

***Pseudomystus stenogramm*, a new species of bagrid catfish from Borneo (Teleostei, Bagridae)**

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Abstract

Pseudomystus stenogramm, a new species of bagrid catfish, is described from the Barito River drainage of southern Borneo. The new species is distinguished from all congeners by its colour pattern.

Key words: Bagridae, *Pseudomystus*, new species, colour pattern, Borneo

Introduction

Pseudomystus (Jayaram) is a genus of bagrid catfishes with about 14 recognised species (depending on synonymy), commonly found in swamps and rivers throughout Southeast Asia. Jayaram (1968) originally described it as a subgenus of *Leiocassis* Bleeker, for those *Leiocassis* species with a relatively short snout and subterminal mouth as opposed to those species with a snout produced beyond an inferior mouth. Mo (1991), in a study of the anatomy and systematics of bagrids, elevated *Pseudomystus* to generic rank based on four putative synapomorphies: 1) a posterior fontanelle absent or reduced to a small hole enclosed entirely in the supraoccipital; 2) the cranial roof elements largely observable through the skin; 3) the pterotic cephalic sensory canal by-passing the extrascapular on way to posttemporal (sensory canal not incorporated into extrascapular); and 4) a hypertrophied nuchal plate (unique among bagrids). Mo's results also indicate that, although *Pseudomystus* was proposed originally as a subgenus of *Leiocassis*, *Pseudomystus* probably is not closely related to *Leiocassis*. Instead *Pseudomystus* is the sister group to a large group of bagrinine genera, of which *Leiocassis* is a member.

Ten of the recognised *Pseudomystus* species were described in the period from 1840–1913. From 1913 until 1959 no new *Pseudomystus* species were described that are considered valid now, but beginning in 1959 three species were described from Borneo (*Pseudomystus robustus* (Inger & Chin, 1959), *Pseudomystus myersi* (Roberts, 1989), and *Pseudomystus flavipinnis* Ng & Rachmatika, 1999) and one from Lao PDR (*Pseudomystus bomboides* Kottelat, 2000).

Many *Pseudomystus* species are beautiful fishes with colour patterns of striking contrast, with light bands and/or blotches on a dark background on the body and fins, with the pattern reversed on some fins in some species. Even some species that were described as having uniformly coloured bodies, e.g. *P. inornatus* (Boulenger, 1894) and *P. robustus*, have blotches and bands when juvenile (Lim & Wong, 1994; Ng & Rachmatika, 1999). *Pseudomystus mahakamensis* (Vaillant, 1902) lacks any blotches or bands on the body, instead possessing a clearly defined midlateral stripe on a dark background.

During a survey of the Barito River drainage in southern Borneo, carried out in collaboration with the Museum Zoologicum Bogoriense, Cibinong, specimens of a *Pseudomystus* species were obtained which were originally identified as *P. mahakamensis*, a species described from two specimens from the Mahakam River drainage in eastern Borneo. Subsequent comparison with the two types of *P. mahakamensis* and a fresh specimen (only three specimens of the species are known) has revealed that the material of the Barito River is from an undescribed species, herein described as *Pseudomystus stenogrammus*.

Material and Methods

Measurements were made point to point with dial callipers and data recorded to a tenth of a millimetre. Counts and measurements were made on the left side of specimens whenever possible, following Ng and Dodson (1999), except for vertebral (prehemal = abdominal and hemal = caudal) counts which follow Siebert and Richardson (1997). Measurements of features of the head are presented as proportions of head length (HL); head length and measurements of body parts are given as proportions of standard length (SL). Fin rays were counted under a binocular dissecting microscope using transmitted light. Vertebral counts were taken from radiographs. Numbers in parentheses following a particular count indicate the number of specimens with that count. Drawings of the specimens were made with a microscope and camera lucida. Institutional codes follow Eschmeyer (1998).

Pseudomystus stenogrammus sp. nov. (Fig. 1, 3a)

Type material. Holotype: MZB 6103, female, 133.3 mm SL; Borneo: Kalimantan Tengah, Sungai Laung at Dessa Maruwei, D. Siebert, O. Crimmen & A. H. Tjakrawidjaja, 15–18 Jul 1992.

Paratypes: All from Borneo: Kalimantan Tengah and collected by D. Siebert, O. Crimmen & A. H. Tjakrawidjaja. BMNH 1998.10.1.4, 1 male, 89.0 mm SL; ZRC 46152, 1 male, 80.1 mm SL; data as for the holotype. BMNH 1998.10.1.1, 1 female, 67.0 mm SL; Barito River at Muara Laung; 20–21 Feb 1991. BMNH 1998.10.1.2, 1 female, 98.9 mm SL; Barito River at Muara Laung; 20–22 Feb 1991. BMNH 1998.10.1.6, 1 male, 80.2 mm SL; Barito River at Muara Laung; 8 Jul 1992.

