

NOTE

Occurrence of *Bothriocephalus acheilognathi* in cyprinid fish from three lakes in the flood plain of the Yangtze River, China

P. Nie*, G. T. Wang, W. J. Yao, Y. A. Zhang, Q. Gao

State Key Laboratory of Freshwater Ecology and Biotechnology, and Laboratory of Fish Diseases, Institute of Hydrobiology, Chinese Academy of Sciences, Wuhan 430072, Hubei Province, PR China

ABSTRACT: Cyprinid fish, *Hemiculter leucisculus*, *Cultrichthys erythropterus* and *Culter dabryi*, were sampled from Liangzi, Honghu and Tangxun lakes in the flood plain of the Yangtze River. The cestode *Bothriocephalus acheilognathi* Yamaguti, 1934 was found in the 3 lakes, but *C. erythropterus* sampled from Liangzi lake was found uninfected due probably to the small sample size. Findings of the cestode in the 3 lakes represent the first record of the parasite in the flood plain of the Yangtze River, indicating that *B. acheilognathi* may be distributed much wider in China than previously recognized.

KEY WORDS: *Bothriocephalus acheilognathi* · *Hemiculter leucisculus* · *Cultrichthys erythropterus* · *Culter dabryi* · Yangtze River flood plain lakes · China

During a study of diseases of grass carp *Ctenopharyngodon idellus* C. & V., in Guangdong Province of south China, a pathogenic cestode was found and named *Bothriocephalus gowkongensis* Yeh, 1955 (Liao & Shih 1956). This parasite has subsequently caused worldwide concern, due to its pathogenicity and distribution. The parasite, now known as *B. acheilognathi* Yamaguti, 1934, is considered to have been introduced from China initially to East Europe and thence to other parts of the world (Hoole 1994). Despite its wide distribution and the large number of fish species reported as definitive hosts (Hoole 1994), the cestode was considered to have a rather limited distribution in China (Pan et al. 1990, Nie 1995). Indeed, the cestode has not hitherto been found in carp *Cyprinus carpio* L. in lakes in the flood plain of the Yangtze River (Nie et al. 1999). However, during further investigations into the fish parasites in lakes in the flood plain, *B. acheilognathi* was recorded in 3 species of cyprinid fish and in 3 lakes. The occurrence of this cestode in these lakes is therefore reported in this paper.

A large number of lakes of various sizes are distributed in the flood plain of the Yangtze River (Chen & Xu 1995). In the present study, the 3 lakes sampled (Table 1) are located in Hubei province. All fish were gill-netted, and transferred to the laboratory on the same day. The fork length and body weight of each fish were measured. Intestines of the fish were removed and examined under a microscope. Helminths found were identified alive and carmine-stained.

The cyprinids *Hemiculter leucisculus* (Basilewsky), *Cultrichthys erythropterus* (Basilewsky) and *Culter dabryi* (Bleeker) were sampled and they all harboured the cestode *Bothriocephalus acheilognathi* (Table 2). Prevalence and abundance of the cestode was higher in *C. erythropterus* than in *H. leucisculus* in both Honghu and Tangxun lakes. The absence of the cestode from *C. erythropterus* in Liangzi lake and the higher infection level in *C. dabryi* in Tangxun lake may be explained by the small sample sizes of each fish species.

Bothriocephalus acheilognathi has been recorded in *Hemiculter leucisculus* in highland lakes in southwest China (Nie 1995), whereas *Cultrichthys erythropterus* and *Culter dabryi* are new final hosts of the cestode.

Since *Bothriocephalus acheilognathi* has not been found in *Cyprinus carpio* and grass carp, the 2 major definitive hosts of the cestode worldwide, nor in many other species of fish in lakes in the flood plain of the

Table 1. Features of the 3 lakes in the flood plain of the lower and middle reaches of the Yangtze River, China

Feature	Liangzi	Honghu	Tangxun
Longitude	114°21'–39'E	113°11'–28'E	114°19'–29'E
Latitude	30°05'–18'N	29°38'–59'N	30°23'–29'N
Area (km ²)	304.3	344.4	36.6
Depth (m)	6.2, 4.16	2.2, 1.91	2.4, 1.85
	(maximum, average)		

*E-mail: pinnie@ihb.ac.cn

Table 2. Prevalence (P, %) and abundance (A, mean \pm SD) of the cestode *Bothriocephalus acheilognathi* in *Hemiculter leuciscus*, *Cultrichthys erythropterus* and *Culter dabryi* from 3 lakes in the flood plain of the Yangtze River, China. N: sample size; FL: fish fork length in cm (mean \pm SD); -: no data obtained

Host species	Liangzi				Honghu				Tangxun			
	N	FL ^a	P	A	N	FL	P	A	N	FL	P	A
<i>H. leuciscus</i>	448	9.15 \pm 1.08	0.89 \pm 0.21	0.018	230	9.99 \pm 0.91	0.43 \pm 0.07	0.004	433	9.13 \pm 0.94	2.3	0.023 \pm 0.15
<i>C. erythropterus</i>	10	12.93 \pm 1.28	0	0	124	11.47 \pm 1.10	0.81 \pm 0.18	0.016	63	9.43 \pm 1.05	23.8	0.27 \pm 0.54
<i>C. dabryi</i>	-				-				3	10.00	33.3	1.33 \pm 2.31

^aSignificant differences not found for same species of fish between localities (p > 0.05)

Yangtze River (Pan et al. 1990, Nie et al. 1999), it was generally believed that *B. acheilognathi* did not exist in lakes of the flood plain. Findings of the parasite in the 3 lakes may indicate that the number of species of definitive host and geographical distribution of the cestode are wider than previously recognized in China. However, further investigations should be carried out to clarify the epidemiology of the cestode in China and be extended to encompass the study of genetic variations of the cestode populations in different species of definitive hosts.

Acknowledgements. We are very grateful for a research grant from the Systematic and Evolutionary Biology Programme of the Chinese Academy of Sciences. Many anonymous fishermen were involved in the sampling effort, to whom our sincere thanks are due.

Editorial responsibility: Wolfgang Körting, Hannover, Germany

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Submitted: January 3, 2000; Accepted: February 29, 2000
Proofs received from author(s): April 17, 2000