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Valenciennea yanoi, a new gobiid fish from the Ryukyu Islands, Japan (Teleostei: Gobiidae)

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Abstract

The gobiid fish *Valenciennea yanoi* n. sp. is described from two specimens collected in 13–20 m at Iriomote Island, Ryukyu Islands, Japan. Diagnostic features include the combination of a low first dorsal fin with a rounded margin, no black spot on the dorsal fin, 12 second-dorsal and anal-fin soft rays, no black spot and no yellow stripe on the snout, no black spot on the upper part of the eye, three narrow vivid sky-blue stripes on the lateral side of the head, and two broad orange and yellow stripes on the body reaching to the rear margin of the caudal fin. The new species is most similar to *Valenciennea parva* Hoese & Larson, 1994, but differs by lacking black spots on the snout and eye and by having broader orange and yellow stripes which reach the rear margin of the caudal fin.

Key words: taxonomy, ichthyology, systematics, coral-reef fishes, gobies, Pacific Ocean.

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Introduction

The species of *Valenciennea* (Perciformes: Gobioidei: Gobiidae) inhabit subtropical and tropical regions of the Pacific and Indian Oceans, where they live on sand or mud bottoms of coastal coral reefs. They excavate their burrows in the sediment by mouth. Most species are found as male-female pairs, sharing a burrow. Members of the genus possess the following combination of diagnostic characters: completely separate pelvic fins; reduced gill rakers on the first arch; large fleshy flaps dorsally on the gill arch; a single row of teeth in the upper jaw; 62–142 longitudinal scale series; second-dorsal and anal-fin counts of I,11–19; relatively large adult body size (for gobies), from 30 to about 160 mm SL; and usually one or more stripes on the head and often on the body (Hoese & Larson 1994).

The genus *Valenciennea* was described by Bleeker (1856) for the type species *Gobius strigatus* Broussonet, 1782, and is now known to contain the following 15 valid species (Hoese & Larson 1994): *Valenciennea alleni* Hoese & Larson, 1994 from Australia; *V. bella* Hoese & Larson, 1994 from Indonesia, Philippines, and the Ryukyu Islands; *V. decora* Hoese & Larson, 1994 from the southwestern Pacific; *V. helsdingenii* (Bleeker, 1958) from the Red Sea and Indo-West Pacific; *V. immaculata* (Ni, 1981) from the western Pacific; *V. limicola* Hoese & Larson, 1994 from the western Pacific; *V. longipinnis* (Lay & Bennett, 1839) from the Indo-West Pacific; *V. muralis* (Valenciennes, 1837) from the Indo-West Pacific; *V. parva* Hoese & Larson, 1994 from the Indo-West Pacific; *V. persica* Hoese & Larson, 1994 from the northwestern Indian Ocean); *V. puellaris* (Tomiyama, 1956) from the Red Sea and Indo-West Pacific); *V. randalli* Hoese & Larson, 1994 from the Indo-West Pacific; *V. sexguttata* (Valenciennes, 1837) from the Red Sea and Indo-West Pacific; *V. strigata* (Broussonet, 1782) from the Indo-West Pacific); and *V. wardii* (Playfair, 1867) from the Red Sea and Indo-West Pacific.

Nine valid species and one unnamed species of *Valenciennea* were reported by Suzuki & Shibukawa (2004) from Japan, i.e. *Valenciennea bella*, *V. helsdingenii*, *V. longipinnis*, *V. parva*, *V. puellaris*, *V. randalli*, *V. sexguttata*, *V. strigata*, *V. wardii*, and *Valenciennea* sp. 1. Suzuki *et al*. (2011) reported *V. limicola* from Japan. In this paper, we describe *Valenciennea* sp. 1 *sensu* Suzuki & Shibukawa (2004) as a new species.

Materials and Methods

The holotype of the new species is deposited in the Osaka Natural History Museum, Japan (ONHM), and the paratype in the Biological Laboratory of the Imperial Palace, Japan (BLIP). Material examined include specimens from the Kanagawa Prefectural Museum of Natural History, Japan (KPM) and the National Museum of Nature and Science, Tsukuba, Japan (NSMT).

