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A new species of *Hampala* (Teleostei: Cyprinidae) from the Lower Tenasserim basin of Thailand

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Abstract. *Hampala siamensis*, new species, is described from the Lower Tennasserim basin in Peninsular Thailand. This new species can be distinguished from its congeners by a saddle-like bar or inverted triangular marking on the body beneath the dorsal fin, rarely reaching the lateral-line scale row, by measurements of the head and body and scale counts. It is the fourth species of *Hampala* recorded from Thailand.

Key words. aquatic biodiversity, Southeast Asia, freshwater fish, taxonomy, Cypriniformes

INTRODUCTION

The genus *Hampala* includes medium-sized predatory cyprinids (up to 600 mm SL) distributed in mainland Southeast Asia, the Greater Sunda Islands and an island in the Palawan chain of the Philippines. There are currently seven recognised species, *H. ampalong*, *H. bimaculata*, *H. dispar*, *H. lopezi*, *H. macrolepidota*, *H. sabana*, and *H. salweenensis*. In a preliminary barcoding study, Ryan & Esa (2006) considered it possible that the species known as *H. bimaculata* may in fact represent more than a single species. *Hampala sabana* was first described as *H. macrolepidota sabana* (Inger & Chin, 1962) and later treated as *H. sabana* in Martin-Smith & Tan (1998).

All three species reported to be found in the mainland of Southeast Asia can be found in Thailand (Doi & Taki, 1994; Vidthayanon, 2017). *Hampala macrolepidota* is widely distributed across all river basins except the Salween and Lower Tenasserim. Though formerly reported only from the Mekong basin, *H. dispar* has been recently reported via social media from both the Meklong and the Chaophraya River basins. Meanwhile, *Hampala salweenensis* is found in the Salween river basin of western Thailand and adjacent Myanmar.

A potential fourth species of *Hampala*, exhibiting a colouration distinct from the above three species, has been suspected to exist in southern Thailand for some time based on informal reports (e.g., Panitvong, 2020: 207). It is described herein as a new species.

MATERIAL AND METHODS

Specimens examined are housed in the following institutions: California Academy of Sciences (CAS), Golden Gate Park, San Francisco, USA; Thailand National History Museum (THNHM), Pathum Thani, Thailand; National Museum of Nature and Science (NSMT), Tsukuba, Japan; and Lee Kong Chian Natural History Museum, Zoological Reference Collection (ZRC), National University of Singapore, Singapore.

Specimens of the new species were caught with hook & line, fixed in formalin for several days and subsequently transferred to 75% ethanol. Meristic characters and measurements were collected following Hubbs & Lagler (1947), as modified by Doi & Taki (1994). Specimens were measured from the left side using dial callipers (up to 0.5 mm). The last two branched dorsal and anal rays, supported by a single pterygiophore (appearing as a single ray branched to the base) are noted as '1½'. Black markings on the body side, referred to herein as bars, are numbered from anterior to posterior as follows: bar 0 (immediately posterior to the opercle); bar 1 (below the dorsal fin); and bar 2 (between the anal and caudal fins). Abbreviations used: HL = head length; SL = standard length.

Radiographs of the holotype were obtained using a digital X-ray machine (FDR Smart X, Fujifilm, Japan) with the following settings: 9 mAs (180 mA; 0.05 s) and 40 kVp with a focal film distance of 100 cm. Vertebral counts follow Roberts (1989).

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***Hampala siamensis*, new species**
(Figs. 1–5)

Hampala macrolepidota (non-Kuhl & van Hasselt) - Ratmuengkhwang, 2014: 33; Suvarnaraksha & Utsugi, 2023: 42 (part).
Hampala sp. Black-backed – Panitvong, 2022: 214.

Holotype. THNHM-F-021558, 226 mm SL adult; Thailand: South Thailand, Ranong Province; La-un River, 10°02′60″N 98°48′40.2″E; Kritsana Sriray, 28 December 2022.

Paratypes. ZRC 65803, 1, 191 mm SL sub-adult, same information as holotype. --- ZRC 66294, 1, 93.5 mm sub-adult; Thailand: South Thailand, Phang-Nga Province; Lam Ru Yai river, 8°36′34″N, 98°16′43″E; Nonn Panitvong, 10 April 2022.

