



A new species, *Microphysogobio wulonghensis* (Teleostei: Cypriniformes: Cyprinidae), from Shandong Province, China

YING-CHUN XING^{1,2}, YA-HUI ZHAO², WEN-QIAO TANG^{1,3} & CHUN-GUANG ZHANG^{2,3}

¹College of Fisheries and Life Sciences, Shanghai Ocean University, 999, Huchenghuan Road, Pudong, Shanghai, 201306 China. E-mail: a_0540@yahoo.cn

²Key Laboratory of Zoological Evolution and Systematics, Institute of Zoology, Chinese Academy of Sciences, 1-5, Beichen West Road, Chaoyang, Beijing, 100101 China. E-mail: zhaoyh@ioz.ac.cn

³Corresponding author. E-mail: wqtang@shou.edu.cn; fish@ioz.ac.cn

Abstract

Microphysogobio wulonghensis sp. nov. is described based on 15 specimens collected from the Wulonghe River in Laiyang County of Shandong Province in eastern China. The new species can be distinguished from all congeners by the combination of the following characteristics: upper lip with one row of well-developed and compressed triangular papillae; two lateral pads of lower lip well-developed, contacting each other behind medial pad; two-thirds of area between pectoral-fin origin and pelvic-fin origin scaleless.

Key words: *Microphysogobio*; Cyprinidae; New species; China

Introduction

The cyprinid genus *Microphysogobio* (Mori, 1934) is distributed from the Amur River to the Honghe River of northern Vietnam in eastern and southeastern Asia. At present, 23 valid species are recognized in the genus (Yue, 1998; Zhao and Zhang, 2001; Eschmeyer and Fricke, 2011). *Microphysogobio* can be distinguished from other genera of the subfamily Gobioninae based on the following characteristics: body small, slim and elongated; snout short and blunt; mouth inferior, horseshoe-shaped; medial pad of lower lip a pair of fleshy protuberances with vertical gap in center in some species, or fleshy protuberance without vertical gap in center in others; two lateral pads well-developed in most species; last unbranched ray of dorsal-fin soft; 7 branched rays in dorsal-fin (vs. 7–8); one row of pharyngeal teeth (vs. 1–3 rows), 5-5; air bladder small, two chambers, anterior one enclosed by fibrous capsule, posterior one equal to anterior one or smaller (Yue, 1998; Kim and Yang, 1999; Xie, 2007). Herein, we describe a new species based on 15 specimens collected from Shandong Province.

Material and method

Materials examined in this study are all deposited in the Institute of Zoology, Chinese Academy of Sciences (ASIZB), Institute of Hydrobiology, Chinese Academy of Sciences (IHB) and the Chonbuk National University, Chonju, Korea (CNUC). Measurements were taken point to point with a digital caliper to 0.01 mm. Counts and measurements were made on the left side of specimens whenever possible. Individual measurements were taken as shown in Fig. 1. Osteological characteristics were observed on soft X-ray photographs. Vertebrae were counted and included both the ultimate vertebra and the anterior four vertebrae comprising the Weberian complex. Radiographs were made using a Kodak DXS-4000 Digital X-ray Specimen System. Statistical analyses were carried out using SYSTAT Version 11 (Wilkinson, 2004). The illustrations used in this paper were drawn according to the relative specimens of species in this genus, and photographs were shot using a ZEISS Stemi-2000C Stereoscope and a Canon EOS300D Camera.

