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Description of new Japanese and northernmost records of a pemphrid fish, *Pempheris vanicolensis*, from Iriomote Island, southern Ryukyu Archipelago

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Abstract. Six specimens of *Pempheris vanicolensis* Cuvier, 1831 were collected at Tudumari Beach on Iriomote Island. This species, *P. schwenkii* Bleeker, 1855 and *P. oualensis* Cuvier, 1831 are unique among the genus in possessing the following characters: surface scales cycloid or weakly ctenoid, deciduous, not divided into basal and distal halves, and scaled part of head region wider than that of other species. *Pempheris vanicolensis* is distinguished from *P. schwenkii* and *P. oualensis* by having a bright yellow pectoral fin, 57–63 pored lateral line scales (*vs* 46–52 in *P. schwenkii*, 62–66 in *P. oualensis*), and 5 1/2 scale rows above the lateral line (*vs* 3 1/2, 6 1/2). This is the first record of *P. vanicolensis* from Japan, and the northernmost distribution in the species. We describe the morphological characters of the specimens and propose the new Japanese name ‘‘Kibire-hatampo” to the species.

Keywords: Pempheridae, *Pempheris vanicolensis*, Kibire-hatampo, new record, northernmost distribution, Iriomote Island, Ryukyu Archipelago, Japan

Introduction

Fishes of the genus *Pempheris* are common in rocky and coral areas of the Pacific Ocean, Indian Ocean, and western Atlantic Ocean (Nelson, 2006). These species school in caves or crevasses during the day and swim into the open water column at night, where they prey on zooplankton (Annese and Kingsford, 2005). This genus is characterized by strongly compressed bodies, one short dorsal fin, large eyes, and the lateral line extending well onto the caudal fin (Cuvier, 1831; Fowler, 1931; Weber and de Beaufort, 1936; Tominaga, 1965, Mooi, 2001). In the genus, 39 species (including nominal ones) have been reported, with three species (*P. japonicus* Steindachner and Döderlein, 1883; *P. schwenkii* Bleeker, 1855; *P. nyctereutes* Jordan and Evermann, 1903) reported from Japan. Additionally, *P. oualensis* Cuvier, 1831 has been reported from the Ryukyu Archipelago, Japan, in recent study (Koeda *et al*., in press).

Six specimens of a *Pempheris* species that had not been previously recorded in Japan were collected at Tudumari Beach, Iriomote Island. These specimens were identified as *P. vanicolensis* by direct observation of the type specimens and previous descriptions of *Pempheris* species. This paper describes the morphological characters of the *P. vanicolensis* specimens and proposes a new Japanese name for the species.

Materials and Methods

Sizes of specimens are reported as standard length (SL; mm), and all additional measurements are percentages of the SL or the head length (HL). The measurement method follows Hubbs and Lagler (1949), except for head depth, predorsal length, prepelvic length,

