

David Cook

## HYDRACARINA OF MICHIGAN

Aims of the course: This problem started out as a continuation of Zoo. 298 taken last spring (1948), and to which was to be added some work on Hydrachnids. However, after some work with the water-mites I decided that they were a more interesting group and decided to devote all my time to them. I am now as reasonably sure as one can be that this is the group that I want to continue on with. Thus this report represents a start on distributional and life-history work of Michigan hydrachnids which I hope to continue in the future.

The early part of the semester was devoted to collecting specimens and acquainting myself with some of the literature of the group. So far I have a bibliography of almost 250 titles and have been able to secure four papers dealing with water-mites.

Following is a list of the Hydrachnids taken during the last semester. Collecting dates ranged between October 6, 1948 and Jan. 24, 1949. With one exception all specimens were taken in Washtenaw Co. All identifications should be regarded as tentative. I feel reasonably sure that they are correct otherwise I made no attempt to identify them to species. However, until I have had an opportunity to examine more material these identifications must remain tentative.

## FAMILY LIMNOCHARIDAE

*Limnochares aquaticus* (Linnaeus) This species was found to be rather common in the Elodea beds at Barton Pond, Washtenaw Co., Mich. T2S/R 6E/S17. They were taken in all collections at this place (Coll. Nos. DC 3 48, DC 4 48, DC 8 48) The date of the last collection being Nov. 11, 1948. One specimen was taken in Barry Co. at Cedar Creek Mill Pond on

Nov. 8, 1948 (Coll. No. DC 7 48).. This Barry Co. specimen is twice as large as any of the Washtenaw Co. individuals. (No bragging intended)

FAMILY EYLAIDAE

Eylais sp. One specimen taken on Oct. 6, 1948 in a backwater area of the Huron River above Geddes Dam (Coll. No. DC 1 48).

FAMILY HYGROBATIDAE

SUBFAMILY ARRHENURINAE

Genus Arrhenurus

Subgenus Arrhenurus

A. superior Mar. Taken in the following collections (DC 3 48, DC 4 48, DC 8 48) This is the most common species of Arrhenurus taken. I took great numbers of a large female of this genus and which probably belong to this species.

A. flabellifer Mar. Taken in the following collections (DC 3,48, DC 4 48, DC 8 48) Not as common as the preceding or following species.

A. magnicaudatus Mar. Taken in the following collections (DC 3 48, DC 4 48, DC 8 48). This was the second most common species of this genus taken.

A. laticornis Mar. Only two specimens of this <sup>SPECIES</sup> ~~genus~~ were taken. One in each of the following collections. (DC 2 48, DC 8 48)

A. americanus Mar. This species was taken in the following collections (DC 2 48, DC 8 48).

Subgenus Megaluracarus I have two individuals of this subgenus which represent two distinct species. However, I am unsure of specific identification at this time.

SUBFAMILY LEBERTIINAE

Lebertia sp. This genus was rather common in the following collection.  
(DC 8 48).

SUBFAMILY SPERCHONINAE

Limnesiopsis anomala (Koenike) One specimen of this species was taken  
in Coll. No. DC 3 48.

Limnesia sp. This genus was represented in the following collections  
(DC 2 48, DC 4 48).

SUBFAMILY PIONINAE

Neumania sp. Several individuals of this genus were taken in Coll. No.  
DC 2 48.

Unionicola crassipes(Muller) Three individuals of this species were taken  
in Coll. No. DC 8 48. These represent free living specimens. I have made  
no attempt to collect any specimens from pelecypods so far.

Piona sp. This genus was represented in collection DC 4 48 and also I  
beleave that the small hydrachnids taken in Coll. No. DC 1 49 are of this  
genus.

SUBFAMILY HYGROBATINAE

Atractides sp. This genus was numerous in the following collections  
(DC4 48, DC 8 48).

Among my collections are some specimens which I cannot identify even to  
genus as they are too opaque to see the necessary structures. It will probably  
prove necessary to treat them with a KOH solution much as I did my pseudo-  
scorpions last semester to remove the internal organs.

Most collecting was done at Barton Pond which was visited quite regularly during the early part of the fall. Here the hydrachnids were taken in fairly shallow water (up to four feet) in large numbers as late as Nov. 11, 1948. The water temperature was 8°C. but the mites were still quite active. About a week and a half later (Nov. 21, 1948) almost all were gone from the area. The water temperature was now 7°C. and the mites acted rather sluggish. A collection attempt a week later produced no hydrachnids. On Jan. 24, 1948 I had an opportunity to sample the deeper water near this area with an Ekman dredge. Coll. No. DC 1 49 was made about 50 feet from the shore in five meters of water. The sample brought up five specimens of what I believe to be a small species of Piona. What was interesting was that this small species was not represented in any of the earlier inshore collections and none of the species taken inshore were taken here. I am hoping to do more sampling later on to determine if the inshore fauna had died off or had moved off into deeper water. I had no way of measuring the bottom temperature at this depth and it may very well have been less than 4°C. and therefore have some bearing on the distribution.

Some specimens were brought back to the laboratory alive and kept in small jars. Little information was gained from these. Some of the smaller crustacea (Copepoda, Cladocera, etc.) were placed in with them. While I did not see any actual feeding activity, dead Cladocera were found in the jar which appeared to have had the juices sucked from their bodies. In other jars I placed specimens which I never fed. These seem to be as active as ever even without food (unless they obtained food from the juices of the Elodea plants which I placed in the jar with them). I did not notice any cannibalism which is supposed to be common among the hydrachnids. This may have been due however, to the fact that I kept only individuals of the same species together and also because most of the mites were of the hard shelled type.

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Hydracarina of Michigan (Cont.)

