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PENSOFT

A new record of *Leptobotia pellegrini* Fang, 1936 (Teleostei, Cypriniformes, Botiidae) from the Western Nghe An Biosphere Reserve, Vietnam

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Abstract

We report a new record of *Leptobotia pellegrini* Fang, 1936 from the Western Nghe An Biosphere Reserve, Vietnam, based on 25 specimens collected in the Kien stream (Ca River), Tuong Duong district, Nghe An province. Morphological features of these specimens were confirmed against the description of this species by Fang (1936). Our new data extend the species' geographic range southward by approximately 650 km from the Gam River (Na Hang, Tuyen Quang province), Vietnam.

Keywords

Ca River, loach, morphological identification, range extension

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Introduction

The loach genus *Leptobotia* Bleeker, 1870 currently contains 18 species distributed in China and Vietnam (Kottelat 2012; Froese and Pauly 2022; Fricke et al. 2022), including *Leptobotia bellacauda* Bohlen & Šlechtová, 2016; *L. brachycephala* Guo & Zhang, 2021; *L. citrauratea* (Nichols, 1925); *L. elongata* (Bleeker, 1870); *L. flavolineata* Wang, 1981; *L. guilinensis* Chen, 1980; *L. hansuiensis* Fang & Hsu, 1980; *L. hengyangensis* Huang & Zhang, 1986; *L. micra* Bohlen & *Šlechtová*, 2017; *L. microphthalma* Fu & Ye, 1983; *L. orientalis* Xu, Fang & Wang, 1981; *L. pellegrini* Fang, 1936; *L. posterodorsalis* Lan & Chen, 1992; *L. punctata* Li, Li & Chen, 2008; *L. rubrilabris* (Dabry de Thiersant, 1872); *L. taeniops* (Sauvage, 1878); *L. tchangi* Fang 1936; and *L. tientainensis* (Wu, 1930). Of these, *L. pellegrini* is relatively widely distributed; it is found in southwestern China (Yangtze River) and in parts of the Pearl River basin in Guangxi. In Vietnam, this species is known from Tuyen

Quang province (Kottellat 2012, 2013). During fieldwork in 2019 in the Kien stream (Ca River), Tuong Duong district, Nghe An province, Vietnam, we collected 25 specimens of a *Leptobotia* species. Morphological and genetic analyses have confirmed these to be *L. pellegrini*, extending its known range approximately 650 km southward in Vietnam.

Methods

Fieldwork was conducted in September 2019 in Kien stream (Fig. 1). Specimens were euthanized immediately after collection by freezing on ice, and fixed with 10% formalin, later transferred into 95% alcohol for preservation; and deposited at the Animal Laboratory, Hong Duc University (HDU-LKSVN) and Vinh University (AMUV-LKSVN).

Twenty-five specimens (14 males, 11 females) were morphologically analyzed (HDU-LKSVN.001 to HDU-LKSVN.005; AMUV-LKSVN.006 to AMUV-LKSVN.025). Measurements and meristic data were taken following Kottelat (1990). Measurements were taken using dial calipers to the nearest 0.1 mm. X-rays of the vertebral column of three specimens (HDU-LKSVN.003, HDU-LKSVN.005, and AMUV-LKSVN.018) were obtained using a high-frequency X-ray machine, model EZy-RAD Pro (Japan).

Specimens were compared with the description of *Leptobotia pellegrini* by Fang (1936). We provide a brief description of the diagnostic characters of this species.

Results

Leptobotia pellegrini Fang, 1936

New record. VIETNAM – **Nghe An Province** • Western Nghe An Biosphere Reserve, Tuong Duong district, Kien stream (Ca River); 19°13′55″N, 104°17′10″E; 255 m a.s.l.; 15.IX.2019; Ong Vinh An, Vi Van Tang and Vo Van Hien leg.; 14 ♀, HDU-LKSVN.001, HDU-LKSVN.003, HDU-LKSVN.005, AMUV-LKSVN.006, AMUV-LKSVN.008, AMUV-LKSVN.010, AMUV-LKSVN.011, AMUV-LKSVN.012, AMUV-LKSVN.013, AMUV-LKSVN.015, AMUV-LKSVN.017, AMUV-LKSVN.021, AMUV-LKSVN.024, AMUV-LKSVN.025; 11 ♂, HDU-LKSVN.002, HDU-LKSVN.004, AMUV-LKSVN.007, AMUV-LKSVN.009, AMUV-LKSVN.014, AMUV-LKSVN.016, AMUV-LKSVN.018, AMUV-LKSVN.019, AMUV-LKSVN.020, AMUV-LKSVN.022, AMUV-LKSVN.023.

