



***Odontanthias randalli* n. sp., a new anthiine fish (Serranidae: Anthiinae) from Indonesia**

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Abstract

Odontanthias randalli, a new species of anthiine serranid fish from southeastern Indonesia, is described, bringing the number of known species in the genus to 14. The new species is clearly distinguished from other members of the genus by the following combination of characters: dorsal-fin soft rays 16–17, lateral-line scales 37 to 39, 3rd dorsal spine longest, 3rd dorsal-fin soft ray the only filamentous dorsal-fin ray, caudal fin lunate with extremely long filamentous lobes, depth of body 2.2 to 2.5 in SL, vomerine-tooth patch arrowhead shaped, and body pinkish with bright yellow spots on upper half and four pale pink blotches below dorsal-fin base. The new species is compared with other members of the genus.

Key words: *Odontanthias*, Serranidae, new species, Indo-Pacific, Indonesia

Introduction

Odontanthias Bleeker is a genus of colorful serranid fishes that belongs to the subfamily Anthiinae. Members of this genus are typically associated with deepwater reefs in 100–400 m, and thus are rarely caught by trawlers. They are also small species, <204 mm standard length, and thus not caught by mainstream hook-and-line fishing over deeper reefs targeting species such as *Epinephelus*, *Pristipomoides* and *Etelis*. Randall and Heemstra (2006) in their review of *Odontanthias* recognized 13 species, all inhabitants of the Indo-Pacific region, noted that there are relatively few specimens in museum collections, and expressed the expectation that additional species would be found in the future.

Members of this genus had previously been considered to belong to the genus *Holanthias* (e.g. Heemstra & Randall, 1986), but they differ from this eastern Atlantic genus in having a lunate or deeply emarginate caudal fin (vs. near-truncate to rounded or rhomboid) and no accessory scales on the body (vs. numerous accessory scales on body). Two Indo-Pacific anthiine species that were previously considered to belong to the genus *Holanthias* were recently placed in a new genus, *Meganthias* Randall & Heemstra, 2006, i.e. *M. kingyo* (Kon, Yoshino & Sakurai, 2000) and *M. natalensis* (Fowler, 1925). Members of *Meganthias* differ from those of *Odontanthias* in having: many accessory scales on the head (vs. rarely present on head); 8 or 9 anal-fin rays (vs. 7, rarely 8); finely serrate preopercular margin (vs. strongly serrate); lips rugose (vs. smooth); and larger size. More recently, two new species of *Meganthias* have been described: *M. carpenteri* Anderson, 2006, from off Nigeria in the Eastern Atlantic; *M. filiferus* Randall & Heemstra, 2008, from off Thailand.

Recent surveys of fish markets in southern Indonesia led to the collection of a diverse range of teleost species. At the Tanjung Luar fish market in eastern Lombok (part of the East Nusa Tenggara island chain), handline fishers operating over deep reef areas (>100 m depth) using small hooks collected a variety of interesting species. Included in these catches were specimens of *Odontanthias*, comprising a single specimen of *O. borbonius* (Valenciennes in Cuvier & Valenciennes, 1828) and 11 specimens that were clearly representatives of an undescribed species. This new species of *Odontanthias* from off southern Indonesia is described herein.

Material and methods

The methods used in this paper follow Randall & Heemstra (2006) and descriptions of the measurements are provided by these authors. Lengths are given as standard length (SL). Gill-raker counts were taken from the first gill arch of the right side, and include rudiments (the gill raker at the angle was included in the lower limb count). Pectoral-fin ray counts were taken from both sides. Vertebral and caudal-fin ray counts were taken from radiographs of the type specimens. In the description, values in parentheses refer to data for the paratypes when different from the holotype. The diagnostic and descriptive characters used in this paper follow those used by Randall & Heemstra (2006) to allow for accurate comparisons between the new species and its congeners.

Specimens, including types, are referred to by the following prefixes for their registration numbers: CSIRO, Australian National Fish Collection, Hobart, Australia; MZB, Museum Zoologicum Bogoriense, Cibinong, Indonesia.

Other material examined in this study: *Odontanthias borbonius*: CSIRO H 7221–02, 124 mm TL, 92 mm SL, Tanjung Luar fish landing site, Lombok, East Nusa Tenggara, Indonesia, collected by W. White and Dharmadi, 06 Nov. 2010.