Diagnosis. *Hampala siamensis*, new species, can be distinguished from its congeners by the combination of the following characters: lateral line scales 26–27; in adults: bar 1 saddle or inverted triangle shape, 5½–6 scales wide by 2½–3 scales deep, barely visible in preserved specimen; a faint horizontal stripe along lateral side of body, 1½–2 scales wide, visible in life only when stressed; upper and lower edges of caudal fin with a gray to black marginal band; all fins pale orange in life; head pointed, wedge-shaped, large (length 32.3–35.0 % SL).

Description: See Figs. 1–5. Mouth terminal, gape oblique, large, with posterior edge beyond anterior margin of eye. A pair of maxillary barbels, each barbel at corner of mouth, as long or longer than eye diameter. Eye relatively large (eye diameter 15.2–24.8% HL), snout long (snout length 32.1–33.8 % HL). Body somewhat compressed, elongate and deepest at dorsal-fin origin (body depth at dorsal-fin origin 28.5–32.4 % SL; body depth at anus 30.3–21.0 % SL), tapering to narrowest point on caudal peduncle (11.9–13.3 % SL). All fins pointed, caudal fin deeply forked (upper caudal-fin lobe 32.1–35.3 % SL, median point of caudal fin 8.7–13.3 % SL, lower caudal-fin lobe 29.4–33.6 % SL). Dorsal fin short with 11 ½ rays (dorsal-fin base length 14.8–15.9 % SL), positioned past mid-body (predorsal length 54.5–56.9 % SL). Anal fin short with 7–8½ rays (anal-fin base length 8.6–13.7 % SL), pre-anal length 72.8–76.3 % SL. Pectoral fin moderately long with 17 rays (pectoral-fin length 16.9–20.9 % SL). Pelvic fin shorter than pectoral fin with 8–9 rays (pelvic-fin base length 16.8–19.8 % SL). Prepelvic length 50.5–53.7 % SL. Pelvic axillary scale present, about 1/3 pelvic-fin length. Gill-rakers 2+9. Total vertebrae 28, 13+15 (holotype).

Lateral line complete, perforating the large scales in a continuous series along body side (26–27, mode 27), starting just above opercular opening, gently sloping downwards towards pelvic-fin origin (reaching 3 scales above pelvic-fin origin), and proceeding parallel to venter towards middle of caudal peduncle, with additional 2 scales on caudal-fin base. Predorsal scales 9–10 (mode 10); dorsal-fin origin lies above 8th scale in lateral-line row; anal-fin origin is below 14–15th (mode 15) scale in lateral-line row; pelvic-fin origin is below 7–8th lateral scales. Circumpeduncular scales 10-12 (mode 12).

Colouration. In preservative (see Fig. 1 middle), body pale yellow to off white, body plain with slight reticulate pattern along scale margins. Bar 1 is faint grey to blackish, no other pattern on body of specimens larger than 150mm SL. Outer edge of caudal-fin lobes and first dorsal-fin ray dark grey to blackish; caudal fin is faint yellowish.

In life (Figs. 2–5), body of adult golden yellow to dull silver, posterior margin of scales with thin black line, forming reticulate pattern. Bar 1 grey, darker when stressed, faded and barely discernible in larger individuals (over 300 mm SL). Fins, orange to pale orange. Outer edge of caudal-fin lobes and first dorsal-fin ray dark grey. Opercle with faint orange marking at centre. Faint grey band above lateral line scale row, prominent along caudal peduncle in some large individuals. In captivity, body dull grey with no conspicuous markings, pale pink opercular area, fins hyaline to pale grey, and caudal fin grey, showing only a faint bar 1 during sleep or stress (Fig. 6, first species).

