

A review of the anthiine fish genus *Pseudanthias* (Perciformes: Serranidae) of the western Indian Ocean, with description of a new species and a key to the species

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Abstract

Nineteen species of the serranid fish genus *Pseudanthias* Bleeker are recognized in the western Indian Ocean (including the Red Sea and Persian Gulf): *Pseudanthias bicolor*, *P. bimaculatus*, *P. bimarginatus*, *P. connelli*, *P. conspicuus*, *P. cooperi*, *P. evansi*, *P. gibbosus*, *P. heemstrai*, *P. hypselosoma*, *P. ignitus*, *P. lunulatus*, *P. marcia*, *P. pulcherrimus*, *P. squamipinnis*, *P. taeniatus*, *P. townsendi*, *P. unimarginatus* and *Pseudanthias pillai* sp. nov. is described from the south-west coast of India. *Pseudanthias gibbosus* (Klunzinger) is resurrected from the synonymy of *P. squamipinnis* and is shown to have a precocious male morph. Discovery of three colour morphs for *P. gibbosus* is an example of the complicated reproductive systems of these species. Diagnoses, distributions, illustrations and a key to all the species of *Pseudanthias* in the western Indian Ocean are given.

Zusammenfassung

Neunzehn Arten der Sägebarsch-Gattung (Serranidae) *Pseudanthias* Bleeker werden im westlichen Indischen Ozean (einschließlich Rotem Meer und Persischem Golf) anerkannt: *Pseudanthias bicolor*, *P. bimaculatus*, *P. bimarginatus*, *P. connelli*, *P. conspicuus*, *P. cooperi*, *P. evansi*, *P. gibbosus*, *P. heemstrai*, *P. hypselosoma*, *P. ignitus*, *P. lunulatus*, *P. marcia*, *P. pulcherrimus*, *P. squamipinnis*, *P. taeniatus*, *P. townsendi*, *P. unimarginatus*; hinzu kommt die neue Art *Pseudanthias pillai* sp. nov., die von der Südwestküste Indiens beschrieben wird. *Pseudanthias gibbosus* (Klunzinger) wird wieder errichtet, *P. squamipinnis* zum Synonym erklärt, und es wird dargestellt, dass bei dieser Art frühreife Männchen eine eigene Morphe bilden. Die Entdeckung von drei Farbmorphen zu *P. gibbosus* gibt einen Hinweis auf die komplizierten Fortpflanzungsverhältnisse dieser Arten. Zu allen Arten der Gattung *Pseudanthias* vom westlichen Indischen Ozean werden Bestimmungsmerkmale, Verbreitung, Abbildungen und ein Bestimmungsschlüssel an- und wiedergegeben.

Résumé

Dix-neuf espèces du genre *Pseudanthias* Bleeker ont été inventoriées dans l'océan Indien occidental (y compris la mer Rouge et le golfe Persique); *Pseudanthias bicolor*, *P. bimaculatus*, *P. bimarginatus*, *P. connelli*, *P. conspicuus*, *P. cooperi*, *P. evansi*, *P. gibbosus*, *P. heemstrai*, *P. hypselosoma*, *P. ignitus*, *P. lunulatus*, *P. marcia*, *P. pulcherrimus*, *P. squamipinnis*, *P. taeniatus*, *P. townsendi*, *P. unimarginatus* et *Pseudanthias pillai* sp. nov. est décrit en provenance de la côte sud-ouest de l'Inde. *Pseudanthias gibbosus* (Klunzinger) est dégagé de la synonymie de *P. squamipinnis* et on montre qu'il a une forme mâle précoce. La découverte de trois formes de couleur pour *P. gibbosus* est un exemple des systèmes reproducteurs compliqués de cette espèce. Diagnostics, distributions, illustrations et une clé pour toutes les espèces de *Pseudanthias* de l'océan Indien occidental sont fournis.

Sommario

Nell'oceano Indiano occidentale (con l'inclusione del Mar Rosso e del Golfo Persico) sono riconosciute diciannove specie di serranidi del genere *Pseudanthias* Bleeker: *Pseudanthias bicolor*, *P. bimaculatus*, *P. bimarginatus*, *P. connelli*, *P. conspicuus*, *P. cooperi*, *P. evansi*, *P. gibbosus*, *P. heemstrai*, *P. hypselosoma*, *P. ignitus*, *P. lunulatus*, *P. marcia*, *P. pulcherrimus*, *P. squamipinnis*, *P. taeniatus*, *P. townsendi*, *P. unimarginatus* e *Pseudanthias pillai* sp. nov. rinvenuta lungo le coste sud-occidentali dell'India. *Pseudanthias gibbosus* (Klunzinger) è risollevato dalla sinonimia con *P. squamipinnis* ed è caratterizzato da una forma maschile precoce. La scoperta di tre forme di colore di *P. gibbosus* è un esempio dei complicati sistemi riproduttivi di queste specie. Si fornisce la diagnosi, la distribuzione, l'illustrazione e una chiave dicotomica di tutte le specie di *Pseudanthias* dell'oceano Indiano occidentale.

INTRODUCTION

In volume 7 of his "Atlas ichthyologique des Indes

Orientalis Néelandaïses ...” Bleeker (1871) erected the genus *Pseudanthias* for six Indo-Pacific anthiine species that he had originally described in the genera *Anthias* and *Serranus*. In another paper (Bleeker 1873b) he corrected his previous error of attributing teeth on the tongue to *Anthias sacer*, the type species of the genus *Anthias*, which he had not previously examined. He also noted that *Anthias sacer* lacks scales on the lower jaw. In his (1873a) “Révision des Espèces Indo-Archipélagiques du Groupe des Anthianini,” Bleeker compared the genus *Pseudanthias* with the three other anthiine genera then known from Indonesia: *Dactylanthias* Bleeker, *Caprodon* Schlegel, and *Holanthias* Günther; this latter genus was recently restricted to two species in the Atlantic Ocean, with the Indonesian species reassigned to the genus *Odontanthias* Bleeker (Randall & Heemstra 2006). The two Indonesian species described by Günther (1872) as *Anthias chrysostrictus* and *A. rhodopeplus* also have lingual teeth and a forked caudal fin; therefore they were recognised as a new genus *Odontanthias*. Bleeker (1871) included the following six Indonesian species in his genus *Pseudanthias*: *P. pleurotaenia*, the type species, *P. hypselosoma*, *P. cheirospilos*, *P. huchtii*, *P. cichlops* and *P. manadensis*. He also gave a brief diagnosis for *Pseudanthias*: “*Pseudanthias* Bleeker scales medium to large; jaws with some canines; vomer and palatines toothed; tongue edentate; snout and lower jaw scaly; preopercle serrate; dorsal fin not or little notched, spines 10; pectoral rays divided; caudal slightly emarginate or incised; branchiostegals 7. Typical species: *Pseudanthias pleurotaenia* Bleeker.” [author’s translation]

In his comprehensive book on serranoid fishes in the British Museum, Boulenger (1895) included *Pseudanthias* as a junior synonym of *Anthias* Bloch, 1792. In the century following Boulenger’s influential work, new species were included in the genus *Anthias* rather than *Pseudanthias*. In their description of *Anthias helenensis* from the Atlantic island of St. Helena, Katayama & Amaoka (1986) re-examined the distinction of *Pseudanthias* from *Anthias*. They noted differences in the cranium of *A. helenensis*, which has the interorbital region flattened, versus distinctly convex (in the three species of *Pseudanthias* that they used for comparison), a shallow excavation in the anterior [ethmoid] part of the cranium, versus a deep excavation in the species of *Pseudanthias*; no broad smooth area on the rear part of the frontals of *A. helenensis*, versus frontals with a broad, convex smooth area; and the supraoccipital

crest extending forward over the rear half of the orbit in *A. helenensis*, versus the crest located distinctly behind the orbit in the species of *Pseudanthias*; and the vomerine tooth patch diamond-shaped, with the rear edge convex posteriorly in *A. helenensis*, versus chevron-shaped, with the rear edge concave in the species of *Pseudanthias*.

In view of the osteological differences between *A. helenensis* and the three species of *Pseudanthias*, we agree with Bleeker, Katayama & Amaoka, Randall & Hutomo (1988) and also with Randall & Pyle (2001) that *Pseudanthias* should be recognised as a valid genus for these Indo-Pacific anthiine species. Since the description of Bleeker’s original six species, an additional 61 nominal species have been described (listed by Randall & Pyle 2001) including 36 described since 1950. Most species of *Pseudanthias* occur on coral or rocky reefs and are difficult to collect unless rotenone is utilised while SCUBA diving. Two other western Indian Ocean species, *Pseudanthias bimarginatus* and *P. unimarginatus* were recently described by Randall (2011) and our accounts for these species are based on his descriptions.

The purposes of our paper are to differentiate the species of *Pseudanthias* of the western Indian Ocean, to clarify the limits of the genus and to describe a new species from the south-west coast of India. In ichthyological terms, the western Indian Ocean is here delimited from the Red Sea to South Africa, Gulf of Aden, Persian Gulf, Arabian Sea to south India, including Sri Lanka, Laccadives, Maldives, Seychelles, Chagos, Comoros, Mascarene Islands and Madagascar. Some species are limited to this region or parts of it, while others occur widely throughout the Indo-Pacific.

METHODS

Counts and measurements were made following Hubbs & Lagler (1964), except as noted below. The spinous rays of the dorsal, anal and pelvic fins are termed dorsal fin ‘spines’; these spines are unbranched, unsegmented and usually stiff. The soft (segmented) fin rays are flexible, usually branched and are called ‘rays’. Scales were counted on the left side, unless some were missing. Counts of cheek scales and scales above and below the lateral line do not include the distinctly smaller scales near the orbit and along the bases of the dorsal and anal fins. Gill raker counts are for the lateral side of the first arch, do not include rudiments and are given as A-B + C-D, where A-B is the range of

counts for the upper limb and C-D the range of counts for the lower limb, with the raker at the angle included in the lower limb count. The anteriormost vertebra with a haemal spine is considered to be the first caudal vertebra; the terminal vertebral element (= "urostyler vertebra"), with which the hypural bones articulate, is included in the vertebral counts. Measurements of specimens less than 15 cm standard length (SL) were made with needlepoint dial and digital calipers to the nearest 0.5 mm; measurements of fish larger than 15 cm were made with a beam compass and metre ruler to the nearest mm. Measurements from the anterior end of the snout were taken from the front of the premaxillary symphysis; those involving the orbit (snout length, orbit diameter and interorbital width) are of the bony orbit; orbit diameter is the horizontal diameter. Maxilla depth is the greatest (vertical) depth of the posterior expansion of the maxilla. Lengths of the paired fins are of the longer fin of the pair. Caudal fin length is the length of the longest ray; caudal concavity is the length of the longest ray minus the length of the shortest middle ray. Anal fin length is taken from the origin of the fin to the rear tip, with the fin depressed. Configurations of the supraneural (predorsal) bones are given in the notation of Ahlstrom et al. (1976). Life colour in the species accounts are briefly summarised, as additional (diagnostic) colour patterns are included in the Key to Species and also shown in the colour photographs for each species. For fish with small gonads, determination of sex was verified with the aceto-carmines squash method of Guerrero & Shelton (1974). In the material examined, length measurements are standard length.

Genus *Pseudanthias* Bleeker, 1871

Type-species, *Anthias pleurotaenia* Bleeker, 1857, by subsequent designation of Bleeker (1873).

Rosanthias Tanaka, 1917 (type-species, *Rosanthias amoenus* Tanaka, 1917, by original designation).

Leptanthias Tanaka, 1918 (type-species, *Leptanthias kashiwae* Tanaka, 1918, by monotypy).

Mirolabrichthys Herre, 1927 (type-species *M. tuka* Herre & Montalban, 1927, by monotypy).

Entonanthias Jordan & Tanaka, 1927 (type-species *E. pascalus* Jordan & Tanaka, 1927, by original designation).

Planctanthias Fowler, 1935: 385 (type-species *Planctanthias preopercularis* Fowler, 1935 [= *Pseudanthias cooperi* (Regan, 1902)] by original designation and monotypy).

Diagnosis: Based on *Pseudanthias pleurotaenia* and 19 western Indian Ocean species: dorsal fin with 10 spines (rarely 11) and 15-18 rays; fin margin not notched before soft-rayed part; fin origin above gill opening (except anterior to gill opening in *P. bicolor*); caudal fin with 15 principal rays, 13 branched rays, rear edge of the fin variously (depending on species and sex) convex, truncate, emarginate, asymmetric, concave, crescentic or deeply forked with elongate lobes, outer (upper and lowermost) rays elongate and filamentous in some species; anal fin with 3 spines and 6-8 rays; pectoral fin rays 16-21, upper two rays and lowermost ray unbranched, rest branched; pelvic fins with spine at leading edge of fin and 5 branched rays. Body oblong-oval; lateral line complete, curved dorsally above pectoral fin and descending in smooth curve to midlateral part of peduncle with 36-64 tubed scales, scale tubes unbranched; 2½-6 scale rows from 5th dorsal fin spine to lateral line; snout more or less scaly, maxilla and interorbital area scaly; bony interorbital width 3.5-3.8 in head length, lower jaw scaly (naked in *P. bicolor*). Jaws with small, slender conical teeth and a few larger canines; front of upper jaw with small, recurved canine tooth on each side pointing anteriorly and laterally and separated by gap about equal to pupil diameter from following row of 17-21 forward-curving teeth; teeth in middle of side of upper jaw longest; band of villiform teeth in about 5 rows posterior to anterior canines, extending medially at front of jaw and narrowing to single row posteriorly on side of jaw; small stout canine projecting strongly forward and outwards on each side at front of lower jaw, fitting just medial to upper canine of that side when jaw closes; side of lower jaw with row of about 16-20 forward-projecting, slightly curved teeth, preceded by two or three short, stout, conical teeth; row of small conical or villiform teeth on palatines; vomer and palatines usually with villiform teeth; tooth patch of vomer triangular, oval or chevron-shaped with rounded ends, rear edge concave posteriorly; tongue and pterygoid bones edentate; no supramaxilla. Opercle with 3 flat spines (except *P. evansi* with 2 spines (uppermost missing)), middle spine at level of centre of eye, acute, clearly largest and most posterior, closer to lower than upper spine; upper opercle spine rudimentary, covered by skin and scales; preopercle vertical edge serrate, number of serrae increasing with growth from 12 in small juveniles to 40 or more; subopercle and interopercle smooth or with few small serrae. Interorbital area convex; branchiostegal rays 7; left and right mem-

branes narrowly united, not connected to isthmus; vertebrae 11+15 or 10+16; supraneural bones 1-3.

Species of the tropical Indo-Pacific fish genus *Pseudanthias* are small plankton-feeding fishes that occur on coral and rocky reefs in depths of 10 to about 300 m. During the day, the species actively feed on plankton above the reef and they also dive into the reef as a refuge from predators. It appears that most species of *Pseudanthias* are sexually dichromatic and/or dimorphic protogynous hermaphrodites. Their harem reproductive system involves separate colonies comprising a distinctively coloured, large territorial male and several smaller, adult females, with a less ornate ("generic") colour pattern. The male usually spawns with more than one female, and the male defends not only his territory but also his females from roving males of nearby colonies. Each colony or social group also includes numerous smaller juveniles that mature first as females (see account of *P. gibbosus*, below). If the male is removed by a predator, one of the larger females transforms to a male defending his territory and the females of his harem from other roving males. The transformation of a female to a functional male with a complete male colour pattern can be accomplished in a week or two, although the time may be influenced by the number and behaviour of other females in the colony. In addition to the basic colour differences between sexes, males often show enhanced variations of their colour patterns associated with courtship and spawning.

Key to Western Indian Ocean species of *Pseudanthias*

(Identifications are much easier with fresh specimens showing life colour pattern)

- 1a. Lateral line scales 57-64; male with second and third dorsal fin spines elongate, filamentous, with yellow fleshy tip preceding scarlet blotch; female with third spine elongate and filamentous; lower jaw naked; upper half of head and body orange-yellow, lower half lavender-pink (Indo-central Pacific: Mauritius and Maldives to Hawaiian and Line Islands).. *P. bicolor*
- 1b. Lateral line scales 37-58; male without second dorsal fin spine elongate (third dorsal fin spine elongate in adult of some species); female without elongate third dorsal fin spine; lower jaw scaly; colour not as in 1a 2
- 2a. Lateral line scales 53-58; caudal fin deeply forked; dorsal fin red with pale violet edge;

yellow stripe from front of upper lip through eye to pectoral-fin base. Males with caudal fin lobes scarlet, outer edge and inner margin violet; head and body yellow, pinkish purple dorsally; red spot at pectoral fin base. Females with head, body and caudal fin lobes yellow (Indo-West Pacific: Maldives to Sumatra)

- *P. ignitus*
- 2b. Lateral line scales 36-52; colour not as in 2a. 3
- 3a. Male: caudal fin distinctly asymmetric, rear edge slightly convex, with upper corner elongate and filamentous; female caudal fin emarginate, with upper lobe slightly longer; body scales reddish, with orange spot at centre; lateral line scales 48-50 (western Indian Ocean: Oman) *P. marcia*
- 3b. Caudal fin symmetric, truncate, convex or concave, lunate or forked; colour not as in 3a. 4
- 4a. Male: caudal fin emarginate to slightly forked, purple, with pale, blue-grey subterminal band at corners; head and front half of body with truncated colour pattern comprising a dark red band from snout and interorbital area across head to above anus, where it joins a dark band from nape to below rear dorsal fin spines; rest of body white or orange; head and body white ventrally. Female: caudal fin posterior margin forked with lobe tips rounded; pectoral fins pointed, middle rays longest; body mostly reddish orange, head, dorsal and caudal fins reddish; underside of head and body white; pelvic and anal fins pale blue to white (western Indian Ocean: KwaZulu-Natal, South Africa) *P. connelli*
- 4b. Caudal fin shape various; colour pattern not as in 4a..... 5
- 5a. Caudal fin crescentic or deeply forked, with filamentous lobes; lateral line scales 40-50.. 7
- 5b. Caudal fin truncate, convex or slightly emarginate; body depth 2.6-2.9 in SL 6
- 6a. Lateral line scales 36-38. Male: body deep pink with yellow stripes and broad yellow zone from nape to above pectoral fin; caudal fin slightly convex, deep pink with yellow rear margin; pelvic fins 3.2-3.6 in SL. Female: pinkish purple; caudal fin truncate with corners slightly exserted, mostly yellow with rays dusky pink proximally (western Indian Ocean: southwestern India) *P. pillai sp. nov.*
- 6b. Lateral line scales 40-45. Male: body reddish,

