

A New Blind Loach, *Oreonectes translucens* (Teleostei: Cypriniformes: Nemacheilinae), from Guangxi, China

Zhen-Ling Zhang^{1,2}, Ya-Hui Zhao¹, and Chun-Guang Zhang^{1,*}

¹Institute of Zoology, Chinese Academy of Sciences, Beijing 100080, China

²Graduate School, Chinese Academy of Sciences, Beijing 100049, China

(Accepted December 12, 2005)

Zhen-Ling Zhang, Ya-Hui Zhao, and Chun-Guang Zhang (2006) A new blind loach, *Oreonectes translucens* (Teleostei: Cypriniformes: Nemacheilinae), from Guangxi, China. *Zoological Studies* 45(4): 611-615. A new blind loach, *Oreonectes translucens* sp. nov., is described based on 3 specimens (25.7-45.8 mm in standard length) collected from a cave in Xia'ao Village, Du'an County, Guangxi Zhuang Autonomous Region of southern China. It is distinguished from all other known *Oreonectes* species by its well-developed crests and vestigial eyes. The new species shares with the similar *O. furcocaudalis* Zhu et Cao possession of dorsal and ventral crests, a forked caudal fin, and 8 (6) dorsal (anal)-fin rays, but can be distinguished from the latter by having vestigial eyes (normal in the latter), well-developed crests (dorsal crest depth of the former 78.0%-87.0% of caudal peduncle depth vs. 31.1%-38.1% in the latter), and fewer vertebrae (4 + 32 vs. 4 + 35). The new species shares with the similar *O. anophthalmus* Zheng possession of vestigial eyes, a semitransparent body when fresh, and a 4 + 32 vertebrae count, but differs from the latter by having crests, a forked caudal-fin (rounded in the latter), and the origin of the dorsal fin vertically opposite to those of the pelvic fins. <http://zoolstud.sinica.edu.tw/Journals/45.4/611.pdf>

Key words: Taxonomy, Cavefish, New species, *Oreonectes translucens*.

Nemacheiline loaches are common in tropical Asia. They occur in a great variety of habitats, but are particularly abundant in swiftly flowing hillside streams, where they are typically found under stones. This preferred habitat may help explain why many of Asia's cave fishes belong to this subfamily (Kottelat, 1990). There are 15 genera and more than 100 species in this subfamily in China (Zhu 1995). The loach genus *Oreonectes* was established by Günther (1868) with *O. platycephalus* as the type (and sole) species. Over a century later, a cave dweller, *O. anophthalmus*, was described by Zheng (1981) based on specimens from Guangxi, China. Subsequently 2 more species, *O. furcocaudalis* Zhu et Cao (1987) and *O. retrodorsalis* Lan et al. (1995) were discovered. These fishes are found in subterranean pools and waterways, or gathered around the outlets of

underground rivers, except for *O. platycephalus* which is often found in open streams (Günther 1868, Zheng 1981, Zhu 1987, Lan 1995).

In 1999, three specimens of a blind *Oreonectes* species were collected from a cave in Xia'ao Village, Du'an County, Guangxi Zhuang Autonomous Region of southern China. Subsequent examination showed that the specimens differed notably from the known blind species of *O. anophthalmus*, as well as from other blind loaches of the subfamily Nemacheilinae. Some characteristics exhibited by the 3 specimens were similar to ones seen in *O. furcocaudalis*, including possession of dorsal and ventral crests, forked caudal fin, etc. However, in other traits, most notably having vestigial rather than normal eyes, the new specimens markedly differed. Clearly the new specimens belonged to a new

*To whom correspondence and reprint requests should be addressed. E-mail: fish@ioz.ac.cn

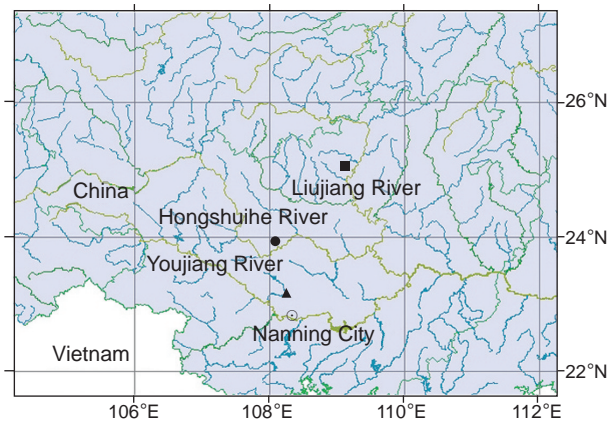


Fig 3. Collection localities of *Oreonectes translucens* sp. nov. (solid circle), *O. furcocaudalis* (solid square), and *O. anophthalmus* (solid triangle).

distinguished from its congeners by possessing the following combination of characters: vestigial eyes; origin of dorsal fin and pelvic fin vertically opposite each other; well-developed dorsal crest and ventral crest; entire body lacking scales and color.

