

Research Article

***PSEUDOLAGUVIA NEPALENSIS*, A NEW CATFISH (TELEOSTEI: SILURIFORMES: ERETHISTIDAE) FROM CENTRAL, NEPAL**

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**ABSTRACT**

There are 18 species reported so far in the genus *Pseudolaguvia* from streams and rivers of the Ganges and Brahmaputra in Nepal, India and Bangladesh, Ayeyarwady and Sittang River drainages in east central Myanmar and from rivers of Western Ghats, peninsular India. We also collected two specimens of *Pseudolaguvia* from a stream, Kasara near to its confluence with Rapti River in central Nepal and on closer examination, it is found to be an undescribed one. Herein, we describe it as new. *Pseudolaguvia nepalensis* sp. nov. is distinguished from all its seventeen congeners in having longer head (32.38-33.58 vs. 6.8-33.1 %SL) and longer pre-pectoral distance (28.41-29.87 vs. 18.3-28.8 %SL). *Pseudolaguvia nepalensis* can be differentiated by having longer caudal fin lower lobe (30.53-33.43 vs. 19.5-30.3 %SL) except *Pseudolaguvia austrina*, *Pseudolaguvia viriosa*, *Pseudolaguvia assula* and *Pseudolaguvia virgulata*. Furthermore, it is distinguished from other closely related congeners by having minute black dots throughout head and body and one dark brown line runs from each nostril to anterior rim of orbit.

**Keywords:** Erethistid catfish, Kasara stream, Tributary of Rapti, River, Central Nepal

**INTRODUCTION**

Genus *Pseudolaguvia* includes small Asian catfishes of the Family Erethistidae that resemble with miniature species of the sisorid genus *Glyptothorax* in morphology, but differs in having a prominent postcoracoid process externally (Ng, 2005b). Ng and Kottelat (2005) pointed out that all *Pseudolaguvia* have a median depression in the thoracic adhesive apparatus and therefore are congeneric.

Members of *Pseudolaguvia* comprise of eighteen species found in streams and rivers of the Ganges and Brahmaputra in Nepal, India and Bangladesh, Ayeyarwady and Sittang River drainages in east central Myanmar and in the rivers of Western Ghats, peninsular India (Ng, 2006; Ng and Lalramliana, 2010; Radhakrishnan *et al.*, 2010). Among the species of *Pseudolaguvia*, fifteen species have been reported from India and among them two are from peninsular India; *Pseudolaguvia austrina* (Radhakrishnan *et al.*, 2010) from a tributary of Bharathapuzha River and *Pseudolaguvia lapillicola* (Britz *et al.*, 2013) from Valapattanam River in the Karnataka part of Western Ghats. Two species, *Pseudolaguvia tenebricosa* (Britz and Ferraris, 2003) from Pathe Chaung, lower Myanmar and *Pseudolaguvia tuberculata* (Prashad and Mukerji, 1929) from Indawgyi in upper Myanmar) were also reported. From Nepal, *Pseudolaguvia assula* from Reu River near confluence with Rapti River, central Nepal (Ng and Conway, 2013) is reported including *P. ribeiroi* and *P. kapuri* which were also listed earlier (Shrestha, 2008; Rajbanshi, 2012).

In a recent sampling of the Kasara stream near to the confluence of Rapti River at Chitwan District, central Nepal, a species of *Pseudolaguvia* showed distinctive features to be designated as new species.

**MATERIALS AND METHODS**

Morphometric measurements were made point to point using digital caliper (0.01 mm accuracy). Counts and measurements were made on the left side of specimens. Measurements were followed by the methodology of Ng and Kottelat (1998) and Ng *et al.*, (2013). Sub units of the head are presented as proportions of head length (HL). Head length and measurements of body parts are given as proportion of standard length (SL). Diagnosis is based on proportional analysis, external morphological traits and color patterns. Materials examined in this study are deposited in Fisheries Research Division, Fish Museum, Kathmandu, Nepal (FRDFM). Comparison materials are from MSUMHH (Manonmaniam Sundaranar University, Museum of Natural History) and from CMA (collections of M. Arunachalam). Sampling was carried out in February 2014 and water quality parameters such as dissolved oxygen, water temperature, pH, total dissolved solids, and conductivity were estimated along with the GPS co ordinates.

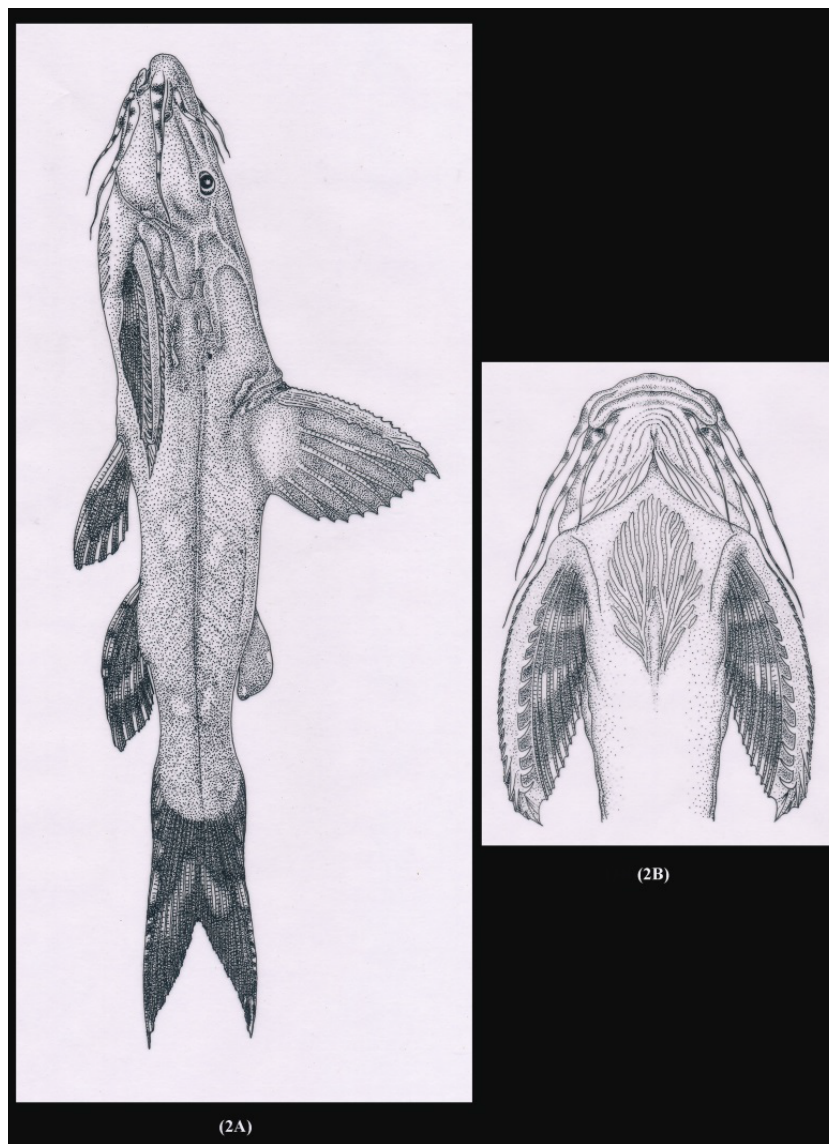
***PSEUDOLAGUVIA NEPALENSIS*, SP. NOV.**

