

Chiloglanis msirii, a new species of African suckermouth catfish (Teleostei: Mochokidae), from the Upper Congo basin

Benedicto Boniphace Kashindye*, Bauchet Katemo Manda**, John P. Friel***,
 Albert Chakona**** and Emmanuel Vreven****

A detailed examination of recently collected specimens of *Chiloglanis* from the Fungwe and Mwanza rivers and those collected during previous surveys of the Lukuga basin revealed the existence of a new species of African suckermouth catfish in the Upper Congo basin. The new species, herein described as *Chiloglanis msirii*, is readily distinguished from its congeners in the Congo basin by: the lack of a mid-ventral cleft on the oral disc; the possession of a single row of widely spaced mandibular teeth; and the possession of a forked caudal fin. Outside the Congo basin, the new species closely resembles *C. swierstrai* from which it is however readily distinguished by having a lower number of total vertebrae and a thicker caudal peduncle. Based on the examined specimens, there was no apparent evidence of sexual dimorphism in shape and size of the fins, body ornamentation, or tuberculation of the skin. This description increases the number of known species of suckermouth catfishes in the Upemba National Park (UNP) to four (*C. lufirae*, *C. microps*, *C. pojeri* and *C. msirii*). Further surveys and the use of integrative taxonomic approaches will likely uncover additional undocumented species diversity in this park. There are concerns, however, that some of this diversity might be lost even before it is formally documented, because of the excessive use of ichthyotoxins and the construction of impoundments that cause drowning of the riffles which are critical habitats for rheophilic species, particularly those in the genus *Chiloglanis* and other specialised groups. The present study highlights and discusses the challenges associated with fish protection in the UNP, with emphasis on the Fungwe and Mwanza rivers.

* Tanzania Fisheries Research Institute, P.O. Box 475, Mwanza, Tanzania. E-mail: bkashindye@yahoo.com (BBK)

** Université de Lubumbashi, Unité de Recherche en Biodiversité et Exploitation durable des Zones Humides. P. O. Box. 1825, Lubumbashi, DR. Congo.
 E-mails: bauchetmanda@gmail.com; bauchet.KatemoManda@unilu.ac.cd (BKM)

*** Alabama Museum of Natural History, Box 870340, Tuscaloosa, AL 35487, USA. E-mail: jp.friel@ua.edu (JPF)

**** National Research Foundation – South African Institute for Aquatic Biodiversity, Private Bag 1015, Makhanda (Grahamstown), 6140, South Africa; and Department of Ichthyology and Fisheries Science, Rhodes University, Makhanda (Grahamstown) 6140, South Africa. E-mail: a.chakona@saiab.ac.za (AC)

***** Royal Museum for Central Africa, Section Vertebrates, Ichthyology, Leuvensesteenweg 13, B-3080 Tervuren, Belgium; and KU Leuven, Laboratory of Biodiversity and Evolutionary Genomics, Charles Deberiotstraat 32, B-3000 Leuven, Belgium.
 E-mails: emmanuel.vreven@africamuseum.be (EV, corresponding author).

Literature cited

- Abell, R., M. L. Thieme, C. Revenga, M. Bryer, M. Kottelat, N. Bogutskaya, B. Coad, N. Mandrak, S. Contreras Balderas, W. Bussing, M. L. J. Stiassny, P. Skelton, G. R. Allen, P. Unmack, A. Naseka, R. Ng, N. Sindorf, J. Robertson, E. Armijo, J. V. Higgins, T. J. Heibel, E. Wikramanayake, D. Olson, H. L. López, R. E. Reis, J. G. Lundberg, M. H. Sabaj Pérez & P. Petry. 2008. Freshwater ecoregions of the world: a new map of biogeographic units for freshwater biodiversity conservation. BioScience, 58: 403–414.
- Abwe, E., J. Snoeks, A. Chocha Manda & E. Vreven. 2019. *Distichodus polli*, a new distichodontid species (Teleostei: Characiformes) from the southern Congo basin. Ichthyological Exploration of Freshwaters, 29: 79–96.
- Almond, R.E.A., M. Grooten & T. Petersen. 2020. Living planet report 2020. Bending the curve of biodiversity loss. World Wide Fund for Nature (WWF), Gland, 159 pp.
- Brooks, T. M., A. Cuttelod, D. P. Faith, J. Garcia-Moreno, P. Langhammer & S. Pérez-España. 2015. Why and how might genetic and phylogenetic diversity be reflected in the identification of key biodiversity areas? Philosophical Transactions of the Royal Society, B, 370: 20140019.
- Darwall, W., V. Bremerich, A. De Wever, A. I. Dell, J. Freyhof, M. O. Gessner, H.-P. Grossart, I. Harrison, K. Irvine, S. C. Jähnig, J. M. Jeschke, J. J. Lee, C. Lu, A. M. Lewandowska, M. T. Monaghan, J. C. Nejstgaard, H. Patricio, A. Schmidt-Kloiber, S. N. Stuart, M. Thieme, K. Tockner, E. Turak & O. Weyl. 2018. The alliance for freshwater life: a global call to unite efforts for freshwater biodiversity science and conservation. Aquatic Conservation: Marine and Freshwater Ecosystems, 28: 1015–1022.

