



***Plectranthias bennetti*, a new species of anthiine fish (Pisces: Serranidae) from the Coral Sea, Australia**

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Abstract

A new species belonging to the anthiine (Serranidae) genus *Plectranthias* is described from a single specimen, 50.3 mm SL, collected at Holmes Reefs, Coral Sea. *Plectranthias bennetti* n. sp. is distinguished by a combination of features including 15 dorsal-fin rays, the fourth dorsal spine longest, unbranched pectoral-fin rays, a complete lateral line of 29–30 tubed scales, dorsal scales on the head extending forward to the anterior portion of the interorbital space, no scales on the maxilla and chin, 20 serrae and three antrorse spines on the preopercular margin, an emarginate caudal fin, and a color pattern of eight red bands on a white background. It is most similar to *P. sagamiensis* from Japan, which differs in having filamentous caudal and dorsal-fin rays, two instead of three antrorse spines on the preopercle, and a color pattern consisting of large pinkish-orange blotches. The DNA barcode sequence for the holotype is included.

Key words: taxonomy, ichthyology, perchlet, sea-bass, coral reef fishes, Indo-Pacific, western Pacific Ocean.

Introduction

The anthiine genus *Plectranthias* Bleeker (1873) contains small, benthic-dwelling fishes that inhabit tropical and warm-temperate seas. The group is mainly restricted to the Indo-Pacific region, the only exception being *P. garrupellus* Robins & Starck (1961), from the western Atlantic. Three species are reported from the eastern Pacific (Anderson & Heemstra 2012). As noted by Chen & Shao (2002), most species are too small for capture by hook and line, live in rocky habitats (and are not easily trawled), occur below scuba-diving depths, and are not commercially important. Therefore, the group remains poorly represented in museum collections and many of the species are known from only one or two sites, frequently on the basis of a single specimen.

TABLE 1

Valid species of *Plectranthias*, with approximate geographic distribution and known depth range

	species	author & date	distribution	depth (m)
1	<i>P. alcocki</i>	Bineesh <i>et al.</i> 2014	Kerala Coast, India	180–320
2	<i>P. alleni</i>	Randall 1980	Southwestern Australia	90–192
3	<i>P. altipinnatus</i>	Katayama & Masuda 1980	Izu Peninsula, Japan	40
4	<i>P. anthioides</i>	(Günther 1872)	Sulawesi, Indonesia	?
5	<i>P. bauchotae</i>	Randall 1980	Southwestern Indian Ocean	140–180
6	<i>P. bennetti</i>	Allen & Walsh, new species	Coral Sea, Australia	63
7	<i>P. bilaticlavata</i>	Paulin & Roberts 1987	New Zealand & Kermadec Is.	164–270
8	<i>P. cirrhitoides</i>	Randall 1980	Rapa, French Polynesia	2–18
9	<i>P. elaine</i>	Heemstra & Randall 2009	South Africa	114
10	<i>P. elongatus</i>	Wu <i>et al.</i> 2011	Southwestern Taiwan	243
11	<i>P. exsul</i>	Heemstra & Anderson 1983	Juan Fernandez Is., S.E. Pacific	140–225
12	<i>P. fijiensis</i>	Raj & Seeto 1983	Fiji	293
13	<i>P. flammeus</i>	Williams <i>et al.</i> 2013	Marquesas	50–55
14	<i>P. foresti</i>	Fourmanoir 1977	Philippines	183–185
15	<i>P. fourmanoiri</i>	Randall 1980	W.-C. Pacific & E. Indian Ocean	5–44
16	<i>P. gardineri</i>	(Regan 1908)	Western Indian Ocean	46–64
17	<i>P. garrupellus</i>	Robins & Starck 1961	Western Atlantic	58–210
18	<i>P. helenae</i>	Randall 1980	Hawaiian Islands & Taiwan	119–263
19	<i>P. inermis</i>	Randall 1980	W. Pacific (E. Indian region)	14–65
20	<i>P. intermedius</i>	(Kotthaus 1973)	Socotra, Arabian Sea	190–290
21	<i>P. japonicus</i>	(Steindachner 1883)	Western Pacific to W. Australia	to 250
22	<i>P. jothyi</i>	Randall 1996	Strait of Malacca, Malaysia	180–400
23	<i>P. kamii</i>	Randall 1980	Western Pacific	183–280
24	<i>P. kelloggi</i>	(Jordan & Evermann 1903)	Hawaii, Japan & W. Pacific	221–370
25	<i>P. klausewitzii</i>	Zajonz 2006	Southern Red Sea	228–235
26	<i>P. knappi</i>	Randall 1996	Philippines	90
27	<i>P. lasti</i>	Randall & Hoese 1995	Northwestern Australia	200–370
28	<i>P. longimanus</i>	(Weber 1913)	Indo–west Pacific	6–73
29	<i>P. maculicauda</i>	(Regan 1914)	Southwestern Pacific	420'
30	<i>P. maugei</i>	Randall 1980	Madagascar	250
31	<i>P. megalepis</i>	(Günther 1880)	Kai Islands, Indonesia	236
32	<i>P. megalophthalmus</i>	Fourmanoir & Randall 1979	New Caledonia	360
33	<i>P. morgansi</i>	(Smith 1961)	E. Africa	80–267
34	<i>P. nanus</i>	Randall 1980	W.-C. Pacific & E. Indian Ocean	6–65
35	<i>P. nazcae</i>	Anderson 2008	Southeastern Pacific	185–200
36	<i>P. pallidus</i>	Randall & Hoese 1995	Queensland, Australia	220
37	<i>P. parini</i>	Anderson & Randall 1991	Southeastern Pacific	260–272
38	<i>P. pelicieri</i>	Randall & Shimizu 1994	Indo–west Pacific	50–70
39	<i>P. randalli</i>	Fourmanoir & Rivaton 1980	Western Pacific	80–300
40	<i>P. retrofasciatus</i>	Fourmanoir & Randall 1979	New Caledonia	200
41	<i>P. robertsi</i>	Randall & Hoese 1995	Queensland, Australia	320–356
42	<i>P. rubrifasciatus</i>	Fourmanoir & Randall 1979	New Caledonia	100
43	<i>P. sagamiensis</i>	(Katayama 1964)	Japan	40–120
44	<i>P. sheni</i>	Chen & Shao 2002	Taiwan	?
45	<i>P. taylori</i>	Randall 1980	Phoenix Islands	183
46	<i>P. vexillarius</i>	Randall 1980	Gulf of Oman	49–63
47	<i>P. wheeleri</i>	Randall 1980	Indo–west Pacific	100
48	<i>P. whiteheadi</i>	Randall 1980	Western Pacific	263
49	<i>P. winniensis</i>	(Tyler 1966)	Indo–west Pacific	20–58
50	<i>P. xanthomaculatus</i>	Wu <i>et al.</i> 2011	Taiwan	200–223
51	<i>P. yamakawai</i>	Yoshino 1972	Japan and Taiwan	to 200

