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A new freshwater goby of *Rhinogobius* Gill, 1859 (Teleostei, Gobiidae) from South Central Vietnam

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Abstract

A new species of freshwater gobiid fish of genus *Rhnogobius* Gill, 1859, was collected from the Cai Phan Rang River basin, South Central Vietnam. *Rhinogobius phuocbinhensis* n. sp. can be well distinguished from other congeners by its specific patterns of coloration and meristic features: (1) fins rays: second dorsal fin rays I/8; anal fin rays I/8; pectoral fin rays modally 19; (2) squamation: longitudinal scale series 26–27 (modally 27); perdorsal scales 9–11 (modally 9); vertebral count 26; and (3) specific colouration pattern: densely-set of small blackish brown spots on cheek and interorbital region to snout in male and many small blackish brown dots in first dorsal fin of both sexes. A brief morphological comparison of this new species with related species would be also addressed.

Key words: Cai Phan Rang River basin, fish biodiversity, new species, Ninh Thuan Province, taxonomy

Introduction

Gobioid fishes are the very important components of benthic freshwater fish fauna in East Asia. The freshwater goby, *Rhinogobius* Gill, 1859, is widely distributed on several islands of the Western Pacific including Japan (Akihito *et al.* 1984, 1993, 2002; Masuda *et al.* 1989; Suzuki *et al.* 2011), Taiwan (Aonuma & Chen 1996; Chen & Shao 1996; Lee & Chang 1996; Chen *et al.* 1998; Chen & Fang 1999; Chen 2009), Hainan (Wu & Ni 1985; Chen *et al.* 2002; Chen & Miller 2013), and Philippines (Herre 1927), and also continental Asia, in Russia, Korea, China, Vietnam, Laos, Cambodia, and Thailand (Chu & Wu 1965; Zheng & Wu, 1985; Chen & Miller 1998; Chen *et al.*, 1999a–c, Chen & Kottelat 2000, 2003, 2005; Chen & Fang 2006; Huang & Chen 2007; Li & Zhong 2007; Li *et al.* 2007; Chen *et al.* 2008; Wu *et al.* 2009; Chen & Miller 2008, 2013; Chen *et al.* 2022).

The life history of *Rhinogobius* species include non-diadromous, landlocked, fluvial species (Mizuno 1960; Mizuno & Goto 1987; Iguchi & Mizuno 1991; Akihito *et al.* 1993, 2002) as well as lake-river migratory species and lentic species (Takahashi & Okazaki 2002).

At present, the author estimates that there are at least over 90 species are known in East and Southeast Asia and some of them still need formal description (Chen & Kottelat 2003, 2005; Chen & Fang 2006; Chen *et al.* 2008; Yang *et al.* 2008; Chen & Miller 2013).

In central Vietnam, very few explorations of freshwater gobiid fauna ever been formally documented. Chen and Kottelat (2005) ever found the four new fluvial species with high vertebral count in northern Vietnam. However, there are some undescribed species of fluvial species which need to be explored in detail in the near future.

In the field survey at Phuoc Binh National Park of second and third authors (ATN & QTH) recently, an undescribed species of *Rhinogobius* was found and collected from the Cai Phan Rang River basin, Ninh Thuan Province, Vietnam. The aim of this paper is documented a new species collected from south central Vietnam with

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normal vertebral count 26 as typical amphidromous species unlike the new finding from northern Vietnam. A brief comparison of this new species with nearby amphidromous species would be also addressed in this paper.

Materials and Methods

The type specimens of the new goby were collected by hand-net and cast-net. All counts and measurements were made from specimens finally preserved in 70% ethanol. Morphometric methods follow Miller (1988) and meristic methods follow Akihito *et al.* (1984), Chen & Shao (1996) and Chen *et al.* (1999b). The terminology of cephalic sensory canals and free neuromast organs (sensory papillae) is from Wongrat & Miller (1979), based on Sanzo (1911). Meristic abbreviations are as follows: A = anal fin; C = caudal fin; D1 = first dorsal fin; D2 = second dorsal fin; LR = longitudinal scale rows; P = pectoral fin; PreD = predorsal scales; SDP = scale series from origin of first dorsal fin to upper pectoral fin origin; TR = transverse scale series from second dorsal to anal fins; V = pelvic fin; VC = vertebral count. All fish lengths are expressed by standard length (SL).

