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## **Descriptions of two new gobies (Gobiidae: *Acentrogobius*) from Milne Bay Province, Papua New Guinea**

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### **Abstract**

Two new species belonging to the gobiid genus *Acentrogobius* are described from mud-bottom habitat in the vicinity of Alotau, Milne Bay Province, Papua New Guinea. *Acentrogobius vanderloosi* is described on the basis of three specimens, 30.4–47.7 mm SL. Diagnostic features include the combination of 10 soft dorsal and anal-fin rays, first two dorsal spines with elongate filaments, pectoral-fin rays 20, scales covering the entire cheek and upper portion of the opercle, and a unique colour pattern that includes a pair of yellow cheek stripes, numerous orange spots on the body, and a mid-lateral row of five, horizontally-elongate dark brown blotches, which are not enclosed within parallel dark stripes. *Acentrogobius violarisi* is described from three specimens, 14.9–30.1 mm SL. It differs from congeners on the basis of its combination of 11 soft dorsal and anal-fin rays, filamentous first dorsal spine, 12–13 predorsal scales, and a colour pattern that includes a mid-lateral row of four, short narrow black bars and spot (at caudal-fin base) enclosed within a pair of brown stripes extending from the pectoral fin to the caudal-fin base, a pair of neon blue cheek stripes, alternating blue and brown bands on the dorsal fins, and orange spots on the upper half of the caudal fin. Both new species were collected/observed at depths from 15–18 m, which is well below the normal depth zone for most members of the genus.

**Key words:** taxonomy, new species, mud bottom, Indo-Australian Archipelago.

## Introduction

The gobiid genus *Acentrogobius* Bleeker 1874 as currently recognised contains a diversity of morphological forms and is most likely a polyphyletic assemblage (Allen & Erdmann 2012). Larson & Lim (2005) described the genus as confusing and a “catch-basket” for a many gobies of similar appearance. Larson & Murdy (2001) highlighted the difficulty presented in trying to characterize *Acentrogobius* in their key to western and central Pacific gobiine genera with this genus appearing in three widely separated couplets. There are at least 25 species in the genus (Eschmeyer 2015), which according to Jaafar (2008, unpublished PhD thesis) is actually divisible into four genera, including *Acentrogobius*, *Amoya* Herre 1937, *Yongeichthys* Whitley 1932, and an undescribed genus. However, *Acentrogobius* is retained for the entire group for the purpose of the current study, pending publication of Jaafar’s investigation. They invariably occur on soft substrata, usually mud or sandy silt, and from our experience retreat to a burrow when disturbed. Most species are found in or close to mangrove habitat, often in brackish water. A few species from India and the northwestern Pacific are known only from freshwater.

The present paper describes two new species of *Acentrogobius* that were collected near the town of Alotau, Milne Bay Province, Papua New Guinea during December 2014. The author had a rare opportunity to investigate a habitat that is frequently overlooked by divers due to poor visibility and impoverished faunal diversity. A series of 19 scuba dives, involving 38 hours underwater, facilitated a detailed survey of a sloping, mud-bottom habitat, extending along 200 m of shoreline to a depth of about 18 m. The fauna of this small area (approximately 8,000 m<sup>2</sup>) was dominated by gobiid fishes including the following genera: *Acentrogobius*, *Amblyeleotris* Bleeker 1874, *Amblygobius* Bleeker 1874, *Ancistrogobius* Shibukawa *et al.* 2010, *Asterropteryx* Rüppell 1830, *Callogobius* Bleeker 1874, *Cryptocentrus* Valenciennes 1837, *Ctenogobiops* Smith 1959, *Drombus* Jordan & Seale 1905, *Fusigobius* Whitley 1930, *Lubricogobius* Tanaka 1915, *Mahidolia* Smith 1932, *Oplopomus* Valenciennes 1837, *Oxyurichthys* Bleeker 1857, *Tomiyamichthys* Smith 1956, *Trimma* Jordan & Seale 1906 (among wreckage), *Tryssogobius* Larson & Hoese 2001, and *Vanderhorstia* Smith 1949.

## Materials and Methods

Lengths are given as standard length (SL), measured from the median anterior point of the upper lip to the base of the caudal fin (posterior end of the hypural plate); body depth is measured at both the origin of the pelvic fins and the origin of the anal fin, and body width at the origin of the pectoral fins; head length (HL) is taken from the upper lip to the posterior end of the opercular membrane, and head width over the posterior margin of the preopercle; orbit diameter is the greatest fleshy diameter; snout length is measured from the median anterior point of the upper lip to the nearest fleshy edge of the orbit; upper-jaw length from the same anterior point to the posterior end of the maxilla; cheek depth is the distance between the posteriormost edge of the maxilla and ventral edge of the fleshy orbit; caudal-peduncle depth is the least depth, and caudal-peduncle length the horizontal distance between verticals at the rear base of the anal fin and the caudal-fin base; lengths of spines and rays are measured to their extreme bases; caudal and pectoral-fin lengths are the length of the longest ray; pelvic-fin length is measured from the base of the pelvic spine to the tip of the longest pelvic soft ray.

