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## ADDITIONS AND NOTES ON THE HEMIPTERA-HETEROPTERA OF OHIO.*


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Some years have passed since the last record of additions to the Hemipterous fauna of Ohio was made, and in the meantime a number of additional species have been noted. It seems desirable to place on record the occurence of these species at this time.

A number of these species were collected by the senior writer, but in recent years his attention has been directed particularly to the Homoptera. About two years ago, the junior author began a survey of the aquatic and semi-aquatic Heteroptera of the state and, incidentally, he has noted many other observations on Heteroptera which are embodied in this paper.

The papers† in which previous records were made have appeared in the Ohio Naturalist, except for the first contribution

*Contribution from the Department of Zoology and Entomology, Ohio State University. No. 39.

†Remarks on the Hemipterous Fauna of Ohio with a Preliminary Record of the Species (Proc. O. Acad. Sci. pp. 60-79, 1900).

A list of Hemiptera Collected in the Vicinity of Bellaire, Ohio. (Ohio Nat., Vol. I, pp. 11-12, 1900).

Note on Aradus ornatus Say. (Ohio Nat. Vol. IV, p. 22, 1903).

Aradidæ of Ohio. (Ohio Nat., Vol. IV, pp. 36-42, 1903).

New Species of Ohio Fulgoridæ. (Ibid. pp. 44-46, 1903).

A Further Contribution to the Hemipterous Fauna of Ohio. (Ohio Nat., Vol. IV, pp. 99-103, 1904).

Report of Progress on Study of the Hemiptera of Ohio and Descriptions of New Species. (Ohio Nat., Vol. V, pp. 273-276, 1905.)

and, therefore, are accessible to members of the Ohio Academy of Science.

It may be noted that the senior author has been responsible for many of the identifications; the observations on life histories are to be credited particularly to the junior author.

Family NOTONECTIDÆ.

**Buenoa platycnemis** Fieber.

Numerous specimens, taken at Columbus, Franklin Co., by the junior writer.

**Notonecta insulata** Kirby.

Several specimens, taken at Berea, Cuyahoga Co., by the junior writer.

**Notonecta variabilis** Fieber.

One specimen, taken at the Ohio State Fair grounds in Columbus by the junior writer.

Family NEPIDÆ.

**Ranatra kirkaldyi** Bueno.

One specimen, taken by Prof. Sanders at Columbus?

Family SALDIDÆ.

**Salda coriacea** Uhler.

One specimen, taken at Oxford, Butler Co., by Prof. W. H. Shideler.

**Salda sp.**

One specimen, taken at Cedar Point by the senior writer.

Family REDUVIIDÆ.

**Arilus cristatus** Linnæus.

Numerous specimens; taken at Sugar Grove, Fairfield Co., by Prof. Barrows; at Oxford by Prof. Shideler; at Columbus by Mr. L. A. Gephart.

**Apiomerus crassipes** Fabricius.

One specimen, taken at West Union, Adams Co., by Mr. W. Harbage.

**Sirthenea carinata** Fabricius.

Two specimens, taken at Athens, Athens Co., by Mr. C. M. Ochs, and at Buckeye Lake, Licking Co., by Mr. F. Cowles.

**Melanolestes abdominalis** Her.-Schfr.

One specimen, taken by the junior writer at Columbus.

Family GERRIDÆ.

**Gerris canaliculatus** Say.

One macropterous specimen, taken by the junior writer, October 15, 1913, on the Olentangy River (Ohio State University Farm.)

**Gerris conformis** Uhler.

One specimen, taken at Ironton, Lawrence Co., by Mr. R. C. Osburn; numerous specimens, collected by the junior writer at Berea, Olmsted Falls, and Columbus. This is a lacustrine as well as a fluviatile species. In the localities cited, several nymphs and adults were taken at various times during the past summer on ponds, small lakes, and streams. During the winter, they hibernate as adults and begin to copulate in early spring. The ova are deposited on material just beneath the surface of the water. In an aquarium, they were laid on floating cork just beneath the surface film and fastened with a viscous substance which is waterproof. These eggs began hatching in eleven days and the first adults appeared thirty-four days later, several requiring a few days longer to complete their metamorphosis. There are probably several generations during the summer, as nymphs and adults were taken on these same bodies of water during the latter part of the season. All specimens reared and collected were macropterous.

**Limnogonus hesione** Kirkaldy.

This tropical species is a noteworthy addition to our fauna. It has been recorded from Florida and Darien, Panama by Kirkaldy (Entomologist, 1902, p. 137).

