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Descriptions of two new gobies (Gobiidae: *Amblygobius*) from the tropical western Pacific Ocean

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Abstract

Two new species belonging to the Indo-Pacific gobiid genus *Amblygobius* are described from mud-bottom habitats. *Amblygobius calvatus* n. sp. is described on the basis of 9 specimens, 23.7–48.0 mm SL, from the El Nido area of northern Palawan in the Philippines. Diagnostic features for the new species include usual counts of 15 segmented dorsal and anal-fin rays, scales entirely cycloid, no scales on the head (including the side of the nape and upper opercle), 80–86 longitudinal body scales, 24–26 transverse body scales, a strongly lanceolate caudal fin, a grayish-brown color in life with two orange-brown stripes on the head and body, 8–11 small black spots or saddles on the upper back, a blackish moustache-like marking above the upper lip, a horizontally oval orange-brown spot on the opercle, and a white pectoral-fin base with a central, horizontally-elongate, reddish-brown marking. *Amblygobius cheraphilus* n. sp. is described from 11 specimens, 14.6–32.9 mm SL, collected near the town of Alotau in Milne Bay Province of Papua New Guinea. It differs from congeners on the basis of a combination of features, including usual counts of 13 segmented dorsal and anal-fin rays, scales entirely cycloid, no scales on the head except for the side of the nape, 56–60 longitudinal scales, 14–18 transverse scales, a moderately lanceolate caudal fin, a grayish color in life with two reddish-brown stripes on the head and body with the lower stripe containing a prominent oval dark-brown spot on the opercle and ending in a dark-brown spot on the caudal-fin base, a series of small brown saddles on the back and predorsal region, and a faint ocellus on the upper caudal-fin rays.

Key words: ichthyology, taxonomy, systematics, coral-reef fishes, new species, Indo-Pacific Ocean

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Introduction

The genus *Amblygobius* Bleeker, 1874 contains moderately sized (to about 15 cm TL) gobies found on coral reefs and adjacent mud or sand bottoms in the Indo-West Pacific Ocean. There are 12 recognized species in the genus (Eschmeyer *et al*. 2016), represented mainly in the East Indian region, where at least 10 species occur (Allen & Erdmann 2012). The group is defined by a combination of features including fused pelvic fins with a well-developed frenum, dorsal and anal fins not connected to the caudal fin, usually two separate dorsal fins with the first containing six thin and flexible spines, the first element of the second dorsal and anal fins unsegmented, cycloid or ctenoid scales covering the body, the cheek and opercle scaleless or with a few scales dorsally on the opercle, a single anterior interorbital pore, 2–3 rows of teeth in both jaws and a large curved canine on each side of the lower jaw, the gill-opening restricted (not free from the isthmus), specialized gill raker structures on the upper part of the first gill arch (Hoese & Allen 1977), and the head-papillae pattern composed of mainly transverse rows. A study of gobiid genetic relationships by Thacker & Roje (2011) found that *Amblygobius* is closely related to *Valenciennea* Bleeker, 1856 and *Signigobius* Hoese & Allen, 1977. They referred to these fishes as burrowing paired gobies, noting that adults form monogamous pairs that occupy and guard a territory centered around their burrow, and feed by sifting sand through their gill rakers.

The genus *Amblygobius* is divisible into two groups based on overall appearance and patterns of scalation. The majority of species are robust, relatively large, and characterized by the presence of ctenoid scales on most of the body, as well as cycloid scales on the median predorsal, the side of the nape, and the upper portion of the opercle. In contrast, *Amblygobius nocturnus* (Herre, 1945), which ranges widely in the Indo–Pacific (from the Persian Gulf to the Tuamotus), is a smaller, more slender species (usually less than about 6–7 cm TL) that lacks ctenoid scales and also lacks scales on the median predorsal and upper opercle. This species is possibly deserving of at least separate subgeneric recognition, in which case either *Yabotichthys* Herre, 1945 (type species *Y. nocturnus*) or *Diaphoroculius* Fowler, 1938 (type species *D. rangiroae* Fowler, 1938) are available. According to Hoese & Larson (in Eschmeyer *et al*. 2016), *D. rangiroae* is the senior synonym, although *A. nocturnus* is in current usage and we follow that precedent here, pending further morphological and genetic study of this widespread species.

The present study notes that *Amblygobius esakiae* Herre, 1939 from Indonesia, Papua New Guinea, and Palau shares similar scalation patterns with *A. nocturnus* and is thus likely a close relative. *Amblygobius* cf. *esakiae* also has been recorded from the southern Red Sea (see Plate 19 in Randall 1994), but this population likely represents an undescribed species based on both the differences in color pattern and the major geographic disjunction between the two populations. Two additional species collected by us, in the Philippines and Papua New Guinea, are also apparently members of the *A. nocturnus* species group and are herein described as new. The four members of this species group are illustrated in Fig. 1.

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) or total length (TL); 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

