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

Hoang Ngoc Thao¹*, Ong Vinh An², Ho Anh Tuan², Hoang Xuan Quang², Nguyen Xuan Khoa³

¹ Hong Duc University, Thanh Hoa province, Vietnam • HNT: hoangngocthao@hdu.edu.vn https://orcid.org/0000-0001-9305-5518  
² Vinh University, Nghe An province, Vietnam • OVA: an.ongvinh@yahoo.com.vn • HAT: hoanhtuan18@gmail.com • HXQ: hoangxuanquang44@gmail.com  
³ Vinh Medical University, Nghe An province, Vietnam • NXK: xuankhoa.nguyen@gmail.com  
* Corresponding author

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

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. citraraeata* (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. microphthalmalma* 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. taeios* (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 (Kottelat 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.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.
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).

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
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.

Acknowledgements

We are grateful to the committees of Tuong Duong district, Nghe An province for facilitating field surveys and the collection of specimens. We are thankful for the partial funding from the “Research on biodiversity of vertebrates in the high mountain area Southwest of Nghe An” project (code B2020-TDV-07). We would also like to thank S. Bryan, who commented on a previous draft manuscript; Felipe Ottoni for support in the review process; reviewers, whose comments to improved the quality of the manuscript; and Robert Forsyth for English-language editing.

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) |
|-------------------------------------------------------|----------------------|---------------------|
| SL/maximum body depth                                  | Mean 4.90 Min 4.32 Max 5.48 Min 4.7 Max 6.1 |
| SL/lateral head length                                 | 3.88 3.70 4.10       |
| SL/length of caudal peduncle                           | 7.56 6.68 8.40       |
| SL/depth of caudal peduncle                            | 8.52 7.60 9.09       |
| Lateral head length/eye diameter                       | 8.79 7.76 10.09      |
| Lateral head length/interorbital width                 | 5.36 4.66 6.70       |
| Length of caudal peduncle/depth of caudal peduncle     | 1.13 0.98 1.34       |

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).
Authors’ Contributions

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

References

Bohlen J, Šlechtová V (2016) Leptobotia bellacauda, a new species of loach from the lower Yangtze basin in China (Teleostei: Cypriniformes: Botiidae). Zootaxa 4205 (1): 065–072. http://doi.org/10.11646/zootaxa.4205.1.5

Bohlen J, Šlechtová V (2017) Leptobotia micra, a new species of loach (Teleostei: Botiidae) from Guilin, southern China. Zootaxa 4250 (1): 090–100. https://doi.org/10.11646/zootaxa.4250.1.7

Dong-Ming Guo, E Zhang (2021) Re-description of the loach species Leptobotia citrauratea (Teleostei, Botiidae), with the description of L. brachycephala from southern Zhejiang Province, China. ZooKeys 1017: 89–109. https://doi.org/10.3897/zookeys.1017.57503

Fang PW (1936) Study on the botidi fishes of China. Sinensia 7 (1): 1–49. Fricke R, Eschmeyer WN, Van der Laan R (eds) (2022) Eschmeyer’s catalog of fishes: genera, species, references. Electronic version. http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp. Accessed: 2022-3-16.

Froese R and Pauly D (Editors) (2022) FishBase. http://www.fishbase.org. Accessed: 2022-3-16.

Kottelat M (1990) Indochinese nemacheilines. A revision of nemacheiline loaches (Pisces: Cypriniformes) of Thailand, Burma, Laos, Cambodia, and southern Viet Nam. Pfeil, Munich, Germany, 262 pp.

Kottelat M (2001) Freshwater fishes of northern Vietnam. A preliminary checklist of the fishes known or expected to occur in northern Vietnam with comments on systematics and nomenclature. World Bank, Washington DC, USA, iii + 140 pp., 15 pls.

Kottelat M (2012) Conspectus Cobitidum: an inventory of the loaches of the world (Teleostei: Cypriniformes: Cobitoidei). The Raffles Bulletin of Zoology 26: 1–199.

Kottelat M (2013) The fishes of the inland waters of Southeast Asia: a catalogue and core bibliography of the fishes known to occur in freshwaters, mangroves and estuaries. The Raffles Bulletin of Zoology 27: 1–663.

Nguyen VH (2005) Freshwater fishes of Vietnam, volume 2. Agriculture Publishing House, Hanoi, Vietnam, 759 pp. [in Vietnamese].