The type specimens of the new goby are deposited in the Fish collection of Southern Institute of Ecology, Ho Chi Minh City (SIE:Ich) and Pisces collection of National Taiwan Ocean University, Keelung (NTOUP). The comparative materials of amphidromous goby, *Rhinogobius leavelli* (Herre, 1935) is same as listed in Chen *et al.* (2024).

Systematics

***Rhinogobius phuocbinhensis* new species**
(Cá bống đá Phước Bình, 佛賓吻鰕虎)
(Figs. 1–4)

Material examined

Holotype.—SIE-Ich 2310131, 38.9 mm SL, a hill stream of Cai Phan Rang River basin, the Phuoc Binh National Park, Ninh Thuan Province, Vietnam, Coll. Q.T. Huynh *et al.*, 13 Oct. 2023.

Paratypes.—NTOUP-2023-10-201, 5 specimens, 34.7–40.9 mm SL, other data same as holotype.

Diagnosis

Rhinogobius phuocbinhensis n. sp. can be well distinguished from other congeners by its specific patterns of coloration and meristic features: (1) fins rays: second dorsal fin rays I/8; anal fin rays I/8; pectoral fin rays modally 19; (2) squamation: longitudinal scale series 26–27 (modally 27); perdorsal scales 9–10 (modally 9); vertebral count 26; and (3) specific colouration pattern: densely-set of small blackish brown spots on cheek and interorbital region to snout in male and many small blackish brown dots in first dorsal fin of both sexes.

Description

Body proportions in Table 1. Body cylindrical anteriorly, compressed posteriorly. Head rather large, somewhat depressed in male. Eye large, dorsolateral. Snout pointed. Cheek somewhat fleshy in male. Lips thick. Mouth oblique, but small, rear edge not yet extending to vertical of anterior margin of eye. Both jaws with 3–4 rows of conical teeth, outer jaws enlarged. Tongue margin rounded. Anterior nostril in short tube and posterior nostril round. Gill opening restricted, extending ventrally near vertical midline of opercle. Vertebral count 10 + 16 = 26 (n=6).

TABLE 1. Morphometry of *Rhinogobius phuocbinhensis* from south central Vietnam.

Type	Holotype	Paratypes		
Sex	M	F	F	F
Standard length	38.9	40.8	36.7	36.4
% in SL				
Head length	33.7%	29.4%	30.0%	28.1%
Predorsal length	42.3%	39.0%	38.5%	38.2%
Snout to 2nd dorsal fin origin	60.9%	58.2%	59.1%	57.8%
Snout to anal fin origin	62.9%	61.7%	61.0%	62.0%
Snout to anus	59.3%	58.1%	57.2%	58.0%
Prepelvic length	31.7%	29.0%	30.4%	28.7%
Caudel peduncle length	13.7%	12.0%	13.7%	13.0%
Caudal peduncle depth	16.2%	25.8%	32.7%	28.0%
First dorsal fin base	20.5%	19.9%	18.3%	18.1%
Second dorsal fin base	16.8%	17.9%	17.8%	18.9%
Anal fin base	15.1%	14.3%	15.7%	14.8%
Caudal fin length	25.3%	24.8%	22.8%	23.8%
Pectoral fin length	24.4%	23.4%	22.7%	22.7%
Pelvic fin length	16.6%	15.2%	15.3%	15.8%
Body depth of pelvic fin origin	20.8%	19.3%	18.8%	19.5%
Body depth of anal fin origin	23.8%	19.1%	20.0%	19.0%
Body width of anal fin origin	16.9%	13.2%	15.5%	13.7%
Pelvic fin origin to anus	29.4%	28.1%	28.5%	29.8%
% in HL				
Snout length	29.8%	34.3%	33.4%	33.0%
Eye diameter	17.9%	25.4%	24.2%	25.4%
Postorbital length	40.8%	48.4%	45.1%	45.5%
Cheek depth	23.4%	28.7%	26.5%	27.1%
Head width in upper gill-opening	34.9%	50.3%	45.1%	52.1%
Head width in maximum	58.8%	74.8%	67.9%	78.8%
Fleshy interorbital width	15.1%	23.1%	19.0%	21.2%
Bony interorbital width	5.7%	8.3%	7.9%	7.2%
Lower jaw length	26.2%	29.3%	28.4%	29.3%

Fins. D1 VI, D2 I/8; A I/8; P 18–19 (modally 19); V I/5+I/5. D1 rounded, 3rd and 4th rays longest, with rear tip while depressed extending to vertical of 2nd branched ray of D2 origin in male, but not reaching the point in female. Origin of A inserted below around first branched ray of D2. The rear tips of D2 and A rays when depressed fall well short of procurrent rays of C. P moderate large and oblong, its rear tip near reaching vertical line through anus. V rounded, spinous rays with somewhat pointed membrane lobe. C elliptical, rear edge rounded.

