

Hongshuia brevibarba, a new species of labeonin fishes (Pisces: Cyprinidae) from the upper Chang-Jiang basin in Guizhou Province, South China

Zhi-Xuan Zeng*, Wei-Han Shao**,***, Zhi-Jun Jin**** and E Zhang**

Hongshuia brevibarba, new species, is described from a small tributary stream of the Qingshui-He (upper Chang-Jiang basin) in Guiyang City, Guizhou Province, China. It can be distinguished from congeners by a combination of characters, including features of oromandibular structures, head shape and fin coloration. The new species exhibits a genetic distance of 4.2 % to 5.7 % between congeneric species. *Hongshuia megalophthalmus* is here regarded as a senior synonym of *H. banmo*.

Introduction

The genus *Hongshuia* is composed of small-sized rheophilic benthic species of labeonine cyprinids (sensu Reid, 1982; Chen et al., 1984) currently known only from the Hongshui-He, a section of the middle Pearl River (=Zhu-Jiang in Chinese) basin (Zhang et al., 2020). Members of this genus exhibit a lower lip with its median lobe modified into a round fleshy plate, the peripheral part of which is greatly protruded to form a ring-like fold posteromedially continuous with the mental region, and the central part sunken to form a round and flat fleshy pad (Zhang et al., 2008).

Four species are ascribed to *Hongshuia* so far and the monophyly of the genus has been confirmed via molecular phylogenetic analyses (Zheng et al., 2010; Yang et al., 2012). This genus was originally erected by Zhang et al. (2008) to accommodate two new species, *H. paoli* Zhang, Qiang & Lan, 2008, and *H. banmo* Zhang, Qiang & Lan, 2008 from the Hongshui-He (a section of the middle Zhu-Jiang basin), respectively at Paoli Village, Fengshan County and Banmo Village, Tian'e County, Guangxi Province. Concurrently, *Sinocrossocheilus megalophthalmus* Chen, Yang & Cui, 2006, a species originally from the same river at Banmo Village (type locality of *H. banmo*), were

* The Department of Endocrinology, Branch of National Clinical Research Center for Metabolic Diseases, Tongji Hospital, Huazhong University of Science and Technology, Wuhan 430030, Hubei Province, P.R.China.
 Email: 985801524@qq.com.

** Institute of Hydrobiology, Chinese Academy of Sciences, Wuhan 430072, Hubei Province, P.R.China.
 Email: zhange@ihb.ac.cn (corresponding author).

*** University of Chinese Academy of Sciences, Beijing 100049, P. R. China. Email: shaoweihan1008@163.com.

**** PowerChina Guiyang Engineering Corporation Limited, Guiyang 550081, P.R.China.
 Email: 974246612@qq.com.

Literature cited

- Chen, J. G. 2004. [Development of structure landform in Miaoling Mountain and special characteristic of ecological environment]. Guizhou Science, 22: 29–33 [in Chinese].
- Chen, X. L., P. Q. Yue & R. D. Lin. 1984. [Major groups within the family Cyprinidae and their phylogenetic relationships]. Acta Zootaxonomica Sinica, 12: 429–439 [in Chinese].
- Chen, X. Y., J. X. Yang & G. H. Cui. 2006. [A new fish species of the genus *Sinocrossocheilus* (Cyprinidae) from Guangxi, China]. Zoological Research, 27: 81–85 [in Chinese].
- Hubbs, C. L. & K. F. Lagler. 1947. Fishes of the great lakes region. Bulletin of the Cranbrook Institute of Sciences, 26: 1–186.
- Kimura, M. 1981. A simple method for estimating evolutionary rate of base substitutions through comparative studies of nucleotide sequences. Journal of Molecular Evolution, 16: 111–120.
- Kottelat, M. 2001. Fishes of Laos. Wildlife Heritage Trust, Colombo, 198 pp.