In live juveniles (smaller than 30 mm; observed in-situ), body hyaline, bar 0, 1 and 2 black, complete from dorsal to venter, ca. 3 scales wide. Additional complete black horizontal bar through eye and square black marking at anal-fin origin, ca. 3 scales wide below lateral-line scale row. A thin horizontal black bar across base of caudal-fin rays. Anterior ⅓ of dorsal fin orange. Base of upper and lower caudal-fin lobes intense orange (Fig. 3). Bar 2 lost at ca. 10 mm SL, and bar 0 at about 15 mm SL (Fig. 3).

Distribution and habitat. *Hampala siamensis* is known to date from two southern Thai provinces, Ranong and Pang-Nga, and is also expected to occur in the province of Krabi. This area is characterised by short rivers that originate in the lower Tenasserim mountain range and flow into the Andaman Sea. Several other species appear to be endemic to this area, including *Schistura udomritthiruji* (Nemacheilidae), *Akysis pulvinatus* (Akysidae), and *Paracanthocobitis epimekes* (Nemacheilidae). The new species was collected only from the upper portions of the La-un (Fig. 7) and Lam Ru Yai rivers during the dry season, from areas of clear and fast flowing water. Juveniles (SL < 50 mm) were observed in densely vegetated bank areas while larger juveniles and subadults (50–150 mm SL) were common in shallow pools with boulders or fallen trees. Presumed adults (SL > 150 mm) were observed in the main channel and deeper pools. *Hampala siamensis* were frequently observed in small groups, of about 3–10 individuals, with subadults sometimes appearing in mixed shoals, together with similar sized individuals of *Barbodes lateristriga* and *B. binotatus* (Fig. 4). They have also been observed to follow foraging *Mastacembelus favus* (Mastacembelidae) and snapping up small prey that had been chased out of hiding by the eel's activities (Fig. 5).

Both La-un (Fig. 7) and Ram Ru Yai rivers are medium to large-sized streams, with channel widths ranging from 5–10

Fig. 1. *Hampala siamensis*, THNHM-F-021558, holotype, 226.2 mm SL; Thailand: South Thailand, Ranong Province; La-un River; shortly after collection (top), after preservation (middle), radiograph (bottom).

metres. In the dry season, the water is clear to yellowish, becoming murky during the rainy season. Riparian vegetation comprises primarily of evergreen forest. At lower elevations, some areas have been converted into oil palm and rubber plantations. Ram Ru Yai also has some tourism activities with a few resorts and bamboo rafting operations. *Hampala* are fished both recreationally and for food throughout its range although they still appear to be relatively common in these river systems.

Fishes co-occurring with the new species include: *Anguilla bicolor* (Anguillidae), *Devario regina*, *Microdevario kubotai*, *Rasbora* cf. *caudimaculata*, *R. paviana* (Danionidae), *Barbodes lateristriga*, *B. binotatus*, *Neolissochilus* sp., *Poropuntius genyognathus* (Cyprinidae), *Schistura robertsi* (Nemacheilidae), *Batasio fluviatilis* (Bagridae), *Silurichthys schneideri* (Siluridae), *Aplocheilus armatus* (Aplocheilidae), *Mastacembelus favus* (Mastacembelidae), *Kuhlia marginata* (Kuhlidae), *Pseudogobiopsis oligactis* (Gobiidae), *Badis*

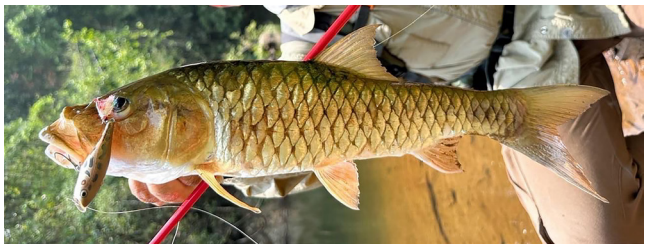

Fig. 2. *Hampala siamensis* adult of ca. 500 mm SL, La-un River, taken by recreational angler; not preserved (photograph by Kritsana Sriray).

