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Redescription of the longnose houndshark *Iago garricki* (Carcharhiniformes: Triakidae), based on specimens recently collected from the South China Sea

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Abstract

The longnose houndshark, *Iago garricki* Fourmanoir & Rivaton 1979, was described based on five specimens collected from Vanuatu. Five additional specimens were recently collected from the waters off Dongsha Atoll, South China Sea. A redescription of this species is provided based on the holotype, non-types collected near the type locality and off Dongsha Atoll. The species is characterized by eye length larger than gill slit height; first dorsal-fin origin not reaching a vertical line through pectoral-fin base; head length 20.2–22.2% TL; preoral length 7.2–8.3% TL; upper labial furrow 2.2–3.4% TL; lateral teeth with 1–3 small cusplets on lateral side basally; diplospondylous centra 53–61; precaudal centra 94–102; and total centra 149–157. The specimens collected from the South China Sea represent the northernmost distributional record of this species.

Key words: Biodiversity, Chondrichthyes, genus *Iago*, taxonomy, distribution

Introduction

The houndshark genus *Iago* Compagno & Springer 1971 is a small group of deep-water sharks distinct from other members of Triakidae by combination of characters: anterior nasal flap not reaching mouth, not barbel-like; first dorsal-fin base length less than caudal-fin length; caudal-fin ventral lobe short; second dorsal fin slightly smaller than first dorsal fin; eyes large, located laterally; first dorsal-fin origin over pectoral inner margins; teeth blade-like (Compagno 1984). Currently, this genus comprises three nominal species: *I. garricki* Fourmanoir & Rivaton 1979 from the western Pacific and southeastern Indian Ocean, including the Philippines, Vanuatu, Papua New Guinea, and northern Australia; *I. mangalorensis* Cubelio, Remya & Kurup 2011 from the west coast of southern India; and *I. omanensis* Norman 1939 from the northern Indian Ocean, including the Red Sea, Gulf of Oman, and India (Ebert *et al.* 2021). Of them, *I. mangalorensis* was described based on one specimen from Mangalore, India, but that specimen was lost and its validity remained uncertain (Fernando *et al.* 2019; Ebert *et al.* 2021). In addition, *I. omanensis* is considered as a species complex due to morphological and genetic diversities from different locations in the northern Indian Ocean (Naylor *et al.* 2012; Fernando *et al.* 2019).

Iago garricki was described from northwestern Efate, Vanuatu in the southwestern Pacific Ocean (Fourmanoir & Rivaton 1979). Compagno (1988) noted the occurrence of *I. garricki* in the Philippines and treated it as *I.* cf. *garricki*, and suggested that the Philippine specimens might be distinct from the New Caledonian specimens. Subsequently, Compagno *et al.* (2005) found no morphological difference between the Philippine specimens and

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the holotype, and suggested that specimens from the Philippines, Australia, and New Caledonia were conspecific. Naylor *et al.* (2012) further confirmed the consistency between specimens from the Sulu Sea and the South China Sea treated by Compagno *et al.* (2005), based on molecular approach. However, all specimens from Compagno *et al.* (2005) were from central Philippine waters, thus the whereabouts of the South China Sea specimen was uncertain. Nevertheless, the putative distribution of *I. garricki* was in the western central Pacific, from the Philippines, Papua New Guinea to northern Australia (White & Ko'ou 2018; Ebert *et al.* 2021).

Basic descriptions of *I. garricki* are provided in the literatures (e.g. Compagno 1984; Last & Stevens 1994; White *et al.* 2006; White *et al.* 2018; Ebert *et al.* 2021). However, including the initial record on the holotype, those descriptions were rather brief, with limited morphometric data. In addition, the type specimens were all large individuals, ranging from 620 to 750 mm in total length (TL), but no information of juveniles was available. Although Compagno *et al.* (2005) examined specimens collected from the Philippines, the authors did not provide further description or morphometric data, leaving difficulties in current taxonomic works.

A total of 11 houndsharks caught by bottom trawlers operating off Dongsha Atoll, South China Sea, were collected at a fishing port in Taiwan. All specimens were recognized as *I. garricki* based on the snout length, tooth shape, orbit size and position of the first dorsal-fin origin relative to the pectoral-fin base. Six of which were not retained prior to examination, except for their stomach contents. The appearance of this species in the South China Sea represents considerable range extension from its known distribution. The holotype and additional specimens were examined by one of the authors (HCH). Here, we provide detailed description on this species, which includes updated information on morphometrics of the holotype, and juveniles of the newly collected specimens.

Materials and methods

Specimens were fixed in 10% formalin and preserved in 70% ethanol. Maturity condition of specimens was determined macroscopically. Measurements, counts, and terminology followed Compagno (1984) and White *et al.* (2021). Measurements were taken by digital calipers record to the nearest 0.1 mm or rulers to the nearest 1 mm. Total length (TL) was used throughout, except where indicated. Tooth and vertebral counts were observed from X-radiographs taken at the Muséum national d'Histoire naturelle, Paris (MHNH), and the National Museum of Marine Biology & Aquarium, Taiwan. Tooth count was only available in the holotype and the South China Sea specimens. Data of *I. omanensis* were obtained from Compagno & Springer (1971). The new specimens were deposited in Biodiversity Research Center, Academia Sinica, Taiwan (ASIZP) and Pisces collection of National Museum of Marine Biology & Aquarium, Taiwan (NMMB-P).

