



A new species of the sandperch genus *Parapercis* from the Philippines (Perciformes: Pinguipedidae)

HSUAN-CHING HO^{1,2,4} & MIRANDA VAN HEDEN³

¹National Museum of Marine Biology & Aquarium, Pingtung, Taiwan

²Institute of Marine Biology, National Dong Hwa University, Pingtung, Taiwan

³17 Sloopstraat, Heusden 9070, Belgium

⁴Corresponding author. E-mail: ogcoho@gmail.com

Abstract

A new species sandperch, *Parapercis altipinnis*, is described based on the holotype collected from Cebu, the Philippines at 55–65 m by SCUBA. The new species belongs to the *P. cylindrica* complex and can be distinguished by an extremely high first dorsal fin, the first spine slightly longer than the head; 3 predorsal scales; 42 or 43 lateral-line scales; teeth present on vomer and palatines. The body is reddish dorsally and blackish ventrally, with 5 large brownish saddles alternating with white bands on dorsal surface; scattered dots on top of head, first dorsal fin and dorsal surface; first dorsal fin milky white with 5 black marks on anterior margin; a black broad band below eye; cheek and throat blackish red surrounding by white color; row of 10 short white bars along the lateral side of body axis; row of 9 deep red to blackish bars on lower half of lateral side of body; base of pelvic fin and lower margin of caudal fin blackish; rows of black spots on soft dorsal fin. A key to the species of the complex is provided.

Key words: Pisces, Teleostei; taxonomy, *Parapercis altipinnis*, new species

Introduction

In December of 2016, the second author sent photographs of a live sandperch (Fig. 1A) purchased from a local aquarium in Belgium, to Dr. Kwang-Tsao Shao of the Academia Sinica, Taiwan, for identification. These photos were then sent to the first author for comments. With an extremely high first dorsal fin and unique coloration, this specimen was identified as an undescribed species in the genus *Parapercis*.

The second author agreed to donate the specimen for further study – a task made difficult by the 10 000 km between Belgium and Taiwan! Fortunately, Prof. Jérôme Mallefet of Université catholique de Louvain, Belgium, helped to preserve the specimen, took photos and sent the specimen to Taiwan. Mr. Arie de Jong, the owner of De Jong Marinelife, where the fish had been purchased, kindly informed us that the specimen had been collected from Cebu, the Philippines, at a depth of between 55–65 meters by SCUBA.

As soon as the fish arrived, it was determined to be an undescribed species of the *Parapercis cylindrica* complex (*sensu* Randall 2003). The complex comprises six species that have a prominent pointed spine at the upper edge of the subopercle, 8 or 10 teeth in the outer row at the front of the lower jaw, palatine teeth, ctenoid scales on the cheek, and 4–6 predorsal scales. The species complex included *P. cylindrica* (Bloch 1792), *P. haackei* (Steindachner 1884), *P. snyderi* Jordan & Starks 1905, *P. australis* Randall 2003, *P. lineopunctata* Randall 2003, and a recent described species *P. binotata* Allen & Erdmann 2017.

Here we formally describe and name this species. The total number of *Parapercis* species is now 89.

Methods and materials

Methods for taking counts and measurements followed Randall (2003). Vertebrae were counted from digital x-rays.

The specimen was preserved in 4% formalin and then transferred to 70% ethanol. The holotype is now deposited in the Pisces collection of the National Museum of Marine Biology & Aquarium, Taiwan (NMMB-P). Comparative material deposited at various museums and data for comparison were taken from Randall (2003) and specimens were examined by the first author.

Taxonomy

Parapercis altipinnis sp. nov.

English name: Karen's sandperch

Figures 1A–D, 2A, B; Tables 1, 2

Parapercis sp. 5: Kuitert & Tonozuka, 2001:569, fig. A–B (Bali, Indonesia, underwater photograph only).

Holotype. NMMB-P26107, 50.3 mm SL, Cebu, the Philippines, ca. 55–65 m, hand net, SCUBA diving, and purchased from an aquarium in Belgium in December, 2016.

Diagnosis. Dorsal-fin rays V, 21; anal-fin rays I, 17; pectoral-fin rays 14 or 15; lateral-line scales 42 or 43; gill rakers on first gill arch 3 + 7; predorsal scales 3; small, partly embedded, cycloid scales on anterior portion and large ctenoid scales in about 4 rows on posterior portion of cheek; single row of vomerine teeth in curved band; palatine teeth present; prominent sharp spine at upper edge of subopercle present; body depth 4.1 in SL (24.3% SL); first two dorsal-fin spines elongate, first slightly longer than head length, second about half length of first; membrane from last dorsal-fin spine joined to base of first soft ray; caudal fin slightly rounded. When alive, body reddish dorsally and blackish ventrally; 5 large brown saddles on dorsal surface; scattered dots on top of head, first dorsal fin and dorsal surface of back; first dorsal fin whitish with 5 black mark on anterior margin of first spine; a black band below eye; cheek and throat blackish; row of 10 white short bars along lateral side of body axis; row of 9 blackish red bars on lower half of lateral body; base of pelvic fin and lower half of caudal fin blackish; row of black spots on base of soft dorsal fin.

