

**AKYSIS HETERURUS, A NEW SPECIES OF CATFISH
(TELEOSTEI: AKYSIDAE) FROM EASTERN SUMATRA, WITH
NOTES ON AKYSIS HENDRICKSONI ALFRED**

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ABSTRACT. - *Akysis heterurus*, new species, is described from the Batang Hari basin in eastern Sumatra. The species closely resembles *A. hendricksoni*, but can be distinguished from it and other congeners by its truncate caudal fin (vs. forked caudal fin) and the presence of 2-3 light brown spots on the dorsum below the dorsal fin (vs. the absence of spots). Some notes on the biology of *A. hendricksoni* are also provided.

INTRODUCTION

Members of the genus *Akysis* are small, cryptically-coloured catfishes found in fast-flowing streams in Asia. They are characterised by a combination of characters: presence of an adipose fin, tubercles arranged in longitudinal rows on the body, and a gill opening extending above the base of the pectoral. There are presently eleven species known, viz. *Akysis variegatus* (Bleeker, 1846), *A. macronema* Bleeker, 1860, *A. pictus* Günther, 1883, *A. baramensis* Fowler, 1905, *A. leucorhynchus* Fowler, 1934, *A. maculipinnis* Fowler, 1934, *A. prashadi* Hora, 1936, *A. hendricksoni* Alfred, 1966, *A. brachybarbatus* He & Chen, 1981, *A. sinensis* He & Chen, 1981, and *A. pseudobagarius* Roberts, 1989.

Recently, a series of specimens of an unidentified *Akysis* were obtained from the Batang Hari basin in eastern Sumatra. These specimens prove to belong to an undescribed species, here named *Akysis heterurus*. The description of the species, with brief notes on its biology and that of its congener, *A. hendricksoni*, form the basis of the present paper.

MATERIALS AND METHODS

Specimens are deposited in the Zoological Reference Collection (ZRC), Department of Zoology, National University of Singapore; the collection of Maurice Kottelat (CMK), Cornol, Switzerland; the Academy of Natural Sciences (ANSP), Philadelphia; the Nationaal

Natuurhistorisch Museum (RMNH), Leiden; and the Institute for Systematics and Population Biology (Zoölogisch Museum), University of Amsterdam (ZMA).

The following anatomical abbreviations are used: HL, head length and SL, standard length. The head length is taken from the tip of the snout to the tip of the operculum. The head depth is taken at the anterior base of the dorsal fin. The caudal peduncle length is the horizontal distance taken from the posterior base of the anal fin to the posterior margin of the hypural complex. Barbel lengths are measured from the base to the tip. All other measurements taken are measured from point to point and follow Ng & Lim (1995) and Ng & Ng (1995). Measurements were made on the left side of the body whenever possible. Fin ray counts follow Hubbs & Lagler (1947). Vertebrae were examined in radiographs and counted in the manner of Roberts (1994).

***Akysis heterurus*, new species**

Figs. 1, 2

Material examined. - Holotype. ZRC 34194, 1 ex., 18.9 mm SL; Sumatra: Jambi, Sg. Alai at 19.5 km Muara Bungo-Muara Tebo road; coll. S. H. Tan & H. H. Ng, 22 Jun.1995.

Paratypes. - ZRC 39248, 7 ex., 18.4-26.1 mm SL; data as for holotype. - CMK 12199, 1 ex., 21.1 mm SL; data as for holotype. - MZB 6209, 1 ex., 25.4 mm SL; data as for holotype.

Diagnosis. - *Akysis heterurus* is distinguished from all its congeners by: truncate caudal fin (vs. forked caudal fin) and the presence of 2-3 light brown spots on the dorsum, below the dorsal fin (vs. absence of the spots). Other characters distinguishing the species but not unique to it are: broad head (24.0-27.7 %SL), presence of 4-6 serrae on the posterior edge of the pectoral spine and long nasal barbel (72-135 %HL).

