

## FOUR NEW SERRANID FISHES OF THE ANTHIINE GENUS *PSEUDANTHIAS* FROM THE SOUTH PACIFIC

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**ABSTRACT.** – Four new species of the anthiine fish genus *Pseudanthias* are described from islands of the South Pacific: *P. carlsoni* from Fiji in 37-46 m (with nontype specimens identified from Papua New Guinea, Solomon Islands, and Loyalty Islands) is characterised by 16 dorsal soft rays; 17 or 18 pectoral rays; 41-45 lateral-line scales; 10-11 + 24-26 gill rakers; body depth 2.7-3.1 in SL; third dorsal spine of males elongate, 1.6-1.85 in head length; males with a narrow red bar on side of body below eighth dorsal spines and a large bright red spot in dorsal fin between sixth and seventh or eighth spines. *P. flavicauda* from Fiji in 30-61 m, has 16 dorsal soft rays; 17-18 pectoral rays; 45-49 lateral-line scales; 10-11 + 24-26 gill rakers; body depth 3.1-3.3 in SL; third dorsal spine of males elongate, 1.5-1.95 in head length; body of males magenta with a large predominately yellow area on back; fins of both sexes mainly yellow, that of caudal fin brightest. *P. hiva* from the Marquesas, one of a complex that includes *P. cooperi*, has 17 or 18 dorsal rays; 19-21 pectoral rays; 45-48 lateral-line scales; 11-13 + 25-27 gill rakers; body depth 3.0-3.2 in SL; both sexes orange to red dorsally, shading to lavender ventrally, the scales on side and ventrally with yellow centers; a narrow orange-red bar on side below eighth and ninth dorsal spines; females with red-tipped caudal lobes; caudal fin of males red with pink margins and lobe filaments. *P. privitera* from Rarotonga in 116 m has 15 dorsal soft rays; 18 pectoral rays; 47-52 lateral-line scales; 8-10 + 24-27 gill rakers; 2 supraneural bones; an elongate body, the depth 3.9-4.7 in SL; a fleshy protuberance at front of upper lip of males, third dorsal spine of males elongate, about 1.4 in head length; body yellow dorsally, pink ventrally, with irregular yellow stripes on side; a broad orange band at and below base of soft portion of dorsal fin, bordered ventrally by pale blue; dorsal fin yellow with some small pink spots; anal fin greenish yellow with a magenta reticulum.

### INTRODUCTION

The species of the Indo-Pacific genus *Pseudanthias* of the subfamily Anthiinae, family Serranidae, are small fishes of tropical and subtropical seas that feed on zooplankton above coral reefs or rocky substrata where they hide with the approach of predators and where they shelter at night. They are usually seen in harem aggregations. Males are the result of sex reversal and are generally larger than females. Should a male be removed, as by predation, the dominant (usually the largest) female of the harem changes sex and assumes the male role and coloration. Species of this genus are among the most colorful of fishes, with red, pink, orange, yellow, violet, and lavender predominating. Because of their small size, they are not sought by fishermen for food, and because of their occurrence over hard substrata, they are not apt to be taken by trawls. The majority of species occur at moderate depths (generally more than 15-20 m), and most were not discovered until ichthyologists began collecting with the use of scuba.

The species of *Pseudanthias* that were described before 1986 were mostly classified in the genus *Anthias* Bloch, type species *Anthias anthias* (Linnaeus). Katayama and Amaoka (1986) showed that *Pseudanthias* Bleeker, type species *Anthias pleurotaenia* Bleeker, is clearly distinct from *Anthias*. Although they continued to list *Mirolabrichthys* and *Franzia* as genera, they wrote, "*Pseudanthias*, *Franzia* and *Mirolabrichthys* closely resemble each other in external and internal characters." Subsequent authors, however, have placed species described in *Franzia* and *Mirolabrichthys* in the genus *Pseudanthias*.

There is a major distributional difference in the species of *Anthias* and *Pseudanthias*. There are eight species of *Anthias*, seven of which occur in the Atlantic and one (undescribed) from off the Galapagos Islands, all usually found deeper than 150 m. The 52 currently accepted species of *Pseudanthias* (Appendix) are confined to the Indo-Pacific, and most are found in scuba-diving depths.

Masuda et al. (1984) recorded and illustrated 17 species of *Pseudanthias* in colour from Japan. Myers (1999) illustrated 22, also in colour, from the islands of Micronesia (two as *Pseudanthias* sp.).

Fewer species have been recorded from the South Pacific region. Allen and Starck (1982) recorded and illustrated 15 species in colour from the Great Barrier Reef (their *Anthias* sp. A is now identified as *Pseudanthias hypselosoma*, and their *Anthias* sp. B was described as *Anthias luzonensis* by Katayama and Masuda, 1983).

Wass (1984) listed seven species from Samoa. Three of these were identified as *Anthias* sp., and specimens were deposited at the California Academy of Sciences. CAS 44374, 67 mm SL, was sent on loan to us; we identify it as *Pseudanthias cooperi* Regan. CAS 44375 is a 24-mm juvenile and was not requested. The larger of the two specimens of CAS 44376, 84 mm SL, was sent on loan and remains unidentified. With a body depth of 2.95 in SL and a prolonged third dorsal spine, it looks like the larger of the two species from Fiji described herein as new. However, Wass' count of 48 lateral-line scales (which we confirm), our count of 11 + 29 gill rakers, a longer third dorsal spine, and notably longer pelvic fins indicate that it is a different, and hence a probable undescribed species. Richard C. Wass was contacted to see if he had colour photographs or colour notes of this species, but he does not. Because colour is so important for the identification of species of *Pseudanthias*, we believe the description of this fish should await the collection of additional specimens and documentation of its colour.

Randall (1985) included seven species of *Pseudanthias* in a checklist of fishes of French Polynesia (one from the Marquesas as *Anthias* sp.).

Kulbicki et al. (1994) recorded five species of *Pseudanthias* from the Chesterfield Islands (one as *Pseudanthias* sp. from 225 m), and Kulbicki and Williams (1997) found seven species at Ouvéa Atoll, Loyalty Islands.

Four South Pacific species of the genus are described in the present paper, one from the Marquesas (the *Anthias* sp. listed by Randall, 1985), one from the Cook Islands, and two with a type locality of Fiji.

## MATERIAL AND METHODS

Specimens of the new species of *Pseudanthias* were deposited variously at the following institutions: Australian Museum, Sydney (AMS); Natural History Museum, London (BMNH); Bernice P. Bishop Museum, Honolulu (BPBM); California Academy of Sciences, San Francisco (CAS); Museum National d'Histoire Naturelle, Paris (MNHN); National Science Museum, Tokyo (NSMT); U.S. National Museum of Natural History, Washington, D.C. (USNM); Raffles Museum of Biodiversity Research, Department of Biological Sciences, National University of Singapore (ZRC).

Lengths given for specimens are standard length (SL), the straight-line distance from the front of the upper lip (when not protruded) to the base of the caudal fin (distal end of the hypural plate). Head length is measured from the same median anterior point to the end of the opercular membrane, and snout length from the same point to the fleshy edge of the orbit. Body depth is the maximum depth from the base of the dorsal spines, and body width the greatest width just posterior to the gill opening. Orbit diameter is the greatest fleshy diameter, and interorbital width the least fleshy width. Caudal-peduncle depth is the least depth, and caudal-peduncle length is measured horizontally from the rear base of the anal fin to the caudal-fin base. Lengths of fin spines and soft rays are taken to their extreme base. Caudal concavity is the horizontal distance from verticals at the tips of the shortest and longest caudal rays.

Lateral-line scale counts include all pored scales, though one may be on or just posterior to the caudal-fin base. Gill-raker counts include rudiments; the upper-limb count is given first, and the raker at the angle is included in the lower-limb count.

Proportional measurements are presented in separate tables for each species as percentages of the standard length. Proportions in the text are ratios rounded to the nearest 0.05. Data in parentheses in the descriptions refer to paratypes.

### *Pseudanthias carlsoni*, new species

(Figs. 1-4; Tables 1-3)

**Material examined.** – Holotype - BPBM 38665, male, 66.2 mm, Fiji, Yanutha Reef, S end of No Name Pass, ocean side, 18°24'30"S, 177°56'E, reef in 37-46 m, spear, J.E. Randall, 30 Jan.1991.

Paratypes – BPBM 30630, 69.0 mm SL, Fiji, Beqa (Mbengga), barrier reef, half way between Yanuca Passage and Frigate Passage, rubble at base of reef slope, 37 m, B.A. Carlson, 13 Mar.1985; ZRC 45768, 2: 59.2-74.2 mm, Fiji, Viti Levu, reef off Soma Soma Bay, 18°15'30"S, 176°49'E, 37 m, spear and quinaldine, J.E. Randall, 27 Jan.1991; USNM 359477, 2: 47.9-74.0 mm, same data as preceding; AMS I.39906-001, 62.1 mm, BMNH 2000.1.6.1, 68.8 mm, CAS 210368, 73.9 mm, and NSMT-P 58835, 73.5 mm, same locality and depth as holotype, spear and hand nets, J.E. Randall & A. Nahacky, 30 Jan.1991.

Other material. – BPBM 15636, 2: 38.4-58.0 mm, Solomon Islands, Alite Reef (off Malaita), 60 m, spear, W.A. Starck, II, 26 Jul.1973; BPBM 19896, 81.0 mm, Loyalty Islands, Maré, 55 m, P. Laboute, 20 Nov.1975; BPBM 36255, 5: 72.8-76.0 mm, Papua New Guinea, NE coast, point W of Wahawe Point, 10°16'S, 150°42'42"E, isolated coral knoll on silty sand, 50 m, spear and hand nets, J.E. Randall & J.L. Earle, 13 Dec.1993; BPBM 36273, 3: 59.0-68.5 mm, Papua New Guinea, same locality as preceding, 45 m, spear, J.E. Randall, 14 Dec.1993; BPBM 36968, 38.5 mm, D'Entrecasteaux Islands, Gallow's Reef, N end, 10°15'24"S, 151°10'18"E, sloping reef in 67-73 m, quinaldine and hand nets, R.L. Pyle & J.L. Earle, 11 Dec.1995; BPBM 36979, 55.5 mm, D'Entrecasteaux Islands, off Normanby Island, reef at 10°15'6"S, 151°2'54"E, 49 m, quinaldine and hand net, J.L. Earle, 12 Dec.1995.

