

***Cobitis zhejiangensis*, a New Species from the Ling River, China (Teleostei: Cobitidae)**

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A new species, *Cobitis zhejiangensis*, is described based on 32 specimens collected in the Ling River, Xianju District, Taizhou City, Zhejiang Province, China. The new species superficially resembles *Cobitis sinensis*, but is distinguished from that species by the following features: deeper body (17.3% versus 14.9% of SL), shorter caudal peduncle length (12.0% versus 13.5% of SL), deeper caudal peduncle depth (11.4% versus 9.5% of SL), color pattern of second Gambetta's zone (rounded ovoidal dots-narrow elongate blotches). Deep caudal peduncle depth and short caudal peduncle length (cpd/cpl: 95.2%) and the color pattern of second Gambetta's zone are the unique features of this species not shared with any other congener species of China.

Key words : description, new species, *Cobitis zhejiangensis*, Cobitidae, Ling River, China

Introduction

The genus *Cobitis* is widely distributed freshwater fish throughout the Eurasia. Up to now there are six species in China : *Cobitis sinensis*, *C. lutheri*, *C. macrostigma*, *C. granoei*, *C. arenae*, *C. dolichorhynchus* (Nichols, 1943; Chen, 1981; Zhu, 1995; Kim *et al.*, 1999; Son and He, 2001).

Among the samples collected by authors in the middle part of Ling river, Xianju district, Taizhou city, Zhejiang province, China, 1996, we have found a relatively numerous materials of loach belonging to the genus *Cobitis*. After a thorough the investigation of this fish and comparison of it with other species of the genus *Cobitis*, it is described herein as a new species of the genus *Cobitis*.

Materials and Methods

The specimens examined for this study were collected in the middle part of Ling river, Xianju district, Taizhou city, Zhejiang province, China (Fig. 1).

Methods for obtaining measurements followed Hubbs & Lagler (1964). Measurements taken by dial caliper were presented as percentages of standard length (SL) and head length (HL). Specimens were sexed by the examination of gonad and/or the lamina circularis of the pectoral fin in male. Scales were prepared from the subdorsal region between head and dorsal fin.

Fin rays were counted with a binocular microscope. Micrographs were taken using an Olympus SZH-ZB with PM-10AK Stereo Microscope System.

Specimens were deposited at the Department

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of Biology, Seowon University, Cheongju, Korea (SUBC).

Results

Cobitis zhejiangensis sp. nov.

(New Chinese name : Zhejianghuachou)

(New English name : Zhejiang spine loach)

(Fig. 2; Table 1)

Holotype : SUBC 9619, male, 73.7 mm SL, Ling River, Xianju district, Taizhou city, Zhejiang province, China; July 8, 1996, Y.M. Son and S. P. He.

Paratype : SUBC 9601–9616, 16 females, 72.8 ~ 93.8 mm SL (mean 79.3 mm) collection details as for the holotype; SUBC 9617–9632 (except

9619) 15 males, 60.1 ~ 76.0 mm SL (mean 71.7 mm), collection details as for the holotype.

Diagnosis : *Cobitis zhejiangensis* sp. nov. is distinguished from its congeners by the combination of the following characters : deeper body depth; shorter caudal peduncle length; deeper caudal peduncle depth; the color pattern of the second zone of Gambetta composing of 16 ~ 23 rounded-ovoidal dots. Suborbital spine strong and relatively short. Mouth very arched with pointedly developed mental lobes.

Description : The number of fin rays were

Table 1. Morphometric data of *Cobitis zhejiangensis* sp. nov.

	Holotype (male)	Paratypes (15 males, 16 females)		
		Mean	Range	SD
Standard length (mm)	73.7	72.9	60.0 ~ 89.8	
In standard length (%)				
Head length	19.4	20.2	17.5 ~ 21.9	1.0
Predorsal length	51.0	51.5	49.4 ~ 53.7	1.3
Preventral length	53.1	54.6	51.5 ~ 57.7	1.6
Body depth	17.2	17.3	15.2 ~ 19.8	1.4
Caudal peduncle depth	11.7	11.4	9.6 ~ 13.3	1.0
Caudal peduncle length	12.9	12.0	10.0 ~ 13.5	1.0
Pectoral fin length				
male	1.6	1.7	1.5 ~ 1.9	0.2
female	1.3	1.4	1.0 ~ 1.5	0.2
In head length (%)				
Snout length	39.9	41.2	36.8 ~ 47.7	3.1
Eye diameter	16.8	16.9	13.5 ~ 19.5	1.5
Interorbital width	13.3	14.2	10.2 ~ 17.9	1.8
In caudal peduncle length (%)				
Caudal peduncle depth	94.8	95.2	80.5 ~ 119.1	11.4

