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Additional records of the coastal tank goby, *Glossogobius laticeps* (Gobiidae: Gobiinae), in East Asia, including its northernmost occurrence

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Abstract

A single specimen of the coastal tank goby, *Glossogobius laticeps* (De Vis 1884) (79.6 mm standard length), was collected from the lower reach of the Mimi River, Miyazaki Prefecture, Kyushu, Japan. This constitutes the first record of the species in Japan and extends its range northwards from the previously known northernmost record in Taiwan. Two additional specimens from Hong Kong, identified as *Gl. laticeps* during an examination of specimens deposited in the Kanagawa Prefectural Museum of Natural History (105.8–140.1 mm standard length), represent the first specimen-based records of the species from mainland China's coast. The diadromous habit of this tropical/subtropical species suggests that its presence on the east coast of Kyushu, which is located in a warm temperate zone, is probably accidental and is most likely due to planktonic larvae being transported from tropical/subtropical rivers to the sea by the Kuroshio Current. Detailed morphological descriptions, illustrations of the cephalic sensory systems, and color photographs of the specimens are provided here.

Key words: diadromous goby; *Glossogobius giuris* complex; Gobiidae; Indo-West Pacific Ocean; Kuroshio Current; new standard Japanese name; northernmost record; tropical/subtropical fish

Introduction

Glossogobius Gill 1859 (Gobiidae) is a highly diverse genus including 42 valid species (plus several undescribed) inhabiting various aquatic environments across the Indo-Pacific region, such as streams, estuaries, saltmarshes and agricultural tanks (Hamilton 1822; Hoese and Hammer 2021; Zarei et al. 2025; Fricke et al. 2026). As *Glossogobius* species are similar in appearance (Akihito and Meguro 1975), their identification usually requires detailed morphological information, viz., blotching pattern on the body, and arrangement of the cephalic sensory systems (Hoese and Hammer 2021; Cheng et al. 2025). Hoese and Hammer (2021) defined the following characters as belonging to the *Gl. giuris* complex: lines of papillae on the cheek and inner preopercular mandibular in two or more rows, and the mental fraenum lacking elevated lateral lobes. The latter complex includes nine valid species [*Gl. flavipinnis* (Aurich 1938), *Gl. intermedius* (Aurich 1938), *Gl. mahalonensis* Hoese, Hadiaty and Herder 2015 and *Gl. matanensis* (Weber 1913) (all inhabiting Indonesia), *Gl. obscuripinnis* (Peters 1868) (Indonesia and the Philippines), and *Gl. bicirrhosus* (Weber 1894), *Gl. giuris* (Hamilton 1822), *Gl. laticeps* (De Vis 1884) and *Gl. olivaceus* (Temminck and Schlegel 1845) (Indo-West Pacific)]. The scientific name *Gl. giuris* still includes two spatially circumscribed lineages, i.e., *Gl. giuris* "clade B" and "clade C", and it is uncertain which clade would represent the true *Gl. giuris* or new species (Hammer et al. 2021; Zarei et al. 2025). Additionally, a species of uncertain identity [*Gl.* sp. sensu Akihito et al. (2013)] inhabits eastern and southeastern Asian rivers

(Akihito et al. 2013; Hoese and Hammer 2021).

The diadromous Coastal Tank Goby, *Gl. laticeps*, occurs in brackish and freshwater areas of coastal rivers in the tropical/subtropical Indo-West Pacific (Hammer et al. 2021; Hoese and Hammer 2021; Cheng et al. 2025; Zarei et al. 2025), being characterized by a longitudinal black border on either side of the chin and isthmus, 19–27 pre-dorsal scales, four or more well-defined longitudinal dark lines on the lateral body surface, and its characteristic cephalic papillae rows pattern (Hammer et al. 2021; Hoese and Hammer 2021; Cheng et al. 2025; Zarei et al. 2025).

During ichthyofaunal surveys along the coast of Miyazaki Prefecture, Kyushu, Japan in November 2025, a single specimen of *Glossogobius*, belonging to the *Gl. giuris* complex, was collected from the lower reach of the Mimi River, northern Miyazaki Prefecture. Following recently provided diagnostic information (Hammer et al. 2021; Hoese and Hammer 2021; Cheng et al. 2025; Zarei et al. 2025), we identified the specimen as *Gl. laticeps*. Additionally, during examination of specimens deposited in the Kanagawa Prefectural Museum of Natural History, two specimens collected from Hong Kong, China, initially identified as *Gl. giuris*, were determined to represent *Gl. laticeps*, to date known in east Asia from voucher specimens, only from Taiwan (Cheng et al. 2025). Therefore, the specimens from Hong Kong extended its distribution range in the region. In addition to the latter regional distribution extension, a recent report indicated *Gl. laticeps* occurring from the Makran basin, southeastern Iran, Gulf of Oman (Zarei et al. 2025). The present specimen from Japan extends the northernmost distributional record by over 730 km.

Glossogobius laticeps has remained largely indiscernible within the *Gl. giuris* complex over a long period (Akihito and Meguro 1975; Hammer et al. 2021; Hoese and Hammer 2021). Hammer et al. (2021) and Zarei et al. (2025) also suggested that some cryptic species may still exist unrecognized within the complex. Accordingly, detailed morphological information is necessary for definitive identification of *Gl. laticeps*, in addition to regional information enabling estimations of local population status. With this in mind, detailed morphological descriptions are provided here, along with illustrations of the cephalic sensory systems and color photographs of the specimens.

Materials and Methods

Counts and measurements were taken to the nearest 0.1 mm using digital calipers, following the methods of Hoese and Allen (1990) and Hoese and Hammer (2021). Standard length is abbreviated as SL. The terminology for cephalic sensory canal pore openings and lines of papillae follows Akihito and Meguro (1975). The specimens, which were preserved in 10 % formalin and subsequently transferred to high-concentration ethanol, were examined under a stereomicroscope. For close examination, the cephalic sensory systems and squamation were reversibly stained with Cyanine Blue 5R in distilled water (Saruwatari et al. 1997). The vertebral numbers were counted from X-ray images, and the urostyle was counted as the last caudal vertebra. The specimens were deposited in the ichthyological collection of the Kanagawa Prefectural Museum of Natural History (KPM-NI), with color photographs and X-ray images registered into the museum Image Database of Fishes (KPM-NR). Different images of the same individual were registered under the same KPM-NR registration number and identified using individualised letters of the alphabet (e.g., KPM-NR 292003A and KPM-NR 292003B). Although the museum specimen numbers are recorded as seven digits (including zeros) on the electronic database (e.g., KPM-NI0097200), only the effective digit numbers are given here. The marine biogeographical divisions around Japan follow Nishimura (1992), with English translations by Kai and Motomura (2022).