**Diagnosis.** – Dorsal rays X,16; anal rays III,7 (rarely 6); pectoral rays 17 or 18; lateral-line scales 41-45; gill rakers

Table 1. Proportional Measurements of Type Specimens of *Pseudanthias carlsoni* Expressed as percentages of the standard length

	Holotype				Paratypes					
	BPBM 38665	USNM 359477	ZRC 45768	AMS I.39906	BMNH 1.6.1*	BPBM 30630	NSMT 58835	CAS 210368	USNM 359477	
Sex	male	female	female	female	male	male	male	male	male	
Standard length (mm)	66.2	47.9	59.2	62.1	68.8	69.0	73.5	73.9	74.0	
Body depth	36.2	36.8	35.5	34.0	34.8	32.6	32.7	33.0	32.3	
Body width	17.0	16.3	16.9	16.1	15.9	16.4	16.7	16.0	15.9	
Head length	32.2	32.6	32.1	31.6	31.4	32.3	31.4	31.1	31.3	
Snout length	7.6	7.5	7.7	6.9	7.1	7.4	6.9	6.8	6.8	
Orbit diameter	9.6	10.9	10.3	10.0	9.8	9.6	9.5	9.4	9.2	
Interorbital width	10.0	10.4	10.1	9.6	9.4	10.0	9.5	9.9	9.5	
Caudal-peduncle depth	15.1	14.7	14.1	13.6	14.1	14.3	13.7	13.9	13.8	
Caudal-peduncle length	22.2	21.4	20.6	22.1	22.8	22.1	22.9	22.4	21.6	
Upper-jaw length	15.1	14.6	14.8	14.5	14.6	14.5	14.5	14.9	14.0	
Predorsal length	31.2	30.8	31.7	31.4	31.6	30.9	30.9	30.8	31.9	
Preanal length	63.3	64.5	63.8	63.2	62.0	65.1	62.4	63.2	63.0	
Prepelvic length	35.7	34.5	33.8	34.0	33.5	36.2	32.9	34.4	33.5	
First dorsal spine	7.6	7.9	8.1	8.0	7.8	7.4	7.1	8.1	7.2	
Second dorsal spine	13.2	12.5	12.1	11.3	11.8	12.6	11.2	12.2	11.2	
Third dorsal spine	19.7	15.1	15.2	16.2	18.9	17.3	17.7	19.7	17.8	
Tenth dorsal spine	14.8	15.0	15.1	13.9	14.0	13.1	14.1	13.6	13.5	
Longest dorsal ray	19.0	18.0	18.5	17.2	18.7	18.9	16.8	18.9	18.4	
First anal spine	8.7	8.4	8.6	8.2	8.4	8.0	8.2	8.5	8.1	
Second anal spine	18.2	18.4	17.9	16.0	16.6	15.9	16.3	16.4	15.6	
Third anal spine	15.1	16.7	15.5	14.5	14.9	13.3	14.9	15.1	13.7	
Longest anal ray	25.0	23.1	25.3	22.7	23.5	23.2	23.1	23.2	23.7	
Caudal-fin length	34.7	38.0	33.0	33.8	35.3	broken	31.2	31.9	34.2	
Caudal concavity	17.2	20.9	16.9	17.5	19.3	—	15.0	14.3	17.6	
Pectoral-fin length	30.8	30.8	31.2	29.1	29.1	broken	29.5	29.0	27.1	
Pelvic-spine length	21.1	20.2	20.1	18.8	19.0	18.4	18.7	19.7	18.9	
Pelvic-fin length	36.5	29.4	29.4	28.1	36.2	29.0	31.6	34.2	32.0	

\*BMNH 2000.1.6.1

10-11 + 24-26 ; body moderately deep, the depth 2.7-3.1 in SL; head length 3.05-3.2 in SL; no papillae on posterior edge of orbit; males without a fleshy protuberance at front of upper lip; vomerine teeth in a small triangular patch; third dorsal spine of males moderately elongate, 1.6-1.85 in head length; caudal fin deeply emarginate to lunate, the caudal concavity 1.5-2.15 in head. Females in life orange-pink with a vertically elongate dusky spot on each scale dorsally on body, the spots becoming yellow ventrally; a narrow lavender-edged yellow band from front of upper lip through lower edge of orbit to pectoral-fin base; males pink, shading to orange anteriorly and pale lavender ventrally, with a red bar on side below eighth and ninth dorsal spines, the same yellow band on the head as females but brighter, and a conspicuous red spot in dorsal fin between sixth and seventh or eighth spines.

**Description.** – Dorsal rays X,16; anal rays III,7 (one of nine paratypes with 6); all dorsal and anal rays branched, the last to base; pectoral rays 17 (17-18), the upper two unbranched; pelvic rays I,5; principal caudal rays 8 + 7, the median 13 branched; upper and lower procurent caudal rays 9 (8-11, usually 9), the posterior three segmented; lateral-line scales 44 (41-45 — see Table 2); scales above first lateral-line scale to base of third dorsal spine 6 (6-7); scales above lateral-line to base of middle dorsal spines 3.5; scales below lateral line to origin of anal fin 16 (16-17); circumpeduncular scales 25; gill rakers 10 + 25 (10-11 + 24-26 — see Table 3);

Table 2. Lateral-line Scale Counts of *Pseudanthias carlsoni*

	41	42	43	44	45
Fiji	2	2	3	2	1
Other localities*	1	4	3	4	1

\*Papua New Guinea, Solomon Islands, and Loyalty Islands

Table 3. Gill-raker Counts of *Pseudanthias carlsoni*

	Upper Limb		Lower Limb				
	10	11	22	23	24	25	26
Fiji	5	5			5	3	2
Other localities*	9	4	1	6	5		1

\*Papua New Guinea, Solomon Islands, and Loyalty Islands

branchiostegal rays 7; pseudobranchial filaments 17 (14-18); vertebrae 10 + 16; supraneural (predorsal) bones 3, their arrangement with neural spines and dorsal pterygiophores as follows: 0/0+0/2/1+1/1/1/ (where 0 is a supraneural bone, / a neural spine, and numerals 1 and 2 are the number of dorsal-fin spines associated with each pterygiophore; after Ahlstrom et al., 1976).

Body moderately deep for the genus, the depth 2.75 (2.7-3.1) in SL, and compressed, the width 2.1 (1.95-2.25) in body depth; head length 3.1 (3.05-3.2) in SL; snout short, the

length 4.25 (4.2-4.6) in head length; front of upper lip without a pointed fleshy protuberance; eye large, the orbit diameter 3.35 (3.0-3.4) in head; posterior edge of orbit without fleshy papillae; interorbital space strongly convex, the least fleshy width 3.2 (3.15-3.35) in head; caudal-peduncle depth 2.15 (2.2-2.3) in head; caudal-peduncle length 1.45 (1.35-1.55) in head.

Mouth moderately large, the maxilla reaching to below posterior half of eye, the upper-jaw length 2.15 (2.1-2.25) in head; mouth strongly oblique, the lower jaw slightly projecting, the gape forming an angle of about 35° to horizontal axis of head and body; posterior end of maxilla truncate with strongly rounded corners; no supramaxilla; a pair of widely separated, forward-projecting canine teeth at front of upper jaw, the tips usually exposed when mouth fully closed; canines followed by an outer row of slender conical teeth (17 in holotype, the more posterior teeth forward-curved), and a band of two irregular inner rows of very small inward-projecting conical teeth, this band extending medial to canines, ending on each side with a large recumbent canine (or pair of canines); front of lower jaw with a well-separated pair of stout canines that project anterolaterally, these teeth just medial to upper canines and projecting outside gape when mouth fully closed (hence overlapping upper lip); a large recurved canine tooth at side of lower jaw about one-third distance from lower jaw symphysis, preceded by a band of villiform teeth in two irregular rows that extends medial to anterior canines, and followed by a row of well-separated slender conical teeth (16 in holotype); vomer with a small triangular patch of villiform teeth; palatines with a single irregular row of very small teeth. Tongue slender and sharply pointed, the upper surface with small papillae. Gill rakers long and slender with a double band of minute rigid projections on inner edge, the longest rakers on lower limb near angle slightly longer than longest gill filaments.

Anterior nostril a short membranous tube at level slightly above center of eye in front of orbit by a distance about half pupil diameter; posterior nostril a large subtriangular opening dorsoposterior to anterior nostril, the internarial distance about equal to greatest diameter of posterior nostril; flap on rear edge of anterior nostril reaching about half distance to posterior nostril when laid back.

Opercle with three strong spines, the lower two acute, the upper broadly triangular; middle opercular spine largest, most posterior, at or slightly above level of center of eye; rounded corner and upper edge of preopercle with 40 serrae (serrae ranging from 25 in 47.7-mm paratype to 43 in 74-mm paratype) that are progressively larger ventrally; lower edge of subopercle with 7 (3-12) serrae; upper edge of interopercle with 9 (3-14) serrae.

Scales ctenoid on head and body, some on head with auxiliary scales, but none on body; head scaled except lips, isthmus, a narrow zone at front of snout, and a broad area on side of snout containing nostrils; no scales basally on membranes of spinous portion of dorsal and anal fins, but a narrow zone of small scales at base of soft portions; progressively smaller

scales on caudal fin extending nearly to posterior margin; progressively smaller scales on pectoral fins extending about three-fourths distance to posterior margin; a midventral triangular scaly process at base of pelvic fins extending posteriorly nearly half length of pelvic spine.

Lateral line a smooth curve approximately following contour of back, the last pored scale ending just before base of caudal fin. Most pores of lateralis system on head small, three on side of snout and the four on mandible the most conspicuous.

