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Meiacanthus solomon*, a new fangblenny (Teleostei: Blenniidae) from the Solomon Islands, with a redescription and new records of *M. limbatus

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Abstract

Meiacanthus solomon sp. nov. (Teleostei: Blenniidae) is described on the basis of the holotype (27.8 mm SL) collected in 60–65 m from the Solomon Islands. The new species is characterized by the following combination of characters: a single, dark, mid-lateral stripe extending from the snout, slightly onto the dorsal part of the pectoral-fin base, and terminating at the base of the caudal fin, with white immediately above and below the stripe in life, and 13 segmented anal-fin rays. It differs from the other similar dark-striped species, including *M. abruptus*, *M. geminatus*, *M. luteus*, *M. vicinus*, and *M. vittatus*, by a combination of color pattern features and fin-ray counts. In addition, *M. limbatus* is redescribed on the basis of recent collections from Indonesia and Papua New Guinea. This fangblenny differs from all others in having a narrow black stripe along the base of the anal fin in adults. In view of a previous misidentification, a partial redescription of the species is provided.

Key words: taxonomy, species, ichthyology, coral-reef fishes, blenny, Pacific Ocean, Papua New Guinea, Indonesia

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Introduction

Members of the genus *Meiacanthus* Norman, 1944 are unique among fishes in having venomous glands associated with a pair of large, grooved, dentary canines that serve as a defense mechanism, allowing them to be ingested and then rejected unharmed by most predators (Springer & Smith-Vaniz 1972, Fishelson 1974, Casewell et al. 2017). This reduced vulnerability to predation is so effective that at least a third of the species of *Meiacanthus* act as mimetic models for other fishes that benefit from the resemblance (Smith-Vaniz et al. 2001).

A new species of deep-reef *Meiacanthus* is described from the Solomon Islands on the basis of the male holotype. With the addition of this new species, the total number of valid species of *Meiacanthus* is now 29, not including several additional undescribed species for which specimens are currently unavailable.

Smith-Vaniz & Allen (2011) documented juveniles and a subadult of *Meiacanthus limbatus* Smith-Vaniz, 1987 from Helen Reef, a species previously known only from the female holotype from Manus Island, Bismarck Archipelago (Smith-Vaniz 1987). In the same publication, Smith-Vaniz & Allen (2011) included color photographs of an adult *M. limbatus* (erroneously believed to be an undescribed species and identified as *Meiacanthus* cf. *abditus*) from the Flores Islands, but unfortunately no specimens were collected. Adults were subsequently collected at three additional Indonesian localities, Milne Bay, Menjangan and Sermata Islands (Fig. 1), which allowed us to determine their correct identity as *M. limbatus*. This fangblenny differs from all others in having a narrow black stripe along the base of the anal fin in adults. In view of the previous misidentification, a partial redescription of the species is provided.

Materials and Methods

Abbreviations used for institutional depositories are as follows: Museum Zoologicum Bogoriense, Cibinong, Java, Indonesia (MZB); Museum of Natural History, Washington, D.C., USA (USNM); Western Australian Museum, Perth, Australia (WAM). Measurements and counts follow Allen & Smith-Vaniz (2011). All dorsal-fin and anal-fin ray counts were made from digital x-rays. Specimen lengths are given in mm standard length (SL).