(Figures 1-4 and Tables 1-6)

**Holotype:** FRDFM 1, 20.52 mm SL; Nepal, Central region, Chitwan District, Kasara khola stream, near the



**Figures 1A & 1B.** *Pseudolaguvia nepalensis*: (1A) lateral view, (1B) ventral view: 20.52 mm SL (Holotype: FRDFM 1) from Kasara khola stream near the confluence of Rapti River at Kasara village, Chitwan District, Central Nepal, 15 February, 2014.



**Figures 2A, 2B.** *Pseudolaguvia nepalensis*: Line drawings- (2A) lateral view, (2B) showing adhesive apparatus (Holotype) FRDFM 1, 20.52 mm SL.



Figures 3A & 3B. Type locality of *Pseudolaguvia nepalensis* sp. nov.: (3A) Confluence of Rapti River and Kasara khola stream, (3B) Kasara khola stream (holotype and paratype).

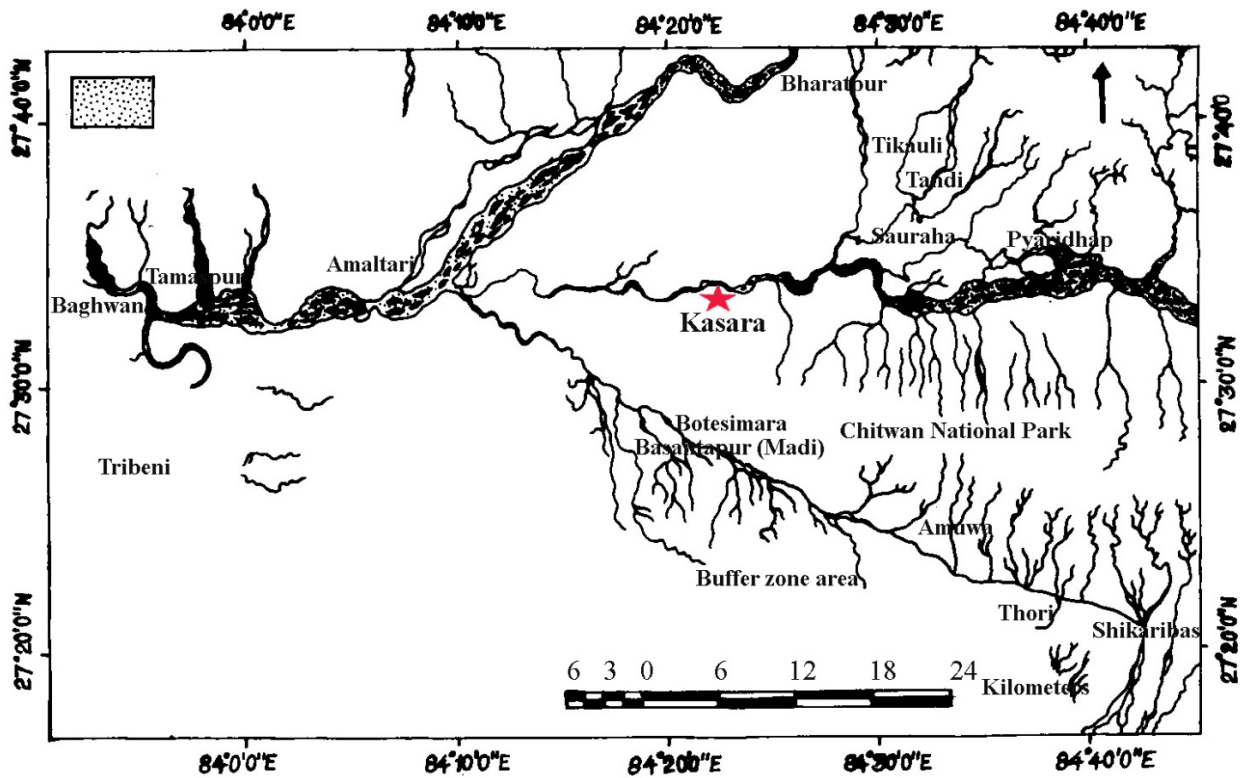


Figure 4. Map showing study area (★): Kasara khola stream at Chitwan National Park (CNP) and Buffer Zone, Nepal.

confluence with Rapti River at old Kasara Ghat, Jagatpur, in the vicinity of Chitwan National Park, (N 27° 33' 97" E 84° 19' 96"), 500 m east of Rapti Kasara bridge; 135 m above sea level, collected by Asha Rayamajhi, 15 February, 2014.

**Paratypes:** FRDFM 2, (1 ex.), 19.95 mm SL; details same as Holotype.

## RESULTS

**Diagnosis:** *Pseudolaguvia nepalensis* is distinguished from all the seventeen congeners in having longer head (32.38-33.58 vs. 6.8-33.1% SL) and greater pre-pectoral length (28.41-29.87 vs. 18.3-28.8 % SL) (Tables 2-4). *Pseudolaguvia nepalensis* can be distinguished except *Pseudolaguvia austrina*, *P. viriosa*, *P. assula* and *P. virgulata*.

by having longer caudal fin lower lobe (30.53-33.43 vs. 19.5-30.3 % SL). *Pseudolaguvia nepalensis* can be distinguished from *Pseudolaguvia ferruginea*, *P. assula*, *P. lapillicola*, *P. ferula*, *P. nubila*, *P. spicula*, *P. viriosa*, *P. foveolata*, *P. inornata* and *P. shawi* in having serrations at anterior margin of dorsal spine (vs. no serrations or smooth anterior margin of dorsal spine) (Tables 5, 6). It can be further distinguished from *Pseudolaguvia austrina*, in having fewer serrations in posterior edge of dorsal spine (7-8 vs. 24) (Table 6). It is distinguished from *Pseudolaguvia muricata* and *P. flavida* by having greater number of serrations on anterior edge of dorsal spine (16 and 19 vs. 6-12) except *Pseudolaguvia virgulata* (9-17 serrations) (Tables 5,6).

