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## BRANCHIODELLIDAE IN ARKANSAS

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The small oligochaetes discussed here occur on the gills or on the ventral surface of the crawfish. They are noticeable particularly on the ventral side of the abdomen. When the crawfish are preserved, the worms usually drop off and fall into the detritus at the bottom of the container. Apparently, there is no agreement on the relationship that exists between the worms and the crawfish.

Stephenson (1930) says: "These are parasites of the external surface and gills of freshwater crayfishes... not parasitic when young, the intestinal tract showing debris and small animals; but in the adult the jaws are used to break the skin of the host in order to suck the blood." This report is similar to one by Hall (1915), who also reported that he had found "several pieces of striated voluntary muscle fiber in the intestine of the adult worms." Moore (1895) reported seeing blood from the crawfish in the worm intestine. Goodnight (1940), a more recent American student of the group, expresses the opinion that they are at most only facultative parasites and in general non-parasitic.

All accounts seem to be based on an observation of the contents of the worm digestive tract in which the indestructible diatom shells attract attention first. Other things are visible--such as algal detritus, nematode worms, and stages of sporozoan life cycles.

The constant association with the crawfish, the chitinous jaws with strength enough to break the skin, the well developed suckers for holdfast organs--all these provide circumstantial evidence that the small worms are parasitic.

A critical study of the relationship between the worms and the hosts would be interesting. There seems to be no host specificity beyond that of the West Coast *Astacus*, which are different species from those of the eastern crawfish, which are *Cambarinae* (Pennak, 1953). Apparently, young crawfish tend to have more worms than the older, but present collections are not adequate to prove this. Goodnight's (1940) monograph is recent and complete, while Pennak's (1953 *Freshwater Invertebrates*) offers the literature published since 1940 and has a key derived from Goodnight. Nine genera and 26 species of North America are described.

The records described in this paper are mainly from Northwest Arkansas. Since there is no evidence of host specificity known, and since the specimens mainly are derived from the detritus in the bottoms of jars containing a variety of crawfish species, no attempt has been made to associate the worms with particular crawfish.

This report is based on 39 collections of crawfish in Arkansas.

## DISTRIBUTION OF SPECIES

*Branchiodella americana*

## Arkansas:

Clarksville  
Farmington  
Fayetteville

Johnson  
Ouachita River  
Springdale

This appears to be a widespread species. The type was described from Texas, and has been reported from North Carolina and New York. The collections are all from Northwest Arkansas, with the exception of a vague Ouachita River record, which represents an area near Camden, Arkansas.

*Cambarincola chirocephala*

## Arkansas:

Alma  
Devils Den  
Farmington

Johnson  
Mena  
Missouri:  
Roaring River

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This is also a widespread species. It was reported from Missouri originally, but since then it has been found in Illinois, New York, Kentucky, Virginia, Indiana, North Dakota, Iowa, Pennsylvania, Alabama, Mississippi, and Tennessee, and in Ontario, Canada.

*Cambarincola elevata*

Arkansas:

Fayetteville

Johnson

This species has been reported from Illinois, Wisconsin, and Missouri, a list to which this paper adds Arkansas.

*Cambarincola macrodonta* /

Arkansas:

Banks

Bentonville

Boxley

Bradley County

Durham

Elkins

Farmington

Johnson

Missouri:

Roaring River

Oklahoma:

McAlester

This species is widespread in Arkansas. The lateral teeth of the upper jaw tend in the Arkansas specimens to be larger than reported in the original description. This species has been reported previously from Mena, Arkansas, by Goodnight (1940). The species was originally described from Colorado. Other states reporting it include Texas, Louisiana, New Mexico, Mississippi, Illinois, Virginia, Missouri, Michigan, South Dakota, Kansas, and Nebraska. This Oklahoma record appears to be the first report from that state.

*Cambarincola vitrea*

Arkansas:

Johnson

This species has a wide distribution. It was described originally from Michigan, and then reported from Wisconsin, Colorado, Missouri, Illinois, Indiana, Florida, Oklahoma, Alabama, New York, Kentucky, North Dakota, Texas, Mississippi, Wyoming, Georgia, and also from Ontario, Canada. There is no explanation for this single record, other than inadequate coverage of Arkansas. Many of the records of distribution of these various species of worms are based upon single collection sites.

*Pterodrilus mexicanus*

Arkansas:

Durham

Goshen

Johnson

Stone County

This is an improbable and unexpected record. The species was originally described from Mirador, Vera Cruz, Mexico, by Ellis (1919). A single, poorly preserved specimen was available. It is characterized, within the genus, by segment VIII bearing a simple four-horned appendage. No other segments have appendages. The Arkansas specimens agree with this description.

*Xironodrilus formosus*

Arkansas:

Fayetteville

Stone County

Originally described from Indiana, it also has been reported from Michigan, Illinois, Missouri, and New York. This is the first record from Arkansas.