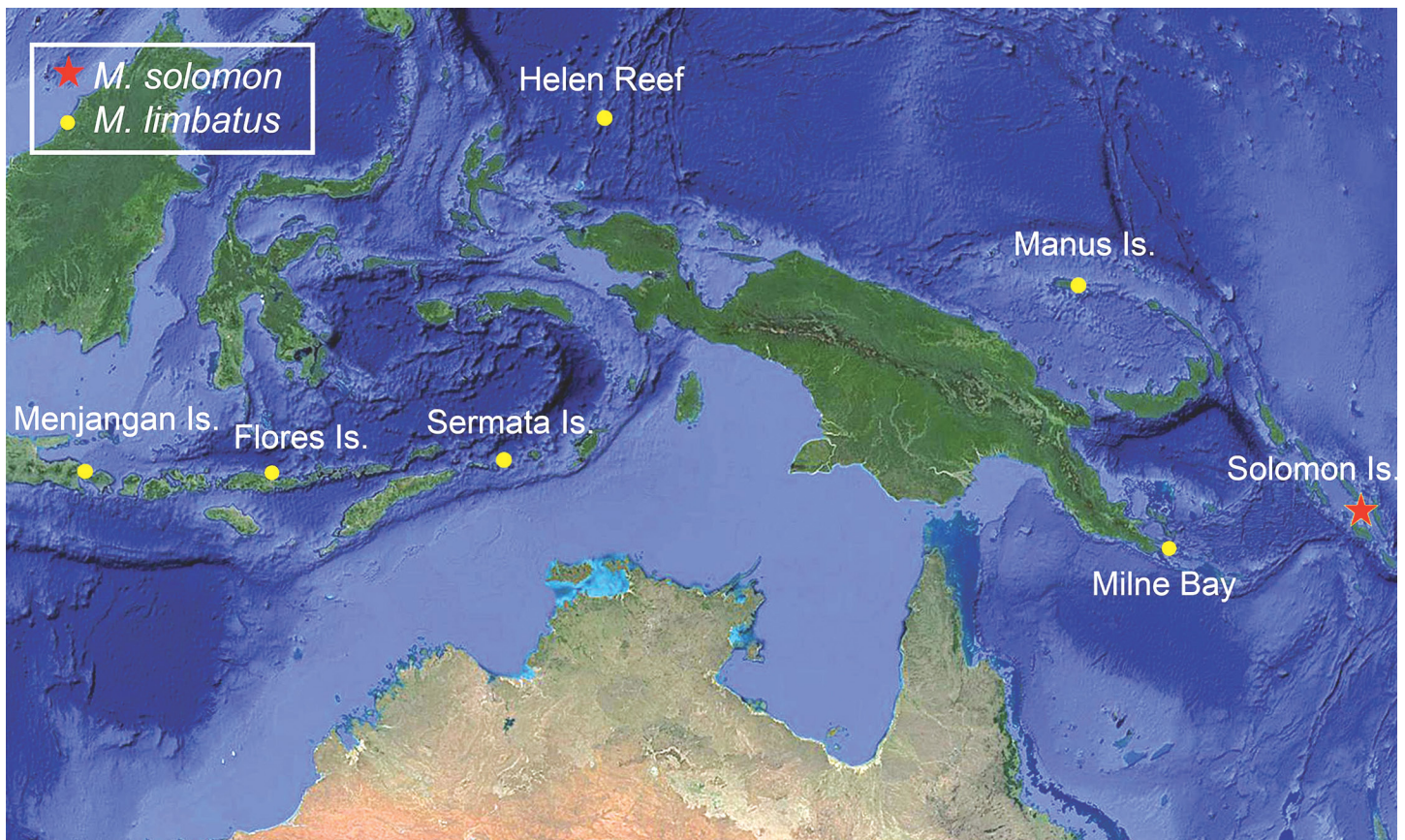


Figure 1. Map of known present distributions of *Meiacanthus solomon* and *M. limbatus*.

Meiacanthus solomon, n. sp.

Solomon Fangblenny

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Figure 2, Table 1.

Holotype. WAM P.34621-001, 27.8 mm SL, male, Solomon Islands, Florida Group, Bayldon Shoals, -9.133°, 160.132°, 60–65 m, at base of steep wall swimming among sea fans, clove oil and hand net, M.V. Erdmann, sta. MVE-16-022, 10 October 2016.

Diagnosis. A species of *Meiacanthus* (subgenus *Meiacanthus*) with a major portion of dentary gland dorsally positioned and held in place laterally by a dorsolateral flange of dentary; dorsal-fin elements IV,25; anal-fin elements II,13; color pattern composed of a single, dark, mid-lateral stripe extending from tip of snout and behind eye, slightly onto dorsal part of pectoral-fin base, and terminating at base of caudal fin, color immediately above and below mid-lateral stripe white (in life); dorsal-fin base with a dark stripe beginning below fourth spine, extending onto about half of dorsal-fin height at middle of fin, tapering strongly at caudal peduncle; dorsal fin with a proximal black stripe bordered by a white stripe, and a submarginal dark stripe widest on the spinous dorsal fin and tapering posteriorly to about third of fin; anal and caudal fins pale and unmarked.

