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## A FURTHER CONTRIBUTION TO THE HEMIPTER- OUS FAUNA OF OHIO.\*

HERBERT OSBORN.

A preliminary list of the Hemiptera of Ohio was published in the proceedings of the Academy in 1900 (8th Annual Rept.), and a short supplementary list in the 9th Annual Report.

Since these publications a number of new species have been added and much additional data obtained concerning the distribution of some of the rarer forms hitherto noted.

Some of these are of sufficient interest to merit a record at this time, especially as a final report upon the group is yet impossible. It is hoped that during the next two years sufficient collections may be made in certain quarters of the State to render possible a monograph of the State fauna in this group. Several members of the Academy have kindly assisted in gathering material and I am especially indebted to Mr. Dury, Prof. Wetzstein, Mr. J. G. Sanders, Prof. Hine, Mr. O. H. Swezey and T. W. Ditto for such help. Mr. Swezey has secured a number of the Fulgoridae and Mr. Ditto most of the Aphididae included in this list.

The Coccidae have been studied exhaustively by Mr. Sanders, and he has prepared an annotated descriptive list for the State, so I have not introduced detailed records here. Prof. F. M. Webster and Mr. A. F. Burgess published a list of this family (Bull. U. S. Dept. Agriculture), and this list was republished with certain revisions and additions by Mr. Geo. B. King, *Ent. News*, XIV, page 204.

Collections at Cincinnati, the south-east portion of the State and in Ashtabula County are especially desired.

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\* Read at the meeting of the Ohio State Academy of Science.

With the previous lists of 321 and 60 species these additions give us a list of 528 species for the State.

## CICADIDÆ.

*Cicada canicularis* Harr. One specimen of this species which is now separated from the *tibicen* of Linnaeus. This specimen agrees in size with typical specimens from Maine and is I believe correctly placed here but additional specimens are much desired. The species differs from *tibicen* in being smaller, about 40 mm. long instead of 50 mm., and the opercles of male are broader than long.

## MEMBRACIDÆ.

*Publilia nigridorsum* Godg. Columbus.  
*Ceresa taurina* Fh. Ashtabula.  
*Ceresa brevicornis* Fh. Medina (Hine).  
*Ceresa vitulus* Fab. Ironton (Hine).  
*Stictocephala lutea* Walk. Ironton, Vinton, Hanging Rock, Sugar Grove, Newark.

## FULGORIDÆ.

*Chlorochara conica* Say. Sandusky (Swezey). Cincinnati (Dury). Columbus (Koebele).  
*Scolops denticatus* Uh. Cincinnati (Dury). Hitherto listed for Bellaire only.  
*Phyllosecelis atra* Germ. Alate form, Cincinnati (Dury).  
*Myndus radialis* Osb. On roots of various plants. Columbus.  
*Myndus fulvus* Osb. Sandusky and Castalia.  
*Myndus viridis* Ball. ? One specimen agreeing closely with this species except in male styles and frontal markings, was collected at Sandusky by Mr. Swezey.  
*Myndus pictifrons* Stal. Collected at Vinton by Prof. Hine.  
*Cixius stigmatus* Say. Cincinnati (Dury).  
*Oliarus humilis* Say. Cedar Point, Sandusky. (Swezey) Castalia, Vinton.  
*Oliarus 5-lineatus* Say. Cedar Point.  
*Kelisia axialis* Van D. Quite common at Columbus September and October 1903 and collected by Mr. Koebele and the writer.  
*Pissonotus aphidioides* Van D. Columbus (Swezey) Koebele?  
*Pissonotus dorsalis* Van D. Columbus (Swezey) June.  
*Phyllodinus Koebelei* Osb. September and October 1903. (Koebele.)  
*Phyllodinus fuscus* Osb. Columbus.  
*Liburnia Kilmani* Van D. Columbus. Newark. (Swezey).  
*Liburnia pellucida* Fieb. Wooster (Webster), Ironton, Columbus, Georgesville?  
*Liburnia lineatipes* Van D. Columbus (Swezey).  
*Liburnia lutulenta* Van D. Abundant at Columbus, Cedar Point.  
*Liburnia oclusa* Van D. Columbus (Swezey).  
*Liburnia Gillettei* Van D. Newark (Swezey).  
*Liburnia Osborni* Van D. ? Columbus.  
*Liburnia incerta* Van D. Newark (Swezey).

## CERCOPIDAE.

*Tomaspis bicincta* Say. Cincinnati (Dury).

## JASSIDAE.

*Phlepsius decorus* O. & B. Several specimens collected at Columbus by Mr. Albert Koebele.