One macropterous ♂, taken during the past summer at Galion, Crawford Co., by Mr. G. K. Rule; immense numbers of apterous ♂ and ♀, collected by the junior writer at Buckeye Lake, and at Minerva Park north of Columbus during September and October 1913, also at the latter locality and at the Ohio State Fair Ground in Columbus during September and October 1914. At these various times, numerous specimens were found copulating. Last October, several ♂ and ♀ were placed in an aquarium; in a few days eggs were deposited on floating cork just beneath the surface of the water. The males died a few days after coition, and the females a few days after the ova were deposited. Many of the individuals remained almost constantly *in coitu* for several days. As the ova and no adults could be found in early spring, the winter is probably spent entirely in the egg stage, while, later on and during the latter part of the summer, immense numbers were found on these same bodies of water. The eggs are slightly enlarged at one end and about three times as long as wide. They vary in length from one to one and one-third of a millimeter, and are of a dirty greenish-yellow color which becomes somewhat darker with age.

As the nymph emerges, the chorion is split longitudinally, the rupture extending a little over one-half of its length to well over the larger end. About fifty days after hatching the adult stage is reached, five ecdyses having taken place. So far as our observations have gone, it seems to be distinctly a lacustrine species, and found almost entirely in the apterous form. They are very active little creatures and congregate in immense numbers near the shore in sheltered places. They are predaceous. Their food

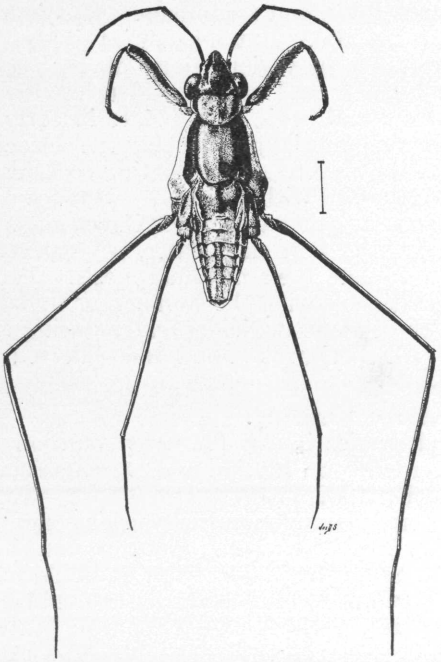

Fig. 1. ♀ Limnogonus hesione Kirk.
(From drawing by J. D. Smith.)

consists of small insects that fall into the water. In case there there are no living victims, they do not disdain food that has been dead for some time, and are often seen feeding on decaying insects. (Id. by Mr. J. R. de la Torre Bueno.)

**Metrobates hesperius** Uhler.

Immense numbers, taken at Berea, at Olmsted Falls, and at Columbus by the junior writer.

**Mesovelia mulsanti** F. B. White.

One nymph, taken at Sandusky by the senior writer.

Family CAPSIDÆ.

**Ceratocapsus pumila** Uhler.
Taken at Cedar Point by the senior writer.

**Resthenia insitiva** Say.
One specimen, taken at Columbus by Mr. Vernon Haber.

**Resthenia confraterna** Uhler.
One specimen, taken at Columbus by the junior writer.

**Adelphocoris superbus** Uhler.
Taken at Sandusky, Erie Co., and at Lakeside, Ottawa Co., by the senior writer.

**Lygus vitticollis** Reuter.
Two specimens, taken at Sandusky by the senior writer.

**Coquilletia mimetica** Osborn.
Two specimens, taken at Oxford by Prof. Shideler and at Columbus by the junior writer.

**Paraxenetus guttulatus** Uhler.
Several specimens, taken at Cedar Point by Mr. DeLong.

**Phytocoris tibialis** Reuter.
Taken at Cedar Point by the senior writer.

**Pœciloscytus americanus** Reuter.
Two specimens, collected at Berea by the junior writer.

**Pœcilocapsus marginatus** Walker.
Numerous specimens, taken at Oxford by Prof. Shideler; at Ironton, and at Vinton, Gallia Co. (Osburn and Hine); by the senior writer at Columbus and Sandusky,

Family ARADIDÆ.

**Aradus quadrilineatus** Walker.
Two specimens, taken by Mr. R. J. Sim in Ashtabula Co., and by the senior writer at Columbus.

**Aradus falleni** Stal.
One specimen, taken at Oxford by Prof. Shideler.

**Aneurus inconstans** Uhler.
Several specimens, taken by Prof. Shideler at Oxford and in Ashtabula Co., by Mr. R. J. Sim.

**Aneurus minutus** Bergroth.
Taken at Cincinnati, Hamilton Co., by Mr. Chas. Dury.

**Nannium pusio** Heidemann.
This species was described by Mr. Heidemann in Ent. Soc. Wash., Vol. XI, p. 189 (Coll. Mr. Chas. Dury, Cincinnati, O.). The senior writer has two specimens in his private collection which were taken by Mr. Dury at Cincinnati.

Family TINGITIDÆ.

**Corythuca marmorata** Uhler.

Many specimens, taken at Castalia, Erie Co., by Mr. DeLong, while sweeping grasses and weeds near shrubbery.

**Gargaphia tiliæ** Walsh.

Several specimens, taken at Oxford by Prof. Shideler and at Cedar Point by Mr. W. J. Kostir.

**Tingis clavata** Stal.

♂ and ♀, collected at Castalia while sweeping grass by Mr. DeLong.

