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CURCULIONIDAE AND CHRYSOMELIDAE FOUND IN AQUATIC HABITATS IN WISCONSIN¹

Lutz J. Bayer² and H. Jane Brockmann³

We became interested in aquatic weevils (Curculionidae) and leaf beetles (Chrysomelidae) during the Aquatic Entomology Course at the University of Wisconsin, in the spring of 1971. Many collections, taken from a variety of aquatic habitats in Wisconsin, contained weevils and leaf beetles. Most of the species were not fully treated in the keys found in aquatic entomology texts. We thought it would be useful to compile keys from the literature and present what is known of the distribution of these insects in Wisconsin.

Nine species of weevils have been found in aquatic habitats in Wisconsin, representing seven genera, all belonging to the subtribe Hydronomi, and twenty-five species of leaf beetles, representing five genera in three subfamilies.

KEY TO FAMILIES

1. Head prolonged into a beak or snout with mandibles usually visible at its tip; antennae usually arising far in front of eyes, on snout Curculionidae
- 1'. Head not prolonged into a beak or snout; antennae arising on front or sides of head, nearer the eyes Chrysomelidae

KEY TO SUBFAMILIES OF AQUATIC CHRYSOMELIDAE

1. Head constricted or neck-like behind the eyes, and not inserted in the prothorax to the eyes; first abdominal sternum very long; elongate, metallic coppery, or blue-black in color I. Donaciinae
- 1'. Head not constricted or neck-like behind the eyes; and usually inserted in the prothorax to the eyes 2
2. Antennae closer together at base, than lengths of first antennal segment; front coxa usually conical and prominent III. Galerucinae
- 2'. Antennae widely separated at base, farther apart than length of first antennal segment; front coxa oval or transverse; third tarsal segment, seen from beneath, entire apically or with a slight median indentation II. Chrysomelinae

Subfamily I. DONACIINAE

The subfamily Donaciinae is represented in the United States by three genera, *Neohaemonia* with two species, *Donacia* with 31 species, and *Plateumaris* with 17 species. The larvae of Donaciinae are truly aquatic. With the exception of *Neohaemonia nigricornis* and *Donacia hirticollis*, the Donaciinae spend their adult lives above submerged parts of the aquatic plants on which they live. The two exceptions confine almost their entire adult life on submerged vegetation, spending only brief periods on the nonsubmerged parts of plants (Hoffman, 1940). Eggs are deposited by the female in various locations on the selected plant. When the eggs hatch, the larvae drop down through the water or crawl down the stem to the roots or the rhizomes of the host plant (Marx, 1957). Some plants may support more than one species of beetle. Species of the genera *Spartanium*, *Nymphaea*, and *Nuphar* are the most common hosts of *Donacia* (Marx,

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1957). *Neohaemonia* is usually found on *Potamogeton*. Donaciinae may also be found on *Pontederia*, *Sagittaria*, *Eleocharis*, *Acorus*, *Scirpus*, *Peltandra*, *Brasenia*, *Eriocaulon*, *Castalia*, *Phragmites*, *Typha* and *Glyceria*.

KEY TO GENERA

- 1. Elytra with outer apical angles produced into a strong spine; front of head with median elevated projection extending over base of antennae; base of antennae approximate, separated by no more than the width of the scape at its center; third tarsal segment small, entire, not deeply bilobed; tarsal segments 1, 2, and 3 without dense pads beneath *Neohaemonia* Szekessy
- 1'. Elytra with outer apical angles not produced into a strong spine; front of head without a median elevated projection extending over base of antennae; base of antennae distant, separated by more than width of the scape at its center; third tarsal segment large, deeply bilobed; tarsal segments 1, 2, and 3 with dense pads beneath 2
- 2. Sutural margin of elytra sinuate near apex *Plateumaris* Thomson
- 2'. Sutural margin of elytra straight to apex *Donacia* Fabricius

