

## Two New Species of Anthiine Fishes of the Genus *Plectranthias* (Perciformes: Serranidae) from Taiwan

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**Kao-Yi Wu, John E. Randall, and Jeng-Ping Chen (2011)** Two new species of anthiine fishes of the genus *Plectranthias* (Perciformes: Serranidae) from Taiwan. *Zoological Studies* 50(2): 247-253. Two new species of anthiine fishes of the genus *Plectranthias* are described from single specimens taken by trawling off southwestern Taiwan at depths of 200-243 m. *Plectranthias elongatus* sp. nov. is characterized by having an elongate body (body depth 3.7 in standard length (SL)), dorsal fin X, 15, pectoral fin 16, lateral-line scales 31, scales present on maxilla, no scales on snout, no antrorse spine on ventral margin of preopercle, posterior margin serrate, and pinkish-white coloration with large orange-red spots on fish when fresh. *Plectranthias xanthomaculatus* sp. nov. is characterized by body depth 3.2 in SL, dorsal rays X, 14, pectoral rays 15, lateral-line scales 30, scales present on maxilla, no scales on snout, the posterior margin of preopercle smooth, with no antrorse spine ventrally, and deep-pink when fresh, with large yellow blotches on body, yellow bands on head, and mainly yellow fins. A key is provided for the 13 species of *Plectranthias* known from off Taiwan. <http://zoolstud.sinica.edu.tw/Journals/50.2/247.pdf>

**Key words:** New species, *Plectranthias*, Anthiine fishes, Serranidae.

The serranid fish genus *Plectranthias* of the subfamily Anthiinae was revised by Randall (1980). He recognized 30 species, of which 1 is from the tropical western Atlantic, and the remaining species are from the Indo-Pacific region. The western Atlantic species, *P. garrupellus*, is known from North Carolina which is well north of the tropics (Heemstra et al. 2003). Randall (1980) wrote that most species of *Plectranthias* were collected in deeper water than usual scuba-diving depths, the majority from areas with a hard bottom, and added that most are small, hence not apt to be taken by hook and line. He noted that 18 of 30 species in the genus were then known from only 1 or 2 collections, and 8 of the 18 were represented by single specimens.

Shen and Lin (1984) recorded *P. kamii*

Randall, 1980, *P. kelloggi* (Jordan and Evermann 1903), and *P. japonicus* (Steindachner, 1883) as the 1st species of the genus from Taiwan, and they described *P. chungchowensis* as a new species for the island. In a review of serranid fishes of Taiwan, Lee (1990) recognized the following 9 species of *Plectranthias*: *P. anthioides* (Günther, 1872); *P. helenae* Randall, 1980; *P. japonicus* (Steindachner, 1883); *P. kelloggi*; *P. longimanus* (Weber 1913); *P. nanus* Randall, 1980; *P. wheeleri* Randall, 1980; *P. whiteheadi* Randall, 1980; and *P. yamakawai* Yoshino, 1972. He placed *P. chungchowensis* in synonymy with *P. whiteheadi* and *P. kamii* in synonymy with *P. anthioides*; however, Randall (1996) resurrected *P. kamii* as a valid species. Lin et al. (1994) reported *P. randalli* Fourmanoir and Rivaton, 1980 as the 1st record for Taiwan. Chen

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and Shao (2002) described *P. sheni* as a new species from Taiwan and provided a key to the 11 species of the genus for the island.

When cataloguing fish specimens at the Museum of the Institute of Zoology, National Taiwan University, the 1st author found 2 unidentified specimens of the genus *Plectranthias*, both taken by trawling at 200-243 m off Hsing-Ta Harbor, Kaohsiung, southwestern Taiwan, one in 2002 and one in 2004. Although similar in morphology and color in alcohol, the 2 specimens were soon determined to be different species. This was even more apparent when the color photographs taken by the 3d author were found. On checking the literature of the genus *Plectranthias*, we ascertained that each of these 2 specimens represents a new species, which are described here.

## MATERIALS AND METHODS

Type specimens of the new species of *Plectranthias* are deposited in the National Museum of Marine Science and Technology (NMMST), Taipei, Taiwan.

Lengths recorded for the specimens are standard length (SL) or head length (HL). Methods of counting and measuring specimens follow Randall (1980).

