

# More Host Records for Acanthocephalan Parasites from Arkansas Fishes (Aphredoderidae, Catostomidae, Centrarchidae, Cyprinidae, Esocidae, Percidae)

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Running Title: Records of Acanthocephalans from Arkansas Fishes

Over the last few years, our research consortium has provided a good deal of novel information on the acanthocephalans of Arkansas fishes (McAllister *et al.* 2014a, b, 2015, 2016a, b, 2018a, b). Here, we continue to document new host records for acanthocephalans from select fishes of the state.

During November 2017 and between March and October 2018, we collected fishes with a backpack electroshocker (DC current) and/or boat electrofisher from 9 sites on their river drainages/basin and 8 counties (Fig. 1). They were placed in aerated habitat water and necropsied within 24 hr. Fish were overdosed with a concentrated solution of tricaine methanesulfonate and measured for total length (TL). A mid-ventral incision from their anus and, anterior to the level of the stomach, was made to expose the gastrointestinal tract and other internal viscera (including gallbladder, gonads, and liver) which was removed and placed in a Petri dish containing 0.9% w/v saline. A stereomicroscope was

used to scan tissues and locate acanthocephalans and, when found, were transferred to Petri dishes containing distilled water overnight to completely evert their proboscides. Specimens were fixed in 70–95% v/v DNA-grade ethanol, stained with acetocarmine and mounted entire in Canada balsam. Select voucher specimens were deposited in the Harold W. Manter Laboratory of Parasitology Collection (HWML), Division of Parasitology, University of Nebraska-Lincoln. Host voucher specimens were deposited in the Henderson State University Museum (HSU), Arkadelphia, Arkansas. We follow Amin's (2013) classification of the Acanthocephala.

Our annotated list of data for fishes harboring acanthocephalans is as follows: host and TL, collection site (latitude and longitude, WGS 84), collection date, prevalence, intensity, and remarks.

The following taxa of acanthocephalans were found in Arkansas fishes:

## EOACANTHOCEPHALA: NEOECHINORHYNCHIDA: NEOECHINORHYNCHIDAE

### *Neoechinorhynchus* sp.

*Hosts and localities:* 1 (210 mm TL) Largemouth Bass (*Micropterus salmoides*), Red River drainage, Mill Creek at Horatio, Sevier County (33°56'23.47"N, 94°21'39.15"W), 20 Mar. 2018. 2 (155, 190 mm TL) Northern Hogsucker (*Hypentelium nigricans*), White River drainage, White River at Rim Shoals, Baxter County (36°15'27.56"N, 92°28'28.72"W), 30 May 2018; 1 (325 mm TL) Golden Redhorse (*Moxostoma erythrurum*), Ouachita River drainage, Caddo River at Caddo Gap, Montgomery County (34°23'56.40"N, 93°37'17.66"W), 25 Aug. 2018. 1 (128 mm TL) Spotted Sucker (*Minytrema melanops*), same locality as above, 18 Oct. 2018.

*Prevalence and intensity:* 1/1 (100%) *M. salmoides*, 3 males, 1 female; 2/3 (67%) *H. nigricans*, 4 male and 2 immature females; 1/6 (17%) *M. erythrurum*, 1

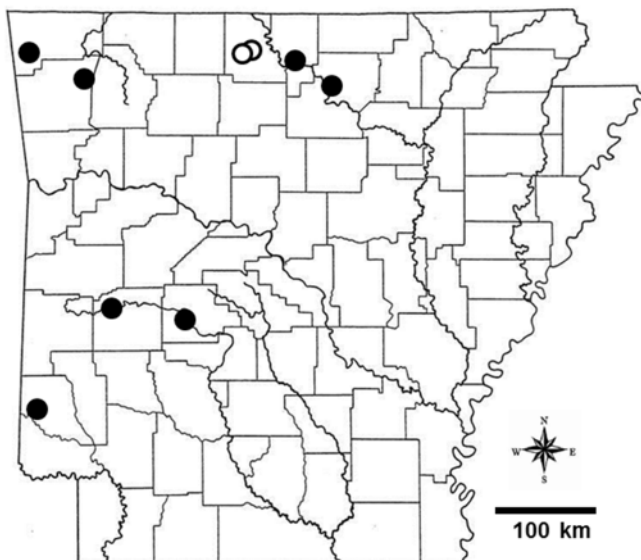


Figure 1. Eight Arkansas counties and major river drainages showing approximate location of 9 different sites (dots) where host fishes were collected.

immature female; 1/1 (100%) *M. melanops*, 1 immature female.