Description. Dorsal-fin rays V, 21; anal-fin rays I, 17; pectoral-fin rays 15 (right side)/14 (left side); pelvic-fin rays I, 5; principal caudal-fin rays 15 (8 + 7), the median 13 branched; upper procurrent rays 7, lower procurrent rays 6; lateral-line scales 42/43; scales above lateral line to origin of dorsal fin 3, to base of anterior soft rays of dorsal fin 2.5; scales below lateral line in a vertical row to origin of anal fin 12; circumpeduncular scales 20; predorsal scale 3; gill rakers on first gill arch 3 + 7; branchiostegal rays 6; pseudobranchial filaments 8; vertebrae 10 + 20.

Body depth 4.1 in SL; body slightly compressed anteriorly, becoming more compressed posteriorly, the greatest width 1.3 in body depth; head length 3.5 in SL; snout pointed, its length 3.1 in HL; orbital diameter 3.4 in HL; eyes oriented as much dorsally as laterally, interorbital space narrow, 10.6 in HL; caudal peduncle depth 3.0 in HL; caudal peduncle length 3.3 in HL.

Mouth slightly oblique with lower jaw slightly projecting; upper jaw extending to a vertical at mid-eye, its length 2.4 in HL; front of upper jaw with 14 incurved canine teeth (7 on each side); broad band of villiform teeth immediately behind anterior canines, narrowing to single row of slender conical teeth along posterior half of jaw; front of lower jaw with 8 canine teeth (4 on each side), the fourth on each side a large recurved canine; very broad band of villiform teeth immediately behind anterior canines, narrowing to single row of small conical teeth along posterior half of jaw; conical teeth in curved row; small conical teeth on palatines. Inner surface of lips with ridges of fleshy papillae. Tongue narrowly triangular with rounded tip.

Gill membranes united, not attached to isthmus, with broad free fold across. Gill rakers short, less than half the length of the longest gill filaments of first gill arch. Anterior nostril a small membranous tube with a posterior flap in front of center of eye about half way to base of upper lip; posterior nostril a large pore with slight rim dorsoposterior to anterior nostril, the internarial distance about half pupil diameter.

Opercle with strong spine, angling slightly upward, on line between lower edge of eye and upper edge of pectoral-fin base; upper edge of subopercle with a strong spine, slightly upward, at level of lower edge of pectoral-fin base; preopercle broadly rounded with a smooth posterior margin; opercular membrane broadest ventrally where it joins the branchiostegal membrane.

Single continuous lateral line originating at upper end of opercular slit, approximately following the contour of back. Head pores well developed, row of 3 large pores above upper jaw; row of 6 large pores along the outer edge

and row of 10 (right side)/9 (left side) small pores along the outer border of cheek scales on preopercle; many small pores on dorsal surfaces of snout, head, nape and around the eyes with a cluster of pores continuing to the origin of lateral line; 4 symmetrical pairs of large pores on lower jaw.

Scales mostly ctenoid, those on side of body with about 30–40 cteni; small cycloid scales in about 5 oblique rows on anterior half of cheek, continuing to about 4 oblique rows of large ctenoid scales on preopercle; large ctenoid scales, with few smaller ones, in about 4 rows on opercle and subopercle; 1 or 2 ctenoid scales on posterior portion of interopercle; no scales on dorsal, anal or pelvic fins; small scales on about basal fourth of pectoral fins; very small scales extending about three-fourths length of caudal fin; scales on chest ctenoid, except for those on anterior border of isthmus which are cycloid.

Origin of dorsal fin about above posterior end of opercular flap, predorsal length 3.6 in SL; first dorsal fin extremely high, the spines progressively shorter; first dorsal-fin spine slightly longer than head, 3.4 in SL; second dorsal-fin spine about half length of first, 1.9 in HL; membrane from fifth dorsal-fin spine attached nearly at base of first soft dorsal-fin ray. Soft dorsal fin highest at anterior half, gradually lower, last ray branched to base, longest rays 1.9 in HL. Origin of anal fin below base of fifth soft dorsal-fin ray, preanal length 2.1 in SL, its shape similar to that of soft dorsal fin; anal-fin spine slender and closely applied to first soft ray, 4.2 in HL; longest soft anal-fin ray 2.2 in HL. Pectoral fin rectangular, middle rays longest, 1.3 in HL. Original of pelvic fins below upper base of pectoral fins, the prepelvic length 3.8 in SL; pelvic-fin spine slender and closely applied to the first soft ray, its length 2.9 in HL; fourth soft pelvic-fin ray longest, reaching base of fourth soft ray of anal fin, its length 1.1 in HL. Caudal fin slightly rounded, the upper corner angular and the lower broadly rounded, its length 4.9 in SL.