Results

Family Triakidae

Iago garricki Fourmanoir & Rivaton, 1979

Figs. 1–5; Table 1

Iago garricki Fourmanoir & Rivaton, 1979: 434, figs. 22 (Efate, Vanuatu, western-central Pacific Ocean). Compagno 1984: 395–396; Last & Stevens 1994: 212–213; White *et al.* 2006: 190–191; White *et al.* 2018: 120–121 Ebert *et al.* 2021: 475.

Materials examined. Holotype. MNHN-IC-1978-0694, 620 mm TL, mature female, 17°05'S; 167°05'E, Vanuatu, Coral Sea, 350 m depth, 1978. **Non-types.** MHNH-IC-1997-3572, 508 mm TL, adult male, 16°65'S; 168°02'E, Vanuatu, western-central Pacific Ocean, 541–577 m depth, 1994. MHNH-IC-2008-1304, 244 mm TL, juvenile male, 15°69'S; 167°01'E, Vanuatu, western-central Pacific Ocean, 509–659 m depth, 2006. MHNH-IC-2008-1346, 250 mm TL, juvenile female, 15°68'S; 167°01'E, Vanuatu, western-central Pacific Ocean, 503–600 m depth, 2006. ASIZP 81240, 280 mm TL, juvenile female, ca. 19°N, 114°E, off western Dongsha Atoll, South China Sea, ca. 300 m depth, bottom trawl, 19 February 2021, coll. Y.-T. Lee. ASIZP 81241, 435 mm TL, adult male, NMMB-P36356, 495 mm TL, adult male, NMMB-P36357, 500 mm TL, adult male, ASIZP 81242, 515 mm TL, adult male, ca. 19°N, 114°E, off western Dongsha Atoll, South China Sea, ca. 300 m depth, bottom trawl, 19 February 2021, coll. C.-H. Lin.

FIGURE 1. Holotype of *Iago garricki*. MNHN-IC-1978-0694, 599 mm TL, adult female. Preserved condition.

Diagnosis. A species of *Iago* with a long, narrow snout, preoral length 35.1% (34.9–38.7%) head length; eye large, length 18.5% (17.0–24.1%) head length; gill slit rather short, the first gill slit height 47.8% (31.4–51.6%) eye length; anterolateral teeth straight to slightly oblique, blade-like, with 1–3 broad, smooth distal cusplets (Fig. 4c); first dorsal-fin origin not reaching a vertical line through pectoral-fin base; caudal-fin ventral lobe moderately developed in adults; body color generally grey, with faint dark edges on dorsal-fin apexes, more prominent in juveniles (Fig. 2).

Description. Morphometric data are provided in Table 1. The following data are provided for the holotype, followed by the range of measured or counted non-types in parentheses.

TABLE 1 Morphometric data of *Iago garricki* and *I. omanensis* from Compagno & Springer (1971). *: Counts were not available on MHNH-IC-2008-1304, and tooth count were not available on MHNH-IC-2008-1346.

	I. garricki			*I. omanensis*
	Holotype	Non-types		Non-types
Total length (mm)	599	244–515 (n=8)		224–582 (n=16)
Measurements (% TL)		Mean (range)	SD	Range
Pre-second dorsal length	58.8	59.0 (55.6–61.4)	1.9	56.8–59.9
Pre-first dorsal length	24.2	26.3 (25.0–28.2)	1.0	24.0–29.5
Head length	20.5	21.4 (20.2–22.2)	0.6	23.0–27.5
Prebranchial length	15.9	17.3 (16.7–17.8)	0.3	16.2–20.0
Prespiracular length	12.1	13.0 (12.2–14.3)	0.6	-
Preorbital length	7.6	7.7 (6.9–8.4)	0.5	-
Prepectoral length	19.5	21.0 (19.2–22.8)	1.4	21.2–25.9
Prepelvic length	41.7	44.2 (41.2–46.2)	1.7	41.6–46.5
Snout-vent length	43.7	45.8 (43.4–47.6)	1.5	43.5–49.1
Preanal length	58.8	61.5 (58.9–64.1)	1.6	58.3–63.4
Precaudal length	77.6	77.0 (75.0–78.4)	1.2	-
Interdorsal space	26.2	24.8 (23.6–26.8)	1.3	21.4–25.3
Dorsal-caudal space	10.9	11.1 (9.7–12.2)	0.7	-
Pectoral-pelvic space	19.0	21.0 (18.1–24.1)	1.8	13.7–20.0
Pelvic-anal space	13.0	12.2 (10.4–14.8)	1.2	11.0–13.2
Anal-caudal space	12.0	10.5 (10.1–11.1)	0.4	7.2–10.5
Pelvic-caudal space	28.8	26.9 (23.9–28.1)	1.3	-
Prenarial length	5.5	5.4 (4.4–6.0)	0.5	-
Preoral length	7.2	7.9 (7.4–8.3)	0.3	5.7–7.6
Eye length	3.8	4.6 (3.6–5.1)	0.4	3.3–5.1

.....Continued on the next page

TABLE 1. (Continued)

