

A New Species of *Euchiloglanis* Regan, 1907 (Actinopterygii: Sisoridae) from Vietnam

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Abstract: A new species of sisorid catfish of the genus *Euchiloglanis* is described from the Gam River, a tributary of the Red River in northern Vietnam. *Euchiloglanis nami* sp. n. differs from all the species placed in *Euchiloglanis* and *Chimarrichthys* by having elongated papillae on the ventral part of maxillary barbell. *Euchiloglanis nami* is distinguished from *E. longibarbatus* by having a wider premaxillary tooth band without indentation and the tip of the maxillary barbell reaching pectoral fin origin. The new species differs from *E. davidi* and *E. kishinouyei* by the depth of the caudal peduncle equal to 20.26–27.40 % of the caudal-peduncle length. It also differs from *E. dorsoarcus* by the anal-fin position being closer to the caudal-fin base than to the pelvic fin. From *E. phongthoensis*, it differs by the distance from the adipose-fin origin to the dorsal-fin insertion close to 50 % of the length of the adipose-fin base. In addition, *E. nami* differs from *E. longus* by having a wider premaxillary tooth band without indentation, shorter caudal peduncle (20.7 % SL), higher caudal peduncle depth (5.0 % SL), shorter distance between dorsal-fin insertion to adipose-fin origin (14.8 % SL), shorter distance from snout to adipose-fin origin (57.4 % SL), shorter pelvic fins length (15.9 % SL) reaching the anus or a little beyond anus, longer adipose-fin base length (33.2 % SL) and narrower interorbital width (24.6 % SL). The new species is the first record of the genus *Euchiloglanis* in the Gam-Lo River system and is the third species in the genus from Vietnam.

Key words: *Euchiloglanis nami* sp. n., new species, Glyptosterninae, Black River, Gam River

Introduction

The usage of the generic names *Chimarrichthys* Sauvage, 1874 and *Euchiloglanis* Regan, 1907 (Siluriformes: Sisoridae: Glyptosterninae) for the same genus-group taxon has been controversial (NG & JIANG 2015, THONI & GURUNG 2018). KOTTELAT (2013) and KANG et al. (2016) proposed the name *Euchiloglanis* to be replaced by the senior

synonym *Chimarrichthys*, thus *Euchiloglanis longus* Zhou, Li & Thomson, 2011 was renamed as *Chimarrichthys longus* (Zhou, Li & Thomson, 2011) (KOTTELAT 2013). FERRARIS (2007) proposed the junior synonym *Euchiloglanis* to be considered valid due to its prevailing usage compared to *Chimarrichthys*. Furthermore, the generic name *Chimarrichthys* is currently used for three species (*C. davidi*, *C. kishinouyei* and *C. longibarbatus*) re-

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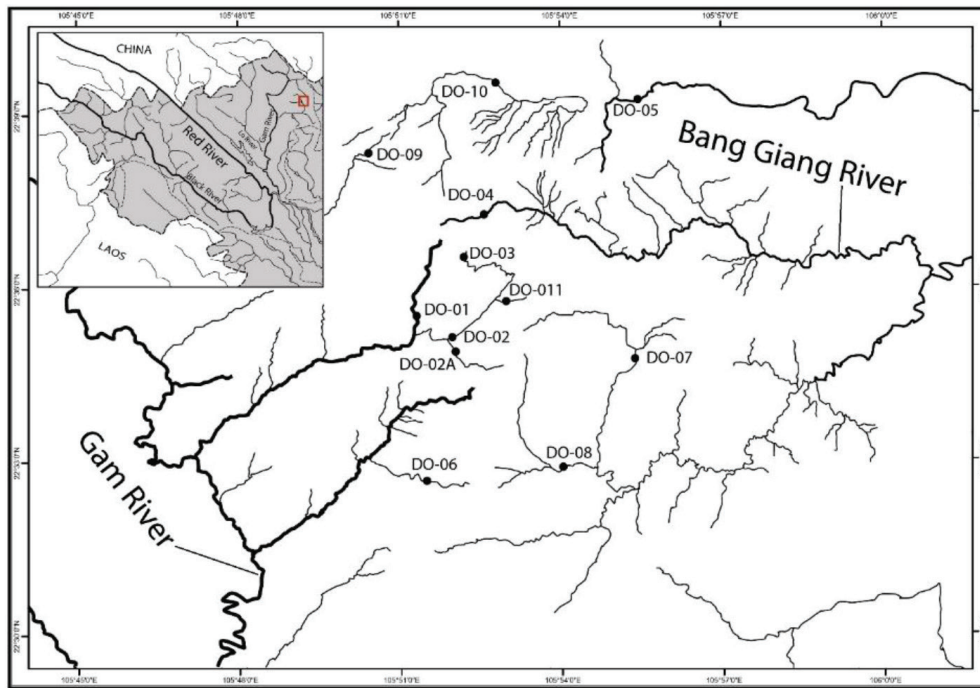


