

# A provisional review of the genus *Stenogobius* with descriptions of a new subgenus and thirteen new species. (Pisces: Teleostei: Gobiidae).

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## Abstract

The gobiid genus *Stenogobius* Bleeker of the tropical Indo-Pacific is reviewed. The genus includes two subgenera, of which one is described as new, and 23 species, 13 are described as new. The subgenus *Stenogobius* Bleeker is of the Indian Ocean region and extreme western Pacific consisting of eight species included in two species groups; *Insularigobius*, subgen. nov. is known only from islands and consists of 15 species within two species groups. The subgenus *Stenogobius* is represented by *S. gymnopomus* (Bleeker), *S. kenya* Smith and *S. macropterus* (Duncker) of Indian Ocean drainages and *S. ingeri*, sp. nov. and *S. mekongensis*, sp. nov. of South China Sea drainages all of which form one species group; *S. laterisquamatus* (Weber), *S. ophthalmoporus* (Bleeker) and *S. psilosinionus*, sp. nov. from the extreme western Pacific form the second species group. The subgenus *Insularigobius* is represented by *Stenogobius caudimaculosus*, sp. nov., *S. genivittatus* (Valenciennes), *S. hawaiiensis*, sp. nov., *S. marqueti*, sp. nov., *S. randalli*, sp. nov. and *S. squamosus*, sp. nov. from the central Pacific and *S. alleni*, sp. nov., *S. blokzevli* (Bleeker), *S. fehlmanni*, sp. nov., *S. hoesei*, sp. nov., *S. kyphosus*, sp. nov., *S. marinus*, sp. nov. and *S. zurstrasseni* (Poeta) of the western Pacific form one species group; *S. polyzona* (Bleeker) from the western Indian Ocean and *S. beauforti* (Weber) from northern coastal streams of New Guinea form another distinctive group. The subgenus *Stenogobius* differs from *Insularigobius* by a combination of features which include coloration, counts of fin rays, rows of teeth, scales, color pattern on juveniles, sexual dimorphic and sexual dichromatic differences. Endemism is frequent in *Stenogobius* with species occurring within particular island groups, on particular islands or within discrete geographical regions.

## Introduction

The genus *Stenogobius* was first established by Bleeker (1874: 317) and included three subgenera; *Stenogobius*, *Oligolepis*, and *Gnatholepis*. Jordan & Seale (1905: 796) elevated *Gnatholepis* to generic level with their account of *G. deltoides*. *Oligolepis* was elevated to generic level by Koumans (1935: 141) with his account of *O. acutipennis*. Since the time of their original descriptions and subsequent elevation to generic level no questions have been raised over the validity of *Oligolepis* and *Gnatholepis*, but *Stenogobius* has been questioned time and time again. Due to the controversy over the validity of *Stenogobius* it has usually been placed in the genus *Awaous* Valenciennes (1837: 96) or its junior synonym *Chonophorus* Poey (1860: 274).

*Stenogobius* can be separated from *Awaous* most notably by the following characteristics: Gill rakers detached, rudimentary and not enclosed by elongate papillae; lack of papillae on gill structure, interior of gill cover and on palate; by having glossohyal bone truncate (somewhat bilobate on *Awaous*); lower jaw terminal (inferior on *Awaous*); pelvic disk not being adherent to body, frenum between pelvic spines without a small fold and pocket near base; caudal fin oblong and somewhat pointed on

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male (always rounded on *Awaous*); sexual dimorphism and dichromatism generally well developed. *Stenogobius* is limited to coastal plains in fresh water to near marine conditions. *Awaous* is occasionally reported from brackish water, but is most often found in fresh water where it is known to ascend streams to relatively high elevations (1000 meters).

In the past, much difficulty has existed over the identification of the species and the numbers that exist. Consequently most forms have been identified either as *Stenogobius genivittatus* (Valenciennes, 1837: 64) or *S. gymnopomus* (Bleeker, 1853a: 270). In Koumans (1953: 35) six species were placed in synonymy with *Stenogobius genivittatus*, of these five are considered valid, four are placed within the subgenus *Insularigobius* and one in the subgenus *Stenogobius*.

During the course of this study it was found that species are differentiated by various proportional measurements and/or by certain zones of squamation. In order to identify these differences it is best to have large samples from specific localities. Two distinctive groups were discovered and *Stenogobius* is herein divided into two subgenera. One of these subgenera has obvious external differences in color or squamation, while the other has very strong sexual dimorphic and dichromatic differences. The genus appears to be represented by 30 species. This study details 23 species of which 13 are described as new. There is considerable difference in the length of species, *Stenogobius alleni*, sp. nov., has so far been recorded with a maximum size of 39.1 mm SL; on the other hand the largest, *S. laterisquamatus* (Weber, 1908: 261) was recorded at 197.1 mm SL.

The two subgenera of *Stenogobius* are divided into two species groups that are strongly correlated to major geographic regions of the Indian and Pacific Oceans. This observation agrees with the biogeographical interpretation of the Pacific Plate presented by Springer (1982).

*Stenogobius* shows a high degree of endemism with the island of New Guinea being represented by the largest number of species followed by the Marquesas Islands. On the accounts of new species it could be argued that these may simply represent populations or varieties, especially in *Insularigobius*. This factor was taken into consideration and no clear intergradation could be substantiated. Distinct differences of related forms in close proximity could be found in the Papua New Guinea region and the Marquesas Islands.

Many of the collections from RMNH have proven to be problematic with some lots having more specimens present than just the type material. Through reading original literature attempts have been made to identify probable types. This situation exists with many of the Bleeker types.

## Methods

Methods follow those utilized by Watson & Lachner (1985). All lengths of specimens are expressed in standard length (SL) to the nearest tenth of a millimeter (mm). Jaw length was measured from anterior tip of upper jaw to posterior edge of maxilla. Formula for rows of teeth is referred to as follows; two to four rows of teeth present anteriorly and two laterally the formula reads 2-4+2, the first half of the formula always

refers to the anterior rows of the teeth and the second portion to the lateral rows. Scales in a horizontal series from upper pectoral base and along the middle of the body laterally to the central hypural base; transverse scale series, count starting at spine of second dorsal fin counting back and down to anal fin. Body depth is measured from anterior base of second dorsal fin to belly, this measurement taken only from males as females vary considerably from gravid to nongravid state.

### Abbreviations

Abbreviations used to designate institutions and collections cited follow Leviton et al (1985), except collections formerly of the Laboratory of Ichthyology, the Crown Prince's Palace (LICPP) which are here regarded as the Laboratory of Ichthyology, Akasaka Imperial Palace (LIAIP) following Akihito & Sakamoto (1989).

Abbreviations for cephalic sensory system follow Lachner & McKinney (1974): ANA, anterior nasal; NA, nasal; AITO, anterior interorbital; PITO, posterior interorbital; AOT, anterior otic; POT, posterior otic; IT, intertemporal; AT, anterior temporal; PT, posterior temporal; POP1,2,3, preopercular.

Abbreviations utilized to represent certain physical characteristics and measurements: A, anal fin; C, caudal fin; D, dorsal fin; LS, scales in horizontal series; P, pectoral fin; PD, predorsal midline scale count; TRB, transverse scale series.

Information and collection data pertaining species from KFRS follow Kailola (1975).

Accounts of species are arranged alphabetically after the nominal for each species group or complex. Species are arranged alphabetically by subgenus in tabular data.

## Systematics

### Genus *Stenogobius* Bleeker 1874: 317

#### Type species

*Gobius gymnopomus* Bleeker 1853a: 270 (type locality: Priaman, Sumatra) by original designation.

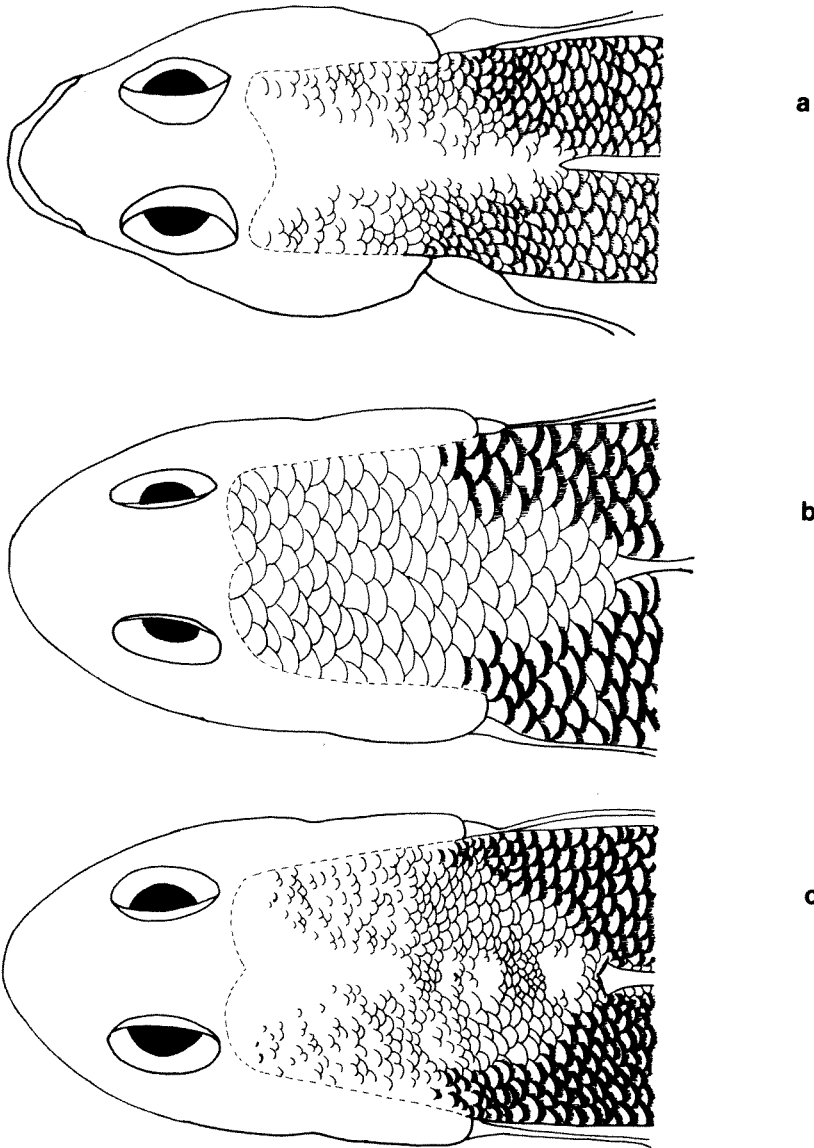
A small to relatively large sized (approximately 40 to 200mm SL), tropical Indo-Pacific goby usually inhabiting freshwater streams and rivers, occasionally marine environments; body elongate, subcylindrical and slightly compressed; head subcylindrical and slightly compressed; length of snout and width of interorbital space varies considerably with size and age of specimen; mouth terminal, lower jaw not protruding and slightly oblique, upper jaw protractile; opercle and preopercle without spines and edges smooth; six spines in first dorsal fin, first dorsal fin may or may not be free from second dorsal fin, often first dorsal fin on males not free while free on females, or free on young males and not on older males; pectoral fin rounded with upper rays free, not feathery in appearance, rays numbering 14-17; pelvic fin always 1,5, fifth rays of each fin joined together its entire length to form a cup-like disk not adherent to body, pointed posteriorly on males and rounded on females; origin of second dorsal fin slightly anterior to anus; caudal fin oblong, rounded on females and juveniles, pointed on males, almost always with 13 branched rays; fleshy papillae on shoulder girdle numbering from zero to five; all cutaneous sensory papillae oriented transversely in each row as defined in Hoese

(1983); pterygiophores 3(12210), as defined by Lachner & McKinney (1974: 875); vertebrate (including urostyle) 10+16=26; branchiostelgal rays five; gillrakers either absent or present as few detached rudiments; scales on body laterally ctenoid with single row of ctenii extending from behind pectoral base on adults and from posterior portion of nape above opercle on young specimens extending posteriorly on caudal fin base; scales on pectoral base, belly, breast, opercle and cheek cycloid; predorsal midline scales always cycloid when present, midline variable ranging from naked to fully scaled (Figures 1a, 1b & 1c); small cycloid scales may be present at bases of second dorsal and anal fins; teeth conical and recurved forming irregular rows, outer row most pronounced, adult males often with canine-like teeth, upper jaw teeth 1-6+0-3, lower jaw teeth 2-7+1-3, number of teeth sexually dimorphic with males possessing more and larger teeth than females, teeth absent from vomer and palatine; teeth on pharyngeals conical, not recurved; tongue slightly truncate to emarginate; gill opening restricted, isthmus broad extending ventrally to pectoral base; anterior nares in short tube, posterior nares without tube; cephalic sensory pore system ANA, NA, AITO, AOT, IT, AT, PT and POP1,2,3 (always paired), and PITO (singular), (Figure 2); dark mark on upper pectoral base, blackish in preservation, black with bluish tinge in life; sexual dimorphism usually developed; sexual papilla of males (Figure 3a) wedge shaped, on females (Figure 3b) the sexual papilla bulbous; sexual dichromatism may or may not be well developed; gut contents mainly with large amounts of fine sand particles, detritus, algae and tiny aquatic organisms; members of genus are substrate divers which seek shelter in the substrate when threatened or as evening falls.

Reproduction has been observed in *Stenogobius (Insularigobius) hawaiiensis*, sp. nov.; courtship involved males with fins extended, mouth open and gill covers extended outwards, dominant male drove away all other prospective males; females appear disinterested in this activity; the breeding site of the one observation was a length of electrical conduit about 300mm in length and approximately 50mm in diameter; the submissive female entered the selected site followed by the male; eggs were deposited on the roof of the conduit approximately 100mm from the entrance and cared for by the male, female was driven away after egg laying activity was completed; number of eggs could not be determined; length of incubation could not be determined as site was disrupted by flooding the following day.

#### Key to subgenera of *Stenogobius*

1a. Blackish bar under eye vertical and somewhat V-shaped extending from below eye to corner of jaw; dorsal and anal fins almost always with 10 rays; pectoral fin rays almost always 16, one species 15; jaw lengths not sexually dimorphic, usually less than 10% of SL; first dorsal fin higher than second with spines generally filamentous on both sexes, spines usually do not flex sharply posteriorly when fin is erect; body coloration not usually sexually dichromatic; juveniles with little or no markings over body, suborbital bar tiny . . . *Stenogobius* Bleeker 1874.



**Figure 1** a: Predorsal midline naked anterior to first dorsal fin; b: Predorsal midline completely scaled with large scales; c: Predorsal midline appearing patchy.

1b. Blackish bar under eye oblique and normally broad extending from below eye to lower edge of preopercle; dorsal and anal fins almost always with 11 rays; pectoral fin rays almost always 15; jaw length usually sexually dimorphic with males having lengths usually greater than 10% of SL and females usually less than 10% of SL; spines of first dorsal fin generally flex posteriorly when erect becoming parallel with body axis, first dorsal fin usually same height as second dorsal fin, spines generally not filamentous on males of most species, never filamentous on females; species sexually dichromatic; juveniles with spotting and bars over body, suborbital bar distinct . . . *Insularigobius*, subgen. nov.

### Subgenus *Stenogobius* Bleeker

(Tables 1-4)

#### Diagnosis

Dorsal fin almost always VI-1,10; anal fin almost always 1,10; pectoral fin rays 14-17, usually 16, one species 15; first dorsal fin normally higher than second dorsal fin with spines long and filamentous; jaw lengths not strongly sexually dimorphic and normally less than 10% of SL; body and fin markings somewhat distinctive; sensory papillae on lower preopercle in one or two rows (Figure 4a & 4b), either pattern may be present on individuals of the same species; sexual dichromatism not always apparent; blackish markings on upper pectoral base divided with one spot visible on upper pectoral base and another under gill cover.

Juveniles generally lack pigmentation, except for a narrow V-shaped bar below eye and banding on first dorsal fin. Some species may have close affinities with continental land masses. The *Stenogobius gymnopomus* species group occurs in the Indian Ocean and the South China Sea; *S. ophthalmoporus* species group occurs in the eastern Indo-Australian Archipelago which is included in the western Pacific.

#### Key to species of the subgenus *Stenogobius*

- 1a. Pectoral rays 15 to 17, usually 16 ..... 2.
- 1b. Pectoral rays 14 to 15, usually 15; Sri Lanka ..... *S. macropterus* (Duncker 1912).
- 2a. Predorsal midline always fully scaled ..... 3.
- 2b. Predorsal midline usually naked ..... 5.
- 3a. Scales in horizontal series 47 to 53 ..... 4.
- 3b. Scales in horizontal series 52 to 61; northern New Guinea  
..... *S. laterisquamatus* (Weber 1908).
- 4a. Predorsal scales 10 to 15; east Africa ..... *S. kenyae* Smith 1959.
- 4b. Predorsal scales 16 to 22; Vietnam to Japan, southward to  
Sulawesi and Ambon, Indonesia ..... *S. ophthalmoporus* (Bleeker 1853).
- 5a. Cheek always naked ..... 6.
- 5b. Cheek always scaled; southern New Guinea ..... *S. psilosinionus*, sp. nov.

- 6a. First dorsal fin with two black bands on basal half of fin .....7.
- 6b. First dorsal fin with black crescentic shaped marking at base and a black band medially; Jawa and Sumatera, Indonesia and Andaman Islands ..... *S. gymnopomus* (Bleeker 1853).
- 7a. Predorsal midline never entirely naked, usually with naked patches, three to 20 small scales present; posterior nostril on a line below lower edge of pupil; body depth 19 to 22% of SL in males; Mekong River Delta, Vietnam ..... *S. mekongensis*, sp. nov.
- 7b. Predorsal midline naked or with up to four scales anterior to first dorsal fin; posterior nostril on a line with center pupil; body depth 16 to 20% of SL in males; Sabah, Malaysia ..... *S. ingeri*, sp. nov.

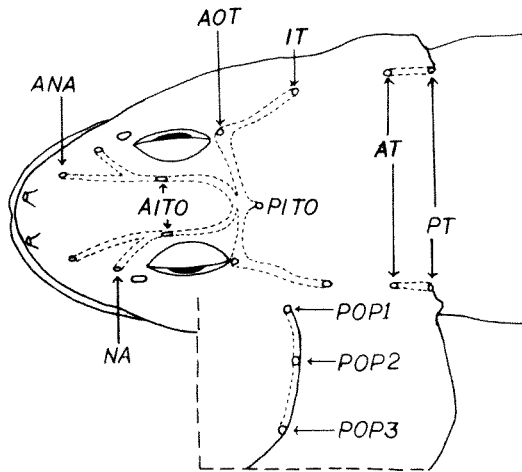


Figure 2 Cephalic sensory pore system.

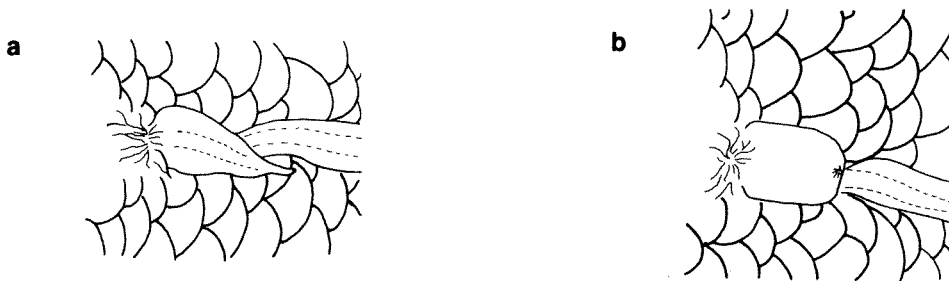
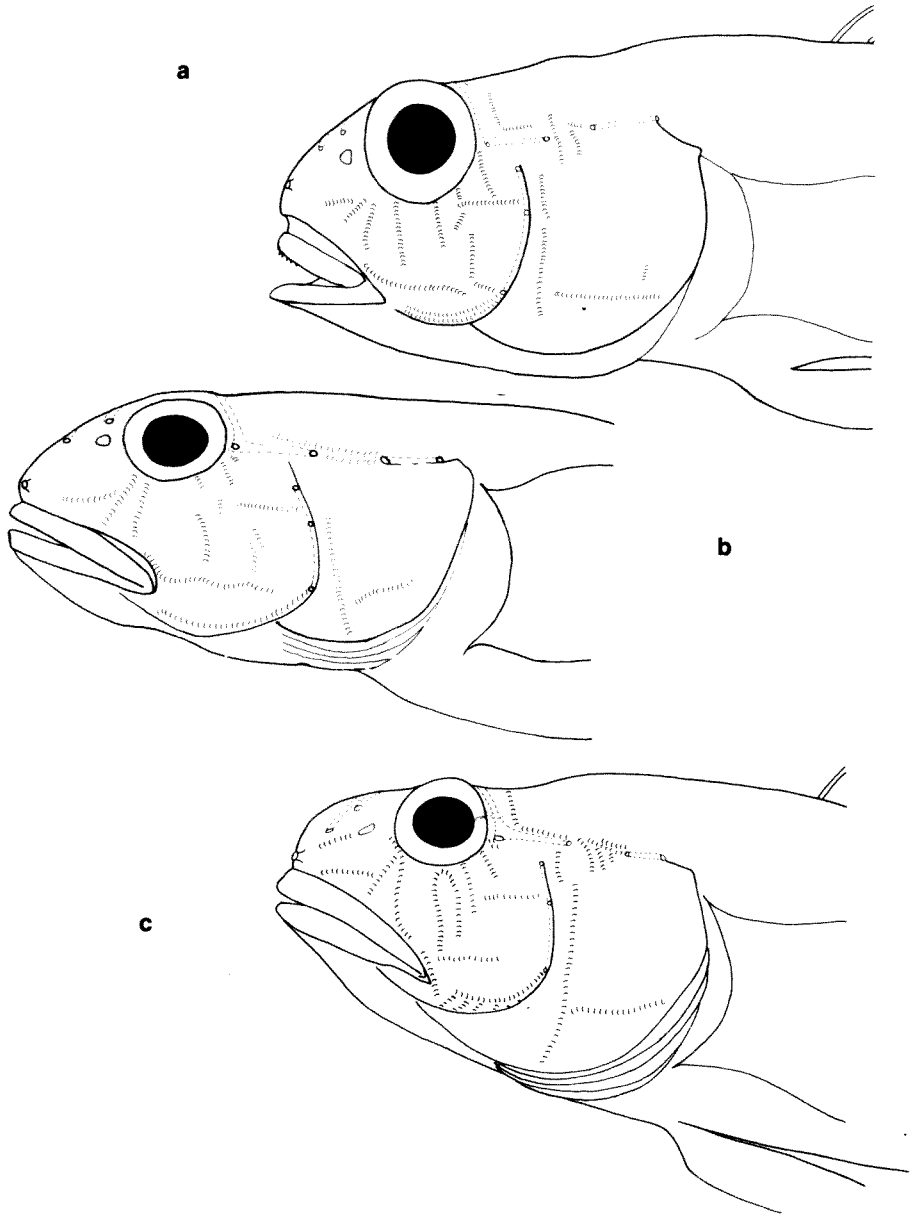


Figure 3 a: Sexual papilla of male; b: Sexual papilla of female.



**Figure 4** Cutaneous sensory papillae found on some individuals of the subgenus *Stenogobius*; **b**: Cutaneous sensory papillae found on some individuals of the subgenus *Stenogobius* and the *S. polyzona* species group; **c**: Cutaneous sensory papillae found on members of the *Stenogobius genivittatus* species group.



