Descriptions of two new freshwater *Glossogobius* (Pisces: Gobiidae) from northern Papua New Guinea

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Abstract

Two new species of *Glossogobius* are described from the Sepik and Ramu river systems of northern Papua New Guinea. *Glossogobius coatesi* sp. nov. is known from 30 specimens taken at distances ranging from 380 to 435 km upstream from the sea, at elevations between 25 and 125 m. It is characterized by a combination of features which include a low number of second dorsal rays (I,8), usually I,8 anal rays, slightly thickened pelvic fins which are somewhat elongated, 27 vertebrae, and a pattern of five large dark blotches along the middle of the side. *Glossogobius torrentis* sp. nov. is described from over 200 specimens collected 450 to 680 km upstream at elevations between 200 and 1800 m. It is distinguished by a well developed mental frenum, low second dorsal and anal counts (I,9 and I,7 respectively), a short, rounded and thickened pelvic fin, and black spot at the rear part of the first dorsal fin.

Introduction

The Gobiidae is the largest family of marine fishes with over 1,500 species. Many species also occur in brackish and fresh waters, particularly in tropical latitudes. Gobiids and their close relatives, the Eleotrididae, are especially well represented in fresh waters of the Australia-New Guinea region. *Glossogobius* is particularly speciose there and is also widespread over a large area of the tropical Indian and Pacific oceans. Outside of Australia-New Guinea there are approximately 13 species, including three species which are primarily estuarine, and at least three others which probably possess a marine larval stage. Most of these were briefly described by Akihito and Meguro (1975). A review, currently in progress by the present authors, indicate there are 27 species occurring in the Australia-New Guinea region, including 16 which are undescribed. The majority of species inhabit freshwater streams and lakes of New Guinea. The present paper includes descriptions of two new species from the adjacent Sepik and Ramu drainages situated in northern Papua New Guinea. The material upon which the descriptions are based was collected by the junior author during trips to the Sepik in 1982 and to the Ramu in 1987, and by T. Roberts in the Ramu River in 1976. Details of the Sepik work and its fish fauna, including diagnoses of five species of *Glossogobius*, are provided separately in this volume in the paper by Allen and Coates.

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Methods

Methods for counts and measurements mainly follow those of Hubbs and Lagler (1958). The longitudinal scale count or scales in lateral series was taken from the upper pectoral base obliquely to the midline and then horizontally to the end of the hypural. The transverse scale row count was taken from the origin of the anal fin upward and backward to the second dorsal base. The count was begun just behind the anal spine. The uppermost small scale along the base of the second dorsal fin was counted as a half scale. Gill raker counts include all rudiments. The number of specimens containing a particular fin ray or spine count is indicated in parentheses immediately after the count in the descriptions. Numbers appearing with an asterisk include the count of the holotype. The last ray of the anal and second dorsal fins is divided at the base and counted as a single element. In the Tables, counts of the holotypes are indicated with an asterisk. Sex was determined by examination of the genital papilla. Head papillae drawings were based on camera lucida outlines, with papillae patterns a composite based of two or more specimens. Terminology of papillae follows Akihito and Meguro (1975) and Hoese (1983). Type specimens are deposited at the Australian Museum, Sydney (AMS); California Academy of Sciences, San Francisco (CAS); Commonwealth Scientific and Industrial Research Organisation, Department of Fisheries, Hobart (CSIRO); National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM); and Western Australian Museum, Perth (WAM).

Glossogobius coatesi sp. nov.

(Figures 1, 2 and 5a)

Holotype

WAM P.29620-009, 1(97 mm SL), Ramu River at Usema Village (5°42′S 145°23′E), G. Allen, D. Coates and L. Parenti, 23 October 1987.

Paratypes

AMS I.27880-001, 3(25-77 mm SL), Kwatit River at Junction with Sepik River (4°05′S 143°06′E), G. Allen & D. Coates, 28 October 1982; CAS 63337, 9(20-84 mm SL), taken with holotype; WAM P.27847-009, 5(24-79 mm SL), Kwatit River at Junction with Sepik River (4°05′S 143°06′E), G. Allen & D. Coates, 28 October 1982; WAM P.29617-001, 3(42-51 mm SL), Ramu River tributary at Brahman Mission (5°44′S 145°23′E), G. Allen and L. Parenti, 22 October 1987. WAM P.29620-006, 9(15-83 mm SL), taken with holotype.