Genus *Odontanthias* Bleeker, 1873

Odontanthias Bleeker, 1873: 236 (type species, *Serranus borbonius* Valenciennes, by original designation)

Species. *Odontanthias* includes 14 nominal species: *O. borbonius* (Valenciennes in Cuvier & Valenciennes, 1828); *O. caudicinctus* (Heemstra & Randall, 1986); *O. chrysostictus* (Günther, 1872); *O. dorsomaculatus* (Katayama & Yamamoto, 1986); *O. elizabethae* Fowler, 1923; *O. flagris* Yoshino & Araga in Masuda *et al.*, 1975; *O. fuscipinnis* (Jenkins, 1901); *O. grahami* Randall & Heemstra, 2006; *O. katayamai* (Randall, Maugé & Plessis, 1979); *O. randalli* **n. sp.**, this paper; *O. rhodopeplus* (Günther, 1872); *O. tapui* (Randall, Maugé & Plessis, 1979); *O. unimaculatus* (Tanaka, 1917); *O. wassi* Randall & Heemstra, 2006.

Odontanthias randalli new species

Figs 1 and 2, Table 1

Holotype. MZB 20010, 209 mm TL, 121 mm SL, Tanjung Luar fish landing site, Lombok, East Nusa Tenggara, Indonesia (08°45' S, 116°35' E), collected by W. White and Dharmadi, 24 Jan. 2011.

Paratypes. 10 specimens: MZB 20011, 190 mm TL, 118 mm SL; MZB 20012, 180 mm TL, 115 mm SL; MZB 20013, 155 mm TL, 100 mm SL; MZB 20014, 200 mm TL, 126 mm SL; CSIRO H 7217–01, 212 mm TL, 126 mm SL; CSIRO H 7218–01, 186 mm TL, 115 mm SL; CSIRO H 7219–01, 158 mm TL, 101 mm SL; CSIRO H 7219–02, 131 mm TL, 91 mm SL; CSIRO H 7220–01, 155 mm TL, 103 mm SL; CSIRO H 7221–01, 190 mm TL, 110 mm SL; collected at same locality as holotype.

Diagnosis. Dorsal rays X, 16–17; anal rays III, 7; pectoral rays 15–16; lateral-line scales 37–39; gill rakers 10–13 + 21–27 (total = 32–39); body depth 2.2–2.5 in SL; spine at angle of preopercle moderately long, extending about half distance to margin of subopercle; vomerine tooth patch arrowhead-shaped; no teeth on mesopterygoids; scales dorsally on snout nearly reaching upper lip; 3rd dorsal spine elongate, 1.36–2.32 in head length; 3rd ray of dorsal fin the longest, greatly produced as a long filament; 2nd anal spine subequal to third, 2.32–2.78 in head length; caudal fin lunate, the lobes very long and filamentous, fin length 1.37–2.01 in SL. Colour when fresh mostly pink; scales on upper half of body each with a bright yellow spot; head pinkish with a vivid yellow, horizontal V-shaped marking originating on snout tip and extending posteriorly as two stripes; lower stripe running posteroventrally below eye to edge of opercle; upper stripe running posterodorsally through about the middle of eye to edge of the opercle just above primary opercular spine; nape yellowish; four pale pinkish blotches present below dorsal fin base; dorsal fin mostly yellow with some pink areas; anal fin pinkish with yellow pigment between second and third spines extending on to posterior portion of posteriorly adjacent fin membranes; caudal fin mostly pink with yellow pigment basally and extending along centre of filamentous lobes; pectoral fins pinkish with yellow pigment basally and extending along centre of filamentous lobes; pectoral fins pinkish with yellow pigment basally and extending along centre of filamentous lobes.

low stripe on anterior third extending from base of fin to about one-third distance of longest rays; pelvic fin mostly pink with yellow pigment on membrane between first and second soft rays.



FIGURE 1. Lateral view of *Odontanthias randalli* n. sp., holotype MZB 20010, 121 mm SL, east Lombok, Indonesia.