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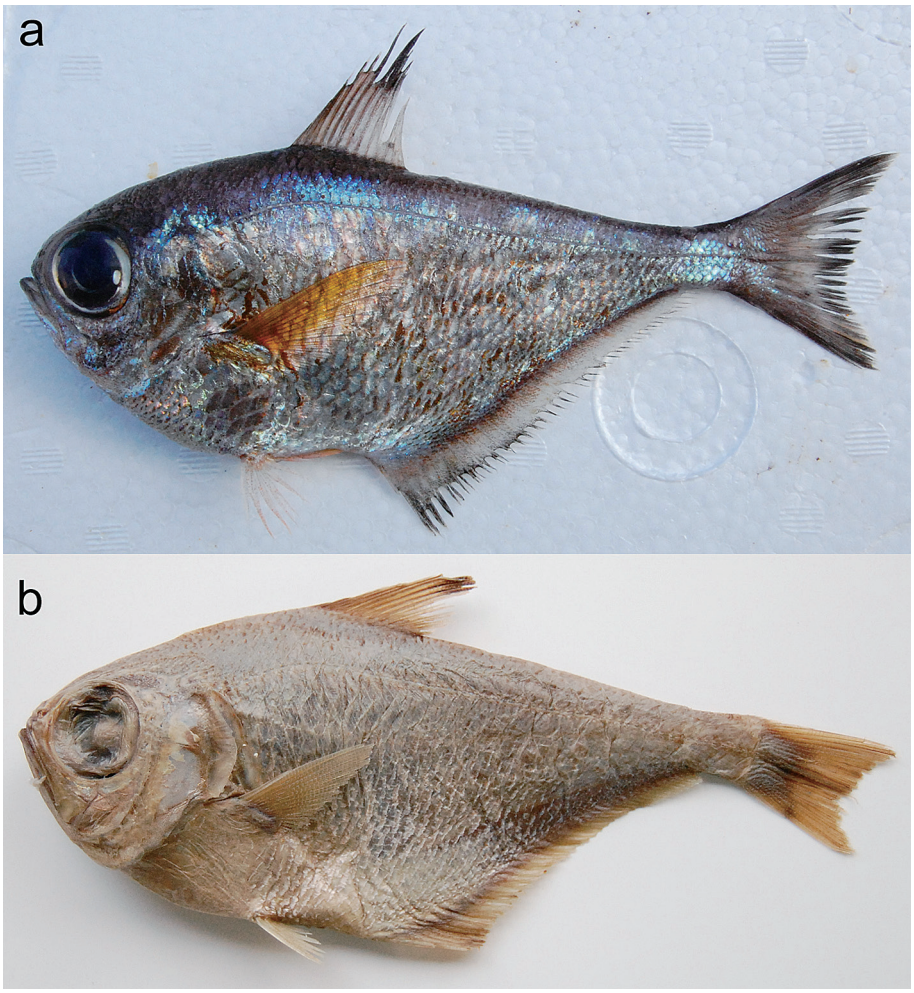

Fig. 1. a, *Pempheris vanicolensis* (URM–P 045427, 153.3 mm SL) collected from Tudumari Beach, Iriomote Island. b, Syntype of *P. vanicolensis* (MNHN–A418, 136.3 mm SL).

preanal length, caudal peduncle length, and caudal peduncle depth, which follow Mooi and Jubb (1996).

The number of pored lateral line scales includes both body sides. Soft x-ray images were used to count the dorsal, anal, procurrent caudal and caudal fin rays, and vertebrae, and the counting method followed Hubbs and Lagler (1949), except for the caudal fin rays, gill rakers, procurrent caudal fin rays, and predorsal scales, which followed Mooi and Jubb (1996).

Materials were deposited at the Muséum National d'Histoire Naturelle, Paris (MNHN), and the Department of Marine Sciences, University of the Ryukyus, Okinawa (URM).

***Pempheris vanicolensis* Cuvier, 1831**

(Fig. 1)

(New Japanese name: Kibire-hatampo)

Pempheris vanicolensis Cuvier in Cuvier and Valenciennes, 1831: 305 (Vanikoro Island, Santa Cruz Islands in the Solomon Islands); Weber and de Beaufort, 1936: 218 (Philippines, Indonesia, Solomon Islands, Samoa, Singapore, and Australia); Mooi, 2001: 3203 (western central Pacific).

Table 1. Measurements of *Pempheris vanicolensis* Cuvier, 1831.

