Description of *Pseudanthias rubrolineatus* (Serranidae: Anthiinae) Collected from Take-shima Island, Kagoshima Prefecture, Southern Japan

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Abstract. Male and female specimens of *Pseudanthias rubrolineatus*, collected from 60 m depth off the south coast of Point Ombo-saki, Take-shima Island, Osumi Group, Kagoshima, Japan, are described in detail. Although numerous underwater photographs of the species have been published from Japanese waters, no specimens have been reported since its original description from New Caledonia. A new Japanese name is proposed for the species.

Keywords: Serranidae, Anthiinae, *Pseudanthias rubrolineatus*, morphology, Kagoshima, Japan.

Introduction

Species of the Indo-Pacific serranid genus *Pseudanthias* occur on coral and rocky reefs in tropical and subtropical areas. Although Randall and Pyle (2001) regarded 52 species of *Pseudanthias* as valid, *P. calloura* Ida and Sakaue, 2001 and *P. charleneae* Allen and Erdmann, 2008 have been subsequently described, and *P. carlsoni* Randall and Pyle, 2001 regarded as a junior synonym of *P. engelhardi* (Allen and Starck, 1982) (see Kuiter, 2004; Allen and Erdmann, 2008).

During an ichthyofaunal survey off Take-shima and Iou-jima Islands in the Osumi Group, Kagoshima Prefecture, southern Japan, from 24 to 30 May 2010, led by Kagoshima University Museum and National Museum of Nature and Science, two specimens (male and female) of the poorly-known species *Pseudanthias rubrolineatus* (Fourmanoir and Rivaton, 1979) were collected at a depth of 60 m off Take-shima Island. The species was originally described on the basis of a single specimen (MNHN 1978-686) collected at 400 m depth northwest of New Caledonia, and despite numerous underwater photographs of individuals in Japanese waters (e.g., Kuiter, 2004; Kuiter and Debelius, 2006), no further morphological descriptions have been forthcoming. In this paper, detailed descriptions of the morphology and coloration of the Take-shima Island specimens are given and a new Japanese name proposed for the species.

Material and Methods

Counts and measurements followed Randall and Pyle (2001) and Allen and Erdmann (2008). The last two soft rays of the dorsal and anal fins were counted as single rays, each pair being associated with a single pterygiophore. Caudal-fin length is the horizontal length from the posterior edge of the hypural plate to a vertical through the tip of the uppermost ray; not included filamentous rays. Standard length is expressed as SL.
Pseudanthias rubrolineatus from Take-shima Island, Japan

Pseudanthias rubrolineatus

(Fourmanoir and Rivaton, 1979)

[English name: Thread-tail Basslet]

[New Japanese name: Itohiki-kohaku-hanadai]

(Fig. 1)

Fig. 1. Color photographs of fresh specimens of Pseudanthias rubrolineatus from Take-shima Island, Kagoshima, Japan. a, KAUM–I. 29771, male, 92.2 mm SL; b, KAUM–I. 29772, female, 74.1 mm SL.

May 2010; KAUM–I. 29790, 49.9 mm SL, off south coast of Point Ombo-saki, Take-shima Island, Mishima, Kagoshima, Japan, 30°48’32"N, 130°2’33"E, 60 m depth, S. Dewa and K. Furuta, 27 May 2010.

?Anthias georgei Allen, 1976: 28, fig. 2 [type locality:
about 40 nautical miles (74 km) west of Bernier Island, Western Australia, 24°59′S, 112°27′E].

*Anthias rubrolineatus* Fourmanoir and Rivaton, 1979: 413, fig. 7 (type locality: Leleizour Island, northwest of New Caledonia).

*Pseudanthias fasciatus* (not of Kamohara): Heemstra and Randall, 1999: 2470 (in part; list only).

*Pseudanthias rubrolineatus*: Randall and Pyle, 2001: 34 (listed as a valid name); Kuiter, 2004: 51, figs. A–F (Izu-oshima Island and Kochi, Japan); Kuiter and Debelius, 2006: 296, unnumbered figs. (Japan).