Lengths of specimens are given as standard length (SL). Proportional measurements are made point to point with a micrometer and binocular microscope to the nearest 0.1 mm. Methods of counting and measuring follow Hoese & Larson (1994), with the following exceptions: gill-raker counts include all rudiments on the outer face of the first arch; the snout tip refers to the anteriormost point of the upper lip; head length includes the opercular membrane; head width and depth are measured at the rear margin of the preoperculum; jaw length is measured between the snout tip and the posteriormost point of the lip; body width and depth are measured at the anal-fin origin; caudal-fin length is measured from the base to the tip of the mid-caudal-fin ray. Fin-ray branching, squamation, and the cephalic sensory pore system of the head are described from preserved material stained with Cyanine Blue. Information about the gill rakers and teeth, and additional details of squamation, were obtained from the paratype stained with Alizarin Red.

The terminology of cephalic sensory pores and papillae follow Akihito (1984) and Shibukawa & Suzuki (2004). The names of colors follow the recommendations of the Japan Color Research Institute (1995). Morphometric data presented in Table 1 are given as percentages of the standard length. In the description, data for the holotype are given first, followed by data for the paratype in parentheses, when different.

Valenciennea yanoi, n. sp.

Japanese common name: Kiito-haze

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Figures 1–5; Table 1.

Valenciennea limicola [*non* Hoese & Larson] Hoese & Larson 1994: 26, plate 5E (Banda Islands, Indonesia).
Valenciennea sp. 1 Suzuki & Shibukawa 2004: 85, 1 fig. (Iriomote Island, Yaeyama Islands, Ryukyu Islands, Japan).

Holotype. OMNH-P 43185, male, 54.2 mm SL, Japan, Ryukyu Islands, Iriomote Island, off Akazaki, 24° 22'27" N, 123°44'52" E, 13 m, Korechika Yano, Aug. 18, 2015.

Paratypes. BLIP 20030484, male, 46.2 mm SL, Japan, Ryukyu Islands, Iriomote Island, Amitori Bay, 20 m, Korechika Yano, Oct. 30, 2003.

Diagnosis. A species of *Valenciennea* with a low rounded first dorsal fin, no black spot on dorsal fin, 12 second-dorsal and anal-fin soft rays, a rounded caudal-fin with a slight extension of the 4th ray, no black spot and no yellow stripe on snout, no black spot on upper part of eye, three narrow vivid sky-blue stripes on lateral side of head, and two broad orange and yellow stripes on body reaching to rear margin of caudal fin.

Description. Dorsal-fin rays VI + I,12; anal-fin rays I,12; pectoral-fin rays 18 on left side and19 on right side (19 on both sides); pelvic-fin rays I,5; branched caudal-fin rays 7+6 (6+6); segmented caudal-fin rays 9+8; scales in longitudinal series on body 79 (75), excluding scales on caudal-fin base; transverse scale rows 22 (20); no predorsal scales.

Figure 1. *Valenciennea yanoi*, holotype, OMNH-P 43185, male, 54.2 mm SL, off Akazaki, Iriomote Island, Ryukyu Islands, Japan. A: fresh specimen; B: alcohol-preserved specimen (T. Suzuki).

Head slightly compressed. Snout convex to slightly pointed. Rear of jaws reaching to below middle of eye (nearly reaching in paratype). Ventral end of gill opening extending to below posterior third of operculum (black arrows of Fig. 2). Anterior nostril tubular, halfway between anteriormost margin of snout and anterior margin of eye; posterior nostril dorsoposterior, halfway between anterior nostril and anterior margin of eye, without a distinct rim. Urogenital papilla of male wart-like, with fimbriate margin.