Thirty measurements were made of the type specimens of the 2 new species and tabulated as a percentage of the SL. Proportional measurements in the text of the descriptions of the new species are rounded to the nearest 0.05.

## RESULTS

### *Plectranthias elongatus* sp. nov.

(Fig. 1, Table 1)

**Holotype:** NMMSTP01301, 54.2 mm SL, Hsing-Ta Harbor, Kaohsiung, SW Taiwan, 22° 41.566'N, 119°54.085'E, depth 243 m, trawl, fishery vessel, J.P. Chen, 30 Nov. 2004.

**Diagnosis:** Dorsal fin X,15; pectoral fin 16; lateral-line scales 31; snout not scaly; maxilla scaly; body elongate, body depth 3.7 in SL; no antrorse spine on ventral margin of preopercle, posterior margin serrate; margins of opercle, interopercle, and subopercle smooth; canine teeth in jaws; 4th and 5th dorsal spines longest; color when fresh, pinkish-white with large orange-red

spots, 1 extending onto posterior spinous portion of dorsal fin.

**Description:** Dorsal fin X,15, anal fin III,7; all dorsal and anal-fin soft rays branched, the last to base; pectoral rays 16, all rays branched except uppermost; pelvic fin I,5; branched caudal rays 8 + 7, upper and lower segmented, simple caudal rays 2, upper procurent caudal rays 4; lower procurent caudal rays 3; lateral-line scales 31; scales above lateral line to origin of dorsal fin 2; scales below lateral line to origin of anal fin 11; oblique rows of scales on cheek 7; circumpeduncular scales 18; gill rakers 6 + 13 (1 + 8 developed); pseudobranchial filaments 12; branchiostegal rays 7; vertebrae 10 + 16; supraneural bones 2, their arrangement with neural spine and dorsal pterygiophores as follows: 0/0/2/1+1/1/1, where "0" is a supraneural bone, "/" a neural spine, and numerals are the number of dorsal spines borne by each pterygiophore.

Body elongated for genus, depth 3.7 in SL, and compressed, width 1.7 in body depth; dorsal profile of the head moderately convex, forming an angle of about 20° to horizontal; head length 2.6 in SL; snout length 4.4 in HL; orbit diameter 3.2 in HL; bony interorbital width very narrow, 13.0 in HL; least depth of caudal peduncle 3.4 in HL; caudal-peduncle length 1.9 in HL.

Mouth terminal, forming an angle of about 30° to horizontal, maxilla nearly reaching a vertical at hind edge of eye, upper-jaw length 2.0 in HL; front of upper jaw with 3 large incurved canine teeth (2 on right side), with a symphyseal gap 3.3 in orbit diameter; a band of villiform teeth on side of jaw in 8 or 9 irregular rows anteriorly, narrowing to 4 or 5 rows along most of side of jaw; medial row of teeth in villiform band toward front of upper jaw inwardly depressible, of these teeth 3 or 4 slightly enlarged; front of lower jaw with a small canine on left side (missing on right), medial to canine of upper jaw when mouth closed; 2 canines posteriorly on side of lower jaw (1 on other side); lower jaw with band of villiform teeth in about 5 irregular rows anteriorly, continuing to symphysis, narrowing to 3 rows along side of jaw; inner medial teeth anteriorly in lower jaw larger and inwardly depressible; a band of villiform teeth forming a V-shape on vomer, with 4 or 5 rows at apex of V; 2 rows of villiform teeth on palatines.

Opercle with 3 flat spines, middle 1 largest, ending most posteriorly, and slightly upcurved; upper spine poorly developed and flexible; lower spine sharp; posterior margin of preopercle with 13 serrae; no serrae or antrorse spine on ventral



Fig. 1. Holotype of *Plectranthias elongatus* sp. nov., NMMSTP01301, 54.2 mm SL.

