



***Peristedion longicornutum*, a new species of armored gurnard from the western Pacific Ocean (Teleostei: Peristediidae)**

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Abstract

The Longhorn Armored Gurnard *Peristedion longicornutum* n. sp. is described from Papua New Guinea, Solomon Islands, and Vanuatu, based on 28 specimens collected with a beam trawl at depths of 340–506 meters. The new species is characterized among the Indo-Pacific species of the genus by 21–23 dorsal-fin soft rays; 20–22 anal-fin soft rays; 29–33 bony plates in the dorsal row; 35–38 in the upper lateral row; 26–29 in the lower lateral row; 23–26 in the ventral row; 3 lip and 6–7 chin groups of barbels; 14–26 branches on the filamentous barbel; 15–24 total chin barbels; the anterior edge of the 4th sensory pore of the rostral projection half a pupil diameter anterior to the anterior edge of the premaxilla; a very long and needle-like rostral projections, length 14.2–22.3% SL; a wide interspace between rostral projections, 0.20–0.30 in rostral-projection width, and a rounded margin on the medial side at the base; a smooth and straight perifacial rim; the upper detached pectoral-fin ray longer than the joined pectoral fin; and the peritoneum pale. A key to the Indo-West Pacific species of the genus *Peristedion* Lacepède, 1801 is presented.

Key words: ichthyology, taxonomy, systematics, coral-reef fishes, Papua New Guinea, Solomon Islands, Vanuatu KAVIENG expedition, New Ireland, New Hanover.

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Introduction

Armored gurnards of the family Peristediidae are small to medium-sized benthic fishes which occur in marine waters on the lower continental shelf and upper continental slope at depths of 50–1,324 m (Teague 1961, Miller 1967a, 1967b, Castro-Aguirre & García-Domínguez 1984, Richards 1999, Miller & Richards 2003, Kawai & Yabe 2006, Kawai 2008, 2016, Bussing 2010, Tenda & Kawai 2012, Ho *et al.* 2013, Ono & Kawai 2014, Richards & Miller 2016). They apparently use their detached pectoral-fin rays and rostral projections to detect buried prey in the sand. The family is currently placed in the order Scorpaeniformes (van der Laan *et al.* 2014, Nelson *et al.* 2016). It includes 6 valid genera (Kawai 2008): *Gargariscus* Smith, 1917 (with a single valid species in the eastern Indian Ocean and western Pacific); *Heminodus* Smith, 1917 (with a single valid species in the western Pacific); *Paraheminodus* Kamohara, 1958 (with 4 valid species in the Indo-West Pacific); *Peristedion* Lacepède, 1801; *Satyrichthys* Kaup, 1873 with 7 valid species in the eastern Indian Ocean and western Pacific (Kawai 2013, 2014); and *Scalicus* Jordan, 1923 (with 8 valid species in the Indo-West Pacific).

The largest genus *Peristedion* is characterized within the family by lacking upper-jaw teeth and having smooth lateral margins of the head and posterior pairs of bony plates in the lower lateral rows contralaterally sutured along the midline (Kawai 2008). A total of 23 valid species have been described prior to this study (Kawai 2016, Eschmeyer *et al.* 2017), as *P. nierstraszi* Weber, 1913 was synonymized with *P. riversandersoni* Alcock, 1894 by Kawai (2016). A total of 13 species are presently known from the western Atlantic, i.e. *P. altipinne* Regan, 1903; *P. antillarum* Teague, 1961; *P. brevirostre* (Günther, 1860); *P. ecuadorensis* Teague, 1961; *P. gracile* Goode & Bean, 1896; *P. greyae* Miller, 1967; *P. imberbe* Poey, 1861; *P. longispatha* Goode & Bean, 1896; *P. miniatum* Goode, 1880; *P. thompsoni* Fowler, 1952; *P. truncatum* (Günther, 1880); *P. unicuspis* Miller, 1967 and an undescribed species (Miller & Richards 2003). There are 4 species in the eastern Pacific, i.e. *P. barbiger* Garman, 1899; *P. crustosum* Garman, 1899; *P. nesium* Bussing, 2010; *P. paucibarbigera* Castro-Aguirre & García-Domínguez, 1984; a single species in the eastern Atlantic and Mediterranean, *P. cataphractum* (Linnaeus, 1758), and 6 species in the Indo-West Pacific, i.e. *P. amblygenys* Fowler, 1938, distributed from Indonesia to the Philippines, Taiwan, and Japan; *P. liorhynchus* (Günther, 1872) from Indonesia east to Philippines, north to Japan, south to Australia; *P. orientale* Temminck & Schlegel, 1843 from Taiwan to Japan; *P. richardsi* Kawai, 2016 from Indonesia; *P. riversandersoni* Alcock, 1894 from Sri Lanka to the Philippines and Japan; and *P. weberi* Smith, 1934 from South Africa to Mozambique and Madagascar (Tenda & Kawai 2012, Ono & Kawai 2014, Kawai 2016).

During the KAVIENG2014 Expedition, several specimens of a species of *Peristedion* with very long rostral projections were collected north and northeast of New Hanover, Papua-New Guinea. Additional specimens of this species were found to occur in the Solomon Sea, Solomon Islands, and Vanuatu. They turned out to belong to an undescribed species, which is described in the present paper.

Materials and Methods

Biometrical counts and measurements follow Kawai *et al.* (2004, 2008), Ono & Kawai (2014), and Kawai (2016); the nomenclature of head spines follows Miller (1967a); and descriptive methods follow Kawai (2016). Standard length (SL) is measured from the anterior tip of the premaxilla to the end of the caudal-fin base. The rostral projection length, width, and interspace were measured from photographs of fresh specimens collected

during the KAVIENG2014 Expedition, as the projections were always partially broken in preserved specimens. The description is based on the holotype; values for the paratypes follow those of the holotype, in parentheses. The genus and species classification follows Eschmeyer *et al.* (2017), family classification follows van der Laan *et al.* (2014), and citation of references follows Fricke (2017).

The holotype is deposited in the fish collection of the National Taiwan University Museum (NTUM). Abbreviations of repositories follow Fricke & Eschmeyer (2017).

***Peristedion longicornutum*, n. sp.**

Longhorn Armored Gurnard

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Figures 1 & 2; Tables 1–4.