Cephalic sensory pore system and papillae as in Fig. 2. Anterior oculoscapular canal with pores B', C (single), D (single), E, F, G, and H'; preopercular canal with K' and L'; preopercular canal with M', N (missing pore N on left side of holotype), and O'. All cephalic sensory papillae poorly developed; rows of papillae uniserial or comprising a single papilla, not forming multiple lines or aggregations; row *a* short and reduced, comprising four wide-spaced sensory papillae; row *b* short, extending from ventralmost part of row *a* to below rear margin of orbit; row *c* extending posterior to a vertical line through anteriormost part of row *a*; row *c* moderately long, extending to just posterior to middle of upper jaw, its posterior end close to anterior end of rows *a* and *b*; *cp* is a single papilla; row *d* interrupted midway, nearly extending to a vertical line through *cp*; each row *f* consists of two papillae; *n* is a single papilla; *s2* is a single papilla; row *x1* interrupted midway, well-separated from row *x2*.

Features based on stained paratype (BLIP 20030484) include: gill rakers 0+6; inwardly curved conical teeth in both jaws; upper jaw with single row of 16 slightly wide-spaced teeth, anterior four large, progressively smaller posteriorly; anterior lower jaw with two rows of large, slightly wide-spaced teeth, outer row with seven teeth, and the inner row with five teeth, followed by a gap, and then a row of five small teeth.

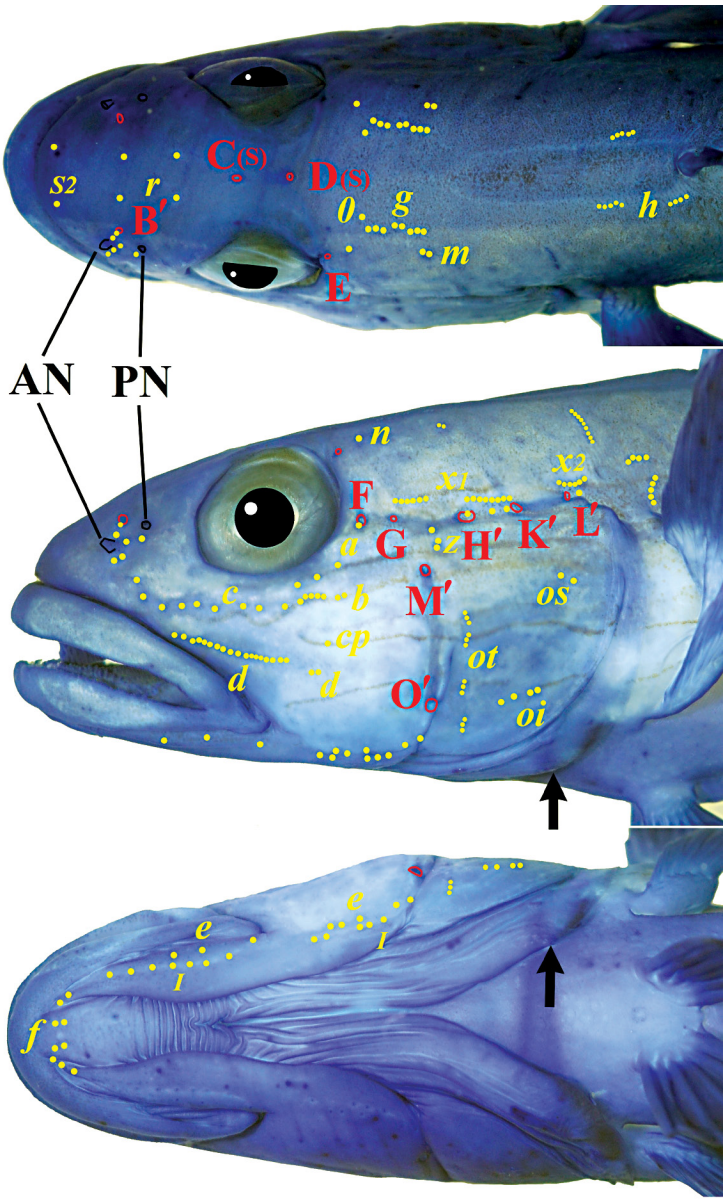

Figure 2. *Valenciennea yanoi*, holotype stained with Cyanine Blue: cephalic sensory pores and papillae of head; dorsal (above), lateral (middle), and ventral (below) views. Yellow dots and lowercase letters show rows of sensory papillae; red circles and uppercase letters show sensory-canal pores. AN and PN (open black circles) indicate anterior and posterior nares. Arrows point to the position of the lower end of gill opening (T. Suzuki).