Description. Dorsal-fin elements IV,25; anal-fin elements II,13; pectoral-fin rays 14–14. Caudal fin: procurrent rays 4+5; segmented rays 6+5, inner rays not elongated or deeply incised. A pair of canines laterally in each jaw, those in lower jaw very large with a deep frontal groove; incisor teeth in lower jaw 20, in upper jaw 22. Pelvic fin long, 28.6 % SL, depressed fin extends about 80% of distance to anal-fin origin. Caudal-fin rays: length of outer,

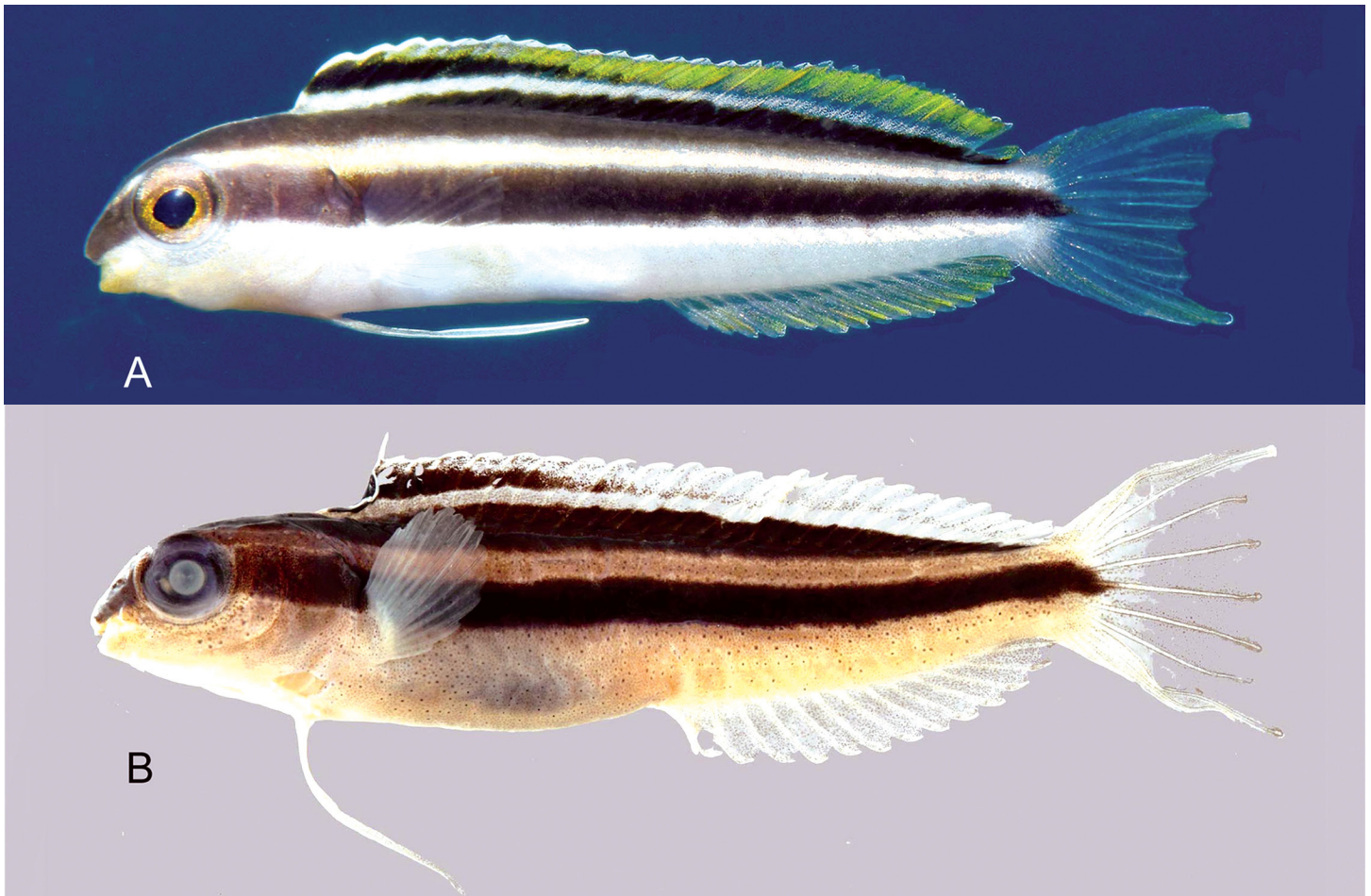


Figure 2. *Meiacanthus solomon*: (A) holotype, WAM P.34621-001, 27.8 mm SL, male, Bayldon Shoals, Florida Group, Solomon Islands (G.R. Allen); (B) preserved holotype (Z.S. Randall).

27.3% SL, and inner 19.6% SL. Head length 26.6% SL; orbit diameter 8.9% SL. Lateral line present, terminating below segmented dorsal-fin ray 4; mandibular and posttemporal pores 3; median supratemporal pores a closely spaced pair. Chin with a pair of cirri. Vertebrae: precaudal 13 + caudal 20.

Color in life. (Fig. 2) Pearly white or slightly yellowish to pale bluish grey with pair of prominent dark-brown to black stripes on upper half of head and body, the upper stripe from midline of snout and along base of dorsal fin to upper edge of caudal peduncle, lower stripe from snout tip to eye, continuing behind eye mid-laterally, expanded slightly onto dorsal part of pectoral-fin base, ending slightly onto caudal-fin base; dorsal and ventral margins of lower black stripe narrowly grey, more pronounced on posterior half, and similar grey margin ventrally on upper black stripe; lower jaw yellowish and slight yellow hue on cheek; iris with conspicuous bronze ring surrounding pupil; dorsal fin with a black basal stripe, beginning at fourth dorsal-fin spine, gradually increasing in width to middle portion of