*Pseudolaguvia nepalensis* sp. nov. is distinguished from

**Table 1.** Morphometric measurements of *Pseudolaguvia nepalensis* (n=2).

No	Standard length (mm)	Holotype	Range	Mean $\pm$ SD
		FRDFM 1 20.52	FRDFM 1, 2 19.95-20.52	
<b>% Standard Length</b>				
1	Predorsal length	44.93	44.93-46.17	45.55 $\pm$ 0.87
2	Preanal length	70.27	70.27-73.93	72.10 $\pm$ 2.59
3	Prepelvic length	51.46	51.46-54.44	52.95 $\pm$ 2.10
4	Prepectoral length	28.41	28.41-29.87	29.14 $\pm$ 1.03
5	Dorsal fin length	24.66	24.66-27.47	26.06 $\pm$ 1.99
6	Dorsal fin base length	13.35	13.35-15.69	14.52 $\pm$ 1.65
7	Dorsal spine length	24.37	22.71-24.37	23.54 $\pm$ 1.17
8	Anal fin base length	14.28	14.28-14.64	14.46 $\pm$ 0.25
9	Pelvic fin length	17.54	17.54-18.55	18.05 $\pm$ 0.71
10	Pectoral fin length	35.23	28.92-35.23	32.08 $\pm$ 4.46
11	Pectoral spine length	26.61	26.61-26.77	26.69 $\pm$ 0.11
12	Caudal fin length (lower lobe)	33.43	30.53-33.43	31.98 $\pm$ 2.05
13	Caudal fin length (upper lobe)	31.58	30.08-31.58	30.83 $\pm$ 1.06
14	Adipose fin base length	11.16	11.16-11.18	11.17 $\pm$ 0.01
15	Dorsal to adipose distance	15.35	15.35-17.14	16.25 $\pm$ 1.27
16	Post adipose distance	17.25	16.14-17.25	16.70 $\pm$ 0.79
17	Caudal peduncle length	16.23	16.23-16.64	16.43 $\pm$ 0.29
18	Caudal peduncle depth	8.48	7.97-8.48	8.22 $\pm$ 0.36
19	Body depth at anus	14.33	13.13-14.33	13.73 $\pm$ 0.84
20	Dorsal fin depth at pre dorsal	17.35	17.35-18.45	17.90 $\pm$ 0.78
21	Head length	33.58	32.38-33.58	32.98 $\pm$ 0.85
22	Head width	21.25	21.25-21.45	21.35 $\pm$ 0.15
23	Head depth	18.52	18.30-18.52	18.41 $\pm$ 0.16
24	Anal fin length	20.13	20.13-22.31	21.22 $\pm$ 1.54
<b>% Head Length</b>				
25	Snout length	52.25	52.25-56.04	54.14 $\pm$ 2.68
26	Inter orbital distance	28.59	28.59-30.80	29.70 $\pm$ 1.56
27	Eye diameter	9.87	9.87-13.93	11.90 $\pm$ 2.87
28	Nasal barbel length	20.17	18.27-20.17	19.22 $\pm$ 1.35
29	Maxillary barbel length	70.25	69.04-70.25	69.64 $\pm$ 0.85
30	Inner mandibular length	43.25	40.40-43.25	41.83 $\pm$ 2.01
31	Outer mandibular barbel length	74.46	67.34-74.46	70.90 $\pm$ 5.03

*Pseudolaguvia muricata* in having narrower inter orbital distance (28.59-30.80 vs. 31.4-36.7 % HL), longer pelvic fin (17.54-18.55 vs. 13.6-15.8 % SL), more serrations on anterior edge of dorsal-fin spine (16 and 19 vs. 8-12) and greater length of caudal fin lower lobe (vs. equal length of both lobes), (Table 2). *Pseudolaguvia nepalensis* is distinct from *Pseudolaguvia virgulata* by the absence of longitudinal markings (vs. series of two or three pale, narrow longitudinal stripes running along the sides of brown body and by the absence of 'Y' shaped pale markings on the dorsal surface of the head (vs. presence of 'Y' shaped pale markings) and distinct from *P. viriosa* by the presence of serrations on the anterior edge of dorsal fin (vs. absence or rugose surface only on distal third of spine) and narrower inter orbital distance (28.59-30.80 vs. 35-38 % HL) (Table 2). *Pseudolaguvia nepalensis* sp. nov. can be differentiated from *P. tenebricosa*, *P. inornata*, *P. ferruginea*, *P. ferula*, *P. nubila*, *P. spicula*, *P. ribeiroi*, and *P. shawi* in having longer pectoral spine (26.61-26.77 vs. 14.32-24.41 %SL). *Pseudolaguvia nepalensis* distinguished from *Pseudolaguvia tuberculata*

and *Pseudolaguvia foveolata* in having longer pectoral fin (28.92-35.23 vs. 18.3 and 27.3 %SL) respectively (Tables 2, 3 and 4).

*Pseudolaguvia nepalensis* can be distinguished from *Pseudolaguvia kapuri* by having shorter adipose-fin base (11.16-11.18 vs. 17.1-18.9 % SL), longer dorsal spine (22.71-24.37 vs. 14.0-15.5 % SL), and narrower head (21.25-21.45 vs. 23.4-24.0 % SL). It is further distinguished from *Pseudolaguvia flavida* in having more serrations on anterior and posterior edge of dorsal spine (16-19 vs. 6) and (7-8 vs. 1) respectively and longer dorsal spine (22.71-24.37 vs. 17.9 % SL), longer pectoral fin (26.61-26.77 vs. 17.9 %SL), longer head (32.38-33.58 vs. 27.6 %SL) and long snout (52.25-56.04 vs. 43 %HL) (Table 3).