		I. garricki		*I. omanensis*
	Holotype	Non-types		Non-types
First gill slit height	1.8	1.8 (1.6–2.0)	0.1	-
Fifth gill slit height	1.4	1.2 (0.9–1.5)	0.2	-
Pectoral-fin anterior margin	13.5	12.3 (11.3–13.8)	0.7	12.7–16.6
Pectoral-fin base length	4.1	4.5 (4.0–5.1)	0.4	4.5–5.6
Pectoral-fin posterior margin	10.6	8.5 (7.0–9.9)	1.0	-
Pectoral-fin inner margin	6.4	6.3 (5.6–7.0)	0.4	-
Caudal-fin dorsal margin	22.4	23.0 (21.6–25.0)	1.2	20.1–22.7
Caudal-fin preventral margin	8.0	8.0 (7.0–9.1)	0.7	-
Caudal-fin upper postventral margin	10.7	9.6 (8.2–10.3)	0.6	-
Caudal-fin lower postventral margin	3.2	2.4 (2.0–3.1)	0.3	-
Caudal-fin subterminal margin length	4.7	5.0 (4.4–6.0)	0.6	-
Caudal-fin terminal margin length	7.0	5.3 (4.2–6.2)	0.7	-
Caudal-fin terminal lobe length	8.3	7.6 (7.0–8.4)	0.5	-
First-dorsal fin length	12.6	11.9 (10.9–12.8)	0.6	-
First-dorsal fin anterior margin	10.3	10.6 (9.5–12.2)	0.9	-
First-dorsal fin base length	7.8	8.5 (6.6–10.2)	1.1	8.3–11.6
First-dorsal fin height	3.8	6.6 (5.7–7.7)	0.6	6.0–8.8
First-dorsal fin inner margin	3.8	4.3 (3.6–4.9)	0.4	-
First-dorsal fin posterior margin	7.8	6.1 (4.4–6.9)	0.9	-
Second-dorsal fin length	9.3	10.1 (9.3–11.0)	0.6	-
Second-dorsal fin anterior margin	8.7	8.4 (4.0–9.9)	1.8	-
Second-dorsal fin base length	5.9	7.0 (3.4–9.9)	1.4	7.3–9.7
Second-dorsal fin height	5.8	4.8 (2.6–6.0)	1.0	4.5–6.5
Second-dorsal fin inner margin	3.2	2.5 (1.2–3.0)	0.5	-
Second-dorsal fin posterior margin	5.6	4.9 (2.9–6.1)	1.0	-
Pelvic-fin length	7.7	8.0 (6.5–9.2)	0.8	8.3–9.6
Pelvic-fin anterior margin	4.6	4.9 (4.1–5.8)	0.5	-
Pelvic-fin height	3.4	3.1 (2.1–3.9)	0.5	-
Pelvic-fin inner margin	3.8	3.8 (3.1–5.1)	0.6	-
Pelvic-fin posterior margin	5.1	4.4 (3.4–5.0)	0.5	-
Anal-fin length	6.7	7.3 (6.8–7.7)	0.3	-
Anal-fin anterior margin	5.1	5.4 (4.9–5.8)	0.3	-
Anal-fin base length	4.9	5.1 (4.6–6.2)	0.5	4.9–6.6
Anal-fin height	2.8	2.6 (1.2–3.6)	0.6	2.6–4.0
Anal-fin inner margin	2.2	2.6 (1.8–3.1)	0.4	-
Anal-fin posterior margin	3.6	3.6 (2.6–4.8)	0.6	-
Head height	8.2	5.6 (4.6–7.2)	0.8	-
Trunk height	9.0	7.3 (5.4–8.7)	1.1	-
Abdomen height	6.9	7.8 (5.7–9.9)	1.5	-
Tail height	5.5	4.5 (3.8–5.1)	0.5	-
Caudal peduncle height	2.7	2.6 (1.8–4.6)	0.9	-
Pelvic midpoint-first dorsal insertion	10.1	13.0 (7.9–16.8)	3.6	-

.....Continued on the next page

TABLE 1. (Continued)

		I. garricki		*I. omanensis*
	Holotype	Non-types		Non-types
Pelvic midpoint-second dorsal origin	24.4	19.4 (15.8–25.2)	2.7	-
Second dorsal origin-anal origin	6.0	5.0 (3.9–6.4)	0.9	-
Second dorsal insertion-anal insertion	5.5	3.9 (3.0–5.4)	1.0	-
Mouth length	3.7	3.6 (3.1–3.9)	0.3	-
Mouth width	7.6	6.9 (5.6–8.4)	1.0	6.4–8.4
Upper labial furrow length	2.7	2.6 (2.2–3.4)	0.3	1.1–2.0
Lower labial furrow length	1.9	1.7 (0.9–2.2)	0.4	0.6–1.4
Nostril width	1.7	1.9 (1.6–2.5)	0.3	-
Internarial space	2.9	3.3 (3.1–3.9)	0.2	3.3–4.2
Clasper inner length		8.6 (4.7–10.2)	1.8	-
Clasper base width		4.1 (3.6–4.8)	0.5	-
Interorbital space	7.4	6.6 (5.4–7.6)	0.8	-
Head width	9.8	8.6 (6.8–10.7)	1.4	-
Trunk width	8.4	7.9 (6.1–9.9)	1.1	-
Abdomen width	5.5	7.1 (4.6–9.2)	1.6	-
Tail width	3.7	3.4 (3.0–4.0)	0.3	-
Caudal peduncle width	2.1	1.7 (1.4–2.2)	0.3	-
Counts*				-
Tooth count	50/44	43–54/36–41		46–55/37–45
Monospondylous centra	41	39–42		34–42
Diplospondylous precaudal centra	57	53–61		45–52
Caudal centra	58	53–58		44–58
Precaudal centra	98	94–102		81–91
Total centra	156	149–157		129–147

Body subtriangular in cross-section at first dorsal-fin base; pectoral–pelvic space 19.0% (18.1–24.1%) TL, pelvic–caudal space 28.8% (23.9–28.1%) TL; second dorsal-fin origin to anal-fin origin 88.4% (66.7–99.1%) anal-fin base length; anal–caudal space 20.5% (16.1–18.2%) preanal length; a distinct hump present at dorsal profile above pectoral fins in holotype (hump absent in other non-types); interdorsal and postdorsal ridge absent. Caudal peduncle long, slender, elliptical in cross-section, tapering towards caudal fin, without lateral keels; height 128% (129–252%) width at upper caudal-fin origin, 25.0% (17.5–38.2%) dorsal–caudal space. Precaudal pits absent.

