

Research Note

The Asian Fish Tapeworm, *Bothriocephalus acheilognathi*, in Fishes from Nevada

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ABSTRACT: A total of 73 fish representing 5 species from the Muddy River and cooling pond of the Moapa Power Plant in Nevada was examined for *Bothriocephalus acheilognathi* (Yamaguti, 1934) (Asian fish tapeworm) and other parasites. Three of 14 *Cyprinella lutrensis* (Baird and Girard, 1853) from the Muddy River and 10 of 11 *Gila robusta* (Baird and Girard, 1853) from the cooling pond of the Moapa Power Plant in Nevada were infected with *Bothriocephalus acheilognathi*. From 79 fish examined from 4 bait fish shops in the Las Vegas, Nevada, area 3 of 38 *Notemigonus crysoleucas* (Mitchill, 1814) were infected with *B. acheilognathi* but none of the 41 *Pimephales promelas* (Rafinesque, 1820) was infected. The bait fish were originally from fish farms in California, Arkansas, and Missouri. *Cyprinella lutrensis* is a new host and the Muddy River in Clark County, Nevada, is a new locality for the Asian fish tapeworm. The finding of *B. acheilognathi* in bait fish obtained from stores in the Las Vegas, Nevada, area represents a potential source for its introduction into new areas.

KEY WORDS: *Bothriocephalus acheilognathi*, Asian fish tapeworm, Nevada.

The Asian fish tapeworm *Bothriocephalus acheilognathi* (Yamaguti, 1934) has been introduced into the United States through shipments of grass carp *Ctenopharyngodon idella* (Valenciennes, 1844), which were brought into this country from China to control aquatic vegetation (Hoffman and Schubert, 1984). The Asian fish tapeworm has spread from its initial introduction in the southern part of the United States to the western part due to infected fish introductions (Heckmann et al., 1986). *Bothriocephalus acheilognathi* is considered one of the most dangerous pseudophyllidean cestodes for cultured carp in Europe (Hoffman and Schubert, 1984).

The Asian fish tapeworm in fishes from the Virgin River in Utah and Nevada was first reported in 1986 (Heckmann et al.) and later confirmed in other species of fish (Heckmann et al., 1987). The objectives of this study were to expand the knowledge of the range of *B. acheilognathi* infection in fishes from Nevada and to determine the potential sources of infection.

Fish were obtained from the cooling pond,

Moapa Power Plant, and the Muddy River in Clark County, Nevada, through the help of fisheries biologists. Fish were also obtained from bait shops in the Las Vegas, Nevada, area. Each fish was weighed and measured and then checked for parasites using standard methods (Heckmann et al., 1986). The abdominal cavity was opened ventrally, and the digestive system was removed and placed in a saline solution. The intestine was examined using a binocular dissecting microscope. Cestodes were excised from the intestinal tract, enumerated, fixed in AFA, stained with Semichons carmine, mounted on glass slides, and identified using standard keys and by comparison to known specimens of *B. acheilognathi* in the senior author's collection.

A total of 73 fish representing 5 different species from the Muddy River and from the cooling pond of the Moapa Power Plant was examined. Three of 14 (21%) *Cyprinella lutrensis* (Baird and Girard, 1953) and 10 of 11 (91%) *Gila robusta* (Baird and Girard, 1953) were infected with *B. acheilognathi*. None of the 17 *Gambusia affinis* (Baird and Girard, 1953), 26 *Poecilia mexicana* (Steindachner, 1863), and 5 *Crenichthys baileyi* (Gilbert, 1893) was infected.

From 4 bait shops in the Las Vegas, Nevada, area 79 bait minnows of 2 species were purchased and examined. Three of 38 (8%) *Notemigonus crysoleucas* (Mitchill, 1814) were infected with *B. acheilognathi*, but none of 41 *Pimephales promelas* (Rafinesque, 1820) was infected. These bait minnows, commonly used for bait by fishermen in Lake Mead, Nevada, originate from commercial ponds in either California, Arkansas, or Missouri. The Muddy River drains into Lake Mead. In the western United States, *B. acheilognathi* has been found previously in *N. crysoleucas*, *P. promelas*, *C. idella*, *G. affinis*, *G. robusta*, *Rhinichthys osculus* (Girard, 1856), *Lepidomeda mollispinis* (Miller and Hubbs, 1960), *Plagopterus argentissimus* (Cope, 1874), and *Ptychocheilus lucius* (Girard, 1856) (Heckmann et al.,

1986). *Cyprinella lutrensis* is a new host for *Bothriocephalus acheilognathi*. This report expands the range of the Asian fish tapeworm to include the Muddy River in Nevada and suggests a potential for its spread by way of infected baitfish.

Two whole mounts of *Bothriocephalus acheilognathi* have been deposited with the Harold W. Manter collection, University of Nebraska State Museum, voucher numbers HWML 35094 and HWML 35095. Two slides with sections of fish intestine infected with *B. acheilognathi* were also deposited with the same collection, voucher numbers HWML 35096 and HWML 35097.

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Research Note

Acanthocephala of the Virginia Opossum (*Didelphis virginiana*) in Arkansas, with a Note on the Life History of *Centrorhynchus wardae* (Centrorhynchidae)

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ABSTRACT: *Centrorhynchus wardae* was collected from the small intestines in 2 of 8 Virginia opossums (*Didelphis virginiana*) examined from Van Buren County, Arkansas, representing a new host record. Because all reports of this acanthocephalan have been of immature specimens collected from mammals, it appears that these represent aberrant infections. The diverse array of mammalian hosts is indicative of the low degree of host specificity exhibited by this parasite. *Oligacanthorhynchus tortuosa* was found in 10 of 15 opossums examined from Van Buren, Washington, and Yell counties in Arkansas, representing a new geographic distribution record for this parasite in the opossum.

KEY WORDS: *Centrorhynchus wardae*, *Oligacanthorhynchus tortuosa*, Acanthocephala, opossum, *Didelphis virginiana*.

The small intestines of 15 Virginia opossums (*Didelphis virginiana*) were examined postmortem for acanthocephalan infections between January and November 1991. The opossums were

live-trapped in Van Buren, Washington, and Yell counties in Arkansas. Two species of acanthocephalans were found, *Centrorhynchus wardae* Holloway, 1958, and *Oligacanthorhynchus tortuosa* (Leidy, 1850) Schmidt, 1972.

Centrorhynchus wardae was found in 2 of 8 opossums from Van Buren County, Arkansas, constituting a new host record for this parasite. One male worm and 1 female worm, and a single female worm, respectively, were found in 2 adult male opossums. All worms were immature. Voucher specimens were deposited in the Harold W. Manter Laboratory, University of Nebraska, Lincoln (accession No. HWML 35091). The only previous report of *C. wardae* from Arkansas was by Richardson et al. (1992), who reported 3 specimens of *C. wardae* from 2 of 30 raccoons (*Procyon lotor*) examined from Van Buren County. The opossums and raccoons hosting *C. wardae*