**Description:** Counts and proportions are from 2 specimens of 19.95 and 20.52 mm standard length respectively. Body moderately compressed. Dorsal profile gently rising anteriorly up to the origin of dorsal fin and thereafter sloping to end of caudal peduncle (Figs.1A, 1B).

**Table 2.** Proportional measurements of *P. muricata*, *P. foveolata*, *P. nubila*, *P. specula*, *P. virgulata*, and *P. tenebricosa* (characters 1-24 expressed as %SL and characters 25-30 expressed as % HL).

No.	Morphometric measurements	<i>P. muricata</i>		<i>P. foveolata</i>		<i>P. nubila</i>		<i>P. specula</i>		<i>P. virgulata</i>		<i>P. tenebricosa</i>	
		n-28; including holotype, Ng, 2005a	n-1; holotype, Ng., 2005a	n-13; including holotype Ng, et al., 2013	n-4 ex. MSUMNH	n-30; including Ng and Lalramliana, 2010	n-2 ex. MSUMNH	n-7; including holotype NG and Lalramliana, 2010	n-2 ex. MSUMNH	n-14; including holotype Britz and Ferraris, 2003	n-2 ex. MSUMNH		
1	Standard len.	20.9-22.6	30	25.9-29.3	23.23-26.5	23.5-31.1	25.47	19.9-28.8	27.36	26.3-31.5	26.89		
2	Predorsal len.	40.9-47.4	38.7	36.6-40.6	41.77	37.4-40.4	41.17	39.6-42.9	43.19	41.4-44.8	40.57		
3	Preanal len.	65.0-73.0	66.6	65.8-69.6	71.09	66.0-69.9	71.18	64.5-66.7	69.59	67.3-70.7	70.06		
4	Prepelvic len.	50.6-57.2	49.7	49.5-52.3	52.11	46.7-50.7	55.79	47.9-50.6	53.75	49.61			
5	Prepectoral len.	20.6-28.8	22.7	22.0-24.9	25.21	21.0-25.0	26.63	21.9-24.9	25.74	20.6-23.0	24.1		
6	Dorsal fin base len.	14.7-18.0	15.3	15.1-17.3	15.76	13.2-15.9	15.77	17.2-19.8	14.25	-	13.54		
7	Dorsal fin spine len.	21.2-26.7	11.3	16.4-19.3	15.33	11.6-14.3	13.84	21.5-24.0	17.73	-	12.94		
8	Anal fin base len.	14.3-17.7	11.3	15.6-19.7	15.67	14.3-17.7	13.61	14.6-16.5	16.30	-	14.95		
9	Pelvic fin len.	13.6-15.8	19	15.8-18.5	16.94	14.6-17.1	16.76	14.6-16.2	16.08	12.8-14.9	16.73		
10	Pectoral fin len.	28.4-38.1	27.3	24.1-26.4	24.84	19.9-23.0	25.60	28.1-28.8	27.12	18.5-24.9	22.46		
11	Pectoral spine len.	26.8-35.7	21.3	18.1-22.0	24.41	15.7-17.4	18.47	23.6-26.2	22.44	-	14.32		
12	Caudal fin len.	23.3-29.7	21.3	20.3-25.3	24.04	24.2-27.5	24.15	28.8-30.0	30.92	25.4-30.4	25.33		
13	Adipose fin base len.	12.3-16.1	24	14.2-15.9	16.49	14.7-17.1	14.68	12.9-15.0	16.71	-	17.89		
14	Dorsal-adipose dist.	-	-	13.1-16.8	18.72	13.9-17.9	18.51	14.5-17.0	17.64	-	16.47		
15	Post adipose dist.	-	-	13.9-16.7	16.70	13.2-18.1	16.74	17.6-18.7	16.45	-	15.95		
16	Caudal peduncle len.	12.6-15.7	20.7	15.7-20.2	16.92	15.4-17.9	18.68	18.2-20.2	17.91	15.4-17.5	16.92		
17	Caudal peduncle dep.			5		8.56-							9.37
18	Body depth at anus		6.1- 8.1		9.1-11.1	9.04	7.9-9.6	7.27-7.85	7.8-9.7	9.10-9.32	8.5-11.5		
19	Head length			11	13.9-	17.85-	12.8-	14.58-	14.5-	16.45-	17.1-	22.61	
20	Head width		11.7-16.5		17.1	18.44	16.8	16.22	17.4	17.87	23.7		
21	Head depth			26.7	29.0-	28.27-	26.0-	28.87-	28.8-	28.84-	26.6-	27.37	
22	Dorsal fin length		29.6-32.7		32.4	30.91	28.8	29.37	32.2	30.21	29.6		
23	Dorsal fin depth			20	19.7-	20.23-	19.2-	22.23-	21.2-	20.87-	23.2-	21.68	
24	Anal fin length		20.6-24.0		21.7	20.98	22.6	22.93	24.4	21.78	25.1		
25	Head width			14.3	15.3-	17.85-	15.6-	20.02-	16.6-	18.90-	12.5-	14.95	
26	Head depth		16.7-19.5		18.9	18.73	19.1	21.43	19.4	19.73	14.6		
27	Snout length												
28	Dorsal fin length		-	-	-	-	-	-	-	-	12.6-	-	
29	Dorsal fin depth		-	-	-	20.87-	-	19.19-	-	23.35-	13.7-	21.05	
30	Anal fin length		-	-	-	23.68	-	19.91	-	24.34	19.7		
31	% of Head length												
32	Head width		-	-	-	67.89-	-	-	-	72.10-	82.5-	79.21	
33	Head depth		-	-	-	74.18	-	-	-	72.37	87.5		
34	Snout length					70.09-	-	-	-	65.31-	44.9-	54.62	
35						73.75				65.53	50.0		
36						44.0-	51.65-	48.6-	48.0-	51.58-	44.7-	53.67	
37			50.0-57.1	52.5	53.1	52.47	51.9	51.9	54.9	54.94	50.6		

28	Inter-orbital width	31.4-36.7	28.8	25.6-31.8	27.59-31.33	28.2-32.1	-	29.3-35.2	30.86-31.69	28.8-32.1	27.45
29	Orbit diameter	11.4-15.1	10	10.8-14.0	13.80-15.98	10.6-13.9	-	12.0-14.9	13.94-14.81	8.8-11.8	13.04
30	Nasal barbel length	13.5-26.1	23.8	8.6-20.9	13.64-16.55	14.6-23.3	-	10.8-18.3	17.04-18.38	-	23.1
31	Maxillary barbel len.	63.9-92.2	72.5	60.4-84.4	86.88-88.52	61.1-85.4	-	60.0-74.6	70.12-74.18	-	87.91
32	Medial mandi.len.	32.9-55.9	42.5	24.2-42.0	4.23-47.62	27.4-51.4	-	32.0-38.6	36.79-37.52	-	42.93
33	Lateral mandi. len.	58.8-83.8	67.5	44.0-63.0	60.81-71.51	39.3-72.6	-	47.7-67.5	58.81-64.57	-	76.36

dep.=depth, Lateral mandi. len.=Lateral mandibular length.

