

Two new species of *Pseudolaguvia* (Teleostei: Erethistidae) from Bangladesh

HEOK HEE NG

Fish Division, Museum of Zoology, University of Michigan, 1109 Geddes Avenue, Ann Arbor, Michigan 48109-1079, USA. Email: heokheen@umich.edu

Abstract

Two new South Asian catfish species of the family Erethistidae, *Pseudolaguvia inornata* and *Pseudolaguvia muricata*, are described from the Brahmaputra and Feni River drainages in Bangladesh. *Pseudolaguvia inornata* from the Feni River drainage can be distinguished from congeners in having a uniform coloration with a pale mid-dorsal stripe and brown submarginal stripes on each lobe of the caudal fin, while *P. muricata* from the Brahmaputra River drainage can be distinguished from congeners by its elongate dorsal and pectoral-fin spines.

Key words: Siluriformes, Sisoroidea, Brahmaputra River drainage, South Asia

Introduction

Members of the genus *Pseudolaguvia* are small erethistid catfishes that resemble members of the sisorid catfish genus *Glyptothorax* externally. The genus is only known from river drainages in the area bordered by the Ganges River drainage to the west and the Sittang River drainage to the east. Six species of *Pseudolaguvia* are considered valid (Ng, 2005): *P. ribeiroi* (Hora, 1921), *P. shawi* (Hora, 1921), *P. tuberculata* (Prashad & Mukerji, 1929), *P. kapuri* (Tilak & Husain, 1975), *P. tenebricosa* Britz & Ferraris, 2003 and *P. foveolata* Ng, 2005.

Examination of *Pseudolaguvia* material collected in Bangladesh revealed two distinct species found to be undescribed. The description of this material as *Pseudolaguvia inornata* new species, and *Pseudolaguvia muricata* new species, forms the basis of this study.

Material and methods

Measurements were made point to point with dial calipers and data recorded to tenths of a millimeter. Counts and measurements were made on the left side of specimens whenever possible, following Ng & Kottelat (1998). Subunits 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). Asterisks after meristic counts indicate values for the holotype.

Material examined in this study is deposited in the following institutions: California Academy of Sciences, San Francisco (CAS), University of Kansas Natural History Museum, Lawrence (KU), Naturhistoriska Riksmuseet, Stockholm (NRM), Department of Zoology, Oklahoma State University, Stillwater (OSUS), University of Michigan Museum of Zoology, Ann Arbor (UMMZ), National Museum of Natural History, Smithsonian Institution, Washington DC (USNM), Zoological Reference Collection, Raffles Museum of Biodiversity Research, Singapore (ZRC), and the Zoological Survey of India, Kolkata (ZSI).

***Pseudolaguvia inornata* sp. nov.**

(Fig. 1)

Glyptothorax sp. Rahman, 1989: 214.

Pseudolaguvia tuberculata (non Prashad & Mukerji) de Pinna, 1996: 8.

Type material. Holotype: UMMZ 245580, 25.8 mm SL; Bangladesh: Chittagong District, Koilla Khal (creek), 10 km E of Feni-Chittagong highway on road to Ramgarh, 22°55'N 91°36'E; W.J. Rainboth et al., 3 February 1978.

Paratypes: UMMZ 209010 (3 alc., 1 c&s), 25.2–27.4 mm SL; data as for holotype.

Diagnosis. *Pseudolaguvia inornata* differs from congeners in having a uniform brown body with a pale mid-dorsal stripe and without any pale patches (vs. brown body without pale mid-dorsal stripe and with yellow bands or light brown patches) and the caudal fin lobes with brown submarginal stripes running along the entire length (vs. transverse brown bands near the tips). It can be further distinguished from *P. foveolata* in having a thoracic adhesive apparatus reaching beyond (vs. not reaching) the base of the last pectoral-fin ray, a deeper body (13.9–16.1% SL vs. 11.0) and fewer vertebrae (29–30 vs. 33); *P. kapuri* in having a shorter adipose-fin base (13.6–16.4% SL vs. 17.1–18.8); from *P. muricata* in having shorter dorsal (18.7–21.7% SL vs. 21.2–26.7) and pectoral (20.4–23.3% SL vs. 26.8–35.7) spines and a longer caudal peduncle (16.3–19.0% SL vs. 12.6–15.5); and from *P. ribeiroi* in having a longer dorsal-fin spine (18.6–21.7% SL vs. 14.2–17.9) and deeper caudal peduncle (7.7–8.5% SL vs. 6.6–7.2). *Pseudolaguvia inornata* further differs from *P. shawi* in having a larger interorbital distance (30.4–34.2% HL vs. 23.4–29.6), from *P.*

tenebricosa in having a longer dorsal-fin spine (18.6–21.7% SL vs. 15.8–17.3) and from *P. tuberculata* in having a shorter adipose-fin base (13.6–16.4% SL vs. 16.8–22.7).

