

A Review of the Cyprinoid Fish Genus *Barbodes* Bleeker, 1859, from Yunnan, China, with Descriptions of Two New Species

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Xiao-Yong Chen, Jun-Xing Yang and Yin-Rui Chen (1999) A review of the cyprinoid fish genus *Barbodes* Bleeker, 1859, from Yunnan, China, with descriptions of two new species. *Zoological Studies* 38(1): 82-88. Fishes of the genus *Barbodes* in Yunnan have been reviewed and 2 new species are described on the basis of specimens deposited in Kunming Institute of Zoology, Chinese Academy of Sciences. Counts and measurements follow Chu and Chen (1989). *Barbodes heterostomus* is distinguished by its terminal mouth, with gape being horizontal in the male, and acclivitous in the female; last unbranched dorsal ray smooth with upper 1/3 articulated; dorsal fin origin anterior to pelvic fin origin; no dark lateral band on sides of body; gill rakers 13-19; lateral line scales 24-29; longest caudal ray length about 2 times that of shortest. It is distributed in Longchuanjiang and Dayingjiang (upper Irrawaddy). *Barbodes baoshanensis* is distinguished by its smooth last unbranched dorsal ray with upper 1/3-1/2 articulated; dorsal fin origin anterior to pelvic fin origin; sides of body with a dark longitudinal band; gill rakers 13-14; lateral line scales 23-28. It occurs in Nujiang (upper Salween) and Longchuanjiang. A key to the species of *Barbodes* in Yunnan is provided.

Key words: *Barbodes*, Taxonomy, New species.

Fishes of the genus *Barbodes* Bleeker, 1859 are widely spread in China, India, Burma, Thailand, and Africa. In China, they mainly occur in Yunnan and only a few species occur in Tibet, Guizhou, and Hainan Island. Fifteen species have been found in Nanpanjiang (upper Pearl River), Yuanjiang (upper Red River), Lancangjiang (upper Mekong), Nujiang (upper Salween), and Irrawaddy river system, Yunnan.

From 1878 to 1962, five species were described: *Barbus margarinus* Day (Anderson 1878) from Nanpoung River, *Barbus cogginii* from Erhai (Chaudhuri 1911), *Barbus gregori* from Erhai (Norman 1923), *Barbus chonglingchungi* (Tchang 1936), and *Barbus huangchuchieni* (Tchang 1962). Wu (1977) described 8 new species and subspecies, *Barbodes* (*B.*) *shanensis carinatus* from Menga, *B.* (*B.*) *parva* from Jinghong, *B.* (*B.*) *daruphani luosuoensis* from Luosuojiang, *B.* (*B.*)

lacustris from Fuxian Lake, *B.* (*B.*) *opisthoptera* from Nujiang river system, *B.* (*B.*) *huangchuchieni rhomboides* from Yuanjiang River, *B.* (*B.*) *exigua* from Xizhou, *B.* (*B.*) *daliensis* from Xiaguan, *B.* (*B.*) *wynaadensis* from Baoshan, and *B.* (*B.*) sp. from Motuo, Tibet. Wang et al. (1982) described *Puntius fuxianhuensis*. Chu and Chen (1989) recorded *Barbodes benasi* from Hecou, Xichou, *B. hexagonolepis* from Longchuanjiang and Dayingjiang, and *B. pierrei* from Jinghong, lower Lancangjiang.

The specimens of *Barbodes* collected in Longchuanjiang and Dayingjiang (upper Irrawaddy), Yunnan, differ from the descriptions of *B. hexagonolepis* (McClelland 1839) in Assam, northeast India, and *B.* (*Barbodes*) sp. (Wu 1977) in Motuo, Tibet, in several aspects (Table 1). The specimens of *Barbodes* collected in Nujiang (upper Salween) and Longchuanjiang differ from the

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description of *B. wynaadensis* (Day 1873) in Wynaad, south India (Table 2), so we consider that these specimens represent 2 new species (Distributions of the 2 new species are shown in Fig. 1. The other species of the genus *Barbodes* are still recognized as valid. Here we make a simple review of *Barbodes* fishes in Yunnan with references to Wu (1977), and Chu and Chen (1989).

