

CONCERNING SOME NORTH AMERICAN WATER-
STRIDERS WITH DESCRIPTIONS OF
THREE NEW SPECIES

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Recent publications on North American water-striders have resulted in a need for revised distributional data. This is especially true for certain species of the family Gerridæ. To illustrate, eight or nine different species have been placed under the name of *Gerris marginatus* Say in the literature. The following notes are based on the water-striders in the collections of Iowa State College, the University of Minnesota, the University of Illinois, the Montana State College, Professor H. E. Summers, Mr. Wm. J. Gerhardt, and the authors.

Gerris remigis Say. (Fig. 1, a).

Say, Thomas, Heter. N. Harm., p. 35, 1832.

Stal, C., Frey, Eugen. Resa, Ins. p. 264, 1859 (*Gerris orba*).

Uhler, P. R., Am. Jl. Sci., ser 3, I, p. 105, 1871 (*Hygrotrechus robusta*).

This is the most common and widespread gerrid in North America. It frequents the wider portions of small streams but is not uncommon in creeks, rivers, ponds and lakes. Both winged and wingless forms occur throughout its entire range. The color and size, even in specimens taken from the same colony, show marked variations. The spines at the ends of the connexiva vary in length. A cotype of *Gerris orba* Stal kindly sent to us by Dr. Yngve Sjostedt, Intendent of the Naturhistoriska Riksmuseet at Stockholm, is before us; it is a typical *G. remigis*. This specimen and the type series at Stockholm bear labels "= *remigis* Say, teste Kirkaldy." The male genitalia of the cotype of *G. orba* Stal (snyn. of *G. remigis* Say) is figured.

A long series of specimens taken at the type locality of *Gerris robusta* Uhler by Mr. E. P. Van Duzee of the California Academy of Science are also typical examples of *G. remigis*. Furthermore, specimens determined by Uhler himself as *G. robusta* are identical with *G. remigis*. The type of *G. robusta* (a damaged female, according to the original description) cannot be found in Uhler's collection, the National Museum, or the Museum of the California Academy of Science. After having studied several hundred specimens of *G. remigis*, some of which have come from every state in the union (with the exception of one or two), Canada and Mexico, the writers feel that both *G. orba* Stal and *G. robusta* Uhler must stand as synonyms of *Gerris remigis* Say.

Gerris nyctalis Drake and Hottes. (Fig 1, b).

Specimens are at hand from the following localities: COLORADO—Dolores, Estes Park, Garrison, Ft. Garland, Pagosa Springs, Placerville, North Park, South Fork, and Veta Pass, August, 1925, C. J. Drake. WASHINGTON—Lake Sutherland, August 8, 1927, C. R. Crosby. CALIFORNIA—Fresno, June 20, 1926, C. J. Drake. IDAHO—Caldwell, July 9, 1926, C. J. Drake. MONTANA—Bozeman, R. A. Cooley.

Gerris nebularis Drake and Hottes. (Fig. 1, c).

In addition to the type localities specimens are at hand from the following states: SOUTH CAROLINA—Clemson, July 9, 1914, F. H. Lathrop. ALABAMA—Birmingham, March 21, 1925, R. Cecil. TENNESSEE—Knoxville, June, 1890, H. E. Summers. MISSISSIPPI—Charleston, Sept. 7, 1925, H. M. Harris; A. and M. College, June 24, 1914, R. W. Harned. NEW YORK—Syracuse, July 26, 1921, C. J. Drake. IOWA—Mt. Pleasant, July 14, 1927, Harris and Johnston. Kansas—Ottawa, May 20, 1925, B. M. Harrison.

Gerris insperatus Drake and Hottes.

OHIO—Wellington, August 7, 1890, H. E. Summers. ILLINOIS—Homer, April 27, 1907. NEW YORK—Cranberry Lake, July 22, 1919, C. J. Drake; Ithaca, May 4, 1888, H. E. Summers. ALABAMA—Birmingham, March 21, 1925, R. Cecil. TENNESSEE—Knoxville, March 17, 1889, H. E. Summers. SOUTH DAKOTA—Pierre, April 22, 1919. This species ranges throughout the eastern portion of the United States, south into Mexico and west to Colorado.

Gerris incurvatus Drake and Hottes.