- most scales yellow with red margin; head yellow, pale, almost white below eye; caudal fin red, with yellow rear margin; anal and pelvic fins of male enlarged; pelvic fin length 1.75-2.4 in SL. Female: yellow dorsally, pink ventrally; dorsal and anal fins yellow, pelvic fins whitish, pectoral fins pinkish (Red Sea)
..... *P. heemstrai*
- 7a. Caudal fin convex to slightly emarginate; lateral line scales 39-48 8
- 7b. Caudal fin emarginate to deeply forked; lateral line scales 37-42 9
- 8a. Lateral line scales 44-47; body depth 2.6-2.9 in SL; interorbital width 3.6-3.9 in head length. Male: caudal fin convex or truncate with short filament at each corner; head red dorsally, paler ventrally; pale violet stripe from lower edge of eye to pectoral fin; body pale pink with red spot on each scale; red blotch proximally on dorsal fin spines 6-9. Female: caudal fin emarginate, with red margin and corners scarlet (Indo-West Pacific: Maldives to Indonesia, Australia and Japan)
..... *P. hypselosoma*
- 8b. Lateral line scales 37-42; body depth 2.8-3.3 in SL; interorbital width 4.0-5.0 in head length. Caudal fin emarginate. Male: head and body with 2 longitudinal dark brown bands, joined on caudal fin by U-shaped curved dark band; caudal fin corners with subterminal pale blue-grey band and a short, exerted yellow filament on each corner; paired fins lavender to red; dorsal fin membranes distinctly incised between spines, third spine longest; anal fin front part white, rear part red. Female: body scales pink and yellow, more yellow dorsally, more pink ventrally; orange-red to lavender stripe from below eye to pectoral fin base; caudal fin dusky yellow, lobe tips yellow, with short filaments (western Indian Ocean: Persian Gulf, Arabian Sea and Gulf of Oman)
..... *P. townsendi*
- 9a. Male: head and front of body red or reddish brown, white ventrally, and a white mid-lateral band from nape to peduncle; paired fins scarlet. Female orange with red spot on each scale; lateral line scales 45-48 (Red Sea, Gulf of Aqaba) *P. taeniatus*
- 9b. Colour not as in 9a 10
- 10a. Male: two broad dark bands from head to caudal fin, upper band from nape to base of upper caudal-fin rays, lower band from eye to lower caudal fin base, where it bends slightly dorsally to join rear end of upper band, forming a dark V-shape on caudal fin. Female: pale (probably orange in life) with faint, subvertical series of dark spots (one on each scale of dorsal half of body); lateral line scales 39-44 (western Indian Ocean: Somalia and Arabian Sea off Diu and Mumbai, India) *P. conspicuus*
- 10b. Colour not as in 10a 11
- 11a. Body depth 3.3-3.7 in SL; head pointed. Head and body below lateral line pink to mauve, with (male) or without (female) yellow or pink spots; dorsal part of body and dorsal and caudal fins bright yellow. Male: rear end of dorsal and anal fins pointed; front of upper lip with a short fleshy protuberance; yellow stripe from protuberance through eye to pectoral fin base (Indo-West Pacific: South Africa to Mozambique, Kenya, Comoros, Seychelles, Maldives, Chagos and Mascarenes, to Sumatra, Indonesia) *P. evansi*
- 11b. Body depth 2.4-3.3 in SL; head not pointed; male with dorsal and anal fins rounded posteriorly; colour not as 11a 12
- 12a. Male: reddish orange, with triangular yellow saddle below spinous dorsal fin; eye bright yellow; purple-edged yellow stripe from front of upper lip over lower edge of eye to pectoral fin base; median fins with pale blue margin; dorsal and anal fin blue, with pale yellow spots on fin rays and spines. Female: head and body apricot, with golden tint midlaterally; lavender-edged yellow stripe from front of upper lip to pectoral fin base; leading edge of pelvic fins broadly white; caudal fin with upper and lower edges violet; lateral line scales 38-43; lower limb gill rakers 23-25; body depth 2.7-3.0 in SL (western Indian Ocean: Red Sea to South Africa, and Maldives) *P. lunulatus*
- 12b. Colour not as in 12a 13
- 13a. Female: head and body reddish orange dorsally, paler ventrally, broad, white-edged, mid-lateral red band from rear edge of head to base of yellow caudal fin; ventral part of body with 5-7 longitudinal rows of red spots; caudal fin deeply lunate, the lobes elongate, about twice head length. Small male (~80 mm SL): third dorsal fin spine distinctly longer than other spines; body depth 2.8-3.1 in SL; head and body below spinous dorsal fin reddish orange, with pink spot on each body scale; rear part of body with red spot covering most of each

- scale; magenta-edged bright yellow stripe from eye to pectoral fin base; head below yellow stripe white; caudal fin pink with orange-yellow streaks; median fins with violet margin; soft dorsal fin with 2 or 3 longitudinal rows of dark spots. Large male (150-180 mm SL): body depth 2.4-2.8 in SL; head and body reddish, paler ventrally; dark red swath from spinous dorsal fin to pectoral fin; body scales with red margin and central golden spot; dorsal fin reddish; anal fin pointed, greenish yellow with red streaks distally; caudal fin golden with pink upper and lower edges; fin lobes thick, tips acute but not filamentous (western Indian Ocean: Red Sea, Gulf of Aqaba to South Africa [off KwaZulu-Natal and south to Eastern Cape Province]..... *P. gibbosus*
- 13b. Colour not as in 13a 14
- 14a. Proximal two-thirds of median fins covered by scales; anterior nostril with slender tentacle reaching to or over rear nostril. Male: 3rd dorsal fin spine greatly elongated and flexible, inter-spinous membranes not incised; head reddish purple, body scales mostly yellow, with red margin; caudal fin red, with yellow edge; dorsal fin red; orange stripe from snout tip to pectoral fin base; pectoral fin dull orange with 1 or 2 (usually 1) dark red or reddish black spots. Female: head and body orange, body scales yellow, with red margins, ventral parts of head and body yellow; purple stripe from eye to pectoral fin base; median fins dull yellow (western Indian Ocean: Red Sea [Gulf of Aqaba, but not in southern Red Sea], South Africa [KwaZulu-Natal, juveniles ranging south to Eastern Cape Province], Mozambique, Madagascar, Comoros, Seychelles, Maldives and Chagos; absent from Oman and Sri Lanka)
..... *P. squamipinnis*
- 14b. Median fins with scales restricted to proximal fourth of these fins; anterior nostril tentacle not reaching over rear nostril; colour not as in 14a; third dorsal fin spine not elongate (except in *P. pulcherrimus* > 35 mm SL) 15
- 15a. Male and female (>35 mm SL) with 3rd dorsal fin spine elongate, flexible and tipped with a fleshy filament. Male: head, body and caudal fin dark pinkish-red; middle third of caudal fin whitish distally; body with longitudinal bands of orange or purple ventrally; dorsal fin pale greenish yellow, with purple-violet edge; anal and pelvic fins white, margin of pelvics and leading edge of anal fin orange to red; dorsal fin greenish yellow, with dark purple edge. Female: pink, with yellow snout and caudal fin; dorsal fin greenish yellow, the spine tips and fin margin lavender (western Indian Ocean: South Africa [KwaZulu-Natal], Seychelles, Maldives, Chagos and Mauritius)
..... *P. pulcherrimus*
- 15b. Colour not as in 5a 16
- 16a. Lateral line scales 42-43. Male: body lavender pink, head yellow dorsally, with narrow magenta band across front of snout and up to eye on each side, then curving back to form a median band on nape; narrow magenta band from eye at level of upper edge of iris to above gill opening; a faint broader magenta band from pupil to yellow opercle; underside of head pinkish-white; iris bright yellow and pale blue; caudal fin red, upper and lower margins lavender; dorsal fin lavender; reddish purple oval on top of head merging on nape with reddish purple stripe along dorsal fin base. Female: orange yellow, paler ventrally, and with similar purple oval on top of head. Both sexes with front of upper lip slightly swollen, front of snout naked (western Indian Ocean: Maldives) *P. bimarginatus*
- 16b. Lateral line scales 43-52; colour not as in 16a 17
- 17a. Male: body orange-yellow, shading to pale lavender-pink ventrally; head yellow, paler ventrally; large oval orange area, bordered by magenta on top of head from snout to nape; front of upper lip slightly swollen, pale lavender-pink; caudal fin dusky yellow, with broad pale blue upper margin and a red submarginal band that narrows posteriorly; remaining fins hyaline yellow, dorsal fin with pink margin, anal and pelvic fins with narrow blue edge (western Indian Ocean: known only from Mauritius)..... *P. unimarginatus*
- 17b. Colour not as in 17a 18
- 18a. Lateral line 43-47; caudal fin slightly concave, caudal concavity 6-17% SL; body depth 2.4-2.9 in SL. Male: head, body and caudal fin red, with irregular, long and short blue stripes and spots; dorsal fin reddish orange, with dark red to black oval spot between fourth and sixth spines; some fish also with a black spot at rear end of dorsal fin; blue-edged red band across nape; pelvic fins pale blue grey, with

1-5 scarlet spots along distal margin. Female: head and body yellow to orange dorsally, paler below, whitish ventrally; dorsal body scales with a yellow spot; median fins yellow (Indo-West Pacific: Mozambique, Madagascar, Réunion and Maldives to Bali, Indonesia).....

..... *P. bimaculatus*

18b. Lateral line 48-52; caudal fin concave to lunate, caudal concavity 19-35% SL; body depth 2.8-3.2 in SL. Male: caudal fin upper and lower rays elongated and filamentous; body pale grey or reddish; head reddish dorsally, white below eye; a transient pink or silver stripe runs just above lateral line; vertically elongate, irregular red blotch (that can be switched on or off) at mid body below lateral line; dorsal and caudal fin red, with outer edge pale blue to white. Female: reddish orange dorsally; paler orange below lateral line; no red blotch at mid-body; head white below eye; tip of lower jaw red (Indo-West Pacific: South Africa to Kenya, Seychelles, Maldives, Mauritius, Chagos and Sumatra, Indonesia).....

..... *P. cooperi*

***Pseudanthias bicolor* (Randall, 1979)**

Anthias (Mirolabrichthys) bicolor Randall, 1979: 4, Figs 1-3 (Oahu, Hawaiian Islands).

Anthias bicolor: Randall & Lubbock 1981: 20, figs 13, 14; Allen & Steene 1987: pl. 25, fig. 3.

Pseudanthias bicolor, Debelius 1993: 104; Randall & Anderson 1993: 14 (Maldives Islands checklist); Kuitert 1998: 73 (underwater photos of male and females at Maldives); Randall & Pyle 2001: 34 (valid species list); Kuitert 2004: 67 (listed from Mauritius and western Pacific); Kuitert & Debelius 2007: 300 (underwater photos of male from Indonesia).

Material examined: **Maldives:** Villingili Id. BPBM 18833: 72 mm; **Mauritius:** W. coast, off Medine, 32 m: BPBM 16334, 4: 34-78 mm; BPBM 19930: 82 mm.

Diagnosis: Caudal fin deeply forked, lobes attenuate, filamentous, particularly in males; caudal concavity 23-32% SL; dorsal fin rays 16-18; dorsal fin origin anterior to upper end of gill opening; male with 2nd and 3rd dorsal fin spines elongated, flexible, with small fleshy tab at tip; 3rd dorsal fin spine elongated in adult female, rear end of fin rounded; anal fin angular, rays 7-8, 3rd to 5th rays elongated; pectoral fins rounded, rays 19-21, uppermost 1 or 2 rays unbranched; pelvic fins pointed. Lateral line scales 57-64; scale rows from 5th dorsal fin spine to lateral line 5 or 6; circumpeduncular scales 31-33; no auxiliary scales; head scaly, except for mandibles



Fig. 1. *Pseudanthias bicolor*, 83 mm SL, male, Mauritius. Photo by J. E. Randall.

Table I. Diagnostic characters of western Indian Ocean species of *Pseudanthias*

	Lateral line	Lower G R	Pectoral fin rays	Dorsal fin rays	SL / BD	SL / HL	Elongate D spines	Front of upper lip
<i>bicolor</i>	57-64	26-29	19-21	16-18	2.7-3.0	2.8-3.2	M 2 nd & 3 rd	Moderately pointed
<i>bimaculatus</i>	43-47	26-28	17-18	16	2.4-2.9	3.0-3.2	None	Normal
<i>bimarginatus</i>	42-43	22-24	16-17	16	3.0-3.3	2.9-3.1	None	Moderately pointed
<i>connelli</i>	39-45	25-29	16-19	15-17	2.4-3.0	2.9-3.4	None	Normal
<i>conspicuus</i>	38-43	26-30	17-19	15-17	2.6-3.0	2.6-2.9	None	Normal
<i>cooperi</i>	48-52	22-27	18-20	15-17	2.8-3.2	3.1-3.4	None	Normal
<i>evansi</i>	47-50	22-26	16-18	16-18	3.0-3.4	3.3-3.7	None	Slightly swollen
<i>gibbosus</i>	39-43	24-28	17-18	16	2.4-3.1	2.9-3.2	None	Normal
<i>heemstrai</i>	42-47	26-31	16-17	16-17	2.7-2.9	3.2-3.4	None	Normal
<i>hypselosoma</i>	44-47	26-30	18-20	16-17	2.6-2.9	2.8-3.0	None	Normal
<i>ignitus</i>	53-58	22-25	19-20	16-17	2.5-3.0	3.0-3.2	None	Slightly pointed
<i>lunulatus</i>	38-43	22-25	16-18	15-16	2.8-3.0	3.0-3.3	None	Normal
<i>marcia</i>	47-50	28-30	19-21	16	2.5-2.9	3.0-3.1	None	Normal
<i>pillai</i>	36-38	28	19	16	2.6-2.9	2.6-2.7	3 rd slightly	Normal
<i>pulcherrimus</i>	40-45	23-27	17-20	15-16	2.9-3.0	3.0-3.4	3 rd M & F	Slightly swollen
<i>squamipinnis</i>	38-44	24-28	15-19	16-18	2.4-3.1	2.7-3.2	3 rd	Normal
<i>taeniatus</i>	45-48	26-29	17-20	16-17	2.6-3.4	3.1-3.4	None	Normal
<i>townsendi</i>	37-42	25-28	16-18	15-17	2.8-3.3	2.9-3.2	3 rd slightly	Normal
<i>unimarginatus</i>	43	25	18	16	3.1	3.1	None	Normal

Fin shapes and colours: C = caudal fin, D = dorsal fin, F= female, M = Male

M C lunate, tips acute; reddish pink inner margin; anal fin pointed; head & body orange-yellow dorsally, lavender pink below; mid-lateral scales pink, with yellow centre; D membranes 3 & 4 red.

M C emarginate, to concave, corners acute; reddish, with blue spots & streaks. M head & body scarlet dorsally, with longitudinal violet stripes ventrally; dark red or black spot on dorsal spines 3-7

C lunate, tips acute; M lavender pink, head yellow dorsally with narrow magenta bands; C red with upper and lower margins lavender-blue; F mainly yellow with flecks of magenta; head same as M

Male C emarginate, tips with subterminal pale blue grey bands. M head & anterodorsal part of body with 2 horizontal dark brown bands joining posteriorly and terminating at midbody.

M & F C slightly concave, tips acute, M with 2 dark brown horizontal bands on body, upper darker, from nape to upper third of peduncle and joining lower band on C.

M C lunate, outer rays filamentous; F C truncate silver to red, with silver streak above LL; red blotch on mid body just below LL; F red-orange dorsally, white below

C deeply lunate; anal & soft D pointed. Head and body mauve; body dorsally yellow; dorsal fin, peduncle, and C yellow M with yellow stripe through eye to pectoral fin.

C deeply lunate; anal & soft D pointed. F White-edged mid-lateral scarlet band from rear edge of operculum to C base; body scales above band with a dark spot.

C truncate, emarginate or convex with outer rays slightly elongated. M body pinkish red with yellow spot on each scale fading to white ventrally; C red, rear margin yellow.

M C convex; female truncate to crescentic, with red tips. M body orange, head red above white line under eye; red spot at base of D spines 6-9; mid-dorsal white stripe from upper lip to D base.

M C forked, lobes scarlet, with mauve outer edges, transparent blue inner fin margin; H & B yellow, purple dorsally, yellow stripe from eye to P1 base; D red, edge violet

C crescentic; lobes elongated in male, violet outer edges. M body reddish orange, with funnel shaped yellow mark below dorsal fin spines; pelvic fin anterior margin white.

MC lower half convex to truncate; upper rays elongated
Males with scales on front part of body yellow, the margin purple.

C convex, red, the rear margin yellow; rear end of D and anal fin pointed. Sex unknown. Body scales yellow, densely overlain by pink markings; dorsal fin mostly yellow, anal fin pink, C red.

C lunate; anal & pelvic fins with red margin; D green-yellow, spines violet. M head and body red, pale ventrally, orange stripe separating dorsal & ventral colours; F pink with yellow snout and C.

C lunate, lobes filamentous; anal fin pointed; M pectoral fins with red spot at tip; M reddish, with small yellow spots; orange stripe from eye to pectoral base; C rear margin yellow; F orange and yellow.

C concave, M white with blue-grey tips; F hyaline yellow & red tips; M paired fins red; M red-brown, white stripe from nape to C base; belly & H below eye white; F red-orange dorsally. purple below

C emarginate with curving violet band connecting dark stripes on body;
M red, with violet-edged midlateral yellow stripe from head to C

C lunate; body pale orange dorsally, yellow on sides, with heliotrope dot at centre of each scale;
C with broad upper margin lavender; pelvic fins hyaline, rays yellow, lateral margin lavender.



Fig. 2. *Pseudanthias bicolor*, male above, female below, Maldives. Photo by J. E. Randall.

and naked area in front of eye containing nostrils. Gill rakers 10-12 + 26-29, notably longer than gill filaments. Body depth 2.7-3.2, head length 2.8-3.2 in SL. Orbit diameter 3.1-4.5, interorbital width 3.8-4.4 in head length. No papillae on rear edge of orbit; upper lip slightly thickened at symphysis in males; snout length minus upper lip subequal to orbit diameter. Dorsal head profile straight; posterior end of maxilla rounded, reaching to or past vertical at rear edge of pupil. Jaw dentition as described for genus but with small slender canine teeth; vomer with oval patch of 6-11 large, stout conical teeth, much larger than in other species of *Pseudanthias*; palatines with elongate patch of teeth smaller than those on vomer. Vertical limb and angle of preopercle serrate, lower limb smooth; subopercle and interopercle smooth in adults. Vertebrae 11+15; supraneurals 0//2/1+1/1/1/1/1. Attains 82 mm SL in Indian Ocean; 100 mm SL at Hawaii.