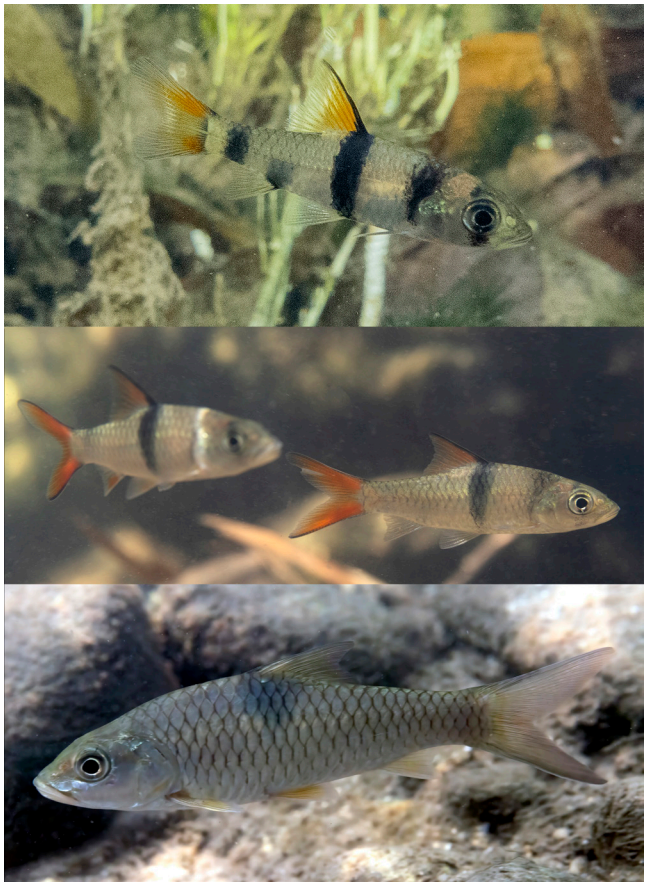

Fig. 3. Underwater photographs of *Hampala siamensis* documenting ontogenetic differences in colour pattern, all from Lam Ru Yai River. From top to bottom: individual below 30 mm SL; individual below 50 mm SL; larger juvenile ca. 100 mm SL. Not collected (all photographs by N. Panitvong).

siamensis (Badidae), *Channa lucius*, and *C. limbata* (Channidae).

Etymology: Named for Siam, historical name of Thailand and of the website "siamensis.org", run by a group of Thailand-based conservationists. Proposed English name: black-backed hampala, Thai name: **ปลากระสูบหลังดำ**.

Comparisons. The following comparisons are based on information available from Doi & Taki (1994) and Inger & Chin (1962) and examination of the material listed below.

Hampala siamensis differs from *H. ampalong*, *H. bimaculata*, and *H. salweenensis* by having only a single marking (bar

Fig. 4. Underwater photograph of *Hampala siamensis* (center) in a mixed school with *Barbodes lateristriga* (left) and *B. binotatus* (right); Lam Ru Yai River (photograph by N. Panitvong). Not collected.

Fig. 5. Underwater photograph of *Hampala siamensis* in close association with *Mastacembelus favus*; Lam Ru Yai River (photograph by N. Panitvong). Not collected.

1) on the body side (vs. two or three markings, bars 0–2). The new species shares the condition of lacking bar 0 and bar 2 with several species (viz. *H. dispar*, *H. lopezi*, *H. macrolepidota*, *H. sabana*). It can be easily distinguished from *H. dispar*, *H. macrolepidota*, and *H. sabana* by the size and shape of bar 1, which appears as a saddle or inverted triangle located entirely above or with ventralmost part just reaching the lateral-line scale row in *H. siamensis* (Fig. 3, 5, 6) versus a narrow vertical stripe (*H. macrolepidota*) or a large inverted triangle (*H. sabana*) that extends below the lateral-line scale row or a circular marking located directly above the lateral-line scale row (*H. dispar*). The new species is distinguished from *H. lopezi* by the absence (vs. presence) of a horizontal black stripe along the side of the body.