fin, then gradually decreasing posteriorly, higher on fin an intermediate white stripe beginning at fin origin becoming narrower posteriorly, bordered above by a prominent black stripe across spinous part of fin, and a submarginal yellow stripe, wider posteriorly, with a very narrow, white, distal margin; anal fin with a narrow translucent basal stripe, a translucent whitish middle portion, and a broad yellowish outer portion; caudal fin translucent with a slight yellow suffusion along dorsal and ventral margins, most noticeable basally, elongated lobe tips with white margins; pelvic fins white; pectoral fins translucent.

Color in alcohol. (Fig. 2) Head and body with two brown stripes, upper from midline of snout and along base of dorsal fin to upper edge of caudal peduncle and lower from snout tip to eye, continuing behind eye mid-laterally, expanded onto bases of dorsalmost 4 or 5 pectoral-fin rays, ending slightly onto caudal-fin base; dorsal fin with brown basal stripe beginning at fourth dorsal spine gradually increasing in width to middle portion of fin, then gradually decreasing posteriorly, another brown stripe through middle of spinous dorsal fin tapering posteriorly, remainder of fin white except for anterior submarginal black stripe. Background color of head and body tan becoming much paler below lower dark stripe; pelvic, anal, and caudal fins white.

Etymology. The specific epithet refers to the Solomon Islands. In 1568, the first European to visit the islands was the Spanish explorer Álvaro de Mendaña de Neira. Subsequently, rumors led to the belief that he had discovered gold there, some of which biblical King Solomon had used for his temple in Jerusalem. Thus, the islands became known as Islas de Salomón. The name is to be treated as a noun in apposition.