Terminology and abbreviations for cephalic pores and papilla rows follow those presented by Akihito (1984). Scales in longitudinal series are counted from the scale above the pectoral-fin base, continuing in a longitudinal row to the posterior edge of the hypural plate; scales in transverse series are counted from the origin of the anal fin anterodorsally to the base of the first dorsal fin; gill rakers are counted on the first gill arch, those on the upper limb listed first; rudiments are included in the counts.

Morphometric data presented as percentages of the standard length are included in Table 1. The range of counts and measurements for paratypes is indicated in parentheses if different from the holotype. Type specimens are deposited at the Western Australian Museum, Perth (WAM).



**Figure 1.** *Acentrogobius vanderloosi*, preserved holotype, WAM P.34319-010, male, 47.7 mm SL, Alotau, Papua New Guinea. Photograph by G.R. Allen.

### *Acentrogobius vanderloosi* Allen, n. sp.

#### Mudslope Goby

Figures 1–3, Tables 1–2.

**Holotype.** WAM P.34319-010, male, 47.7 mm SL, Alotau, Papua New Guinea, 4.8 km east of main wharf, 10° 18.256'S, 150° 24.768'E, 14.5 m, clove oil and rotenone, G.R. Allen, 13 December 2014.

**Paratypes.** WAM P.34319-011, 2 female specimens, 30.4–45.2 mm SL, same data as holotype except collected on 20 December with rotenone.

**Diagnosis.** Dorsal-fin rays VI + I, 10, dorsal spines thin and flexible, first two with long filamentous tips, that of second spine longest 2.3–3.2 in SL, reaching to base of about sixth soft ray of second dorsal fin when laid back; anal-fin rays I, 10; pectoral-fin rays 20; caudal fin lanceolate, slightly longer than head length in adult; longitudinal scale series 30; transverse-scales 9–10; predorsal-scales 12–13; finely ctenoid scales covering body, becoming cycloid on breast, pectoral-fin base, nape, and head; uppermost portion of opercle with three scale rows; cheek fully scaled; colour in life pale grey with numerous widely scattered dark-edged, orange spots on body, five, horizontally-elongate dark brown blotches on side of body at level of pectoral-fin base, (including one at middle of caudal-fin base), and pair of orange stripes on cheek.

**Description.** Dorsal-fin rays VI + I, 10; anal-fin rays I, 10; pectoral-fin rays 20; pelvic-fin rays I, 5; all dorsal, anal, pectoral and pelvic soft rays branched, except upper and lowermost 1–2 pectoral-fin rays; segmented caudal-fin rays 17; branched caudal-fin rays 14; longitudinal scale series 30; transverse scales 10 (9–10); predorsal scales 12 (13); preopercular scales 8; circumpeduncular scales 12; gill rakers on first branchial arch 1 + 7.

Body elongate and laterally compressed, more strongly posteriorly; body depth at pelvic-fin base 5.1 (4.9–5.2) in SL; body depth at anal-fin origin 5.4 (6.0) in SL; head width slightly greater than depth at level of preopercular margin; head length 3.6 (3.5–3.7) in SL; snout short and rounded, length 4.4 (3.9–4.1) in HL; eye diameter 3.4 (2.9–3.1) in HL; eyes of each side in contact with each other on interorbital; distance between snout and origin of first dorsal fin 3.1 (2.7–3.0) in SL, between snout and origin of second dorsal fin 1.9, between snout and origin of anal fin 1.7 (1.8), and between snout and origin of pelvic fins 3.2 (3.2–3.3), all in SL.

