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Redescription of *Parapercis okamurai* Kamohara, 1960 (Perciformes: Pinguipedidae), based on specimens newly collected from Taiwan and Japan

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Abstract

A rare species of sandperch, *Parapercis okamurai*, is redescribed based on 2 types and 15 specimens newly collected from Taiwan and Japan. The species is unique in having cycloid scales on the parietal, opercle and subopercle, except for few large ctenoid scale that covers the base of the opercular spine; body color yellowish dorsally, with 10 or 11 faint yellow bands on lateral body and pale ventrally; and black spots on inner side of upper pectoral fin base. It can also be distinguished from congeners by having a combination of the following characters: dorsal-fin rays V, 23; anal-fin rays I, 19; pectoral-fin rays 18; pored lateral-line scales 59–64; medial predorsal scales 9–10; transverse scale rows 4.5–5.5/14–15; circumpeduncular scales 20–21; gill raker 4–5+9–10=13–16; 4 pairs of canine teeth at front of lower jaw; 2–4 rows of teeth on vomer; 2 rows of teeth on palatines; scales on cheek moderately large, each half embedded; and body color yellowish dorsally and a prominent ocellus at upper caudal-fin base.

Key words: Pisces, taxonomy, sandperch, *Parapercis okamurai*

Introduction

Kamohara (1960) reviewed the sandperch family Paraperidae (=Pinguipedidae) from Japan and described a new species *Parapercis okamurai* based on two specimens collected from the Mimase fish market by Osamu Okamura and Kunio Amoaka. The type specimens were evidently trawled in Tosa Bay near Kochi Prefecture. Although this species was mentioned by several authors (Okamura in Masuda *et al.*, 1984, Nakabo, 2000, Shinohara *et al.*, 2001), no additional information was added, except for Okamura in Masuda *et al.* (1984:229), who was collector of the type series, noted the appearance of "10 reddish cross-bands on side of body".

Recently the author collected 14 yellowish specimens from Taiwan (trawled off northeastern Taiwan and Diaoyu-tai Islands) and in a visit to the National Museum of Nature and Science, Tsukuba, the author found an additional specimen collected from off Izu Islands, southern Japan. All of these specimens are recognized in this study as the rare species, *P. okamurai*. Examination of the types specimens of *P. okamurai* also confirm the identification of these newly considered specimens.

Weber (1913) described *Neopercis striolata* (= *Parapercis striolata*) based on a single specimen collected from Indonesia (ZMA 112463). Kamohara (1937) described a similar species, *Neopercis mimaseana* (= *Parapercis mimaseana*) based on a single specimen collected from Mimase fish market, southern Japan. He separated *P. mimaseana* from *P. striolata* by the covering of cycloid cycloid scales on the chest and abdomen and a relatively short snout versus ctenoid scales on these areas, and a longer snout in *N. striolata*. The holotype of *P. mimaseana* has been lost and a neotype was selected subsequently (Kamohara, 1961), which should not be recognized as valid according to the International Code of Zoological Nomenclature (ICZN, 1999). Randall *et al.* (2008) proposed that these two species are conspecific.

Parapercis okamurai is closely similar to *P. striolata* and *P. moki* by sharing similar meristic values and several morphological features. A detailed description is provided, which includes new information regarding coloration.

Methods and material

Methods for taking measurements and counts generally followed Randall *et al.* (2008). Proportional data were taken for the selected specimens. All proportional measurements were taken from point to point, except for the caudal-peduncle length, which was taken along a horizontal distance between the posterior end of the dorsal-fin base and the posterior margin of the hypural plate. Interorbital width was taken as the least fleshy width. Type specimens and comparative materials are deposited in the Pisces Collection, National Museum of Marine Biology & Aquarium, Pingtung (NMMB-P); Hokkaido University Museum, Hakodate (HUMZ); National Museum of Nature and Science, Tsukuba (NSMT-P); Queensland Museum, Brisbane (QM); Department of Biology, Faculty of Sciences, Kochi University, Kochi (BSKU) and Zoölogisch Museum, Universiteit van Amsterdam, Amsterdam (ZMA, now at the Naturalis Biodiversity Center, Leiden (RMNH)). Vertebrae were counted from radiographs, with the urostyle counted as the last vertebra.