OREGON—Corvallis, June 26, 1926, C. J. Drake. BRITISH COLUMBIA—Victoria, July 4-7, 1926, C. J. Drake. CALIFORNIA—Fresno, June 20, 1926, C. J. Drake. IDAHO—Moscow, April 3, 1913, J. M. Aldrich; Caldwell, July 8, 1926, C. J. Drake. MONTANA—Bozeman, 1906 and Gallatin Co., June 3, 1902, R. A. Cooley. *G. incurvatus* is very common in the northwest and along the Pacific coast. Its known range extends east into Illinois.

Gerris incognitus Drake & Hottes.

OREGON—Corvallis, June 26, 1926, C. J. Drake. CALIFORNIA—Fresno, June 20, 1926, C. J. Drake. IDAHO—Moscow, April 1913; Caldwell, July 9, 1926, C. J. Drake. MONTANA—Gallatin Mtns., August 25, 1925, and Big Fork, August 20, 1912, R. A. Cooley. This is one of the most common gerrids in the northwest. It has been frequently confused in collections with both *G. marginatus* and *G. gillettei*.

Gerris comatus Drake and Hottes.

NEW YORK—Ithaca, August 26, 1890, H. E. Summers; Buffalo, E. P. Van Duzee. ILLINOIS—Algonquin, November 2, 1908. MINNESOTA—North Branch, June 17, 1922, C. E. Mickel; Mora, June 16, 1922, and Detroit, July 2, 1922, W. E. Hoffman. IOWA—Albia, Ames, Atlantic, Cedar Falls, Clear Lake, Elkader, Lovilia, Ft. Dodge, McGregor, Mason City, Oelwein, Red Oak, and Webster City, June-August, 1927, Harris and Johnston. SOUTH DAKOTA—Brookings, April 28, 1921, H. C. Severin. NEBRASKA—Big Springs, August 26, 1925, C. J. Drake. COLORADO—Dolores, Garrison, Hudson, Mesa Verde National Park, Pagosa Springs, South Fork, Wray and Veta Pass, August, 1925, C. J. Drake. MONTANA—Bozeman, August, 1913, R. A. Cooley. *G. comatus* has been confused in practically every collection and in the literature with *G. marginatus* Say. It is one of the most common species in eastern Canada and United States, occurring from Colorado to the Atlantic Coast.

Gerris comatus var. *mickeli* Drake and Hottes.

A female was taken in a swamp at Corvallis, Oregon, June 26, 1926, and another at Wray, Colorado, August 4, 1925, by C. J. Drake. These two specimens and the types from Minnesota are brachypterous. The male is unknown. This variety differs from typical *G. comatus* in having longer and more numerous hairs on the connexival spines and a stripe along each side of the pronotum in front. Male specimens may prove it to be a distinct species.

Gerris marginatus Say.

TENNESSEE—Knoxville, June 13, 1891, H. E. Summers. NORTH CAROLINA—Southern Pines, March 2, 1916. OHIO—Delaware, July 12, 1916, C. J. Drake. NEW YORK—Buffalo, 1890, E. P. Van Duzee. IOWA—Ames, Albia, Atlantic, Burlington, Cedar Falls, Clear Lake, Donnelson, Elkader, Farmington, Ft. Dodge, Ft. Madison, Jewell, Mason City, McGregor, Oelwein, and Red Oak, June-August, 1927, Harris and Johnston. KANSAS—Lawrence. MINNESOTA—Rochester, June 15, 1922, C. E. Mickel. COLORADO—Wray and Mesa Verde National Park, August, 1925, C. J. Drake. MISSISSIPPI—Charleston, August 31, 1925, H. M. Harris. WEST VIRGINIA—Morgantown, July, 1927, L. E. Dills. TEXAS—Weslaco, July 17, 1927, M. McPhail. *G. marginatus* probably occurs in every state in the union. Several species have been confused with it in literature.