Scales. Body with moderately large ctenoid scales, anterior region of predorsal area naked; posterior dorsal area and belly cycloid. LR 26–27 (modally 27); TR 9–10 (modally 9); PreD 9–10 (modally 9); and SDP 6–7 (modally 6). Head and prepelvic region naked. Anterior edge of midpredorsal squamation reaching the midline of upper end of gell-opening.

FIGURE 1. Fresh catch of alive *Rhinogobius phuocbinhensis* n. sp., Cai Phan Rang River basin, south central Vietnam. (upper one: male; lower one: female).

Head lateral-line system (Fig. 2)

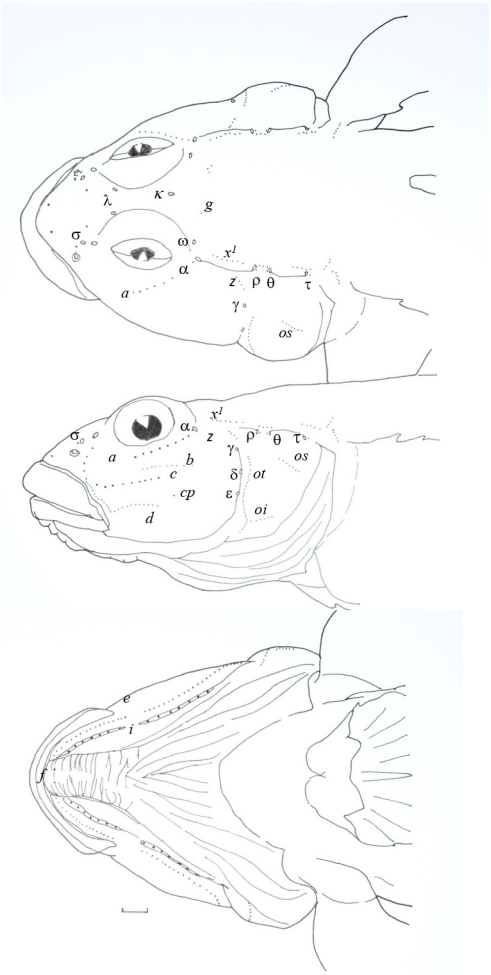

FIGURE 2. Head lateral-line system of *Rhinogobius phuocbinhensis*, holotype, 38.9 mm SL, Cai Phan Rang River basin, south central Vietnam.

Canals: Nasal extension of anterior oculoscapular canal with terminal pore σ located in between anterior and posterior nostrils. The gap between two oculoscapular canals is less than the length of posterior oculoscapular canal. Anterior interorbital sections of oculoscapular canal with paired poreλ. A single pore κin near rear of interorbital region. Pore ω present near posterior, dorsal margin of eye. Lateral section of anterior oculoscapular canal with pore α and terminal pore ρ. Posterior oculoscapular canal with two terminal pores θ and τ. Preopercular canal with three pores γ, δ and ε.

Sensory papillae: Row *a* extending froward beyond vertical of anterior margin of orbit. Row *b* length less than eye diameter. Rows *c*, *d* longer. A single *cp* papilla. Row *f* paired. Anterior edge of row *oi* almost connected to lower region of row *ot*.

Colouration of fresh preserved (Figs. 1, 3–4)

Body light brown to yellowish brown. Side of body with 6–8 major grayish brown blotches with a median row of blackish brown dots. The blotches with several tiny black to blackish brown spots. Dorsal region of body with 5–6 major grayish blotches. Caudal fin base with a blackish brown crescent range of black dots. Head light brown to yellowish brown. Dorsal side of snout with a pair of blackish brown stripes united to snout tip, but lacking any of infraorbital stripe or bars. Lips and dorsal snout grayish brown to light brown. Cheek light brown with very densely set of blackish brown spots in male but yellow brown spotless in female. Branchiostegal membrane grayish and spotless in both sexes.