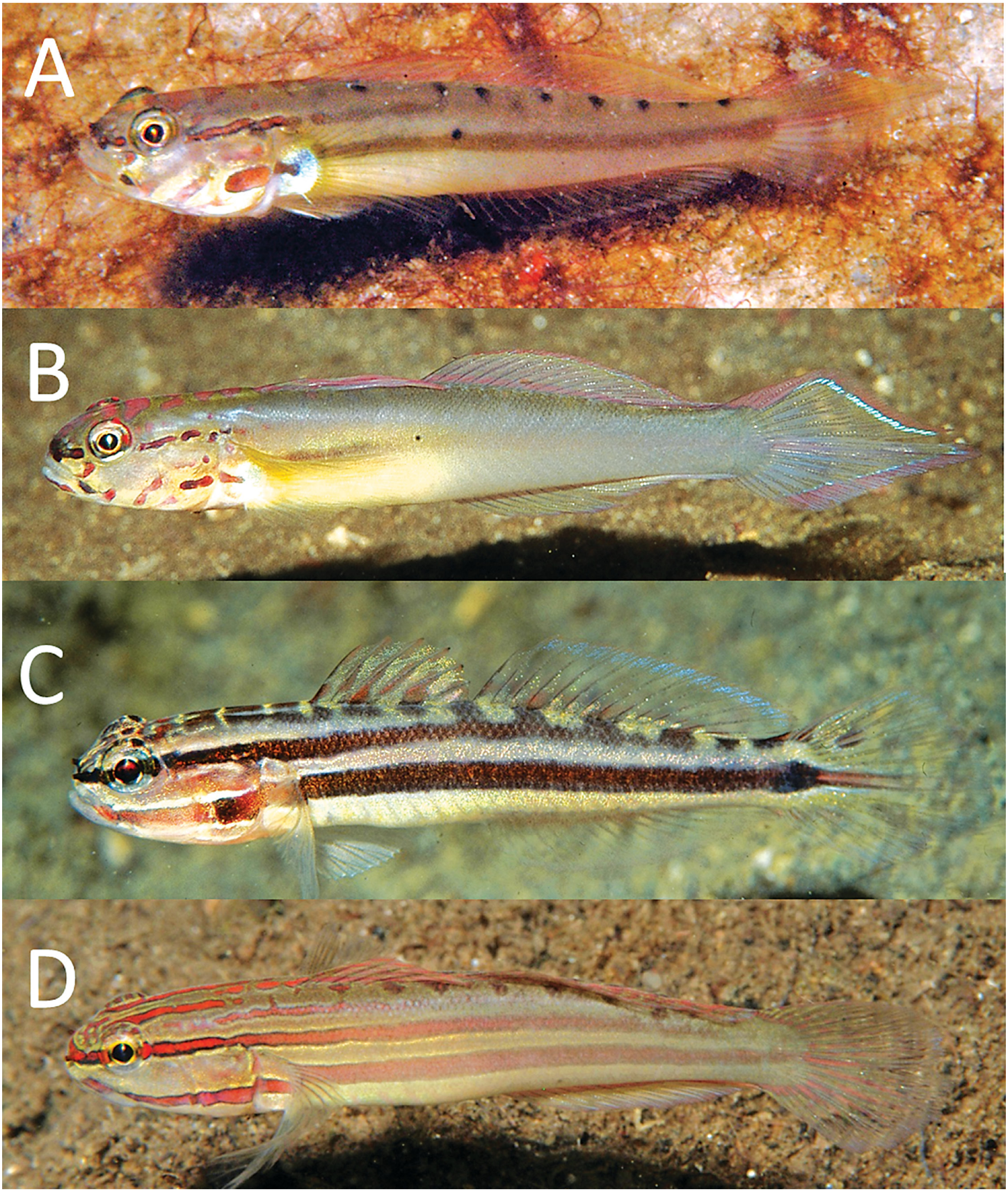

Figure 1. *Amblygobius nocturnus* species group: A) *A. calvatus* n. sp., Miniloc Island, Palawan, Philippines; B) *A. esakiae*, Bali, Indonesia; C) *A. cheraphilus* n. sp., Alotau, Papua New Guinea; D) *A. nocturnus*, Alotau, Papua New Guinea (all G.R. Allen).

posterior end of the maxilla; 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-fin soft ray.

Terminology and abbreviations for cephalic pores and papilla rows follow those presented by Akihito (1984). Cyanine Blue 5R (acid blue 113) stain was used to make pores and papillae more obvious (Saruwatari *et al*. 1997), and an airjet was used to further accentuate them.

Longitudinal scales are counted along the lateral midline from the first scale above the pectoral-fin base, continuing horizontally to the posterior edge of the hypural plate; transverse scales are counted along a vertical from the origin of the anal fin anterodorsally to the base of the first dorsal fin; circumpeduncular scales were counted in a vertical zigzag row around the caudal peduncle, immediately anterior to the caudal-fin base; gill rakers are counted on the first gill arch, those on the upper limb listed first; rudiments are included in the counts. Digital x-rays were utilized for vertebral counts.

Morphometric data presented as percentages of the standard length are included in Tables 1 & 2. The range of counts and measurements for paratypes is indicated in parentheses, if different from the holotype. Type specimens are deposited at the National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM) and the Western Australian Museum, Perth (WAM).

Amblygobius calvatus, n. sp.

Baldhead Siltgoby

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Figures 1A–4; Table 1.

Amblygobius sp. Allen & Erdmann 2012: 957 (El Nido, Palawan, Philippines).

Holotype. WAM P.32885-002, male, 42.6 mm SL, Big Lagoon, Miniloc Island, off El Nido, northern Palawan, Philippines, 11º09.226’ N, 119º19.300’ E, 18–20 m, clove oil, M.V. Erdmann, 14 June 2009.

Paratype. USNM 432516, 2 specimens, 37.6–42.9 mm SL; WAM P.32885-013, 6 specimens, 23.7–48.0 mm SL), all collected with holotype.

Diagnosis. Dorsal-fin rays VI + I,14–15; anal-fin rays I,15–16; caudal fin strongly lanceolate, longer than head length; longitudinal scales 80–86; transverse scales 24–26; body scales entirely cycloid; no scales on head,

Figure 2. *Amblygobius calvatus*, preserved holotype, male, 42.6 mm SL, Miniloc Island, northern Palawan, Philippines (G.R. Allen).

Figure 3. *Amblygobius calvatus*, underwater photograph, approx. 47 mm SL, Miniloc Island, northern Palawan, Philippines (G.R. Allen).

including side of nape and upper opercle; color in life grayish-brown with two orange-brown stripes on head and body, upper stripe short, ending before soft dorsal fin, lower stripe from horizontally ovate, orange-brown spot on opercle, continuing as a pale body stripe from upper pectoral-fin base to middle of caudal-fin base; pale pectoral-fin base with small, rectangular dark orange-brown spot across middle portion; a series of 8–11 small black spots or saddles on upper back.

Description. Dorsal-fin rays VI + I,15 (one paratype with VI + I,14); anal-fin rays I,15 (one paratype with I,16); pectoral-fin rays 20 (19–20); pelvic-fin rays I,5; all dorsal, anal, pectoral, and pelvic-fin soft rays branched, except upper and lowermost 2–3 pectoral-fin rays; segmented caudal-fin rays 17; branched caudal-fin rays 13; upper unsegmented caudal-fin rays 6 (6–7): lower unsegmented caudal-fin rays 6 (4–7); longitudinal scales about 80 (80–86); transverse scales 24 (24–26); predorsal scales absent from side of nape; prepelvic scales (embedded) 9 (8–10); circumpeduncular scales 24 (24–25); gill rakers on first branchial arch 0 + 6; vertebrae 10 + 16=26 (4 specimens).

