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Diversity of Sisorid catfish of the genus *Pseudolaguvia* (Teleostei: Siluriformes) in Northeastern India

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Abstract

Northeastern India, a part of the Indo-Burma biodiversity hotspot, is blessed with five different drainage systems, *viz*. the Brahmaputra, the Barak-Surma-Meghana, the Chindwin, the Kaladan and the Karnaphuli. The colourful diminutive catfishes of the genus *Pseudolaguvia* are one of the representative freshwater fish fauna of the region. The routine studies on the collected fishes from various rivers of northeastern India since 2017 to date have revealed the distribution of 16 species under the genus *Pseudolaguvia*, which can be characterised into two groups based on the presence or absence of serrations on the anterior edges of the dorsal spine. Of the 16 species of *Pseudolaguvia* in the region, 12 species are categorised under the species group with smooth edges on the anterior dorsal spine, whereas the remaining four species are under the second category of the group with serrated edges on the anterior dorsal spine. The Brahmaputra River system has a maximum diversity of *Pseudolaguvia* with 11 species; the Barak-Surma-Meghna River systems have 3 species, while the Karnaphuli and the Kaladan River systems have one species each.

Keywords: Diminutive catfish, freshwater, North-Eastern India, *Pseudolaguvia*

Introduction

The diminutive catfish under the genus *Pseudolaguvia* Misra, 1976 are colourful small catfish under the family Sisoridae of the order Siluriformes. They are characterised by having a subcylindrical short body with minute tubercles on the skin; depressed head with small eyes towards dorsum; four pairs of barbel; gill opening wide confluence with isthmus and no laminar portion of the opercle; well-formed thoracic adhesive apparatus, almost extending to abdomen; median groove on head swallowed, reaching base of occipital process; conspicuous cubito-humeral process, strong and internally serrated dorsal spine, non-plaited paired fins, and forked caudal fin. Currently, there are 26 valid species of *Pseudolaguvia* recognised globally, with 22 of these species found in India (Fricke *et al.,* 2025). Northeastern India, a part of the Indo-Burma biodiversity hotspot of the world, is blessed with five different drainage systems, *viz*. the Brahmaputra, the Barak-Surma-Meghana, the Chindwin, the Kaladan, and the Karnaphuli (Lokeshwor, 2022). Among those Indian species, 16 species occur in the inland waters of northeastern India. The present papers will give insights into different groups of *Pseudolaguvia* found in Northeastern India.

Materials and Methods

The present study has been conducted on various specimens collected from different parts of Northeastern India, deposited at Assam Don Bosco University Fish Museum (ADBU-MF). The specimens were preserved in translucent bottles in 10% formalin buffer solution (Walsh & Meador, 1998). Count and measurements were made on the left side of specimens whenever possible with dial calipers to the nearest 0.1mm (Ng & Kottelat, 2013). Fins and lateral lines were counted using a Stereoscopic microscope under transmitted and reflected light. The information for comparative materials was obtained from either physical examination of the type specimens from the original repository or the original publication of the species.

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Results and Discussion

The present studies have revealed the distribution of 16 species under the genus *Pseudolaguvia* in different river drainages of Northeastern India (Table 1). The Brahmaputra drainage system is inhabited by 11 species of *Pseudolaguvia*, the Barak-Surma-Meghna drainage system has 3 species, and the Kaladan and the Karnaphuli drainage systems have one species each. To date, no representative species under the genus *Pseudolaguvia* has been reported from the Chindwin drainage system of northeastern India.