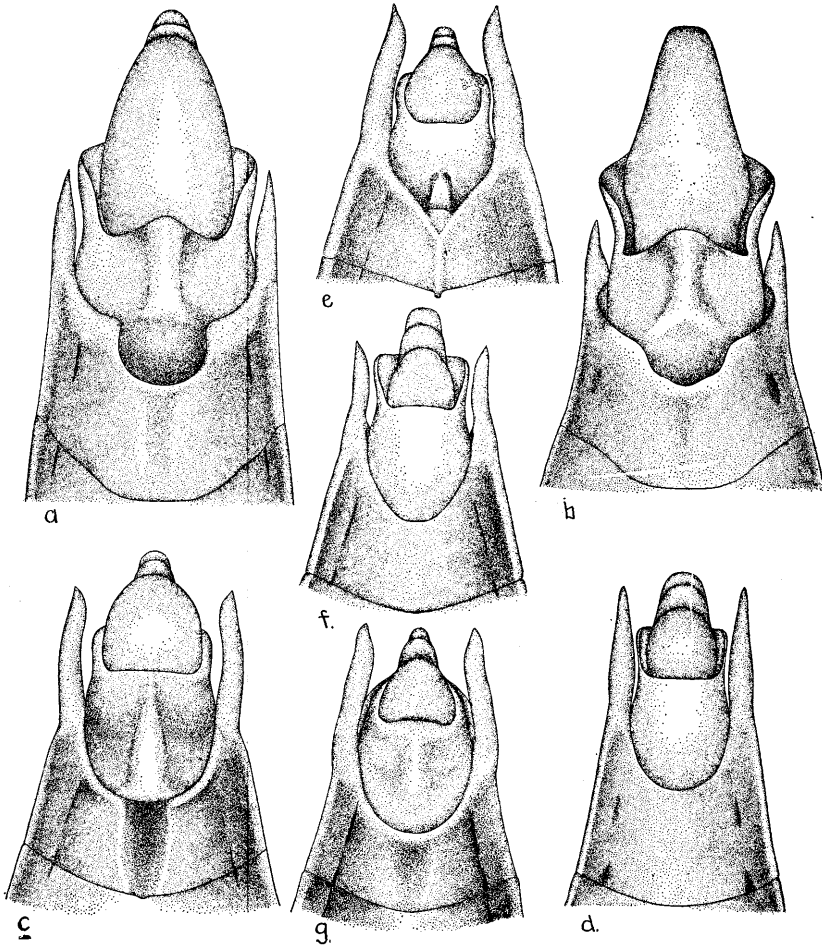


Fig. 1. Ventral aspect of male genitalia of the larger species of *Gerris*. a, *Gerris remigis* Say; b, *G. nyctalis* D. & H.; c, *G. nebularis* D. & H.; d, *G. notabilis* D. & H.; e, *G. uhleri* D. & H.; f, *G. rufoscutellatus* Latr.; g, *G. conformis* Uhl. (Drawn by Miss Kathleen Doering).

Gerris pingreensis Drake and Hottes.

COLORADO—Pingree Park and Estes Park, August 20-24, 1925, C. J. Drake. IDAHO—T. D. A. Cockerell. This species is common in the ponds and lakes in the high altitudes of the Rocky Mountains.

Gerris alacris Hussey.

OHIO—Hocking Co., May 10, 1916, C. J. Drake.

Gerris gillettei Lethierry and Severin.

COLORADO—Dolores, Ft. Garland, Garrison, Pagosa Springs, Pingree Park, Trinidad, South Fork, Wray and Veta Pass, August, 1925, C. J. Drake. MONTANA—Bozeman, June 1, 1924, R. A. Cooley. CALIFORNIA—Fresno, June 20, 1926, C. J. Drake. TEXAS—Rock Island, July 10, 1922, Grace O. Wiley. UTAH—Saltair, July 5. This is a western species and is found in the Rocky Mountain states and along the Pacific slope.

Gerris buenoi Kirkaldy.

NEW YORK—Rochester, September 1, 1890; Buffalo, September, 1886, E. P. Van Duzee. ONTARIO—Ottawa, April 26, 1922, C. H. Curran. MASSACHUSETTS—Forest Hills, November 1, 1915, H. M. Parshley. IOWA—Ames, Cedar Falls and Mt. Pleasant, July 14, 1927, Harris and Johnston. SOUTH DAKOTA—Brookings, April 28, 1921, H. C. Severin. COLORADO—Ft. Collins, August 23, 1925, C. J. Drake. OREGON—Corvallis, June 26, 1926, C. J. Drake. BRITISH COLUMBIA—Victoria, July 4-7, 1926, C. J. Drake. *G. buenoi* is a transcontinental species and is very common in southern Canada and northern United States.

Gerris notabilis Drake and Hottes. (Fig. 1, d).

CALIFORNIA—Fresno, June 20, 1926, C. J. Drake. WASHINGTON—San Juan Island, July 2, 1926, C. J. Drake. IDAHO—Moscow, 1913. MONTANA—Shields River, July 17, 1925. COLORADO—Dolores, Garrison, Mesa Verde National Park, South Fork, August, 1925, C. J. Drake. IOWA—Ames, July, 1925, C. J. Drake. This is a very common species in the Rocky Mountains and along the Pacific coast. It ranges as far east as central Iowa. The much longer legs and the different genital characters separate it from *G. rufoscutellatus*.

