TECHNICAL CONTRIBUTION

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Length–weight relationships of two cavefish species, *Sinocyclocheilus jii* Zhang & Dai, 1992 and *Sinocyclocheilus guilinensis* Ji, 1985 (Cypriniformes: Cyprinidae)

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Summary

Length–weight relationships of two cavefish species, *Sinocylocheilus jii* Zhang & Dai, (Acta Zootaxonomica Sinica, 17, 1992, 377) and *Sinocyclocheilus guilinensis* Ji, 1985, were calculated based on data from 186 specimens sampled by gill nets and fish traps from subterranean rivers of the Pearl River basin in China between 2008 and 2014. Results indicate that mean LWR parameters *b* for these two cavefish species are 2.88 and 2.61, respectively. A maximum size was recorded for *S. jii*.

1 | INTRODUCTION

The cyprinid genus *Sinocyclocheilus* is highly diverse (60 valid species); all are cave species as well as the second largest freshwater fish genus in China (Xing, Zhang, Fan, & Zhao, 2016; Zhang & Zhao, 2015). Distribution is limited to karst areas in southwestern China, including Guizhou and Yunnan provinces and the Guangxi Zhuang Autonomous Region (Zhao & Zhang, 2009).

Sinocyclocheilus jii was described by Zhang and Dai (1992), and which is known only from subterranean rivers of Fuchuan county, tributaries of the Hejiang River of the Pearl (Zhujiang) River basin (Zhang & Dai, 1992). *Sinocyclocheilus guilinensis* was originally described in a field survey report in 1982, based on the specimens collected from Guilin city, Guangxi, but later correctly identified as *S. jii* (Shan, Lin, Yue, & Chu, 2000). Zhao and Zhang (2009) revised the genus and recognized it as a valid species. These two species are similar in morphology.

Chinese cavefishes are under serious threat, since their population sizes are always low (Zhao, Gozlan, & Zhang, 2011). Lack of basic biological data for these species restricts their further study because of the difficulty in obtaining enough samples. There are no length–weight relationship (LWR) data for Chinese cavefish species n FishBase. This study provides LWR data for these two closely-related and rare cavefishes, *S. jii* and *S. guilinensis*.

2 | MATERIALS AND METHODS

A total of 186 specimens of *S. jii* and *S. guilinensis* were collected from subterranean rivers of Fuchuan County and Guilin City,

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TABLE 1 LWR parameters of *Sinocyclocheilus jii* and *Sinocyclocheilus guilinensis*

Species	N	Standard Length (cm)		Weight (g)		95% CI of *a*	*a*	95% CI of *b*	*b*	R^2
		Max	Min	Max	Min					
Sinocyclocheilus jii	152	15.99	4.37	66.3	1.6	0.01539–0.0348	0.0251	2.73–3.03	2.88	.970
Sinocyclocheilus guilinnensis	34	12.05	3.82	23.7	1.2	0.01675–0.0675	0.04213	2.33–2.88	2.61	.928

Guangxi Zhuang Autonomous Region in China, respectively, between 2008 and 2014. Specimens were fixed in 10% formalin, preserved in 75% alcohol, and deposited in the Zoological Museum of the Institute of Zoology, Chinese Academy of Sciences (ASIZB). Standard lengths of specimens were measured using a digital caliper to the nearest 0.01 cm. Total body weights were to the nearest 0.1 g.

LWR parameters were calculated using the regression equation $W = a L^b$, where W is the total weight, L is the standard length, a and b are regression parameters, a is the intercept (coefficient related to body form) and b the slope of the log transformed equation: log $W = \log a + b \log L$ (Froese, 2006; Koutrakis & Tsikliras, 2003; Ricker, 1973). The correlation between W and L (or log W and log L) was evaluated by the coefficient of determination R^2.

3 | RESULTS

From this study, a combined total of 186 samples of *S. jii* (152 specimens) and *S. guilinensis* (34 specimens) were used to estimate the LWRs. Standard length and total weight, LWR parameters, the 95% confidence interval (CI) of *a* and *b*, as well as R^2 are presented in Table 1.

4 | DISCUSSION

There are very few data on the growth and biology in general of cavefishes, especially for those distributed in China. Normally, *b* values will vary between 2.5 and 3.5 (Carlander, 1969; Froese, 2006). Our data showed that the parameters of the LWR equation of *S. jii* and *S. guilinensis* were well within the normal range for species having this slender body shape, one of the characteristics to identify the species, since both are very similar in morphology except for the rows of scales above and below the lateral line (Zhao & Zhang, 2009; Zhao, Zhang, &

Zhou, 2009). In addition, one *S. jii* individual was 15.99 cm SL, which represents a new maximum size for this species.

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