It has been found that *Pseudolaguvia* species can be characterised into two groups based on the presence or absence of serrae on the anterior edge of the dorsal spine (Lokeshwor & Pringranchi, 2022). The species groups are 1. Serrations on the anterior edge of the dorsal spine: Four *Pseudolaguvia* species of Northeastern India are coming under this group (Figs. 1 A-D), *viz. Pseudolaguvia fucosa* (Ng *et al.* 2016), *P. muricata(* Ng 2005b), *P. ribeiroi* (Hora 1921) and *P. virgulata* (Ng & Lalramliana 2010a); and 2. Smooth surface on the anterior edge of the dorsal spine: Twelve *Pseudolaguvia* species of Northeastern India are coming under this group (Figs. 2 A-L), *viz. P. ferruginea* (Ng 2009), *P. ferula* (Ng 2006), *P. foveolata* (Ng 2005a), *P. inornata* (Ng 2005b), *P. jiyaensis* (Tamang & Sinha 2014), *P. magna* (Tamang & Sinha 2014), *P. meghalayaensis* (Lokeshwor & Pringranchi 2022), *P. nubila* (Ng *et al.* 2013), *P. shawi* (Hora 1921), *P. spicula* (Ng & Lalramliana 2010b), *P. vespa* (Praveenraj *et al.* 2021), and *P. viriosa* (Ng & Tamang 2012). Tables 1 and 2 show the comparative meristic count of two species groups of *Pseudolaguvia* species of Northeastern India. Among the *Pseudolaguvia* species group with the serrated anterior edge of the dorsal fin, limited meristic information is available for *P. ribeiroi*. Thus, it needs a proper study with freshly collected specimens from in and around its type locality. Wide ranges of variation have been observed within the specimens of *P. fucosa, P. muricata* and *P. virgulata* in terms of meristic counts. Similarly, the *Pseudolaguvia* species groups with the smooth anterior edge of the dorsal fin have also been observed with variation within the species. Apart from this, there is a need to review the entire *Pseudolaguvia* diversity through integrated taxonomic approaches to determine the exact validity of each species.

Comparative Materials and Data

Pseudolaguvia ferula: 1 ex., 25.4 mm SL; India, Assam, Chirang district, Aie River at Chirang (Brahmaputra Basin), 26°33′54.92″N 90°34′04.57″E, Altitude 82 m above sea level (Reg. No. ADBU-MF 5438). *P. ferruginea*: 8 exs., 25.5–26.3 mm SL; India, Assam, Chirang district, Khujia River at South Kajalgaon (Brahmaputra Basin), 26°29′17.31″N 90°29′41.97″E, Altitude 76 m above sea level (Reg. No. ADBU-MF 5352). *P. meghalayaensis*: Holotype: 28.7 mm SL; India, Meghalaya, North Garo Hills, confluence of Rongkil and Rongdal stream at Rajasimla (Brahmaputra Basin), 25° 54′35″N 90° 55′01″E, Altitude 72 m ASL (Reg. No. ZSI FF 9406); 2 paratypes, 25.4–26.0 mm SL; data same as holotype (Reg. No. ADBU-MF 1060/2-3). *P. muricata*: Data from Ng (2005b). *P. nubila*: Holotype: 29.2 mm SL; India, Mizoram, Saiha district, Sala River (a tributary of the Kaladan River) in the vicinity of Lungpuk village, 22°03′36.11″N 92°55′15.37″E (Reg. No. ZSI FF 4861); 2 paratypes, 25.8–28.5 mm SL; data same as holotype (Reg. No. ZSI FF 4862). *P. ribeiroi*: 1 ex., 26.2 mm SL; India, Assam, Chirang district, Aie River at Chirang (Brahmaputra drainage) (Reg. No. ADBU-MF 5475); data from (Hora 1921). *P. shawi*: Holotype: 24.6 mm SL; India, West Bengal, Mahanadi River below Darjeeling (Brahmaputra drainage) (Reg. No. ZSI F 10085/1); 1 ex.,30.4 mm SL; India, Meghalaya, West Garo Hills, Damring River at Dekachang (Brahmaputra drainage), 25°89′54.4″N 90°61′47.5″E (Reg. No. ADBU-FM 5012/1); 13 exs., 26.3–27.6 mm SL; India, Assam, Chirang district, Khujia River at South Kajalgaon (Brahmaputra drainage), 26°29′32.2″N 90°29′35.27″E (Reg. No. ADBU-MF 5353); Additional data from Ng (2005a; 2009) and Tamang *et al.* (2006). *P. spicula*: Data from Ng & Lalramliana (2010b). *P. vespa*: Data from Praveenraj *et al.* (2021). *P. virgulata*: Data from Ng & Lalramliana (2010a). *P. viriosa*: Holotype: 26.0 mm SL; India, Arunachal Pradesh, East Siang district, Sile River, approximately 1 km upstream from RCC bridge, about 10 km form Ruksin and about 26 km before Pasighat, 27°52′37.6″N 95°18′18.0″E (Reg. No. ZSI V/APRC/P-524); 2 paratypes, 23.0–27.1 mm SL; data same as holotype (Reg. No. RGUMF 007).