Body elongate and laterally compressed, more so posteriorly; body depth at pelvic-fin base 5.4 (5.0–5.5) in SL; body depth at anal-fin origin 6.2 (5.7–6.4) in SL; head length 3.5 (3.1–3.5) in SL; head width 1.2 (1.1–1.2) in HL; head depth 1.7 (1.7–1.8) in HL; snout short and rounded, length 4.3 (4.3–5.4) in HL; eye diameter 3.7 (3.6–4.3) in HL; interorbital width 2.1 (1.7–3.0) in eye diameter; distance between snout and origin of first dorsal fin 3.2 (3.0–3.5) in SL, between snout and origin of second dorsal fin 1.9 (1.8–2.0), between snout and origin of anal fin 1.6 (1.6–1.7), and between snout and origin of pelvic fins 3.2 (2.9–3.5), all in SL.

Mouth terminal, jaws extending to a vertical at anterior edge of eye; jaw teeth mainly small and villiform, those of lower jaw in three rows, middle row smallest, and those of outer row consisting of about 10 teeth, including a pair of enlarged posteriorly-curved canines posteriorly on each side; upper jaw teeth also in three rows, those of inner two rows about equal-sized, outer row consisting of two widely-spaced canines on each side; tongue broad with rounded anterior margin, broadly attached anteriorly to floor of mouth; anterior extent of gill opening below rear portion of opercle (Fig. 4); pattern of papillae and sensory pores on head as shown in Fig. 4; 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').

Cycloid scales covering body, gradually increasing in size posteriorly, those on prepelvic region and side of breast embedded; no scales on cheek, operculum, and entire nape region; no dermal crest, barbels, or preopercular spines present on head.

First-dorsal-fin origin behind bases of pelvic and pectoral fins by distance about equal to pupil diameter; dorsal-fin spines thin and flexible, gradually increasing in length to fourth and fifth spines, first dorsal-fin spine 2.6 (2.6–3.2), second dorsal-fin spine 2.1 (2.1–2.7), fourth dorsal-fin spine 1.7 (1.7–2.2), all in HL; spine of

TABLE 1

Proportional measurements (as percentage of SL)
for type specimens of *Amblygobius calvatus*

	holotype	paratypes						
	WAM P.32885	WAM P.32885	WAM P.32885	USNM 432516	USNM 432516	WAM P.32885	WAM P.32885	WAM P.32885
	male	male	male	female	female	male	male	female
Standard length	42.6	48	42.1	42.9	37.6	33	31.2	30.2
Head length	28.8	31.1	31.8	28.8	30.4	29	31	29.1
Head width	14.5	16.3	15.8	14.3	15.1	14.9	15.5	15.6
Head depth	17.2	18.8	18.4	16.1	17.3	16.6	17.2	17.1
Body depth at pelvic origin	18.6	20	18.8	18.1	18.6	18.2	20	18.9
Body depth at anal origin	16.3	16.7	16.7	15.7	15.9	16.7	17.6	15.8
Caudal-peduncle depth	9.7	10.2	9.9	10.4	10.6	10.2	11.3	10.1
Caudal-peduncle length	14.2	14	16.4	15.8	12.8	12.9	12.2	13.6
Snout length	6.6	6.3	6.4	6.6	6.4	6.1	7.3	5.4
Eye diameter	7.9	7.4	7.4	6.7	7.5	7.6	8.2	8.2
Interorbital width	3.7	3.4	3.6	4.1	3	2.8	3.4	2.7
Cheek depth	8.6	8.7	9	9	8.6	9.1	9.2	9.9
Upper jaw length	9.6	10	9.8	10.4	10.4	10.2	11.1	30.6
Snout to 1st dorsal-fin origin	31.7	28.8	31.1	32.1	32	33.8	33.7	32.4
Snout to 2nd dorsal-fin origin	51.7	49.7	53.1	53	53	54.8	55.2	52.1
Snout to anal-fin origin	61.7	59.5	60	60.2	59.9	59.7	60.6	60.7
Snout to pelvic-fin origin	31.6	32.6	32.5	32.9	34.4	30.2	28.9	29.6
Base of dorsal fins	53.9	53.6	55.2	54.8	53.3	54	54.7	50.9
First dorsal spine	11	11.5	12	10.4	9.6	9.6	11	10.7
Second dorsal spine	13.4	13.2	14.5	13.5	12	10.8	12.9	11.9
Fourth dorsal spine	16.6	18.3	18.4	17.4	15	13.2	14.3	14.6
Spine of second dorsal fin	11.8	12	13.2	12.7	10.3	11.5	11	9.5
Longest soft dorsal-fin ray	16.5	18.2	20.6	17	16.9	14.6	14.9	15
Anal-fin spine	6.5	7.4	7.1	6.9	6.5	7	8.1	6.2
Longest soft anal-fin ray	15	16.7	17.7	16.6	16.8	13.6	14.4	14.2
Pectoral-fin length	24.4	25.6	27.3	26.9	25.2	24.4	27.5	25.3
Pelvic-fin length	19.9	20.6	19.9	18.7	18.1	18.3	19.4	17.5
Pelvic-fin spine	6.6	7.3	7.8	6.5	6.6	5.6	6.8	6.4
Caudal-fin length	36.8	37	42.3	39.8	33.4	34.5	34.3	31.5

second dorsal fin 2.4 (2.3–3.1) in HL; longest (penultimate) segmented ray of second dorsal fin 1.7 (1.5–2.1) in HL; anal-fin spine 4.4 (3.8–4.7) in HL and longest (penultimate) segmented ray of anal fin 1.9 (1.7–2.2) in HL; pectoral fin pointed, middle rays longest, 4.1 (3.6–4.1) in SL; pelvic fins completely connected by membrane, with well-developed frenum; pelvic-fin length 5.0 (4.9–5.7) in SL; caudal fin strongly lanceolate, longer than head, its length 2.7 (2.4–3.2) in SL.