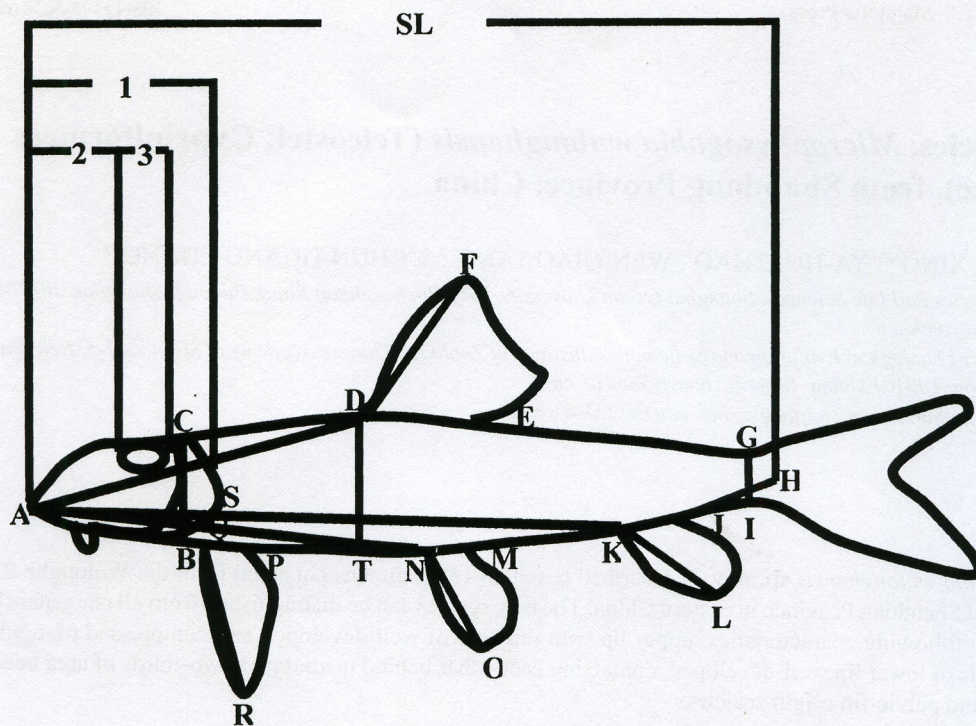


FIGURE 1. Principal measurements taken on *Microphysogobio* species. The picture is based on the type species of *Microphysogobio*, *M. hsinglungshanensis*. Standard length (SL), from tip of snout to last half-centrum (point A to point H); body depth, from insertion of dorsal-fin vertically to ventral midline (D–T); pre-dorsal length, from tip of snout to origin of dorsal fin (A–D); head to dorsal-fin origin, from nape (point between head and body, dorsal scales start here) to dorsal-fin origin (C–D); dorsal-fin length, from origin of dorsal fin to tip of longest ray (D–F); dorsal-fin base length, from anterior to posterior end of dorsal-fin base (D–E); pre-anal length, from tip of snout to origin of anal fin (A–K); anal-fin length, from origin of anal fin to tip of longest ray (K–L); anal-fin base length, from anterior to posterior end of anal-fin base (K–J); pre-pectoral length, from tip of snout to base of anterior pectoral-fin ray (A–Q); pectoral-fin length, from base of anterior pectoral-fin ray to tip of the longest ray (Q–R); pectoral-fin base length, from anterior to posterior end of pectoral-fin base (Q–P); pre-pelvic length, from tip of snout to base of anterior pelvic-fin ray (A–N); pelvic-fin length, from base of anterior pelvic-fin ray to tip of longest ray (N–O); pelvic-fin base length, from anterior to posterior end of pelvic-fin base (N–M); caudal peduncle length, from end of anal-fin base to last half-centrum (J–H); caudal peduncle depth, at approximately middle of caudal peduncle (G–I); head length, from tip of snout to most posterior point of operculum (including skin flap, I; A–S); head depth, from nape vertically to the venter (C–B); head width, distance between most posterior margins of opercles; snout length, from tip of snout to anterior margin of circumorbital series (2); eye diameter, from anterior to posterior margins of circumorbital series (3), pressing tips of calipers to firm points (bony rim); rictal barbel length, from anterior to posterior end of rictal barbel.

***Microphysogobio wulonghensis* sp. nov.**

(Fig. 2; Table 1)

Holotype. ASIZB 176476, 41.2 mm standard length (SL), Wulonghe River (36° 43' N, 120° 44' E), Laiyang County, Shandong Province, China; 3 May 1929.

Paratypes. ASIZB 43503, 41.6 mm SL; ASIZB 176473-75 (3 specimens), 39.8–46.8 mm SL; ASIZB 176477-86 (10), 30.8–43.1 mm SL. Other data including locality as for holotype.

Diagnosis. The new species is distinguished from all congeners by the following combination of characteristics: two-thirds of area between pectoral-fin origin and pelvic-fin origin scaleless (Fig. 2a); upper lip with one row of well-developed and compressed triangular papillae; two lateral pads on lower lip well-developed, contacting each other behind medial pad (Fig. 2b1, 2b2).