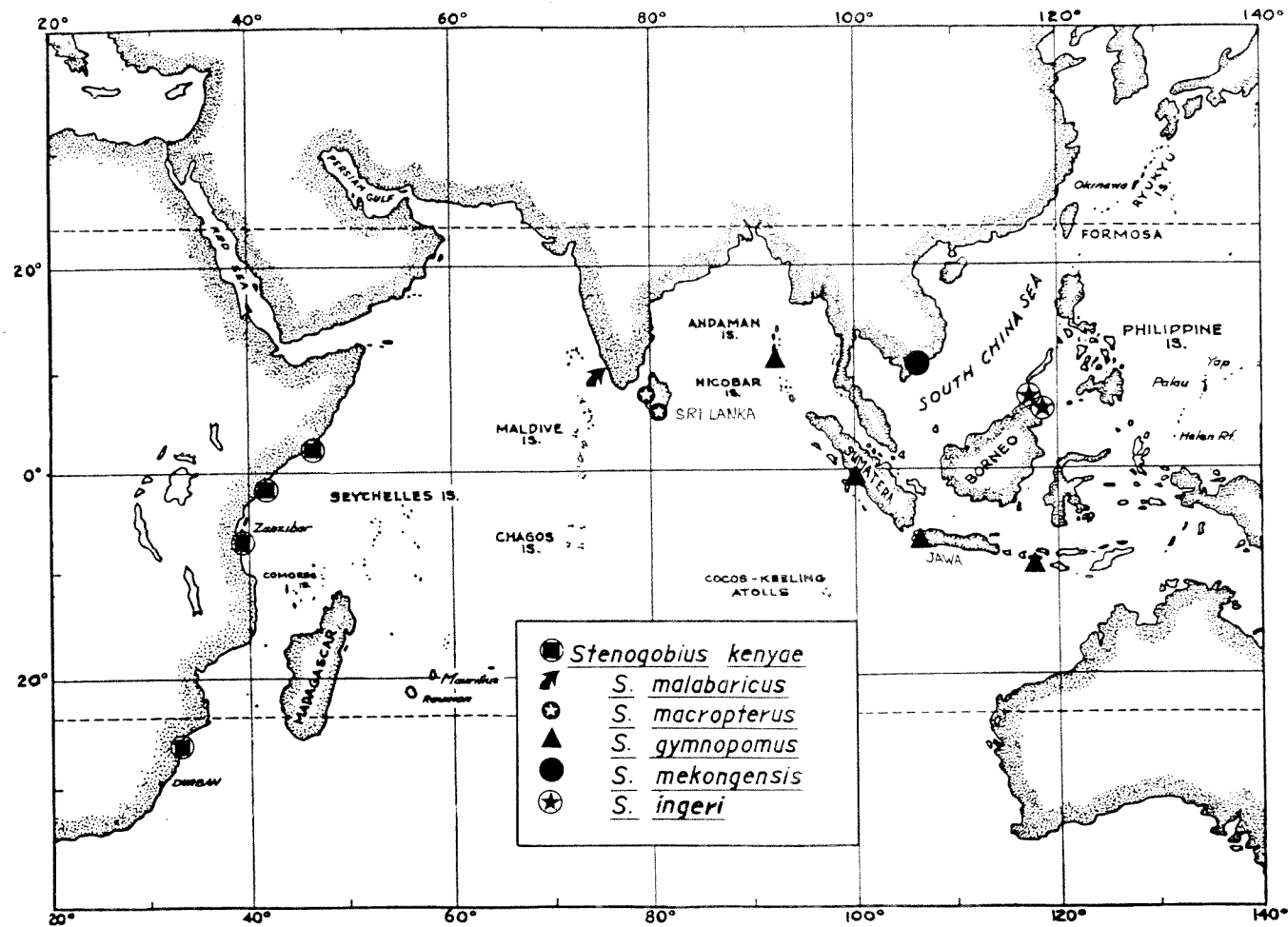


Figure 5 Distributional map of *Stenogobius gymnopomus* species group.

**Table 1** Morphometrics in species of the subgenus *Stenogobius* in percent of the standard length.

Species	Jaw length in males				
	6	7	8	9	10
<i>S. gymnopomus</i>			3	5	1
<i>S. ingeri</i>				12	3
<i>S. kenyae</i>				2	3
<i>S. laterisquamatus</i>			2	2	2
<i>S. macropterus</i>				2	1
<i>S. mekongensis</i>			1	—	3
<i>S. ophthalmoporus</i>		1	3	7	3
<i>S. psilosinionus</i>		1	4	4	4

Species	Jaw length in females				
	6	7	8	9	10
<i>S. gymnopomus</i>			4	2	1
<i>S. ingeri</i>	1	—	8	1	
<i>S. kenyae</i>				5	
<i>S. laterisquamatus</i>			4	2	
<i>S. macropterus</i>				1	
<i>S. mekongensis</i>			2	1	
<i>S. ophthalmoporus</i>			4	4	
<i>S. psilosinionus</i>		3	10	5	1

Species	Caudal peduncle depth					
	8	9	10	11	12	13
<i>S. gymnopomus</i>				8	9	
<i>S. ingeri</i>	1	1	11	11	1	
<i>S. kenyae</i>	1	—	—	5	4	
<i>S. laterisquamatus</i>		3	6	3	2	
<i>S. macropterus</i>				2	1	1
<i>S. mekongensis</i>				4	3	
<i>S. ophthalmoporus</i>			3	8	8	3
<i>S. psilosinionus</i>			1	13	16	2

Species	Caudal peduncle length							
	14	15	16	17	18	19	20	21
<i>S. gymnopomus</i>	2	—	6	5	2	2		
<i>S. ingeri</i>	1	5	6	11	1			
<i>S. kenyae</i>			1	5	3	1		
<i>S. laterisquamatus</i>			1	1	6	4	1	1
<i>S. macropterus</i>	1	—	1	2				
<i>S. mekongensis</i>				5	2			
<i>S. ophthalmoporus</i>		2	6	8	6	1		
<i>S. psilosinionus</i>		1	3	16	9	3		

Table 1 (continued)

	Body depth at second dorsal fin origin in males								
	16	17	18	19	20	21	22	23	24
<i>S. gymnopomus</i>					2	3	2		
<i>S. ingeri</i>	1	3	4	2	1				
<i>S. kenya</i>				3		1			
<i>S. laterisquamatus</i>				2	1	1			
<i>S. macropterus</i>						2	1		
<i>S. mekongensis</i>				1	—	1	1		
<i>S. ophthalmoporus</i>				2	5	3	3	—	1
<i>S. psilosinionus</i>		1	1	1	3	4	1	1	

	Head length						
	22	23	24	25	26	27	28
<i>S. gymnopomus</i>	1	5	4	5	2		
<i>S. ingeri</i>	1	—	9	14	1	—	2
<i>S. kenya</i>		2	3	1	1	3	
<i>S. laterisquamatus</i>	2	3	5	2	1		
<i>S. macropterus</i>			1	2	1		
<i>S. mekongensis</i>		2	3	1	1		
<i>S. ophthalmoporus</i>	1	9	4	5	1	—	1
<i>S. psilosinionus</i>			7	12	10	1	2

	Preanal length									
	50	51	52	53	54	55	56	57	58	59
<i>S. gymnopomus</i>				2	3	2	7	3		
<i>S. ingeri</i>				3	4	7	6	3	1	1
<i>S. kenya</i>			1	3	1	3	2	1	—	1
<i>S. laterisquamatus</i>	1	—	2	2	1	1	2	4		
<i>S. macropterus</i>					1	2	1			
<i>S. mekongensis</i>				1	2	1	2	1		
<i>S. ophthalmoporus</i>		1	—	4	6	4	3	4		
<i>S. psilosinionus</i>				2	4	6	7	5	2	2

***Stenogobius (Stenogobius) gymnopomus* species group.**

(Figures 5, 6a, 6b, 6c, 6d, 6e & 6f)

This species group is from the Indian Ocean with one species showing strong affinities to continental masses. The group is identifiable in having cheek naked; opercle almost always naked; predorsal midline usually naked or with naked patches, one species fully scaled; pectoral base naked or with scales primarily on central region of base, these may extend downward to lower base; usually three crescentic bars between second dorsal and anal fins.

Sexual dimorphic characteristics developed; male genital papilla somewhat conical and slightly depressed appearing wedge-shaped, about three times the length of the

length, length varies with size and age of specimen; on females genital papilla cylindrical with a rounded tip, about two times the length of base, appearing bulbous; all unpaired fins and filamentous spines of first dorsal fin longer on males than females.

This group is currently represented by five species of which two are described as new.

***Stenogobius (Stenogobius) gymnopomus (Bleeker 1853)***

(Figure 7)

*Gobius gymnopomus* Bleeker, 1853a: 270 (type locality: Priaman, Sumatra)

*Gobius richardsonii* Bleeker, 1853b: 508 (type locality: Padang, Sumatra)

*Gobius gymnopomus*. — Bleeker, 1859: 116

*Gobius richardsonii*. — Bleeker, 1859: 118

*Gobius gymnopomus*. — Gunther, 1861: 65

*Stenogobius gymnopomus*. — Bleeker, 1874: 317

*Stenogobius gymnopomus*. — Koumans, 1953: 34

**Material examined**

Twenty specimens from Indonesia and the Andaman Islands totalling nine males, seven females, four juveniles; size range 32.9 to 75.3, largest male 74.0, largest female 75.3, smallest gravid female 64.7.

**Probable holotype**

RMNH 4552, male (62.8), Priaman, Sumatra, Dutch East Indies, 1850, I. Pfeffer.

**Additional material**

IRSNB 19.853, 11(32.9-65.0), five males, two females, four juveniles, river at village of Nayapuram (Knappuram), South Andaman, Andaman Islands, 14 December 1974, J.-P. Gosse; MZB 4406, female (63.1), Ciawi, Sumur, Pandegland, Jawa Barat, Indonesia, 22 January 1982, Voetikno; MZB 4415, female (64.7), Selatan di Desa Cisiih, S. Cisiih, Sumur, Pandeglang, Jawa Barat, Indonesia, 23 January 1982, D. Wowor & D.I. Hartot; RMNH 4552, 5(67.5-75.3), three males, two females from same container as probable holotype, probably includes holotype for *Gobius richardsonii*, whose type locality is Padang, Sumatra in freshwater; SMF 6582, female (67.5), Brang-Nee River, Sumbawa, Dutch East Indies, January 1910, J. Elbert.

**Diagnosis**

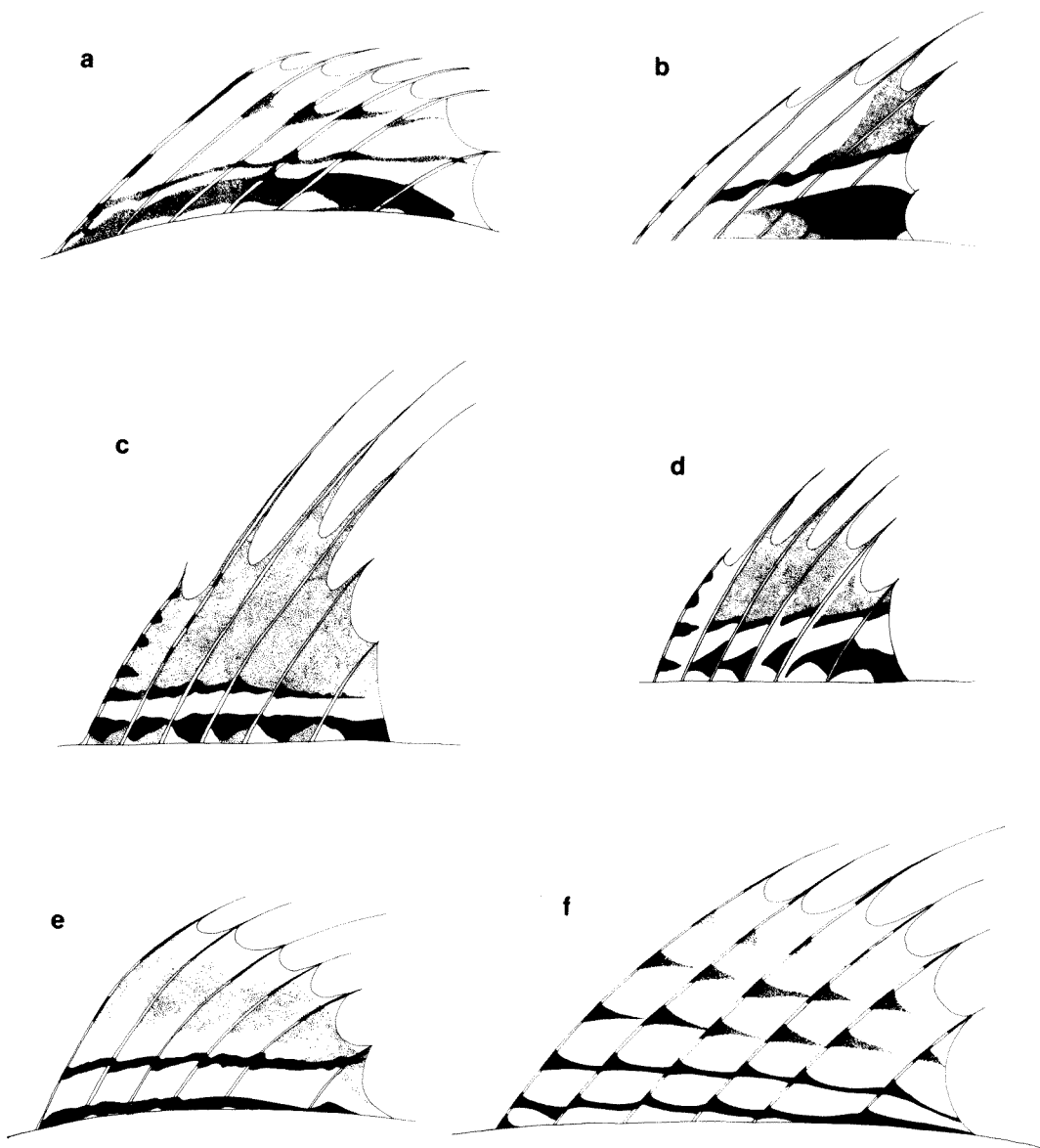
Cheek naked; opercle naked; central pectoral base sometimes scaled; breast and belly anteriorly naked; predorsal region naked or with few scales anterior to first dorsal fin; first dorsal fin with blackish mark on posterior half of fin near base, marking darkest posterior to fifth spine appearing slightly crescentic; pectoral fin rays 16.

**Relationship**

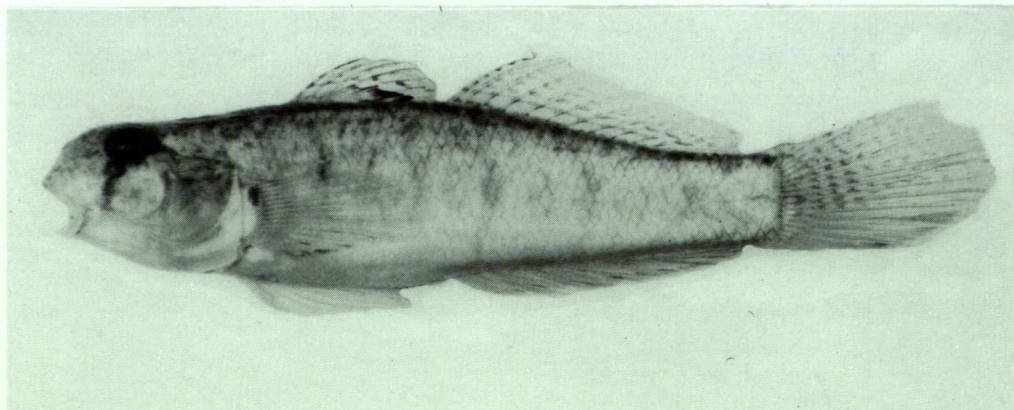
This species appears very close to *Stenogobius macropterus*, but differs by dorsal fin marking and having 16 pectoral fin rays.

**Description**

D VI-1,9 to VI-1,10, almost always VI-1,10; A 1,10; P 15 to 17, usually 16. LS 49 to 53, usually 50 to 52; TRB 11 to 13, usually 11 to 12; PD either naked or with scales near anterior base of first dorsal fin; cheek naked; opercle naked; pectoral base, usually



**Figure 6** a: First dorsal fin of *Stenogobius gymnopomus*; b: First dorsal fin of *Stenogobius macropterus*; c: First dorsal fin of male of *Stenogobius kenya*; d: First dorsal fin of female of *Stenogobius kenya*; e: First dorsal fin of *Stenogobius ingeri*; f: First dorsal fin of *Stenogobius mekongensis*.

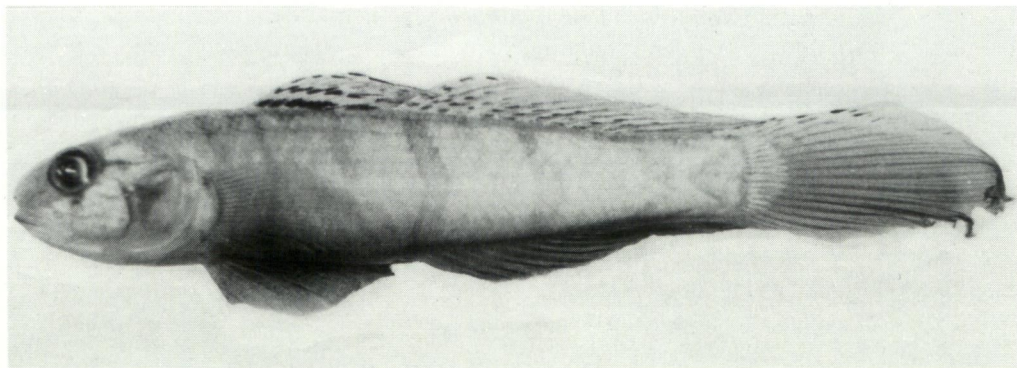


**Figure 7** *Stenogobius gymnopomus* (Bleeker), MZB 4415, female (67.7), Jawa Barat, Indonesia.

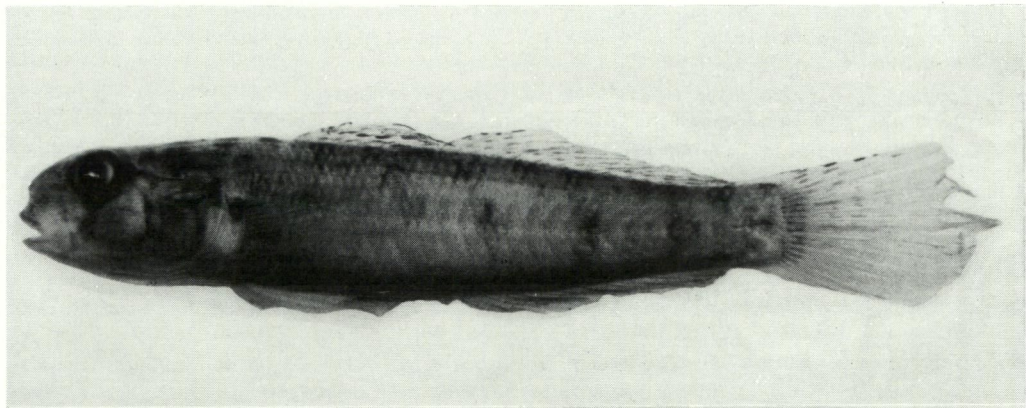
naked; anterior region of belly naked; breast naked. Jaw extending under anterior edge of eye. Upper jaw teeth, males 3+2; females 1-3+1. Lower jaw teeth, males 3-4+2, females 1-3+1-2.

Color in preservation: Background straw-yellow; snout slightly dusky with some blackish spotting; short black diagonal bar in front of eye; upper jaw dusky anteriorly; lower jaw with small dusky spot at anterior tip; some dusky spotting on cheek and upper opercle; nape with much black speckling, continuing posteriorly, but becoming less distinct; three faint brownish or blackish bars between second dorsal and anal fins, two brownish or blackish bars below the first dorsal fin; very faint dusky patch between each crescentic bar along midline; body ventrally without noticeable markings. First dorsal fin with black band along lower base, very faint anteriorly, posterior to fifth spine band intensifies then descends, disappearing between sixth spine and posterior base of fin, this band appearing crescentic, medially faint black band extending length of fin, both bands separated by translucent band, remainder of fin slightly dusky; spine on second dorsal fin with six black marks, remainder of fin with six even rows of black spots appearing on membrane between rays and spine; caudal fin with eight vertical bars formed by blackish pigmentation on membrane between rays and upper two-thirds of fin, most pronounced on upper anterior portion of fin, rest of fin slightly dusky; anal fin slightly dusky with dusky margin; pelvic disk without pigmentation on females, dusky between rays on males; pectoral fin without pigmentation.

Color in life: Life colors after Bleeker's original account based on the holotype. Upper body color green and yellow below; back sprinkled with dark spots; below dorsal fin three curved and angular dark streaks, angled convexly posteriorly; transverse dark band below eye; snout with irregular dark bands; spinous dorsal fin with violet base, middle streaked lengthwise in yellow, upper reddish-violet with yellow marks, dark rays violet-green with yellow marks, double margin of yellow and reddish-violet; pectoral fin yellow with black spot on upper base; pelvic disk violet; anal fin reddish-violet with



**a**



**b**

**Figure 8** a: *Stenogobius ingeri*, sp. nov., FMNH 68462, HOLOTYPE, male (68.7), Sabah, Malaysia; b: *Stenogobius ingeri*, sp. nov., NSMT P.41080, PARATYPE, female (51.4), Sabah, Malaysia.

double margin of violet and orange; caudal fin with violet and greenish marks above double margin of yellow and reddish-violet.

Bleeker does not equate dark to a specific color.

#### **Remarks**

**Distribution:** Known from the Indian Ocean slopes of Sumatera, Jawa and Sumbawa in western Indonesia and the Andaman Islands.

#### **Ecology**

Reported from rivers and estuaries near mouths of rivers in both marine and fresh water conditions.

***Stenogobius (Stenogobius) ingeri*, sp. nov.**

(Figures 8a & 8b)

*Stenogobius (Stenogobius) ingeri*, sp. nov. (type locality: Sungei Marikut, Kalabakan, Tawau District, Sabah, Malaysia)

*Stenogobius gymnopomus*. — Inger & Chin, 1962: 179

**Material examined**

Thirty three specimens from Sabah, Malaysia, totalling 16 males, 14 females, three juveniles; size range 26.0 to 68.7, largest male 68.7, largest female 62.9, smallest gravid female 41.1.

**Holotype**

FMNH 68462, male (68.7), Sungei Marikut, Kalabakan, Tawau District, Sabah, Malaysia, 16 June 1956, R.F. Inger.

**Paratypes**

AMS I.25616-001, two males (41.7-53.9), same collection data as holotype; FMNH 68458, male (60.8), Kinabatangan District, Sabah, Malaysia, 21 June 1956, R.F. Inger & P.K. Chin; FMNH 68461, two females (42.2-62.0), Sungei Maga, Kalabakan, Tawau District, Sabah, Malaysia, 11 June 1956, R.F. Inger; FMNH 96569, 12(26.0-63.0), six males, six females, same collection data as holotype; LIAIP 1956008, 2(26.0-42.0), one female, one juvenile, Kinabatangan District, Sabah, Malaysia, 6 June 1956, R.F. Inger; MZB 5650, two males (36.6-40.1), same collection data as holotype; NSMT P.41079, male (35.8), same collection data as holotype; NSMT P.41080, female (51.4), same collection data as holotype; SMF 20497, two males (35.6-49.0), same collection data as holotype; USNM 278369, 2(41.1-64.4), one male, one female, same collection data as holotype.

**Diagnosis**

Cheek naked; opercle naked; central pectoral base usually naked; belly anteriorly naked; breast naked; predorsal midline naked or with few scales anterior to first dorsal fin; body depth of males 16 to 20% of SL, usually 17 to 19%; first dorsal fin with two parallel black bands extending basally and medially entire length of fin.

**Relationship**

This species appears most closely related to *Stenogobius mekongensis* and more distantly to *S. kenya*. It differs from *Stenogobius kenya* by having predorsal region mostly naked, if scales are present these are always tiny; it differs from *S. mekongensis* by being more slender, and with fewer scales on predorsal midline and opercle naked.

**Description**

D VI-1,10 to VI-1,11, usually VI-1,10; A 1,10; P 15 to 17, usually 16. LS 49 to 54, usually 50 to 53; TRB 11 to 13, usually 11 to 12; PD usually naked; cheek naked; opercle naked; pectoral base usually naked; belly anteriorly naked; breast naked. Jaw reaching under anterior edge of eye. Upper jaw teeth, males 2-3+1-2; females 1-2+1. Lower jaw teeth, males 3-4+2; females 2-3+1-2.

Color in preservation: Background slightly brownish; three well developed, broad crescentic blackish bars between second dorsal and anal fins, two or three faint blackish bars below first dorsal fin; dusky spot at hypural base; body ventrally without notable markings. Snout slightly dusky, may have some weak spotting; upper jaw slightly dusky, lower jaw with small dusky spot on anterior tip; cheek without spotting; upper opercle



**Table 2a** Fin length in males of species belonging to the subgenus *Stenogobius*, expressed to the nearest whole percent of the standard length.