**Table 1.** Proportional measurements of holotypes of *Plectranthias elongatus* sp. nov. and *P. xanthomaculatus* sp. nov. as percentages of the standard length

	<i>P. elongatus</i>	<i>P. xanthomaculatus</i>
Standard length (mm)	54.2	57.6
Head length	38.5	44.3
Depth of body	26.9	30.6
Width of body	15.5	19.6
Snout length	8.9	10.1
Postorbital of head	20.5	24.0
Bony interorbital width	3.0	3.30
Diameter of orbit	11.8	12.7
Length of upper jaw	19.6	21.5
Depth of maxilla	5.4	6.1
Least depth of caudal peduncle	11.3	11.8
Length of caudal peduncle	20.7	22.9
Snout to origin of dorsal fin	36.7	38.9
Snout to origin of anal fin	69.4	69.4
Snout to origin of pelvic fin	36.5	36.5
Length of dorsal fin base	50.6	47.6
Length of 1st dorsal spine	6.6	4.0
Length of 3rd dorsal spine	11.6	10.2
Length of 4th dorsal spine	14.0	12.9
Length of 5th dorsal spine	14.4	13.4
Length of last dorsal spine	7.0	4.1
Length of longest dorsal ray	15.9	14.8
Length of anal fin base	14.6	14.8
Length of 1st anal spine	7.4	6.6
Length of 2nd anal spine	17.7	12.7
Length of 3rd anal spine	12.2	10.1
Length of longest anal ray	19.2	17.0
Longest pectoral fin	34.3	29.2
Length of pelvic spine	11.4	10.4
Length of pelvic fin	21.0	17.0
Length of caudal fin	22.9	30.2

margin; margins of subopercle and interopercle smooth; free edge of posttemporal bone smooth.

Anterior nostril a thin, moderately long, membranous tubule, rim higher posteriorly, in front of center of pupil; posterior nostril an elliptical slit with little rim, its lower margin slightly above base of anterior nostril; posterior nostril separated from edge of orbit by a distance about equal to its least diameter; a large pore between anterior and posterior nostrils.

Lateral line complete, broadly arched over pectoral fin, its highest point at 5th and 6th lateral-line scales (below base of 4th dorsal spine), then following contour of back to straight peduncular section; scales ctenoid; scales dorsally on head progressively smaller anteriorly, extending forward to level of posterior nostrils; scales on suborbital extending to below middle of pupil; maxilla scaly; no scales on snout, lower jaw, chin, or gill membranes; small scales basally on all fins except spinous portion of dorsal and anal fins (full extent of squamation on fins not known due to loss of scales).

Origin of dorsal fin over 3rd lateral-line scale; 1st dorsal spine short, 5.8 in HL, slightly more than 1/2 length of 2nd dorsal spine; 4th dorsal spine longest, 2.7 in HL (5th spine nearly as long, 2.75 in HL); 10th dorsal spine 5.5 in HL; longest dorsal ray 2.4 in HL; origin of anal fin below base of 4th dorsal soft ray; 1st anal spine 5.2 in HL; 2nd anal spine longest, 2.2 in HL; 3rd anal spine 3.2 in HL; longest anal soft ray 2.0 in HL; caudal fin asymmetrically rounded (dorsal 1/2 more posterior, with at least 2 rays exerted), lower 1/2 of fin slightly emarginate; caudal-fin length to end of longest filament 1.15 in HL; pectoral fins pointed, 10th ray longest, equal to HL, 2.9 in SL, reaching a vertical at base of 3rd or 4th anal ray; pelvic fins not reaching anus, 1.85 in HL.

Color of holotype when fresh: body pinkish-white dorsally, shading to yellowish-white ventrally, with large orange-red spots, 6 in a row above lateral line from nape to base of caudal fin, last 2 small and interconnected; a 2nd row of orange-red spots below lateral line, last 3 extending to ventral edge of body; a large orange-red spot below basal 1/2 of pectoral fin; head pink, shading to pinkish-white ventrally, with a large, squarish, orange-red spot on opercle at level of ventral edge of eye, a similar spot extending posteriorly from upper part of eye, and a small spot extending posteriorly from lower part of eye; an oblique orange-red streak on cheek, its upper end below center of eye; snout and front of lower jaw blotched with

orange and yellow; iris mainly greenish-yellow; spinous portion of dorsal fin with pink spines and pinkish-white membranes, except for extension of large 3rd red spot dorsally on body well into last 3 spines and adjacent membranes; soft portion of dorsal fin translucent-whitish, rays tinged with pink posteriorly; anal fin whitish; caudal fin translucent-white with pink rays; pectoral fins transparent with pale-pink rays; pelvic fins translucent-white with pink rays.