Gerris canaliculatus Uhler.

FLORIDA—Gainesville, July 14, 1918, C. J. Drake. MISSISSIPPI—Charleston, September 9, 1925, H. M. Harris; Natchez, September 8, 1924, H. M. Harris; Vicksburg, Port Gibson, Woodville, McComb and Agr. College, July, 1921, C. J. Drake. ARKANSAS—Little Rock, August 30, 1926, H. M. Harris. OHIO—Rockbridge, September 30, 1916, C. J. Drake. NEW YORK—Ithaca, August, 1890, H. E. Summers; Syracuse, 1917-21, C. J. Drake. ILLINOIS—Oakton, August 15, 1905; Pulaski, July 10, 1907; Dubois, August, 1913.

Gerris argenticollis Parshley.

Sugar Grove, Ohio, July 28, 1916, C. J. Drake. Agr. College, Mississippi, April, 1916, R. W. Harned. Chicago, Illinois, W. A. Gerhard.

Gerris mexicanus Champion.

Two specimens, Cuernavaca, Mexico, May 15, 1898.

Gerris cariniventris Champion.

Tegucigalpa, Honduras. Four specimens, which agree with two of Champion's cotypes before us.

Tenagonus hesione Kirkaldy.

OHIO—Columbus, Rockbridge, and Buckeye Lake, 1916, C. J. Drake. MISSISSIPPI—Summit, September 4, 1926, and Charleston, September 8, 1926, H. M. Harris; McComb, Fayette, and Vicksburg, July, 1921, C. J. Drake. FLORIDA—Gainesville, May-July, 1921, C. J. Drake. TEXAS—Bryan, October 25, 1927, H. G. Johnston. ILLINOIS—Havana, October 4, 1910; Dubois, August 13, 1917. The long-winged form is common in Mississippi and Florida but uncommon in the northern states. One winged example from Columbus, Ohio, is at hand.

Tenagonus hyalinus Fabricius.

MEXICO—Minatitlan, February 1, 1892, H. Osborn. WEST INDIES—Grenada, September 25, 1891, H. E. Summers.

Tenagonus quadrilineatus Champion.

MEXICO—Colima, L. Conradt. HONDURAS—Tegucigalpa, July 14-19, 1917, H. G. Dyer.

Trepobatopsis denticornis Champion.

TEXAS—Clifton, May 30, 1907. This is the first known record of this insect occurring in the United States. Another specimen from Cantarina, Monterey, Mexico, April 10, 1910, is before us. It has the wings broken off.

Trepobates floridensis, n. sp.

Distinctly smaller than any other known species of the genus. Body above black, an elongate spot on either side and an interrupted line on posterior margin of mesonotum, a small spot on each side and more or less of basal margin of pronotum, a line on each side of head above the eyes and the posterior margin between these lines yellowish brown. Body beneath and a broad stripe on each side of mesonotum yellowish. Rostrum reaching a little beyond anterior coxæ, dark brown, the basal segment yellowish. Antennæ dark brown, yellowish at base segment I long, slightly curved, subequal to II and III conjoined; II very slightly shorter than III.

Pronotum practically twice as broad as long, impressed on each side of the disc. Mesonotum broadly and rather uniformly impressed along the median line, the posterior margin truncate. Legs much shorter and slenderer than in *T. pictus* Uhl., dark brown; the anterior tibiæ strongly curved, slenderer at base and apex. Connexivum moderately broad, concolorous. Abdomen above without spots. Length 2.5 mm.; width 1.0 mm.

Holotype, apterous male, East Florida, collection of authors. The much smaller size and the shorter and slenderer legs and antennæ separate this species from any of its congeners. The intermediate legs and the second antennal segment, as in *T. pictus*, are without long hairs. The proportional lengths of the antennal segments in these two species are: *pictus*, I:II:III:IV—80:43:49:47; *floridensis*, 50:24:26: (missing).

Rheumatobates tenuipes Meinert.

MARYLAND—Glen Echo, September 8, 1893. MISSISSIPPI—Charleston, September 8, 1926, H. M. Harris. FLORIDA—Gainesville, J. M. Watson, TENNESSEE—Knoxville, June 5, 1890, H. E. Summers.