Fig. 1. Map showing collection site of *Euchiloglanis nami* sp. n. in Phia Oac-Phia Den National Park, northern Vietnam.

stricted to the upper Yangtze River in the Hengduan Mountain Region of China (ZHOU et al. 2011a). Therefore, in the present study, although species placed in both *Chimarrichthys* and *Euchiloglanis* were compared, the latter generic name was used for species distributed in the Red River system. *Euchiloglanis* spp. (and *Chimarrichthys* spp.) are characterised by having premaxillary tooth bands that extend posteriorly (CHU 1981). Prior to the present study, six species were recognised, i.e., *E. davidi*, *E. kishinouyei*, *E. longibarbus*, *E. longus* (KOTTELAT 2013), *E. phongthoensis* and *E. dorsoarcus* (NGUYEN 2005).

The Gam River is one of the largest tributaries, which is located in the Red River basin in the opposite side to the Black River (Da River), where three species of *Euchiloglanis* have been recorded (NGUYEN 2005, NGUYEN et al. 2019, ZHOU et al. 2011a). In Vietnam, the genus *Euchiloglanis* is represented by two species, *E. phongthoensis* and *E. dorsoarcus*, which are distributed in the Da River (NGUYEN 2005, NGUYEN et al. 2019). During two surveys in the Phia Oac-Phia Den National Park in Cao Bang Province, seven specimens were collected at one sampling site in the Gam River and identified as *Euchiloglanis* (CHU 1981). Based on morphology, the present study described these specimens as the new species *E. nami* sp. n.

Materials and Methods

The field surveys were carried out from 20th to 27th May 2020 and from 5th to 12th May 2021 in the Phia Oac-Phia Den National Park in Cao Bang Province, northern Vietnam. Sampling was conducted in two river systems: stations DO.04, DO.05, DO.07, DO.08, DO.09, DO.10 in the Bang Giang River flowing into China, while the rest of the stations belonged to the Gam River (Fig. 1). Fish samples were collected by a hand net. Electro-fishing provided by fishers was employed in case of necessity at some stations. Of these sampling sites, specimens of *Euchiloglanis* were collected at DO.02 in the Gam River, a tributary of the Red River (Fig. 1). Measurements and counts were taken from the left side of each specimen. Measurements were made point-to-point to the nearest 0.1 mm using a calliper and expressed as a percentage of standard length (SL). Counts and observations were made under a stereomicroscope. Measurements and counts followed KANG et al. (2016). Subunits of the head were presented as proportions of head length (HL). Additionally, the distance from the pectoral-fin origin to the pelvic-fin origin (Pt-Pl) and the distance from the pelvic-fin origin to the anus (Pl-A) were measured (ZHOU et al. 2011a). All specimens were preserved in Museum of Biol-



Fig. 2. *Euchiloglanis nami* sp. n., HNUE-F00283, holotype, 142.3 mm SL; Phia Oac-Phia Den National Park; Cao Bang Prov., Vietnam. Dorsal, ventral and lateral views. Scale bar 10 mm.