Holotype. NTUM 12297, 100.7 mm SL, western Pacific Ocean, Papua New Guinea, New Ireland Province, north of New Hanover, 2° 15.61' S, 150° 16.63' E–2° 14.519' S, 150° 13.84' E, 450–474 m, beam trawl, R/V *Alis*, sta. CP4446-10, 1 September 2014, 10:40–11:30 h.

Paratypes. ASIZP 74097, 1 specimen, 106.4 mm SL, 9.1528° S, 152.4694° E, off southwestern Woodlark Island, Milne Bay Province, Papua New Guinea, 10 Nov. 2010. ASIZP 74098, 1 specimen, 113.9 mm SL, 9.3778° S, 152.2778° E, off southwestern Woodlark Island, Milne Bay Province, Papua New Guinea, 10 Nov. 2010. ASIZP 74099, 1 specimen, 111.1 mm SL, 7.9389° S, 148.175° E, southern Huon Gulf, Morobe Province, Papua New Guinea, Papua New Guinea, 8 Nov. 2010. HUMZ 228773, 1 specimen, 109.2 mm SL, off eastern Espiritu Santo Island, Vanuatu, 15° 07' 58.8" S, 167° 16' 58.8" E, 502–470 m, R/V *Alis*, Cruise MUSORSTOM 8, sta. CP 1090, 6 Oct. 1994. KAUM-I 98950, 1 specimen, 82.4 mm SL, off western San Cristobal Island, Solomon Islands, 10° 25' 59.988" S, 161° 25' 0.012" E, 350–362 m, R/V *Alis*, Cruise Salomon/boa 3, sta. CP 2845, 23 Sept. 2007. MNHN 1998-1213, 2 specimens, 106.6–110.0 mm SL, same data as HUMZ 228773. MNHN 1998-1218, 2 specimens, 99.0–102.3 mm SL, off eastern Espiritu Santo Island, Vanuatu, 15° 07' 58.8" S, 167° 16' 58.8" E, 494–516 m, R/V *Alis*, Cruise MUSORSTOM 8, sta. CP 1089, 6 Oct. 1994. MNHN 2009-0746, 1 specimen, 107.1 mm SL, off Big Bay, northern Espiritu Santo, Vanuatu, 14° 55' 2.4024" S, 166° 57' 33.606" E, 400–546 m, R/V *Alis*, Cruise BOA 1, sta. CP 2436, 9 Sept. 2005. MNHN 2014-0931, 2 specimens, 85.7–96.0 mm SL, same data as KAUM-I 98950. MNHN 2014-1412, 3 specimens, 94.3–113.7 mm SL, off eastern Guadalcanal Island, Solomon Islands, 9° 34' 59.988" S, 160° 46' 59.988" E, 414–456 m, R/V *Alis*, Cruise Salomon/boa 3, sta. CP 2848, 24 Sept. 2007. MNHN 2014-1428, 1 specimen, 104.6 mm SL, off western San Cristobal Island, Solomon Islands, 10° 25' 59.988" S, 161° 19' 59.988" E, 506–567 m, R/V *Alis*, Cruise Salomon/boa 3, sta. CP 2839, 22 Sept. 2007. MNHN 2014-1435, 2 specimens, 98.4–107.2 mm SL, off western San Cristobal Island, Solomon Islands, 10° 25' 59.988" S, 161° 22' 0.012" E, 381–422 m, R/V *Alis*, Cruise Salomon/boa 3, sta. CP 2837, 22 Sept. 2007. MNHN 2017-0006, 113.1 mm SL, sta. CP4446-11, same data as holotype. NTUM 11071, 2 specimens, 90.7–106.5 mm SL, northeast of New Hanover, 2° 26.36' S, 150° 39.33' E–2° 25.92' S, 150° 38.31' E, 366 m, R/V *Alis*, sta. CP4419-4, 28 Aug. 2014. NTUM 11156, 2 specimens, 99.8–116.6 mm SL, northeast of New Hanover, 2° 15.00' S, 150° 16.64' E–2° 14.90' S, 150° 14.35' E, 417–421 m, R/V *Alis*, sta. CP4444-8, 1 Sept. 2014. NTUM 11167, 3 specimens, 94.6–97.4 mm SL, north of New Hanover, 2° 15.83' S, 150° 15.61' E–2° 15.3' S, 150° 16.98' E, 342–380 m, R/V *Alis*, sta. CP4445-17-18, 1 Sept. 2014. NTUM 12296, 94.2 mm SL, western Pacific Ocean, Papua New Guinea, New Ireland Province, northeast of New Hanover, 2° 26.27' S, 150° 37.65' E–2° 26.85' S, 150° 39.74' E, 335–340 m, beam trawl, R/V *Alis*, sta. CP4418-9, 28 Aug. 2014, 10:12 h.

Diagnosis. A species of *Peristedion* characterized by 21–23 dorsal-fin soft rays; 20–22 anal-fin soft rays; 29–33 bony plates in dorsal row, 35–38 in upper lateral row, 26–29 in lower lateral row, 23–26 in ventral row; 3 lip and 6–7 chin groups of barbels; 14–26 branches on filamentous barbel; 15–24 total chin barbels; anterior edge of 4th sensory pore of rostral projection located half a pupil diameter anterior to anterior edge of premaxilla; very long and needle-like rostral projections, length 14.2–22.3% SL; a wide interspace between rostral projections, interspace 0.2–0.3 in rostral-projection width; rostral projection with rounded margin on medial side at base; perifacial rim smooth and straight; upper detached pectoral-fin ray longer than joined pectoral fin; and peritoneum pale.

Description. Dorsal-fin elements VIII+23 (VII–IX+21–23); anal-fin elements 21 (20–22); pectoral-fin rays (including two detached rays) 13 (13–15); pelvic-fin elements I,5 (I,5); principal caudal-fin rays 12 (11–12). Gill rakers 5+1+16 (4–7+1+15–20). Branchiostegal rays 7 (7–8). Bony plates in dorsal row 31 (29–33); bony plates in upper lateral row 37 (35–38); bony plates in lower lateral row 28 (26–29); bony plates in ventral row 25 (23–26); bony plates before anus 2 (2–4). Groups of barbels (lip+chin) 3+6 (3+6–7); branches of filamentous barbel 17 (14–26); total chin barbels 19 (15–24). Vertebrae 11+27.