Color in life. (Figs. 1A & 3) Generally grayish brown, grading to yellowish tan on breast and abdomen; two orange-brown stripes on head and body; upper stripe short, more orange anteriorly with narrow dark-brown margin, fading rapidly and ending below origin of soft dorsal fin; lower stripe starting as a prominent, horizontally ovate, red-brown spot, much larger than pupil, on opercle, continuing as a central horizontally-elongate, orange-brown marking on pectoral-fin base, then extending back to middle of caudal-fin base, broader and darker than upper stripe and more-or-less uniform in width, except slightly expanded at caudal-fin base; oblique pink band on posterior cheek and another abbreviated pink band just behind rear corner of mouth; black-edged red spot just below posterior nostril and blackish-rimmed anterior nostrils; reddish spot on preorbital and dark brown rectangular marking on posterior portion of upper lip; narrow white-to-pinkish ring around pupil, iris grayish with orange hue on middle portion and brown streak on dorsal rim; a series of about 8–11 dark brown spots or saddles along upper back below dorsal fins to upper caudal-fin base, saddle markings continued forward on predorsal region as 4–5 larger reddish saddles, anteriormost just behind eyes; several small brown-edged red spots on side of nape; dorsal and anal fins with semi-translucent membranes and reddish rays, dorsal fins with red outer margin, and anal fin with red basal stripe; caudal fin semi-translucent with reddish rays, red on outer margin dorsally with blue submarginal streak; pelvic fins pale yellowish with white spine; pectoral fins semi-translucent, base white or pale bluish.

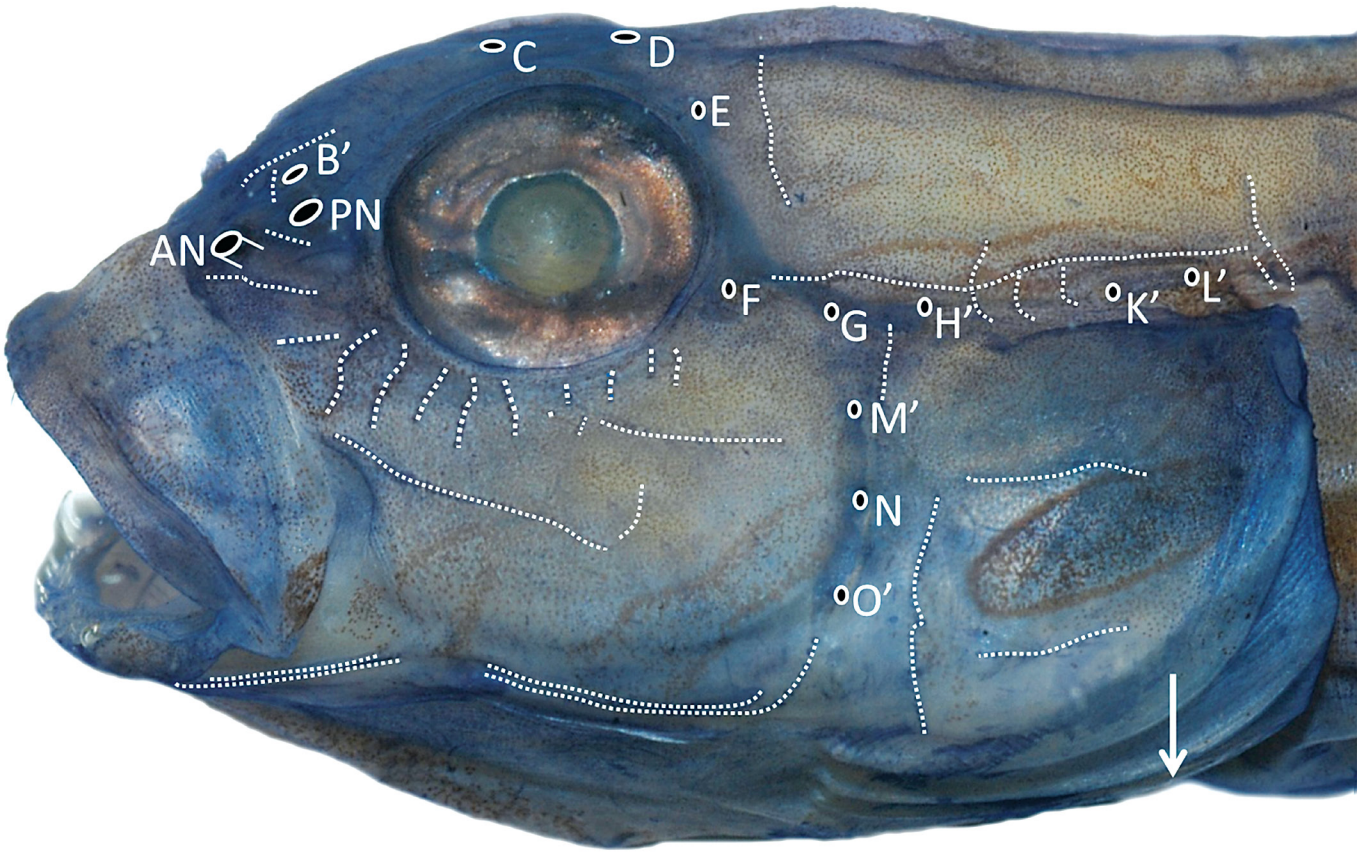

Figure 4. *Amblygobius calvatus*, preserved paratype, lateral head, 42.9 mm SL, Miniloc Island, northern Palawan, Philippines: sensory pores marked as white-ringed spots B' through O'; main rows of papillae indicated by dotted lines ; anterior and posterior nostrils labelled AN and PN; arrow denotes point of gill-membrane attachement. Specimen stained with cyanine blue. (G.R. Allen).

Color in alcohol. (Fig. 2) Generally tan with at least trace of dark markings described above, including stripes on head and body, spots or saddles on nape and upper back, large spot on opercle, smaller spot on pectoral-fin base, oblique bands on cheek, and markings on snout; fins semi-translucent without markings.

Etymology. The new species is named *calvatus* (Latin: bald), with reference to its lack of scales on the entire nape region.

Distribution and habitat. The new species is currently known only from the type specimens collected at Miniloc Island, near El Nido on northern Palawan, Philippines. A photograph by GRA from Chuuk in Micronesia may belong to the same species. The species likely ranges widely in the East Indian region and western Pacific Ocean. The habitat consists of silt-mud substratum in highly sheltered bays and lagoons at depths from about 10–20 m. Loosely scattered, mainly solitary individuals were encountered at the type locality. The fish were invariably associated with muddy burrows into which they retreated when closely approached by divers.