KEY TO WISCONSIN SPECIES OF *DONACIA*

- 1. Pronotal disc pubescent 2
- 1'. Pronotal disc glabrous 3
- 2. Elytra pubescent *pubescens*
- 2'. Elytra glabrous *pubicollis*
- 3. Middle tibia with apical tooth-like projection on inner side near tibial spur . *piscatrix*
- 3'. Middle tibia without apical tooth-like projection 4
- 4. Pronotal disc deeply and usually densely punctate, rugose or densely strigose, punctures large 5
- 4'. Pronotal disc impunctate or more or less shallowly and sparsely punctate, not rugose or densely strigose, sometimes finely wrinkled, if present punctures usually small 18
- 5. Elytral epipleuron wider than outer interval and not limited by a ridge . . *quadricollis*
- 5'. Elytral epipleuron narrower than outer interval and usually limited by a ridge. . . 6
- 6. Posterior femur reddish brown or at least almost half reddish brown 7
- 6'. Posterior femur black or metallic or at most with small, frequently indistinct, reddish brown area at base 9
- 7. Antennal segments reddish brown, occasionally with vague darkish areas at the apex of each segment *porosicollis*
- 7'. Antennal segments black or metallic, with reddish brown basally 8
- 8. Pronotum with anterior, median V-shaped impression bordered behind by oblique obtuse ridges, ridges broken medially by median line. *aequalis*
- 8'. Pronotum without oblique obtuse ridges bordering V-shaped anterior median impression *porosicollis*
- 9. Metasternum and first abdominal segment densely and somewhat coarsely punctate, sparsely pubescent, pubescence not obscuring surface structure. 10
- 9'. Metasternum and first abdominal segment densely and finely punctate, densely pubescent, pubescence obscuring surface structure 14
- 10. Discal elytral intervals impunctate, finely and densely wrinkled *distincta*
- 10'. Discal elytral intervals sparsely and shallowly punctate, coarsely and somewhat sparsely wrinkled on disc, and densely wrinkled at apex 11
- 11. Posterior femur gradually enlarging from base to apical quarter, not extending to apical margin of third abdominal segment *bimpressa*
- 11'. Posterior femur enlarging from basal quarter to apical quarter, usually extending to or beyond apical margin of third abdominal segment. 12
- 12. Median pronotal line impressed, extending from anterior impression to basal impression, impressions deep, pronotal disc swollen on either side on median line, elytra convex apically *tuberculifrons*

- 12'. Median pronotal line absent or indistinct, never deeply impressed, anterior and basal median impressions absent or shallow, pronotal disc not swollen, elytra flattened apically. 13
13. Posterior femur not strongly clavate; posterior tibia metallic, generally not reddish brown basally; eyes large, not strongly protruding. *fulgens*
- 13'. Posterior femur more strongly clavate; posterior tibia metallic, but generally reddish brown basally; eyes smaller, strongly protruding. *subtilis*
14. Spaces between pronotal punctures smooth, shiny. 15
- 14'. Spaces between pronotal punctures minutely punctulate and rugulose, opaque. *porosicollis*
15. Discal elytral intervals impunctate, finely and densely wrinkled. *distincta*
- 15'. Discal elytral intervals sparsely punctulate, coarsely and somewhat sparsely wrinkled on disc, finely and densely wrinkled at apex. 16
16. Median pronotal line impressed, extending from anterior impression to basal impression, impressions deep, pronotal disc swollen on either side of median line, elytra convex apically. *tuberculifrons*
- 16'. Median pronotal line absent or indistinct, never deeply impressed, anterior and basal median impressions absent or shallow, pronotal disc not swollen, elytra flattened apically. 17
17. Posterior femur not strongly clavate; posterior tibiae metallic generally not reddish brown basally, eyes large, not strongly protruding. *fulgens*
- 17'. Posterior femur more strongly clavate; posterior tibia metallic, but generally reddish brown basally, eyes smaller, strongly protruding. *subtilis*
18. Pronotum distinctly alutaceous, opaque. 19
- 18'. Pronotum not or slightly alutaceous, shining. 20
19. Posterior tibia (when viewed from behind) evenly and strongly bowed. *hypoleuca*
- 19'. Posterior tibia (when viewed from behind) only slightly bowed at about apical third. *texana*
20. Posterior femur with one subapical tooth; rarely with indistinct anterior denticle. 23
- 20'. Posterior femur with two distinct subapical teeth. 21
21. Six apical antennal segments bicolored or reddish brown (Males). *cincticornis*
- 21'. Six apical segments black or metallic. 22
22. Posterior femur reddish brown beneath, dark area above. *cincticornis*
- 22'. Posterior femur black, or metallic, reddish brown basally. *proxima*
23. Posterior femur gradually enlarged from base or basal third. 24
- 23'. Posterior femur abruptly clavate from middle. *texana*
24. Pronotum with triangular anterior impression, bordered behind by oblique obtuse ridges, ridges broken medially by median line. *aequalis*
- 24'. Pronotum with anterior impression absent, or if present, not bordered behind by distinct oblique obtuse ridges. 25
25. Anterior tibia with apical, tooth-like projection on outer edge. 26
- 25'. Anterior tibia without apical, tooth-like projection on outer edge. 28
26. Posterior femur not extending beyond apex of third abdominal segment. *biimpressa*
- 26'. Posterior femur extending beyond apex of third abdominal segment. 27
27. Posterior femur reddish brown beneath, dark area above; antennal segments 4-11 bicolored or occasionally reddish brown but not entirely black. *cincticornis*
- 27'. Posterior femur black or metallic, reddish brown basally, antennal segments 4-11 black or metallic, unicolorous. *proxima*
28. Pronotum except for disc densely punctate. *biimpressa*
- 28'. Pronotum not densely punctate. 29
29. Females with apex of last abdominal segment rounded or subangulate; males with denticulate ridge behind subapical tooth on ventral surface of posterior femor. *cincticornis*
- 29'. Females with apex of last abdominal segment emarginate or subtruncate; males without denticulate ridge behind subapical tooth on ventral surface of posterior femor. *rufescens*