MATERIALS AND METHODS

Counts and measurements follow Chu and Chen (1989). Examined materials belong to the collection of Kunming Institute of Zoology, Chinese Academy of Sciences. Abbreviations used in this paper are: TL, total length; HL, head length; SL, standard length; ED, eye diameter; HP-DN, hard part of last unbranched dorsal ray—distance from nostril to posterior margin of opercular; P-LL, scale rows between pectoral fin origin and lateral line; V-LL, scale rows between ventral fin origin and lateral line; P-V, scales between pectoral fin and base of pelvic fin; and L/S, longest /shortest caudal ray.

RESULTS

Genus *Barbodes* Bleeker, 1859

Barbodes Bleeker, 1859: 431 (type species. *Barbodes belinka* Bleeker, 1859).

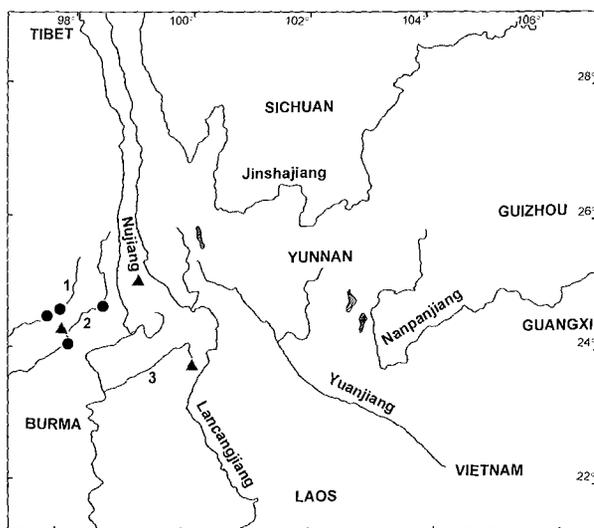


Fig. 1. Distributions of *Barbodes heterostomus* and *B. baoshanensis* in Yunnan. ● *B. heterostomus*, ▲ *B. baoshanensis*, 1. Dayingjiang, 2. Longchanjiang, 3. Nanding River.

Barbels 2 pairs, usually developed; gill rakers fewer; branched dorsal rays 8-9, last unbranched dorsal ray osseous and serrated posteriorly in most species, smooth and nonosseous in a few species; pharyngeal teeth 3 rows.

Key to species of *Barbodes* in Yunnan

- 1a. Last unbranched dorsal ray smooth and articulated on upper part; dorsal ray 4, 9-10 2
- 1b. Last unbranched dorsal ray osseous and serrated posteriorly; dorsal ray 4, 7-8 4
- 2a. Sides of body with a dark longitudinal band 3
- 2b. No dark band on sides of body; gill rakers 13-19; longest caudal ray length about 2 times that of shortest; mouth gape horizontal in male, accivitous in female *B. heterostomus*
- 3a. Lateral line scales 32 *B. benasi*
- 3b. Lateral line scales 23-28 *B. baoshanensis*
- 4a. Dorsal fin origin anterior to pelvic fin origin 5
- 4b. Dorsal fin origin posterior to pelvic fin origin 7
- 5a. Lateral line scales 31-33; body smaller; tip of dorsal fin with a black blotch; barbels well developed, rostral surpassing middle of eye, maxillary surpassing posterior margin of eye *B. parvus*
- 5b. Lateral line scales 45-50; body larger; tip of dorsal fin without a black blotch; barbels very weak, rostral shorter than 1/2 of eye diameter, maxillary reaching or surpassing anterior margin of eye 6
- 6a. Gill rakers 13-16; body more slender; head length longer than body depth *B. chonglingchungi*
- 6b. Gill rakers 24-28; body less slender; head length shorter than or almost equal to body depth *B. fuxianhuensis*
- 7a. A ridge extends from head to dorsal fin origin 8
- 7b. No ridge on the back 11
- 8a. Distance between dorsal fin origin and caudal fin base almost equal to distance between dorsal fin origin and posterior margin of preopercle *B. opisthopterus*
- 8b. Distance between dorsal fin origin and caudal fin base almost equal to distance between dorsal fin origin and posterior margin of eye or snout tip 9
- 9a. Back curved and belly straight; sides of body with a slightly dark band; distance between dorsal fin origin and caudal fin base almost equal to distance between dorsal fin origin and posterior margin of eye *B. shanensis carinatus*
- 9b. Back and belly curved almost to the same degree; no dark band along sides of body; distance between dorsal fin origin and caudal fin base almost equal to distance between dorsal fin origin and snout tip 10
- 10a. Barbels developed, rostral reaching middle of eye or even longer, maxillary reaching or surpassing posterior margin of preopercle; circumpeduncle scales 16-18, transverse scales 28-29; lateral line tubes without branch *B. rhomboides*
- 10b. Barbels less developed, rostral reaching or surpassing anterior margin of eye, maxillary not reaching posterior margin of preopercle; circumpeduncle scales 12-16, transverse scales 24-28; lateral line tubes with 1 branch in some specimens *B. huangchuchieni*
- 11a. Lateral line scales 26-33; body deeper, standard length 2.3-2.7 times body depth 12
- 11b. Lateral line scales 32-47; body shallower, standard length 2.9-3.8 times body depth 13