Head length 108% (90.5–112%) pectoral–pelvic space; head slightly depressed, rather flat in lateral view, slightly convex over eye, slightly concave on preorbital snout, post-oral head straight. Snout tip narrowly rounded in dorsoventral view; moderately pointed in lateral view, narrowly rounded in ventral view in both juveniles and adults (Fig. 3); preoral snout 35.1% (34.9–38.7%) head length. Eyes elliptical, large, eye length 18.5% (17.0–24.1%) head length; positioned laterally on head; fleshy subocular ridges vestigial; anterior notch absent, posterior notch not prominent; nictitating lower eyelids external; subocular pouches shallow, scaled with secondary lower eyelids. Spiracles very small, bean-shaped, positioned below middle of eye.

Gill slits rather short; first and second gill slits tallest, fifth shortest; height of the fifth 74.8% (56.8–87.8%) height of the first; height of the first 8.8% (7.6–9.2%) head, 47.8% (31.4–51.6%) eye length. Upper margin of gill slits barely reaching a horizontal line through lower margins of eyes.

Nostrils moderately large, with circular incurrent apertures; well separated from mouth; width 57.8% (45.5–79.5%) internarial space, 43.9% (33.3–61.5%) eye length, 91.9% (80.0–137%) in first gill slit height; excurrent apertures small, bean-shaped; anterior nasal flaps broadly triangular, large; mesonarial flaps and posterior nasal flaps poorly developed.

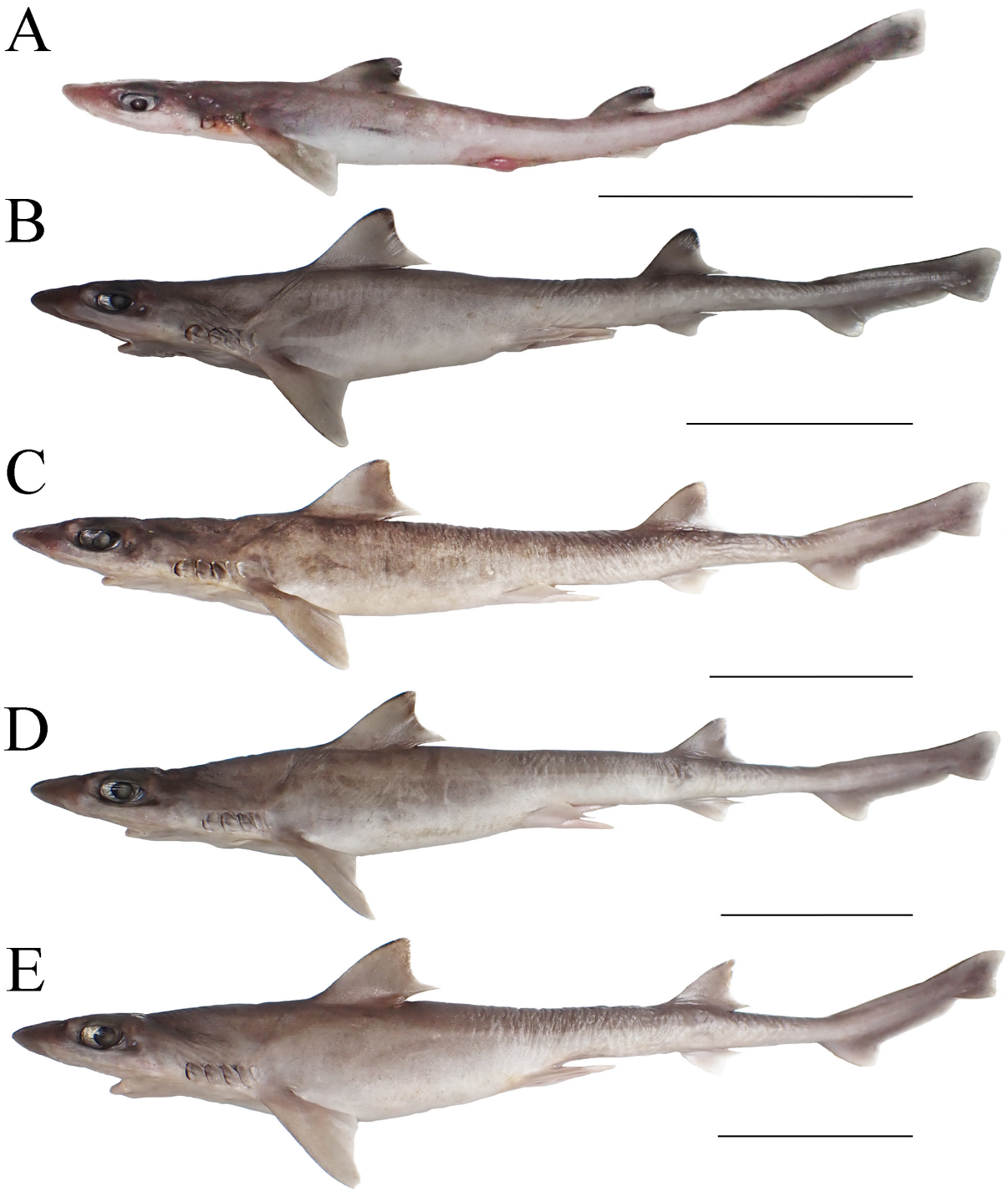

FIGURE 2. Fresh coloration (previously frozen) of *Iago garricki* specimens collected from the South China Sea. A. ASIZP 81240, 280 mm TL, juvenile female. B. ASIZP 81241, 435 mm TL, adult male. C. NMMB-P36356, 495 mm TL, adult male. D. NMMB-P36357, 500 mm TL, adult male E. ASIZP 81242, 515 mm TL, adult male. Scale bar = 10 cm.