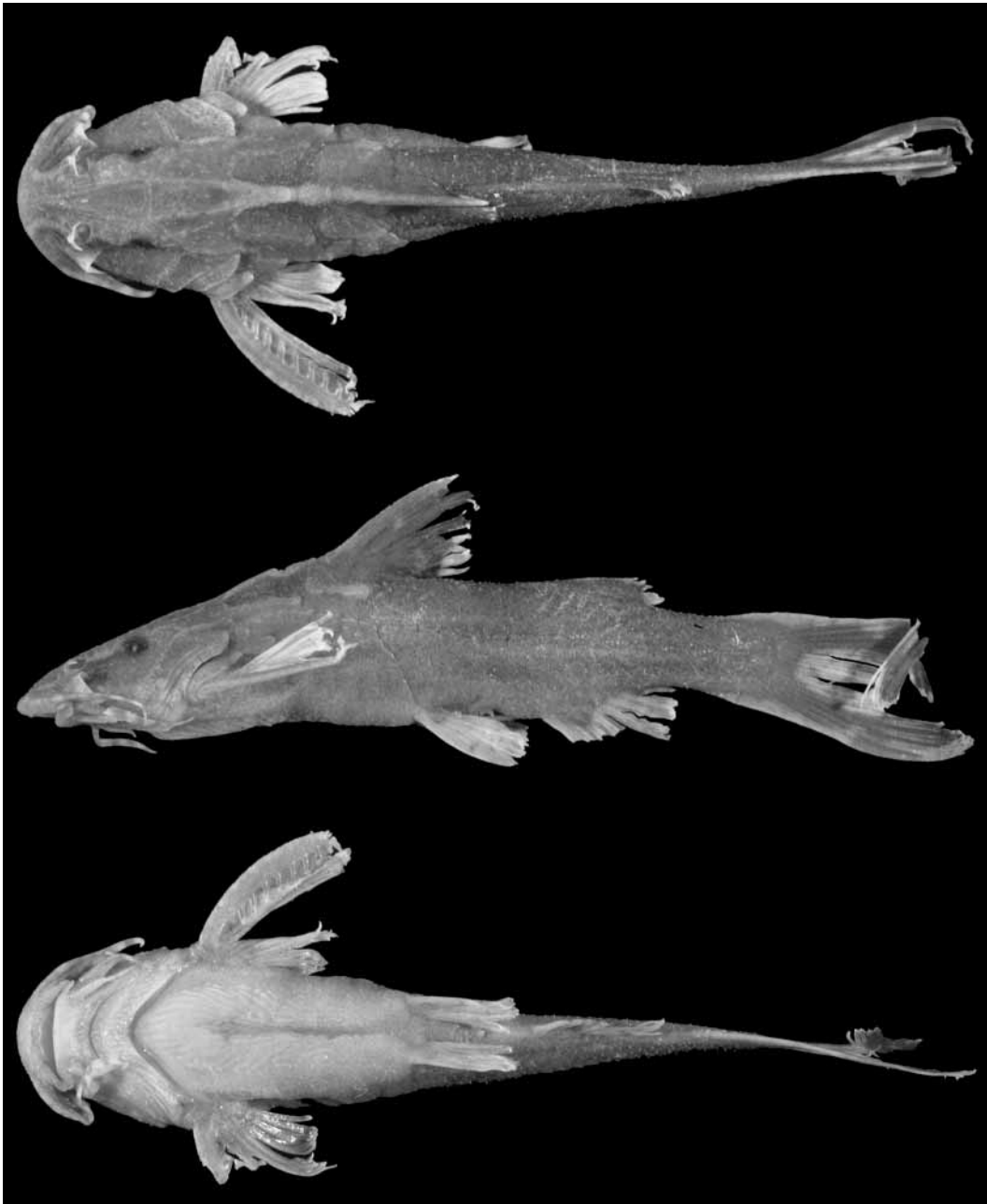


FIGURE 1. *Pseudolaguvia inornata*, UMMZ 245580, holotype, 25.8 mm SL; dorsal, lateral and ventral views.

Description. Biometric data as in Table 1. Head depressed, body moderately compressed. Dorsal profile rising evenly from tip of snout to origin of dorsal fin, then sloping gently ventrally to end of caudal peduncle. Ventral profile flat to anal-fin base,

then sloping gently dorsally to end of caudal peduncle. Supraoccipital spine reaching nuchal shield. Weberian lamina well developed, approximately same length as supraoccipital spine and extending parallel to either side of spine. Eye ovoid, horizontal axis longest; located entirely in dorsal half of head. Orbit with free margin. Gill openings narrow, extending from posttemporal to isthmus. Branchiostegal membranes united at isthmus. Caudal peduncle of moderate length and depth. Anus and urogenital openings located at vertical through middle of adpressed pelvic fin. Skin prominently tuberculate, with conical tubercles particularly prominent on dorsal third of head and body. Lateral line complete and midlateral. Vertebrae 10+19=29 (2) or 11+19=30* (3). Abdomen with thoracic adhesive apparatus consisting of longitudinal, unculiferous ridges arranged in elliptical field and with prominent central median depression. Adhesive apparatus extending to midway between base of last pectoral-fin ray and pelvic-fin origin.