		Second dorsal fin length																							
		38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
	<i>S. gymnopomus</i>		1	—	1	1	2	—	1	2	—	—	—	1											
	<i>S. ingeri</i>				1	—	2	1	2	1	2	1	1	—	—	1	2	—	—	—	1				
	<i>S. kenya</i>											1	—	1	1	1									
	<i>S. laterisquamatus</i>									1	1	—	1	—	1	1	1								
	<i>S. macropterus</i>										1	—	—	—	—	—	—	2							
	<i>S. mekongensis</i>					1	—	1	—	—	—	—	1	—	—	1									
	<i>S. ophthalmoporus</i>	1	—	—	—	2	—	—	—	—	1	—	—	1	—	1	3	1	2	1					
	<i>S. psilosinonius</i>	1	—	—	—	—	—	2	—	—	—	1	1	1	1	—	—	2	2	—	—	1	—	—	1

		Anal fin length																		
		38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	
	<i>S. gymnopomus</i>		1	1	1	2	1	2	—	—	—	1								
	<i>S. ingeri</i>			2	1	—	2	1	2	1	2	1	1	1	—	—	—	—	1	
	<i>S. kenya</i>										1	1	1	1						
	<i>S. laterisquamatus</i>								2	1	—	—	1	—	1	1				
	<i>S. macropterus</i>								1	—	—	—	—	1	1					
	<i>S. mekongensis</i>					1	—	—	—	2	—	1								
	<i>S. ophthalmoporus</i>	1	—	1	—	1	—	1	—	—	1	1	—	2	2	1	2	1		
	<i>S. psilosinonius</i>		1	1	—	2	—	—	1	2	—	—	2	—	2	—	1	—	1	

		Caudal fin length																							
		24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
	<i>S. gymnopomus</i>	1	—	1	2	—	—	—	1	—	—	—	—	—	—	—	1								
	<i>S. ingeri</i>					1	—	2	2	—	—	2	—	2	—	1	—	2	—	1	1	—	—	—	1
	<i>S. kenya</i>													1	—	1	1	1							
	<i>S. laterisquamatus</i>															1	1	—	—	—	1	—	—	—	1
	<i>S. macropterus</i>												1	—	—	—	—	1	—	—	—	—	—	—	1
	<i>S. mekongensis</i>				1	—	—	—	—	—	—	—	—	—	—	1	—	1							
	<i>S. ophthalmoporus</i>															1	—	1	—	2	2	—	1	1	1
	<i>S. psilosinonius</i>										1	—	2	1	—	1	1	2	—	1	—	1	—	2	

**Table 2b** Fin lengths in females of species belonging to the subgenus *Stenogobius*, expressed to the nearest whole percent of the standard length.

	Second dorsal fin length										
	35	36	37	38	39	40	41	42	43	44	45
<i>S. gymnopus</i>						2	1	2	—	1	
<i>S. ingeri</i>	1	1	2	3	2	—	1				
<i>S. kenyae</i>					2	—	2	1			
<i>S. laterisquamatus</i>			1	1	—	1	1	2			
<i>S. macropterus</i>											1
<i>S. mekongensis</i>									2	1	
<i>S. ophthalmoporus</i>					1	2	1	1	1	—	1
<i>S. psilosinionus</i>	1	1	2	—	2	3	3	4	2	1	

	Anal fin length												
	33	34	35	36	37	38	39	40	41	42	43	44	
<i>S. gymnopus</i>									2	3	1	—	1
<i>S. ingeri</i>	1	—	—	3	3	2	1						
<i>S. kenyae</i>					1	1	2	1					
<i>S. laterisquamatus</i>			1	2	—	2	—	1					
<i>S. macropterus</i>												1	
<i>S. mekongensis</i>										2	1		
<i>S. ophthalmoporus</i>						2	3	1	—	—	—	—	1
<i>S. psilosinionus</i>			1	4	3	2	8	1					

	Caudal fin length												
	24	25	26	27	28	29	30	31	32	33	34	35	36
<i>S. gymnopus</i>				1	—	3	—	1					
<i>S. ingeri</i>			2	1	—	3	2						
<i>S. kenyae</i>						1	1	—	2				
<i>S. laterisquamatus</i>				1	2	1	—	1	1				
<i>S. macropterus</i>													1
<i>S. mekongensis</i>						1	1	—	—	—	—	1	
<i>S. ophthalmoporus</i>				1	—	2	1	—	—	—	—	—	1
<i>S. psilosinionus</i>			2	—	1	1	2	3	4	5			

may have two or three blackish bands; nape with four blackish bands that may appear as divided symmetrical spots on large specimens, similar banding along dorsum to caudal peduncle, not distinctive posteriorly. First dorsal fin with black band along entire base, medially another black band extending length of fin, these are separated by a translucent band, distally fin is dusky, tips of the first four spines black; spine on second dorsal fin with black marks anteriorly, three to four rows formed by dusky spots on membrane between rays extending length of fin; caudal fin light above with some dusky markings on upper anterior half of fin, darkest along margin, lower half of fin dusky; anal fin and pelvic disk dusky on males, pelvic disk translucent on females, anal fin also translucent, but with dusky margin.

### Remarks

Distribution: Known only from the Malaysian province of Sabah on northeastern Borneo.

Ecology: Specimens examined were collected from streams and rivers in fresh water near the coast.

Etymology: This species is named for Robert F. Inger who collected all known specimens.

### *Stenogobius (Stenogobius) kenya* Smith 1959

(Figure 9)

*Stenogobius kenya* Smith, 1959: 190 (type locality: Sabaki River, Kenya)

*Stenogobius gymnopomus*. — Smith, 1959: 190 (Somalia)

### Material examined

Ten specimens from the eastern coastal region of Africa, totalling five males, five females; size range 26.8 to 83.6, largest male 83.6, largest female 64.1, smallest gravid female 58.6.

### Paratypes

RUSI 878, 3(58.6-83.6), one male, two females, Sabaki River, Kenya.

### Additional material

CAS-SU 31507, male (60.4), Msimbazi Creek, Dar-Es-Salaam, Tanzania, 26 April 1934, A.W.C.T. Herre; NMC 81-193, two females (38.9-44.7), Rufiji River at Utete, east end of town adjacent to Lake Chemchem, Tanzania, 30 July 1979, A.J. Hopson *et al*; NMC 81-194, male (51.0), Rufiji River mouth shore at Ndundu ferry landing, Tanzania, 31 July 1979, A.J. Hopson *et al*; RUSI 5456, male (26.8), Sodwana Bay, Kwazulu, South Africa, 25 November 1975; ZMH 19307, 2(41.2-58.5), one male, one female, Giuba River, Gumbo, Somalia, 14 December 1926, D. Vinciguerra.

### Diagnosis

Cheek naked; opercle usually naked, may have few large scales; pectoral base naked; belly usually naked, may have few thin scales; breast usually naked, may have one to five scales; predorsal region fully scaled with large scales numbering 10 to 15; first dorsal fin with two parallel black bands on basal half of fin.

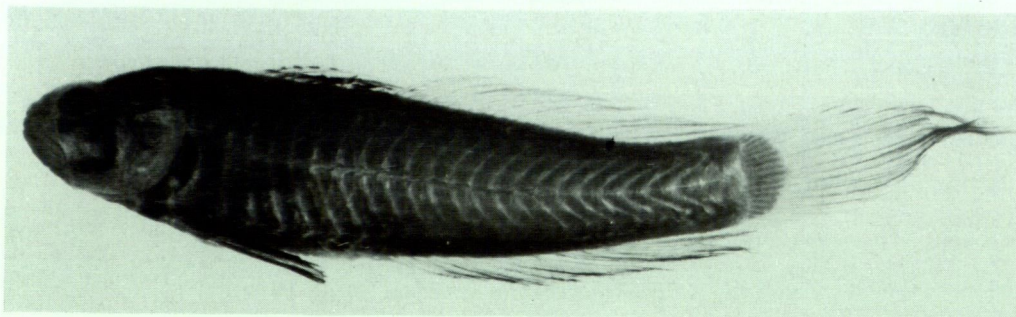
### Relationship

This species appears most closely related to *Stenogobius ingeri* and *S. mekongensis*; it can be distinguished from these forms by the presence of large scales on the predorsal midline.

### Description

D VI-1, 10 to VI-1, 11, usually VI-1, 10; A I, 10 to I, 11, usually I, 10; P 15 to 16. LS 47 to 53; TRB 11 to 12, usually 12; PD 10 to 15; cheek naked; opercle usually naked; pectoral base naked; belly anteriorly naked or with few thin scales; breast naked or with few embedded scales. Jaw reaching under anterior edge of eye. Upper jaw teeth, males 3+2; females 2-3+1-2. Lower jaw teeth, males 4+2; females 4+1-2.

Color in preservation: Body background yellowish or brownish; three large slightly crescentic blackish bars between second dorsal and anal fins, two similar blackish bars



**Figure 9** *Stenogobius kenya* J.L.B. Smith, RUSI 878, PARATYPE, male (83.6) Kenya.

below first dorsal fin. First dorsal fin with four to six evenly spaced black marks along anterior edge of first spine, a black band along fin base, pronounced on posterior edge of membrane separating spines, a medial black band extending from first spine to upper edge of fin at sixth spine, both separated by translucent band, distal half of fin dusky; second dorsal fin with two to four rows of dusky streaks on membrane forming distinct bands on basal half of fin, distal half slightly dusky; upper third of caudal fin with blackish spotting and streaks, rest of fin dusky; anal fin dusky, darkest along margin; pelvic disk dusky on males, translucent on females; pectoral fin translucent.

**Remarks**

Distribution: Specimens examined reported from Somalia to South Africa in waters entering the Indian Ocean.

Ecology: Reported from fresh water to marine conditions in lowland rivers and bays.

***Stenogobius (Stenogobius) macropterus (Duncker 1912)***

(Figure 10)

*Awaous macropterus* Duncker, 1912: 252 (type locality: Ginganga near Vakvella, Ceylon)

*Stenogobius malabaricus*. — Munro, 1955: 236 (in part)

*Stenogobius malabaricus*. — Jayaram, 1981: 351 (in part)

**Material examined**

Four specimens from Sri Lanka, totalling three males, one female; size range 48.2 to 73.1, largest male 71.0, largest female 73.1, no gravid material.

**Lectotype**

ZMH 413, male (71.0), Ginganga near Vakvella, Ceylon, September 1909, G. Duncker.

**Paralectotype**

ZMH 413, male (52.4), same collection data as lectotype.

**Additional material**

CAS-SU 30139, female (73.1), Colombo, Ceylon, 4 April 1934, A.W.C.T. Herre; USNM 270374, male (48.2), fresh water tributary to Bentota Ganga, 2.7 miles south of Pitigata on road to Talgaswela, Bentara-Elipiya District, Sri Lanka, 7 July 1969, W.F. Smith-Vaniz.

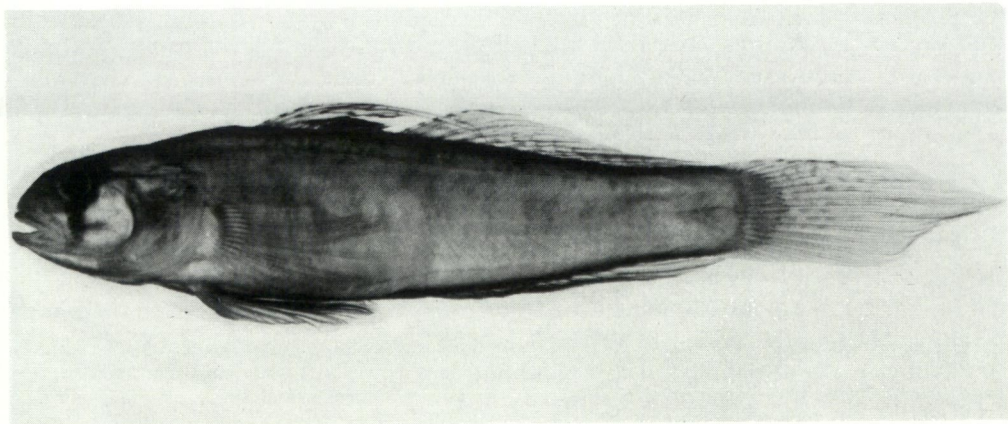


Figure 10 *Stenogobius macropterus* (Duncker), USNM 270374, male (48.2), Sri Lanka.

### Diagnosis

Opercle naked; cheek naked; pectoral base usually naked; belly anteriorly usually naked; breast naked; predorsal midline naked or with few scales near first dorsal fin; first dorsal fin with crescentic to slightly tear-shaped blackish mark near posterior base of fin, most pronounced after fourth spine; pectoral fin with 14 to 15 rays, usually 15.

### Relationship

*Stenogobius macropterus* is most closely related to *S. gymnopomus*, it can be distinguished by the presence of 15 pectoral rays, 16 in *S. gymnopomus*.

### Description

D VI-1, 10; A I, 10; P 14 to 15, usually 15. LS 49 to 51; TRB 11 to 12; PD usually naked; cheek naked; opercle naked; pectoral base usually naked; belly anteriorly naked or with few embedded scales near pelvic base; breast naked. Jaw extending under anterior edge of eye. Upper jaw teeth, males 3+2; female 3+2. Lower jaw teeth, males 3+2; female 3+2.

Color in preservation: Body background brownish yellow; three faded brown crescentic bars between second dorsal and anal fins. First dorsal fin with black crescentic mark between fourth and sixth spines, medially a black band extending length of fin, both marks separated by a translucent band, distal half of fin dusky; second dorsal fin with translucent band along base, distally fin dusky; anal and caudal fins dusky; pelvic disk dusky on males, translucent on females; pectoral fin translucent.

Color in life: Color is based on Duncker's original description. Three faded brownish-yellow bars between second dorsal and anal fin, which are slightly convex; ctenii on edge of each scale blackish; dark-brown spot on upper pectoral base; first dorsal fin with large dark spot, small white spot medially, between the fourth and sixth spine, dark band runs entire length of fin, remainder of first dorsal fin dusky; second dorsal fin with clear stripe along its base, remainder of fin darkened on male; pelvic fin with medial region

darkened; dorsal surface with dark pigmentation, ventrally not dark, male with row of spots on the bases of fins; caudal fin on male clear distally with dark border ventrally, middle with reddish oblique band, paralectotype with eight darkish transverse bands, remainder of fin dusky; pectoral fin pigmented as is pelvic fin.

Duncker does not equate dark to a particular color.

### Remarks

Distribution: Sri Lanka.

Ecology: Reported from brackish and fresh water streams.

Note: This species may be synonymous with *Stenogobius malabaricus* (Day 1865: 27), but until material can be examined from the type locality it cannot be placed there with certainty. The putative type, BMNH 1889.2.1:4303, is a dried half-skin (A.C. Wheeler, pers. comm.). Unfortunately, in this condition it is impossible to evaluate diagnostic characteristics.

### *Stenogobius (Stenogobius) mekongensis*, sp. nov.

(Figures 11a & 11b)

*Stenogobius (Stenogobius) mekongensis*, sp. nov. (type locality: Bassac River, Chau-Doc, upper Mekong River Delta, Vietnam).

*Chonophorus lachrymosus*. — Kawamota *et al.*, 1975: 45

### Material examined

Seven specimens from the Mekong River Delta, Vietnam totalling four males, three females; size range 49.2 to 69.1, largest male 69.1, largest female 68.4, no gravid material.

### Holotype

NSMT P.23911, male (59.8), Bassac River at Chau-Doc, upper Mekong River Delta, Vietnam, 25 July 1971.

### Paratypes

LIAIP 1971268, two females (67.7-68.4), Cantho River, Vietnam, 26 December 1971; LIAIP 1972382, two males (60.8-69.1), Cantho Province, Vietnam, 14 June 1972; NSMT P.23912, female (67.0), same collection data as holotype; USNM 272584, male (49.2), same collection data as holotype.

### Diagnosis

Predorsal midline always scaled, ranging from few close to dorsal fin to entirely scaled with small scales; opercle usually naked; cheek naked; pectoral base scaled; belly anteriorly usually scaled next to pelvic base; breast with embedded scales; posterior nostril on line even or below lower margin of pupil; basal half of first dorsal fin with paired black bands; weak banding on distal half.

### Relationship

*Stenogobius mekongensis* appears most closely related to *S. ingeri*. It is much more robust than that species appearing more like *Stenogobius gymnopus* in this respect, it differs from that species by having more scales on pectoral base, predorsal midline, position of the posterior nostril, and on the dorsal fin markings.

**Table 3** Scale counts in species of the subgenus *Stenogobius*.

Species	Lateral series																
	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	
<i>S. gymnopomus</i>				1	5	2	7	1									
<i>S. ingeri</i>				1	3	—	4	4	1								
<i>S. kenya</i>	2	2	—	—	—	—	—	1									
<i>S. laterisquamatus</i>							1	—	—	1	—	6	—	2	—	1	1
<i>S. macropterus</i>				2	1	—	—	1									
<i>S. mekongensis</i>					1	—	1	—	1								
<i>S. ophthalmoporus</i>		1	2	6	5	2	3										
<i>S. psilosinionus</i>						2	1	5	4	4	5	4	3				

Species	Predorsal midline																			
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
<i>S. gymnopomus</i>	8	1	5	3	—	6	—	—	1											
<i>S. ingeri</i>	14	2	5	2	2															
<i>S. kenya</i>												1	—	4	1	3	1			
<i>S. macropterus</i>	3	—	1																	
<i>S. mekongensis</i>					2	1	—	—	—	—	—	1	—	—	1	—	—	1	—	
<i>S. ophthalmoporus</i>																		2	1	2
<i>S. psilosinionus</i>				2	5	3	1	3	2	—	1	2	1	—	—	—	2	—	2	—

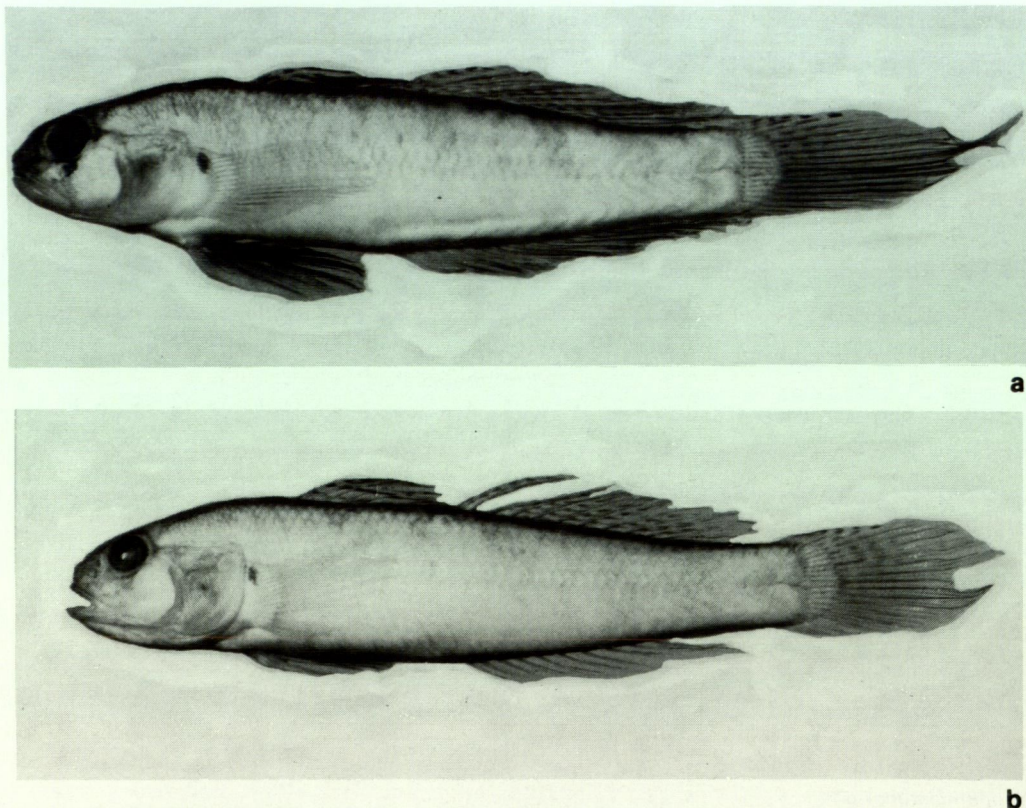
  

Species	Predorsal midline (continued)														
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
<i>S. laterisquamatus</i>					1	—	1	1	2	1	2	3	1	—	2
<i>S. mekongensis</i>	—	1													
<i>S. ophthalmoporus</i>	5	—	7	2	—	—	1								
<i>S. psilosinionus</i>	1	1	2	1	1	—	1								

## Description

D VI-1,10; A I,10; P 15 to 17, usually 16. LS 50 to 54, usually 51; TRB 11 to 12; PD scales always present, but usually patchy along midline; cheek naked; opercle usually naked; pectoral base scaled; belly anteriorly usually scaled near pelvic base; breast with embedded scales. Jaw extending under and beyond the anterior edge of eye. Upper jaw teeth, males 3+1-2, females 1-2+1. Lower jaw teeth, males 4-5+2; females 3-4+2. Posterior nostril appears on a line even with, or slightly below, lower margin of orbit.

Color in preservation: Background straw-yellow, body with three faint, broad, crescentic dusky bars between second dorsal and anal fins; three faint narrow dusky bars below first dorsal fin; body ventrally without pigmentation; snout and upper jaw dusky; cheek without markings; upper opercle with two faint dusky bands; nape slightly dusky; dorsum with some dusky spotting, most distinctive posteriorly. First dorsal fin with black band along base, most pronounced posteriorly, medially another black band extending from first spine not quite reaching sixth spine, translucent band between black



**Figure 11** a: *Stenogobius mekongensis*, sp. nov., NSMT P.23911, HOLOTYPE, male (59.8), Chau-Doc, Vietnam; b: *Stenogobius mekongensis*, sp. nov., NSMT P.23912, PARATYPE, female (67.0), Chau-Doc, Vietnam.

bands, distal half of fin may have two or more faint dusky bands; second dorsal fin with three to four rows of dusky dash-like markings, most pronounced on membrane between rays forming bands entire length of fin; caudal fin with eight or so vertical bars formed by blackish pigmentation on membrane between rays on upper two-thirds of fin, most pronounced on upper anterior portion, rest of fin dusky; anal fin dusky; pelvic disk dusky on males and translucent on females; pectoral fin without notable pigmentation.

#### **Remarks**

Distribution: Known only from the Mekong River Delta region of Vietnam.

Ecology: Specimens examined were reported from fresh water rivers and streams.

Etymology: This species is named for the Mekong River Delta region from which all specimens examined were obtained.



***Stenogobius (Stenogobius) ophthalmoporus* species group.**

(Figures 12, 13a, 13b & 13c)

This group is restricted to a narrow geographical region extending from Vietnam and the Ryukyu Islands in the north, to the islands of Sulawesi, Indonesia and eastern Papua New Guinea in the south. It is identifiable in having cheek almost always scaled; opercle always scaled; predorsal midline with scales present, usually fully scaled, mostly naked in one species; lower pectoral base always scaled, scales may cover entire base; usually four crescentic bars present between second dorsal and anal fins, variable in one species; sexual dichromatism may be well developed.

Sexual dimorphic characteristics well developed; filamentous spines of first dorsal fin normally much longer, and length of unpaired fins greater on males than females; sexual dimorphic differences not always evident on small males.

This species group currently represented by three species of which one is described as new.

***Stenogobius (Stenogobius) ophthalmoporus* (Bleeker 1853)**

(Figures 14a & 14b)

*Gobius ophthalmoporus* Bleeker, 1853c: 340 (type locality: Ambon, Moluccas Islands, Dutch East Indies)

*Gobius ophthalmoporus*. — Gunther, 1861: 17

*Gobius lacrymosus* Peters, 1868: 265 (type locality: Luzon, Philippines)

*Chonophorus lacrymosus*. — Weber, 1894: 412 (Celebes)

*Gobius ophthalmoporus*. — Steindachner, 1901: 429 (Halmahera: Moluccas Islands)

*Awaous lacrymosus*. — Jordan & Richardson, 1910: 49 (Philippines)

*Chonophorus lacrymosus*. — Herre, 1927: 212 (Philippines)

*Gobius ophthalmoporus*. — Fowler, 1928: 405 (western Pacific)

*Stenogobius genivittatus*. — Koumans, 1935: 125 (in part)

?*Aparrius sabagensis* Roxas & Ablan, 1940: 165 (type locality: Luzon, Philippines)

*Chonophorus lacrymosus*. — Herre, 1953: 739 (Philippines)

*Stenogobius genivittatus*. — Koumans, 1953: 35 (in part)

*Stenogobius lacrymosus*. — Akihito *et al.*, 1984: 271 (Japan)

**Material examined**

Twenty nine specimens from Indonesia, Vietnam, Taiwan and the Philippines totalling 15 males, eight females, six juveniles; size range 16.4 to 142.1, largest male 142.1, largest female 87.4, smallest gravid female 62.1.