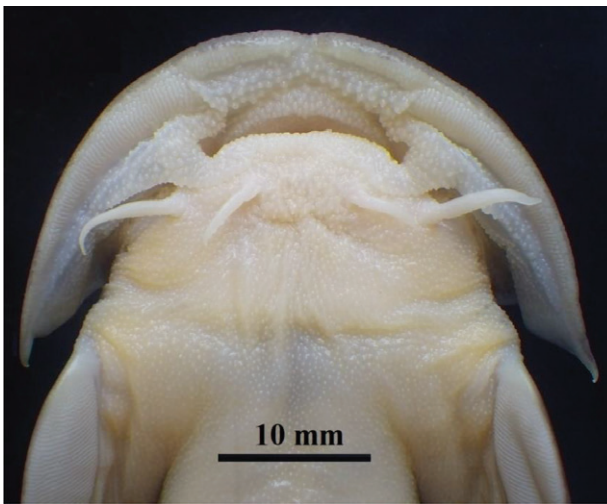


Fig. 3. Ventral profile of the head part of holotype of *Euchiloglanis nami* collected from the Gam River of the Red River, northern Vietnam.

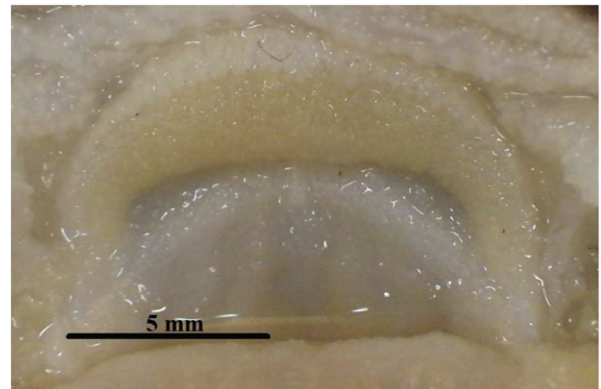


Fig. 4. Ventral view of premaxillary tooth band of *Euchiloglanis nami* collected from the Gam River of the Red River, northern Vietnam.

ogy, Hanoi National University of Education. Data for *E. dorsoarcus* and *E. phongthoensis* is from NGUYEN (2005), while for *E. longus* (known also as *C. longus*), *E. davidi*, *E. kishinouyei*, and *E. longibarbatus* from ZHOU et al. (2011a).

Results

Euchiloglanis nami sp. n.

Figs. 2, 3, 4; Tables 1, 2

Type material: Holotype HNUE-F00283, 142.3 mm SL; Vietnam: Cao Bang Province,

Anal-fin base length	6.68	6.54	6.18–6.86	0.22	6.9	5.0–8.1	0.65	5.6	6.3	5.1–8.4	1.10	6.1	6.9	5.1–9.2	0.97	6.8	7.0	5.3–13.0	1.43
Caudal-fin length	11.17	12.04	11.53–13.42	0.76	19.7	16.3–25.0	1.79	18.3	17.4	16.0–19.6	1.31	16.7	17.3	11.8–20.0	1.86	14.4	14.3	11.0–19.1	2.25
Adipose-fin base length (% of head length)	34.43	33.19	31.81–35.74	1.41	26.7	21.6–30.7	2.41	23.3	25.0	21.1–28.6	2.53	25.9	27.9	22.6–34.2	3.08	28.4	30.0	24.7–63.0	6.46
Snout length	50.32	51.92	49.43–55.21	2.10	54.9	37.9–64.0	3.64	59.9	57.5	55.7–60.1	1.68	59.9	58.8	47.2–82.6	8.63	49.5	52.2	30.8–65.3	6.40
Eye diameter	6.33	8.05	8.00–8.71	0.81	7.2	5.7–9.0	0.79	6.5	6.0	4.6–7.5	0.95	4.7	6.1	3.8–9.1	1.54	8.5	7.4	5.5–12.0	1.40
Interorbital width (% of Pt-P1 length)	24.05	24.57	20.97–29.45	2.86	28.5	24.1–35.2	2.10	26.3	28.9	25.4–32.3	2.50	30.4	30.6	22.1–45.7	5.98	25.1	28.3	23.0–38.7	3.68
Pectoral-fin length	85.47	86.42	71.25–97.26	10.49	98.7	83.0–117.1	7.41	82.2	90.3	75.5–103.0	9.54	76.4	83.6	71.2–92.8	5.28	91.7	89.0	78.5–103.3	5.22
Pl-A length (% of Pl-A length)	60.33	55.01	47.50–60.33	4.67	101.1	72.7–125.0	11.17	88.2	96.8	70.8–124.6	17.57	81.3	87.6	75.5–104.9	8.27	119.4	124.6	97.8–148.6	10.29
Pelvic-fin length (% of length of caudal peduncle)	101.39	108.48	92.54–126.32	12.28	70.5	59.1–93.2	9.42	69.9	66.0	55.5–78.5	7.26	69.0	69.5	60.7–82.0	5.39	56.2	51.5	43.1–68.4	5.35
Caudal-peduncle depth	24.83	24.12	20.26–27.40	2.40	37.6	29.3–46.2	4.05	32.3	31.8	28.2–34.3	2.15	33.5	33.0	26.8–44.5	4.55	18.7	20.6	14.1–27.0	3.36

