slightly narrowed apically, widest behind middle; disc with round to irregularly shaped, dense setigerous punctures, interpuncture space with a few granules. Elytral length >2.0× width, width 2.0× pronotal width; striae not impressed, with deep, quadrate punctures; interstriae about 0.5× strial width, weakly convex, each interstria with 1 row of small, round, setiferous punctures. Pygidium almost completely visible, covered only at extreme base. Sexual dimorphism present in size and antennal insertion.

Natural history. According to Hamilton (1983b), both *Auletobius cassandrae* and *Temnocerus perplexus* have the same general distribution in eastern North America; they have been collected at both separate and common sites, and occur on the same host plant, sweetfern (*C. peregrina*). The females of both species oviposit in and then cut the terminal leaf primordia of sweet fern, which causes this tissue to fall to the ground and provide food and protection for the larva. Adults of both species feed on leaves of sweetfern, though in different manners. *Temnocerus perplexus* feeds by scraping off strips of the upper epidermis.

Some species of *Temnocerus* are "tip cutters". Females of these species oviposit in young terminal plant growth; after oviposition they cut off the terminal part with their mandibles so the larvae can pupate in the ground after their development in the dead terminal tissues (Hamilton 2010). Hamilton (1983a) reported the tip cutting behavior of *T. perplexus* on sweetfern (*Comptonia peregrina*) in the Midwest. The females in some other species of *Temnocerus* are known to oviposit in terminal buds or shoots without excising them (Dieckman 1974; Hamilton 1994).

Phenology. This species is univoltine. In Wisconsin, adults have been collected in June.

Collecting methods. One Wisconsin specimen was examined during this study from Wood County.

Distribution. *United States.* CT, DC, GA, IA, IL, IN, KS, MA, ME, MI, NC, NH, NJ, NY, OH, PA, RI, WI. *Canada.* NB, ON, PE, PQ.

Wisconsin county records. This species was previously recorded from Oconto County (O'Brien and Wibmer 1982; Downie and Arnett 1996). Oconto, Wood.

Figures 23–24. *Temnocerus perplexus* (Blatchley). **23)** Habitus, dorsal view. **24)** Habitus, lateral view.

Tribe Auletini Desbrochers

Genus *Auletobius* Desbrochers

Type species. *Involvulus sanguisorbae* Schrank, 1798, subsequent designation by Legalov (2001).

Generic diagnosis. *Auletobius* can be recognized by the randomly punctured elytra (except in *A. cassandrae*), by the slender rostrum, by the unexposed pygidium, by the absence of the scutellary striole, and by the strongly convex, protuberant eyes.

Key to Wisconsin species of adult *Auletobius* species

1. Size 3.3–3.8mm; integument black, clothed with fine, gray pubescence; antennae inserted at middle of rostrum . . . . . ***A. ater* (LeConte)**

— Size 1.8–2.2mm; integument brownish yellow, clothed with fine, yellow pubescence; antennae inserted at basal ¼ of rostrum . . . . . ***A. cassandrae* (LeConte)**

Auletobius ater (LeConte)

(Fig. 25–26)

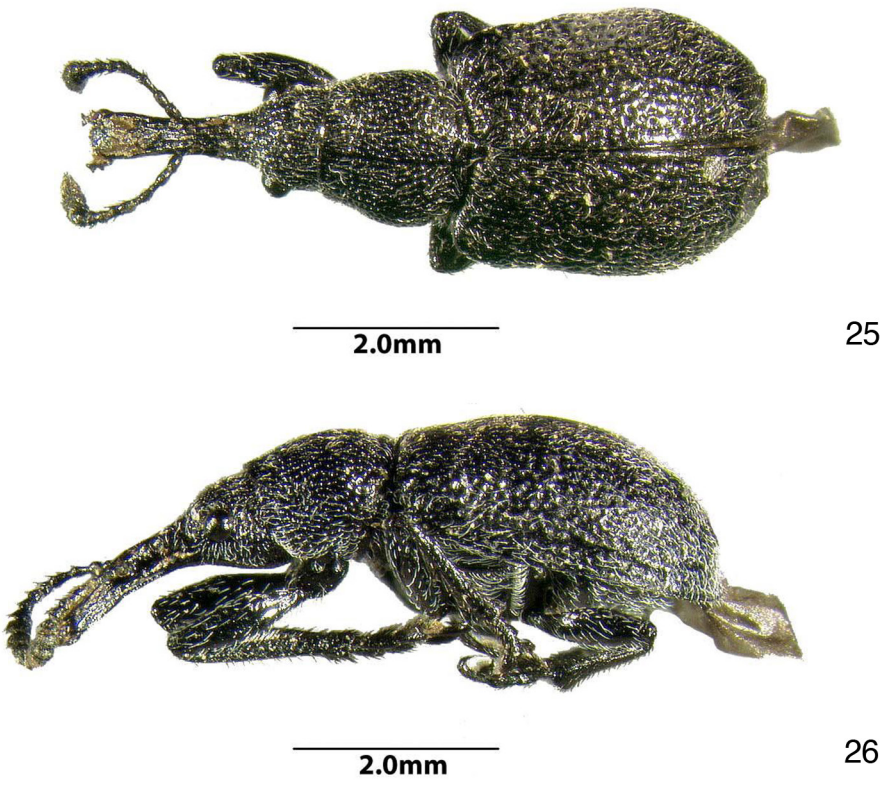
Diagnosis. *Auletobius ater* can be recognized by the confused elytral punctures that are deep and not in rows, by the antennae that are inserted near the middle of the rostrum, by the cleft claws of each pretarsus, by the white pubescence, by the larger size (over 3mm), and by the setose, conspicuous sex patch on declivity of elytral apices in the males.

Description. Length 3.3–3.8mm. Integument black. Vestiture consisting of white setae. Head weakly convex, with a transverse, very weak and not so noticeable impression behind eye; surface with large, close, deeply impressed punctures. Rostrum stouter than other *Auletobius* species; surface shining, with close, elongate, deep punctures forming longitudinal ridges, setae sparse. Eyes round and protuberant. Antennae inserted at middle of rostrum. Pronotum as long as wide, widest in basal ½; weakly arcuate laterally, very weakly constricted before apical margin; disc convex, with large, close, deeply impressed punctures, interpunctural space weakly shining, minutely reticulate. Elytral length 1.2× width, width at base 1.4× pronotal width, surface with deeply impressed, very large, close punctures that are not arranged in any particular order, interpuncture space slightly shining, smooth, disc not noticeably impressed in basal ¼. Sexual dimorphism distinct, males with setose conspicuous sex patch on declivity of elytral apices.

Natural history. This species can generally be found on sweetfern (*Comptonia peregrina*), bayberry (*Myrica* Linnaeus spp.), and oak (*Quercus* spp.).

Phenology. In Wisconsin, adults have been collected from May to July, with a peak in June.

Collecting methods. The 11 Wisconsin specimens examined during this study from four counties represent a **new state record** (Appendix 1). One specimen was collected by hand on foliage of Hill's oak (*Q. ellipsoidalis*), another was collected by beating oak (*Quercus* spp.). It can also be collected by sweeping fields of sweetfern.



Figures 25–26. *Auletobius ater* (LeConte). **25)** Habitus, dorsal view. **26)** Habitus, lateral view.

Distribution. *United States*. AR, CT, IL, IN, MA, MD, ME, MI, MN, MO, NC, NJ, NY, OH, PA, RI, SC, TN, TX, WI. *Canada*. MB, ON, PQ.

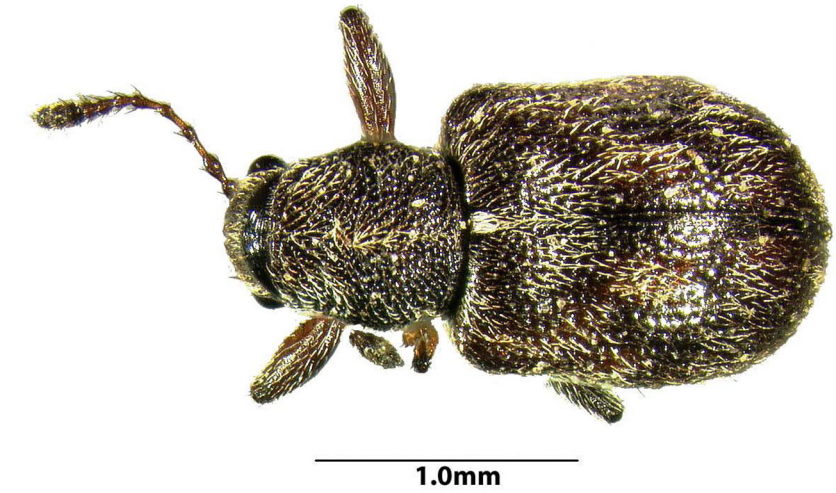
Wisconsin county records. Dane, Grant, Iowa, Wood.

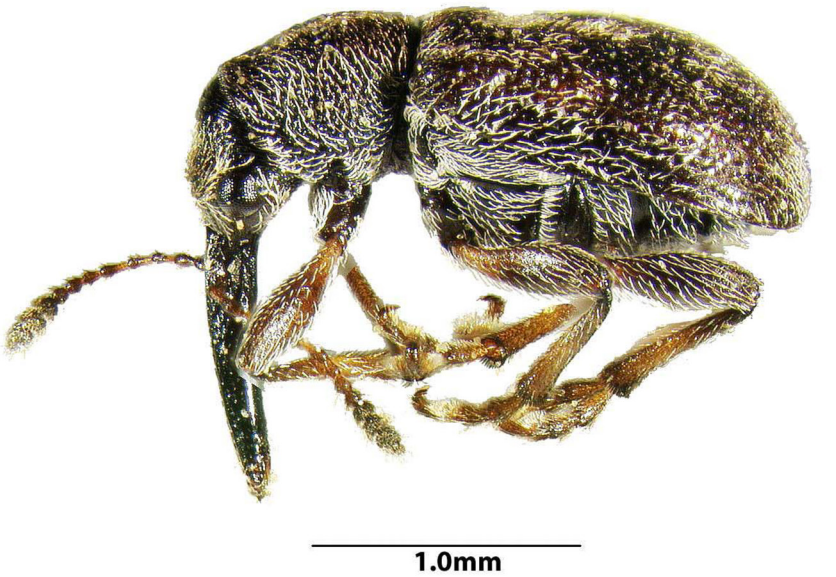
Auletobius cassandrae (LeConte)

(Fig. 27–28)

Diagnosis. *Auletobius cassandrae* can be recognized by the deeply impressed, round to quadrate, weakly-rowed elytral punctures, by the antennae that are inserted in basal ¼ of rostrum, by the head that is constricted behind the eyes, by the bicolored pubescence that is yellow and white with the irregular white cross bands on the elytra, by the smaller size (around 2.0 mm), and by the small bulbous area on declivity of each elytron that bears an inconspicuous setose sex patch in the males.