Comparisons. The new species is most similar in appearance to *A. esakiae* (see Fig. 1B), but differs in lacking scales on the entire nape region and upper operculum (versus scales on both sides of the mid-dorsal portion of the nape and upper operculum). Color-pattern differences include the fully developed midlateral stripe in *A. calvatus* vs. a partial stripe in *A. esakiae* restricted to the anterior portion of the body (at least in adults). In addition, the opercular spot of *A. calvatus* is larger and oval shaped vs. a narrow band on *A. esakiae*.

Amblygobius cheraphilus, n. sp.

East Indies Siltgoby

urn:lsid:zoobank.org:act:CE50F749-42D3-4738-8554-75CA9C877E65

Figures 1C, 5–7; Table 2.

Amblygobius sp. 1 Kuiter & Tonozuka 2001: 663 (Bali and Flores, Indonesia).
Amblygobius sp. 1 Senou *et al*. 2004: 380 (Iriomote Isl., Ryukyu Islands, Japan and unspecified Indonesian locality).

Holotype. WAM P.34525-001, female, 32.9 mm SL, Alotau, Papua New Guinea, off Nawae Constructions shipyard, 4.8 km west of main Alotau wharf, 10º18.256' S, 150º24.768' E, 14.5 m, clove oil, G.R. Allen & M.V. Erdmann, 29 March 2016.

Paratypes. USNM 432517, 4 specimens, 14.5–26.9 mm SL, Alotau, Papua New Guinea, off Driftwood Resort, 3.6 km west of main Alotau wharf, 10º18.661' S, 150º25.336' E, 6–10 m, clove oil, G.R. Allen, 2 June 2016; WAM P.34525-002, 6 specimens, 22.9–27.4 mm SL, collected with holotype.

Figure 5. *Amblygobius cheraphilus*, preserved holotype, female, 32.9 mm SL, Alotau, Papua New Guinea (G.R. Allen).

Diagnosis. Dorsal-fin rays VI + I,13–14; anal-fin rays I,13–14; caudal fin moderately lanceolate, slightly longer than head length in adult; longitudinal scales 56–60; transverse scales 15–17; body scales entirely cycloid; no scales on head except side of nape with 14–18 rows of cycloid scales; color in life grayish with two dark reddish-brown stripes on head and body; upper stripe across snout, through mid-eye, ending below middle of soft dorsal fin; lower stripe from rear maxilla to middle base of caudal fin with portion on opercle containing a prominent oval dark-brown spot (usually larger than pupil) and stripe ending in a prominent triangular dark-brown spot on caudal-fin base; small brown saddles along back and across predorsal region; small (slightly less than pupil size) ocellus on upper rays of caudal fin.

Description. Dorsal-fin rays VI + I,13 (2 paratypes with VI + I,14); anal-fin rays I,13 (one paratype with I,14); pectoral-fin rays 20 (paratypes with 18 except one specimen with 17 on one side, another with 19 on one side, and another with 19 on both sides); pelvic-fin rays I,5; all dorsal, anal, pectoral and pelvic soft rays branched, except upper and lowermost 2–3 pectoral-fin rays; segmented caudal-fin rays 17; branched caudal-fin rays 13; upper unsegmented caudal-fin rays 7 (5–7): lower unsegmented caudal-fin rays 6 (4–7); longitudinal scales 59 (56–59); transverse scales 15 (15–17); predorsal scale rows on side of nape 18 (14–18); prepelvic scales (embedded) 8 (7–10); circumpeduncular scales 19 (19–20); gill rakers on first branchial arch 0 + 6; vertebrae 10+16 = 26 (4 specimens).

Body elongate and laterally compressed, more strongly posteriorly; body depth at pelvic-fin base 4.8 (4.7–5.2) in SL; body depth at anal-fin origin 5.3 (5.2–5.8) in SL; head length 3.8 (3.4–3.8) in SL; head width 1.3 (1.1–1.3) in HL; head depth 1.3 (1.5–1.6) in HL; snout short and rounded, length 4.8 (4.5–5.8) in HL; eye diameter 3.0 (2.9–3.8) in HL; interorbital width 4.4 (4.1–5.7) in eye diameter; distance between snout and origin of first dorsal fin 3.1 (2.9–3.2) in SL, between snout and origin of second dorsal fin 1.8 (1.8–1.9), between snout and origin of anal fin 1.5 (1.6–1.7), and between snout and origin of pelvic fins 3.2 (3.0–3.6), all in SL.

Mouth terminal, jaws extending to a vertical at anterior edge of eye; jaw teeth mainly small and villiform, those of lower jaw in three rows, middle row smallest, and those of outer row consisting of about 10 teeth,