*Pseudanthias* sp. cf. *rubrolineatus*: Yoshino, 2008: 123 (Izu-oshima Island, unnumbered fig.).

**Material examined.** KAUM–I. 29771, male, 92.2 mm SL, off south coast of Point Ombo-saki, Take-shima Island, Mishima, Kagoshima, Japan, 30°48′32″N, 130°24′33″E, 60 m depth, S. Dewa and K. Furuta, 27 May 2010; KAUM–I. 29772, female, 74.1 mm SL, collected with KAUM–I. 29771.

**Description.** Proportional measurements are given as percentages of SL in Table 1. Dorsal-fin rays X, 16; anal-fin rays III, 7; pectoral-fin rays 17 on each side of body (16 on left side of body in KAUM–I. 29771); pelvic-fin rays I, 5; pored lateral-line scales 37–40; scales above first lateral-line scale to base of second dorsal-fin spine 6; scales above lateral line to base of middle of spinous portion of dorsal fin 3; scales below lateral line to origin of anal fin 15–16; circumpeduncular scales 22; gill rakers 10–11 + 25–26 = 35–37.

Mouth moderately large, posterior end of maxilla just reaching to a vertical through middle of pupil; mouth strongly oblique, forming an angle of 50–60 degrees to horizontal axis of head and body; lower jaw slightly projecting; posterior margin of maxilla nearly straight, corners rounded; front of upper lip fleshy, forming a small protuberance. A pair of widely separated, downward-projecting canine teeth at front of upper jaw, followed by an outer row of slender conical teeth (18 teeth in male and 15 female), more posterior teeth forward-curved; an inner band of small slender teeth. A pair (two pairs in female) of widely separated, stout, laterally recurved canines at front of lower jaw, these canines just medial to upper canines when mouth closed, tips of the recurved canines exposed when mouth closed; 2 large recurved canines (1 in one side of male) at each side of lower jaw about one-third distance from lower jaw symphysis; a villiform teeth band between anterior and posterior recurved canines; no teeth on lower jaw posterior to posterior canines. A pair (two pairs in female) of widely separated, stout, laterally recurved canines at front of lower jaw, these canines just medial to upper canines when mouth closed, tips of the recurved canines exposed when mouth closed; 2 large recurved canines (1 in one side of male) at each side of lower jaw about one-third distance from lower jaw symphysis; a villiform teeth band between anterior and posterior recurved canines; no teeth on lower jaw posterior to posterior canines. Vomer with a small triangular patch of villiform teeth in about 2 rows. Palatines with a band of villiform teeth in about 7–10 rows at its widest point. Tongue triangular and sharply pointed, upper surface with small
Pseudanthias rubrolineatus
from Take-shima Island, Japan

papillae. Gill rakers long and slender with a double
band of minute rigid projections on inner edge; longest
raker near angle much longer than longest gill filaments,
and less than orbit diameter.

Anterior nostril membrane tube with skin flap pos-
teriorly, the flap reaching posterior nostril when laid
back; anterior nostril at level with upper margin of
pupil. Posterior nostril vertically elongate; a short skin
flap at anterior margin of nostril, the flap reaching
posterior margin of nostril when laid back; posterior
nostril between anterior nostril and anterodorsal mar-
gin of orbit. Opercle with 3 flat spines, lower 2 spines
acute and tips exposed, upper spine with rounded tip
embedded in scales; middle spine largest, at level of
center of eye. Upper edge of preopercle with serrae
(30 in male and 25 in female), progressively larger
ventrally, with serrae (6 in male and 3 in female) just
below angle. Lower edge of subopercle with serrae (6
in male and 3 in female); upper edge of interopercle
with serrae (8 in male and 5 in female).

Ctenoid scales on head and body, except for lips,
isthmus, and around snout region; no scales on pelvic
fin and basal spiny portions of dorsal and anal fins;
soft-rayed portions of dorsal and anal fins with few
scales; caudal fin nearly fully scaled; small scales on
basal half of pectoral fin. Lateral line smoothly curved
approximately following contour of back.