TABLE 1. Morphometric measurements of holotype of *P. altipinnis* sp. nov.

NMMB-P26107	In mm	%SL	%HL
Standard length (SL)	50.3		
Body depth	12.2	24.3	84.7
Body width	9.3	18.5	64.6
Head length (HL)	14.4	28.6	*
Snout length	4.7	9.3	32.6
Eye diameter	4.2	8.3	29.2
Interorbital width	1.36	2.7	9.4
Upper-jaw length	6.0	11.9	41.7
Caudal-peduncle depth	4.9	9.7	34.0
Caudal-peduncle length	4.4	8.7	30.6
Pre-dorsal length	14.0	27.8	*
Pre-anal length	24.3	48.3	*
Pelvic-fin length	13.3	26.4	92.4
Length of dorsal-fin base	31.6	62.8	*
Length of 1st dorsal-fin spine	14.7	29.2	102.1
Length of 2nd dorsal-fin spine	7.6	15.1	52.8
Longest dorsal-fin ray	7.4	14.7	51.4
Length of anal-fin base	21.6	42.9	*
Length of anal-fin spine	3.4	6.8	23.6
Longest anal-fin ray	6.5	12.9	45.1
Pectoral-fin length	11.2	22.3	77.8
Caudal-fin length	10.3	20.5	71.5
Length of pelvic-fin spine	5.0	9.9	34.7
Pre-pelvic length	13.1	26.0	*

Color when fresh generally reddish on dorsal half and blackish on lower half, with irregular deep colored saddles, bars, dots and white patches. Broad dark band below eye; front of lower jaw blackish; large patch mixed with white, red and black colors surrounding by white on cheek; an X-shaped mark on top of anterior portion of snout, accompanied by bright white patch on each side of upper lip; bright white patch on upper portion of eye. Scattered blackish red dots on top of head, on dorsal surface and on spinous dorsal fin; five brownish blotches alternating with white bands on dorsal surface, first on nape and at base of first dorsal fin, second to fourth at base of soft dorsal fin and the last, small blotch, on caudal peduncle. Row of about 10 short, white bars along the lateral side of body axis; row of nine deep red bands along lower half of lateral side of body, first two rather blackish. First dorsal fin milky white with scattered dots, leading spine with five black marks on anterior surface; second dorsal fin nearly transparent, with three rows of blackish spots, those on the lower row along the base of soft dorsal fin. Pectoral fin mostly transparent with small patch mixed with milky white, red and black colors at its base; pelvic fin blackish red at base, gradually becoming transparent distally; anal fin semi-transparent, slightly reddish and blackish; caudal fin with rows of short indistinct bars on upper half and blackish red on lower half. Coloration of a matured male can be seen in Kuitert & Tono-zuka (2001:569, fig. A–B).

Color when preserved blackish in general with various dark patches or dots. A black patch on upper margin of eye and a broad bar below the eye; small dots on top of head and dorsal surface of body; posterior third of jaws white with some black pigment; a broad black bar crocking anterior portion of chin and lip on lower jaw; posterior portion of gill membrane black. Five indistinct saddles on dorsal surface of body; row of 9 bars along lower half of lateral side of body. First dorsal fin blackish with scattered dots, the leading spine with 5 black marks on anterior surface; soft dorsal fin with three rows of spots, the lower row along the base of the fin, large and scattered in arrangement, those in upper row less distinct; anal fin blackish with a pale line; caudal fin blackish, slightly darker on lower half and with rows of indistinct short bars on upper half.

Etymology. The specific name is derived from the Latin *alti* (long) and *pinnis* (fin) in referring to the extremely high first dorsal fin.

Distribution. Known only from the holotype collected from Cebu, the Philippines, at around 55–65 m depth.

Ecological note. That *Parapercis* is generally believed to be protogynous and that the change from female to male is often accompanied by color changes, but not elongation of certain fin rays (Ho, pers. obs.). The holotype has a pairs of saccus connecting to the cloaca, which are most likely ovaries but without eggs. The specimen might be a juvenile or a mature female just after spawning. Underwater photographs of a male individual are provided in Kuitert & Tono-zuka (2001; as *Parapercis* sp. 5). It shows sexual dimorphism in the coloration, but not the high dorsal fin, in present species.

TABLE 2. Selected characters of species in the *P. cylindrica* complex. Data are those provided in Randall (2003), Allen & Erdmann (2017), and from the examination of the first author. *See description for details.