Family LYGÆIDÆ.

**Lygæus bicrucis** Say.

Several specimens, taken at Oxford by Prof. Shideler and at Columbus by Mr. H. D. Chase.

**Heræus plebejus** Stal.

One specimen, taken by the senior writer at Columbus.

Family CORREIDÆ.

**Aufeius impressicollis** Stal.

Large numbers, taken at Columbus by the junior writer while sweeping grasses on the University farm. This seems to be the first record of its occurrence east of the Mississippi river. In the private collection of the senior writer, there is a good series of specimens from Nebraska, South Dakota and Colorado.

This species varies in color and a little in size. Most of the specimens taken here are a little larger, and, as a rule, are of a darker color. There is a gradation in color and size until some of the specimens agree with the ones from the other localities while all agree in structure.

**Anasa armigera** Say.

Many specimens, taken at Columbus by Mr. Haber; at Sugar Grove by Prof. Sanders; at Chillicothe, Ross Co., by Mr. E. G. Heinzelman; and at Greenville, Darke Co., by Mr. Griff Eidson.

**Catorhintha mendica** Stal.

Two specimens, taken at Columbus and at Cedar Point by the junior writer.

**Leptocoris trivittatus** Say.

The season of 1913 witnessed a rather widespread occurrence of the box elder bug in the western part of the state, and, altho this is the first appearance of the species in the state, it seems to deserve a definite record and the attention of entomologists in adjoining states. The species is known to have migrated eastward thru Kansas, Iowa, and Illinois but, so far as we are aware no records for the species have been made for Indiana or Ohio' Within the last few years the species has evidently gained con-

siderable extension; its occurrence during the summer cited included localities all the way from the northern to the southern portion of the state and eastward to far past the central portion.

The localities indicated on the map will show the distribution of the species in the state. Many of these records were secured thru the Ohio Experiment Station, the Extension Department of Ohio State University, and members of the Department of Zoology and Entomology of the University. Thru these sources specimens have been received and identified from the following localities:


Fig. 2. Map showing distribution of Box Elder Bug in Ohio, 1913.

Oxford, Butler Co.; Williamsburg, Clermont Co.; Washington C. H., Fayette Co.; Osborn and Yellow Springs, Greene Co.; Catawba, Clark Co.; Ft. Recovery and Celina, Mercer Co.; West Liberty, Logan Co.; Columbus, Franklin Co.; Galena, Delaware Co.; Montpelier, Williams Co.; Liberty Center, Henry Co.; Bowling Green and Longley, Wood Co.; Helena and Clyde, Sandusky Co.; Chicago Jc. and Norwalk, Huron Co.; Berea, Cuyahoga Co.; Carrolton, Carroll Co.

The factors affecting the distribution within the state are not apparent, at least so far as the present records indicate. The advance within the state appears to be independent of all railway lines; this also seems substantially true of many of the different

river valleys and other topographic features. If only the northern series of records were taken into consideration, it might be thought to follow the principal railway lines of this portion of the state, but, moreover, several important railways pass thru counties that are not included among these records. It seems that the advance and dissemination of the species is due mainly to natural flight and its progress eastward may be expected to follow this method. It will be interesting to watch for the eastward extension of its present margin of distribution. During the summer of 1914, no records for the species were made in the state; if the insect is present during the coming summer, we will be glad to receive such records.

Family PENTATOMIDÆ.

**Banasa packardi** Stal.

One specimen, taken at Buckeye Lake by Mr. Cowles.

**Apeteticus modestus** Dallas.

One specimen, taken at Hanging Rock, Lawrence Co., by Prof. Hine.

**Cœnus delius** Say.

Many specimens of this widely distributed species have been collected: at Oxford by Prof. Shideler; at Medina, Medina Co., and at Blendon, Franklin Co., by Prof. Hine; at Tiffin, at Berea, and at Columbus numerous specimens were taken by the junior writer.

**Euschistus servus** Say.

Two specimens, taken at Oxford by Prof. Shideler, and at Sugar Grove, Fairfield Co., by Mr. Marshall.

**Euschistus ictericus** Linn.

Taken at Cedar Point by the senior writer, at Medina by Prof. Hine, and at Columbus by the junior writer.

**Elasmucha lateralis** Say.

Two specimens, taken at Rockbridge, Hocking Co. by Prof. Barrows and at Columbus by Mr. Axtell.

**Dendrocoris humeralis** Uhler.

Taken at Hanging Rock by Prof. Hine and at Columbus by the senior writer.

**Neottiglossa undata** Say.

One specimen, taken at Columbus by the senior writer.

**Perillus bioculatus** Fabricius.

Numerous specimens, taken by the junior writer at Berea, at Tiffin, and at Columbus. At Tiffin many specimens were found feeding upon the adult Colorado potato beetle.

**Solubea pugnax** Fabricius.

This is a southern species, taken at Hanging Rock, Lawrence Co. by Prof. Hine and at Columbus by Prof. Barrows.