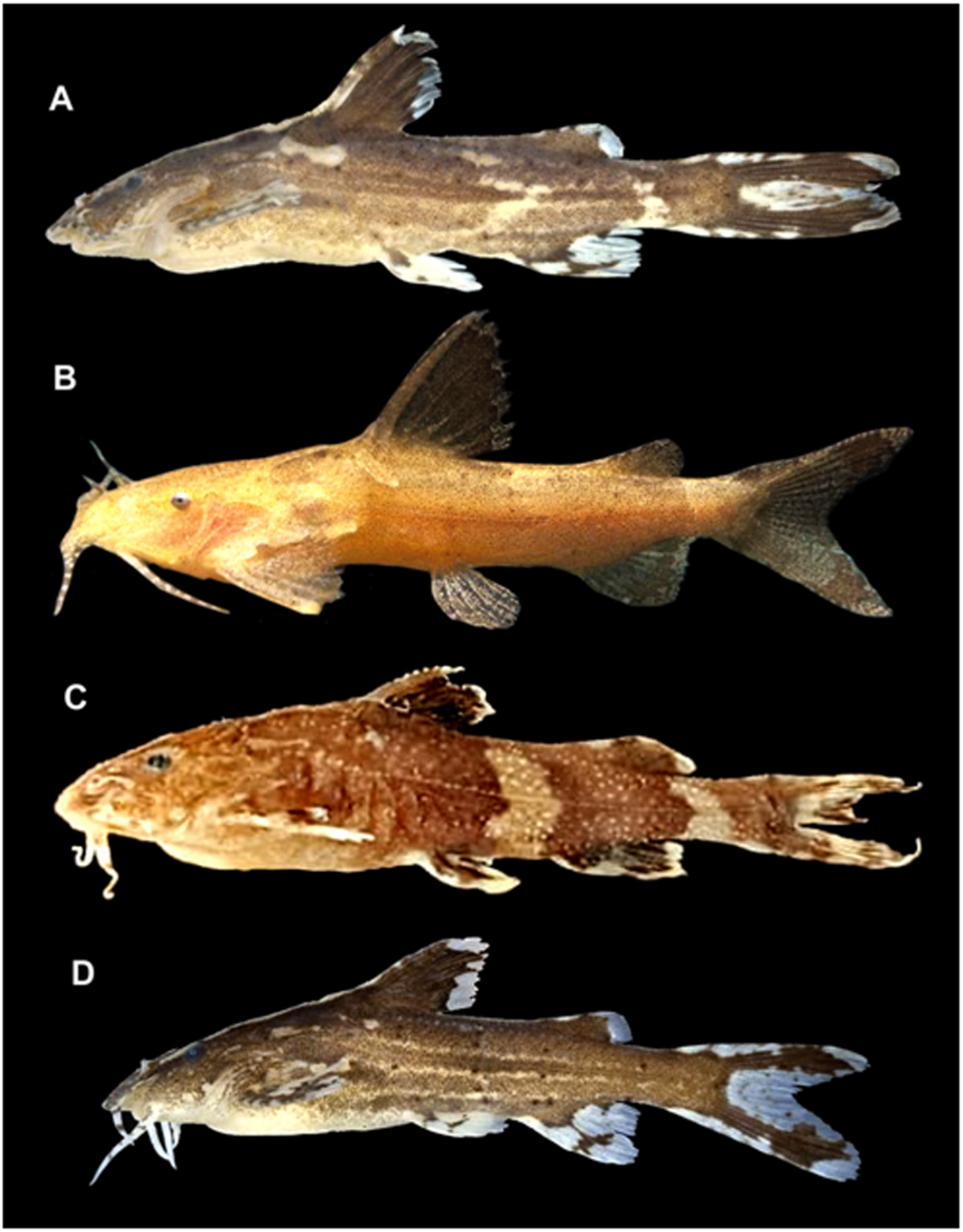

Fig. 1. Lateral view of four species of *Pseudolaguvia* from the Northeastern India with serrated anterior edge of dorsal spine **(A)** *Pseudolaguvia fucosa* (Photo courtesy H. H. Ng) **(B)** *P. muricata* (Photo courtesy H. H. Ng), **(C)** *P. ribeiroi* (26.2 mm SL; Reg. No. ADBU-MF 5475), **(D)** *P. virgulata* (Photo courtesy H. H. Ng).