The genus was revised by Randall (1980), who recognized 30 species, including 17 that he described as new taxa. An additional 20, mainly deep-water species, have been described since that publication (Table 1). Randall (1996) provided an updated key to the 42 species that were currently known and several new species have been described over the past two decades (Chen & Shao 2002, Zajonz 2006, Anderson 2008, Heemstra & Randall 2009, Wu *et al.* 2011, Williams *et al.* 2013, and Bineesh *et al.* 2014). The 51st species in this genus is described in the present paper, based on a single specimen that was recently collected at a depth of 63 m from the ceiling of a large cave at Holmes Reefs in the Coral Sea, about 230 km east of the city of Cairns, Queensland, Australia.

Materials and Methods

Standard length (SL) was measured from the most anterior point of the upper lip to the base of the caudal fin (end of the hypural plate). The depth of the body is the greatest depth. The width of the body was measured just behind the gill opening. Head length (HL) was taken from the most anterior point of the upper lip to the end of the opercular flap. The caudal-peduncle length was measured diagonally from the base of the last anal-fin ray to midbase of the caudal fin. Pectoral-fin ray counts include the short uppermost ray. The scale count above the lateral line to the origin of the dorsal fin was made in a straight oblique line above the second tubed lateral-line scale. The scales below the lateral line to the origin of the anal fin were counted in a straight oblique line, slanting posteriorly down to the anal fin origin. The cheek scales are the diagonal rows of large scales between the eye and angle of the preopercle. Gill-raker counts were made on the first gill arch and include all rudiments; the raker at the angle is included with the lower-limb count. The count of preopercular serrae include all serrae on the upper margin, above the midpoint of the rounded corner of the preopercle. An x-ray was utilized to determine the vertebral count and dorsal ray-pterygiophore-neural spine interdigitation pattern. The latter is presented as a formula with “0” representing a supraneural, “/” a neural spine, and numerals indicating the number of spines or segmented rays borne by each pterygiophore.

Morphometric data for the new species are presented in the description as proportional measurements of the SL or HL and percentage of the SL (in parentheses). The holotype is deposited at the Queensland Museum, Brisbane, Australia (QM). The DNA sequence for the mitochondrial marker COI (DNA barcode) was obtained for the holotype via the FISH-BOL barcode project (www.boldsystems.org) and is publically available on both the barcode database BOLD as well as on the Genbank database.



Figure 1. *Plectranthias bennetti*, preserved holotype, QM I.39334, 50.3 mm SL, Holmes Reefs, Coral Sea (G.R. Allen).