Description. Length 1.8–2.2mm. Integument dark reddish brown; head and pronotum usually darker than elytra. Elytral vestiture consisting of yellow and white setae, the white setae forming irregular cross bands; vestiture of head and pronotum consisting of setae all white or intermixed with yellow. Head strongly convex, transversely





Figures 27–28. *Auletobius cassandrae* (LeConte). **27)** Habitus, dorsal view. **28)** Habitus, lateral view.

impressed behind eyes; surface with small, close, rather weakly impressed punctures. Rostral length about 1.4× pronotal length, in lateral view nearly straight and distinctly flattened apically; in dorsal view narrower basally, more-or-less parallel-sided anteriad antennal insertion and sometimes slightly constricted at apical ¼; surface glabrous, minutely reticulate, with scattered, fine, shallow punctures. Antennae inserted in basal ¼ of rostrum. Pronotum very slightly longer than wide, widest at middle; weakly arcuate laterally, very weakly constricted before apical margin; disc convex, with large, deeply impressed, close punctures; interpuncture space shining. Elytral length 1.4× width, width at base 1.6× pronotal width; striae with punctures large, deeply impressed, placed in even rows; interstriae as wide as or slightly narrower than striae, shining, with scattered minute points; disc weakly impressed on basal quarter, somewhat inflated behind; on declivity each elytron bears an inconspicuous setose sex patch in males. Sexual dimorphism present in elytra.

Natural history. This species is a specialist on sweetfern (*Comptonia peregrina*). Further information on *A. cassandrae* can be found in Hamilton (1983b).

Phenology. In Wisconsin, adults have been collected from May to September.

Collecting methods. Twenty-eight Wisconsin specimens were examined during this study from eight counties, forming nine county records. It is most commonly collected by sweeping fields of sweetfern. One specimen was collected in a Malaise trap, and another by sweeping forest floor.

Distribution. *United States.* AL, CT, FL, GA, IL, MA, ME, MI, MS, NC, NE, NH, NJ, NY, PA, RI, SC, TX, WI. *Canada.* NS, PQ.

Wisconsin county records. This species was previously recorded from Oneida County (O'Brien and Wibmer 1982; Hamilton 1983; Downie and Arnett 1996). Bayfield, Florence, Jackson, Juneau, Marinette, Oconto, Oneida, Shawano, Wood.

Genus *Pterocolus* Say

Type species. *Attelabus ovatus* Fabricius, 1801, by monotypy.

Generic diagnosis. *Pterocolus* can be recognized by the metallic blue-green to blue-black integument, by the distinct lateral carina on the pronotum with the prothoracic pleuron strongly excavated beneath it, by the antennae that are inserted close to the eyes, and by the elytra that is individually rounded apically.

Pterocolus ovatus (Fabricius)

(Fig. 29–30)

Diagnosis. *Pterocolus ovatus* can be easily recognized by the metallic blue-green to blue-black integument, by the distinct lateral carina on the pronotum with the prothoracic pleuron strongly excavated beneath it, by the antennae inserted close to the eyes, and by the elytra that are individually rounded apically.

Description. Length 2.8–3.2 mm. Body bright metallic blue or green; antennae, rostrum, and legs somewhat darker. Vestiture consisting of inconspicuous, fine setae. Head densely punctured on vertex. Rostral length about 0.7× pronotal length, constricted at antennal insertion, diverging to broad apex; surface shining, with 2 longitudinal rows of close punctures near lateral margin, area between rows very finely, sparsely punctured. Frons much narrower than dorsal tip of rostrum. Pronotal width about 1.3× length, widest at junction of elytral humeral angles; disc strongly convex, with dense, evenly spaced punctures, each bearing 1 short, recumbent hair-like seta; interpuncture spaces shining, smooth, much narrower than diameter of puncture. Elytral width 1.2× length; striae moderately impressed, with moderate, deeply impressed punctures; interstriae about 2.0× strial width, shining, smooth, with 1 irregular row of medium-sized punctures, each bearing 1 recumbent, fine seta. Visible abdominal tergites with large, strong, dense punctures.

Natural history. *Pterocolus ovatus*, the thief weevil, is an obligate egg-predator and nidus-kleptoparasite of *Homeolabus analis* (Hall and Buss, 2007). It may also use *Synolabus bipustulatus* as host (Vogt 1992). It is found throughout the range of *H. analis* (Vogt 1992), except for southern Florida (Anderson 1992), as well as eastern and southwestern United States where other leaf-roller hosts such as *S. bipustulatus* are found (Vogt 1992). In

Wisconsin, two individuals of *H. analis* and a *P. ovatus* were observed on the same oak scrub on different leaves (personal observation, JJ).

Phenology. In Wisconsin, adults have been collected from June to September.

Collecting methods. The 16 Wisconsin specimens examined during this study from seven counties represent a **new state record** (Appendix 1). This species is most readily collected by beating oak (*Quercus* spp.), and by hand collecting from oak leaves.

Distribution. *United States.* AL, AR, AZ, CT, DC, FL, GA, IA, IL, IN, KS, LA, MA, MD, ME, MI, MN, MO, NC, NJ, NY, OH, OK, PA, RI, SC, TN, TX, VA, WI. *Canada*. Country only.

Wisconsin county records. Dane, Dodge, Grant, Monroe, Sauk, Trempealeau, Waukesha.

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Figures 29–30. *Pterocolus ovatus* (Fabricius). **29)** Habitus, dorsal view. **30)** Habitus, lateral view.

Summary

In the face of the biodiversity crisis (e.g. Raven and Miller 2020) and the sixth mass extinction event the Earth is, according to many, currently experiencing (e.g. Rix et al. 2017), there is an ever increasing, critical need to obtain taxonomic and ecological information for a plethora of species. This is particularly true for the understudied invertebrates, to address questions relating to conservation biology and habitat management in order to responsibly manage species' habitats and better conserver them.

Faunal surveys are the first and necessary step for acquiring taxonomic and natural history data for species. With over 62,000 species globally, weevils (Curculionoidea) were far too daunting to take on as a whole. Accordingly, the primitive weevils, and in this case Attelabidae, was the focus of our study. Since it is also not plausible to carry out a global or even continental survey, a state-wide faunal survey in Wisconsin was conducted to develop a starting point.

We hope this Wisconsin attelabid survey, which yielded over 550 specimens totaling 14 species in nine genera, provides a foundation upon which we can begin addressing both our ignorance of the entomofauna and our need for basic species distributional, phenological, and natural history information. In addition to providing a baseline for the Wisconsin attelabid fauna, these results should also be useful at the larger, and more biologically natural scale of upper Midwestern North America or the western Great Lakes region.

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Appendix 1. Detailed specimen label data for each species are listed below by species, county and collection year for the adults examined in this study. As a source reference for future studies, the data also include available natural history and collecting method information about each species. The label data listed include: 1) repository; 2) collector; 3) collecting date(s); 4) natural history information; 5) collection method; and 6) geographical locality, including county and possibly latitude/longitude or GPS coordinates. All data are direct transcriptions from specimen labels.

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
Synolabus bipustulatus	WIRC	Shenefelt R	7/28/48				Griffith St. Nursery	Wood	0.0 E
	WIRC	McNeel W	6/23/49				Wood Co., Wis. 27	Wood	0.0 E
	WIRC	Shenefelt R	7/23/51				1/2 mi. W. of GSN	Wood	0.0 E
	WIRC	Shenefelt R	7/27/51				Nepco Lake, Nepco Boys Camp	Wood	0.0 E
	WIRC		6/10/75				N/A	Jackson	0.0 E 21N 4W 33
	WIRC	Maxwell Judith A.	6/15/97	6/19/97	Collected in flight intercept trap- oak savanna mid successional	Flight intercept trap	Fort McCoy - 1.5 Mi E. of Badger Drop Zone	Monroe	
	WIRC	Maxwell Judith	6/26/97	6/30/97			Fort McCoy-1.5 Mi. E. of Badger Drop Zone	Monroe	
	WIRC	Maxwell J	8/25/97	8/29/97			Fort McCoy-N. Post 1mi. W. of Big Rock	Monroe	
	WIRC	Kirk Kathyrn	7/15/98		Woods/wetland edge	WDNR-BER funnel trap funnel trap	Meadow Valley WA	Jackson	21N 1E SESE4
	WIRC	R. D. Shenefelt	7/24/98				Griffith St. Nursery	Wood	0.0 E
	CMBC	Brabant Craig	5/27/99		during the day off low foliage, 10am-2pm	hand collected	Mecan River State Fishery Area (WDNR). el: 8	Marquette	43.952670N 89.339428W
	CMBC	Brabant Craig	1999/05/27		swept off low foliage in late pm; grassy field	Sweep net	Katovich family property, elev: 982'asi	Waukesha	44.129736N 89.235042W
	CMBC	Brabant Craig	6/16/01		off scrub oak leaves 11am, sunny, ~73F	hand collected	~1mi S of Brockway in Hwy 27 r.o.w, el:839'a	Jackson	44.268407 N 90.841762W
	CMBC	Brabant Craig	6/17/01		off scrub oak leaves 11am, sunny, ~73F	hand collected	~1mi S of Brockway in Hwy 27 r.o.w, el:839'a	Jackson	44.268407N 90.841762W
	CMBC	Brabant Craig	6/18/01		off scrub oak leaves 11am, sunny, ~73F	hand collected	~1mi S of Brockway in Hwy 27 r.o.w, el:839'a	Jackson	44.268407N 90.841762W
	CMBC	Brabant Craig	2003/07/26	8/1/03	unbaited Townes malaise trap in sand/oak barrens	Malaise trap	just north of Spring Green	Sauk	43.199357N 90.062699W

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	Young Daniel K.	5/20/04		On scrub oak leaf	Hand collected	Mecan River SGA	Marquette	43.952646N 89.339483W
	WIRC	Kirk Kathryn	5/25/06				Sandy barrens. WDNR-Henry's Elfin Study Jackson Co. Forest	Jackson	21N 3W SWSW1
	WIRC	Young Daniel K.	6/11/09		ex: foliage Quercus alba Linneaus	Hand collected	environs Coloma	Waushara	44.03282N 89.53226W
	WIRC	Young Daniel K.	6/23/09	7/3/09	in oak/pine barrnes	Malaise trap	Quincy Bluff TNC	Adams	43.86746N 89.88538W
	WIRC	Young Daniel K.	5/3/10	5/12/10	oak-pine savanna	Yellowvane trap	Quincy Bluff TNC	Adams	43.87119N 89.88017W
	WIRC	Gruber Jeffrey P.	8/18/12		Beaten from branches of Quercus sp. tree	Beating	Rocky Run CK SFA	Columbia	43.27' 18" N 89.22' 49" W
	CMBC	Brabant Craig	8/18/12		hand collected with beating sheet from Quercus sp. branches	beating	Rocky Run Crk Fishery Area, north of Morse	Columbia	43.456071N 89.383760W
	WIRC	Janicki Julia	6/1/13		beating white oak	Beating	Navarino state wildlife area	Shawano	44.676913N 88.515587W
	WIRC	Janicki Julia	6/2/13		Beating red oak	Beating	Deer Creek Wildlife Area	Waupaca	44.59647N 88.638431W
Synolabus nigripes	MPM		1911/07/07				Genoa	Vernon	
	MPM		1911/07/20	7/12/11			Wylusing	Grant	
	WIRC	Sanders J. G.	6/11/16				St Croix Fl	Polk	
	WIRC	Fluke Chas	8/1/17				Madison	Dane	
	WIRC	Marshall Wm. S.	5/26/20		Collection of Wm. S. Marshall			Dane	
	WIRC	Marshall Wm. S.	5/26/20		Collection of Wm. S. Marshall			Dane	
	WIRC	Chambers E. L.	5/10/22				Hatchville	Dunn	
	WIRC	Chambers E. L.	5/10/22				Hatchville	Dunn	
	WIRC	Chambers E. L.	5/10/22				Hatchville	Dunn	