Gam River drainage, Nguyen Binh District, Tai Soang bridge no.2 stream (Fig. 1), 22°35'19.7"N 105°51'90.3"E; 1005 a.s.l., 6 May 2021, coll. H.D. Tran, H.Q. Nguyen, N.T. Nguyen, A.N.T. Do.

Paratypes. HNUE-F00284, 137.1 mm SL, 6 May 2021, coll. H.D. Tran, H.Q. Nguyen, N.T. Nguyen, A.N.T. Do; HNUE-F00285-89, 61.6–146.3 mm SL, 21 May 2020, Coll. H.D. Tran, H.V. Pham, V.S. Ngo. Same locality as for holotype.

Etymology. The specific name is in honour of the young ichthyologist and our best friend Mr. Chu Hoang Nam. The species name is a noun in genitive case.

Diagnosis. *Euchiloglanis nami* sp. n. can be distinguished from congeners by the following unique combination of characteristics: D. i, 6; A. i, 4; P. i, 15–16; C. 16; wider premaxillary tooth band without indentation (Fig. 4); elongate and thread-like maxillary barbell with pointed tip reaching to pectoral fin origin; elongated papillae ventral part of maxillary barbell; anal-fin origin closer to caudal-fin base than to pelvic-fin insertion; distance from adipose-fin origin to dorsal-fin insertion close to 50% of length of adipose-fin base; depth of caudal peduncle equal to 20.26–27.40% of length of caudal peduncle; shorter dorsal-fin insertion to adipose-fin origin (12.05–15.90% SL); shorter caudal-fin length (11.53–13.42% SL); longer adipose-fin base length (31.81–35.74% SL); adipose fin not connected with caudal-fin base; pelvic fins reaching anus or a little beyond anus; narrower interorbital width (20.97–29.45% HL).

Description. Morphometric and meristic data are given in Table 1. Distance from pupil to tip of snout longer than to dorsal corner of gill opening. Barbells flattened, in four pairs, including elongated and threadlike maxillary barbell with pointed tip reaching to pectoral fin origin.

Anterior margin of premaxillary tooth band exposed when mouth closed. Oral teeth conical and pointed, arranged irregularly and embedded in skin. Premaxillary tooth band without indentation. Dorsal profile rising gradually from behind gill cover to origin of dorsal fin and then sloping slowly ventrally to end of caudal peduncle.

Adipose fin not connected with caudal-fin base. Origin of adipose fin opposite vertical through tip of pelvic-fin rays. Distance from anal-fin origin to base of caudal fin shorter than distance from anal-fin origin to pelvic-fin origin. Pelvic fins reaching the anus or a little beyond the anus.

Colouration. Greyish brown on dorsal and lateral surfaces of head and body, light yellow on ventral region. Dorsal surfaces of head and body

Table 2. Counts and proportional measurements of *Euchiloglanis nami* sp. n. and other two species of *Euchiloglanis* in Vietnam.