***Plectranthias bennetti* Allen & Walsh, n. sp.**

Bennett's Perchlet

DNA barcode GenBank accession number KT601636 (BOLD BIN: ACV8788)

Figures 1–4.

Holotype. QM I.39334, 50.3 mm SL, northwestern section of western part of Holmes Reefs, 16° 24.327' S, 147° 49.442' E, Coral Sea, Australia, 63 m, hand net, T. Bennett, May 11, 2015.

Diagnosis. Dorsal-fin rays X,15; pectoral-fin rays 13, all unbranched; lateral line complete, tubed scales 29–30; scales dorsally on head extending to anterior portion of interorbital, but well short of level of posterior nostrils; no scales on maxilla or chin; body depth 2.6 in SL; posterior margin of preopercle with 20 tiny serrae; ventral margin of preopercle with 3 antrorse spines; fourth dorsal spine longest, 2.4 in HL; caudal fin slightly emarginated; color in alcohol entirely pale, but with prominent bands in life.

Description. Dorsal-fin rays X,15; most spines with tiny skin tassel, extending beyond tip of spine (evident in live fish); anal-fin rays III,7, second spine longest and stoutest; pectoral-fin rays 13, all unbranched, middle rays longest and reaching to about base of third anal spine; pelvic fin I,5; caudal fin with 7 + 6 branched rays, 3 dorsal and 2 ventral unbranched rays, and 5 dorsal and 5 ventral procurrent rays; lateral line complete with 29 tubed scales on left side and 30 tubed scales on right side; scales above lateral line to origin of dorsal fin 3; scales above LL to base of middle dorsal spine 1; scales below LL to origin of anal fin 10; diagonal rows of scales on cheek 5; scales on top of head extending forward to anterior portion of interorbital region, well short of level of posterior nostrils; circumpeduncular scales 14; no scales on chin, maxilla or snout; gill rakers 5 + 13, including 4



Figure 2. *Plectranthias bennetti*, fresh holotype, QM I.39334, 50.3 mm SL, Holmes Reefs, Coral Sea (F. Walsh).

rudiments on upper arch; pseudobranchial filaments 15; vertebrae 9 + 17 = 26; supraneurals 3; supraneural-dorsal ray-pterygiophore-neural spine interdigitation pattern 0/00/2/1+1/1/1/1/1/1/1/1+1/1+1/1+1/1+1/1/1+1/1/1.

Moderately deep body, its greatest depth 2.6 in SL (38.0% SL); head length 2.3 in SL (43.5% SL); snout length 4.4 in HL (9.9% SL); orbit diameter 4.1 in HL (10.7% SL); bony interorbital width 9.1 in HL (4.8% SL), upper jaw length 2.7 in HL (16.1% SL); least depth of caudal peduncle 3.5 in HL (12.3% SL); caudal peduncle length 2.3 in HL (18.7% SL); snout to dorsal-fin origin 3.1 in SL (32.4% SL); snout to anal-fin origin 1.5 in SL (66.7% SL); snout to pelvic-fin origin 2.5 in SL (39.8% SL); length of longest (4th) dorsal spine 2.4 in HL (17.9% SL); length of longest (2nd) anal spine 2.1 in HL (21.3% SL); pectoral-fin length 1.3 in HL (33.0% SL); pelvic-spine length 2.1 in HL (20.3% SL); longest pelvic-ray length 1.7 in HL (26.4% SL).

Mouth large, slightly oblique, posterior margin of maxilla reaching almost to a vertical at posterior edge of eye; maxilla expanded posteriorly, with long, low, lateral ridge running parallel to dorsal margin; lower jaw slightly protruding; upper jaw without conspicuous enlarged canines, but a band of about 8–9 rows of small, depressible sharp-tipped teeth, with inner rows becoming progressively longer, innermost row with largest teeth; lower jaw with a band of about 7 rows of small, depressible sharp-tipped teeth anteriorly, gradually narrowing to a single row at posterior end of jaw, except interrupted at middle of side of jaw by 3 slightly enlarged canines, band of small teeth continued posteriorly, narrowing to a single row at end of jaw; vomer with roughly V-shaped band of 1–4 rows of sharp-tipped conical teeth, largest teeth in innermost row; palatines with 2–3 rows of small, sharp-tipped conical teeth; tongue small, narrow, pointed, without teeth.

Opercle with 3 prominent flat spines, middle spine much longer than others and dagger-like; preopercle with 20 small spines along posterior margin and 3 antrorse spines on ventral margin; interopercle with pair of weak crenulations adjacent to subopercle junction; subopercle with 4–5 weak serrae or crenulations. Pair of nostril openings on each side of snout, adjacent to anterior border of orbit; the posterior opening elliptical and about three times size of nearby ovate, anterior opening; prominent, pointed skin flap just below anterior opening, its length about one-half pupil diameter.