- 12a. Transverse scales 20; posterior margin of scales black; distance between dorsal fin origin and caudal fin base almost equal to distance between dorsal fin base and nostril or snout tip *B. vernayi*
- 12b. Transverse scales 21-23; posterior margin of scales the same color as other parts of scales or light gray; distance between dorsal fin origin and caudal fin base almost equal to distance between dorsal fin base and posterior margin of eye or nostril *B. pierreii*
- 13a. Last unbranched dorsal ray longer than head length; distance between anal fin origin and caudal fin base almost equal to or shorter than distance between anal fin origin and pelvic fin origin *B. margarianus*
- 13b. Last unbranched dorsal ray shorter than head length
- 14a. Distance between pelvic fin and pectoral fin origins longer than distance between pelvic fin and anal fin origins *B. exiguus*
- 14b. Distance between pelvic fin and pectoral fin origins shorter than or almost equal to distance between pelvic fin and anal fin origins *B. daliensis*

***Barbodes heterostomus* Chen and Yang, sp. nov.**
(Fig. 2)

Barbodes (*Barbodes*) sp.: Wu, 1977: 239-240.

Barbodes hexagonolepis Chu and Chen, 1989: 184-185 (non McClelland, 1839).

Holotype: KIZ-7801066, 195 mm SL, 1978, male, Nabang, Yinjiang, Yunnan.

Paratypes: KIZ-764409, 232 mm SL, 1976, female, Mangyun; KIZ-764231, 196 mm SL, 1976, female, Jiucheng, Yunnan; KIZ-7801064, 168 mm SL, male (collected with holotype).

Diagnosis: Mouth terminal, gape horizontal in male, acclivitous in female; last unbranched dorsal ray smooth with its upper 1/3 articulated; dorsal fin origin anterior to pelvic fin origin; no dark band on sides of body; gill rakers 13-19; longest caudal ray length about 2 times that of shortest; LR 24-29.

Description: D IV, 9-10; A III, 5; P I, 12-17; V I, 8; LR 24-29; P-LL 3.5-4.5; V-LL 2.5-3; Pred S 8-12, circumpeduncle scales 10-12. Pharyngeal teeth 3 rows, 2.3.5-5.3.2 or 2.3.4-4.3.2. Counts and proportional measurements are shown in Table 3.

Head moderately compressed, shorter than body depth. Snout blunt, mouth terminal, arc-like;

gape horizontal in male, acclivitous in female; postlabial groove interrupted. Maxillary barbels extending posteriorly below anterior margin of eye, intergape obviously shorter than interorbital. Eye moderately large; interorbital width broad and convex, longer than jaw length. Barbels 2 pairs, longer in male than in female. In male, rostral barbels shorter, extending to anterior margin of eye or middle of eye; maxillary barbels extending to posterior margin of eye or surpassing preopercle. In female, rostral barbels either not reaching anterior margin of eye or surpassing it; maxillary barbels extending to posterior 1/2 of eye. With 3-6 rows of tubercles below eyes.