Identification. Morphological characteristics of our specimens from Kien stream conform to the description of *L. pellegrini* by Fang (1936): dorsal fin with 2 simple and 8 branched rays; anal fin with 2 simple and 5.5 branched rays; pelvic fin with 1 simple and 7 or 8 branched rays; pectoral fin with 1 simple and 12 or 13 branched rays; caudal fin with 2 simple and 17 branched rays (1+17+1). Eye medium, eye diameter 2.59–3.24% of snout–vent length; suborbital spine simple, reaching posterior margin of the eye (Fig. 2). Vertebral column with 4+35 vertebrae, 4 comprising the swimbladder complex (Fig. 3). Predorsal distance 53.44–57.50% of

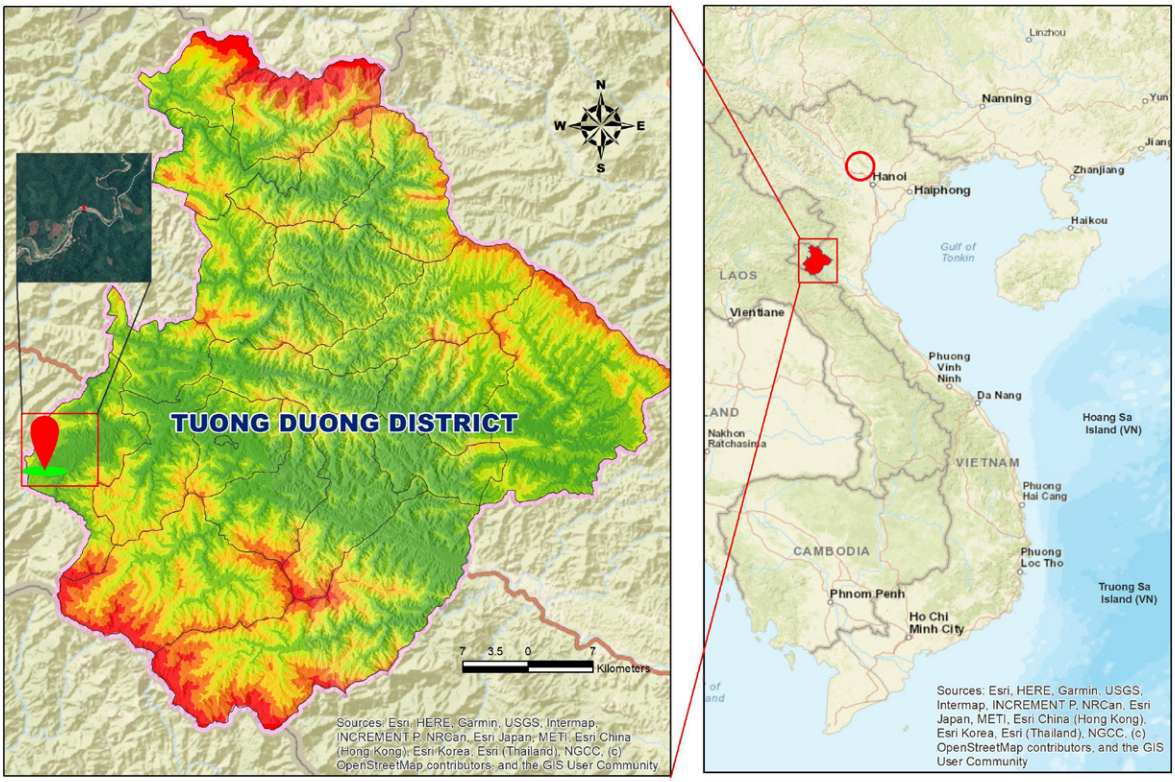

Figure 1. Distribution of *Leptobotia pellegrini* in Vietnam. Red rectangle: location of the newly reported; red circle: previously recorded in Tuyen Quang province