Origin of dorsal fin over or slightly anterior to upper end of gill opening, the predorsal distance 3.2 (3.15-3.25) in SL; first dorsal spine 4.2 (3.85-4.5) in head; second dorsal spine 2.45 (2.55-2.8) in head; third dorsal spine longest, particularly in males, 1.65 (1.6-2.15) in head; tenth dorsal spine 2.2 (2.15-2.5) in head; longest dorsal soft ray (tenth in holotype) 1.7 (1.65-1.85) in head; origin of anal fin below base of fourth dorsal soft ray, the preanal distance 1.6 (1.55-1.6) in SL; first anal spine 3.7 (3.75-4.0) in head; second anal spine longest, 1.75 (1.75-2.05) in head; third anal spine 2.15 (1.95-2.45) in head; third anal soft ray longest, 1.3 (1.25-1.4) in head; caudal fin deeply emarginate to lunate, its length 2.9 (2.65-3.2) in SL, the caudal concavity 1.85 (1.5-2.15) in head; pectoral fins pointed, the tenth ray longest, 3.25 (3.2-3.7) in SL; origin of pelvic fins below lower base of pectoral fins, the prepelvic distance 2.8 (2.75-3.05) in SL; pelvic spine 1.55 (1.6-1.75) in head; second pelvic soft ray longest, 2.75 (2.75-3.55) in SL.

Colour of holotype in alcohol: head and body uniform pale orangish brown; fins pale yellowish.

Colour of holotype when fresh: upper half of head and anterior body orange, shading to pink posteriorly, each scale with a yellow spot; ventral part of body whitish; a narrow orange-red bar on side of body below eighth and ninth dorsal spines; a narrow, lavender-edged, yellow stripe from upper lip through lower part of orbit to pectoral-fin base; head below yellow stripe pale orange-yellow; iris orange and violet with an inner rim of yellow; dorsal fin translucent yellow on spinous portion with an irregular red spot between sixth and eighth spines, the spot largely rimmed with pale blue; soft portion of fin progressively more red posteriorly; tips of anterior dorsal spines pink, becoming a continuous pink margin across each interspinous membrane posterior to sixth spine and as a lavender-blue margin on soft portion; anal fin whitish with a pink-edged yellow band from base of third spine to tip of third and fourth soft rays; caudal fin orange, shading to red posteriorly, with a yellow streak distally in the center of each lobe; pectoral fins pale yellowish pink; pelvic fins whitish, the leading edge orange, followed by a narrow yellow band, the tip of filamentous second ray red.

Colour in alcohol of female paratypes: head and body pale orangish brown, the scales on dorsal part of body with a vertically elongate dusky spot, these becoming progressively fainter ventrally on midside of body, disappearing on ventral third; fins pale yellowish.

Colour of females when fresh: orange-pink with a vertically elongate dusky spot on each scale dorsally on body, the spots becoming yellow ventrally; a narrow lavender-edged yellow band from front of upper lip through lower edge of orbit to pectoral-fin base; iris yellow with a violet ring; dorsal fin translucent yellow, faintly suffused with pink, the spine tips bright pink, the margin of the soft portion lavender, disappearing posteriorly; anal fin translucent lavender, this colour strongest on leading edge, followed by a pale yellow band nearly reaching tip of third soft ray; caudal fin yellow, shading to red centroposteriorly, with a faint narrow lavender upper and lower margin; pectoral fins pale yellowish pink; pelvic fins pale lavender suffused with pale yellow.

**Etymology.** – This species is named in honor of Bruce A. Carlson who collected the first specimen in Fiji in 1985, suspected it was undescribed, and provided a detailed colour description.

**Remarks.** – As noted above, all of the type specimens of this new species are from Fiji. Specimens from Papua New Guinea, Solomon Islands, and the Loyalty Islands identified here as *Pseudanthias carlsoni* are not listed as paratypes because of the difference in gill-raker counts (Table 3). Attempts to find differences in other meristic characters or in proportional measurements were not successful. A comparison of Figure 1 of the holotype of *P. carlsoni* with Figure 4 of a male from Papua New Guinea fails to show any trenchant difference in colour. The Papua New Guinea specimen had a small yellow spot at the distal end of each caudal-fin lobe, whereas the holotype had only an indistinct yellow streak in the middle of each lobe tip. Whether this difference is within the range of colour variation for each area remains for further documentation.

*Pseudanthias carlsoni* occurs on moderately deep reefs; specimens have been collected from depths of 37 to 73 m.

This species appears to be most closely related to *P. engelhardi* Allen and Starck (1982: 48, figs. 2, 3), described from four specimens collected at Escape Reef, Great Barrier Reef in 50-60 m. *P. engelhardi* has the same meristic data as *P. carlsoni*, the third dorsal spine is elongate in the male, and the colour figure of the male holotype of *P. engelhardi* has an orangish bar on the side of the body (a better colour illustration of the same male fish is shown in Randall et al., 1990: 92). *P. engelhardi* differs in having a deeper body (38.2-39.0% SL, compared to 32.3-36.8% for *P. carlsoni*), shorter dorsal spines (tenth dorsal spine 11.7-12.5% SL, compared to 13.6-15.1% for *P. carlsoni*) (the measurements in Allen and Strack's Table 2 for the second dorsal spine appear to be those for the third spine, also notably shorter than this spine in *P. carlsoni*). A noteworthy difference in colour is the lack of the prominent bright red spot in the spinous portion of the dorsal fin of the male of *P. engelhardi*.

Myers (1999: 107, pl. 32 G) recorded *P. engelhardi* from Palau based on an underwater photograph of a male. The narrow bar on the side of its body is below the seventh dorsal spine and is more yellow than orange; specimens should be

collected to confirm the identification.

***Pseudanthias flavicauda*, new species**  
(Figs. 5-8; Table 4)

**Material examined.** – Holotype - BPBM 33921, male, 56.8 mm, Fiji, Beqa (Mbengga) Island, ocean side, steep drop-off, 61 m, hand nets, C.J. Boyle, 16 Jul.1985.

Paratypes – BPBM 38667, 64.7 mm, Fiji, Yanuca Island, ocean side, rock and rubble bottom, 35 m, hand nets, A. Nahacky, Mar.1985; BPBM 38668, 3: 47.2-59.0 mm, same data as holotype; BPBM 37209, 65.8 mm, Fiji, Viti Levu, near Serua Island, fore-reef slope, hand nets, A. Nahacky, 21 Jun.1990; AMS I.39907-001, 56 mm, BMNH 2000.1.6.2, 57.5 mm, CAS 210369, 58.7 mm, and USNM 359478, 59.2 mm, Fiji, Beqa (Mbengga), barrier reef, 18°28'20"S, 178°6'E, beneath large overhang in reef, 30 m, spear, J.E. Randall, 2 Feb.1991.

**Diagnosis.** – Dorsal rays X,16; anal rays III,7; pectoral rays 17 or 18; lateral-line scales 45-49; gill rakers 10-11 + 24-26; body depth 3.1-3.3 in SL; head length 3.15-3.3 in SL; no papillae on posterior edge of orbit; upper lip of males slightly fleshy and finely papillate anteriorly, but not developed to a protuberance; vomerine teeth in a small, broadly triangular patch; third dorsal spine of males moderately elongate, 1.5-1.95 in head length; caudal fin deeply emarginate to lunate, the caudal concavity 1.05-2.5 in head length. Colour of female orange-pink, shading to pink ventrally, the scales dorsally on body with dusky yellow centers; head mainly yellow dorsally; dorsal, anal, and paired fins mainly translucent pale yellow; caudal fin bright yellow. Body of males magenta with a large predominately yellow area on back between base of fourth dorsal spine and fourth or fifth dorsal soft rays; head pink, suffused with yellow dorsally, with a pink-edged yellow band from eye to pectoral-fin base; fins mainly yellow except anal which is lavender with a yellow band.

**Description.** – Dorsal rays X,16; anal rays III,7; all dorsal and anal rays branched, the last to base; pectoral rays 17 (17-18), the upper two unbranched; pelvic rays I,5; principal caudal rays 8 + 7, the median 13 branched; upper and lower procurrent caudal rays 9, the posterior three segmented; lateral-line scales 45 (46-49); scales above first lateral-line scale to base of second dorsal spine 5; scales above lateral-line to base of middle dorsal spines 2.5; scales below lateral-line to origin of anal fin 16 (16-17); circumpeduncular scales 26 (26-27); gill rakers 10 + 26 (10-11 + 24-26); branchiostegal rays 7; pseudobranchial filaments 13 (14-17); vertebrae 10 + 16; supraneural (predorsal) bones 3, their arrangement with neural spines and dorsal pterygiophores as follows: 0/0+0/2/1+1/1/1/ (where 0 is a supraneural bone, / a neural spine, and numerals 1 and 2 are the number of dorsal-fin spines associated with each pterygiophore; after Ahlstrom et al., 1976).

Body depth 3.3 (3.1-3.3) in SL; body width 2.2 (2.0-2.3) in body depth; head length 3.3 (3.15-3.3) in SL; snout length 3.55 (3.65-3.95) in head length; eye large, the orbit diameter 3.3 (3.0-3.45) in head; posterior edge of orbit without

papillae; interorbital space strongly convex, the least fleshy width 3.5 (3.4-3.6) in head; caudal-peduncle depth 2.3 (2.3-2.45) in head; caudal-peduncle length 1.3 (1.3-1.45) in head.

Mouth moderately large, the maxilla reaching to below posterior half of eye, the upper-jaw length 1.9 (1.95-2.05) in head; mouth terminal and strongly oblique, the gape forming an angle of about 35° to horizontal axis of head and body; front of lips finely papillate, the upper lip of males a little fleshy but not forming a protuberance; posterior end of maxilla slightly indented centrally, the corners strongly rounded, the edge usually irregular or serrate; a pair of widely separated, forward-projecting canine teeth at front of upper jaw, followed by an outer row of slender conical teeth (15 in holotype), the more posterior teeth forward-curved; an inner band of smaller teeth (progressively shorter lingually), this band in about five rows anteriorly where it ends on each side in a very large recumbent canine; front of lower jaw with a well-separated pair of stout, laterally recurved canines just medial to upper canines when mouth closed; tips of anterior canines sometimes exposed when mouth closed; a large recurved canine tooth (or pair of teeth) at side of lower jaw about one-third distance from lower jaw symphysis, preceded by a band of villiform teeth in two irregular rows that extends medial to anterior canines, and followed by an irregular row of about 17 slender incurved conical teeth; vomer with a small triangular patch of villiform teeth in about three rows that is about four times as broad as its medial length; palatines with a band of villiform teeth in about five

rows at its widest point (near anterior end). Tongue triangular and sharply pointed, the upper surface with small papillae. Gill rakers long and slender with a double band of minute rigid projections on inner edge, the longest rakers on lower limb near angle much longer than longest gill filaments, and about three-fourths orbit diameter.