Description. - Head depressed and broad, body moderately compressed. Dorsal profile rising evenly but not steeply from the tip of snout to the origin of dorsal fin, then sloping gently ventrally from there to caudal peduncle. Ventral profile horizontal to origin of anal, then sloping dorsally to caudal peduncle. Head covered with small tubercles, body with tubercles arranged in 5-6 longitudinal rows on each side. Median fontanel not reaching base of occipital process. Occipital process narrow, its tip tapering and reaching predorsal plate. Anterior nostril tubular. In %SL: head length 18.4-26.6, head width 24.0-27.7, predorsal distance 36.1-37.5, preanal length 57.3-63.5, prepelvic length 38.5-49.5, prepectoral length 18.3-21.2, body depth at anus 12.5-15.3, length of caudal peduncle 19.0-22.3, depth of caudal peduncle 8.5-10.9, pectoral-spine length 20.0-24.1, pectoral-fin length 23.6-26.2, length of dorsal fin base 13.0-16.3, pelvic-fin length 10.3-14.4, length of anal fin base 18.8-25.2, caudal-fin length 21.5-28.0, adipose-fin length 17.4-26.0; in %HL: snout length 30-44, interorbital distance 40-58, eye diameter 14-18, nasal barbel length 71-135, maxillary barbel length 89-156, inner mandibular barbel length 50-94, outer mandibular barbel length 89-138. Branchiostegal rays 4. Gill rakers 1+6. Vertebral formula 15+17-18 = 32 (2 specimens), 33 (2 specimens) or 16+17-19 = 33 (1 specimen), 34 (1 specimen), 35 (1 specimen).

Fin ray counts: dorsal I, 3, ii or I, 4, i; pectoral I, 4, ii or I, 5, i or I, 6, i; pelvic ii, 3, i or i, 4, i; anal iv, 5, i or iv, 6, i or iii, 6, i or ii, 6, i or iii, 5, ii; caudal 7/. Dorsal origin nearer tip of snout than caudal flexure. Pectoral spine stout, with 4-6 large serrae posteriorly. Anal origin slightly posterior to adipose origin. Depressed dorsal not reaching adipose fin. Caudal fin truncate.

Colour. - Live specimens: dorsal surface and sides of head and body brown. The belly, chest and ventral surface of the head light-yellow with fine brown spots. Three irregular light-yellow patches over the top and sides: one on the occipital region, another posterior to the dorsal fin and contiguous with the adipose fin and the third from the posterior end of the adipose base to immediately anterior to the caudal flexure. The latter two markings are contiguous with, or laterally narrowly separated from similar markings that extends dorsally from the surroundings of the anal fin. The light-yellow markings have fine light-brown reticulations on them. Two to three light-yellow spots ventral to the dorsal fin on both sides of the body. Adipose fin brown, except for light-yellow at the origin and along the edge. Basal two-thirds of dorsal fin brown, the remaining one-third with brown spots. Pectoral, pelvic, anal and caudal fins with brown spots. Barbels and pectoral spines transversely barred with brown rings. Colour of specimens in 70% alcohol similar to that of live specimens, except for its lighter tone.

Distribution. - Presently only known from the Batang Hari basin in eastern Sumatra.

Etymology. - From the Greek *heteros* (=different) and *oura* (=tail). Named after its tail shape, which is distinctly different from all its congeners.

Discussion. - *Akysis heterurus* differs from all its congeners most notably in the shape of its caudal fin. All other known species of *Akysis* possess a distinctly forked caudal fin, whereas that of *A. heterurus* is truncate (see Fig. 3). *Akysis heterurus* also possesses 2-3 light brown spots on the dorsum below the dorsal fin, a trait absent in all other species. In its general body shape and colouration, it closely resembles *A. hendricksoni*, but can be easily differentiated by the shape of its caudal fin (Fig. 3), the presence of spots below the dorsal fin (vs. the absence of spots), 9-10 branched caudal fin rays (vs. 11 branched caudal