Body fusiform, covered with bony plates. Head large and depressed. Snout broad. Perifacial rim smooth and straight, gradually increasing in width posteriorly, terminating at posterior edge of preopercle. Rostral projections very long and needle-like with curved margin on medial side at base; 4 sensory pores on each ventral side, anterior edge of 4th sensory pore half a pupil diameter anterior to anterior edge of premaxilla. Wide interspace between rostral projections, interspace 0.22 (0.20–0.30) in rostral-projection width. Single rudimental spine absent (present or absent) on bases of rostral projections. Mouth large and inferior without teeth on both jaws. Posterior margin of upper jaw nearly situated one pupil diameter before anterior margin of orbit. Posterior part of lower jaw with a ridge. Posterior tip of lower jaw situated below anterior margin of orbit. Vomer and palatine toothless. Three groups of barbels on lip: 1st group with cluster of 3 (1–5) barbels; 2nd with 3 (3–4); 3rd consisting of filamentous barbel with 17 (14–26) branches. Six (6, rarely 7) groups of barbels on chin, total barbels 19 (15–24): 1st group

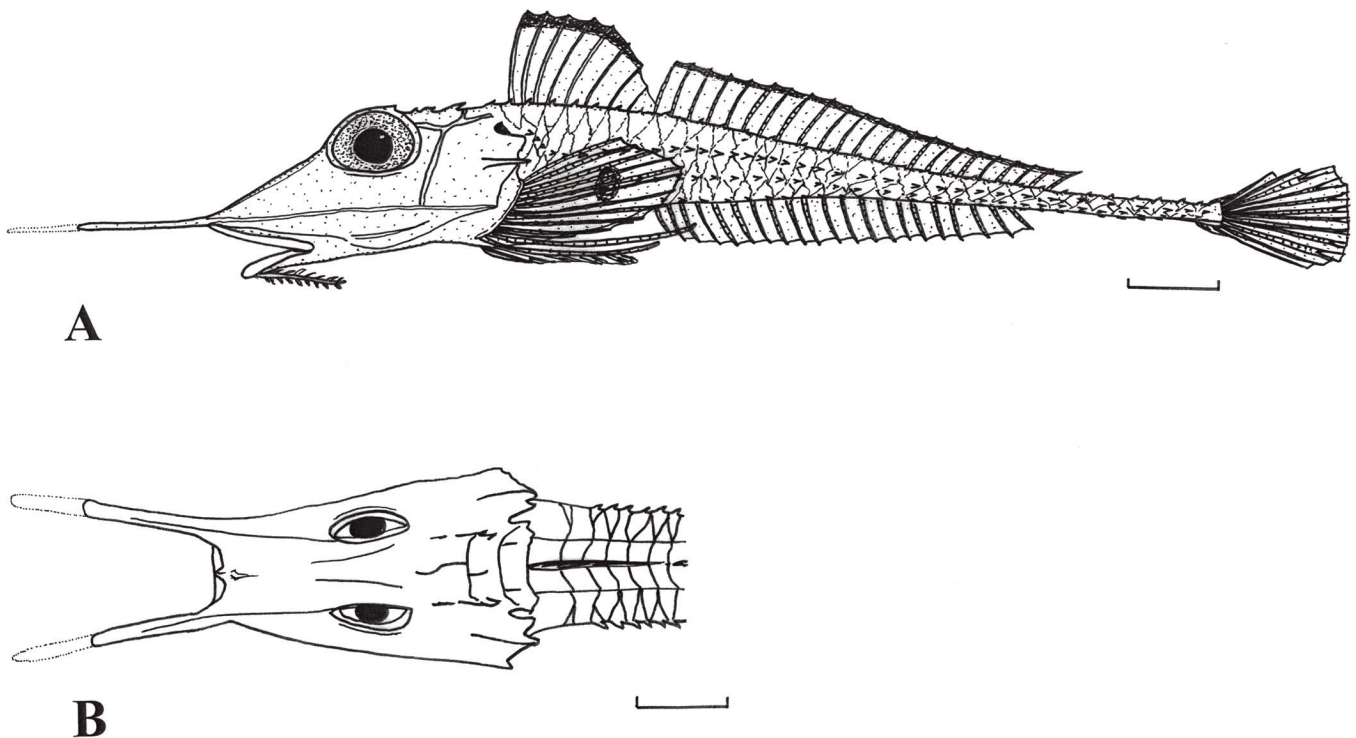


Figure 1. *Peristedion longicornutum*, n. sp., NTUM 12297, holotype, 100.7 mm SL, north of New Hanover, New Ireland Province, Papua New Guinea: A) Lateral view. B) Head, dorsal view. The rostral projections show the state of the preserved specimen; the dotted lines indicate the original extent of the projections. Scales indicate 10 mm.

TABLE 1

Peristedion longicornutum, n. sp., holotype and paratypes (mm)
from New Hanover, Papua New Guinea