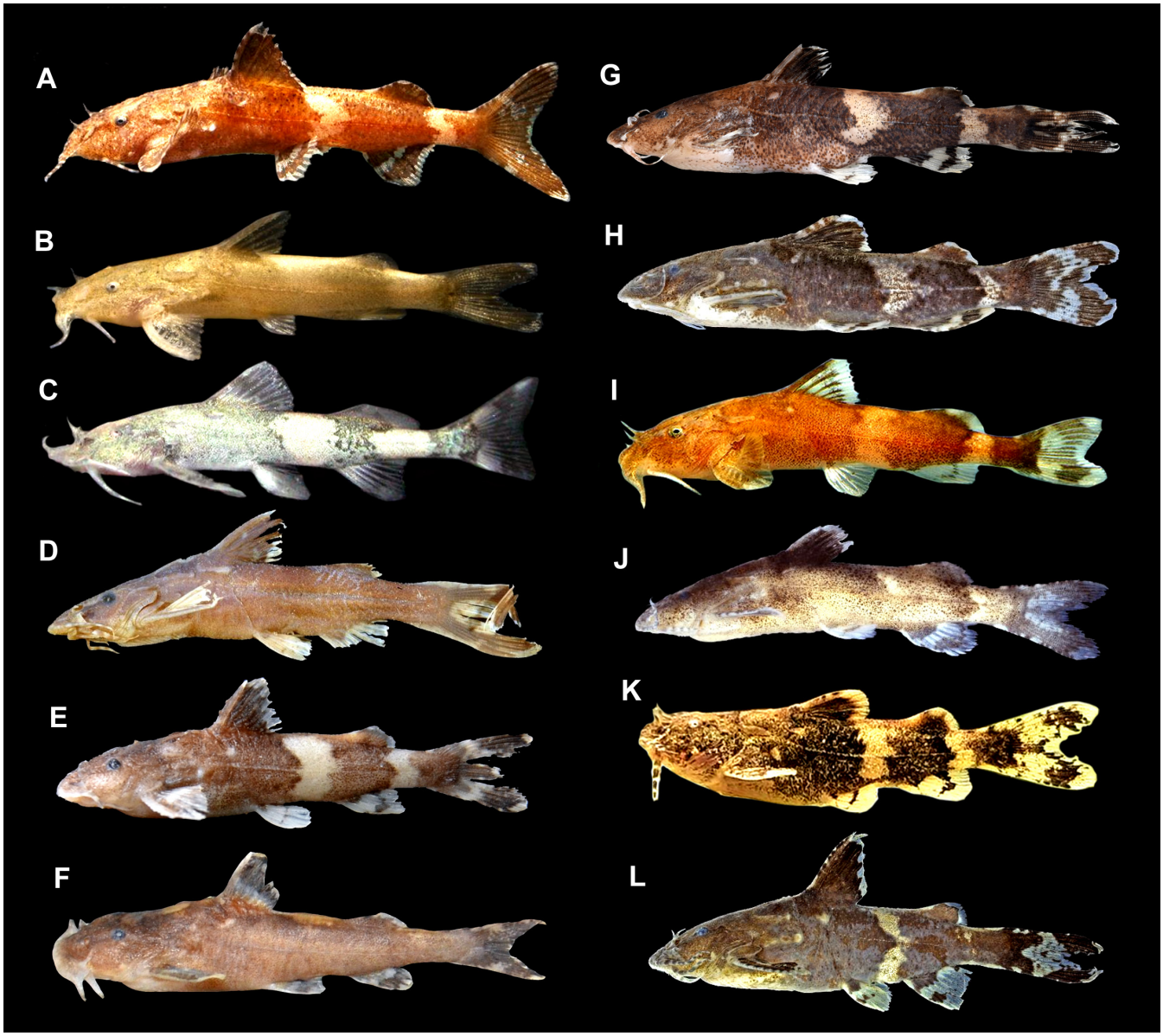

Fig. 2. Lateral view of twelve species of *Pseudolaguvia* from the Northeastern India with smooth anterior edge of dorsal spine **(A)** *Pseudolaguvia ferruginea* (Photo courtesy H. H. Ng), **(B)** *P. ferula* (Photo courtesy H. H. Ng), **(C)** *P. foveolata* (Photo courtesy H. H. Ng), **(D)** *P. inornata* (Photo courtesy H. H. Ng), **(E)** *P. jiyaensis* (Photo courtesy L. Tamang), **(F)** *P. magna* (Photo courtesy L. Tamang), **(G)** *P. meghalayaensis* (Photo courtesy Y. Lokeshwor), **(H)** *P. nubila* (Photo courtesy H. H. Ng), **(I)** *P. shawi* (Photo courtesy N. Mukherji), **(J)** *P. spicula* (Photo courtesy H. H. Ng), **(K)** *P. vespa* (Photo courtesy A. Lima), **(L)** *P. viriosa* (Photo courtesy H. H. Ng).

Table 1. Distribution of *Pseudolaguvia* in different river drainage systems of Northeastern India. **Brahma R** –Brahmaputra River; **Ba-Su-Me R–** Barak –Surma-Meghna River; **Chin R–** Chindwin River; **Kala R–**Kaladan River; **Karna R –** Karnaphuli River; **'+'**– Present; **'-'**– Absent