Life colours: Male: dorsal half of body yellow-orange, lower half lavender pink (bluish in natural light); yellow-orange pink-edged cheek stripe from front of snout through lower part of eye to mid pectoral fin base; dorsal fin yellow with scarlet blotch at front, yellow fleshy tab at tip of 2nd and 3rd dorsal fin spines, margin lavender; caudal fin pinkish with lobes reddish with narrow blue outer edges; pectoral, pelvic and anal fins pinkish, pelvic and anal fins reddish distally with narrow blue leading edge.

Females similar with pelvic fins whitish, other fins pinkish, dorsal and anal fins with blue margins, caudal fin lobes reddish with narrow blue outer edges.

Distribution: Indo-West Pacific: in the western Indian Ocean, known only from the Maldives, Sri Lanka, Mauritius and Chagos. Randall & Lubbock (1981) reported specimens from the Philippines,

Marshall and Loyalty Islands, Papua New Guinea, Hawaii and Indonesia (Molucca Islands). Kishimoto et al. (1983) reported juveniles from the Ryukyu Islands of southern Japan. Known from 20-30 m at Mauritius (Allen & Steene 1987) and reported to depths of at least 68 m.

Remarks: Found on lagoon patch reefs, deep reefs and outer reef slopes in small groups near caves.

Pseudanthias bimaculatus (Smith, 1955)

Anthias bimaculatus Smith, 1955: 339, Fig. 1 (Bay of Bocage, Mozambique). Smith 1961: 364, Pl. 35, Figs C, D; Fourmanoir & Guézé 1967: 56 (record from Réunion); Heemstra & Randall 1986: 511, Pl. 32, Fig. 166.3.

Pseudanthias bimaculatus: Randall & Hutomo 1988: 669-673, Pl. 1; Randall & Anderson 1993: 14; Kuitert 1998: 74; Manilo & Bogorodsky 2003: 104 (Arabian Seas checklist); Kuitert 2004: 54 (underwater photos of male and female from Indonesia); Allen 2005:108; Kuitert & Debelius 2007: 297 (underwater photos of males from Indian Ocean); Fricke et al. 2009: 48 (Mascarene Islands checklist).

Material examined: Aldabra: SAIAB 5619: 87 mm; Mozambique: male holotype; off Bay of Bocage, SAIAB 47, 87 mm; SAIAB 958, 2: 73-83 mm; SAIAB 959, 2: 86-91 mm; SAIAB 962: 86 mm, same locality as holotype; Pinda: Non-type material examined: Madagascar: Nosy Inja: SAIAB 54712, 86 mm SL; Maldives: BPBM 34696: 3, 25-72 mm; Mauritius: BPBM 16334, 2, 70-78 mm.

Diagnosis: Caudal fin emarginate, lobes not filamentous; caudal concavity 6-17% SL; dorsal fin rays 16; 3rd to 10th dorsal fin spines subequal; anal fin pointed, rays 7-8; 2nd to 4th rays elongated; pectoral fins rounded, rays 17-18, pelvic fins angular, reaching just past anus; lateral line scales 43-47; scale rows from 5th dorsal fin spine to lateral line 3 or 4; circumpeduncular scales 26-28; head with small auxiliary scales; proximal half of median fins scaly, but spinous dorsal fin naked. Gill rakers 10-11 + 26-28. Body depth 2.6-2.9, head length 3.0-3.2 in SL. Orbit diameter 3.2-3.6, interorbital width 3.4-4.0 in head length. Upper lip not thickened at symphysis; snout length less than orbit diameter; dorsal head profile convex; no papillae on rear edge of orbit; maxilla reaching vertical at rear edge of pupil. Jaw dentition as described for genus; vomer with triangular patch of villiform teeth, narrow band of villiform teeth on palatines. Preopercle

with 32-45 serrae on vertical limb, few serrae on lower limb; sub- and interopercle strongly serrate. Vertebrae 10+16; supraneurals 3: 0/00/2/1+1/1/1/1/1/. Attains 90 mm SL.

Life colours: Male: head and body deep purple to reddish, paler ventrally; males from Maldives with yellow cheek stripe and irregular yellow stripes on head and body dorsally. Males from Mozambique: body reddish purple with irregular, jagged pale pink or white streaks, in a different pattern for each fish. Madagascar and Mozambique fish with oblique,

violet-edged red or dull yellow cheek stripe from front of snout through lower part of eye to pectoral fin base; caudal fin deep violet-pink, blue submarginally with yellow tips; males from Maldives with yellow spots on central caudal fin rays; both sexes with 3-6 narrow mauve stripes from pectoral fin along flanks to caudal fin (less obvious on females); dorsal fin of males deep pink, with iridescent blue margin and dark red or purplish blotch on middle dorsal fin spines, a second spot, if present, vaguely defined at base of posterior fin rays; anal fin mauve, with darker yellow streaks and spots and iridescent blue margin; pelvic fins pale mauve, with darker mauve leading edge and distal margin and 1-5 red spots along rear margin.

Mozambique female (from painting by Margaret Smith): head and body of females orange-yellow, with mauve streaks ventrally and on tail fin; cheek stripe yellow with violet edges; median fins yellow. Maldives female: body yellow dorsally interspersed with short vertical pink streaks; caudal fin yellow proximally fading to hyaline blue-green.

Distribution: Western Indian Ocean from Mozambique (14°10'S, 40°50'E) Nacala Bay, Pinda, Pemba), Aldabra, northern Madagascar, Maldives and Réunion, to Bali, Java and Indonesia. Also reported from New Caledonia. Known from depths of 4-62 m; common on steep outer slopes off north-west Madagascar (Allen 2005).

Remarks: Colour patterns similar to western Pacific *Pseudanthias pleurotaenia* (Bleeker, 1857) with which it hybridizes in Indonesia (Kuitert 1990). Colour patterns of western Indian Ocean *P. bimaculatus* seem more variable than fish identified

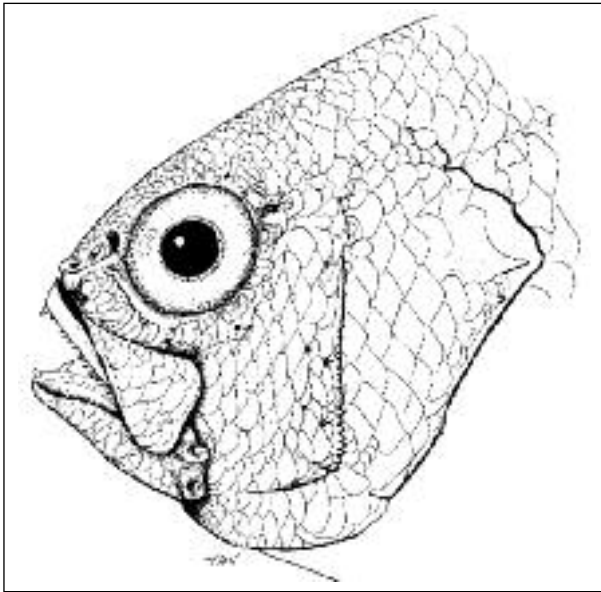


Fig. 3. *Pseudanthias bimaculatus*, 87 mm SL, holotype, SAIAB 47, N. Mozambique. Drawn mainly from left side, with some features completed from right side, by J. M. Vincent.

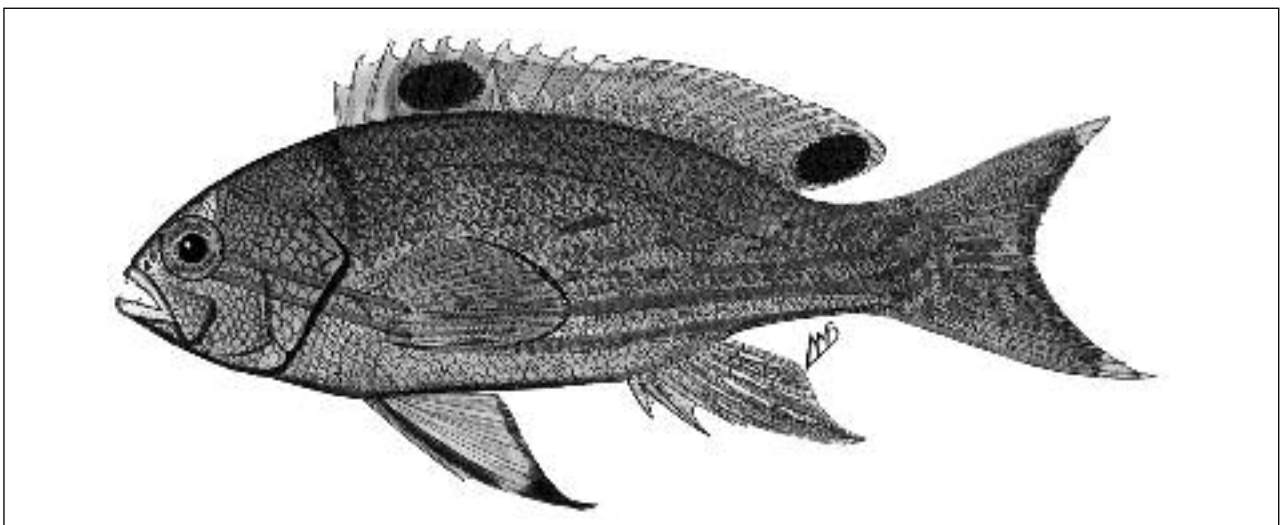


Fig. 4. *Pseudanthias bimaculatus*, 118 mm TL, holotype, N. Mozambique. Drawn by M. M. Smith, from Smith (1955).



Fig. 4. *Pseudanthias bimaculatus*, 118 mm TL, holotype, N. Mozambique. Drawn by M. M. Smith, from Smith (1955).

as *P. bimaculatus* from Bali and other Indonesian Islands. Indian Ocean fish do not show the large square blotch that is common on the body of *P. pleurotaenia*. The conspecificity of specimens from the Indian Ocean and western Pacific should be tested with DNA sequences.

***Pseudanthias bimarginatus* Randall, 2011**

Pseudanthias bimarginatus Randall, 2011: 80, Pl. 1 A-C (North Malé Atoll, Maldives).

Pseudanthias parvirostris (non Randall & Lubbock



Fig. 6. *Pseudanthias bimaculatus*, male, Pemba, Mozambique. Photo by R. Koch.



Fig. 7. *Pseudanthias bimaculatus*, female, Maldives. Photo by R. Pethiyagoda.

1981); Randall & Anderson 1993: 14 (Maldives); Debelius 1993: 106 (underwater photo of male in the Maldives); Kuitert 1998: 76 (underwater photo of male and female in 42 m, from Maldives); Kuitert & Debelius 2007 (underwater photos from Maldives).

Diagnosis: (From Randall 2011). Caudal fin forked, lobe tips acute, 2.4-2.6 in SL; caudal fin concavity 3.7-4.1 in SL; dorsal fin with 16 rays, no elongated spines; soft dorsal fin higher than spinous part; end of dorsal fin notched by shortening of last 3 rays; anal fin rays 7, male anal fin pointed, 4th and 5th rays elongated; pectoral fin pointed, rays 16-17; pelvic fin pointed, first two rays elongated and filamentous, reaching past anal fin spines in male; lateral line scales 42-43; scale rows from 5th dorsal fin spine to lateral line 4; circumpeduncular scales 21; no auxiliary scales; distinct naked zone about half

pupil diameter in width across front of snout. Gill rakers 9 + 22-24. Body depth 3.0-3.3, head length 2.9-3.1 in SL. Orbit diameter 2.9-3.8, interorbital width 3.5-3.8, snout length 3.8-4.5 in head length. Rear edge of orbit with 18 prominent fleshy papillae. Front of upper lip thickened and slightly protuberant; maxilla reaching past centre of eye; rear end of maxilla distinctly rounded dorsally, lower corner slightly rounded; greatest maxilla depth 1.9 in orbit diameter; upper jaw length 2.0-2.1 in head length. Vomer with chevron-shaped patch of villiform teeth, palatines with band of similar sized villiform teeth. Preopercle vertical limb finely serrate; edge of subopercle and interopercle smooth. Vertebrae 10+16; supraneurals 2. Attains 50 mm SL.

Life colours: Male holotype: lavender-pink, head yellow dorsally, with narrow magenta band across front of snout, continuing to edge of orbit on each side and curving back to form median band on



Fig. 8. *Pseudanthias bimarginatus*, 48 mm SL, male, Mauritius. Photo by J. E. Randall.



Fig. 9. *Pseudanthias bimarginatus*, 35 mm SL, female, Maldives. Photo by J. E. Randall.

nape; narrow magenta band from orbit at level of upper edge of iris to above upper end of gill opening, broader but less distinct magenta band from orbit at level of centre of eye to yellow opercle flap; ventral part of head pinkish white; iris yellow and pale blue with ventro-posterior magenta arc; caudal fin red with broad upper and lower pinkish blue margins; dorsal and anal fins pinkish blue, dorsal fin with indistinct pink margin and anal fin with narrow blue margin; pectoral fins with pale pink rays and transparent membranes; pelvic fins with pale yellow rays and hyaline membranes.

Female (34 mm SL): head and body yellow, shading to pinkish white on abdomen and ventrally on head, with magenta flecks, mainly one per scale on dorsal two-thirds of body; narrow magenta bands on head and iris as described for male; median and pelvic fins yellow, becoming darker yellow on scaly basal part, margins pink except posteriorly.

Distribution: Republic of Maldives, North Malé Atoll, lagoon, east side of Furana Island.

Remarks: The five specimens of this species from the Maldives were first identified by Randall & Anderson (1993) as *Pseudanthias parvirostris* (Randall & Lubbock, 1981), type locality being the Solomon Islands. The colour pattern of fish from the two island groups is very similar, particularly in the pattern of the narrow magenta bands dorsally on the head, but the difference in caudal fin colours of the male phase (caudal fin centrally yellow in Solomon Islands fish and red in the Maldives) and there are differences in the gill raker counts: modally one fewer upper limb raker for Maldives fish and a higher mean count of lower limb rakers; more numerous and smaller serrae on preopercle of *P. bimarginatus* compared with *P. parvirostris* of the same size, the absence of serrae on subopercle and interopercle of *bimarginatus*, versus well developed serrae in *parvirostris*, and *P. bimarginatus* has a naked zone on the front of the snout while *P. parvirostris* has scales dorsally on the snout extending forward to the upper lip. The soft-rayed part of the dorsal fin of *P. bimarginatus* is distinctly higher than the spinous part, but the two parts are equally high in *P. parvirostris*.

Pseudanthias connelli (Heemstra & Randall, 1986)

Anthias connelli Heemstra & Randall, 1986: 511, Pl. 33, 166.4 (A) male & (B) female (photos of fresh colours; off Brighton Beach, Durban, South Africa).

Pseudanthias connelli: Kuitert 2004 (underwater photos of male, nuptial male and female from South Africa); Kuitert & Debelius 2007 (underwater photos of male and female from South Africa).

Material examined: The original description of *Pseudanthias connelli* was published (as *Anthias connelli*) inadvertently and without designation of a holotype. A lectotype and paralectotypes are here designated to clarify the generic assignment and taxonomic status of this species and the paralectotypes. The lectotype for *Anthias connelli* is hereby

selected as: SAIAB 10571, male, 112 mm SL, South Africa, off Brighton Beach, Durban, wreck at 23 m depth; A. D. Connell, collector. Paralectotypes (all with same locality as for lectotype): BPBM 24764, 3: 57-108 mm, depth 28-30 m; CAS 57165, 2: 60-65 mm; SAIAB 458, 11: 57-112 mm, depth 28-30 m; SAIAB 10527, 106 mm; SAIAB 10572, 109 mm; SAIAB 87655, 100 mm; USNM 285752, 6: 43-69 mm. WAM P 28451.001, 2: 69-109 mm.

Diagnosis: Caudal fin emarginate in male, lobe tips bluntly pointed; rear margin slightly concave or slightly forked in female, caudal concavity 7-12% SL; dorsal fin rays 15-17; interspinous membranes slightly incised; no elongated spines; rear end of fin pointed; anal fin rays 6-8; fin of male enlarged and pointed from elongated middle rays; pectoral fins pointed, rays 16-19, middle rays longest reaching vertical at anus; pelvic fins rounded, reaching anus. Lateral line scales 39-45; scale rows from 5th dorsal fin spine to lateral line 2; circum-peduncular scales 22-25; head including lower jaw scaly (with a few small auxiliary scales), except for area in front of line joining anterior nostrils. Gill rakers 10-12 + 25-29. Body robust, depth 2.4-3.0, head length 2.9-3.4 in SL. Orbit diameter 4.0-4.5, interorbital width 4.1-4.4 in head length. Front of upper lip not thickened or protuberant; snout length subequal to

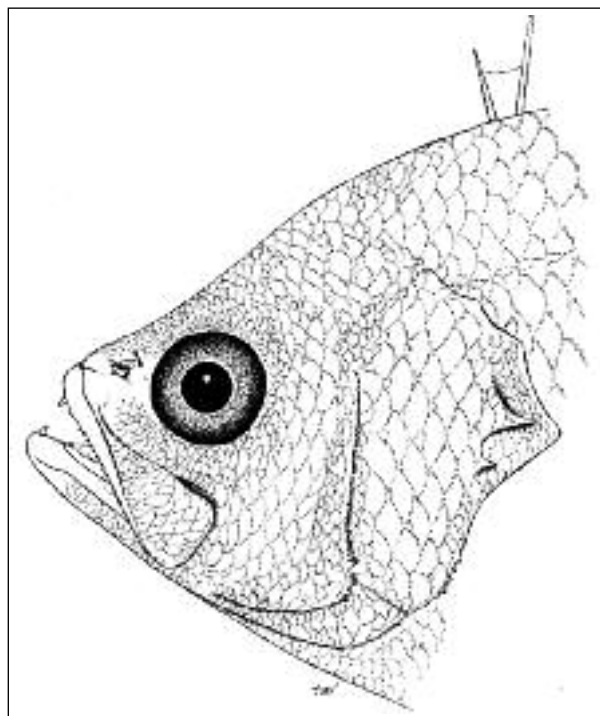


Fig. 10. *Pseudanthias connelli*, 101 mm SL, wreck off Brighton Beach, South Africa. Drawn by J. M. Vincent.

orbit diameter; no papillae on rear edge of orbit; dorsal head profile of female slightly convex, male head profile slightly concave over eyes with interorbital area slightly convex; maxilla truncate with well rounded corners, maxilla reaching just past vertical at centre of orbit; jaws with small slender conical teeth and a few larger canines; front of upper jaw with small recurved canine on each side of symphysis, pointing anteriorly and laterally, separated by gap followed by row of 19-21 forward curving small

teeth; teeth at middle of side of upper jaw longest; band of villiform teeth in 4 or 5 rows posterior to anterior canines, extending medially at front of jaw and narrowing to one row as it passes posteriorly on side of jaw; front of lower jaw with small stout canine projecting strongly and laterally, fitting medially to upper jaw canines with mouth closed; vomer with chevron-shaped patch of villiform teeth; band of similar teeth on palatines. Preopercle vertical limb with 33-37 serrae, angle rounded, ser-



Fig. 11. *Pseudanthias connelli*, 83 mm SL, male, Cape Vidal, KZN, South Africa. Photo by P. C. Heemstra.