*Measured from photographs of fresh specimens

	Holotype		Paratypes			
	NTUM 12297	NTUM 11071 (2)	NTUM 11156 (2)	NTUM 11167 (3)	NTUM 12296	MNHN 2017-0006
Standard length (mm SL)	100.7	90.7, 106.5	99.8, 116.6	94.6, 97.3, 97.4	94.2	113.1
Body depth	16.0	13.3, 17.8	15.0, 19.9	14.4, 15.4, 16.8	14.7	15.2
Body width	12.8	12.7, 14.8	13.8, 17.9	12.1, 12.1, 14.0	12.7	13.3
Head length	35.1	30.8, 38.6	30.1, 37.0	32.0, 33.4, 33.6	32.2	36.3
Head depth	14.8	13.7, 18.8	15.3, 19.2	14.2, 15.0, 16.1	16.4	16.2
Head width	20.4	18.8, 24.7	22.4, 22.2	20.9, 22.5, 21.0	20.6	23.7
Snout to dorsal fin	35.2	31.2, 38.6	36.7, 36.3	33.2, 33.8, 33.7	31.7	37.3
Snout to anal fin	49.5	46.3, 51.2	49.5, 54.0	45.0, 47.6, 50.6	44.9	55.3
Snout to anus	48.2	40.9, 52.7	47.8, 54.9	46.6, 48.7, 45.4	44.0	49.2
Snout length	16.6	15.3, 18.3	16.7, 17.2	15.7, 16.4, 16.0	15.6	16.9
Rostral projection length	22.5*	14.8*, 17.8*	18.1*	18.6*, --, 14.6*	17.2*	18.6*
Rostral projection width	2.2*	2.2*, 2.5*	2.2*, 2.6*	2.1*, --, 1.9*	2.5*	2.3*
Interspace between rostral projections	10.2*	9.3*, 9.3*	10.0*	7.4*, --, 7.8*	8.7*	9.5*
Filamentous barbel length	8.8	7.9, 11.7	8.9, 10.0	8.1, 8.6, 9.2	8.8	10.8
Upper jaw length	12.5	10.8, 14.2	12.8, 12.4	12.1, 12.8, 12.8	11.7	13.4
Lower jaw length	10.7	8.8, 11.1	10.2, 10.4	8.1, 9.2, 10.5	9.7	10.4
Orbit diameter	9.2	7.9, 9.5	9.1, 9.4	8.3, 8.4, 8.4	7.9	9.5
Interorbital width	7.5	7.1, 8.6	7.3, 7.7	7.1, 7.6, 7.3	6.8	8.3
Pectoral-fin length (joined fin only)	17.9	15.2, 18.3	15.3, 19.4	16.1, 17.2, 16.7	15.5	18.4
Upper detached pectoral-fin ray length	22.4	20.2, 23.1	22.2, 25.9	18.2, 20.7, 20.2	19.4	23.8
Lower detached pectoral-fin ray length	18.7	17.8, 21.6	17.3, 21.8	16.1, 17.4, 18.1	16.3	19.7
Pelvic-fin length	16.8	16.9, 21.4	18.4, 22.1	16.3, 17.8, 15.0	17.5	18.7
First dorsal-spine length	11.3	9.0, 10.2	5.4+, 10.4	8.4, 9.0, 8.0	10.3	7.7
Caudal-peduncle length	11.4	10.1, 12.8	12.9, 13.9	10.5, 10.9, 11.3	10.2	13.5
Caudal-peduncle depth	1.9	1.9, 2.1	2.1, 3.1	1.9, 1.9, 2.2	2.0	2.2

TABLE 2

Peristedion longicornutum n. sp., additional paratypes (mm)

	Paratypes								
	ASIZP 74097-98 (2)	ASIZP 74099	HUMZ 228773 (1), MNHN 1998- 1213 (2)	MNHN 1998- 1218 (2)	MNHN 2009- 0746	KAUM-I 98950 (1), MNHN 2014-0931 (2)	MNHN 2014- 1412 (3)	MNHN 2014- 1428	MNHN 2014-1435 (2)
	PNG		Vanuatu			Solomon Islands			
Standard length (mm SL)	106.4-113.9	111.1	106.6-111.0	99.0-102.3	107.1	82.4-96.0	94.3-113.7	194.6	98.4-107.2
Body depth	15.0-18.2	15.5	16.2-17.3	14.4-15.0	13.1	13.3-15.6	14.0-15.8	17.2	14.0-16.2
Body width	11.2-13.2	11.4	10.6-11.4	9.6-9.8	11.9	8.4-12.4	8.5-9.5	10.5	9.9-11.1
Head length	35.8-40.1	36.7	36.4-38.3	33.1-35.5	35.1	29.8-31.9	32.5-38.7	36.6	33.2-36.9
Head depth	15.1-16.6	16.1	16.3-16.7	14.7	12.6	13.1-15.0	14.2-15.4	16.7	14.9-16.1
Head width	20.5-25.9	22.6	22.2-24.6	20.8-21.1	broken	17.6-22.5	20.8 (n=1)	26.2	19.1-23.4
Snout to dorsal fin	35.3-40.4	36.7	36.9-38.5	33.4-35.0	35.1	29.7-32.1	32.3-38.7	36.9	34.2-37.0
Snout to anal fin	52.5-60.9	53.0	53.0-54.4	46.2-49.7	51.1	40.6-45.9	44.1-56.0	53.7	47.4-52.7
Snout to anus	46.2-53.2	46.9	47.6-48.6	41.9-44.7	45.4	35.9-40.8	41.1-50.1	48.2	42.9-48.5
Snout length	16.9-20.1	17.8	16.4-18.5	15.6-16.4	17.3	14.5-15.4	15.8-18.5	17.2	15.8-16.7
Rostral projection length	broken	broken	19.4	broken	broken	12.0-13.6 (2)	17.1 (n=1)	broken	17.7 (n=1)
Rostral projection width	1.9-2.1	2.1	2.1-2.4	2.1	2.2	1.6-1.8	1.8-2.5	2.3	1.9-2.2
Interspace between rostral projections	9.5 (n=1)	8.0	8.4-8.6	7.9	broken	6.1-7.2 (2)	7.5-8.4	7.6	7.9-8.1
Filamentous barbel length	11.9-14.1	11.5	13.4-14.5	10.2-13.0	broken	9.2-10.6	10.5-12.1	11.3	9.8-10.9
Upper jaw length	13.5-15.6	13.8	14.0-14.9	13.2-13.3	13.1	11.3-11.8	12.6-15.5	14.5	13.0-13.8
Lower jaw length	14.7-15.8	15.3	15.2-15.7	13.8-15.1	15.1	11.6-13.1	13.2-15.8	14.4	13.1-14.7
Orbit diameter	8.9-10.0	9.8	9.7-10.7	8.8-9.7	8.8	7.7-8.2	8.4-10.3	10.3	9.0-10.3
Interorbital width	7.1-8.0	7.7	7.4-8.0	7.0-7.5	7.4	6.2-6.5	7.2-7.9	7.6	7.2-7.6
Pectoral-fin length (joined fin only)	18.0-19.8	19.0	17.1-17.9	17.2-17.7	17.9	14.6-15.6	15.8-19.1	17.4	17.0-17.9
Upper detached pectoral-fin ray length	24.3-27.8	26.1	24.1-25.4	23.3-24.6	22.9	19.5-22.6	22.1-24.8	23.5	23.8-25.0
Lower detached pectoral-fin ray length	20.5-23.9	22.6	20.7-21.8	19.3-20.5	19.2	16.1-19.2	19.3-20.8	20.5	20.2-22.6
Pelvic-fin length	20.5-22.2	20.6	19.8-20.4	19.0-19.1	19.5	14.5-15.9	17.7-20.9	19.2	18.2-20.7
First dorsal-spine length	9.6-11.6	9.5	10.2 (n=2)	8.2 (n=2)	12.5	7.9-9.3	8.8-10.6	8.2	8.1-10.0
Caudal-peduncle length	8.8-10.6	10.7	10.1-10.7	9.5-9.6	11.5	7.8-11.4	10.8-12.0	10.2	9.7-10.2
Caudal-peduncle depth	1.8	2.0	1.9-2.0	1.8-1.9	1.8	1.6-1.8	1.8-1.9	2.1	1.8-2.1