TABLE 1

Frequency distribution of characters in species of *Meiacanthus*

Species	dorsal-fin spines			dorsal-fin segmented rays					anal-fin segmented rays					pectoral-fin rays										
	3	4	5	24	25	26	27	28	13	14	15	16	17	18	26	27	28	29	30	31	32	33		
<i>M. solomon</i>		1			1				1															
<i>M. vittatus</i>	1	23			5	11	8	1		3	15	6			20	3	1							
<i>M. luteus</i>	3	28				8	20				1	3	18	9				1	12	4	13	1		
<i>M. limbatus</i>		22	4		1	4	14	7				9	11	2	4	3	17	1	1					

Species	precaudal vertebrae			caudal vertebrae					total vertebrae						
	12	13	14	20	21	22	23	24	33	34	35	36	37		
<i>M. solomon</i>		1			1								1		
<i>M. vittatus</i>		21	1		6	8	8			5	9	8			
<i>M. luteus</i>	6	24	1			10	19	2				15	14	2	
<i>M. limbatus</i>	7	17	2		2	9	10	5				1	13	10	2

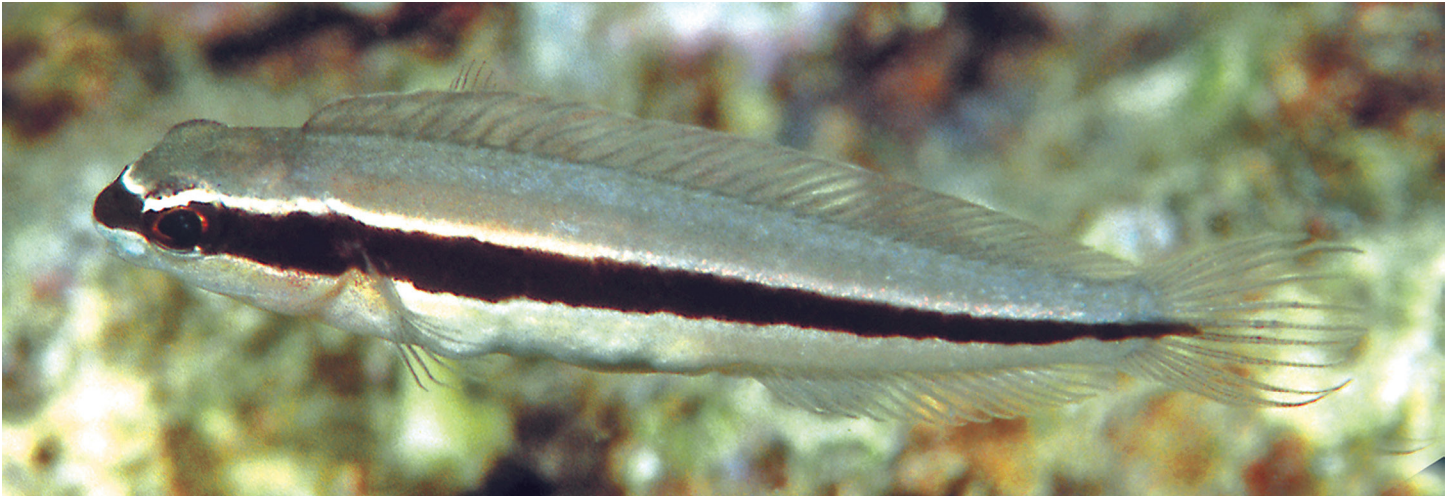


Figure 3. *Meiacanthus vittatus*, Madang, Papua New Guinea (G.R. Allen); after Smith-Vaniz & Allen (2011).

Distribution and habitat. *Meiacanthus solomon* is known only from deep-reef habitat in 60–65 m and only from the Solomon Islands type locality (Fig. 1), but likely will prove to be more widely distributed when more deepwater collections are available. Three other species of *Meiacanthus*, i.e. *M. grammistes* (Valenciennes, 1836), *M. atrodorsalis* (Günther, 1877), and *M. crinitus* Smith-Vaniz, 1987; are also known from Solomon Island reefs but they are relatively shallow-water species that are more widely distributed.

Remarks. Because the outermost caudal-fin rays extend distinctly beyond the others and the pelvic fin is also elongate in the relatively small holotype, we suspect that in large individuals both of these fins are sexually dimorphic, as in other species with elongate pelvic fins.)