Results

Parapercis okamurai Kamohara, 1960

New English name: Yellow Sandperch

Figures 1A–E, 3A–B; Tables 1–2

Materials. Holotype. BSKU 8872 (103.8), Mimase fishin port, Kochi Prefecture, Japan. **Paratypes.** BSKU 8917 (91.8), same as holotype. **Non-types.** NMMB-P11430 (102.7 mm), NMMB-P11440 (1, 104.2 mm), Nan-fang-ao fish market, Yilan, NE Taiwan, NW Pacific Ocean, ca. 200 m, 16 Jul. 2010, coll. H.-C. Ho. NMMB-P17673 (7, 96.1–121.0 mm; 1, cleared & stained, 121.4 mm), HUMZ 220768 (2, 103.4–108.7 mm), NSMT-P 115455 (1, 113.8 mm), QM I.39132 (1, 124.4 mm), near Diao-yu-tai Islands (Senkaku Islands), ca. 200 m, NE Taiwan, collected from Da-xi fish market by Ho, H.-C., 12 Nov. 2012. NSMT-P 101545 (1, 104.0 mm), 34°40.95'N, 139°17.92' E, off Izu-oshima I., Izu Is., Tokyo Prefecture, Japan, 220–277 m, 14 May 2004.

Diagnosis. A species of *Parapercis* that differs from congeners in having cycloid scales on the parietal region and most parts of the opercle and subopercle; dorsal surface uniformly yellowish, lateral body with 10 faint yellow bands, paler ventrally; membranes between first and third dorsal-fin spines black; an irregular black spot on the inner portion of the upper pectoral-fin base; a prominent ocellus on the upper part of the caudal-fin base, and a combination of characters.

Description. Morphometric data are provide in Table 1. The following data are provided for the holotype, followed by the range of all measured/counted others in parentheses, except as otherwise noted.

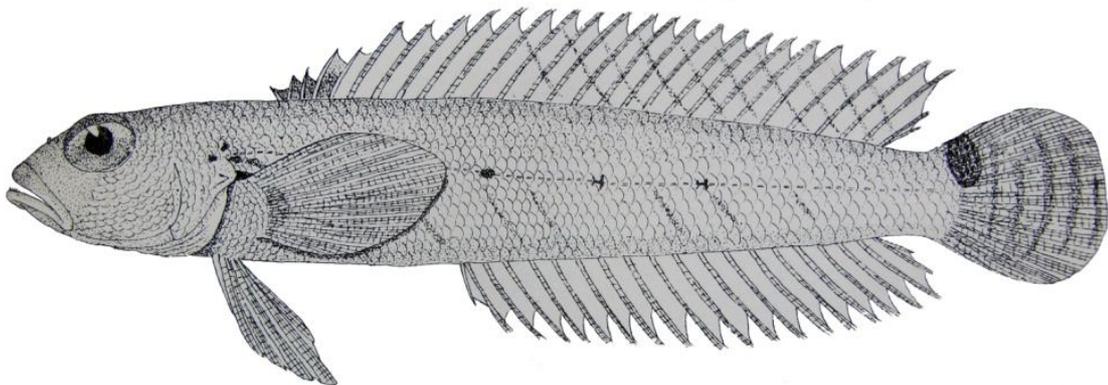
Dorsal-fin rays V, 23 (IV, 24 in paratype and V, 22 in 1 non-type); anal-fin rays I, 19; all dorsal and anal soft rays branched, the last at base; pectoral-fin rays 18 or 19, branched, except for uppermost ray; pelvic-fin rays I, 5; principal caudal-fin rays 9 (upper) + 8 (lower) = 17 (15 branched); pored lateral-line scales 61 (59–64, not including 3 or 4 pored scales on base of caudal fin); scales above first lateral-line scale to origin of dorsal fin 4.5 (4.5 or 5.5); scales below lateral line posteroventrally to origin of anal fin 15 (13–16); medial predorsal scales 9–10; circumpeduncular scales 20–21; gill rakers of first gill arch 4+10=14 (4–5+9–11=13–16); pseudobranchial filaments 12–17 (broken in holotype, 13 in paratype); branchiostegal rays 6; vertebrae 10 + 22 = 32 (6 specimens examined).

Body relatively slender, body depth at pectoral-fin base 15.4% (13.5–17.2%) of SL; body slightly depressed anteriorly, body width at pectoral fin base 18.2% (15.6–20.0%) of SL, cylindrical medially and strongly compressed posteriorly. Head short, its length 26.7% (25.8–28.9%) of SL; ventral part of head, chest, and abdomen flat; snout short, its length 7.8% (6.9–8.6%) of SL; eye large, orbit diameter 9.0% (8.1–10.2%) of SL; interorbital space very narrow and flat, the least fleshy width 2.1% (1.5–2.4%) of SL.