Species	<i>Euchiloglanis nami</i> sp. n. (n=7)			<i>E. dorsoarcus</i> (n=1)	<i>E. phongthoensis</i> (n=5)	
	Holotype	Paratypes				
Locality	Cao Bang Province, Gam River			Lai Chau Province, Da River	Lai Chau Province, Da River	
Source	The present study			NGUYEN (2005)	NGUYEN (2005)	
Dorsal-fin rays	i, 6	i, 6		i, 5		i, 6
Pectoral-fin rays	i, 16	i, 15–16		i, 15		i, 15–16
Pelvic-fin rays	i, 5	i, 5		i, 5		i, 5
Anal-fin rays	i, 4	i, 4		i, 4		i, 4
Branched caudal-fin rays	16	16				15
		Mean	Range		Mean	Range
Body depth	13.28	11.71	9.43–14.73	12.85	13.16	14.10–14.22
Head length	22.21	22.50	21.19–23.86	26.88	24.04	23.75–25.00
Caudal peduncle length	20.38	20.74	20.00–21.88	33.58	20.96	19.42–23.04
Caudal peduncle depth	5.06	4.99	4.31–5.48	4.13	5.35	4.90–5.88
in % of head length						
Snout length	50.32	51.92	49.43–55.21	53.19	52.63	49.02–55.56
Eye diameter	6.33	8.05	8.00–8.71	42.55 (error data)	6.55	5.91–7.45
Interorbital width	24.05	24.57	20.97–29.45	25.51	26.04	25.00–28.09
in % of length of caudal peduncle						
Caudal-peduncle depth	24.83	24.12	20.26–27.40	16.37	25.32	27.03–28.57

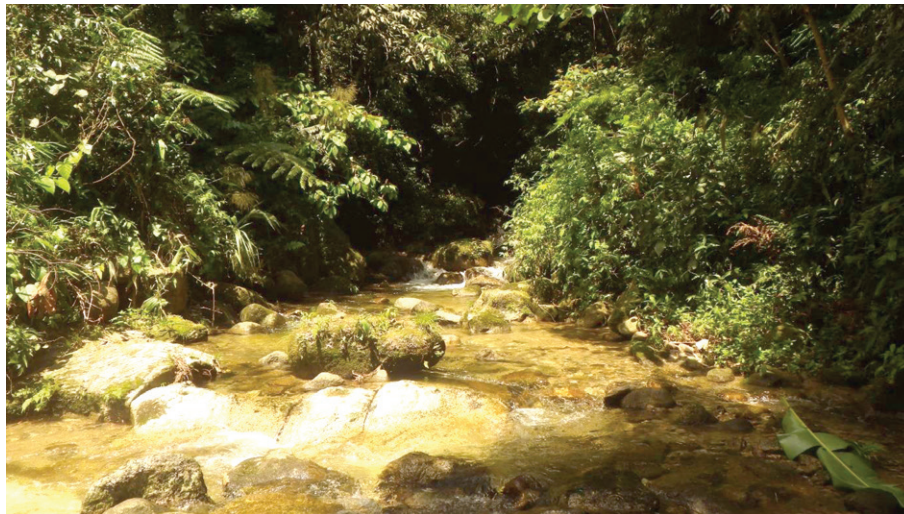


Fig. 5. Habitat of new species *Euchiloglanis nami* in the Gam River of the Red River, northern Vietnam.

with series of small light-yellow patches: two ovoid patches on occipital region, three on each side of base of dorsal fin origin, two on each side of base of dorsal fin base, elliptical patch on anterior base of origin and last of adipose fin. Adipose fin greyish brown, with lighter colour around distal margin. Caudal fin greyish brown at base, caudal fin tip fading to pale yellow in distance, with dark submarginal band. Dorsal surfaces of pectoral and

pelvic fins grayish brown, ventral surfaces light yellow.

Habitat and ecology. *Euchiloglanis nami* has been collected from medium-sized rivers with stony or rock substrate. *Euchiloglanis nami* is found in rapid flow and creeps along the substrate (Fig. 5).