Diagnosis. *Pseudomystus stenogrammus* (Fig. 1) and *P. mahakamensis* (Fig. 2) are immediately distinguishable from all other *Pseudomystus* by a pigmentation pattern of a light, midlateral stripe on a dark back ground instead of either a uniform colour pattern in adults (*P. inornatus* and *P. robustus*) or a colour pattern of light, transverse bands and/or blotches on a dark background (all other species). They are also distinguished from all their congeners by a strongly depressed head and deeply forked caudal fin with very long, lanceolate lobes, strongly asymmetric, upper lobe longest (vs. moderately depressed head and caudal fins with triangular lobes that are subequal, with upper lobe slightly longer).



FIGURE 1. *Pseudomystus ornatus*, paratype, male, ZRC 46152, 80.1 mm SL.

Pseudomystus stenogrammus most closely resembles *P. mahakamensis* but can be distinguished from it by: a thinner midlateral stripe (compare Figs. 1 & 2); a shorter adipose-fin base (11.5–14.7 % SL vs. 15.2–18.8 respectively); a wider head (15.2–17.3 % SL vs. 17.8–18.4 respectively); and anterior edge of pectoral spine denticulate almost to tip (Fig. 3a) vs. only proximal half of anterior edge of pectoral spine denticulate respectively (Fig. 3b).

Description. Head depressed and broad; snout rounded when viewed from dorsal view. Orbit not free, eyes dorsal, not visible from ventral view. Lips with large, fleshy rictal lobes, upper lip overhangs mouth, inner margin slightly plicate. Maxillary barbels reaching to midway along pectoral fin, nasal barbels reaching to two-thirds of distance to rear of head, outer mandibular barbels reaching to beyond pectoral-fin base, inner mandibular barbels reaching to posterior edge of branchiostegal membrane. Body terete, with lit-

tle lateral compression; body in shape of elongate cone, widest just behind pectoral fins. Dorsal profile rising evenly but not steeply from tip of snout to origin of dorsal fin, then gently sloping posteroventrally from that point to end of caudal peduncle. Ventral profile horizontal to origin of anal fin, then sloping posterodorsally to end of caudal peduncle. Dorsal origin nearer tip of snout than end of caudal peduncle. Dorsal spine stout, without serrations on posterior edge. Depressed dorsal fin not reaching adipose fin. Pectoral spine stout, with minute denticulations along nearly of all anterior edge and with 11–14 large serrae on posterior edge (Fig. 3a). Anal origin slightly posterior to vertical through adipose fin origin. Caudal fin forked; upper and lower lobes lanceolate, upper lobe about twice as long as lower, with upper simple principal ray very elongate.



FIGURE 2. *Pseudomystus mahakamensis*, male, RMNH 7838, 84.6 mm SL.

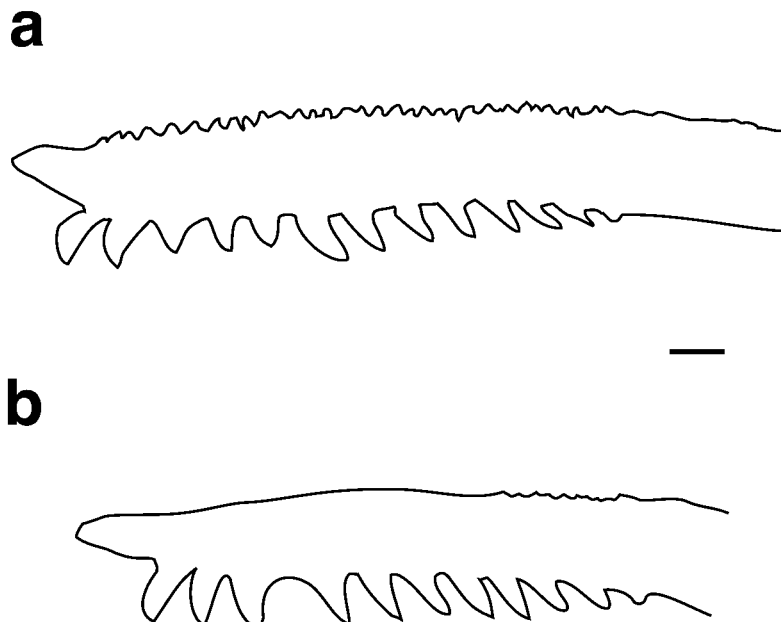


FIGURE 3. Right pectoral spines of: a. *P. ornatus*, (BMNH 1998.10.1.6, paratype, male, 80.2 mm SL); b. *P. mahakamensis* (RMNH 7838, syntype, male, 83.8 mm SL). Scale bar indicates 1 mm.