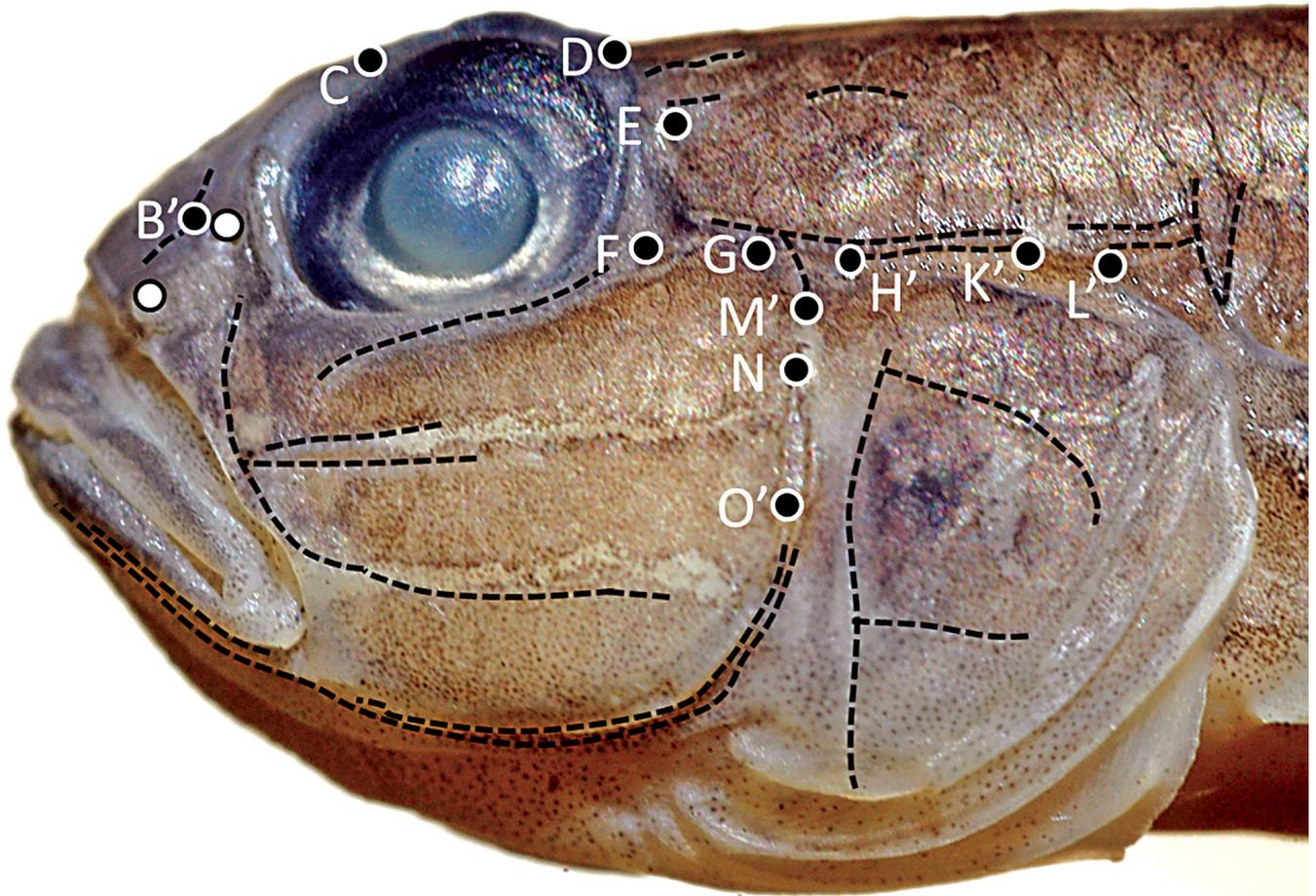
Mouth terminal, jaws extending to a vertical at anterior edge of eye; chin relatively smooth, without mental frenum; jaw teeth small and conical, densely packed in several rows, those in outermost row at front of jaws largest, including pair of enlarged, dagger-like posteriorly curved canine on each side at front corner of upper jaw and single, similar canine on each side at front corner of lower jaw; tongue broad with bilobed anterior margin,

broadly attached anteriorly to floor of mouth; anterior extent of gill opening below about rear edge of preopercle; pattern of papillae rows and sensory pores on head as shown in Fig. 2; anterior oculoscapular pores include snout pore (B'), single anterior (C) and posterior (D) interorbital pores, and three postorbital pores (E, F, and G); remaining pores include three preopercular pores (M', N, and O') and three posterior oculoscapular pores (H', K', and L'); cheek papillae mainly in longitudinal pattern. Additionally, there is a single transverse row containing 7–11 papillae across the chin.

Finely ctenoid scales covering body, becoming cycloid on nape, operculum, and preoperculum; cycloid scales also present on breast and pectoral-fin base; cheek (preopercle) entirely scaled with about five transverse rows; opercle with three rows of scales on uppermost portion; no dermal crest, barbels, or preopercular spines present on head.

First dorsal fin origin slightly behind level of rear portion of pelvic-fin base; dorsal spines thin and flexible, anterior two spines with long filamentous tips, that of second spine longest 2.3 (3.3) in SL, reaching to base of sixth soft ray of second dorsal fin of holotype when laid back; spine of second dorsal fin 2.7 (2.5–3.0) in HL; longest (penultimate) ray of second dorsal fin 1.5 (1.6–1.7) in HL, longest ray (penultimate) of anal fin 1.7 (1.8–2.0) in HL, pectoral fin pointed, middle rays longest, 3.6 (3.5–3.9) in SL; pelvic fins completely connected by membrane, with well-developed frenum (posterior edge smooth, without fleshy lobes); pelvic-fin length 4.2 (4.0–4.4) in SL; caudal fin lanceolate, slightly longer than head, its length 3.2 (3.4–3.5) in SL.

**Color of holotype in life.** (Fig 3) Generally pale grey with about 40–60 widely scattered, brown-edged, orange spots intermixed with small diffuse brown blotches, more or less arranged in five irregular horizontal rows on side of body; longitudinal row of five larger, diffuse dark brown blotches on side of body at level of pectoral-fin base, including rounded one on middle of caudal-fin base; head grey to pale bluish with pair of prominent



**Figure 2.** *Acentrogobius vanderloosi*, preserved holotype, WAM P.34319-010, male, 47.7 mm SL, Alotau, Papua New Guinea; lateral view of head with sensory pores and main rows of papillae indicated by white-edged spots and broken lines respectively. Nostrils are shown by black-edged white spots. Photograph by G.R. Allen.