Anterior nostril a short membranous tube at a level slightly above center of eye, in front of orbit by a distance of about one-third orbit diameter; posterior nostril a large vertically elongate aperture dorsoposterior to anterior nostril, the internarial distance about equal to greatest diameter of posterior nostril; flap on rear edge of anterior nostril reaching nearly half distance to posterior nostril when laid back.

Opercle with three flat spines, the lower two acute, the upper with rounded tip; middle opercular spine at level of center of eye, largest, and most posterior; upper edge of preopercle with 25 (21-30) serrae, progressively larger ventrally, with 3 (0-5) serrae just below angle; lower edge of subopercle with 6 (4-11) serrae; upper edge of interopercle with 4 (4-9) serrae.

Scales ctenoid on head and body, a few on head with auxiliary scales, but none on scales of body; head scaled except lips, isthmus, a narrow zone at front of snout, and a broad area on side of snout containing nostrils; no scales basally on spinous portion of dorsal and anal fins, but a narrow zone of small scales at base of soft portions; caudal

Table 4. Proportional Measurements of Type Specimens of *Pseudanthias flavicauda* Expressed as percentages of the standard length

	Holotype			Paratypes					
	BPBM 33921	BPBM 38668	AMS 39907	BPBM 38668	CAS 210369	BPBM 38668	USNM 359478	BPBM 38667	BPBM 37209
Sex	male	female	female	male	male	male	male	?	male
Standard length (mm)	56.8	47.2	56.0	57.8	58.7	59.0	59.2	64.7	65.8
Body depth	30.1	30.5	32.0	31.0	31.6	31.0	32.1	32.5	32.4
Body width	13.5	15.3	15.6	14.9	15.3	15.1	15.2	14.0	15.0
Head length	30.5	31.4	30.5	30.8	30.6	31.6	31.7	30.1	31.1
Snout length	8.4	7.9	7.7	8.1	8.3	8.5	8.3	7.6	8.3
Orbit diameter	9.3	10.5	9.0	9.2	8.9	9.4	9.4	9.2	9.0
Interorbital width	8.8	8.7	8.8	8.8	8.6	9.1	9.2	8.8	8.9
Caudal-peduncle depth	13.1	12.9	13.0	13.2	12.4	13.0	13.4	13.2	13.3
Caudal-peduncle length	23.4	22.6	22.3	23.9	22.0	22.6	21.9	23.2	22.2
Upper-jaw length	16.0	15.4	15.7	15.7	15.6	15.9	15.6	15.0	15.8
Predorsal length	28.9	29.2	29.1	28.2	29.1	29.9	30.0	28.5	29.3
Preanal length	60.0	59.7	62.8	60.8	61.2	61.0	62.5	61.2	61.1
Prepelvic length	34.0	35.1	34.8	34.5	34.3	34.0	35.2	34.4	35.0
First dorsal spine	7.6	7.5	7.2	7.2	7.2	7.1	6.8	7.6	7.2
Second dorsal spine	11.8	10.6	11.3	11.6	11.9	10.2	11.5	11.9	11.7
Third dorsal spine	20.2	14.8	17.8	18.8	19.1	16.2	18.9	18.8	20.6
Tenth dorsal spine	14.6	13.2	13.4	12.4	13.9	13.2	12.9	13.9	13.5
Longest dorsal ray	18.9	16.9	17.9	17.3	18.8	17.5	16.9	broken	18.8
First anal spine	8.8	8.4	8.0	8.1	8.8	7.8	8.5	8.5	8.8
Second anal spine	17.0	17.4	17.6	17.3	17.9	16.8	17.7	17.3	17.0
Third anal spine	16.5	16.5	16.3	15.7	16.1	16.2	15.8	15.7	15.8
Longest anal ray	23.1	23.3	24.6	23.2	29.6	25.0	25.7	26.9	26.9
Caudal-fin length	32.2	26.9	41.2	40.7	43.4	35.9	40.0	broken	32.8
Caudal concavity	17.8	12.7	27.2	26.8	29.3	18.6	26.5	—	18.7
Pectoral-fin length	24.3	25.6	27.0	24.5	27.8	26.2	27.1	broken	25.5
Pelvic-spine length	19.4	20.3	19.3	20.2	19.9	19.8	20.3	19.1	19.8
Pelvic-fin length	27.3	25.5	28.4	27.9	29.0	27.8	28.3	broken	27.0

fin nearly fully scaled, the scales progressively smaller posteriorly; small scales on pectoral fins extending about half distance to posterior margin; a midventral triangular scaly process at base of pelvic fins extending posteriorly about two-fifths length of pelvic spine.

Lateral line a smooth curve approximately following contour of back, the last pored scale ending just before base of caudal fin. Most pores of lateralis system of head small, those most conspicuous are one before the anterior and one before the posterior nostril, four on side of mandible, and a few in the suborbital series.

Origin of dorsal fin slightly anterior to upper end of gill opening, the predorsal distance 3.45 (3.35-3.5) in SL; first dorsal spine 4.0 (3.95-4.65) in head; second dorsal spine 2.6 (2.5-3.1) in head; third dorsal spine longest, particularly in males, 1.5 (1.5-2.2) in head; holotype with no filaments from membrane near tips of dorsal spines, but some paratypes with a moderately long (up to half orbit diameter) filament on third spine, and very short ones on other spines; tenth dorsal spine 2.05 (2.15-2.5) in head; longest dorsal soft ray (sixth in holotype, sixth to eleventh in paratypes) 1.6 (1.65-1.85) in head; origin of anal fin below base of second to third dorsal soft ray, the preanal distance 1.65 (1.6-1.7) in SL; first anal spine 3.5 (3.5-4.2) in head; second anal spine longest, 1.8 (1.7-1.9) in head; third anal spine 1.85 (1.85-2.0) in head; third anal soft ray longest, 1.3 (1.05-1.35) in head; caudal fin deeply emarginate to lunate (may appear forked if not fully spread), its length 3.1 (2.4-3.7) in SL, the caudal concavity 1.95 (1.05-2.5) in head; pectoral fins pointed, the tenth ray longest, 4.1 (3.6-4.1) in SL; origin of pelvic fins below lower base of pectoral fins, the prepelvic distance 2.95 (2.85-2.9) in SL; pelvic spine 1.55 (1.55-1.6) in head; first or second pelvic soft ray longest, 3.65 (3.45-3.9) in SL.

Colour of holotype and paratypes in alcohol: head and body pale yellowish; fins translucent whitish.

Colour of holotype when fresh: body with a broad yellow area on back between base of fourth dorsal spine and fourth to fifth dorsal soft rays; rest of body magenta, the outer part of the scales yellow (progressively more yellow anteriorly), shading to orange posteriorly on caudal peduncle; head, chest, and adjacent abdomen pink, the dorsal part of head suffused with yellow; ventral part of chest yellow, becoming orange on isthmus; a narrow yellow band, edged below with violet, from behind lower part of eye to upper base of pectoral fin; a small magenta blotch near front of snout at edge of upper lip; upper lip orange anteriorly, shading posteriorly to yellow; orbit narrowly rimmed with yellow; iris yellow with a middle ring of purple that is broadest dorsally; spinous portion of dorsal fin translucent yellow, the outer anterior part of first four spines magenta, this colour continuing as a margin to sixth dorsal soft ray; soft portion of dorsal fin a mixture of translucent yellow and violet; anal fin translucent violet with a band of translucent yellow from base of spines and first soft ray, narrowing to tip of third soft ray; margin of fin anterior to tip of third soft ray pink; caudal fin yellow, the base of fin a mixture of magenta and orange, the upper

and lower margins pink, broadening and darkening to magenta basally; pectoral fins with yellow rays and translucent membranes; pelvic fins translucent pale yellow, the leading edge pink.

Colour in life of mature females: body pink, the scale centers of about upper half of body dusky orange; dorsal part of head, snout, and chin yellow, suffused with pink, shading to pink ventrally; dorsal and anal fins translucent yellow, the dorsal with a pink margin except anteriorly, and the anal with a pink to lavender margin anterior to fifth soft ray; caudal fin bright yellow; paired fins yellow, the pelvics with a pink to lavender leading edge.

**Etymology.** – This species is named *Pseudanthias flavicauda* from the Latin, in reference to the yellow caudal fin of both sexes; the specific name is a noun in apposition to *Pseudanthias*.

**Remarks.** – The ten type specimens were all collected off the islands of Fiji on reefs in the depth range of 30-61 m.

Of the valid species of *Pseudanthias*, *P. flavicauda* seems closest in general morphology to *P. randalli* (Lubbock & Allen, 1978) which ranges from the Ryukyu Islands to Indonesia and east to Palau and the Marshall Islands. The females of both are similar in colour, but the male of *randalli* is very different, broadly striped with orange and magenta. *P. randalli* differs further in having fewer lateral-line scales (38-46, compared to 45-49 for *flavicauda*), fewer gill rakers (8-10 + 22-24, compared to 10-11 + 24-26 for *flavicauda*), and the vomerine teeth are in a chevron-shaped patch instead of a triangular one.

The species which appears to be most closely related is *Pseudanthias* sp. B of Myers (1999: 109, pl. 35 G) from Guam, of which we have two specimens from Robert F. Myers and one collected by the junior author. The Guam species differs in having 43-45 lateral-line scales, longer third dorsal and second anal spines, and slightly in the colour pattern of the male (female specimens not yet available). The Guam male lacks the yellow area dorsally on the body, and the pelvic fins are bright yellow.

#### *Pseudanthias hiva*, new species

(Figs. 9-11; Tables 5-8)

*Anthias* sp. Randall, 1985: 469 (Marquesas Islands).

**Material examined.** – Holotype - BPBM 12223, male, 93.1 mm, Marquesas Islands, Hiva Oa, NW side of Tepuhiaatuna Point, 20 m, quinaldine and spear, J.E. Randall & D.B. Cannoy, 26 Apr. 1971.