Fig. 12. *Pseudanthias connelli*, 62 mm SL, female, wreck off Brighton Beach, KZN, South Africa. Photo by P. C. Heemstra.

rae slightly enlarged at curve, lower limb with 9 or 10 serrae; subopercle and interopercle with few small serrae. Vertebrae 11+15 or 10+16. Supraneurals 3: 0/0+0/2/1+1/1/1/1/. Attains 110 mm SL.

Life colours: Male: head and front half of body with truncated colour pattern of dark red band from snout and interorbital area crossing head to above anus, joining dark band from nape to below rear dorsal fin spines; rear half of body and most of caudal fin red, fin tips red with submarginal violet bands; dorsal and anal fin pale pink; underside of head and abdomen pale pink to white; pelvic fins pale pink proximally, hyaline distally. Male in nuptial colours: rear half of body pinkish white; dorsal, anal and pelvic fins pale blue-grey; caudal fin dark purple violet, with broad pale blue grey bands cutting off dark purple lobe tips.

Female: head and dorsal two-thirds of body reddish orange, scales red, with yellow margins; head below eye and abdomen pale pink to white; caudal fin dull red, with rear margin pale blue-grey and base pale apricot; dorsal fin reddish, with dull yellow spots proximally; anal fin hyaline blue grey, with pale blue outer edge.

Remarks: The original description of *P. connelli* was to be included in a review that was delayed and it was inadvertently published in the book *Smiths' Sea Fishes*. The species was named for Allan D. Connell, who recognized its undescribed status and collected all of the type specimens.

Females mature at 70 mm SL and change sex at 100 mm SL. No pyloric caeca. This species has a predilection for sunken steel ships and barges. Its distribution is usually limited to wrecks along the coast of

KwaZulu-Natal, South Africa from Margate to Sodwana Bay. It has been seen in depths of 23-30 m in southern KZN and at Diepgat Canyon, Sodwana Bay, from 48-54 m (C. van Jaarsveld, pers. comm.).

***Pseudanthias conspicuus* (Heemstra, 1973)**

Anthias conspicuus Heemstra, 1973 (May): 200, Fig. 1 (Arabian Sea off Diu, India).

Anthias bitaeniatus Kotthaus, 1973 (November): 19, Fig. 289 (Arabian Sea 125 nautical miles west of Bombay).

Pseudanthias conspicuus: Randall & Pyle 2001: 34 (listed as a valid species); Manilo & Bogorodsky 2003: 104 (Arabian Sea checklist).

Material examined: India, Arabian Sea off Diu, 20°23'N, 70°00'E: USNM 205864, 64 mm male holotype; FMNH 70651, 12: 47-74 mm paratypes; USNM 205863, 73 mm male paratype; off Bombay, BPBM 28181, 4: 42-61 mm; *Anthias bitaeniatus*, Arabian Sea 125 nautical miles west of Bombay, ZMH 5126, 57.1 mm male holotype. Somalia, Indian Ocean off north end of Somalia; USNM 205862, 79 mm male? paratype, same data as USNM 205863. Oman, CAS 73273, 75 mm.

Diagnosis: Caudal fin crescentic; 29-36% SL; caudal concavity 12-29% SL; dorsal fin rays 15-17, no elongated spines or rays, but interspinous membranes produced as short filament behind tip of each spine; anal fin rays 7 (one of 15 fish with 6 anal fin rays); pectoral fin pointed, reaching 3rd anal fin spine, rays 17-19; pelvic fin pointed. Lateral line scales 38-43; scale rows between 5th dorsal fin spine and lateral line 2 or 3; circumpeduncular scales



Fig. 13. *Pseudanthias conspicuus*, 74 mm SL, male paratype, FMNH 70651, Arabian Sea off Mumbai, India. Photo by P. C. Heemstra, from Heemstra (1973).

22-26; no auxiliary scales on head or body. Soft dorsal and anal fins scaly at base and along proximal part of inter-radial membranes; caudal fin scaly three-fourths of distance to distal margin; pectoral fins scaly over proximal half of fin; pelvic fins with scales in rows on ventral side. Gill rakers 10-13 + 26-30. Body depth 2.6-3.0, head length 2.6-2.9 in SL. Orbit diameter 3.1-3.9, interorbital width 4.5-5.2 in head length. Dorsal head profile slightly convex; maxilla reaching past vertical at centre of orbit. Nostrils subequal; anterior nostril in short tube, posterior margin elongated into short slender tentacle reaching slit-like rear nostril. No papillae on rear edge of orbit. Jaw dentition as described for genus. Preopercle vertical limb with 23-38 serrae; lower limb smooth; few small serrae on ventral edge of subopercle and rear edge of interopercle. Vertebrae 11+15 or 10+16; supraneurals 3: 0/0+0/2/1+1/1/ 1/1/. Female *P. conspicuus* mature at 40 mm SL and change sex at about 60 mm SL; the species attains 80 mm SL.

Preserved colour: (There are no photographs of fresh or live specimens of *Pseudanthias conspicuus*).

Male: head and body pale, with two broad dark bands from head to caudal fin, upper band from nape running to end of dorsal fin to join dark band on opposite side and covering dorsal third of peduncle, and then splitting again and bending ventrally from base of upper caudal-fin rays, joining lower band running from eye to lower caudal fin base, then bending slightly dorsally to join rear end of upper band, forming dark wide V-shape on central part of caudal fin.

Female: pale (probably orange in life) with faint, subvertical series of dark spots (one on each scale of

dorsal half of body, and each dark spot formed as cluster of minute melanophores).

Distribution: The species is known from northern Somalia, Oman (Muscat) and western India (Diu to Mumbai), but is probably more widespread. It has been collected in depths of 21 m and 86-93 m.

Remarks: The description of *Anthias bitaeniatus* Kotthaus, based on a single specimen and published in November 1973, matches that of *Anthias conspicuus* Heemstra, published in May 1973, except for the count of scales from lateral line to anal fin origin, 14-18 for *A. conspicuus* versus 11 for *P. bitaeniatus*. This difference is probably the result of differences in the methods of counting these transverse scale series. A count of 14 or 15 scales was recorded for this transverse scale series when the holotype of *Anthias bitaeniatus* was examined by the first author. The colour patterns of the two holotypes (preserved male specimens) are the same. The original report of the absence of teeth on the vomer and palatines of *A. bitaeniatus* was a mistake; there are minute teeth on both palatines and vomer.

The colour pattern of male *Pseudanthias taeniatus* Klunzinger, 1884, in which the body is dark reddish brown, with a curving midlateral white stripe is similar to that of male *P. conspicuus*, but the latter has a wider band that terminates on the black V-shaped mark of the caudal fin. The caudal fin of male *P. taeniatus* is white to pale violet. Randall & Pyle (2001) listed *P. bitaeniatus* as a synonym of *P. townsendi* without comment. We have explained above why we consider *P. bitaeniatus* to be a synonym of *P. conspicuus*.



Fig. 14. *Pseudanthias conspicuus*, 64 mm SL, female paratype, FMNH 70651, Arabian Sea off Mumbai, India. Photo by P. C. Heemstra, from Heemstra (1973).

***Pseudanthias cooperi* (Regan, 1902)**

Anthias cooperi Regan, 1902: 273 (Maldives: Had-dummati Atoll, 40 fms). Heemstra & Randall 1986: 511, Fig. 166.5, Pl. 33, Fig. 166.5 A, B.

Leptanthias kashiwae Tanaka, 1918: 525, Pl. 138, Fig. 387 (Kashiwajima, Kochi Prefecture, Japan).

Planctanthias preopercularis Fowler, 1935: 385, Figs 18 & 19 (Natal coast of South Africa). Smith 1965: No. 455, p. 200, Pl. 21, Fig. 455.

Anthias altus Smith, 1961: 363, Fig. 2 (off Lamu, Kenya).

Pseudanthias taeniatus (non Klunzinger, 1884): Katayama 1978: 216, Fig. 1.

Anthias kashiwae: Allen & Steene, 1987: 53, Pl. 25, Figs 25-1 (Mauritius), 25-2 (Kenya).

Pseudanthias cooperi: Randall & Anderson 1993: 14 (record of 6 specimens from Maldives); Debelius 1993: 104 (underwater photographs; distribution given as East Africa, Mascarenes, Maldives, but not in the Red Sea or Arabian Sea); Winterbottom & Anderson 1997: 7 (new record for Chagos Islands); Terashima et al. 2001: 43 (underwater photo of fish at Mauritius); Randall & Pyle 2001: 34 (listed as valid species); Manilo & Bogorodsky 2003: 104 (Arabian Seas checklist); Kuitert 1998: 74 (underwater photos of male and two females); Kuitert 2004: 46 (underwater photos of males and females from the Maldives, South Africa, and Kenya); Kuitert & Debelius 2007: 295 (underwater photos of male and female from Maldives); Fricke et al. 2009: 48 (Mascarene Islands checklist).

Material examined: St Brandon Shoals: BMNH 1908.3.23.61:39 mm. Comoros: SAIAB 7772, 88 mm male. Kenya: SAIAB 170, *Anthias altus*: 73 mm, male holotype; SAIAB 957, 59 mm, paratype, Lamu. Madagascar: SAIAB 7772. Maldives: BPBM 188868, 2: 66-68 mm; Maldives: BMNH 1901.12.31;15, 42 mm, female holotype. Mauri-

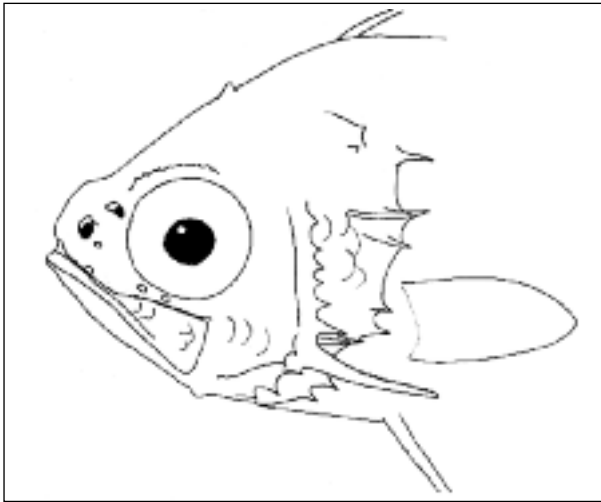


Fig. 15. *Pseudanthias cooperi*, 14 mm SL, paratype of *Planctanthias preopercularis*, ANSP 63917, KZN coast, South Africa. Drawn by P. C. Heemstra.

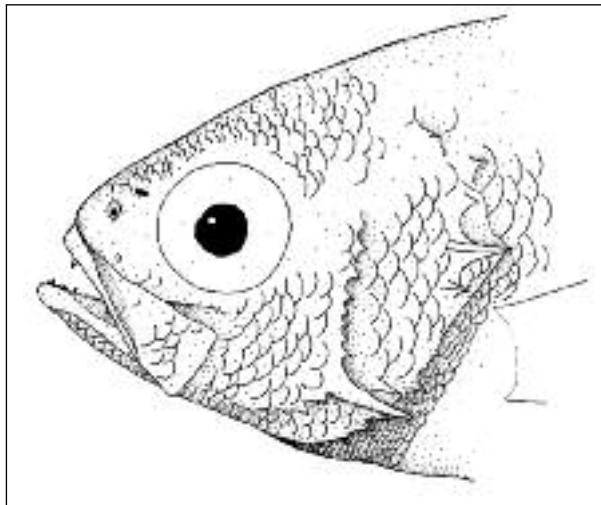


Fig. 16. *Pseudanthias cooperi*, 29 mm SL, holotype of *Planctanthias preopercularis*, ANSP 63916, KZN coast, South Africa. Drawn by P. C. Heemstra.

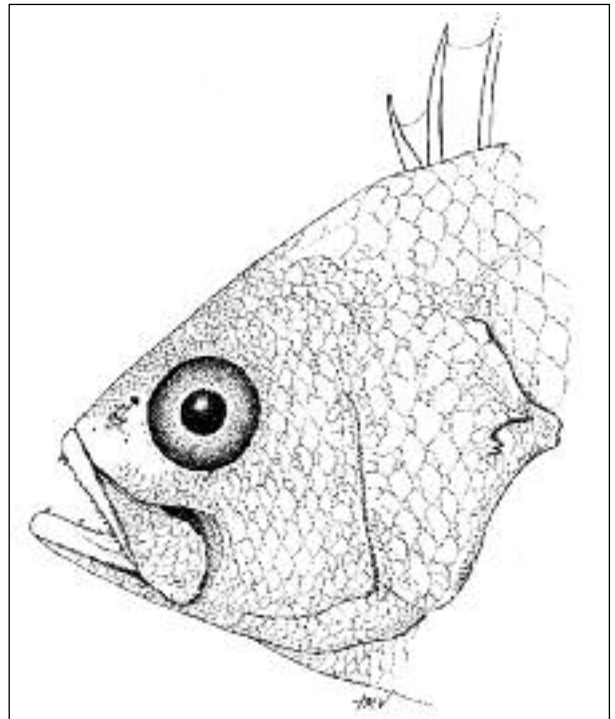


Fig. 17. *Pseudanthias cooperi*, 92 mm SL, SAIAB 12337, wreck off Brighton Beach, South Africa. Drawn by J. M. Vincent.

tius: BPBM 20220, 3: 49-87 mm; BPBM 21849, 5: 49-67 mm; BPBM 22927, 75 mm; SAIAB 930, 77 mm. **Seychelles:** SAIAB 8543, 3: 67-77 mm; SAIAB 79243, 2: 59-69 mm, Denis Id; ANSP 106343, 2: 62-70 mm. **South Africa:** Sodwana Bay, SAIAB 8859 36: 38-77 mm; Sodwana Bay, KZN; SAIAB 9246, 10: 62-92 mm; Sodwana Bay, KZN; SAIAB 10528, 79 mm; Durban, KZN; *Planctanthias preopercularis:* holotype, ANSP 63916, 29 mm; ANSP 63917, 14 mm; ANSP 63918, 27 mm; ANSP 63919, 28 mm; ANSP 63920, 28 mm; ANSP 63921, 27 mm; ANSP 63922, 26 mm; ANSP 63923, 26 mm; ANSP 63924, 26 mm; **Tanzania:** BPBM 16400 (1:78). **Cocos-Keeling Ids:** ANSP 134531, 3: 38-56 mm; ANSP 134533, 52 mm; 134534, 4: 52-67 mm. **Australia:** Northwest Cape, Western Australia, WAM P 25370-002, 3: 49-56 mm; WAM P 25371-002, 2: 77-80 mm. New South Wales, WAM P 25325-002, 62 mm.

Diagnosis: Male caudal fin lunate, with elongated lobes, outer rays filamentous; caudal concavity 19-35% SL; female caudal fin emarginate; dorsal fin rays 15-17, no elongated spines or rays, spinous and soft-rayed parts of equal height; anal fin rays 7-8; pectoral fins obtusely pointed, rays 18-20; pelvic fins pointed with slight elongation of 2nd and 3rd rays, reaching between anus and 3rd anal fin spine. Lateral line scales 48-52; scale rows between 5th dorsal fin spine and lateral line 2 or 3; circum-peduncular scales 25-27; few auxiliary scales on head; soft dorsal and anal fins scaly at base and along proximal part of inter-radial membranes; caudal fin scaly halfway to distal margin; pectoral fins

scaly over proximal half of fin; pelvic fins with scales in rows on ventral side. Gill rakers 8-11 + 22-28. Body depth 2.8-3.2, head length 3.1-3.4 in SL. Orbit diameter 3.0-3.8, interorbital width 3.9-4.3 in head length. Dorsal head profile slightly convex; maxilla reaching vertical at centre of orbit, male maxilla with few irregular small serrae at lower rear edge; no papillae on rear edge of orbit. Jaw dentition as described for genus; villiform teeth in triangular patch on vomer and in narrow band on palatines. Preopercle vertical limb with 14-27 serrae, larger ventrally; ventral limb smooth; few small serrae on ventral edge of subopercle and on rear edge of interopercle. Nostrils subequal; anterior nostril in short tube, rear margin with short flap not reaching slit-like rear nostril. Vertebrae 11+15 (n = 14) or 10+16 (n = 9); or 11+16 (one specimen); supraneural bones 2: 0/0/2/1+1/1/1/1/; one specimen with single supraneural: /0/2+1/1/1/1/1/. Attains 100 mm SL.

Life colours: Male: variable; head, body and fins red, or pale reddish grey or almost white, with white streak from front of snout along lower edge of eye and across cheek to pectoral fin base; often showing an irregular, vertically elongate scarlet blotch below lateral line at mid body; silvery white streak running parallel with and just above lateral line also commonly seen; caudal fin scarlet, with elongated upper and lowermost rays pale blue; anal fin pale greenish yellow; pelvic fins reddish.