Mouth large, the maxilla reaches a vertical through anterior 1/4 of eye, upper jaw short, its length 9.5% (8.9–10.5%) of SL. Mouth slightly oblique, forming an angle of about 15° to horizontal axis of body, lower jaw projecting. Front of each lower jaw with 4 (4–5, sometime with 1 or 2 missing teeth) recurved canine teeth, the third (third or fourth) one on each side twice as large as the rest; side of lower jaw with a row of 22 (20–23) stout, conical teeth that curve medially, anterior 8 (7–8) increasingly larger and more strongly recurved; remaining teeth

in outer row on side of jaw subequal in length; broad band of villiform teeth median to canines in about 5 (5–6) rows at front of lower jaw, gradually tapering posteriorly to a narrow band ending before midpoint of the jaw. Front of each upper jaw with 4 (4–5) recurved canine teeth, increasing in length laterally, third about twice as large as 1st and slightly curving laterally as well as posteriorly; side of upper jaw with row of 20 (18–21) stout and conical teeth slightly curve medially, gradually smaller posteriorly; band of about 6 (5–6) rows of villiform teeth medial to canines at front of lower jaw, gradually tapering posteriorly to a single row extending to end of jaw. Vomer with a triangular patch of 2 (2–4) rows of stout, conical teeth, those on anterior margin largest, posterior ones progressively smaller; palatine with two rows of stout teeth, each row with 7 (6–7) smaller teeth. Lips smooth, their inner surface with large fleshy papillae that interdigitate with anterior teeth. Tongue broadly rounded, reaching forward to slightly beyond anterior margin of vomerine teeth.

Gill membranes free from isthmus, forming a broad transverse free fold, the middle part narrowly attached to body dorsally, only free at posterior one-fifth. Gill rakers short and spinous, longest about 1/3 length of longest gill filament. Nostrils small, anterior nostril in front of center of eye (viewed from side), a little less than half way to groove at margin of upper lip, with high anterior rim and pointed posterior flap that nearly reaches to anterior margin of posterior nostril when laid back; posterior nostril dorsoposterior to anteriornostril, its aperture ovate, with low anterior rim.



A.



B.



C.

FIGURE 1. *Parapercis okamurai* Kamohara, 1960. A. Original drawing of holotype, BSKU 8872, after Kamohara, 1960, fig. 2. B–C. NMMB-P11430, non-type, 102.7 mm SL. B. fresh condition. C. preserved condition.