Paratypes – BPBM 11792, 50.6 mm, Marquesas Islands, Fatu Hiva, point at N side of Hanau Bay, rock and sand, 30.5 m, quinaldine, J.E. Randall, 20 Apr. 1971; BPBM 11861, 5: 46.7-57.5 mm, Marquesas Islands, Fatu Hiva, off point at N end of Hanau Bay, rocky patch in 34 m, rotenone, J.E. Randall, D. B. Cannoy & R.M. McNair, 21 Apr. 1971; BPBM 11929, 4: 28.7-42.3 mm, Marquesas Islands, Tahuata, off point at S end of Vaitahu Bay, base of rocky drop-off, 30.5 m, rotenone, J.E. Randall, D.B. Cannoy & J.R.

Haywood, 23 Apr.1971; AMS I.39908-001, 36.0 mm, CAS 210370, 37.2 mm, MNHN 2000-4, 42.0 mm, NSMT-P 58836, 43.8 mm, and USNM 359479, 46.8 mm, all with same data as BPBM 11929; AMS I.39909-001, 87.2 mm, BPBM 38671, 60.0 mm, CAS 210371, 97.8 mm, MNHN 2000-3, 98.2 mm, and USNM 359480, 100.4 mm, all with same data as holotype; BPBM 38530, 3: 32-42 mm, Marquesas Islands, Eiao, about one-half mile S of Waituha Bay, boulder bottom, 15 m, rotenone, J.L. Earle, 7 Oct.1998.

**Diagnosis.** – Dorsal rays X,17 or 18 (usually 17); anal rays III,7; pectoral rays 19 to 21 (rarely 21); lateral-line scales 45-48; gill rakers 11-13 + 25-27; body depth 3.0-3.2 in SL; head length 3.0-3.2 in SL; no papillae on posterior edge of orbit; front of upper lip of males without a prominent fleshy protuberance; vomer with very small teeth in one to three rows forming a chevron shape; tenth dorsal spine longest, 2.05-2.3 in head length; caudal fin lunate, the caudal concavity 1.4-2.4 in head length. Colour of females in life orange, shading to pink ventrally, the scales dorsally on body with dusky yellow centers, those ventrally with yellow; a narrow orange-red bar on body below eighth dorsal spine; a yellow-orange band, bordered below by violet, from lower part of eye to pectoral-fin base; dorsal fin orange with a violet margin; front half of anal fin magenta with a violet margin, the posterior half yellow; caudal fin orange, shading posteriorly to yellow, the lobe tips bright red. Colour of body of males lavender-red dorsally, shading to pale lavender ventrally, the scales below lateral-line with yellow centers; head orange-red above a bluish white line from lower edge of orbit to lower base of pectoral fin, pale orange below; dorsal fin translucent orange-yellow with a lavender margin;

anal fin translucent lavender with a row of small yellow spots on membranes; caudal fin red, the upper and lower edges and filaments pink; pelvic fins light red.

**Description.** – Dorsal rays X,17 (three of 24 paratypes with 18, the rest 17); anal rays III,7; all dorsal and anal rays branched, the last to base; pectoral rays 20 (19-21, only one with 21), the upper two unbranched; pelvic rays I,5; principal caudal rays 8 + 7, the median 13 branched; upper and lower procurrent caudal rays 9, the posterior three segmented; lateral-line scales 48 (45-48; see Table 7); scales above first lateral-line scale to base of second dorsal spine 6; scales above lateral-line to base of middle dorsal spines 3.5; scales below lateral line to origin of anal fin 15 (14-15); circumpeduncular scales 26 (26-27, usually 26); gill rakers 11 + 27 (11-13 + 25-27; see Table 8); branchiostegal rays 7; pseudobranchial filaments 18 (12-22); vertebrae 10 + 16; supraneural (predorsal) bones 3, their arrangement with neural spines and dorsal pterygiophores as follows: 0/0+0/2/1+1/1/1/ (where 0 is a supraneural bone, / a neural spine, and numerals 1 and 2 are the number of dorsal-fin spines associated with each pterygiophore [after Ahlstrom et al., 1976]).

Body depth 2.9 (2.8-3.2) in SL; body width 2.3 (1.95-2.3) in body depth; head length 3.0 (3.0-3.2) in SL; snout short, its length 4.1(3.9-4.25) in head length; orbit diameter 4.1 (3.0-4.25) in head; posterior edge of orbit without fleshy papillae; interorbital space strongly convex, the least fleshy width 3.45 (3.35-3.7) in head; caudal-peduncle depth 2.2

Table 5. Proportional Measurements of Type Specimens of *Pseudanthias hiva* Expressed as percentages of the standard length

	Holotype			Paratypes					
	BPBM 12223	BPBM 11929	BPBM 11929	BPBM 11792	BPBM 11861	BPBM 38671	AMS 1.39909	CAS 210371	USNM 359480
Sex	male	immat.	female	female	female	female	male	male	male
Standard length (mm)	93.1	31.6	42.3	50.6	57.5	60.0	87.2	97.8	100.4
Body depth	34.8	32.0	32.8	33.4	31.0	35.5	33.3	32.8	30.9
Body width	15.2	15.6	15.6	15.7	15.8	15.4	15.1	14.9	14.7
Head length	29.9	33.0	33.1	31.4	31.4	31.6	30.7	29.5	29.4
Snout length	7.3	7.8	7.8	7.3	7.4	7.8	7.2	7.7	7.4
Orbit diameter	7.3	11.1	10.0	9.4	9.1	8.9	8.6	7.0	6.9
Interorbital width	8.7	9.7	9.6	9.6	9.0	9.4	8.5	8.8	8.0
Caudal-peduncle depth	13.6	13.0	12.9	13.2	12.8	14.1	13.2	13.5	13.4
Caudal-peduncle length	22.1	21.9	21.3	22.4	21.4	20.5	21.4	22.2	22.2
Upper-jaw length	14.0	15.6	14.8	14.4	14.3	14.9	14.1	13.9	13.0
Predorsal length	27.7	31.3	30.3	29.5	28.7	28.2	27.3	27.7	27.0
Preanal length	62.0	59.5	61.2	59.4	62.7	63.8	63.1	62.1	61.4
Prepelvic length	32.5	34.8	34.3	33.2	36.5	34.1	33.4	32.4	32.1
First dorsal spine	7.2	7.7	7.7	7.9	7.1	8.1	7.8	7.3	7.0
Second dorsal spine	10.0	9.4	11.1	11.0	9.3	10.4	10.1	10.2	9.9
Tenth dorsal spine	13.9	15.0	14.8	15.2	13.9	14.6	13.8	13.5	12.5
Longest dorsal ray	21.0	17.8	18.9	18.8	17.8	20.1	17.2	21.3	22.9
First anal spine	7.6	9.4	9.4	8.1	8.7	9.9	7.6	7.7	7.6
Second anal spine	10.0	16.6	16.5	15.8	16.4	14.7	13.5	13.3	12.4
Third anal spine	13.9	14.0	broken	14.0	14.0	14.5	14.3	13.6	13.7
Longest anal ray	25.4	20.8	20.8	20.1	16.4	20.9	19.5	23.4	24.0
Caudal-fin length	43.7	34.6	36.4	38.0	34.7	36.1	32.3	60.3	55.2
Caudal concavity	26.9	15.2	17.8	19.9	15.4	18.2	15.3	41.2	36.1
Pectoral-fin length	26.6	27.9	28.5	28.9	29.0	28.2	26.4	25.2	25.8
Pelvic-spine length	15.7	17.7	17.6	18.0	18.7	16.6	15.2	16.1	15.0
Pelvic-fin length	30.3	27.6	28.7	28.0	28.8	29.4	25.0	26.7	28.9

(2.2-2.55) in head; caudal-peduncle length 1.35 (1.3-1.55) in head.

Mouth moderately large, the maxilla reaching to below posterior half of eye, the upper-jaw length 2.05 (2.1-2.25) in head; mouth strongly oblique, the gape forming an angle of about 40° to horizontal axis of head and body; front of lips and edge of snout above upper lip finely and densely papillate in adults; upper lip of males not forming a prominent fleshy protuberance; posterior end of maxilla truncate, the upper corner strongly rounded, the lower corner less so; a pair of widely separated, forward-projecting, stout canine teeth at front of upper jaw, followed by an outer row of slender, forward-curved, conical teeth (14 in holotype), and an inner band of villiform teeth (in about five irregular rows anteriorly), ending anteriorly in a very large recumbent canine that projects medially and posteriorly; front of lower jaw with a well-separated pair of stout, laterally-curved canines (two on one side in holotype) just medial to upper canines when mouth closed; a large recurved canine tooth (or pair of teeth) at side of lower jaw about one-third jaw length from symphysis, preceded by a band of villiform teeth in two rows, increasing to six rows anteriorly (in large males) as it continues medial to anterior canines; lateral canine of lower jaw followed by a row of slender conical teeth (11 in holotype) that curve inwardly and anteriorly; vomer with a chevron-shaped band of small villiform teeth in one to three irregular rows; palatines with one to three irregular rows of small villiform teeth. Tongue slender and triangular with pointed tip, the upper surface with small papillae. Gill rakers long and slender with a double band of minute rigid

projections on inner edge, the longest rakers on lower limb near angle much longer than longest gill filaments, about equal to orbit diameter in large males.

Anterior nostril a short membranous tube in front of center of eye by a distance about equal to pupil diameter in holotype (half pupil or less in small females); posterior nostril a large vertically elongate to subtriangular opening dorsoposterior to anterior nostril, the internarial distance about equal to greatest diameter of posterior nostril; pointed flap on rear edge of anterior nostril reaching about half distance to posterior nostril when laid back (less than half in large males, more than half in small females).

Opercle with three flat spines, the lower two acute, the upper obtusely angular to bluntly rounded (usually covered by scales); middle opercular spine largest, most posterior, at level of lower edge of pupil; upper edge of preopercle with 35 (12-35) serrae, progressively larger ventrally, the one at angle much the largest in females; preopercle with 5 (0-7) serrae just below angle; lower edge of subopercle with 5 (2-13) serrae; upper edge of interopercle with 4(0-14) serrae.