Diagnosis

A species of *Glossogobius* characterised by a low number of second dorsal rays (I,8), usually I,8 anal rays, slightly thickened, somewhat elongate pelvic fins, 27 vertebrae, and a distinctive lobed mental frenum. It is most closely related to a group of species that includes *G. bulmeri, G. celebius,* and *G. torrentis.* It differs from *G. celebius* in lacking a pair of extra lateral canal pores above the preoperculum and also in lacking a short side branch (row 6) of papillae

row 5, and from *G. bulmeri* in having fewer soft dorsal rays (I,8 versus I,9-10), a less robust head shape, and in not having the prepelvic area and pectoral base fully scaled, and from *G. torrentis* sp. nov. in having 19-21 versus 15-18 pectorial rays, 14-17 versus usually 8-14 (12-16 in one population) predorsal scales, modally 9.5 versus 8.5 transverse scale counts, usualy 2 + 10 or 11 versus usually 1 + 6-9 gill rakers on the outer face of the first gill arch, usually 10 + 17 versus 11 + 16 or 11 + 17 vertebrae, and usually 8 rather than 9 soft rays in the second dorsal fin.

Description

First dorsal spines 6 (28*); segmented caudal rays 9 8 (23*), 9 9 (1). Other meristics are given in Tables 1-8.

Head length 27.8-29.3% SL; head depth at posterior preopercular margin 13.4-14.3% SL; head width at posterior preopercular margin 16.0-17.1% SL; snout 7.1-8.8% SL; eye without lappet, diameter about 1.2 in snout; eye diameter 4.6-6.2% SL in specimens 65-100 mm SL, 6.1-8.3% SL in specimens 37-50 mm SL; a small bump below eye; anterior nostril at end of short tube; posterior nostril with slightly elevated rim; preoperculum short, distance from end of eye to upper posterior preopercular margin subequal to eye in adult (4.8-5.6% SL in specimens 65-100mm SL); less than eye in juvenile (4.4-4.8% SL in specimens 37-50 mm SL); postorbital long, about equal to distance from anterior margin of jaws to posterior end of eye (14.2-15.4% SL); gill opening broad, reaching to below posterior preopercular margin; mental frenum prominent, curved with a lateral lobe on each side; tip of lobe free.

Mouth moderate; reaching to below anterior margin of jaw, length 9.2-11.2% SL; jaws forming an angle of 30-35° with body axis; upper margin of upper jaw in line with middle of eye. Teeth in upper jaw conical: outer row teeth slightly enlarged, curved and wideset, 2 inner rows of small inwardly directed teeth, followed by single row of medium sized inwardly directed teeth. Teeth in lower jaw conical: outer row teeth slightly enlarged, curved and wideset developed anteriorly only; 1-2 inner rows of small inwardly directed teeth, followed by single row of medium sized inwardly directed teeth. Tongue distinctly bilobed. Gill rakers on outer face of first arch short and slender; much shorter than filament length; rakers on inner face of first arch and other arches very short and stubby, not noticeably denticulate.

Cheeks slightly bulbous. Interorbital narrow, fleshy width subequal to pupil diameter, bony interorbital 1.6-2.0% SL in specimens 65-100 mm SL, 1.0-1.5 in specimens 37-50mm SL. Predorsal area scaled forward to just behind eye, with narrow triangular naked area in posterior interorbital region, scales ctenoid laterally and posteriorly, becoming cycloid anteriorly and medially; cheek naked; operculum with 1-2 rows of cycloid scales dorsally.

Body slender, depth at pelvic origin 15.8-16.9% SL; depth at anal origin 15.2-17.7% SL in specimens 67-100 mm SL, 13.4-14.8% SL in specimens 37-50mm SL.

Body covered mostly with large ctenoid scales, cycloid on midline of belly, prepelvic area, pectoral base and medially and anteriorly on predorsal area; small naked patch just behind pelvic insertion.

First dorsal fin low, without filamentous spines; second to sixth (males) or fourth to sixth (female) spines reaching approximately same point and extending beyond other spines when fin depressed. First dorsal fin triangular; second dorsal fin height subequal to first dorsal height; height of anal fin slightly lower than second dorsal fin; pectoral fin with obtuse posterior margin, reaching to just above or slightly beyond anus, 23.6-25.6% SL; pelvic disc long, reaching to anus, length 21.7-23.0% SL in specimens 65-100 mm SL, 23-7-26.0% SL in specimens 37-50 mm SL, width 12.9-14.3% SL; fifth pelvic ray with 11-13 terminal branches.