- Kumar, S., G. Stecher & K. Tamura. 2016. MEGA7: molecular evolutionary genetics analysis version 7.0 for bigger datasets. *Molecular Biology and Evolution*, 33: 1870–1874.
- Lin, R. D. & C. G. Zhang. 1986. [Description of a new species of the barbinae genus *Barbodes* from China (Cypriniformes: Cyprinidae)]. *Acta Zootaxonomica Sinica*, 11: 108–110 [in Chinese].
- Nguyen, L. T., H. A. Schmidt, V. A. Haeseler & B. Q. Minh. 2015. IQ-TREE: a fast and effective stochastic algorithm for estimating maximum-likelihood phylogenies. *Molecular Biology and Evolution*, 32: 268–274.
- Pellegrin, J. 1931. Description de deux cyprinidés nouveaux de Chine appartenant au genre *Schizothorax* Heckel. *Bulletin de la Société zoologique de France*, 56: 145–149.
- Reid, G. M. 1982. The form, function and phylogenetic significance of the vomero-palatine organ in cyprinid fishes. *Journal of Natural History*, 16: 497–510.
- Roberts, T. R. 1989. The freshwater fishes of Western Borneo (Kalimantan Barat, Indonesia). *Memoirs of the California Academy of Science*, 14: 1–210.
- Tang, Q. Y., J. Freyhof, B. X. Xiong & H. Z. Liu. 2008. Multiple invasions of Europe by East Asian cobitid loaches (Teleostei: Cobitidae). *Hydrobiologia*, 605: 17–28.
- Thompson, J. D., T. J. Gibson, F. Plewniak, F. Jeanmougin & D. J. Higgins. 1997. The Clustal X windows interface: flexible strategies for multiple sequences alignment aided by quality analysis tools. *Nucleic Acids Research*, 25: 4876–4882.
- Wang, D. Z. & Y. Y. Chen. 1989. [Three new species of Cyprinidae from Guizhou]. *Journal of Zunyi Medicine College*, 12: 29–34 [in Chinese].
- Wang, X., F. Liu, D. Yu & H. Z. Liu. 2019. Mitochondrial divergence suggests unexpected high species diversity in the opsariichthine fishes (Teleostei: Cyprinidae) and the revalidation of *Opsariichthys macrolepis*. *Ecology and Evolution*, 9: 2664–2677.
- Wu, L. 1989. [The fishes of Guizhou]. Guizhou People's Publishing House, Guiyang, 314 pp. [in Chinese].
- Xiao, W. H., Y. P. Zhang & H. Z. Liu. 2001. Molecular systematics of Xenocyprinae (Teleostei: Cyprinidae): taxonomy, biogeography, and coevolution of a special group restricted in East Asia. *Molecular Phylogenetics and Evolution*, 18: 163–173.
- Yang, L., M. Arunachalam, E. Sado, B. A. Levin, A. S. Golubtsov, J. Freyhof, J. P. Friel, W. J. Chen, M. V. Hirt, R. Manickam, M. K. Agnew, A. M. Simons, K. Saitoh, M. Miya, R. L. Mayden & S. P. He. 2012. Molecular phylogeny of the cyprinid tribe Labeonini (Teleostei: Cypriniformes). *Molecular Phylogenetics & Evolution*, 65: 362–379.
- Yuan, L. Y., E Zhang & Y. Huang. 2008. Revision of the labeonine genus *Sinocrossocheilus* (Teleostei: Cyprinidae) from South China. *Zootaxa*, 1809: 36–48.
- Zeng, Z. X. & F. Liu. 2020. [Current status of fish diversity in the Qingshui River of Guizhou province]. *Journal of Guizhou Normal University (Natural Sciences)*, 38: 11–18 [in Chinese].
- Zhang, C. G., G. Z. Shao, H. L. Wu & Y. H. Zhao. 2020. [Species catalogue of China. Volume 2: Animals, Vertebrates (V), Fishes]. Science Press, Beijing, 630 pp. [in Chinese].
- Zhang, E. X. Qiang & J. H. Lan. 2008. Description of a new genus and two new species of labeonine fishes from South China (Teleostei: Cyprinidae). *Zootaxa*, 1682: 33–44.
- Zheng, L. P., J. X. Yang, X. Y. Chen & W. Y. Wang. 2010. Phylogenetic relationships of the Chinese Labeoninae (Teleostei, Cypriniformes) derived from two nuclear and three mitochondrial genes. *Zoologica Scripta*, 39: 559–571.
- Zhao, H. T., J. P. Sullivan, Y. G. Zhang & Z. G. Peng. 2014. *Paraqianlabeo lineatus*, a new genus and species of labeonine fishes (Teleostei: Cyprinidae) from South China. *Zootaxa*, 3841: 257–270.