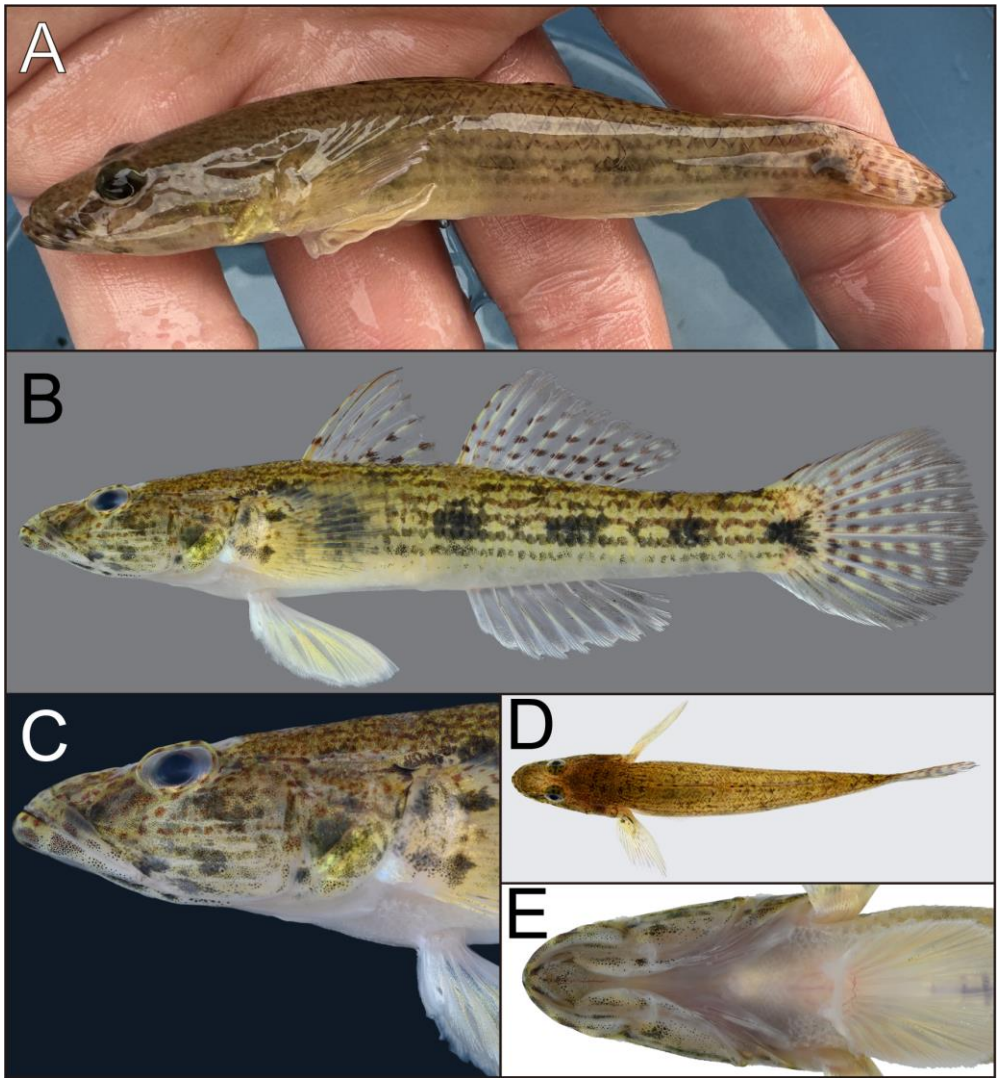

Fig. 1. A–E: Color images of *Glossogobius laticeps* collected from lower reach of Mimi River, Hyuga City, Miyazaki Prefecture, Japan (KPM-NI 97200, 79.6 mm SL). A, lateral view of live specimen immediately after collection (image number: KPM-NR 292003Q); B, lateral view of fresh specimen (KPM-NR 292003C); C, lateral view of head of fresh specimen (KPM-NR 292003G); D, dorsal view of fresh specimen (KPM-NR 292003H); E, ventral view of head of fresh specimen (KPM-NR 292003L). Photos by Y. Ogata (A) and T. Kurihara (B–E).

Results and Discussion

***Glossogobius laticeps* (De Vis 1884)**

[English name: Coastal Tank Goby; new standard Japanese name: Tatesuji-uro-haze]

(Figs. 1–4; Table 1)

Material examined. JAPAN: KPM-NI 97200, 79.6 mm SL, urogenital papilla undeveloped, lower reach of Mimi River, Hyuga City, Miyazaki Prefecture, Kyushu (32º20'47.1"N, 131º35'22.4"E), under aquatic shore vegetation, 4 Nov. 2025, hand net, coll. by Takumi Kurihara. **CHINA:** KPM-NI 3632, 140.1 mm SL, male, Tai-Ho River, Hong Kong, 13 Dec. 1996, casting net; KPM-NI 3633, 105.8 mm SL, female, other data as for KPM-NI 3632. Photographs of KPM-NI 97200, 3632 and 3633 registered as KPM-NR 292003A–Q, 292009A–G and 292010A–G, respectively.

Description

Counts and measurements (as % SL) of the present

Table 1. Counts and measurements of *Glossogobius laticeps* from Miyazaki Prefecture, Japan and Hong Kong, China (present study); and Australia and New Guinea (Hoese and Hammer 2021*); Iran (Zarei et al. 2025); and Taiwan (Cheng et al. 2025).

