

# A novel species of sisorid catfish, *Pseudecheneis nagalandensis* sp. nov., (Teleostei: Sisoridae) from the Chindwin Basin of Nagaland, India

Bungdon Shangningam\* and Laishram Kosygin

Zoological Survey of India, Freshwater Fish Section, 27 J.L. Nehru Road, Kolkata - 700016, West Bengal, India;  
Email: bdshangningam@gmail.com; lkzsi@yahoo.com

**Zoobank:** urn:lsid:zoobank.org:pub:B7CE38A9-F619-40E8-8140-72BA2F941E36

## Abstract

A novel sisorid catfish, *Pseudecheneis nagalandensis* sp. nov., collected from the Tizu River, Chindwin Basin, Nagaland, northeast India is described. This new species differs from its congeners due to the presence of a long ray of pelvic fin that extends up to anal-fin origin, slender caudal peduncle and the thoracic adhesive apparatus with 13–14 transverse ridges which are separated by grooves. This is the only species of the genus *Pseudecheneis* currently known from Nagaland.

**Keywords:** Fresh Water Catfish, Nagaland, New Species, Tizu River

## Introduction

Freshwater fishes of the genus *Pseudecheneis* Blyth, 1860 are small rheophilic catfishes dwelling at the bottom of swiftly flowing streams and rivers of the south and mainland of south-east Asia. The genus can be distinguished in possessing a thoracic adhesive apparatus comprised of a series of transverse ridges called laminae separated by grooves known as sulcae (de Pinna, 1996; Robert, 1998). Currently, nineteen valid species of *Pseudecheneis* are recognised (Fricke *et al.* 2020), viz., *P. brachyura* Zhou *et al.* 2008, *P. crassicauda* Ng & Edds, 2005, *P. eddsi* Ng, 2006, *P. gracilis* Zhou *et al.* 2008, *P. immaculata* Chu, 1982, *P. koladynae* Anganthoibi & Vishwanath, 2010, *P. longipectoralis* Zhou *et al.* 2008, *P. maurus* Ng & Tan, 2007, *P. paucipunctata* Zhou *et al.* 2008, *P. paviei* Vaillant, 1892, *P. serracula* Ng & Edds, 2005, *P. sirenica* Vishwanath & Darshan, 2007, *P. stenura* Ng, 2006, *P. sulcata* (McClelland, 1842), *P. sulcatoides* Zhou & Chu, 1992, *P. suppaetula* Ng, 2006, *P. sympelvica* Roberts, 1998, *P. tchangi* (Hora, 1937) and *P. ukhrulensis* Vishwanath & Darshan, 2007.

The Tizu River is important headwater river of the Chindwin Basin in northeast India. It drains the south-eastern part of Nagaland and north-eastern part of Manipur. The river originates from the central part of Nagaland and runs in northeast direction through

Zunheboto, Phek and Kiphire districts and empties itself in the Chindwin River of Myanmar. The main tributaries of Tizu are the Zunki, Lanye, Likimro, Challou, Chingai, Chammu and Laniye. The Tizu meets the Challou River at Akash-bridge forming a boundary between Manipur and Nagaland. It forms an ideal habitat for many hill stream fishes. However, its ichthyofauna is poorly explored.

An ichthyological exploration in the Tizu River resulted in the discovery of an undescribed species of the rheophilic catfish of genus *Pseudecheneis*, described herein as *P. nagalandensis* sp. nov.

## Material and Methods

The specimens were collected by using a local scoop net. The specimens examined were fixed in 10% formaldehyde and preserved in 70% ethanol. Digital callipers were used for taking measurements and all data recorded to tenths of a millimetre. Subunits of head are expressed as proportions of head length, while Head Length (HL) and measurements of body parts are given as proportions of Standard Length (SL). Stereo zoom light microscope was used to count fin rays. Counts and measurements follow Ng & Rainboth (2001). Numbers in parentheses after a particular count is the number of specimen corresponding that count. Procedure relating to bone clearing and staining follows Hollister (1934). Osteological observations were

