



7-28-2005

### Collection of Asian tapeworm (*Bothriocephalus acheilognathi*) from the Yampa River, Colorado

David Ward

*Arizona Game and Fish, Research Branch, Phoenix, Arizona*

Follow this and additional works at: <https://scholarsarchive.byu.edu/wnan>

---

#### Recommended Citation

Ward, David (2005) "Collection of Asian tapeworm (*Bothriocephalus acheilognathi*) from the Yampa River, Colorado," *Western North American Naturalist*: Vol. 65 : No. 3 , Article 11.

Available at: <https://scholarsarchive.byu.edu/wnan/vol65/iss3/11>

This Note is brought to you for free and open access by the Western North American Naturalist Publications at BYU ScholarsArchive. It has been accepted for inclusion in Western North American Naturalist by an authorized editor of BYU ScholarsArchive. For more information, please contact [scholarsarchive@byu.edu](mailto:scholarsarchive@byu.edu), [ellen\\_amatangelo@byu.edu](mailto:ellen_amatangelo@byu.edu).

## COLLECTION OF ASIAN TAPEWORM (*BOTHRIOCEPHALUS ACHEILOGNATHI*) FROM THE YAMPA RIVER, COLORADO

David Ward<sup>1</sup>

*Key words:* Asian tapeworm, *Bothriocephalus acheilognathi*, humpback chub, roundtail chub, bonytail chub, Colorado pikeminnow.

On 20 July 2004 a single Asian tapeworm (*Bothriocephalus acheilognathi*) was collected from the intestine of a roundtail chub (*Gila robusta*) in the Yampa River in Dinosaur National Monument in northwestern Colorado. This fish (274 mm TL) was collected at river mile 24 and dissected in the field. A single tapeworm was removed from the intestine and preserved in ethanol. The tapeworm was later identified in the laboratory as *B. acheilognathi* by its characteristic arrow-shaped scolex (Poole et al. 1984). This is the 1st recorded incidence of Asian tapeworm infecting fish in the Yampa River drainage.

Asian tapeworm is considered one of the most dangerous pseudophyllidean cestodes of carp in Europe (Heckman et al. 1987) and can cause heavy infections in juvenile cyprinids, especially when spreading into new locations (Hoffman and Schubert 1984). When parasites are numerous, marked enlargement of the abdomen can occur with severe hemorrhagic enteritis and intestinal blockage (Hoole and Nisan 1994). Asian tapeworm can cause high mortality when infecting new host species (Hoffman and Schubert 1984), and parasitized carp in hatcheries often cease feeding, become emaciated (Hoole and Nisan 1994), and die with up to 100% losses (Korting 1975).

Asian tapeworm was introduced into North America with grass carp imported from China to control aquatic vegetation (Hoffman and Shubert 1984) and has since become widespread through bait bucket introductions. It was first found in the Colorado River in Grand Canyon in 1990 (Minckley 1996) and in the San Juan and upper Colorado Rivers in 1994 (Hauck 1997).

Asian tapeworm has been identified as 1 of 6 potential threats to the continued persistence of humpback chub (*Gila cypha*) in Grand Canyon (USFWS 2002) and is considered a potential reason for documented declines in adult humpback chub condition in the Little Colorado River (Meretsky et al. 2000). Brouder (1999) found a strong negative correlation between growth of roundtail chub and Asian tapeworm infestation in the Verde River, Arizona. Reduced growth as a result of high Asian tapeworm infestation may increase predation risk and decrease survival of endangered cyprinid fishes. The interaction of slow growth and increased early life mortality is already considered an important cause of Colorado pikeminnow declines in the upper Colorado River basin (Kaeding and Osmundson 1988).