Description. Dorsal rays X, 16 (16–17); anal rays III, 7; all dorsal and anal soft rays branched, the last to bases; pectoral rays 15 (15–16), all except uppermost branched; pelvic rays I, 5, all soft rays branched; principal caudal rays 15 (14 in one paratype), middle 13 (12 in one paratype) branched; upper procurrent caudal rays 7 (6–8), posteriormost 3 segmented; 7 (6–7) lower procurrent caudal rays, posteriormost 3 segmented; lateral-line scales 37–39; scales above lateral line to origin of dorsal fin 5; full-size scales above lateral line to base of middle dorsal spines 1; scales below lateral line to origin of anal fin 18 (17–19); circumpeduncular scales 18 (18–19); gill rakers 12+24 (10–13 + 21–27), total 32–39; vertebrae 10+16; supraneural (predorsal) bones 2.

Body moderately deep, depth 2.3 (2.2–2.5) in SL; body compressed, width 2.5 (2.2–2.5) in body depth; head length 2.63 (2.63–2.84) in SL; eye large, orbit diameter 3.17 (3.11–3.65) in head length; snout short, 4.99 (4.53–5.16) in head length; interorbital region convex, least width 3.80 (3.40–3.95) in head length; caudal-peduncle depth 2.79 (2.61–2.89) in head length; caudal-peduncle length 2.21 (1.77–2.11) in head length.

Mouth moderately large, maxilla extending posterior to vertical through posterior third of pupil, upper-jaw length 2.17 (2.05–2.34) in head length; mouth oblique, forming an angle of about 50° to horizontal axis of head and body, lower jaw projecting; upper jaw with band of about six or seven rows of villiform teeth anteriorly, narrowing to two or three rows posteriorly, inner teeth (three on each side) enlarged and retrorse; point of greatest curvature on each maxilla with two (one lost on left side of holotype based on socket evidence) stout, anteriorly directed canine teeth, much longer than adjacent teeth; outer row of 22–24 teeth laterally on upper jaw posterior to canine longer, stouter, and more widely spaced than remaining band of teeth, those posterior to third to sixth tooth antrorse; lower jaw with slightly narrower band of villiform teeth, in about five rows anteriorly, narrowing to two posteriorly, several enlarged inner teeth near symphysis; point of greatest curvature on each dentary with a short, relatively stout canine tooth jutting forward and laterally; a second similar-sized canine present almost halfway to back of jaw from symphysis (lost on left side of jaw in holotype); patch of villiform teeth on vomer arrowhead-shaped (Fig. 2); patch of villiform teeth on palatines relatively long, broad anteriorly, narrowing posteriorly; no separate patch of teeth on mesopterygoids; no teeth on tongue.

Nostrils situated anterior to orbit at level of midline of pupil, anterior opening at end of small membranous tube; tube with short, rounded posterior flap that reaches aperture of much larger, comma-shaped posterior nostril (partly hidden by margin of infraorbital series); large sensory pore present just above internarial space.

Opercle with three flat spines; middle spine clearly largest and equidistant from other two, its tip nearly reaching almost two thirds distance to tip of pointed opercular flap; upper opercular spine blunt and covered by a scale; posterior margin of preopercle with 18–31 strong serrae; angle of preopercle with large flat spine extending about half the distance to margin of subopercle; three to five serrae on ventral edge of preopercle next to spine at angle; posttemporal with two or three, very short, stout serrae.

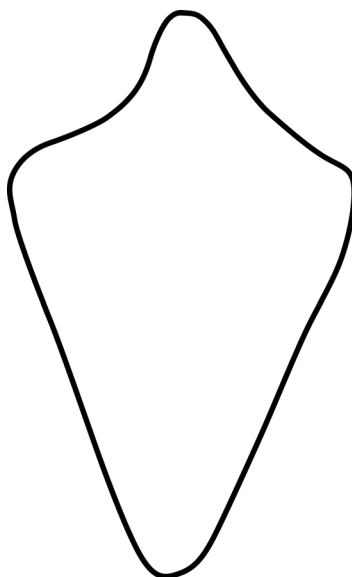


FIGURE 2. Shape of vomerine tooth patch of *Odontanthias randalli* n. sp.

Scales ctenoid; no accessory scales; scales progressively smaller anteriorly on head, those dorsally on snout nearly reaching base of upper lip; preorbital region naked; mandible mostly scaled; small scales basally on soft portions of dorsal and anal fins; progressively smaller scales on caudal fin extending about three quarters distance to posterior margin; small scales on about basal fifth of pectoral fins; pelvic fin without axillary scale; small patch of scales of variable size present between bases of pelvic fins. Lateral line continuous, highly arched over pectoral fin, forming an angle as it joins straight peduncular portion.