Hampala siamensis can be further differentiated from *H. ampalong* by its smaller caudal peduncle length (12.3 vs. 14 % SL) and orbit diameter (19.7 vs. 24.0 % of HL), from *H. bimaculata* by its deeper body (body depth at dorsal-fin origin 30.1 vs. 27.5% SL), and from *H. dispar* by its longer head (33.5 vs. 30.6% SL) and longer upper and lower caudal-fin lobes (33.5 vs. 28.5% SL and 31.7 vs. 27.9% SL, respectively). The new species can be further differentiated from *H. lopezi* and *H. salweenensis* by its shorter snout (32.6

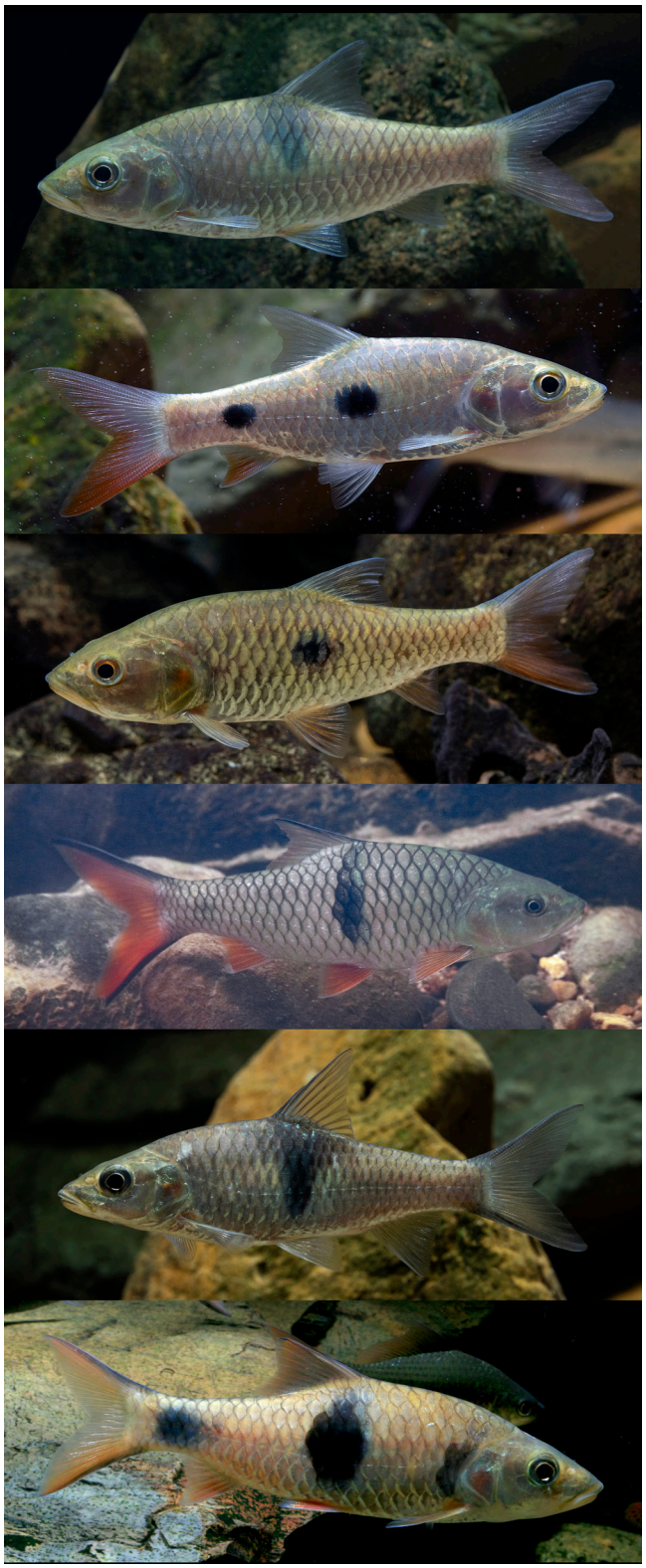

Fig. 6. Species of *Hampala* showing live colouration. From top to bottom: *H. siamensis* (ca. 100–120 mm SL); *H. ampalong* (ca. 150 mm SL); *H. dispar* (ca. 150 mm SL); *H. macrolepidota* (ca. 150 mm SL); *H. sabana* (ca. 120 mm SL); *H. salweenensis*. Not collected. Photographs by N. Panitvong.

vs. 35.6% HL in *H. lopezi*, 36.7 % in *H. salweenensis*), and from *H. salweenensis* by its narrower interorbital width (28.3 vs. 34.0% HL). It further differs from *H. sabana* in having fewer circumpeduncular scales (10–12, mode 12 vs. 14.5).