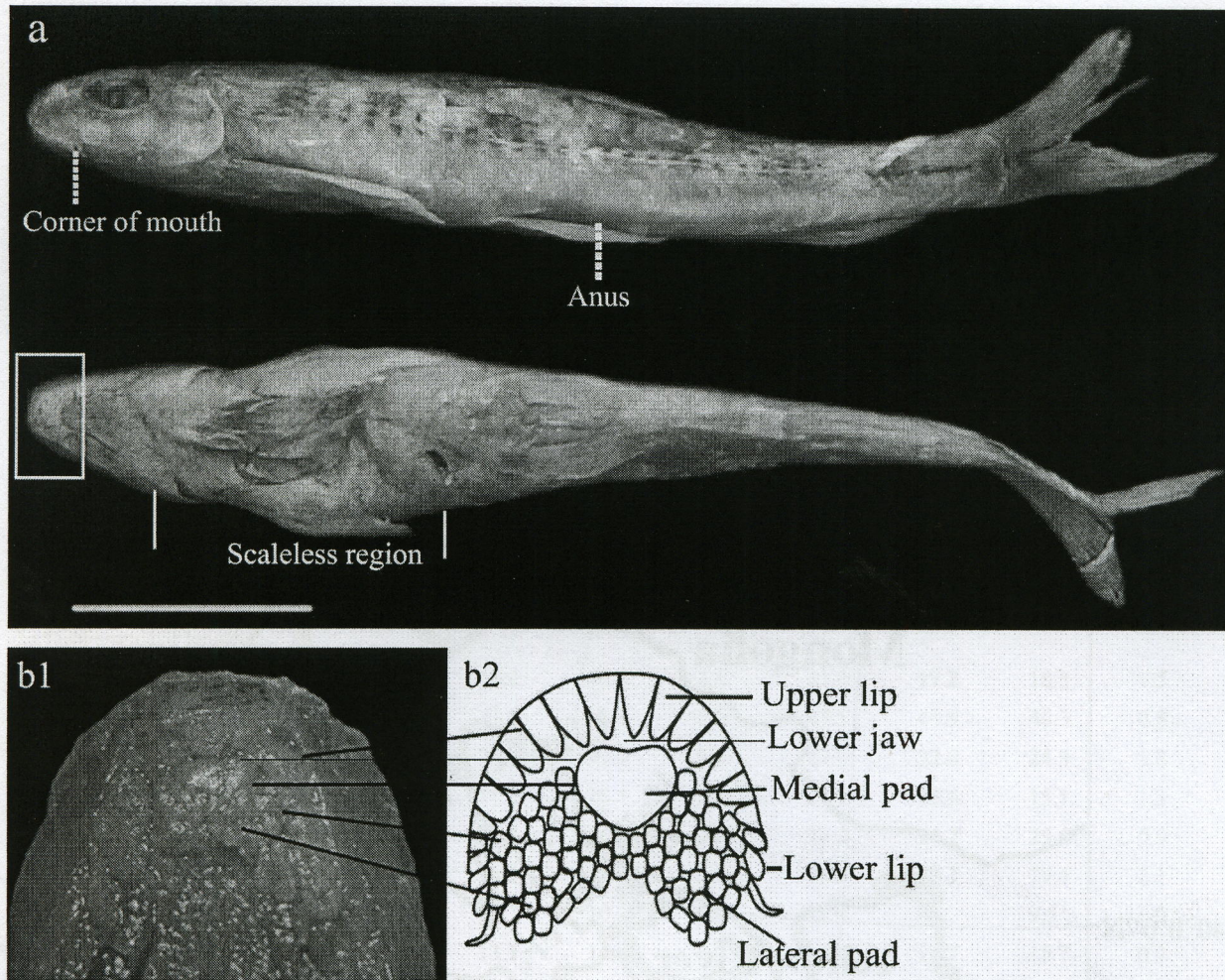


FIGURE 2. Lateral and ventral views of *Microphysogobio wulonghensis* sp. nov. Holotype, ASIZB 176476, 41.2 mm SL: a, lateral and ventral views; b1, photograph of upper and lower lips; b2, illustration of upper and lower lips.

The new species is most similar to *Microphysogobio amurensis*, *M. anudarini*, *M. chinssuensis*, *M. hsinglungshanensis*, *M. linghensis*, *M. rapidus* and *M. yaluensis* in having incompletely scaled regions on the thoracic and abdominal areas. Additionally, the distributions of these eight species are all north of the Yangtze River (Fig. 3). However, the new species differs in having upper lip with well-developed papillae (vs. simple upper lip without papillae in *M. linghensis*), upper lip with compressed triangular papillae, lateral pads contacting each other behind medial pad (vs. upper lip with umbonate papillae, lateral pads separated each other behind medial pad in *M. amurensis*, *M. chinssuensis*, *M. hsinglungshanensis*, *M. rapidus* and *M. yaluensis*), two-thirds of area between pectoral-fin origin and pelvic-fin origin scaleless (vs. scaleless region restricted to area before pelvic-fin base in *M. anudarini*).

Description. General body features are shown in Fig. 2. Morphometric and metric characteristics are listed in Table 1. Body small, slim and elongated. Thoracic and abdominal regions flat, caudal region compressed. Dorsal profile rising gently from snout tip to dorsal-fin origin, then almost horizontal, or sloping slightly to end of caudal peduncle. Ventral profile horizontal to anal-fin base, then rising gently to caudal fin. Caudal peduncle short and moderately compressed. Greatest body depth exactly at dorsal-fin origin; least depth of caudal peduncle closer to caudal-fin base than to dorsal-fin base. Anus and urogenital opening at one third of area from pelvic-fin origin to anal-fin origin. Air bladder smaller than eye diameter, with slim vessel connecting to intestine, divided into two chambers, anterior chamber oblate, enclosed by thick fibrous capsule; posterior chamber much smaller than anterior one.