Origin of dorsal fin about level with upper end of preopercular margin; first dorsal spine slightly more than half length of second dorsal spine; third dorsal spine longest, 1.36 (1.36–2.32) in head length; tip of third ray of soft dorsal fin longest, 1.22 (0.89–1.52) in head length, produced and filamentous; origin of anal fin below base of second to third dorsal soft rays; first anal spine short, about half length of second; second anal spine subequal in length to third, often slightly longer, 2.66 (2.32–2.78) in head length; second anal soft ray longest, 1.41 (0.97–1.52) in head length; caudal fin lunate, lobes very long and pointed, fin length 1.39 (1.37–2.01) in SL; caudal concavity 0.65 (0.61–1.06) in head length; pectoral fins pointed, ninth ray longest and reaching vertical through origin of anal fin; ninth ray 1.28 (1.16–1.31) in head length; second ray of pelvic fins longest.

Colour (when fresh). Body pinkish, shading to pale pinkish ventrally; scales on upper half of body each with a bright yellow spot; head pinkish with a vivid yellow V-shaped marking originating from snout tip with the lower stripe running posteroventrally below the eye to edge of opercle and the upper stripe running posterodorsally through about the middle of the eye to the edge of the opercle just above the primary opercular spine; jaws and chin pinkish; nape and interorbital area yellowish; four pale pinkish blotches below dorsal fin base, third blotch at level of junction of last dorsal spine and first ray palest and most obvious; spinous dorsal fin mostly yellow, with pink pigment on anterior spines and on membrane between spines in posterior portion of fin; soft dorsal fin mostly yellow with pink pigment defining each ray; anal fin pinkish with yellow pigment on membrane between second and third spines and some yellow on membranes between other anal-fin elements; anterior edges of distal portions of first and second rays bright pink; caudal fin mostly pink with yellow pigment basally and extending along centre of filamentous lobes; pectoral fins pinkish with yellow stripe on anterior third extending from base of fin to about one-third distance of longest rays; pelvic fin mostly pink with yellow pigment on membrane between first and second soft rays.

TABLE 1. Proportional measurements of the holotype (MZB 20010) and ten paratypes of *Odontanthias randalli* as percentages of standard length.

	Paratypes (n=10)		
	Holotype	Min.	Max.
Total length (mm)	209	131	212
Standard length (mm)	121	91	126
Body depth	43.7	39.9	45.5
Body width	17.4	16.3	19.2
Head length	38.1	35.2	38.0
Snouth length	7.6	7.0	8.4
Orbit diameter	12.0	10.1	11.7
Interorbital width	10.0	9.6	10.5
Upper-jaw length	17.5	16.0	17.4
Caudal-peduncle depth	13.6	12.6	13.7
Caudal-peduncle length	17.2	18.0	19.9
Predorsal length	34.4	32.6	34.7
Preanal length	67.4	66.3	69.5
Prepelvic length	38.9	35.5	38.8
Dorsal-fin base	65.5	61.9	67.6
First dorsal spine	6.4	5.5	7.1
Second dorsal spine	10.4	8.5	11.4
Third dorsal spine	27.9	16.3	26.1
Fourth dorsal spine	17.9	14.2	17.1
Tenth dorsal spine	13.7	11.7	14.1
First dorsal ray	14.7	14.4	17.7
Longest dorsal ray	46.4	32.9	56.0
Last dorsal ray	9.1	7.1	9.1
Anal-fin base	18.9	17.9	20.1
First anal spine	8.1	7.1	8.6
Second anal spine	14.3	13.4	15.9
Third anal spine	14.4	12.6	15.7
Longest anal ray	26.9	24.4	36.5
Caudal-fin length	71.9	52.0	73.0
Caudal concavity	58.7	36.0	59.3
Pectoral-fin length	29.6	29.0	31.3
Pelvic-spine length	18.7	16.8	19.0



FIGURE 3. Lateral view of *Odontanthias borbonius*, CSIRO H 7221–02, 92 mm SL, east Lombok, Indonesia.

Distribution. Currently known only from East Lombok in the Nusa Tenggara region of Indonesia. All type specimens were collected from the fish market at Tanjung Luar from handline fishers operating in local waters.