Head pores: Nasal pore above a point midway between anterior and posterior nostrils; anterior interorbital pore small, above midpupil; posterior interorbital

Figure 1. *Glossogobius coatesi,* holotype, 97 mm SL, male, Ramu River, Papua New Guinea.

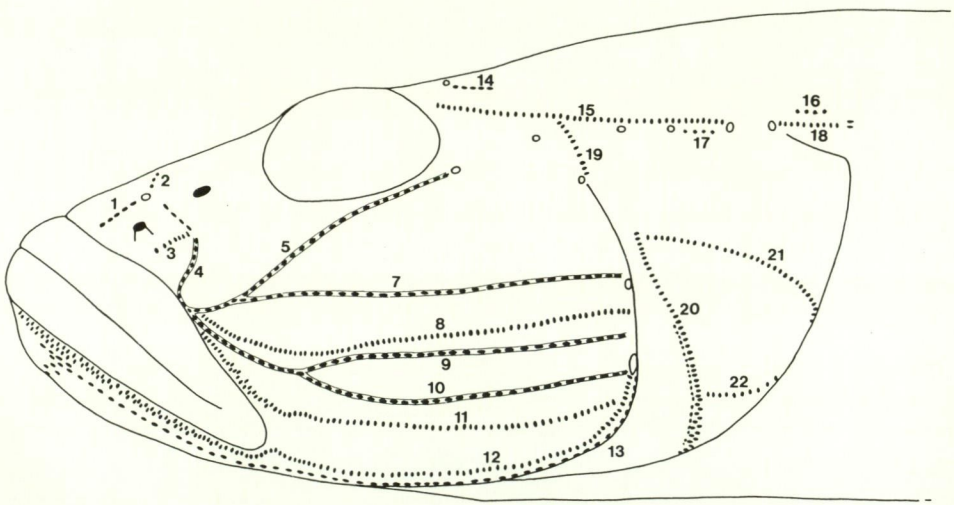

Figure 2. Head papillae pattern of *Glossogobius coatesi.* The numbering system of papillae rows is from Akihito and Meguro (1975).

pore minute, above posterior margin of eye; postorbital pore behind eye small and not in contact with eye; infraorbital pore below postorbital, moderately large; lateral canal long, with first pore above posterior quarter of preoperculum; second lateral canal pore above posterior preopercular margin; terminal lateral canal pore above middle of operculum; short tube above operculum, with pore at each end; 3 preopercular pores, upper pore in line with lower margin of eye and widely separated from lower 2 pores.

Papillae: (Figure 2). Line 1 (before nasal pore) a single row of papillae extending to end of snout. Line 2 (between nasal pores) a single row of papillae, line curved with a median gap between two sides. Line 5 (suborbital) single row of papillae forming oblique row. Line 6 (suboribital side branch) absent. Lines 7, 9, 10, 11 (lower cheek rows) each with single row of papillae. Line 12 (outer preopercular-mandibular) a single row of papillae forming longitudinal line ventrally becoming vertical along posteroventral margin of preoperculum. Line 13 (inner preopercular-mandibular) a single row of papillae forming longitudinal line ventrally and vertical line posteriorly. Line 20 (anterior opercular) composed of two rows of papillae or several rows anteroventrally. Line 21 (upper opercular) a single row of papillae in slightly curved row. Line 22 (lower opercular) a single line of papillae in short row. Other papillae: anterior sides of belly with numerous vertical papillae lines; two dense and merging clusters of papillae behind mental frenum; a vertical line of papillae anteriorly on most body scales.

Coloration in alcohol: Brownish on back grading to tan on lower sides of belly; 5 diffuse large rounded dark brown blotches on middle of sides, first below first dorsal fin, second below inter-dorsal area, third below second dorsal fin, fourth on caudal peduncle and fifth at base of caudal fin; top of snout and much of cheeks and operculum grey-brown; first dorsal fin mainly translucent or may have weak spotting, usually a small blackish spot (often absent in females) centred on sixth dorsal spine; second dorsal and caudal fin with diffuse dark spotting (more prominent in males), more or less arranged in rows; anal fin slightly dusky with whitish margin; pelvic and pectoral fins translucent; a brown wedge-shaped mark covering base of uppermost pectoral rays. Freshly captured specimens are similar in colour, although the dark spots and blotches on the body and fins are more prominent.