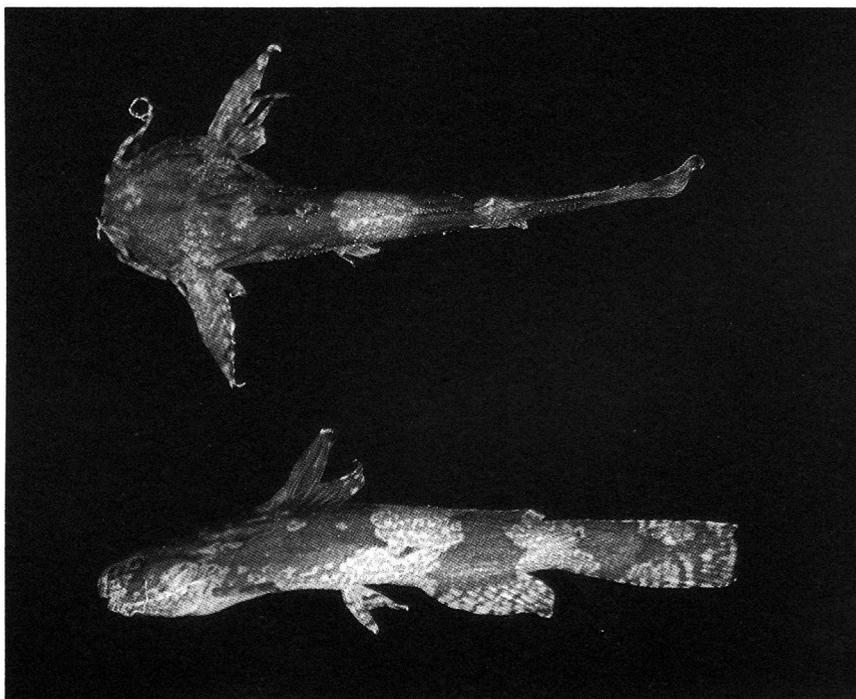


Fig. 1. *Akysis heterurus*. ZRC 39248, paratypes, 19.6 & 19.4 mm SL.

fin rays) and the broader head shape (vs. more triangular head shape; see Fig. 4). The two species are geographically separate: *A. heterurus* is known from eastern Sumatra and *A. hendricksoni* from northern Peninsular Malaysia and southern Thailand.

Akysis heterurus is easily differentiated from *A. pictus* and *A. prashadi* by its serrated pectoral spines (vs. non-serrated pectoral spines) (Günther, 1883; Hora, 1936) and the presence of light-yellow spots below the dorsal fin (vs. the absence of spots) (Prashad & Mukerji 1929: Pl. 8 Fig. 1). The head and body markings of *A. heterurus* are brown (vs. grey head speckled with black and black body markings in the two species).

Akysis macronema is known only from four specimens collected from Lahat, Sumatra (Bleeker, 1860), of which two are in RMNH. Of these, only the two syntypes (RMNH 6729) are now extant; both the syntypes are in extremely poor condition — they are badly dehydrated and all traces of the original colour have disappeared. From Bleeker's description and the examination of the syntypes, the eyes of *A. heterurus* are bigger and set further apart (eye diameter 7-11 %HL vs. 14-18; interorbital distance 40-58 %HL vs. 32-35) (see Bleeker, 1860; 1862: Pl. 84 Fig. 1). However, morphometric characters, if used to differentiate *A. heterurus* from *A. macronema*, may not be reliable, given the condition and the number of specimens. The head shape is distinctly different between the 2 species. As there is little flesh on the head, we feel that changes of the head shape due to shrinkage will be minimal. Until fresh material is collected and other morphometric differences can be determined, *A. macronema* is here differentiated from *A. heterurus* by its head shape (See Fig. 4) and larger eyes that are set further apart.

Akysis heterurus can be separated from *A. variegatus* not only by the different shape of the caudal fin and the presence of spots below the dorsal fin (vs. absence) but also the presence of 4-6 comparatively large serrae in the pectoral spine (vs. 1-4 smaller serrae). *Akysis heterurus* also has a deeper caudal peduncle and longer anal fin base and nasal barbels than *A. variegatus* (depth of caudal peduncle 8.5-10.9 %SL vs. 5.2-8.3; length of anal fin base 18.8-25.2 %SL vs. 8.4-17.1; nasal barbel length 71-135 %HL vs. 33-62). *Akysis variegatus* is known only from western Java so far.