Description: The general appearance is as shown in figure 1. Morphometric data for the holotype and for 2 paratypes are given in table 1. Morphometric data for 2 specimens of *O. anophthalmus* and 9 specimens of *O. furcocaudalis* are also listed in table 1 for comparison.

Dorsal-fin rays iii, 8; anal-fin rays iii, 6; pectoral-fin rays i, 11; pelvic-fin rays i, 6; branched caudal-fin rays, 16. Numbers of gill rakers (12) and vertebrae (4 + 32) only counted for the largest

Table 1. Comparison of proportional measurements in 3 species of *Oreonectes*

	<i>O. translucens</i> sp. nov.			<i>O. anophthalmus</i>		<i>O. furcocaudalis</i>		
	Holotype	Paratypes (n = 2)		(n = 2)		(n = 9)		
Number of specimens (n)								
Catalogue number (ASIZB)	94785	94786	94787	69287	70022	74107 - 74115		
Standard length (mm)	45.8	29.4	25.7	39.1	27.3	27.6 - 42.3		
Percent (%) of standard length						Range	Mean	
Predorsal length	54.7	50.9	50.4	62.7	60.1	54.2	56.1	55.2
Prepelvic length	55.6	53.1	51.1	58.7	56.8	56.0	57.8	56.8
Pre-anus length	68.9	66.3	64.6	68.3	67.3	70.7	74.0	72.8
Preanal length	75.7	71.8	69.5	77.3	73.0	74.7	79.7	77.4
Body width (at dorsal origin)	8.0	7.8	8.7	11.8	11.6	7.1	8.9	8.0
Body width (at anal origin)	5.8	5.6	5.6	8.4	10.1	4.0	4.8	4.3
Height of dorsal fin	17.6	15.9	17.2	9.9	8.9	13.3	15.8	14.6
Length of dorsal fin base	12.4	10.8	11.5	9.8	8.8	10.1	13.1	11.4
Length of upper caudal lobe	24.4	25.4	26.0	16.1	16.5	21.5	23.5	22.5
Length of anal fin	15.0	17.8	17.9	13.8	14.6	14.6	19.0	15.8
Length of pelvic fin	15.0	17.8	17.9	9.9	11.6	12.8	14.7	13.7
Length of pectoral fin	22.4	21.7	21.4	15.7	15.5	17.8	21.3	19.6
Body height (at dorsal origin)	14.3	14.2	13.2	15.9	12.4	14.7	17.1	15.7
Length of caudal peduncle	13.2	16.8	14.0	18.3	19.8	11.3	13.4	12.5
Caudal peduncle depth	9.5	5.2	4.9	10.6	9.8	6.9	8.4	7.6
Lateral length of head	24.3	23.7	23.1	24.3	22.8	27.4	30.2	28.4
Dorsal length of head	30.9	27.9	26.6	25.4	24.9	26.2	29.4	27.7
Percent (%) of lateral length of head								
Head height (at eye)	-	-	-	-	-	34.3	37.9	36.6
Head height (at nape)	48.9	49.1	48.2	53.8	65.3	40.2	45.0	43.4
Head width (at eye)	-	-	-	-	-	16.7	24.7	21.0
Maximum head width	56.7	55.7	52.4	82.1	75.1	45.8	51.6	49.5
Snout length	-	-	-	-	-	35.2	41.8	38.5
Eye diameter	-	-	-	-	-	7.1	9.7	8.2
Interorbital width	-	-	-	-	-	23.3	28.2	25.5
DCD-CPD	78.0	86.9	80.8	-	-	31.1	38.1	34.1
CPL-CPD	2.8	3.2	2.9	1.7	2.0	1.4	1.9	1.6

DCD, dorsal crest depth; CPD, caudal peduncle depth; CPL, caudal peduncle length; -, no data.

specimen, the holotype (ASIZB 94785).

Body elongate, with posterior portion from dorsal fin origin to caudal-fin base laterally compressed. Head slightly depressed. Snout round. Eyes vestigial. Anterior and posterior nostrils well separated. Each anterior nostril placed at end of a small, obliquely cut tube, which is prolonged into a short barbel. Posterior nostrils elliptical, with olfactory lamellae barely visible inside naris. Mouth inferior, curved. Surface of upper and lower lips smooth, a marked median groove in middle of lower lip. Maxillary barbels less than 1/2 of head length, outer rostral barbels reaching middle of posterior nostril and inner rostral barbels to root of anterior nostril.