**Syntypes**

RMNH 4510, two males (62.5-94.5), Ambon, Moluccas Islands, Dutch East Indies. Female (62.1) in same container not appearing to be of two specimens originally described by Bleeker is included in this study.

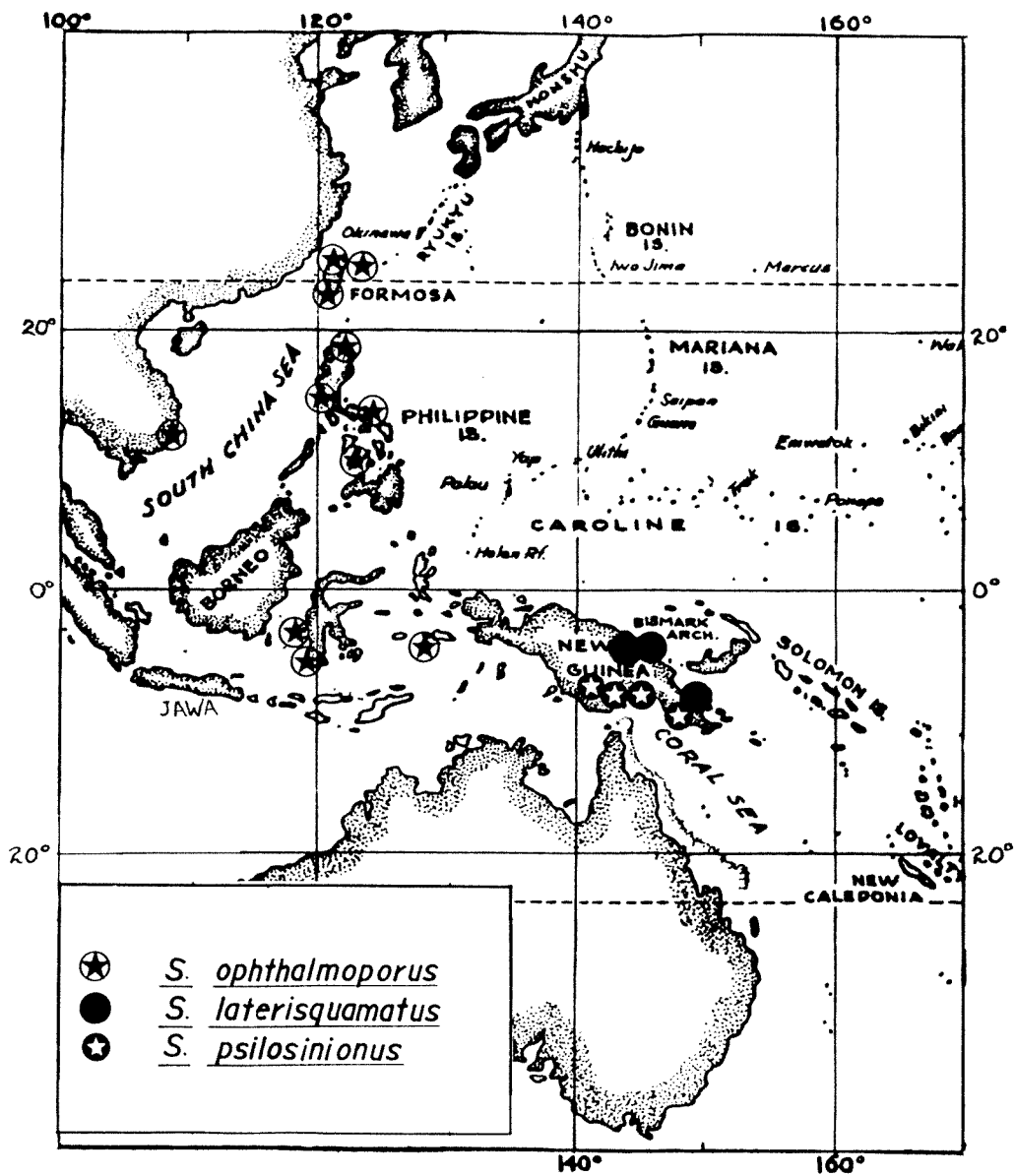


Figure 12 Distributional map of *Stenogobius ophthalmoporus* species group.

**Additional material**

BMNH 1870.3.29:4, female (59.5), Quingoa River, Bulacan Province, Luzon, Philippines, November 1860, W.C.H. Peters, syntype for *Gobius lacrymosus*; LIAIP 1963148, male (55.6), Aparri, Luzon, Philippines, September 1963; LIAIP 1967255, 2(65.1-76.0), one male, one female, Litse, I-lan, Taiwan, 30 October 1967; LIAIP 1974067, female (87.4), Song Cai River at Than Minh, 15 km above its mouth near Nhatrang, Vietnam, 27 September 1974; MNHN 6159, two females (59.5-69.1), same collection data as BMNH 1870.3.29:4, syntypes for *Gobius lacrymosus*; SMF 881, male (142.1), Tobelo, Halmehera, Moluccas Islands, Dutch East Indies, 17 March 1894, W. Kuchenthal; UMMZ 209051, female (83.6), Panay River, 23 km upriver from the sea at village of Salocan, Capiz Province, Panay, Philippines, 25 June 1979, J. Spielberg; USNM 135784, female (65.3), Pucot River near Mariveles, Manila Bay, Luzon, Philippines, 29 January 1909, Albatross Expedition; USNM 139342, male (39.7), Batangas River, Batangas, Luzon, Philippines, 7 June 1909, Albatross Expedition; USNM 143820, male (55.0), Cabugao River, Catanduanes Island, Philippines, 1909, Albatross Expedition; USNM 160747, male (88.9), Guimaras Island, vicinity of Buena Vista, Iloilo Province, Panay, Philippines, 14 January 1909, Albatross Expedition; USNM 160748, male (62.5), Anilao River, Passi, Iloilo Province, Panay, Philippines, 13 January 1909, Albatross Expedition; USNM 191230, male (70.3), I-lan., Taiwan, 1960, R.E. Kuntz & W.H. Wells; USNM 257895, male (98.9), Agno River, one km south of Urbizopolo, Pangasinan, Luzon, Philippines, 16 March 1976, T.R. Roberts; USNM 260531, six juveniles (16.4-22.9), same collection data as USNM 257895; ZMA 111.557, two males (111.4-112.5), river north of Madjene, Tjenrana, Celebes, Dutch East Indies, 1888, M. Weber; ZMA 113.656, male (45.7), river near Maros, northeast of Makassar, Celebes, Dutch East Indies, 1888, M. Weber; ZMA 113.657, male (94.5), Minralang near Parepare, Celebes, Dutch East Indies, 1888, M. Weber.

**Diagnosis**

Predorsal midline fully scaled, usually 19 to 21; cheek almost always scaled; opercle scaled; pectoral base scaled; belly scaled anteriorly near pelvic base; breast always with exposed or embedded scales; basal half of first dorsal fin with two black bands, lower band may originate behind first or second spine; sexual dichromatism not well developed.

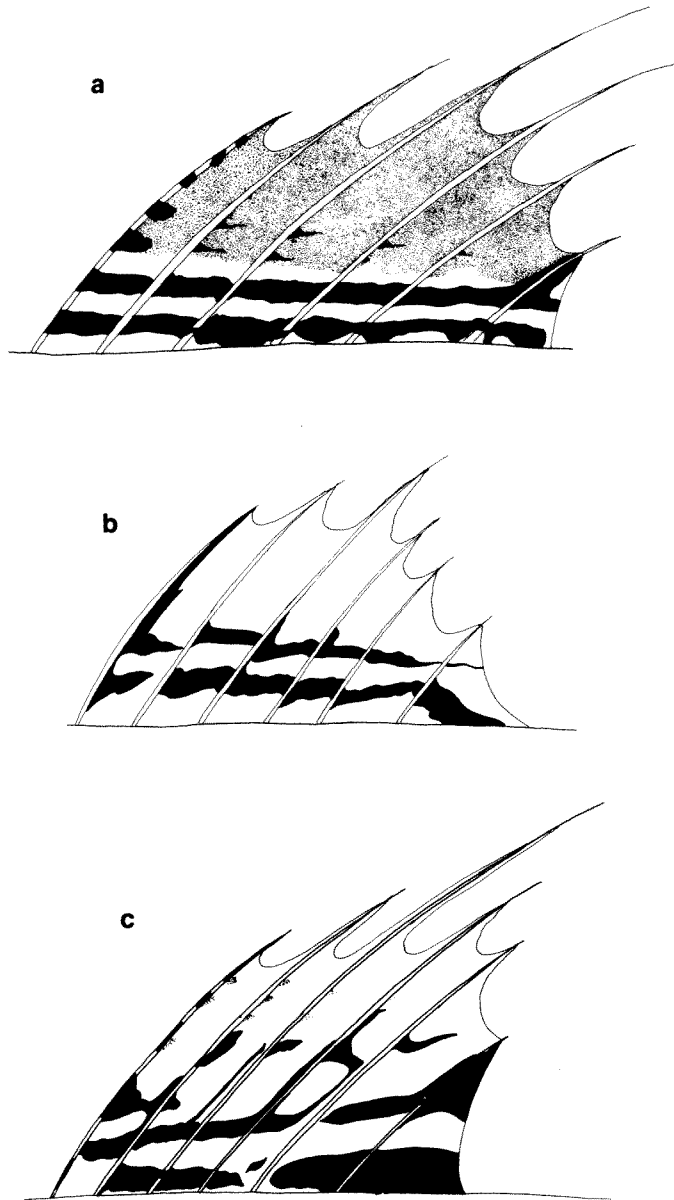
**Relationship**

This species appears most closely related to *Stenogobius psilosinionus*, but differs by slightly shorter head, shorter preanal length, fewer scales in horizontal series, and by having predorsal midline always fully scaled. Its nearest relative outside the species group appears to be *Stenogobius mekongensis*.

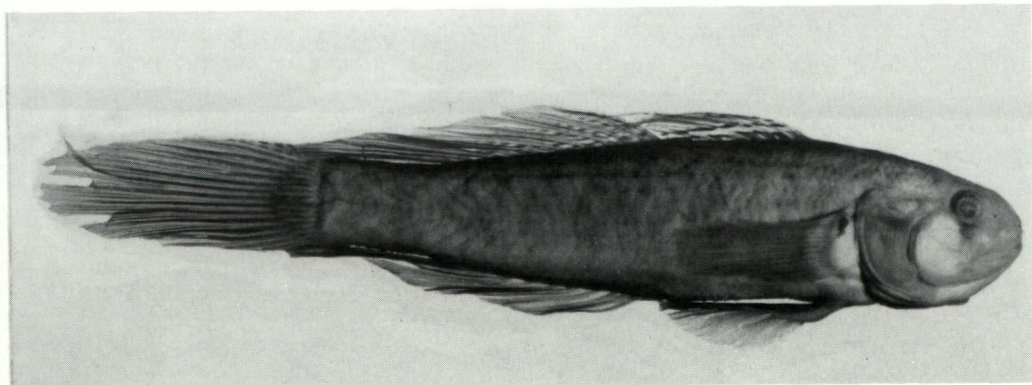
**Description**

D VI-1, 10; A I, 9 to I, 10, almost always I, 10; P 15 to 16, usually 16. LS 48 to 53, usually 50 to 51; TRB 11 to 14, usually 12; PD 16 to 22, usually 19 to 21; cheek almost always scaled; opercle scaled; pectoral base scaled. Jaw reaching under anterior edge of eye. Upper jaw teeth, males 1-4+0-2; females 1-3+0-2. Lower jaw teeth, males 2-6+1-3; females 2-3+1-2. Dentition varies with size and maturation of specimens.

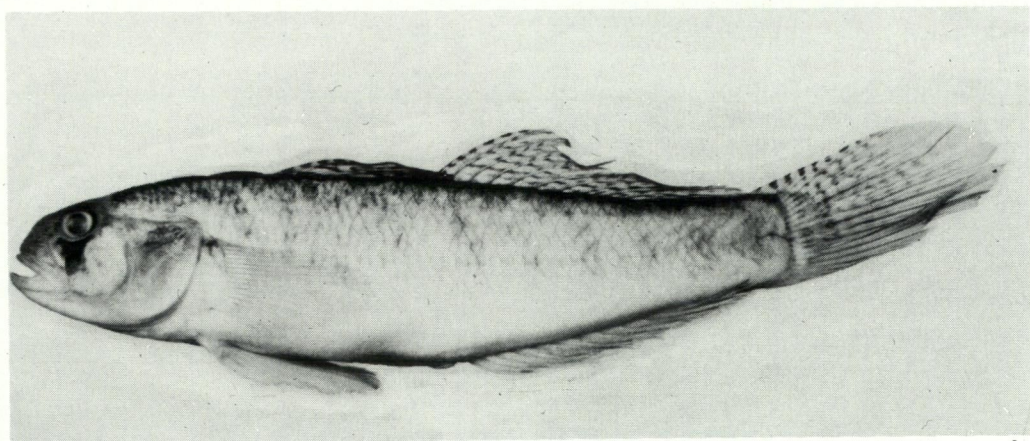
Color in preservation: Background grayish; trunk with zero to four grayish to blackish crescentic bars between the second dorsal and anal fins, normally four present, two faint and narrow dusky bars may be present below first dorsal fin, usually absent on larger specimens; upper half of body may have irregular blackish spotting and streaks;



**Figure 13** a: First dorsal fin on *Stenogobius ophthalmoporus*; b: First dorsal fin on *Stenogobius laterisquamatus*; c: First dorsal fin on *Stenogobius psilosinionus*.



a



b

**Figure 14** a: *Stenogobius ophthalmoporus* (Bleeker). USNM 257895, male (98.9). Luzon, Philippines. b: *Stenogobius ophthalmoporus* (Bleeker). LIAIP 1974067, female (87.4). Song Cai River, Vietnam.

suborbital bar short extending to or near posterior corner of jaw. First dorsal fin with black band along entire base, medially black band extending length of fin, translucent band separating both black bands, spines with black spots on distal half of fin; spine of second dorsal fin with four to six black marks, remainder of fin with four to six irregular rows of blackish pigmentation on both rays and membrane; upper unbranched and procurent rays of caudal fin with four to seven blackish vertical streaks, upper half of fin may have dusky marks on rays forming irregular rows; membrane on pelvic disk and anal fin dusky, usually most pronounced on males, on females anal fin with light margin.

Color in life: Life colors of male based on Bleeker's original description: Body anteriorly and pectoral fin green; basal half of first dorsal fin glassy pinkish-green, above

two blackish-violet longitudinal bands, outer half reddish-violet with two bands of violet; second dorsal fin pinkish-violet basally, reddish-violet in the middle and violet on the outer half; anal fin is reddish-violet with blackish-violet margin; caudal fin pinkish-violet, rays are golden, upper margin of fin reddish-violet. Life colors of female based on illustration from Akihito et al, 1984. Female background gray, belly pinkish-violet, dusky longitudinal streaking along midline with dusky spot on caudal fin base, near dorsal surface more longitudinal streaking; on back much dusky speckling; near isthmus the gill membrane pinkish-violet, fin markings similar to those described from preservation.

### Remarks

Distribution: *Stenogobius ophthalmoporus* is known from Vietnam, Taiwan, Japan, Philippines and western Indonesia. The most widely distributed species represented in this study.

Ecology: Specimens examined were reported from estuaries in near marine conditions, to lowland rivers and streams in fresh water.

Note: *Aparrius sabagensis* is here regarded as a probable synonym based on the illustration and data given in original description. Types are no longer available having been destroyed during World War II.

In the listing of synonymies and citations for *Stenogobius ophthalmoporus* an inconsistency in spelling is noted for *lacrymosus* and *lachrymosus*. It is unclear why most previous authors failed to follow the spelling of the original description. The listing above reflects the spelling as each appears in accounts cited.

### *Stenogobius (Stenogobius) laterisquamatus* (Weber 1908) (Figures 15a, 15b & 15c)

*Oxyurichthys laterisquamatus* Weber, 1908: 261 (type locality: Moso River, tributary of Tami River, Dutch East Indies)

*Paroxyurichthys laterisquamatus*. — Koumans, 1953: 51

### Material examined

Fourteen specimens from rivers on the northern coast of the island of New Guinea, totalling six males, six females, two juveniles; size range 38.2 to 197.1, largest males 197.1, largest female 152.4, no gravid material.

### Syntypes

ZMA 116.477, two males (87.0-106.4), Moso River, tributary of Tami River, North New Guinea, Dutch East Indies, L.F. de Beaufort & M. Weber.

### Additional material

AMS I.24632-001, male (97.3), Sepik River, Papua New Guinea, November 1982, D. Coates; FMNH 24604, male (149.2), Koragu, Sepik River, New Guinea, 23 May 1929, A.W.C.T. Herre; FMNH 24605,

**Table 4** Pectoral ray counts in species of the subgenus *Stenogobius*.

	Pectoral rays			
	14	15	16	17
<i>S. gymnopomus</i>		1	18	1
<i>S. ingeri</i>		4	19	2
<i>S. kenya</i>		5	6	
<i>S. laterisquamatus</i>		1	13	
<i>S. macropterus</i>	1	3		
<i>S. mekongensis</i>		2	3	2
<i>S. ophthalmoporus</i>		4	17	1
<i>S. psilosinoinus</i>		2	29	

juvenile (38.2), Marienberg, Sepik River, New Guinea, 27 May 1929, A. W. C. T. Herre; KFRS F03091, male (197.1), creek near Kapuramhembo near Embi, Papua New Guinea, 8 February 1971; KFRS F.5466-01, 4(83.3-103.3), one male, three females, Ramu River, channel between river island and eastern bank, four km south of Bunapas Mission, Madang, Papua New Guinea, 6 October 1987, G. R. Allen & L. Parenti; WAM P.27847-007, 3(44.2-75.8), two females, one juvenile, Kwatit River at confluence with Sepik River, Papua New Guinea, 28 October 1982, G. R. Allen & D. Coates; WAM P.28206-002, female (152.4), Sepik River near Pagwi, Papua New Guinea, 1 September 1983, D. Coates.

### Diagnosis

Largest and most scaled *Stenogobius*; scales in horizontal series 52 to 62; cheek scaled; opercle scaled; predorsal midline 22 to 32 scales; belly anteriorly scaled; breast scaled; markings and patterns over body vary from one drainage to next; specimens retain juvenile markings to relatively large size (75.8 in this study) with sexual papilla not developed though distinguishable.

### Relationship

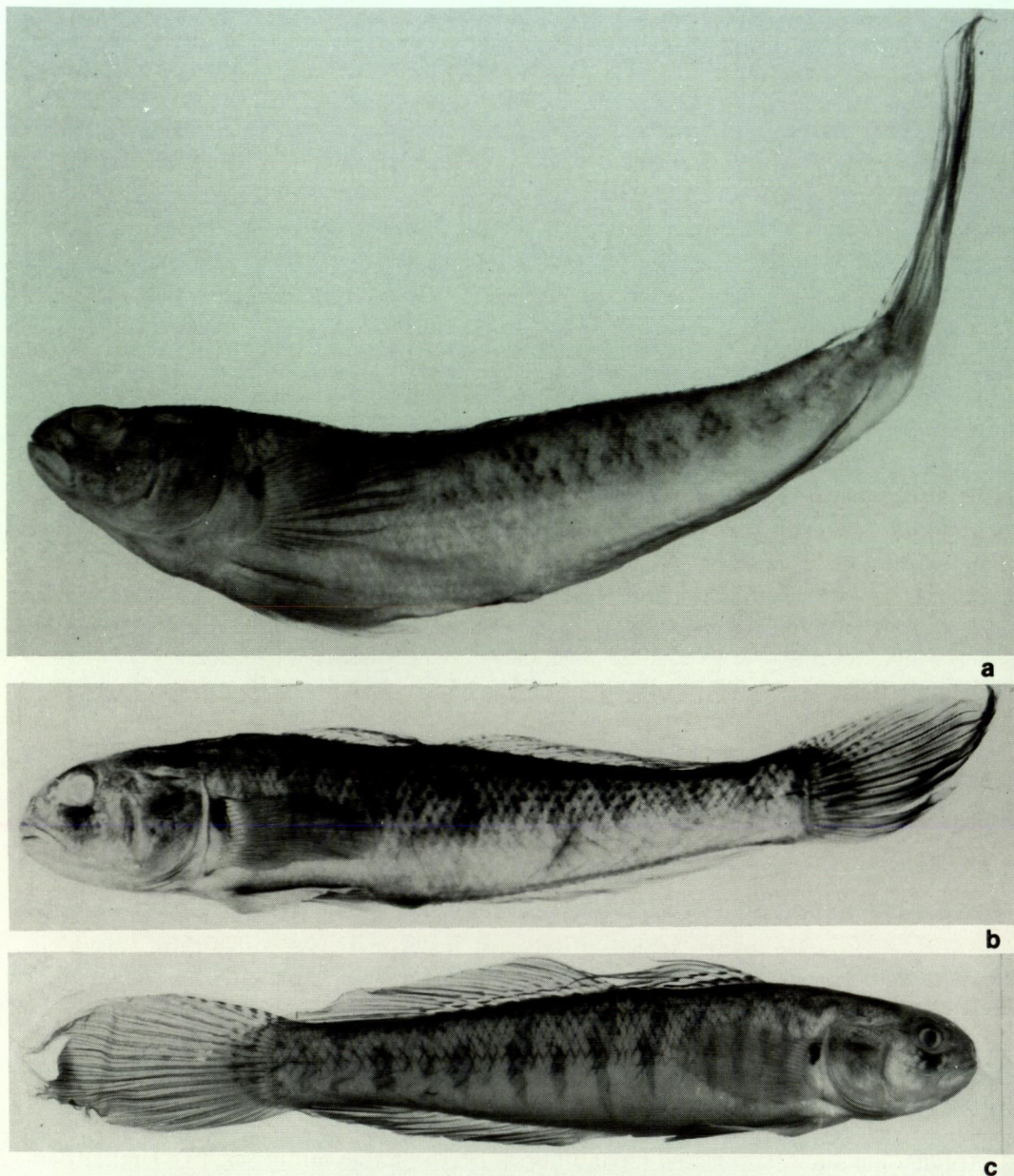
This species most closely related to *Stenogobius psilosinoinus* but differs in predorsal scales, size and body markings.

### Description -

D VI-1,10; A 1,10; P 15 to 16, almost always 16. LS 52 to 62; TRB 14 to 16, usually 14 to 15; PD 22 to 32; cheek 22 to 104 scales; opercle 21 to 127 scales; belly anteriorly scaled next to pelvic base; breast scaled; number of scales increases with size of specimen, especially on cheek and opercle. Jaw reaching under pupil. Teeth in upper jaw, males 2-6+2-3; females 2-3+1-2. Lower jaw teeth, males 3-7+2; females 2-5+1-2.

Color in preservation: *Stenogobius laterisquamatus* most variable of all *Stenogobius* examined. Populations differ in form of color pattern from one river system to the next. Three color forms described below.

Sepik River: Background grayish; series of irregular blackish spots midlaterally; three blackish diagonal bars below second dorsal fin to midline on males, two similar bars below first dorsal fin; on females, no diagonal bars but a black spot on posterior edge of each scale on upper half of body; head grayish; nape dusky; ventral surfaces generally immaculate. First dorsal fin with translucent band along base terminating after sixth spine, black band originating at first spine terminating at or near tip of sixth spine,



**Figure 15** **a:** *Stenogobius laterisquamatus* (Weber). AMS I. 24632-001, male (97.4). Sepik River, Papua New Guinea; **b:** *Stenogobius laterisquamatus* (Weber). WAM P.28206-002, female (149.2). Sepik River, Papua New Guinea; **c:** *Stenogobius laterisquamatus* (Weber), KFRS F.5466-01, male (103.3). Ramu River, Papua New Guinea.



medially another black band extending length of fin, both black bands separated by translucent band, along first spine black band extending along membrane from midlateral band to tip of spine; second dorsal fin with four rows of irregular black streaks located on membrane between rays forming bands almost entire length of fin; caudal fin with some black streaks forming irregular vertical bands limited to upper anterior half of fin; anal and pectoral fins dusky; pelvic disk dusky.