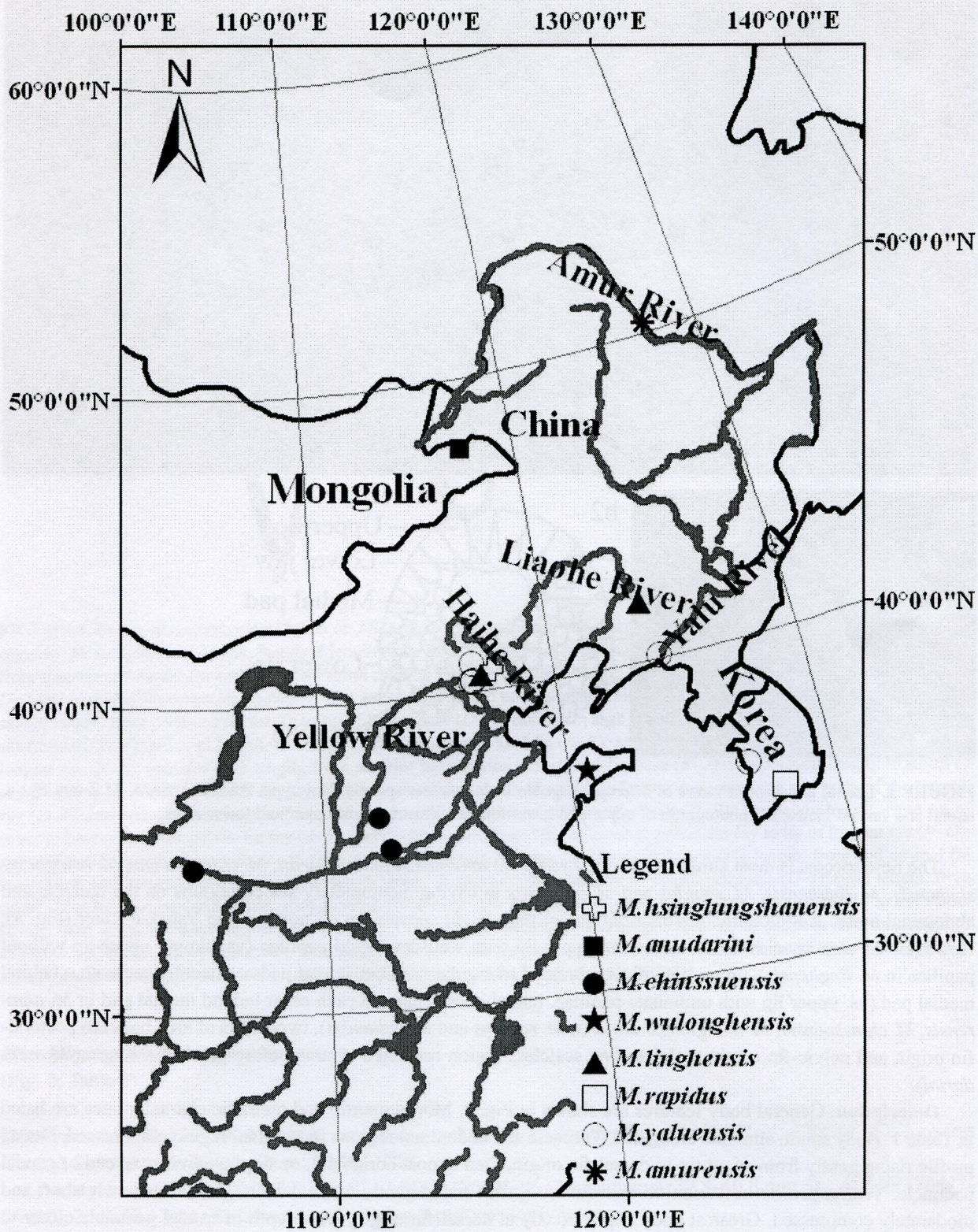


FIGURE 3. Distribution of *Microphysogobio wulonghensis* sp. nov. and similar species. Hollow cross, *M. hsinglungshanensis*; solid square *M. anudarini*; solid circle, *M. chinssuensis*; solid star, *M. wulonghensis* sp. nov.; solid triangle, *M. linghensis*; hollow square, *M. rapidus*; hollow circle, *M. yaluensis*; asterisk *M. amurensis*.

TABLE 1. Meristics and morphometrics of *Microphysogobio wulonghensis* **sp. nov.** and other species in the “incompletely scaled” group.