First dorsal fin translucent with 5–7 horizontal rows of blackish brown dots. Its membrane with a grayish spot in front of second spines. Second dorsal fin with translucent with 8–10 oblique rows of blackish brown dots with a distal grayish brown margin. Anal fin gray entirely. Pectoral fin translucent with several vertical rows of small brownish black dots from anterior part of fin membrane to the base. Its basal region with a somewhat square mark un upper side. Caudal fin translucent with 7–8 somewhat vertical rows of grayish black curves or waving lines. Lower part of fin membrane with a grayish region. Pelvic fin pale to gray and spotless.

FIGURE 3. *Rhinogobius phuocbinhensis*, holotype (upper one), 38.9 mm SL; paratype, 40.9 mm SL, Cai Phan Rang River basin, south central Vietnam.

Etymology

The specific name, *phuocbinhensis*, refers to the collecting type locality: the small tributary in the Cai Phan Rang River basin of Phuoc Binh National Park, Ninh Thuan, Vietnam.

FIGURE 4. Head pigmentation pattern of *Rhinogobius phuocbinhensis*, holotype (upper one), 38.9 mm SL; paratype (lower one), 40.9 mm SL, Cai Phan Rang River basin, south central Vietnam.

Distribution

This new species is, thus far, only found in the hill-stream of the Cai Phan Rang River, south central Vietnam. However, since it belongs to amphidromous species, is rather possible to find the species inhabiting the nearby river basins.

Remarks

This new species, *Rhinogobius phuocbinhensis*, also rather similar to *R. leavelli* Herre, 1935 which mainly occurring in Hainan islands as well as southern region of mainland China than any other congeneric species. However, the new species can be well separate from *R. leavelli* by the following features: (1) predorsal scales: modally 9–10 (modally 9) vs. 10–16 (usually 13–14); (2) longitudinal scale rows: 26–27 vs. 32–34; (3) caudal fin base: tiny brown curve vs. conspicuous large black curve; and (4) branchiotegal membrane: gray and spotless in male vs. several orange stripes or bars in male. Furthermore, the unpublished DNA molecular data represents that the very distinct divergence of mitogenetic D-loop sequences can well separate the two discrete and highly possible as allopatric species (Chen, unpublished data).

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References

Akihito, Iwata, A., Sakamoto, K. & Ikeda, Y. (1993) Suborder Gobioidei. *In*: Nakabo, T. (Ed.), *Fishes of Japan with pictorial keys to the species*. Tokai University Press, Tokyo. pp. 997–1392. [in Japanese]

Akihito, Prince, Hayashi, M., & Yoshino, T. (1984) Suborder Gobioidei. *In*: Masuda, H., Amaoka, K., Araga, C., Uyeno, C.T. & Yoshino, T. (Eds.), *The Fishes of Japanese Archipelago*. Tokai University Press, Tokyo, pp. 228–289.

Akihito, Sakamoto, K., Ikeda, Y. & Sugiyama, K. (2002) Suborder Gobioidei. *In*: Nakabo, T. (Ed.), *Fishes of Japan with pictorial keys to the species, 2nd English Edition*. Tokai University Press, Tokyo, pp. 1139–1310.

Aonuma, Y. & Chen, I-S. (1996) Two new species of *Rhinogobius* (Teleostei: Gobiidae) from Taiwan. *Journal of Taiwan Museum*, 49, 7–13.

Chen, I-S. (2009) *The Indicator Species of Riverine Fishes in Taiwan, Vol. II, Diadromous Fishes*. National Taiwan Ocean University Press, Keelung. [in Chinese]

Chen, I-S., K.Y. Chen & S.C. Wang (2024) A new freshwater goby of *Rhinogobius* Gill, 1859 (Teleostei, Gobiidae) from the Jangshi basin, Fujian Province, southeastern China. *Zootaxa*, 0000, 000-000.