Mouth considerably arched (less arched in juveniles), width 36.9% (25.7–41.6%) head length; length 48.5% (37.1–65.5%) width; tongue very large, flat, blunted apically, covering almost the entire floor; buccal papillae absent, buccopharyngeal denticles present on anterior part of the palate to the level of spiracle. Labial furrows moderately elongate; lower furrows distinctly shorter than upper furrows, length 71.6% (39.2–91.9%) length of upper furrows; length of upper furrows 73.6% (58.7–91.3%) mouth length; anterior tip of upper furrows anterior to vertical mid-orbit, reaching about level of lower jaw symphysis.

Teeth including symphysials in 50/44 (43–54/36–41) rows, 2–4 series functional. Tooth formula of upper jaw 24+3+23 (20–25+1–4+20–25), lower jaw 22+1+21 (18–20+1–2+17–20). Teeth not arranged in diagonal files, no toothless spaces at symphysis. Tooth size similar between jaws, but different in shape between and along jaws (Fig. 4). Symphyseal teeth in upper jaw only slightly smaller than anterolateral teeth, with erect, slender, symmetrical cusp, notched medially and laterally, medial and lateral margins smooth, moderately notched (Fig. 4A). Anterolateral teeth in upper jaw with somewhat broad, straight to slightly oblique, blade-like cusps; mesial margins weakly convex basally, straight distally; 1–3 broad, smooth distal cusplets present; both margins and basal cusplets without serrations (Fig. 4C). Lateral teeth in upper jaw becoming more oblique gradually towards posterolateral side. Symphyseal teeth size in lower jaw same as anterolateral teeth (Fig. 4B). Anterolateral teeth shape in lower jaw similar to upper jaw, but with straight cusps, becoming somewhat oblique gradually towards posterolateral side (Fig. 4D).