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	Chambers E. L.	5/10/22				Hatchville	Dunn	
	WIRC	Chambers E. L.	5/10/22				Hatchville	Dunn	
	WIRC	Chambers E. L.	5/10/22				Hatchville	Dunn	
	WIRC	Chambers E. L.	5/10/22				Hatchville	Dunn	
	WIRC	Chambers E. L.	5/10/22				Hatchville	Dunn	
	WIRC		6/30/29				Madison	Dane	
	WIRC	Fluke Chas	7/8/29				Madison	Dane	
	WIRC	Callenbach Jr. J.	6/21/32				Gay Mills	Crawford	
	WIRC	Fluke Chas	7/9/35				Madison	Dane	
	WIRC	Schwehr D	8/11/67				Open oaks Grady Tract, trail inter 25	Dane	
	WIRC	Schuh B	10/3/81				Valders	Manito-woc	
	WIRC	Maxwell Judith A.	6/10/95		on flowers, oak barrens	Hand collected	Fort McCoy	Monroe	17N 2W 5
	WDNR		8/10/95		sand pr./ burned 95. 80F, p/ cloudy, 12:00. study 053/ SNA 205	Sweep net	Morgan Coulee Prairie	Pierce	25N 16W 34
	WDNR		8/22/95		sweep net "Battle Hollow", dry-mesic savanna, DNR study 053/ SNA 177	sweep net	Battle Bluff Pr. U:2	Vernon	11N 7W 4NE4
	WDNR		1995/08/29		bluff pr./burned 1996, 85F 12:00. study 053 SNA 170	Sweep net	Rush Creek Pr.	Crawford	10N 6W 6SW4
	WDNR		1996/07/30		sweep net on "Evans site", DNR study 053	sweep net	Spring Green (E) U:8	Sauk	8N 4E 6NE
	WDNR		8/7/96		sweep net to EtOH bluff prairie, DNR study 053, SNA 170	sweep net	Rush Creek Prairie	Crawford	10N 6W 65W4
	WIRC		1996/08/07		Sweep net to EtOH, bluff prairie. Study 053/SNA 170	Sweep net	Rush Creek Prairie	Crawford	10N 6W 6SW4
	WDNR		1996/08/07		sweep net to EtOH bluff prairie, DNR study 053, SNA 170	sweep net	Rush Creek Prairie	Crawford	10N 6W 65W4

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WDNR		1996/08/26				study053/SNA210 Black Earth Prairie	Dane	8N 6E 27SW4
	WDNR		1996/09/06		sweep net on "Evans site". DNR study 053	sweep net	Spring Green (E) U:8	Sauk	8N 4E 6NE
	WDNR		1997/06/25		taken from sweep net in prairie dropseed. DNR study 053	sweep net	Black Earth U:3	Dane	8N 6E 27SW
	WDNR		1997/07/22		taken from pitfall trap in native prairie. DNR study 053	pitfall trap	Drachenberg Pr. U:	Iowa	8N 5E 30N
	WDNR		1997/08/01		sweep in little blue stem and side oats grama. TNC/DNR study 053/ SNA 170	sweep net	Hogback Prairie	Crawford	9N 4W 32N
	WDNR		1997/08/03		Sweep mixed short grasses/ unburned sand prairie	Sweep net	Crex Meadows	Burnett	39N 19W 13N4
	WDNR		1997/08/29		DNR study 053	sweep net	Spring Green West	Sauk	9N 3E 35NE
	WIRC	Williams Andrew H.	8/11/99		Feeding on leaves of Rhus typhina, 2PM, cloudy, 76F	Hand collected	Hwy 133 sandy prairie	Grant	8N 2W 19
	WIRC	Williams Andrew H.	8/11/99		Feeding on leaves of Rhus typhina, 2PM, cloudy, 76F	Hand collected	Hwy 133 sandy prairie	Grant	8N 2W 19
	WIRC	Williams Andrew H.	8/11/99		Feeding on leaves of Rhus typhina, 2PM, cloudy, 76F	Hand collected	Hwy 133 sandy prairie	Grant	8N 2W 19
	WIRC	Williams Andrew H.	8/11/99		Feeding on leaves of Rhus typhina, 2PM, cloudy, 76F	Hand collected	Hwy 133 sandy prairie	Grant	8N 2W 19
	CMBC	Brabant Craig	5/30/01		during the day off of smooth sumac on edge of sandy prairie	hand collected	Spring Green Preserve~(TNC) elevation: 73	Sauk	43.199364 N 90.059100 W
	WIRC	Messer P	6/8/03		On sumac forest area day	Hand collected	Devil's Lake SP	Sauk	43.428 N 87.729 W
	WIRC	Messer P	6/8/03		On sumac forest area day	Hand collected	Devil's Lake SP	Sauk	43.428 N 87.729 W
	WIRC	Messer P	6/8/03		On sumac forest area day	Hand collected	Devil's Lake SP	Sauk	43.428 N 87.729 W
	WIRC	Messer P	6/8/03		On sumac forest area day	Hand collected	Devil's Lake SP	Sauk	43.428 N 87.729 W
	WIRC	Messer P	6/8/03		On sumac forest area day	Hand collected	Devil's Lake SP	Sauk	43.428 N 87.729 W

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	Dorshorst John J.	5/17/04	5/24/04	dry lime prairie	Malaise trap	Dewey Heights Prairie SNA	Grant	42 44' 08" N 91 01' 08" W
	MAPC	Pynnonen Mark	5/21/12		Beating Quercus branches	Beating	LWRSWA Mazomanie Unit	Dane	43.22893N 89.80245 W
	WIRC	Janicki Julia	6/25/12		on sumac	Hand collected	Rim of the city road lookout	La Crosse	43.826763 N 91.202192 W
	WIRC	Janicki Julia	6/25/12		on sumac	Hand collected	Rim of the city road lookout	La Crosse	43.826763 N 91.202192 W
Homeolabus analis	WIRC	Stevens Jim			Wild rose	Hand collected		Waukesha	
	WIRC				Collection of Wm. S. Marshall			Dane	
	WIRC	Janicki Julia			On scrub oak leaf along with another H.analis and a Pterocolus ovatus	Hand collected	Spring Green Preserve	Sauk	43.115404 N 90.034963 W
	WIRC	Janicki Julia			On scrub oak leaf along with another H.analis and a Pterocolus ovatus	Hand collected	Spring Green Preserve	Sauk	43.115404 N 90.034963 W
	WIRC	Stevens Jim			Wild rose	Hand collected		Waukesha	
	MPM		before Oct 1897						
	MPM		before Oct 1897						
	MPM		before Oct 1897						
	WIRC		1898/06/15		Collection of Wm. S. Marshall			Dane	
	WIRC		1898/06/15		Collection of Wm. S. Marshall			Dane	
	WIRC		1898/06/15		Collection of Wm. S. Marshall			Dane	
	WIRC		1898/06/15		Collection of Wm. S. Marshall			Dane	
	WIRC	Ball E	7/25/17				St. Croix Fl	Polk	
	WIRC	Harley H	7/27/18				Lorain	Polk	

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	MPM	Snyder W	7/1/23				Beaver Dam	Dodge	
	WIRC	Shenefelt R. D.	6/21/47				Griffith St. Nursery	Wood	
	WIRC	Shenefelt R. D.	7/25/47				Griffith St. Nursery	Wood	
	WIRC	Shenefelt R. D.	6/19/51				Griffith St. Nursery, S. 14 Mi Ca.	Wood	
	WIRC	Young Daniel K.	7/15/92				LWRSWA Mazomanue Unit	Dane	43.223811 N 89.803778 W
	WIRC	Young Daniel K.	7/15/92				LWRSWA Mazomanue Unit	Dane	43.223811 N 89.803778 W
	WIRC	Young Daniel K.	7/15/92				LWRSWA Mazomanue Unit	Dane	43.223811 N 89.803778 W
	WIRC	Young Daniel K.	7/15/92				LWRSWA Mazomanue Unit	Dane	43.223811 N 89.803778 W
	WIRC	Young Daniel K.	7/15/92				LWRSWA Mazomanue Unit	Dane	43.223811 N 89.803778 W
	WIRC	Young Daniel K.	7/15/92				LWRSWA Mazomanue Unit	Dane	43.223811 N 89.803778 W
	WIRC	Young Daniel K.	7/15/92				LWRSWA Mazomanue Unit	Dane	43.223811 N 89.803778 W
	WIRC	Young Daniel K.	7/15/92				LWRSWA Mazomanue Unit	Dane	43.223811 N 89.803778 W
	WIRC	Young Daniel K.	7/15/92				LWRSWA Mazomanue Unit	Dane	43.223811 N 89.803778 W
	WIRC	Young Daniel K.	7/15/92				LWRSWA Mazomanue Unit	Dane	43.223811 N 89.803778 W
	WIRC	Young Daniel K.	7/15/92				LWRSWA Mazomanue Unit	Dane	43.223811 N 89.803778 W
	WIRC	Young Daniel K.	7/15/92				LWRSWA Mazomanue Unit	Dane	43.223811 N 89.803778 W
	WIRC	Young Daniel K.	7/15/92				LWRSWA Mazomanue Unit	Dane	43.223811 N 89.803778 W
	WIRC	Young Daniel K.	7/15/92				LWRSWA Mazomanue Unit	Dane	43.223811 N 89.803778 W
	WIRC	Young Daniel K.	7/15/92				LWRSWA Mazomanue Unit	Dane	43.223811 N 89.803778 W