Dorsal-fin origin posterior to upper end of gill open-
ing and just above upper end of pectoral-fin base. Base
of soft-rayed portion of dorsal fin longer than base of
spinous portion. Upper end of pectoral-fin base slight-
ly anterior to pelvic-fin origin. Tip of depressed pelvic
fin extending slightly beyond anus in male (reaching
to anus in female). Anal-fin origin posterior to last
dorsal-fin spine base. Third dorsal-fin spine longest,
particularly in male; tip of the spine with a filament.
Thirteenth dorsal-fin soft ray longest, longer than third
dorsal-fin spine. Second anal-fin spine longest. Caudal
fin lunate, not deeply forked, with several filamentous
rays on upper and lower lobes.

Color when fresh. — Based on color photographs
(Fig. 1): upper half of head and anterior body orange,
shading to yellow posteriorly; ventral part of body
pinkish; each scale on upper part of body with a yel-
loish green spot, that on middle part of body with a
yellow spot. A narrow, curved red stripe from above
pectoral-fin base to upper part of caudal peduncle at
caudal-fin base; the stripe across lateral line below base
of fifth or sixth dorsal-fin soft ray. A narrow, pale pink
stripe from upper lip through below orbit to lower part
of pectoral-fin base; a narrow reddish stripe from tip
of snout to anterior margin of orbit; a broad pale yellow
band from snout to pectoral-fin base between the pink
and reddish stripes; area below the pink stripe yellow-
ish. Iris yellow with red stripe ventrally. Dorsal fin
translucent yellow with lavender margin, red to orange
basally with irregular yellow spots. Pectoral fin trans-
lucent white. Pelvic fin translucent pink to red, without
markings. Anal fin translucent yellow, with pinkish
basally; anteroventral margin of the fin lavender. Cau-
dal fin orange to red, shading to translucent yellow
posteriorly; lavender-edged yellow margin on each
lobes; caudal-fin filaments yellow.

Remarks. The present specimens from Take-shima
Island agree with the original description and figure
of the holotype (MNHN 1978-686, 26.5 mm) of An-
thias rubrolineatus (= Pseudanthias rubrolineatus)
in Fourmanoir and Rivaton (1979), and underwater pho-
tographs of the species in Kuiter (2004) and Kuiter
and Debelius (2006), with the exception of some counts;
e.g., 16 or 17 pectoral-fin rays (versus 18 in the holo-
type) (Fourmanoir and Rivaton, 1979); 37–40 pored
lateral-line scales (versus 42); and 25 or 26 gill rakers
on the lower limb (versus 24). These small differences
may simply reflect the limited overall number of spec-
imens available.

Pseudanthias rubrolineatus can be easily distin-
guished from all other congeneres, except P. georgei
(Allen, 1976), by the caudal fin having several prolonged
filaments in both sexes. Pseudanthias georgei, origi-
nally described as Anthias georgei by Allen (1976) on
the basis of three specimens (holotype, WAM P.25205-
001, 79.5 mm SL; 2 paratypes, WAM P.25205-002,
29.0–32.8 mm SL) from a depth of 71 fathoms (ca.
130 m) off Bernier Island, Western Australia, Indian
Ocean, has subsequently been regarded as a valid spe-
cies (Randall and Pyle, 2001; Hutchins, 2001; Allen
et al., 2006) with prolonged caudal-fin filaments (Al-
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However, Allen’s (1976) description was based on preserved specimens, the fresh and/or live coloration of the species being unknown, although color is most important for the identification of species of *Pseudanthias* as Randall and Pyle (2001) and Ida and Sakaue (2001) pointed out. Furthermore, no additional specimens or underwater photographs of *P. georgei* have been recorded since the original description. Therefore, taxonomic characters of *P. georgei* and relationships between *P. georgei* and *P. rubrolineatus* have remained unclear. Although Randall and Pyle (2001) treated both species as valid, they did not give diagnostic characters for each, and although Kuiter (2004) also regarded *P. rubrolineatus* as valid, he appended “(*P. rubrolineatus*) appears to be identical to *Anthias georgei*, a possible senior synonym” to the former species account. In addition, neither additional specimens nor photographs of *P. rubrolineatus* from the western central Pacific, including the type locality, have been recorded. Therefore, any taxonomic decision regarding the two nominal species should await the collection of additional specimens and documentation of coloration. There remains also the possibility that the Japanese population is an undescribed species, closely related to *P. rubrolineatus* and/or *P. georgei*.