*Phlepsius majestus* O. & B. A specimen seen while collecting but escaped from net. It is a very active flyer and one of the most difficult Jassids to capture.

*Thamnotettix fusoria* O. & B. Rather plentiful at Columbus in September and October, 1903.

*Chlorotettix spatulatus* O. & B. Columbus, October, 1903.

*Dieraneura communis* Gill. Wooster (F. M. W.).

*Empoasca obtusa* Walsh.

## APHIDIDAE.

- Phylloxera caryaeren* Riley. (Ditto.)  
*Pemphigus rubi* Thos. (Ditto.)  
*Pemphigus populicaulis* Fh. (Ditto.)  
*Pemphigus populitransversus* Riley.  
*Shizoneura corni* Fab. Columbus. (Ditto.)  
*Shizoneura Rileyi* Thos. On elm. (Ditto.)  
*Phyllaphis fagi* L. Weed. (Ditto.)  
*Lachnus longistigma* Monell, on willow, Columbus.  
*Lachnus platanicola* Riley. Columbus.  
*Cladobius Smithae* Monell, on willow, Columbus. (Ditto.)  
*Cladobius bicolor* Oest. Willow, Columbus. (Ditto.)  
*Cladobius flocculosus* Weed. Columbus.  
*Chaitophorus negundinis* Thos. (Ditto.)  
*Chaitophorus viminalis* Monell. (Ditto.)  
*Callipterus discolor* Monell. (Ditto.)  
*Callipterus bellus* Walsh. (Ditto.)  
*Drepanosiphum acerifolii* Thos. (Ditto.)  
*Aphis cornifoliae* Fh. Columbus. (Ditto.)  
*Aphis maidis* Fh. On corn. (Ditto.)  
*Aphis pomi*. Previously listed as mali.  
*Aphis Fitchii*. Columbus. (Ditto.)  
*Aphis rubicola* Oestl. Columbus. (Ditto.)  
*Aphis crataegifoliae* Fh. (Ditto.)  
*Aphis rumicis* L. Columbus. (Ditto.)  
*Aphis prunifoliae* Fh.  
*Aphis maculatae* Oestl. (Ditto.)  
*Aphis marutae* Oestl. Columbus. (Ditto.)  
*Siphocoryne salicis* Monell. Columbus. (Ditto.)  
*Myzus rosarum* Walk. (Ditto.)  
*Rhopalosiphum berberidis* Fh. (Ditto.)  
*Nectarophora cucurbitae* Thos. (Ditto.)  
*Nectarophora pisi*. The pea aphid.  
*Nectarophora circumflexa* Buckton. (Ditto.)

## COCCIDAE.

<i>Pseudococcus trifolii</i> Forbes.	<i>Saissetia hemisphericum</i> Targ.
" <i>pseudonipae</i> Ckll.	<i>Pulvinaria innumerabilis</i> Rathv.
<i>Phenacoccus acericola</i> King.	<i>Aspidiotus ostreaformis</i> Curtis.
" <i>Osbornii</i> Sanders.	" <i>juglans</i> Comst.
<i>Ericoccus azaleae</i> Comst.	" <i>glandiliferous</i> Ckll.
<i>Gossyparia spuria</i> (Modect).	" <i>lataniae</i> Sign.
<i>Kermes galliformis</i> Riley.	" <i>cyanophylli</i> Sign.
" <i>pubescens</i> Bogue.	<i>Chrysomphalus aurantii</i> Mask.
" <i>andrei</i> King.	<i>Aspidiotus comstocki</i> Johns.
" <i>trinotatus</i> Bogue	" <i>uvae</i> Comst.
<i>Asterolecanium variolosum</i> (Ratz).	" <i>ulmi</i> Johns.
<i>Eulecanium caryae</i> Fitch.	" <i>cydoniae crawii</i> Ckll.
" <i>Fletcheri</i> Ckll.	<i>Chionaspis americana</i> Johns.
" <i>Cockerelli</i> Hunter.	" <i>gleditsiae</i> Sand.
" <i>Fitchii</i> Sign.	" <i>carpae</i> Cooley.
" <i>canadense</i> Ckll.	" <i>euonymi</i> Comst.
" <i>Websterii</i> King.	" <i>ortholobis</i> Comst.
" <i>tulipifera</i> Cook.	<i>Hemichionaspis aspidistrae</i> Sign.
" <i>quercitrionis</i> Fitch.	<i>Diaspis boisduvalii</i> Sign.
" <i>magnoliarum</i> Ckll.	<i>Parlatoria zizyphus</i> (Lucas).
" <i>querifex</i> Fitch.	<i>Fiorinia fioriniac</i> (Targ.)
" <i>prunastri</i> Fouse.	<i>Comstockiella sobalis</i> Comst.
<i>Saissetia depressum</i> Targ.	