Rheumatobates trulliger Bergroth.

TENNESSEE—Knoxville, June 15, 1890, H. E. Summers. MISSISSIPPI—Charleston, September 7, 1925, H. M. Harris; Shipman, August 2, 1921, C. J. Drake. A wingless male and female from Shipman, Miss., have been compared with the type of *R. trulliger* for the authors by the late Dr. E. Bergroth.

Rheumatobates hungerfordi Wiley.

TEXAS—Weslaco, July 17, 1927, M. McPhail; Bryan, October 25, 1927, H. G. Johnston.

Rheumatobates rileyi Bergroth.

MISSISSIPPI—Charleston, September, 1925 and 1926, H. M. Harris. FLORIDA—Gainesville, J. R. Watson. OHIO—Cuyahoga Co., and Berea, July, 1914, C. J. Drake. IOWA—Ames, Albia, Cedar Falls, Oelwein and Mt. Pleasant, June-August, 1927, Harris and Johnston. ILLINOIS—Havana, July 7-13, 1917.

Mesovelgia cryptophila Hungerford.

IOWA—Wapello, August 5, 1926, H. M. Harris. MISSISSIPPI—McComb, September 8, 1924, H. M. Harris.

Microvelgia oreadis, n. sp.

Elongate, narrow, fusiform; dark fuscous black, the sides of connexiva a little lighter. Pronotum with a broad transverse rufofulvous band in front, the abdominal tergites each with a pale brownish spot. Head with the usual, shiny, impressed median line and blackish spots above the eyes. Antennæ about one-half as long as body, pilose, with a few scattered setæ, dark brownish black; segment I paler and tinged at base with testaceous, stoutest, slightly curved; the proportional lengths of segments:—I:II:III:IV = (male) 17:14:19:25, (female) 17:18:25:30. Rostrum stout, brownish testaceous, the terminal segment blackish, reaching a little beyond the middle of mesonotum.

Pronotum short, coarsely pitted behind, the basal margin slightly emarginate. Mesonotum about half as long as pronotum. Legs brownish, the coxæ, trochanters, and tibiæ beneath lighter; tibiæ clothed with numerous long setæ. Connexivum very broad, broader in female than in male. Abdomen with the last tergite truncate at apex in male, rounded in female. Body beneath flattened, yellowish to dark brown. Length (male) 2.21 mm.; (female) 2.78 mm.; width (male) .79, (female) .93 mm.

Holotype, apterous male, and *allotype*, apterous female, Estes Park, Colorado, August 24, 1925. *Paratypes* (253 specimens), taken with type, also at Fort Collins, Colorado, August 23, 1925, Placerville, Colorado, August 15, 1925, and Dolores, Colorado, August 15, 1925, C. J. Drake, collector. Types in collection of authors. Paratypes in collections of Iowa State College, University of Kansas, U. S. National Museum, British Museum of Natural History, H. H. Knight and the authors.

In many of the specimens some of the dorsal segments of abdomen and connexiva bear flattened silvery hairs which are grouped in patches. This species is perhaps most closely related to *M. setipes* Champion. However, it is slightly smaller and the setæ like hairs on the tibiæ are

more numerous. The proportional lengths of the antennal segments of the males of *M. oreadis* are also much different.

Microvelia irrasa, n. sp.

Oblong, rather densely clothed with very long erect hairs; black, the pronotum with a broad transverse orange band. Head with an impressed median black line, the vertex with a prominent pit on each side above the eyes. Antennæ long, slender, dark fuscous, the basal portion of segment I and all of II and III lighter, the proportional length of the segments:—I:II:III:IV = 45:38:42:39; segment I moderately stout, distinctly curved, III slenderer than II, IV fusiform. Rostrum stout, apical segment black, surpassing intermediate coxæ.

Pronotum transverse, shallowly and broadly emarginate behind, slightly shorter than metanotum and about two-fifths the length of mesonotum. Mesonotum strongly narrowed posteriorly, truncate behind. Legs yellowish, somewhat tinged with brown, the tarsi black; clothed with dense whitish pile with numerous extremely long yellowish hairs. Connexivum broad. First genital segment deeply emarginate behind, strongly and roundly excavated beneath. Length, 4.14 mm.; width, 1.5 mm.

Holotype, apterous male, Orizaba, Mexico, January 17, in Drake collection. *Paratypes*, 2 males, taken with type. The female and the winged form are unknown.