\* Author for correspondence

**Table 1.** Morphometric data of holotype and paratypes of *Pseudecheneis nagalandensis* (n=8)

	<b>Holotype</b> (ZSI FF 7679)	<b>Paratype</b> ZSI FF 7680	<b>Average</b>	<b>SD</b>
Standard length (in mm)	58.7	30.8–42.0		
<b>In percentage of Standard length</b>				
Head length	19.9	19.7–22.4	20.8	1.0
Head width	18.4	16.4–19.4	18.0	0.9
Head depth at eye	11.4	11.3–14.0	12.2	0.9
Body depth at anus	15.7	11.0–15.7	13.8	1.6
Pre-dorsal length	36.6	35.6–38.0	37.1	0.9
Pre-anal length	60.6	55.2–62.9	60.8	2.6
Pre-pelvic length	41.6	37.3–41.6	40.3	1.5
Pre-pectoral length	18.1	16.5–19.8	17.9	1.2
Dorsal-fin base length	12.4	10.5–13.3	12.0	1.1
Anal-fin length	20.4	18.3–21.7	20.2	1.2
Pelvic-fin length	22.8	19.9–22.1	21.6	1.1
Pectoral-fin length	31.5	28.3–32.9	30.9	2.0
Caudal-fin length	25.2	19.4–26.6	23.7	2.2
Adipose-fin base length	21.6	17.8–22.0	20.3	1.6
Dorsal to adipose distance	17.0	12.9–17.9	16.3	1.7
Post-adipose distance	18.7	17.6–19.4	17.9	2.0
Caudal-peduncle length	25.0	19.2–25.0	23.3	2.2
Caudal-peduncle depth	04.3	03.6–04.4	4.3	0.4
<b>In percentage of Head length</b>				
Snout length	58.1	46.4–59.5	53.4	5.0
Inter-orbital distance	30.8	29.8–35.1	33.0	2.7
Eye diameter	09.4	09.1–11.9	10.3	0.9
Nasal barbel length	18.8	10.3–18.8	13.4	2.9
Maxillary barbel length	36.8	36.8–50.7	42.0	5.1
Inner mandibular-barbel length	17.9	10.6–17.9	15.5	3.2
Outer mandibular-barbel length	29.9	22.7–33.3	27.6	4.1
Head depth at occiput	74.4	59.1–74.4	69.9	6.1

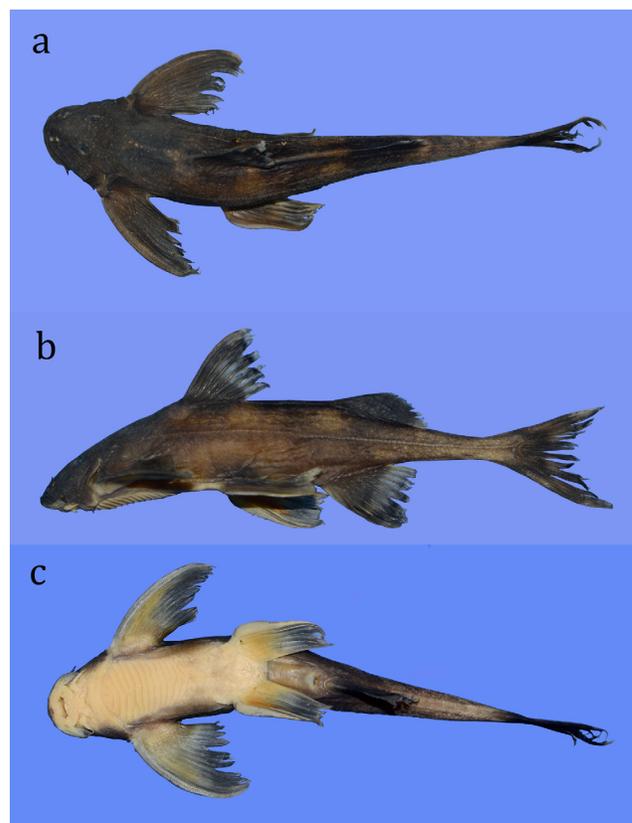
made from cleared and alizarin-stained specimen. Count of vertebrae follows Roberts (1994). Specimens examined are deposited in the Freshwater Fish Section, Zoological Survey of India (ZSI), Kolkata, India.

