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The pirate perch, *Aphredoderus sayanus*, the only surviving member of the North American family Aphredoderidae, occurs throughout Arkansas in the Coastal Plain physiographic region and where it inhabits oxbow lakes, swamps, ditches, quiet ponds, and small rivers and streams (Lee 1980; Robison and Buchanan 1988). It is found in both clear and turbid water, often over a soft muddy bottom where it feeds on various invertebrates, especially insects (Becker 1983; Smith 1979). This fish is well-known for having the anus and urogenital openings jugular between the gill membranes in the adult where they migrated forward from the normal abdominal position in the juvenile during development (Page and Burr 1991).

The pirate perch has been the subject of several endoparasite surveys (Hopkins 1933; Elkins and Corkum 1976; Cooper 1996), some of which report acanthocephalan parasites from this host (Buckner and Buckner 1976; Williams 1976; Sukhdeo and Hernandez 2005; Hernandez et al. 2007). Herein we document new host and geographic records for 2 acanthocephalans from pirate perches from central Arkansas.

Four *A. sayanus* (mean = 30 ± 2.4, range = 27-33 mm standard length) were collected on 10 June 2002 with standard nylon seines (6 x 1.5 m and 9 x 1.5 m of 3.2 mm mesh) from the Caddo River at St. Hwy 7 bridge, Clark County (Sec. 31, T6S, R20W). They were placed in 10% formalin and returned to the laboratory for examination of helminth parasites. The entire gastrointestinal tract and coelomic cavity was examined. Acanthocephalans were transferred to 70% ethanol and shipped to the junior author (OA) for identification and further processing. Specimens were punctured with a fine needle and subsequently stained in Mayer's acid carmine, destained in 4% HCL in 70% ethanol, dehydrated in ascending concentrations of ethanol to 100% (24hr each), cleared in graduated (increasing) concentration of terpineol in 100% ethanol to 100%, then 50% terpineol and 50% Canada balsam (24 hr each), and finally whole mounted in Canada balsam. Voucher specimens of parasites were deposited in the United States National Parasite Collection (USNPC), Beltsville, Maryland. Voucher specimens of *A. sayanus* were deposited in the fish collection at Henderson State University, Arkadelphia, Arkansas as HSU 3185.

One of 4 (25%) pirate perches (33 mm) was found to be co-infected in the posterior intestine with a single pomphorhynchid acanthocephalan, *Pomphorhynchus lucyi* Williams and Rogers, 1984 (USNPC 100602), and 3 (2 males, 1 female) heteracanthocephalids closest to *Aspersentis* Van Cleave, 1929 (USNPC 100603). The specimen of *P. lucyi* possessed 15 proboscis hooks per row rather than 20-23, which is more typical of the species (Williams and Rogers 1984). However, all other morphological characteristics fit the description of *P. lucyi* (see Amin et al. 2003 for key to species).

The type host of *P. lucyi* is the lake chubsucker, *Erimyzon sucetta* from Florida (Williams and Rogers 1984). Other hosts include several species (and families) of fresh and brackish water fishes of the southeastern Gulf Coast of the United States (primarily Alabama and Florida), including *Amia calva*, *Notemigonus chrysoleucus*, *Opsopoeodus emiliae*, *Carpiodes velifer*, *Minytrema melanops*, *Lepomis auritis*, *L. gulosus*, *L. macrochirus*, *L. marginatus*, *L. microlophus*, *L. punctatus*, *Stronglura marina*, *Anguilla rostrata*, and *Ameiurus serracanthus* (Williams and Rogers 1984). Eleven of these hosts occur in the Caddo River (Robison and Buchanan 1988).

Interestingly, heteracanthocephalids are parasites of fishes in New Zealand, the former Soviet Union, Antarctica, and the Kerguelen and Falkland Islands (Amin 1982), and *Aspersentis* spp. are parasites of fishes in Antarctic and subAntarctic regions (Zdzitowiecki and White 1996; Palm et al. 1998; Zdzitowiecki 1981, 2001; Pichelin et al. 2002; Laskowski and Zdzitowiecki 2004, 2005). Unfortunately, our 3 specimens of heteracanthocephalids were contracted which rendered them less taxonomically informative than desirable for

definitive identification beyond family. Nevertheless, both acanthocephalans represent new host and noteworthy geographic records. In the future, we suggest a clinal study on *P. lucyi* as well as specific attempts at obtaining relaxed specimens of the heteracanthocephalids for specific identity.

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Literature Cited

Amin OM. 1982. Acanthocephala. *In*: Parker SP, editor. Synopsis and classification of living organisms. New York: McGraw-Hill Book Company. p 933-941.