	<i>cylindrica</i>	<i>australis</i>	<i>haackei</i>	<i>lineopunctata</i>	<i>binotata</i>	<i>snyderi</i>	<i>altipinnis</i>
Gill rakers	2–3+6–8	3–4+6–8	3+8	3–4+8–10	3–4+10	2–4+7–10	3+7
Predorsal scales	5–6	5–6	3–4	4	5–6	4	3
Cheek scale rows	7–8	7	ca. 7–8	5–6	5	4	4*
Canines at front of lower jaw	10	10	10	8	8	8	8
Edge of preopercle	Finely serrate	Irregular; partially finally serrate	Lower edge serrate to irregular	Smooth, slightly irregular	Smooth	Smooth	Smooth
Black patch on first dorsal fin	Yes	Yes	Yes	No	Yes (preserved)	Yes	No
Other character			Nape fully scaled	Dotty lines on body	Black band on rear edge of cheek		



FIGURE 1. Living or fresh coloration of *Parapercis altipinnis* **sp. nov.**, holotype. A. lateral view of right side; B. lateral view of left side of head; C. dorsal view; D. ventral view of anterior head and body, from dead specimen. Photos by M. van Heden (A) and J. Mallefet (B–D).



FIGURE 2. *Parapercis altipinnis* sp. nov., holotype. A. fresh specimen, photo by J. Mallefet. B. preserved specimen, photo by K. Koeda.

Comparisons

Table 2 lists the selected characters to separate the six species of the *P. cylindrica* complex. The extremely high dorsal fin (e.g. first spine longer than the head length) separates *Parapercis altipinnis* from all other congeners in the complex, as well as the entire genus.

Of the other five species in the complex, *Parapercis altipinnis* is most similar to *P. snyderi* in having 43 or less pored lateral-line scales, 8 canines at front of lower jaw, 4 rows of ctenoid scales on the cheek, and a smooth posterior margin of preopercle. The remaining species have 45 or more pored lateral-line scales. *Parapercis altipinnis* differs from *P. snyderi* mainly in the height of first dorsal fin and coloration. The saddles of the dorsal surface are brownish red and less distinct (vs. saddles of *P. snyderi* that are solid black and connected to the spots on base of dorsal fin that form U-shaped marks there); there is a broad black band below the eye (vs. yellow band); first dorsal fin milky white with scattered dots (vs. the fin blackish with yellow patches); upper jaw yellowish and

anterior third of lower jaw blackish (vs. most parts of jaws blackish); spots on dorsal, anal and caudal fin relatively indistinct (vs. rather distinct when fresh); and lower half darker than the upper half of caudal fin (vs. the lower half not distinctly darker than the dorsal half).

Parapercis lineopunctata also has 8 canines at front of lower jaw, however, it differs from *P. altipinnis* in having lines of dots on lateral sides of body and a large yellow spot on first dorsal fin, and more pored lateral-line scales. A recent described species, *Parapercis binotata*, has 46–48 pored lateral-line scales, 5 or 6 predorsal scales and different coloration that can be separated from the new species easily. Others congeners can be separated from the new species mainly by having more pored lateral-line scales and 10 canines at front of lower jaw.

Key to species of *Parapercis cylindrica* complex

- 1a Interorbital scaled *Parapercis haackei* (Australia) 2
- 1b Interorbital naked 2
- 2a Front of lower jaw with 10 canines; 6–7 rows of ctenoid scales on cheek; pored lateral-line scales 45 or more 3
- 2b Front of lower jaw with 9 canines; 4–6 rows of ctenoid scales on cheek; pored lateral-line scales 43 or less 4
- 3a Pored lateral-line scales 44–50; caudal fin yellowish when fresh
..... *Parapercis cylindrica* (Western Pacific: north to Japan, south to New South Wales and east to the Marshall Islands)
- 3b Pored lateral-line scales 48–59; caudal fin whitish when fresh *Parapercis australis* (Queensland, New Caledonia and Tonga)
- 4a Two rows of black dots from behind eye along back to about middle of body; pored lateral-line scales 45–51; 5–6 ctenoid scale rows on cheek 5
- 4b No rows of dots at same area; pored lateral-line scales 38–43; 4 ctenoid scale rows on cheek 6
- 5a A conspicuous black band on the cheek and row of yellow to brown bars on lateral side of the body
..... *Parapercis binotata* Allen & Erdmann (Solomon Islands)
- 5b No black mark on the cheek; row of black bars on lateral side of the body *Parapercis lineopunctata*
(Western Pacific: Indonesia, Philippines, Papua New Guinea, Solomon Islands, south to Australia and Lord Howe Island)
- 6a First dorsal fin extremely high, slightly more than head length; its color white with small dots
..... *Parapercis altipinnis* **sp. nov.** (Cebu, the Philippines)
- 6b First dorsal fin normal, about 10 times in head length; its color blackish, usually with few yellow patches
..... *Parapercis snyderi* (Western Pacific: southern Japan to Queensland)

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