	Present specimens $n = 6$	Syntype specimens $n = 3$
Standard length (mm)	133–153	115–136
Measurements		
As % of the standard length		
Head length	30.9 (30.1–31.7)	29.6 (29.4–29.8)
Head depth	32.8 (30.6–34.5)	32.5 (31.5–33.1)
Predorsal fin length	40.0 (38.6–41.4)	39.1 (38.3–39.7)
Prepelvic fin length	39.4 (38.3–40.3)	39.7 (39.1–40.4)
Preanal fin length	51.9 (50.7–52.9)	50.8 (42.6–56.0)
Length of pelvic fin origin to anal fin origin	14.3 (12.1–15.7)	15.8 (14.7–17.9)
Body depth	43.2 (42.4–44.3)	43.1 (42.6–43.5)
Length of dorsal fin base	16.4 (15.7–17.0)	15.3 (14.8–15.7)
Length of anal fin base	51.1 (48.6–52.1)	52.1 (50.8–53.9)
Caudal peduncle length	8.3 (7.1–9.2)	9.4 (8.8–9.7)
Caudal peduncle depth	8.2 (7.5–8.6)	8.0 (7.8–8.2)
Length of dorsal fin origin to pelvic-fin origin	42.7 (41.7–43.7)	42.4 (41.9–42.6)
Length of dorsal fin origin to anal fin insertion	59.3 (57.9–61.4)	57.6 (56.8–58.1)
As % of the head length		
Snout length	22.1 (20.0–23.4)	20.3 (20.0–20.6)
Eye diameter	38.1 (35.6–39.5)	41.6 (41.1–42.5)
Interorbital width	27.0 (25.6–27.9)	26.5 (25.0–28.2)
Upper jaw length	49.8 (48.9–51.2)	52.6 (52.3–52.9)
Longest dorsal fin length	72.3 (69.8–75.0)	Damaged
Longest anal fin length	47.2 (47.5–48.9)	Damaged
Longest pectoral fin length	82.7 (82.5–83.0)	Damaged
Longest pelvic fin length	41.8 (39.5–44.2)	Damaged

Data include mean, with ranges in parentheses

Material examined. All specimens from Tudumari Beach, Iriomote Island, southwestern Ryukyu Archipelago, Japan (24˚25.20′N, 123˚46.28′E ; Fig. 2), 1 m depth. URM–P 45427– 45429, 3 specimens, 132.3–153.3 mm SL, 10 Nov. 2009, coll. K. Koeda and K. Maeda; URM–P 45680– 45682, 3 specimens, 139.9–144.1 mm SL, 11 Feb. 2010, coll. K. Koeda, K. Maeda and S. Shiomi.

Diagnosis. *Pempheris vanicolensis* is unique in the genus *Pempheris* in having the following combination of characters: 57–63 pored lateral line scales; 5 1/2 scale rows above lateral line; bright yellow pectoral fin in fresh specimens; no black spot on pectoral fin base; clearly keeled prepelvic area. This species belongs to Group C of Tominaga (1963), with surface scales cycloid or weakly ctenoid, deciduous, not divided into basal and distal halves; and unscaled part of the head region limited to anterior to the eye.

Description. Proportional measurements as percentages and counts of the present specimens and syntypes are shown in Tables 1 and 2, respectively. Strongly compressed body, with great body depth (2.3–2.4 in SL). Dorsal outline convex to dorsal fin base, then extending linearly to caudal peduncle; ventral outline convex to anal fin base, then extending linearly to caudal peduncle.

Snout length very short (4.3–5.0 in HL); eye large (2.5–2.8 in HL); mouth large and very oblique; maxillary reaching to vertical at center of pupil; lower jaw projecting beyond upper jaw; villiform teeth on vomer, palatines, and jaws.

Table 2. Counts of *Pempheris vanicolensis* Cuvier, 1831.

	Present specimens $n = 6$	Syntypes $n = 3$
Standard length (mm)	133–153	115–136
Counts		
Dorsal fin rays	VI, 9	VI, 8–9
Anal fin rays	III, 40–43	III, 40–41
Pectoral fin rays	18	18-19
Pelvic fin rays	I, 5	I, 5
Caudal fin rays	9 + 8	9 + 8
Upper procurrent rays	7 – 8	6
Lower procurrent rays	4 – 5	4
Lateral line scales	57–63	58–63
Scale lows above lateral line	5.5	5.5
Scales lows below lateral line	12–14	12–13
Predorsal scales	32–35	30–31
Cheek scales row	6	Damaged
Circumpeduncular scales	16	Damaged
Upper gill rakers	8	8
Lower gill rakers	19–21	20–21
Total gill rakers	27–29	28–29
Vertebrae	25	25

Scales deciduous, thin, semicircular in shape, far wider than long, not divided into basal and distal halves; scales of ventral area larger than those of dorsal area; almost all parts of head scaled, except for anterior to eye; about one-third of basal part of anal fin covered with small scales; scales above lateral line more deciduous; pored lateral line scales adherent and forming a line parallel to dorsal outline to middle of caudal fin.