Etymology. Named after John E. Randall, who has made such a significant contribution to the knowledge of anthiine fishes, and Indo–Pacific fishes in general. The review of the *Odontanthias* genus he co-authored provided detailed description of the nominal species and their relationships with closely related genera. Proposed vernacular name: Lombok Swallowtail

Comparisons. *Odontanthias randalli* can be separated from the other 13 nominal species of this genus by a combination of coloration, morphology and meristics.

Odontanthias randalli is distinguishable from *O. rhodopeplus*, *O. grahami*, *O. dorsomaculatus*, *O. unimaculatus*, *O. elizabethae* and *O. caudicinctus* in having 16–17 dorsal soft rays (vs. 12–14). It can be separated from *O. chrysostictus* and *O. katayamai* in having very long caudal fin lobes (vs. short, rounded caudal fin lobes) and the third dorsal spine longer than other spines (vs. subequal in length). It differs from *O. fuscipinnis*, *O. flagris*, *O. tapui* and *O. wassi* in having very long, filamentous caudal-fin lobes (vs. short or long, broadly rounded or paddle-like caudal lobes). *Odontanthias randalli* also differs from *O. tapui* in having the third dorsal spine longer than other dorsal spines. It differs from *O. borbonius* in modal number of dorsal soft rays of 16 (vs. 17), coloration and body depth.

The third dorsal soft ray is extremely long and filamentous in *O. randalli*, but no other dorsal rays are filamentous. In contrast, most of the other nominal species (except *O. flagris* and *O. wassi*) have nearly half of the anterior dorsal soft rays produced as filaments. *Odontanthias randalli* has more lateral-line scales than *O. rhodopeplus* (37–39 vs. 30–33), and fewer than *O. borbonius* (39–43), *O. caudicinctus* (46–51), *O. flagris* (40–46), *O. fuscipinnis* (42–47) and *O. wassi* (42). The new species has fewer gill rakers (32–39) than most of the other nominal species, i.e. 44 or more in *O. elizabethae*, *O. wassi* and *O. fuscipinnis*; 39 or more in *O. chrysostictus*, *O. dorsomaculatus*, *O. grahami*, *O. katayamai*, *O. rhodopeplus*, *O. tapui* and *O. unimaculatus*. *Odontanthias randalli* has a low number of pectoral-fin rays, i.e. 15–16 (modally 15), compared to 18 or more in *O. caudicinctus*, *O. dorsomaculatus* and *O. unimaculatus*; strongly modally 17 in *O. borbonius* and *O. fuscipinnis*; and strongly modally 16 in *O. tapui*. The vomerine tooth patch in *O. randalli* is elongate and somewhat arrowhead-shaped; it is most similar to that of *O. tapui* (see Fig. 1 in Randall & Heemstra, 2006).

The colour patterns of *Odontanthias* species are very distinctive (see Randall & Heemstra, 2006 for fresh specimen images of 13 of the nominal species). The body colour pattern of *O. randalli* is closest to *O. tapui* and *O. chrysostictus* in being pinkish with a bright yellow spot on each scale of the upper half of body. The body colour differs from these species in having four pale pink blotches below the dorsal-fin base. The caudal-fin shape is also very distinctive in *O. randalli*, i.e. lunate with very long filamentous lobes. Among *Odontanthias* species, only *O. elizabethae* possesses similarly long and filamentous caudal-fin lobes.

Three species of *Odontanthias* have been previously recorded from Indonesia, *O. borbonius*, *O. chrysostictus* and *O. rhodopeplus*, all from northern Sulawesi in the north portion of the archipelago. *Odontanthias randalli* is one of the first two species of *Odontanthias* to be recorded from southern Indonesia (Lombok), with a single specimen of *O. borbonius* (Fig. 3) taken at the same site. Lombok represents a new locality record for *O. borbonius*.