The Yampa River is one of the few large rivers in the entire Colorado River system that retains characteristics of its historic hydrograph and has become one of the only places where all of the endangered “big river fishes” of the Colorado River can still be found. Once established, Asian tapeworm will be extremely difficult to eradicate, and it is likely to spread throughout the Yampa and Green River systems as it is non-host specific and has an extremely rapid life cycle, maturing from egg to adult in less than 15 days at 25°–30°C (Hoffman 1976, Granath and Esch 1983). Habitat alteration and predation by introduced fish species are known factors contributing to the decline of southwestern native fishes, but introductions of new parasites such as the Asian tapeworm may also play an important role in the continuing decline of native fish populations.

<sup>1</sup>Arizona Game and Fish, Research Branch, 2221 W. Greenway Road, Phoenix AZ 85023.

## LITERATURE CITED

- BROUDER, M.J. 1999. Relationship between length of roundtail chub and infection intensity of Asian fish tapeworm *Bothriocephalus acheilognathi*. *Journal of Aquatic Animal Health* 11:302–304.
- GRANATH, W.O., JR., AND G.W. ESCH. 1983. Temperature and other factors that regulate the composition and infrapopulation densities of *Bothriocephalus acheilognathi* (cestoda) in *Gambusia affinis* (Pices). *Journal of Parasitology* 69:116–1124.
- HAUCK, A.K. 1997. Aquaculture newsletter. Utah Department of Agriculture, Fish Health Program, Salt Lake City.
- HECKMANN, R.A., P.D. GREGER, AND J.E. DEACON. 1987. New host records for the Asian fish tapeworm *Bothriocephalus acheilognathi*, in endangered fish species from the Virgin River, Utah, Nevada, and Arizona. *Journal of Parasitology* 73:226–227.
- HOFFMAN, G.L. 1976. The Asian tapeworm, *Bothriocephalus gowkongensis*, in the United States and research needs in fish parasitology. Pages 84–90 in *Proceedings of the 1976 fish farming conference, annual convention of the catfish farmers of Texas*. Texas Agricultural and Mechanical University, College Station.
- HOFFMAN, G.L., AND G. SHUBERT. 1984. Some parasites of exotic fishes. Pages 233–261 in W.R. Courtney, Jr., and J.R. Stauffer, Jr., editors, *Distribution, biology and management of exotic fishes*. Johns Hopkins University Press, Baltimore, MD.
- HOOLE, D., AND H. NISAN. 1994. Ultrastructural studies on intestinal response of carp, *Cyprinus carpio* L., to the pseudophyllidean tapeworm, *Bothriocephalus acheilognathi* Yamaguti, 1934. *Journal of Fish Diseases* 17:623–629.
- KAEDING, L.R., AND D.B. OSMUNDSON. 1988. Interaction of slow growth and increased early-life mortality: an hypothesis on the decline of Colorado squawfish in the upstream regions of its historic range. *Environmental Biology of Fishes* 22:287–298.
- KORTING, W. 1975. Larval development of *Bothriocephalus* sp. (Cestoda: Pseudophyllidea) from carp (*Cyprinus carpio*) in Germany. *Journal of Fish Biology* 7:727–733.
- MERETSKY, V.J., R.A. VALDEZ, M.E. DOUGLAS, M.J. BROUDER, O.T. GORMAN, AND P.C. MARSH. 2000. Spatiotemporal variation in length-weight relationships of endangered humpback chub: implications for conservation and management. *Transactions of the American Fisheries Society* 129:419–428.
- MINCKLEY, C.O. 1996. Observation on the biology of the humpback chub in the Colorado River basin 1980–1990. Master's thesis, Northern Arizona University, Flagstaff.
- POOLE, D., K. RYDER, AND C. ANDREWS. 1984. The control of *Bothriocephalus acheilognathi* in grass carp, *Ctenopharyngodon idella*, using Praziquantel. *Fisheries Management* 15:31–33.
- USFWS. 2002. Humpback chub (*Gila cypha*) recovery goals: amendment and supplement to the humpback chub recovery plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region, Denver, CO.

Received 10 August 2004

Accepted 6 December 2004