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	Young Daniel K.	7/15/92				LWRSWA Mazomanue Unit	Dane	43.223811 N 89.803778 W
	WIRC	Young Daniel K.	6/29/94				Mazomanie Wildlife Area 3 mi NNW Mazoma	Dane	
	WIRC	Gruber Jef-frey P.	6/3/99		on leaf of Quercus sp.	hand collected	Mecan river SWA	Mar-quette	17N 10E 8
	CMBC	Brabant Craig	5/15/00		off oak leaves in sand/ oak barrens, 1-4pm, ~67F, mostly cloudy	hand collected	Blue River Sand Barrens, ~WDNR. elev: 681'a	Grant	43.195083 N 90.535035 W
	CMBC	Brabant Craig	5/15/00		off oak leaves in sand/ oak barrens, 1-4pm, ~67F, mostly cloudy	hand collected	Blue River Sand Barrens, ~WDNR. elev: 681'a	Grant	43.195083 N 90.535035 W
	CMBC	Brabant Craig	5/15/00		off oak leaves in sand/ oak barrens, 1-4pm, ~67F, mostly cloudy	hand collected	Blue River Sand Barrens, ~WDNR. elev: 681'a	Grant	43.195083 N 90.535035 W
	CMBC	Brabant Craig	5/25/00		from vegetation/flowers on periphery of old sand quarry, sunny, windy, 68F	hand collected	Ft. McCoy Barrens State Natural Area ~WDNR	Monroe	43.987193N 90.696849W
	CMBC	Brabant Craig	5/25/00		from vegetation/flowers on periphery of old sand quarry, sunny, windy, 68F	hand collected	Ft. McCoy Barrens State Natural Area ~WDNR	Monroe	43.987193N 90.696849W
	CMBC	Brabant Craig	5/29/00		off leaves of scrub oak in sandy oak barrens ~68F, cloudy	hand collected	Blue River Sand Barrens, ~WDNR	Grant	43.195083 N 90.535035 W
	CMBC	Brabant Craig	5/29/00		off leaves of scrub oak in sandy oak barrens ~68F, cloudy	hand collected	Blue River Sand Barrens, ~WDNR	Grant	43.195083 N 90.535035 W
	CMBC	Brabant Craig	6/17/00		off scrub oak leaves in sand barrens, 12-2pm, sunny, ~65F, calm	hand collected	Blue River Sand Barrens. ~WDNR	Grant	43.195083N 90.535035 W
	WIRC	Young Daniel K.	7/26/00		off of oak foliage in oak/ sand/pine barrens	Hand collected	2 mi NNW of Lone Rock LWRSWA- Lone Rock	Richland	43 11' 38" N 9014' 20" W
	WIRC	Young Daniel K.	7/2/00		off of oak foliage in oak/ sand/pine barrens	Hand collected	2 mi NNW of Lone Rock LWRSWA- Lone Rock	Richland	43 11' 38" N 90 14' 20" W
	CMBC	Brabant Craig	5/18/01		from under leaf of scrub oak, 10:40 a ~ noon, ~65F, mostly cloudy, calm	hand collected	Blue River Sand Barrens ~WDNR	Grant	43.195083 N 90.535035 W

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	Hillstrom Mike	6/16/01				Black River State Forest	Jackson	44 16' 12" N 90 50' 49" W
	CMBC	Brabant Craig	6/16/01		off scrub oak leaves 11am, sunny, ~73F	hand collected	~1mi S of Brockway in Hwy 27 r.o.w, el:839'a	Jackson	44.268407 N 90.841762 W
	WIRC	Williams Andrew H.	6/20/01		On leaf of oak scrub 2 ft tall	Hand collected	Hwy 133 sandy prairie	Grant	8N 1W 10,11
	CMBC	Brabant Craig	7/15/01	8/5/01	unbaited Townes malaise trap in sandy oak barrens	Malaise trap	Kettle Moraine State Forest	Wauke-sha	42.872520 N 88.513994 W
	CMBC	Brabant Craig	5/31/02	6/11/02	unbaited Townes Malaise trap in sandy oak barrens	Malaise trap	Kettle Moraine State For-est, S. Unit	Wauke-sha	42.872520 N 88.513994 W
	CMBC	Brabant Craig	5/31/02	6/11/02	unbaited Townes Malaise trap in sandy oak barrens	Malaise trap	Kettle Moraine State For-est, S. Unit	Wauke-sha	42.872520 N 88.513994 W
	CMBC	Brabant Craig	5/31/02	6/11/02	unbaited Townes Malaise trap in sandy oak barrens	Malaise trap	Kettle Moraine State For-est, S. Unit	Wauke-sha	42.872520 N 88.513994 W
	CMBC	Brabant Craig	6/11/02	6/24/02	unbaited Townes malaise trap in sandy oak barrens	Malaise trap	Kettle Moraine State For-est, S. Unit	Wauke-sha	42.872520 N 88.513994 W
	CMBC	Brabant Craig	6/11/02	6/24/02	unbaited Townes malaise trap in sandy oak barrens	Malaise trap	Kettle Moraine State For-est, S. Unit	Wauke-sha	42.872520 N 88.513994 W
	CMBC	Brabant Craig	6/11/02	6/24/02	unbaited Townes malaise trap in sandy oak barrens	Malaise trap	Kettle Moraine State For-est, S. Unit	Wauke-sha	42.872520 N 88.513994 W
	CMBC	Brabant Craig	6/24/02	7/7/02	unbaited Townes malaise trap in sandy oak barrens	Malaise trap	Kettle Moraine State For-est, S. Unit	Wauke-sha	42.872520 N 88.513994 W
	CMBC	Brabant Craig	6/24/02		off sandy trail between grassland and mixed decid. Hardwoods	hand collected	Kettle Moraine St. Forest, ~Southern Unit, 90	Wauke-sha	42.872520 N 88.513994 W
	CMBC	Brabant Craig	6/24/02	7/7/02	unbaited Townes malaise trap in sandy oak barrens	Malaise trap	Kettle Moraine State For-est, S. Unit	Wauke-sha	42.872520 N 88.513994 W
	CMBC	Brabant Craig	7/18/02		2:30~3:30pm, overcast, ~82F, rain, sandy oak sa-vanna habitat		Quincy Bluff The Nature Conservancy el:894'	Adams	43.867589 N 89.885783 W
	WIRC	Young Daniel K.	7/5/05		foliage of Quercus sp.	hand collected	Quincy Bluff TNC	Adams	43 52' 03" N 89 53' 08" W
	WIRC	Engelhardt Cheri	6/22/06				Spring Green Prairie	Sauk	43 11' 53" N 90 03' 33" W
	WIRC	Young Daniel K.	6/22/06		Quercus In: oak savanna	hand collected	Sppring Green Prairie	Sauk	43 11' 57" N 90 03' 34" W

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	Young Daniel K.	6/22/06		Quercus In: oak savanna	hand collected	Sppring Green Prairie	Sauk	43 11' 57" N 90 03' 34" W
	WIRC	Young Daniel K.	6/22/06		Quercus In: oak savanna	hand collected	Sppring Green Prairie	Sauk	43 11' 57" N 90 03' 34" W
	WIRC	Young Daniel K.	6/22/06		Quercus In: oak savanna	hand collected	Sppring Green Prairie	Sauk	43 11' 57" N 90 03' 34" W
	WIRC	Young Daniel K.	6/11/09		ex: foliage Quercus alba Linneaus	hand collected	environs Coloma	Waushara	44.03282 N 89.53226 W
	WIRC	Young Daniel K.	6/12/09		foliage Quercus sp.	hand collected	LWRSGA Mazomanie Unit	Dane	43.23196 N 89.79784 W
	WIRC	Young Daniel K.	6/12/09		foliage Quercus sp.	hand collected	LWRSGA Mazomanie Unit	Dane	43.23196 N 89.79784 W
	WIRC	Brabant Craig	6/26/11		off leaves of Quercus sp., 11a-2p, ~78F, mostly sunny	Hand collected	<1 mile south of Gotham, Gotham Pine Barre	Richland	43.209230 N 90.289731 W
	WIRC	Brabant Craig	6/26/11		off leaves of Quercus sp., 11a-2p, ~78F, mostly sunny	Hand collected	<1 mile south of Gotham, Gotham Pine Barre	Richland	43.209230 N 90.289731 W
	WIRC	Janicki Julia	7/21/11		On oak scrub	Hand collected	Quincy Bluff SNA	Adams	43 53' 30" N 89 52' 12" W
	MAPC	Pynnonen Mark	5/14/12		Beating Quercus branches	Beating	Arena Pines and Sand Barrens SNA	Iowa	43.17614 N 89.93231 W
	MAPC	Pynnonen Mark	5/14/12		Beating Quercus branches	Beating	Spring Green Preserve SNA	Sauk	43.19903 N 90.06176 W
	MAPC	Pynnonen Mark	6/8/13		Beating Quercus branches	Beating	Mecan River Public Hunting Ground	Marquette	43.95268 N 89.33950 W
Himatolabus pubescens	MPM		before Oct 1897						
	WIRC		before Oct 1897		Collection of Wm. S. Marshall				
	MPM		before Oct 1897		Collection of Wm. S. Marshall				
	MPM		before Oct 1897		Collection of Wm. S. Marshall				
	MPM		before Oct 1897		Collection of Wm. S. Marshall				
	MPM		before Oct 1897		Collection of Wm. S. Marshall				

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	MPM		before Oct 1897		Collection of Wm. S. Marshall				
	MPM		before Oct 1897		Collection of Wm. S. Marshall				
	WIRC		1898/06/15		Collection of Wm. S. Marshall			Dane	
	MPM		5/30/09				Beaver Dam	Dodge	
	MPM		1909/07/17				Beaver Dam	Dodge	
	MPM		1910/06/19				Beaver Dam	Dodge	
	MPM		1915/06/23				Beaver Dam	Dodge	
	MPM		1915/07/23				Beaver Dam	Dodge	
	WIRC	Ball E	7/22/17				St. Croix Fl	Polk	
	WIRC	Ball E	7/22/17				St. Croix Fl	Polk	
	WIRC	Harley H	7/13/18				Amery	Polk	
	WIRC	Harley H	7/13/18				Amery	Polk	
	WIRC	Harley H	7/13/18				Amery	Polk	
	WIRC	Harley H	7/13/18				Amery	Polk	
	WIRC	Harley H	7/13/18				Amery	Polk	
	WIRC	Harley H	7/13/18				Amery	Polk	
	WIRC	Harley H	7/23/20			Sweeping	Lake Wingra	Dane	
	WIRC	Fluke Chas	6/26/31					Door	
	WIRC	Gruber Jeffrey P.	7/25/99		swept from foliage in oak/pine forest	Sweep net	Black River State Forest	Jackson	20N 2W 5/8
Eugnamptus angustatus	MPM		before Oct 1897						
	WIRC	Messer P			Swept meadow weeds day	Sweep net		Waukesha	42.920 N 88.471W
	MPM		before Oct 1897						
	MPM	Rauterberg F	before Oct 1897						
	MPM		before Oct 1897						