TABLE 1. Biometric data for *Pseudolaguvia inornata* (n=4)

	Holotype	Range	Mean±SD
%SL			
Predorsal length	43.8	41.7–43.8	42.4±0.99
Preanal length	66.7	64.3–67.5	66.1±1.37
Prepelvic length	52.7	46.4–52.9	50.1±3.22
Prepectoral length	26.4	23.0–26.4	24.2±1.60
Length of dorsal-fin base	15.1	12.0–15.1	13.9±1.49
Dorsal-fin spine length	21.7	18.6–21.7	19.5±1.48
Length of anal-fin base	15.1	11.9–15.9	14.7±1.86
Pelvic-fin length	15.5	13.5–15.5	14.3±0.87
Pectoral-fin length	26.0	20.6–26.0	23.5±2.22
Pectoral-fin spine length	23.3	20.4–23.3	21.9±1.20
Caudal-fin length	28.7	27.8–29.8	28.8±1.00
Length of adipose-fin base	13.6	13.6–16.4	14.8±1.19
Caudal peduncle length	19.0	16.3–19.0	17.4±1.17
Caudal peduncle depth	8.5	7.7–8.5	8.1±0.37
Body depth at anus	15.9	13.9–16.1	15.5±1.04
Head length	30.6	28.5–30.6	29.4±0.90
Head width	20.2	20.1–22.2	20.8±0.97
Head depth	15.9	15.9–17.9	16.6±0.91
%HL			
Snout length	49.4	49.4–54.1	51.4±2.14
Interorbital distance	30.4	30.4–34.2	32.3±1.56
Eye diameter	12.7	12.7–14.9	13.5±1.02
Nasal barbel length	15.2	12.2–15.2	13.8±1.24
Maxillary barbel length	78.5	78.4–83.3	80.6±2.52
Inner mandibular barbel length	40.5	37.8–41.1	40.1±1.56
Outer mandibular barbel length	57.0	55.4–62.8	59.2±3.56

Mouth small, inferior and with papillate lips; upper jaw projecting beyond lower jaw. Oral teeth small and in irregular rows on all tooth-bearing surfaces. Premaxillary tooth band consisting of single broad lunate patch across midline; with conical teeth and not exposed when mouth is closed. Dentary tooth band narrow, with conical teeth.

Barbels in four pairs. Nasal barbel very short and broad, extending to midway between its base and anterior orbital margin. Maxillary barbel slender, with broad skin flap at base and extending to base of pectoral-fin spine. Outer mandibular barbel with broad skin flap on dorsal margin and extending to base of pectoral-fin spine; inner mandibular barbel broad and shorter, reaching to vertical through middle of orbit.

Dorsal fin located about two-fifths along body; with 4,i (1) or 5* (4) rays and straight margin. Dorsal-fin spine flattened, straight and robust; spine extending to line through base of pelvic fin. Anterior margin of spine smooth, posterior margin with 4–6 small serrations.

Pectoral fin with stout, blade-like spine, sharply pointed at tip, and with 5,i (1) or 7* (4) rays. Anterior spine margin with 16–18 small serrations. Posterior spine margin with 8–9 large serrations. Pectoral-fin margin straight anteriorly and posteriorly. Coracoid with short posterior processes, extending just beyond base of posteriormost pectoral-fin ray. Pelvic-fin origin at vertical through middle of dorsal-fin base. Pelvic fin with i,5 (5) rays and straight margin; tip of adpressed fin not reaching anal-fin origin. Adipose fin short, posterior end deeply incised. Fin located above anal-fin base. Anal fin with iii,7* (2), iv,6 (1) or iv,7 (2) rays, and straight anterior and posterior margins. Caudal peduncle moderately deep. Caudal fin deeply forked, with i,7,7,i (5) principal rays; upper and lower lobes pointed, with lobes of equal length but lower lobe slightly broader than upper. Procurrent rays symmetrical, extending only slightly anterior to fin base.

Coloration. In 70% alcohol: dorsal and lateral surfaces of head and body medium brown, fading to light brown on lateral surfaces of head and dorsal and lateral surfaces of head and body. Faint dark line running from anterior orbital margin to tip of snout. Light brown stripe running along supraoccipital spine and continuing along nuchal shield and anterior edge of dorsal spine. Lateral tips of nuchal plates with light brown spots. Light brown band running mid-dorsally between dorsal and adipose fins and extending along dorsal margin of adipose fin. Dorsal fin brown, with irregular hyaline margin distally. Pectoral and pelvic hyaline, with scattered melanophores. Anal fin hyaline, with brown along base and irregular brown stripe running along length of first and second branched anal-fin rays. Caudal fin hyaline, with subdistal brown stripe running along length of each lobe. Nasal and maxillary barbels brown dorsally, light brown ventrally; all mandibular barbels light brown.

Distribution and habitat. Known from the type locality in the Feni River drainage in Bangladesh (Fig. 2). The Feni River debouches into the Bay of Bengal to the east of the mouth of the Ganges-Brahmaputra system, and drains the western end of the Chittagong Hill Tracts. *Pseudolaguvia inornata* was collected from a clear, shallow, moderately

flowing stream with a predominantly sandy bottom. *Devario devario* (Cyprinidae) and *Batasio batasio* (Bagridae) were collected along with *P. inornata*.