Female: head and body reddish orange dorsally, body yellow-orange below lateral line; ventral part of head white, with red spot on front end of lower

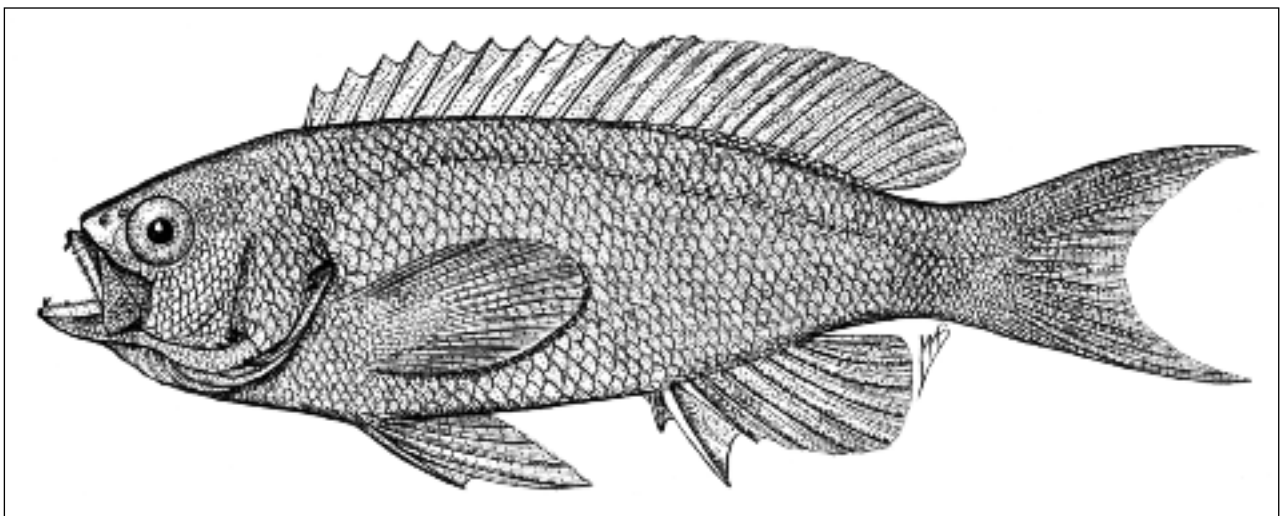


Fig. 18. *Pseudanthias cooperi*, 73 mm SL, male holotype of *Anthias altus*, SAIAB 957, Lamu, Kenya. Drawn by M. M. Smith, from Heemstra & Randall (1986).

jaw; caudal fin red basally, rear margin wide, hyaline pale blue grey, with scarlet tip at each corner.

Distribution: *Pseudanthias cooperi* is a widely distributed species, occurring from the western Indian Ocean: South Africa to Kenya, Comoro Islands, Maldives, Réunion, Mauritius and Seychelles to Western Australia, Indonesia, Philippines, Taiwan and Japan.

Remarks: We examined specimens from the localities listed above and found no significant differ-

ences in meristic or morphological characters. The colour patterns of western Pacific and Indian Ocean specimens are very similar, with both populations showing the distinctive irregular red blotch at mid body below the lateral line and the longitudinal silver streak between the lateral line and dorsal fin base. The colour patterns of the fins are also similar. There remains a need for a comparison of DNA sequences of Indian Ocean and western Pacific populations.

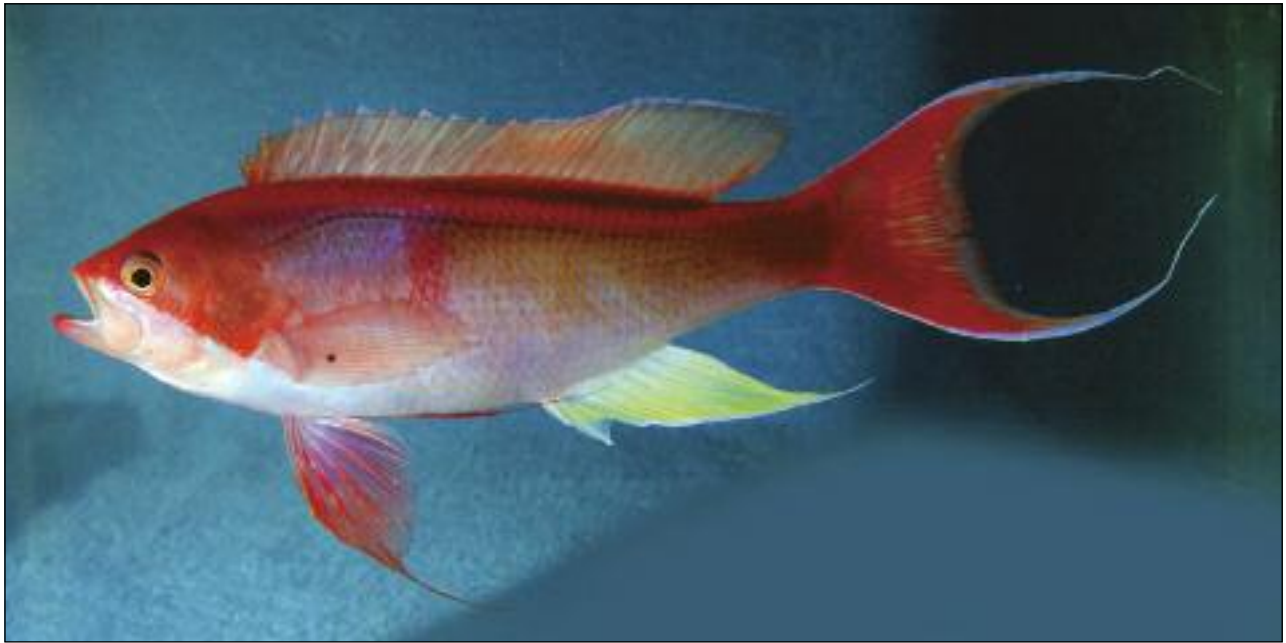


Fig. 19. *Pseudanthias cooperi*, 94 mm SL, male, Cape Vidal, KZN, South Africa. Photo by P. C. Heemstra.



Fig. 20. *Pseudanthias cooperi*, 40 mm SL, female, Sodwana Bay, South Africa. Photo by R. E. Stobbs.

***Pseudanthias evansi* (Smith, 1954)**

Anthias evansi Smith, 1954: 1, Fig. 1 (Shimoni, Kenya). Smith 1955: 342 (records from Aldabra, Alphonse, Assumption, Astove, Cosmoledo and Providence Ids); Smith 1961: 363, Pl. 35, Fig. A (description and colour painting); Heemstra & Randall 1986: 512, pl. 35 (brief diagnosis, records from Mauritius, Réunion, Chagos, Maldives and Cocos Keeling Ids.); Allen & Steene 1987: 53, Pl. 24, Fig. 4, (underwater photo from Vilingilli, Atoll, Maldives).

Mirolabrichthys evansi: Heemstra 1973: 207; Winterbottom et al. 1989: 27, Pl. IV, Fig. G (record and colour photograph of specimen).

Pseudanthias evansi: Randall & Anderson 1993: 14 (Maldives checklist); Debelius 1993: 105 (underwater photo); Winterbottom & Anderson 1997: 7

(record from Chagos); Kuitert 1998: 75 (photos of male and female; Fricke 1999: 207 (records for Mauritius and Réunion); Terashima et al. 2001: 43 (underwater photo of fish at Mauritius); Manilo & Bogorodsky 2003: 104 (Arabian Seas checklist); Kuitert 2004: 79 (5 underwater photos Maldives fish); Fricke et al. 2009: 48 (Mascarene Islands & Aldabra); Heemstra et al. 2004: 3319 (listed from Rodrigues Island); Kuitert & Debelius 2007: 301 (underwater photos of male and female from Maldives).

Material examined: Christmas Island: WAM 26103-002, 2: 58-66 mm SL. Grand Comoro Id: SAIAB 30548, 48 mm SL. Seychelles: Amirante Ids, ANSP 106198, 10: 44-80 mm SL. ANSP 106204, 2: 60-73 mm SL. Cosmoledo: SAIAB

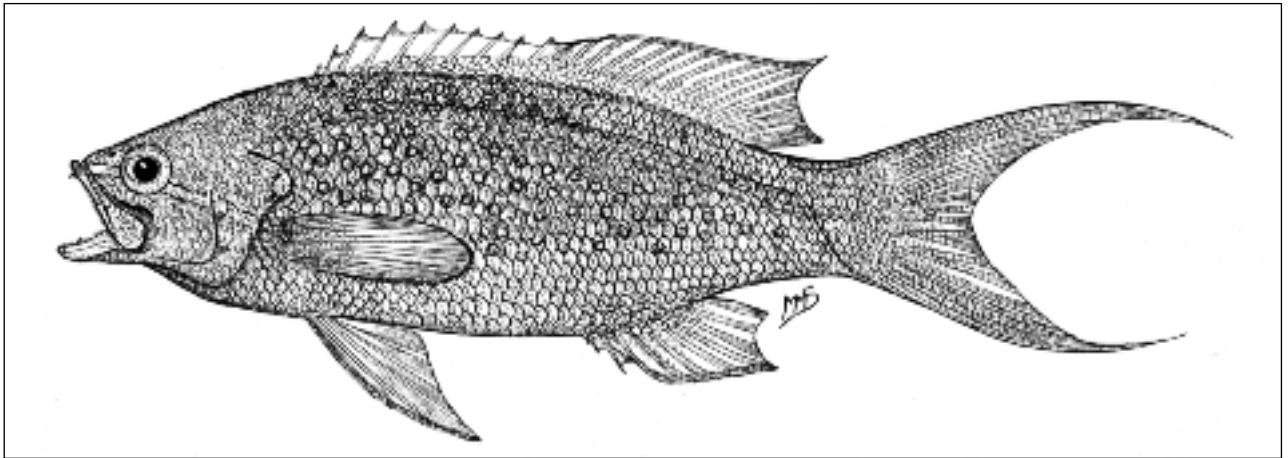


Fig. 21. *Pseudanthias evansi*, 113 mm TL, holotype, Shimoni, Kenya. Drawn by M. M. Smith.



Fig. 22. *Pseudanthias evansi*, 68 mm SL, Mauritius. Photo by P. C. Heemstra.

98637, 4: 54-771 mm. **Christmas Id:** WAM P 26103-002, 2: 58-66 mm. **Chagos:** ROM 43458, 76 mm; ROM 43462, 48 mm. **South Africa:** SAIAB 33274, 76 mm.

Diagnosis: Caudal fin large, lunate; lobes attenuate, 33-47% SL; caudal concavity 27% SL, males with upper lobe slightly longer than lower and about twice head length, female caudal fin relatively shorter. Dorsal fin rays 16-18; no elongated spines, but adults with rear end of fin pointed by elongation of 8th to 11th rays; longest ray twice length of longest spine. Anal fin rays 8-9, fin pointed in adults, reaching to or beyond vertical at caudal-fin base; pectoral fin rays 16-18; pectoral and pelvic fins reaching vertical at anus or anal fin origin. Lateral line scales 47-50; scale rows between 5th dorsal fin spine and lateral line 3 or 4; circumpeduncular scales 25-27, numerous smaller auxiliary scales present. Soft dorsal and anal fins scaly at base and along proximal part of inter-radial membranes; caudal fin scaly halfway to distal margin; pectoral fins scaly over proximal half of fin; pelvic fins with scales in rows on ventral side. Gill rakers 9-11 + 22-26. Body slender, depth 3.0-3.4 in SL; head small, length 3.3-3.7 in SL. Head pointed, dorsal profile straight or slightly convex; mouth oblique, front of upper lip of adults swollen, with rounded protuberance, lower jaw shorter; maxilla expanded and rounded posteriorly, reaching almost to vertical at rear edge of eye. Jaw dentition as described for genus; vomer with few minute teeth; 2 or 3 rows of small conical teeth on palatines. Nostrils subequal; anterior nostril in short floppy tube, rear margin slightly longer; rear nostril oval. Preopercular vertical limb with 22-26 serrae, one at angle usually larger, lower limb usually smooth; subopercle and interopercle with few small serrae. Vertebrae 10 +16 (n = 23) or 10+15 (n = 2); supraneurals 3: /0+0/2/1+1/1/1/1/. Our largest specimen is 80 mm SL. Attains 93 mm SL.

Life colours: Male: head and lower two-thirds of body pink to mauve, thickly covered with small yellow spots; upper third of body bright yellow from nape, extending onto dorsal and caudal fins; anal and pelvic fins whitish; pelvic fins lilac; yellow stripe from front of upper jaw to eye and continuing behind eye to upper end of pectoral fin base. Females similar, but yellow spots sparse or absent.

Distribution: Indian Ocean from Kenya to South Africa (Sodwana Bay), Seychelles, Maldives, Réunion, Mauritius, Rodrigues, Chagos to Sumatra, Indonesia and Christmas Island. Not reported from

Red Sea. Depth: 4-30 m, along drop-offs and in outer reef lagoons.

Remarks: The unique colour pattern, pointed head, body with short pectoral fins, long pelvic and caudal fins, readily identifies this *Pseudanthias* species. It feeds in schools above drop-offs and reefs, often near the surface.

***Pseudanthias gibbosus* (Klunzinger, 1884)**

Anthias (Pseudanthias) gibbosus Klunzinger, 1884: 9 (Red Sea).

Anthias squamipinnis (non Peters, 1855): Boulenger 1895: 329 (*Anthias (Pseudanthias) gibbosus* listed in synonymy); Kuitert 2004: 24 (listed as a synonym of *P. squamipinnis*).

Franzia fasciata Kamohara, 1954: 3, Fig. 1 (Okinoshima, Kochi Prefecture, Japan).

Anthias fasciata: Allen & Starck 1982: 49 (underwater photo of red-striped female from Great Barrier Reef misidentified as a male).

Anthias fasciatus: Connell 1993: 199, Fig. 1 (photo of fresh red-striped female from off Park Rynie, south coast of KwaZulu-Natal, South Africa).

Pseudanthias fasciatus: Krupp & Paulus 1991: 388-392 (description and underwater photos of fish in the Red Sea and from Sri Lanka); Debelius 1993: 105 (underwater photo of red-striped female from Red Sea misidentified as a male); Khalaf & Disi 1997: 105 (photo of fresh female specimen); Kuitert 2004: 52-53 (photos of fish from Japan, Indonesia, Australia and Red Sea).

Pseudanthias cf. *fasciatus*: Kuitert & Debelius 2007: 296 (underwater photos of male and female from Red Sea, Gulf of Aqaba).

Material examined: Gulf of Aqaba: SM 23664, 63 mm; SM 23663, 64 mm; SM 23665, 64 mm. **Seychelles:** BPBM 26430, 120 mm. **South Africa:** SAIAB 37656, 2: 77-80 mm; SAIAB 26180, 60 mm; SAIAB 27034, 60 mm; SAIAB 56132, 168 mm; SAIAB 56576, 84 mm; SAIAB 56615, 110 mm.



Fig. 23. *Pseudanthias gibbosus*, 80 mm SL, small male, Sodwana Bay, KZN, South Africa. Photo by P. C. Heemstra.

Diagnosis: aural fin lunate; dorsal fin rays 16, rays longer than spines; anal fin pointed with 7 rays, third ray elongated; pectoral fin rays 17-18, reaching vertical at anus; pectoral and pelvic fins subequal; pelvic fin with 2nd ray slightly enlarged, filamentous, reaches anus. Lateral line scales 39-43; scale rows from 5th dorsal fin spine to lateral line 2 ½-3 ½; circumpeduncular scales 22-26; no auxiliary scales on head or body. Body depth equals head length, 2.4-3.1 in SL. Orbit diameter equal to or greater than snout length. Jaw dentition as described for genus; palatines in band, narrowing posteriorly. Vertebrae 11+14 or 11+15 or 11+16; supraneurals 2 or 3: 0/0/2/1+1/1/1/1/; 0/0+0/2/1+1/1/1/1/1/. Attains at least 180 mm SL.

Small male (77 mm SL): upper caudal fin lobe longer than lower, lobes with slender filament, upper much longer than lower, length of upper lobe from caudal fin base 49% SL; lower caudal lobe 43% SL; dorsal fin with 3rd spine slightly elongated and distinctly longer than 4th spine; pectoral fin rays 18. Lateral line scales 42. Gill rakers 10 + 25. Body depth 3.0, head length 3.0 in SL. Orbit diameter 2.9, snout length 4.5 times in HL. Villiform teeth in elongate oval patch on vomer; preopercle with 19 small serrae on vertical limb, 2 serrae at angle slightly enlarged.

Large male (168 mm SL): caudal fin forked; lobes broad, pointed, tips acute but not filamentous; cau-

dal concavity 31% SL; pectoral fin bluntly rounded. Lateral line scales 42; scale rows from 5th dorsal fin spine to lateral line 3; soft dorsal and anal fins scaly at base and along proximal part of inter-radial membranes; caudal fin scaly halfway to distal margin. Gill rakers 12 + 28. Body robust, depth 2.5 in SL; head length 3.0 in SL. Head distinctly convex; maxilla widely expanded posteriorly, rear edge truncate, dorsal and ventral corners well rounded, reaching vertical at anterior edge of pupil. Villiform teeth in triangular patch on vomer. Preopercle with numerous small close-set serrae; few small serrae on ventral edge of subopercle and also on rear edge of interopercle.

Females (60-117 mm SL): caudal fin deeply lunate, lobes attenuate and distinctly longer than head length, caudal concavity 20-36% SL; outer rays elongated as short filaments. Dorsal fin with 3rd spine slightly to distinctly longer than 4th spine, but stiff, not filamentous; pectoral fin rays 17-18. Gill rakers 10-13 + 24-28. Body depth 2.4-2.9, head length 2.9-3.0 in standard length. Orbit diameter 3.4-4.5, interorbital width 3.6-4.1 in head length. Maxilla distal end slightly convex with dorsal end rounded, ventral corner with low knob, reaching vertical at front edge of pupil; villiform teeth in triangular patch on vomer.

Life colours: Small male: body and dorsal part of body pinkish purple; a broad reddish blotch from nape and spinous dorsal fin to abdomen, enclosed



Fig. 24. *Pseudanthias gibbosus*, 171 mm SL, large male, (upper body with spear wound), Park Rynie, KZN, South Africa. Photo by A. D. Connell.

scales with orange centre; ventral rear half of body with dull orange spots forming about seven longitudinal series. Caudal fin rays pink, with yellow submarginal streaks. Soft dorsal fin with two rows of dark brown spots and third fainter row distally.

Large male (150-180 mm SL): head and body reddish, paler ventrally; dark red area behind opercle from spinous dorsal fin to pectoral fin; body scales with reddish margin and central golden spot; dorsal fin reddish; anal fin with mauve leading edge, greenish yellow with red streaks distally; caudal fin golden with mauve upper and lower edges. .

Female (63 mm SL): head and body reddish orange dorsally, each scale with dark spot; white-edged red band running horizontally and mid-laterally from rear edge of opercle to base of caudal fin; ventral part of body pale, each scale with red spot, creating five or six series of red spots; caudal-fin lobes mostly yellow with narrow violet edge along fin margins; inner part of fin dusky greenish yellow; tips of dorsal fin spines magenta; red stripe with pale violet edges from eye to pectoral fin base.

Distribution: *Pseudanthias gibbosus* (previously known as *Pseudanthias fasciatus*) was reported from the Gulf of Aqaba, Red Sea (Krupp and Paulus 1991), KwaZulu-Natal, South Africa (Connell 1993), Indonesia (Bali), Australia, Taiwan and Japan. Usually seen below 30 m, known to 100 m at Sodwana Bay; common below 50 m at Aliwal Shoal MPA, South Africa. Photographed in the

northern Transkei, Eastern Cape Province, South Africa, by V. Fraser.