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	MPM	Rauterberg F	before Oct 1897						
	WIRC		1898/06/22		Collection of Wm. S. Marshall			Dane	
	MPM		1910/07/13	7/19/10			Prescott	Pierce	
	MPM		1910/07/13	7/19/10			Milwaukee Public Museum Expedition Prescott	Pierce	
	WIRC	Burrill A. C.	7/13/12			Sweep net	Monona Lake	Dane	
	WIRC	DeLong D	7/18/16				Blue River	Grant	
	WIRC	Shenefelt R. D.	7/8/47		Collected from misc. veg. oak wilt pot on Hwy 73	Hand collected	Hwy 73	Wood	
	WIRC	McNeel W.	6/2/49		Collected from wilted oak	Hand collected		Grant	
	WIRC	McNeel W.	8/1/49		Collected from forest floor	Hand collected		St. Croix	
	WIRC	Haas G	6/18/55		On Hazelnut	Hand collected		Dane	
	MPM	Borkin S	6/23/82		low prairie, oak opening, adjacent lowland forest		ca 5 mi S Broadhead, Swenson Prairie and Oak Opening	Rock	
	WIRC	Messer P	6/30/01	Field sweep forest edge day	Sweep net			Wauke-sha	42.939N 88.461 W
	WIRC	Brabant Craig	7/11/01	2001/08/05	Unbaited malaise trap on edge of southern mixed deciduous hardwood forest	Malaise trap	3 miles north of Argyle Thomas Wedel property	Lafayette	42 44' 05" N 89 51' 09" W
	CMBC	Brabant Craig	7/15/01	8/5/01	unbaited Townes malaise trap in sandy oak barrens	Malaise trap	Kettle Moraine State Forest	Wauke-sha	42.872520 N 88.513994 W
	WDNR	Sauer S	7/11/03		Sweep net pass 1 of 3, prairie dropseed, dry/dry-mesic prairie. WDNR	Sweep net	Drachenberg Prairie	Iowa	8N 5E 32NW4
	CMBC	Brabant Craig	7/26/03	8/1/03	unbaited Townes malaise trap in sand/oak barrens	Malaise trap	just north of Spring Green	Sauk	43.199357 N 90.062699 W
	WIRC	Foltz Sarah	7/12/07		On vegetation or fungus	Hand collected	Hemlock Draw	Sauk	
	WIRC	Janicki Julia	8/18/11		In mixed hardwood forest on uphill slope	Malaise Trap	Hemlock Draw	Sauk	43.36063 N 89.94788 W

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	Hernandez Natalie	6/19/12	6/27/12	15 pan traps located within 1.25mi GPS, with yellow tile, filled with propylene glycol surrounded by lake, marshes, forest, prairie, savanna and horticulture	pan traps	UW Arboretum	Dane	43.046053 N 89.420825 W
	WIRC	Hernandez Natalie	6/19/12	6/27/12	15 pan traps located within 1.25mi GPS, with yellow tile, filled with propylene glycol surrounded by lake, marshes, forest, prairie, savanna and horticulture	pan traps	UW Arboretum	Dane	43.046053 N 89.420825 W
	CMBC	Brabant Craig	6/24/12		hand collected from branches/vegetation using beating sheet in hardwood stand	beating	Goose Lake Wildlife Area (WDNR) elev: 911'asi	Dane	43.107327 N 89.037256 W
	WIRC	Janicki Julia	6/25/12		Sweeping vegetation around round	Sweep net	Battle Bluff Prairie	Vernon	43 26' 41" N 91 11' 53" W
	WIRC	Janicki Julia	6/26/12		Sweeping forest understory	Sweep net	Near brady bluff prairie in perrot state park	Trempea-leau	44 01' 07" N 91 28' 02" W
	MAPC	Pynnonen Mark	6/27/12		at florescent light at the edge of mixed forest	At florescent light	Madison School Forest	Dane	43.94812 N 89.58753 W
	WIRC	Gruber Jeffrey P.	7/14/13		mating pair beaten from branches of Carya ovata tree, oak savanna forest	beating	Rocky Run CK SFA	Columbia	43 27' 28" N 89 20' 12" W
	WIRC	Gruber Jeffrey P.	7/14/13		mating pair beaten from branches of Carya ovata tree, oak savanna forest	beating	Rocky Run CK SFA	Columbia	43 27' 28" N 89 20' 12" W
Eugnamptus puncticeps	WIRC				Sweep net to EtOH, 26/30, D-M Savannah Prairie, Study 053/ SNA 177	Sweep net	Battle Bluff Prairie	Vernon	11N 7W 4NE4
	WIRC		1996/08/07		Sweep net to EtOH Bluff Prairie, Study 053/SNA 170, U:4	Sweep net	Rush Creek Prairie	Crawford	10N 6W 6SW4
	WIRC	Willliams Andrew	7/2/99		Very active, on tips of leaflets of Rhus glabra, excavating lower surface, leaving circular scars visible above and below, upper epidermis undamaged, limy hill prairie	Hand collected	Middle Sime Bald G10	Grant	8N 3W 36

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	Willliams Andrew	7/2/99		Very active, on tips of leaflets of Rhus glabra, excavating lower surface, leaving circular scars visible above and below, upper epidermis undamaged, limy hill prairie	Hand collected	Middle Sime Bald G10	Grant	8N 3W 36
	WIRC	Willliams Andrew	7/2/99		Very active, on tips of leaflets of Rhus glabra, excavating lower surface, leaving circular scars visible above and below, upper epidermis undamaged, limy hill prairie	Hand collected	Middle Sime Bald G10	Grant	8N 3W 36
	WIRC	Willliams Andrew	7/2/99		Very active, on tips of leaflets of Rhus glabra, excavating lower surface, leaving circular scars visible above and below, upper epidermis undamaged, limy hill prairie	Hand collected	Middle Sime Bald G10	Grant	8N 3W 36
	WIRC	Willliams Andrew	7/2/99		Very active, on tips of leaflets of Rhus glabra, excavating lower surface, leaving circular scars visible above and below, upper epidermis undamaged, limy hill prairie	Hand collected	Middle Sime Bald G10	Grant	8N 3W 36
	WDNR	Sauer S	7/11/03		Sweep net pass 3 of 3, prairie dropseed, dry/dry-mesic prairie	Sweep net	Drachenberg Prairie	Iowa	8N 5E 3NW4
Haplorhynchites aeneus	MPM		before Oct 1897						
	MPM		1909/07/28	7/31/09			Yellow River	Burnett	
	MPM		before Oct 1897						
	MPM		1911/07/30	8/4/11			Rutlege	Grant	
	MPM		1911/08/05	8/10/11			Rutlege	Grant	
	MPM		1909/07/28	7/31/09			Yellow River	Burnett	
	MPM		before Sept 1889				Milwaukee	Milwaukee	
	MPM		1909/08/05	8/7/09			Randall	Burnett	

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	LeGue C	8/19/98		yellow flower mix		E. of Woodworth, Benedict Prairie	Kenosha	
	WIRC	LeGue C	8/19/98		yellow flower mix		E. of Woodworth, Benedict Prairie	Kenosha	
	WIRC	Suter W.	9/13/81			Sweep net	E. of Woodworth, Benedict Prairie	Kenosha	
		LeGue C	7/29/98				E. of Woodworth, Benedict Prairie	Kenosha	0.0 E
		Suter W	7/26/98			Sweep RR	E. of Woodworth, Benedict Prairie	Kenosha	0.0 E
		Suter W	7/26/98				E. of Woodworth, Benedict Prairie	Kenosha	0.0 E
		Suter W	1998/07/17			Sweep	E. of Woodworth, Benedict Prairie	Kenosha	0.0 E
		Suter W	8/11/98			Sweep	E. of Woodworth, Benedict Prairie	Kenosha	0.0 E
		LeGue C	7/19/98			Sweep	E. of Woodworth, Benedict Prairie	Kenosha	0.0 E
		Suter W	8/19/98			Sweep	E. of Woodworth, Benedict Prairie	Kenosha	0.0 E
		Suter W	8/25/98			Sweep	E. of Woodworth, Benedict Prairie	Kenosha	0.0 E
		Suter W	7/17/98			Sweep	E. of Woodworth, Benedict Prairie	Kenosha	0.0 E
		LeGue C	8/19/98				E. of Woodworth, Benedict Prairie	Kenosha	0.0 E
		LeGue C	7/8/98				E. of Woodworth, Benedict Prairie	Kenosha	0.0 E
		LeGue C	7/29/98				E. of Woodworth, Benedict Prairie	Kenosha	0.0 E
	WIRC	Williams Andrew H.	8/12/97		On disc flowers of Helianthus pauciflorous, 2pm	Hand collected		Burnett	41N 15W 14
	WIRC	Williams Andrew H.	8/13/97		On disc flowers of Solidago ptarmicoides, morning	Hand collected		Burnett	
	WIRC	Williams Andrew H.	8/12/97		On disc flowers of Helianthus pauciflorous, 2pm	Hand collected		Burnett	41N 15W 14
	WIRC	Williams Andrew H.	8/12/97		On disc flowers of Helianthus pauciflorous, 2pm	Hand collected		Burnett	41N 15W 14

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	Williams Andrew H.	8/12/97		On disc flowers of Helianthus pauciflorous, 2pm	Hand collected		Burnett	41N 15W 14
	WIRC	Williams Andrew H.			On disc flowers of Helianthus occidentalis, 2pm	Hand collected		Burnett	41N 15W 14
	WIRC	Williams Andrew H.	8/12/97		On disc flowers of Helianthus pauciflorous, 2pm	Hand collected		Burnett	41N 15W 14
	WIRC	Williams Andrew H.	8/12/97		On disc flowers of Helianthus pauciflorous, 2pm	Hand collected		Burnett	41N 15W 14
	WIRC	Williams Andrew H.			On disc flowers of Helianthus occidentalis, 2pm	Hand collected		Burnett	41N 15W 14
Merhynchites bicolor	WIRC				Collection of Wm. S. Marshall				
	WIRC				Collection of Wm. S. Marshall				
	WIRC	Collector initials: LMB					Madison	Dane	
	WIRC				Collection of Wm. S. Marshall				
	WIRC				Collection of Wm. S. Marshall				
	WIRC	Balduf W.			From hips of Rosa blanda or carolina.		Aquisition number 80 Chetek Chetek	Barron	
	WIRC	Sanders J. G.					Madison	Dane	
	WIRC	Balduf W.			From hips of Rosa blanda or carolina.		Aquisition number 80 Reared Chetek		
	UWO	Meyer M. 0.5 mi S Oshkosh Winnebago Merhynchites bicolor Attelabidae						Barron	
	WIRC				Mating. Collection of Wm. S. Marshal		Verona	Dane	
	WIRC		1111/07/13				Madison	Dane	
	WIRC	Roark	1111/07/14		Rose		Madison	Dane	
	WIRC		1111/07/16				Madison	Dane	

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
			before Oct 1987						
	MPM		before Oct 1987						
	MPM		before Oct 1987						
	MPM		before Oct 1987						
	MPM		before 1907				Milwaukee	Milwaukee	
	MPM		before 1907				Milwaukee	Milwaukee	
	MPM		before 1907				Milwaukee	Milwaukee	
	MPM		8/8/07				Milwaukee	Milwaukee	
	MPM		8/8/07				Milwaukee	Milwaukee	
	MPM		8/8/07				Milwaukee	Milwaukee	
	MPM		8/8/07				Milwaukee	Milwaukee	
	MPM		8/8/07				Milwaukee	Milwaukee	
	MPM		1909/07/09				Cement Mills	Milwaukee	
	MPM		1909/07/09				Cement Mills	Milwaukee	
	MPM		1909/07/09				Cement Mills	Milwaukee	
	WIRC	Kodish	3/24/05				Madison	Dane	
	WIRC	Sanders J. G.	4/10/10				Madison	Dane	
	WIRC	Sanders J. G.	4/10/10				Madison	Dane	
	MPM		1910/07/07	7/12/10			North Hudson	St. Croix	
	MPM		1910/07/25					Dodge	