	River Basins in Northeastern India				
	Brahma R	**Ba-Su-Me R**	**Chin R**	**Kala R**	**Karna R**
P. ferruginea Ng, 2009	+	-	-	-	-
P. ferula Ng, 2006	+	-	-	-	-
P. foveolata Ng, 2005	+	-	-	-	-
P. fucosa Ng *et al.,* 2016	-	-	-	-	+
P. inornata Ng, 2005	+	-	-	-	-
P. jiyaensis Tamang & Sinha, 2014	+	-	-	-	-
P. magna Tamang & Sinha, 2014	+	-	-	-	-
P. meghalayaensis Lokeshwor & Pringranchi, 2022	+	-	-	-	-
P. muricata Ng, 2005	-	+	-	-	-
P. nubila Ng *et al.*, 2013	-	-	-	+	-
P. ribeiroi (Hora, 1921)	+	-	-	-	-
P. shawi (Hora, 1921)	+	-	-	-	-
P. spicula Ng & Lalramliana, 2010	-	+	-	-	-
P. vespa Praveenraj *et al.,* 2021	+	-	-	-	-
P. virgulata Ng & Lalramliana, 2010	-	+	-	-	-
P. viriosa Ng & Tamang, 2012	+	-	-	-	-

Table 2. Comparative meristic counts of *Pseudolaguvia* species group with serrated anterior edge of dorsal spine.