Distribution

The species is known from the Sepik and Ramu rivers at elevations from 25-125 m.

Etymology

Named for David Coates in recognition of his assistance with studies of fishes of Papua New Guinea.

Remarks

No major differences were noted in specimens from the Sepik and Ramu rivers.

Glossogobius torrentis sp. nov.

(Figures 3, 4 and 5b)

Holotype

WAM P.29615-009, 1(70 mm SL), Ramu River tributary near Dumpu airstrip (5°53′S 145°46′E), G. Allen, L. Parenti and G. Coates, 21 October 1987, 500 km upstream, 350 m elevation.

Paratypes

AMS I.27508-001, 15(28-64 mm SL), taken with holotype; CAS 63336, 77(25-63 mm SL), taken with holotype; CAS 63338, 42(15-56 mm SL), Ramu River tributary at Gusap Downs (6°06′S, 145, 145°58′E), G. Allen, L. Parenti and G. Coates, 21 October 1987; USNM 260513, 16(29-59 mm SL), Ramu River near Mt. Otto, T. Roberts, 11 February, 1976; USNM 263450, 6(46-71 mm SL), Ramu River tributary near Mt. Otto, T. Roberts, 10 February, 1976; WAM P.29614-007, 40(15-56 mm SL), Ramu River tributary at Gusap Downs (6°06′S 145°58′E), G. Allen, L. Parenti and G. Coates, 21 October 1987; WAM P.29615-002, 49(17-71 mm SL), taken with holotype; WAM P.29619-006, 3(26-44 mm SL), Ramu River tributary stream at Brahman Mission (5°44′S 145°22′E), G. Allen and L. Parenti, 23 October 1987.

Non-type Material

AMS I.27881-001, 7(30-43 mm SL), Wongol stream, 8 km E of Lumi, Torricelli Mts., Sepik River System (3°30′S, 142°07′E), G. Allen and D. Coates, 24 October, 1983; CSIRO B.322, 3(28-31 mm SL), Ganz River near Jimmi River junction, Sepik River system, A.M. Rapson, 8 December, 1955; CSIRO B.324, 3(23-49 mm SL), Jimmi River, at Rink River Bridge, Sepik System, A.M. Rapson, 10 December, 1955; WAM P.27835-005, 2(20-31 mm SL), Nimbrin Stream 4 km W of Maprik on Lumi Road, Torricelli Mts., Sepik River System, (3°37′S, 143°01′E), G. Allen and D. Coates, 19 October, 1982; WAM P.27840-003, 25(20-65 mm SL), Wongol Stream, 8 km E of Lumi Torricelli Mts., Sepik River System (3°30′S, 142°07′E), G. Allen and D. Coates, 24 October, 1983.

Diagnosis

A species of *Glossogobius* characterised by second dorsal rays usually I,9 and anal rays usually I,7 or I,8; a well developed mental frenum, a short, rounded and thickened pelvic fin; vertebrae usually 11 + 16 or 17; a black spot at the rear part of the first dorsal fin. It is most closely related to a group of species that includes *G. bulmeri, G. celebius,* and *G. coatesi.* It differs from *G. bulmeri* in having a less robust head shape and in not having the prepelvic area and pectoral base fully scaled, from *G. celebius* in lacking a pair of extra lateral canal pores above the preoperculum and also in lacking a short side branch (row 6) of papillae row 5, and from *G. coatesi* sp. nov. on the basis of the differences given under the diagnosis for that species.

Description

First dorsal spines 6 (64*); segmented caudal rays 8/7 (1), 8/8 (3), 9/7 (2), 9/8 (75*). Other meristics shown in Tables 1-8.