This report represents the results of a further study of the water-mites of Michigan. Again most of the time was spent in making collections and in identifying the material collected. However, as a possible starting point for life history work, any aquatic insects taken were looked over for possible attached hydrachnid larvae. A few insects were taken during the semester which did have the larvae. Early in May a weekend field trip was made to the counties of the "thumb" region of Michigan for the purpose of obtaining county records. Over 40 individual collections were made this spring, of which, much of the material has not been looked over. This will be done during next winter.

MICHIGAN SPECIES LIST (Cont.)

Family Eylaidae

Eylais This genus was very common and taken in nearly every collection made in temporary ponds. Due to the variability of the eye-plate, the character on which most specific identification is based, there has been little work done on the taxonomy of the American species. Among my material are specimens in which the eye-plates differ so much that I am sure that two or more species are represented.

Family Hydrachnidae

Hydrachna This genus was also very common in temporary pond conditions. I do not feel qualified to attempt specific identification at this time, but again I am sure that more than one species are present. Larvae belonging to this genus were found attached to aquatic insects.

Family Hydryphantidae  
Subfamily Diplodontinae

Diplodontus despiciens (Mull.) Taken in the following collections.  
(DC 21 49, DC 37 49, DC38 49) This species was very abundant in Coll.  
No. DC 38 49.

Subfamily Hydryphantinae

Hydryphantes ruber (de Geer) This species was taken in Barry Co.  
(Coll: No. DC 11 49). The chitinous plate on which the median eye is  
situated does not agree exactly with that described for the species but  
is much closer than to any other species.

Family Hygrobatidae  
Subfamily Arrhenurinae  
Genus Arrhenurus  
Subgenus Micruracarus

A. infundibularis Mar. (Coll. No. DC 21 49) one individual taken.

A. ovalis Mar. (Coll. No. DC 21 49) one individual taken.

Subgenus Megaluracarus

A. semicircularis Piers. (Coll. No. DC 38 49) one individual taken.

A. apetiolata Piers. (Coll. No. DC 21 49) one individual taken.

A. megalurus Mar. (Coll. Nos. DC 21 49, DC 37 49, DC 38 49) very  
common.

A. marshallae Piers. (Coll. No. DC 21 49) two individuals taken

A. birgei Mar. (Coll. No. DC 21 49) a few individuals taken

Subgenus Arrhenurus

A. planus Mar. Taken on several occasions this spring in the thumb  
region of Michigan. Found in temporary ponds.

Subfamily Lebertiinae

Oxus elongatus Mar. two individuals taken in Coll. No. DC 21 49

Subfamily Sperchoninae

Limnesia undulata (Mull.) Numerous in Coll. No. DC 21 49

Limnesia fulgida Koch Numerous in Coll. No. DC 21 49

Most of the material collected in the "thumb" area has not been classified. Aquatic insects belonging to the families Hydrophilidae, Belostomatidae, Corixidae, and Nepidae were found with the sac-like water mite larvae of<sup>n</sup> them. All seemed to belong to the genus Hydrachna. Most of the larvae hatched but I was unable to get them to grow. Most of them died. Possibly the crustaceans I was using as food were too large or heavily protected for them.

**THE HYDRACARINA OF MICHIGAN**

**David R Cook**

**(an outline of proposed work)**

**I. Review of work done on Water Mites**

- a. Foreign (mainly European)
- b. North American

**II. Morphology**

- a. External
- b. Internal

**III Methods of Collecting, Preserving, observing, Rearing, etc.**

**IV. Classification of the Hydracarina (to subfamilies of genera)**

**V. Classification of Michigan Hydracarina**

- a. Keys to Michigan species
- b. Good illustrations showing all key characters

**VI. Short description and notes on the synonymy of Michigan species, also habitat preference if any.**

**VII Distribution of Michigan Hydracarina**

- a. List of county records
- b. Maps showing distribution

**VIII Life histories (probably two), the species to be determined later.**

**IX. Comparison of mite fauna in several contrasting waters. Very extensive collections will be made. An attempt will be made to correlate the the fauna with chemical, physical and biological conditions present.**

**X. Bibliography**



## HYDRACARINA OF MICHIGAN (Cont.)

This summer most of my time was spent in collecting mites. A total of 15 days were spent traveling to 45 counties for the purpose of getting county records. This included all of the Upper Peninsula and the northern half of the Lower Peninsula. Besides this, usually at least one other day a week was spent in collecting various localities near by. 161 collections were made this summer which will probably total well over 2000 mites. This material will be worked up and included in a future report.

A field record sheet was made up this summer which has aided me greatly in recording my collection data. A sample sheet is included.

I expect to add quite a few species of mites to those of the Douglas Lake region as reported in Marshall's 1927 paper. I have found the following genera around here which Marshall did not include: Frontipoda, Oxus, Atractides, Koenikea, Aturus, Sperchon, and Pseudosperchon.

This last week three afternoons were spent collecting the mite fauna of the Maple River. I took three genera there that I had not taken elsewhere this summer (Aturus, Sperchon, and Pseudosperchon). This suggested that they might be strictly stream forms. However, today (Aug. 11) a collection made on a rocky, wave swept beach of Carp Lake produced two of the above genera. This would suggest that continual flowing water is not necessary as there must be many calm days in which there is little or no water movement. This opens up an interesting type of habitat which has been little touched by workers in Hydracarina. I hope to make extensive collections in stream and rocky shore habitats in Barry County after the Biological Station closes. The results will be included in a future report.

Little was done on life history work this summer since I was away so much of the time. I did however, succeed in getting Arrhenurus superior to breed and lay eggs. These hatched in a little over a week. As I did not have time

to experiment with possible hosts for the larvae, nothing further was done.

The finding of Hydrachma larvae on several species of Hemiptera suggests that this genus might be an easy one to run through a life history on.