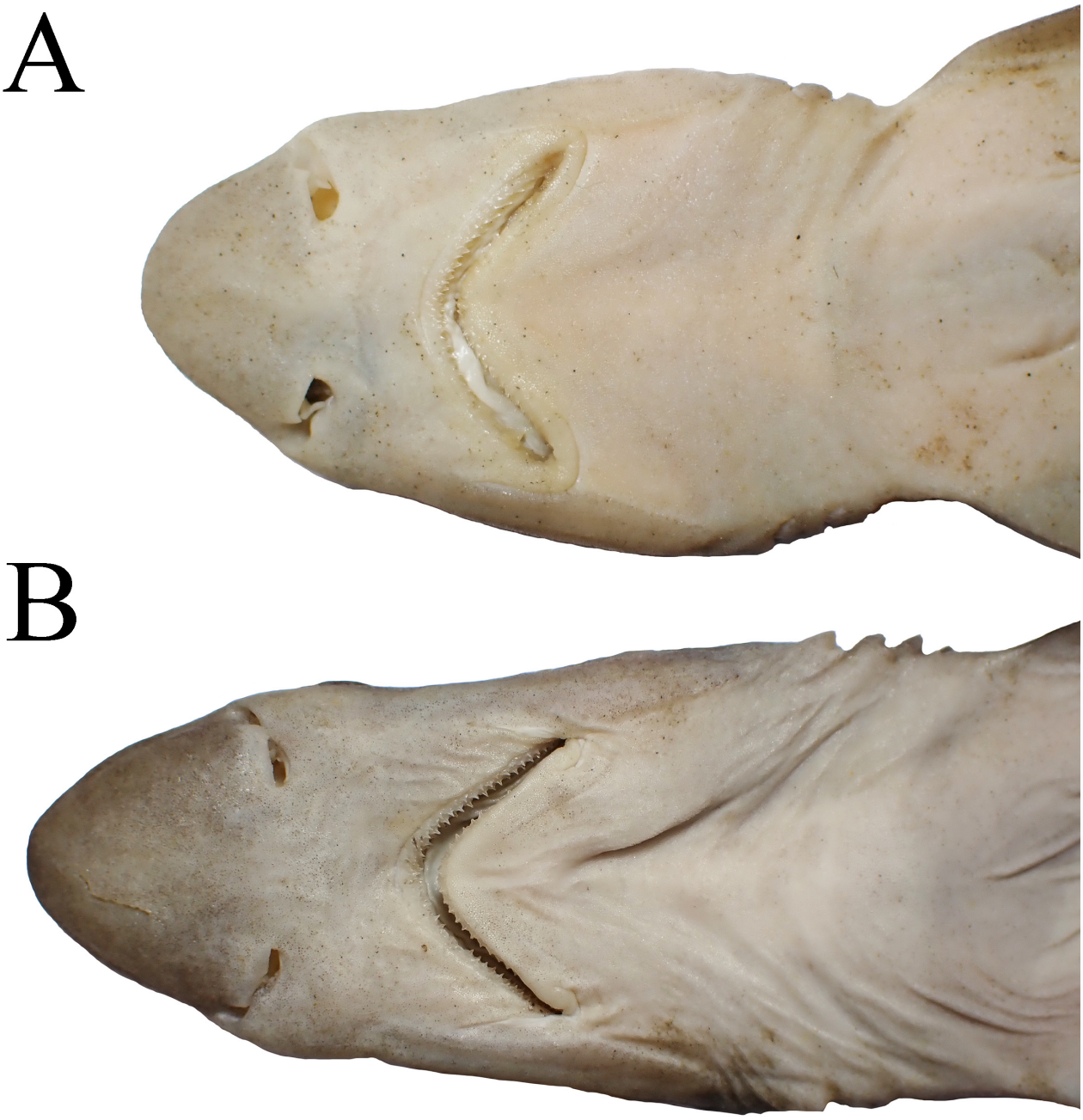

FIGURE 3. Ventral views of head. A. ASIZP 81240, 280 mm TL, juvenile female. B. ASIZP 81242, 515 mm TL, adult male.

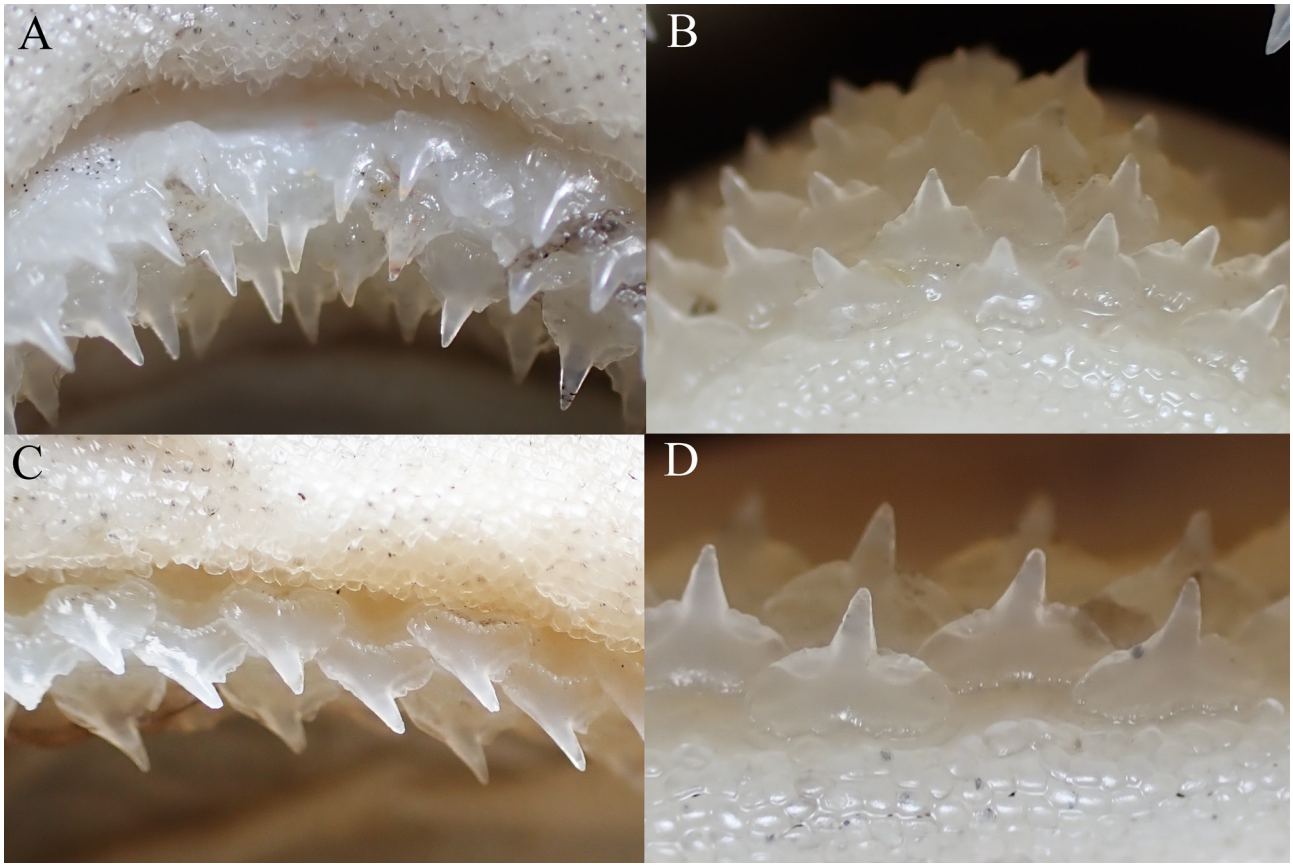

FIGURE 4. Teeth of ASIZP 81242, 515 mm TL, adult male. A. upper jaw symphyseal teeth. B. lower jaw symphyseal teeth. C. left upper jaw lateral teeth. D. left lower jaw lateral teeth.