Remarks: Boulenger (1895) considered Klunzinger's *Pseudanthias gibbosus* to be a synonym of Peters' *P. squamipinnis*, but he apparently did not examine specimens of either species. The original description (in German) of *P. gibbosus* fits the species currently known as *P. fasciatus* better than it fits *P. squamipinnis*. Herewith a translation by the first author of Klunzinger's 1884 key and description of *Anthias (Pseudanthias) gibbosus* [Our comments in square brackets].

“b. Third dorsal fin spine not filamentous. [The third dorsal fin spine is elongated in male *P. gibbosus*, but it is pungent, not flexible and filamentous, as in *P. squamipinnis*.] Body high, oval (depth $2\frac{1}{2}$ in SL); [The standard length / body depth ratio of 2.5 in SL is more common in *P. gibbosus* than in *P. squamipinnis*]. Fins not scaly or only on the base. [The proximal two-thirds of the fins of *P. squamipinnis* are covered with small scales.] Lateral line scales ~40. [The meristic characters of *P. squamipinnis* and *P. gibbosus* overlap.]

2. *Anthias (Pseudanthias) gibbosus* KLZ. [The KLZ, abbreviation for Klunzinger, indicates that this species is here described as a new species by Klunzinger.]

Lateral line [scales] c. 40;

3. Dorsal fin with 10 spines, 16-17 rays; body depth $2\frac{1}{2}$ - $2\frac{3}{4}$ times in SL; head $3\frac{1}{2}$ in SL. Head



Fig. 25. *Pseudanthias gibbosus*, 115 mm SL, female, (lower abdomen with spear wound), Park Rynie, KZN, South Africa. Photo by P. C. Heemstra.



Fig. 26. *Pseudanthias fasciatus*, Papua New Guinea. Photo by J. E. Randall.

profile very convex, [The dorsal head profile does look more convex than that of *P. squamipinnis*, but this is difficult to appreciate without similar sized specimens in hand.] body deep, third dorsal fin spine not filamentous. The tail fin is no more complete [vollkommen] than in the present specimens. Some head scales with one or a few smaller scales at their base. Dorsal and anal fins scaly only at base of soft-rays. Third dorsal fin spine shorter than fourth, stiff, not filamentous. Colour reddish, with almost horizontal slightly descending pale stripe from behind lower part of eye to mid pectoral fin base. On one specimen I also see in addition a brighter yellow band from the opercle spine running mid-laterally, straight back to the tailfin. [This character of the midlateral yellow band which is red in life, but quickly becomes yellow after death, or in preservative, is diagnostic for female *P. gibbosus*, previously known as *P. fasciatus*]. This species is closely related to *Ps. squamipinnis*." [END OF TRANSLATION].

Pseudanthias heemstrai Schuhmacher, Krupp & Randall, 1989

Pseudanthias heemstrai Schuhmacher, Krupp & Randall, 1989: 339, Figs 1 & 2, Pls 1-8 (Aqaba, Jordan). Khalaf & Disi 1997: 105 (underwater photo of male showing red streak on isthmus and elongated fins); Debelius 1993: 105 (underwater photo of male showing elongated pelvic fins and enlarged anal fin); Kuitert 2004: 40 (males showing nuptial colours); Kuitert & Debelius 2007: 293 (underwater photos of male showing elongated pelvic fins and enlarged anal fin and females from Gulf of Aqaba, Red Sea).

Material examined: Gulf of Aqaba: SAIAB 26175, 89 mm paratype; BPBM 28867, 5: 76-86 mm; BPBM 17888, 4: 68-96 mm; SAIAB 41277, 6: 72-91 mm; SAIAB 59985, 30: 19-45 mm.

Diagnosis: Caudal fin rear margin truncate or slightly emarginate in females, convex or truncate in males, upper and lowermost ray exerted in some males; dorsal fin 15-17 rays, 3rd spine longest, 1-6% SL longer than 4th spine of males; pectoral fin rays 16-17; anal fin rays 7, fin of both sexes enlarged, pointed, reaching past caudal-fin base; pelvic fins of male much elongated, 1st and 2nd rays enlarged, reaching middle anal fin rays or past anal fin base. Lateral line scales 42-47; scale rows from 5th dorsal fin spine to lateral line 5-7; head with some auxiliary scales. Gill rakers 11-12 + 26-31. Body depth 2.7-2.9, head length 3.2-3.3 in standard length. Orbit diameter 3.5-4.1, interorbital width 3.8-4.4 in head length; mouth large, maxilla reaching past vertical at mid-eye; lower jaw projecting slightly in

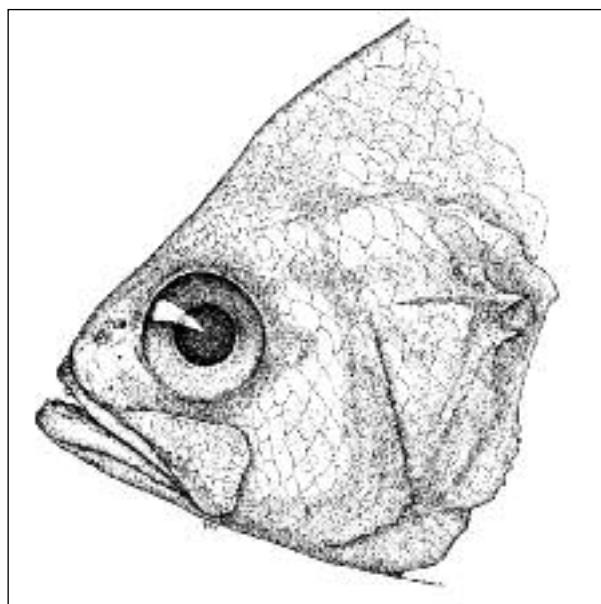


Fig. 27. *Pseudanthias heemstrai*, 89 mm SL, BPBM 17888, north of Dahab, Gulf of Aqaba. Drawn by D. P. Voorvelt, from Schuhmacher et al. (1989).



Fig. 28. *Pseudanthias heemstrai*, 92 mm SL, male, Eilat, Gulf of Aqaba. Photo by P. C. Heemstra.



Fig. 29. *Pseudanthias heemstrai*, 83 mm SL, female, Eilat, Gulf of Aqaba. Photo by P. C. Heemstra.

front of upper jaw when mouth closed (absence of maxilla in Fig. 1 of original description was a mistake). Jaw dentition as described for genus; vomer with patch of triangular to heart-shaped villiform teeth. Preopercle vertical limb with 34 serrae, 3 serrae at angle enlarged; sub- and interopercle smooth or with few inconspicuous serrae. Vertebrae 11+15, 11+16 in one fish; supraneurals 3: 0/00/2/1+1/1/1/1/. Attains 98 mm SL.

Life colours: Male: body mostly reddish dorsally, each scale with yellow spot and red margin; head dull orange laterally, more reddish pink dorsally, operculum golden; lower part of head and body pale pink, with mid-ventral scarlet streak on isthmus; anal and pelvic fins pale bluish grey, with irregular yellow spots; caudal fin dark red with rear margin yellow or pale bluish grey.

Courtship photographs of the male show the pinkish red scale margins on the flanks becoming scarlet, as the yellow centres of the scales become darker; an irregular, diffuse, mid-lateral white band appears behind the yellow operculum and widens gradually as it extends towards the tail; above the anal fin the band becomes much wider, covering the upper half of the peduncle and caudal fin base as it forms a bright white oval spot on the dorsal surface of the peduncle. This white band is also seen on territorial males (Krupp & Paulus 1991): the pale median orange band that runs from the tip of upper

jaw to the dorsal fin origin becomes dark orange-red; in dorsal view, it joins the folded dorsal fin to form a long red band. The broad whitish or yellow rear margin of the caudal fin becomes bright red.

Female: body yellow dorsally, scales lavender pink with central yellow spot on each scale; ventral half of body pale purple to white, with median red streak on throat; median fins yellow; pectoral and pelvic fins pinkish-blue.

Distribution: *Pseudanthias heemstrai* is endemic to the Red Sea. It has been collected off Eilat and Aqaba, at the north end of the Gulf of Aqaba, where it occurs in large aggregations of several hundred fish. Also found 5 km north of Dahab and on the Yemen coast of the Red Sea and has been photographed in depths of 13-67 m.

Remarks: The unique combination of unusual fin shapes and colour patterns for *P. heemstrai* makes this species easy to recognise. In natural light below 30 m, the caudal fin in the male seems to have a large squareish black blotch covering most of the fin.

Pseudanthias hypselosoma Bleeker, 1878

Pseudanthias hypselosoma Bleeker, 1878: 58, Pl. 2, Fig. 2 (New Guinea). Randall & Anderson 1993: 14 (Maldives fish checklist); Kuitert 1998: 75 (photo of displaying males from Bali, Indonesia; photo of female presumed to be from Maldives, with truncate hyaline caudal fin, the rear edge and

corners scarlet); Randall & Pyle 2001: 34 (valid species list); Kuitert & Debelius 2007: 293 (underwater photos of male and female from Indo-West Pacific).

Material examined: Maldives: BPBM 18881, 6: 33-54 mm. Australia: SAIAB 98689, 2: 46-55 mm; SAIAB 98690, 60 mm; WAM P 25325-001, 57 mm. Christmas Island: WAM P 26103-036, 60 mm.

Diagnosis: Caudal fin convex to truncate, or slightly concave; upper and lowermost rays slightly exerted; dorsal fin rays 16 or 17, third to 10th spines subequal; anal fin pointed in males, rounded in females, rays 7; pectoral fin slightly pointed, reaching vertical at anus, rays 18-20; pelvic fin pointed, 2th ray slightly elongated, reaching anus. Lateral line scales 44-47; scale rows from 5th dorsal fin spine to lateral line 3 or 3½; circumpeduncular scales 22-25; no scales on dorsal and anal fins, but dorsal fin with low scaly sheath and few rudimentary scales between dorsal fin rays. Gill rakers 10-13 + 26-30. Body depth greater than head length, 2.6-2.9, head length 2.8-3.0 in SL. Orbit diameter 3.1-3.7, interorbital width 3.6-3.9 in head length. Dorsal head profile slightly convex; maxilla reaching past vertical at centre of orbit; no papillae on rear edge of orbit. Nostrils subequal; anterior nostril in short tube, with fleshy flap on posterior rim. Jaw

dentition as described for genus; vomer with villiform teeth in chevron-shaped band and in narrow band on palatines. Preopercle angular, finely serrate, with ~24 serrae on vertical limb and 3 or 4 enlarged serrae at angle; sub- and interopercle with few small serrae. Vertebrae 11+15; supraneurals 3: 0/0+0/2/1+1/1/1/1/. Our smallest mature female is 33 mm SL; our largest female is 57 mm SL; we examined three males, 54, 60 and 60 mm SL.

Life colours: Male: body pinkish red dorsally with yellow-gold spot at base of each scale, paler ventrally; dorsal fin orangish, with scarlet spot between spines 6 to 9, yellow spots basally on rear half of fin; caudal fin reddish with faint yellow spots, triangular mauve area near red filamentous lobe tips; head red dorsally, with pale blue grey stripe from lower edge of eye to lower end of pectoral fin base; courting males with median fins red, fin margins with narrow pale bluish-grey edge.

Female: reddish orange, paler ventrally with all fins hyaline greenish yellow, caudal fin with rear margin and fin tips scarlet.

Distribution: Indo-West Pacific: Maldives to Indonesia; Philippines, Papua New Guinea, New Caledonia, Australia (Great Barrier Reef and New South Wales). Depth range: 10-40 m. In the Maldives, *P. hypselosoma* is usually seen below 30 m on remote patch reefs.



Fig. 30. *Pseudanthias hypselosoma*, 55 mm SL, male, Maldives. Photo by J. E. Randall.



Fig. 31. *Pseudanthias hypselosoma*, 50 mm SL, female, Maldives. Photo by J. E. Randall.

***Pseudanthias ignitus* (Randall & Lubbock, 1981)**

Anthias ignitus Randall & Lubbock, 1981: 18, Fig. 12 (Maldivian Islands, North Malé Atoll, Villingili).

Pseudanthias ignitus: Debelius 1993: 106 (photo of male and females at Maldives); Randall & Anderson 1993: 14 (Maldives checklist); Randall & Pyle 2001: 34 (valid species list); Debelius 1993, 106 (underwater photo of male and females at Mal-

dives); Kuitert 1998: 75 (underwater photo of male courtship display at Maldives); Randall & Pyle 2001: 34 (valid species list); Kuitert 2004: 71 (photo of males and females at Maldives); Kuitert & Debelius 2007: 301 (underwater photos of male courtship display from Maldives).

Diagnosis: Caudal fin deeply forked, lobes distinctly longer than head; lobe tips acute; caudal



Fig. 32. *Pseudanthias ignitus*, 58 mm SL, male, Maldives, J. E. Randall.



Fig. 33. *Pseudanthias ignitus*, 38 mm SL, female, Maldives. Photo by J. E. Randall.

concavity 23-33% SL; dorsal fin rays 16 or 17, fin margin smooth and convex, inter-spinous membranes not incised; dorsal fin origin at vertical from rear edge of preopercle; anal fin rays 7; anal fin margin rounded; pectoral fins bluntly pointed, rays 19-20, middle rays longest, 3.0-4.0 in SL reaching vertical at anal fin origin; pelvic fins with 2nd pelvic ray slightly prolonged in females, very elongate in males, reaching well past anal fin spines. Lateral line scales 53-58; scale rows from 5th dorsal fin spine to lateral line 4 or 5; circumpeduncular scales 29-33; no auxiliary scales on body; head scaly except for mandibles, throat, branchiostegal rays and membranes, and sides of snout from front edge of eye to mid upper lip; pectoral fins scaly on basal third or more; pelvic fins with small scales on basal rays. Gill rakers 11-12 + 22-25. Body depth 2.5-3.0, head length 3.0-3.2 in SL. Orbit diameter 3.6-4.4, interorbital width 3.8-4.4 in head length. Dorsal head profile straight; snout length subequal to orbit diameter, 3.6-4.4, in head length; male with front of upper lip swollen, forming fleshy, movable protuberance; maxilla reaching to or posterior to vertical at rear edge of pupil, posterior end of maxilla rounded; no fleshy papillae on rear edge of orbit. Jaw dentition as described for genus. Preopercle with 14 serrae on vertical limb, lower limb smooth. Vertebrae 26; supraneurals 1. Attains 60 mm SL.

Life colours: Male: head and body yellow to orange, more reddish dorsally and suffused with lavender ventrally; head pink to reddish dorsally, yellow ventrally, with lavender-edged orange stripe from front of snout over lower part of eye to rear

edge of operculum just in front of upper edge of pectoral fin base; small red spot at pectoral fin base; iris orange, lavender ventrally and greenish dorsally; upper lip reddish orange, tip of proboscis bright yellow. Dorsal fin scarlet with narrow violet margin; rear half of dorsal fin base greenish yellow, yellow increasing posteriorly; anal fin hyaline lavender; pelvic fins hyaline yellow with filament lavender; caudal fin base orange becoming yellow distally, with lobes red and narrow violet margin on upper and lower edge of fin lobes.

Female: Similar but much less intense, body yellow dorsally.

Distribution: Indian Ocean: Maldives, also Similan Islands and Thailand in the Andaman Sea. Depth range: 18-25 m.

Remarks: The type specimens were collected on a lagoon reef in 25 m. *Pseudanthias ignitus* is very similar to *P. dispar* (Herre, 1955) of the western Pacific.

Pseudanthias lunulatus (Kotthaus, 1973)

Anthias lunulatus Kotthaus, 1973: 20, Fig. 290 (off east coast of Somalia).

Pseudanthias lunulatus: Randall & Pyle 2001: 34 (listed as valid species); Manilo & Bogorodsky 2003: 104 (listed from Arabian Sea); Kuiter 2004: 42 (underwater photos of male and females from Maldives, Mauritius and Sudan coast of Red Sea); Kuiter & Debelius 2007: 294 (underwater photos of male and female from Red Sea and Maldives).

Pseudanthias n. sp.: Kuiter 1998: 74 (underwater photos of male and female identified as yellow-eye basslet at Maldives).

Material examined: **Somalia:** ZMH 5127, 57 mm holotype. USNM uncat. 5: 66-76 mm. **Red Sea:** ZMH 5128, 38 mm, paratype; USNM uncat. 3: 80-81 mm. **Seychelles:** SAIAB 98596, 94 mm. **Mauritius:** BPBM 16378, 76 mm; SAIAB 51975, 4: 58-79 mm; SAIAB 8626, 2: 30-60 mm. **Bali:** SAIAB 20015, 2: 74-75 mm.

Diagnosis: Caudal fin deeply lunate in both sexes, fin lobes attenuate, slender; caudal concavity 20-24% SL. Dorsal fin with 3rd to 10th spines subequal, rays 15 or 16, longest ray longer than longest spine; anal fin rays 7, fin margin pointed due to elongation of 2nd to 4th rays reaching past caudal fin base; pectoral fin rays 17 or 18; pelvic fins elongated in male, reaching past anus. Lateral line scales 38-43; scale rows from 5th dorsal fin spine to lateral line 2½; circumpeduncular scales 22-28; head scaly except for area around nostrils, branchiostegal rays and membranes and gular area of lower jaw; no auxiliary scales present. Gill rakers 9-10 + 22-25. Body depth greater than head length, 2.8-3.0, head

length 3.0-3.3 in SL. Orbit diameter 2.7-4.0, interorbital width 3.9-5.2 in head length. Snout length subequal to orbit diameter; maxilla reaching vertical at rear edge of pupil; upper lip not thickened at symphysis. Jaw dentition as described for genus; villiform teeth in triangular patch on vomer and in elongate band on palatines. Preopercle, subopercle and interopercle serrate. Vertebrae 10+16; supraneural bones 3: 0/0+0/2/1+1/1/1/1/. Females mature at 60 mm SL; attains 120 mm SL.

Life colours: Male: Head and body red or pink, with small dusky yellow spot on each scale, persisting in alcohol as dusky spot; yellow magenta-edged triangular saddle blotch below spinous dorsal fin; dorsal and anal fins bluish with small yellow spots; tips of dorsal fin membranes pink; caudal fin pale reddish, upper and lower edges pink; series of close-set small yellow spots along scaly sheath at dorsal fin base. Iris bright yellow, usually with black crescent anteriorly; magenta-edged yellow stripe from front of upper jaw to lower edge of eye, thence to pectoral



Fig. 34. *Pseudanthias lunulatus*, male, Maldives, from Kuiter (2004).