Comparisons. The new species will key to couplet 7 in Smith-Vaniz & Allen's (2011) key to species of *Meiacanthus* with lateral stripes, but differs from the two species in couplet 8 as follows: *Meiacanthus vittatus* Smith-Vaniz, 1976 (Fig 3), known from Papua New Guinea and New Britain, has a uniformly gray dorsum and dorsal fin and usually fewer pectoral-fin rays (13 vs. 14); *M. luteus* Smith-Vaniz, 1987 (Fig. 4), an Australian endemic, has more segmented dorsal-fin and anal-fin rays (26 or 27 and 15–18 vs. 25 and 13), more pectoral fin rays (usually 15 or 16 vs. 14), the dark stripe on the dorsum not extending onto the base of the dorsal fin (vs. extending distinctly onto the base of the dorsal fin), and, in life, the area above the mid-lateral dark stripe bright yellow (vs. white). Three other species, *M. geminatus* Smith-Vaniz, 1976, *M. vicinus* Smith-Vaniz, 1987, and *M. abruptus* Smith-Vaniz & Allen, 2011, have only one dark mid-lateral stripe (an additional dark stripe may or may not be present along the dorsal contour of the body); all further differ in having the mid-lateral stripe not extending onto the dorsal part of the pectoral-fin base; in having distributions only west of 120° E longitude (see Smith-Vaniz & Allen 2011: fig. 1), and color patterns that do not closely resemble those of *M. solomon*.



Figure 4. *Meiacanthus luteus*, Keppel Island, Queensland, Australia (R.H. Kuitert); after Smith-Vaniz & Allen (2011).

Meiacanthus limbatus, Smith-Vaniz

Figures 5–9; Table 1.

Meiacanthus (Meiacanthus) limbatus Smith-Vaniz, 1987: 19, figs. 3c, 7c (original description; Papua New Guinea, Bismarck Archipelago, Manus Island, Los Negros Island); Smith-Vaniz & Allen 2011: 54, color photographs 22 A–C (description; Helen Reef).

Meiacanthus cf. *abditus* Smith-Vaniz & Allen 2011: 52, color photographs 17 & 18 (comparison with *M. abditus*; Flores Island, Indonesia).

Expanded diagnosis. A species of *Meiacanthus* (subgenus *Meiacanthus*) with a major portion of dentary gland dorsally positioned and held in place laterally by a dorsolateral flange of dentary; dorsal-fin elements IV or V, 24–27 (usually IV, 26 or 27); anal-fin elements II, 16–18; pectoral-fin rays 13–15, usually 14; adult males with inner caudal-fin rays produced as filaments; color pattern composed of a dark mid-lateral stripe that does not extend onto dorsal part of pectoral fin base and only very slightly onto caudal-fin base; a lower dark stripe extending from upper lip through lower half of pectoral fin to base of caudal fin; anal fin of adults with dark basal stripe (best developed in males); pelvic fin sexually dimorphic in adults, depressed fin extends to or beyond anal-fin origin in males and about 25–30% of distance to anal-fin origin in females. Median supratemporal pores 1 or 2 but surprisingly variable (2 in 6 of 7 specimens from Menjangan Island, Bali, Indonesia; 1 in 6 of 7 specimens from Sermata Islands, Maluku, Indonesia; and 1 in 4 of 8 specimens from Milne Bay, Papua New Guinea).

Color in life. (Figs. 5–7) Head and body with three dark brown stripes tapering posteriorly, separated by bluish-white to grey interspaces; dorsal stripe extends along dorsal body contour and terminates on dorsal edge of caudal-fin base; middle stripe extends from snout, through eye, just above pectoral fin, and terminates mid-



Figure 5. *Meiacanthus limbatus*, males (front lateral and head down), females (far right and upper center), Menjangan Island, Bali, Indonesia (G.R. Allen).