Akysis leucorhynchus has a distinct white snout. Based on this, *A. leucorhynchus* is easily separable from *A. heterurus* (which lacks the white snout). *Akysis heterurus* can be further differentiated from *A. leucorhynchus* in having a longer anal-fin base, deeper and shorter caudal peduncle and larger eyes (length of anal-fin base 18.8-25.2 %SL vs. 9.7-16.6; caudal peduncle depth 8.5-10.9 %SL vs. 5.5-7.1; length of caudal peduncle 12.1-14.1 %SL

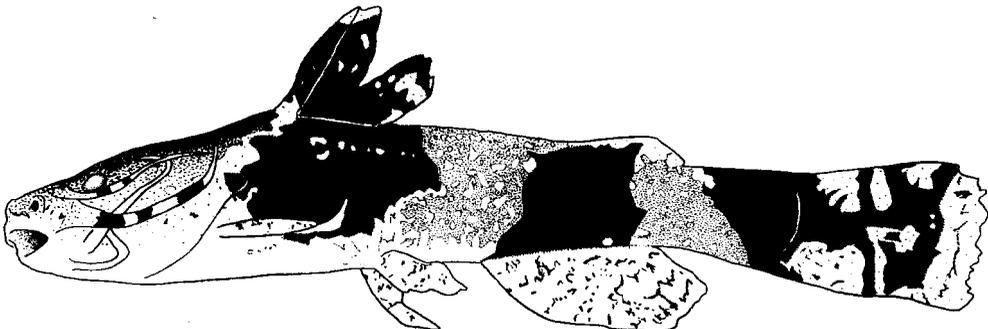


Fig. 2. Schematic illustration of *Akysis heterurus* (ZRC 39248, Sumatra: Jambi, paratype, 19.4 mm SL) showing colour pattern. Note broken dorsal fin and that fin rays have not been included.

vs. 17.6-25.9; eye diameter 14-18 %HL vs. 9-14) *Akysis heterurus* has distinct light-coloured patches on the body (vs. indistinct light-coloured patches on the body of *A. maculipinnis*). The head shapes of *A. heterurus* and *A. maculipinnis* are also different (see Fig. 4).

Akysis heterurus can be differentiated from *A. baramensis* by the following combination of characters: premaxillary toothband of *A. heterurus* not exposed when mouth is closed (vs. premaxillary toothband exposed when mouth is closed), longer nasal and inner mandibulary

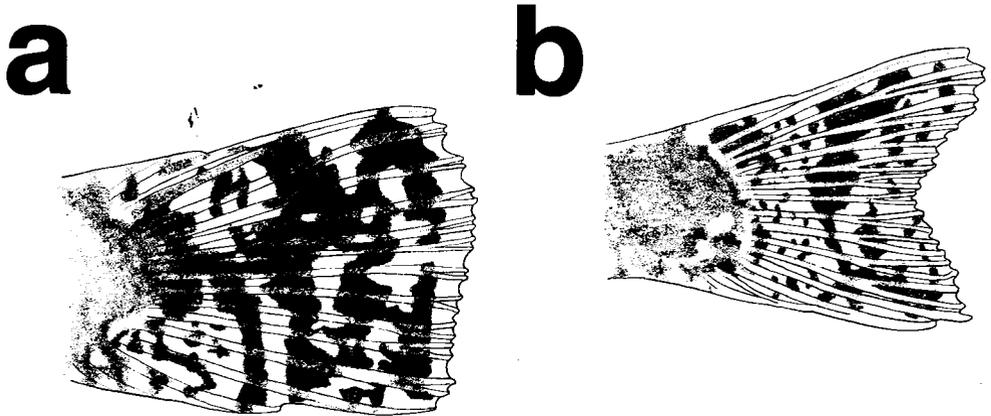


Fig. 3. Schematic illustration of caudal fins. a. *Akysis heterurus*, ZRC 39248, 18.4 mm SL. b. *A. hendricksoni*, ZRC 38731, 23.0 mm SL.