***Pseudecheneis nagalandensis* sp. nov.** (Figure 1)

**Material examined:** Holotype: 58.7 mm SL, India, Nagaland, Phek District, Tizu River at Sohomi (Chindwin River basin), 25°45'N 94°29'E, 793m above sea level, 24-iii-2018, coll. BD Shangningam (ZSI FF 7679).

Paratypes. 7 specimens, 30.8–42.0 mm SL, same data as holotype one paratype (38.5 mm SL) dissected for osteology (ZSI FF 7680).

**Diagnosis:** *Pseudecheneis nagalandensis* sp. nov. is separated from its congeners in possessing the following blend of characters: 13–14 transverse ridges on the thoracic adhesive apparatus that separated by grooves; teeth on outer edge of both tooth bands exposed when



**Figure 1.** *Pseudecheneis nagalandensis* sp. nov., holotype, ZSI FF 7679, 58.7 mm SL; a. dorsal, b. lateral and c. ventral view.

mouth closed; pelvic fin extending to the anal-fin origin, 14 branched pectoral-fin rays; eye diameter 9.1–11.9% HL; snout length 46.4–59.5% HL; anal-fin length 18.3–21.7% SL; 36 total vertebrae.

**Description:** Morphometric data presented in Table 1. Dorsal profile rises steeply from snout tip to dorsal-fin origin, slightly straight till adipose-fin base then gently sloping ventrally to end of caudal peduncle. Ventral profile remains horizontal till anal-fin base then sloping gradually to end of caudal-fin origin. Caudal peduncle long and moderately elongated. Anus and urogenital openings located anterior to anal-fin origin, skin smooth, tuberculated sparsely on head, opercular and predorsal region, lateral line complete and mid-lateral, total vertebrae 36 comprising of 18 abdominal and 18 post-abdominal vertebrae, gill rakers on first branchial arch 10 (1).

Mouth inferior, with thin papillated lips gill opening moderate, extends from post temporal to slightly beyond base of pectoral fin. Head acutely triangle when viewed from above, ventral surface covered with unculiferous collar on distal margin of branchiostegal membrane just anterior to thoracic adhesive apparatus. Thoracic adhesive apparatus comprised of 13–14 transverse ridges or laminae separated by grooves or sulcae; last 2–3 ridges not joining at midline of adhesive apparatus (Figure 2). Adhesive apparatus extends from posterior of distal margin of branchiostegal membrane to middle of last pectoral-fin ray.

Barbels flattened, four pairs. Major portion of maxillary barbel joins snout through a flap of skin, ventral surface with papillae, distal tip nearly reaching to level of anterior rim of eye. Nasal barbel not reaching midway between posterior nare and anterior margin of eye, base covered with a diminutive flap of skin. Inner mandibular barbel short, distal tip not reaching end of branchiostegal membrane outer mandibular barbel extends to level of anterior margin of eye, its origin postero-lateral to inner mandibular barbel; eye minute, subcutaneous, located on dorsum of head.

Teeth arranged in irregular rows, embedded in skin with tips exposed, prominent at their outer edges. Outer teeth shovel shaped and inner teeth conical. Premaxillary tooth band semi-circular with two spatulate and one to four incisiform teeth along its outer edge. Dentary tooth band crescentic with three large teeth along its outer edge. Teeth on outer edge of both tooth bands exposed when mouth closed.



**Figure 2.** Thoracic adhesive apparatus of *Pseudecheneis nagalandensis* sp. nov., showing laminae and sulcae.

Dorsal fin with i, 6(8) rays, origin located at point through anterior third of body, margin straight. Adipose-fin base long, 17.7–21.0 % of standard length, longer than anal-fin base, situated closer to dorsal-fin origin than to caudal-fin base. Pectoral fin with i, 14(8) rays long, almost reaching end of pelvic-fin base. First undivided ray not ossified, ventral surface with regular striae. Pelvic fin with i, 5(8) rays, origin opposite to base of fifth branched dorsal-fin ray. Pelvic fin separated by a short gap, as wide as 1.0–1.6 eye diameter. First unbranched ray of pelvic fin broadened, ventral surface covered with 18–32 prominent regular plicae (Figure 3). Anal fin with iii, 8(8) rays, outer rays longer, extending to level of posterior of adipose fin. Caudal fin deeply forked with i,7, 8, i(8) principal rays, tip of lobes pointed, lower lobe slightly longer.