*Xironodrilus dentatus*

Arkansas:

Bentonville

Devils Den

Farmington

Fayetteville

Norfolk Lake

Polk County

Stone County

Oklahoma:

McAlester

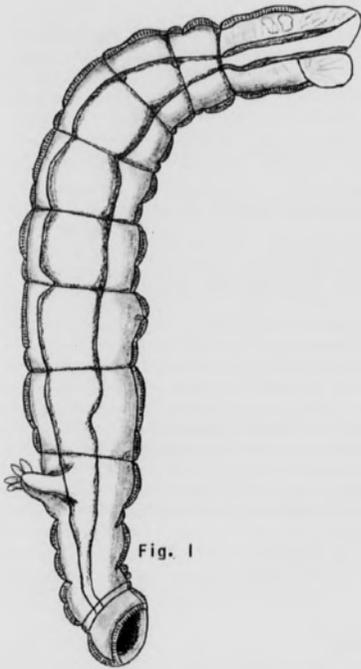


Fig. 1



Fig. 2

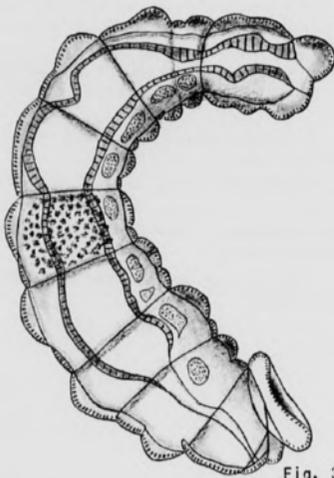


Fig. 3

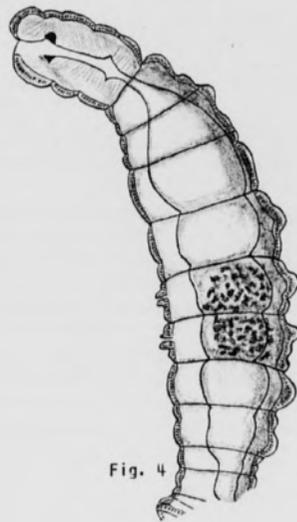


Fig. 4

- Fig. 1. *Pterodrilus mexicanus*, lateral view showing processes on segment VIII.  
Fig. 2. *Xironodrilus dentatus*, dorsal view.  
Fig. 3. *Branchiobdella americana*, lateral view.  
Fig. 4. *Cambarincola macrodonta*, lateral view.

*Xironodrilus pulcherrimus* originally was described by Moore (1894), and Ellis (1919) recognized two subspecies. These were named *X. pulcherrimus pulcherrimus* and *X. pulcherrimus dentatus* by Goodnight (1940). In a later paper, Goodnight (1943) elevated *X. pulcherrimus* to specific rank, with the holotype from Missouri. *X. pulcherrimus* seems restricted to North Carolina, while *X. dentatus* is widespread, with reports from Missouri and Oklahoma in the western part of its range and West Virginia in the eastern portion. This is the first record for Arkansas.

## KEY TO KNOWN SPECIES OF BRANCHIOBELLELLIDAE IN ARKANSAS\*

1. (2) With one pair of testes, in fifth segment. *Branchiobdella americana*.
2. (1) With two pairs of testes, in fifth and sixth segments.....3
3. (4) Body with an appendage bearing four horns on the eighth segment.....  
*Pterodrilus mexicanus*.
4. (3) Body without an appendage bearing four horns.....5
5. (14) Body cylindrical, e.g., not flattened.....6
6. (7) Upper lip of mouth of four subequal lobes; the major annulations of the body segments distinctly and visibly elevated over the minor annulations.  
*Cambarincola chirocephala*.
7. (6) Upper lip of mouth entire, excepting a small median emargination.....8
8. (9) Major annulation of eighth segment distinctly elevated over minor annulations.....*C. elevata*.
9. (8) Major annulation of eighth segment not so elevated.....10
10. (11) Middle tooth of upper jaw long and prominent when compared with the small lateral teeth.....*C. macrodonta*.
11. (10) Middle tooth of upper jaw longer than other four teeth, but small enough that all 5 teeth may be considered subequal.....*C. vitrea*.
12. (5) Body flattened, sucker ventral.....*Xironodrilus dentatus*.

\* Based on Goodnight's 1940 key.

## SUMMARY

Four genera and eight species of Branchiobdellidae--*Branchiobdella americana*, *Cambarincola chirocephala*, *C. elevata*, *C. macrodonta*, *C. vitrea*, *Pterodrilus mexicanus*, *Xironodrilus formosus*, and *X. dentatus*--are reported from Arkansas, with a few records from Missouri and Oklahoma.

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