Head, nape, predorsal, and prepectoral area, as well as dorsal part of body just below first dorsal fin naked; remaining body covered with ctenoid scales, except for cycloid scales in a narrow oblique band from front of first dorsal fin to upper end of gill opening, 9 scales ventrally on prepelvic area (5 scales), broadly on abdomen, and in two rows at base of anal fin (one row).

Origin of first dorsal fin slightly posterior to upper base of pectoral fins; first dorsal fin somewhat rectangular, slightly higher than second dorsal fin, no spines filamentous, fifth spine longest, reaching to space between base of first and second segmented rays of second dorsal fin when adpressed (base of second segmented ray), sixth dorsal spine reaching to base of second segmented ray of second dorsal fin when adpressed; posterior end of first dorsal fin attached to base of second dorsal fin via a low membrane. Last segmented ray of second dorsal fin longest, reaching to unsegmented caudal-fin rays when adpressed (not reaching to caudal-fin rays); distal margin straight.

All dorsal and anal-fin soft rays branched. Anal fin lower than second dorsal fin (same height in paratype), its origin above space between base of first and second segmented rays of second dorsal fin; 11th segmented anal-fin ray longest, last ray not reaching to caudal fin when adpressed; distal margin slightly convex. Pectoral fins oblong, reaching to below space between base of sixth spine of first dorsal fin and origin of second dorsal fin, segmented rays branched, except upper and lower two rays. Pelvic fins completely separate, without frenum or membrane connecting both fins (Fig. 2), not reaching to anus when adpressed; origin slightly anterior to or below lower base of pectoral fins, all segmented rays branched. Rear margin of caudal fin rounded; fourth branched ray slightly extended.

Color when fresh. (Figs. 1A & 4A) Background color of head, body, and fins light sky-blue, paler ventrally on head and abdomen, with numerous light reddish yellow dots; two bright orange-yellow stripes on side of head and body, the uppermost from lower half of eye to dorsal edge of caudal peduncle and upper base of caudal fin, continuing prominently onto two rays of fin; second stripe from behind corner of mouth, across cheek, to ventral edge of caudal peduncle and narrowing across caudal fin; an irregular pale yellow stripe on cheek between two orange-yellow stripes; three narrow vivid sky-blue stripes on lateral side of head; dorsal part of head and body mainly orange-yellow, except for indistinct blue dorsal margin to upper orange-yellow stripe; seven well-spaced, dusky-edged, orange-yellow bars linking the two orange-yellow stripes on side of body; dorsal fins with blue and yellow bands, blue bands dominant on first dorsal fin, and yellow on second dorsal fin; caudal fin also blue-and-yellow-banded, orange-yellow extensions of the body stripes most prominent.

Color in life. (Figs. 3 & 5A) Similar color as fresh, except middle lateral side of body more bluish; a blue stripe above the lower yellow stripe on ventral side of body; color of dorsal and caudal fins pale except two broad yellow stripes on caudal fin; blue band distally on anal fin.

Color of holotype in alcohol. (Fig. 1B) Colors faded to beige and brown; bright blue streak below eye remains as a dull blue mark.

Figure 3. *Valenciennea yanoi*, underwater photograph, approx. 65 mm TL, about 13 m depth, off Akazaki, Iriomote Island, Ryukyu Islands, Japan (K. Yano).

Distribution. Presently known from Iriomote Island, Ryukyu Islands, Japan. Additional records from underwater photographs in the Image Database of Fishes, KPM-NR include Okinawa and Miyako Island (Ryukyu Islands, Japan), Mindoro (Philippines), Palau, Mabul Island (Sabah, Malaysia), and Bali (Lesser Sunda Islands, Indonesia). There is also a photographic record from the Banda Islands of Indonesia (see Remarks).