Body naked, no lateral line scales. Lateral line incomplete, with only 3 or 4 lateral pores behind head. Lateral line pores present on head.

Dorsal fin short, serrated along posterior edge of last unbranched ray, height of dorsal fin 17.6% (15.9%-17.2%) in SL, length of dorsal-fin base 12.4% (10.8%-11.5%) in SL. Dorsal-fin origin vertically opposite pelvic-fin insertion, predorsal length 54.7% (51.1%-53.1%) in SL, prepelvic length 55.6% (50.4%-50.9%) in SL. Anal-fin origin just posterior to anus. Pectoral fin long and narrow, almost reaching pelvic-fin origin, length of which is 22.4% (21.4%-21.7%) in SL. Pelvic fin extending slightly beyond anus. Dorsal crest origin vertically opposite anal-fin insertion, along entire length of caudal peduncle and connecting with caudal-fin rays. Dorsal crest gradually heightening from origin, reaching a maximum height at end of caudal peduncle. DCD over 1/2 of CPD (for holotype DCD 78.0% in CPD, for paratypes 80.8%-86.9%) (Fig. 2). Ventral crest smaller, originating midway between end of anal-fin base and end of caudal peduncle, joining with caudal-fin. Its depth less than 1/2 of DCD. Both dorsal and ventral crests semitransparent, soft, and thin.

Color : Body semitransparent when fresh, grayish after preservation in alcohol, with no markings in either case (i.e., no speckling, spots, etc.).

Distribution : Known only from Xia'ao Cave near Xia'ao Town, Du'an County, Guangxi Zhuang Autonomous Region, China (Fig. 3).

Etymology : The specific name, *translucens*, comes from the Latin word for transparent, in reference to the species' appearance when fresh.

Remarks : Loaches of the subfamily Nemacheilinae are the most speciose group of fishes in the hill streams of Southeast Asia (Kottelat 2004). Zhu (1989 1992) divided the Chinese species of the subfamily Nemacheilinae

into 15 genera based on the morphology of the anterior nostrils, the distance between the anterior and posterior nostrils, the morphology of the swim bladder, and whether or not scales are present on the head. The new species is assigned to the genus *Oreonectes* since it shares with the 4 other known *Oreonectes* species the distinguishing features of the genus: a short barbel at the extremity of each tube-like anterior nostril, a relatively short distance between the anterior and posterior nostrils, and an absence of scales on the head. With this new addition, the genus *Oreonectes* now contains 5 species: *O. platycephalus*, *O. anophthalmus*, *O. furcicaudalis*, *O. retrodorsalis*, and *O. translucens* sp. nov. All but the 1st one are endemic to Guangdong Province and Guangxi Zhuang Autonomous Region of southern China, while *O. platycephalus* is found in Guangdong and Guangxi Provinces of China and Quang Ninh Province of northern Vietnam. *Oreonectes anophthalmus*, *O. furcicaudalis*, and *O. translucens* are found in different tributaries of the Xijiang River (Fig. 3), the longest river in the Zhujiang (Pearl) River basin. *Oreonectes translucens* sp. nov. is known only from Xia'ao Cave in Du'an County, which is in the Hongshuihe River watershed. *Oreonectes anophthalmus* and *O. furcicaudalis* are known only from Taiji Cave of Qifengshan Mt. in Wuming County, part of the Youjiang River basin, and from portions of the Liujiang River in Rongshui County, respectively.

Oreonectes translucens sp. nov. and *O. anophthalmus* are the only known troglobites in the genus. Both possess vestigial eyes and semitransparent bodies when fresh. Their vertebrae counts (4 + 32) are also the same. *Oreonectes translucens* sp. nov. differs from *O. anophthalmus* by having a well-developed dorsal crest and a forked caudal fin. Moreover, the dorsal fin origin of *O. translucens* is just vertically opposite to that of the pelvic fin (vs. behind it in *O. anophthalmus*), and *O. translucens* sp. nov. has an incomplete lateral line with only 3 or 4 lateral pores behind the head (while *O. anophthalmus* has no lateral line).

The closest known relative to the new species appears to be *O. furcicaudalis*. Both of these species possess dorsal and ventral crests, forked caudal fins, the origin of the dorsal fin vertically opposite to that of the pelvic fin, and 8(6) dorsal(anal)-fin rays. *Oreonectes furcicaudalis* and *O. translucens* sp. nov. differ in the development of the eyes (normal in the former vs. vestigial in the latter), in the size of the crests (less developed, with a DCD of 31.1%-38.1% in CPD, in the

former vs. more developed, with a DCD of 78.0%-86.9% in CPD, in the latter) and in vertebrae numbers (4 + 35 vs. 4 + 32).