Specimens No. or number of specimens	KPM-NI 97200	KPM-NI 3632, 3633	n = 91*	n = 10	n = 10
Locality	Miyazaki Prefecture	Hong Kong	Australia / New Guinea	Iran	Taiwan
Standard length (SL, mm)	79.6	105.8–140.1	29.0–161.0	36.0–73.6	65.4–140.6
Total length (mm)	100.5	130.1–177.2	-	-	-
Counts					
Dorsal-fin rays	VI–I, 9	VI–I, 9	VI–I, 9	VI–I, 8–9	VI–I, 9
Pectoral-fin rays	20	20	19–21	18–20	20–21
Pelvic-fin rays	I, 5	I, 5	-	-	I, 5
Anal-fin rays	I, 8	I, 8	I, 7–8	VI–I, 8–9	I, 8
Caudal-fin segmented rays	9 + 8	7 + 8	17	-	-
Caudal-fin branched rays	7 + 7	7 + 7	12–14	-	-
Lateral scale rows	33 (left), 32 (right)	32–34 (left), 33 (right)	27–33	30–32	33–35
Transverse scale rows	8 (left), 9 (right)	8–9 (left), 9 (right)	9–11	9–11	9–11
Pre-dorsal scales	27	24–25	19–27	19–25	22–24
Pre-pelvic scales	9	9–10	10–16	-	-
Measurements (% SL)					
Head length	29.5	31.3–32.2	27.0–33.3	33.8–36.9	28.2–32.6
Snout length	10.1	10.6–11.3	9.7–11.6	-	-
Eye diameter	5.9	4.9–5.9	4.3–7.9	-	-
Upper jaw length	12.4	12.4–13.6	10.9–13.3	-	-
Body depth	17.5	18.1–19.1	14.5–19.2	16.3–17.9	15.7–18.6
Pre-anus length	50.5	53.1–54.7	-	-	50.6–53.9
Pre-first dorsal fin length	36.3	37.6–39.2	-	-	35.1–37.8
Pre-second dorsal fin length	55.9	56.5–57.6	-	-	55.1–58.0
Pre-anal fin length	58.3	58.1–61.4	-	-	57.2–60.4
Pre-pelvic fin length	30.2	29.9–32.5	-	-	30.9–33.7
Caudal peduncle length	20.7	21.2–23.3	-	22.4–26.9	22.7–26.6
Caudal peduncle depth	10.7	9.9–11.1	8.7–12.1	9.2–9.8	9.3–10.4
First dorsal-fin base length	17.1	15.6–17.0	-	11.4–13.7	14.2–18.6
Second dorsal-fin base length	21.5	18.1–20.3	-	17.3–20.2	19.0–21.2
Anal-fin base length	17.6	16.2–20.1	-	14.4–18.2	15.0–18.3
Pectoral fin length	18.7	23.6–24.1	20.6–27.2	23.2–27.7	19.3–22.6
Pelvic fin length	21.0	22.9–23.1	19.0–22.5	21.5–24.2	18.3–22.8
Caudal fin length	25.1	26.1–26.4	22.4–27.0	26.5–31.4	24.2–31.6

Hyphens ("-") used where data unavailable. * Most measurements (% SL) based on specimens 70–120 mm SL.

specimens are presented in Table 1, together with previously published data (Hoese and Hammer 2021; Cheng et al. 2025; Zarei et al. 2025).

General morphology

Body horizontally elongated, cylindrical, deepest at origin of first dorsal fin; dorsal profile gently elevated from snout tip to first dorsal-fin origin, horizontal from first dorsal-fin origin to that of second, thereafter gently lowering to end of second dorsal-fin base; ventral profile of body lowering from tip of lower jaw to origin of pelvic fin, thereafter very gently elevating to posterior end of anal-fin base; caudal peduncle compressed, dorsal and ventral profiles horizontal. Vertebral number 27 (precaudal + caudal = 10 + 17) (KPM-NI 97200: Fig. 3). Head depressed, broad, conical in lateral view. Cheek broad (especially in KPM-NI 3632). Eye dorsolateral, more dorsal than lateral, large, diameter 20 % head length in KPM-NI 97200 (16 % and 18 % in KPM-NI 3632 and 3633, respectively); each eye enclosed in KPM-NI 97200, interorbital width about 43 % of eye diameter; interorbital width of KPM-NI 3632 and 3633 greater than KPM-NI 97200, about 56 % and 82 % of eye diameter, respectively; eye oval, pupil circular; upper part of iris smooth, without projection. Two pairs of moderately separated nostrils opening in front of eyes; anterior nostril circular, with short tube-like flap, opening near upper lip; posterior nostril slightly elongated, oval, without flap, opening diago-

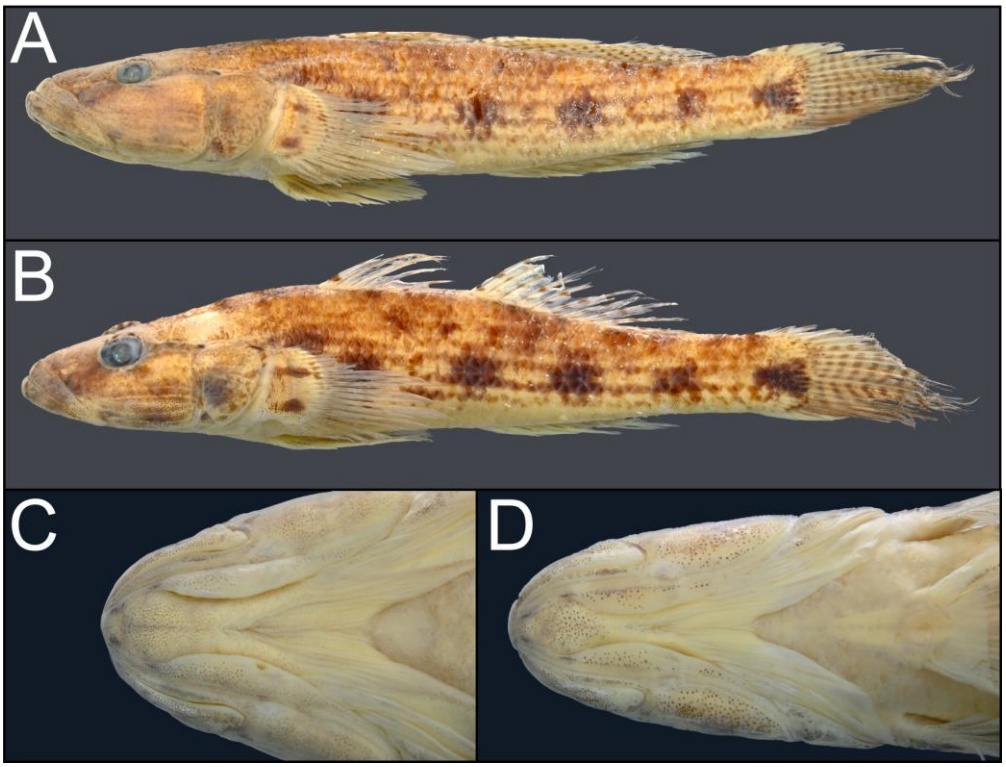

Fig. 2. A–D: Preserved specimens of *Glossogobius laticeps* collected from Tai-Ho River, Hong Kong, China (KPM-NI 3632, 140.1 mm SL; KPM-NI 3633, 105.8 mm SL). A, lateral view of KPM-NI 3632 (image number: KPM-NR 292009C); B, lateral view of KPM-NI 3633 (KPM-NR 292010C); C, ventral view of head of KPM-NI 3632 (KPM-NR 292009E); D, ventral view of head of KPM-NI 3633 (KPM-NR 292010E). Photos by T. Kurihara.