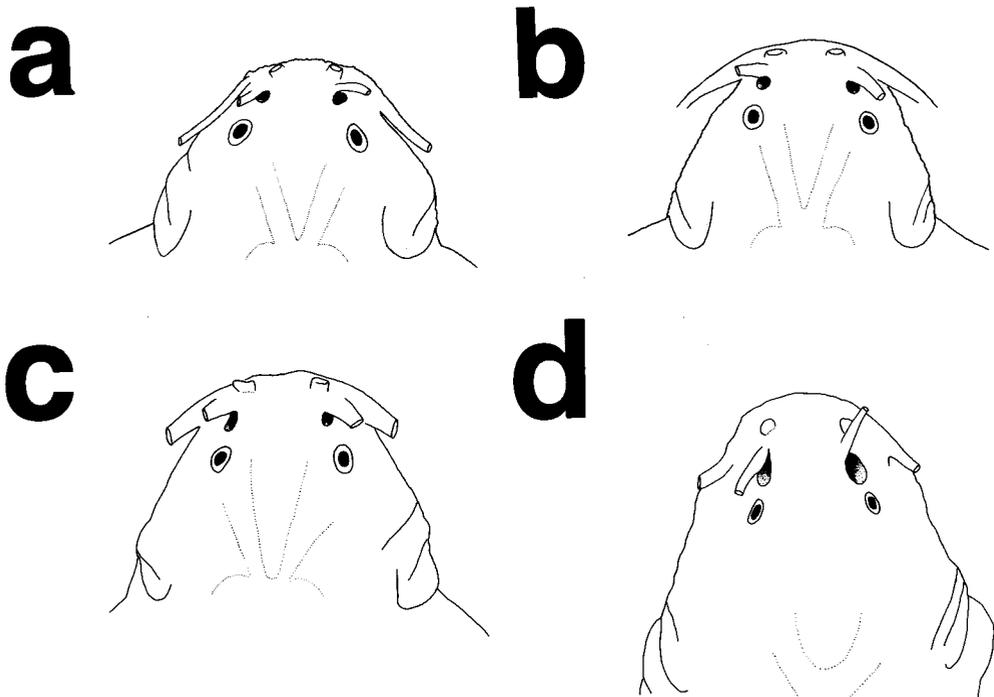


Fig. 4. Schematic illustration of dorsal view of heads. a. *Akysis heterurus*, ZRC 39248, 33.0 mm SL. b. *A. hendricksoni*, ZRC 23396, 32.4 mm SL. c. *A. maculipinnis*, ZRC 35519, 19.4 mm SL. d. *A. macronema*, RMNH 6729, 35.7 mm SL.

barbels of *A. heterurus* (nasal barbels 71-135 %HL vs. 23-48; inner mandibular barbels 50-94 %HL vs. 13-26), and brown dorsum with light-yellow transverse bands of *A. heterurus* (vs. dusky-brown dorsum with light-yellow patches).

The head and body of *A. pseudobagarius* is extremely narrow and elongate, with the snout strongly overhanging the lower jaw; this is different from that of *A. heterurus*. Furthermore, the premaxillary toothband of *A. heterurus* is not exposed when the mouth is closed and the pectoral spine has 4-6 serrae (vs. premaxillary toothband entirely exposed when the mouth is closed and pectoral spine with 8-9 serrae).

Akysis heterurus differs from *A. brachybarbatus* in having a different shape of the caudal fin, 4-6 serrae on the pectoral spine (vs. no serrae), and the base of the barbels rounded (vs. the base of the barbels broadened and flattened).

Akysis heterurus differs from *A. sinensis* in having the caudal fin truncate (vs. forked with sharply-pointed lobes), 4-6 serrae on the pectoral spine (vs. 6-9 serrae) and the body is light brown with light-yellow transverse bands (vs. yellow with a large irregular light brown patch on the dorsum).

Notes on Biology. - *Akysis heterurus* was caught at the base of young *Pandanus* growing submerged along the banks of a deep, fast-flowing stream. The pH of the water was 6.7. Other catfish caught with this species were: *Parakysis grandis*, *Mystus micracanthus* and *Hemibagrus* aff. *nemurus*.

Akysis hendricksoni Alfred

Akysis hendricksoni Alfred, 1966: 467-470 (type locality: Malaysia: Trengganu, Trengganu River, Kuala Brang). - Kottelat et al., 1992: 11.