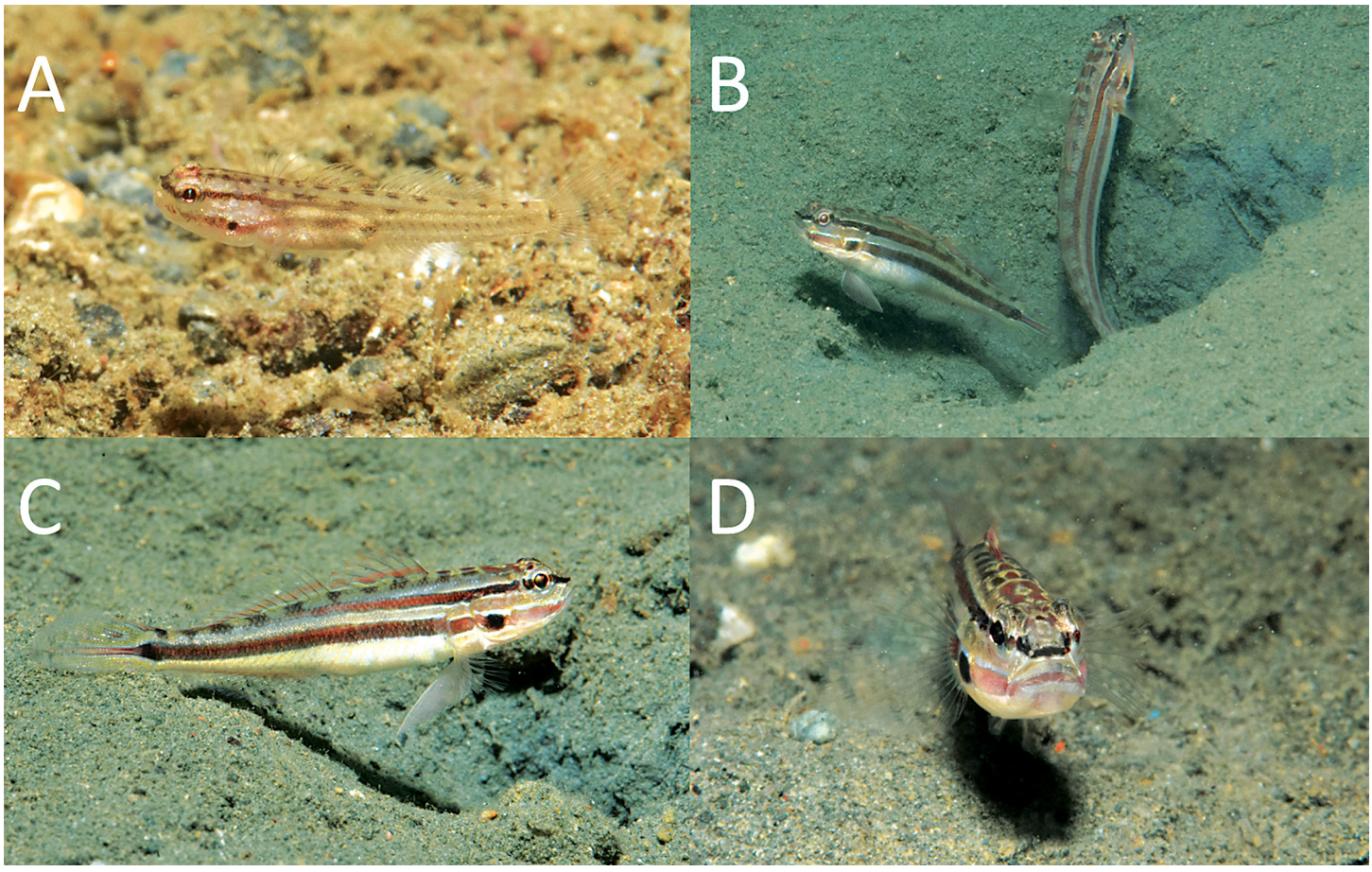

Figure 6. *Amblygobius cheraphilus*, underwater photographs, Alotau, Papua New Guinea: A) juvenile, approx. 10 mm TL; B) pair in burrow, approx. 35 mm SL; C) lateral view & D) head-on view, approx 32 mm SL (G.R. Allen).

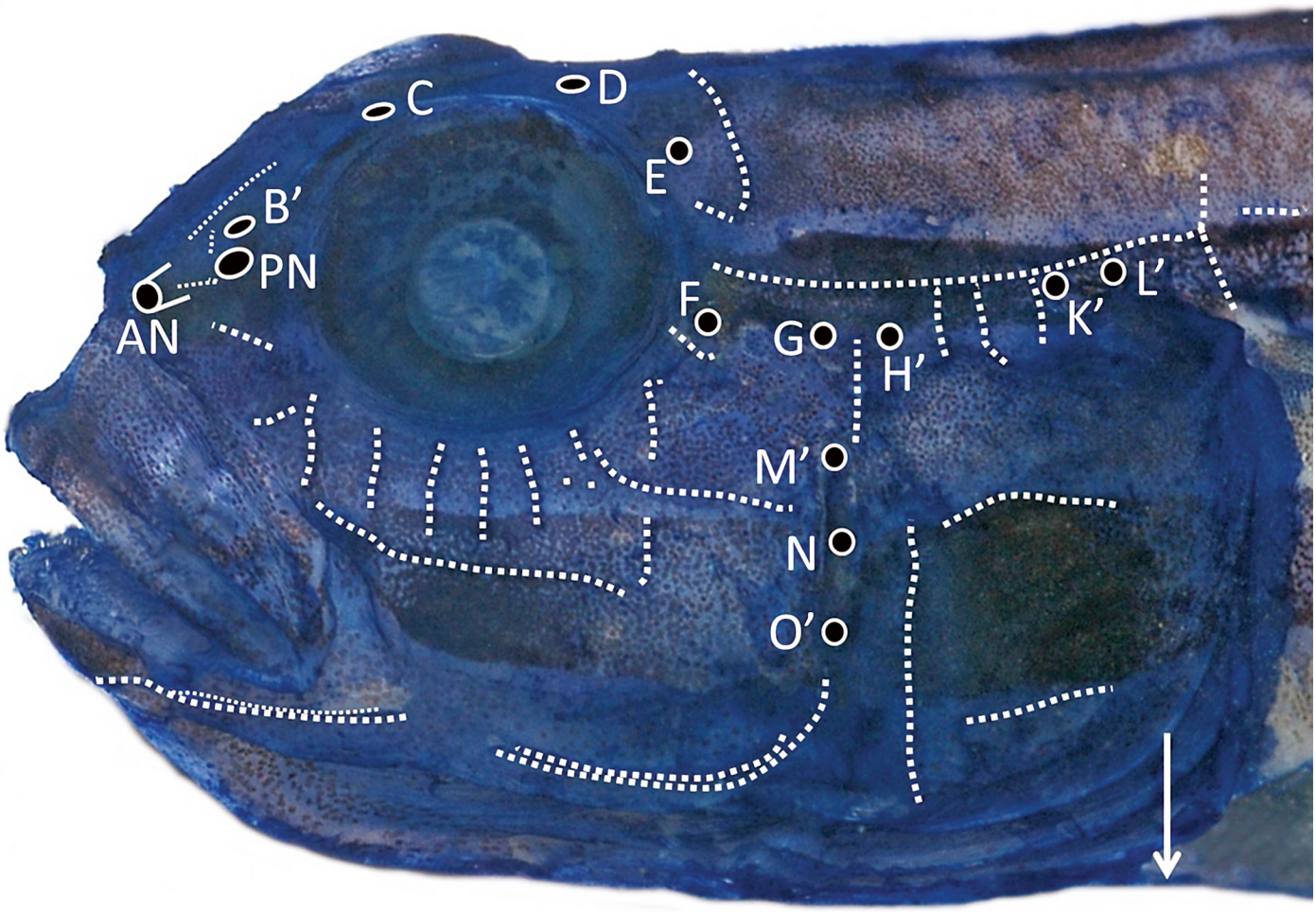

Figure 7. *Amblygobius cheraphilus*, preserved holotype, lateral head, 32.9 mm SL, Miniloc Island, northern Palawan, Philippines: sensory pores marked as white-ringed spots B' through O'; main rows of papillae indicated by dotted lines ; anterior and posterior nostrils labelled AN and PN; arrow denotes point of gill-membrane attachement. Specimen stained with cyanine blue. (G.R. Allen).

including a pair of enlarged posteriorly-curved canines posteriorly on each side; upper jaw teeth also in three rows, those of inner two rows about equal sized, outer row consisting of two widely-spaced canines on each side; tongue broad with rounded anterior margin, broadly attached anteriorly to floor of mouth; anterior extent of gill opening below rear portion of opercle (Fig. 7); pattern of papillae and sensory pores on head as shown in Fig. 7; 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').