Aside from the other structures, the larger size, extremely long hairs clothing body and legs, and the structure of antennæ and thorax separate this species from its congeners. It has somewhat the general aspect of a *Rhagovelia*, but belongs to the group of species of *Microvelia* containing *M. americana* Uhler. The hind femora of the male bears along the distal half of the inner surface several spines two or three of which are strongly curved. In the holotype the hind femora are slightly stouter and the spines are shorter than in the paratypes; also in the holotype the spines on the right femora are slightly more developed than those on the left.

Microvelia fontinalis Bueno.

Specimens are at hand from the following localities: OHIO—Berea, July 16, 1914, C. J. Drake. TENNESSEE—Knoxville, June 27, 1891, H. E. Summers. VIRGINIA—near Plummer's Island, Maryland, October 30, 1921, H. S. Barber. IOWA—Burlington, August 4, 1926, H. M. Harris. COLORADO—Wray, August 4, 1925, C. J. Drake.

This species has heretofore been recorded in literature from Ohio, New York, New Jersey, Indiana and Michigan. One of the Tennessee specimens is winged, this form previously being unknown. (*Morphotype*, in the collection of H. E. Summers at Iowa State College.)

Macropterous form: Brownish fuscous with two elongate white spots at base of elytra, the pronotum with a transverse orange or fulvous stripe in front. Pronotum strongly developed, coarsely pitted, carinate down the middle, the apex broad and sub-truncate; humeri large and prominent. Hemelytra extending to tip of abdomen, dark brown with two of the cells beyond the basal spots tending to become more or less whitish. Length 2.5 mm.; width, .93 mm.

Microvelia hinei Drake.

Originally described from Ohio, *M. hinei* has since been recorded from New York, Massachusetts, Michigan, and Florida. The authors possess specimens from the following additional localities: ARKANSAS—Little Rock, August 30, 1926, H. M. Harris. MISSISSIPPI—Charleston, Crowder, Fayette, McComb, Ocean Springs and Woodville, various dates (C. J. Drake and H. M. Harris). DISTRICT COLUMBIA—Washington, August 13, 1889, O. Heidemann, and December 30, 1915, W. L. McAtee. IOWA—Wapello, August 16, 1926, H. M. Harris.

Microvelia borealis Bueno.

Heretofore known from Maine, New York, New Jersey, Connecticut, Massachusetts, Indiana, Michigan, Illinois and Kansas. To these may be added the following additional localities: OHIO—Lake Pippin, Sugar Grove, Rock Bridge, Delaware, and Columbus, June-August, 1916, C. J. Drake. IOWA—Ames, Wall Lake, Burlington, and Farragut, summers of 1924-1927, C. J. Drake and H. M. Harris. MISSISSIPPI—Port Gibson, Vicksburg, and Woodville, July, 1921, C. J. Drake; Charleston, and Crowder, August, 1925, H. M. Harris. FLORIDA—Gainesville, June 9, 1918, C. J. Drake. NEBRASKA—Fremont, August 30, 1925, C. J. Drake. OREGON—Corvallis, June 30, 1926, C. J. Drake. CANADA—Ottawa, Quebec, September 7, 1890.

Microvelia austrina Bueno.

Described from Raleigh, N. C., and heretofore known only from there. Specimens are at hand from: MISSISSIPPI—Charleston, September 7, 1925, H. M. Harris; and TENNESSEE—Knoxville, June-July, 1891, H. E. Summers. Many of the Tennessee specimens are winged. (*Morphotypes* in the Summers' collection at Iowa State College).

Macropterous form: Pronotum strongly developed, dark brown with a large transverse fulvous spot in front, coarsely pitted, the humeri very prominent. Hemelytra extending to tip of abdomen, dark brown, the veins fairly distinct. Length, 1.92-2.14 mm.; width, .61-.64 mm.

Hydrometra martini Kirkaldy.

OHIO—Columbus, Tiffin, Malta, Prentice, and Zanesville, July-August, 1916, C. J. Drake. FLORIDA—Gainesville, July 7, 1918, C. J. Drake. MISSISSIPPI—Port Gibson, Agr. College, Woodville, and McComb, July, 1921, C. J. Drake; Charleston, September 7, 1925, H. M. Harris. NEW YORK—Ithaca, August 7, 1895. OREGON—Corvallis, June 26, 1926, C. J. Drake. This species has heretofore been doubtfully recorded from the Pacific Slope. More than a hundred specimens were taken in a swamp at Corvallis, Oregon.