Color in alcohol pale with traces of dark pigment at sites of orange-red spots dorsally on body, last 3 spots below lateral line, and on lateral line itself.

*Etymology*: This species is named *elongatus* in reference to its elongate body.

### ***Plectranthias xanthomaculatus* sp. nov.**

(Fig. 2, Table 1)

*Holotype*: NMMSTP01302, 57.6 mm SL, Hsing-Ta Harbor, Kaohsiung, SW Taiwan, 22° 42.64'N, 119°51.70'E, depth 200-223 m, trawl, fishery vessel, J.P. Chen, 15 Aug. 2002.

*Diagnosis*: Dorsal fin X, 14; pectoral fin 15; lateral-line complete, scales 30; snout naked; maxilla scaly; body depth 3.2 in SL; no antrorse spine on ventral margin of preopercle, posterior margin smooth; margins of opercle, interopercle, and subopercle smooth; canine teeth in jaws; 4th and 5th dorsal spines longest; head and body deep-pink when fresh, with large yellow blotches; yellow bands on head, and mainly yellow fins.

*Description*: Dorsal fin X, 14; anal fin III, 7; all dorsal and anal-fin soft rays branched, the last to base; pectoral fin 15, all rays branched except uppermost; pelvic fin I, 5; branched caudal rays 8 + 7; upper and lower segmented, simple caudal rays 2; upper procurrent caudal rays 5; lower procurrent caudal rays 4; lateral-line scales 30; scales above lateral line to origin of dorsal fin 2.5; scales below lateral line to origin of anal fin 8; oblique rows of scales on cheek 7; circumpeduncular scales 15; gill rakers 6 + 10 (1 + 7 developed); pseudobranchial filaments 13; branchiostegal rays 7; vertebrae 10 + 16; supraneural bones 2, their arrangement with neural spine and dorsal pterygiophores as follows: 0/0/2/1+1/1/1, where "0" is a supraneural bone, "/" a neural spine, and numerals are the number of dorsal spines borne by each pterygiophore.

Body slightly elongated for genus, depth 3.2 in SL, and compressed, width 1.55 in body depth; dorsal profile of head moderately convex, forming

an angle of about 20° to horizontal; head length 2.3 in SL; snout length 4.4 in HL; orbit diameter 3.5 in HL; bony interorbital width very narrow, 13.4 in HL; least depth of caudal peduncle 3.75 in HL; caudal-peduncle length 2.0 in HL.

Mouth terminal, oblique, forming an angle of about 30° to horizontal, maxilla nearly reaching a vertical at hind edge of eye; upper-jaw length 2.05 in HL; a recurved canine tooth anteriorly at side of upper jaw (2 on right side), with a symphyseal gap 3.3 in orbit diameter; a band of villiform teeth in about 4 or 5 irregular rows continuing along side of jaw; anterior medial teeth of villiform band of teeth inwardly depressible, 2 of them slightly enlarged; no canines at front of lower jaw but a small 1 posteriorly in jaw; lower jaw with a band of villiform teeth in about 4 irregular rows anteriorly, narrowing to 3 rows along side of lower jaw; a gap at symphysis of lower jaw without teeth; medial anterior villiform teeth inwardly depressible; a band of villiform teeth forming a V-shape on vomer, with 3 rows at apex of V; 4 rows of villiform teeth on palatines.

Opercle with 3 flat spines, middle 1 largest, most posterior, and slightly upcurved; upper spine poorly developed and flexible; lower spine sharp; no antrorse spine on ventral margin of preopercle; posterior margin of preopercle and margins of subopercle and interopercle smooth; free edge of posttemporal bone smooth.

Nostrils anterior to orbit at level of dorsal 1/2 of pupil; anterior nostril a moderately long, membranous tubule, rim higher posteriorly; posterior nostril an elliptical opening with little rim, its lower margin slightly above base of anterior

nostril, its upper margin level with dorsal end of anterior nostril; opening of posterior nostril shorter than tubule of anterior nostril; posterior nostril separated from edge of orbit by a distance about equal to its least diameter; a pore between anterior and posterior nostrils.