Dorsal fin origin slightly anterior to the vertical from pelvic fin origin. Last unbranched dorsal ray strong and smooth, upper 1/3 articulated; longer than pectoral fin; shorter than or almost equal to head length in female, longer than head length in male; hard part shorter than distance from nostril to posterior margin of opercle. Outer margin of dorsal fin concave; dorsal fin origin nearer to snout than to caudal base, or in middle of them, or nearer to caudal base than to snout. Outer margin of anal fin straight, its origin nearer to pelvic fin origin than to caudal fin base or almost equal to it. Pectoral fin length shorter than head length or almost equal to it. With 3-4 scales between pectoral fin tip and pelvic fin origin. Pelvic fin origin nearer to pectoral fin origin than to anal fin origin or almost equal to it; 3-4 scales between pelvic fin tip and anal fin origin in male; 3-6 scales in female. Longest caudal ray 1.9-2.6 (2.2) times the shortest. Body covered with fairly large scales; breast covered with smaller scales. Dorsal fin base covered with scale sheath; pelvic fin base with a longitudinal axillary scale. Lateral line bending down in middle of body; only 1 pore on each lateral line scale. Gill rakers short. Pharyngeal teeth sharp and bent. Abdominal membrane black. In life, black and green on back and sides of body, belly reflecting white sheen. Tips of dorsal fin and caudal fin gray.

Etymology: From the Greek, *hetero*, other, and

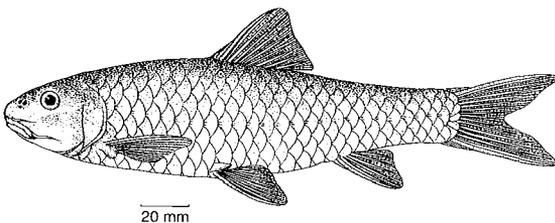


Fig. 2. Lateral view of *Barbodes heterostomus* sp. nov., holotype, KIZ 7801066, 195 mm SL, Nabang, Yinjiang, Yunnan.

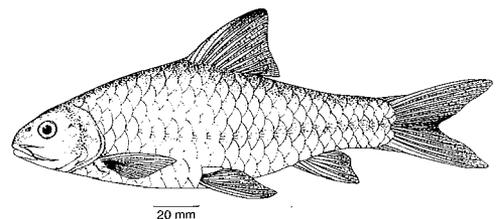


Fig. 3. Lateral view of *Barbodes baoshanensis* sp. nov., holotype, KIZ 839345, 163 mm SL, Baoshan, Yunnan.

stomus, mouth, with *heterostomus* alluding to the different morphology of the mouth between male and female.

Distribution: Occurs in Longchuanjiang and Dayingjiang (upper Irrawaddy), Yunnan.

***Barbodes baoshanensis* Chen and Yang sp. nov.**
(Fig. 3)

Barbodes (*Barbodes*) *wynaadensis* Wu, 1977: 238-239 (non Day, 1873).

Holotype: KIZ-839345, 163 mm SL, 1983, male, Baoshan, Yunnan.

Paratypes: KIZ-799347, 125 mm SL, 1979, male, Nujiang, Yunnan; KIZ-8310188, 174 mm SL, 1983, female, Longchuan, Yunnan; KIZ-6411006, 134 mm SL, male, 1964, Nanding River, Boshang, Lingcang, Yunnan.

Diagnosis: Last unbranched dorsal ray smooth with its upper 1/3-1/2 articulated; dorsal fin origin anterior to pelvic fin origin; sides of body with a dark longitudinal band; LR 23-28; gill rakers 13-14.

Description: D IV, 9; A III, 5; P I, 14-17; V I, 8; LR 23-28; P-LL 3.5; V-LL 2.5; Pred S 10; circumpeduncle scales 11-12. Pharyngeal teeth 3 rows, 2.3.5-5.3.2, 2.2.5-5.2.2, or 1.3.5.-5.3.1. Counts and proportional measurements are shown in Table 4.

Head moderately compressed, shorter than body depth. Snout blunt, mouth subterminal, arc-like; post-labial groove interrupted. Maxillary barbels extending posteriorly below anterior margin

of eye, intergape obviously shorter than interorbital width. Eye moderately large; interorbital width broad and convex, longer than jaw length. Barbels 2 pairs, rostral shorter, extending to anterior margin of eye; maxillary extending to posterior margin of eye, or near anterior margin of preopercle. With 4-5 rows of tubercles below eyes.

Dorsal fin origin slightly anterior to the vertical from pelvic fin origin. Last unbranched dorsal ray slightly strong and smooth, with its upper 1/3-1/2 articulated; almost equal to pectoral fin length; shorter than head length. Outer margin of dorsal fin concave; dorsal fin origin nearer to snout than to caudal fin base. Outer margin of anal fin straight, its origin nearer to pelvic fin origin than to caudal fin base or almost equal to it. With 2-3 scales between pectoral fin tip and pelvic fin origin. Pelvic fin origin nearer to anal fin origin than to pectoral fin origin; 2-3 scales between pelvic fin tip and anal fin base.