Habitat. *Valenciennea yanoi* occurs on sand or mud bottoms of bays and inlets at depths of 8–20 m (Suzuki & Shibukawa 2004).

Etymology. The new species is named in honor of Mr. Korechika Yano, who first discovered the new species and photographed it underwater. The specific epithet is a noun in the genitive case.

TABLE 1

Proportional measurements (as percentage of SL) for male type specimens of *Valenciennea yanoi*

	holotype OMNH-P 43185	paratype BLIP 20030484
Standard length (mm)	54.2	46.2
Head length	28.9	31.7
Head depth	16.5	16.3
Head width	14.9	15.6
Upper jaw length	13.0	12.6
Eye diameter	6.3	7.0
Snout length	9.8	9.9
Bony interorbital width	4.4	3.7
Body depth	16.5	16.0
Body width	11.6	8.0
Caudal-peduncle length	17.2	15.2
Caudal-peduncle depth	9.9	9.2
Base of second dorsal fin	29.4	29.4
Third dorsal-spine length	13.3	13.6
Fouth dorsal-spine length	15.8	15.5
Pectoral-fin length	18.2	20.8
Pelvic-fin rength	15.2	14.3
Caudal-fin length	26.5	19.5

Comparisons. Three species of *Valenciennea*, i.e. *V. yanoi*, *V. limicola*, and *V. parva*, share a low, rounded first dorsal fin without a black spot, a bluish background color, and two orange or yellow stripes on the body when alive or fresh (Figs. 4 & 5). *Valenciennea yanoi* differs from *V. parva* in having a slight extension in the upper lobe of the caudal fin (vs. smoothly rounded), no black spots on the snout and upper part of the eye (vs. black spots on the snout and upper part of the eye), and two broad orange and yellow stripes on the body reaching to the rear margin of the caudal fin (vs. narrow stripes not reaching the rear margin). *Valenciennea yanoi* differs from *V. limicola* in having 12 second dorsal and anal-fin rays (vs. 16–17), a rounded caudal fin with a slight extension in the upper lobe (vs. a lanceolate caudal fin), no yellow stripe on the snout (vs. a yellow stripe), three narrow vivid, sky-blue stripes on the side of the head (vs. a wide band), two broad orange and yellow stripes on the body reaching to the rear margin of the caudal fin (vs. upper stripe narrow, indistinct below second dorsal fin, and lower stripe broad), and seven indistinct dark bars on the body (vs. bars absent)(Hoese & Larson 1994).