TABLE 3

Peristedion longicornutum n. sp., holotype and paratypes, proportions (% SL)
from New Hanover, Papua New Guinea

	Holotype		Paratypes			
	NTUM 12297	NTUM 11071 (2)	NTUM 11156 (2)	NTUM 11167 (3)	NTUM 12296	MNHN 2017-0006
Standard length (mm SL)	100.7	90.7-106.5	99.8-116.6	94.6-97.4	94.2	113.1
Body depth	15.9	14.7-16.7	15.0-17.1	15.2-17.2	15.6	13.4
Body width	12.7	13.9-14.0	13.8-15.4	12.4-14.4	13.5	11.8
Head length	34.9	34.9-36.2	30.2-31.7	32.9-35.3	34.2	32.1
Head depth	14.7	15.1-17.6	15.3-16.5	15.0-16.6	17.4	14.3
Head width	20.3	20.7-23.2	19.0-22.4	21.6-23.1	21.9	21.0
Snout to dorsal fin	35.0	34.4-36.2	31.1-36.8	34.6-35.1	33.6	33.0
Snout to anal fin	49.2	48.1-51.1	46.3-49.6	47.8-52.0	47.7	48.9
Snout to anus	48.0	45.1-49.5	47.1-47.9	46.6-51.5	46.7	43.5
Snout length	16.5	16.9-17.2	14.8-16.7	16.4-16.9	16.6	14.9
Rostral projection length	22.3	16.3-16.7	18.1	15.0-19.7	18.3	16.4
Rostral projection width	2.2	2.4-2.4	2.2	2.0-2.2	2.6	2.0
Interspace between rostral projections	10.1	8.7-10.2	10.0	7.8-8.0	9.2	8.4
Filamentous barbel length	8.7	8.7-11.0	8.6-8.9	8.6-9.4	9.3	9.6
Upper jaw length	12.4	11.9-13.3	10.6-12.8	12.4-13.5	12.4	11.8
Lower jaw length	10.6	9.7-10.4	8.9-10.3	8.6-10.8	10.2	9.2
Orbit diameter	9.1	8.7-8.9	8.1-9.1	8.5-8.9	8.4	8.4
Interorbital width	7.4	7.8-8.1	6.6-7.3	7.3-8.0	7.2	7.3
Pectoral-fin length (joined fin only)	17.8	16.8-17.2	15.3-16.6	16.5-18.2	16.4	16.3
Upper detached pectoral-fin ray length	22.2	21.7-22.3	22.2-25.9	18.7-21.9	20.6	21.0
Lower detached pectoral-fin ray length	18.6	19.6-20.3	17.3-21.8	16.6-18.6	17.3	17.4
Pelvic-fin length	16.7	18.6-20.1	18.4-22.1	15.4-18.3	18.6	16.5
First dorsal-spine length	11.2	8.4-11.2	5.4-10.4	8.2-9.5	10.9	6.8
Caudal-peduncle length	11.3	11.1-12.0	12.9-13.9	10.8-11.6	11.0	11.9
Caudal-peduncle depth	1.9	2.0-2.1	2.1-3.1	2.0-2.3	2.1	1.9

TABLE 4

Peristedion longicornutum n. sp., additional paratypes, proportions (% SL)