Key to species of *Odontanthias* (adapted from Randall & Heemstra, 2006)

- 1a. Dorsal soft rays 12–14; body depth 2.4–2.9 in SL 2
- 1b. Dorsal soft rays 15–19; body depth 1.9–2.4 in SL 7
- 2a. Third dorsal spine of adults longer than other dorsal spines (except females of some species); caudal fin emarginate, the fin length 2.5–3.0 in SL 3
- 2b. Third dorsal spine not longer than other dorsal spines; caudal fin lunate, with filamentous lobes, 1.2–2.5 in SL 6
- 3a. Dorsal soft rays 12–13; lateral-line scales 30–33; base of caudal fin with a black bar, often bordered with white
..... *O. rhodopeplus* (Japan to India)
- 3b. Dorsal soft rays 14; lateral-line scales 35–44; no black bar at base of caudal fin. 4
- 4a. Spine at angle of preopercle long, reaching edge of subopercle; pectoral rays 16; broad submarginal blackish band in soft portion of dorsal fin; no black band or spots on membrane of third dorsal spine *O. grahami* (New South Wales)
- 4b. Spine at angle of preopercle reaching only about halfway to edge of subopercle; pectoral rays 18–19; no blackish band in soft portion of dorsal fin; slender black band in distal part of membrane of third dorsal spine 5
- 5a. Lateral-line scales 44; body depth 2.6–2.7 in SL *O. dorsomaculatus* (Western Indian Ocean)
- 5b. Lateral-line scales 34–38; body depth 2.35–2.6 in SL *O. unimaculatus* (Japan to Philippines)
- 6a. Lateral-line scales 38–42; gill rakers 44–47; caudal fin very lunate with long filamentous lobes, the fin length 1.15–1.4 in SL; pelvic fins very long and filamentous, 1.95–2.5 in SL; large brown area posteriorly on body between soft portions of dorsal and anal fins and on anterior half of caudal peduncle, remainder white *O. elizabethae* (Hawaii)
- 6b. Lateral-line scales 46–51; gill rakers 37–41; caudal fin not very lunate, the fin length 1.9–2.7 in SL; pelvic fins not very long, 3.5–4.2 in SL; colour not as above, males with a dark brown blotch covering most of caudal-fin base
..... *O. caudicinctus* (east Africa)
- 7a. Third dorsal spine extremely elongate, 1.25–2.4 in SL *O. flagris* (Japan)
- 7b. Third dorsal spine not extremely elongate, >3.4 in SL 8
- 8a. Third dorsal spine not longer than other dorsal spines 9
- 8b. Third dorsal spine longer than other dorsal spines (except in females of *O. borbonius*) 11
- 9a. Caudal fin with very long caudal lobes, the fin length 1.2–1.6 in SL; gill rakers 42–47 *O. tapui* (Pacific Islands)
- 9b. Caudal fin without very long caudal lobes, the fin length 2.1–2.95 in SL; gill rakers 39–43 10
- 10a. Caudal-fin mainly yellow; caudal-fin lobes tapering and not broad, the fin length 2.1–2.35 in SL; mandible fully scaled; scales dorsally on snout ending at line joining anterior nostrils; filamentous second pelvic ray long, 2.7–3.15 in SL; lateral-line scales 36–38.
..... *O. chrysostictus* (Indonesia)
- 10b. Caudal-fin mainly red; caudal-fin lobes broad and not tapering, the fin length 2.6–2.95 in SL; mandible scaled forward to second mandibular pore; scales dorsally on snout nearly reaching base of upper lip; filamentous second pelvic ray extremely long, 1.7–2.05 in SL; lateral-line scales 38–42 *O. katayamai* (Mariana Is., Japan and Taiwan)
- 11a. Caudal-fin lobes not tapering, broadly rounded and paddle-like, the fin length 2.4–2.8 in SL; lateral-line scales 42–47
..... *O. fuscipinnis* (Hawaii and Johnston Is.)
- 11b. Caudal-fin lobes tapering, not broadly rounded and paddle-like, the fin length 1.2–2.55 in SL; lateral-line scales 37–43 ... 12
- 12a. Body depth 1.9–2.25 in SL; dorsal soft rays 16–18 (strongly modal at 17); pink to red with 9–11 distinct dark brown or yellow blotches, most larger than eye; a broad yellow band from front of snout to base of pectoral fin
..... *O. borbonius* (east Africa to western Pacific)
- 12b. Body depth 2.2–2.5 in SL; dorsal soft rays 16–17 (rarely 17); colour not as above. 13
- 13a. Second dorsal ray longest, 1.5 in head length; lateral-line scales 42; colour pinkish with a large yellow area on body above pectoral fins. *O. wassi* (American Samoa)
- 13b. Third dorsal ray longest, very elongate, 0.7–1.1 in head length; lateral-line scales 37; colour pinkish with numerous yellow spots on dorsal half of body and yellow stripes on head. *O. randalli* n. sp. (Indonesia)

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