Material examined. - ZRC 1414, 1 ex., holotype, 23.3 mm SL; Malaysia: Trengganu, Trengganu River, Kuala Brang; coll. E. R. Alfred, T. Selvarajah & J. R. Hendrickson, 8 Jul. 1958. - ZRC 1416, 1 ex., paratype, 24.5 mm SL; data as for holotype. - ZRC 23387-23412, 26 ex., 23.7-48.7 mm SL; CMK 8179, 30 ex., 23.0-38.7 mm SL; Malaysia: Trengganu, stream outside Sekayu waterfall park; coll. P. K. L. Ng et al., 18 Mar. 1992. - ZRC 38751, 77 ex., 22.5-37.8 mm SL; Malaysia: Trengganu, tributary of Sungei Trengganu, immediately downriver of Sekayu waterfall; coll. P. K. L. Ng et al., 16 May 1995. - ZRC 27599-27600, 2 ex., 24.9-30.0 mm SL; Malaysia: Selangor, Sabak Bernam, Sungei Bernam; coll. P. K. L. Ng et al., 19 Sept. 1992

Diagnosis. - *Akysis hendricksoni* is differentiated from all its congeners by its generally shorter nasal barbels (54.7-78.9 %SL) and colouration (brown with an irregular yellow transverse band across the dorsum and sides behind the dorsal and another behind the adipose fin).

Discussion. - Examination of a large series confirms that the diagnostic features used by Alfred (1966) for the species are valid. *Akysis hendricksoni* has been recorded from two places in Peninsular Malaysia: the Trengganu River drainage in the northeast (type locality) and the Sabak Bernam drainage in the west (Alfred, 1966; Ng et al., 1992; Kottelat et al., 1992). The habitats in which *A. hendricksoni* were caught were similar to those of *A. heterurus*. The type locality of *A. hendricksoni* (a stagnant backwater with leaf litter substrate) is probably not the typical habitat of this species, as Alfred (1966) only managed to catch three specimens and none the following year. Instead, my colleagues and I have caught

large numbers in a large, fast-flowing river with a sandy bed. The fish were caught from fallen logs and leaf litter. It appears that *A. hendricksoni* normally prefers deep waters, although this fact could not be confirmed because the fishes were only caught when the water levels of the rivers had been artificially lowered to the point where it was possible to catch the fish using tray nets.

Many specimens of *A. hendricksoni* regurgitated small atyid shrimps of the genus *Caridina* after capture. The predatory nature of these diminutive catfish has been confirmed by captive specimens in the aquarium, which voraciously consumed bloodworms (chironomid larvae).

Comparative material. - *Akysis baramensis* - ANSP 114887, 1 ex., holotype, 35.9 mm SL; ANSP 88950, 9 ex., paratypes, 32.5-39.4 mm SL; Borneo: Baram river; coll. W. H. Furness III, 1898 (photograph and radiograph examined).

Akysis brachybarbatus - CMK 5667, 2 ex., paratypes, 33.2-34.1 mm SL; China: Yunnan, Menglian County, Mekong River basin; Jul. 1978.

Akysis leucorhynchus - CMK 4969, 9 ex., 22.5-30.2 mm SL; Thailand: Nan Province, Mae Nam Nan basin: market at Chang Klang, about 80 km north of Nan on road 1080; coll. M. Kottelat, 9 Mar. 1985. - CMK 5149, 1 ex., 23.2 mm SL; Thailand: Trang Province, Khlong Lam Bon, a tributary of Mae Nam Trang at Ban Kao Lak; S. Lumlerdacha, coll. M. Kottelat & T. R. Roberts, 2 Apr. 1985.

Akysis macronema - RMNH 6729, 2 ex., syntypes, 35.1-35.7 mm SL, Sumatra: Lahat, C. A. M. M. M. von Ellenrieder, 1860.

Akysis maculipinnis - ZRC 35519-35521, 3 ex., 19.4-20.4 mm SL; CMK 10708, 4 ex., 18.0-31.3 mm SL; Thailand: Trat Province, 18 km on Trat-Bo Rai road (3271); coll. M. Kottelat et al., 3 Dec. 1993.

Akysis pseudobagarius - CMK 6855, 1 ex., 58.4 mm SL; Borneo: Kalimantan Barat, Kapuas River mainstream at Nanga Embaluh; coll. M. Kottelat et al., 27 Apr. 1990.

Akysis variegatus - RMNH 6881, 16 ex., syntypes, 22.2-33.3 mm SL; Bleeker collection. - ZMA 104.652, 1 ex., 30.2 mm SL; Indonesia: Jakarta, harbour channel near laboratory; P. N. van Kampen, Jan. 1906.

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