**Figure 3.** *Acentrogobius vanderloosi*, underwater photograph of holotype, WAM P.34319-010, male, 47.7 mm SL, Alotau, Papua New Guinea. Photograph by G.R. Allen.

orange stripes on cheek, short orange band behind eye, and thin orange line above upper lip, opercle bluish grey with interrupted orange markings around periphery and orange and brown markings on central portion; dorsal fins translucent greyish; first dorsal fin with pair of vertically elongate orange-brown markings on membranes between first two spines and 3–4 additional markings of same colour scattered on basal portion of fin; second dorsal fin with three rows of pale brownish spots, alternating with three rows of horizontally elongate, neon blue spots; anal fin yellowish white with three rows of brown stripes; caudal fin translucent greyish with orange rays and blue streaks on membranes; pelvic fins mainly yellowish white with brown streaks on membranes; pectoral fins translucent with broad stripe across upper base and thinner orange to brown stripe on lower base.

**Color of holotype in alcohol.** (Fig. 1) Generally brown, grading to tan ventrally on head and body with orange (tan in preservative) and brown markings still evident as described above, although row of five large, dark brown blotches more contrasted than in live individuals; pair of brown-edged pale tan stripes on cheek and pale tan (formerly orange) markings evident on opercle; fins mainly translucent dusky grey, covered with tiny black melanophores; pectoral-fin base with pair of diffuse brownish stripes.

**Distribution and habitat.** The new species is currently known only from the type locality, but probably ranges widely within the Indo-Australian Archipelago (i.e. East Indian region). The habitat consists of moderately sloped (about 20 degrees) mud substratum. The slope begins in approximately 1.5 m depth and flattens out at about 18 m. The first impression is a featureless bottom with very few fishes, but closer inspection reveals numerous burrows occupied by a variety of fishes and invertebrates. A total of about eight individuals of the new species were observed on the lower section of the slope in 15–18 m depth. Only widely scattered, solitary individuals were seen, and each was invariably associated with a muddy burrow, into which the fish retreated when approached.

TABLE 1

Proportional measurements (as percentage of SL) for type specimens  
of *Acentrogobius vanderloosi* and *A. violarisi*.

	<i>A. vanderloosi</i>			<i>A. violarisi</i>	
	holotype	paratype	paratype	holotype	paratype
	WAM P. 34319-010	WAM P. 34319-011	WAM P. 34319-011	WAM P. 34319-004	WAM P. 34319-005
Sex	male	female	female	female	female
Standard length	47.7	45.2	30.4	30.1	24.1
Head length	28.1	27.1	28.5	28.2	28.0
Head width	20.1	17.9	19.2	14.8	16.0
Head depth	18.4	17.2	16.8	18.3	16.6
Body depth pelvic origin	19.8	19.1	20.5	18.5	19.7
Body depth anal origin	18.4	16.7	16.6	17.0	19.1
Caudal-peduncle depth	11.8	12.0	11.3	10.9	11.5
Caudal-peduncle length	14.7	15.1	18.5	18.7	19.8
Snout length	6.4	6.6	7.3	5.3	5.7
Eye diameter	8.2	8.8	9.7	8.9	9.2
Cheek depth	7.8	7.0	7.3	7.1	8.3
Upper jaw length	11.7	8.6	10.7	11.3	10.8
Snout to first dorsal origin	32.6	33.8	37.3	32.9	33.6
Snout to second dorsal origin	51.3	52.3	53.8	53.8	53.7
Snout to anal fin origin	57.5	55.7	57.1	56.5	54.5
Snout to pelvic-fin origin	31.0	30.2	31.1	31.0	28.8
Base of dorsal fins	52.0	49.2	50.7	51.3	50.8
First dorsal spine	36.7	30.3	20.3	31.1	31.6
Second dorsal spine	42.9	31.5	31.6	14.6	15.4
Third dorsal spine	25.2	14.6	17.1	11.9	15.3
Second dorsal-fin spine	10.5	11.0	9.4	9.5	10.0
Longest soft dorsal ray	18.7	16.0	17.6	18.7	19.8
Anal-fin spine	8.5	7.3	7.8	7.3	7.0
Longest soft anal ray	16.4	13.7	15.5	23.2	22.6
Pectoral-fin length	28.1	25.7	28.6	30.0	31.9
Pelvic-fin length	23.6	22.5	25.3	25.2	24.5
Pelvic-fin spine	9.3	9.3	8.7	9.8	11.5
Caudal-fin length	31.0	29.7	28.7	35.3	29.6

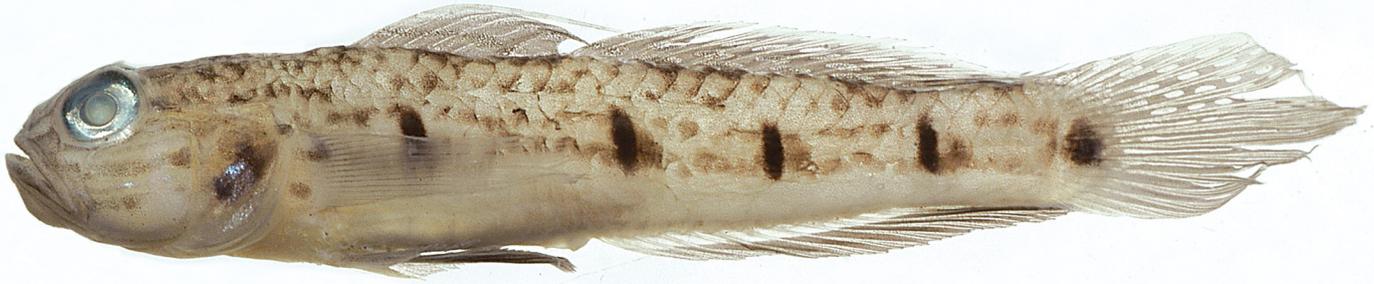
**Etymology.** The new species is named *vanderloosi* in honour of Robert (“Rob”) Vanderloos, owner and operator of the live-aboard dive vessel *Chertan*, based at Alotau, Papua New Guinea. His generosity in providing assistance to the author was instrumental in the discovery of this new species.