Scales ctenoid on head and body, with auxiliary scales (small females with none or only a few on head); head scaled except lips, isthmus, and a broad area on side of snout containing nostrils; no scales basally on spinous portion of dorsal and anal fins, but a narrow zone of small scales at base of soft portion; basal three-fourths or more of caudal fin scaled, the scales progressively smaller posteriorly; small scales on pectoral fins extending about half distance to posterior margin; a midventral triangular scaly process at base of pelvic fins extending posteriorly about two-fifths length of pelvic spine.

Lateral line a smooth curve approximately following contour of back, the last pored scale ending on base of caudal fin. Most pores of lateralis system of head small, the most conspicuous before anterior and posterior nostrils, three in suborbital series between maxilla and orbit, and four on side of mandible.

Table 6. Pectoral-ray counts of species of the *Pseudanthias cooperi* complex

	17	18	19	20	21
<i>P. cooperi</i>		9	30	4	
<i>P. hiva</i>			8	15	1
<i>P. mooreanus</i>		1	16	11	1
<i>P. olivaceus</i>	1	17	7	1	

Table 7. Lateral-line scale counts of species of the *Pseudanthias cooperi* complex

	44	45	46	47	48	49	50	51	52	53	54	55
<i>P. cooperi</i>			1	6	16	12	5	1	2			
<i>P. hiva</i>		4	6	9	5							
<i>P. mooreanus</i>						4	4	8	7	3	2	1
<i>P. olivaceus</i>	3	9	8	5		1						

Table 8. Gill Raker counts of species of the *Pseudanthias cooperi* complex

	Upper Limb						Lower Limb				
	8	9	10	11	12	13	24	25	26	27	28
<i>P. cooperi</i>			16	25	2		9	18	10	5	1
<i>P. hiva</i>				12	11	1		4	13	7	
<i>P. mooreanus</i>		2	17	10			1	14	9	5	
<i>P. olivaceus</i>	1	9	15	1			2	9	8	6	1

Origin of dorsal fin slightly anterior to upper end of gill opening, the predorsal distance 3.4 (3.0-3.5) in SL; first dorsal spine 4.0 (3.95-4.75) in head; second dorsal spine 2.85 (2.75-3.45) in head; tenth dorsal spine longest, 2.05 (2.15-2.3) in head; a small filament from membrane near tip of dorsal spines; longest dorsal soft ray (thirteenth in holotype) 1.65 (1.75-1.85) in head; origin of anal fin below base of fourth dorsal soft ray, the preanal distance 1.7 (1.6-1.7) in SL; first anal spine 3.9 (3.4-3.85) in head; second anal spine longest, 2.0 (1.9-2.1) in head; third anal spine 2.25 (2.2-2.35) in head; third or fourth anal soft ray longest, 1.55 (1.5-1.6) in head; caudal fin deeply emarginate to lunate, its length 2.55 (2.45-3.05) in SL, the caudal concavity 1.6 (1.4-2.4) in head; pectoral fins pointed, the tenth or eleventh rays longest, 3.45 (3.35-3.5) in SL; origin of pelvic fins below midbase of pectoral fins, the prepelvic distance 3.0 (2.75-2.9) in SL; pelvic spine 1.75 (1.65-1.9) in head; second pelvic soft ray longest, 3.55 (3.4-3.6) in SL.

Colour of holotype and paratypes in alcohol: uniform pale brown, the fins pale yellowish.

Colour of holotype when fresh: body red dorsally, the scale centers dusky violet, shading to pale lavender ventrally, the scales below lateral line with a yellow spot (vertically elongate dorsally, round ventrally); a narrow orange-red bar on upper side of body below eighth to ninth dorsal spines; a pale blue line from below eye to lower pectoral-fin base; head above line orange-red, pale orange below; dorsal fin orange-yellow, the dorsal filaments and margin of soft portion lavender-pink; anal fin pale lavender-pink with a row of small yellow spots on each membrane of soft portion of fin; caudal fin red, the upper and lower margins and lobe filaments pink; pectoral fins pale pink; pelvic fins light red.

Colour of females in life: body orange-red dorsally, shading to pink ventrally, the scales with dusky yellow centers dorsally and yellow centers ventrally; a narrow orange-red bar on body below eighth dorsal spine, its upper end at lateral line; head orange, shading to pale orange ventrally, with a yellow band, bordered below by violet, from lower part of eye to lower pectoral-fin base; iris purple with an inner rim of yellow; dorsal fin orange with a violet margin; front half of anal fin magenta with a purple margin, the posterior half yellow; caudal fin orange, shading posteriorly to yellow, the lobe tips bright red, the upper and lower edges violet; pectoral fins with transparent membranes and pale pink rays; pelvic fins pale yellow with a light lavender-blue leading edge.

**Etymology.** – This species is named *Pseudanthias hiva* in reference to its being endemic to the Marquesas Islands; *hiva* is a noun in apposition to *Pseudanthias*. Legend suggests that the old Polynesian name for the Marquesas was Hiva, and this name is retained in three of the island names today, Hiva Oa (type locality), Fatu Hiva, and Nuku Hiva (Randall and Cea Egaña, 1984).

**Remarks.** – *Pseudanthias hiva* was first collected in 1971 at Fatu Hiva and Tahuata, the most southern islands of the Marquesas. In 1998 three additional specimens were

obtained at the northern uninhabited island of Eiao, and underwater photographs were taken there and at Nuku Hiva. The species occurs over rocky substrata, usually at depths greater than 25 m, but it has been observed as shallow as 10 m.

*Pseudanthias hiva* is one of a small group of similar species that include *P. cooperi* (Regan, 1902) [*P. kashiwae* (Tanaka) was placed in the synonymy of *P. cooperi* by Heemstra and Randall in Smith and Heemstra (1986)], *P. mooreanus* (Herre, 1935), and *P. olivaceus* (Randall & McCosker, 1981). These fishes are moderately slender with deeply emarginate to lunate caudal fins, the third spine of males not elongate, 16 to 18 dorsal soft rays, usually 19 or 20 pectoral rays, 44-55 lateral-line scales, front of upper lip of males without a fleshy protuberance, and vomerine teeth in a chevron-shaped band. Tables 6-8 present meristic data of these species to provide a comparison with *P. hiva*. As may be noted, *P. hiva* differs from the other species of the complex in having modally 20 pectoral rays and 11-13 upper-limb gill rakers. *P. hiva* differs further from *P. cooperi* in having 3 instead of 2 supraneural bones.

#### *Pseudanthias privitera*, new species

(Fig. 12 ; Table 9)

**Material examined.** – Holotype - BPBM 38669, female, 46.5 mm, Cook Islands, Rarotonga, W side, off Matavera, reef in 116 m, hand nets, R.L. Pyle, 6 Jan.1991.

Paratypes – BPBM 38670, 55.2 mm, AMS I.39928-001, 44.5 mm, CAS 210375, 54.1 mm, and USNM 359481, 45.7 mm, same data as holotype.

**Diagnosis.** – Dorsal rays X,15; anal rays III,7; pectoral rays 18; lateral-line scales 47-52; gill rakers 8-10 + 24-27; supraneural bones 2; body elongate, the depth 3.9-4.7 in SL; head length 3.1-3.5 in SL; orbital papillae present; mouth terminal in females, inferior in males as result of a movable fleshy protuberance at front of upper lip; no recurved canine at side of lower jaw; vomer with only a few small teeth in a triangular patch; third dorsal spine of male elongate, about 1.4 in head length; caudal fin deeply emarginate to lunate, the caudal concavity 2.15-3.25 in SL. Colour when fresh: yellow dorsally with a broad orange band at and below base of soft portion of dorsal fin, bordered ventrally by pale blue; body pink ventrally with irregular yellow stripes on side; dorsal fin yellow with some small pink spots; anal fin greenish yellow with a reticulum of magenta; caudal fin a mixture of pink, magenta, orange, and yellow.

**Description.** – Dorsal rays X,15; anal rays III,7; all dorsal and anal rays branched, the last to base; pectoral rays 18, the upper two and lower three unbranched; edges of pectoral rays very finely serrate distally (as illustrated for *Pseudanthias smithvanizi* by Randall and Lubbock, 1981: fig. 7); pelvic rays I,5; principal caudal rays 8 + 7, the median 13 branched; upper procurent caudal rays 11 (10-11), the posterior two or three segmented; lateral-line scales 47 (48-52); scales above first lateral-line scale to base of second

dorsal spine 5; scales above lateral-line to base of middle dorsal spines 3.5; scales below lateral line to origin of anal fin 14 (14-15); circumpeduncular scales 26 (25-26); gill rakers 9 + 27 (8-10 + 24-26); branchiostegal rays 7; pseudobranchial filaments 10 (10-12); vertebrae 10 + 16; supraneural (predorsal) bones 2, their arrangement with neural spines and dorsal pterygiophores as follows: 0/0/2/1+1/1/1/ (where 0 is a supraneural bone, / a neural spine, and numerals 1 and 2 are the number of dorsal-fin spines associated with each pterygiophore; after Ahlstrom et al., 1976 ).

Body slender, the depth 3.9 (3.95-4.7) in SL, and compressed, the width 1.95 (1.7-1.9) in body depth; head length 3.5 (3.1-3.5) in SL; snout length 4.3 (4.0-4.4) in head length; eye large, the orbit diameter 3.2 (3.15-3.3) in head; posterior edge of orbit with 21 (23-25) prominent fleshy papillae; interorbital space slightly convex, the least fleshy width 3.35 (3.15-3.5) in head; caudal-peduncle depth 2.2 (2.1-2.6) in head; caudal-peduncle length 1.3 (1.3-1.35) in head.