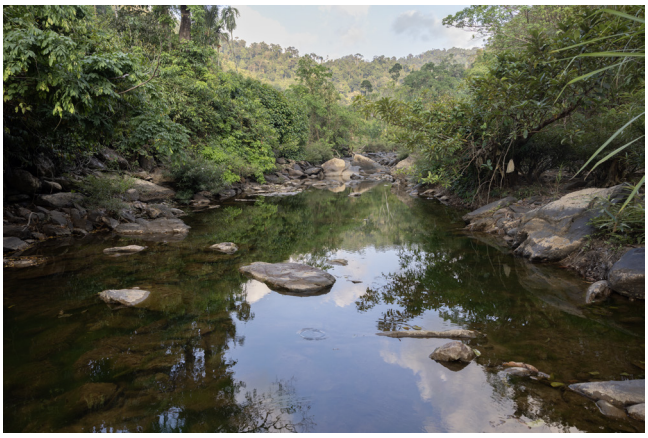

Fig. 7. La-un river, Ranong Province, South Thailand; type locality of *Hampala siamensis* (photograph by N. Panitvong).

Aspects of caudal-fin colouration in life may also prove useful for distinguishing between the species of *Hampala* (Fig. 6) and this character deserves further investigation.

Comparative material examined:

Hampala ampalong – ZRC 60059, 9 ex., 80.2-97.1 mm SL; Sumatra: Jambi; 2018.

Hampala bimaculata – ZRC 45665, 10 ex., 20.1-136.0 mm SL; North Kalimantan: Kayan River basin; Sungai Seba Ai, tributary to Kayan River (01°59.86′N 115°06.77′E, 550 m asl); 1999. --- ZRC 65451, 6 ex., 15.3-91.9 mm SL; North Kalimantan: Kayan River basin; Iwan; Sungai Panan, tributary to Iwan river, ca. 60 mins upstream from Data Dian; 1999. --- ZRC 65446, 8 ex., 26.5-109.5 mm SL; North Kalimantan: Kayan River basin; Sungai Nah, tributary to Kayan river, ca. 20 mins upstream of fork to Iwan river; 1999. --- ZRC 65421, 4 ex., 38.9-79.5 mm SL; North Kalimantan: Kayan River basin; Sungai Belanyan Tekan, tributary to Kayan river; 1999. --- ZRC 65411, 3 ex., 66.3-74.0 mm SL; North Kalimantan: Kayan River basin; Sungai Pingai, next to air strip, ca. 10 mins downstream of Data Dian; 1999. --- ZRC 65457, 3 ex., 28.9-61.3 mm SL; North Kalimantan: Kayan River basin; Sungai Busang Matu, tributary to Kayan river ca. 500 m upstream of Data Dian; 1999. --- ZRC 65463, 11 ex., 21.2-61.8 mm SL; North Kalimantan: Kayan River basin; Sungai I'sau, ca. 15 mins upstream of Data Dian; 1999. --- ZRC 65420, 3 ex., 27.2-31.3 mm SL; North Kalimantan: Kayan River basin; Sungai Nga'ha, tributary to Kayan river; 1999. --- ZRC 56311, 1 ex., 87.3 mm SL; East Kalimantan: Mahakam River basin; SLJ Jaya II logging concession, km 84, Anak Sungei Bakung, feeding into Boh River (00°58.758′N 115°06.395′E, 134 m asl); 2017. --- ZRC 64528, 2 ex., 128.6-136.6 mm SL; West Kalimantan: Kapuas River basin; Sungei Sekedam Besar, Sibau River; 1998. --- ZRC 64527, 1 ex., 63.8 mm SL; West Kalimantan: Kapuas River basin; Sibau River; 1998.

