

## Noteworthy Trematode (Digenea) Parasites of the Pirate Perch, *Apherododerus sayanus* (Percopsiformes: Aphredoderidae), from Southeastern Oklahoma

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In Oklahoma, the Pirate Perch, *Apherododerus sayanus* (Gilliams) occurs in two counties of the southeastern corner of the state in the easternmost tributaries of the Red River (Miller and Robison 2004). This fish inhabits oxbow lakes, swamps, ditches, quiet ponds, and small rivers and streams (Page and Burr 2011). It is found in both clear and turbid water, often over a soft muddy bottom where it feeds on various invertebrates (especially crustaceans and insects) but will also feed on small fishes (Smith 1979; Becker 1983). Although the pirate perch has been the subject of several endoparasite surveys (Hopkins 1933; Buckner and Buckner 1976; Elkins and Corkum 1976; Williams 1976; Cooper 1996; Sukhdeo and Hernandez 2005; Hernandez et al. 2007; McAllister and Amin, 2008; McAllister et al., 2012), nothing, however, is known about helminths of *A. sayanus* from Oklahoma. Herein we document new geographic records for 2 trematode parasites of *A. sayanus* from the southeastern part of the state.

During October 2011 and again during November 2012 and May 2013, five adult *A. sayanus* (mean total length  $\pm$  SD = 62.2  $\pm$  7.1, range 47–72 mm) were collected by aquatic dip-net or baited minnow trap from Lukfata ( $n = 3$ ) and Yashau ( $n = 2$ ) creeks, McCurtain County (33.968825°N, 94.766173°W, 34.019156°N, 94.75496°W) (Figure 1). Specimens were placed in creek water and taken to the laboratory for immediate necropsy.

Fish were killed by prolonged immersion in a concentrated chloretone<sup>®</sup> (chlorobutanol) solution. The gills and gill filaments were not examined for monogene trematodes. A mid-ventral incision was made to expose the viscera and the entire gastrointestinal tract and other organs were examined for helminths. Trematodes were stained with acetocarmine, dehydrated in a graded ethanol series, and mounted in Canada balsam. A voucher specimen was deposited in the United States National Parasite Collection (USNPC), Beltsville, Maryland. Host voucher specimens were deposited in the Henderson State University Herpetological Collection (HSU), Arkadelphia, Arkansas as HSU 3479, 3519.

Two *A. sayanus* (both from Yashau Creek) were infected with digene trematodes, including one (57 mm TL) with a single allocreadiid, *Crepidostomum isostomum* Hopkins, 1931 USNPC 106784 in the intestines and a gorgorderid, *Phyllodistomum superbum* Stafford, 1904 USNPC 106785 in its urinary bladder and the other (65 mm TL) with one strigeoid, *Clinostomum marginatum* (Rudolphi, 1819) (USNPC 107002) in the small intestine.

*Crepidostomum isostomum* has been previously reported from *A. sayanus* (Hopkins 1931; Elkins and Corkum 1976) and is also known from a wide variety of fishes, including Prickly Sculpin (*Cottus asper*), Greenside Darter (*Etheostoma blennioides*),