Head depressed, length 26.5-30.0% SL (27.0-30.0% SL in specimens 50-70 mm SL, 26.5-29.0% in specimens 40-50 mm SL); depth at posterior preopercular margin 14.8-16.2% SL in specimens 60-70m mm SL, 13.2-15.0% SL in specimens 40-60 mm SL; width at posterior preopercular margin 17.5-20.0% SL in specimens 60-70 mm SL, 15.7-17.4% SL in specimens 40-60 mm SL. Body depth at posterior preopercular margin increasing with size, 14.3-16.8% SL in specimens 60-70 mm SL, 11.1-15.4% SL in specimens 40-60 mm SL. Snout rounded in dorsal view, slightly convex in lateral view;; 7.2-9.9% SL. Eye about 1.6-2 in snout, 5.5-6.5% SL in specimens 60-70 mm SL, 5.7-8.1% SL in specimens 40-60 mm SL. Small bump below eye present. Anterior nostril at end of short tube, just above upper lip. Posterior nostril with raised rim, midway between eye and anterior nostril, about 2 nostril diameters from eye and from anterior nostril. Preoperculum short, distance from end of eye to upper posterior preopercular margin less than eye and about half snout length, 5.4-6.5% SL in specimens 60-70 mm SL, 3.9-5.0% SL in specimens 40-60 mm SL. Postorbital short, subequal to distance from tip of snout to mideye or to posterior end of eye, 13.7-16.1% SL. Gill opening reaching to below a point just behind posterior preopercular margin; mental frenum distinct, with curved posterior margin and short lateral lobes fused to chin.

Mouth small reaching to below anterior margin of eye to anterior margin of pupil; jaws forming an angle of 35-45° with body axis; upper margin of upper jaw in line with or just below lower margin of eye, upper jaw 10.1-12.3% SL in specimens 60-70 mm SL, 9.7-11.1% SL in specimens 40-60 mm SL. Teeth in upper jaw: outer row of teeth conical, slightly enlarged and wideset, 2 inner rows of smaller depressible inwardly directed teeth, innermost row larger than middle row. Teeth in lower jaw: teeth in outer row conical, slightly enlarged and wideset anteriorly, 2 inner rows of smaller depressible inwardly directed teeth. Tongue tip bilobed. Gill rakers on outer face of first arch short and pointed; much less than filament length. Rakers on inner face of first arch and other arches short and denticulate.

Cheeks bulbous; interorbital narrow, fleshy interorbital varying from slightly less than eye to slightly less than pupil diameter, bony interorbital 1.8-2.7% SL in specimens 60-70 mm SL, 0.7-1.2% SL in specimens 40-60 mm SL; predorsal area scaled forward to level just behind to just before posterior preopercular margin, side of nape sometimes scaled to eye; cheek and operculum naked.

Body slender, depth at pelvic origin 15.5-18.8% SL; body covered mostly with large ctenoid scales, cycloid on midbelly; pectoral base naked or with few scales on central or lower part; prepelvic area naked or with a small triangular patch immediately before pelvic fin, scales sometimes continuous with those on side of breast; belly with small naked patch immediately behind pelvic insertion; first dorsal fin acutely pointed, second and third spines longest and subequal. Second dorsal fin immediately behind first dorsal in male, separated by 2 scale rows in females; subequal in height to first dorsal fin. Anal fin slightly lower

than second dorsal fin. Pectoral fin with sharply rounded margin, reaching to above a point betwqeen anus and anal origin, length 23.6-27.0% SL. Pelvic fin fifth ray with 6-15 terminal branches. Pelvic fins thick, with heavily branched rays; pelvic disc as wide as long; reaching almost to anus, but well short of anal fin origin, length 16.3-22.8% SL, width 13.6-16.2% SL in specimens 60-70 mm SL, 12.0-14.5% SL in specimens 40-60 mm SL.

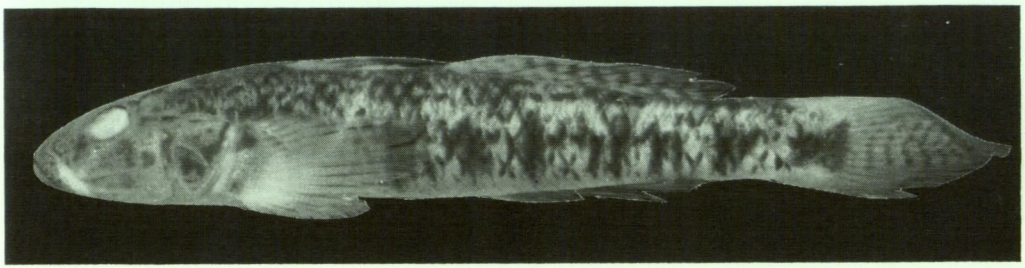

Figure 3. *Glossogobius torrentis*, holotype, 70 mm SL, male, tributary of Ramu River, near Dumpu, Papua New Guinea (WAM P.29615-009).