nally behind anterior nostril, its center level with inferior edge of pupil. Snout long, approximately 1.7 times eye diameter in KPM-NI 97200 (2.3 times and 1.8 times in KPM-NI 3632 and 3633, respectively). Mouth large, oblique, posteriorly beneath anterior margin of pupil in KPM-NI 97200 (reaching beneath anterior margin of pupil in KPM-NI 3632 and 3633); upper jaw moderately blunt, lower jaw protruding beyond snout tip; lower jaw tip smooth, without barbel; single sparse row of diagonal conical teeth on premaxillary, becoming larger posteriorly; teeth blunt, vertical in anterior region of premaxillary; triple rows of relatively large, sharp conical teeth set closely diagonal on mandibular; palatine and tongue without teeth; tongue thick, bilobed. Mental fraenum indistinctly truncated, without elevated lateral lobes. Gill opening large, upper edge just anterior to top of pectoral-fin base, ventrally extending just anterior to posterior margin of preoperculum. Anus circular, beneath posterior end of first dorsal-fin base. Urogenital papilla of KPM-NI 97200 undeveloped, elongated with pointed tip in KPM-NI 3632 (male specimen), and short, blunt with notched tip in KPM-NI 3633 (female specimen). Pectoral-fin horizontally elongated, elliptical; pectoral-fin base slightly oblique, its top and bottom level with bottom of pupil and posterior end of mouth, respectively; 7th–9th pectoral-fin rays longest, barely reaching just above anterior margin of anus. Pelvic disc complete, I/5+5/I, much longer than wide; anterior membrane present, without lateral lobes; origin beneath pectoral-fin base. Region around pelvic-fin spines flat. All pelvic-fin rays branched, posteriorly reaching a vertical through base of 6th first dorsal-fin spine when depressed. First dorsal fin triangular, 2nd spine longest, last spine shortest, no elongated filamentous spines; first dorsal-fin origin posterior to pelvic-fin origin. Second dorsal fin anteriorly slightly higher than first dorsal fin, 1st

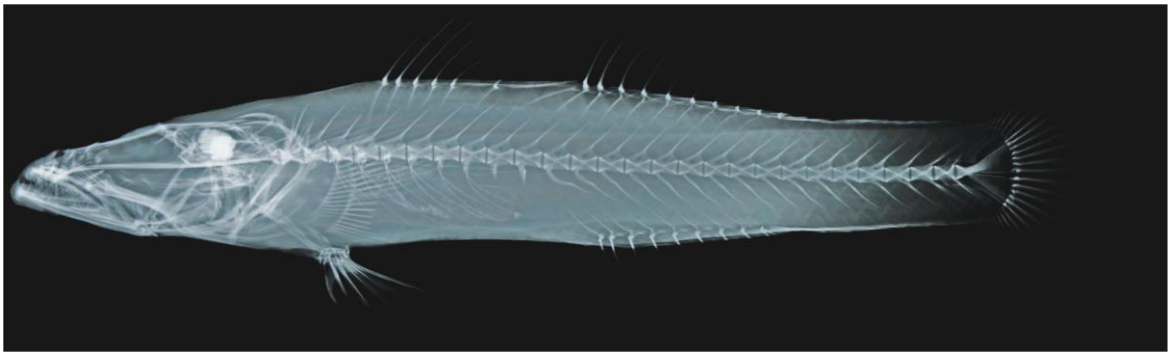

Fig. 3. X-ray image of lateral view of *Glossogobius laticeps* [KPM-NI 97200, 79.6 mm SL (image number: KPM-NR 292003P)]. Photo by Y. Ogata.

ray longest, following rays gradually shorter posteriorly, posterior rays shortest, reaching about halfway to caudal fin when appressed; spine of second dorsal fin as long as 3rd spine of first dorsal fin; all second dorsal-fin rays branched, posteriormost from base. Anal fin distal profile rounded, origin beneath 1st ray of second dorsal fin; 2nd–4th anal-fin rays longest; all anal-fin rays branched, posteriormost from base; posterior end of anal-fin base beneath base of 8th and 9th rays of second dorsal fin. Caudal fin rhomboid, with pointed posterior edge.

Squamation

Pre-dorsal region almost fully covered with smallish cycloid scales, reaching to just behind cephalic sensory canal pore E (Fig. 1D, Fig. 4A). Upper opercle (from top to approximately one-third of opercle) covered by a patch of small cycloid scales extending from anterior preopercular margin to beyond mid-opercular region (ca. 28, arranged in five vertical rows in KPM-NI 97200). Either side of isthmus with small cycloid scales. Remainder of head scaleless. Pectoral-fin base covered by small cycloid scales in 11 transverse rows, posteriorly reaching base of 4th–20th pectoral-fin rays. Pre-pelvic region covered by small cycloid scales. Remaining body scales with small ctenii. Caudal-fin base posteriorly covered by ctenoid scales of similar size to those of pre-pelvic region. Pre-pelvic and anterior pre-dorsal scales obscure (embedded under mucus layer in KPM-NI 3632).