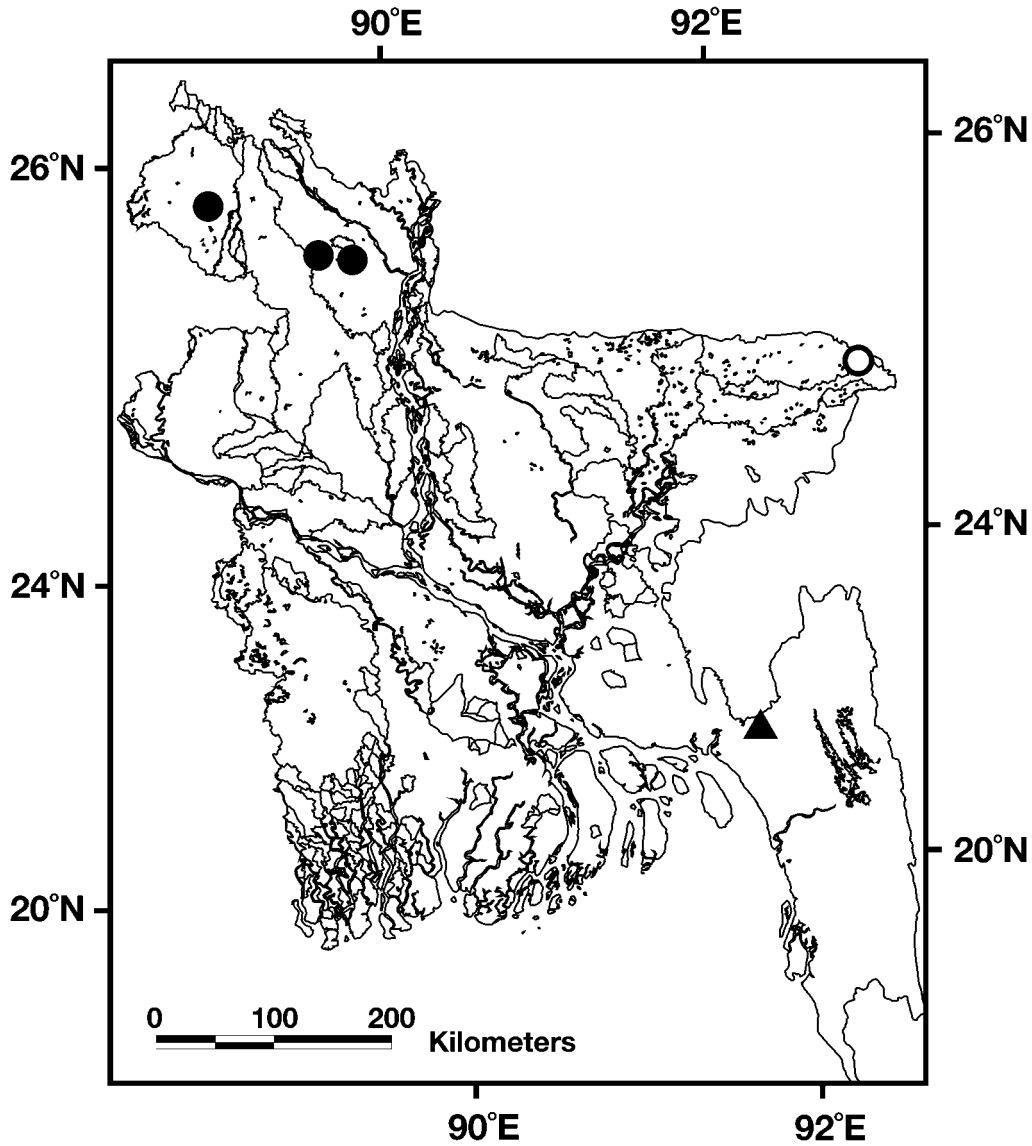


FIGURE 2. Map of Bangladesh showing collection localities of *Pseudolaguvia inornata* (▲) and *P. muricata* (●) and *P. muricata* (○). Open circle indicates type locality.

Etymology. From the Latin *inornatus*, meaning unadorned, in reference to the absence of pale markings on the sides of the body in this species. Used as an adjective.

***Pseudolaguvia muricata* sp. nov.**

(Fig. 3)

Glyptothorax sp. Rahman, 1989: 213.

Type material. Holotype: UMMZ 245581, 22.6 mm SL; Bangladesh: Sylhet District, Rangapani Khal (creek), 6 km NNW of Jaintapur on Sylhet-Shillong highway, 25°10'N 92°6'E; W.J. Rainboth et al., 19 February 1978.

Paratypes: NRM 52292 (2), 20.9–21.5 mm SL; UMMZ 208655 (6), 20.5–23.2 mm SL; data as for holotype. UMMZ 208909 (1), 20.0 mm SL; Bangladesh: Rangpur District, Jabuneswari River just downstream from Badarganj ghat, 25°42'N 89°5'E; W.J. Rainboth & A. Rahman, 3 April 1978. UMMZ 208933 (8), 18.8–25.7 mm SL; ZRC 50382 (3), 21.2–22.6 mm SL; Bangladesh: Rangpur District, Ghaghat (Jagat) River, 7 km E of Rangpur on Badarganj road, 25°45'N 89°7'E; W.J. Rainboth & A. Rahman, 3 April 1978. CAS 222658 (2), 20.2–21.0 mm SL; UMMZ 208993 (5), 19.9–23.3 mm SL; Bangladesh: Dinajpur District, Tangam River at Thakurgaon, 200 m upstream from bridge on road to sugar refinery, 26°2'N 88°26'E; W.J. Rainboth & A. Rahman, 6 April 1978.