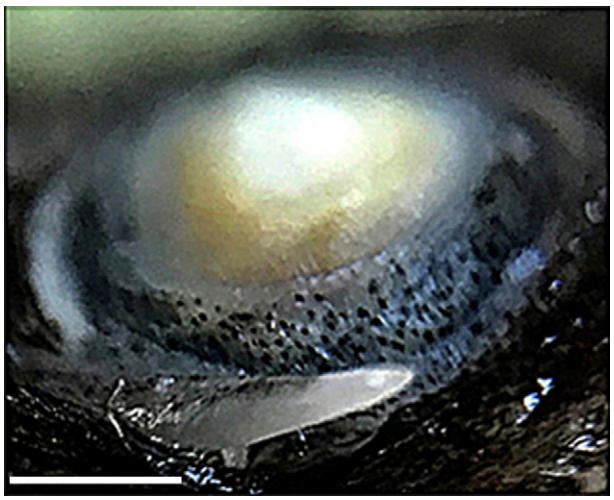

Figure 2. Suborbital spine of *Leptobotia pellegrini* from Nghe An Province, Vietnam (HDU-LKSVN.001, female; SL 177.9 mm) (scale bar: 1 mm).

the snout-vent length. Measurements and ratio between body parts of the specimens presented in Table 1.

Dorsal fin short, longest ray shorter than head length; pelvic fin short, origin of pelvic fins located at base of first and second branched rays of dorsal fin, tip of pelvic fin not reaching anal, reaching or exceeding anus; caudal fin is forked (length of median rays 1.3–1.4 times in length of the lower lobe); the anus positioned in the median between the anal-fin base and pelvic-fin base; Anal fin reaching half of the distance between the end of the anal fin base and caudal fin base when adpressed.

Dorsal fin with two black horizontal stripes, one on the base of fin and the other near tip of dorsal-fin rays. Body orange, with 6–8 black blotches across the body, from occipital to base of caudal fin (Fig. 4).

Table 1. Morphometric measurements of *Leptobotia pellegrini* from Kien stream (Tuong Duong district, Nghe An province, Vietnam).

Morphometric	♂ (*n* = 14)			♀ (*n* = 11)		
	Min	Max	Mean	Min	Max	Mean
Standard length: SL (mm)	82.29	146.92	101.27	83.00	98.40	91.14
In percentage of SL (%)						
Total length	118.36	125.33	121.78	109.82	126.54	123.07
Dorsal head length	18.72	23.00	21.79	21.78	23.89	22.45
Lateral head length	24.40	26.94	25.74	25.05	26.36	25.87
Predorsal length	3.44	57.50	55.03	54.01	56.99	55.47
Pre-pelvic length	23.35	26.78	25.04	23.74	26.72	25.39
Pre anus length	67.69	71.66	69.39	66.36	73.51	69.57
Preanal length	76.88	80.71	79.01	77.74	81.29	79.63
Head depth at eye	10.13	12.04	11.00	10.91	11.43	11.12
Head depth at nape	13.28	15.45	14.59	14.15	16.00	14.96
Maximum body depth	18.26	23.16	20.37	19.45	21.40	20.51
Body depth at dorsal-fin origin	17.40	20.00	18.74	17.31	20.21	19.12
Depth of caudal peduncle	11.00	13.15	11.80	11.19	12.37	11.69
Length of caudal peduncle	11.91	14.36	13.13	12.42	14.97	13.49
Snout length	9.67	11.79	10.80	9.81	11.40	10.71
Head width at nares	6.92	8.59	7.69	7.29	8.11	7.70
Maximum head width	9.56	10.54	10.09	8.77	10.55	10.00
Body width at dorsal origin	8.72	11.84	10.34	9.70	11.20	10.44
Body width at anal origin	6.75	7.82	7.37	6.42	8.30	7.46
Eye diameter	2.59	3.24	2.84	2.89	3.29	3.08
Interorbital width	4.02	5.42	4.79	4.32	5.58	4.90
Height of dorsal fin	12.66	17.78	15.36	13.89	18.36	15.37
Length of upper caudal lobe	20.07	26.80	22.99	22.24	25.34	24.11
Length of median caudal ray	8.32	10.80	9.34	8.14	10.66	9.52
Length of lower caudal lobe	19.59	26.09	23.54	21.48	27.19	25.01
Depth of anal fin	11.08	16.18	13.88	12.76	15.60	14.31
Length of pelvic fin	13.23	16.05	14.95	13.58	16.19	15.09
Length of pectoral fin	14.08	17.07	15.42	15.50	16.67	15.99
Length of dorsal fin base	11.64	13.78	12.80	12.12	13.36	12.68
Length of anal fin base	5.69	8.59	7.44	7.06	8.36	7.67