Distribution. Known from the Gam River (Song Gam) drainage, a tributary of the Red River in northern Vietnam.

Discussion

The subfamily Glyptosterninae contains three tribes: Glyptothoracini, Pseudecheneidini and Glyptosternini. There are ten genera in the tribe Glyptosternini (*Creteuchiloglanis*, *Euchiloglanis*, *Exostoma*, *Glaridoglanis*, *Glyptosternon*, *Myersglanis*, *Oreoglanis*, *Parachiloglanis*, *Pareuchiloglanis* and *Pseudexostoma*) (GUO et al. 2007). The tribe Glyptosternini is distinguished from the two others by no adhesive apparatus on the thorax and the presence of plaited adhesive organs on the paired-fins (Fig. 6) (THOMSON & PAGE 2006, LI et al. 2007).

Euchiloglanis differs from other genera in this tribe by having an interrupted post-labial groove, a crescent-shaped toothpatch in the upper jaw, a band that curves posteriorly at the sides (vs. not curved posteriorly), the gill openings not extending onto the ventral, and small pointed teeth in both jaws (vs. strong, distally flattened teeth) (Fig. 7) (THOMSON & PAGE 2006, ZHOU et al. 2011b).

Euchiloglanis nami is morphologically different the species of *Euchiloglanis* (or *Chimarrichthys*): from *E. longibarbatulus* by having an elongate and threadlike maxillary barbell with a pointed tip reaching to pectoral fin origin (vs. the maxillary barbell elongated as a thread, with the tip reaching beyond the gill opening). *Euchiloglanis nami* differs from *E. davidi* and *E. longibarbatulus* by the wider premaxillary tooth band without indentation (vs. premaxillary band with a median indentation in *E. davidi* and *E. longibarbatulus* with premaxillary band with three indentations, one in the middle and two on the sides). There is a difference between *E. nami* and *E. davidi*, *E. kishinouyei* and *E. longibar-*

batus in the depth of the caudal peduncle: equal to 20.26–27.40% of the caudal-peduncle length (vs. 29.3–46.2, 28.2–34.3, and 26.8–44.5%, respectively), and a greater number of branched pectoral-fin rays (15–16 vs. 11–14) (Table 1). It differs from *E. dorsoarcus* by having the anal-fin origin closer to the caudal-fin base than to the pelvic-fin origin (vs. the anal-fin origin closer to the pelvic-fin origin than to the caudal-fin base) and a shorter caudal peduncle (20.74 vs. 33.58% SL) (Table 2). Furthermore, *E. nami* is distinguished from *E. phongthoensis* by having the distance from the adipose-fin origin to the dorsal-fin insertion close to 50% of the length of the adipose-fin base (vs. equal to the length of the adipose-fin base) and a bigger eye (8.05 vs. 6.55% HL) (Table 2). In addition, the new species is also different from *E. davidi*, *E. kishinouyei* and *E. longibarbatulus* by having two ovoid patches on occipital region, three on each side of base of dorsal fin origin, two on each side of base of dorsal fin and an elliptical patch on anterior base of origin and one of

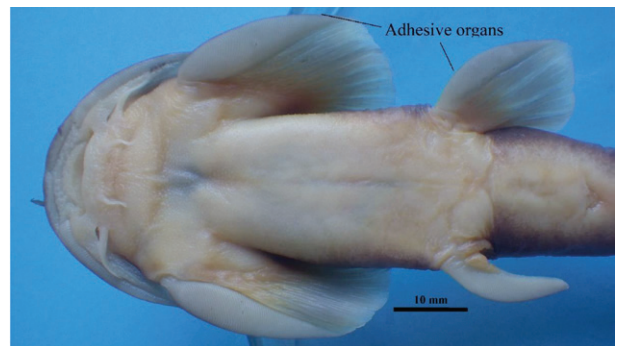


Fig. 6. Plaited adhesive-organs in paired-fins of the tribe Glyptosternini.