Diagnosis. *Pseudolaguvia muricata* differs from congeners in having longer dorsal (21.2–26.7% SL vs. 14.3–21.7) and pectoral (26.8–35.7% SL vs. 15.9–23.3) spines. It can be further distinguished from *P. foveolata* in having a thoracic adhesive apparatus reaching beyond (vs. not reaching) the base of the last pectoral-fin ray, a shorter caudal peduncle (12.6–15.7% SL vs. 20.7) and fewer vertebrae (28–30 vs. 33); *P. kapuri* in having a shorter adipose-fin base (12.3–16.1% SL vs. 17.1–18.8); from *P. ribeiroi* in having a shorter caudal peduncle (12.6–15.7% SL vs. 16.4–18.2); and from *P. inornata* in having (vs. lacking) light brown patches on the body and a shorter caudal peduncle (12.6–15.7% SL vs. 16.3–19.0). *Pseudolaguvia muricata* further differs from *P. shawi* in lacking a color pattern of strongly contrasting brown and yellow bands and a larger interorbital distance (31.4–36.7% HL vs. 23.4–29.6); from *P. tenebricosa* in having a shorter caudal peduncle (12.6–15.7% SL vs. 16.9–18.9); and from *P. tuberculata* in having a shorter adipose-fin base (12.3–16.1% SL vs. 16.8–22.7) and caudal peduncle (12.6–15.7% SL vs. 16.2–20.1).

Description. Biometric data as in Table 2. Head depressed, body moderately compressed. Dorsal profile rising evenly from tip of snout to origin of dorsal fin, then sloping gently ventrally to end of caudal peduncle. Ventral profile flat to anal-fin base, then sloping gently dorsally to end of caudal peduncle. Supraoccipital spine reaching nuchal shield. Weberian lamina well developed, approximately same length as supraoccipital spine and extending parallel to either side of spine. Eye ovoid, horizontal axis longest; located entirely in dorsal half of head. Orbit with free margin. Gill openings narrow, extending from posttemporal to isthmus. Branchiostegal membranes united at isthmus. Caudal peduncle short and moderately slender. Anus and urogenital openings located at vertical through middle of adpressed pelvic fin. Skin prominently tuberculate, with conical tubercles particularly prominent on dorsal third of head and body. Lateral

line complete and midlateral. Vertebrae 9+19=28 (4), 10+18=28 (10), 9+20=29 (1), 10+19=29 (11) or 10+20=30* (2). Abdomen with thoracic adhesive apparatus consisting of longitudinal, unculiferous ridges arranged in elliptical field and with prominent central median depression. Adhesive apparatus extending to midway between base of last pectoral-fin ray and pelvic-fin origin.