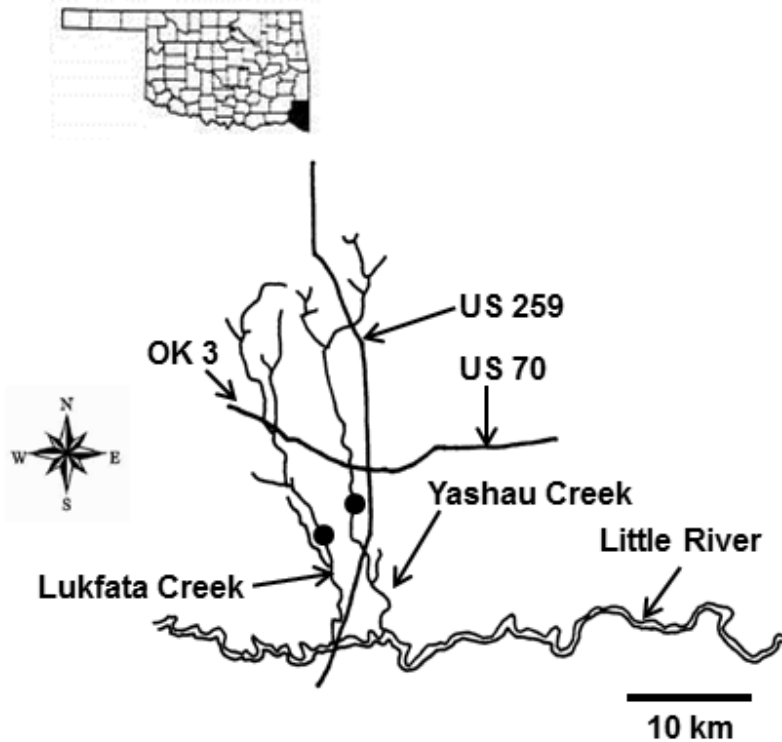


Figure 1. Collection sites in Lukfata and Yashau creeks, Little River watershed, McCurtain County, Oklahoma. Other tributaries in this watershed not shown.

Swamp Darter (*E. fusiforme*), Johnny Darter (*E. nigrum*), Banded Darter (*E. zonale*), Yellow perch (*Perca flavescens*), Logperch (*Percina caprodes*), Trout-perch (*Percopsis omiscomaycus*), and Arctic Grayling (*Thymallus arcticus*) (see Hoffman, 1999). This fluke has been reported previously from Georgia (Howard and Aliff 1980), Kentucky (Aliff 1977; Talton and Gleason 1978), Louisiana (Elkins and Corkum 1976), New York (Van Cleave and Mueller 1934), North Dakota (Woods, 1971), Tennessee (Bangham and Venard, 1942), and Wisconsin (Fischthal, 1947a, b, 1953), and the Canadian Provinces of British Columbia (Bangham and Adams, 1954), Ontario (Dechtiar 1972; Dechtiar and Lawrie 1988) and Quebec (Lyster 1940). The life cycle involves three possible routes of infection: (1) flukes infect a first intermediate host such as a freshwater sphaeriid clam and an aquatic arthropod serves as the second intermediate host; (2) flukes infect clams and fishes ingest them to become infected; or (3)

fishes become infected by either method (Cribb 1987). This is the first time *C. isostomum* has been reported from any Oklahoma fish.

*Phyllodistomum superbum* (= *P. pearsei*) has been previously reported from Georgia (Howard and Aliff, 1980), New York (Van Cleave and Mueller, 1934), Tennessee (Bangham and Venard, 1942), Texas (Meade and Bedinger, 1972; Ingham and Dronen, 1980), and Wisconsin (Fischthal, 1947a). It is known from Pirate Perches (as *P. pearsei*, Elkins and Corkum 1976) and other fishes, including Bluespotted Sunfish (*Ennaecanthus gloriosus*), Flier (*Centrarchus macropeterus*), Pumpkinseed (*Lepomis gibbosus*), Warmouth (*L. gulosus*), Largemouth Bass (*Micropterus salmoides*), and White Crappie (*Pomoxis annularis*) (see Hoffman, 1999). The life cycle of *Phyllodistomum* spp. involves sphaeriid clams as first intermediate hosts and damselfly and trichopterous larvae as second intermediate hosts, with fishes eat-

ing the infected insects (Schell 1967; Wanson and Larson 1972). We document *P. superbum* from Oklahoma for the first time.

*Clinostomum marginatum* is a very common trematode (Lane and Morris 2000) that is cosmopolitan in distribution and, according to Hoffman (1999), it is "likely capable of infecting any species of freshwater fish." The yellow grub has been reported previously from *A. sayanus* (Hopkins, 1933) and it has been reported commonly from Oklahoma (Rabideau and Self 1953; Spall 1969; Bonett et al. 2011).

In conclusion, we document 2 new distributional records for digene trematodes from an Oklahoma fish. There are 176 species of fishes in Oklahoma (Miller and Robison 2004), and, except for game fishes (see Hoffman 1999), few non-game fishes from the state have been reported as hosts of helminth parasites (Seamster 1938a, b; Self 1954; Rabideau and Self 1955; Self and Timmons 1955; Self and Campbell, 1956; Roberts 1957; Mackiewicz 1964; Spall 1969; Scalet 1971; Oetinger and Buckner 1976). In addition, one of the most distinctive fish assemblages occur in the lowland waters of the Southeastern Coastal Plain region, especially McCurtain County, where most are known and where the hosts reported herein were collected. We expect with additional surveys, new host and distributional records will be reported for more of the fishes of Oklahoma.

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