	P. fucosa **Data from Ng *et al.* (2016)**	***P. muricata*** **Data from Ng (2005b)**	***P. ribeiroi*** **Data from Hora (2021) & ADBU-MF 5475**	***P. virgulata*** **Data from Ng & Lalramliana (2010)**
Dorsal-fin rays	i,5	i,4–5	i,6	i,4–5. i
Anal-fin rays	iv,5–7	iv,6–7	iii,6	iii-iv,6–7, i
Pectoral-fin rays	i,6, i	i,5–6, i	i,6	i,5–6, i
Pelvic-fin rays	i,5	i,5	i,5	i,5
Caudal-fin rays	i,7+6–7,i	i,7+7,i	i,7+7,i	i,7+7,i
Serrae on anterior margin of dorsal spine	4–10	8–12	5–11	9–17
Serrae on posterior margin of dorsal spine	2–5	6–10	4	3–5
Serrae on anterior margin of Pectoral spine	9–15	14–18	13	11–17
Serrae on the posterior margin of the Pectoral spine	6–8	9–13	8	6–8
Vertebrae	29–31	28–30	--	29–30

Table 3. Comparative meristic count of *Pseudolaguvia* species group with smooth anterior edge of dorsal spine

	P. ferruginea **Data from Ng (2009) & ADBU-MF 5352**	***P. ferula*** **Data from Ng (2006) & ADBU-MF 5438**	***P. foveolata*** **Data from Ng (2005a)**	***P. inornata*** **Data from Ng (2005b)**	***P. jiyaensis*** **Data from Tamang & Sinha (2014)**	***P. magna*** **Data from Tamang & Sinha (2014)**
Dorsal-fin rays	i,5	i,4, i	i,6	i,4, i–i,5	i,5, i–i,6	i,5, i
Anal-fin rays	iii,5,i	iii,6,i	iii,6	iii–iv,6–7	iii,7,i	iii–iv,4–7
Pectoral-fin rays	i,7	i,7	i,7	i,5, i–i,7	i,6–7, i	i,5, i
Pelvic-fin rays	i,5	i,5	i,5	i,5	i,6–7	i,5, i
Caudal-fin rays	i,7+7,i	i,7+7,i	i,7+7,i	i,7+7,i	i,6–7+8, i	i,6–7+7–9,i
Serrae on posterior margin of dorsal spine	3–4	4–5	2	4–6		4–7
Serrae on anterior margin of Pectoral spine	8–14	11–15	5	16–18	9–12	5–7
Serrae on the posterior margin of the pectoral spine	5–8	5–7	6	8–9	6–7	6–9
Vertebrae	30–32	28–30	33	29–30	25–27	
	P. meghalayaensis **ZSI FF 9406 (holotype); ADBU-MF 1060/2-3 (paratypes)**	***P. nubila*** **ZSI FF 4861 (holotype); ZSI FF 4862 (paratypes)**	***P. shawi*** **ADBU-FM 5012/1 & 5353/13**	***P. spicula*** **Data from Ng & Lalramliana (2010)**	***P. vespa*** **Data from Praveenraj *et al.* (2021).**	***P. viriosa*** **ZSI V/APRC/P-524 (holotype); RGUMF 007 (paratypes)**
Dorsal-fin rays	i,6	i,5	i,5–6	i,5	i,5–6, i	i,5
Anal-fin rays	ii,6–7, i	iv,5–6, i	i,8	iii,5, i	iv,5–6, i	iv,6
Pectoral-fin rays	i,7–8	i,6–8, i	i,6–7	i,6, i	i,7–8	i,5, i
Pelvic-fin rays	i,5	i,5	i,5	i,5	i,4–5, i	i,5
Caudal-fin rays	i,7+7,i	i,7+7,i	i,7+7,i	i,7+7,i	i,7+7,i	i,7+7,i
Serrae on posterior margin of dorsal spine	3–5	low asperities	--	3–5	3	7–11
Serrae on anterior margin of pectoral spine	9	7–8	7–11	9–15	7–9	13–27
Serrae on the posterior margin of the pectoral spine	11	6–7	5–6	5–7	5–6	8–11
Vertebrae	--	31–32	31–32	30–32	33	28–29

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