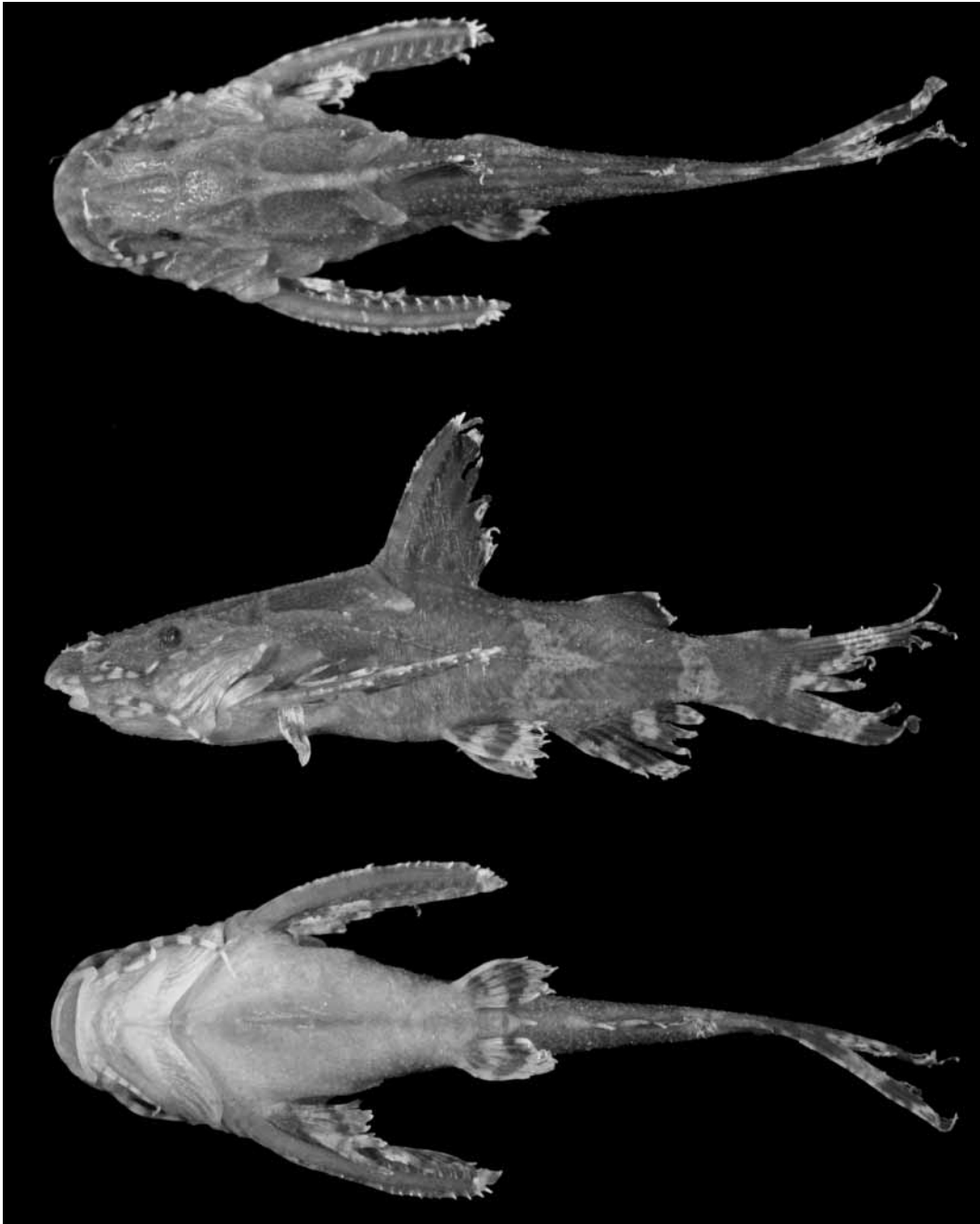


FIGURE 3. *Pseudolaguvia muricata*, UMMZ 245581, holotype, 22.6 mm SL; dorsal, lateral and ventral views.

TABLE 2. Biometric data for *Pseudolaguvia muricata* (n=28).

	Holotype	Range	Mean±SD
%SL			
Predorsal length	47.3	40.9–47.4	44.5±2.03
Preanal length	69.5	65.0–73.0	68.7±2.39
Prepelvic length	53.1	50.6–57.2	53.4±1.78
Prepectoral length	28.8	20.6–28.8	23.7±2.19
Length of dorsal-fin base	15.9	14.7–18.0	16.0±1.02
Dorsal-fin spine length	24.8	21.2–26.7	24.1±1.71
Length of anal-fin base	17.7	14.3–17.7	16.3±1.11
Pelvic-fin length	15.5	13.6–15.8	14.8±0.83
Pectoral-fin length	38.1	28.4–38.1	32.6±3.47
Pectoral-fin spine length	33.6	26.8–35.7	30.9±2.90
Caudal-fin length	24.3	23.3–29.7	26.5±2.06
Length of adipose-fin base	14.2	12.3–16.1	14.5±1.14
Caudal peduncle length	15.4	12.6–15.7	14.4±0.90
Caudal peduncle depth	8.0	6.1–8.1	7.2±0.56
Body depth at anus	14.6	11.7–16.5	14.4±1.22
Head length	32.7	29.6–32.7	31.2±0.88
Head width	23.0	20.6–24.0	22.6±0.97
Head depth	19.5	16.7–19.5	17.8±0.83
%HL			
Snout length	51.4	50.0–57.1	52.6±2.40
Interorbital distance	33.8	31.4–36.7	33.6±1.56
Eye diameter	13.5	11.4–15.1	12.9±1.13
Nasal barbel length	13.5	13.5–26.1	18.9±4.29
Maxillary barbel length	81.1	63.9–92.2	77.0±8.91
Inner mandibular barbel length	47.3	32.9–55.9	41.1±6.40
Outer mandibular barbel length	83.8	58.8–83.8	71.0±8.39

Mouth small, inferior and with papillate lips; upper jaw projecting beyond lower jaw. Oral teeth small and in irregular rows on all tooth-bearing surfaces. Premaxillary tooth band consisting of single broad lunate patch across midline; with conical teeth and not exposed when mouth is closed. Dentary tooth band narrow, with conical teeth.

Barbels in four pairs. Nasal barbel very short and broad, extending to midway between its base and anterior orbital margin. Maxillary barbel slender, with broad skin flap at base and extending to base of pectoral-fin spine. Outer mandibular barbel with broad skin flap on dorsal margin and extending to base of pectoral-fin spine; inner mandibular barbel broad and shorter, reaching to vertical through midway between posterior orbital margin and base of pectoral-fin spine.

Dorsal fin located about two-fifths along body; with 4,i (17) or 5* (11) rays and straight margin. Dorsal-fin spine long, flattened, slightly curved and robust; spine extending to line through base of first anal-fin ray. Anterior margin of spine with 8–12 low serrations, posterior margin with 6–10 serrations.

Pectoral fin with stout, blade-like spine, sharply pointed at tip, and with 5,i (10) or 6* (18) rays. Anterior spine margin with 14–18 small serrations. Posterior spine margin with 9–13 serrations. Pectoral-fin margin straight anteriorly and posteriorly. Coracoid with moderate posterior processes, extending to midway between base of last pectoral-fin ray and pelvic-fin origin.

Pelvic-fin origin at vertical through base of last dorsal-fin ray. Pelvic fin with i,5 (28) rays and straight margin; tip of adpressed fin not reaching anal-fin origin.

Adipose fin short, posterior end deeply incised. Fin located above anal-fin base. Anal fin with iv,6 (26) or iv, 7* (2) rays, and straight anterior and slightly convex posterior margin.

Caudal peduncle moderately slender. Caudal fin deeply forked, with i,7,7,i (28) principal rays; upper and lower lobes pointed, with lobes of equal length but lower lobe slightly broader than upper. Procurrent rays symmetrical, extending only slightly anterior to fin base.