Ramu River: Background light tan; above midline all scales have dusky margin which forms a reticulated pattern, most pronounced on males; from behind pectoral base to caudal base with dusky trunk bars alternating in width and length, some appearing as blotches and others as crescentic bars, trunk bars only markings extending below midline numbering 14 in males and 11 in females. Vertical cheek bar very indistinct, appearing as short dusky bars radiating in three directions below eye; snout dusky in males. First dorsal fin similar to that described for specimens from Sepik River. Second dorsal fin in males with paired dusky streaks on membrane between rays near base of fin appearing as a continuation of bars on first dorsal fin, upper two thirds of fin with vertical dusky bars and limited to membrane between rays; females similarly marked but with three or four streaks instead of two. Anal fin dusky in males; females dusky on membrane between rays on basal half, rest of fin without pigmentation. Caudal fin in males with black spotting on upper procurrent rays, membrane between rays dusky; females with black spotting on upper and anterior half of fin, lower two thirds of fin membrane dusky. Pelvic disk in males dusky medially to posterior edge of fin, anteriorly and laterally fin without pigmentation, pigmentation not on rays or spines; females without pigmentation. Pectoral fin translucent in both sexes.

Gogol River: Pattern based on slide of female (98 SL) provided by G.R. Allen. Specimen marked similarly to females from Ramu River. Many scales above midline have broad dusky marks which form uneven patterns as well as reticulation formed by dark scale margins. Midlateral bars not extending to lower half of body except on caudal peduncle. Fins marked similarly to those from Ramu River.

#### **Remarks**

Distribution: This species is endemic to the northern coast of the island of New Guinea.

Ecology: A river fish found in fresh water.

Note: *Stenogobius laterisquamatus* remains problematic, this is primarily due to size and pattern differences noted on specimens from different drainages without signs of intergradation. Morphometrics as well as scale counts fail to reveal data that would help distinguish between possible species. Electrophoresis may help to differentiate between species, if indeed significant differences exist. Though electrophoresis may prove helpful in resolving some of the problems in separating species of *Stenogobius*, this may not be entirely practical, specimens are often times difficult to obtain under the best of circumstances. The prospect of bringing properly chilled specimens in good condition for electrophoresis could prove almost impossible. Then there is no assurance that electrophoresis would yield revealing results. If enough evidence cannot be gathered to substantiate species, then it would seem likely that many subspecies exist.

***Stenogobius (Stenogobius) psilosinionus*, sp. nov.**

(Figures 16a, 16b & 16c)

*Stenogobius (Stenogobius) psilosinionus*, sp. nov. (type locality: Fly River, Papua New Guinea)

*Proxyurichthys laterisquamatus*. — Berra *et al.*, 1975: 321

*Stenogobius* cf. *genivittatus*. — Roberts, 1978: 64

**Material examined**

Thirty two specimens from the southern coastal plain of New Guinea, totalling 13 males, 19 females; size range 29.2 to 96.5, largest male 96.5, largest female 94.5, no gravid material.

**Holotype**

USNM 217270, male (53.1), turbid fresh water creek, lower Fly River, 236 km upriver from Toro Pass, Papua New Guinea, 11 December 1975, T.R. Roberts.

**Paratypes**

KFRS F01876, male (96.5), Laloki River, Papua New Guinea, 9 June 1971; KFRS F03040, male (80.2), mouth of Kempwelch River, Papua New Guinea, 6 November 1970; KFRS F03449, male (80.5), Laloki River, 15 miles north of Port Moresby, Papua New Guinea, 20 June 1970, B.B. Collette; KFRS F.4314-02, female (57.8), 0.5 mile downstream from Aroa River bridge, Papua New Guinea, 18 April 1973; KFRS F.5048-03, male (96.4), Kibi Creek, Wabo damsite, Gulf Province, Papua New Guinea, 18 January 1977; USNM 217269, two females (35.3-35.8), shallow, muddy backwater open to Fly River mainstream opposite mouth of Suki Creek, 264 km upriver from Toro Pass, Papua New Guinea, 10 December 1975, T.R. Roberts; USNM 274591, three females (29.2-41.0), same collection data as holotype; USNM 279325, female (81.7), same collection data as KFRS F03449; WAM P.28201-008, 20(48.6-96.3), eight males, 12 females, Laloki River two km east of Bluff Inn Hotel, Papua New Guinea, 10 November 1982, G.R. Allen & J. Paska.

**Diagnosis**

Scales in lateral series 52 to 59; cheek scaled; opercle scaled; pectoral base scaled; breast scaled; belly anteriorly scaled next to pelvic base; predorsal midline usually with naked patches, seldom fully scaled; four blackish crescentic bars between second dorsal and anal fins, and two blackish crescentic bars below first dorsal fin, these markings extend to ventral surface.

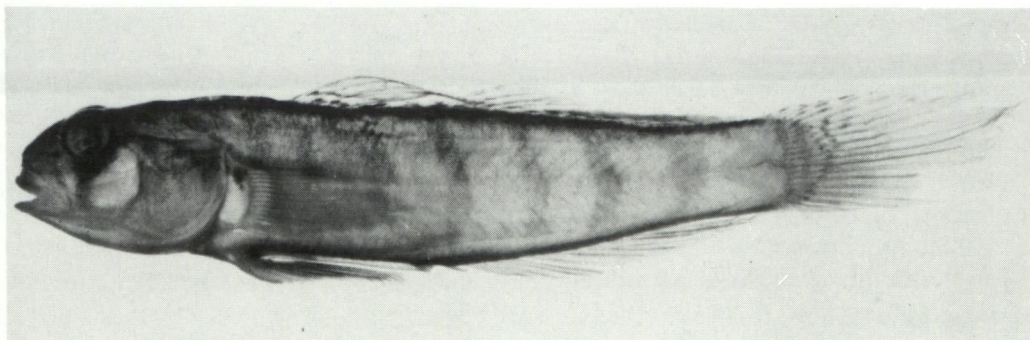
**Relationship**

This species most closely related to *Stenogobius laterisquamatus*; it differs by having fewer scales along predorsal midline, slightly thicker caudal peduncle and smaller size.

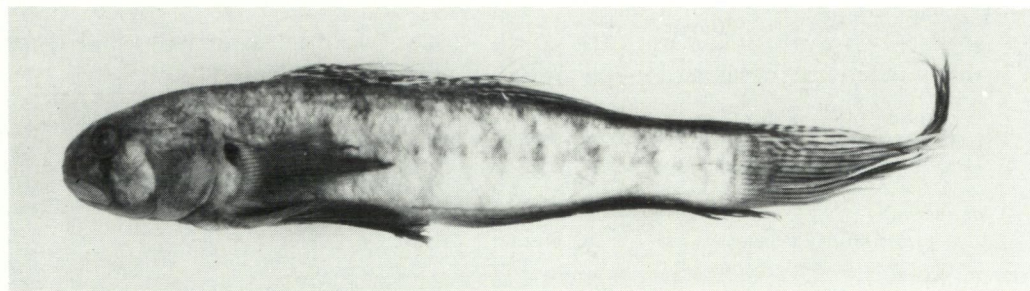
**Description**

D VI-1,10; A I,10; P 15 to 16, almost always 16. LS 52 to 59, usually 54 to 58; TRB 11 to 16, usually 13 to 15; PD two to 25, usually with naked patches; cheek scaled; opercle scaled; pectoral base scaled; belly anteriorly scaled near pelvic base; breast scaled. Jaw reaching under anterior edge of eye. Upper jaw teeth, males 2-4+1-2; females 1+1. Lower jaw teeth, males 3-4+2-3; females 2-3+1-2.

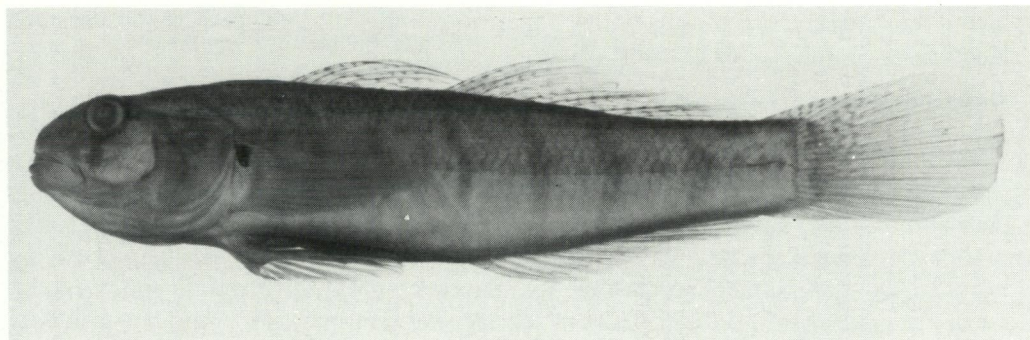
Color in preservation: Background light tan on juveniles, light gray on females and dark gray on males; four blackish crescentic bars between second dorsal and anal fins, two blackish crescentic bars below first dorsal fin; nape with some blackish spotting, blackish spotting in area of first dorsal fin; snout dusky; upper opercle with some



a



b



c

**Figure 16** a: *Stenogobius psilosinionus*. sp. nov., USNM 217270; HOLOTYPE. male (53.1). Fly River, Papua New Guinea; b: *Stenogobius psilosinionus*. sp. nov., KFRS F01876. PARATYPE, male (96.5). Laloki River, Papua New Guinea; c: *Stenogobius psilosinionus*, sp. nov., USNM 279325. PARATYPE, female (81.7), Laloki River, Papua New Guinea.

blackish spotting; markings not evident on small specimens; adults males much darker than females, especially at bases of dorsal and anal fins and on snout. First dorsal fin with black band at base originating either after first or second spine terminating at end of fin, translucent band above basal band originating at base of first spine, above a narrow black band extending from first spine to upper tip of fifth spine, distal half of fin dusky; second dorsal fin with some distinct black marks on spine, rest of fin with dusky streaks on membrane between rays forming irregular bands numbering three to four; upper half of caudal fin with dusky streaking forming irregular vertical bars; uppermost branches rays and procurent rays with blackish streaking, lower half of fin dusky; anal fin dusky; pelvic disk dusky on males, translucent on females; pectoral fin translucent.

### Remarks

Distribution: Known from the southern coastal plain of New Guinea.

Ecology: Known from lowland rivers and streams primarily over mud bottoms in fresh water.

Etymology: Name taken from the Greek words *psilos* (naked or bare) and *inion* (nape) in reference to the predominately naked predorsal midline.

### *Insularigobius*, subgen. nov.

(Tables 5 - 9)

### Type species

*Gobius genivittatus* Valenciennes 1837: 64 (type locality: Tahiti).

### Etymology

After the Latin word *insula* meaning island and *gobius* a name of a fish, in this case gobies; the name is in reference to the fact that all known specimens in this subgenus, including many not referred to in this paper, were reported only from island habitats, whether of continental or volcanic origin.

### Description

Dorsal fin rays almost always VI-I, 11; anal fin rays almost always I, 11; pectoral rays 14-16, almost always 15; first dorsal fin usually same height or shorter than second dorsal fin, spines of first dorsal usually flex posteriorly when fin is erect, spines not usually filamentous; jaw lengths usually sexually dimorphic; sensory papillae on lower preopercle in single row and may or may not have short transverse rows of papillae along lower edge of preopercle (Figures 4b & 4c); sexes are strongly dichromatic; body and fin markings tending not to differ between species; blackish mark on upper pectoral base continues anteriorly as a short bar under gill cover; two narrow blackish oblique bands from posterior edge of opercle to lower anterior edge of nape; all species have short vertical dash-like bars under most scales from midline to dorsal surface, zig-zag-like pattern formed by black margins on edges of scales along lateral midline from behind pectoral base to caudal fin base; juveniles with background of light tan to brown, laterally body covered with combination of brownish or blackish spots and bars; black oblique cheek bar prominent. Species belonging to this subgenus have close affinities

with insular habitats throughout the tropical Indo-Pacific and has not been reported from continental habitats.

*Insularigobius* is divided into two principle groups. The *Stenogobius polyzona* species group which occurs in and peripheral to the Indian Ocean and the *S. genivittatus* species group of the western and central Pacific from French Polynesia and the Hawaiian Island to Japan and Indonesia. The *Stenogobius genivittatus* species group is further divided into three species complexes, the *S. genivittatus*, *S. blokzeyli* and *S. marqueti* complexes; these may or may not form a natural arrangement.

**Key to species of the subgenus *Insularigobius*.**

- 1a. Short rows of sensory papillae generally absent along lower preopercle (Figure 4b); first dorsal fin spotted in females ..... 2.
- 1b. Short rows of sensory papillae along lower preopercle (Figure 4c); first dorsal fin in females with medial band or vertical pigmentation between spines ..... 3.
- 2a. Eyes facing slightly upward; males without filamentous spines on first dorsal fin; jaw lengths weakly sexually dimorphic; northern New Guinea ..... *S. beauforti* (Weber 1908).
- 2b. Eyes facing outward; adult males with filamentous spines on first dorsal fin; jaw lengths strongly sexually dimorphic; Madagascar and Reunion ..... *S. polyzona* (Bleeker 1867).
- 3a. One or two large spots appearing on caudal peduncle of one or both sexes ..... 4.
- 3b. No spots appearing on caudal peduncle ..... 6.
- 4a. Caudal peduncle length 13 to 14% of SL; Hiva Oa, Marquesas Islands ..... *S. marqueti*, sp. nov.
- 4b. caudal peduncle length 14 to 16% of SL ..... 5
- 5a. Breast almost always naked, seldom with few embedded scales; opercle almost always naked; predorsal midline usually with naked patches; Nuku Hiva, Marquesas Islands . . . *S. caudimaculosus*, sp. nov.
- 5b. Breast almost always with few embedded scales, seldom naked; opercle usually with scales; predorsal midline almost always fully scales; Ua Pou, Marquesas Islands ..... *S. squamosus*, sp. nov.
- 6a. Body depth in males at second dorsal origin 22 to 24% of SL; Philippines ..... *S. kyphosus*, sp. nov.
- 6b. Body depth in males at second dorsal origin always 21% or less of SL ..... 7.
- 7a. First dorsal fin in adult females with midlateral band and second dorsal fin with many small spots ..... 10.

- 7b. First dorsal fin in adult females with blackish pigmentation between rays on membrane appearing as scribbles .....8.
- 8a. Predorsal scales 16 to 23, usually 19 to 20; Hawaiian Islands .....*S. hawaiiensis*, sp. nov.
- 8b. Predorsal scales 13 to 20, usually 15 to 19 .....9.
- 9a. Scales in lateral series 46 to 51, usually 48 to 49; Society Islands ..... *S. genivittatus* (Valenciennes 1837).
- 9b. Scales in lateral series 49 to 52, usually 50 to 52; Tubuai Islands .....*S. randalli*, sp. nov.
- 10a. Mature males with elongate fins and no evidence of juvenile markings at less than 40 SL; trunk bars present but indistinct; New Britain, Bismarck Archipelago ..... *S. alleni*, sp. nov.
- 10b. Mature males with elongate fins and no evidence of juvenile markings at greater than 40 SL; trunk bars generally distinct ..... 11.
- 11a. Predorsal midline scale count highly variable and almost always with naked patches; breast naked or with few embedded scales ..... 12.
- 11b. Predorsal midline scale count not variable and almost always without naked patches; breast scaled or with numerous embedded scales ..... 13.
- 12a. Head and pectoral fin dusky on both sexes; trunk bars in females generally distinctive, numbering three to 10; Admiralty and Solomon Islands ..... *S. hoesei*, sp. nov.
- 12b. Head and pectoral fin weakly dusky in males and not at all in females; trunk bars in females generally weak or absent, numbering zero to three; Irian Jaya, Indonesia ..... *S. marinus*, sp. nov.
- 13a. First dorsal fin in large males often with filamentous spines; second dorsal fin in females with numerous spots that form two to five irregular rows; Yap and Palau Islands ..... *S. fehlmanni*, sp. nov.
- 13b. First dorsal fin in large males without filamentous spines; second dorsal fin of females with spots that form two to three rows ..... 14.
- 14a. Anterior teeth in one row of upper jaw of females; Lesser Sunda Islands, Indonesia .....*S. zurstrasseni* (Popta 1912).
- 14b. Anterior teeth in three rows on upper jaw of females; Bali ..... *S. blokzeyli* (Bleeker 1861).

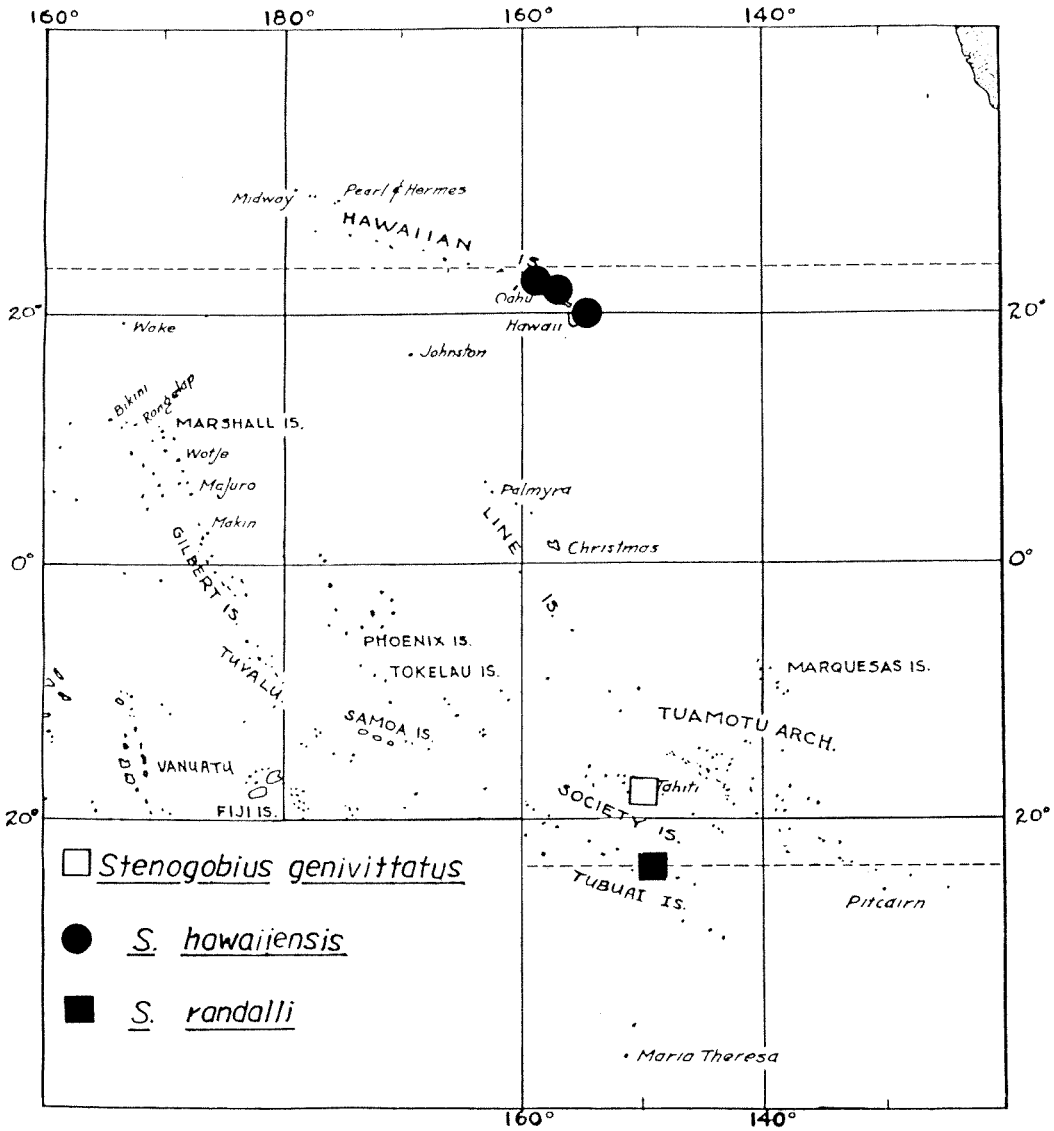


Figure 17 Distribution map of *Stenogobius genivittatus* species complex.

***Stenogobius (Insularigobius) genivittatus* species group.**

Short transverse rows of papillae below lower preopercular cutaneous sensory papillae row (Figure 4c).

Sexual dimorphism well developed: Jaw lengths much greater on adult males, fins more elongate, more and larger teeth in both jaws.

***Stenogobius (Insularigobius) genivittatus* species complex**  
(Figure 17)

This complex is recognized in having predorsal midline almost always fully scaled, breast scaled, opercle may or may not be scaled, no spots on caudal peduncle. This complex includes three species of which two are described as new.

***Stenogobius (Insularigobius) genivittatus* (Valenciennes 1837)**  
(Figures 18a & 18b)

*Gobius genivittatus* Valenciennes, 1837: 64 (type locality: Tahiti)

*Gobius genivittatus*. — Gunther, 1861: 13 (in part)

*Gobius genivittatus*. — Gunther, 1877: 170 (in part)

*Chonophorus genivittatus*. — Fowler, 1928: 409 (in part)

*Stenogobius genivittatus*. — Koumans, 1935: 124 (in part)

*Awaous genivittatus*. — Fowler, 1938: 299 (in part)

*Stenogobius genivittatus*. — Koumans, 1953: 35 (in part)

**Material examined**

Fifty six specimens from the Society Island, French Polynesia, totalling 31 males, 24 females, one juvenile; size range 21.5 to 81.2, largest male 81.2, largest female 69.8, smallest gravid female 48.7.

**Holotype**

MNHN A.1344, male (52.0), Tahiti.

**Additional material**

BMNH 1873.4.3:96, female (67.3), Tahiti; BMNH 1926.10.25:6, male (43.6), Tahiti; CAS-SU 24708, male (48.8), creek, Moorea, Society Islands, 22 February 1929, A.W.C.T. Herre; FMNH 24600, female (58.4), freshwater, Tahiti, Society Islands, February 1929, A.W.C.T. Herre; FMNH 24601, male (58.1), same collection data as CAS-SU 24708; FMNH 24602, male (50.1), same collection data as CAS-SU 24708; MNHN 1927-140, male (46.9), Tahiti; MNHN 1984-804, three females (39.3-42.9), Tahiti, Society Islands, 1984, G. Marquet; MNHN 1987-926, 12(21.5-68.9), four males, seven females, one juvenile, Moorea, Society Islands, April 1986, G. Marquet; NMW 79818, male (51.1), Society Islands, 1874; USNM 270644, three males 953.9-65.9), Opunohu River, Moorea, Society Islands, March 1985, G. Marquet; USNM 278704, 20(43.4-69.3), 12 males, eight females, Moorea, Society Islands, 26 January 1986, G. Marquet; USNM 280372, 9(50.5-81.2), five males, four females, Tahiti, Society Islands, June 1986, G. Marquet.

**Diagnosis**

Scales on predorsal midline 13 to 20, usually 15 to 18; scales in horizontal series 46 to 51, usually 48 to 49; breast scaled; belly anteriorly with small naked patch next to pelvic base.