- De Vos, L. 1993. Le genre *Chiloglanis* (Siluriformes, Mochokidae) dans le bassin de la Ruzizi: description de deux nouvelles espèces. Revue de Zoologie Africaine, 107: 153–168.
- Flitcroft, R., M. S. Cooperman, I. J. Harrison, D. Juffe-Bignoli & P. J. Boon. 2019. Theory and practice to conserve freshwater biodiversity in the Anthropocene. Aquatic Conservation: Marine and Freshwater Ecosystems, 29: 1013–1021.
- Fricke, R., W. N. Eschmeyer & R. Van der Laan. (eds.). 2021. Eschmeyer's catalog of fishes: genera, species, references. Available from <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp> (accessed 14 January 2021).
- Friel, J. P. & T. R. Vigliotta. 2008. *Atopodontus adriensi*, a new genus and species of African suckermouth catfish from the Ogooué [sic] and Nyanga River systems of Gabon (Siluriformes: Mochokidae). Proceedings of the Academy of Natural Sciences of Philadelphia, 157: 1–23.
- Friel, J. P. & T. R. Vigliotta. 2011. Three new species of African suckermouth catfishes, genus *Chiloglanis* (Siluriformes: Mochokidae), from the lower Malagarasi and Luiche rivers of western Tanzania. Zootaxa, 3063: 1–21.
- Garcia-Moreno, J., I. J. Harrison, D. Dudgeon, V. Clausnitzer, W. Darwall, T. Farrell, & N. Tubbs. 2014. Sustaining freshwater biodiversity in the Anthropocene. Pp. 247–270 in: A. Bhaduri et al. (eds.), The global water system in the Anthropocene: challenges for science and governance. Springer International, Switzerland.
- Garrick, D. E., J. W. Hall, A. Dobson, R. Damania, R. Q. Grafton, R. Hope, C. Hepburn, R. Bark, F. Boltz, L. De Stefano, E. O'Donnell, N. Matthews, A. Money. 2017. Valuing water for sustainable development. Science, 358: 1003–1005.
- Gosse, J.-P. 1986. Mochokidae. Pp. 105–152 in J. Daget et al. (eds.), Check-list of the Freshwater Fishes of Africa (CLOFFA). Volume 2.. ISBN, Bruxelles, MRAC, Tervuren & ORSTOM, Paris.
- Kasongo Ilunga, K. M., E. Abwe, E. Decru, A. Chocha Manda & E. Vreven. 2020. Description of a new small-sized *Synodontis* species (Siluriformes: Mochokidae) that is important for local subsistence fisheries in the middle Lufira (Upper Congo River, DR Congo). Journal of Fish Biology, 96: 1142–1159.
- Katemo Manda, B., J. Snoeks, A. Chocha Manda & E. Vreven. 2018. Hidden species diversity in *Raiamas salmolucius* (Teleostei: Cyprinidae) from the Congo basin: two new species based on morphometric evidence. Ichthyological Exploration of Freshwaters, 28: 345–363.
- Katemo Manda, B., J. Snoeks, E. Decru, R. Bills & E. Vreven. 2020. *Enteromius thespesios* (Teleostei: Cyprinidae): a new minnow species with a remarkable sexual dimorphism from the southeastern part of the Upper Congo River. Journal of Fish Biology, 96: 1160–1175.
- Legros, H. 1995. Aux racines de l'identité : mémoire et espace chez les Yeke du Shaba, Zaïre. Journal des Africanistes, 65: 201–220.
- Malaisse, F. 1969. La pêche collective par empoisonnement au «buba» (*Tephrosia vogelii* Hook. f.): son utilisation dans l'étude des populations de poissons. Naturalistes belges, 50: 481–500.
- Mo, T. P. 1991. Anatomy, relationships and systematics of the Bagridae (Teleostei: Siluroidei) with a hypothesis of siluroid phylogeny. Koeltz Scientific Books, Koenigstein (Germany) and Champaign (USA), 216 pp.
- Mukweze Mulelenu, C., B. Katemo Manda, E. Decru, A. Chocha Manda & E. Vreven. 2020. Review of the *Cyphomyrus* Myers, 1960 (Osteoglossiformes: Mormyridae) of the Lufira basin (Upper Lualaba: DR Congo): a generic reassignment and the description of a new species. Journal of Fish Biology, 96: 1123–1141.
- Paugy, D., C. Lévêque, I. Mouas & S. Lavoué. 2011. Poissons d'Afrique et peuples de l'eau. IRD, Marseille, 320 pp.
- Poll, M. 1976. Exploration du parc national de l'Upemba. Fondation pour Favoriser les Recherches Scientifiques en Afrique, Fascicule 73, Poissons, 127 pp.
- Reid, A. J., A. K. Carlson, I. F. Creed, E. J. Eliason, P. A. Gell, P. T. J. Johnson, K. A. Kidd, T. J. MacCormack, J. D. Olden, S. J. Ormerod, J. P. Smol, W. W. Taylor, K. Tockner, J. C. Vermaire, D. Dudgeon & S. J. Cooke. 2019. Emerging threats and persistent conservation challenges for freshwater biodiversity. Biological Reviews, 94: 849–873.
- Roberts, T. R. 1989. Systematic revision and description of new species of suckermouth catfishes (*Chiloglanis*, Mochokidae) from Cameroun. Proceedings of the California Academy of Sciences, 46: 151–178.
- Sabaj, M. H. 2020. Codes for natural history collections in ichthyology and herpetology. Copeia, 108: 593–669.
- Schedel, F. D. B., E. J. W. M. N. Vreven, B. Katemo Manda, E. Abwe, A. Chocha Manda & U. K. Schliewen. 2018. Description of five new rheophilic *Orthochromis* species (Teleostei: Cichlidae) from the Upper Congo drainage in Zambia and the Democratic Republic of the Congo. Zootaxa, 4461: 301–349.
- Schmidt, R. C., H. L. Bart Jr., D. W. Nyingi & N. N. Gichuki. 2014. Phylogeny of suckermouth catfishes (Mochokidae: *Chiloglanis*) from Kenya: the utility of growth hormone introns in species level phylogenies. Molecular Phylogenetics and Evolution, 79: 415–421.
- Schmidt, R. C., H. L. Bart Jr. & W. D. Nyingi. 2015. Two new species of African suckermouth catfishes, genus *Chiloglanis* (Siluriformes: Mochokidae), from Kenya with remarks on other taxa from the area. Zootaxa, 4044: 45–64.
- Schmidt, R. C., H. L. Bart Jr. & F. Pezold. 2016. High levels of endemism in suckermouth catfishes (Mochokidae: *Chiloglanis*) from the Upper Guinean forests of West Africa. Molecular Phylogenetics and Evolution, 100: 199–205.