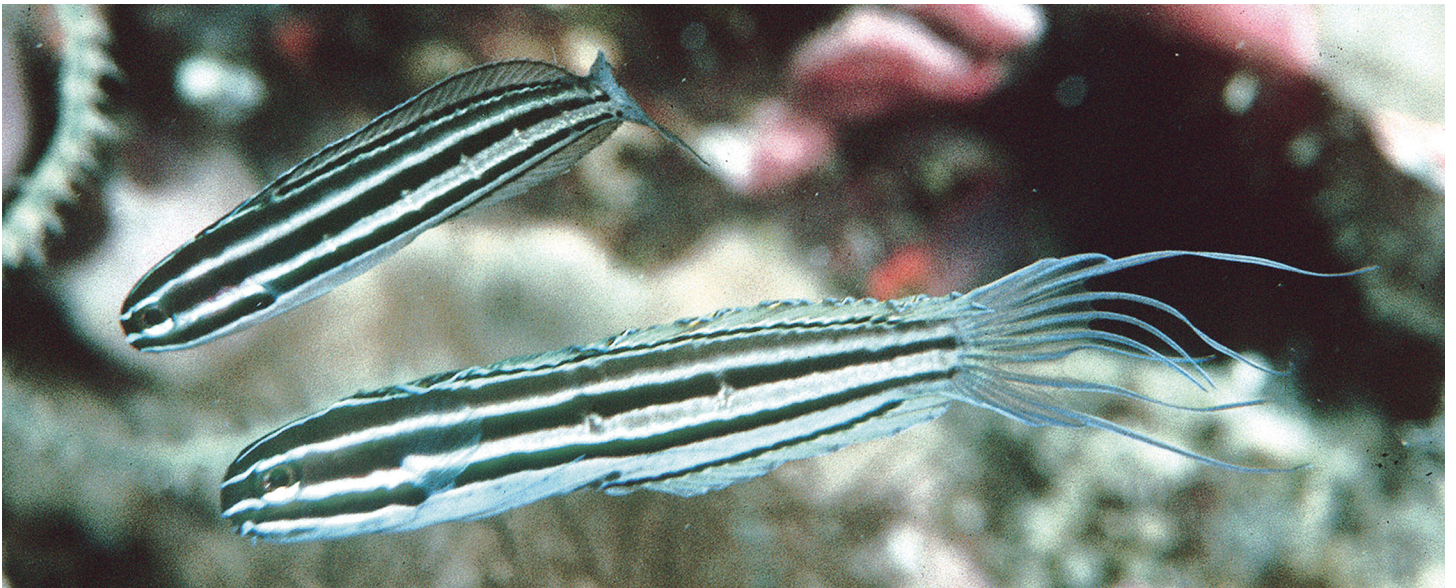


Figure 6. *Meiacanthus limbatus*, male (front), female (behind), Flores Island, Indonesia (R.H. Kuiter).

laterally at caudal-fin base; ventral stripe encircles mouth, often forming a broad band on chin in adults, extending through lower half of pectoral-fin base, and terminates on lower caudal peduncle distinctly anterior to the caudal-fin base; mid-side of body frequently with 3–6 short, narrow, vertical, pale (yellowish to grey) lines, intersecting middle dark stripe. Head brown dorsally except for a narrow, white, predorsal stripe extending to anterior margin of eye, sometimes more forward on snout, uniting with a narrow V-shaped apex of dorsal body stripes. Dorsal fin with a dark-brown to blackish basal stripe with a narrow white stripe immediately above, remainder of fin mostly light tan (orange in large males); large males with narrow submarginal orange stripe (absent in females) and a fine black stripe immediately above and a narrow white distal margin. Anal fin of males mostly pale orange except for



Figure 7. *Meiacanthus limbatus*, group of mostly females, Sermata Island, Maluku, Indonesia (G.R. Allen).



Figure 8. *Meiacanthus limbatus*, top: 33.9 mm SL, male, WAM P.33765-001, Menjangan Island, Bali, Indonesia (S.J. Raredon); bottom: 32.0 mm SL, female, USNM 445712, Menjangan Island, Bali, Indonesia (S.J. Raredon).

a dark-brown to blackish stripe basally and a narrow white distal margin. Pelvic and caudal fins pale dusky, except caudal fin yellow in 27.2 mm SL male from Helen Reef (Smith-Vaniz & Allen 2011: fig. 22C).

Color in alcohol. (Fig. 8) Configuration of dark stripes on body and fins as in life, except no evidence of orange color; background light tan except for a black chin on some individuals (Fig. 9). Narrow pale lines on mid-side of the body sometimes persist as pale indentations on middle dark stripe.

Etymology. The Latin “*limbatus*,” meaning bordered, alludes to the dark stripe at the base of the anal fin.