Cephalic sensory systems (Fig. 4A–B)

Anterior oculoscapular canal pore openings: B′, C (S), D (S), E, F, G, and H′; posterior oculoscapular canal pore openings: K′ and L′; preopercular canal pore openings: M′, N and O′. Except for C (S) and D (S), all canal pore openings paired. Lines of papillae (Fig. 4B): line 1, double row from pore opening B′; line 2, irregular double row from vicinity of pore opening B′ and dorsally across snout; line 3, single row from beneath anterior nostril and connecting to line 4; line 4 extending from before posterior nostril to upper margin of lips in irregular double or triple transverse row; line 5, running below eye, in single row anteriorly and posteriorly, in double row around midpoint; line 6, single row branching from middle of line 5, posteriorly reaching beneath pore opening F; five longitudinal lines on cheek (lines 7–11); line 7, anteriorly and posteriorly single, in double row at midpoint, anteriorly joining line 5; line 8, a single row of relatively large papillae, posteriorly reaching pore opening N; lines 9 and 10, irregular double or triple rows, joined to each other anteriorly; line 11, single row of slightly distinct papillae; line 12, single row along underside of head, just above line 13 (also along underside of head but doubled and anteriorly reaching lower-jaw tip); line 14, single short, longitudinal row from under pore opening E; line 15, single longitudinal row of slightly distinct papillae, running between pore openings F and K′; line 16, single short, longitudinal row of slightly distinct papillae, running just above line 18, and starting from pore opening L′;

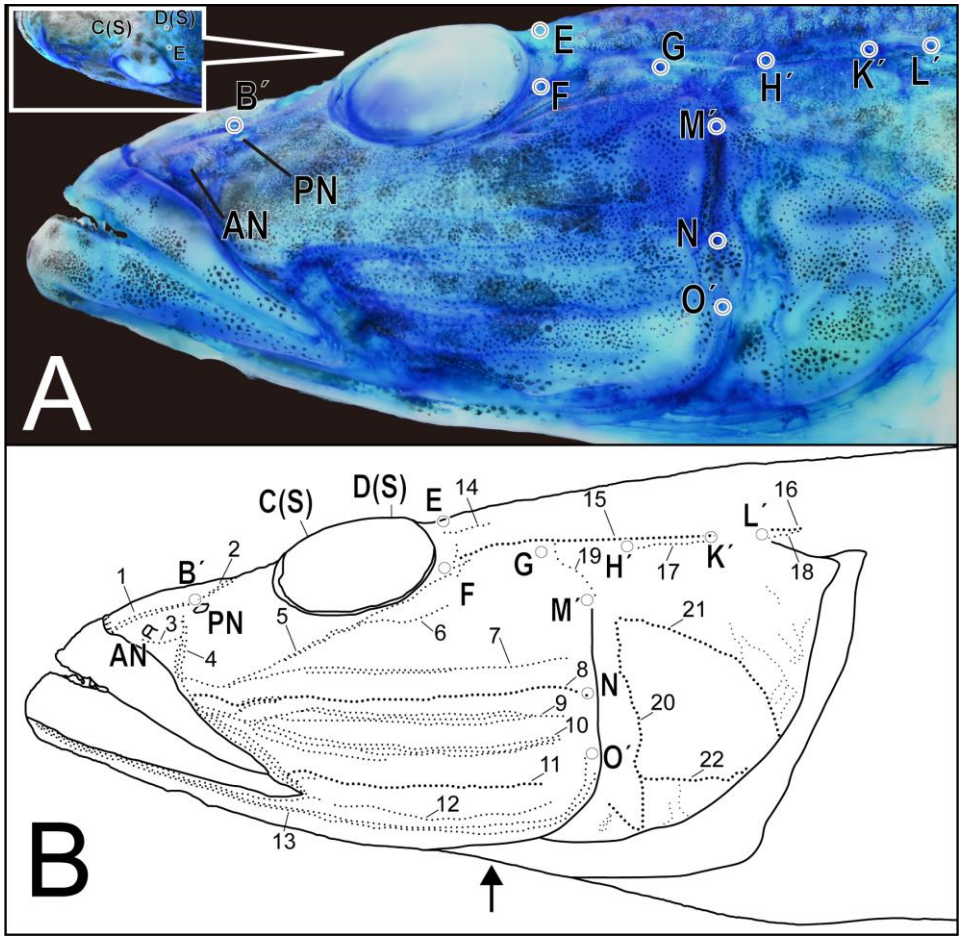

Fig. 4. A–B: Color image (A) and diagrammatic illustration (B) of head of preserved specimen of *Glossogobius laticeps* collected from lower reach of Mimi River, Hyuga City, Miyazaki Prefecture, Japan (KPM-NI 97200, 79.6 mm SL). A: head stained with cyanine blue. Terminology for cephalic sensory canal pore openings and papillae lines follows Akihito and Meguro (1975), with following exceptions, AN: anterior nostril; PN: posterior nostril. Arrow indicates lower attachment of gill membranes.

line 17, single longitudinal row between pore openings K′ and H′; line 18, single short, longitudinal row along line 16; line 19, single sparse row of indistinct papillae, diagonally extending between pore openings G and M′; line 20, single transverse row on anterior opercle; line 21, single longitudinal row from top of line 20, curving towards middle of posterior opercular margin; line 22, almost horizontal single row between lower part of line 20 and posterior opercular margin. Lines 20 and 22 with extra short thin rows of papillae at lower opercle; line 21 with similar at upper opercle.

Coloration of fresh specimen (Fig. 1A–E)

Dorsal and lateral body yellowish-brown with black mottling; ventral body whitish-yellow; seven longitudinal dark lines above and below midline of lateral body, dorsally indistinct; from uppermost, 1st and 7th lines thin, the latter relatively distinct, 2nd line more obvious than uppermost and lowermost lines, 3rd–6th lines prominent; 1st–3rd lines starting from anterior margin of nape, reaching origin of second dorsal fin (1st and 2nd lines) and base of 7th second dorsal-fin ray (3rd line), respectively; 4th–7th lines extending from pectoral-fin base to just before caudal-fin base; 7th line dotted; a pupil-sized single black spot diagonally backward of upper pectoral-fin base; five oval black spots larger than eye along mid lateral aspect of body, covering 4th–6th longitudinal dark lines; anteriormost black spot barely connecting