Mouth moderately large, the maxilla reaching to below posterior half of eye, the upper-jaw length 2.1 (2.05-2.15) in head; mouth terminal in females, inferior in males, and strongly oblique, the gape forming an angle of about 40° to horizontal axis of head and body; upper lip very narrow along side of jaw; fleshy anterior part of upper lip of males (about three-fourths orbit diameter in width), forming a movable protuberance that extends distinctly anterior to front of lower

lip; posterior end of maxilla truncate, the upper corner strongly rounded, the lower corner slightly rounded; a pair of widely separated, slightly incurved, canine teeth at front of upper jaw that are only slightly forward-projecting; canines followed by an outer row of slender conical teeth (24 in holotype), that curve inwardly and anteriorly; a band of villiform teeth lingual to anterior canine and extending medial to it, this band in four irregular rows anteriorly, soon narrowing to a single row along side of jaw; no pair of large recumbent canines medially at upper jaw (instead a slightly enlarged conical tooth at medial edge of villiform band); front of lower jaw with a well-separated pair of stout canines that project strongly forward and slightly laterally, this pair just medial to upper canines when mouth closed; a band of incurved teeth in two to three rows medial to anterior canine, continuing posterior to canine as a single row of incurved slender conical teeth; no canine at side of lower jaw, but at place where usually seen in species of *Pseudanthias*, the posterior teeth (12 in holotype) change to curving inwardly and anteriorly; vomer with only 3 (3-7) very small teeth in a triangular patch; palatines with a single row of very small teeth. Tongue very slender and sharply pointed, the upper surface with scattered small papillae. Gill rakers long and slender with a double band of minute rigid projections on inner edge, the longest rakers on lower limb near angle much longer than longest gill filaments, and about three-fourths orbit diameter.

Anterior nostril a short membranous tube without a posterior

Table 9. Proportional measurements of type specimens of *Pseudanthias privitera* Expressed as percentages of the standard length

	Holotype		Paratypes		
	BPBM 38669	AMS I.39928	USNM 359481	CAS 210375	BPBM 38670
Sex	female	?	female	?	male
Standard length (mm)	46.5	44.5	45.7	54.1	55.2
Body depth	25.6	23.8	24.6	21.3	25.5
Body width	13.1	12.3	13.3	12.5	13.7
Head length	28.4	29.5	28.9	29.6	32.1
Snout length	6.6	7.0	6.6	7.4	6.9
Orbit diameter	8.9	9.4	9.2	9.1	8.6
Interorbital width	8.5	8.7	8.6	8.5	8.3
Caudal-peduncle depth	12.8	11.3	13.1	12.2	12.2
Caudal-peduncle length	21.8	22.9	22.1	22.5	20.8
Upper-jaw length	13.6	14.1	13.5	14.2	13.8
Predorsal length	29.6	29.7	30.1	29.5	29.3
Preanal length	57.9	56.0	57.0	55.9	57.4
Prepelvic length	30.0	31.4	30.5	32.5	31.4
First dorsal spine	7.1	6.2	6.8	6.1	7.1
Second dorsal spine	10.7	10.3	10.6	9.6	10.1
Third dorsal spine	13.5	16.0	14.5	17.6	22.7
Tenth dorsal spine	12.3	12.8	12.0	13.1	12.8
Longest dorsal ray	18.9	broken	17.5	broken	21.6
First anal spine	broken	9.2	9.9	11.7	10.4
Second anal spine	11.9	11.8	12.0	12.1	12.3
Third anal spine	13.3	13.5	13.2	14.1	13.3
Longest anal ray	20.0	broken	broken	broken	21.0
Caudal-fin length	43.1	broken	broken	broken	56.7
Caudal concavity	30.7	—	—	—	46.3
Pectoral-fin length	28.0	29.2	27.1	29.2	26.5
Pelvic-spine length	17.2	17.4	17.1	16.3	16.7
Pelvic-fin length	27.4	broken	27.4	27.3	26.0



Figs. 1-6. 1. Holotype of *Pseudanthias carlsoni*, male, BPBM 38665, 66.2 mm SL, Yanutha Reef, Fiji. 2. Paratype of *Pseudanthias carlsoni*, female, ZRC 45768, 59.2 mm SL, Viti Levu, Fiji. 3. Underwater photograph of male of *Pseudanthias carlsoni*, Fiji. 4. Male of *Pseudanthias carlsoni*, BPBM 36255, 76.0 mm SL, NE Papua New Guinea. 5. Holotype of *Pseudanthias flavicauda*, BPBM 33921, male, 56.8 mm SL, Beqa, Fiji. 6. Paratype of *Pseudanthias flavicauda*, BPBM 38668, female, 59.0 mm SL, Beqa, Fiji.

flap at a level slightly above center of eye, in front of orbit by a distance of about one-half pupil diameter; posterior nostril a large subtriangular aperture dorsoposterior to anterior nostril, the internarial distance slightly greater than greatest diameter of posterior nostril.

Opercle with three flat spines, the lower two acute, the upper bluntly rounded; middle opercular spine at level of center of eye, largest, most posterior and equidistant to other two spines; upper margin of preopercle with 25 (20-29) very small serrae; edge of preopercle below angle with 0 (0-2) tiny serrae; lower edge of subopercle with 3 (1-5) tiny serrae; upper edge of interopercle with 1 (1-3) tiny serrae.

Scales ctenoid on head and body, none with auxiliary scales; head scaled except lips, isthmus, and a broad area on side of snout containing nostrils; scales dorsally on snout very small; a band of small oblique scales on about basal fifth of soft portions of dorsal and anal fins, narrowing as it passes

forward onto spinous portion; caudal fin nearly fully scaled, the scales progressively smaller posteriorly; small scales basally on pectoral fins (too many lost to determine how far posteriorly they extend on these fins); a midventral triangular scaly process at base of pelvic fins extending posteriorly nearly half length of pelvic spines.

Lateral line a smooth curve approximately following contour of back, the last pored scale at base of caudal fin. Many pores of lateralis system of head conspicuous, especially one in front of each nostril, three along margin of preorbital, a close-set supraorbital pair above front of pupil, and four on side of mandible.

Origin of dorsal fin above second lateral-line scale, the predorsal distance 3.4 (3.3-3.4) in SL; first dorsal spine 4.0 (4.0-4.85) in head; second dorsal spine 2.65 (2.65-3.1) in head; third dorsal spine usually longest, notably so in males, 2.1 (1.4-2.0) in head; tenth dorsal spine 2.1 (2.2-2.4) in head;



Figs. 7-12. 7. Aquarium photograph of male of *Pseudanthias flavicauda*, Fiji. 8. Underwater photograph of female of *Pseudanthias flavicauda*, Fiji. 9. Holotype of *Pseudanthias hiva*, male, BPBM 12223, 93.1 mm, Hiva Oa, Marquesas Islands. 10. Paratype of *Pseudanthias hiva*, female, BPBM 11792, 50.6 mm SL, Fatu Hiva, Marquesas Islands. 11. Underwater photograph of female of *Pseudanthias hiva*, Eiao, Marquesas Islands. 12. Holotype of *Pseudanthias privitera*, female, BPBM 38669, 46.5 mm SL, Rarotonga, Cook Islands. Red of anterior dorsal fin is an artifact due to a red object beneath this part of the fin.

a slender short filament from membrane near tip of each dorsal spine; thirteenth dorsal soft ray longest, 1.5 (1.3-1.65) in head; origin of anal fin below base of second dorsal soft ray, the preanal distance 1.75 (1.75-1.8) in SL; first anal spine broken in holotype, 2.5-3.2 in head of paratypes; second anal spine 2.4 (2.3-2.5) in head; third anal spine longest, 2.15 (2.1-2.2) in head; third or fourth anal soft ray longest, 1.4 (1.35) in head; caudal fin lunate, its length 2.3 (1.75) in SL, the caudal concavity 3.25 (2.15) in SL; pectoral fins pointed, the tenth ray longest, 3.8 (3.4-3.7) in SL; origin of pelvic fins below lower base of pectoral fins, the prepelvic distance 3.35 (3.2-3.3) in SL; pelvic spine 1.65 (1.7-1.8) in head; second pelvic soft ray longest, 3.85 (3.65-4.15) in SL.

Colour of type specimens in alcohol light orangish brown, the fins translucent whitish.

Colour of female holotype when fresh: upper third of body

yellow with a broad orange band at base of soft portion of dorsal fin and on adjacent back, bordered below by pale blue; lower two-thirds of body pink, the broad middle zone below lateral-line with irregular narrow yellow stripes from large conjoined yellow spots, one per scale; head orange-yellow dorsally, pink ventrally, the snout yellow, the zone posterior to eye crossed by three indistinct yellow stripes; ventral part of head and chest yellow; iris mainly purple with an inner ring of yellow; dorsal fin translucent yellow, the small filament from membrane near tip of each spine magenta; a pink dash in outer part of each spinous membrane, and some small indistinct pink spots on soft portion of fin; anal fin greenish yellow with a magenta reticulum; caudal fin pale pink centroposteriorly, the upper lobe orange basally, shading to yellow, the filamentous tip orange-red; lower lobe yellow; upper and lower margins of fin magenta; paired fins pale lavender-pink, the pelvics with a broad yellow band over first two soft rays.

The 55.2-mm male paratype similar in fresh coloration to female holotype: body less yellow and more pale pink; outer part of first three dorsal spines pink; last six membranes of spinous portion of fin with an oblique pink spot below the pink dash; soft portion of dorsal fin with a fine pink reticulum. The gonad of this fish is small and contains some ovarian as well as testicular tissue, thus indicating it was undergoing a change from female to male. Its present colour may therefore differ from the definitive male colour pattern.

**Etymology.** – This species is named *Pseudanthias privitera* in honor of Lisa A. Privitera, the wife of the junior author, who provided assistance to him during the collection of the type specimens. The specific name is treated as a noun in apposition.

**Remarks.** – This species was collected at 116 m on a very steep reef slope with ledges and caves. It was observed in aggregations within about a meter of the substratum.

*Pseudanthias privitera* seems to be most closely related to *P. flavoguttatus* (Katayama and Masuda, 1980), collected from Sagami Bay, Japan at a depth of about 50 m, and later by the junior author at Palau in 90 m. It shares with this species 15 dorsal soft rays, 18 pectoral rays, 48-50 lateral-line scales, papillae on posterior border of orbit, prolonged third dorsal spine in the male, lunate caudal fin, 2 supraneural bones, and a basic colour pattern of pink with irregular yellow stripes from rows of yellow spots (*P. flavoguttatus* well illustrated in colour in Masuda and Kobayashi, 1994: 122, figs. 7, 8). *P. flavoguttatus* differs in its deeper body (3.1-3.9 in SL, compared to 3.9-4.7 for *P. privitera*), in the lower-limb gill-raker count of 24-25, compared to 25-27 for *P. privitera*, and in having six quadrangular red spots along the back.