**Table 3.** Proportional measurements of *Pseudolaguvia inornata*, *P. ferruginea*, *P. flavida*, *P. tuberculata*, *P. austrina*, and *P. ferula* (characters 1-24 expressed as %SL and characters 25-30 expressed as % HL).

No.	Morphometric measurements	<i>P. inornata</i>		<i>P. ferruginea</i>	<i>P. flavida</i>	<i>P. tuberculata</i>	<i>P. austrina</i>	<i>P. ferula</i>	
		% of SL	n-4; including holotype, Ng, 2005a	n-18; including holotype, Ng, 2009	n-2, ex. MSUMNH	n-1; Holotype, Ng, 2009	n-1, Britz and Ferraris, 2003	Radhakrishnan et al., 2010	n-15; including holotype, Ng, 2006
1	Standard len.	25.2-27.4	22.6-28.9	20.27-21.41	24.6	30	25.3-35.6	19.6-25.4	19.71
2	Pre dorsal len.	41.7-43.8	35.3-40.8	41.94-43.07	39.4	-	37.9-46.4	36.3-40.4	40.79
3	Pre anal len.	64.3-67.5	62.8-67.3	67.82-68.52	63.8	-	72.6-79.6	64.9-70.1	67.78
4	Pre pelvic len.	46.4-52.9	45.1-49.6	48.01-50.81	45.9	-	-	49.2-53.6	50.08
5	Pre pectoral length	23.0-26.4	18.3-24.5	24.29-25.85	19.5	-	20.1-27.9	21.4-25.2	24.25
6	Dorsal fin base len.	12.0-15.1	14.9-17.3	14.15-14.55	16.7	-	-	7.9-11.9	13.24
7	Dorsal spine len.	18.6-21.7	13.0-16.6	13.96-16.86	17.9	-	-	17.3-18.7	18.06
8	Anal fin base len.	11.9-15.9	13.7-17.7	14.16-14.95	15.4	-	-	13.2-14.9	13.85
9	Pelvic fin len.	13.5-15.5	11.4-16.0	16.35-17.07	10.2	13.3	16.0-20.9	13.0-14.7	15.85
10	Pectoral fin len.	20.6-26.0	19.5-22.6	20.33-22.33	22.4	18.3	26.0-34.3	24.1-27.5	26.38
11	Pectoral spine len.	20.4-23.3	16.3-18.8	19.59-21.02	17.9	-	-	20.2-24.3	19.58
12	Caudal fin len.	27.8-29.8	21.8-26.2	24.05-25.46	22	26.7	25.7-43.9	21.7-26.6	26.48
13	Adipose fin base len.	13.6-16.4	11.4-14.8	14.62-15.54	11	-	12.7-16.1	11.5-13.0	13.65
14	Dorsal-adipose dist.	-	14.2-17.3	16.44-18.01	16.3	-	29.5-32.7	-	16.18
15	Post adipose dist.	-	14.1-19.2	13.87-14.06	14.6	-	-	-	20.85
16	Caudal peduncle len.	16.3-19.0	16.5-20.0	17.70-19.29	17.9	18.3	8.8-14.7	18.2-19.4	16.69
17	Caudal peduncle dep.	7.7-8.5	6.5-8.1	7.38-7.40	6.5	10	10.3-14.7	6.9-7.8	7.71
18	Body depth at anus	13.9-16.1	10.5-12.4	12.28-13.22	11	23.3	19.2-25.1	12.1-13.8	12.02
19	Head length	28.5-30.6	27.7-29.6	28.77-29.85	27.6	30	23.6-31.1	26.4-28.5	28.92
20	Head width	20.1-22.2	20.1-22.2	20.64-21.21	22	26.7	24.2-27.0	17.1-19.1	18.47
21	Head depth	15.9-17.9	14.5-15.8	15.59-16.25	16.3	15	-	13.7-16.5	13.44

22	Dorsal fin len.	-	-	-	-	-	23.3-29.1	-	-
23	Dorsal fin depth	-	-	15.89-17.84	-	20	-	-	-
24	Anal fin len.	-	-	-	-	-	17.9-27.8	-	-
<b>% of HL</b>									
25	Head width	-	-	-	-	88.9	-	e	-
26	Head depth	-	-	-	-	50	-	-	-
27	Snout length	49.4-54.1	46-50	-	43	55.6	42.6-55.7	44.3-50.7	49.82
28	Inter-orbital width	30.4-34.2	27-31	-	32	27.8	36.0-42.7	25.4-31.7	25.26
29	Orbit diameter	12.7-14.9	9-12	-	12	11.1	4.4-8.1	8.6-11.7	13.68
30	Nasal barbel len.	12.2-15.2	6-15	-	12	-	26.7-46.8	7.2-11.7	8.95
31	Maxillary barbel len.	78.4-83.3	53-71	-	43	-	77.2-100	68.6-76.7	67.54
32	Medial mand. len.	37.8-41.1	26-35	-	15	-	36.7-67.7	21.4-29.9	25.79
33	Lateral mand. len.	55.4-62.8	43-54	-	34	-	52.5-82.3	35.7-49.3	44.04