Genus *DONACIA* Fabricius

- aequalis* Say. Dane County, June (Schaeffer, 1925, p. 114); Madison, 25 September, *Solidago* flowers; Milwaukee County, 23 June; Polk County, 28 October; Wood County, Grand Rapids, 3 July; Wisconsin Rapids, 15 July.
- biimpressa* Melsheimer. Columbia County, Lodi, 9 June (Marx, 1957, p. 264); Juneau County, Mather, 1 July; Polk County, Amery, 20 August, 23 September, water weeds; Wood County, Cranmoor, 5 June (Marx, 1957, p. 264); June, Hooker USNM (Schaeffer, 1925, p. 98).
- cincticornis* Newman. Barron County, Rice Lake, 25 August; Bayfield County, 11, 18 August (Marx, 1957, p. 266); Bayfield (Schaeffer, 1925, p. 80); Bayfield, August (var. *tenuis* Schaeffer) (Schaeffer, 1925, p. 83); Dane County, 4 September, 15 September (Marx, 1957, p. 266); Madison, 21, 27 July, water lily leaves; Florence County, Spread Eagle, 30 July (Marx, 1957, p. 266); Oneida County, Pelican Lake, 10 August (Marx, 1957, p. 266); Polk County, Amery, 29 August, 18 September, yellow water lily; Vilas County, Tenderfoot Lake, July (Schaeffer, 1925, p. 80); Tenderfoot Lake, July (Marx, 1957, p. 266); Washington County, West Bend, 24, 26 June, 17 July, 24 August (Marx, 1957, p. 266); Waukesha County, Muskego, 7-16 August (Marx, 1957, p. 266).
- distincta* LeConte. Bayfield County, Bayfield, 26 June (Marx, 1957, p. 266); Bayfield County, June (Schaeffer, 1925, p. 104); Dane County, Madison, 22 May, 1 June; University of Wisconsin Arboretum, May; Polk County, Amery, 10 June; Wood County, Cranmoor, 30 October (Marx, 1957, p. 266).
- fulgens* LeConte. Wisconsin, (one ♀) no data (Marx, 1957, p. 267); Vilas County, Trout Lake, 15 August.
- hypoleuca* Lacordaire. Wood County, Griffith State Nursery, 3 July.
- piscatrix* Lacordaire. Calumet County, Forest Junction 31 July; Dane County, Madison, 3 August; Oneida County, 4 July (Marx, 1957, p. 271); Vilas County, Trout Lake, 14 July; Tenderfoot Lake, July (Marx, 1957, p. 271); Walworth County, 3 July (Marx, 1957, p. 271); Elkhorn, July (Schaeffer, 1925, p. 67); Washington County, Cedar Lake, 26 June (Marx, 1957, p. 271); West Bend, 24, 26 June, 17 August (Marx, 1957, p. 271).
- porosicollis* Lacordaire. Dane County, May (Schaeffer, 1925, p. 102); Madison, 10 May; Mendota Lake, 10 May.
- proxima* Kirby. Bayfield County, 11 August (Marx, 1957, p. 272); Dane County, Madison, 3 August; Sawyer County, Connors Lake, 3 August; Shawano County, Cloverleaf Lakes, 11 June (Marx, 1957, p. 272); Vilas County, Tenderfoot Lake, July, August (Marx, 1957, p. 272); Tenderfoot Lake, August (Schaeffer, 1925, p. 85); Washington County, West Bend, 17, 22 August (Marx, 1957, p. 272); Waukesha County, Oconomowoc, 16 July.