**Sexual dimorphism:** In both sex, urogenital papillae located immediately posterior to anus. Males with a squarish shaped papilla, its apex pointing posteriorly (Figure 4a). Females with flat, comparatively smaller papillae, bilobed and a small rounded mid-ventral posteriorly projecting lobe (Figure 4b).



**Figure 3.** Pelvic fin of *Pseudecheneis nagalandensis* sp. nov., showing presence of plicae.



**Figure 4.** Genital papilla of *Pseudecheneis nagalandensis* sp. nov., a. male, ZSI FF 7679, 58.7 mm SL; b. female ZSI FF 7680, 36.1 mm SL.

**Coloration:** In preservative, body dark brown on dorsal and lateral surface. Ventral part of body and head slightly creamish yellow. Body with distinct sequence of pale yellowish saddles or patches: first small patches located on dorsal-fin origin, second saddle across end of dorsal-fin base; third saddle with three patches across adipose-fin origin and fourth saddle at end of adipose fin. Adipose - fin brown, distal margin yellowish. Dorsal surface of paired fins brown with yellowish band on inner half and distal margin hyaline. Median fins with pale yellow band at middle, and hyaline distal margin. Caudal fin brown, middle and distal tip of both lobes tinged yellow.



**Figure 5.** Tizu River, type locality of *Pseudecheneis nagalandensis*.

**Distribution:** *Pseudecheneis nagalandensis* is currently known to have distributed only in the type locality, Tizu River, Nagaland, India.

**Habitat:** Tizu River (Figure 5), the type locality of *Pseudecheneis nagalandensis* has predominantly riffle habitat with rocky substratum and cool water. The species was found attached to bottom of stone when collected. Some other fish species belonging to the genera *Psilorhynchus*, *Glyptothorax*, *Garra* and *Schistura* are found in the same locality.

**Etymology:** The species is christened after Nagaland state, its type locality.

## Discussion

*Pseudecheneis* is rheophilic and bottom-dwelling catfish with poor swimming capability and limited mobility. The populations of *Pseudecheneis* amongst river system or in the similar river system are simply isolated owing to lack of individual migration and gene exchange (Zhou *et al.*, 2008). Considering the distribution restriction of the rheophilic fishes to particular region, the new species under description is compared more extensively with its congeners occurring in the same basin and neighbouring drainages.

In the Chindwin-Irrawaddy River drainage, four species of *Pseudecheneis* are recognised viz., *P. ukhrulensis* from Ukhrul District, Manipur, India; *P. brachyura*, *P. gracilis* and *P. stenura* from the Irrawaddy River, China. *Pseudecheneis nagalandensis* is differentiated from *P. ukhrulensis* in possessing longest ray of pelvic fin

reaching (vs. not reaching) anal-fin origin, exposed (vs. unexposed) teeth on the outer edge of the premaxillary and dentary tooth bands when the mouth is closed, more branched pectoral-fin rays (14 vs. 13), lesser head length (19.7–22.4% SL vs. 19.2–19.3), lesser body depth (11.0–15.9% SL vs. 19.7–20.8), greater caudal-peduncle length (19.2–25.0% SL vs. 25.1–26.7), greater inter-orbital distance (28.9–35.1% HL vs. 22.7–25.7), shorter snout (46.4–59.5% HL vs. 61.4–66.9) and a smaller eye (9.1–11.9% HL vs. 12.9–13.6); from *P. brachyura* in having more branched anal-fin rays (8 vs. 7), fewer transverse ridges on thoracic adhesive apparatus (13–14 vs. 14–20), greater head length (19.7–22.4% SL vs. 15.5–18.2) and greater predorsal length (35.6–38.0% SL vs. 30.1–33.3); from *P. gracilis* in having more branched anal-fin rays (8 vs. 6–7), fewer transverse ridges on thoracic adhesive apparatus (13–14 vs. 16–20), greater head length (19.7–22.4% SL vs. 14.9–18.6), greater predorsal length (35.6–38.0% SL vs. 27.3–34.8), shorter caudal peduncle (19.2–25.0% SL vs. 27.5–35.8) and shorter snout (46.4–59.5% HL vs. 64.0–69.6) and from *P. stenura* in having fewer vertebrae (36 vs. 38–39), greater prepelvic length (37.3–41.5% SL vs. 31.5–36.7), greater anal-fin length (18.3–21.7% SL vs. 12.6–14.9), shorter post-adipose distance (17.6–19.4% SL vs. 20.6–25.4), shorter caudal peduncle (19.2–25.0% SL vs. 30.3–34.5), deeper caudal peduncle (3.6–4.4% SL vs. 2.9–3.6), greater head length (19.7–22.4% SL vs. 15.3–18.3) and lesser snout length (46.4–59.5% HL vs. 60.4–68.4).