	<i>Microphysogobio wulonghensis</i> sp.nov. (n=15)				<i>Microphysogobio linghensis</i> (n=6)			
Dorsal fin	iii, 7				iii, 7			
Anal fin	ii, 6				ii, 6			
Pectoral fin	i, 9–11				i, 9–12			
Pelvic fin	i, 7				i, 7			
Total vertebrae	35–38				35–36			
Gill rakers	16–18				9–13			
Lateral-line scales	31–37				34–37			
Scales above lateral-line	3–4				4			
Scales below lateral-line	2–3				2			
Pre-dorsal scales	10				9–10			
Circumpeduncular scales	8–10				12			
	Max	Min	Mean	SD	Max	Min	Mean	SD
Standard length	46.8	30.8	38.8	4.3	42.7	31.6	37.3	3.9
In % of standard length								
Body depth	22.0	13.2	18.5	2.6	21.4	17.2	18.8	1.5
Pre-dorsal length	49.3	43.0	46.1	2.0	47.1	44.9	46.3	0.8
Head to dorsal fin	47.8	24.0	27.9	5.8	27.1	22.0	24.3	1.8
Dorsal-fin base length	19.8	11.2	16.1	2.2	17.1	13.6	15.1	1.3
Dorsal-fin length	27.3	21.6	24.1	2.0	27.1	24.7	25.6	0.9
Pre-anal length	84.1	73.2	77.9	3.2	82.1	77.3	79.4	2.1
Anal-fin base length	13.7	7.7	10.3	1.9	11.0	8.2	9.5	1.0
Anal-fin length	19.9	13.1	15.6	2.0	16.5	14.7	15.7	0.7
Pre-pectoral length	28.0	22.3	24.7	1.7	27.6	23.2	25.1	1.5
Pectoral-fin base length	8.6	3.9	5.1	1.2	7.7	5.3	6.2	0.8
Pectoral-fin length	24.2	19.0	20.9	1.7	23.6	16.6	20.3	2.7
Pre-pelvic length	53.2	46.3	49.3	2.4	53.5	47.2	50.2	2.4
Pelvic-fin base length	5.4	3.1	4.3	0.7	7.6	4.5	5.3	1.1
Pelvic-fin length	21.8	14.0	17.1	2.6	18.2	14.3	16.4	1.3
Caudal-peduncle length	17.1	11.5	13.3	1.6	16.0	10.7	13.4	2.4
Caudal-peduncle depth	9.6	6.9	8.0	0.8	10.2	8.4	9.1	0.7
Head length	25.1	21.3	22.6	1.1	25.9	20.7	23.5	1.9
In % of head length								
Head depth	69.9	47.8	60.1	5.0	69.9	55.8	60.9	4.9
Head width	63.2	51.5	58.8	3.6	73.0	56.2	60.9	6.3
Snout length	37.1	28.7	32.1	2.3	36.6	27.7	31.0	3.2
Eye diameter	41.5	30.7	36.5	2.5	37.4	29.8	33.4	2.7
Interorbital width	25.5	16.4	21.9	2.4	29.9	19.9	23.9	4.1
Mouth width	21.4	10.8	15.2	2.5	34.7	14.8	24.2	9.5
Rictal barbel length	16.8	6.5	11.2	2.8	34.7	7.8	20.4	14

continued.

	<i>Microphysogobio amurensis</i> (n=10)				<i>Microphysogobio chinssuensis</i> (n=10)			
Dorsal fin	iii, 7				iii, 7			
Anal fin	ii, 6				ii, 6			
Pectoral fin	i, 10–11				i, 10–12			
Pelvic fin	i, 7				i, 7			
Total vertebrae	38–41				35–36			
Gill rakers	14–17				13–18			
Lateral-line scales	39–40				35–38			
Scales above lateral-line	4				4–5			
Scales below lateral-line	2				2			
Pre-dorsal scales	12				10–11			
Circumpeduncular scales	10–12				12			
	Max	Max	Min	Mean	SD	Min	Mean	SD
Standard length	51.0	50.8	36.2	43.1	5.4	43.5	46.0	2.6
In % of standard length								
Body depth	13.0	21.2	15.2	18.1	1.8	11.4	12.0	0.8
Pre-dorsal length	52.0	47.2	42.8	45.2	1.5	40.9	45.0	3.0
Head to dorsal fin	25.0	27.4	21.9	24.0	1.7	21.3	23.0	1.2
Dorsal-fin base length	15.0	19.2	12.3	16.7	2.1	12.4	14.0	1.1
Dorsal-fin length	26.0	28.6	22.5	26.3	1.9	19.5	23.0	1.9
Pre-anal length	82.0	82.9	77.5	79.3	1.6	73.1	77.0	2.5
Anal-fin base length	10.0	12.2	8.8	10.7	1.1	8.1	9.0	0.6
Anal-fin length	16.0	19.6	14.2	16.2	1.5	12.6	14.0	0.9
Pre-pectoral length	26.0	27.4	23.3	25.4	1.3	21.4	24.0	1.4
Pectoral-fin base length	5.2	7.6	4.3	6.1	1.0	3.8	4.5	0.5
Pectoral-fin length	21.0	28.5	18.4	23.0	2.9	16.0	19.0	1.5
Pre-pelvic length	51.0	60.1	48.4	53.0	3.4	46.1	48.0	1.7
Pelvic-fin base length	5.0	6.5	3.2	5.3	0.9	4.0	4.3	0.3
Pelvic-fin length	17.0	19.5	15.1	17.7	1.2	11.9	15.0	1.7
Caudal-peduncle length	18.0	16.1	8.6	12.7	2.4	11.9	15.0	2.1
Caudal-peduncle depth	6.8	10.7	8.1	9.3	0.7	5.7	6.3	0.5
Head length	24.0	25.0	20.9	22.7	1.4	20.9	23.0	1.1
In % of head length								
Head depth	56.0	75.6	57.3	63.5	5.1	42.9	51.0	4.3
Head width	57.0	70.5	55.5	63.2	5.2	48.2	52.0	2.5
Snout length	39.0	40.6	29.7	35.1	3.5	30.7	34.0	2.6
Eye diameter	37.0	32.5	23.6	27.0	2.7	26.6	31.0	2.9
Interorbital width	22.0	31.0	20.6	24.7	3.0	17.3	19.0	1.5
Mouth width	32.0	31.7	20.8	24.7	4.1	20.6	27.0	3.6
Rictal barbel length	23.0	20.9	16.4	18.8	1.5	16.0	19.0	2.3

continued.