Proportional measurements. In % SL: head length 22.3–23.9, head width 15.2–17.3, head depth 9.7–11.0, predorsal distance 31.3–34.3, preanal length 60.4–63.0, prepelvic length 45.5–46.9, prepectoral length 18.7–21.3, body depth at anus 9.0–10.4, length of caudal peduncle 16.2–21.1, depth of caudal peduncle 5.4–6.6, pectoral-spine length 13.7–18.5, pectoral-fin length 17.3–21.6, dorsal-spine length 7.5–13.6, length of dorsal-fin base 8.2–10.6, pelvic-fin length 10.9–14.9, length of anal-fin base 16.6–19.0, caudal-fin length 54.7–58.6 (males), 34.2–47.7 (females), length of adipose-fin base 11.5–14.7, dorsal fin to adipose findistance 26.1–33.4. In % HL: snout length 26.5–32.8, interorbital distance 25.7–28.9, eye diameter 10.0–13.9, nasal barbel length 50.3–73.1, maxillary barbel length 112.1–134.3, inner mandibular barbel length 41.9–64.2, outer mandibular barbel length 90.6–119.9.

Counts. Branchiostegal rays: 7 (5) or 8 (1). Gill rakers: 4+8 (1). Vertebral counts: total 44 (3) or 45 (3), prehaemal 14 (1), 15 (4) or 16 (1), haemal 28 (1), 29 (1) or 30 (4), peduncle 11 (2) or 12 (4), position of proximal dorsal-fin pterygiophore 1 (2) or 2 (4), position of anal-fin pterygiophore 18 (1) or 19 (5) and ribs 10 (3) or 11 (3). Fin ray counts: dorsal II,4,i (3) or II,5,i (3); pectoral I,6,i (2), I,7 (1) or I,7,i (3); pelvic i,5 (6); anal viii,9 (1), vii,10 (4) or vii,11 (1); caudal 8/9 (6).

Colouration in alcohol. Dorsal and lateral surfaces of head, body, and middle rays of both lobes of caudal fin medium purplish brown; ventral surfaces of head and body cream but underside of head with scattered melanophores. Area around openings of sensory canals on dorsal surface of head of most specimens pale. Distinct, cream midlateral stripe running along lateral line; midlateral stripe begins at edge of opercle as series of isolated, aligned white spots, spot interspaces decrease rapidly posteriorly, interspaces coalesce shortly behind dorsal-fin origin to become thin, solid white line, white line ends before caudal fin rays in most specimens; white lateral stripe crossed by vertical rows of small white spots in many specimens, each spot pale area surrounding secondary sense organ or papilla. Dorsal fin with faint, transverse, purplish brown band across middle one-third; intraradial membranes hyaline. Pectoral fin cream coloured, but with leading edge darkly pigmented. Pelvic fin cream coloured. Anal fin cream coloured in most specimens, but in one male specimen anal fin with pigmentation pattern as that of dorsal fin. Adipose fin medium purplish brown, with distal margins cream coloured. Dorsal and ventral edges of caudal fin with broad, cream-coloured band, dorsal band of caudal starting at beginning of procurrent rays, ventral band continuous with cream coloured ventor; middle caudal fin rays cream coloured from base to tips, cream coloured area around base of middle caudal fin rays spot-like, converging with midlateral stripe in some males.

Dimorphism. Females larger than males in examined specimens; males with elongate, pointed urogenital papilla and with proximal half of middle most ray(s) of lower caudal lobe fleshy, perhaps glandular in nature.

Distribution. *Pseudomystus stenogrammus* is only known from the Barito River drainage of southern Borneo.

Etymology. The epithet *stenogrammus* is compounded from the Greek words *stenos*, meaning narrow, and *gramme*, meaning line. The epithet, meaning narrow line, is proposed in reference to the thin white line along the lateral line of the new species and is to be treated as a noun in apposition.