*Pseudecheneis nagalandensis* is compared with its congeners present in the neighbouring Brahmaputra River drainage in northeast India viz., *P. sirenica* from Siren River, Upper Siang District, Arunachal Pradesh and *P. sulcata* from Khasi Hills, Meghalaya. *Pseudecheneis nagalandensis* differs from *P. sirenica* in having exposed (vs. unexposed) teeth on the outer edge of the premaxillary and dentary tooth bands when the mouth is closed, a greater predorsal length (35.6–38.0% SL vs. 31.9–32.2), shorter pelvic fin (19.9–22.1% SL vs. 22.9–23.2), shorter adipose-fin base (17.8–22.0% SL vs. 22.7–23.1), shorter post-adipose distance (17.6–19.4% SL vs. 19.8–22), shorter caudal peduncle (19.2–25.0% SL vs. 27.6–30.2), greater head length (19.7–22.4% SL vs. 18.2–18.8), shorter snout (46.4–59.5% HL vs. 63.9–65.2) and shorter maxillary barbel (36.8–50.7% HL vs. 53.1–60.4); from *P. sulcata* in having (vs. lacking) a prominent bony spur on the

anterodorsal surface of the first dorsal-fin pterygiophore, more branched pectoral-fin rays (14 vs. 12–13) and greater anal-fin length (18.3–21.7% SL vs. 11.9–14.2).

The new species *Pseudecheneis nagalandensis* is compared with its congeners present in the Ganges River drainage viz., *P. crassicauda*, *P. eddsi*, *P. suppaetula* and *P. serracula*. It is distinguished from *P. crassicauda* in having fewer vertebrae (36 vs. 38–39), lesser caudal-peduncle depth (3.6–4.4% SL vs. 6.0–6.6) and a greater eye (9.1–11.9% HL vs. 7.5–8.3); from *P. eddsi* in having longer anal-fin rays (18.3–21.7% SL vs. 10.9–13.3), more branched pectoral-fin rays (14 vs. 12–13) and shorter caudal peduncle (19.2–25.0% SL vs. 25.2–27.8); from *P. suppaetula* in having fewer vertebrae (36 vs. 37–38), shorter adipose-fin base (17.8–22.0% SL vs. 26.6–30.6), more branched pectoral-fin rays (14 vs. 12), fewer unbranched anal-fin rays (three vs. four) and a greater eye (9.1–11.9% HL vs. 8.1–8.3) and from *P. serracula* in having shorter adipose-fin base (17.8–22.0% SL vs. 26.8–30.4), shorter snout (46.4–59.5% HL vs. 62.2–68.6) and longer anal-fin ray (18.3–21.7% SL vs. 12.3–15.6).

Anganthoibi & Vishwanath (2010) described *Pseudecheneis koladynae* from Koladyne River from Lawntlai District, Mizoram, India. On further comparison, the new species *P. nagalandensis* differs from *P. koladynae* in having longest ray of pelvic fin reaching (vs. not reaching) anal-fin origin, longer pectoral fin (28.2–32.9% SL vs. 21.2–26.6), longer caudal peduncle (19.2–25.0% SL vs. 16.0–18.8), lesser caudal peduncle depth (3.6–4.4% SL vs. 4.7–6.0), greater head length (19.7–22.4% SL vs. 17.7–19.9), shorter maxillary barbel (36.8–50.7% HL vs. 58.7–72.3) and shorter snout (46.4–59.5% HL vs. 66.6–72.5).