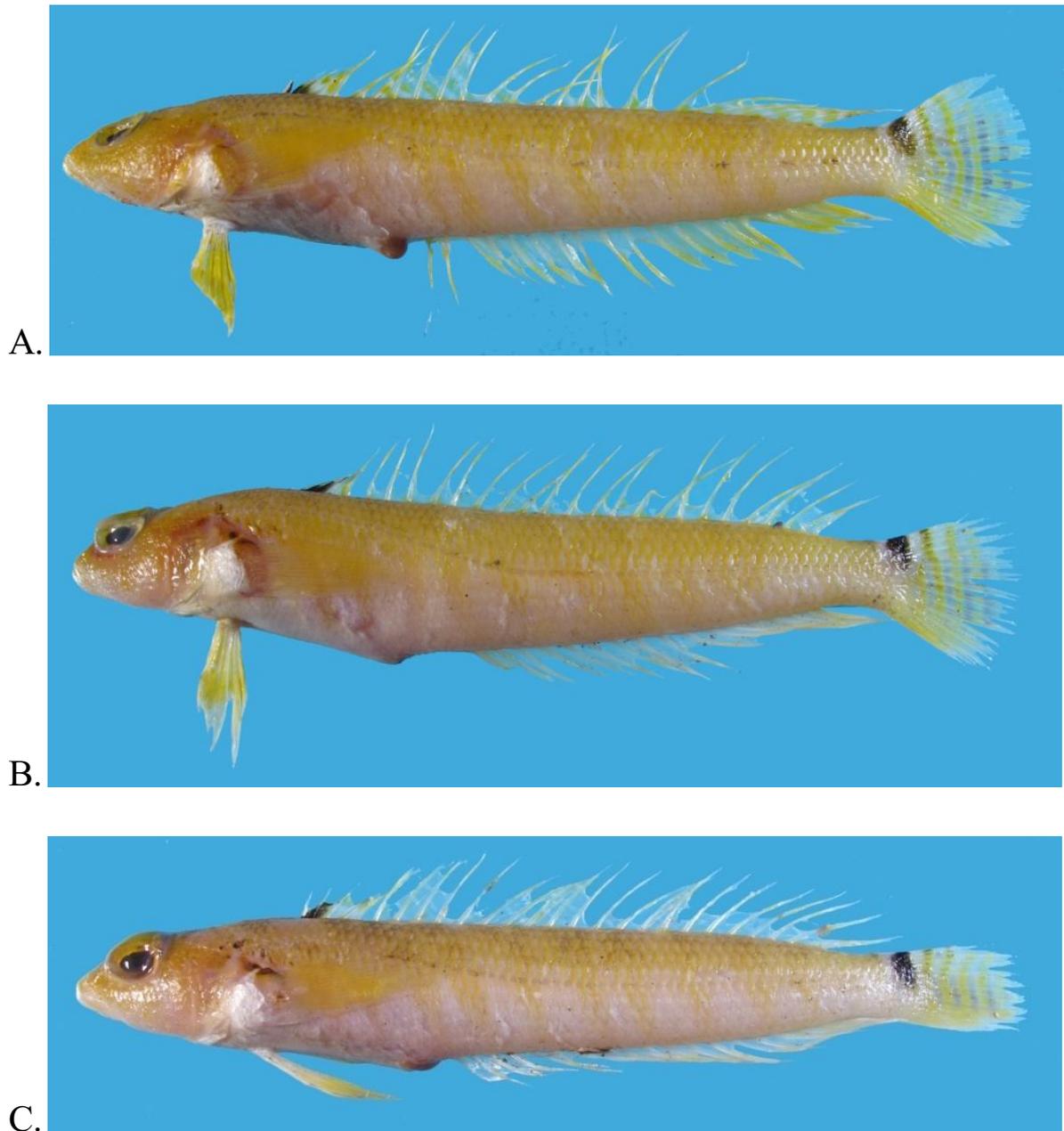


FIGURE 2. Fresh coloration of *Parapercis okamurai* Kamohara, 1960, non-types. A. NMMB-P17673, 1 of 8, 121.0 mm SL. B. NMMB-P17673, 1 of 8, 119.8 mm SL. C. QM I.39132, 124.4 mm SL.

Pores of cephalic sensory system with row of 4 large pores above maxilla; 2 pores near nostrils, one between nostril and one below; row of 3 pores on either side on anterior half of interorbital space (1 pairs of extra pores between posterior nostrils in paratype); 2 irregular series of small pores medially on posterior half of interorbital space; many small pores with subcutaneous canals posteriorly on occiput, pores divided into several irregular double series, from anterior end of lateral line on body, continuing to ventral margin of eye and upper part of opercle; cheek with 9 (8–10) irregular double series of pores; series of 6 large pores along the margin of preopercle; a series of 4 large pores on mandible; 2 medial pores at front of chin.

Opercle with single sharp spine, level with ventral edge of pupil (when viewed from side); subopercle with a single sharp spine at posteroventral corner; preopercle broadly rounded, its free edge smooth except for slight indentations at each pore site, extending from level of ventral edge of orbit downward and forward to slightly in front of a vertical at posterior edge of orbit.

TABLE 1. Morphological data of *Parapercis okamurai* and *P. striolata*.