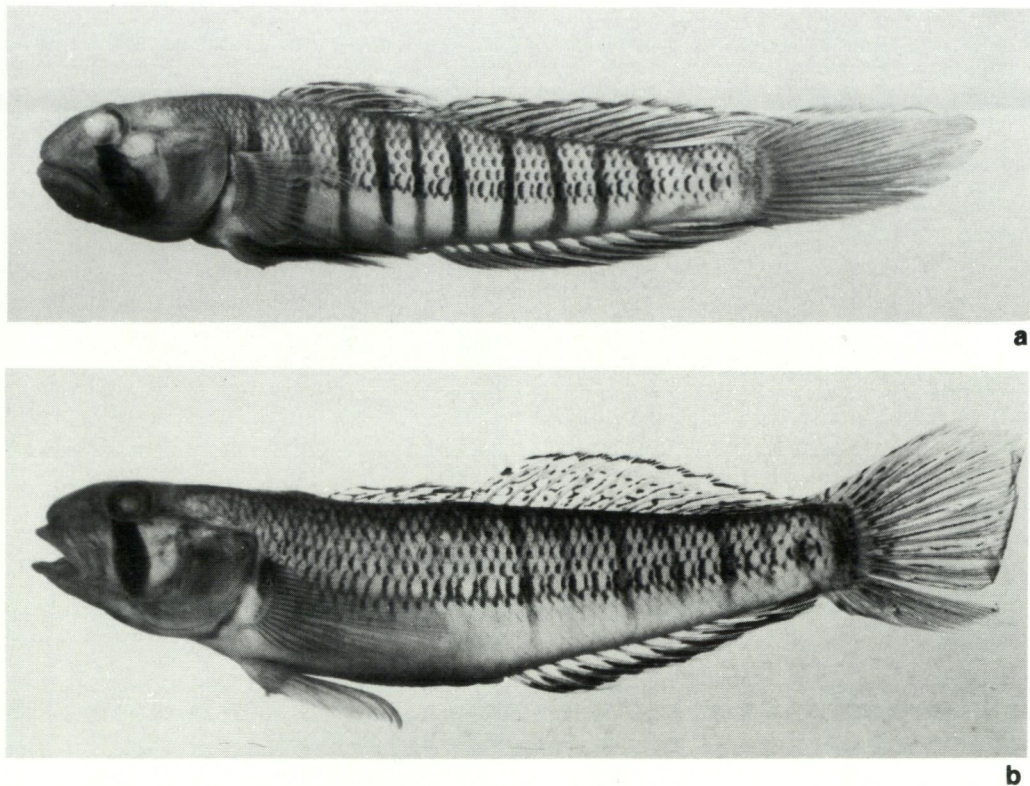


Figure 18 a: *Stenogobius genivittatus* (Valenciennes). USNM 278704, male (69.3), Moorea, Society Islands; b: *Stenogobius genivittatus* (Valenciennes). MNHN 1987-926, female (68.9). Moorea, Society Islands.

### Relationship

*Stenogobius genivittatus* appearing most closely related to *S. randalli* differing by having fewer scales in horizontal series and fewer rows of teeth; it differs from *S. hawaiiensis* by having fewer predorsal scales, fewer teeth and usually more trunk bars in males.

### Description

D VI-1, 10 to VI-1, 11, almost always VI-1, 11; A I, 10 to I, 12, almost always I, 11; P 15 to 16, usually 15. LS 46 to 51, usually 48 to 49; TRB 10 to 13, usually 12; PD fully scaled, 13 to 19, usually 15 to 17; cheek naked; opercle usually naked; upper pectoral base may or may not be scaled; lower pectoral base almost always naked; belly anteriorly with small naked patch posterior to pelvic base; breast scaled. Jaw reaching under posterior edge of pupil on females to beyond posterior edge of eye on males. Upper jaw teeth, males 2-5+1-2, usually 3+2; females 1-3+0-1, usually 1+0-1. Lower jaw teeth, males 3-4+1-3, usually 3+2; females 1-4+1-2, usually 1-2+1. Teeth in outer row enlarged in males.

**Table 5** Morphometrics in species of the subgenus *Insularigobius* in percent of the standard length.

Species	Jaw length in males								
	8	9	10	11	12	13	14	15	16
<i>S. alleni</i>			1	2					
<i>S. beauforti</i>		2	6						
<i>S. caudimaculosus</i>		1	4	10	2	2			
<i>S. fehlmanni</i>		4	11	7	2	1	1		
<i>S. genivittatus</i>		8	14	6	3				
<i>S. hawaiiensis</i>	2	4	3	10	12	7	5	6	1
<i>S. hoesei</i>		1	5	6	3	2	1		
<i>S. kyphosus</i>				1	—	1	1		
<i>S. marinus</i>		1	7	14	4				
<i>S. marqueti</i>		3	8	5	7	1	2		
<i>S. polyzona</i>		4	4	6	5	3	1		
<i>S. randalli</i>				1	2	—	1		
<i>S. squamosus</i>		2	7	5	4				
<i>S. zurstrasseni</i>			2						

Species	Jaw length in females					
	8	9	10	11	12	13
<i>S. alleni</i>		4	3			
<i>S. beauforti</i>	2	9	8	1		
<i>S. blokzeyli</i>			2			
<i>S. caudimaculosus</i>		5	11	5		
<i>S. fehlmanni</i>	2	26	10	1		
<i>S. genivittatus</i>	2	9	10	—	1	
<i>S. hawaiiensis</i>	6	28	22	10	2	
<i>S. hoesei</i>		7	13	4		
<i>S. kyphosus</i>	1	2	2	3		
<i>S. marinus</i>		4	3	2		
<i>S. marqueti</i>		5	13	9		
<i>S. polyzona</i>	2	7				
<i>S. randalli</i>			1	—	2	
<i>S. squamosus</i>		6	8	2	3	1
<i>S. zurstrasseni</i>		5	3			

Species	Caudal peduncle depth in males				
	8	9	10	11	12
<i>S. alleni</i>		1	1	1	
<i>S. beauforti</i>		6	4		
<i>S. caudimaculosus</i>			13	6	
<i>S. fehlmanni</i>	2	16	15	3	
<i>S. genivittatus</i>		8	19	2	1
<i>S. hawaiiensis</i>	1	7	24	15	1
<i>S. hoesei</i>		4	12	2	1
<i>S. kyphosus</i>				2	2
<i>S. marinus</i>		9	14	3	
<i>S. marqueti</i>		7	18	1	
<i>S. polyzona</i>		1	7	4	5
<i>S. randalli</i>			4		
<i>S. squamosus</i>		3	14	2	
<i>S. zurstrasseni</i>			2	1	

Table 5 (continued)

	Caudal peduncle depth in females						
	7	8	9	10	11	12	13
<i>S. alleni</i>			6	1			
<i>S. beauforti</i>		3	9	3	2		
<i>S. blokzeyli</i>				2			
<i>S. caudimaculosus</i>			2	12	7		
<i>S. fehlmanni</i>	1	1	28	17			
<i>S. genivittatus</i>			15	7	1		
<i>S. hawaiiensis</i>		8	10	35	5	1	1
<i>S. hoesei</i>			6	16	2	1	
<i>S. kyphosus</i>				8	1		
<i>S. marinus</i>			8	1			
<i>S. marqueti</i>			9	17	1		
<i>S. polyzona</i>			7	2	—		
<i>S. randalli</i>			2	1			
<i>S. squamosus</i>			7	7	5		
<i>S. zurstrasseni</i>			1	5	2		

	Caudal peduncle length						
	18	12	13	14	15	16	17
<i>S. alleni</i>			1	2	6	1	
<i>S. beauforti</i>			1	1	10	13	2
<i>S. blokzeyli</i>			1				
<i>S. caudimaculosus</i>				5	13	19	3
<i>S. fehlmanni</i>			4	23	29	10	1
<i>S. genivittatus</i>	2		3	20	23	5	
<i>S. hawaiiensis</i>	4	18	46	32	10	1	
<i>S. hoesei</i>	2	4	21	9	5		
<i>S. kyphosus</i>		3	7	2	1		
<i>S. marinus</i>		2	16	12	3	2	
<i>S. marqueti</i>		2	17	14	14	5	1
<i>S. polyzona</i>		2	2	13	7	7	1
<i>S. randalli</i>		4	2	1			
<i>S. squamosus</i>				3	20	13	2
<i>S. zurstrasseni</i>			6	2	2	1	

	Body depth at second dorsal fin origin on males										
	14	15	16	17	18	19	20	21	22	23	24
<i>S. alleni</i>				1	2						
<i>S. beauforti</i>				5	1	1					
<i>S. caudimaculosus</i>					4	9	4	2			
<i>S. fehlmanni</i>	1	1		5	8	4					
<i>S. genivittatus</i>			4	10	6	5	3	1			
<i>S. hawaiiensis</i>			4	1	6	7	5	1			
<i>S. hoesei</i>			2	4	6	2	1				
<i>S. kyphosus</i>									2	1	1
<i>S. marinus</i>			5	10	4	1					
<i>S. marqueti</i>		4	6	8	5	1					
<i>S. polyzona</i>		2	2	2	4	6	1				
<i>S. randalli</i>			1	1	1	1					
<i>S. zurstrasseni</i>					1	1					
<i>S. squamosus</i>			3	9	3	3					

Table 5 (continued)

	22	23	24	25	26	Head length				
						27	28	29	30	31
<i>S. alleni</i>				3	2	5				
<i>S. beauforti</i>			2	2	11	6	2	1	1	1
<i>S. blokzeyli</i>			1	1						
<i>S. caudimaculosus</i>					14	23	3			
<i>S. fehlmanni</i>			1	14	20	23	9	2		
<i>S. genivittatus</i>			5	9	27	11	2			
<i>S. hawaiiensis</i>	1	9	27	33	34	8	1			
<i>S. hoesei</i>				2	9	13	13	5		
<i>S. kyphosus</i>				3	5	5				
<i>S. marinus</i>					5	18	10	2		
<i>S. marqueti</i>				2	5	34	7	4	1	
<i>S. polyzona</i>				10	10	7	3	2		
<i>S. randalli</i>				1	2	4				
<i>S. squamosus</i>					11	23	4			
<i>S. zurstrasseni</i>				1	5	5				

	31	32	33	34	35	Predorsal length			
						36	37	38	39
<i>S. alleni</i>			1	5	4				
<i>S. beauforti</i>			3	8	5	6	4	—	1
<i>S. blokzeyli</i>					1	1			
<i>S. caudimaculosus</i>		1	7	13	14	4	1		
<i>S. fehlmanni</i>	2	5	12	17	18	11	3	1	
<i>S. genivittatus</i>	1	16	21	12	3				
<i>S. hawaiiensis</i>	7	13	20	34	15	6	2		
<i>S. hoesei</i>			2	8	15	13	3	1	
<i>S. kyphosus</i>			1	3	5	1	3		
<i>S. marinus</i>			2	15	13	4	2		
<i>S. marqueti</i>		2	6	13	21	11			
<i>S. polyzona</i>	3	4	7	9	6	2	1	1	
<i>S. randalli</i>	1	3	1	1	1	1			
<i>S. squamosus</i>	1	2	19	13	2				
<i>S. zurstrasseni</i>	1	3	2	2	2	2	1		

	50	51	52	53	54	Preanal length						
						55	56	57	58	59	60	61
<i>S. alleni</i>					2	1	4	3				
<i>S. beauforti</i>			1	3	8	5	8	2				
<i>S. blokzeyli</i>					1	—	—	—	—	—	—	1
<i>S. caudimaculosus</i>				3	8	15	9	4	1			
<i>S. fehlmanni</i>	3	6	9	16	16	10	6	1	2			
<i>S. genivittatus</i>				9	14	11	10	5	2	—	1	
<i>S. hawaiiensis</i>	1	1	5	14	20	22	20	18	6	4	1	
<i>S. hoesei</i>		1	—	1	4	5	8	12	6	3	2	
<i>S. kyphosus</i>			1	2	—	4	3	1	2			
<i>S. marinus</i>				3	4	16	7	5				
<i>S. marqueti</i>			1	2	2	9	11	13	9	2	4	
<i>S. polyzona</i>			1	3	8	8	6	3	2	1		
<i>S. randalli</i>					1	2	2	1	—	—	—	1
<i>S. squamosus</i>					2	12	15	2	1	3	1	1
<i>S. zurstrasseni</i>		2	2	1	3	1	1	—	—	1		

Color in preservation: Basic color of body tannish or brownish to grayish; blackish trunk bars in males originate behind pectoral base extending to hypural base, extending from dorsal surface to ventral surface, usually poorly marked on caudal peduncle; in females trunk bars between second dorsal and anal fins extending to hypural base, two or three weak dusky bands may be found below first dorsal fin to midline, trunk bars in females lack intensity found in males. In both sexes membrane between spines and rays of both dorsal fins with markings appearing as irregular scribbles, outer margin in both sexes with blackish border; blackish streaking on membrane between rays of caudal fin. Pelvic disk dusky with blackish band between fifth rays in males; in females pelvic disk is colorless except dusky streak between fifth rays. Anal fin in males dusky with light margin along entire base; in females anal fin is dusky with light margin along edge of fin.

Color in life: Life color of males based on freshly collected specimens provided by G. Marquet, represented in collection USNM 280372. Color in males similar to those described in preservation. Outer margin of both dorsal fins reddish with thin blue line along edge. Life color in females based on a slide provided by G. Marquet, of a specimen approximately 70 SL photographed at night in an estuary on Tahiti. Females do not appear to differ much from description in preservation. Outer margin of anal fin bluish; some blue flecks on head and pectoral base appears bluish.

#### Remarks

Distribution: *Stenogobius genivittatus* is herein considered an endemic species of the Society Islands, French Polynesia.

Ecology: All specimens were reported from fresh water in either streams or estuaries. According to G. Marquet (pers. comm.) on Tahiti this species does not leave the upper reaches of estuaries, but on Moorea it moves well inland to the bases of waterfalls.

### *Stenogobius (Insularigobius) hawaiiensis*, sp. nov.

(Figures 19a & 19b)

*Stenogobius (Insularigobius) hawaiiensis*, sp. nov. (type locality: Honolulu, Oahu, Hawaiian Islands)

*Awaous genivittatus*. — Jenkins, 1902: 52

*Awaous genivittatus*. — Jordan & Evermann, 1905: 492

*Awaous genivittatus*. — Fowler, 1938: 299 (in part)

*Chonophorus genivittatus*. — Gosline & Brock, 1960: 269

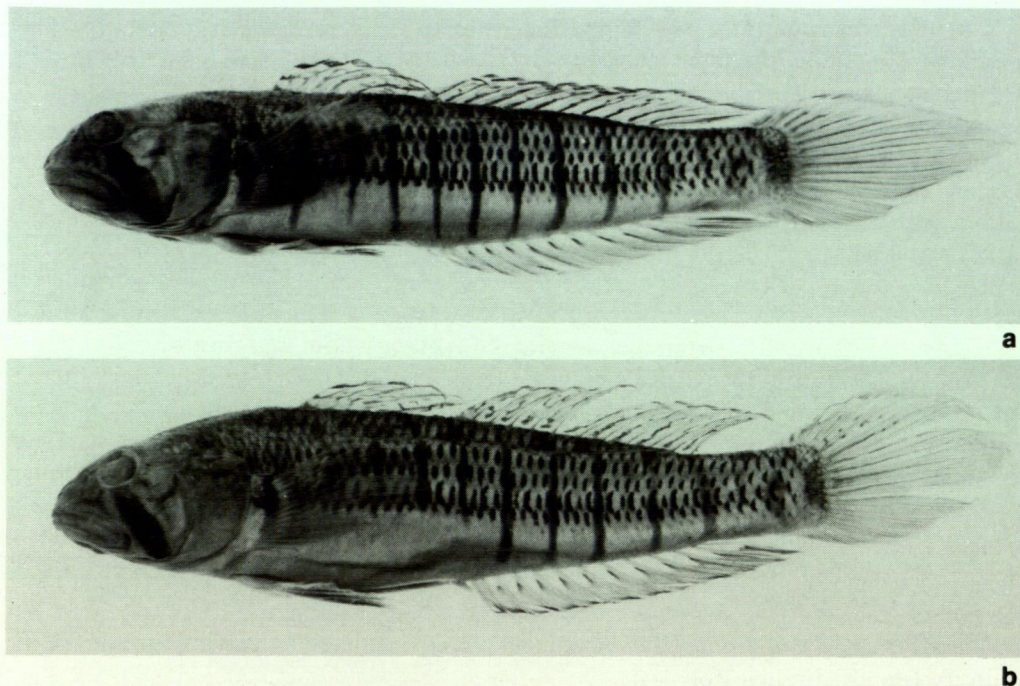
*Chonophorus genivittatus*. — Tinker, 1978: 394

#### Material examined

One hundred and fifty six specimens from the Hawaiian Islands, totalling 52 males, 69 females, 35 juveniles; size range 19.7 to 114.3, largest male 114.3, largest female 93.9, smallest gravid female 47.6.

#### Holotype

CAS-SU 07552, male (114.3), Honolulu, Oahu, Hawaiian Islands, July 1901, A. Seale.



**Figure 19** a: *Stenogobius hawaiiensis*, sp. nov., BPBM 26373, PARATYPE, male (86.9), Molokai, Hawaiian Islands; b: *Stenogobius hawaiiensis*, sp. nov., BPBM 26373, PARATYPE, female (79.6), Molokai, Hawaiian Islands.

#### Paratypes

AMNH 2349, 3(56.1-95.0), one male, two females, Hawaiian Island, 1896; ANSP 86151, 9(67.0-93.7), three males, six females, same collection data as holotype; ANSP 91401, 38(23.1-96.5), 15 males, 21 females, two juveniles, Laie Stream, Oahu, Hawaiian Islands, November 1922, C.M. Cooke et al; BPBM 26373, 4(76.1-86.9), two males, two females, Kewalo Stream, Molokai, Hawaiian Islands, 28 March 1980, R.E. Watson; BPBM 26380, 2(71.3-83.6), one male, one female, Kaipapau Stream, Oahu, Hawaiian Islands, 4 July 1980, R.E. Watson; CAS 22830, 2(39.2-71.4), one male, one female, Hanalei River, Kauai, Hawaiian Islands, 7 August 1949, P.R. Needham et al; CAS 58053, 6(72.1-110.0), three males, three females, same collection data as holotype; LIAIP 1974002, 5(35.5-56.9), two males, three females, Nuuanu Stream, Honolulu, Oahu, Hawaiian Islands, 9 March 1974; USNM 55146, 11(46.8-73.7), three males, eight females, Waimea River, Kauai, Hawaiian Islands, June 1902, Albatross Expedition; USNM 55166, two males (92.9-99.5), Honolulu, Oahu, Hawaiian Islands, July 1902, Albatross Expedition; USNM 55392, 16(55.7-96.7), seven males, nine females, Hilo, Hawaii, Hawaiian Islands, 16 July 1902, Albatross Expedition; USNM 55393, 4(49.0-59.6), one male, three females, Hanapepe River, Kauai, Hawaiian Islands, June 1902, Albatross Expedition; USNM 55394, 31(19.7-81.2), five males, seven females, 19 juveniles, Hanalei River, Kauai, Hawaiian Islands, 22 June 1902, Albatross Expedition; USNM 121870, 2(33.1-55.1), one female, one juvenile, Haleiwa, Oahu, Hawaiian Islands, 10 December 1944, J.R. Simon; USNM 214000, 4(39.6-75.6), two males, two females, Kahana Stream, Oahu, Hawaiian Islands, July 1971, A. Timbol.

#### Additional material

CAS 22828, male (32.5), Hanalei River, Kauai, Hawaiian Islands, 31 July 1949, J.R. Needham et al;

MNHN 8909, two males (98.2-100.0), Sandwich Islands, ca. 1870, M. Ballieu; USNM 279324, 13 juveniles (20.4-38.8), same collection data as USNM 55393.

### Diagnosis

Largest *Insularigobius* recorded; possesses a relatively high scale count in horizontal series, 47 to 52, usually 48 to 50; high predorsal scale count, always fully scaled, 16 to 23, usually 19 to 20; belly anteriorly almost always scaled close to pelvic base; breast always with many embedded scales; up to five rows of teeth in upper jaw and up to six in lower jaw.

### Relationship

*Stenogobius hawaiiensis* is most closely related to *S. genivittatus*. It differs from that species by possessing a slightly deeper caudal peduncle, generally more predorsal scales, males with more teeth in upper and lower jaws, by being of much greater length, and by having slightly fewer lateral trunk bars.

### Description

D VI-I, 10 to VI-I, 11, almost always VI-I, 11; A I, 10 to I, 11, almost always I, 11; P 14 to 16, usually 15; first dorsal fin slightly filamentous in males, most pronounced on fourth and fifth spines. LS 47 to 52, usually 48 to 50; TRB 11 to 14, usually 11 to 12; PD fully scaled, 16 to 23, usually 19 to 20; cheek almost always naked; opercle may or may not be scaled; upper pectoral base may or may not be scaled; lower pectoral base almost always naked; belly anteriorly with small naked patch adjacent to pelvic base; breast always with embedded scales. Jaw reaching under and beyond eye in males and under pupil in females. Upper jaw teeth, males 2-6+1-3, usually 3-4+1-2; females 1-4+0-2, usually 1-2+0. Lower jaw teeth, males 3-6+1-3, usually 3-6+2; females 2-5+1-2, usually 3+1.

Color in preservation: Pattern on body similar to that described for the subgenus. differences in females are small spots on upper caudal fin and two to four trunk bars below first dorsal fin; small females may have spots on membrane between spines and rays that form two to three rows, adult females never display this characteristic and have vertical pigmentation between spines and rays on membrane that appear as scirbbles.

Color in life: Life colors are based on slides of living and freshly preserved specimens as well as observations in the field by the author. In both males and females suborbital bar is edged in blue; pectoral base bluish; head and upper body greenish; outer margins of pelvic and anal fins bluish; lower margin of caudal fin bluish, upper caudal fin with two bluish-white bands. In males lower three fourths of both dorsal fins pinkish with purplish pigmentation on membrane between rays and spines; outer margin of both fins reddish. Females similarly marked, but lacks the intensity of males. It is interesting to note that the intensity of body and most fin markings in life never seemed to achieve those of freshly killed material. Observation of breeding and brooding males lacked the intensity of those after death as well. Even vertical trunk bars are more intense in preservation than in life.

### Remarks

Distribution: Known only from the high islands of Hawaii.

**Table 6a** Fin lengths in males of species belonging to the subgenus *Insularigobius*, expressed to the nearest whole percent of the standard length.

	Second dorsal fin length																								
	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57						
<i>S. alleni</i>						1	—	—	—	—	—	—	—	—	1	1									
<i>S. beauforti</i>	1	1	—	1	—	1	—	1	—	—	—	3													
<i>S. caudimaculosus</i>		1	—	1	2	—	2	2	2	—	4	—	1	2	—	—	1	1							
<i>S. fehlmanni</i>					1	—	—	2	2	2	1	1	2	7	—	4	2	2	—	—	1	—	—	—	1
<i>S. genivittatus</i>						1	1	2	—	4	2	4	4	6	1	2	1	—	2						
<i>S. hawaiiensis</i>				2	3	2	1	1	2	1	3	2	7	3	5	4	5	3	—	1	—	1			
<i>S. hoesei</i>					1	1	—	2	3	1	—	2	1	1	—	2	—	2	2						
<i>S. kyphosus</i>																		2	—	—	1	—	—	1	
<i>S. marinus</i>				2	—	3	4	5	1	3	—	4	—	2	1	—	—	1							
<i>S. marqueti</i>	1	—	1	2	—	3	1	2	2	—	4	2	4	2	1	1	—	—	—	1					
<i>S. polyzona</i>					2	—	1	1	1	1	2	3	—	2	1	—	1	1	3	1	—	—	1		
<i>S. randalli</i>																2	1	—	1						
<i>S. squamosus</i>	1	—	1	2	1	4	1	1	—	1	1	2	1	—	1	—	—	1							
<i>S. zurstrasseni</i>							1	—	1																

	Anal fin length																	
	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56
<i>S. alleni</i>							1	—	—	—	1	—	1					
<i>S. beauforti</i>	1	2	—	—	—	1	2	2										
<i>S. caudimaculosus</i>			1	3	2	6	2	1	—	2	—	—	2					
<i>S. fehlmanni</i>	1	—	1	1	1	3	—	4	1	2	4	6	2	—	1	1		
<i>S. genivittatus</i>				1	—	2	1	4	6	6	2	4	2	2				
<i>S. hawaiiensis</i>		1	1	3	1	2	3	3	5	4	5	6	2	5	1	1	2	2
<i>S. hoesei</i>				3	3	3	2	1	1	1	—	1	—	2	—	1		
<i>S. kyphosus</i>														1	—	3		
<i>S. marinus</i>			1	2	2	3	5	6	4	1	1	1						
<i>S. marqueti</i>	1	1	—	4	2	—	3	3	6	2	1	1	1	1				
<i>S. polyzona</i>	1	—	2	1	1	1	—	3	4	1	1	2	3	2				
<i>S. randalli</i>											1	1	1	1				
<i>S. squamosus</i>		2	3	2	2	1	—	3	2	1	1	1						
<i>S. zurstrasseni</i>			1	1														



Table 6a (continued)

	Caudal fin length																										
	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42								
<i>S. alleni</i>						1	—	—	—	—	—	—	—	—	1	—	1										
<i>S. beauforti</i>					2	—	—	—	1	1	—	—	2														
<i>S. caudimaculosus</i>		1	1	2	5	5	1	1	—	2	—	—	1														
<i>S. fehlmanni</i>			1	1	—	—	2	3	—	—	1	2	1	3	3	3	2	2	—	—	—	—	—	—	—	1	1
<i>S. genivittatus</i>					1	3	1	1	2	7	3	1	2	2	1												
<i>S. hawaiiensis</i>		2	3	1	—	1	3	5	3	3	4	5	4	4	3	1	2	1	1	1							
<i>S. hoesei</i>						1	2	2	4	1	2	1	—	3	—	1											
<i>S. kyphosus</i>																		1	1	—	—	—	—	—	—	1	
<i>S. marinus</i>				1	1	—	3	1	5	8	—	2	1	1	1												
<i>S. marqueti</i>	1	2	—	3	2	—	3	3	3	5	—	2	1	—	—	—	—	1									
<i>S. polyzona</i>				1	1	—	1	—	1	—	1	3	—	—	4	1	—	4	1	—	—	—	—	—	—	1	
<i>S. randalli</i>															1	—	3										
<i>S. squamosus</i>			2	4	—	—	4	—	2	1	—	1															
<i>S. zurstrasseni</i>				1	—	1																					

**Table 6b** Fin length in females of species belonging to the subgenus *Insularigobius*, expressed to the nearest whole percent of the standard length.