**Comparisons.** The new species belongs to the group of *Acentrogobius* species with longitudinal rows of sensory papillae on the cheek, an unrestricted gill opening extending forward to the level of the opercle/preopercle, and a single transverse row of papillae on the chin (= *Yongeichthys* of Jaafar 2008). This assemblage includes the following additional species from the Indo-Australian Archipelago: *A. caninus* (Valenciennes 1837), *A. cenderawasih* Allen & Erdmann 2012, *A. cyanomos* (Bleeker 1849), *A. nebulosus* (Forsskål 1775), *A. signatus* (Peters 1855), *A. suluensis* (Herre 1927), *A. viganensis* (Steindachner 1893), and *A. violarisi* n. sp. (description below). I have followed Jaafar (2008) in considering *A. audax* Smith 1959 as a junior synonym of *A. viganensis* and *A. madraspatensis* (Day 1868) and *A. multifasciatus* (Herre 1927) as junior synonyms of *A. signatus*. Illustrations and/or diagnoses for these species were provided by Koumans (1953), Akihito (1984), Herre (1927), Kuitert & Tonzuka (2001), Suzuki *et al.* (2004), Larson & Lim (2005), and Allen & Erdmann (2012). Important diagnostic features of this group are compared in Table 2. The new species differs from nearly all other congeners from the Indo-Australian Archipelago in having the combination of cheek scales, 10 anal-fin rays, and 20 pectoral-fin rays. It is one of only two species (with *A. caninus*) from the region that possesses scales on the operculum, which is entirely naked in other species. The new species also differs from most members of the genus in having long filamentous extensions of the first two dorsal spines. Although filamentous spines are also found in some of the other species, this feature is generally restricted to the first spine in *A. violarisi* and second or third spine in *A. nebulosus* and *A. suluensis*. The first four dorsal spines of *A. cenderawasih* are generally filamentous, although only the third is considerably elongate. The colour pattern of *A. vanderloosi* is also unique for the genus, particularly the combination of a pair of yellow cheek stripes, numerous orange spots on the body, and the lack of parallel dark stripes on the side that enclose the large dark marks along the side in other *Acentrogobius*.

TABLE 2

Comparison of diagnostic features of *Acentrogobius* species from the Indo-Australian Archipelago with longitudinal papillae rows on the cheek and unrestricted gill opening (abbreviations as follows: D. rays = soft rays in second dorsal fin; A. rays = soft rays in anal fin; P. rays = pectoral-fin rays; Long. sc. = scales in longitudinal series; PDS = predorsal scales)  
<sup>1</sup> scales are restricted to the upper portion of the opercle

Species	D. rays	A. rays	P. rays	Long. sc.	PDS	Cheek	Opercle
<i>A. caninus</i>	9–10	8–9	17–19	24–29	19–25	naked	scaled <sup>1</sup>
<i>A. cenderawasih</i>	11	11	17–18	32–33	13–14	naked	naked
<i>A. cyanomos</i>	10	8–10	17–19	22–26	10–13	naked	naked
<i>A. nebulosus</i>	9–10	8–9	18–20	27–30	2–9	naked	naked
<i>A. signatus</i>	9	9	15–17	20–28	0–9	naked	naked
<i>A. suluensis</i>	9	9	15–17	20–28	0–9	naked	naked
<i>A. vanderloosi</i>	10	10	20	30	12–13	scaled	scaled <sup>1</sup>
<i>A. viganensis</i>	9	9	16–17	23–28	7–12	naked	naked
<i>A. violarisi</i>	11	11	16–18	28–29	12–13	naked	naked



**Figure 4.** *Acentrogobius violarisi*, preserved holotype, WAM P.34319-004, female, 30.1 mm SL, Alotau, Papua New Guinea. Photograph by G.R. Allen.

### *Acentrogobius violarisi* Allen, n. sp.

#### Alotau Goby

Figures 4–6, Tables 1–2.

**Holotype.** WAM P.34319-004, female, 30.1 mm SL, Alotau, Papua New Guinea, 4.8 km east of main wharf, 10° 18.256'S, 150° 24.768'E, 15 m, rotenone, G.R. Allen, 20 December 2014.