Chen, I-S., Cheng, Y.H. & Shao, K.T. (2008) A new species of *Rhinogobius* (Teleostei: Gobiidae) from the Julongjiang Basin in Fujian Province, China. *Ichthyological Research*, 55, 335–343.
https://doi.org/10.1007/s10228-008-0045-2

Chen, I-S. & Fang, L.S. (1999) *The freshwater and estuarine fishes of Taiwan.* National Museum of Marine Biology and Aquarium Press, Pingtung, 296 pp. [in Chinese]

Chen, I-S. & Fang, L.S. (2006) A new species of *Rhinogobius* (Teleostei: Gobiidae) from the Hanjiang basin, in Guangdong Province, China. *Ichthyological Research*, 53, 247–253.
https://doi.org/10.1007/s10228-006-0342-6

Chen, I-S., Kottelat, M. & Miller, P.J. (1999a) Freshwater gobies of the genus *Rhinogobius* from the Mekong basin in Thailand and Laos, with descriptions of three new species. *Zoological Studies*, 38, 19–32.

Chen, I-S. & Kottelat, M. (2000) *Rhinogobius maculicervix*, a new species of goby from the Mekong basin in northern Laos. *Ichthyological Explorations of Freshwaters*, 11, 81–87.

Chen, I-S. & Kottelat, M. (2003) Three new freshwater gobies of the genus *Rhinogobius* (Teleostei: Gobiidae) from northeastern Laos. *The Raffles Bulletin of Zoology*, 51, 87–95.

Chen, I-S. & Kottelat, M. (2005) Four new freshwater gobies of the genus *Rhinogobius* (Teleostei: Gobiidae) from northern Vietnam. *Journal of Natural History*, 39, 1407–1429.
https://doi.org/10.1080/00222930400008736

Chen, I-S. & Miller, P.J. (1998) Redescription of *Gobius davidi* (Teleostei:Gobiidae) and comparison with *Rhinogobius lentiginis*. *Cybium*, 22, 211–221.

Chen, I-S. & Miller, P.J. (2008) Two new species of freshwater gobies of genus *Rhinogobius* (Teleostei: Gobiidae) in southern China, around the northern region of the South China Sea. *The Raffles Bulletin of Zoology, Supplement* 19, 225–232.

Chen, I-S. & Miller, P.J. (2013) A new freshwater goby of *Rhinogobius* (Teleostei: Gobiidae) from Hainan Island, southern China. *Journal of Marine Science and Technology, Supplement* 21, 124–129.

Chen, I-S., Miller, P.J. & Fang, L.S. (1998) A new species of freshwater goby from Lanyu (Orchid Island), Taiwan. *Ichthyological Explorations of Freshwaters*, 9, 255–261.

Chen, I-S., Miller, P.J., Wu, H.L. & Fang, L.S. (2002) Taxonomy and mitochondrial sequence evolution in non-diadromous species of *Rhinogobius* (Teleostei: Gobiidae) of Hainan Island, southern China. *Marine and Freshwater Research*, 53, 259–273.
https://doi.org/10.1071/MF01167

Chen, I-S. & Shao, K.T. (1996) A taxonomic review of the gobiid fish genus *Rhinogobius* Gill, 1859, from Taiwan with descriptions of three new species. *Zoological Studies*, 35, 200–214.

Chen, I-S., Wang S.C., Chen, K.Y. & Shao, K.T. (2022) A new freshwater goby of *Rhinogobius lingtongyanensis* (Teleostei, Gobiidae) from the Dongshi river basin, Fujian Province, southeastern China. *Zootaxa*, 5189, 018–028.
https://doi.org/10.11646/zootaxa.5189.1.5

Chen, I-S., Wu, H.L. & Shao, K.T. (1999b) A new species of *Rhinogobius* (Teleostei:Gobiidae) from Fujian Province, China. *Ichthyological Research*, 46, 171–178.
https://doi.org/10.1007/BF02675435