	<i>Microphysogobio rapidus</i>				<i>Microphysogobio yaluensis</i>			
Dorsal fin	iii, 7				iii, 7			
Anal fin	ii, 6				ii, 6			
Pectoral fin	i, 12–13				i, 9–13			
Pelvic fin	i, 7				i, 7			
Total vertebrae	38–41				33–41			
Gill rakers	22–25				10–26			
Lateral-line scales	36–38				34–39			
Scales above lateral-line	4				4			
Scales below lateral-line	2				2			
Pre-dorsal scales	10				10			
Circumpeduncular scales	12				12			
	Max	Min	Mean	SD	Max	Min	Mean	SD
Standard length	59.5	54.9	57.2	2.1	60.6	30.7	43.7	6.6
In % of standard length								
Body depth	19.7	17.1	18.3	1.4	22.2	15.6	19.0	1.5
Pre-dorsal length	46.6	45.8	46.2	0.3	49.4	42.9	45.9	1.5
Head edge to dorsal	23.6	22.3	23.2	0.6	28.4	21.9	24.9	1.8
Dorsal-fin base length	15.6	13.7	14.7	0.8	22.7	12.0	15.3	1.7
Dorsal-fin length	23.7	21.8	22.6	0.8	28.4	19.5	25.4	1.5
Pre-anal length	77.1	73.9	75.1	1.4	84.9	74.1	78.2	2.2
Anal-fin base length	10.9	8.5	9.8	1.0	13.7	6.7	9.8	1.8
Anal-fin length	15.7	14.1	15.0	0.7	19.6	12.5	15.9	1.4
Pre-pectoral length	26.0	24.5	25.4	0.7	27.9	16.8	24.8	1.7
Pectoral-fin base length	6.9	5.5	6.2	0.7	7.9	4.2	5.6	0.8
Pectoral-fin length	20.7	19.5	19.9	0.6	27.5	18.8	23.4	2.1
Pre-pelvic length	53.4	51.7	52.5	0.9	75.4	19.7	51.0	5.6
Pelvic-fin base length	5.7	4.8	5.4	0.4	6.8	3.7	5.2	0.7
Pelvic-fin length	16.1	14.1	15.2	0.8	21.1	13.6	17.7	1.6
Caudal-peduncle length	16.6	12.8	15.4	1.8	19.7	9.2	14.3	2.5
Caudal-peduncle depth	8.0	7.6	7.9	0.2	10.9	7.9	9.1	0.6
Head length	24.0	22.7	23.1	0.6	24.4	20.0	22.5	1.2
In % of head length								
Head depth	768.5	60.8	65.1	3.2	73.3	56.6	63.6	3.9
Head width	766.3	16.6	51.8	24.0	74.9	55.4	66.4	3.8
Snout length	446.0	40.1	43.7	2.6	46.0	29.1	36.5	3.4
Eye diameter	333.4	31.8	32.9	0.7	39.5	24.7	30.7	2.9
Interorbital width	320.3	17.9	18.7	1.1	36.0	18.1	26.8	3.1
Mouth width	339.9	19.6	28.3	8.7	40.9	23.3	30.8	4.2
Rictal barbel length	217.0	11.2	13.4	2.6	26.4	12.0	16.6	3.1

Head triangular from side view. Snout short, rounded, smaller than eye diameter, depressed in front of nostrils. Anterior nostril tubular, short, next to posterior nostril. Mouth inferior, curved; corners opposite to posterior nostrils. Upper lip thick, covering upper jaw; upper jaw invisible when mouth closed; upper lip with one row of well-developed and compressed triangular papillae, two or more rows of papillae on corner of mouth. Lower lip divided into three pads, middle one heart-shaped; fleshy protuberances without vertical gap in the center; two lateral pads well-developed and connected to upper lip at corners of mouth, with many papillae, contacting each other behind medial pad. Pair of short rictal barbels, shorter than half of eye diameter. Eyes large and rounded. Interorbital profile slightly concave. Gill openings large, extending downward beyond pectoral-fin base. Gill rakers well-developed. Pharyngeal teeth in one row, 5-5.

Dorsal-fin origin anterior to pelvic-fin origin, nearer to snout tip than to caudal-fin base; distance between snout tip and dorsal-fin origin nearly equal to distance from posterior end of dorsal-fin base to caudal-fin origin. Dorsal fin short, end of dorsal-fin base opposite to posterior end of pelvic-fin base; last unbranched ray soft. Pectoral fin short, ending two scales away from pelvic-fin origin when adpressed; insertion at vertical through posterior margin of operculum, end extending opposite to dorsal-fin origin. Pelvic-fin insertion midway between pectoral-fin origin and anal-fin base, opposite to second or third branched ray of dorsal fin. Anal fin short, insertion nearly midway between pelvic-fin origin and caudal-fin base. Caudal fin bifurcate, upper lobe slightly shorter than lower one.