Fig. 36. *Pseudanthias lunulatus*, female, Maldives, from Kuiter (2004).



Fig. 35. *Pseudanthias lunulatus*, 78 mm SL, female, Mauritius. Photo by J. E. Randall.

fin base; pelvic fins hyaline with bright white leading edge.

Female: reddish orange or pink; all body scales on dorsolateral part of body with dusky yellow spot, which persists in alcohol as yellowish dorsolateral area; eye stripe similar to male; pelvic fins with bright white leading edge.

Distribution: Indo-West Pacific: Somalia, north-east coast; Sudan, Maldives and Mauritius to Bali, Indonesia. Usually found on reefs below 50 m.

***Pseudanthias marcia* Randall & Hoover, 1993**

Pseudanthias marcia Randall & Hoover, 1993: 47 (off Rahah Bay, south-west coast of Oman). Randall 1995: 123 (underwater photos of males; and photograph of female with life colours); Randall & Pyle 2001: 34 (listed as valid species); Kuitert 2004: 34 (underwater photos of males and female); Kuitert & Debelius 2007: 293 (underwater photos of male and female from Maldives and Arabian Sea).

Material examined: Oman: SAIAB 525, 100 mm, paratype.

Diagnosis: Caudal fin asymmetric; dorsal fin rays 16, dorsal spines progressively longer with small cirrus from tip of each interspinous membrane; anal fin rays 7; pectoral fin rays 19-21; pelvic fins elongated with 2nd ray filamentous. Lateral line scales 47-50; scale rows from 5th dorsal fin spine to lateral line 4; circumpeduncular scales 28-29; auxiliary scales on head, none on body; pointed projection of small scales basally on soft portion of dorsal and anal fins;

small scales on caudal fin nearly to posterior margin; pelvic fin rays scaly medially to about 3/4 distance to posterior margin. Gill rakers 13 + 28-30. Body depth more than head length, 2.5-2.9, head length 3.0-3.1 in SL. Orbit diameter 4.5-5.3, interorbital width 4.0-4.4 in head length. Dorsal head profile straight; maxilla reaching past centre of orbit, posterior edge truncate with rounded corners; no papillae on rear edge of orbit. Jaw dentition as described for genus; villiform teeth in triangular patch on vomer and in short narrow band on palatines. Preopercle vertical limb with 46 serrae; subopercle and interopercle with few small serrae. Vertebrae 10+15; supraneurals 3: 0/0+0/2/1+1/1/1/1. Attains 101 mm SL, 160 mm including caudal filament.

Male: caudal fin slightly convex to truncate, with upper rays distinctly elongated, forming long filament; caudal fin concavity 32-37% SL; dorsal fin angular, longest rays about twice length of longest spines; anal fin enlarged, acute, longest ray 34-36% SL, reaching past vertical at caudal fin base; usually 20; pelvic fins elongated, 41-52% SL, reaching 4th anal fin ray.

Female: caudal fin crescentic, upper rays slightly elongated; caudal fin concavity 16% SL; anal fin rounded posteriorly, not reaching vertical at caudal-fin base; pelvic fin barely reaching anus.

Life colours: Male: head and body mostly reddish orange; scales on rear half of body mostly yellow with red margins; head and body paler ventrally; diffuse red streak on mid-body from lateral line to



Fig. 37. *Pseudanthias marcia*, 98 mm SL, male, Oman. Photo by J. E. Randall.



Fig. 38. *Pseudanthias marcia*, 54 mm SL, female, Oman. Photo by J. E. Randall.

pectoral fin, below 8th and 9th dorsal fin spines; pale lavender streak from below eye to lower end of pectoral fin base; pale whitish band dorsally on caudal peduncle; caudal fin yellow with red rays becoming reddish distally in middle part, upper filament blueish with red margin; anal fin pectoral fins pinkish, orange basally with lavender leading edge; pelvic fins yellowish with lavender leading edge.

Female: similar to male but caudal fin with pointed scarlet lobe tips. Head and body reddish orange, body scales yellow with dull red margins. Head below eye white or pale yellow.

Distribution: This species is endemic to Oman. It has been found at two localities: a reef near Fahal Island off Muscat and a rocky drop-off at Rahah Bay on the south-western coast. Depth range 14-30 m.

Pseudanthias pillai n. sp.

Holotype: SAIAB 86517, male, 119 mm SL, India, off Charakkadu, Kerala, India (10°30' N, 75°24'E); depth 175-200 m; specimen retrieved from trawler catch by K. V. Akilesh, April 2009.

Paratype: SAIAB 97562, female, 100 mm SL, trawled off Kochi, India (9°56' N, 76°E).

Diagnosis: Based on the holotype; data for paratype, when different, given in parentheses. Caudal fin rear margin slightly convex; no elongated rays; principal rays 15, median 13 rays branched; dorsal and ventral procurrent rays 6, mostly hidden by skin and scales, posterior rays segmented. Dorsal fin rays X, 16; third spine pungent,

slightly (4% SL) longer than fourth spine; dorsal fin spines 3, 4, and 5 with fleshy cirrus at tip; rear margin of fin pointed and elongate, with 9th to 14th rays elongated, reaching well past caudal fin base; 9th ray of holotype abnormally shortened, 8 mm compared to 27 mm for the 8th and 10th soft rays. Anal fin rays III, 7; third ray abnormally shortened, about half length of adjacent rays. No abnormally shortened fin rays on paratype (anal fin extends to verti-

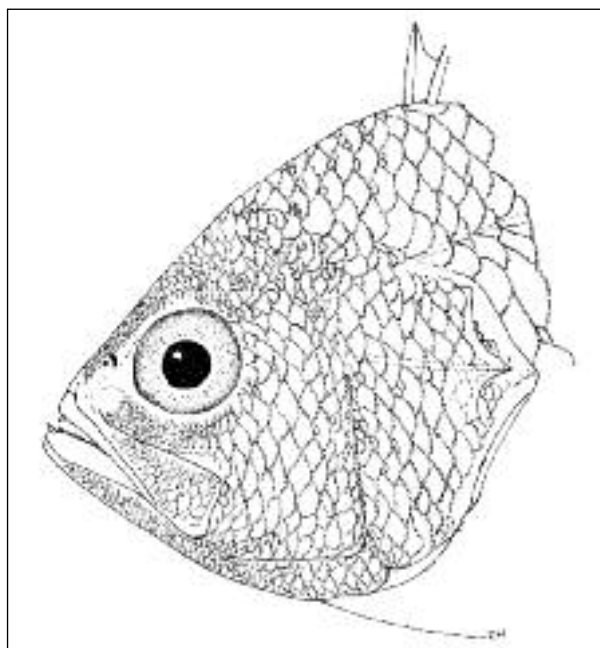


Fig. 39. *Pseudanthias pillai*, 119 mm SL, holotype, SAIAB 86517, off Charakkadu, Kerala, S.W. India. Drawn by E. Heemstra.

Table II. Proportional measurements as % SL of *Pseudanthias pillai* holotype and paratype.

	Holotype SAIAB 86517	Paratype SAIAB 97562
Sex	Male	Female
Standard length (mm)	119	100
Body depth	39	35
Body width	16.8	16
Head length	37	38
Snout length	7.3	9.1
Orbit diameter	8.7	9.1
Interorbital width	8.1	8.2
Upper jaw length	15	15
Maxilla greatest depth	5.9	6.3
Peduncle depth	13	12
Peduncle length	22	19
Snout to dorsal fin origin	33	33
Snout to anal fin origin	65	64
Dorsal fin base	62	63
First dorsal fin spine	6.6	5.6
Second dorsal fin spine	12	10
Third dorsal fin spine	18	16
Fourth dorsal fin spine	15	14
Tenth dorsal fin spine	13	14
Longest dorsal ray	25	24
Anal fin length	34	48
First anal fin spine	8.2	10
Second anal fin spine	15	17
Third anal fin spine	15	15
Longest anal fin ray	25	29
Caudal fin length	29	27
Caudal concavity	2	2
Pectoral fin length	29	30
Pelvic spine length	17	17
Pelvic fin length	31	28

cal at caudal-fin base). Pectoral fin rounded, rays 19, dorsal two rays and ventralmost ray unbranched, the rest branched, reaching 3rd (2nd) anal fin spine; pelvic fin rays pointed, 3.2 (3.6) in SL, reaching 3rd (2nd) anal fin spine. Lateral line scales 38 (36); scale rows between lateral line and 5th dorsal fin spine 2½; circumpeduncular scales 20 (22). Gill rakers 11 + 28.

Description: Additional measurements are given in Table II. Body depth subequal to head length, 2.6 (2.9), head length 2.7 (2.6) in SL; snout shorter than or equal to orbit diameter; no papillae on rear edge of orbit. Orbit diameter 4.2 in head length; interorbital area convex; its width less than orbit diameter, 4.6 in head length. Opercle with 3 flattened spines; middle spine acute, lower spine a right angle between middle spine and lower end of opercle; upper spine hidden by scales. Preopercle vertical

limb with 41 serrae dorsally, then smooth gap and 7 larger serrae at angle, lower limb with one minute serra; preopercle serrae of paratype smaller and more irregular; about 24 serrae along vertical edge, with 6 larger serrae at angle; sub- and interopercles smooth. Body and head (including lower jaw) scaly; scales ctenoid; maxilla truncate posteriorly, with rounded corners; maxilla with 9 (12) vertical scale series; scales extending forward over snout, almost reaching upper lip. Spinous dorsal fin naked, but with few scales along base; soft-rayed part of dorsal fin with few thin, transparent scales on fin membranes. Small auxiliary scales on head and front of body. Dorsal head profile slightly convex; anterior nostril short fleshy tube, rear margin with slender V-shaped tentacle reaching front edge of oval rear nostril. Mouth slightly oblique, lower jaw projecting about 1 mm in front of upper lip; maxilla reaching vertical at rear edge of orbit; lower jaw with band of minute slender teeth, band widening anteriorly, with small conical tooth projecting dorso-laterally on each side at front of lower jaw, followed by large, curved, retrorse canine posterior to the smaller conical tooth at front of jaw. Premaxilla with outer row of ~20 small, slender teeth with tips curved posteriorly and visible below upper lip when mouth closed. Vomer with minute sharp slender teeth in triangular patch with concave sides, palatines with band of similar teeth in 5 rows anteriorly narrowing to 2 rows posteriorly. Tongue pointed, edentate. Upper lip not swollen at symphysis. Vertebrae 10+16; supraneurals 3: 0/0+0/2/1+1/1/1/1/.

Life colours: Body pinkish purple; scales on dorsal half of body with central dark brown spot, formed by cluster of minute melanophores, scale margins pinkish purple; caudal fin purple with yellow corners posteriorly; dorsal fin yellow, spines and rays purple. Female pelvic fins yellowish and those of male pale pink. Male holotype colours more vivid than those of female.



Fig. 40. *Pseudanthias pillai*, 119 mm SL, holotype, off Kochi, S.W. India. Photo by K. V. Akhilesh.

Distribution: *Pseudanthias pillai* has been found off Kochi and Charakkadu, on the south-west coast of India.

Etymology: The species epithet honours Dr N. G. K. Pillai, Scientist Emeritus, Indian Council of Agricultural Research (ICAR), former Principal Scientist and Head of the Division of Pelagic Fisheries, Central Marine Fisheries Research Institute (CMFRI), India, and former Director in charge of CMFRI, in recognition of his valuable contributions to the better understanding of marine fishes and the fisheries of India.

Remarks: The minor colour difference between the two type specimens might be a result of the male being fresher when it was photographed. The similarities in the male and female colour patterns may indicate that the female has begun to change sex.

Pseudanthias pulcherrimus (Heemstra & Randall, 1986)

Anthias pulcherrimus Heemstra and Randall, 1986: 512, Plate 33, Fig. 166.8 (A) female & (B) male (photos of fresh colours) specimens from Maldives, Chagos Archipelago and Mauritius.

Pseudanthias pulcherrimus. Kuitert 1998: 76 (underwater photos of male and female from Maldives); Terashima et al. 2001: 44 (underwater photo of male from Mauritius); Randall & Pyle 2001: 34 (listed as valid species); Kuitert 2004: 61 (underwater photos of males and females from Maldives); Kuitert & Debelius 2007: 298 (underwater photos of male and female from Maldives); Fricke et al. 2009: 49 (distribution given as Mauritius, Seychelles, Maldives, Chagos, and new record for Réunion).

Material examined: The original description of *Pseudanthias pulcherrimus* was published (as *Anthias pulcherrimus*) inadvertently and without designation of a holotype. A lectotype and paralectotypes are here designated to clarify the generic assignment and taxonomic status of this species and the paralectotypes. The lectotype for *Anthias pulcherrimus* is hereby selected as: SAIAB 86492, 73 mm SL, male specimen speared by J. E. Randall, Mauritius, west coast off Wolmar, 56 m depth (photo in Heemstra & Randall 1986: Pl. 33, 166.8 B).

Paralectotypes: BPBM 16378, 2: 39–50 mm, Mauritius, west coast, off Wolmar, 55 m depth; BPBM 22541, 41 mm, Mauritius, west coast off Flic en Flac, 42 m depth; BPBM 16375, 1: 59 mm, Mauritius, west coast off Wolmar, 56 m depth;

BPBM 34647, 4: 28–61 mm, Mauritius, west coast off Flic en Flac; ROM 87931, 2: 38–52 mm, Chagos, Solomons, 33–43 m depth; ROM 87932, 2: 41–53 mm, Chagos Archipelago; SAIAB 17260, 2: 33–57 mm, Maldives, North Malé, 39 m depth; SAIAB 7773, 78 mm SL Mauritius, north-east of Grand Baie, 10 m depth.

Diagnosis: Caudal fin lunate, lobes attenuate, upper lobe longer on females, caudal concavity 7.6–11.0% SL; dorsal fin rays 15–16, 3rd spine elongate in both sexes except for females less than 35 mm SL; anal fin pointed, rays 7; pectoral fin bluntly pointed, rays 17–20; pelvic fins angular, 2nd ray longest, reaching 3rd anal fin spine. Lateral line scales 40–45; scale rows from 5th dorsal fin spine to lateral line 3; no auxiliary body scales. Gill rakers 9–11 + 23–27. Body depth 2.9–3.0, head length 3.1–3.4 in SL. Orbit diameter slightly longer than snout, orbit diameter 2.9–3.3, interorbital width 3.5–4.5 in head length. Dorsal head profile straight; upper lip thickened at symphysis; tongue tip with median ventral crest; no papillae on rear edge of orbit. Jaw dentition as described for genus; vomer with triangular patch of villiform teeth; palatines with elongate band of villiform teeth. Preopercle vertical limb with 26 serrae, 4 serrae at angle enlarged; subopercle and interopercle each with 5 coarse serrae. Vertebrae 10+16; supraneurals 2 or 3: /00/2/1+1/1/1/1/ or 0/00/2/1+1/1/1/1/. Female mature at 50 mm; attains 80 mm SL.

Life colours: Male: dark red to dark pink with faint, irregular, reddish orange longitudinal band

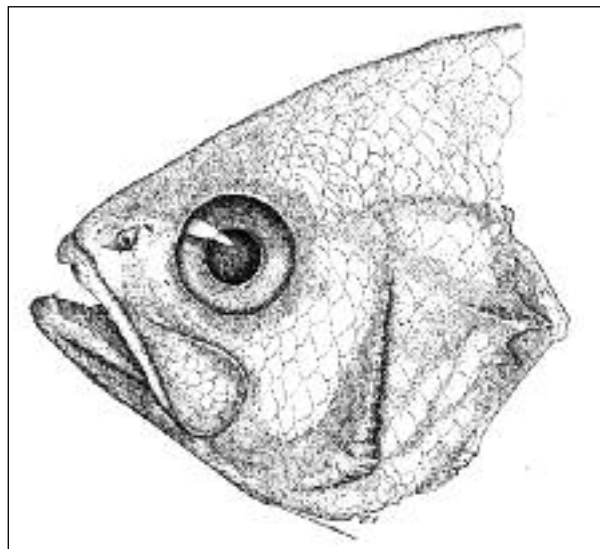


Fig. 41. *Pseudanthias pulcherrimus*, 41.4 mm SL, paralectotype, BPBM 22541, Mauritius. Drawn by D. P. Voorvelt.

from pectoral fin base to peduncle; abdomen pale pink; caudal fin dark red, pinkish white distally; dorsal and anal fins yellow with mauve edge; anal and pelvic fins whitish to pale blue-grey, with conspicuous scarlet margin.

Females and juveniles: pink with yellow caudal fin and snout; dorsolateral body scales with group of black dots making dark spot at centre of each scale;

dorsal fin greenish-yellow, spine tips and fin margin lavender, spines and rays pink basally; pelvic and anal fins hyaline whitish lavender with lavender leading edge.

Distribution: Western Indian Ocean: South Africa (Sodwana Bay and Aliwal Shoal), Chagos, Madagascar, Maldives, Mauritius and Réunion. Depth range: 10-55 m.



Fig. 42. *Pseudanthias pulcherrimus*, 73 mm SL, male lectotype, Mauritius. Photo by J. E. Randall.



Fig. 43. *Pseudanthias pulcherrimus*, 40 mm SL, female paralectotype, Mauritius. Photo by J. E. Randall.

Remarks: The original description of *P. pulcherrimus* was to be included in a review that was delayed and it was inadvertently published in the book *Smiths' Sea Fishes*.

This species is very similar to *Pseudanthias randalli* Lubbock & Allen, 1978, of the western Pacific but *P. randalli* male has pale blue pelvic fins with a dark red rear margin and the ventral part of body is dark reddish purple.

***Pseudanthias squamipinnis* (Peters, 1855)**

Serranus (Anthias) squamipinnis Peters, 1855: 429 (Mozambique).

Anthias squamipinnis: Smith 1965, No. 459; p. 201, Pl. 20 (two colour variations); Heemstra 1973: 201; Jones & Kumaran 1980:237; van der Elst 1981: 283; Heemstra & Randall 1986: 512, Pl. 32, Fig. 166.9 (A) & (B) (paintings of male and female from Kenya); Allen & Steene 1987: Pls 26-3, 26-4 (underwater photos of male & female at Maldives); Winterbottom et al. 1989: 27, Fig.150 (monochrome photo of male from Chagos).