Cycloid scales covering body, gradually increasing in size posteriorly, those on prepelvic region and side of breast embedded; no scales on cheek, operculum, and mid-dorsally on nape; cycloid scales on side of nape extending forward to level of middle of opercle; no dermal crest, barbels, or preopercular spines present on head.

First-dorsal-fin origin behind bases of pelvic and pectoral fins by distance about equal to pupil diameter; dorsal-fin spines thin and flexible, gradually increasing in length to fourth or fifth spines, first dorsal-fin spine 2.2 (2.2–3.1), second dorsal-fin spine 1.9 (1.9–2.7), fourth dorsal-fin spine 1.7 (1.7–2.3), all in HL; spine of second dorsal fin 3.0 (2.3–3.3) in HL; longest (penultimate) segmented ray of second dorsal fin 1.6 (1.6–1.8) in HL; anal-fin spine 4.5 (3.5–5.4) and longest (penultimate) segmented ray of anal fin 2.3 (1.6–2.2) in HL; pectoral fin pointed, middle rays longest, 3.7 (3.5–3.9) in SL; pelvic fins completely connected by membrane, with well-developed frenum; pelvic-fin length 3.8 (3.7–4.6) in SL; caudal fin moderately lanceolate, slightly longer than head, its length 3.1 (3.0–3.5) in SL.

TABLE 2

Proportional measurements (as percentage of SL)
for type specimens of *Amblygobius cheraphilus*

	holotype	paratypes								
	WAM P.34525	WAM P.34525	WAM P.34525	WAM P.34525	WAM P.34525	USNM 432517	WAM P.34525	USNM 432517	USNM 432517	WAM P.34525
	female	female	male	male	male	female	male	male	male	male
Standard length	32.9	29.9	27.4	27.3	27.3	26.9	26.7	26.6	24.7	22.9
Head length	26.3	27.4	26.6	29.3	27.4	28.3	27.7	29.4	28	28.4
Head width	15.9	14.3	15.7	16.9	16	14.3	16.3	15.3	15.6	14.4
Head depth	20.1	17.1	17.5	18.6	18.8	19.1	19	19.9	18.8	18.5
Body depth at pelvic origin	20.9	20.8	19.5	20.2	19.7	21.3	20.3	20.1	19.3	19.6
Body depth at anal origin	19	19.2	17.4	19.1	19.2	17.3	19.2	19.1	17.5	17.7
Caudal-peduncle depth	9.2	10.1	9.5	10.8	10.4	10	10.6	10.3	10.9	10.9
Caudal-peduncle length	13.2	14.4	13.3	13.5	14.1	16.2	13.4	14.2	14.6	15.3
Snout length	5.5	5.1	5.8	5.2	4.7	5.8	5.2	6.5	6.3	5.7
Eye diameter	8.7	8.2	9.1	8.3	7.6	9.7	7.4	9.5	8.9	8.8
Interorbital width	2	1.7	2.2	1.8	1.8	1.9	1.8	1.8	2	1.5
Cheek depth	9.5	9.8	9.2	8.5	9.2	8.9	10.2	9.1	8	8.7
Upper jaw length	9.6	10.1	10.3	10.4	10.3	10.7	11	10.4	10.7	10.1
Snout to 1st dorsal-fin origin	32.6	32.8	31.4	32	32.4	33.4	32.7	33.4	34.2	34.2
Snout to 2nd dorsal-fin origin	55.8	56.3	53.5	52.8	53.7	56.2	52.6	55.7	54	54
Snout to anal-fin origin	65.1	63.3	58.6	59.1	59.5	62.3	59.6	61.1	59.1	60.1
Snout to pelvic-fin origin	30.9	33.3	27.8	28.4	29	30.3	30.7	30.9	31.7	30.6
Base of dorsal fins	52.5	50.7	49.8	52.5	51.3	51.1	52.7	53.3	52.7	56.4
First dorsal spine	11.9	10.1	10.9	9.4	10.2	11.8	11.2	10.2	12.6	10
Second dorsal spine	13.8	13.9	13.7	11	12.3	14.1	13.9	11.6	14.6	13.1
Fourth dorsal spine	15.2	15.9	14.6	12.7	13.9	15.2	16.5	14.2	16.8	15.7
Spine of second dorsal fin	8.8	8.2	10.4	9.2	11.7	10.8	11.1	11	11.6	10.5
Longest soft dorsal-fin ray	16.2	15.4	15	18.2	15.6	15.6	15.8	17.6	17.4	15.9
Anal-fin spine	5.9	5.1	6.9	6	5.5	7.1	6.7	6.1	8.1	6.8
Longest soft anal-fin ray	11.4	12.7	15.4	13.5	13.2	17.1	17.3	17.1	18.8	15.9
Pectoral-fin length	26.7	27.3	25.9	29	27.5	28.1	28.1	27.1	27.3	26.6
Pelvic-fin length	26.4	27.1	23.1	27.3	24.1	26.1	21.2	22	21.8	21.7
Pelvic-fin spine	8.6	7.7	9.3	8.3	9	8.6	7.8	9.2	7.9	8.3
Caudal-fin length	31.9	28.7	30.2	30.3	30.8	32.5	32.2	32.8	33.9	31.6