*Remarks:* Unfortunately, since only immature female specimens were recovered, specific identification was not possible. Three species of *Neoechinorhynchus* have been previously reported from *M. erythrurum*, including *N. crassum* Van Cleave, 1919, *N. cylindratus* (Van Cleave, 1913) Van Cleave, 1919, and *N. strigosus* Van Cleave, 1949 (see Hoffman 1999). However, to date, only *N. cylindratus* has been reported from Arkansas fishes (McAllister *et al.* 2016b). This present finding represents the first acanthocephalan reported from an Arkansas *M. erythrurum*. In addition, it is the second time a *Neoechinorhynchus* sp. has been reported from *M. melanops* from the state; the first report was from a specimen collected in Union County (see McAllister *et al.* 2018b). The Pirate Perch has never been reported, to our knowledge, to harbor a *Neoechinorhynchus* sp., and we document a new host record herein for that parasite genus.

*Neoechinorhynchus cylindratus* (Van Cleave, 1911) Van Cleave, 1919

*Hosts and localities:* 1 (162 mm) Green Sunfish (*Lepomis cyanellus*), White River drainage, Crooked Creek at Yellville, Marion County (36°13'27.71"N, 92°40'59.01"W), 26 May 2018. 2 (130, 208 mm TL) Ozark Bass (*Ambloplites constellatus*), White River drainage, Crooked Creek at Pyatt, Marion County (36°14' 44.685", 92°50'4.5708"), 27 May 2018.

*Prevalence and intensity:* 1/1 (100%), 1 female; 2/9 (22%), 8 females.

*Remarks:* Unfortunately, the proboscides of these specimens were contorted; however, all other morphological characters fit those of *N. cylindratus* (Van Cleave 1919). Several other centrarchids from Arkansas and Missouri have been previously reported as hosts of *N. cylindratus* (McAllister *et al.* 2016b, 2018a); however, *A. constellatus* is a new host record for the parasite. This acanthocephalan has previously been reported from *L. cyanellus* (Hoffman 1999).

**PALEOACANTHOCEPHALA: ECHINORHYNCHIDA:  
ECHINORHYNCHIDAE**

***Acanthocephalus* sp.**

*Hosts and localities:* 1 (63 mm TL) Bigeye Shiner (*Notropis boops*), White River drainage, White River at Elkins, Washington County (35°58'25.60"N, 93°59'03.47"W), 24 Mar. 2018; 1 (82 mm TL) Steelcolor Shiner (*Cyprinella whipplei*), same locality and date; 2 (75 and 104 mm TL) *Ambloplites ariommus* (Shadow Bass), Arkansas River drainage, Flint Creek at

Gentry, Benton County (36°14'33.95"N, 94°29'14.71"W), 23 Mar. 2018; 1 (175 mm TL) Grass Pickerel (*Esox americanus*), Red River drainage, Mill Creek at Horatio, Sevier County (33°56'23.47"N, 94°21'39.15"W), 14 May 2018; 1 (112 mm TL) *H. nigricans*, White River drainage, Crooked Creek at Yellville, Marion County (36°13'27.71"N, 92°40'59.01"W), 27 May 2018; 1 (190 mm TL) *H. nigricans* (same specimen herein for *Neoechinorhynchus* sp.); 2 (72 and 83 mm TL) *Aphredoderus sayanus* (Pirate Perch), same Horatio locality herein, 20 May 2018 and 20 Aug. 2018.