Discussion

Fifteen species of *Pseudomystus* are now known. The genus is distributed in Thailand, Malaysia, and Indonesia, on Java, Sumatra, and Borneo, with only *Pseudomystus siamensis* (Regan, 1913) and *P. bomboides* known from north of the Thai Peninsula. Borneo has the greatest number of species by far, with at least 10, followed by Sumatra, with about seven. However, the region inhabited by *Pseudomystus* remains under-collected and the distributions of *Pseudomystus* species from the southern part of the range are poorly documented, being in many cases known from very few specimens and localities. Range extensions (e.g. from Borneo to Sumatra for *Pseudomystus fuscus* (Popta, 1904) and *Pseudomystus rugosus* (Regan, 1913) by Tan and Ng, 2000), and additional new species are to be expected as the ichthyofauna of the area becomes better known.

Comparative material

Pseudomystus mahakamensis: RMNH 7838, 2 males, syntypes, 83.8–84.6 mm SL; Borneo: Tepoe. CMK 7785, 1 female, 92.0 mm SL; Borneo: Kalimantan Timur, Mahakam River, boulders upstream of Melak.

Acknowledgments

We thank the Indonesian Institute of Sciences (LIPI) for permission to conduct fieldwork in Kalimantan, Indonesia, Agus Tjakrawidjaja and Abdul Mun'im for their efforts that were essential to the success of fieldwork, Maurice Kottelat (CMK) and Martien van Oijen (RMNH) for the loan of material under their care, Tan Heok Hui for taking the photograph in Fig. 2, and the All Catfish Species Inventory (NSF DEB-0315963) for financial support. The Carl L. and Laura C. Hubbs Research Fellowship from the Museum of Zoology, University of Michigan to the first author has provided additional support for this project.

References

Boulenger, G.A. (1894) Descriptions of new freshwater fishes from Borneo. *Annals and Magazine of Natural History (Series 6)*, 13, 245–251.

- Eschmeyer, W. (1998) *Catalog of Fishes*. California Academy of Sciences, San Francisco, 2905 pp.
- Inger, R.F. & Chin, P.K. (1959) New species of fresh-water catfishes from North Borneo. *Fieldiana Zoology*, 39, 279–296.
- Jayaram, K.C. (1968) Contributions to the study of bagrid fishes (Siluroidea: Bagridae). 3. A systematic account of the Japanese, Chinese, Malayan and Indonesian genera. *Treubia*, 27, 287–386.
- Kottelat, M. (2000) Diagnoses of a new genus and 64 new species of fishes from Laos (Teleostei: Cyprinidae, Balitoridae, Bagridae, Syngnathidae, Chaudhuriidae and Tetraodontidae). *Journal of South Asian Natural History*, 5, 37–82.
- Lim, K.K.P. & Wong, A. (1994) Fishes of the Kinabatangan Basin, Sandakan District, Sabah, East Malaysia. *Sabah Museum Journal*, 1, 39–71.
- Mo, T.-P. (1991) Anatomy and systematics of Bagridae (Teleostei) and siluroid phylogeny. *Theses Zoologicae*, 17, 1–216.
- Ng, H.H. & Dodson, J.J. (1999) Morphological and genetic descriptions of a new species of catfish, *Hemibagrus chrysops*, from Sarawak, East Malaysia, with an assessment of phylogenetic relationships (Teleostei: Bagridae). *The Raffles Bulletin of Zoology*, 47, 45–57.
- Ng, H.H. & Rachmatika, I. (1999) The catfishes (Teleostei: Siluriformes) of Bentuang Karimun National Park, West Kalimantan, Indonesia. *The Raffles Bulletin of Zoology*, 47, 167–183.
- Tan, H.H. & Ng, H.H. (2000) The catfishes (Teleostei: Siluriformes) of central Sumatra. *Journal of Natural History*, 34, 267–303.
- Popta, C.M.L. (1904) Descriptions préliminaires des nouvelles espèces de poissons recueillies au Bornéo central par M. le Dr. A. W. Nieuwenhuis en 1898 et en 1900. *Notes of the Leyden Museum*, 24, 179–202.
- Roberts, T.R. (1989) The freshwater fishes of Western Borneo (Kalimantan Barat, Indonesia). *Memoirs of the California Academy of Sciences*, 14, xii + 1–210.
- Regan, C.T. (1913) A synopsis of the siluroid fishes of the genus *Liocassis*, with descriptions of new species. *Annals and Magazine of Natural History (Series 8)*, 11, 547–554.
- Siebert, D.J. & Richardson, P.J. (1997) *Rasbora laticlavia*, a new cyprinid from Kalimantan, Indonesia, and lectotype designation for *R. vaillantii*. *Ichthyological Exploration of Freshwaters*, 8, 89–95.
- Vaillant, L. L. (1902) Résultats zoologiques de l'expédition scientifique Néerlandaise au Bornéo central. Poissons. *Notes of the Leyden Museum*, 24, 1–166, Pls. 1–2.