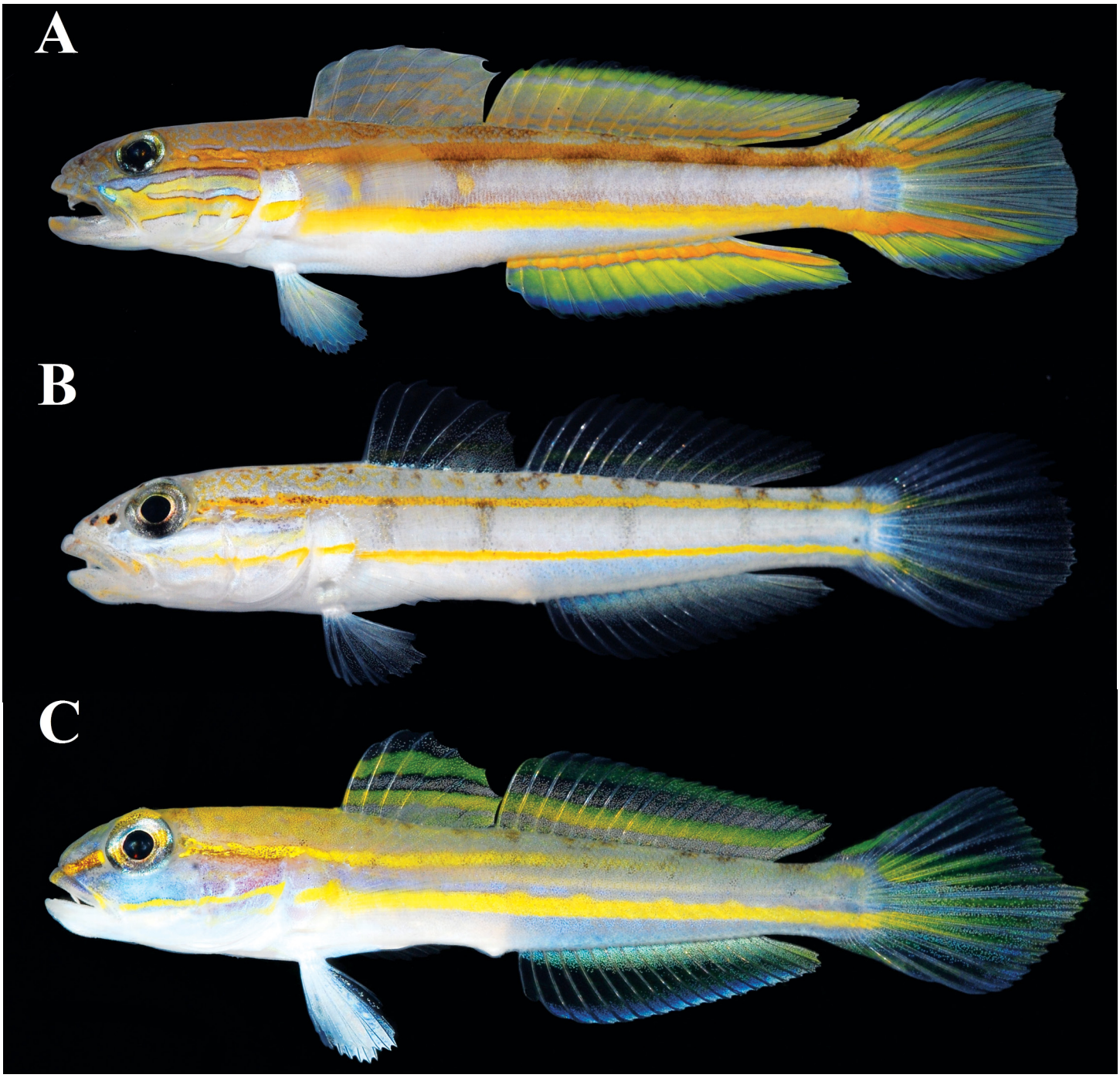

Figure 4. Specimens of *Valenciennea* photographed when fresh. A: *Valenciennea yanoi*, holotype; B: *V. parva*, NSMT-P 125367, 23.8 mm SL, Iriomote Island, Ryukyu Islands, Japan; C: *V. limicola*, KPM-NI 27318, 23.8 mm SL, Okinawa, Ryukyu Islands, Japan (T. Suzuki).

Remarks. Hoese & Larson (1994: Plate 5E) included an underwater photo identified as *Valenciennea limicola* taken by the third author, at Banda, Indonesia. The photo is reidentified as *V. yanoi* by having three narrow blue stripes on the mid-lateral side of head and two broad orange and yellow stripes on body reaching to the rear margin of caudal fin.