First dorsal fin spine shortest and last longest; first soft ray longest in dorsal fin; dorsal fin base clearly shorter than longest dorsal fin ray; second anal soft ray longest of anal fin; uppermost and lowermost branched rays of caudal fin longest; posterior margin of caudal fin forked; fourth ray of pectoral fin longest; depressed pelvic fin beyond anus, but not reaching anal fin origin.

Color when fresh: Body scales silvery; red coppery patches in ventral and anal areas; pale purple areas where scales rubbed off with irregular vertical dark purple bars indicating traces of scales; body darker above and paler below; dorsal fin broadly black along front margin and tip; anal fin zonal brackish along margin; pectoral fin bright yellow; upper, lower, and posterior margins of caudal fin dusky; few pigments present in pelvic fin soft rays.

Color in formalin: Body silver, except paler areas where scales were rubbed; black and dusky parts of dorsal, anal, and caudal fins remain; pigments remaining in pelvic fin soft rays.

Distribution: Iriomote Island (this study); Vanikoro Island, Santa Cruz Islands in Solomon Islands (Cuvier, 1831), Philippines, Indonesia, Singapore, Solomon Islands, Samoa, and Australia (Weber and de Beaufort, 1936). This record is the northern distribution limit of *P. vanicolensis*.

Remarks: Four syntypes are recorded for *P. vanicolensis* in Cuvier (1831). However, one specimen (66.0 mm SL) is significantly smaller and more damaged than the other specimens (114.7–136.3 mm SL), so it is excluded from the present description.

Jordan and Hubbs (1925) wrote that specimens of *P. japonicus* reported by Snyder (1912) from Okinawa Island was misidentified as *P. vanicolensis*. However, the characters described for the reexamined specimens corresponded with the characters of *P. schwenkii* which is the most common species around Okinawa Island, and differed from our specimens and the syntypes of *P. vanicolensis*. For example, pored lateral line scales of the specimens described in Jordan and Hubbs (1925) are 49 or 51 (*vs P. schwenkii*: 46–52). This suggests Jordan and Hubbs (1925) misidentified *P. schwenkii*

Fig. 2. Tudumari Beach in Iriomote Island, where the present specimens of *Pempheris vanicolensis* were collected.

as *P. vanicolensis*.

Pempheris vanicolensis is easily distinguished from congeneric species in Japan in having 57–63 pored lateral line scales (*vs* 46–52 in *P. schwenkii*, 72–81 in *P. japonicus*, 67–76 in *P. nyctereutes*, 62–66 in *P. oualensis*) and 5 1/2 scale rows above lateral line (*vs* 3 1/2 in *P. schwenkii*, 12 in *P. japonicus*, 8 in *P. nyctereutes*, 6 1/2 in *P. oualensis*).

Comparative specimens: *P. vanicolensis*: MNHN–A224, A–418, and B–2513, 3 syntypes, 114.7–136.3 mm SL, Vanikoro Island, Santa Cruz Islands in Solomon Islands. *P. schwenkii*: URM–P 45485–45497, 12 specimens, 105.5–116.3 mm SL, Ginowan Fishing Port (26˚17.13′N, 127˚44.30′E) in Okinawa Island, Japan. *P. schwenkii*: URM–P 45498, 45499, 2 specimens, 111.7–126.0 mm SL, Mizugama (26˚21.35′N, 127˚44.19′E) Okinawa Island, Japan. *P. japonicus*: URM–P 45422, 45423, 2 specimens, 139.5–149.4 mm SL, Mizugama Okinawa Island, Japan. *P. japonicus*: URM–P 45424–45426, 3 specimens, 78.8–108.4 mm SL, Wagu Fishing Port, Mie, Japan (35˚14.16′N, 136˚48.19′E). *P. nyctereutes*: URM–P 45413–45421, 45484, 20 specimens, 102.2–167.9 mm SL, Shina Fishing Port, Kochi, Japan (33˚19.40′N, 134˚11.53′E). *P. oualensis*: URM–P 45408–45412, 5 specimens, 182.9–187.2 mm SL, Yaeyama Islands, southwestern Ryukyu Archipelago, purchased at Wholesale Fish Market in Naha, Okinawa Island, Japan.

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