	Second dorsal fin length														
	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
<i>S. alleni</i>			1	—	5	—	—	1							
<i>S. beauforti</i>				4	5	3	4	—	1						
<i>S. blokzeyli</i>													1		
<i>S. caudimaculosus</i>						2	1	7	6	3	2				
<i>S. fehlmanni</i>		2	—	4	5	7	9	5	3	2	3	1			
<i>S. genivittatus</i>			1	1	2	4	3	3	4	2	3				
<i>S. hawaiiensis</i>					5	1	4	6	14	15	7	10	3	1	2
<i>S. hoesei</i>	1	—	—	—	2	1	5	4	6	4	—	1			
<i>S. kyphosus</i>						1	—	1	—	3	1	2	—	—	1
<i>S. marinus</i>		1	—	2	3	—	3								
<i>S. marqueti</i>			1	2	2	3	8	6	4	1					
<i>S. polyzona</i>			2	—	1	1	—	2	2	1					
<i>S. randalli</i>									1	—	1	1			
<i>S. squamosus</i>				3	5	1	5	2	1	2	1				
<i>S. zurstrasseni</i>						4	1	1	1						

	Anal fin length														
	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
<i>S. alleni</i>					2	3	1	1							
<i>S. beauforti</i>				2	—	8	4	3							
<i>S. blokzeyli</i>						1									
<i>S. caudimaculosus</i>							4	4	5	8					
<i>S. fehlmanni</i>	2	—	2	2	3	7	12	9	1	1	2				
<i>S. genivittatus</i>					1	1	5	5	4	4	2				
<i>S. hawaiiensis</i>		1	1	—	2	1	6	7	13	13	15	3	1	—	2
<i>S. hoesei</i>						4	3	7	4	6					
<i>S. kyphosus</i>							1	2	1	1	—	3			
<i>S. marinus</i>				3	1	2	3								
<i>S. marqueti</i>				1	1	4	3	10	6	—	2				
<i>S. polyzona</i>				1	1	1	1	1	1						
<i>S. randalli</i>								1	—	—	—	2			
<i>S. squamosus</i>						1	5	8	3	3					
<i>S. zurstrasseni</i>						1	—	2	3	1					

	Caudal fin length													
	21	22	23	24	25	26	27	28	29	30	31	32	33	34
<i>S. alleni</i>					1	2	3	—	1					
<i>S. beauforti</i>				1	1	4	4	6	1					
<i>S. blokzeyli</i>						1								
<i>S. caudimaculosus</i>					3	9	9							
<i>S. fehlmanni</i>					1	5	8	10	8	4	3			
<i>S. genivittatus</i>					2	2	6	7	2	1				
<i>S. hawaiiensis</i>			2	3	4	10	12	12	8	5	2	2	1	1
<i>S. hoesei</i>					1	—	5	4	8	3	—	2		
<i>S. kyphosus</i>						2	1	1	1	3				
<i>S. marinus</i>					1	3	1	1	3					
<i>S. marqueti</i>	1	—	1	1	3	8	11	1						
<i>S. polyzona</i>					1	—	5	1	1	—	1			
<i>S. randalli</i>									2	—	—	1		
<i>S. squamosus</i>					5	8	5	1	1					
<i>S. zurstrasseni</i>					1	3	2	—	—	1				

Ecology: Known from fresh water streams, rivers and upper reaches of estuaries always close to the coast. This species is common over fine gravel and stones in areas of riffles.

Etymology: This species is named for the Hawaiian Islands where it is an endemic.

***Stenogobius (Insularigobius) randalli*, sp. nov.**

(Figure 20)

*Stenogobius (Insularigobius) randalli*, sp. nov. (type locality: Tubuai, Tubuai Islands, French Polynesia)

**Material examined**

Seven specimens from Tubuai, Tubuai Islands, French Polynesia, totalling four males, three females; size range 48.1 to 82.8, largest male 82.8, largest female 75.9, no gravid material.

**Holotype**

USNM 280371, male (80.2), fresh water stream, Tubuai, Tubuai Islands, French Polynesia, July 1986, G. Marquet.

**Paratypes**

USNM 292573, 6(48.1-82.8), three males, three females, same collection data as holotype.

**Diagnosis**

Predorsal midline fully scaled ranging 17 to 20, usually 18 to 19; scales in horizontal series 49 to 52, usually 50 to 51; TRB 12 to 13; breast scaled; upper pectoral base usually with one to three scales; opercle may or may not be scaled; first and second dorsal fins in females with pigmentation on membrane between spines and rays appearing as vertical bars, generally not appearing as scribbles.

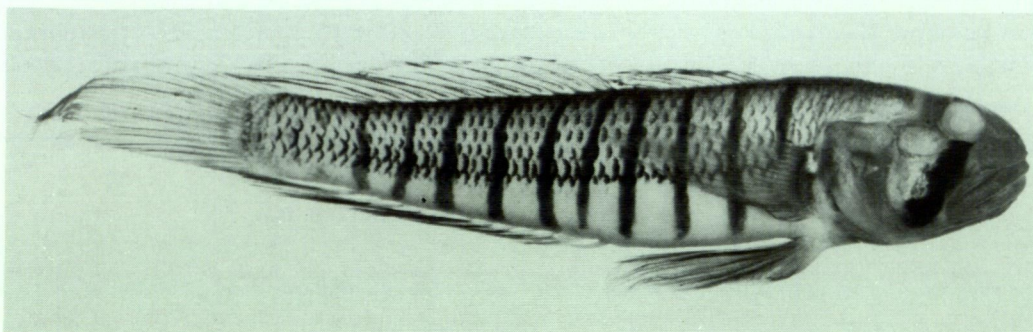
**Relationship**

This species appears closest to *Stenogobius genivittatus*, but has more scales along predorsal midline, in horizontal series as well as generally more teeth in both jaws. When compared to *Stenogobius hawaiiensis* it differs by having slightly shorter caudal peduncle and smaller size; females tend to be slightly longer jawed, and have more teeth in both jaws.

**Description**

D VI-1, 10 to VI-1, 11, usually VI-1, 11; A I, 11 to I, 12, usually I, 11; P 15 to 16. LS 49 to 52, usually 50 to 51; TRB 12 to 13; PD 17 to 20, usually 18 to 19; cheek naked; opercle may or may not be scaled; upper pectoral base usually scaled; lower pectoral base usually naked; breast scaled; belly anteriorly scaled close to pelvic base. Jaw extending under posterior edge of pupil on both sexes to beyond posterior edge of eye in males. Upper jaw teeth, males 3-5+1-2, usually 3+2; females 3+1. Lower jaw teeth, males 3-4+2-3, usually 3-4+2; females 4+2. Teeth on outer row enlarged in males.

Color in preservation: In both sexes coloration and pigmentation very close to that of *Stenogobius genivittatus*, pigmentation on both dorsal fins differ in appearing as vertical bars between rays and spines instead of appearing as scribbles.



**Figure 20** *Stenogobius randalli*, sp. nov., USNM 280371. HOLOTYPE, male (80.2). Tubuai, Tubuai Islands.

**Color in life:** Life color of both sexes based on freshly collected specimens from type lots. Color of males similar to those described for *Stenogobius genivittatus*. Outer margin of both dorsal fins reddish with thin blue line along edge. In females outer margin of anal fin bluish; some blue flecks on head; pectoral base bluish.

**Remarks**

**Distribution:** *Stenogobius randalli* is currently known only from type locality.

**Etymology:** This species is named in honor of John E. Randall for his many contributions to Indo-Pacific ichthyology.

***Stenogobius (Insularigobius) marqueti* species complex.**

(Figure 21)

This species complex is limited to the Marquesas Islands of French Polynesia. The group currently includes three species, all of which are described as new, more species may exist. The species represented are *Stenogobius marqueti*, *S. caudimaculosus* and *S. squamosus*.

It is reasonable to assume as more ichthyological surveys take place in the Marquesas Islands additional new taxa will be discovered. Recent revisions of other gobioid genera, such as Hoese & Randall (1982) and Randall & Hoese (1985), have demonstrated the existence of several endemic species at this locality.

***Stenogobius (Insularigobius) marqueti*, sp. nov.**

(Figures 22a & 22b)

*Stenogobius (Insularigobius) marqueti*, sp. nov. (type locality: Hiva Oa, Marquesas Islands, French Polynesia)

**Material Examined**

Sixty five specimens from Hiva Oa, Marquesas Islands, French Polynesia, totalling 33 males, 30 females, two juveniles; size range 24.0 to 73.9, largest male 73.9, largest female 66.6, smallest gravid female 42.8.

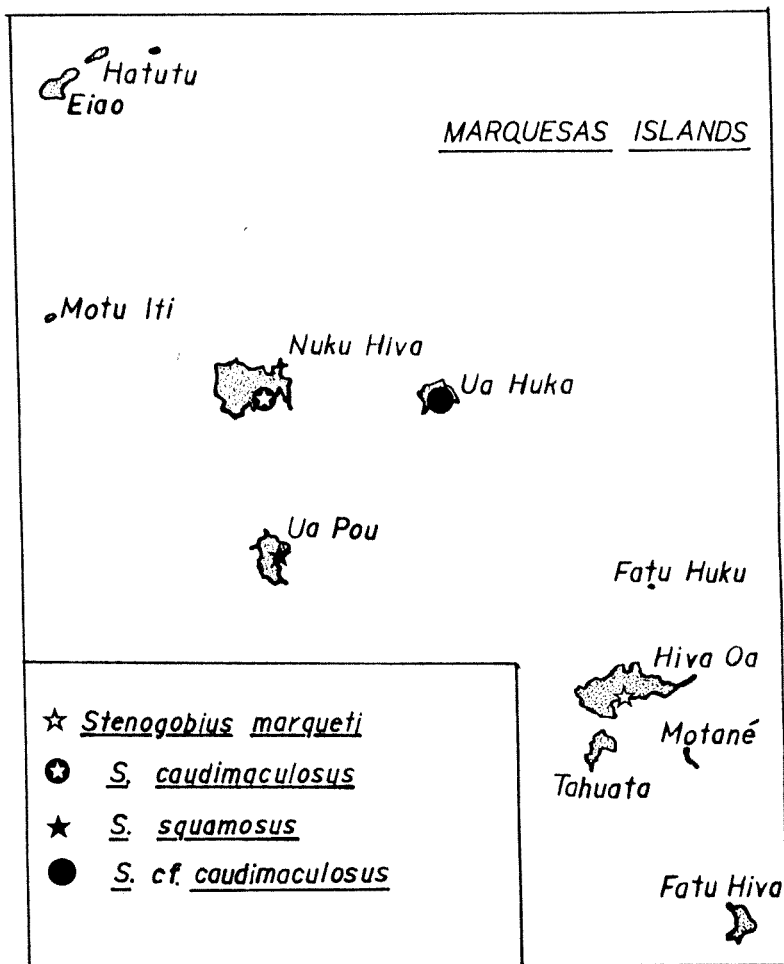
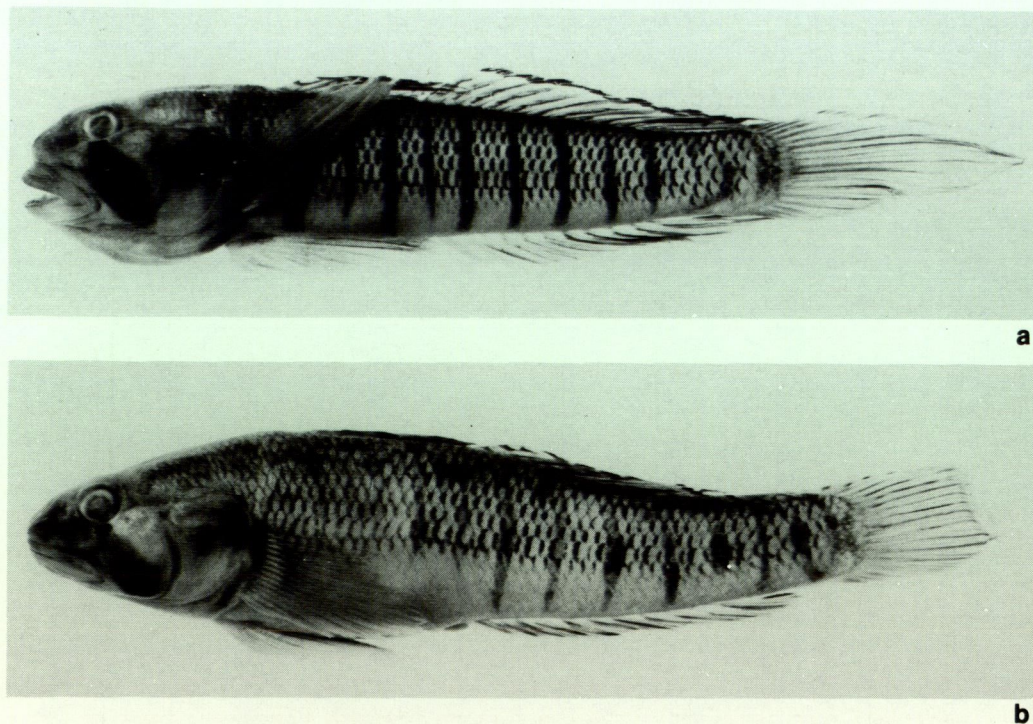


Figure 21 Distributional map of *Stenogobius marqueti* species complex.



**Figure 22** **a:** *Stenogobius marqueti*, sp. nov., MNHN 1987-930. PARATYPE, male (73.9). Hiva Oa, Marquesas Islands; **b:** *Stenogobius marqueti*, sp. nov., MNHN 1987-930, PARATYPE, female (63.4). Hiva Oa, Marquesas Islands.

**Holotype**

CAS-SU 24497, male (50.7), Hiva Oa, Marquesas Islands, French Polynesia, February 1929, A.W.C.T. Herre.

**Paratypes**

AMS I.26910-001, 9(33.5-61.1), three males, six females, Hiva Oa, Marquesas Islands, French Polynesia, 8 January 1987, G. Marquet; BPBM 12126, 20(24.1-67.4), 16 males, three females, one juvenile, fresh water stream entering head of Tahauku Bay, Hiva Oa, Marquesas Islands, French Polynesia, 25 April 1971, J.E. Randall et al; CAS 58054, 5(34.6-53.2), same collection data as holotype; MNHN 1987-930, 8(24.0-73.9), five males, two females, one juvenile, same collection data as AMS I.26910-001; SMF 21567, 5(45.2-61.6), two males, three females, same collection data as AMS I.26910-001; USNM 289987, 8(50.4-54.9), four males, four females, same collection data as AMS I.26910-001; WAM P.29656-001, 9(35.5-60.5), same collection data as AMS I.26910-001.

**Diagnosis**

Scales on predorsal midline six to 21, usually 15 to 19, sometimes with naked patches; scales in a horizontal series 48 to 51, usually 49 to 50; breast usually with one to five embedded scales, may be naked; belly anteriorly with large naked patch near pelvic base; pectoral base naked; opercle naked; females with one or two large spots on caudal peduncle.

**Table 7** Scale counts in species of the subgenus *Insularigobius*.

	Lateral series									
	44	45	46	47	48	49	50	51	52	
<i>S. alleni</i>				4	4	1				
<i>S. beauforti</i>		1	3	5	13	3	2			
<i>S. caudimaculosus</i>					2	17	12	7	1	
<i>S. fehlmanni</i>			1	6	15	22	13	5		
<i>S. genivittatus</i>			1	7	14	16	8	5		
<i>S. hawaiiensis</i>			2	25	40	27	16	4		
<i>S. hoesei</i>	1	2	2	11	14	7				
<i>S. kyphosus</i>		1	—	2	6	2	—	1		
<i>S. marinus</i>	2	1	2	2	8	10	1			
<i>S. marqueti</i>					4	17	29	5		
<i>S. polyzona</i>				4	13	8	2			
<i>S. randalli</i>						1	2	3	1	
<i>S. squamosus</i>						5	18	15		
<i>S. zurstrasseni</i>				4	7	7	10	1		

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**Table 7** — continued

	Predorsal scales																								
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
<i>S. alleni</i>			1	—	—	—	—	—	—	—	—	—	—	—	1	—	2	1	2	3					
<i>S. beauforti</i>														2	1	4	6	4	6	5					
<i>S. caudimaculosus</i>	1	—	1	1	—	—	3	—	—	1	1	2	1	1	3	5	3	5	5	7	3				
<i>S. fehlmanni</i>										1	—	—	—	—	3	13	15	25	10	1					
<i>S. genivittatus</i>													1	2	11	17	13	7	4						
<i>S. hawaiiensis</i>																3	10	16	33	23	22	7	2		
<i>S. hoesei</i>					1	—	1	—	—	1	1	2	3	4	7	12	2	6	3						
<i>S. kyphosus</i>																1	1	5	3	1	1	1			
<i>S. marinus</i>			2	1	2	1	2	—	1	3	1	1	1	3	2	4	1	4	4	1					
<i>S. marqueti</i>							1	1	—	—	2	—	2	1	2	7	8	12	7	9	4	1			
<i>S. polyzona</i>																3	15	5	7	1					
<i>S. randalli</i>																			1	2	3	1			
<i>S. squamosus</i>																2	3	11	9	9	1	2	2		
<i>S. zurstrasseni</i>											1	—	—	1	3	11	6	6	3						

R. E. Watson

**Relationship**

*Stenogobius marqueti* appears more like *S. genivittatus* than its closer relatives *S. squamosus* and *S. caudimaculosus*. It differs from *Stenogobius genivittatus* by having fewer scales, being more slender, and the presence of a spot or spots on the caudal peduncle of females.

**Description**

D VI-1,11; A I,11; P 15 to 16, almost always 15. LS 48 to 51, usually 49 to 50; TRB 12 to 14, usually 13; PD six to 21, may have naked patches; cheek naked; opercle naked; pectoral base naked; belly anteriorly with large naked patch near pelvic base; breast usually with one to five embedded scales, never fully scaled, but may be naked. Jaw reaching under pupil to posterior edge of eye in males; in females usually under center of eye. Upper jaw teeth, males 1-4+0-2, usually 2-3+1-2; females 0-2+0-1, usually 0-1+0. Lower jaw teeth, males 2-4+1-2, usually 2-4+1-2; females 2-3+0-1, usually 2-3+1. Teeth in outer row slightly enlarged in males.

Color in preservation: In both sexes body markings similar to those described for *Insularigobius*, except females have one or two spots on caudal peduncle. In males first and second dorsal fins have dusky bars on membrane between rays and spines that tend to be adjacent to anterior edge of each spine or ray and do not appear as scribbles, but rather as bars; pectoral fins and pelvic disk dusky, pelvic disk with blackish band between the fifth rays; upper margin of caudal fin with two white bands, rest of fin almost entirely dusky, darkest on membrane between rays.

**Remarks**

Distribution: *Stenogobius marqueti* is known only from fresh water streams on the island of Hiva Oa, Marquesas Islands.

Etymology: This species is named in honor of Gerard Marquet in appreciation of his extensive collection efforts in fresh waters throughout French Polynesia and the discovery of four new species of *Stenogobius*.

***Stenogobius (Insularigobius) caudimaculosus*, sp. nov.**

(Figures 23a, 23b & 23c)

*Stenogobius (Insularigobius) caudimaculosus*, sp. nov. (type locality: Nuku Hiva, Marquesas Islands, French Polynesia)

**Material examined**

Fourty three specimens from Nuku Hiva, Marquesas Islands, French Polynesia, totalling 19 males, 21 females, three juveniles; size range 24.8 to 69.9, largest male 69.9, largest female 68.5, smallest gravid female 49.4.

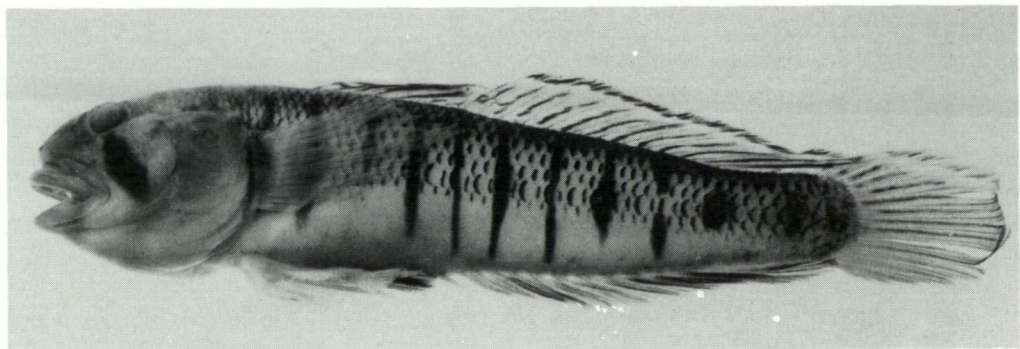
**Holotype**

MNHN 1987-929, male (69.9), fresh water stream, Nuku Hiva, Marquesas Islands, French Polynesia, 28 December 1986, G. Marquet.

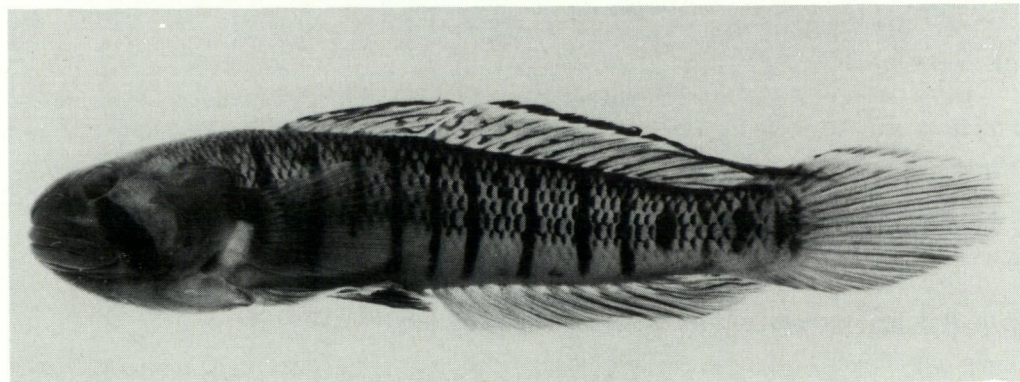
**Paratypes** (same collection data as holotype)

AMS I.26911-001, 9(41.3-62.7), five males, four females; MNHN 1987-1843, 12(24.8-68.5), four males,

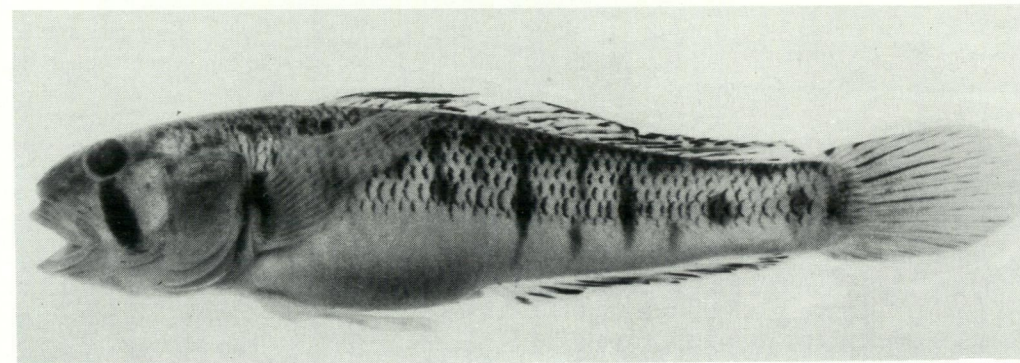




a



b



c

**Figure 23** a: *Stenogobius caudimaculosus*, sp. nov., MNHN 1987-929. HOLOTYPE, male (69.9). Nuku Hiva, Marquesas Islands; b: *Stenogobius caudimaculosus*, sp. nov., WAM P.29317-001. PARATYPE, male (65.9), Nuku Hiva, Marquesas Islands; c: *Stenogobius caudimaculosus*, sp. nov. MNHN 1987-1843. PARATYPE, female (68.5), Nuku Hiva, Marquesas Islands.

five females, three juveniles; SMF 21568, 5(43.1-68.5), three males, two females; USNM 292572, 6(44.9-62.7), one male, five females; WAM P.29317-001, 10(38.9-65.9), five males, five females.