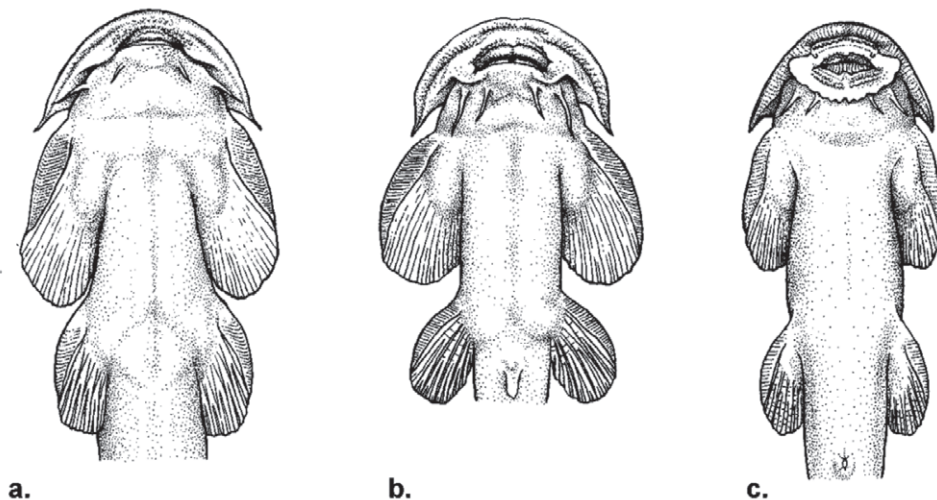


Fig. 7. Three types of the post-labial groove on the lower jaw of the tribe Glyptosternini (THOMSON & PAGE 2006). a. *Parachiloglanis*; b. *Euchiloglanis*, *Glaridoglanis*, *Glyptosternon* and *Pareuchiloglanis*; c. *Exostoma*, *Myersglanis*, *Oreoglanis* and *Pseudexostoma*.

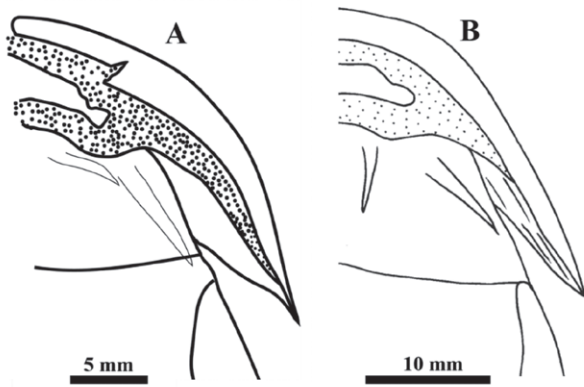


Fig. 8. Ventral view of maxillary barbells of *Euchiloglanis*. A, *E. nami*; B, *E. longus* (ZHOU et al. 2011a).



Fig. 9. Ventral view of premaxillary tooth band of *Euchiloglanis*. A, *E. nami* (the present study); B, *E. longus* (ZHOU et al. 2011a).

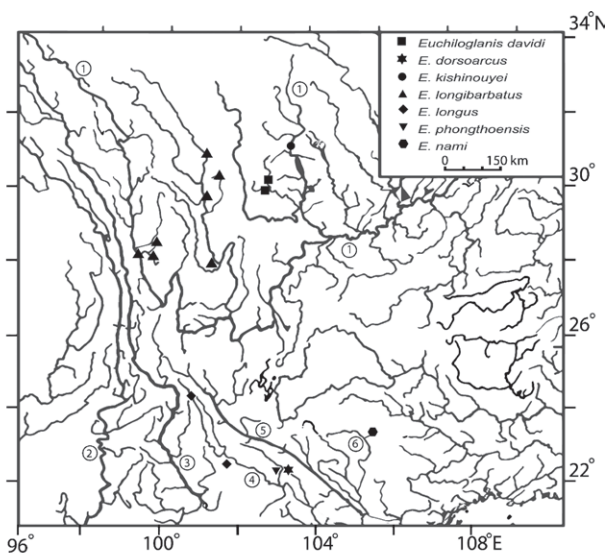


Fig. 10. Collecting localities of *Euchiloglanis* (modified after Zhou et al. 2011a). 1, Yangtze River; 2, Salween River; 3, Mekong River; 4, Da River; 5, Red River; 6, Gam River

the adipose fin (Fig. 2 in the present study and Figs. 1, 5, 6 in ZHOU et al. 2011a).