Lateral line complete, broadly arched over pectoral fin, its highest point at 5th lateral-line scale (below base of 4th dorsal spine), then approximately following contour of back to straight peduncular portion; scales ctenoid; scales progressively smaller anteriorly on dorsal part of head, extending forward to level of posterior nostrils; scales on suborbital extending to below hind edge of pupil; maxilla scaly; no scales on snout, lower jaw, chin, or gill membranes; small scales basally on all fins except spinous portion of dorsal and anal fins (full extent of squamation not known due to loss of scales).

Origin of dorsal fin over 2nd lateral-line scale; 1st dorsal spine short, 11.0 in HL, slightly more than 1/2 length of 2nd dorsal spine; 5th dorsal spine longest, 3.3 in HL (4th spine nearly as long, 3.45 in HL); 10th dorsal spine 11.0 in HL; longest dorsal soft ray 3.0 in HL; origin of anal fin below base of 4th dorsal soft ray; 1st anal spine 6.7 in HL; 2nd anal spine longest, 3.5 in HL; 3rd anal spine 4.4 in HL; longest anal soft ray 2.6 in HL; caudal fin 1.45 in HL; lower 1/2 of caudal fin slightly rounded, upper 1/2 slightly emarginate; 2nd and 5th principal caudal fin rays exerted as short filaments; pectoral fins rounded, 9th ray longest, 1.5 in HL, 3.35 in SL, reaching a vertical at base of 1st and 2nd anal spines; pelvic fins not reaching anus, their length 2.6 in HL.



Fig. 2. Holotype of *Plectranthias xanthomaculatus* sp. nov., NMMSTP01302, 57.6 mm SL.

Color of holotype in alcohol uniformly pale with no traces of dark pigment. Color of body when fresh deep-pink, scales paler centrally, with 2 rows of large yellow blotches on upper 1/2 of body, 1st as 7 spots along back, one on nape above and adjacent to lateral line, 4 extending into base of dorsal fin, and last 2 dorsally on caudal peduncle; a 2nd row of 6 yellow blotches below lateral line, the last linked by a curved band to posterior spot of upper series; a large elliptical yellow blotch anteriorly on side of body, obliquely oriented, with lower 2/3 covered by pectoral fin; head deep-pink with 3 yellow bands, 2 extending posterior to eye, lower 1 enlarged as a dusky-yellow blotch on opercle; 3rd yellow band running obliquely from front of snout across cheek to corner of preopercle; snout and chin mainly yellow; iris mainly blackish with an inner golden-yellow ring; spinous portion of dorsal fin with yellow spines, membranes mainly pink except for 2 large yellow blotches extending into fin from body; soft portion of fin pale yellowish except for bright yellow on basal blotches; anal, caudal, and pelvic fins yellow; pectoral fins transparent with orange-yellow rays.

**Etymology:** This species is named *xanthomaculatus* in reference to the yellow blotches in life.

## DISCUSSION

*Plectranthias elongatus* sp. nov. is the most slender species of the genus. The closest in body depth is *P. megalophthalmus* Fourmanoir & Randall, 1979 from New Caledonia, with a body depth of 3.4 in SL. The 2 species share the same count of 15 dorsal-fin rays and 31 lateral-line scales, but they are easily separated by the much-larger eye of *P. megalophthalmus*, the orbit diameter 2.9 in head length versus 3.2 for *P. elongatus* sp. nov., by its lack of canine teeth, and by its smooth posterior preopercle edge.

Of the known species of this genus, *Plectranthias xanthomaculatus* sp. nov. is most closely related to the Australian species *P. lasti* Randall & Hoese 1995, described from 2 specimens, 49.2 and 68.0 mm SL, the former from Western Australia at 200-204 m, and the latter from Queensland at 365-370 m in depth. There is no record of fresh coloration for either specimen. *Plectranthias xanthomaculatus* sp. nov. and *P. lasti* share the following characters: 14 dorsal soft rays, 15 pectoral rays, 30 lateral-line scales, no scales on snout; scales present on maxilla; and

smooth posterior preopercle edge. *Plectranthias xanthomaculatus* sp. nov. differs from *P. lasti* in having a more-elongate body (body depth 3.2 in SL compared to 3.05 for *P. lasti*); 5th dorsal spine longest, but 4th spine nearly as long, 3.3 and 3.45 in HL for each (5th dorsal spine distinctly longest in *P. lasti*, 2.9-3.0 in HL); pectoral fins shorter, 1.5 in HL (1.3 in *P. lasti*); pelvic fins much shorter, 2.6 in HL (1.8 in *P. lasti*), pseudobranchial filaments 13 (15-17 for *P. lasti*), opening of posterior nostril not larger than anterior nostril (ovate opening of posterior nostril nearly twice as large as anterior nostril in *P. lasti*), and gill rakers 6 + 10, 1 + 7 developed (5 + 12, 1 + 7 developed for *P. lasti*).