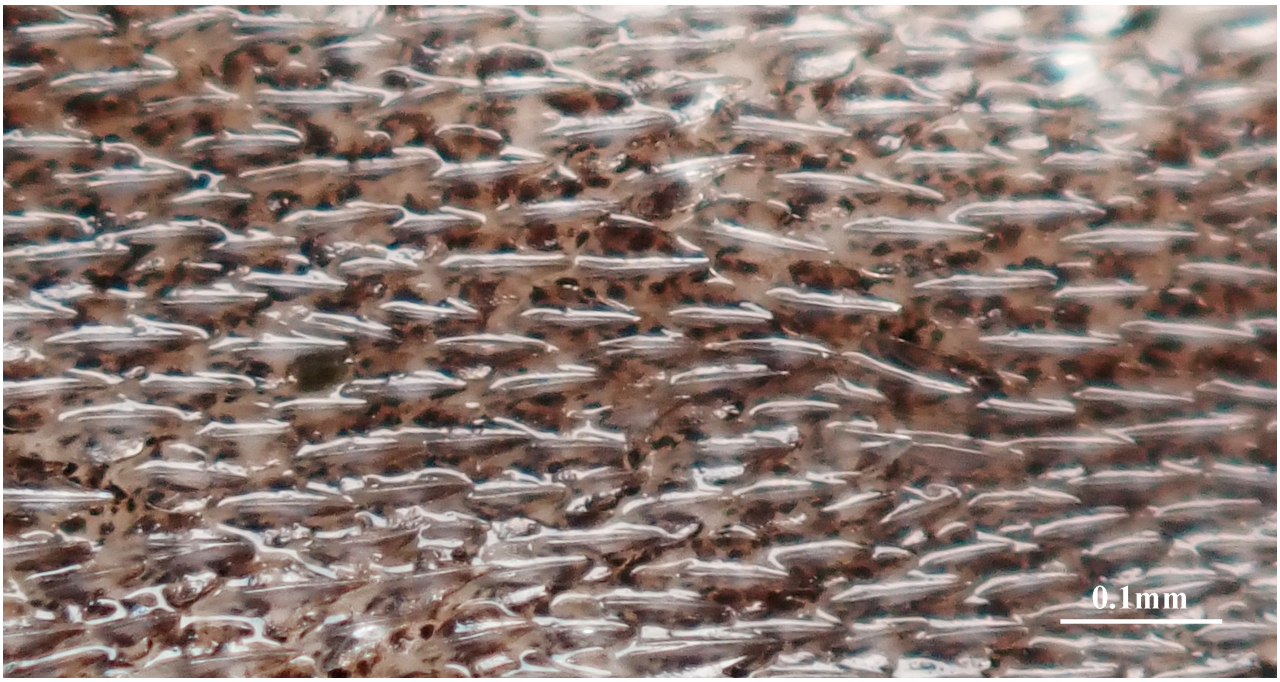

FIGURE 5. Dermal denticles from below first dorsal-fin base of ASIZP 81242, 515 mm TL, adult male.

Lateral trunk denticles below first dorsal fin small and imbricated; crowns narrowly pointed distally; apices narrowly pointed; crowns with 2–4 longitudinal ridges; no prominent reticulations on crown; crown length much longer than width (Fig. 5).

Pectoral fins triangular; subequal or slightly larger than first dorsal fin; anterior margin straight; posterior margin 78.6% (58.9–79.6%) anterior margin; base narrow, its length 30.4% (29.6–41.2%) anterior margin; apex broadly rounded; posterior margin moderately concave; free rear tips broadly round; inner margins straight; origin under fourth gill opening to midway between fourth and fifth gill openings. Pelvic fins very narrowly subtriangular; anterior margin somewhat convex, 33.8% (36.2–42.3%) pectoral-fin anterior margin; apex very broadly rounded; posterior margin concave; free rear tip acutely pointed; inner margins straight. Claspers of four adult males long, slender and narrow-based; length (56.8–82.0%) pelvic-anal space; apex narrowly rounded, extending to near midway of pelvic-anal space.

First dorsal fin falcate; anterior margin concave basally, slightly convex distally; apex narrowly rounded (broadly rounded in juveniles); posterior margin deeply concave to the free rear tip; free rear tip narrowly pointed; inner margin straight; origin reaching a vertical line through anterior half of middle pectoral-fin inner margin, before pectoral-fin base; free rear tip slightly posterior to midway between pectoral-fin base and pelvic fin origin; insertion about opposite to pectoral fin apex; first dorsal-fin base 29.7% (28.1–40.5%) interdorsal space, 71.1% (54.6–95.2%) dorsal–caudal-fin space; fin height 70.8% (68.6–93.5%) base length; inner margin 39.4% (47.4–84.3%) height, 27.9% (37.5–68.7%) base length.

Second dorsal fin slightly falcate, smaller than the first dorsal fin, height 74.5% (48.9–86.1%) first dorsal-fin height, base length 76.4% (56.6–107%) first dorsal-fin base length; anterior margin slightly concave basally, straight distally; apex narrowly rounded (broadly rounded in juveniles); posterior margin upright, deeply concave before the free rear tip; free rear tip pointed, terminating barely anterior to anal-fin free rear tip; inner margin straight; origin slightly anterior to anal-fin origin; insertion well posterior to fin apex, opposite to anal-fin insertion; second dorsal-fin base length 54.4% (40.8–81.0%) dorsal–caudal space; height 69.1% (57.0–77.5%) base length; inner margin 77.2% (35.8–67.9%) height, 53.4% (26.6–39.9%) base length.

Anal fin low and weakly falcate, about half of second dorsal fin; height 69.1% (35.8–62.3%) second dorsal-fin height, base length 82.6% (62.4–96.1%) second dorsal-fin base length; anterior margin weakly convex; apex broadly rounded; posterior margin concave; free rear tip short, narrowly pointed, well separated from lower caudal-fin origin; inner margin straight; insertion nearly opposite to fin apex, just posterior to second dorsal-fin insertion; anal-fin base length 40.8% (40.6–61.4%) anal–caudal space; fin height 57.8% (27.7–69.6%) base length; inner margin 78.8% (39.7–93.3%) height, 45.6% (27.7–53.8%) base length; preanal ridges and grooves absent.