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	MPM		1910/07/25					Dodge	
	MPM		1911/06/26				Two Rivers	Manito-woc	
	WIRC	Wilcox	7/11/12		On Rosa	Hand	Madison	Dane	
	WIRC	Wilcox	7/11/12		On Rosa	Hand	Madison	Dane	
	WIRC	Wilcox	7/11/12		On Rosa	Hand	Madison	Dane	
	WIRC	Wilcox	7/11/12		On Rosa	Hand	Madison	Dane	
	WIRC	Wilcox	7/11/12		On Rosa	Hand	Madison	Dane	
	WIRC	Wilcox	7/11/12		On Rosa	Hand	Madison	Dane	
	MPM		1913/06/25				Beaver Dam	Dodge	
	MPM		1913/06/25				Beaver Dam	Dodge	
	MPM		1913/06/25				Beaver Dam	Dodge	
	MPM		1913/06/25				Beaver Dam	Dodge	
	MPM		1913/06/25				Beaver Dam	Dodge	
	MPM		1913 July		wild rose	hand collected		Waushara	
	WIRC	Burrill A. C.	6/16/14		on Rosa rugosa	Hand	Madison	Dane	
	WIRC	Burrill A. C.	6/16/14		on Rosa rugosa	Hand	Madison	Dane	
	WIRC	Burrill A. C.	6/16/14		on Rosa rugosa	Hand	Madison	Dane	
	WIRC	Burrill A. C.	6/16/14		on Rosa rugosa	Hand	Madison	Dane	
	WIRC	Chandler G	7/1/14		On Rosa	Hand	Madison	Dane	
	WIRC	Chandler G	7/1/14		On Rosa	Hand	Madison	Dane	
	WIRC	Chandler G	7/1/14		On Rosa	Hand	Madison	Dane	
	WIRC	Chandler G	7/1/14		On Rosa	Hand	Madison	Dane	
	WIRC	Chandler G	7/1/14		On Rosa	Hand	Madison	Dane	
	WIRC	Chandler G	7/1/14		On Rosa	Hand	Madison	Dane	
	WIRC	Chandler G	7/1/14		On Rosa	Hand	Madison	Dane	
	WIRC	Chandler G	7/1/14		On Rosa	Hand	Madison	Dane	
	WIRC	Chandler G	7/1/14		On Rosa	Hand	Madison	Dane	
	WIRC	Chandler G	7/2/14				Madison	Dane	
	WIRC		7/4/14				Madison	Dane	
	WIRC	Chandler G	7/5/14				Madison	Dane	

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	Chandler S. C.	7/6/14		on Rosa rugosa	Hand	Madison	Dane	
	WIRC	Chandler G	7/6/14				Madison	Dane	
	WIRC	Chandler G	7/6/14				Madison	Dane	
	WIRC	Chandler G	7/6/14				Madison	Dane	
	WIRC	Chandler G	7/6/14				Madison	Dane	
	WIRC	Chandler G	7/6/14				Madison	Dane	
	WIRC	Chandler S. C.	7/6/14		on Rosa rugosa	Hand	Madison	Dane	
	WIRC	Chandler G	7/6/14				Madison	Dane	
	WIRC	Chandler S. C.	7/6/14		on Rosa rugosa	Hand	Madison	Dane	
	WIRC	Chandler G	7/6/14				Madison	Dane	
	WIRC	Chandler S. C.	7/6/14		on Rosa rugosa	Hand	Madison	Dane	
	WIRC	Chandler S. C.	7/6/14		on Rosa rugosa	Hand	Madison	Dane	
	WIRC	Chandler S. C.	7/6/14		on Rosa rugosa	Hand	Madison	Dane	
	WIRC	Chandler S. C.	7/6/14		on Rosa rugosa	Hand	Madison	Dane	
	WIRC	Chandler S. C.	7/6/14		on Rosa rugosa	Hand	Madison	Dane	
	WIRC	Chandler G	7/6/14				Madison	Dane	
	WIRC	Chandler G	7/6/14				Madison	Dane	
	WIRC	Chandler G	7/6/14				Madison	Dane	
	WIRC	Chandler G	7/6/14				Madison	Dane	
	WIRC	Chandler G	7/6/14				Madison	Dane	
	WIRC	Chandler G	7/6/14				Madison	Dane	
	WIRC	Chandler S. C.	7/6/14		on Rosa rugosa	Hand	Madison	Dane	
	WIRC	Chandler S. C.	7/6/14		on Rosa rugosa	Hand	Madison	Dane	
	WIRC	Chandler G	7/6/14				Madison	Dane	
	WIRC	DeLong D	7/6/16				Madison	Dane	

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	Fluke Chas. L.	6/24/17				Madison	Dane	
	WIRC	Fluke Chas. L.	6/24/17				Madison	Dane	
	WIRC	Fluke Chas. L.	6/24/17				Madison	Dane	
	WIRC	Fluke Chas. L.	6/24/17				Madison	Dane	
	WIRC	Fluke Chas. L.	6/24/17				Madison	Dane	
	WIRC	Fluke Chas. L.	6/24/17				Madison	Dane	
	WIRC	Fluke Chas. L.	6/24/17				Madison	Dane	
	WIRC	Fluke Chas. L.	6/24/17				Madison	Dane	
	WIRC	Fluke Chas. L.	6/24/17				Madison	Dane	
	MPM		1917/07/21			on lakeshore	Oshkosh	Win-nebago	
	MPM		1917/07/21			on lakeshore	Oshkosh	Win-nebago	
	WIRC		1918/07/20		Collection of Wm. S. Marshall		Marshfield	Marathon	
	WIRC		1920/06/02		Collection of Wm. S. Marshall		Nakoma	Dane	
	WIRC		1920/07/25		Collection of Wm. S. Marshall		Blue Mounds	Dane	
	WIRC		1922/04/28				Madison	Dane	
	WIRC	Chambers E. L.	7/3/23				Waterloo	Jefferson	
	WIRC	Holmquist A	8/3/23				Amery	Polk	
	WIRC	Holmquist A	8/3/23				Amery	Polk	
	WIRC	Chambers E. L.	6/28/24				Cravitz	Marinette	

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	Chambers E. L.	6/28/24				Cravitz	Marinette	
	WIRC	Chambers E. L.	6/28/24				Cravitz	Marinette	
	WIRC	Chambers E. L.	6/28/24				Cravitz	Marinette	
	WIRC	Chambers E. L.	7/1/24				Green Bay	Brown	
	WIRC	Chambers E. L.	7/1/24				Green Bay	Brown	
	WIRC	Chambers E. L.	7/1/24				Green Bay	Brown	
	WIRC	Chambers E. L.	7/1/24				Green Bay	Brown	
	WIRC	Chambers E. L.	7/1/24				Green Bay	Brown	
	WIRC	Chambers E. L.	7/1/24				Green Bay	Brown	
	WIRC	Chambers E. L.	7/1/24				Green Bay	Brown	
	WIRC	Chambers E. L.	7/1/24				Green Bay	Brown	
	WIRC	Chambers E. L.	7/1/24				Green Bay	Brown	
	WIRC	Chambers E. L.	7/1/24				Green Bay	Brown	
	WIRC	Chambers E. L.	7/1/24				Green Bay	Brown	
	WIRC	Chambers E. L.	7/1/24				Green Bay	Brown	
	WIRC	Chambers E. L.	7/1/24				Green Bay	Brown	
	WIRC	Chambers E. L.	7/1/24				Green Bay	Brown	
	WIRC	Chambers E. L.	7/3/25				Baraboo	Sauk	

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	Chambers E. L.	7/3/25				Baraboo	Sauk	
	MPM	Nash Guy	6/24/30				Wisconsin Rapids	Wood	
	MPM	Nash Guy	6/29/30				Wisconsin Rapids	Wood	
	MPM		1930/07/04		on wild rose	hand collected	Oshkosh	Winnebago	
	MPM		1930/07/04		on wild rose	hand collected	Oshkosh	Winnebago	
	MPM		1930/07/04		on wild rose	hand collected	Oshkosh	Winnebago	
	MPM		1930/07/04		on wild rose	hand collected	Oshkosh	Winnebago	
	MPM		1930/07/05		on wild rose	hand collected	Oshkosh	Winnebago	
	MPM		1931/06/06				Lincoln Park	Milwaukee	
	MPM		1931/06/06				Lincoln Park	Milwaukee	
	MPM		1931/06/06				Lincoln Park	Milwaukee	
	WIRC		1936/06/14				Madison	Dane	
	WIRC		1936/06/24				Madison	Dane	
	MPM		1937/06/15		on grass near woods	hand collected	Oshkosh	Winnebago	
	WIRC	1938 June					Madison	Dane	
	WIRC	1938 June					Madison	Dane	
	WIRC	1938 June					Madison	Dane	
	WIRC	1938 June					Madison	Dane	
	WIRC	1941					Madison	Dane	
	WIRC	1941 May					Madison	Dane	
	WIRC	1941 May					Madison	Dane	
	WIRC	1941 June					Madison	Dane	
	WIRC	1941 June					Madison	Dane	

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	1941 June					Madison	Dane	
	WIRC	1941 June					Madison	Dane	
	WIRC	Balduf W.	7/1/45		From hips of Rosa carolina villosa, aquisition number 2a-d	Reared	Endeavor	Marquette	
	WIRC	Balduf W.	7/1/45		From hips of Rosa carolina villosa, aquisition number 2a-d	Reared	Endeavor	Marquette	
	WIRC	Balduf W.	7/2/45		From hips of Rosa rugosa	Reared	Ashland	Ashland	
	WIRC	Balduf W.	5/22/46		From hips of Rosa blanda glandulosa. Aquisition number 31	Reared	Gordon	Douglas	
	WIRC		1947/04/20					Dane	
	WIRC	Balduf W.	6/9/47		From hips of Rosa blanda. Aquisition number 79		Solon Springs	Douglas	
	WIRC	Balduf W.	6/9/47		From hips of Rosa carolina. Aquisition number 81		Black River Falls	Jackson	
	WIRC	Balduf W.	6/10/47		From hips of Rosa arkansana, aquisition number 37	Reared	Madison	Dane	
	WIRC	Balduf W.	6/12/47		From hips of Rosa arkansana, aquisition number 37	Reared	Madison	Dane	
	WIRC	Balduf W.	6/16/47		From hips of Rosa carolina. Aquisition number 81	Reared	Black River Falls	Jackson	
	WIRC	Balduf W.	5/24/48		From hips of Rosa blanda, from hips of Rosa carolina. Acquisition number 103	Reared	Rice Lake	Barron	
	WIRC	Balduf W.	5/24/48		From hips of Rosa blanda, from hips of Rosa carolina. Acquisition number 103	Reared	Rice Lake	Barron	
	WIRC	Balduf W.	5/31/48		From hips of Rosa blanda. Aquisition number 79	Reared	Solon Springs	Douglas	
	WIRC	Balduf W.	6/5/48		From hips of Rosa carolina. Aquisition number 81	Reared	Black River Falls	Jackson	
	WIRC	Balduf W.	6/8/48		From hips of Rosa carolina. Aquisition number 81	Reared	Black River Falls	Jackson	