Chen, I-S., Yang, J.X. & Chen, Y.R. (1999c) A new species of *Rhinogobius* (Teleostei: Gobiidae) from the Honghe Basin,Yunnan Province, China. *Acta Zoologica Taiwanica*, 10, 45–52.
Chu, Y.T. & Wu, H.L. (1965) A preliminary study of the zoogeography of gobioid fishes of China. *Oceanography and Liminology, Sinica*, 7, 122–140. [in Chinese]
Gill, T.N. (1859) Notes on a collection of Japanese fishes by Dr. J. Morrow. *Proceedings of Academy of Natural Sciences Philadelphia*, 11, 144–159.
Herre, A.W.C.T. (1927) Gobies of Philippines and China Sea. *Monograph of Burraeu Science Manila*, 2, 1–352.
Herre, A.W.C.T. (1935) Two new species of *Ctenogobius* from South China (Gobiidae). *Lingnan Science Journal, Canton*, 14 (3), 395–397.
Huang, S.P. & Chen, I-S. (2007) Three new species of *Rhinogobius* Gill, 1859 (Teleostei: Gobiidae) from the Hanjiang basin, southern China. *The Raffles Bulletin of Zoology, Supplement* 14, 101–110.
Iguchi, K. & Mizuno, N. (1991) Mechanism of embryonic drift in the amphidromous goby, *Rhinogobius brunneus*. *Environmental Biology of Fishes,* 31, 295–300.
https://doi.org/10.1007/BF00000694
Lee, S.C. & Chang, L.T. (1996) A new goby, *Rhinogobius rubromaculatus* (Teleostei: Gobiidae), from Taiwan. *Zoological Studies*, 3, 30–35.
Li, F., Zhong, J.S. & Wu, H.L. (2007) A new species of the genus *Rhinogobius* from Fujian Province, China (Teleostei: Gobiidae). *Acta Zootaxanomica Sinica*, 3, 981–985. [in Chinese]
Masuda, Y., Ozawa, T. & Enami, S. (1989) Genetic differentiation among eight color types of the freshwater goby, *Rhinogobius brunneus*, from western Japan. *Japanese Journal of Ichthyology*, 36, 30–41.
https://doi.org/10.1007/BF02905670
Miller, P.J. (1998) New species of *Coryrogobius*, *Thorogobius*, and *Wheelerigobius* from West Africa (Teleostei: Gobiidae). *Journal of Natural History,* 22, 1245–1262.
https://doi.org/10.1080/00222938800770761
Mizuno, N. (1960) Description of a new freshwater goby from Japan. *Memoirs of the College of Science, University of Kyoto*, (Ser. B), 27, 117–119.
Mizuno N. & Goto, A. (1987) *Japanese freshwater fishes, and their distribution, variation and speciation*. Tokai University Press, Tokyo, 244 pp. [in Japanese]
Sanzo, L. (1911) Distribuzione delle papille cutanee (organi ciatiforme) e suo valore sistematico nei gobi. *Mitteilungen aus der zoologischen Sation zu Neapel*, 20, 249–328.
Suzuki, T., Chen, I.-S. & Senou, H. (2011) A new species of *Rhinogobius* Gill, 1859 (Teleostei: Gobiidae) from the Bonin islands, Japan. *Journal of Marine Science and Technology*, 19, 693–701.
https://doi.org/10.51400/2709-6998
Takahashi, S. & Okazaki, T. (2002) A new lentic form of the Yoshinobori species complex, *Rhinogobius* spp. from Lake Biwa, Japan, compared with lake-river migrating *Rhinogobius* sp. OR. *Ichthyological Research*, 49, 333–339.
https://doi.org/10.1007/s102280200049
Wongrat, P. & Miller, P.J. (1991) The innervation of head neuromast rows in eleotridine gobies (Teleostei: Gobioidei). *Journal of Zoology*, 225, 27–42.
https://doi.org/10.1111/j.1469-7998.1991.tb03799
Wang, S.C. & Chen, I-S. (2022) A new freshwater goby, *Rhinogobius lianchengensis* (Teleostei: Gobiidae) from the Minjiang river basin, Fujian Province, China. *Zootaxa*, 5189, 045–056.
https://doi.org/10.11646/zootaxa.5189.1.7
Wu, H.L. & Ni, Y. (1985) Gobiidae. *In*: Anonnymous (Ed.), *The freshwater and estuarine fishes of Hainan Island*. Guangdong Science and Technology Press, Guangzhou, pp. 259–314. [in Chinese]
Wu, H.L., Zhong, J.S. & Chen, I-S. (2009) Taxonomic research of the gobioid fishes (Perciformes: Gobioidei) in China. *Korean Journal of Ichthyology*, 21, 63–72.
Yang, J.Q., Wu, H.L. & Chen, I-S. (2008) A new species of *Rhinogobius* (Teleostei: Gobiidae) from Feiyunjiang basin in Zhejiang Province, China. *Ichthyological Research*, 55, 379–385.
https://doi.org/10.1007/s10228-008-0076-8
Zheng, M.L. & Wu, H.L. (1985) A study of freshwater gobiid fishes of Zhejiang Province, China, with descriptions of two new species. *Acta Zootaxanomica Sinica*, 10, 328–333.