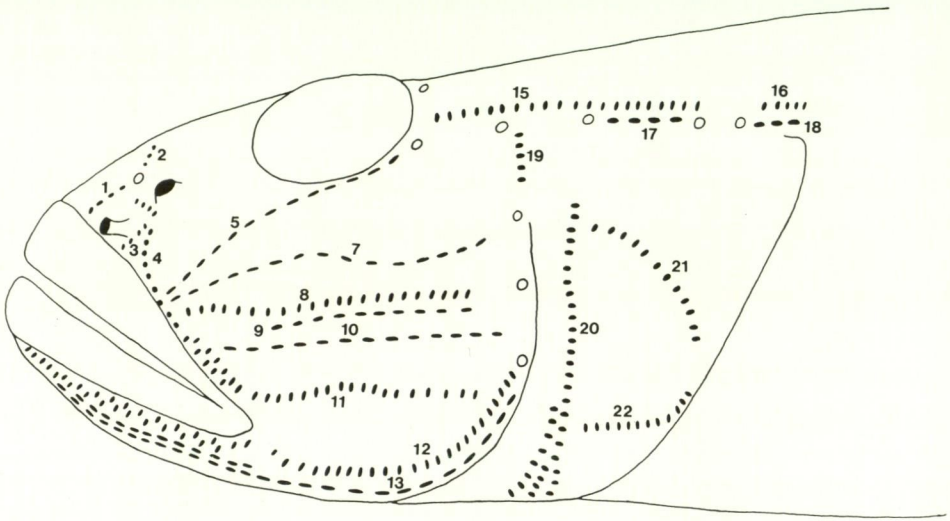

Figure 4. Head papillae pattern of *Glossogobius torrentis*. The numbering system of papillae rows is from Akihito and Meguro (1975).

Head pores: nasal pore just in front of posterior nostril; anterior interorbital pore; posterior interorbital pore; postorbital pore behind eye; infraorbital pore below postorbital; lateral canal pore above preoperculum; terminal lateral canal pore above anterior operculum; short tube above operculum, with pore at each end; 3 preopercular pores, upper in line with or just below lower margin of eye, middle pore midway between upper and lower pores.

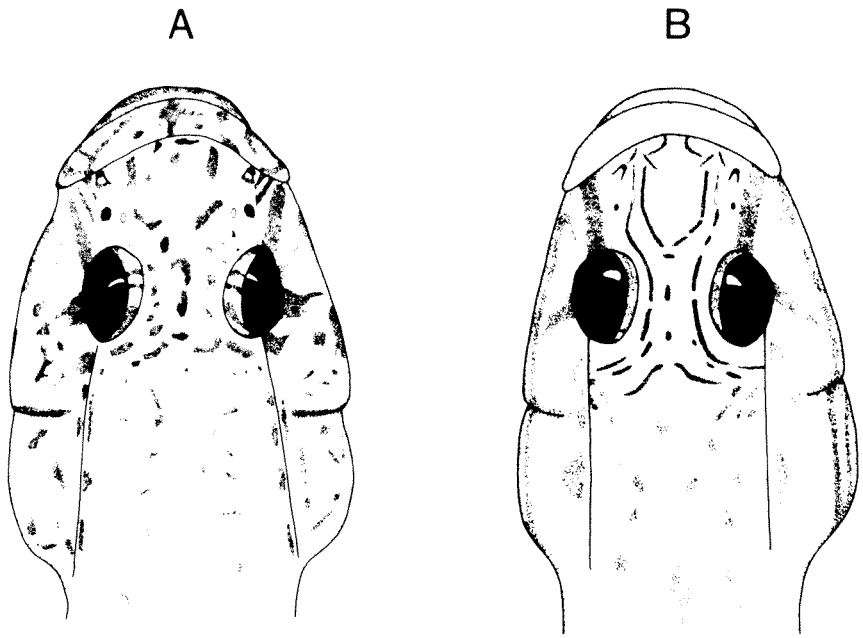

Figure 5. Dorsal view of heads showing pigment pattern. A. *Glossogobius coatesi*. B. *G. torrentis*.