	<i>P. okamurai</i>				<i>P. striolata</i>			
	Holotype	Paratype	Non-type		Holotype	Non-type		SD
SL (mm)	108.3	91.8	96.1–124.4 (n=12)		125.4	88.1–167.0 (n=12)		SD
% of SL	Mean (range)				Mean (range)			
Head length	26.7	28.9	27.2 (25.8–28.2)		30.6	27.1 (26.1–28.7)		0.8
Body depth	15.4	17.2	14.9 (13.5–16.7)		20.4	17.5 (15.0–19.1)		1.2
Body width	18.2	20.0	17.5 (15.6–19.5)		21.8	19.2 (17.1–20.6)		1.2
Snout length	7.8	8.6	7.7 (6.9–8.2)		8.9	7.8 (6.9–8.6)		0.6
Eye diameter	9.0	9.8	9.0 (8.1–10.2)		10.4	8.9 (8.0–9.9)		0.6
Interorbital width	2.1	1.9	1.9 (1.5–2.4)		–	2.4 (1.9–2.8)		0.3
Upper jaw	9.5	10.5	9.6 (8.9–10.2)		10.8	9.9 (9.1–10.6)		0.6
Predorsal length	28.0	31.6	29.9 (28.0–31.6)		32.9	29.9 (28.6–31.9)		1.0
Prepelvic length	24.7	24.7	23.9 (22.8–25.9)		32.5	24.3 (22.5–25.8)		1.0
Preanal length	46.9	44.3	46.6 (44.4–48.0)		53.7	47.1 (44.7–50.0)		1.5
Dorsal-fin base	62.6	65.9	64.9 (62.7–67.6)		60.6	63.8 (60.7–66.3)		1.7
1st dorsal-fin spine	1.8	–	2.5 (1.8–3.2)		–	2.4 (1.6–3.2)		0.6
2nd dorsal-fin spine	2.8	–	4.0 (3.2–4.8)		–	5.0 (4.1–6.1)		0.7
3rd dorsal-fin spine	4.0	5.0	5.8 (5.2–6.4)		–	6.9 (6.2–7.9)		0.7
4th dorsal-fin spine	6.0	6.4	6.9 (6.0–7.6)		–	8.0 (7.4–8.9)		0.5
5th dorsal-fin spine	6.5	7.1	7.5 (6.5–8.0)		8.7	8.6 (8.2–10.2)		0.6
Longest dorsal-fin ray	12.7	12.4	12.8 (11.0–14.1)		15.5	13.8 (11.9–15.2)		1.1
Anal-fin base	46.5	47.5	45.9 (43.9–48.4)		41.5	45.1 (42.2–48.8)		1.8
Anal-fin spine	4.9	3.9	3.2 (2.0–4.0)		–	3.4 (2.8–4.3)		0.4
Longest anal-fin ray	12.1	12.4	11.9 (10.4–12.8)		11.2	11.4 (10.2–12.3)		0.7
Pectoral-fin length	21.2	21.1	20.7 (18.3–21.9)		23.9	23.5 (20.5–25.8)		1.5
Pelvic-fin length	18.7	21.5	19.2 (17.7–20.4)		–	18.4 (16.9–19.7)		1.0
Pelvic-fin spine length	6.5	6.1	5.9 (4.4–6.6)		–	5.7 (4.7–6.5)		0.7
Cdual-fin length	19.6	18.5	17.9 (16.5–20.3)		–	19.0 (16.9–21.1)		1.5
Caudal-peduncle length	8.3	8.4	8.0 (7.1–9.0)		9.1	9.1 (8.0–10.9)		1.0
Caudal-peduncle Depth	8.3	8.4	8.2 (7.6–8.7)		9.3	9.0 (8.3–9.5)		0.3

Scales finely ctenoid on body, becoming cycloid anterior to a line from base of third dorsal spine to upper end of gill opening; scales extending forward to a vertical line through upper end of preopercle; scales on pectoral-fin base weakly ctenoid anteriorly and cycloid posteriorly; those on area anterior to pectoral-fin base weakly ctenoid dorsally and cycloid ventrally; those on opercle cycloid, except for 1 or 2 large ctenoid scale covering opercular spine; those on subopercle cycloid, a small naked area on lower one-fourth of subopercle; interopercle naked; cheek scales cycloid, in about 9 irregular horizontal rows below the eye, all relatively large and imbricate, extending anteriorly to a vertical through anterior one-fourth of eye (some non-type with weakly ctenoid scales posteriorly); progressively smaller ctenoid scales extending out onto basal portion of caudal fin for at least one-third height of fin; lateral line broadly arched over pectoral fin, then gradually descending to become horizontal midlaterally on posterior fourth or so of body.

Origin of dorsal fin over 6th (5th or 6th) lateral-line scale, predorsal length 28.0% (28.0–31.6%) of SL, slightly longer than head length; 5 dorsal-fin spines, all relatively slender, progressively longer posteriorly; 1st dorsal-fin spine 1.8% (1.8–3.2%) of SL (broken in paratype); 2nd dorsal-fin spine 2.8% (3.2–5.0%) of SL; 3rd dorsal-fin

spine 4.0% (5.2–6.4%) of SL; 4th dorsal-fin spine 6.0% (6.0–7.6%) of SL; 5th spine longest, 6.5% (6.5–8.0 %) of SL (not available in paratype), fully connected by membrane to 1st soft ray; soft dorsal fin higher than spinous one, penultimate dorsal-fin ray longest, 12.7% (11.0–14.1%) of SL; origin of anal fin below base of 5th (5th or 6th) dorsal-fin ray, preanal length 46.9% (44.3–48.0%) of SL; anal-fin spine short, 4.9% (2.0–4.0%) of SL; penultimate anal-fin ray longest, 12.1% (10.4–12.8%) of SL; caudal fin rounded, without prolonged upper lobe, the fin length 19.6% (16.5–20.3%) of SL; pectoral fins broadly rounded when spread, tenth ray longest, total fin length 21.2% (17.7–21.1%) of SL; origin of pelvic fins anterior to pectoral-fin origin, below base of exposed part of opercular spine (slightly forward in smaller non-types), prepelvic length 24.7% (22.8–25.9%) of SL, shorter than head length; pelvic-fin spine slender, 6.5% (4.4–6.6%) of SL; pelvic fins just reaches anus (slightly beyond the anus in paratype and smaller non-type and not reaching in larger non-types), total fin length 18.7% (17.7–21.5%) of SL, fourth pelvic-fin ray longest.