Body covered with fairly large scales; breast covered with smaller scales. Dorsal fin base covered with scale sheath, pelvic fin base with a longitudinal axillary scale. Lateral line bending down in middle of body; only 1 pore on each lateral line scale. Gill rakers short. Pharyngeal teeth sharp and bent. Abdominal membrane black. A dark longitudinal band along sides of body. Tips of dorsal fin and caudal fin gray.

Etymology: From its Chinese name of “Baoshan”, and its type locality Baoshan, Yunnan.

Table 1. Comparison of *Barbodes heterostomus* sp. nov., *B. hexagonolepis*, and *B. sp.*

	<i>B. heterostomus</i>	<i>B. hexagonolepis</i> ^a	<i>B. sp.</i> (Wu)
Lateral line scales	24 - 29	28 - 31	25 - 27
V-LL	2.5 - 3	2 - 2.5	2.5 - 3
P-V	2 - 4	–	1 - 2
L/S	1.9 - 2.6	–	3
Tubercle rows	3 - 6	–	3
Percentage of TL			
Body depth	3.7 - 4.8	5 - 5.5	3.2 - 3.4
Head length	4.1 - 6.0	5 - 5.5	4.0 - 4.5
Caudal peduncle length	7.0 - 9.6	5 - 5.5	4.7 - 6.3
Percentage of HL			
Snout length	2.8 - 5.5	5 - 6	2.9 - 3.1
Eye diameter	2.8 - 5.5	5 - 6	3.6 - 4.4
Snout length/ED	0.7 - 1.8	1.5 - 2	1.2 - 1.4
Interorbital width/ED	1.0 - 1.8	2.5	1.5 - 1.6
Gill rakers	13 - 19	–	11 - 12
HP-DN	< 1	< 1	= 1

^aThe data of *B. hexagonolepis* were cited from Day (1958).

Distribution: Occurs in Nujiang (upper Salween) and Longchuanjiang (upper Irrawaddy).

DISCUSSION

The specimens of *B. heterostomus* in Yunnan were once considered as *B. sp.* (Wu 1977) found in Motuo, Tibet. Both of them were once assigned to *B. hexagonolepis* (Chu and Chen 1989). However, *B. heterostomus* actually differs from both *B. sp.*

and *B. hexagonolepis*. The distributions of *B. heterostomus* and *B. sp.* do not overlap each other. *B. heterostomus* occurs in Longchuanjiang and Dayingjiang (upper Irrawaddy), Yunnan while *B. sp.* occurs in Motuo, Yaluzangbujiang, Tibet. Furthermore, *B. heterostomus* differs from *B. sp.* in scale number between pectoral fin and pelvic fin base, longest/shortest caudal ray, tubercle rows, body depth, caudal peduncle length, gill rakers, and length of hard part of last unbranched dorsal ray vs. distance from nostril to posterior margin of

Table 2. Comparison of *Barbodes baoshanensis* sp. nov. and *B. wynaadensis*

	<i>B. baoshanensis</i>	<i>B. wynaadensis</i> ^a
Lateral line scales	23 - 28	26 - 28
V-LL	2.5	2.5 - 3
Percentage of TL		
Body depth	3.6 - 4.2	4.3 - 5
Head length	4.9 - 5.2	4.8 - 5
Caudal peduncle length	7.6 - 8.4	5 - 5.5
Snout length/ED	1.1 - 1.4	1.5 - 2.0
Interorbital width/ED	1.7 - 2.0	1.8
Head length/ED	3.7 - 4.9	5
Dorsal fin base length/Body depth	0.4 - 0.5	0.8

^aThe data of *B. wynaadensis* were cited from Day (1958).

Table 3. Counts and proportional measurements of *Barbodes heterostomus* sp. nov.