## HETEROPTERA.

<i>Canthophorus cinctus</i> . Cincinnati. Previously listed for Columbus.
<i>Amnestus pusillus</i> Uh. Cincinnati. (Dury, Coll.)
<i>Corimelaena Gillettei</i> V. D. Ironton.
<i>Mincus strigipes</i> Fab. Columbus.
<i>Podisus maculiventris</i> Say. <i>Spinus</i> Dall. Generally distributed.
<i>Brochymena 4-pustulata</i> Fab.
<i>Euschistus tristigmus</i> Say var. Van D.
<i>Chariesterus antennator</i> Fab. was noted in various stages on <i>Euphorbia nutans</i> the past summer. Have seen specimens in Cincinnati (Dury, Coll).
<i>Alydus 5-spinosus</i> Say. Sandusky (H. O.). Cincinnati (Dury, Coll.).
<i>Corizus hyalinus</i> . Found in various stages on <i>Euphorbia nutans</i> in September.
<i>Ishmorynchus didymus</i> Zett. Vinton (Hine). Columbus.
<i>Belonochilus numenius</i> Say. Columbus.
<i>Ishnodemus falcis</i> Say. Cedar Point. Sandusky.
<i>Geocoris limbatus</i> Stal.
<i>Cymodema tabida</i> Stal. Ironton.
<i>Cymus angustatus</i> Stal. Columbus.
<i>Cymus lividus</i> Stal. Castalia.
<i>Ligyrocoris constricta</i> Say. Cincinnati (Dury).
<i>Ptochiomera nodosa</i> Say.
<i>Microtoma carbonaria</i> Rossi. Columbus.
<i>Salacia pilosula</i> Stal.
<i>Emblethis arenarius</i> L. Cedar Point.
<i>Lygaeus Kalmii</i> . Stal. Cedar Point. Sandusky.
<i>Araldus aequalis</i> Say. Collected at Cincinnati by Prof. Hine.

- Aradus ornatus* Say. Collected by Mr. Dury at Cincinnati. This is an especially interesting addition to our list as the species has been unknown since Say's description in 1831, until a few years ago when Bergroth rediscovered it. I have noted it in the *Ohio Naturalist*, volume IV, page 22.
- Aradus Duryi* Osb. Cincinnati, collected by Mr. Dury.
- Aradus Duzei* Bergroth. Westerville, J. G. Sanders. Cincinnati (Dury).
- Brachyrhynchus lobatus* Say. Cincinnati by Mr. Dury.
- Neuroctenus elongatus* Osb. Cincinnati (Dury).
- Neuroctenus ovatus* Stal. Cincinnati (Dury). Two species. Previously recorded for Mexico and North Carolina.
- Coriscus propinquus* Reut. Columbus.
- Opsicoetus personatus* L. Has been rather frequent in Columbus and Sandusky.
- Pelagonus americanus* Uh. Cedar point. Sandusky.
- Limnopus rufoscutellatus* Lat. Cedar Point.

## OHIO PLANTS WITH EXTRA-FLORAL NECTARIES AND OTHER GLANDS.\*

JOHN H. SCHAFFNER.

The existence of glands and nectaries outside of the flower or inflorescence has been a subject of much interest to biologists. Delpino, Darwin, Trelease, and many others have given a large amount of information in regard to the occurrence and nature of these organs; yet much is still obscure and any one so inclined may at least obtain considerable pleasure by making observations along this line.

Various views have been held as to the cause and use of extra-floral glands and their secretions. Delpino considered that the power to secrete nectar by any extra-floral organ has been specially gained in every case for the sake of attracting ants and wasps as a body-guard, or as defenders of the plant against enemies. Darwin while admitting that this may be the case in some plants did not think that all such glands originated in this way. He held that the saccharine matter in nectar was excreted as a waste product of chemical changes in the sap and that this product might then become useful for accomplishing cross-fertilization or for attracting a body-guard, and thus the nectary would become an object for selection. He cites the case of the leaves of certain trees where a saccharine fluid, often called honey-dew, is excreted without the aid of special glands. By some, the special use of extra-floral nectar is supposed to be to divert ants and other insects from visiting flowers which they might otherwise injure. But many plants have nectar long before and long after the flowering period. On *Viburnum opulus*, for example, nectar is still present and abundantly used by ants late in October. Another view has been that certain of these glands act as absorptive

\*Read at the Meeting of the Ohio State Academy of Science.