In the Mekong River drainage, China, *Pseudecheneis immaculata* and *P. sympelvica* are considered valid. *Pseudecheneis nagalandensis* is distinguished from *P. immaculata* in having more branched pectoral-fin rays (14 vs. 12–13), greater eye diameter (9.1–11.9% HL vs. 4.4–9.3), greater predorsal length (35.6–37.9% SL vs. 28.9–33.4) and a shorter caudal peduncle (19.2–25.0% SL vs. 28.2–32.9) and from *P. sympelvica* in having separated (vs. fused) pelvic fins and in the presence (vs. lacking) of a prominent bony spur on the anterodorsal surface of the first dorsal-fin pterygiophore.

*Pseudecheneis nagalandensis* can be easily distinguished from *P. tchangi* reported from the Yunnan Province, China

in having fewer transverse ridges on the thoracic adhesive apparatus (13–14 vs. 21) and from *P. maurus* of Song Thuy Loan River drainage of Central Vietnam in having a thoracic adhesive apparatus with sulcae uninterrupted (vs. interrupted in midline).

*Pseudecheneis nagalandensis* is compared with its remaining four congeners occurring in the Red River and Salween drainage of China. It is distinguished *P. longipectoralis* in having fewer transverse ridges on the thoracic adhesive apparatus (13–14 vs. 14–21), more branched pectoral-fin rays (14 vs. 12–13) and greater eye (9.1–11.9% HL vs. 5.0–9.2); from *P. paviei* in the presence (vs. lacking) of a prominent bony spur on the anterodorsal surface of the first dorsal-fin pterygiophore, more branched pectoral-fin rays (14 vs. 11–13) and more branched anal-fin rays (8 vs. 7); from *P. paucipunctata* in having more branched anal-fin rays (8 vs. 7), greater predorsal length (35.6–38.0% SL vs. 30.7–35.8) and from *P. sulcatoides* in the presence (vs. lacking) of a prominent bony spur on the anterodorsal surface of the first dorsal-fin pterygiophore, more branched pectoral-fin rays (14 vs. 11–12) and a shorter snout (46.4–59.5% HL vs. 60.0–73.3).

**Comparative materials:** *Pseudecheneis sirenica*: paratype, 84.2 mm SL; India: Arunachal Pradesh, Upper Siang District, Siren River (ZSI FF 4153) additional

information from Vishwanath and Darshan (2007). *Pseudecheneis koladyneae*: paratype, 54.66 mm SL; India: Mizoram, Lawntlai District, Koladyne River (ZSI FF 4621) additional information from Anganthoibi and Vishwanath (2010). *Pseudecheneis ukhrulensis*: 117.7 mm SL, holotype, MUMF 2214, 110 mm SL, paratype, ZSI FF 4152, paratype, 122.13 mm SL; India: Manipur, Ukhrul District, Chatrickong River at Khyayang (MUMF 2280). *Pseudecheneis sulcata*: 6 specimens, 67.7–78.1 mm SL; India: West Bengal; Darjeeling, Jaldhaka River at Bindu (ZSI FF 5656).

**Published information used for comparison:** Anganthoibi and Vishwanath (2010) for *P. maurus*, *P. sympelvica* and *P. tchangii*; Zhou (2008) for *P. brachyuran* and *P. gracilis*; Ng (2006a) for *P. stenura* and *P. eddsi*; Ng (2006b) for *P. suppaetula*; Ng and Edds (2005) for *P. serracula* and *P. crassicauda*; Zhou et al., (2008) for *P. longipectoralis*, *P. paviei*, *P. paucipunctata* and *P. sulcatoides*.

## Acknowledgements

The authors are grateful to Dr. Kailash Chandra, Director, ZSI for permission to undertake the present work. The first author is grateful to Mr Velatso Demo, Divisional Forest Officer, Phek District, Nagaland for the hospitality and help extended during the fish collection trip to Tizu River, Nagaland.