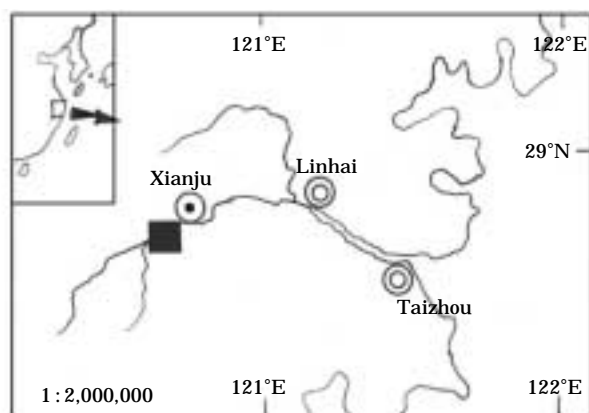


Fig. 1. Map showing the collecting locality (■) of *Cobitis zhejiangensis* of this study.

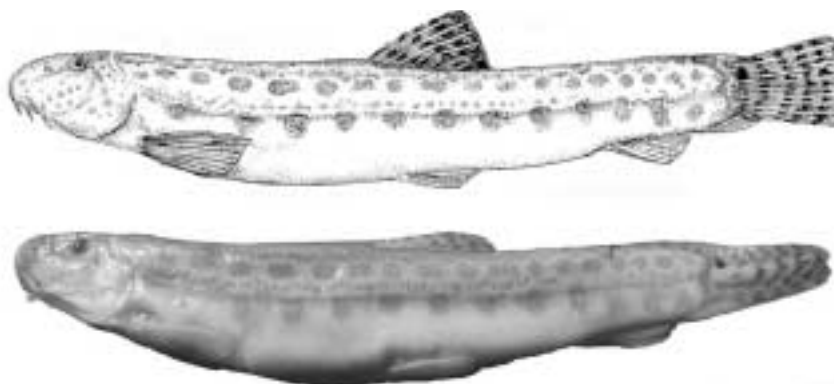


Fig. 2. *Cobitis zhejiangensis* sp. nov. holotype, SUBC 9619, male 73.7 mm SL, Top : picture, Botton : photograph.

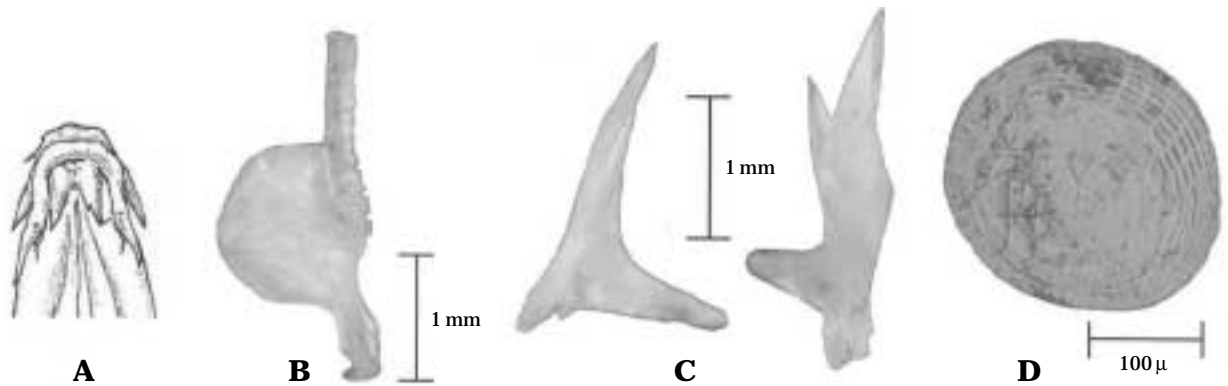


Fig. 3. Mouth part (A), lamina circularis (B), suborbital spine (C), subdorsal scale (D) of *Cobitis zhejiangensis* sp. nov.

counted in all specimens. The number of fin rays are very constant. D. i, 7 (in a single specimen was 8), A. i, 5 (in 2 specimens were 6), V. i, 6 (in a single specimen was 7), P. i, 7 (in 2 specimens were 8), C. 16 (in 2 specimens were 15).

Morphometric data are given in Table 1.

Body moderately deep. Caudal peduncle depth (Cpd) deep. Caudal peduncle length (Cpl) considerably short. Cpl slightly longer than Cpd (cpd/cpl : 95.2%). Insertion of the dorsal fin almost the middle of body. Ventral origin moderately posterior being 51.5 ~ 57.7% (mean 54.6%) of SL. Snout somewhat blunt. Mouth very arched with moderately pointedly developed mental lobes and relatively long barbels (Fig. 3-A). Suborbital spine strong and relatively short, its terminal not passing over the middle of eye, laterocaudal process considerably short, less than 1/3 of the mediocaudal process (Fig. 3-C).