a black spot diagonally behind uppermost pectoral-fin base; posteriormost spot triangular, continuous with black blotch on caudal-fin base; patches of fine gold dots over entire body lateral surface, forming dotted mesh across 3rd–7th longitudinal dark lines. Lips pale, anteriorly yellowish; posterior end without pigmentation, but a distinct black blotch around either side. Upper lip anterodorsally with five small wedge-like black marks vertical to mouth opening, anteroventrally with six black spots increasing in size and sparser posteriorly; single semi-elliptical endogenous black spot on midpoint of dorsal profile. Tip of lower lip with a single large black spot; anterodorsally a black bar along mouth, with two black nostril-sized spots beneath bar; anteroventrally a single black blotch, followed by a second prominent blotch twice the size of the former; posteriorly with sparse black dots. Tip and center of chin weakly pigmented with sparse black dots, either side bordered by short longitudinal black band (Fig. 2E); sporadic diffuse black dots behind chin not forming distinct pattern. Center of isthmus pale, a longitudinal black border along either side. Dorsal margin of eye yellowish-brown, with six black spots in two longitudinal rows not connected to interorbital, and scattered fine goldish dots; a thin gold line along posterodorsal margin; anterior and posterior margin with small gathering of black dots, the former weaker; three small areas of black dots on inferior margin; iris dark gold, pupil bluish-black; two diagonal dark bars extending from anteroventral margin of eye to endogenous semi-elliptical black spot on upper lip, and from posteroventral margin to middle of preopercle, respectively (more distinct in life) (Fig. 1A). Cheek with large irregular cloud-like black blotches on lower half, ventrally smaller and posteriorly thinner; fine gold dots on upper half. Vicinity of papillae on cheek and lower half of nape without pigmentation, forming thin whitish line along each row of papillae. Nape with dark mottling and patches of irregular transverse dark bands, not being distinct dots. Posterior preopercular margin bordered by numerous black dots of various size. Upper half of opercle yellowish-brown (scaled area darker brown); lower half anteriorly blackish, and posteriorly goldish, with metallic sheen. Posterior opercular margin becoming darker dorsally, paler ventrally. Pectoral fin almost transparent, yellowish, with two pairs of dark blotches on base and anterior region of membrane near base, respectively; lower pair of blotches interconnected to form a circle tapering at midpoint; membrane anterodorsally with a dark quarter circle broken arc; fine black dots on upper and lower edges of all rays; base and lower edge of each ray goldish, ventrally brighter. Pelvic-fin spine, and 1st and 2nd rays whitish translucent, other rays whitish and goldish translucent, brighter towards midpoint of each ray; membrane almost transparent, with gold bordering and numerous fine silver dots near midpoint of each ray; a few small black dots on 3rd and 4th rays, and inter-spinous membrane. First dorsal-fin membrane almost transparent, without blotch near top of fin; a small weak accumulation of black dots on membrane just above posterior end of fin base; a small clearly defined black blotch on membrane behind 1st spine; diffuse black dots on membrane near tip of 4th–6th spines, becoming larger posteriorly; 1st spine with 3 black pigmented areas on anterior edge, upper half yellowish; 2nd spine blackish, except for base; 3rd–6th spines with black blotches on membrane, forming triple quarter-circle dotted arcs; accumulations of gold dots on 3rd–6th spines forming single quarter-circle dotted arc; fine gold dots diffuse on membrane behind 6th spine; membrane behind base of 1st spine and distally on 1st–3rd spines orangish. Second dorsal-fin rays whitish translucent; membrane almost transparent, with diffuse fine reddish-purple dots on margin; oval black blotches, posteriorly elongated or V-shaped, present near spine and following rays, forming three dark dotted lines; spine and vicinity orangish; vicinity of 7th–9th rays with diffuse silver dots. Anal fin

elements translucent; middle of each ray slightly yellowish, with gathering of fine black dots; membrane almost whitish with diffuse fine silver dots on margin; diffuse fine black dots posteriorly on membrane, denser posteriorly. Ventral surface of posterior caudal peduncle with short longitudinal gold bar. Caudal-fin base pale yellowish, with small gold spots; rays with six transverse dark stripes and goldish interspaces; a distinct black blotch near base of fin rays posteriorly touching membrane; upper and lower membrane almost transparent, with diffuse fine black dots, denser ventrally.

Coloration of preserved specimens

KPM-NI 97200: eye milky-whitish, obscuring pupil profile; body pale whitish with blotches and distinct longitudinal lines; gold metallic sheen on opercle faded, becoming silver; gold dots on head and body lost; diffuse fine reddish-purple dots on margin of second dorsal fin becoming black. KPM-NI 3632 and 3633 (Fig. 2A–D): eye whitish but pupil remaining distinct; black bordering either side of chin and isthmus slightly less distinct than in KPM-NI 97200; body yellowish-brown, ventrally paler; two uppermost longitudinal brown lines on lateral body surface indistinct, five following lines well defined; middle of pelvic fin grayish with whitish margin; anal fin grayish; metallic sheen on opercle, and gold dots on head and body absent. Remaining body coloration patterns similar to KPM-NI 97200.

Habitat

KPM-NI 97200 was collected from shallow water under a soil overhang in a creek with a muddy/sandy bottom, in the lower reach of the Mimi River. Submerged bamboos were found nearby. At the same time, *Eleotris melanosoma* Bleeker 1852, *Eleotris oxycephala* Temminck and Schlegel 1845, *Gymnogobius petschiliensis* (Rendahl 1924), *Microphis* (*Oostethus*) *brachyurus brachyurus* Bleeker 1853, *Rhinogobius similis* Gill 1859, *Sicyopterus japonicus* (Tanaka 1909) and an unidentified petromyzontid ammocoete larva were also collected.

Distribution

Glossogobius laticeps is distributed in the following Indo-West Pacific regions: Japan (Miyazaki Prefecture, Kyushu); northwestern and southwestern Taiwan; the coast of mainland China (Hong Kong); Indonesia (Papua); Papua New Guinea; northeastern Australia; and southern Iran (Hoese and Hammer 2021; Cheng et al. 2025; Zarei et al. 2025; present study) (Fig. 5).

Identification

The present specimens from Japan (KPM-NI 97200) and China (KPM-NI 3632–3633) corresponded closely to the following diagnostic characters of the genus *Glossogobius* (e.g., Hoese and Allen 2009; Akihito et al. 2013; Cheng et al. 2025): body elongated, anteriorly almost cylindrical and posteriorly compressed; snout long, with protruding lower jaw; mouth large, posteriorly reaching beneath eye; tongue bilobed; at least six lines of papillae running longitudinally on cheek; vicinity of pelvic-fin spines not protruded anteriorly; gill opening large, anteriorly extending beneath posterior preopercular margin; and 27 vertebrae. All of the specimens were subsequently allocated to the *Gl. giuris* complex, based on the following characteristics (Hoese and Hammer 2021): some lines of papillae on cheek (lines 7, 9 and 10) in two or more rows; a line of papillae under the head (line 13) in two rows; and mental fraenum indistinctly truncated, without elevated lateral lobes, and were later found to conform to the following diagnostic characters of *Gl. laticeps* (Hammer et al. 2021; Hoese and Hammer 2021; Cheng et al. 2025; Zarei et al. 2025): head depressed; no barbels near tip of lower jaw; in preserved specimens, tip and center of chin weakly pigmented with sparse black dots, paler in smaller specimen