*Pseudanthias aurulentus* (Randall & McCosker, 1981: 67, fig. 9) from 52 m at Tabuaeran (Fanning Island), Line Islands is also a related species, having almost the same meristic data and morphology and rows of small yellow spots on the side of the body. It differs also in its deeper body and in colour, having two red stripes on the dorsal half of the body.

Following Heemstra (1973), *Pseudanthias privitera* would be classified in the genus *Mirolabrichthys* Herre; however, Randall and Lubbock (1981) have shown that this taxon should be regarded as a subgenus. The two characters that defined *Mirolabrichthys*, two instead of three opercular spines and the conical protuberance on the upper lip of males, did not hold when five additional species were described, one of which was intermediate in the structure of the labial protuberance.

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Appendix 1. Nominal species currently regarded as belonging to the genus *Pseudanthias*.

Original Name	Current Name <sup>1</sup>	Type Locality
<i>Franzia affinis</i> Tanaka 1915	<i>P. squamipinnis</i>	Japan
<b><i>Anthias albofasciatus</i></b> Fowler & Bean 1930	<b><i>P. albofasciatus</i></b>	South China Sea
<i>Anthias altus</i> Smith 1961	<i>P. cooperi</i>	Kenya
<i>Rosanthias amoenus</i> Tanaka 1917	<i>P. elongatus</i>	Japan
<i>Franzia ardens</i> Jordan & Thompson 1914	<i>P. squamipinnis</i>	Japan
<b><i>Anthias (Mirolabrichthys) aurulentus</i></b> Randall & McCosker 1982	<b><i>P. aurulentus</i></b>	Line Islands
<b><i>Anthias (Mirolabrichthys) bartlettorum</i></b> Randall & Lubbock 1981	<b><i>P. bartlettorum</i></b>	Marshall Islands
<b><i>Anthias (Mirolabrichthys) bicolor</i></b> Randall 1979	<b><i>P. bicolor</i></b>	Hawaiian Islands
<b><i>Anthias bimaculatus</i></b> Smith 1955	<b><i>P. bimaculatus</i></b>	Mozambique
<i>Anthias bitaeniatus</i> Kotthaus 1973	<i>P. townsendi</i>	Arabian Sea
<b><i>Pseudanthias caudalis</i></b> Kamohara & Katayama 1959	<b><i>P. caudalis</i></b>	Japan
<i>Anthias cheirospilos</i> Bleeker 1857	<i>P. squamipinnis</i>	Indonesia
<b><i>Serranus cichlops</i></b> Bleeker 1853	<b><i>P. cichlops</i></b> <sup>2</sup>	Indonesia
<b><i>Anthias connelli</i></b> Heemstra & Randall 1986	<b><i>P. connelli</i></b>	South Africa
<b><i>Anthias conspicuus</i></b> Heemstra 1973	<b><i>P. conspicuus</i></b>	Arabian Sea
<b><i>Anthias cooperi</i></b> Regan 1902	<b><i>P. cooperi</i></b>	Maldives
<b><i>Mirolabrichthys dispar</i></b> Herre 1955	<b><i>P. dispar</i></b>	Solomon Islands
<b><i>Anthias elongatus</i></b> Franz 1910	<b><i>P. elongatus</i></b>	Japan
<b><i>Anthias engelhardi</i></b> Allen & Stark II 1982	<b><i>P. engelhardi</i></b>	Great Barrier Reef
<b><i>Anthias evansi</i></b> Smith 1954	<b><i>P. evansi</i></b>	Kenya
<b><i>Franzia fasciata</i></b> Kamohara 1954	<b><i>P. fasciatus</i></b>	Japan
<b><i>Anthias (Mirolabrichthys) flavoguttatus</i></b> Katayama & Masuda 1980	<b><i>P. flavoguttatus</i></b>	Japan
<b><i>Anthias fucinus</i></b> Randall & Ralston 1985	<b><i>P. fucinus</i></b>	Hawaiian Islands
<b><i>Anthias georgei</i></b> Allen 1976	<b><i>P. georgei</i></b>	Western Australia
<i>Anthias (Pseudanthias) gibbosus</i> Klunzinger 1884	<i>P. squamipinnis</i>	Red Sea
<b><i>Pseudanthias heemstrai</i></b> Schuhmacher, Krupp & Randall 1989	<b><i>P. heemstrai</i></b>	Red Sea
<b><i>Anthias huchtii</i></b> Bleeker 1857	<b><i>P. huchtii</i></b>	Indonesia
<b><i>Anthias hutomoi</i></b> Allen & Burhanuddin 1976	<b><i>P. hutomoi</i></b>	Indonesia
<b><i>Pseudanthias hypselosoma</i></b> Bleeker 1878	<b><i>P. hypselosoma</i></b>	Papua New Guinea
<b><i>Anthias (Mirolabrichthys) ignitus</i></b> Randall & Lubbock 1981	<b><i>P. ignitus</i></b>	Maldives
<i>Mirolabrichthys imeldae</i> Burgess 1977	<i>P. lori</i>	Philippines
<i>Leptanthias kashiwae</i> Tanaka 1918	<i>P. cooperi</i>	Japan
<i>Anthias lepidolepis</i> Bleeker 1857	<i>P. squamipinnis</i>	Indonesia
<b><i>Anthias (Pseudanthias) leucozonus</i></b> Katayama & Masuda 1982	<b><i>P. leucozonus</i></b>	Japan
<b><i>Anthias lori</i></b> Lubbock & Randall in Fourmanoir & Laboute 1976	<b><i>P. lori</i></b>	Loyalty Islands
<b><i>Anthias lunulatus</i></b> Kotthaus 1973	<b><i>P. lunulatus</i></b>	Somalia
<b><i>Anthias (Pseudanthias) luzonensis</i></b> Katayama & Masuda 1983	<b><i>P. luzonensis</i></b>	Philippines
<b><i>Anthias manadensis</i></b> Bleeker 1856	<b><i>P. manadensis</i></b> <sup>2</sup>	Indonesia
<b><i>Pseudanthias marcia</i></b> Randall & Hoover 1993	<b><i>P. marcia</i></b>	Oman
<b><i>Anthias mooreanus</i></b> Herre 1935	<b><i>P. mooreanus</i></b>	Society Islands
<i>Anthias mortoni</i> Macleay 1883	<i>P. huchtii</i>	Papua New Guinea
<b><i>Anthias nobilis</i></b> Franz 1910	<b><i>P. nobilis</i></b>	Japan
<b><i>Anthias (Pseudanthias) olivaceus</i></b> Randall & McCosker 1982	<b><i>P. olivaceus</i></b>	Cook Islands
<b><i>Anthias (Mirolabrichthys) parvirostris</i></b> Randall & Lubbock 1981	<b><i>P. parvirostris</i></b>	Solomon Islands
<b><i>Entonanthias pascalus</i></b> Jordan & Tanaka 1927	<b><i>P. pascalus</i></b>	Okinawa
<i>Franzia pectoralis</i> Tanaka 1917	<i>P. squamipinnis</i>	Japan
<b><i>Anthias pictilis</i></b> Randall & Allen 1978	<b><i>P. pictilis</i></b>	Lord Howe Island
<b><i>Anthias pleurotaenia</i></b> Bleeker 1857	<b><i>P. pleurotaenia</i></b>	Indonesia
<b><i>Anthias pulcherrimus</i></b> Heemstra & Randall 1986	<b><i>P. pulcherrimus</i></b>	Mauritius
<b><i>Anthias randalli</i></b> Lubbock & Allen 1978	<b><i>P. randalli</i></b>	Philippines
<b><i>Anthias (Mirolabrichthys) regalis</i></b> Randall & Lubbock 1981	<b><i>P. regalis</i></b>	Marquesas Islands
<i>Franzia ruber</i> Tanaka 1917	<i>P. squamipinnis</i>	Japan
<b><i>Anthias rubrizonatus</i></b> Randall 1983	<b><i>P. rubrizonatus</i></b>	Solomon Islands
<b><i>Anthias rubrolineatus</i></b> Fourmanoir & Rivaton 1979	<b><i>P. rubrolineatus</i></b>	New Caledonia
<b><i>Pseudanthias sheni</i></b> Randall & Allen 1989	<b><i>P. sheni</i></b>	Western Australia
<b><i>Pseudanthias smithvanizi</i></b> Randall & Lubbock 1981	<b><i>P. smithvanizi</i></b>	Solomon Islands
<b><i>Serranus (Anthias) squamipinnis</i></b> Peters 1855	<b><i>P. squamipinnis</i></b>	Mozambique
<b><i>Anthias (Pseudanthias) taeniatus</i></b> Klunzinger 1884	<b><i>P. taeniatus</i></b>	Red Sea
<b><i>Caesioperca thompsoni</i></b> Fowler 1923	<b><i>P. thompsoni</i></b>	Hawaiian Islands
<b><i>Anthias townsendi</i></b> Boulenger 1897	<b><i>P. townsendi</i></b>	Iran
<i>Anthias (Pseudanthias) truncatus</i> Katayama & Masuda 1983	<i>P. hypselosoma</i>	Okinawa
<b><i>Mirolabrichthys tuka</i></b> Herre & Montalban in Herre 1927	<b><i>P. tuka</i></b>	Philippines
<b><i>Pseudanthias venator</i></b> Snyder 1911	<b><i>P. venator</i></b>	Japan
<b><i>Anthias (Pseudanthias) ventralis</i></b> Randall 1979	<b><i>P. ventralis</i></b>	Pitcairn Island
<b><i>Anthias xanthomaculatus</i></b> Fourmanoir & Rivaton 1979	<b><i>P. xanthomaculatus</i></b>	New Caledonia

<sup>1</sup> Valid species highlighted in bold.

<sup>2</sup> *Pseudanthias cichlops* (Bleeker) and *P. manadensis* (Bleeker) have not been convincingly linked to any species recognized today.