Coloration. In 70% alcohol: dorsal and lateral surfaces of head and body medium to dark brown, fading to lighter brown on lateral surfaces of head and ventral surfaces of head and body. Faint dark line running from anterior orbital margin to tip of snout. Two series of light brown markings on body: first consisting of paired light brown spots above and below lateral line between dorsal and adipose fins, coalescing to form incomplete transverse band in some individuals and second consisting of transverse band on anterior half of caudal peduncle. Light brown markings indistinct in some individuals. Dorsal fin brown, with irregular distal hyaline band. Adipose fin brown, with irregular hyaline distal margin. Pectoral and anal fins hyaline, with brown melanophores forming irregular transverse bands at base and subdistally. Pelvic fins hyaline, with brown melanophores forming irregular transverse bands subdistally. Caudal fin brown at base of lobes, hyaline throughout much of lobe and with scattered brown melanophores; moderately broad, transverse subdistal brown bands present near tips of lobes. Maxillary and all mandibular barbels light brown, annulated with brown rings, nasal barbels brown dorsally, light brown ventrally.

Distribution and habitat. Known from the Brahmaputra River drainage in Bangladesh (Fig. 2). The type locality of *P. muricata* is a clear, shallow, slow-flowing stream with a mixed substrate of sand and detritus, with the fish being found amongst detritus in areas with current. Other fish species collected at this locality were: *Barilius barna* (Cyprinidae), *Barilius bendelisis* (Cyprinidae), *Barilius tileo* (Cyprinidae), *Devario devario* (Cyprinidae), *Oreichthys cosuatis* (Cyprinidae), *Psilorhynchus sucatio* (Psilorhynchidae), *Lepidocephalichthys guntea* (Cobitidae), *Acanthocobitis botia*

(Balitoridae), *Schistura corica* (Balitoridae), *Schistura savona* (Balitoridae), *Amblyceps mangois* (Amblycipitidae), *Mystus bleekeri* (Bagridae), *Olyra longicaudata* (Bagridae), *Conta conta* (Erethistidae), *Hara jerdoni* (Erethistidae), *Pseudolaguvia ribeiroi* (Erethistidae), *Pseudolaguvia shawi* (Erethistidae), *Aplocheilus panchax* (Aplocheilidae), *Xenentodon cancila* (Belonidae), *Microphis deocata* (Syngnathidae), *Chanda nama* (Ambassidae), *Parambassis baculis* (Ambassidae), *Parambassis ranga* (Ambassidae), *Channa gachua* (Channidae), *Ctenops nobilis* (Osphronemidae), *Badis badis* (Badidae), *Nandus nandus* (Nandidae), *Glossogobius giuris* (Gobiidae), *Mastacembelus pancalus* (Mastacembelidae) and *Tetraodon cutcutia* (Tetraodontidae).

Etymology. From the Latin *muricata*, meaning spiny (like a murex), in reference to the elongate dorsal and pectoral-fin spines of this species. Used as an adjective.

Discussion

Britz & Ferraris (2003) diagnose *P. tuberculata* from *P. tenebricosa* by the contact between the adipose fin and the base of the last dorsal-fin ray in the former species (while *P. tenebricosa* and all other congeners lack this contact). I have obtained fresh material from northern Myanmar (UMMZ 245493) that, except for the adipose fin not contacting the base of the last dorsal-fin ray, is otherwise identical in other respects to *P. tuberculata*. In some of this material, particularly in smaller specimens, the adipose fin extends anteriorly into a faint ridge that approaches very close to, but never touches, the base of the last dorsal-fin ray. This is most likely the reason behind Prashad and Mukerji's (1929) assertion that the adipose fin contacts the base of the last dorsal-fin ray in *P. tuberculata*. The adipose-fin base and snout are longer in the material from northern Myanmar than in the paratypes of *P. tenebricosa* examined (16.8–22.7% SL vs. 14.2–16.0 and 52.7–55.5% HL vs. 48.1–50.0 respectively), and it is these reasons that argue for the continued recognition of the two species as distinct. An examination of the two specimens from northern Myanmar (CAS 98614) quoted by Britz & Ferraris (2003) shows that they are conspecific with my material (UMMZ 245493). They are hence reidentified here as *P. tuberculata*.

Pseudolaguvia is not a diverse group, and this diversity is confined to a small area (between the Ganges and Sittang River drainages). Therefore, it is not surprising that most of the species are sympatric, and in a few cases, even syntopic. The underlying mechanism for this occurrence is yet to be investigated. While it is known that fish form heterospecific shoals in order to better avoid predators or to increase foraging efficiency (Pitcher, 1986), this seems unlikely in species of *Pseudolaguvia*, given their cryptic habits and the fact that the catfishes are armed with spines. It is also possible that the fish are not actively shoaling, but have merely aggregated in areas providing the most cover.

The combination of a small body size and greatly enlarged fin spines in *P. muricata* is seldom seen in the Siluriformes, being only known in the members of the Neotropical

Doradidae and the Erethistidae. Within the Erethistidae, it is known to occur in one other erethistid, *Hara jerdoni*. Again, the underlying reason for this unusual morphology is unclear. At least two hypotheses can be postulated for this: 1) the spines are an antipredator defense mechanism and 2) the spines may be useful in helping the fish maintain station in a swift-flowing environment. Although both hypotheses require rigorous testing beyond the scope of this study, they are seemingly supported by the (personal) observation that individuals of *Hara jerdoni* frequently remain at rest with the fin spines partially or fully erect amongst submerged vegetation.