Papillae: line 1 (before nasal pore) a short single row. Line 2 (between nasal pores) a single curved row continuous across snout or with a slight gap middorsally. Line 5 (suborbital) a single row meeting 7 below and slightly in front of anterior margin of eye. Line 6 (suborbital side branch) absent. Lines 7, 8, 9 and 10 (lower cheek rows) single, almost reaching posterior preopercular margin. Line 11 (lowermost cheek row) largely a single row, often double above posterior part of upper lip. Line 12 (outer preopercular-mandibular) a single row (appearing double adjacent to lower jaw), with a slight gap at end of jaws or no gap. Line 13 (inner preopercular-mandibular) varying from single row (in young) to 2 or 3 rows adjacent to lower jaw (in specimens over 50 mm SL), becoming single posterior to end of jaws. Line 20 (anterior opercular) a single row dorsally, becoming double ventrally. Line 21 (upper opercular) a single strongly curved row. Line 22 (lower opercular) a single row, curving dorsally a short distance along posterior opercular margin. Several vertical papillae rows on belly. A curved vertical line of papillae anteriorly on most body scales (often obscure dorsally and posteriorly).

Coloration in alcohol: Brown on back grading to tan on lower sides of belly; head and nape darker brown; scales with dark margins; often with duffuse brown blotches or bars on back and side, one below first dorsal fin, one below front of second dorsal fin, one near end of second dorsal fin and one on dorsal midline

of caudal peduncle; midside with broken longitudinal black or dark brown stripe; usually a large round blotch on midside below second dorsal origin, a slightly smaller spot anteriorly on belly ventral to middle of side and below first dorsal fin; midside of body with series of thin vertical dark brown lines, single or in groups of 2-3 lines; first groups below front of second dorsal fin, second below middle of second dorsal fin, third below end of second dorsal fin, and last two groups on caudal penduncle; a dark brown or black vertically elongate spot at base of caudal fin followed posteriorly by a triangular dark brown or black spot, the two spots often connected medially; first dorsal fin of males with black spot posteriorly; second dorsal fin with small brown spots in longitudinal rows; caudal fin with vertical bands of small brown spots; other fins mainly pale tan. Colour in life similar except black spot at rear of first dorsal fin surrounded by yellow.

Distribution

The species is known from the Torricelli Mountains and the Jimmi River in the Sepik River Drainage and in mountain streams of the Ramu River at elevations between 200 and 1800 m.

Remarks

Specimens from the Torricelli Mountains differ in several features from specimens from the Ramu River. Specimens from the Torricelli Mountains have 28 vertebrae compared with 27 in Ramu specimens (Table 7), generally fewer predorsal scales (Table 2), slightly higher pectoral ray counts (Table 1) and a smaller pelvic fin. Although the two forms may represent distinct species, they are treated as one here, largely due to the variability of the pectoral ray and predorsal scale counts in specimens from the Ramu River (Tables 1 and 2). Specimens from the Dumpu area tend to be intermediate with respect to these counts (Tables 1 and 2). Specimens from the Sepik River usually have 14 branched caudal rays, while adults from most localities in the Ramu River usually have 13 (Table 3). However, specimens from Gusap Downs on the Ramu River often have 14 branched caudal rays. Specimens from the Sepik River area have a shorter pelvic fin (16.3-20.0% SL in specimens 35-65 mm SL) than specimens from the Ramu River (19.6-22.8% SL). Specimens from the Jimmi River differ in having 9.5 transverse scale counts (versus usually 8.5, Table 4). Gill raker counts also show considerable heterogeneity (Tables 5 and 6). Because of the differences between specimens from the Sepik and Ramu rivers, the Sepik River specimens are excluded from the type series.

Etymology

From the Latin, *torrentis* = of a swift stream.

Table 1. Pectoral ray and counts in various populations of *Glossogobius coatesi* and *G. torrentis*.

Population	Pectoral Rays						
	15	16	17	18	19	20	21
G. coatesi	–	–	–	–	12	11*	1
G. torrentis							
Torricelli Mts.	–	11	11	–	–	–	–
Jimmi River	–	–	2	1	–	–	–
Dumpu (Ramu)	–	13	19*	3	–	–	–
Gusap Downs (Ramu)	–	5	22	3	–	–	–
Brahman Mission	–	1	2	–	–	–	–
Near Mt. Otto	3	5	12	1	–	–	–

Table 2. Predorsal scale counts in various populations of *Glossogobius coatesi* and *G. torrentis*.

Population	Predorsal Scales									
	8	9	10	11	12	13	14	15	16	17
G. coatesi	–	–	–	–	–	–	3*	5	8	3
G. torrentis										
Torricelli Mts.	2	2	3	3	–	–	–	–	–	–
Jimmi River	–	–	–	1	2	–	–	–	–	–
Dumpu (Ramu)	–	4	7*	5	2	2	–	–	–	–
Gusap Downs (Ramu)	–	–	–	–	2	2	4	5	2	–
Brahman Mission	–	–	–	–	1	1	–	–	–	–
Near Mt. Otto	–	–	–	6	6	7	3	–	–	–

Table 3. Branched caudal ray counts in various populations and size classes in *Glossogobius coatesi* and *G. torrentis*.