Euchiloglanis nami differs from *E. longus*, which is also distributed in the Red River system in the following characteristics: elongate and thread-like maxillary barbell with pointed tip reaching to pectoral fin origin (vs. not elongated as a thread)

(Fig. 8); wider premaxillary tooth band without indentation (Fig. 9); shorter caudal peduncle (20.7 vs. 22.3% SL), higher caudal peduncle depth (5.0 vs. 4.5% SL); shorter distance between dorsal-fin insertion to adipose-fin origin (14.8 vs. 19.4% SL); shorter distance from snout to adipose-fin origin (57.4 vs. 61.5% SL); shorter pelvic fins length (15.9 vs. 16.6% SL), reaching the anus or a little beyond anus (vs. reaching beyond the anus) (Fig. 2); longer adipose-fin base length (33.2 vs. 30.0% SL); narrower interorbital width (24.6 vs. 28.3% SL).

The genus *Euchiloglanis* (or *Chimarrichthys*) is mainly distributed in the Yangtze River Basin and the upper reaches of the Black River, a tributary of the Red River (ZHOU et al. 2011a, NGUYEN et al. 2019) (Figs. 1, 10). Prior to the present study, species of *Euchiloglanis* have not yet been recorded in the upper mainstream of the Red River (ZHOU et al. 2011a) and in the Gam-Lo River systems as well as in any other river basins in Vietnam, except for the Black River in Phong Tho district, Lai Chau Province (NGUYEN 2005, NGUYEN et al. 2019). He et al. (2001) suggested that *Euchiloglanis* may have originated in the Jinsha-Jiang, the upper reach of the Yangtze River. It is stated that the origin and history of the Black River are different from that of the upper mainstream Red River and in the past, this river may have been connected with the upper reaches of the Yangtze River Basin (ZHOU et al. 2011a). Thus, the occurrence of *Euchiloglanis nami* in the Gam River, a tributary located in the opposite side of the Black River via the main stream of the Red River (Figs. 1, 10), could be worthy to explain the geographical distribution of this genus.

The tribe Glyptosternini has two species of *Euchiloglanis* (*E. phongthoensis* and *E. dorsoarculus*) and four species of *Pareuchiloglanis* (*P. namdeensis*, *P. tamduongensis*, *P. brevicaudatus* and *P. Pareuchiloglanis* sp.) in the Da River, Phong Tho District, Lai Chau Province (NGUYEN 2005, NGUYEN et al. 2019, TRAN et al. 2021). This fact implies that the Da River Basin might have suitable environments for species in this tribe. Remarkably, a very similar species to *E. nami*, *E. longus*, is distributed in the upper stream of the Black River, which is clearly distinguished from *E. phongthoensis* and *E. dorsoarculus* that are recorded in the same river system (Fig. 10). Since species of this genus are a group of demersal and with low mobility and non-migratory fishes (LI et al. 2021), it is highly possible to suggest that *E. longus* and *E. nami* are different species due to the long distance between them. Similarly, this fact suggests that *E. nami* is different from *E. phongthoensis* and *E. dorsoarculus*, which are distrib-

uted in different river systems (Fig. 10), although they share the number of fin rays (Table 2) and colouration pattern (Fig. 2 in the present study and Figs. 55, 56 in NGUYEN 2005). On the other side of the mainstream of the Red River, the Gam-Lo River system has only one species of the Glyptosternini tribe, *E. nami*, even though intensive surveys in four protected areas (Bac Me Nature Reserve – Ha Giang Province, Nam Xuan Lac Nature Reserve – Bac Kan Province, Cham Chu Nature Reserve – Tuyen Quang Province and Phia Oac – Phia Den National Park – Cao Bang Province) were conducted. Additional taxonomic studies on the tribe Glyptosternini in the Red River within Vietnam may have insights into the distributional pattern of this tribe.

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