Comparative materials: *Oreonectes anophthalmus* (4 specimens) ASIZB 69287, 39.1 mm SL, Wuming County, Guangxi, coll. Zhang Chun-Guang and Zhao Ya-Hui, 10 May 1999; ASIZB 70022, 27.3 mm SL, ASIZB 70023, 14.4 mm SL, Wuming County, Guangxi Zhuang Autonomous Region; coll. Zhang Chun-Guang and Zhao Ya-Hui, 9 June 1999; ASIZB 60294 (holotype), 41.2 mm SL, Wuming County, Guangxi, coll. 1981. *Oreonectes furcocaudalis* (9 specimens) ASIZB 74107, 40.0 mm SL, ASIZB 74108, 42.3 mm SL, ASIZB 74109, 36.0 mm SL, ASIZB 74110, 34.7 mm SL, ASIZB 74111, 34.1 mm SL, ASIZB 74112, 28.7 mm SL, ASIZB 74113, 34.4 mm SL, ASIZB 74114, 29.5 mm SL, ASIZB 74115, 27.6 mm SL. All 9 specimens are from Rongshui County, Guangxi, coll. Lan Jia-hu, Nov. 2003.

Acknowledgments: We would like to thank Mr. Gau-Yan Lee, a doctoral candidate of ASIZB for taking photos of the specimen. This study was supported by grant (NSFC-J0030092 and NSFC-30470251) from the National Science Foundation of China.

REFERENCES

- Cheng QT, BS Zheng. 1987. Systematic synopsis of Chinese fishes. Beijing: Science Press. (in Chinese)
- Günther A. 1868. Catalogue of the fishes in the British Museum. Vol. 7. London: Trustees Press.
- Kottelat M. 1984. Revision of the Indonesian and Malaysian loaches of the Subfamily Noemacheilinae. Jpn. J. Ichthyol. **31**: 225-260.
- Kottelat M. 1990. New species and populations of cave nemacheilines in South and South-east Asia (Osteichthyes: Balitoridae). Mem. Biospeol. **17**: 49-55.
- Kottelat M. 2001. Freshwater fishes of northern Vietnam. A preliminary check-list of the fishes known or expected to occur in northern Vietnam with comments on systematics and nomenclature. Washington, DC: The World Bank Press.
- Kottelat M. 2004. *Schistura spekuli*, a new species of cave fishes from northern Vietnam (Teleostei: Balitoridae). Ichthyol. Explor. Freshw. **15**: 187-191.
- Lan JH, JX Yang, YR Chen. 1995. Two new species of the subfamily Nemacheilinae from Guangxi, China (Cypriniformes: Cobitidae). Acta Zootaxon. Sinica **20**: 366-372. (in Chinese)
- Leviton AE, RH Gibbes, E Heal, CE Dawson. 1985. Standards in herpetology and ichthyology: part I. Standard symbolic codes for institutional resource collections in herpetology and ichthyology. Copeia **1985**: 802-832.
- Lin SY. 1932. New cyprinid fishes from White Cloud Mountain, Canton. Lingnan Sci. J. **11**: 379-383.
- Meng QW. 1995. Systematics of fishes. Beijing: China Agriculture Press, pp. 256-257.
- Nichols JT. 1943. The fresh-water fishes of China. Nat. Hist. Central Asia **9**: 210, 270
- Zhao YH, CG Zhang, JX Peng. 2002. Methods of making transparent skeleton and X-ray photography of fish (in Chinese). In Q. Lin, CG Zhang, and HN Jin, editors. Proceedings of the Conference, China Biological Collections for the 21st Century. Beijing: China Science and Technology Press, pp. 298-301.
- Zheng PS. 1981. Freshwater fishes of Guangxi Province. Nanning, China: Guangxi People's Publishers. (in Chinese)
- Zhu SQ. 1989. The loaches of the subfamily Nemacheilinae in China (Cypriniformes: Cobitidae). Nanjing, China: Jiangsu Science and Technology Publishing House. (in Chinese)
- Zhu SQ. 1995. Synopsis of Freshwater fishes of China. Nanjing, China: Jiangsu Science and Technology Publishing House. (in Chinese)
- Zhu SQ, WX Cao. 1987. The Nemacheiline fishes from Guangdong and Guangxi with descriptions of a new genus and three new species (Cypriniformes: Cobitidae). Acta Zootaxon. Sinica **12**: 321-331.