Population		Branched Rays				
		11	12	13	14	15
G. coatesi	(21-30 mm)	–	2	2	–	–
	(31-60 mm)	–	–	3	2	–
	(61-100 mm)	–	–	5	5	1
G. torrentis						
Torricelli Mts.	(21-30 mm)	1	1	3	1	–
	(31-50 mm)	–	–	2	13	1
Jimmi River	(28-31 mm)	–	–	–	4	–
Dumpu (Ramu)	(21-30 mm)	–	3	–	–	–
	(31-71 mm)	–	–	15	4*	–
Gusap Downs (Ramu)	(21-30 mm)	–	1	–	–	–
	(31-40 mm)	–	–	3	1	–
	(41-55 mm)	–	–	5	8	3
Brahman Mission	(26 mm)	–	–	1	–	–
	(43-44 mm)	–	–	1	1	–
Near Mt. Otto	(28-30 mm)	–	–	1	–	–
	(31-60 mm)	–	2	7	1	1

Table 4. Longitudinal and transverse scale counts in *G. coatesi* and various populations of *G. torrentis*.

Population	Transverse Count			Longitudinal Count					
	8.5	9.5	10.5	28	29	30	31	32	33
G. coatesi	–	19*	1	–	5	9	5*	–	–
G. torrentis									
Torricelli Mts.	11	1	–	–	3	2	3	3	1
Jimmi River	–	3	–	–	–	2	1	–	–
Dumpu (Ramu)	10*	–	–	4	4	6	1*	–	–
Gusap Downs (Ramu)	15	–	–	–	7	6	1	–	–
Brahman Mission	2	–	–	–	1	1	–	–	–
Near Mt. Otto	15	1	–	1	6	6	2	1	–

Table 5. Gill raker counts on outer face of first gill arch in *Glossogobius coatesi* and various populations of *G. torrentis*.

Population	Total Raker Counts						Upper Rakers		
	6	7	8	9	10	11	0	1	2
G. coatesi	–	–	–	1	7*	4	–	1*	11
G. torrentis									
Torricelli Mts.	–	2	6	3	–	–	–	10	–
Jimmi River	–	–	1	–	1	–	–	1	1
Dumpu (Ramu)	–	3	6*	2	–	–	–	10*	1
Gusap Downs (Ramu)	3	4	4	–	–	–	3	8	–
Brahman Mission	–	–	2	–	–	–	–	2	–
Near Mt. Otto	–	4	2	–	–	–	–	6	–

Table 6. Gill rakers on outer face of second arch in *Glossogobius coatesi* and various populations of *G. torrentis*.

Population	Total Raker Count				Upper Rakers	
	5	6	7	8	0	1
G. coatesi	–	8	7*	1	11*	1
G. torrentis						
Torricelli Mts.	1	7	2	–	8	1
Jimmi River	–	1	1	–	2	–
Dumpu (Ramu)	2	10*	–	–	12*	–
Gusap Downs (Ramu)	8	4	–	–	11	1
Brahman Mission	–	2	–	–	2	–
Near Mt. Otto	–	5	–	–	5	–

Table 7. Vertebral counts in *G. coatesi* and various populations of *G. torrentis*.

Population	Vertebrae					
	10+16	11+15	10+17	11+16	10+18	11+17
G. coatesi	1	–	10	–	–	–
G. torrentis						
Torricelli Mts.	–	–	–	–	1	11
Ramu River	–	1	–	51	–	2

Table 8. Second dorsal and anal ray counts in *G. coatesi* and various populations of *G. torrentis*.

Population	Second Dorsal Rays				Anal Rays			
	I,7	I,8	I,9	I,10	I,6	I,7	I,8	I,9
G. coatesi	1	26*	1	–	–	–	27*	1
G. torrentis								
Torricelli Mts.	–	5	23	–	–	25	3	–
Jimmi River	–	–	3	–	–	2	1	–
Dumpu (Ramu)	–	–	22*	9	–	27*	1	–
Gusap Downs (Ramu)	–	1	26	3	1	27	3	–
Brahman Mission	–	–	3	–	–	2	1	–
Near Mt. Otto	–	–	21	1	–	20	2	–

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