Coloration. When fresh (Figs. 1A, 1C–E), dorsal surface of head and cheek and dorsal half of body yellowish; ventral surface of head and ventral half of body pale; about 10–12 faint yellowish bars extending from lateral axis to near ventrum of body; pectoral-fin base and chest bright white; some irregular dark brown spots on shoulder, a larger irregular black spot at inner side of pectoral-fin base dorsally; scales on lateral line more yellow than other parts; pectoral fin, pelvic fin and lower half of anal fin yellowish; a black patch on anterior portion of spinous dorsal fin; soft dorsal fin pale with many oblique yellow bars; a prominent ocellus on upper portion of caudal-fin base; caudal fin pale with five yellowish narrow bars on upper 2/3 of the fin.

When preserved (Figs. 1B, 3A–B), body uniformly pale brownish; a few small spots on shoulder region; anterior portion of spinous dorsal fin with a black patch; an irregular spot on inner side of upper pectoral-fin base; soft dorsal fin, pectoral and anal fins pale; pelvic fin slightly blackish on dorsal surface, pale elsewhere; a prominent black spot on upper portion of caudal-fin base; caudal fin pale with 5 vertical bar on upper two-thirds of the fin.



FIGURE 3. *Parapercis striolata* (Weber, 1913), HUMZ 199842, 154.8, lateral view, Mimase fish market, Tosa bay. A. fresh, photo by HUMZ. B. preserved.