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	Balduf W.	6/14/48		From hips of Rosa carolina. Aquisition number 81	Reared	Black River Falls	Jackson	
	WIRC	Shenefelt R. D.	6/24/49				Sec. 129 Port Edwards	Wood	
	WIRC		6/30/49				University of Wisconsin Arboretum	Dane	
	WIRC	Balduf W.	6/6/50		From hips of Rosa blanda or carolina. Aquisition number 80		Chetek	Barron	
	WIRC	Ball H.	1950 August				Madison	Dane	
	WIRC	Balduf W.	6/2/51		From hips of Rosa carolina or blanda. Aquisition number 80	Reared	Chetek	Barron	
	WIRC	Balduf W.	6/3/51		From hips of Rosa blanda or carolina. Aquisition number 80		Chetek	Barron	
	WIRC	Shenefelt R. D.	6/19/59				Griffith St. Nursery, S. 14 Mi. Ck.	Wood	
	WIRC	Shenefelt R. D.	6/19/59				Griffith St. Nursery, S. 14 Mi. Ck.	Wood	
	WIRC	Shenefelt R. D.	6/19/59				Griffith St. Nursery, S. 14 Mi. Ck.	Wood	
	WIRC	Shenefelt R. D.	6/19/59				Griffith St. Nursery, S. 14 Mi. Ck.	Wood	
	WIRC	Shenefelt R. D.	6/19/59				Griffith St. Nursery, S. 14 Mi. Ck.	Wood	
	WIRC	Carney Don	6/23/60				Campus	Dane	
	WIRC	Schwehr D	6/27/67		On rose	Hand	Madison, Arb. Nursery	Dane	
	WIRC	Schwehr D	7/3/67		On wild rose bloom	Hand	Madison, Dunn's Marsh	Dane	
	WIRC	Schwehr D	7/10/67				Madison, Greene Prairie	Dane	
	WIRC	Bayer L. J.	1972/06/30		Ex: Rose	Hand	Arboretum	Dane	
	WIRC	Bayer L. J.	1972/06/30		Ex: Rose	Hand	Arboretum	Dane	
	WIRC	Bayer L. J.	1972/06/30		Ex: Rose	Hand	Arboretum	Dane	
	WIRC	Bayer L. J.	1972/06/30		Ex: Rose	Hand	Arboretum	Dane	
	WIRC	Hall D.	7/13/74				Oregon	Dane	

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC		1978/06/25				UW Green Bay	Brown	
	WIRC	Buchli B	6/15/86		On Rose	Hand	Nelson Rd., DNR trail west, Deerfield	Dane	
	WIRC	Buchli B	6/15/86		On Rose	Hand	Nelson Rd., DNR trail west, Deerfield	Dane	
	WIRC	Buchli B	6/15/86		On Rose	Hand	Nelson Rd., DNR trail west, Deerfield	Dane	
	WIRC	Williams Andrew H.	6/25/94		Mating in flower of Rosa sp, 10 AM, 73F, sunny	Hand	Vale Prairie	Green	3N 8E 23
	WIRC	Williams Andrew H.	6/25/94		Mating in flower of Rosa sp, 10 AM, 73F, sunny	Hand	Vale Prairie	Green	3N 8E 23
	WDNR		1995/06/19		dry-mesic prairie, study 053/ SNA 139	Sweep net	Muralt Bluff Prairie U:2	Green	3N 8E 36NW
	WIRC	Williams Andrew H.	6/29/95		In flowers of rosa sp, 78F, noon, cloudy	Hand	Bush Clover Prairie Grant 5N 3W 17 Merhynchites bicolor Attelabidae	Grant	5N 3W 17
	WDNR		1995/07/06		DNR study 053	Sweep net	Thomson Prairie U:4	Iowa	6N 5E 24/NE
	WIRC	Maxwell J	7/11/95		On Rosa sp, oak savanna	Hand	Fort McCoy	Monroe	19N 3W 25
	WDNR	Henderson R. A.	7/11/95		TNC/DNR study 053	Sweep net	Meffert Prairie	Dane	8N 8E 14SW
	WDNR		1995/07/11		dry mesic prairie. DNR study053	sweep net	Koch Prairie	Dane	8N 8E 27NE4
	WDNR		6/18/05		yellow pan trap in native prairie, summer 1996, DNR study 053	pan trap	Omro Prairie	Win-nebago	18N 15E 19NE
	WIRC	Williams Andrew H.	6/19/96		1 or 2 seen on leaves of Rosa sp, 65F, cloudy, 10AM	Hand	Bush Clover Prairie	Grant	5N 3W 17
	WDNR		1996/07/04		sweep net in prairie drop-seed. DNR study 053	Sweep net	Klassy Prairie	Green	3N 7E 15
	WDNR	Lisken Antje	7/11/96		in burned prairie	Sweep net	Westport Drumlin Prairie	Dane	8N 9E 11
	WDNR		1996/08/01		from wild rose, dry-mesic prairie, DNR study 053	hand collected	Vale Prairie Green		3N 8E 23SW4
	WDNR		1997/07/24		taken from sweep net in native prairie. DNR/TNC study 053	Sweep net Thou-sand Rock Pt. Prairie		Iowa	6N 5E 24NE

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	Williams Andrew H.	7/24/97		Male of mating pair in flower of Rosa sp, 7pm, fiar, 70F	Hand	Barnes Prairie, RC01	Racine	
	WIRC	Katovich K	5/17/98				1.5 mi W. Lone Rock; LWRSGA -L.R. Unit	Richland	
	WIRC	Williams Andrew H.	6/19/98		1 of several, some mating, in flowers of Rosa sp, 5PM, fair, 80F		Barnes Prairie	Grant	3N 21 28
	WIRC	Suter W.	1998/06/28			Sweep net	E. of Woodworth, Benedict Prairie	Kenosha	
	WIRC	Williams Andrew H.	7/11/98		Inside flower of Rosa sp., 11AM, sunny,74F	Hand	Muralt Prairie	Green	3N 8E 25
	CMBC	Brabant Craig	6/8/99		from vegetation/flowers on periphery of old sand quarry during the day	hand collected	Ft. McCoy Barrens State Natural Area. ~WDNR	Monroe	43.987193 N 90.694849 W
	CMBC	Brabant Craig	6/8/99		from vegetation/flowers on periphery of old sand quarry during the day	hand collected	Ft. McCoy Barrens State Natural Area. ~WDNR	Monroe	43.987193 N 90.694849 W
	WIRC	Suter W.	6/17/00				E of Woodworth, Benedict Prairie	Kenosha	
	WDNR		2000/06/23		from low-growing rose species. DNR study 053	hand collected	Williams pasture	Iowa	6N 5E 35NWN
	WIRC	Williams Andrew H.	7/10/00		On flower of Rosa sp, 10 AM, sunny, 73F	Hand Hwy 54 & RR ROW Prairie, PG01		Portage	22 23N R78E
	WIRC	Brabant Craig	6/18/01	6/30/01	unbaited townsend malaise trap in sandy oak barrens	Malaise trap	Kettle Moraine State Forest, Southern Unit	Waukesha	42 52' 21" N 88 30' 46" W
	UWO	Adams	6/28/01				Oshkosh South	Winnebago	
	UWO	Adams	6/28/01				Oshkosh South	Winnebago	
	UWO	Adams	6/28/01				Oshkosh South	Winnebago	
	CMBC	Brabant Craig	6/11/02	6/24/02	unbaited Townes malaise trap in sandy oak barrens	Malaise trap	Kettle Moraine State Forest, S. Unit	Waukesha	42.872520 N 88.513994 W
	CMBC	Brabant Craig	6/11/02	6/24/02	unbaited Townes malaise trap in sandy oak barrens	Malaise trap	Kettle Moraine State Forest, S. Unit	Waukesha	42.872520 N 88.513994 W

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	CMBC	Brabant Craig	6/11/02	6/24/02	unbaited Townes malaise trap in sandy oak barrens	Malaise trap	Kettle Moraine State Forest, S. Unit	Waukesha	42.872520 N 88.513994 W
	UWO	Anderson T.	6/13/06				Oshkosh at River side cemetary	Winnebago	
	UWO	Anderson Tim	6/13/06				Oshkosh at riverside cemetary	Winnebago	
	CMBC	Brabant Craig	7/26/07		off Rosa sp. in power line right-of-way on a sandy roadside	hand collected	PBEC 2003-47; Midtown Rd E of Kruger Rd, el 991'asi	Burnett	45.831131 N 92.338003 W
	CMBC	Brabant Craig	7/26/07		off Rosa sp. in power line right-of-way on a sandy roadside	hand collected	PBEC 2003-47; Midtown Rd E of Kruger Rd, el 991'asi	Burnett	45.831131 N 92.338003 W
	WIRC	Evans M	6/10/09		On rose buds, back yard, 7:15pm, 73 deg. F, overcast & humid	Hand	Madison	Dane	
	WIRC	Evans M	6/10/09		On rose buds, back yard, 7:15pm, 73 deg. F, overcast & humid	Hand	Madison	Dane	
	WIRC	Evans M	6/11/09		On roses	Hand	Madison	Dane	
	WIRC	Evans M	6/11/09		On roses	Hand	Madison	Dane	
	WIRC	Evans M	6/12/09		On roses, photo'd	Hand	Madison	Dane	
	WIRC	Evans M	6/12/09		On roses, photo'd	Hand	Madison	Dane	
	WIRC	Evans M	6/11/10		On roses in backyard, 6:30pm	Hand	Madison	Dane	
	WIRC	Evans M	6/11/10		On roses in backyard, 6:30pm	Hand	Madison	Dane	
	WIRC	Evans M	6/11/10		On roses in backyard, 6:30pm	Hand	Madison	Dane	
	WIRC	Evans M	7/7/11		flew to rose in backyard	hand collected	Madison	Dane	
	WIRC	Janicki Julia	6/18/12		on wild rose	hand collected	UW Arboretum	Dane	43.042896 N 89.424010 W
	WIRC	Janicki Julia	6/18/12		on wild rose	hand collected	UW Arboretum	Dane	43.042896 N 89.424010 W
	WIRC	Janicki Julia	6/18/12		on wild rose	hand collected	UW Arboretum	Dane	43.042896 N 89.424010 W