*Prevalence and intensity:* 1/1 (100%) *N. boops*, 2 males and 6 immature females; 1/3 (33%) *C. whipplei*, 2 immature females; 2/2 (100%) *A. ariommus*, 5 and 1 immature females; 1/4 (25%) *E. americanus*, 1 immature female; 1/5 (20%) *H. nigricans*, 1 immature female and 1 male and 2 immature females; 2/9 (22%) *A. sayanus*, 1 immature female each.

*Remarks:* Unfortunately, only males and immature females were found in hosts, which precluded specific identification. *Acanthocephalus dirus* (Van Cleave, 1931) Van Cleave and Townsend, 1936 (reported as syn. *A. jacksoni* Bullock, 1962) had been previously reported from *H. nigricans* (see summary in Hoffman 1999). However, we document a new host record for the genus *Acanthocephalus* from *A. sayanus*. McAllister *et al.* (2016b, 2018a) had previously reported *A. dirus* from 2 darters, 1 sunfish, and 1 shiner from Arkansas. Compared to its North American congeners, *A. dirus* has the widest distribution and diversity of hosts (Amin 1985). Here, we document the first acanthocephalan and only the second helminth from *A. ariommus*. In addition, we report the initial acanthocephalan from *C. whipplei*.

***Acanthocephalus tahlequahensis*** Oetinger and Buchner, 1976

*Host and locality:* 1 (570 mm TL) Walleye (*Sander vitreus* syn. *Stizostedion vitreum*), White River drainage, White River at Rim Shoals, Baxter County (36°15'27.56"N, 92°28'28.72"W), 30 May 2018.

*Prevalence and intensity:* 1/1 (100%); 7 males, 29 females.

*Remarks:* This acanthocephalan shows little host specificity as it has been previously reported from a wide suite of fishes and families, including catostomids, ictalurids, cyprinids, cottids, centrarchids, and percids from Arkansas, Missouri, and Oklahoma (McAllister *et al.* 2016b, 2018a). Walleye have been reported to harbor numerous acanthocephalans, including those in the genera *Echinorhynchus*, *Leptorhynchoides*,

*Neoechinorhynchus*, and *Pomphorhynchus* (Hoffman 1999). We document *A. tahlequahensis* in *S. vitreus* for the first time, and the initial species of *Acanthocephalus* documented from this host.

#### POMPHORHYNCHIDAE

*Pomphorhynchus bulbocolli* Linkins in Van Cleave, 1919

*Hosts and localities:* 1 (290 mm TL) *H. nigricans*, White River drainage, Crooked Creek at Yellville, Marion County (36°13'27.71"N, 92°40'59.01"W), 29 May 2018; 1 (mm TL) *H. nigricans*, Ouachita River drainage, Bear Creek at Bear, Garland County (34°32'02.1588"N, 93°17'02.7492"W), 20 Nov. 2017. 1 (119 mm) Duskystripe Shiner (*Luxilus pilsbryi*), White River drainage, Calico Creek at Calico Rock, IZARD County (36°07'24.4128"N, 92°08'38.6088"W), 31 May 2018.

*Prevalence and intensity:* 1/5 (20%) and 1/1 (100%) *H. nigricans*, 1 male; and 1/1 (100%) *H. nigricans*, 1 specimen; 1/1 (100%) *L. pilsbryi*, 2 specimens.

*Remarks:* This acanthocephalan has been previously reported from *H. nigricans* from Kentucky (Gleason 1984) and other North American fishes (Amin 1987; Hoffman 1999). It has also been reported from cyprinid fishes of the state, including *L. pilsbryi* from the same locality (McAllister *et al.* 2016b), but this is the first time *P. bulbocolli* has been reported from an Arkansas Northern Hogsucker.

Here we have provided new information (host records) on acanthocephalan parasites of some Arkansas fishes from the Arkansas, Ouachita, Red, and White river drainages of the state. We suggest surveys on more fishes of the Red and Mississippi-St. Francis river drainages, where little work has been done on their parasites in general. This will undoubtedly increase our knowledge of the acanthocephalans and other parasites of fishes in Arkansas.

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