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Sinocyclocheilus brevifinus (Teleostei: Cyprinidae), a new species of cavefish from Guangxi, China

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Abstract

Sinocyclocheilus brevifinus sp. nov. is described from a subterranean river at Maohedong Village, Guangxi Zhuang Autonomous Region, Southern China. The new species can be distinguished from all congeners in having functional eyes, last simple dorsal fin ray soft and without serrations along posterior margin, eye diameter small (3.4–5.0 %SL), tip of depressed dorsal fin not reaching vertical at anal fin origin, tip of depressed pelvic fin far from anus, maxillary barbel not reaching anterior edge of operculum, rostral barbel not reaching posterior edge of operculum, scales of lateral line row significantly larger than those of scale rows immediately above and below lateral line, and flanks with distinct black spots and blotches.

Key words: Cyprinidae, *Sinocyclocheilus*, new species, Guangxi, China

Introduction

Hypogean fishes of the genus *Sinocyclocheilus* Fang 1936 are endemic to aquatic systems in a karst region of China. As a group they are characterized as having compressed bodies, well-developed cephalic lateralis systems, and two pairs of barbels (Zhao & Zhang, 2009). However, many morphological variations of their body form exist across the multiple species and lineages (Zhao & Zhang 2009). A total of 60 species of *Sinocyclocheilus* are currently recognized (Zhao & Zhang 2009; Zhou *et al.* 2009, 2011; Wu *et al.* 2010; Zhu *et al.* 2011, 2012; Zheng *et al.* 2013; Gan *et al.* 2013; Lan *et al.* 2013; Wang *et al.* 2014; Li & Li 2014). Species of *Sinocyclocheilus*, regardless of their degree of troglobitic habit or their degree of morphological (or other) adaptations for a troglomorphic or troglobitic life cycle, are only found in a narrow karstic area of the Yunnan-Guizhou Plateau and adjacent regions in southern China, including southern Guizhou, eastern Yunnan, and northern Guangxi Provinces (Zhao & Zhang 2009). All of the species are associated with habitats near entrances of subterranean systems to water bodies of caves or various karst formations in complete darkness. Thus far, without including the new species described herein from Guangxi, there have been 26 species of *Sinocyclocheilus* recorded in Guangxi (Zhou & Zhang 2005; Wu *et al.* 2010; Zhu *et al.* 2011, 2012; Zhen *et al.* 2013; Gan *et al.* 2013; Lan *et al.* 2013; Wang *et al.* 2014; Li & Li 2014); three species have also been recorded from Hezhou (*S. huangtianensis* Zhu, Zhu & Lan, *S. jii* Zhang & Dai, and *S. gracilis* Li & Li; Zhao & Zhang 2009; Zhu *et al.* 2011).

With the unique natural habitat conditions that these species are associated with, species of *Sinocyclocheilus*, are hypothesized to have evolved a number of highly specialized and adaptive characters. These vary by species but include degradation of eyes, loss of pigmentation, well-developed barbels, and in some cases, an elaborate and well-developed cephalic and body lateralis system. Since the description of *Sinocyclocheilus* by Fang (1936) there has been considerable research on the genus. Most investigations have been morphological in nature and descriptions of new species (Zhao & Zhang 2006); however, some studies have examined and proposed species relationships (Chu & Cui 1985; Shan & Yue 1994; Wang & Chen 1989, Xiao *et al.* 2005; Chen *et al.* 2009; Meng *et*

There are four main groups within *Sinocyclocheilus*; these include the *S. jii* group, the *S. angularis* group, the *S. cyphotergous* group and the *S. tingi* group. These groups are characterized by different morphologies and generally having separate ranges (Zhao & Zhang 2009). Species of the *S. jii* group have no serrations on the posterior margin of the posterior-most unbranched ray of the dorsal fin, a normal eye, a short pectoral fin, and a slightly humped nuchal region. This group is distributed upriver of the Guijiang and Hejiang rivers, east and north of Guangxi (Zhao & Zhang 2009). Phylogenetic relationships of only some species of *Sinocyclocheilus* have been investigated. This is primarily due to a lack of materials resulting from extremely limited access to the subterranean aquatic habitats. While the sister group relationships of *Sinocyclocheilus brevifinu* are unknown, based on the above traits and species groups outlined by Zhao & Zhang (2009), the species is phenetically most similar to species of the *S. jii* group.

Comparative materials

Sinocyclocheilus jii ASIZB 62726, holotype, 123.6 mm SL, Fuchuan County, Guangxi Zhuang Autonomous Region; PFR12011001–PFR12011004, 4, 100.5–139.8 mm SL, Fuchuan County, Guangxi Zhuang Autonomous Region, China.

Sinocyclocheilus guilinensis ASIZB 113753, holotype, 107.3 mm SL, Guilin City, Guangxi Zhuang Autonomous Region, China; 01060503–01060506, 4, 70.0–76.1 mm SL, Dabu Village, Guilin City, Guangxi Zhuang Autonomous Region, China.

Sinocyclocheilus gracilis PRFRI 201207001, Holotype, 87.1 mm SL; Zhaoping County, Guangxi Zhuang Autonomous Region, China.

Sinocyclocheilus huangtianensis, 201007001–201007003, 3, 74.9–91.4 mm SL; Huangtian Town, Hezhou City, Guangxi Zhuang Autonomous Region, China.

Sinocyclocheilus macrolepis, IHB 871V455–IHB 871V459, 5, 89.6–115.7 mm SL, Libo County, Guizhou Province, China.

Sinocyclocheilus yishanensis, IHB 810132, 1, 183.4 mm SL, Yizhou City, Guangxi Zhuang Autonomous Region, China.

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