	Paratypes								
	ASIZP 74097-98 (2)	ASIZP 74099	HUMZ 228773 (1), MNHN 1998-1213 (2)	MNHN 1998-1218 (2)	MNHN 2009- 0746	KAUM-I 98950 (1), MNHN 2014-0931 (2)	MNHN 2014- 1412 (3)	MNHN 2014- 1428	MNHN 2014-1435 (2)
	PNG		Vanuatu			Solomon Islands			
Standard length (mm SL)	106.4-113.9	111.1	106.6-111.0	99.0-102.3	107.1	82.4-96.0	94.3-113.7	194.6	98.4-107.2
Body depth	14.1-16.0	14.0	14.9-15.7	14.5-14.7	12.2	16.1-16.3	13.9-14.8	16.4	14.2-15.1
Body width	10.5-11.6	10.3	9.9-10.4	9.4-9.9	11.1	9.8-12.9	8.3-10.1	10.0	10.1-10.4
Head length	33.6-35.2	33.0	33.5-35.1	33.4-34.7	32.8	33.2-36.2	34.0-34.5	35.0	33.7-34.4
Head depth	14.2-14.6	14.5	15.0-15.3	14.4-14.8	11.8	15.6-16.1	13.5-15.1	16.0	15.0-15.1
Head width	19.3-22.7	20.3	20.2-22.5	20.3-21.3	-	21.4-23.4	22.1 (n=1)	25.0	19.4-21.8
Snout to dorsal fin	33.2-35.5	33.0	33.5-35.3	33.7-34.2	32.8	33.4-36.0	33.9-34.3	35.3	34.5-34.8
Snout to anal fin	49.3-53.5	47.7	49.1-49.8	46.7-48.6	47.7	47.5-49.3	46.8-49.3	51.5	48.2-49.2
Snout to anus	43.4-46.7	42.2	44.1-44.7	42.3-43.7	42.4	41.9-43.7	43.2-44.1	46.1	43.6-45.2
Snout length	15.9-17.6	16.0	15.4-16.9	15.8-16.0	16.2	16.0-17.6	16.3-16.8	16.4	15.6-16.1
Rostral projection length	-	-	17.8 (n=1)	-	-	14.2-14.6 (2)	18.1 (n=1)	-	18.0 (n=1)
Rostral projection width	1.8	1.9	1.9-2.3	2.1	2.1	1.8-2.1	1.9-2.2	2.2	1.9-2.1
Interspace between rostral projections	8.9 (n=1)	7.2	7.7-7.8 (n=2)	7.7-8.0	-	7.1-8.6 (2)	7.4-8.2	7.3	7.4-8.2
Filamentous barbel length	11.2-12.4	10.4	12.3-13.2	10.0-13.1	-	11.0-11.2	10.6-11.1	10.8	10.0-10.2
Upper jaw length	12.7-13.7	12.4	12.7-13.6	13.0-13.3	12.2	12.3-13.8	12.8-13.6	13.9	12.9-13.2
Lower jaw length	13.8-13.9	13.8	14.2-14.4	13.9-14.8	14.1	13.6-14.1	13.8-14.0	13.8	13.3-13.7
Orbit diameter	8.4-8.8	8.8	8.9-10.0	8.9-9.5	8.2	8.5-9.3	8.9-9.3	9.8	9.1-9.6
Interorbital width	6.7-7.0	6.9	6.7-7.4	7.1-7.3	6.9	6.8-7.5	6.9-7.6	7.3	7.1-7.3
Pectoral-fin length (joined fin only)	16.9-17.4	17.1	15.6-16.4	16.8-17.9	16.7	16.0-18.9	16.8-17.1	16.6	16.7-17.3
Upper detached pectoral-fin ray length	22.8-24.4	23.5	21.9-23.7	22.8-24.8	21.4	22.8-25.1	21.8-23.5	22.5	23.3-24.2
Lower detached pectoral-fin ray length	19.3-21.0	20.3	18.8-20.0	18.9-20.7	17.9	18.8-21.4	18.3-20.5	19.6	20.5-21.1
Pelvic-fin length	19.3-19.5	18.5	18.3-18.6	18.6-19.3	18.2	16.6-18.7	18.2-18.8	18.4	18.5-19.3
First dorsal-spine length	9.0-10.2	8.6	9.4-9.7 (2)	8.3 (n=1)	11.7	8.2-10.4	7.7-10.4	7.8	8.2-9.3
Caudal-peduncle length	7.7-10.0	9.6	9.5-9.8	9.4-9.6	10.7	9.5-11.9	10.0-12.7	9.8	9.0-10.4
Caudal-peduncle depth	1.6-1.7	1.8	1.7-1.9	1.8-1.9	1.7	1.9	1.7-1.9	2.0	1.8-2.0

with cluster of 3 (2–3) barbels; 2nd with 3 (2–4); 3rd with 4 (2–4); 4th with 3 (2–4); 5th with 3 (2–5); 6th with 3 (1–3); 7th with 2 only, in MNHN 1998-1218 (102.3 mm SL). Gill rakers on first arch comb-like. Gill membrane narrowly united to isthmus. Eye large. Interorbital concave. Single spine with ridge on opercle. No spines on nasal, lateral ethmoid, and mesethmoid. Single ridge on 4th infraorbital below orbit. Frontal-1 spine stout. Frontal-2 spine weakly prominent. Parietal spine stout. Posttemporal spine weak with ridge.

Bony plates on body mainly in 4 rows, each plate with a single backwardly directed spine. Dorsal row: 1st plate largest; a backwardly directed spine on each plate decreasing in size posteriorly except for last 2 plates. Upper lateral row: posterior 11 (7–13) plates with a forwardly directed spine; 1st to 4th plates small, 5th smaller, slanted obliquely downward. Lower lateral row: a row of plates ending at caudal peduncle; posterior 3 (2–3) plates contralaterally sutured with plates of other side along ventral midline. Ventral row: a backwardly directed spine on each plate decreasing in size posteriorly, reducing to a low ridge, except for last 2 plates; row of plates absent at caudal peduncle. Two (2 to 4) large bony plates in front of anus with a low ridge; contralateral pairs of plates raggedly sutured along ventral midline.

Dorsal fin originating at anterior margin of 2nd bony plates in dorsal row, ending at caudal peduncle. Joined pectoral fin reaching beyond anus. Two detached pectoral-fin rays thick, upper ray longer than lower ray and joined pectoral fin. Pelvic fin reaching to level of anus (reaching to level of anus or slightly beyond anus). Caudal fin weakly emarginate.

Color in life. (Fig. 2) Head, body, and all fins rose; area surrounding the eye and anterior dorsal surface of body marbled with yellow; eye yellowish green, dorsal and ventral margins dark grey; rostral projections with some dark pigment; perifacial rim and lateral line with a few grey spots. Distal half of first dorsal fin purple, with a black margin; second dorsal fin with a distal black margin; pectoral fin with a dark red spot on the fused part, detached rays red with white tips.

Color in preservative. Head, body and all fins yellowish, except for black margin of dorsal fin; peritoneum yellowish; eye dark grey. Joined section of pectoral fin often with a central, dark grey spot.

Etymology. The specific epithet is derived from tall or extended, *longus* in Latin, and horned, *cornutus* in Latin; *cornutum* is the nominative singular neuter form. The name refers to the unusually long rostral projections of the new species. The species name is treated as a compound neuter adjective.



Figure 2. *Peristedion longicornutum*, n. sp., fresh photographs immediately after collection; upper: dorsal view, holotype, NTUM 12297, 100.7 mm SL, Papua New Guinea; lower: side view, paratype, NTUM 11167, specimen 1, 97.3 mm SL, Papua New Guinea (J.-N. Chen).

Distribution. Known from the southwestern Pacific Ocean: Papua New Guinea (Morobe, Milne Bay, New Hanover), Solomon Sea, Solomon Islands (San Cristobal, Guadalcanal), Vanuatu (Espiritu Santo) (Fig. 3); the new species was trawled from confirmed depths of 340–506 m (total depth range of stations 335–567 m).