- pubescens* LeConte. Vilas County, Trout Lake, August (Marx, 1957, p. 272); Tenderfoot Lake, July (Schaeffer, 1925, p. 92); Tenderfoot Lake, July (Marx, 1957, p. 272).
- pubicollis* Suffrian. Dane County (Marx, 1957, p. 247); April (Schaeffer, 1925, p. 120).
- quadricollis* Say. Dane County, Mendota, 29 July; Vilas County, Lower Trout Lake, 12 August; Tenderfoot Lake, June (Schaeffer, 1925, p. 93); Tenderfoot Lake, July (Marx, 1957, p. 272); Washington County, Cedar Lake, 13 July (Marx, 1957, p. 272); West Bend, 17 July (Marx, 1957, p. 272).
- rufescens* Lacordaire. Wood County, Griffith State Nursery, 8 July.
- subtilis* Kunze. Barron County, Rice Lake, 25 August; Bayfield County, Bayfield (Marx, 1957, p. 275); Dane County, 23 May, 4 June, 12, 18 August; 12 August (Marx, 1957, p. 275); Madison, 10 May-11 September, 17 October; Mendota Lake, 10 May, 29 June; University of Wisconsin Campus, 7 May; Dodge County, Beaver Dam, 12 June (Marx, 1957, p. 275); Juneau County, Mather, 1 July; Milwaukee County, 23 June; 1, 10 July (Marx, 1957, p. 275); Polk County, Amery, 5 June on burdock; Waukesha County, Muskego, 21 July (Marx, 1957, p. 275); Wood County, Griffith State Nursery, 27 June.
- texana* Crotch. Dane County, 7 August; Wood County, Griffith State Nursery, 3 July-4 August.

tuberculifrons Schaeffer. Wisconsin (one ♂) no locality (Marx, 1957, p. 276); Dane County, May (Schaeffer, 1925, p. 108).

KEY TO THE WISCONSIN SPECIES OF *PLATEUMARIS*

- 1. Hind femur uniform metallic luster with a moderately large or large tooth .*emarginata*
- 1'. Hind femur bicolored or entirely red, tooth variable 2
- 2. Side pieces of prosternum relatively coarsely strigate-rugose or coarsely vermiculate-rugose 3
- 2'. Side pieces of prosternum rather finely rugose, especially in apical half, basal half occasionally strigate-rugose, but not coarsely and generally indistinctly so; last dorsal segment emarginate at apex. 4
- 3. Side pieces of prosternum coarsely strigate and without any indication of a pubescent spot near anterior coxae; last dorsal segment truncate or rounded apically *sulcicollis*
- 3'. Side pieces of prosternum coarsely and rather vermiculate-rugose with a more or less distinct pubescent spot near anterior coxae; last dorsal segment emarginate *diversa*
- 4. Hind femur narrower at base than at apex and moderately thickened towards the sub-apical tooth; prothorax shining and densely rugose, not alutaceous; intervals of elytra more or less densely punctate *fulvipes*
- 4'. Hind femur moderately robust, at base as wide or wider than at apex and gradually widening to the sub-apical tooth; intervals of elytra scarcely punctate; prothorax generally alutaceous and feebly shining; surface punctate or punctate-rugose. *germari*