*Pseudanthias rubrolineatus* is similar to *P. fasciatus* (Kamohara, 1954) in having a distinct, blue- or white-edged reddish longitudinal stripe on the mid-lateral surface of the body [thus, Heemstra and Randall (1999) mistakenly treated *P. rubrolineatus* as a junior synonym of *P. fasciatus*]. However, the blue- or white-edged reddish stripe of *P. rubrolineatus* extends posteriorly above the lateral line at the caudal-fin base (middle of upper half of caudal-fin base; Fig. 1), whereas that of *P. fasciatus* extends onto the lateral line (near middle of caudal-fin base; Fig. 2). In large male *P. fasciatus* the stripe becomes indistinct or absent during courtship (Kuiter, 2004). In addition, the reddish stripe of *P. rubrolineatus* is narrower than that of *P. fasciatus* (see Figs. 1–2). The upper and lower lobes of the caudal fin in *P. rubrolineatus* are not prolonged, although having several filamentous rays (Fig. 1), and the fin lunate rather than deeply forked. The caudal-fin lobes of *P. fasciatus*, however, are extremely prolonged, although without filamentous rays (Fig. 2), the fin being deeply forked.

*Pseudanthias rubrolineatus* is likely to be widely distributed in the western Pacific Ocean (and in the eastern Indian Ocean if *P. georgei* is identical with *P. rubrolineatus*). However, collected examples of the species are known only from New Caledonia (Fourmanoir and Rivaton, 1979) and Japan (this study). Underwater photographs of the species are also limited, having been published only from Japanese waters.
in depths of 40–55 m (Kuiter, 2004; Kuiter and Debelius, 2006; Yoshino, 2008 as *P. sp. cf* rubrolineatus). Notwithstanding, numerous underwater photographs of the species taken by scuba divers in Japanese waters have been uploaded to internet web sites, indicating that the species occurs along the Pacific coast of southern Japan, and the Izu and Ogasawara Islands. Twenty one underwater photographs taken from Izu Peninsula (Futo and Osezaki), the Izu Islands (Izu-oshima Island), the Ogasawara Islands (Chichi-jima Island), and the Tokara Islands (Yokoate-jima Island) are registered in the Image Database of Fishes at KPM. The fourth author identified the following four specimens as *P. rubrolineatus* (although not available to this study): BSKU 79057, 40.7 mm SL, Shimizu Port, Tosa-shimizu, Kochi, Japan, 8 m, H. Morita, June 10 2006; KPM–NI 11561, 19.8 mm SL, off Yome-jima Island, Muko-jima Islands, Ogasawara Islands, from stomach of *Epinephelus fasciatus* from 70 m, O. Morishita, Sept. 2002; KPM–NI 11581, 17.9 mm SL, KPM–NI 11582, 28.6 mm SL, Tatsumi Bay, Chichi-jima Island, Ogasawara Islands, 45 m, O. Morishita, Dec. 2001.

‘Itohiki-kohaku-hanadai’ meaning ‘thread-amber-basslet’ is herein proposed as the new standard Japanese name for the present specimens of *P. rubrolineatus*. The two Take-shima Island specimens were collected by the second and third authors from five individuals forming a harem, the former being the two largest individuals. The species was noted as usually forming a harem with five or six individuals frequenting areas of large rocks scattered on gravelled slopes in depths of 55–80 m at Take-shima Island, Kagoshima.

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