Lateral line complete, almost straight. Body covered by moderately sized cycloid scales. Lateral-line scales 31(1 specimen), 32 (4), 33 (2), 34 (1), 35 (3), 36 (3) or 37 (1). Scales above lateral line 4, below lateral line 2 (12) or 3 (3). Pre-dorsal scales 10, regularly arranged. Circumpeduncular scales 8 (1) or 10 (14). Two-thirds of area between pectoral-fin origin and pelvic-fin origin scaleless.

Coloration in alcohol. The specimens were fixed and preserved in formalin in 1929, and transferred to alcohol in 2005. Body brownish, back darker and belly lighter. 8-9 large dark brown spots along mid-side from gill opening to caudal-fin base. Each lateral-line scale has a dark spot. All fins light grayish.

Distribution. From the collection record, the new species is only found in the Wulonghe River, a costal river in the Shandong Peninsula (Fig. 3). The locality is near Laiyang County, Shandong Province, China.

Etymology. The name, *wulonghensis*, is derived from the name of the collection locality, Wulonghe River (“he” means river in Chinese). The names of most species in this genus are based on the collection locality.

Discussion

The size of the scaleless region on thoracic and abdominal area is the most important characteristic to distinguish species in the genus *Microphysogobio*. The genus can be divided by this characteristic into two groups: “completely scaled” and “incompletely scaled” groups. The “completely scaled” group includes sixteen species: *M. alticarpus* Bănărescu and Nalbant, 1968; *M. brevirostris* (Günther, 1868); *M. elongatus* (Yue and Yang, 1977); *M. fukiensis* (Nichols, 1926); *M. jeoni* Kim and Yang, 1999; *M. kachekensis* (Oshima, 1926); *M. kiatingensis* Wu, 1930; *M. koreensis* Mori, 1934; *M. labeoides* (Nichols and Pope, 1927); *M. longidorsalis* Mori, 1935; *M. microstomus* Yue, 1995; *M. pseudelongatus* Zhao and Zhang, 2001; *M. tafangensis* (Wang, 1935); *M. tungtingensis* (Nichols, 1926); *M. vietnamica* Mai, 1978 and *M. yunnanensis* (Yue and Yang, 1977). The “incompletely scaled” group includes *M. amurensis* (Taranetz, 1937); *M. anudarini* Holcík and Pivnicka, 1969; *M. chinssuensis* (Nichols, 1926); *M. hsinglungshanensis* Mori, 1934; *linghensis* Xie, 1986; *M. rapidus* Chae and Yang, 1999; *M. yaluensis* (Mori, 1928) and *M. wulonghensis* **sp. nov.**

Microphysogobio wulonghensis **sp. nov.** differs from congeners of the “incompletely scaled” group as follows: upper lip well-developed, with compressed triangular papillae; medial pad of lower lip consists of a heart-shaped fleshy protuberance without a vertical gap in the center, two lateral pads contacting each other behind medial pad (Fig. 4f1, 4f2) vs. upper lip simple, without papillae; medial pad of lower lip consists of a pair of oval fleshy protuberances with a vertical gap in the center, two lateral pads separated each other behind medial pad (Fig. 4a), to distinguish from *M. linghensis*. Upper lip with compressed triangular papillae; two lateral pads contacting each other behind medial pad (Fig. 4f1, 4f2) vs. upper lip with umbonate papillae; two lateral pads separated each other behind medial pad (Fig. 4b, c, d, e), to distinguish from *M. chinssuensis*, *M. yaluensis*, *M. amurensis*, *M. rapidus* and *M. hsinglungshanensis* (Mori, 1934).

The distance between anus and anal-fin origin 2.14-3.24% SL, two-thirds of area between pectoral-fin origin and pelvic-fin origin scaleless (Fig. 2a) vs. distance between anus and anal-fin origin 19.0-20.8% SL, scaleless region restricted to area before pelvic-fin base in *M. anudarini* (Kottelat, 2006).