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	Janicki Julia	6/23/13		on rose	hand collected	Kettle Moraine Southern Unit	Waukesha	42.875886 N 88.525545 W
	WIRC	Janicki Julia	6/23/13		on rose	hand collected	Kettle Moraine Southern Unit	Waukesha	42.875886 N 88.525545 W
	WIRC	Janicki Julia	6/23/13		on rose	hand collected	Kettle Moraine Southern Unit	Waukesha	42.875886 N 88.525545 W
Temnocerus aeratus	MPM	1897 October							
	MPM	1897 October							
	WIRC	McNeel W.	8/23/49		Collected from non-wilting Q.macrocarpa	Hand collected		Waupaca	
	WIRC	McNeel W.	8/23/49		Collected from non-wilting Quercus alba	Hand collected		Waupaca	
	WIRC	McNeel W.	8/26/49		Collected from non-wilting Q. macrocarpa	Hand collected		Marquette	
	WIRC	Shenefelt R. D.	8/9/51		Collected from non-wilting Q. macrocarpa	Hand collected	2.2 Miles E. of Plover	Portage	
	WIRC	Shenefelt R. D.	8/9/51		Collected from non-wilting Q. macrocarpa	Hand collected	2.2 Miles E. of Plover	Portage	
	WIRC	Gruber Jeffrey P.	8/24/00	9/12/00	Flight-intercept trap in dry-mesic northern hardwood forest	Flight-intercept trap	Eau Claire Co. Forest	Eau Claire	44 41' 06" N 90 56' 55" W
	WIRC	Gruber Jeffrey P.	8/15/12			Beating	Spread Eagle Barrens SNA	Florence	
	WIRC	Gruber Jeffrey P.	8/15/12			Beating	Spread Eagle Barrens SNA	Florence	
	WIRC	Gruber Jeffrey P.	8/16/12		Beaten from branches of Quercus sp. tree; aspen, oak and Jack pine forest surrounding pine barrnes	Beating	Dubnar Barrens SNA	Marinette	45 39' 00" N 88 14' 59" W
Temnocerus cyanellus	WIRC	Wickham			Collection of Wm. S. Marshall		Bayfield	Bayfield	
	WIRC		1898/05/29		Collection of Wm. S. Marshall			Dane	
	WIRC		1899/05/30		Collection of Wm. S. Marshall			Dane	

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	MPM		1911/06/01				Beaver Dam	Dodge	
	WIRC	Marshall Wm. S.	1922 July				Lake Namakagon	Bayfield	
	WIRC	Barak A	5/22/68				Hull	Portage	
	WIRC	Barak A	5/25/68				Hull	Portage	
Temnocerus perplexus	WIRC		1931/06/23				Wisconsin Rapids	Wood	
	WIRC		1931/06/27				Cranmoor	Wood	
Auletobius ater	MPM		before Oct 1897						
	MPM		before Oct 1897						
	MPM		before Oct 1897						
	MPM		before Oct 1897						
	WIRC		1898/06/15		Collection of Wm. S. Marshall			Dane	
	WIRC		1898/06/21		Collection of Wm. S. Marshall			Dane	
	WIRC		1900/05/24		Collection of Wm. S. Marshall			Dane	
	WIRC	Shenefelt R. D.	7/7/47				OW Hwy13	Wood	
	WIRC		1977/06/17				Arena	Iowa	43 10' N 89 55' W
	WDNR		1996/08/06		to EtOH, sand prairie. DNR study 053	Sweep net	Walking Iron Park	Dane	8N 6E 8NWSE
	CMBC	Brabant Craig	5/29/00		off leaves of scrub oak in sandy oak barrens, ~68F, cloudy	hand collected	Blue River Sand Barrens ~WDNR elev: 681'asi	Grant	43.195083 N 90.535035 W
	CMBC	Brabant Craig	5/30/01		collected during day in sand/oak barrens, partly cloudy, ~75F		Blue River Sand Barrens ~WDNR, elev: 681'asi	Grant	43.195083 N 90.535035 W
	WIRC	Young Daniel K.	6/12/09		ex: foliage Quercus ellipsoidalis E. J. Hill	Hand collected	LWRSGA, Mazomanie Unit	Dane	43.22702 N 89.80288 W

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	Janicki Julia	6/18/13		Beating oak	Beating	Blue River Sand Barrens SNA	Grant	43.194086 N 90.533867 W
Auletobius cassandrae	WIRC		1911/07/20				Wis. Exp. Sta. Ace. No. 222 Cranmoor	Wood	
	WIRC	Shenefelt R. D.	9/5/46		Collected from Pj+ PN+ misc. veg.		NW area	Marinette	
	WIRC	Shenefelt R. D.	9/5/46		Collected from Pj+ PN+ misc. veg.		NW area	Marinette	
	WIRC	McNeel W.	8/14/49		Collected from forest floor	Hand collected		Jackson	
	WIRC	Lirsinger J.	7/22/68		sweep sample	Sweep net		Juneau	
	WIRC		1975/05/12	5/22/75	Gypsy Moth- M.T.	Malaise Trap		Bayfield	46N 9W 16
	WIRC	Roberts S. L.	9/4/81				Cranmoor	Wood	
	WIRC	Otto Robert	5/20/95		Swept in forest understory	Sweep net	5 mi SE Mountain Chute road	Oconto	
	WIRC	Kirk Kathyrn	7/30/96		lupines. WDNR-BER	Sweep net	Staffon Rd.	Jackson	22N 2W SENW34
	WIRC	Kirk Kathyrn	7/30/96		lupines. WDNR-BER	Sweep net	Staffon Rd.	Jackson	22N 2W SENW34
	WIRC	Kirk Kathyrn	7/31/96		pan trap, grass under young pines, WDNR-BER	pan trap	West Castle Mound	Jackson	21N 3W NWNW2
	WIRC	Kirk Kathyrn	9/6/97		wetland habitat; WDNR-End. Res.		Black River SF	Jackson	
	WIRC	Kirk Kathyrn	9/8/97		Pine/oak barrens; Dike 17 W.A. ; WDNR-End Res.		Black River SF	Jackson	21N 2W 2SE12
	WIRC	Janicki Julia	5/23/12		Sweeping marshy vegetation	Sweep net	Moquah barrens SNA	Bayfield	46.624503 N 91.209213 W
	WIRC	Janicki Julia	5/23/12		Sweeping marshy vegetation	Sweep net	Moquah barrens SNA	Bayfield	46.624503 N 91.209213 W
	WIRC	Janicki Julia	6/23/12		Sweeping marshy barren with many semi-aquatic to aquatic vegetation	Sweep net	Within Chequamegon SP, Moquon auto tour 1	Bayfield	46 37' 36" N 91 12' 35" W
	WIRC	Janicki Julia	5/16/13		Sweeping Comptonia peregrina	Sweep net	Dunbar Barrens SNA	Marinette	45.658935 N 88.255000 W
	WIRC	Janicki Julia	5/16/13		Sweeping Comptonia peregrina	Sweep net	Dunbar Barrens SNA	Marinette	45.658935 N 88.255000 W

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	WIRC	Janicki Julia	5/16/13		Sweeping Comptonia peregrina	Sweep net	Dunbar Barrens SNA	Marinette	45.658935 N 88.255000 W
	WIRC	Janicki Julia	5/16/13		Sweeping Comptonia peregrina	Sweep net	Dunbar Barrens SNA	Marinette	45.658935 N 88.255000 W
	WIRC	Janicki Julia	5/16/13		Sweeping Comptonia peregrina	Sweep net	Road to Spread Eagle Barrens	Florence	45.817430 N 88.167477 W
	WIRC	Janicki Julia	5/16/13		Sweeping Comptonia peregrina	Sweep net	Road to Spread Eagle Barrens	Florence	45.817430 N 88.167477 W
	WIRC	Janicki Julia	5/16/13		Sweeping Comptonia peregrina	Sweep net	Dunbar Barrens SNA	Marinette	45.658935 N 88.255000 W
	WIRC	Janicki Julia	5/16/13		Sweeping Comptonia peregrina	Sweep net	Road to Spread Eagle Barrens	Florence	45.817430 N 88.167477 W
	WIRC	Janicki Julia	6/1/13		Sweeping Comptonia peregrina	Sweep net	Navirino State Wildlife Area	Shawano	44.676913 N 88.515587 W
	WIRC	Janicki Julia	6/28/13		Sweeping oak-pine barren with sweet fern and prairie grasses	Sweep net	Navarino State Wildlife Area	Shawano	44.676913 N 88.515587 W
	WIRC	Janicki Julia	8/7/13		Sweeping oak-pine barren with sweet fern and prairie grasses	Sweep net	Navarino Wildlife Area	Shawano	44.676913 N 88.515387 W
	WIRC	Janicki Julia	8/7/13		Sweeping oak-pine barren with sweet fern and prairie grasses	Sweep net	Navarino Wildlife Area	Shawano	
Pterocolus ovatus	WIRC				Collection of Wm. S. Marshall			Dane	
	WIRC		1898/06/01		Collection of Wm. S. Marshall			Dane	
	MPM		1911/06/12				Beaver Dam	Dodge	
	MPM		before Oct 1911				Beaver Dam	Dodge	
	MPM		before Oct 1911				Beaver Dam	Dodge	
	WIRC	McNeel W.	7/28/49		collected from forest floor	hand collected		Trempea-leau	
	WIRC	Maxwell J	8/1/97	8/5/97	Collected in flight intercept trap in oak savannah	Flight intercept trap	Fort McCoy, S.point, 1 mi W. of Lafayette Pass	Monroe	

Species	Repository	Collected by	Date start	Date end	Collecting info	Collecting method	Locality	County	Lat/Lon
	CMBC	Gruber Jeffrey P.	6/17/00	6/25/00	unbaited flight intercept trap in sandy oak barrens	flight intercept trap	Blue River Sand Barrens ~WDNR, elev: 681'asi	Grant	43.195083 N 90.535035 W
	CMBC	Brabant Craig	5/31/02	6/11/02	unbaited Townes malaise trap in sandy oak barrens	Malaise trap	Kettle Moraine State Forest, S.Unit	Waukesha	42.872520 N 88.513994 W
	CMBC	Brabant Craig	5/31/02	6/11/02	unbaited Townes malaise trap in sandy oak barrens	Malaise trap	Kettle Moraine State Forest, S.Unit	Waukesha	42.872520 N 88.513994 W
	CMBC	Brabant Craig	6/11/02	6/24/02	unbaited Townes malaise trap in sandy oak barrens	Malaise trap	Kettle Moraine State Forest, S. Unit	Waukesha	42.872520 N 88.513994 W
	CMBC	Brabant Craig	8/14/03	8/21/03	unbaited Townes malaise trap in sandy trail in oak-dominated northern dry forest (site#2)	Malaise trap	9 mi S. of Adams-Frndshp Quincy Bluff	Adams	43.86511 N 89.87704 W
	CMBC	Brabant Craig	8/14/03	8/21/03	unbaited Townes malaise trap in sandy trail in oak-dominated northern dry forest (site#2)	Malaise trap	9 mi S. of Adams-Frndshp Quincy Bluff	Adams	43.86511 N 89.87704 W
	WIRC	Arevalo R.	9/6/09		Sweep net along road side	Sweep net	Devils Lake State Park	Sauk	43 24' 11" N 89 44' 49" W
	WIRC	Gruber Jeffrey P.	6/8/13		Beaten from branches of Quercus sp. tree, junction of prairie grassland and mixed hardwood/conifer forest	Beating	Kettle Moraine SF Southern Unit	Waukesha	42 52' 26" N 88 30' 46" W
	WIRC	Gruber Jeffrey P.	6/8/13		Beaten from branches of Quercus sp. tree, junction of prairie grassland and mixed hardwood/conifer forest	Beating	Kettle Moraine SF Southern Unit	Waukesha	
	WIRC	Gruber Jeffrey P.	6/8/13		Beaten from branches of Quercus sp. tree, junction of prairie grassland and mixed hardwood/conifer forest	Beating	Kettle Moraine SF Southern Unit	Waukesha	
	WIRC	Janicki Julia	6/18/13		On leaf of oak scrub with Homeolabus analis	Hand collected	Spring Green Preserve	Sauk	43.115404 N 90.034963 W