Ventral profile flat to anal fin base and thereafter sloping to end of caudal peduncle. Ventral profile is flat up to anal fin base and thereafter sloping to end of caudal peduncle. Body depth at dorsal fin origin 17.35-18.45 ( $17.90 \pm 0.78$ ) %SL, at anus 13.13-14.33 ( $13.73 \pm 0.84$ ) %SL and at caudal peduncle 7.97-8.48 ( $8.22 \pm 0.36$ ) %SL (Table 1). Dorsal and ventral portions of head depressed. Head depth at occiput 18.30-18.52 ( $18.41 \pm 0.16$ ) %SL and its width 21.25-21.45 ( $21.35 \pm 0.15$ ) %SL. Snout conical; mouth small and inferior, upper jaw projecting beyond lower jaw. Eyes ovoid, not visible from ventral side. Width of orbit is 9.87-13.93 ( $11.90 \pm 2.87$ ) %HL and width of inter orbit is 28.59-30.80 ( $29.70 \pm 1.56$ ) %HL. Four pairs of barbels, one pair of maxillary; cylindrical, with broad skin flap at base and its length 69.04-70.25 ( $69.64 \pm 0.85$ ) %HL; extended up to base of pectoral fin spine (Figs. 2A, 2B). One pair of short and broad nasal barbel, its length 18.27-20.17 ( $19.22 \pm 1.35$ ) %HL extended anterior to orbital margin. One pair of outer mandibular; with broad skin flap on dorsal margin and its length is 67.34-74.46 ( $70.90 \pm 5.03$ ) %HL; extended to base of pectoral-fin spine and one pair of broad and shorter inner mandibular barbel; its length is 40.40-43.25 ( $41.83 \pm 2.01$ ) %HL, reaches midway between posterior margin of orbit to base of pectoral fin spine.

Supraoccipital spine almost reaches to nuchal shield. Supraoccipital spine and Weberian lamina are approximately equal in length. Weberian lamina is well developed, extending parallel to both sides of dorsal spine. Prominent tubercles on head; particularly, on lateral part, below orbit, snout and base of maxillary barbel but dorsal part of head from tip of snout to occiput not much tuberculated. Conical tubercles are prominent after dorsal fin insertion to base of caudal fin; laterally tubercles are in scattered form in posterior margin of body.

Lateral line complete and positioned at mid laterally. Thoracic adhesive apparatus with longitudinal unculiferous ridges with prominent central median depression, extending to near midway between base of last pectoral fin ray and pelvic fin origin (Fig. 2B). Gill opening is extended from post-temporal to isthmus. Branchiostegal united with

isthmus. Anus and urogenital openings are located at middle of adpressed pelvic fin in vertical position.

Fin counts are: dorsal fin rays i-4 (2); anal fin rays iii-6 (1) or 10 (1); pelvic fin rays i-5 (2); pectoral fin rays i-5 (2); caudal fin rays i,8,7,I (1) or i,7,7,I (1) including principal rays. Dorsal fin with straight margin and its length is 24.66-27.47 ( $26.06 \pm 1.99$ ) %SL and length of dorsal fin base is 13.35-15.69 ( $14.52 \pm 1.65$ ) %SL. Dorsal spine having serrations on both anterior and posterior edge and extended to 3/4<sup>th</sup> of pelvic fin ray. Length of dorsal spine is 22.71-24.37 ( $23.54 \pm 1.17$ ) %SL. Anterior edge of dorsal spine has 16 (1)-19 (1) serrations (except granulations) and its posterior edge with 7 (1) and 8 (1) serrations. Distance between tip of snout to anterior origins of fins with predorsal distance 44.93-46.17 ( $45.55 \pm 0.87$ ) %SL and prepelvic distance 51.46-54.44 ( $52.95 \pm 2.10$ ) %SL. Dorsal fin inserted nearer tip of snout than to caudal fin base and anterior to the pelvic fin. Pelvic and pectoral fins are not equal in length. Pectoral fin long with sharp tip, its length 28.92-35.23 ( $32.08 \pm 4.46$ ) %SL. Anterior edge of pectoral spine has more serrations 16 (1)-21 (1) and its posterior edge having 8 (1) and 10 (1) serrations. Pelvic fin commenced vertically opposite at base of last dorsal fin ray, its tip of adpressed fin not reaching anal fin origin. Length of pelvic fin 17.54-18.55 ( $18.05 \pm 0.71$ ) %SL. Adipose fin is located opposite of anal fin base, its posterior end deeply incised. Length of adipose fin is 11.6-11.18 ( $11.17 \pm 0.01$ ) %SL. Length of anal fin is 20.13-22.31 ( $21.22 \pm 1.54$ ) %SL; its anterior margin straight and posterior margin slightly convex. Caudal fin is deeply forked with pointed lobes; its lower lobe is slightly broader and longer than upper one. Length of lower lobe is 30.53-33.43 ( $31.98 \pm 2.05$ ) %SL and upper lobe 30.08-31.58 ( $30.83 \pm 1.06$ ) %SL. Length of caudal fin is more or less equal to head length. Length of head is 32.38-33.58 ( $32.98 \pm 0.85$ ) %SL. Caudal peduncle short and moderately slender, its length and depth are 16.23-16.64 ( $16.43 \pm 0.29$ ) %SL and 7.97-8.48 ( $8.22 \pm 0.36$ ) %SL.

**Coloration:** In 10 % formalin: Dorsal and lateral side of body is slightly dark brown in colour and dorsal and lateral side of head is chocolate brownish. Ventral part of head,