Comparisons. *Peristedion longicornutum* n. sp. closely resembles *P. weberi* in having a wide interspace between the rostral projections, the rostral projection with a rounded margin on the medial side at the base, the perifacial rim smooth and straight, and the anterior edge of 4th sensory pore of the rostral projection anterior to the anterior edge of the premaxilla (Kawai 2016); it differs from that species by its very long and needle-like rostral projections, length 14.2–22.3% of SL (versus 10.8–12.5% of SL in *P. weberi*). The very long and needle-like rostral projections and the wide interspace between them distinguish the new species from most Atlantic and eastern Pacific species; only *P. antillarum* from the western Atlantic might be confused in this respect, but the latter differs in the presence of a rostral spine (vs. absent), a smaller eye (9.9–12.0 in SL vs. 8.1–9.2 in SL), a very long filamentous barbel, length 19.5–21.3% SL (vs. 8.6–13.2% SL), 17 dorsal-fin soft rays (vs. 21–23), 17–18 anal-fin soft rays (vs. 20–22), 25–26 bony plates in the dorsal row (vs. 29–33), 31 in the upper lateral row (vs. 35–38), 20 in the lower lateral row (vs. 26–29), and 20 in the ventral row (vs. 23–26), 2 lip and 0 chin groups of barbels (vs. 3 and 6–7), and 6–8 branches of filamentous barbel (vs. 14–26).

Remarks. This interesting deepwater species of *Peristedion* with long rostral projections was discovered during the KAVIENG2014 Expedition. With a maximum observed standard length of 116.6 mm, it is the smallest known species in the Indo-West Pacific: the maximum observed SL is 166 mm in *P. amblygenys*, 242 mm in *P. liorhynchus*, 159 mm in *P. orientale*, 132 mm in *P. richardsi*, 146 mm in *P. riversandersoni*, and 159 mm in *P. weberi* (Ono & Kawai 2014, Kawai 2016).

Among the 7 species in the Indo-West Pacific (Fig. 4), *P. longicornutum* keys out close to *P. weberi*, which is distributed in the western Indian Ocean. Other species of peristediid fishes recorded from near the type locality at New Hanover include *Satyrichthys laticeps* (Schlegel, 1852) and *S. moluccense* (Bleeker, 1850) (Fricke *et al.*, in prep.). These species were trawled at similar depths of 269–658 m, to the northwest, north, and northeast of New Hanover. At station CP4446, *P. longicornutum* and *S. moluccense* co-occurred.

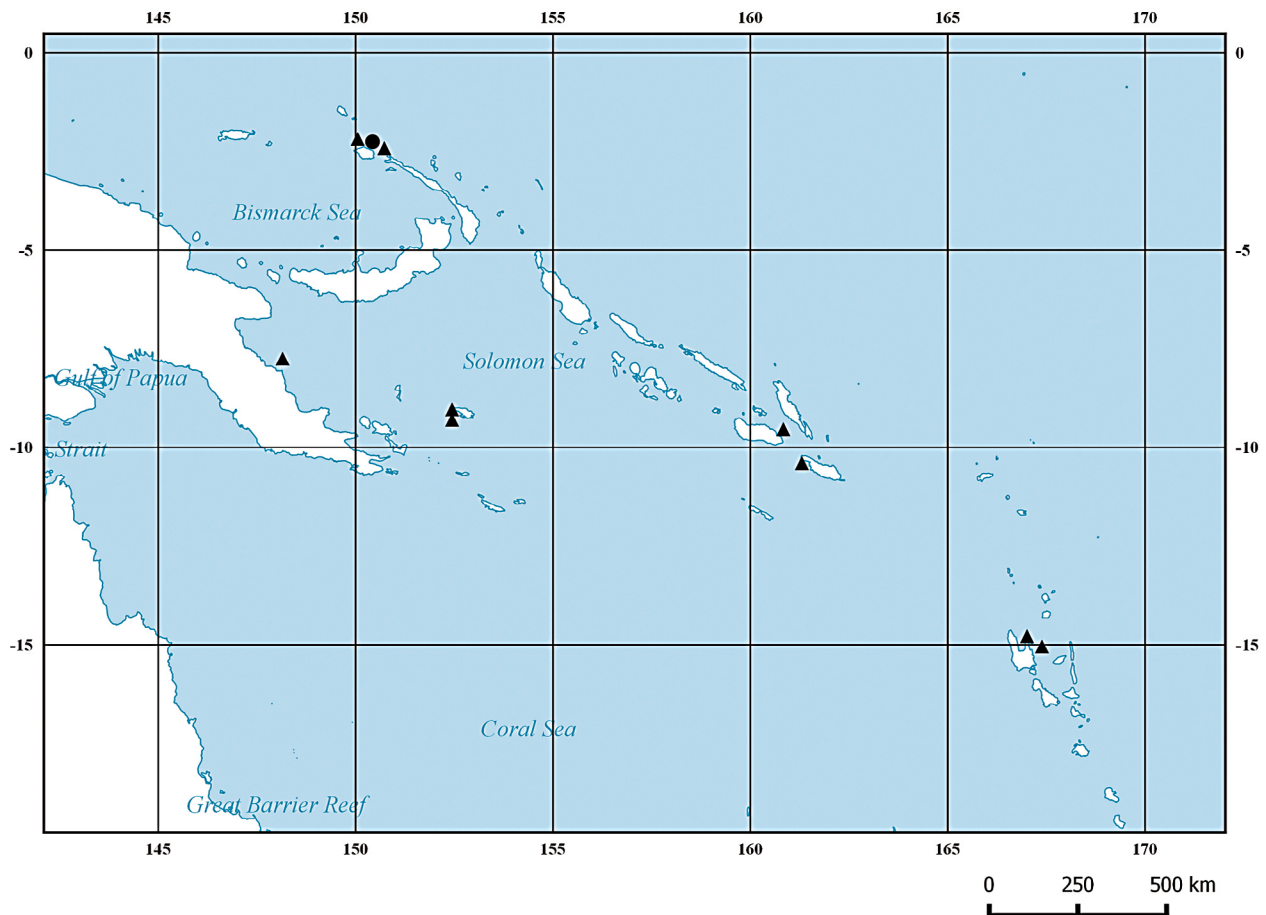


Figure 3. *Peristedion longicornutum*, geographical distribution in the western Pacific: ● type locality; ▲ paratype localities.