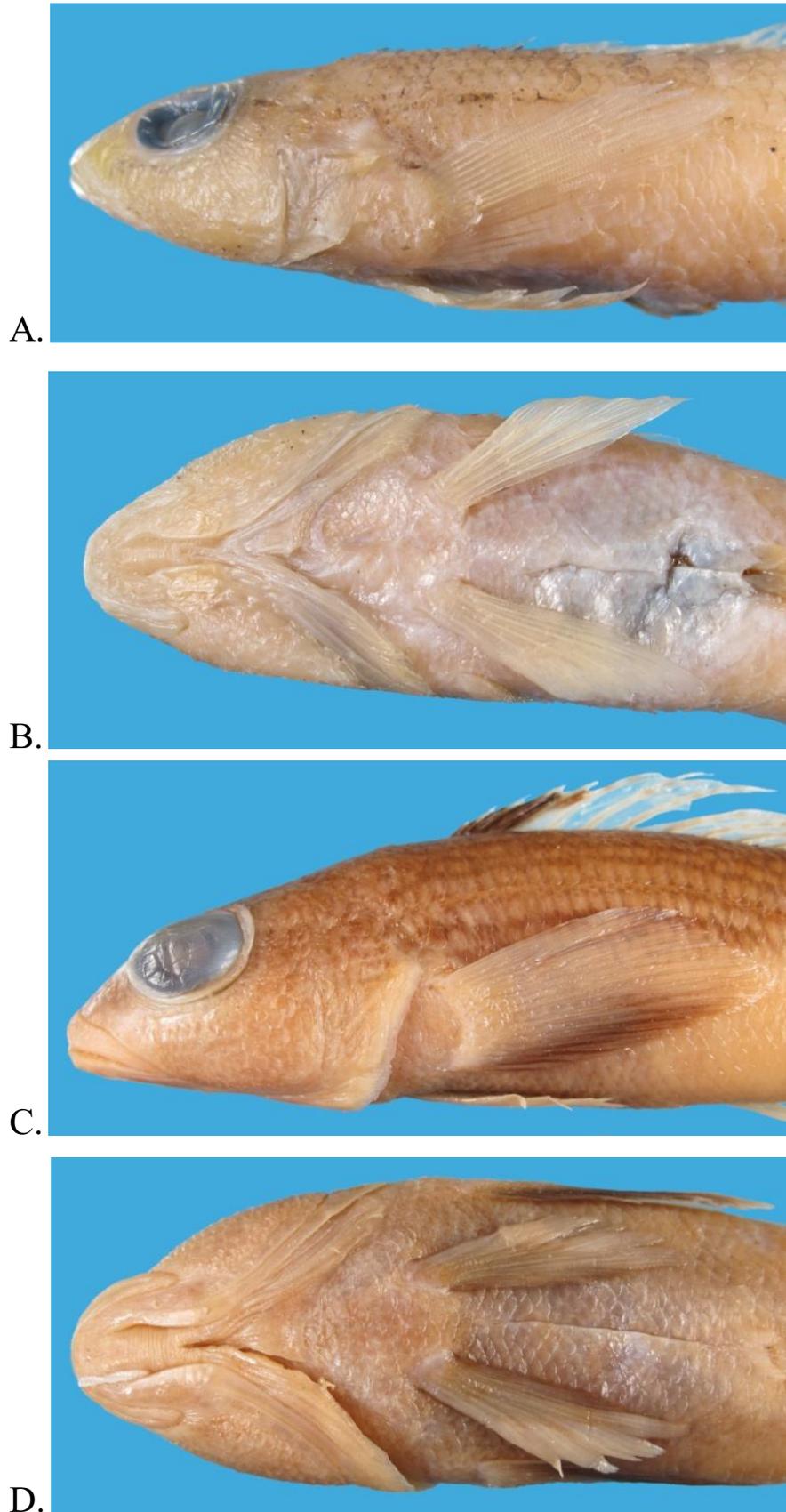


FIGURE 4. A–B. *Parapercis okamurai*, non-type, NMMB-P17673, 1 of 8, 121.0 mm. C–D. *Parapercis striolata* (Weber, 1913), HUMZ 75351, 143 mm SL, Mimase fish market. A, C. lateral view of anterior body. B, D. ventral view of anterior body.

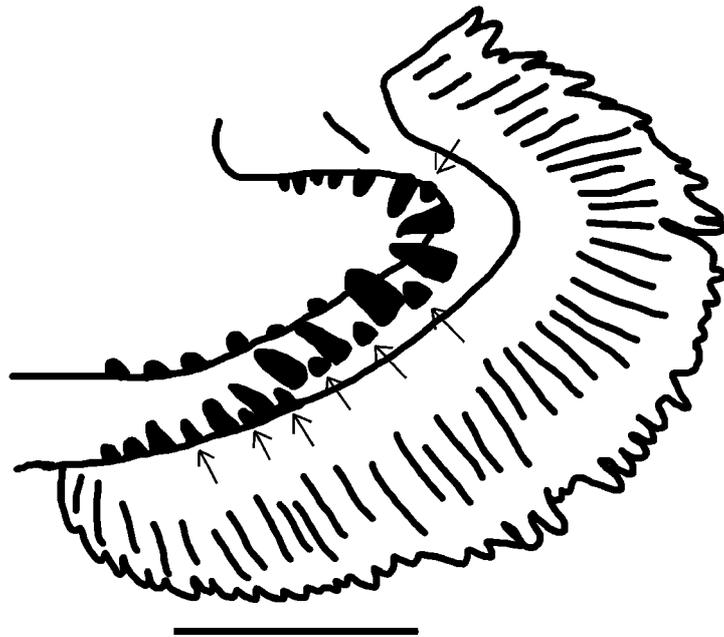


FIGURE 5. Drawing of first left gill arch of *Parapercis striolata*, HUMZ 75352, 138.9 mm SL, lateral view of outer face. Arrows point to the small rakers that alternating the regular ones.

Distribution. Known from southern Japan off Kochi Prefecture and Izu Island, northeastern Taiwan off Nanfang-ao, and Diao-yu-tai Islands (Pinnacle Islands or Senkaku Islands). A single available data was trawled from off Izu Island at depth 220–277 m, whereas other specimens were evidently collected from around 200 m.

Remarks. Although Okamura *et al.* (1982) mentioned that there are 10 reddish bars on lateral side of body of *P. okamurai*, the original description provided 10 yellowish bars.

Of all known species, *P. okamurai* is most similar to *P. striolata* (Figs. 2A–B, 3C–D). It differs from *P. striolata* in having cycloid scales on the parietal region and most parts of the opercle and subopercle, the anterior few rows of the nape, and on the chest (vs. ctenoid or weakly ctenoid in these areas in *P. striolata*); some faint yellow stripes on upper half of body when fresh, but faded in preserved specimens (vs. prominent stripes in both fresh and preserved specimens); 13–15 transverse scale rows below the lateral line (vs. 17–18 transverse scale rows); about 10 faint yellow bars on lateral axis of body when fresh (vs. uniformly yellowish in same area); a black spot at inner side of upper pectoral-fin base (vs. absent); a prominent ocellus on upper portion of caudal-fin base (vs. a fuzzy ocellus in same location); a uniform yellow pectoral fins (pale in preservation) and slightly blackish pelvic fins (vs. lower part of pectoral fins and dorsal side of pelvic fins usually black); and about 5 narrow bars on upper two-thirds of caudal fin (vs. up to 11 bars at same location).