## References

- Anganthoibi, N. and Vishwanath, W. 2010. *Pseudecheneis koladyneae*, a new sisorid catfish from Mizoram, India (Teleostei: Siluriformes). *Ichthyol. Explor. Freshw.*, **21**: 199–204.
- Chu, X.L. 1982. Phylogeny of the genus *Pseudecheneis* (Siluriformes: Sisoridae), with descriptions of two new species. *Acta Zootax. Sinica*, **7**: 428–437.
- de Pinna, M.C.C. 1996. A phylogenetic analysis of the Asian catfish families Sisoridae, Akysidae, and Amblycypetidae, with a hypothesis on the relationships of the neotropical Aspredinidae (Teleostei, Ostariophysi). *Fieldiana: Zoology (New Series)*, **84**: 1–83. <https://doi.org/10.5962/bhl.title.5359>.
- Fricke, R., Eschmeyer, W. N. and Van der Laan, R. (eds) 2020. Eschmeyer's Catalog of Fishes: Genera, Species, References. Electronic version accessed 20 Nov 2019. <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>.
- Hollister, G. 1934. Clearing and dyeing fishes for bone study, *Zool.*, **12**: 89–101.
- Hora, S.L. 1937. Notes on fishes in the Indian Museum. XXXVI. On a new genus of Chinese catfishes allied to *Pseudecheneis* Blyth. *Rec. Indian Mus.*, **39**: 348–350.
- McClelland, J. 1842. On the freshwater fishes collected by William Griffith. *Calcutta J. Nat. His.*, **2**: 560–589.
- Ng, H.H. 2006a. The identity of *Pseudecheneis sulcata* (McClelland, 1842), with description of two new species of rheophilic catfish (Teleostei: Sisoridae) from Nepal and China. *Zootaxa*, **1254**: 45–68.
- Ng, H.H. 2006b. *Pseudecheneis suppaetula*, a new species of glyptosternine catfish (Teleostei: Sisoridae) from India. *Zootaxa*, **1267**: 59–68. <https://doi.org/10.11646/zootaxa.1267.1.3>.
- Ng, H.H. and Edds, D.R. 2005. Two new species of *Pseudecheneis*, rheophilic catfishes (Teleostei: Sisoridae) from Nepal. *Zootaxa*, **1047**: 1–19. <https://doi.org/10.11646/zootaxa.1047.1.1>.

- Ng, H.H. and Rainboth, W.J. 2001. A review of the sisorid catfish genus *Oreoglanis* (Siluriformes: Sisoridae) with descriptions of four new species. *Occasional Papers of the Museum of Zoology of the University of Michigan*, **732**: 1–34.
- Ng, H.H. and Tan, H.H. 2007. *Pseudecheneis maurus*, a new species of glyptosternine catfish (Teleostei: Sisoridae) from central Vietnam. *Zootaxa*, **1406**: 25–32.
- Roberts, T.R. 1994. Systematic revision of Asian bagrid catfishes of the genus *Mystus* Sensu stricto, with a new species from Thailand and Cambodia. *Ichthyol. Explor. Freshw.*, **5**: 241–256.
- Roberts, T.R. 1998. *Pseudecheneis sympelvicus*, a new species of rheophilic sisorid catfish from Laos (Mekong basin). *Raffles Bull. Zool.*, **46**: 289–292.
- Vishwanath, W. and Darshan, A. 2007. Two new catfish species of the genus *Pseudecheneis* Blyth (Teleostei: Siluriformes) from north-eastern India. *Zoos Print Journal*, **22**(3): 2627–2631. <https://doi.org/10.11609/JoTT.ZPJ.1608.2627-31>.
- Zhou, W. and Chu, X.I. 1992. A new species of *Pseudecheneis* with comments on osteological differentiations at species level (Siluriformes: Sisoridae). *Acta Zootaxonomica Sinica*, **17**: 110–115.
- Zhou, W., Li, X. and Yang, Y. 2008. A review of the catfish genus *Pseudecheneis* (Siluriformes: Sisoridae) from China, with the description of four new species from Yunnan. *Raffles Bull. Zool.*, **56**(1): 107–124.