- Schmidt, R. C., H. L. Bart Jr., F. Pezold & J. P. Friel. 2017. A biodiversity hotspot heats up: nine new species of suckermouth catfishes (Mochokidae: *Chiloglanis*) from Upper Guinean forest streams in West Africa. *Copeia*, 105: 301–338.
- Schmidt, R. C. & C. Barrientos. 2019. A new species of suckermouth catfish (Mochokidae: *Chiloglanis*) from the Rio Mongo in Equatorial Guinea. *Zootaxa*, 4652: 507–519.
- Skelton, P. H. & P. N. White. 1990. Two new species of *Synodontis* (Pisces: Siluroidei: Mochokidae) from southern Africa. *Ichthyological Exploration of Freshwaters*, 1: 277–287.
- Skelton, P. H. 2001. A complete guide to the freshwater fishes of southern Africa. Second edition. Struik, Cape Town, 395 pp.
- Taverne, L. & A. Aloulou-Triki. 1974. Étude anatomique, myologique et ostéologique du genre *Synodontis* Cuvier (Pisces: Siluriformes, Mochocidae [sic]). *Annales du Musée Royal de l'Afrique Centrale*, Série 8, Sciences Zoologiques, 210: 1–69.
- Thieme, M. L., R. Abell, M. L. J. Stiassny, B. Lerner, P. H. Skelton, G. G. Teugels, E. Dinnerstein, A. K. Toham, N. Burgess & D. Olsen. 2005. Freshwater ecoregions of Africa and Madagascar: a conservation assessment. Island Press, Washington D.C., 431 pp.
- Vanleeuwe, H., Institut Congolais pour la Conservation de la Nature, P. Henschel, C. Pélassier, D. Moyer & A. Gotanegre. 2009. Recensement des grands mammifères et impacts humains: parcs nationaux de l'Upemba et des Kundelungu, République Démocratique du Congo, Février, 2009. Wildlife Conservation Society (New York), U. S fish and wildlife service (Washington, D.C.) & Panthera, partners in wild cats conservation, 30 pp.
- Vreven, E., B. Katemo Manda, E. Abwe, U. Schliewen, J. Snoeks, T. Musschoot, K. M. Kasongo Ilunga & A. Chocha Manda. 2015. Avertissement des auteurs de la liste de poissons de la province du Katanga (DRC) établie le 1er novembre 2014. Pp. 360–488 in: M. Hasson (ed.), Katanga: des animaux et des hommes. Volume 2: La faune. Musée Royal de l'Afrique Centrale. Tervuren.
- Wright, J. J. & L. M. Page. 2006. Taxonomic revision of Lake Tanganyikan *Synodontis* (Siluriformes: Mochokidae). *Bulletin of the Florida Museum of Natural History*, 46: 99–154.

Received 12 August 2020

Revised 3 October 2020

Accepted 28 July 2021

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.