Genus *PLATEUMARIS* Thomson

diversa Schaeffer. Wisconsin, O. Dietz Coll., ♂ allotype (Schaeffer, 1925, p. 144).
emarginata Kirby. Wisconsin, Knab Coll. (Schaeffer, 1925, p. 135).
fulvipes Lacordaire. Dane County, June, Marshall Coll. (Schaeffer, 1925, p. 146).
germari Mannerheim. Wisconsin, Minnesota University Coll. (Schaeffer, 1925, p. 141).
sulcicollis Lacordaire. Bayfield County, Bayfield, Wickham Coll. (Schaeffer, 1925, p. 126); Door County, 25 June; Florence County, 27 June; Polk County, St. Croix Falls, ex *Acer saccharinum*; Amery, 10 June.

Genus *NEOHAEMONIA* Szekessy

nigricornis Kirby. Dane County, 10 May, 1 June; Fish Lake, 18 May, sweep of *Lemna*.

Subfamily II. CHRYSOMELINAE

There are four species of *Hydrothassa* found in the United States, two of which occur in Wisconsin. They may be found on swamp plants, particularly Ranunculaceae. One species, *Prasocuris phellandri*, is found in the Northeastern United States, but has not been collected in Wisconsin to date. It may be found on *Sium*, Water Parsnip.

KEY TO THE GENERA OF THE TRIBE PRASOCURINI

- 1. Basal margin of pronotum with a fine elevated bead; form very elongate, length at least 2.5 times width; sutural dark stripe not much wider around scutellum . . . (No specimens from Wisconsin in our collection). *Prasocuris* Latreille
- 1'. Basal margin of pronotum without such a bead; form broader, length less than 2.5 times width; sutural dark stripe abruptly widened around scutellum; ventral surface nearly glabrous *Hydrothassa* Thomson

Genus **HYDROTHASSA** Thomson

KEY TO SPECIES OF *HYDROTHASSA*
(after Schaeffer, 1928, p. 288)

- 1. All elytral intervals impunctate; form narrower and relatively more elongate; size smaller, 3-4 mm *vittata*
- 1'. Some of the elytral intervals more or less distinctly punctate; form broader and size larger, 4-7 mm *obliquata*

obliquata LeConte. Dane County, University of Wisconsin Arboretum, Teal Pond, 6 May.
vittata Olivier. Bayfield County, 29 June; Milwaukee County, 9 April.

Subfamily III. GALERUCINAE

Genus **PYRRHALTA** Joannis

Subgenus GALERUCELLA Crotch

According to Wilcox (1965), North American forms are all considered to belong to the single species, *P. nymphaeae*, although they make up a rather heterogeneous group. It differs from similar species in the comparatively wide prosternum, lack of apical tibial spurs, and the long, slender symmetrical aedeagus. It is found throughout the United States and Canada. The larvae feed on leaves of *Nuphar*, *Polygonum*, *Myrica*, *Brasenia*, *Nymphaea*, and *Sagittaria*.

nymphaeae (Linnaeus). Clark County, Chili, 7 July; Dane County, 29 May, 17 July; Lake Wingra, 8 July; Mendota Lake, 7 June, 10 July; Madison, 9 May, 21 August; Mazomanie, 21 September, ex *Salix*; Manitowoc County, Point Beach State Park, 21 September; Vilas County, Tenderfoot Lake, July; Wood County, Griffith State Nursery, 9-16 July; near Nekoosa 28 May, ex waterlily pads.

Family CURCULIONIDAE
Tribe ERIRHININI
Subtribe HYDRONOMI

Tanner (1943) included 11 genera and 53 species in this aquatic or semi-aquatic subtribe. Eggs are deposited upon and in stems and roots of aquatic plants. Some species simply drop their eggs on leaves or on the soil and grass of pasture land.

The members of *Bagous*, the largest genus in this group, feed on a variety of aquatic plants. They have been collected on *Carex*, *Eleocharis*, *Cyperus*, *Potamogeton*, and *Ptilimnium*. Species of *Tanysphyrus* may be found feeding on *Lemna*, and of *Endalus* on *Scirpus* and *Typha*.