**Paratypes.** WAM P.34319-005, juvenile and female specimens, 14.9–24.1 mm SL, collected with holotype.

**Diagnosis.** Dorsal-fin rays VI + I,11, dorsal spines thin and flexible, first longest with filamentous tip, 3.2 in SL, reaching to base of about fourth or fifth soft ray of second dorsal fin when laid back; anal-fin rays I,11; pectoral-fin rays 16–18; caudal fin lanceolate, longer than head length; longitudinal scale series 28–29; transverse-scales 8; predorsal-scales 12–13; ctenoid scales covering body, becoming cycloid on breast, pectoral-fin base, and nape; cheek and opercle naked; colour in life pale grey with brown scribbling on back, mid-lateral row of four, short narrow black bars and spot (at caudal-fin base) positioned between pair of brown stripes extending from pectoral fin to caudal-fin base, pair of neon blue stripes across cheek, alternating blue and brown bands on dorsal fins, and orange spots on upper half of caudal fin.

**Description.** (counts taken on all specimens, proportional measurements taken on holotype and largest paratype) Dorsal-fin rays VI + I,11; anal-fin rays I,11; pectoral-fin rays 16 on both sides of holotype (17 on paratypes, except one side of 24.1 mm specimen with 18); pelvic-fin rays I, 5; all dorsal, anal, pectoral and pelvic soft rays branched, except first two upper and lowermost pectoral-fin rays; segmented caudal-fin rays 18 (17); branched caudal-fin rays 14; longitudinal scale series 29 (28); transverse scales 8; predorsal scales 12 (13); prepelvic scales 6 (4–6); circumpeduncular scales 12; gill rakers on first branchial arch 0 + 8.

Body elongate and laterally compressed, more strongly posteriorly; body depth at pelvic-fin base 5.4 (5.1) in SL; body depth at anal-fin origin 5.9 (5.2) in SL; head width slightly greater than depth at level of preopercular margin; head length 3.5 (3.6) in SL; snout short and rounded, length 5.3 (4.9) in HL; eye diameter 3.2 (3.0) in HL; eyes of each side in contact with each other on interorbital; distance between snout and origin of first dorsal fin 3.0 in SL, between snout and origin of second dorsal fin 1.9, between snout and origin of anal fin 1.8, and between snout and origin of pelvic fins 3.2 (3.5), all in SL.

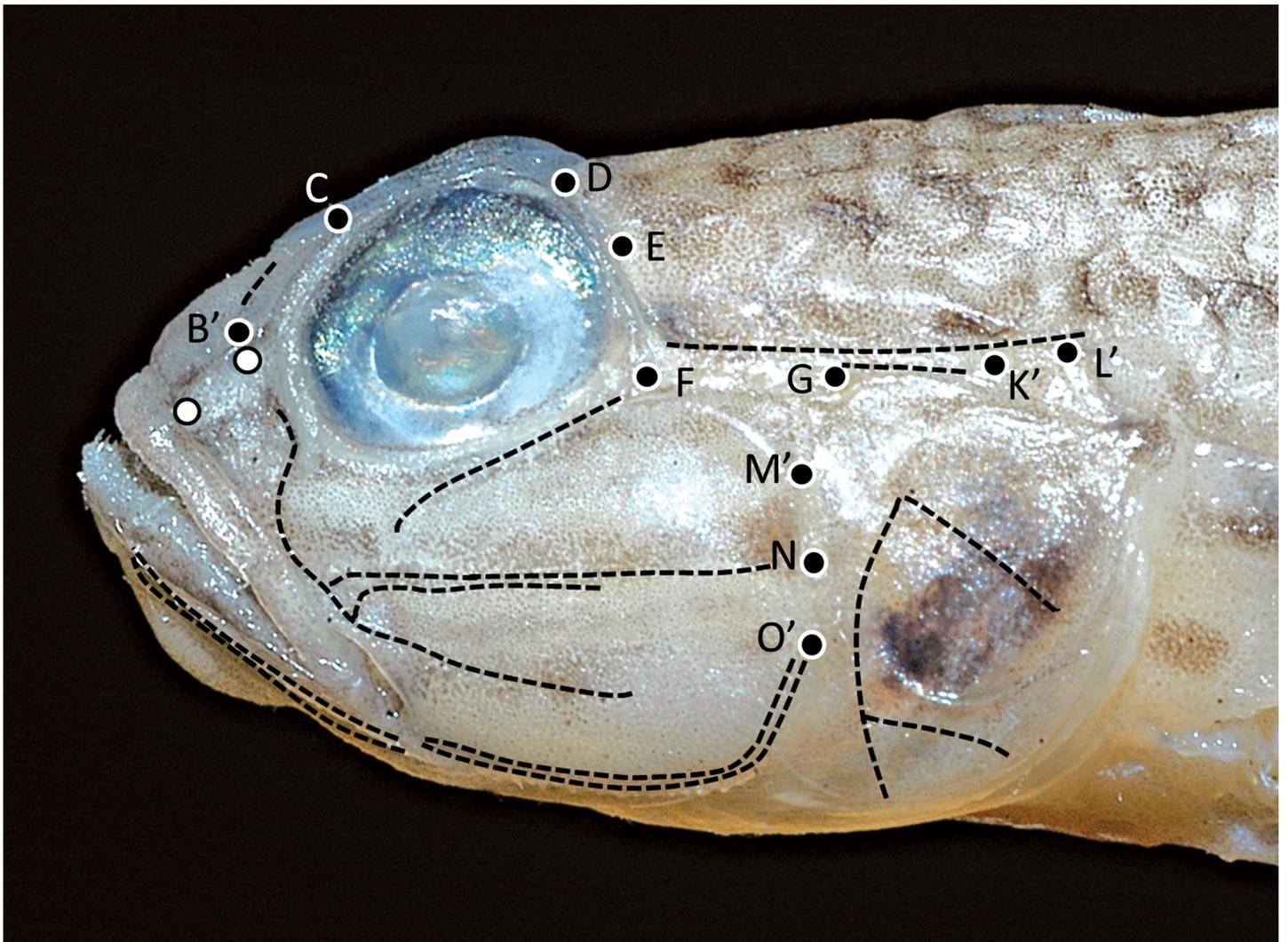
Mouth terminal, jaws extending to a vertical at anterior edge of pupil; chin relatively smooth, without mental frenum; jaw teeth small and conical, densely packed in several rows, those in outermost row at front of jaws largest, including three teeth on each side of symphysis of upper jaw and 1–2 enlarged, recurved canines on each side at front corner of lower jaw; tongue broad with bilobed anterior margin, broadly attached anteriorly to