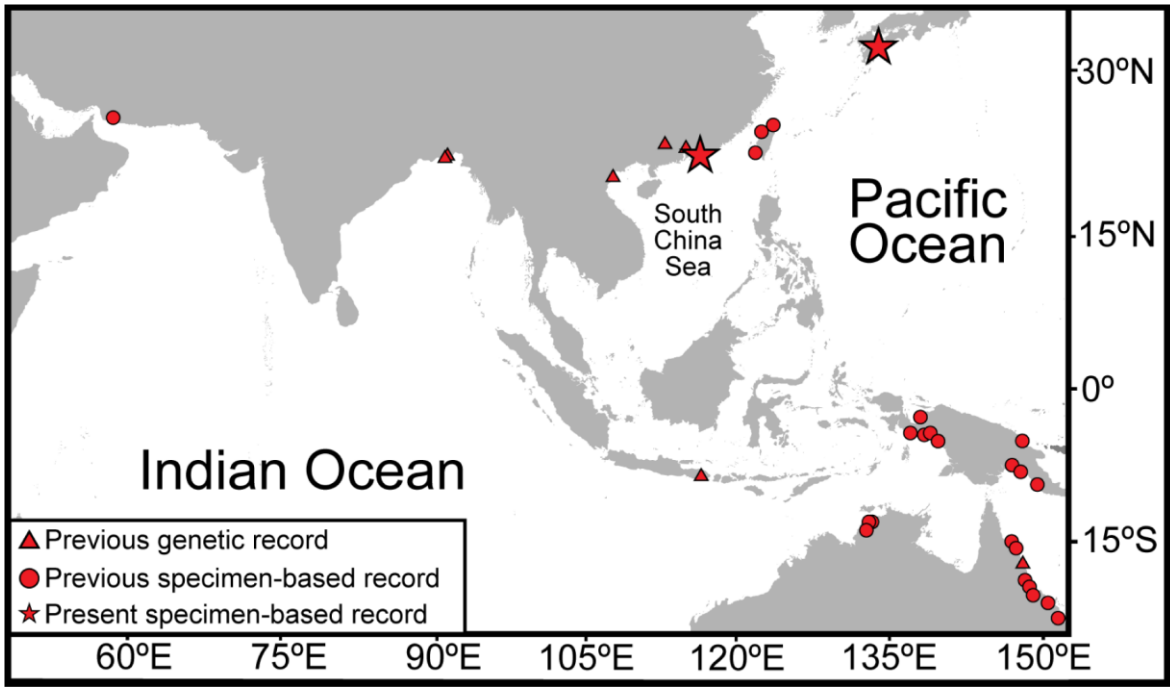

Fig. 5. A distributional map of *Glossogobius laticeps*, based on both genetic and specimen-based records.

(KPM-NI 97200), grayish in larger specimens (KPM-NI 3632–3633); no distinct transverse band behind chin; both sides of chin and isthmus bordered by short clear longitudinal black band in smaller specimen (KPM-NI 97200), slightly obscure in larger specimens (KPM-NI 3632–3633); nape without black dots; iris lacking projection into pupil; two dark bars starting from anteroventral and posteroventral margins of eye, and extending to middle of upper lip and middle of preopercle, respectively; number of pre-dorsal scales 25–27 (in KPM-NI 3632, anterior pre-dorsal scales embedded in mucus layer); pre-dorsal scaled area anteriorly touching cephalic sensory canal pore E; line of papillae beneath eye (line 5) in multiple rows, branched (line 6 present); no transverse row of papillae on cheek; curved line of papillae on upper operculum (line 21) with extra short rows; scalation on upper opercle starting from just behind anterior preopercular margin and posteriorly beyond midpoint of opercle; gill opening anteroventrally beyond posterior preopercular margin; body light brown, ventrally paler; four or more longitudinal dark lines on lateral body; five obvious oval black spots along midline of lateral body, with two longitudinal dark lines extending above and below former; pectoral fin yellowish, with 20 rays; pelvic fin whitish to grayish; first dorsal-fin membrane almost transparent, without distinct distal blotch; small weak accumulation of black dots on membrane just above posterior end of first dorsal-fin base, without a distinct blotch; near first dorsal-fin base, a small distinct black blotch on membrane behind 1st spine; 3rd–6th dorsal-fin spines with rows of black blotches forming triple quarter circle of dotted arcs; second dorsal fin with a single spine and nine rays; upper margin of second dorsal fin reddish-purple when fresh, blackish when preserved; black blotches in vicinity of each second dorsal-fin element forming triple dotted lines; anal fin whitish to grayish; no distinct unpigmented area behind triangular black spot on caudal-fin base.

Remarks

As mentioned above, *Gl. laticeps* has previously been reported from and southward of the Makran basin, Iran, the present specimen from Japan (KPM-

NI 97200) extending the northernmost record of the species by over 730 km. Hammer et al. (2021) and Zarei et al. (2025) also suggested that *Gl. laticeps* is possibly distributed across mainland China, Vietnam, Bangladesh and Indonesia (Jawa Timur), based on genetic samples [referred to as *Gl. giuris* clade A in Hammer et al. (2021)]. The present specimens from Hong Kong (KPM-NI 3632–3633) verified the distribution of *Gl. laticeps* in mainland China. Future distribution assessments require specimen-based confirmation from Vietnam and Bangladesh. Although Cheng et al. (2025: 169) described the distribution range of *Gl. laticeps* in Taiwan as "northwestern and southeastern Taiwan", the information appended to the examined specimens (Cheng et al. 2025: 163–164) indicates that the correct range is "northwestern and southwestern Taiwan".

