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

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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.

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