There is presently only one economically important species, *Lissorhoptrus simplex* (Say), which is a serious pest of cultivated rice. It is widely distributed throughout the eastern United States, and has been found in Columbia, Dane and LaCross counties in Wisconsin. The larva, known as the rice-root maggot destroys the roots, while the adult, "rice water weevil", feeds on the foliage.

KEY TO GENERA OF WISCONSIN HYDRONOMI

- 1. Third segment of hind tarsus emarginate or bilobed 4
- 1'. Third segment of hind tarsus simple, legs long and slender 2
- 2. Club of antenna partly smooth and shining; funicle composed of 6 segments; prosternum excavated *Lissorhoptrus*
- 2'. Club entirely pubescent and sensitive; funicle composed of seven segments; prosternum broadly and deeply excavated in front of coxae 3
- 3. Pronotum feebly constricted in front *Bagous*

- 3'. Pronotum very strongly constricted and tubulate in front (Recorded from Iowa, no Wisconsin record) *Pnigodes*
- 4. Beak curved; funicle composed of six segments, the 2nd short; 3rd segment of tarsus broad, deeply bilobed, last segment short. 5
- 4'. Beak straight; funicle either 6 or 7 segmented, 2nd segment long; last segment of tarsus long. 6
- 5. Last segment of tarsus broad, the claws well separated 7
- 5'. Last segment of tarsus narrow, projecting beyond the lobes of the 3rd, the claws slender *Onychylis*
- 6. Front and middle tibia serrate on the inner side; 3rd tarsal segment narrow, slightly emarginate; funicle composed of six segments *Lixellus*
- 6'. Front and middle tibia not serrate within; 3rd tarsal segment broad, deeply bilobed, funicle composed of seven segments. *Anchodemus*
- 7. Elytra but slightly if any wider than the thorax; length usually 2 mm or more *Endalus*
- 7'. Elytra much wider than the thorax; length less than 1.5 mm. *Tanysphyrus*

Genus ANCHODEMUS LeConte

angustus LeConte. Dane County, 20 June, 17 July, 14 September.

Genus BAGOUS Germar

KEY TO WISCONSIN SPECIES OF BAGOUS

- 1. Tarsus short; prothorax scarred with deep impressions *carinatus*
- 1'. Tarsus long; prothorax finely rugose 2
- 2. Tarsus long, 4th segment as long as 2nd and 3rd combined, the first three segments narrow with long white setae; beak one and one-half times as long as the prothorax *longirostris*
- 2'. Tarsus long, 4th segment less in length than the 2nd and 3rd combined, the first three segments slightly broader than the above; prothorax finely rugose; beak only as long as prothorax *americanus*

americanus LeConte. Dane County, 20 July; Walworth County, Elkhorn (Tanner, 1943, p. 20); Washington County, West Bend (Tanner, 1943, p. 20).

carinatus Blatchley. Milwaukee County, 6 July; Wood County, Cranmoor (Tanner, 1943, p. 23).

longirostris Tanner. Jefferson County, Lake Koshkonong, Ft. Atkinson, 19 July. (Tanner, 1943, Type Locality, Type in U.S. National Museum).

Genus ENDALUS Laporte

limatulus (Gyllenhal). Milwaukee County, 6 July.

Genus LISSORHOPTRUS LeConte

simplex (Say). Columbia County, Lodi, Gibraltar Bog, 20 May; Dane County, 29 May, 4 June; LaCrosse County, 7 August.

Genus LIXELLUS LeConte

filiformis (LeConte). Columbia County, Lodi, Gibraltar Bog, 20 May; Dane County, 10 May; Farm Pond on Route KP, 18 May.

Genus ONYCHYLIS LeConte

nigrirostris (Boheman). Columbia County, Lodi, Gibraltar Bog, 20 May; Dane County, 22

May-28 June, 17 July, 14 September; Dane County, Madison, University of Wisconsin Campus, 15 July, at light; University of Wisconsin Arboretum, 26 June, in marsh; Fish Lake, 18 May; Farm Pond on Route KP, 18 May.

Genus TANYSPHYRUS Germar

lemnae (Fabricius). Dane County, 18 May, 24, 27 June; Madison, 1 May; Farm Pond on Route KP, 18 May; Milwaukee County, 10 July.

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