An undescribed species in the *Gl. giuris* complex [*Glossogobius* sp. sensu Akihito et al. (2013) (Japanese name: Futago-haze)], has been reported from southern Japan and Taiwan, as well as in other regions of east and southeast Asia (Tomiyama 1936; Yonezawa 2010; Akihito et al. 2013; Maeda 2017). Based on morphological information from Tomiyama (1936) and Akihito et al. (2013), we concluded that *Glossogobius* sp. sensu Akihito et al. (2013) is a distinct species, meaning that the Japanese standard name "Futago-haze" is inapplicable to *Gl. laticeps*. The differences in morphology between *Glossogobius* sp. sensu Akihito et al. (2013) (noted by each study) and *Gl. laticeps* (Hammer et al. 2021; Hoese and Hammer 2021; Cheng et al. 2025; Zarei et al. 2025; present study) are as follows: seven longitudinal dark lines are clearly present, but are restricted to the upper-half of the lateral body (Tomiyama 1936: fig. 36) (vs. 1st and 7th dark lines on lateral body thin, the latter relatively distinct; 2nd line more obvious than uppermost and inferiormost lines, 3rd–6th dark lines prominent; inferiormost line on lower half of lateral body); Akihito et al. (2013: 1464) shows no line laterally on body (vs. seven longitudinal dark lines present); pre-dorsal scales and pectoral-fin rays numbered 15–19 and 19, respectively (Akihito et al. 2013) [vs. 19–27, 19–21 (mostly 20), respectively]; largest specimen reaching 200 mm SL (Akihito et al. 2013) (vs. largest known specimen 161.0 mm SL, maturation at ca. 80–120 mm SL). As Yonezawa (2010) and Maeda (2017) failed to provide detailed diagnostic information, although noting two dark bars extending from the anteroventral and posteroventral eye margins, it is difficult to determine whether the goby they treated was actually *Gl. laticeps*.

"Futago-haze" has hitherto been regarded as a Data Deficient species, referred to as *Glossogobius* sp. (Yonezawa 2010; Maeda 2017). In fact, although several records of "Futago-haze" have been reported (e.g., Akihito et al. 2013), the extents of its distribution range are unclear due to its confused taxonomy. If the gobies described by Yonezawa (2010), Akihito et al. (2013) and Maeda (2017) are indeed the same species, this could be because they belong to *Gl. giuris*, given its distribution range (i.e., east and southeast Asia) (Hammer et al. 2021; Hoese and Hammer 2021; Zarei et al. 2025). However, the possibility that *Gl. giuris* includes at least two cryptic and sympatric lineages (Hammer et al. 2021) and that east Asia represents the edge of the distribution range of *Gl. laticeps* and *Gl. giuris* (Hammer et al. 2021; Hoese and Hammer 2021; Zarei et al. 2025; Cheng et al. 2025), make a detailed examination of the relationship between these lineages and the apparent undescribed species necessary.

Glossogobius laticeps exhibits diadromous behavior in tropical and subtropical rivers, with its planktonic larvae inhabiting marine environments (Hoese and Hammer 2021; Zarei et al. 2025). Because *Gl. laticeps* has not been collected in comprehensive ichthyofaunal surveys along eastern Kyushu (Iwatsuki et al. 2017; Koeda et al. 2018, 2020; Murase et al. 2019, 2021), the occurrence of *Gl. laticeps* in

east Kyushu's warm temperate zone is likely accidental, resulting from northward larval transport driven by the Kuroshio Current. Additionally, the Japanese specimen was recognized as a juvenile, being < 90 mm SL (Hoese and Hammer 2021; Cheng et al. 2025; Zarei et al. 2025), with the sides of the chin distinctly bordered by a longitudinal black band (Cheng et al. 2025), and the urogenital papilla undeveloped (Hoese and Hammer 2021; Cheng et al. 2025). In contrast, the specimens collected from the subtropical coast of mainland China were recognized as adults, due to their size exceeding 100 mm SL (Hoese and Hammer 2021; Cheng et al. 2025), the obscurity of the longitudinal border on either side of chin (Cheng et al. 2025), and the distinct development and sexual dimorphism of the urogenital papillae (Hoese and Hammer 2021; Cheng et al. 2025). Therefore, although *Gl. laticeps* is likely to be abundant in areas further south of the subtropical zone, such as Taiwan (e.g., Cheng et al. 2025), the species may not be able to maintain a stable population in the warm temperate and subtropical zones influenced by warm currents flowing along the coasts of Kyushu, Shikoku, and Honshu in Japan. Interestingly, the northernmost distribution records of *Glossogobius* have recently been reported from this area (Koreeda and Motomura 2022; Furuhashi et al. 2023), including *Gl. bicirrhosus* from subtropical Japan (Furuhashi et al. 2023) [previously confined to tropical zones (Akihito et al. 2013; Yoshigo 2014)]. There has also recently been an increase in records of other tropical and subtropical estuarine and/or diadromous fish species along the coast of Miyazaki Prefecture (e.g., Ogata et al. 2017, 2021; Kurihara et al. 2021; Ogata and Murase 2022, 2023; Nakamura et al. 2025a,b; present study). The occurrence of *Gl. laticeps* in the temperate zone may also imply that its distribution range is expanding. However, in the case of *Gl. aureus* Akihito and Meguro 1975, a species often sympatric with tropical and subtropical populations of *Gl. laticeps* (e.g., Akihito and Meguro 1975; Cheng et al. 2025), the temperate record was based on specimens in the Kuroshio basin of Japan (excluding the Nansei Islands) in 1994–1997 (Ishida et al. 1998). Since that time, the species has not been observed during (at least) the last 10 years (Akihito et al. 2013; Yoshigo 2014; Nakae et al. 2018; Motomura 2023). Therefore, based on current distribution dynamics of its congeners, factors that may influence the occurrence of *Gl. laticeps*, are difficult to predict. Similar to previous suggestions for Indo-West Pacific populations (Hammer et al. 2021; Cheng et al. 2025; Zarei et al. 2025), the actual distribution range of *Gl. laticeps* in east Asia may also be underestimated, given that current records are extremely regional (Cheng et al. 2025; present study). Further data collection is essential for greater clarity.

At present, no applicable Japanese standard name exists for *Gl. laticeps*. Therefore, the new standard Japanese name "Tatesuji-uro-haze" is proposed for the species [based on the specimen from Miyazaki Prefecture, Japan (KPM-NI 97200)], "tatesuji" referring to the four or more dark longitudinal lines along the body, and "uro-haze" being the Japanese standard name for the genus *Glossogobius* (Hoese and Hammer 2021; Cheng et al. 2025; Zarei et al. 2025). Most of the other Japanese species of *Glossogobius* (and the *Gl. giuris* complex) either lack such lines, or, if present, are indistinct (Tomiyama 1936; Akihito et al. 2013; Hammer et al. 2021, Hoese and Hammer 2021; Zarei et al. 2025).

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