No.	Morphometric measurements	<i>P. shawi</i>	<i>P. assula</i>	<i>P. ribeiroi</i>	<i>P. kapuri</i>	<i>P. viriosa</i>	<i>P. lapillicola</i>	
	% of standard length	Tamang <i>et al.</i> , 2006. In: Ng, 2005a	n-3 ex. MSUMNH	n-6; including holotype, Ng and Convey, 2013	Tamang <i>et al.</i> , 2006. In: Ng, 2005b	Ng and Lalramliana, 2010	n-14; including holotype, Ng and Tamang, 2013	n-4; including holotype, Britz <i>et al.</i> , 2013
1	Standard len.	23.1	19.3-20.76	20.2-23.5	24.6	-	23.1-27.2	21.8-27.2
2	Pre-dorsal len.	45	39.81-42.23	41.2-46.1	45.5	-	41.1-47.1	39.5-41.8
3	Pre-anal len.	69.7	66.23-72.21	64.2-69.3	70.3	-	67.7-71.9	64.2-68.0
4	Pre-pelvic len.	51.9	48.80-51.55	51.5-54.2	51.2	-	52.3-56.9	47.0-49.1
5	Pre-pectoral len.	25.5	23.16-24.66	21.5-26.8	23.6	-	23.8-28.6	23.7-25.5
6	Dorsal fin base len.	13.4	14.64-15.80	12.3-18.4	16.7	-	14.6-18.0	16.1-16.7
7	Dorsal spine len.	14.3	12.91-14.66	20.3-24.8	15	14.0-15.5	23.4-29.0	15.7-18.0
8	Anal fin base len.	13.9	13.70-15.77	14.2-18.4	15.9	-	13.4-17.7	13.9-15.5
9	Pelvic fin len.	16	14.68-17.10	14.2-18.9	15.4	-	13.1-15.6	16.9-18.2
10	Pectoral fin len.	24.2	24.18-25.48	27.6-32.5	22.4	-	29.2-36.6	25.8-28.0
11	Pectoral spine len.	18.6	18.18-19.32	23.3-28.3	18.3	-	26.9-32.9	18.3-20.1
12	Caudal fin len.	19.5	20.56-21.48	28.2-33.2	26	-	26.5-32.4	28.6-30.3
13	Adipose fin base len.	17.7	13.99-19.22	13.1-17.2	13	17.1-18.9	12.5-15.4	21.2-23.9
14	Dorsal-adipose dist.	-	12.64-18.75	10.7-16.2	-	-	11.7-15.4	29.2-30.1
15	Post adipose dist.	-	14.48-15.34	14.7-18.8	-	-	14.6-18.6	16.6-20.3
16	Caudal peduncle len.	16	17.36-19.29	15.4-17	17.9	-	14.8-17.7	14.8-17.9
17	Caudal peduncle depth	7.4	7.81-8.41	7-8.3	6.9	7.3-9.2 (Ng)	7.4-9.8	7.5-8.2
18	Body depth at anus	14.3	15.28-16.20	13.7-16.2	14.6	-	16.9-19.0	16.5-17.2
19	Head length	6.8	29.90-30.67	29.4-32.4	7.2	-	28.5-33.1	28.5-31.6
20	Head width	-	20.77-22.40	21.7-24.8	-	23.4-24.0	21.5-23.5	24.6-25.9
21	Head depth	-	16.71-17.87	16.2-17.6	-	-	16.0-20.8	19.4-20.7
22	Dorsal fin len.	-	-	-	-	-	-	23-24.1
23	Dorsal fin dep.	-	20.66-22.02	-	-	-	-	12.5-15.9
24	Anal fin len.	-	-	-	-	-	-	23.4-24.7
<b>% of Head length</b>								
25	Head width	77.9	70.14-73-93	-	77.8	-	-	-
26	Head depth	60.3	58.11-59.77	-	62.5	-	-	-
27	Snout length	51.5	51.23-52.45	49-55	55.6	-	50-54	34-42
28	Inter-orbital width	32.4	28.55-29.65	29-36	34.7	-	35-38	30-33
29	Orbit diameter	13.2	11.82-15.27	9-13,	9.7	-	11-15 d	14-15
30	Nasal barbel len.	-	13.83-18.92	-	-	-	11,16	25-27
31	Maxillary barbel len.	-	89.54-95.73	-	-	-	55-81	99-106
32	Medial mandibular len.	-	35.77-45.61	-	-	-	33-43	44-47
33	Lateral mandibular len.	-	63.12-74.32	-	-	-	44-65	60-66



**Table 5.** Comparative meristic characters.

No.	Meristic characters	<i>P. nepalensis</i> n=2, including holotype	<i>P. muricata</i> Ng, 2005a	<i>P. foveolata</i> Ng, 2005a	<i>P. nubila</i> Ng. et al., 2013	<i>P. spicula</i> Ng and Lalramliana, 2010	<i>P. virgulata</i> NG and Lalramliana, 2010	<i>P. tenebricosa</i> Britz and Ferraris, 2003	<i>P. inornata</i> Ng, 2005a	<i>P. ferruginea</i> Ng, 2009
34	Dorsal spine at ant. edge	16 and 19 eg	8-12	smooth	smooth	smooth	9-17 ss	not known	smooth	Smooth
35	Dorsal spine at post. edge	7-8	6-10	2 ss	ls	3-5	3-5 ls	weak serration	4-6 ss	3-4
36	Pectoral spine at ant. edge	16 and 21	14-18	5 ss	7-8	9-15	11-17 ss	Serration	16-18	8-14
37	Pectoral spine at post. edge	8 and 10	9-13	6 ls	6-7	5-7	6-8 LS	5-7	8-9 ls	5-8

**Table 6.** Comparative meristic characters.

No.	Meristic characters	<i>P. lavidia</i> Ng, 2009	<i>P. austrina</i> Radhakrishnan et al., 2010	<i>P. ferula</i> Ng, 2006	<i>P. shawi</i> Tamang et al., 2006.	<i>P. assula</i> Ng and Convey, 2013	<i>P. viriosa</i> Ng & Tamang, 2012	<i>P. lapillicola</i> Britz et al., 2013	<i>P. kapuri</i> Ng and Lalramliana, 2010
1	Dorsal spine at ant. edge	6	granulated	smooth	smooth	smooth	smooth	smooth	Serrated
2	Dorsal spine at post. edge	single s	24 ss	4-5 ss	roughened	4-6 ss	7-11	3 m+2 sms	-
3	Pectoral spine at ant. edge	10	17-19 strong s	11-15	vms	12-19 s	13-27	granulate	-
4	Pectoral spine at post. edge	8	7-11 strong s	5-7	7	9-12 s	8-11	7-9 s	-

eg=except granulation, s=serration, ss=small serration, ls=large serration, ant.=anterior, post.=posterior, ls= Low asperities, vms=very minute serration, m=serration at middle of spine, sms=more proximal serration.

thoracic adhesive apparatus, chest and belly have light brown colour. Pelvic insertion to caudal fin base is dark brown in colour. Minute black dots peppering on head and body, covers throughout dorsal, lateral and ventral part even in dorsal fin, paired fin and caudal fin. A brown dark line runs from each nostril to anterior rim of orbit.

Body encircled with two light brown indistinct markings; first light brown blotch on sides of body between dorsal and adipose fin and second blotch on anterior half of caudal peduncle formed incomplete transverse band. Dorsal-fin ray is dark brown except distal part hyaline. Pectoral fin hyaline, with irregular chocolate brown melanophores at middle/subdistal part. Pectoral-fin is banded alternately with black and pale yellow colour throughout their lengths. Pelvic-fin hyaline with irregular chocolate brown sub distal band. Anal fin hyaline with irregular transverse brown chocolate bands at subsdital with melanophores at base. Adipose fin brown and hyaline in distal part. Caudal fin chocolate brown, its outer margin (distal part) hyaline, sub-distal and proximal part with chocolate brown transverse band and has scattered blotches or melanophores. Nasal, maxillary and both outer and inner mandibular barbels are light brown, annulated with brown rings.