Scales small and oval with a relatively large central forcal area and 25 ~ 29 radial grooves (Fig. 3-D).

Color and pigmentation : Color pattern is shown in Fig. 2. Coloration in alcohol is generally yellowish-white.

A weak dark brown streak present from the tip of snout to the eye. Behind the eye it disappears. The four Gambetta's zones normally developed. The second zone consists of 16 ~ 24 (\bar{X} 19.7) rounded-ovoidal dots. The fourth zone formed of a row of 11 ~ 16 (13.1) dark brown relatively short vertical spots. A jet spot conspicuous at the upper

base of caudal fin. A series of dorsal median dusky gray spots arranged as follows : 5 ~ 7 (\bar{X} 5.8) predorsal, 2 ~ 3 (2.1) subdorsal, 5 ~ 9 (6.8) postdorsal. The dorsal fin and caudal fin with four to five rows of grayish dots, other fins pale.

Sexual dimorphism : The male specimens have a relatively small roundish lamina circularis at the base of the pectoral fins (Fig. 3-B). The second fin ray of the pectoral fin is thicker and longer in males than in females : 1.49 ~ 1.89% (mean 1.65%) of SL in males and 1.10 ~ 1.48% (1.36%) in females. Males (mean 71.7 mm SL) is smaller than females (mean 79.3 mm SL).

Habitat and distribution : Up to now the species is distributed only in the middle parts of Ling River flowing into Yellow sea, Xianju district, Taizhou city, Zhejiang province, China (Fig. 1). The species inhabits in sand and gravel bottoms of stream with moderately low water velocity, and less than 1 m deep and about 10 ~ 20 m wide.

Etymology : The specific name "*Cobitis zhejiangensis*" was given after the Zhejiang Province of China where the specimens were collected.

Discussion

Up to now the genus *Cobitis* from China would become to consist of six species : *Cobitis sinensis*, *C. lutheri*, *C. macrostigma*, *C. granoei*, *C. arenae*, *C. dolichorhynchus* (Nichols, 1943; Chen, 1981;

Zhu, 1995; Kim *et al.*, 1999; Son and He, 2001). Nichols (1943) reported five species of the genus *Cobitis* of China : *C. Sinensis*, *C. macrostigma*, *C. arenae*, *C. dolichorhynchus*, *C. melanoleuca*.

Chen (1981) added three species of *C. lutheri*, *C. granoei* and *C. rarus* but Cheng and Zheng (1987) and Zhu (1995) excluded *C. rarus* from the list of genus *Cobitis* of China, while Zhu (1995) added *C. laterimaculata*. After then Son and He (2001) transferred *C. laterimaculata* from *Cobitis* to *Niwaella*.

The genus *Cobitis* are characterized by the following features : the color pattern on the body sides with four pigmentary zones of Gambetta; the marked sexual dimorphism of long and thick second ray of pectoral fin with an osseous lamina circularis on the base of pectoral fin in males (Nalbant, 1963, 1993).

This new species is placed in the genus *Cobitis* because it has normally well developed four pigmentary zones of Gambetta and relatively small roundish lamina circularis on the base of pectoral fins in males. Present population superficially resembles *C. sinensis* in shape and color pattern (Zheng, 1989; Kim *et al.*, 1999). But the former is easily distinguished from the latter by the following features : deeper body (17.3% versus 14.9% of SL); shorter caudal peduncle length (12.0% versus 13.5% of SL); deeper caudal peduncle depth (11.4% versus 9.5% of SL); the color pattern of second Gambetta's zone : rounded ovoidal dots - narrow elongate blotches (Sauvage and Dabry de Thiersant, 1874; Nichols, 1943; Chen, 1981; Zheng, 1989). Especially deep caudal peduncle depth and short caudal peduncle length (cpd/cpl : 95.2%) and the color pattern of second Gambetta's zone are the unique features of this species not sharing with any other congener species of China (Nichols, 1943; Zhu, 1995; Chen, 1981; Cheng and Zheng, 1987; Kim *et al.*, 1999, 2003). Consequently *Cobitis zhejiangensis* is the endemic

species of China.

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중국산 미꾸리과 어류 1신종 *Cobitis zhejiangensis*의 기재
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中國 浙江省의 靈江(Ling River)에서 採集한 32個體의 標本을 根據로 하여 中國産 미꾸리科 1新種 *Cobitis zhejiangensis*를 記載하였다. 本 種은 外形上으로 類似한 *C. sinensis*에 比해서는 體高와 尾柄高가 높은 反面 尾柄長이 顯著히 짧았으며 體側 斑紋의 數와 形態에 있어서도 뚜렷한 差異를 보였다. 特히 짧은 尾柄長과 第二 Gambetta's zone의 斑紋의 數와 形態는 *Cobitis*屬의 어떤 種과도 區別되는 本 種의 特徵적인 形質로 判斷되었다.