Caudal fin asymmetrical, upper lobe moderately narrow; terminal lobe enlarged, ventral lobe narrow, moderately developed in adults, weakly developed in juveniles; dorsal margin moderately long, 28.8% (27.6–33.3%) precaudal length, nearly straight to weakly convex, slightly concave above terminal lobe, without lateral undulations; preventral margin slightly convex, 73.3% (59.2–83.3%) in dorsal–caudal space, apex broadly rounded; lower postventral margin very short, moderately concave; upper postventral margin slightly concave anteriorly, slightly convex near subterminal notch; subterminal notch very short; subterminal margin weakly convex, terminal margin nearly straight to slightly convex; subterminal margin length 67.1% (71.8–88.5%) terminal margin length; terminal lobe margins straight to slightly concave; terminal lobe length 75.7% (63.6–73.8%) dorsal-caudal margin.

Total vertebral centra 156 (149–157), precaudal centra 98 (94–102), monospondylous centra 41 (39–42), diplospondylous precaudal centra 57 (53–61).

Coloration. When fresh, grey to brownish grey dorsally, gradually becoming paler ventrally. In adults, dorsal fins dusky, with narrow dark edges on apexes; dark blotches on dorsal-fin apexes present in juveniles. Caudal fin generally greyish brown with narrow white margins on terminal and lower lobe; weak black edges on dorsal margin, more prominent in juveniles; anal fin dusky, with inconspicuous white margin on apex; pectoral fins mostly dusky, with narrow dark edges on anterior margins; posterior margins somewhat whitish; pelvic fins uniformly dusky, without any dark edges; ventral surface completely white. In preservative, eyes white, others very similar to fresh color.

Size. To about 750 mm TL (Fourmanoir & Rivaton 1979). Length-at-birth is estimated approximately 280 mm TL, given the presence of umbilical scar in the small specimens (ASIZP 81240).

Distribution. Known from Indo-Pacific, from the South China Sea to northwestern and northeastern Australia, including Indonesia, the Philippines, Papua New Guinea and Vanuatu. Bathymetric range 250–659 m. The occurrence of *I. garricki* from the South China Sea represents the northernmost distributional record (ca. 700 km northward extension from the Philippines).

Ecology. Stomach contents of one specimen (ASIZP 81242) and six adult males (470–500 mm TL, not retained)

included small Macrouridae (*Hymenocephalus* sp., *Nezumia* sp., *Ventrifossa* spp.), crustaceans (Penaeoidea, Munidae) and cephalopods. This species is assumed benthic and has a generalist diet.

Remarks. Fourmanoir & Rivaton (1979) described *I. garricki* based on five specimens. One of the specimens was designated as holotype and preserved in MHNH, but the whereabouts of other specimens is unknown. A search for those paratypes in MHNH by HCH was unsuccessful.

Iago garricki can be distinguished from its only congener, *I. omanensis*, by having a shorter head, its length 20.2–22.2% TL (vs. 23.0–27.5% TL) and longer upper labial furrow (2.2–3.4% TL, vs. 1.1–2.0% TL). The two species can further be separated by the preoral length, which is slightly longer in *I. garricki* (7.2–8.3% TL, vs. 5.7–7.6% TL in *I. omanensis*), although the values slightly overlap. The shape of lateral teeth is also unique in *I. garricki*, in which small cusplets on lateral side present basally (vs. cusplets absent in *I. omanensis*). Vertebral count also separates the two species, *I. garricki* has more diplospondylous centra (53–61, vs. 45–52 in *I. omanensis*), more precaudal centra (94–102, vs. 81–91), and more total centra (149–157, vs. 129–147) (data taken from Compagno & Springer, 1971).

According to Ebert *et al*. (2021), *I. garricki* is further distinguished from *I. omanensis* by having much smaller gill slits, their length smaller than eye length (vs. longer than eye length in *I. omanensis*), and the first dorsal-fin origin over pectoral-fin inner margin (vs. situated well over the pectoral-fin base). Geographically, the distribution of *I. garricki* does not overlap with that of *I. omanensis*, the former is restricted to the western Pacific and the southeastern Indian Ocean, while the latter occurs in the northern Indian Ocean, including the Red Sea.

Although having similar morphometrics, juveniles of *I. garricki* generally process broader dorsal-fin tips, a less arched mouth, and a poorly developed caudal-fin ventral lobe when compared to adults. Juveniles have large dark blotches on the dorsal fins (vs. only narrow dark margins present on fin edges in adults), and prominent black edges on caudal fin dorsal margin (vs. poorly-defined black edges present in adults).

Difference in morphometrics and counts between the holotype and the other non-types are observed. For example, the holotype has three more lower jaw teeth than the other non-types. Some morphometrics (e.g. first dorsal-fin height, caudal-fin proportions) of the holotype are also not within the range of the non-types. Furthermore, the holotype processes a distinct hump on the dorsal profile above pectoral fins, but it was not observed in other examined specimens. The hump is not likely a result of preservation condition, as it already existed when fresh (Fourmanoir & Rivaton 1979: fig. 22a). We assume the difference as sexual dimorphism, mature female processes a humped dorsal profile above pectoral fins, and may have difference in morphometrics and counts. Since only one mature female (the holotype) was examined, however, it warrants further investigation given the smaller size of other examined male specimens comparing to the holotype.

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