	Holotype		Paratypes	
	KIZ 7801066	KIZ764231	KIZ7801064	KIZ7801062
Standard length (mm)	195	196	168	110
Sex	male	female	male	female
Dorsal fin rays	4, 9	4, 9	4, 9	4, 9
Anal fin rays	3, 5	3, 5	3, 5	3, 5
Pectoral fin rays	1,15	1,17	1,14	1,15
Pelvic fin rays	1, 8	1, 8	1, 8	1, 8
Lateral line scales	25	27	25	27
P-LL	3.5	3.5	3.5	3.5
V-LL	2.5	2.5	2.5	2.5
Predorsal scales	8	10	8	8
Circumpeduncle scales	12	12	12	12
Percentage of SL				
Body depth	3.5	3.5	3.1	3.2
Head length	4.4	4.2	4.2	4.4
Caudal peduncle length	6.5	6.5	5.6	6.1
Caudal peduncle depth	8.5	8.2	7.6	8.5
Percentage of HL				
Snout length	4.4	2.9	3.6	4.2
Eye diameter	3.7	3.9	3.6	2.8
Interorbital width	2.2	2.6	2.4	2.8

opercle (Table 1). So actually, *B. heterostomus* and *B. sp.* are distinct both in distribution and morphology.

The distributions of *B. heterostomus* and *B. hexagonolepis* do not overlap each other. *B. heterostomus* occurs in Longchuanjiang and Dayingjiang (upper Irrawaddy), Yunnan while *B. hexagonolepis* occurs in Brahmaputra, Assam, northeast India. Moreover, they differ in lateral line scale number, body depth, caudal peduncle length, snout length, eye diameter, and interorbital width (Table 1).

B. sp., found in Motuo, Tibet, is distributed in Yaluzangbujiang (upper Brahmaputra, India), suggesting *B. sp.* and *B. hexagonolepis* respectively occur in the upper and lower reaches of the same river. Both species differ in lateral line scale number, body depth, head length, snout length, eye diameter, interorbital width, and length of hard part of last unbranched dorsal ray (Table 1). Because the specimen of *B. hexagonolepis* from Brahmaputra, northeast India, was not available, further work is required to clarify the relationship between these 2 species.

The distributions of *B. baoshanensis* and *B. wynaadensis* do not overlap each other. *B. baoshanensis* occurs in Nujiang (upper Salween) and Longchuanjiang (upper Irrawaddy) while *B.*

wynaadensis occurs in Wynaad, south India. Moreover, both species differ in body depth, caudal peduncle length, snout length, head length, and dorsal fin base length (Table 2). Their distribution and morphology are clearly distinct.

Chaudhuri (1911) once reported *B. cogginii* from Erhai. However, there are only 2 species, *B. exiguus* and *B. daliensis*, which can be found in Erhai now. Chu and Chen (1989) considered that *B. cogginii* was a synonym of *B. exiguus* or *B. daliensis*, and it was more similar to *B. exiguus*. Following the opinion of Chu and Chen (1989), we do not include *B. cogginii* in species identification key appeared in this paper.

Chu and Chen (1989) considered *B. parvus* to be a synonym of *Barbus colemani* Fowler, 1937 by having the same gill raker number, a black blotch on the tip of the dorsal fin, and similar body size except for the difference in pharyngeal teeth which are 2 rows in *B. colemani* and 3 rows in *B. parvus*. However, this difference is of doubtful significance, since all *Barbodes* species have 3 rows of pharyngeal teeth. In fact, our finding in the present work reveals slight differences from the above: (1) lateral line scales 29, scales above the lateral line 5, scales below it 3 or 2.5 in *B. colemani* against 31-33, 6, and 2.5-3 respectively in *B. parvus*; (2) last unbranched dorsal ray osseous and

Table 4. Counts and proportional measurements of *Barbodes baoshanensis* sp. nov.

	Holotype	Paratypes		
	KIZ 839345	KIZ 8310188	KIZ 799347	KIZ 6411006
Standard length (mm)	163	174	126	134
Sex	male	male	male	male
Dorsal fin rays	4, 9	4, 9	4, 9	4, 9
Anal fin rays	3, 5	3, 5	3, 5	3, 5
Pectoral fin rays	1,15	1,14	1,17	1,15
Pelvic fin rays	1, 7	1, 8	1, 8	1, 8
Lateral line scales	24	28	23	24
P-LL	3.5	3.5	3.5	3.5
V-LL	2.5	2.5	2.5	2.5
Predorsal scales	10	10	10	10
Circumpeduncle scales	12	11	12	12
Percentage of SL				
Body depth	2.7	2.9	2.9	3.4
Head length	4.0	4.0	3.8	4.1
Caudal peduncle length	5.8	6.7	6.3	6.7
Caudal peduncle depth	7.1	7.6	7.4	7.9
Percentage of HL				
Snout length	3.2	3.4	3.3	3.3
Eye diameter	4.6	4.9	3.7	3.7
Interorbital width	2.3	2.8	2.4	2.4