floor of mouth; anterior extent of gill opening below about rear edge of preopercle; pattern of papillae rows and sensory pores on head as shown in Fig. 5; anterior oculoscapular pores include snout pore (B'), single anterior (C) and posterior (D) interorbital pores, and three postorbital pores (E, F, and G); remaining pores include three preopercular pores (M', N, and O') and two posterior oculoscapular pores (K' and L'); cheek papillae mainly in longitudinal pattern. Additionally, there is a single transverse row containing 4–6 papillae across the chin.

Ctenoid scales covering body, becoming cycloid on nape (including predorsal); cycloid scales also present on breast and pectoral-fin base; cheek and opercle naked; no dermal crest, barbels, or preopercular spines present on head.

First dorsal fin origin about level with pelvic-fin origin, slightly behind pectoral-fin base; dorsal spines thin and flexible, first longest with filamentous tip, 3.2 in SL, reaching to base of about fourth or fifth soft ray of second dorsal fin when laid back; spine of second dorsal fin 3.0 (2.8) in HL; longest (penultimate) ray of second dorsal fin 1.5 (1.4) in HL, longest ray (penultimate) of anal fin 1.2 in HL, pectoral fin pointed, middle rays longest, 3.3 (3.1) in SL; pelvic fins completely connected by membrane, with well-developed frenum (posterior edge smooth, without fleshy lobes); pelvic-fin length 4.0 (4.1) in SL; caudal fin lanceolate, longer than head, 2.8 (3.4) in SL.

**Color of freshly collected female holotype.** (Fig 6, upper) Bluish grey dorsally grading to pale grey on sides with irregular brown scribbling on back interspersed with small, irregular neon blue markings; mid-lateral row of four, short narrow black bars and large black spot (at caudal-fin base), enclosed within pair of orange-brown stripes, extending from pectoral fin to caudal-fin base; pair of neon blue stripes across cheek, alternating blue and brown bands on dorsal fins, and orange spots on upper half of caudal fin; opercle with three large blue



**Figure 5.** *Acentrogobius violarisi*, preserved holotype, WAM P.34319-004, female, 30.1 mm SL, Alotau, Papua New Guinea; lateral view of head with sensory pores and main rows of papillae indicated by white-edged spots and broken lines respectively. Nostrils are shown by black-edged white spots. Photograph by G.R. Allen.



**Figure 6.** *Acentrogobius violarisi*, underwater photograph of female holotype, WAM P.34319-004, 30.1 mm SL, (upper) and probable male (lower), approximately 40 mm SL, Alotau, Papua New Guinea. Photographs by G.R. Allen.

spots, forward-slanting blue band, and narrow blue posterior margin; lips and chin dusky brownish with orange suffusion; iris brownish dorsally, yellow medially, and bluish ventrally; lower margin of eye neon blue; first dorsal fin with three alternating bands of neon blue and orange-brown, filament of first spine with three alternating orange-brown and white sections; second dorsal fin blue with about six oblique rows of large orange brown spots (some coalesced) and orange-brown outer margin; anal fin dusky blackish with broad, whitish basal stripe; caudal fin bluish on dorsal two-thirds, grading to tannish ventrally, upper half of fin with about 25–30 orange spots; pelvic fin pale yellowish; pectoral fin translucent with pair of brown stripes on base.

**Color in life of male.** (from underwater photograph of uncollected individual, approximately 40 mm SL, Fig. 6, lower) Similar to female holotype described in previous paragraph except noticeably pale yellowish white on belly region and narrow dark bars along the middle of the side with ventral, posteriorly-directed extension, giving overall impression of L-shaped mark. Possibly this variation is a male feature.