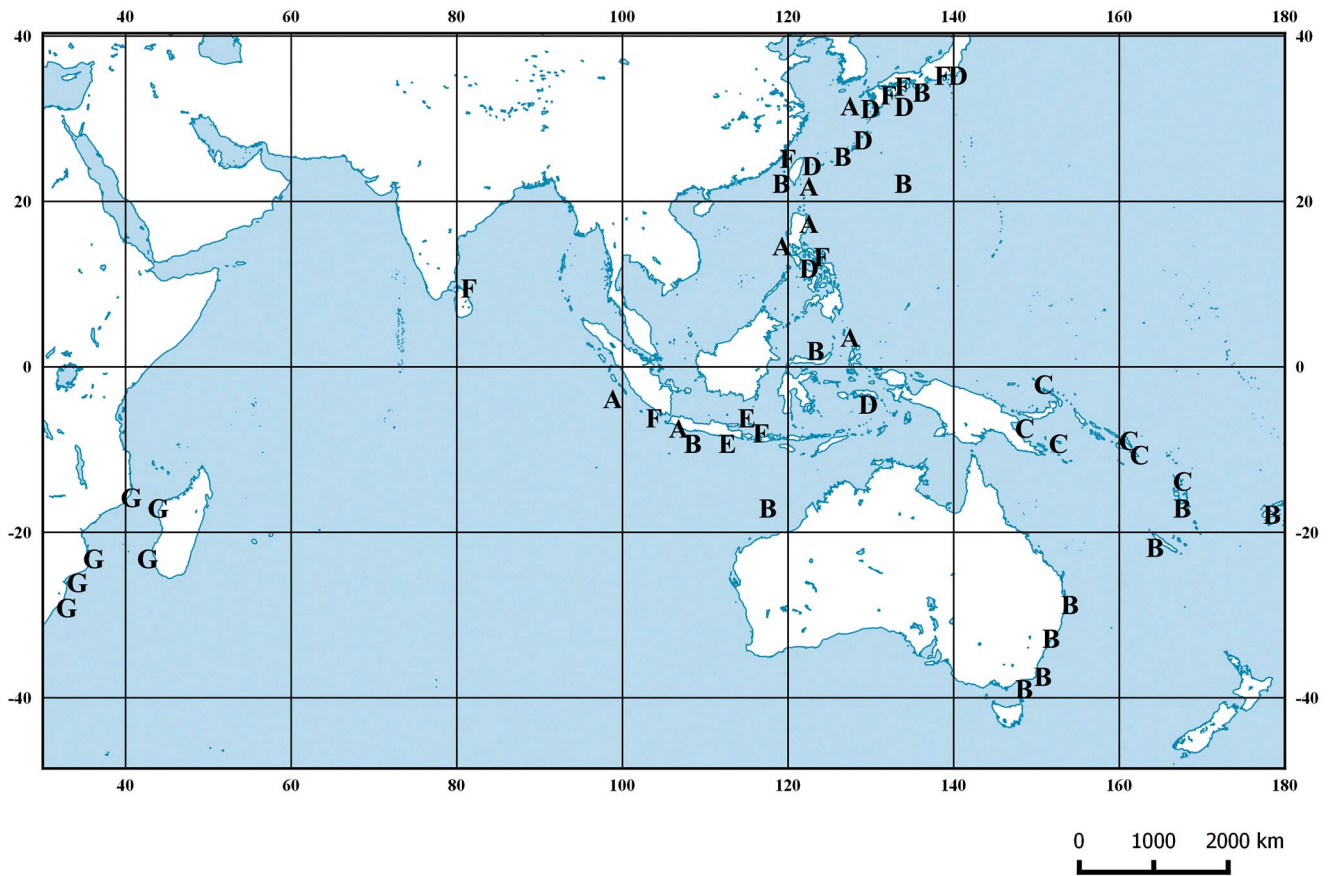


Figure 4. Geographical distribution of the species of *Peristedion* in the Indo-West Pacific: A) *P. amblygenys* B) *P. liorhynchus* C) *P. longicornutum*, n. sp. D) *P. orientale* E) *P. richardsi* F) *P. riversandersoni* G) *P. weberi*.

Key to the Indo-Pacific species of the genus *Peristedion*, updated after Kawai (2016)

- 1a. Anterior edge of 4th sensory pore of rostral projection posterior to anterior edge of premaxilla [eastern Indian & western Pacific Oceans] *P. liorhynchus*
- 1b. Anterior edge of 4th sensory pore of rostral projection anterior to anterior edge of premaxilla 2

- 2a. Perifacial rim smooth and straight 3
- 2b. Perifacial rim protruding starting near anterior margin of lower jaw 5

- 3a. Moderate interspace between rostral projections (0.56–0.94 in rostral-projection width) [Japan & Taiwan] ..
..... *P. orientale*
- 3b. Wide interspace between rostral projections (0.20–0.51 in rostral-projection width) 4

- 4a. Rostral projections long and needle-like, 14.2–22.3% SL [Papua New Guinea, Solomon Islands to Vanuatu]
..... *P. longicornutum*, n. sp.
- 4b. Rostral projections moderate and triangular, 10.8–12.5% SL [western Indian Ocean] *P. weberi*

- 5a. Rostral projection with rounded margin on medial side at base [eastern Indian & western Pacific Oceans] ...
 *P. riversandersoni*
- 5b. Rostral projection with straight margin on medial side at base 6
- 6a. Rostral projection spatulate and very narrow interspace between rostral projections, 1.33–1.73 in rostral-
 projection width [Indonesia] *P. richardsi*
- 6b. Rostral projection triangular and moderate interspace between rostral projections, 0.86–1.08 in rostral-
 projection width [eastern Indian & western Pacific Oceans] *P. amblygenys*

Comparative material examined:

Peristedion antillarum: MCZ 28088 (holotype), 135 mm SL, MCZ 28089 (paratype), 68.5 mm SL, Barbados.
Peristedion weberi: SAIAB 109 (holotype), 151 mm SL, Mozambique; SAIAB 28345 (1), 159 mm SL, SAIAB 28346 (3), 129–151 mm SL, SAIAB 74472 (5), 125–147 mm SL, SAIAB 74510 (1), 131 mm SL, Mozambique; SAIAB 87579 (1), 154 mm SL, South Africa; SAIAB 189418 (2), 143–144 mm SL, Madagascar.

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