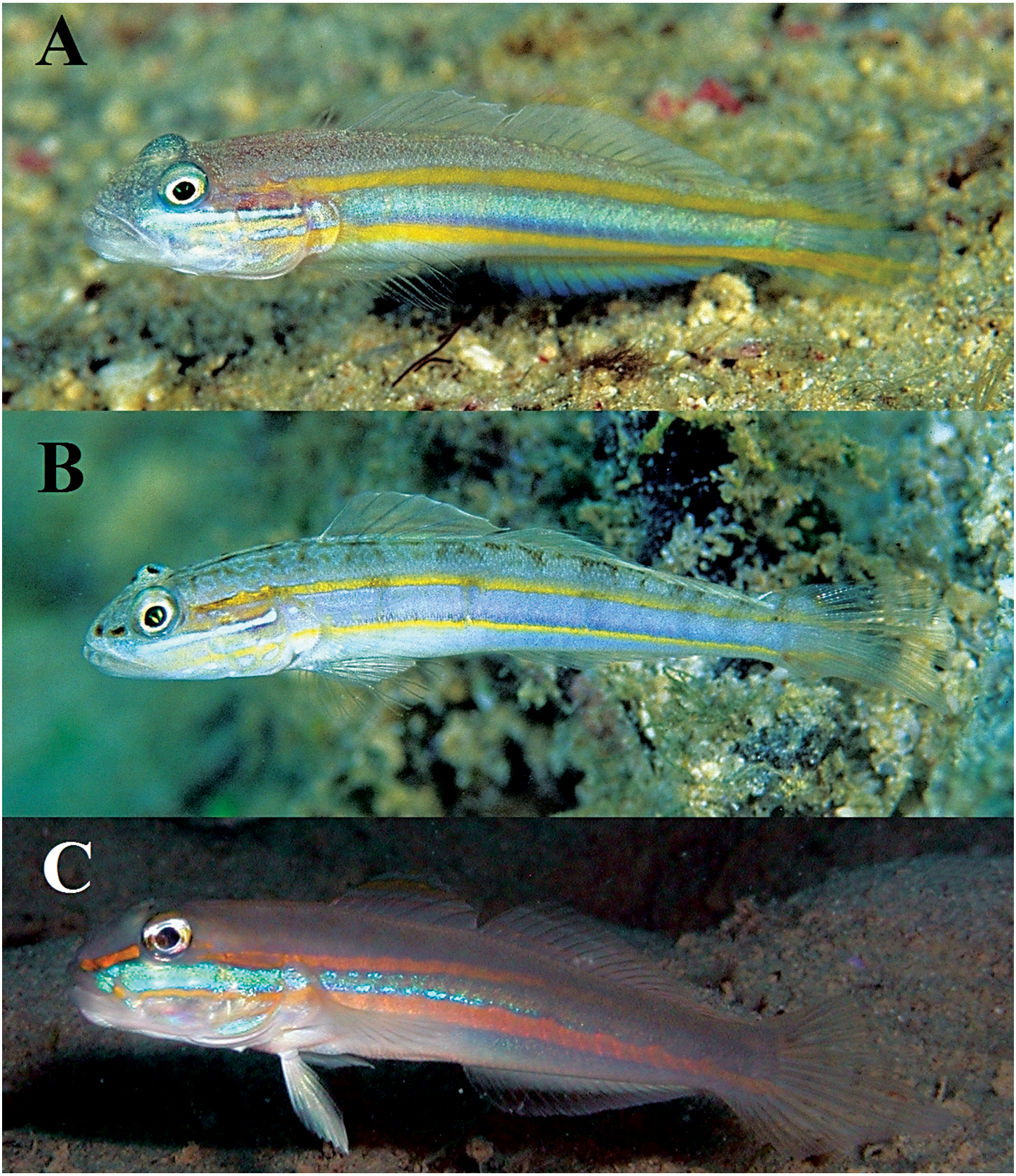

Figure 5. *Valenciennea* species, underwater photographs. A: *Valenciennea yanoi*, KPM-NR 98039A, Mabul Island, Malaysia (K. Uchino); B: *V. parva*, KPM-NR 69121A, New Caledonia (K. Uchino); C: *V. limicola*, KPM-NR 43929, Kin-wan Inlet, Okinawa, Ryukyu Islands, Japan (T. Seko).

Other material examined. *Valenciennea limicola*: KPM-NI 27318, 23.8 mm SL, Japan, Ryukyu Islands, Okinawa, 22 m, Tooru Seko, Oct. 12, 2010. *Valenciennea parva*: NSMT-P 125367, 23.8 mm SL, Japan, Ryukyu Islands, Iriomote Island, 6 m, Masatomi Suzuki, Aug. 18, 2012.

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