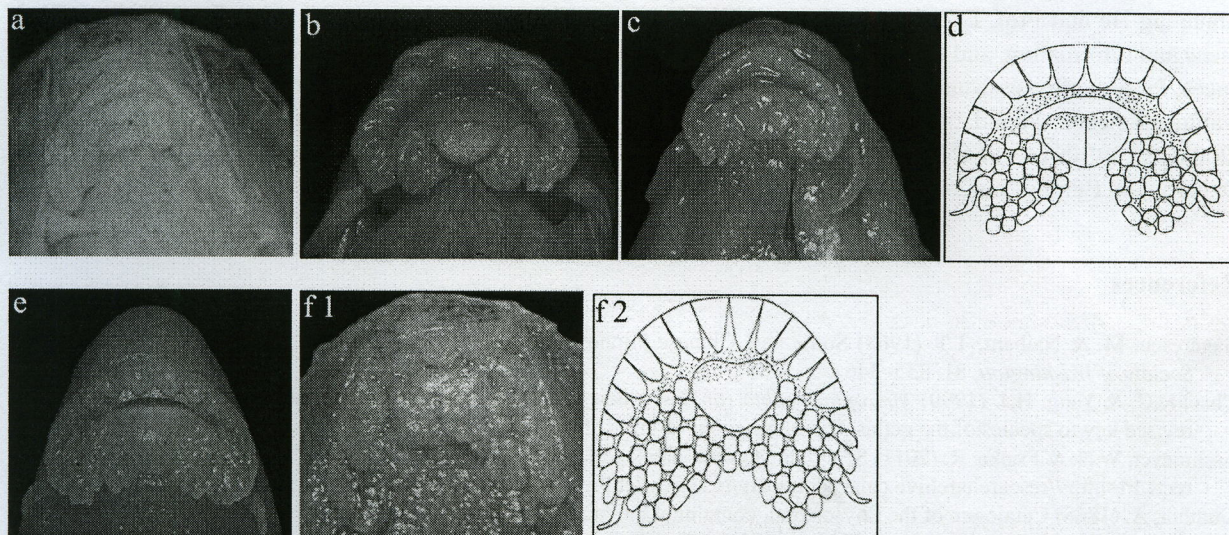


FIGURE 4. Comparison of lip shapes of species in the “incompletely scaled” group. a, *M. linghensis*, ASIZB 184871, 42.7 mm SL; b, *M. chinssuensis*, ASIZB 168078, 45.9 mm SL; c, *M. yaluensis*, ASIZB 184660, 40.7 mm SL; d, *M. amurensis*, printed in the light of IBH 12208735-0382, 44.8 mm SL; e, *M. rapidus*, CUNC 37898, 56.2 mm SL; f1, f2: *M. wulonghensis* sp. nov., ASIZB 176476, 41.2 mm SL.

Comparative materials (all measurements in SL):

Microphysogobio amurensis: IHB 12208735 (10 specimens), 43.5–50.5 mm, Amur River Basin: Heihe City (50° 15.34' N, 127° 30.07' E), Heilongjiang Province, China; May, 1958.

Microphysogobio chinssuensis: ASIZB 168078, 45.9 mm, Yellow River Basin: Linnan Village (36° 14' N, 112° 15' E), Hechuan Town, Anze County, Shanxi Province, China; 2 September 2007, Y.H.Zhao & C.G.Zhang. ASIZB 168978, 49.9 mm, Huaihe River Basin: Qinhe River, Wulongkou Town (35° 11' N, 112° 39' E), Jiyuan City, Henan Province, China; 4 September 2007. IBH 12208726 (8), 36.2–50.8 mm, Huaihe River Basin: Hejia Village (34° 43.58' N, 104° 53.51' E), Wushan County, Gansu Province, China; August 1980.

Microphysogobio linghensis: ASIZB 184871-73 (3), 38.0–42.7 mm, Haihe River Basin: Miyun Reservoir (40° 29' N, 116° 58' E), Miyun District, Beijing, China; 4 June 2010, Y.H.Zhao & C.G.Zhang. IBH 12208899 (3), 31.6–37.5 mm, Liaohe River Basin: Yanghe River (41° 52.31' N, 124° 0.57' E), Fushun City, Liaoning Province, China; April 1982.

Microphysogobio rapidus: CNUC 37898-901 (4), 54.9–59.5 mm, Nakdonggang River Basin: Sancheong gun (35° 18' N, 127° 59' E), Kyongsangnam-Do, Korea; 5 April 2008.

Microphysogobio yaluensis: ASIZB 170563-69 (7), 43.5–52.3 mm, Yalu River Basin: Sidaoqiao (40° 07' N, 124° 23' E), Dandong City, Liaoning Province, China; 11 July 2005, Y.H.Zhao. ASIZB 184658-69 (12), 35.4–45.6 mm, Haihe River Basin: Xisiduhe River (40° 19.82' N, 116° 29.01' E), Huairou District, Beijing, China; April 2004, C.G.Zhang & Y.H.Zhao. ASIZB 184670-77 (8), 38.7–47.0 mm, Haihe River Basin: Jumahe River (39° 39.15' N, 115° 27.52' E), Duya Village, Laishui County, Hebei Province, China; 5 August 2009, C.G.Zhang & Y.H.Zhao. ASIZB 158382-83, 73365-70 (8), 35.3–55.3 mm, Haihe River Basin: Hongjunzhuang (40° 20.34' N, 116° 35.85' E), Huairou District, Beijing, China; 21 March 2004, C.G.Zhang & Y.H.Zhao. ASIZB 73370-78 (9), 38.8–60.6 mm, Haihe River Basin: Labagoumen (40° 53.47' N, 116° 37.18' E), Huairou District, Beijing, China; April 2003, C.G.Zhang & Y.H.Zhao. ASIZB 158373-81 (9), 30.7–50.8 mm, Haihe River Basin: Huairou Reservoir (40° 18.69' N, 116° 36.52' E), Huairou District, Beijing, China; 20 April 2003, C.G.Zhang & Y.H.Zhao. CUNC 37896-97 (2), 50.4–58.7 mm, Gungang River Basin: Buyeo-gun (36° 14' N, 126° 50' E), Korea; June 2009.

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