nonserrated posteriorly in *B. colemani* against osseous and serrated posteriorly in *B. parvus*; and (3) barbels shorter than eye diameter in *B. colemani*, but longer than eye diameter in *B. parvus*. Furthermore, Smith (1945) examined 1 specimen of *B. colemani* collected in the gorge of the Mechem, Thailand, and found that this specimen also had only 2 rows of pharyngeal teeth. Although Smith considered that this specimen was "a defect or an abnormality, as the teeth in this genus are normally triserial", the 2 specimens were collected from different places and times. So this phenomenon could not be an accident. The distributions of *B. parvus* and *B. colemani* do not overlap each other. *B. parvus* occurs in Jinghong, Yunnan, China while the type of *B. colemani* occurs in Mepoon, central Thailand. So we consider that *B. parvus* obtained in China is not a synonym of *B. colemani* in Thailand, and may represent a distinct species.

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REFERENCES

- Anderson J. 1878. Anatomical and zoological researches: comprising an account of zoological results of the two expeditions to western Yunnan in 1868 and 1875. London: Quaritch. 1. Fishes. pp. 861-869, pl. 529.
- Bleeker P. 1859. Conspectus systematis cyprinorum. Nat. Tijd. Neder-Indie **20**: 431.
- Chaudhuri BL. 1911. Contribution to the fauna of Yunnan based on collections made by J. Coggin Brown 1909-1910. Rec. Indian Mus. **6**: 13-24.
- Chu XL, YR Chen, eds. 1989. The fishes of Yunnan, China. Part I Cyprinidae. Beijing: Science Press, pp.180-203. (in Chinese).
- Day F. 1873. On some new fishes of India. J. Linn. Soc. (Zool.) **11**: 524-530.
- Day F. 1958. The fishes of India. London: W. Dawson & Sons., pp. 564, 569.
- Fowler HW. 1937. Zoological results of the third de Schaunsee Siamese expedition. Part VIII, -Fishes obtained in 1936. Proc. Acad. Nat. Sci. Philad. **89**: 197.
- McClelland J. 1839. Indian Cyprinidae. Asiatic Res. **2**: 217-465.
- Norman JR. 1923. Three new fishes from Yunnan, collected by Professor J. W. Gregory, FRS. Ann. Mag. Nat. His. **11**: 561-563.
- Smith HM. 1945. The fresh-water fishes of Siam, or Thailand. Smith. Inst. U.S. Nat. Mus. Bull. **188**: 179-180.
- Tchang TL. 1936. Notes on a new *Barbus* from Yunnan. Bull. Fan-Mem. Inst. Biol. **7**: 63-64.
- Tchang TL. 1962. Name list of fishes in Xishuangbanna, Yunnan, and a new species. Acta Zool. Sinica **14**: 96-97. (in Chinese).
- Wang YH, DD Zhuan, LC Gao. 1982. Description on three new barbin fishes from lake Fuxianhu, Yunnan Province. Acta Zootaxonomica Sinica **7**: 216-222. (in Chinese).
- Wu XW. 1977. The Cyprinid fishes of China. Vol. 2. Shanghai: Scientific Technical Press, pp. 236-252. (in Chinese).

雲南四須魮屬 (*Barbodes*) 魚類之分類整理及兩新種描述

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本文對雲南的四須魮屬魚類進行了分類整理，並描述了兩個新種。標本來自中國科學院昆明動物研究所的館藏標本。標本測量依據褚新洛和陳銀瑞 (1989) 的方法。異口四須魮的特徵為：背鰭不分枝鰭條光滑，上端 1/3 分節；背鰭起點先於腹鰭起點；體側不具黑色縱帶；側線鱗 24-29，外側鰓耙數 13-19，尾鰭最長鰭條長度是最短鰭條的 2 倍；分布於龍川江和大盈江（伊洛瓦底江上游）。保山四須魮的特徵為：背鰭末根不分枝，鰭條光滑，上端 1/3-1/2 分節；背鰭起點先於腹鰭起點；體側沿側線有一條黑色縱帶；側線鱗 23-28，外側鰓耙數 13-14，分布於怒江（薩爾溫江上游）和龍川江。

關鍵詞：四須魮屬，分類，新種。

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