Distribution and habitat. This gregarious species, with schools as large as 40–50 individuals, some retreating into crevices when disturbed, is typically found in 25–55 m near vertical walls or caves and is probably widely distributed throughout Indonesia, Papua New Guinea, and Palau, excluding the continental margins (Fig. 1).

Comparisons. *Meiacanthus limbatus* is a member of a group of species with two dark mid-lateral stripes, one immediately above and one below the pectoral fin, including at least 7 mostly allopatric species as discussed and compared by Smith-Vaniz & Allen (2011). Adults of *M. limbatus* differ from all other species of *Meiacanthus* in having a narrow dark stripe along the anal-fin base (this stripe may be very faint in some females), and most individuals (but not all) have the chin, including the lower lip, heavily pigmented (Fig. 9). *Meiacanthus crinitus* is superficially similar to *M. limbatus* and both species have the inner caudal-fin rays produced as filaments in adult males, but, in addition to lacking a dark anal-fin stripe, it differs in having dark stripes on the caudal peduncle or caudal-fin base terminating as thin lines and the lower stripe typically ending as a small separated spot.

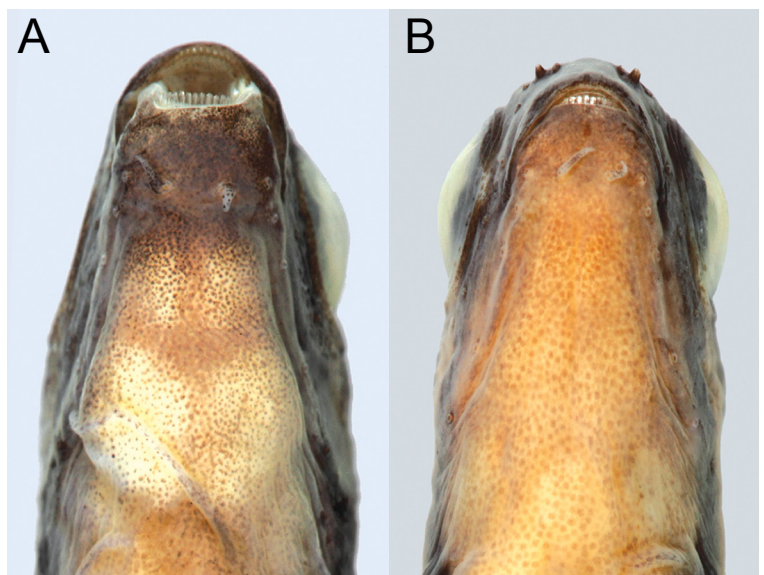


Figure 9. *Meiacanthus limbatus*, A: WAM P.34311-001, 42.0 mm SL, male, Sermata Islands, Indonesia; B: WAMP.33765-001, 36.6 mm SL, male, Menjangan Island, Indonesia (S.J. Raredon).

Material examined. 28 specimens, 10.4–42.0 mm SL. WAM P.27826-018 (37.0), holotype of *M. limbatus*, Bismarck Archipelago, Manus Island, Los Negros Id., -2.066°, 147.416°, 35–41 m, G.R. Allen & R. Knight, 6 October 1982; USNM 397427 (5, 10.4–26.3), Palau, South West Islands, Hatohobei, Helen Reef, -2.133°, 131.126°, 22–34 m, J.T. Williams et al., 22 September 2008; WAM P.34978-001 (8, 28.9–34.7), Papua New Guinea, Milne Bay, Barracuda Point, -10.15895°, 150.46182°, 65 m, M.V. Erdmann, 20 December 2016; USNM 445712 (2, 32.0–36.6), MZB 21249 (1, 33.0), and WAM P.33765-001 (4, 27.9–33.9), Indonesia, Bali, Menjangan Island, -8.097°, 114.527°, 20–72 m, vertical wall, clove oil and hand-net, G.R. Allen & M.V. Erdmann, 14 September 2012; WAM P.34311-001 (7, 27.0–42.0), Indonesia, Sermata Islands, Lelang Island, Tanjung Wahar, -8.194°, 128.822°, 40–55 m, M.V. Erdmann, 26 November 2014.

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