Scales ctenoid without ctenial bases in posterior fields (see Fig. 1 in Anderson & Heemstra 2012); lateral line broadly arched over pectoral fin following body contour, then following straight path mid-laterally on side of caudal peduncle, ending at caudal-fin base; dorsal and anal fins with a few small scattered scales encroaching onto base of fin; base of caudal fin covered with small scales, extending nearly two-thirds length of inter-radial membranes; basal one-fifth of pectoral fins covered with small scales. Most dorsal spines with small skin tassel at tip when alive, but not apparent in preserved specimen; dorsal fin deeply incised before first segmented fin-ray; anal fin with more or less pointed profile with first two segmented rays longest; caudal fin slightly emarginate in life (damaged in preserved holotype); pectoral fin lanceolate with eighth ray (counting from uppermost) longest and reaching vertical with base of first or second segmented anal-fin ray; pelvic fins reaching well beyond anus, nearly to anal-fin origin.

Color in life. (Figs. 2 & 3) White with eight red to red-orange bands or bars as follows: forward slanting band from just in front of dorsal fin origin to rear edge of eye, four slightly backward slanting bands from below third dorsal spine to base of middle soft dorsal-fin rays, each linked across white interspace in two places to their neighboring bands by irregular cross stripes, and three short bands/bars from below posterior dorsal fin to caudal-fin base; head with triangular orange zone medially on predorsal region, yellow band on side of snout, short, posterior slanting yellow band on cheek from lower rear corner of eye, and vertically elongate, irregular yellow marking on reddish operculum; fins generally translucent, except membrane of first dorsal spine yellow and those of second and third dorsal spines white; also white interspaces between red bands along base of dorsal fin extending for short distance along bases of adjacent dorsal-fin rays, small white spot on membrane near base of last anal-fin ray, and large yellow spot on pectoral-fin base. The freshly dead specimen (Fig. 2) exhibited a similar, but slightly less vivid, coloration.

A live specimen, approximately the same size as the holotype, was sold to the Japanese aquarium trade by Cairns Marine (Queensland, Australia); it exhibited a relatively rapid (about 10 minutes) color change, losing the irregular cross stripes, resulting in more or less uninterrupted white interspaces between the reddish bands (Fig. 4). This change was possibly related to stress due to confinement in a small aquarium.



Figure 3. *Plectranthias bennetti*, holotype in aquarium, QM I.39334, 50.3 mm SL, Holmes Reefs, Coral Sea (F. Walsh).

Color in alcohol. (Fig. 1) Generally uniform pale yellowish without distinctive color or markings; fins translucent.

Distribution and habitat. The new species is currently known only from the Coral Sea at Holmes Reefs. The holotype was collected from the ceiling of a cave at a depth of 63 m. The only other known specimen was captured by Tim Bennett at the same location several months earlier, but sold to the Japanese marine aquarium trade.



Figure 4. *Plectranthias bennetti*, aquarium specimen, about 50 mm SL, Holmes Reefs, Coral Sea (F. Walsh).

Etymology. This species is named *bennetti* in honor of the marine aquarium-fish collector Timothy Bennett, who captured the holotype.

DNA barcode. The mtDNA sequence of the COI marker was obtained for the holotype and submitted to the DNA barcode database BOLD and Genbank (accession number KT601636). There were no close matches on the databases, and the nearest neighbor lineage on BOLD was 12.8% (pairwise) away, i.e. *Plectranthias kelloggi* from the Philippines and Vanuatu.



Figure 5. *Plectranthias sagamiensis*, aquarium specimen, about 60 mm SL, from 55 m depth, Izu Peninsula, Japan (K. Endoh).

Comparisons. The new species appears to be most similar to *P. sagamiensis* (Fig. 5) from Japan, particularly with regard to the shared characters of 13 unbranched pectoral-fin rays, complete lateral line with 29–30 scales, numerous small serrae on the posterior edge of the preopercle, dorsal head scales extending to the mid-interorbital region, and the fourth dorsal spine longest. Aside from the considerable distance separating their geographic distributions, the two species are clearly separable by their basic color patterns, consisting of large, irregular pinkish-orange blotches in *P. sagamiensis* vs. reddish bands in *P. bennetti*. In addition, *P. sagamiensis* differs in having filamentous extensions on the caudal and soft-dorsal fin rays and two rather than three antrorse spines on the ventral margin of the preopercle. The presence of three spines is an unusual feature for this genus, with most species possessing 0–2 spines. However, it is difficult to assess the significance of this feature on the basis of only a single specimen, which might be anomalous in this respect.

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