These 2 new species can be recognized from other species of *Plectranthias* of Taiwan by the following key.

### Key to the species of *Plectranthias* of Taiwan (modified from Chen and Shao 2002)

- 1a. No pectoral rays branched; lateral line incomplete..... 2
- 1b. Some pectoral rays branched; lateral line complete..... 3
- 2a. Pectoral rays 14-16; lateral-line scales 16-22; no serrae on interopercle; a vertical row of 3 small dark spots at base of caudal fin ..... *P. nanus*
- 2b. Pectoral rays 12 or 13; lateral-line scales 12-15; 1-8 coarse serrae on interopercle; 1 or 2 small dark spots at base of caudal fin ..... *P. longimanus*
- 3a. Head, including maxilla and chin, almost completely scaled ..... 4
- 3b. Head not completely scaled (most of snout, chin, and often the maxilla naked) ..... 5
- 4a. Caudal fin rounded or truncate with rounded corners; no elongated dorsal soft rays; no large canine teeth on lower jaw; lower-limb gill rakers 10-12; no red bars on body or red spot on caudal fin ..... *P. japonicus*
- 4b. Caudal fin emarginate; 2nd dorsal soft ray elongated as a filament; a pair of stout canine teeth at front of lower jaw; lower-limb gill rakers 14-17; red bars dorsally on body and a red spot dorsally on base of caudal fin ..... *P. kelloggi*
- 5a. No antrorse spine on ventral margin of preopercle ..... 6
- 5b. Two antrorse spines on ventral margin of preopercle..... 8
- 6a. Lateral-line scales 37-39; body deep, depth 2.3 in SL; pink with 2 broad oblique dark red bars on body and a dark-red band extending ventroposteriorly from eye ..... *P. randalli*
- 6b. Lateral-line scales 30 or 31; body elongate, depth 3.2-3.7 in SL; color not as in 6a ..... 7
- 7a. Dorsal fin X,15; margin of preopercle serrate; body depth 3.7 in SL; pinkish-white with large orange-red spots ..... *P. elongatus* sp. nov.
- 7b. Dorsal fin X,14; margin of preopercle smooth; body depth 3.2 in SL; red with large yellow blotches on body and yellow bands on head, fins mainly yellow ..... *P. xanthomaculatus* sp. nov.
- 8a. Lateral-line scales 28-30; dorsal soft rays 15 or 16 ..... 9
- 8b. Lateral-line scales 31-35 (*whiteheadi* with 30-35); dorsal soft rays 17 or 18 (rarely 16 in *yamakawai*) ..... 10
- 9a. Dorsal soft rays 16; pectoral rays 13; 3rd dorsal spine 2.45 in head length; pale yellow with large red blotches forming

- a reticulum.....*P. wheeleri*
- 9b. Dorsal soft rays 15; pectoral rays 14; 3rd dorsal spine 2.1-2.35 in head length; interconnected, yellow-spotted, red blotches dorsally on body, continuing below lateral line as 4 bars..... *P. helenae*
- 10a. Third dorsal spine longest ..... 11
- 10b. Fourth or 5th dorsal spine longest ..... 12
- 11a. Lateral-line scales 32 or 33; cheek scale rows 5; yellowish-pink with 2 longitudinal rows of large dusky blotches, 1 above lateral line and 1 midlateral on body ..... *P. sheni*
- 11b. Lateral-line scales 35-37; cheek scale rows 6; light-red, pink ventrally, with irregular dusky-yellow bars and blotches.....*P. kamii*
- 12a. Body moderately deep, depth 2.4-2.7 in SL; pectoral rays 14; numerous small dark brown spots dorsally on head and body, and a large red spot on midside of body..... *P. yamakawai*
- 12b. Body not deep, depth 2.85-3.0 in SL; pectoral rays 15; 2 rows of large dark red blotches dorsally on body, one above and one below lateral line.....*P. whiteheadi*

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