Amin, OM, SMA Abdullah, and **FT Mhaisen.** 2003. Description of *Pomphorhynchus spindletruncatus* n. sp. (Acanthocephala: Pomphorhyncidae) from freshwater fishes in northern Iraq, with the erection of a new pomphorhynchid genus, *Pyriproboscis* n. gen., and keys to genera of the Pomphorhynchidae and the species of *Pomphorhynchus* Monticelli, 1905. Systematic Parasitology 54:229-235.

Becker GC. 1983. The fishes of Wisconsin. Madison: University of Wisconsin Press. 1052 p.

Bucker RL and **SC Buckner**. 1976. A new species of *Leptorhynchoides* Kostylev 1924 (Acanthocephala) from the pirate perch, *Aphredoderus sayanus* (Gilliams). Journal of Parasitology 62:955-958.

Cooper JE. 1996. Parasites and cyclopoid predators of age-0 fish in the Roanoke River, North Carolina. Estuaries 19:146-161.

Elkins CA and **KC Corkum**. 1976. Growth dynamics and seasonal prevalence of *Crepidostomum isostomum* and *Phyllodistomum pearsei* in *Aphredoderus sayanus*. Journal of Wildlife Diseases 12:208-214.

Hernandez AD, **JF Bunnell**, and **MVK Sukhdeo**. 2007. Composition and diversity patterns in metazoan parasite communities and anthropogenic disturbance in stream ecosystems. Parasitology 134:91-102.

Hopkins S. 1933. Note on the life history of *Clinostomum marginatum* (Trematoda). Transactions of the American Microscopical Society 52: 147-149.

Laskowski Z and **K Zdzitowiecki**. 2004. New morphological data on a sub-Antarctic acanthocephalan, *Aspersentis johni* (Baylius, 1929) (Palaeacanthocephala: Heteracanthocephalidae). Systematic Parasitology 59:39-44.

Laskowski Z and **K Zdzitowiecki**. 2005. The helminth fauna of some notothenioid fishes collected from the shelf of Argentine Islands, West Antarctica. Polish Polar Research 26:315-324.

Lee DS. 1980. *Aphredoderus sayanus. In* Lee DS, Gilbert CR, Hocutt CH, Jenkins RE, McAllister DE, and Stauffer JR Jr., editors. Atlas of North American freshwater fishes. Raleigh: North Carolina State Museum of Natural History. p 484.

Page LM and **BM Burr**. 1991. A field guide to freshwater fishes: North America north of Mexico. Boston: Houghton Mifflin Company. 432 p.

Palm HW, **N Reimann**, **M Spindler**, and **J. Plotz**. 1998. The role of the rock cod *Notothenia coriiceps* Richardson, 1844 in the life-cycle of Antarctic parasites. Polar Biology 19:399-406.

Pichelin S, L Smales, and **R. Bray.** A discussion on the Heteracanthocephalidae Petrochenko, 1956 (Acanthocephala: Palaeacanthocephala). Systematic Parasitology 52:145-152.

Robison HW and **TM Buchanan**. 1988. Fishes of Arkansas. Fayetteville: University of Arkansas Press. 536 p.

Smith PW. 1979. The fishes of Illinois. Urbana: University of Illinois Press. 314 p.

Sukhdeo MVK and **AD Hernandez**. 2005. Food web patterns and parasite's perspectives. *In* Thomas F, Renaud F, and Guégan J-F, editors. Parasitism & ecosystems. UK: Oxford University Press. 231 p.

Williams EH Jr. 1976. *Pilum pilum* gen. et sp. n. (Acanthocephala: Echinorhynchidae) from freshwater fishes of the southeastern United States. Journal of Parasitology 62:102-104.

Williams EH Jr and **WA Rogers**. 1984. *Pomphorhynchus lucyi* sp. n. (Acanthocephala) from fresh and brackish water fishes of the southeastern U.S. Gulf Coast. Journal of Parasitology 70:580-583.

Zdzitowiecki K. 1981. Redescription of *Aspersentis austrinus* Van Cleave, 1929 (Acanthocephala). Acta Parasitologica Polonica 28:73-83.

Zdzitowiecki K. 2001. Acanthocephala occurring in intermediate hosts, amphipods, in Admiralty Bay (South Shetland Islands, Antarctica). Acta Parasitologica 46:202-207.

Zdzitowiecki K and **MG White**. 1996. Acanthocephalan infection of inshore fishes at the South Orkney Islands. Antarctic Science 8:273-276.