**Color in alcohol.** (Fig. 4) Generally pale greyish tan with brown and black markings on side of body as described for the freshly collected holotype; pair of dusky brownish stripes across cheek; lower lip mainly dusky brown; side of snout dusky brown except nostrils whitish; pair of dark brown spots on middle section of operculum with silvery area between them; dorsal fins dusky brownish with oblique rows of faint pale spots on second dorsal; anal fin mainly dark brown except broad whitish stripe on basal portion; caudal fin with dusky brown membranes and pale tan rays, the dark membranes punctuated with large pale spots on upper half of fin; pelvic fins with dusky brown membranes and tan rays; pectoral fins translucent. General colouration of the paratypes is similar except the smallest (14.9 mm SL) has a mid-lateral row of four rounded spots, rather than short narrow bars.

**Distribution and habitat.** The new species is currently known only from the type locality, but further collecting in similar conditions across the East Indian region will likely extend the range. The habitat is essentially the same as described for *A. vanderloosi*. Fewer than 10 individuals of the new species were observed on the lower section of the slope in 15–18 m depth. Only widely scattered, solitary individuals were seen, and each was invariably associated with a muddy burrow.

**Etymology.** The species is named *violarisi* in honour of Julius Violaris, owner of Nawe Constructions at Alotau, for allowing uninterrupted access to the survey site that yielded the new species, and for his generosity in continuing to provide an excellent home base for the MV *Chertan*, the live-aboard dive vessel that served as the logistic centre for the trip on which the new species was collected.

**Comparisons.** The new species belongs to the same group of *Acentrogobius* species with longitudinal rows of sensory papillae on the cheek, an unrestricted gill opening extending forward to the level of the opercle/preopercle, and a single transverse row of papillae on the chin as discussed above in the Comparisons section for *A. vanderloosi*. It is especially distinguished from most congeners inhabiting the Indo-Australian Archipelago by its combination of 11 soft dorsal and anal-fin rays, a feature shared only by *A. cenderawasih* (Table 2). It is most similar to *A. cenderawasih* (Fig. 7), which is currently known from the Philippines (Luzon), Indonesia (West Papua), and the Solomon Islands (Kolombangara). These species have similar dorsal, anal, and pectoral-ray counts, as well as similar overall colour patterns. However, *A. violarisi* differs in having the first dorsal spine elongated, reaching the base of the fourth or fifth soft ray of the second dorsal fin when depressed, in contrast to *A. cenderawasih*, which has the first 4–5 spines with filamentous tips with the longest (third) reaching the caudal peduncle. Notable colour differences of *A. cenderawasih* include five horizontally elongate (versus vertically elongate), dark spots along the middle of the side, distinct alternating blue and brown bands (versus mainly a transparent fin with a single row of large, very faint brown spots) on the first dorsal fin, and scattered orange spots on the entire caudal fin (versus only on the upper half of the fin). Allen & Erdmann (2012) mistakenly reported 9 dorsal and anal-fin rays and 27–29 longitudinal scales for *A. cenderawasih* in the main text (page 953) of their treatment of East Indian reef fishes. However the correct counts of 11 dorsal and anal-fin rays and 32–33 longitudinal scales were given in the original description, which appeared on page 1166 of this same



**Figure 7.** *Acentrogobius cenderawasih*, underwater photograph, approximately 40 mm SL, Kolombangara, Solomon Islands. Photograph by R. & S. Churchill.

work. Additionally, there was no mention of the chin papillae in the original description, but examination of two paratypes of *A. cenderawasih* (WAM P.33045-012) indicates a single transverse row with nine papillae. The new species is also similar to *A. suluensis* (Fig. 8), which ranges from western Indonesia (Bali) and the Philippines, northward to the Ryukyu Islands. The two species have similar colour patterns, both including a mid-lateral row of five dark marks enclosed in a pair of parallel stripes between the pectoral and caudal-fin bases. However, the dark markings are horizontally-rectangular in *A. suluensis* compared to the four narrow vertically elongate bars and round spot (at caudal-fin base) of *A. violarisi*. Other colour differences of *A. suluensis* include a prominent dark, oblique band on the side of the snout, solid dark band on the opercle double row of large brown spots on the second dorsal fin, uniformly pale yellow anal fins, and a caudal fin with central blue streaks and a pale-edged red band along the dorsal edge. This species also differs in having a filamentous second dorsal spine (versus first spine in *A. violarisi*), nine (versus 11) dorsal and anal soft rays, and 0–9 (versus 12–13) predorsal scales. There is also an apparent size difference. Kuitert & Tonozuka (2001) reported a maximum total length of approximately 110 mm compared to a maximum observed size of about 50 mm for the new species. Similar to most members of the genus, *A. suluensis* inhabits relatively shallow water, usually less than five m depth, compared to the 15–18 m depth range of *A. violarisi*.



**Figure 8.** *Acentrogobius suluensis*, underwater photograph, approximately 50 mm SL, Bali, Indonesia. Photograph by T. Tonozuka.

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**Addendum.** Just prior to publication, two additional specimens of *Acentrogobius vanderloosi*, 44.0–73.7 mm SL, were collected by M.V. Erdmann at Batanta Island (0° 53.969'S, 130° 30.995'E), Raja Ampat Islands, West Papua Province, Indonesia. The specimens will eventually be deposited at WAM.

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