It is also similar to *Parapercis moki* Ho & Johnson, 2013 but differs by having 5 dorsal-fin spines (vs. 4 spines), upper body uniform yellowish with some faint narrow strips (vs. 6 oblique bars), a black spot on inner, dorsal part of pectoral-fin base (vs. absent), 59–63 pored lateral-line scales (vs. 56), 9–10 medial predorsal scales (vs. 12), 20–21 circumpeduncular scales (vs. 26), a relatively short upper jaw (8.9–10.5%, vs. 11.6% of SL) and a shorter prepelvic length (22.8–25.9%, vs. 27.3% of SL).

Discussion

Examination of the holotype of *Parapercis striolata*, specimens from near the type locality of *P. mimaseana* (e.g. Mimase fish market) and specimens from the western Pacific Ocean has revealed that all specimens appear to be the same species, except for the holotype of *P. striolata*, which possesses all cycloid scales on the cheek, two rows of stout teeth on the vomer, and 3 rows of teeth on the palatines. The remaining specimens have several ctenoid scales on the dorsoposterior region of the cheek; 3–4 rows of teeth on the vomer, with the anteriormost row

distinctly larger; and 2 rows of teeth on the palatines. It is not possible to judge whether these characters differences represent intraspecific or interspecific variation, until more specimens are collected from the type locality of *P. striolata* become available for examination. These two nominal species are here treated as conspecific as suggested by Randall *et al.* (2008).

It is notable that all specimens of *P. striolata* (including the holotype) have a row of small gill rakers alternating with the regular ones on the outer row of the first gill arch (Fig. 5). This is a unique character for *P. striolata*, since it has not been found in any other member (personal observation).

Although Ho & Johnson (2013) described *Parapercis moki* as having multiple rows of canals with pores on the cheeks and gill covers, *P. striolata* and *P. okamurai* also have a similar pore distribution on the cheeks, but these pores are restricted to the upper region of the gill cover, and are not present on the subopercle.

Ho & Shao (2010) included *P. striolata* (previously referred to *P. mimaseana*) in the Taiwanese fish fauna. Two voucher specimens (NTUM 4566) deposited at National Taiwan University were examined and confirmed to be *P. striolata*. The current account of pinguipedid species in Taiwan is 28.

Comparative material. *Parapercis striolata*: ZMA 112463 (125.4), holotype of *Neopercis striolata*, Siboga station 254, 5°40'S, 132°26'E, near Kai Islands, Indonesia, 310 m. BMNH 1986.10.1.9 (1, 121.7), Bali, Indonesia, eastern Indian Ocean. HUMZ 36564 (1, 88.1), Kochi, Japan, no other date. HUMZ 75351 (1 female, 143.0), HUMZ 75352 (1, 137.4), HUMZ 75353 (1, 108.4), HUMZ 75354 (1, 94.1), Mimase fish market, Kochi, Japan, 1 Mar. 1978. HUMZ 131742 (1, 94.0), HUMZ 131743 (1, female, 129.9), no data. HUMZ 199841 (1, male, 167.0), HUMZ 199842 (1, male, 154.8), 26°35.68'N, 125°4.57'E, eastern Okinawa Islands, East China Sea, 186–192 m, 27 May 2007. MNHN 1984-0657 (3, 107.1–134.5), ca. 15°00'N, 122°30'E, Philippine Sea off central Luzon east of Polillo Islands, Nov. 1980. NTUM 4566 (2, 126.3–127.5), Chong-zhou, Kaohsiung, SW Tawian, 26 Feb. 1984. *Parapercis moki*: NMMB-P0892 (104.4), holotype, Chong-Chou, Kaohsiung, southwestern Taiwan, northern South China Sea, 29 Nov. 1984.

TABLE 2. Meristic data of *Parapercis okamurai* and *P. striolata*.

	<i>P. okamurai</i>			<i>P. striolata</i>
	Holotype	Paratype	(n=15)	Non-type (n=12)
Dorsal-fin rays	V, 23	IV, 24	V, 23 (V, 22–23)	V, 22–23
Anal-fin rays	I, 19	I, 20	I, 19 (I, 19)	I, 19
Pectoral-fin rays	18/18	18/18	18 (18–19)	17–19
Pored lateral-line scales	61/61	62/62	63 (59–64)	61–64
Predorsal scales	9	9	9 (9–10)	9–11
Transverse scale rows (upper)	4.5	4.5	4.5 (4.5–5.5)	4.5–5.5
Transverse scale rows (lower)	14	14	15 (13–15)	17–18
Circumpeduncular scale rows	20	21	20 (20–21)	25–27
Pseudobranchial filaments	–	13	16 (12–16)	14–20
Gill rakers	4+10	5+9	4+10=14 (4–5+9–11=13–16)	4–5+6–10=10–15

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