Comparative material

Pseudolaguvia foveolata: UMMZ 244867, holotype, 30.0 mm SL; India: West Bengal, Tista River at Tista barrage, 26°45'10"N 88°34'11"E.

P. kapuri: KU 28644 (1), 21.4 mm SL; Nepal: Dang, Rajpur, Rapti River at Rajpur, 27°50'35.9"N 82°33'47.9"E. KU 29169 (3), 14.1–25.2 mm SL; Nepal: Jhanka, Kankai River at Raj-Marg highway. OSUS 15816 (1), 27.1 mm SL; Nepal: Nawalparasi, Narayani River to 2 km below Tribeni Barrage. OSUS 15845 (1), 24.3 mm SL; Nepal: Nawalparasi, Narayani River at Tribeni Ghat. OSUS 17425 (1), 25.2 mm SL; Nepal: Nawalparasi, Narayani River below Rapti River confluence. USNM 165090 (1), 28.1 mm SL; India: Uttar Pradesh, Katarnian Ghat, Garuwa River, 28°20'N 81°9'E.

P. ribeiroi: UMMZ 208653 (2), 24.5–25.7 mm SL; Bangladesh: Sylhet District, Rangapani Khal (creek), 6 km NNW of Jaintapur on Sylhet-Shillong highway, 25°10'N 92°6'E. UMMZ 208955 (37), 14.7–25.7 mm SL; Bangladesh: Mahananda River at Tetulia, near location of Dak Bungalow. UMMZ 243649 (8), 16.4–23.2 mm SL; India: West Bengal, Schutunga River (tributary of the Mansai River) at Ansole, 26°22'24"N 89°11'17"E.

P. shawi: UMMZ 208654 (1), 23.4 mm SL; Bangladesh: Sylhet District, Rangapani Khal (creek), 6 km NNW of Jaintapur on Sylhet-Shillong highway, 25°10'N 92°6'E. UMMZ 243652 (8), 17.2–28.3 mm SL; West Bengal, Raidak I River at Shipra, just outside Buxa Tiger Reserve, Sankosh River drainage, 26°31'12"N 88°42'32"E.

P. tenebricosa: USNM 374987 (4 paratypes), 26.0–28.5 mm SL; Myanmar: Kayin, Pathe Chaung, hill stream, 21 km east of Toungoo, 19°01'11"N 96°35'33"E.

P. tuberculata: ZSI F10876/1, holotype, 29.6 mm SL; Myanmar: Myitkyina, Sankha, a large hill-stream, midway between Kamaing and Mogaung. CAS 98614 (2), 28.3–30.1 mm SL; Myanmar: Kachin, Nan Kwe Chaung, west of Myitkyina, on both sides of highway bridge, 25°19'56"N 97°16'48"E. UMMZ 245493 (15), 22.7–33.0 mm SL; Myanmar: Kachin, Myitkyina district, hillstreams at Tonpan village on road from Myitkyina to Tanai.

Acknowledgments

I am grateful to the following for access to material under their care: David Catania (CAS), Andrew Bentley (KU), Sven Kullander (NRM), Anthony Echelle (OSUS), Douglas Nelson (UMMZ), Jeffrey Williams (USNM), Kelvin Lim (ZRC) and A. K. Karmakar (ZSI). This work was funded by support from the Carl L. and Laura C. Hubbs Research Fellowship from the Museum of Zoology, University of Michigan, and the All Catfish Species Inventory (NSF DEB-0315963).

Literature cited

- Britz, R. & Ferraris, C.J. (2003) A new species of the Asian catfish genus *Pseudolaguvia* from Myanmar (Teleostei: Ostariophysi: Siluriformes: Erethistidae). *Zootaxa*, 388, 1–8.
- Ng, H.H. (2005) *Pseudolaguvia foveolata*, a new catfish (Teleostei: Erethistidae) from northeast India. *Ichthyological Exploration of Freshwaters*, 16.
- Ng, H.H. & Kottelat, M. (1998) The catfish genus *Akysis* Bleeker (Teleostei: Akysidae) in Indochina, with the descriptions of six new species. *Journal of Natural History*, 32, 1057–1097.
- de Pinna, M.C.C. (1996) A phylogenetic analysis of the Asian catfish families Sisoridae, Akysidae, and Amblycipitidae, with a hypothesis on the relationships of the neotropical Aspredinidae (Teleostei, Ostariophysi). *Fieldiana Zoology (New Series)*, 84, 1–83.
- Pitcher, T.J. (1986) Functions of shoaling in teleosts. In: Pitcher, T.J. (Ed.), *The Behavior of Teleost Fishes*. John Hopkins University Press, Baltimore, pp. 294–337.
- Prashad, B. & Mukerji, D. D. (1929) The fish of the Indawgyi Lake and the streams of the Myitkyina District (Upper Burma). *Records of the Indian Museum*, 31, 161–223.
- Rahman, A.K.A. (1989) *Freshwater Fishes of Bangladesh*. The Zoological Society of Bangladesh, Dhaka, 364 pp.