Color in life. (Figs. 1C & 6) Generally pale gray to tan, grading to white or yellowish-white on breast and abdomen; two primary reddish-brown to dark-brown stripes on body; upper stripe from snout tip (joining stripe of opposite side above upper lip) to below mid-portion of soft dorsal fin, gradually tapering and becoming less distinct posteriorly; lower stripe from rear maxilla to base of caudal fin, broader than upper stripe and more-or-less uniform in width, usually darker than upper stripe, except notably pinkish across lower cheek, portion on opercle forming a prominent oval dark-brown spot, usually larger than pupil, stripe ending in triangular, dark-brown marking at middle base of caudal fin; primary head stripes usually with narrow pearl-white margins, most prominent on upper edge of lower stripe; additional broad dusky pinkish stripe on head between primary stripes, extending from below eye to slightly beyond level of pectoral-fin base; narrow orange to pinkish ring around pupil, iris grayish with dark-brown stripe through middle portion and brown markings on dorsal rim; series of eight dark-brown saddles along upper back below dorsal fins to upper caudal-fin base, those on posterior half of body merged with upper primary body stripe; markings continued forward on predorsal region as three tripartite, red-brown saddles, ending with doughnut-shaped marking (about eye-sized) immediately behind interorbital; fins mainly semi-translucent except basal part of both dorsal fins with faint pinkish stripe, and caudal fin with small (slightly less than pupil size) pinkish-brown ocellus on upper rays, about one-quarter distance out on fin, and faint tapering extension of lower primary body stripe onto middle portion of fin.

Color in alcohol. (Fig. 5) Generally pale gray with brown primary head and body stripes and saddle-like markings on upper back; dark brown spot on opercle and at base of caudal fin particularly conspicuous; fins semi-translucent except dusky brownish stripe on basal portion of both dorsal fins and faint remnant of ocellus on upper caudal fin.

Etymology. The new species is named *cheraphilus* (Greek: mud-loving) with reference to its mud and silt habitat.

Distribution and habitat. The new species is currently known from the type specimens collected at Alotau in Milne Bay Province of Papua New Guinea, and also on the basis of photographs from the Ryukyu Islands of Japan (Senou *et al*. 2004), the islands of Bali and Flores in Indonesia (Kuiter & Tonozuka 2001), and Yap in Micronesia (photograph by GRA). It probably ranges widely in the East Indian region, but has been either overlooked due to its seldom-dived habitat or has been confused with the similar *A. nocturnus*. The preferred habitat consists of soft mud substratum, sometimes near freshwater-stream mouths, at depths between about 2–12 m. Occasional solitary individuals and pairs were encountered at the type locality. The fish were invariably associated with a muddy burrow, into which they retreated when approached at close range.

Comparisons. The new species is most similar to *A. nocturnus* (Fig. 1D), with which it co-occurs. However, it differs noticeably by the prominent oval dark-brown spot on the opercle and the prominent dark spot at the caudal-fin base, a secondary dusky pinkish stripe on the head between the darker primary stripes, the faint ocellus on the upper caudal fin, and slightly larger scales (56–60 in longitudinal series versus 63–72). The new species also lacks the red head stripes, on either side of the median predorsal zone, which are diagnostic for *A. nocturnus*. According to Kuiter & Tonozuka (2001), the Indonesian examples of A. *cheraphilus* attain an estimated 95 mm TL, larger than *A. nocturnus*, which reaches about 70 mm TL (Allen & Erdmann 2012). However, we have only seen small specimens of A. *cheraphilus* (< about 40 mm TL) in Papua New Guinea.

Material Examined: (all WAM) *Amblygobius decussatus*: P.25238-004, 2 specimens, 24-41 mm SL, Ambon, Indonesia, 03°35’ S, 128°10’ E; P.31138, 33 mm SL, Kimbe Bay, New Britain, Papua New Guinea, 05°26’ S, 150°05’ E. *Amblygobius esakiae*: P.29595-032, 4 specimens, 36–43 mm SL, Madang, Papua New Guinea, 05°10’ S, 145°48’ E; P.31544-001, 55 mm SL, Mansuar Island, Raja Ampat Islands, West Papua Province, Indonesia, 00°37’ S, 130°33’ E; P.31557-004, 47 mm SL, Waigeo Island, Raja Ampat Islands, West Papua Province, Indonesia, 00°18’ S, 130°56’ E. *Amblygobius nocturnus*: P.27660-028, 2 specimens, 27–32 mm SL, Rowley Shoals, Western Australia, 17°18’ S, 119°22’ S; P.27662-035, 28 mm SL, Rowley Shoals, Western Australia, 17°18’ S, 119°22’ S; P.27666-040, 33 mm SL, Rowley Shoals, Western Australia, 17°06’ S, 119°37’ S; P.28021-068, 5 specimens, 20–35 mm SL, Rowley Shoals, Western Australia, 17°18’ S, 119°22’ S; P.29595-033, 38 mm SL, Madang, Papua New Guinea, 05°10’ S, 145°48’ E; P.30309-007, 30 mm SL, Cassini Island, Western Australia, 13°56’ S, 125°37’

E; P.30310-018, 3 specimens, 40–44 mm SL, Institut Islands, Western Australia, 14°09' S, 125°39' E; P.30397-055, 39 mm SL, Manukan Island, Sabah, Malaysia, 05°58' N, 116°00' E; P.30398-005, 42 mm SL, Gaya Island, Sabah, Malaysia, 06°10' N, 116°01' E; P.30412-033, 2 specimens, 31–38 mm SL, Bohaydulong Island, Sabah, Malaysia, 04°36' N, 118°47' E; P.30684-020, 4 specimens, 33–51 mm SL, Monte Bello Islands, Western Australia, 20°28'06" S, 115°32'42" E; P.31196-004, 3 specimens, 20–37 mm SL, Hibernia Reef, Timor Sea, 11°59' S, 123°22' E; P.31436-067, 30 mm SL, Ashmore Reef, Timor Sea, 12°15' S, 122°58' E; P.31503-010, 3 specimens, 17–28 mm SL, Peleng Island, Banggai Islands, Sulawesi, Indonesia, 01°39' S, 123°10' E; P.31653-007, 33 mm SL, Cassini Island, Western Australia, 13°55' S, 125°38' E; P.33277-012, 29 mm SL, Adele Island, Western Australia, 15°33.464' S, 123°08.041' E; P.33288-055, 2 specimens, 32–40 mm SL, Montgomery Reef, Western Australia, 16°00.865' S, 124°10.389' E.

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