**Distribution and habitat:** *Pseudolaguvia nepalensis* is from one population from a stream known as Kasara khola at Kasara village at Chitwan National Park, Chitwan District, Nepal (Figs. 3A, 3B, 4). The type locality of the species in which the holotype and paratype were collected had clear,

unpolluted, shallow, moderately-flowing water (2 m depth and in average 0.45 m depth) with the substrate types of silt, pebbles, boulders, covered by logs and detritus. During fish collection, air temperature was 18.5°C, water temperature 21°C, pH 6.1, dissolved oxygen 8.8 mg/l, conductivity 0.01ms, and total dissolved solids 197 ppm. At this locality, other fish species collected were; *Barilius barna*, *Chela laubuca*, *Danio dangila*, *Garra mullya*, *Psilorhynchus sucatio*, *Psilorhynchus nepalensis*, *Somileptes gongota*, *Mystus vittatus*, *Ompok pabda*, *Xenentodon cancila* and *Tetraodon cutcutia*.

**Etymology:** Named after the country (Nepal) where it was collected.

## DISCUSSION

Within closely related congeners, three species of *Pseudolaguvia*; *P. ribeiroi*, *P. kapuri* and *P. assula* have been reported from Central Nepal and one species *Pseudolaguvia muricata* is reported from Bangladesh.

Among the closely related congeners, *Pseudolaguvia nepalensis* sp. nov. has been distinguished from *Pseudolaguvia muricata* (Ng, 2005b) by having greater number of serrations on anterior edge of dorsal spine (vs. less serration on anterior edge of dorsal spine), narrower inter orbital distance (vs. greater inter orbital distance), minute black dots peppering throughout head and body (vs. no black dots on the head and body), brown dark line runs from each nostril to anterior margin of eyes (vs. faint dark line starts

from the snout tip to anterior rim of orbit instead of nostril), by having dorsal spine extended to 3/4<sup>th</sup> of pelvic fin ray (vs. extending to line through base of first anal fin ray), by having nasal barbels have light brown colour; annulated with dark brown bands (vs. no annulations with brown band but having brown colour dorsally and light brown ventrally (Ng, 2005b). Furthermore *Pseudolaguvia nepalensis* and *P. muricata*, are geographically variant. Taylor and Gotelli (1994) have been mentioned genetically isolated erethistid catfish, having allopatric speciation. On the contrary, the *Pseudolaguvia nepalensis* sp. nov. and *Pseudolaguvia assula* (Ng and Conway, 2013) are from same geographic region, but having variation in longer prepectoral distance (28.41-29.87 vs. 21.5-26.8 %SL) and shorter adipose fin base length (11.16-11.18 vs. 13.1-17.2 % SL). Similarly *Pseudolaguvia nepalensis* is distinct with *Pseudolaguvia kapuri* (Tilak and Husain, 1974) by pelvic fin not reaching the base of the first anal fin ray (vs. reaching) and *Pseudolaguvia nepalensis* distinguished from *Pseudolaguvia austrina* by the presence of longitudinal, elliptical shape thoracic adhesive apparatus (vs. rhomboidal shaped thoracic adhesive apparatus) (Radhakrishnan et al., 2010).

## COMPARISON MATERIALS

***Pseudolaguvia ferruginea*:** MSUNMH106, 1ex, 21.5 mm SL; CMA49, 1ex, 20.21 mm SL; from Karola River, Jalpaiguri, West Bengal, collected by M. Arunachalam and C. Vijayakumar and M. Raja, 28 November 2012.

***Pseudolaguvia spicula*:** MSUMNH107, 1ex, 25.47 mm SL; CMA50, 1ex, 23.66 mm; from Kajaldoba Anthojora stream, Jalpaiguri, West Bengal, collected by M. Arunachalam, 27 November 2012.

***Pseudolaguvia shawi*:** MSUMNH110, 1ex, 20.76 mm SL; CMA52, 2ex, 18.48-19.30 mm SL; from Mahananda River at Bidan Nagar, West Bengal, collected by M. Arunachalam, 29 November 2012 and also data from Tamang et al., 2006.

***Pseudolaguvia virgulata*:** MSUMNH108, 1ex, 26.96 mm SL; CMA51, 1ex, 26.76 mm SL; from small stream away from Lunlei village, Mizoram, collected by M. Arunachalam, C. Vijayakumar and M. Raja, 24 May 2013 and also data from Ng and Lalrammliana (2010).

***Pseudolaguvia ferula*:** MSUMNH109, 1ex, 19.71 mm SL; from Siltousa River, Jalpaiguri, West Bengal, collected by M. Arunachalam and team, 9 March 2013 and also data from Ng (2006).

***Pseudolaguvia tenebricosa*:** CMA52, 1ex, 26.89 mm SL; from small stream away from Lunlei village, Mizoram, collected by M. Arunachalam and team, 24 May 2013 and also data from Britz and Ferraris (2003).

***Pseudolaguvia nubila*:** MSUMNH111, 1ex, 26.50 mm SL, CMA53, 2ex, 23.23-25.71 mm SL; Kajaldoba Anthojora stream, Jalpaiguri, West Bengal, collected by; M. Arunachalam, 27 November and also data from Ng et al., (2013).

***Pseudolaguvia kapuri*:** Data from Tilak and Husain, (1974).

***Pseudolaguvia muricata*:** Data from Ng (2005b).

***Pseudolaguvia inornata*:** Data from Ng, (2005a).

***Pseudolaguvia lapillicola*:** Data from Britz et al. (2013).

***Pseudolaguvia assula*:** Data from Ng and Conway, (2013).

***Pseudolaguvia ribeiroi*:** Data from Tamang et al, (2006).

***Pseudolaguvia foveolata*:** Data from Ng, (2005a).

***Pseudolaguvia flavida*:** Data from Ng, (2009).

***Pseudolaguvia viriosa*:** Data from Ng and Tamang, (2012).

***Pseudolaguvia assula*:** Data from Ng and Conway, (2013).

***Pseudolaguvia austrina*:** Radhakrishnan et al., (2010).

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