Hampala dispar – ZRC 39329, 3 ex., 95.4-122.3 mm SL; Thailand: Buri Ram, Amphoe Muang; 1994. --- ZRC 40888, 1 ex., 184.4 mm SL; Thailand: Nakhon Rachasima (Korat) province, outskirts of town near Wat Leab, ditch near padi and vegetable fields, access via Soi Monkan Tree (14°59′46.9″N 102°03′02.8″E); 1997.

Hampala lopezi – CAS 138090, 4 ex., 54.3-190.0 mm SL; Philippines: Palawan, Busuanga Island, Barrio San Nicolas, Wayan creek; 1940.

Hampala macrolepidota – ZRC 43847, 1 ex., 91.5 mm SL; Java: West Java Province: Cipipang, Ciliwong River; 1997. --- ZRC 44089, 1 ex., 155.0 mm SL; Java: West Java Province: Banjar Pasar; 1997. --- ZRC 65888, 4 ex., 63.3-112.0 mm SL; ZRC 66162, 1 ex., 185 mm SL; Java: West Java Province: Tasikmalaya, Cibalung basin; 2024. --- ZRC 66246, 1 ex., 121.8 mm SL; Java: East Java Province: Surabaya, Brantas basin; 2024. --- ZRC 50672, 2 ex., 96.4-133.6 mm SL; Sarawak: Baram River basin, Mulu, Sungei Melinau; 1998. --- ZRC 42287, 12 ex., 35.6-135.6 mm SL; Sumatra: Jambi, Kerinci, Danau Lingkat; 1996.

Hampala sabana – ZRC 43960, 1 ex., 126.7 mm SL; Sabah: Danum Valley, stream at km 105 on main line west after turnoff to Borneo Rainforest Lodge (5°03′02.9″N 117°34′34.1″E); 1996. --- ZRC 44001, 1 ex., 122.0 mm SL; Sabah: Danum Valley, stream at km 113 on main line west (logging road) after turnoff to Borneo Rainforest Lodge (5°00′37.6″N 117°31′43.88″E); 1996. --- ZRC 43936, 8 ex., 22.5-111.5 mm SL; Sabah: Danum Valley, Sungai Palum Tambun, tribut. of Sg. Segama, upstream of Danum Valley Field Centre; 1996. --- ZRC 40406, 2 ex., 80.7-91.0 mm SL; Sabah: Danum Valley, Sungai Bilong at ca. km 83 on main line west after turnoff to Borneo Rainforest Lodge; 1996. --- ZRC 45455, 4 ex., 52.7-65.2 mm SL; Sabah: Danum Valley, Cabin stream right, km 50 on road to Danum Valley Field Centre; 1996. --- ZRC 43987, 7 ex., 24.3-53.5 mm SL; Sabah: Danum Valley, small tributary of Sg. Bole; 1996. --- ZRC 65705, 2 ex., 92.6-110.6 mm SL; Sabah: Danum Valley Conservation Area, Tembeling stream; 2015. --- ZRC 65621, 2 ex., 61.0-111.4 mm SL; Sabah: Danum Valley Conservation Area, Rhino-pool stream; 2015.

***Hampala* intermediate form** fide Inger & Chin, 1962 – ZRC 65626, 3 ex., 103.0-127.3 mm SL; Sabah: Kalabakan Forest Reserve, 30m stream; 2015. --- ZRC 65648, 3 ex., 105.6-131.9 mm SL; Sabah: Kalabakan Forest Reserve, 0m stream; 2015. --- ZRC 65682, 2 ex., 54.5-68.3 mm SL; Sabah: Kalabakan Forest Reserve, Gaharu Estate stream; 2015. --- ZRC 65647, 1 ex., 106.9 mm SL; Sabah: Kalabakan Forest Reserve, 120m stream; 2015. --- ZRC 65653, 1 ex., 108.2 mm SL; Sabah: Kalabakan Forest Reserve, Virgin Jungle Rainforest stream; 2015. --- ZRC 65802, 2 ex., 31.4-35.0 mm SL; Sabah: Kalabakan Forest Reserve, 30m stream; 2017.

Hampala salweenensis – NSMT-P 35838, holotype, 200.6 mm SL; Thailand: Mae Hong Son, Ban Phuei Phan, Mae Surin River (photograph examined only).

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