Received 7 Apr 2022

Revised 17 July 2022

Accepted 22 Aug 2022

The whole contribution can be purchased as PDF file.

Availability

Generally all our publications are available as PDF files; full publications as a general rule after the printed version is out of print. If you have questions concerning particular contributions please contact us by e-mail:
pdf@pfeil-verlag.de.

The PDF files are protected by copyright.

The PDF file may be printed for personal use. The reproduction and dissemination of the content or part of it is permitted. It is not allowed to transfer the digital personal certificate or the password to other persons.

Prices

Books: Prices are to be found in the catalog.

Articles in journals and single contributions or chapters in books:

10 EURO basic price per order (including the first 10 pages),
and

0,50 EURO per page, beginning with the 11th page.

Page numbers are found in the contents of the publications.

Orders

Use our order form for PDF files or send your order informal per e-mail (pdf@pfeil-verlag.de). The only accepted payment is by credit card. While using the order form for PDF files, your data will be transmitted by secure link (ssl). You also may send the informations informally by e-mail, fax, phone or mail.

Handling

As soon as possible, depending on our business hours and your order, you will receive your PDF file together with the certificate and password by e-mail.

Larger PDF files can be downloaded from our webspace, if necessary.

Your invoice will be sent out by e-mail after we charged your credit card.

To open the encrypted PDF files you have to install your personal certificate after your first order. All PDF files with the same certificate can be opened from that time on.

Dieser Beitrag kann als PDF-Datei erworben werden.

Verfügbarkeit von PDF-Dateien

Prinzipiell sind von allen unseren Publikationen PDF-Dateien erhältlich. Komplette Publikationen in der Regel erst nachdem die gedruckte Version vergriffen ist. Anfragen bezüglich bestimmter Beiträge richten Sie bitte per E-Mail an pdf@pfeil-verlag.de.

Die PDF-Dateien sind urheberrechtlich geschützt.

Ein Ausdruck der PDF-Dateien ist nur für den persönlichen Gebrauch erlaubt.

Die Vervielfältigung von Ausdrucken, erneutes Digitalisieren sowie die Weitergabe von Texten und Abbildungen sind nicht gestattet.

Das persönliche Zertifikat und das Passwort dürfen nicht an Dritte weitergegeben werden.

Preise

Bücher: Die Preise sind dem Katalog zu entnehmen. Zeitschriftenbeiträge und einzelne Kapitel aus Sammelbänden bzw. Büchern:

10 EURO Grundbetrag pro Bestellung (einschließlich der ersten 10 Seiten),
und

0,50 EURO pro Seite ab der 11. Seite.

Den Umfang der Beiträge entnehmen Sie bitte den Inhaltsverzeichnissen.

Bestellungen

Bestellungen sind mit dem PDF-Bestellformular oder formlos per E-Mail (pdf@pfeil-verlag.de) an uns zu richten. Die Bezahlung ist ausschließlich per Kreditkarte möglich. Bei Verwendung unseres Bestellformulars werden die Kreditkartendaten über eine gesicherte Verbindung (ssl) übermittelt. Sie können die Daten aber auch formlos per E-Mail, Fax, Post oder telefonisch übermitteln.

Abwicklung

So bald wie möglich, aber abhängig von unseren Bürozeiten und der gewünschten Bestellung, schicken wir Ihnen die PDF-Datei(en) zusammen mit Ihrem persönlichen Zertifikat und dem zugehörigem Passwort per E-Mail. Größere Dateien bieten wir Ihnen gegebenenfalls zum Herunterladen an.

Der fällige Betrag wird von Ihrer Kreditkarte abgebucht und Sie erhalten die Rechnung ebenfalls per E-Mail.

Um die verschlüsselten PDF-Dateien öffnen zu können, muss bei der ersten Bestellung das passwortgeschützte persönliches Zertifikat installiert werden, welches anschließend auf dem Rechner verbleibt. Alle mit diesem Zertifikat verschlüsselten Dateien können anschließend auf diesem Rechner geöffnet werden.