Pseudanthias squamipinnis: Randall & Anderson 1993: 14 (Maldives checklist); Debelius 1993: 106 (underwater photo of male and female in Red Sea); Khalaf & Disi 1997: 77 (photos of male and female with life colours from Aqaba); Kuitert 1998: 76 (underwater photos of male and females at Maldives); Terashima et al. 2001: 44 (underwater photograph of male at Mauritius); Randall & Pyle 2001: 34 (listed as valid species); Heemstra & Heemstra 2004: 160 (paintings of male and

female from South Africa); Kuitert & Debelius 2007: 290 (underwater photos of male and females from Red Sea and South Africa Fricke et al. 2009: 49 (Red Sea, Aldabra, Réunion, Madagascar and Mauritius); Allen 2005: 108 (listed from north-west Madagascar).

Material examined: South Africa: SAM 25834, 68 mm SL; SAIAB 10529, 80 mm; SAIAB 98691, 9: 39-69 mm. Mauritius: SAIAB 5678, 58 mm; SAIAB 7770, 58 mm. Mozambique: SAIAB 8371, 71 mm. Seychelles: ANSP 106190, 18: 41-52 mm SL. Red Sea: SLR 637, 2: 47-75 mm; HUF F 9390, 5: 74-90 mm; HUF F g 367, 5: 36-74 mm; HUF F 5880, 2: 47-54 mm; HUF F 7015, 4: 60-72 mm; SAIAB 4148, 72 mm. Persian Gulf: FMNH 2472, 49 mm.

Diagnosis: Caudal fin lunate, lobes produced in males and females; caudal concavity 12-41% SL. Dorsal fin rays 16-18; dorsal fin origin over upper end of gill opening; males with 3rd dorsal fin spine greatly elongated, up to 80% SL, 4th to 10th dorsal fin spines subequal, soft-rayed part of fin equal in height to spinous part. Anal fin with 6-8 rays, margin angular in male, the 2nd to 4th rays slightly elongated. Pelvic fins rounded, reaching to or slightly past anal fin origin; pectoral fin rays 15-19. Lateral line scales 38-44; 2-3 scale rows from 5th dorsal fin spine to lateral line; circumpeduncular scales 22; head completely scaly except for tip of snout, tip of mandible, and gular area. Proximal half of median fins scaly. Gill rakers 8-11 + 23-28, distinctly longer

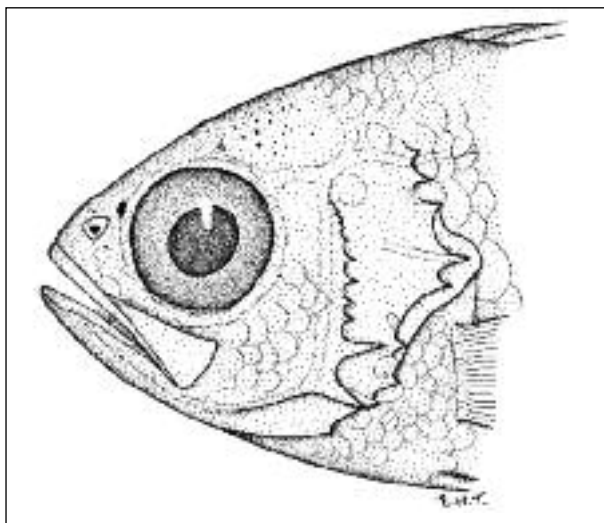


Fig. 44. *Pseudanthias squamipinnis*, 16 mm SL, juvenile, SAIAB 9316, Sodwana Bay, KZN, South Africa. Drawn by E. M. Tarr.

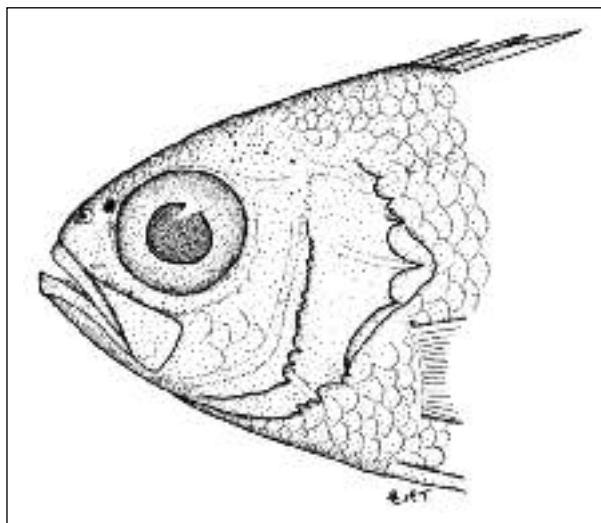


Fig. 45. *Pseudanthias squamipinnis*, 27 mm SL, juvenile, SAIAB 9316, Sodwana Bay, KZN, South Africa. Drawn by E. M. Tarr.



Fig. 46. *Pseudanthias squamipinnis*, 88 mm SL, male, Aliwal Shoal, KZN, South Africa. Photo by P. C. Heemstra.



Fig. 47. *Pseudanthias squamipinnis*, male, Sharm el Sheikh, Gulf of Aqaba. Photo by S. V. Bogorodsky.



Fig. 48. *Pseudanthias squamipinnis*, 50 mm SL, female, Sodwana Bay, South Africa. Photo by R. Winterbottom.

than gill filaments. Body depth 2.4–3.1, head length 2.6–3.4 in SL. Orbit diameter longer than snout, 2.6–3.2, interorbital width 3.5–4.4 in head length. Slender cirrus on rear edge of anterior nostril reaching to or beyond rear nostril. Dorsal head profile convex; upper lip not thickened at symphysis; maxilla reaching vertical at rear edge of pupil; no papillae on rear edge of orbit. Jaw dentition as described for genus; vomer with triangular patch of villiform teeth. Preopercle vertical limb with 18–31 serrae, 1–3 serrae at preopercle angle noticeably larger than others, subopercle and interopercle with 3–4 serrae. Vertebrae 10+15–16; supraneurals 3: 0/00/2/1+1/1/1/1/. Females mature at 47 mm SL, and are ready to change to males at 60 mm SL. Attains 90 mm SL.

Life colours: Male: body scales yellow, scale margins red or pale bluish grey; head pinkish purple dorsally; pink stripe from eye to pectoral fin base, head below stripe white with pink tinge; caudal fin red, inner rear margin yellow, upper and lower edges of fin lobes pale violet; dorsal fin reddish dorsally, edged with pale blue, proximal rear part of fin with small red spots extending onto peduncle and membranes of anal fin; leading edge of anal fin pale blue; pelvic fin membranes red; oval red spot at tips of dorsal pectoral fin rays.

Female: head, body and fins orange; body scales orange with purple margins; lavender edged gold stripe from lower edge of eye to pectoral fin base; dorsal half of iris lavender, lower half orange.

Distribution: Tropical and subtropical Indo-West Pacific: Red Sea, Mozambique to South Africa (Margate; juveniles extend south to Knysna in sum-

mer), Agalega Islands, Aldabra, Chagos, Comoros, Madagascar, Mauritius, Réunion, Laccadives, Maldives, Seychelles, to Indonesia, Japan, Philippines, Australia and Marshall Islands.

Remarks: *Pseudanthias squamipinnis* is very similar to *P. cheirospilos* (Bleeker, 1857) and Kuitert (2004) recognised *P. cheirospilos* as a valid western Pacific species and gave characters (colour pattern differences and lesser caudal fin concavity for males) by which it can be distinguished from *P. squamipinnis* of the western Indian Ocean. These species are apparently allopatric.

***Pseudanthias taeniatus* (Klunzinger, 1884)**

Anthias (*Pseudanthias*) *taeniatus* Klunzinger, 1884: 9, Pl. 3, Fig. 2: (Kosseir, Egypt, Red Sea).

Pseudanthias taeniatus: Khalaf & Disi 1997: 78 (brief description, underwater colour photo of male from Gulf of Aqaba); Field & Field 1998: 109 (underwater photos of male and female);



Fig. 49. *Pseudanthias taeniatus*, male, Gulf of Aqaba. Photo by J. E. Randall.



Fig. 50. *Pseudanthias taeniatus*, 73 mm SL, female, Gulf of Aqaba. Photo by J. E. Randall.

Kuiter 2004: 33 (underwater photos of males and females from Red Sea); Kuiter & Debelius 2007: 291 (underwater photos of male and female from Egypt, Red Sea).

Material examined: Red Sea: HUIJ 7009, 3: 55-84 mm; NMW 42427, 72 mm; MNHN 1977-813, 2: 65-71 mm; BPBM 13874, 7: 46-84 mm; SMNS 3447, 5: 40-67 mm; NMS 2752, 58 mm; SM 16146, 84 mm.

Diagnosis: Caudal fin emarginate, lobes acute; caudal concavity 13-22% SL; branched rays 13. Dorsal fin with 16-17 rays; no elongated spines or rays; dorsal fin origin over upper end of gill opening; anal fin with 6-8 rays, margin rounded in female, angular in male; pectoral fins bluntly rounded, rays 17-20; pelvic fins short, rounded, not reaching anal fin origin. Lateral line scales 44-49; scale rows from 5th dorsal fin spine to lateral line 2 or 3; circumpeduncular scales 24-27; head completely scaly except for tip of snout; proximal third of median fins scaly; no auxiliary scales. Gill rakers 8-12 + 26-29, distinctly longer than gill-filaments. Body depth 2.6-3.5, head length 3.2-3.4 in SL. Orbit diameter 3.0-4.0, interorbital width 3.7-4.3 in head length; slender cirrus on rear edge of anterior nostril reaching halfway to rear nostril. Dorsal head profile; upper lip not thickened at symphysis; snout length less than orbit diameter; maxilla truncate with well rounded corners; no papillae on rear edge of orbit. Jaw dentition as described for genus; vomer with oval to chevron-shaped patch of villiform teeth; similar teeth in narrow band on

palatines. Opercle with 3 flattened spines, 2 lower spines acute, upper spine obtuse and hidden by skin and scales; preopercle vertical limb with 18-31 serrae, 3 serrae at preopercle angle noticeably larger than others; subopercle and interopercle with 3-4 serrae. Vertebrae 10+16; supraneural bones 3: 0/0+0/2/1+1/1/1/1/. Females mature at 70 mm SL; attains 90 mm SL.

Life colours: Male: head and body dark reddish brown, ventral parts pinkish white; irregular white streak from nape to caudal fin; paired fins dark red; dorsal and anal fins pale pinkish; caudal fin pinkish white with dark red subterminal bands.

Female: orange, with red spot on each body scale; ventral body surface whitish- pink; caudal fin hyaline yellow with lobe tips red.

Distribution: *Pseudanthias taeniatus* appears to be endemic to the Red Sea. Field and Field (1998) reported it as more common in the northern Red Sea. It was not reported from Oman (Randall 1995) or the Persian Gulf, nor was it taken by the *Meteor* (Kotthaus 1973) off Somalia or by the *Anton Bruun* in the Arabian Sea.

Pseudanthias townsendi Boulenger, 1897

Anthias townsendi Boulenger, 1897: 420 (Mekran coast, Iran).

Pseudanthias townsendi: Randall 1995: 124, Fig. 274 (underwater photo of female); Kuiter 2004: 32 (underwater photos of male and females); Field 2005: 41 (underwater photo of male); Kuiter & Debelius 2007: 291 (underwater photos of male and females from Arabian Sea and Oman).

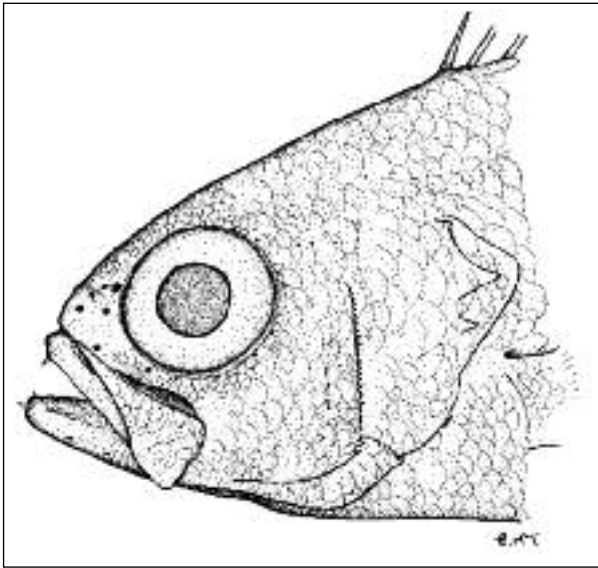


Fig. 51. *Pseudanthias townsendi*, 85 mm TL, holotype, BMNH 1897.9.22.1, Iran. Drawn by E. M. Tarr.

Material examined: Oman: BMNH 1987.9.22.1, 67 mm, holotype. Persian Gulf: FMNH 5742, 71 mm.

Diagnosis: Caudal fin concave in both sexes, lobe tips rounded with 2 or 3 short exerted rays, caudal concavity 7.4% in SL. Dorsal fin with 15-17 rays, 3rd spine slightly (10%) longer than 4th spine; anal fin with 7 rays, fin pointed, due to elongation of 3rd and 4th rays; pectoral fin rounded, symmetric, rays 16-18, distinctly shorter than head length, reaching ver-

tical at anus; pelvic fins rounded, reaching anal fin origin. Lateral line scales 37-42; scales from 5th dorsal fin spine to lateral line 2 or 3; circumpeduncular scales 22-24; lower jaw scaly, with distinct pores; no auxiliary scales. Gill rakers 10-11 + 25-28. Body depth 2.8-3.3, head length 2.9-3.2 in SL. Orbit diameter 2.7-3.5, interorbital width 4.0-5.0 in head length. Dorsal head profile straight to slightly convex; no papillae on rear edge of orbit. One or 2 laterally curved canines at front of lower jaw; small canine on vomer; 1 or 2 rows of minute canines on palatines. Nostrils subequal, anterior nostril in short tube, rear edge with slender tentacle just reaching front edge of rear nostril. Vertebrae: 10+16 or 11+15; supraneurals 2: 0/0/2/1+1/1/1/1/ or supraneurals 3: 0/0+0/2/1+1/1/1/1/. Attains 90 mm SL.

Life Colours: Male: colour variable, often pale yellow with deep red to dark brown band from nape to caudal fin, band then narrowing, turning and running anteriorly, becoming more dark reddish towards anterior part of head and joining band from opposite side, forming reddish mask over front of head; underside of head white; caudal fin pinkish proximally surrounding a U-shaped band, distal to pinkish area is dark red semicircle, with red lobe tips and subterminal pale blue stripes; dorsal fin reddish distally, pale pink proximally; pectoral fin rays and pelvic fins lavender or reddish to red; anal fin with leading edge pale blue, white distally, pinkish proximally with posterior reddish blotch.

Female: nondescript orange, body scales alternating



Fig. 52. *Pseudanthias townsendi*, 64 mm SL, male, Bahrain, Persian Gulf. Photo by J. E. Randall.



Fig. 53. *Pseudanthias townsendi*, 52mm SL, female, Persian Gulf. Photo by J. E. Randall.

series with yellow centre and pink margins, more yellow dorsally and more pink ventrally; head orange-red to lavender cheek stripe from below eye to pectoral fin base, yellowish below; dorsal fin pale basally, orangish distally; caudal fin with yellow tips; anal fin whitish basally, orange distally with red spot at tip.

Distribution: North-western Indian Ocean: Persian Gulf, Gulf of Oman, and Arabian Sea. Depth range 20-63 m on rocky reefs.

***Pseudanthias unimarginatus* Randall, 2011**
Pseudanthias unimarginatus Randall, 2011: 82, Pl. 2 A, B (Mauritius).

Diagnosis: Based on 53 mm SL holotype (Randall 2011). Caudal fin forked, lobe tips filamentous, 2.3 in SL; caudal concavity 3.4 in SL; dorsal fin rays 16; fourth to tenth dorsal spines subequal, 2.8 in head length; anal fin pointed, rays 7; pectoral fin rays 18;



Fig. 54. *Pseudanthias unimarginatus*, 54 mm SL, male, Mauritius. Photo by J. E. Randall.

pelvic fin reaching to base of 3rd anal fin ray. Lateral line scales 43; circumpeduncular scales 23; no auxiliary scales on body; head scaly except for throat and gill membranes, lips and broad zone on side of snout including nostrils; scales dorsally on snout extending to base of upper lip; scales on dorsal fin extending three-fourths distance to margin at middle of fin; scales on anal fin extending half way onto soft portion, scales on caudal fin reaching three-fourths distance to rear margin; pectoral fins with scales on about basal fourth. Gill rakers 8-9 + 25. Body depth equals head length, body depth 3.1, head length 3.1 in SL. Orbit diameter longer than snout length, 3.4, snout length 3.9, interorbital width 4.0 in head length. Front of upper lip swollen; maxilla nearly reaching vertical at rear edge of orbit, upper jaw length 1.95 in head length; rear end of maxilla strongly rounded dorsally, lower corner only slightly rounded; greatest depth of maxilla 1.8 in orbit diameter; lower rear part of orbit with 22 papillae. Anterior nostril a short tubule higher posteriorly, midway from orbit to front of snout; rear nostril diameter half of internarial space. Upper jaw with recurved canine tooth on each side of diastema; symphyseal gap nearly equal to pupil diameter; outer row of 19 moderately large, forward-curving teeth on side of upper jaw; stout canine on each side at front of lower jaw (two adjacent teeth on right side) projecting strongly forward and slightly lateral; band of villiform teeth in lower jaw, outer row enlarged; few tiny teeth in chevron-shaped band on vomer; irregular row of very small conical teeth on palatines. Preopercle vertical limb with 22 small serrae; most of angle and ventral limb smooth; no serrae on subopercle or interopercle. Vertebrae 10+16; supraneurals 2. Attains 53 mm SL.

Life colours: Male (holotype; female unknown): body orange-yellow, shading to pale pink ventrally; scale centres with indistinct pale lavender pink spot; head orange-yellow shading to pale pinkish yellow, paler ventrally; large elliptical orange area, bordered by magenta, dorsally on head from snout to nape; front of upper lip pale lavender-pink; caudal fin yellow, with broad pale blue upper margin and red submarginal band that narrows posteriorly; remaining fins hyaline yellow, dorsal fin spines and rays tipped with lavender; anal and pelvic fins with pale blue edge.

Remarks: This species is known only from the 53 mm SL male holotype collected on a small reef with mainly rock bottom in 53 metres off the west coast of Mauritius. It is likely to occur elsewhere but not likely to be seen by divers.

According to Randall (2011), *Pseudanthias unimarginatus* is a close relative of both *P. parvirostris* and *P. bimarginatus*. It shares many characters with both, and it aligns with one or the other with some characters, such as snout length with *P. bimarginatus*, and interorbital width and gill-raker count with *P. parvirostris*. All three species have a unique elliptical colour pattern dorsally on the head. It differs from both in caudal fin colour and in having 18 pectoral fin rays, but more than one specimen is needed to verify the pectoral fin count difference.

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