Discussion

Compared with Fang's (1936) description of *Leptobotia pellegrini*, meristic data showed little difference: dorsal 2, 8; anal 2, 5.5 (vs. 2, 5 described by Fang); pelvic 1, 7–8 (vs. 1, 7); pectoral 1, 12–13 (vs. 1, 12–14); caudal 1, 17, 1. Ratios between the body parts are given in Table 2. The specimens from Kien stream (Nghe An, Vietnam) have a higher SL/length of caudal peduncle ratio than described by Fang (average 7.56, min–max 6.68–8.4 vs. 6.3–7.0); the lateral head length/interorbital width ratio of specimens tends to be lower than described by Fang (average 5.36, min–max 4.66–6.7, vs. 5.5–7.2).

Regarding geographic distribution of this species, *L. pellegrini* is known from the type locality in Sichuan

Figure 3. X-ray image showing the vertebral column of *Leptobotia pellegrini* from Nghe An Province, Vietnam (HDU-LKSVN.005, female; SL 115.5 mm) (Scale bar: 1 mm).

Figure 4. *Leptobotia pellegrini* from Nghe An province, Vietnam. **A.** Female (HDU-LKSVN.001; SL 177.9 mm); **B.** Male (HDU-LKSVN.003; SL 115.9 mm).

Table 2. Morphometric data of *Leptobotia pellegrini* from Kien stream (Tuong Duong district, Nghe An province, Vietnam) and Fang's (1936) description.

Morphometric data	Kien stream ($n = 25$)			Fang, 1936 ($n = 15$)	
	Mean	Min	Max	Min	Max
SL/maximum body depth	4.90	4.32	5.48	4.7	6.1
SL/lateral head length	3.88	3.70	4.10	3.6	4.1
SL/length of caudal peduncle	7.56	6.68	8.40	6.3	7.0
SL/depth of caudal peduncle	8.52	7.60	9.09	7.8	9.5
Lateral head length/eye diameter	8.79	7.76	10.09	7.9	10.4
Lateral head length/interorbital width	5.36	4.66	6.70	5.5	7.2
Length of caudal peduncle/depth of caudal peduncle	1.13	0.98	1.34	1.2	1.4

province in China and from Tuyen Quang province, Vietnam (Fang 1936; Kottelat 2001, 2011, 2012; Bohlen and Šlechtová 2016). In Vietnam, a report of *L. elongata* in the Lo River (a tributary of the Hong River) by Kottelat (2001: fig. 102) and the Gam River, Tuyen Quang province by Nguyen (2005: 206, fig. 103) was re-identified as *L. pellegrini* by Kottelat (2012, 2013). Thus, until now, the genus *Leptobotia* has been known in Vietnam only by the presence of *L. pellegrini* in the Hong river basin. Our new record of *L. pellegrini* extend the range of this species by approximately 650 km south from the nearest known occurrence in the Gam River of Na Hang, Tuyen Quang province, Vietnam. This also confirms the wide distribution of *L. pellegrini* as compared to other species in this genus.

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Authors' Contributions

Data curation: TNH. Formal analysis: AVO, HAT, XKN. Methodology: HAT. Supervision: QH. Writing – original draft: QH. Writing – review and editing: TNH.

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