### Diagnosis

Predorsal midline, usually patchy, seldom naked or fully scaled; scales in horizontal series 48 to 52, usually 49 to 50; breast almost always naked; belly anteriorly with large naked patch next to pelvic base; pectoral base naked; opercle almost always naked; cheek naked; caudal peduncle length 13 to 16% of SL, usually 14 to 15%; large spot or spots on caudal peduncle of both sexes.

### Relationship

This species has an elongate caudal peduncle, when compared to all other *Insularigobius*, except *Stenogobius squamosus*. It appears very similar to *Stenogobius squamosus*, apparently its closest relative; but differs from it by having a shorter caudal peduncle and fewer scales.

### Description

D VI-1,11; A I,11; P 14 to 16, almost always 15. LS 48 to 52, usually 49 to 50; TRB 12 to 14, usually 13; PD usually with naked patches; cheek naked; opercle almost always naked; pectoral base naked; breast almost always naked, but may have one to three scales present. Jaw reaching under pupil to posterior edge of eye in males, females reaching under center to posterior edge of pupil. Upper jaw teeth, males 1-3+0-2, usually 2-3+1; females 0-2+0-1, usually 1+0. Lower jaw teeth, males 3-4+1-2; females 3+1. Teeth on outer row of both jaw enlarged in males. Sexual dimorphism similar to that described for *Stenogobius genivittatus* species group, but differs by male possessing slightly shorter and broader based sexual papilla.

Color in preservation: Basic body coloration as with those described for *Insularigobius*. Trunk bars distinctive on both sexes in being broadened medially; blackish or dusky spot found on caudal peduncle with weak spot often present on hypural base. Both dorsal fins in males with dusky bars between spines and rays tending not to appear as scribbles, margin of both dorsal fins with black band and a thin translucent band along edge; second dorsal fin in females with small irregular dusky spots at base of membrane between rays, above spots dusky bars similar to those of males. In both sexes caudal fin with dusky streaks on membrane between rays, appearing darkest on upper half, in males caudal fin dusky, two blackish band near top of fin, with translucent band between, this marking appears to continue from second dorsal fin. Anal fin markings similar to those described for *Stenogobius genivittatus*. Pectoral fin dusky in both sexes, most pronounced in males. Pelvic disk dusky in males; females with dusky band on membrane between fifth rays.

### Remarks

Distribution: Known only from fresh water streams on Nuku Hiva, Marquesas Islands.

Etymology: The name is derived from the Latin words *cauda* meaning tail and

*maculosus* meaning spotting. This is in reference to the spot or spots that exist on the caudal peduncle of this species.

Note: This species is unique in possessing two distinctive phases of adult males. Primary males appear fully adult with elongate fins and similar to adult males of other species. Secondary males appear adolescent in having shorter fins and shorter jaw, but may reach a large size, the largest specimen examined, the holotype, was determined to be a secondary male. This has only been observed in this species of *Stenogobius*.

***Stenogobius (Insularigobius) squamosus, sp. nov.***

(Figures 24a & 24b)

*Stenogobius (Insularigobius) squamosus, sp. nov.* (type locality: Ua Pou, Marquesas Islands, French Polynesia)

**Material Examined**

Thirty nine specimens from Ua Pou, Marquesas Islands, French Polynesia, totalling 20 males, 19 females; size range 30.4 to 79.0, largest male 74.0, largest female 79.0, smallest gravid female 50.3.

**Holotype**

MNHN 1987-928, male (74.0), fresh water stream, Ua Pou, Marquesas Islands, French Polynesia, 26 December 1986, G. Marquet.

**Paratypes** (same collection data as holotype)

AMS I.27133-001, 9(37.6-71.8), four males, five females; MNHN 1987-1842, 10(30.4-79.0), five males, five females; SMF 21569, 5(50.3-72.7), one male, four females; USNM 289986, 5(43.1-63.1), four males, one female; WAM P.29316-001, 9(37.4-66.4), five males, four females.

**Diagnosis**

Species has most elongate caudal peduncle of all *Insularigobius* examined, 14 to 17% of SL, usually 15 to 16%; predorsal midline usually fully scaled, usually 17 to 19; scales in horizontal series 49 to 51, usually 50 to 51; opercle may or may not be scaled; one to two spots present on caudal peduncle.

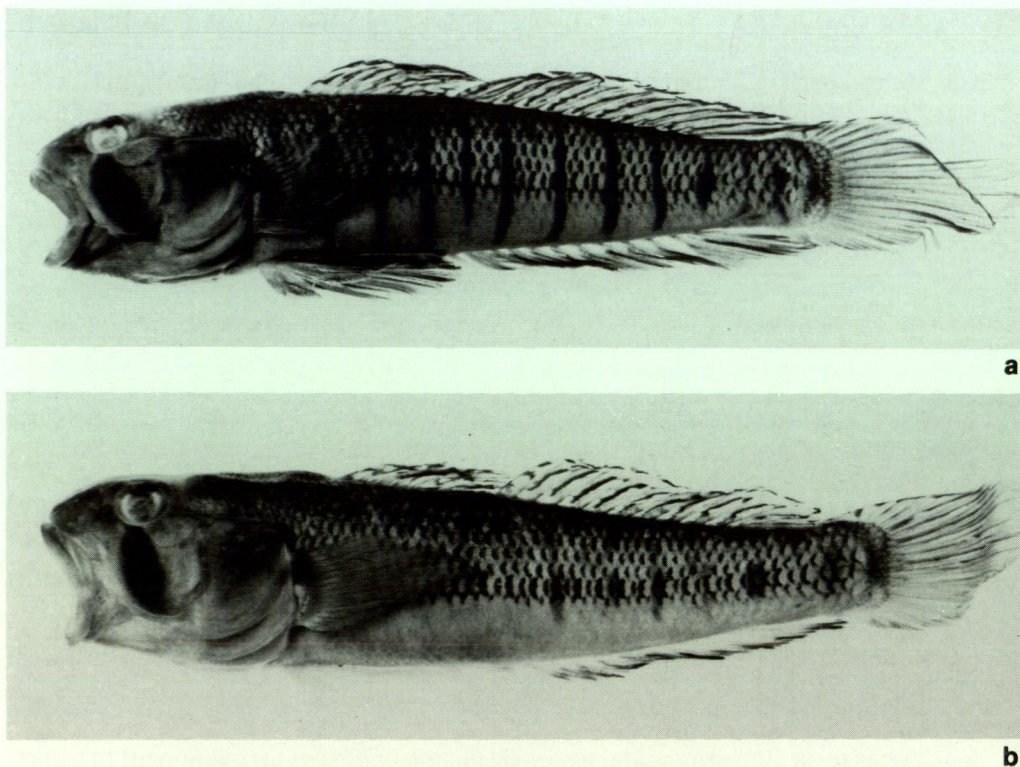
**Relationship**

This species is most closely related to *Stenogobius caudimaculosus* and a yet undescribed form (MNHN 1987-927) from Ua Huka, Marquesas Islands, it differs by having more scales and longer caudal peduncle.

**Description**

D VI-1,11; A I,11 to 1,12, almost always 1,11; P 15. LS 49 to 51, usually 50 to 51; TRB 12 to 14, usually 13 to 14; PD 15 to 22, usually 17 to 21; cheek naked; opercle may or may not be scaled; pectoral base naked. Jaw reaching under pupil to posterior edge of eye in males, jaw in females reaches under center or posterior edge of pupil. Upper jaw teeth, males 2-3+1; females 0-2+0-1, usually 2+1. Lower jaw teeth, males 3-4+1-2, usually 4+2; females 2-3+1, usually 3+1. Teeth on outer row of both jaws in males enlarged. Sexual dimorphic differences similar to those described for *Stenogobius caudimaculosus*.

Color in preservation: Body pattern almost identical to *Stenogobius caudimaculosus*, only noticeable difference is the lack of intensity of spotting and trunk bars. The same conditions exist with fin markings.



**Figure 24** **a:** *Stenogobius squamosus*, sp. nov., MNHN 1987-928. HOLOTYPE, male (74.0), Ua Pou, Marquesas Islands; **b:** *Stenogobius squamosus*, sp. nov., MNHN 1987-1842. PARATYPE, female (79.0), Ua Pou, Marquesas Islands.

### Remarks

**Distribution:** Known only from fresh water streams on the island of Ua Pou, Marquesas Islands.

**Etymology:** The name is taken from the Latin word *squamosus* meaning scaled. This is in reference to the fact it is the most scaled species of the *Stenogobius* examined from the Marquesas Islands.

### *Stenogobius (Insularigobius) blokzeyli* species complex.

(Figure 25)

This group is closely related to *Stenogobius genivittatus* species complex and is most easily separated by females possessing rows of spots on the second dorsal fin and a medial band on first dorsal fin. This complex is centered along the western Pacific Ocean.

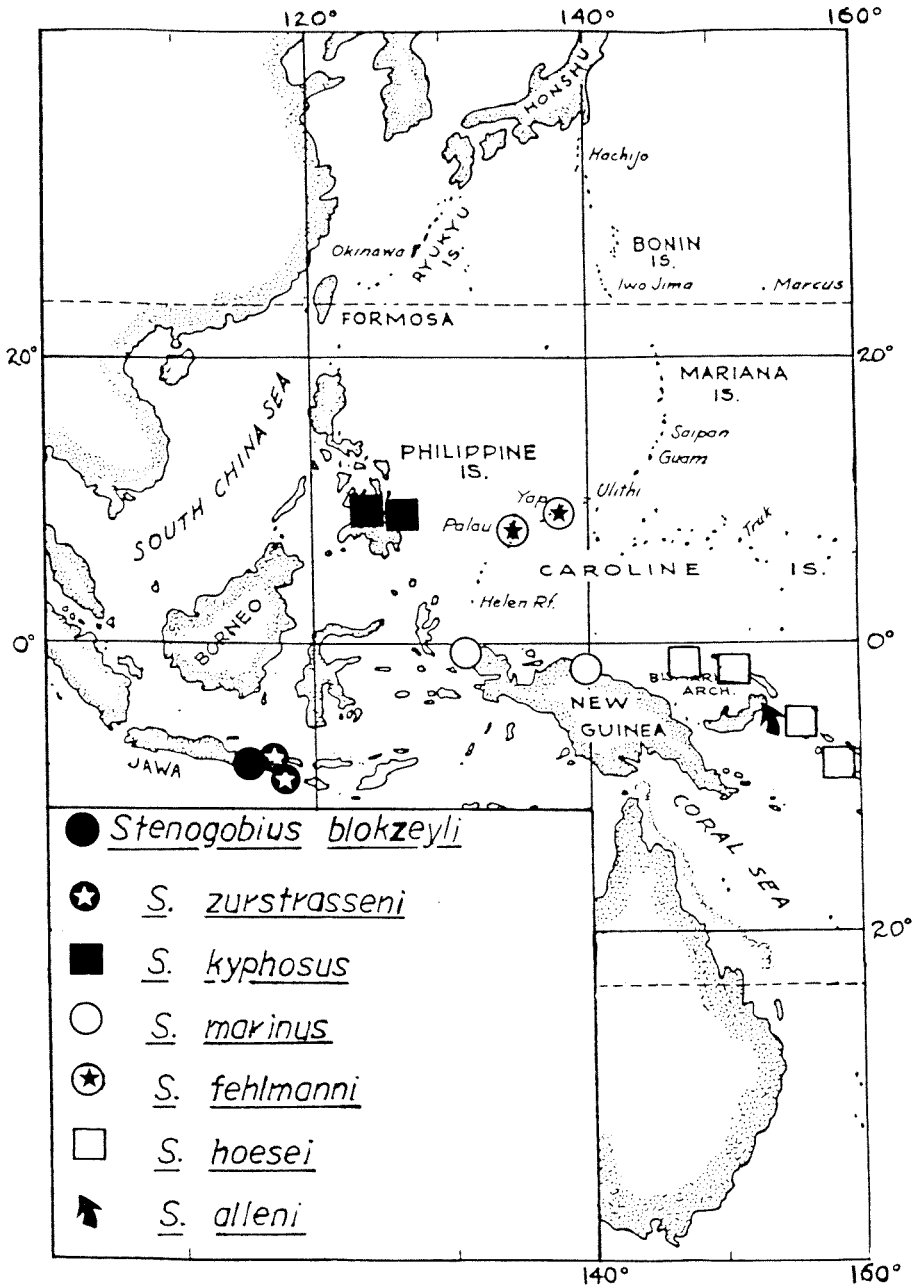


Figure 25 Distributional map of *Stenogobius blokzeyli* species complex.

***Stenogobius (Insularigobius) blokzeyli* (Bleeker 1861)**

*Gobius blokzeyli* Bleeker, 1861: 240 (type locality: Bali)

**Material examined**

Two females from Bali, Indonesia, size range 58.8 to 70.8.

**Syntypes**

RMNH 4511, two females (58.8-70.8), Bali, Sunda Islands, Dutch East Indies.

**Diagnosis**

Upper pectoral base scaled; lower base may or may not be scaled; breast with embedded scales; belly anteriorly scaled close to pelvic base; upper jaw teeth 3+1, lower jaw teeth 3-4+1-2.

**Relationship**

Exact relationships cannot be ascertained until more material can be obtained from type locality.

**Description**

D VI-I, 11; A I, 11, P 15. LS, TRB and PD impossible to obtain due to poor condition of specimens; opercle scaled; cheek naked; upper pectoral base scaled; lower pectoral base may or may not be scaled; breast with embedded scales; belly scaled close to pelvic base.

Color in preservation: Background grayish brown; trunk bars vaguely visible as is the oblique cheek bar. First dorsal fin with brownish medial band; other fin markings not apparent.

**Remarks**

Distribution: Known only from the type locality of Bali, Sunda Islands, Indonesia.

Note: *Stenogobius blokzeyli* appears to be a valid species, however it cannot be fully evaluated at this time, as more material is needed from the type locality. The types are in very poor condition and are of one sex. It does have more teeth in both jaws than females of any other species of *Insularigobius*.

***Stenogobius (Insularigobius) alleni*, sp. nov.**

(Figures 26a & 26b)

*Stenogobius alleni*, sp. nov. (type locality: New Britain, Bismarck Archipelago, Papua New Guinea)

**Material examined**

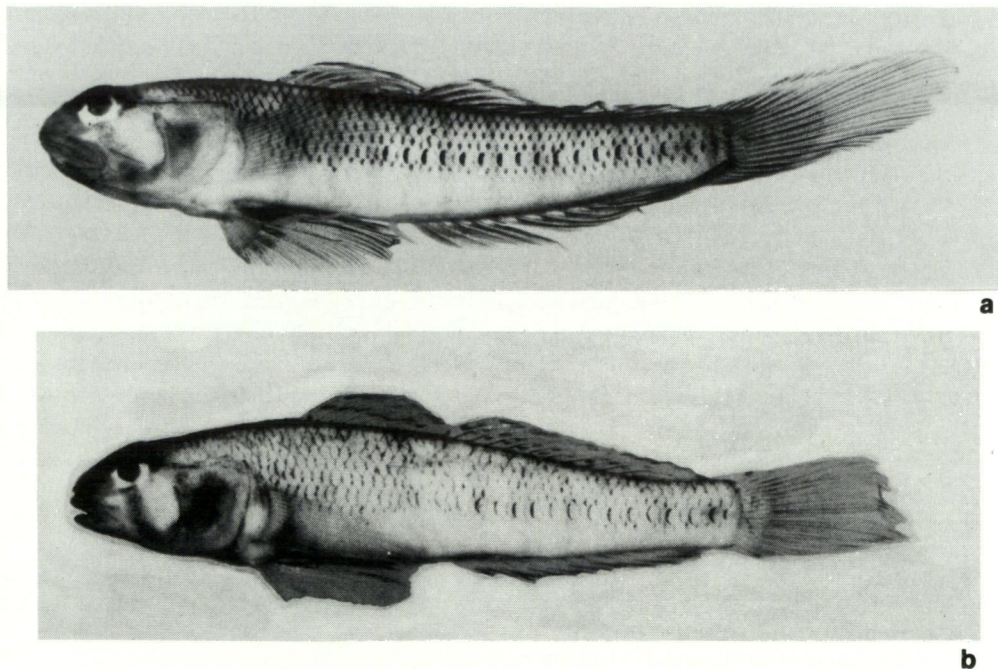
Ten specimens from New Britain, Bismarck Archipelago, Papua New Guinea totalling three males, seven females; size range 28.4 to 39.1, largest male 36.5, largest female 39.1, no gravid material.

**Holotype**

WAM P.28177-010, male (36.5), Tovarua Stream near public beach, New Britain, Bismarck Archipelago, Papua New Guinea, 10 October 1983, G.R. Allen and R.C. Steene.

**Paratypes** (same collection data as holotype)

AMS I.25440-001, 2(33.9-35.0), one male, one female; USNM 276274, 2(33.9-35.9), one male, one female; WAM P.28177-003, five females (28.4-39.1).



**Figure 26** a: *Stenogobius alleni*, sp. nov., WAM P.28177-010, HOLOTYPE, male (36.5), New Britain, Papua New Guinea; b: *Stenogobius alleni*, sp. nov., WAM P.28177-003, PARATYPE, female (39.1), New Britain, Papua New Guinea.

### Diagnosis

A small, elegant *Stenogobius*; vertical trunk bars very faint in both sexes; first dorsal fin in males with short bars on membrane that do not appear as scribbles, second dorsal fin similarly marked; first dorsal fin in females with midlateral band and dusky margin, second dorsal with dusky spots forming two rows on membrane; predorsal midline with two to 18 scales, usually fully scaled, but may be with naked patches; belly anteriorly naked close to pelvic base; breast naked. This is the smallest species of *Stenogobius* known.

### Relationship

The species closest in size is *Stenogobius beauforti*, which appears to be a very distant relative. It may be most closely related to *Stenogobius fehlmanni*, but differs in lacking black pigmentation in first and second dorsal fins that appear as scribbles, by lacking filamentous dorsal spines, being slightly more slender, a shorter head, and by its small size.

### Description

D VI-1,11; A 1,11; P 15. LS 47 to 49, usually 47 to 48; TRB 10 to 12, usually 11; PD usually fully scaled; cheek naked; opercle usually naked; pectoral base naked; belly

anteriorly naked; breast naked. Jaw extending under to anterior edge of pupil in females and to posterior edge of pupil in males. Upper jaw teeth, males 2+1-2, usually 2+2; females 1-2+0-1. Lower jaw teeth, males 3-4+2, usually 3+2; females 3+1. Teeth in outer row slightly enlarged in males.

Color in preservation: Males; first and second dorsal fins dusky, first dorsal fin with short bars medially on membrane that forms a band not appearing as scribbles, fin with a dusky margin; second dorsal fin with dusky bars between spine and rays not appearing as scribbles and fin with dusky margin; caudal fin dusky with two whitish streaks separated by dusky streak on upper margin and whitish band on lower margin of fin; anal and pectoral fins as well as pelvic disk dusky; dusky vertical trunk bars originate behind pectoral base and terminate between second dorsal and anal fins, bars somewhat crescentic and often indistinct, numbering seven to 10. Females; first dorsal fin with blackish medial band and dusky spotting above; second dorsal fin with blackish spots on membrane forming two to three rows; caudal fin with some whitish spots on upper third of fin, rest of fin translucent; anal fin with some dusky streaking and spotting, blackish band near margin with a whitish edge; pelvic disk translucent; pectoral fin slightly dusky; upper body dusky; snout dusky; vertical trunk bars very indistinct and limited to midline between second dorsal and anal fins, numbering two to five.

#### Remarks

Distribution: Known only from the type locality.

Ecology: Reported from a small fresh water stream.

Etymology: This species is named in honor of Gerald R. Allen for his contributions to the fresh water ichthyology of Papua New Guinea.

### *Stenogobius (Insularigobius) fehlmanni*, sp. nov.

(Figures 27a & 27b)

*Stenogobius (Insularigobius) fehlmanni*, sp. nov. (type locality: Babelthuap Island, Palau Islands)

#### Material examined

Eighty seven specimens from the Palau Islands and Yap Island of the Caroline Islands totalling 28 males, 55 females, four juveniles; size range 14.1 to 75.1, largest male 75.1, largest female 64.1, smallest gravid female 29.7.

#### Holotype

CAS 51193, male (74.4), Behes Stream, Ngermelech Village, Melekeiok Municipality, Babelthuap Island, Palau Islands, 27 September 1955, H.A. Fehlmann *et al.*

#### Paratypes

AMS 1.24812-002, female (48.7), Chimmel River, 20 meters below Arai Reservoir, Babelthuap Island, Palau Islands, 23 November 1983, J. June; CAS-SU 29233, female (47.7), Palau Islands, 15 October 1933, A. W. C. T. Herre; CAS 51194, female (41.4), stream at Rumu village at bridge on road to Teguren canal from bridge upstream, Yap Island, 2 September 1956, M. Brittan; CAS 57868, male (52.1), fresh water streamlet bordering north side of old Japanese airfield, Arakabesan Island, Palau Islands, 11 September 1955, H.A. Fehlmann *et al.*; CAS 57869, 2(38.1-38.4), one male, one female, streamlet tributary of Gihmel River in vicinity of Ngeruluebe village, Arai Municipality, Babelthuap Island, Palau Islands, 19 September 1955, H.A. Fehlmann *et al.*; CAS 57870, female (49.5), Didyong, fresh water streamlet draining into Komebail



lagoon, Arakabesan Island, Palau Islands, 9 October 1955, H.A. Fehlmann *et al*; CAS 57871, 3 females (45.0-50.6), Ngertehiyah stream flowing through Ngerubodoru Village (Ngerbodel), Koror Island, Palau Islands, 12 October 1955, H.A. Fehlmann *et al*; CAS 57872, 2(28.9-48.3), one male, one female, Ilmaw stream, Ngetkip Village, Arai Municipality, south end of Babelthuap Island, Palau Islands, 25 October 1955, H.A. Fehlmann *et al*; CAS 57873, 6(35.1-45.8), three males, three females, Airisong stream, one to 1.5 miles north of Ngetkip Village, Arai Municipality, Babelthuap Island, Palau Islands, 26 October 1955, Sumang & Fehlmann; CAS 57874, female (41.5), Kyam stream south of Medorum Village, Aimeliik Municipality, Babelthuap Island, Palau Islands, 2 November 1955, H.A. Fehlmann *et al*; CAS 57875, 21(17.6-53.2), six males, 13 females, two juveniles, upper mangrove zone, south fork Arakitaoch stream, 1.2 miles southeast of Ngarekeai village, Arai Municipality, Babelthuap Island, Palau Islands, 15 November 1955, H.A. Fehlmann *et al*; CAS 57876, 3(14.1-41.4), one male, one female, one juvenile, channel of Arakitaoch stream through mangrove swamp about one mile southeast of Ngarekeai village, Arai Municipality, Babelthuap Island, Palau Islands, 20 September 1957, Sumang *et al*; CAS 58052, 43(21.1-75.1), 14 males, 28 females, one juvenile, same collection data as holotype.

### Diagnosis

Spines of first dorsal fin in males usually filamentous, may reach seventh or eighth ray of second dorsal fin; scale count in lateral series 46 to 51, usually 48 to 50; scales in predorsal midline almost always fully scaled ranging nine to 19, usually 17; upper pectoral base usually naked; opercle may or may not be scaled; cheek almost always naked; breast always scaled.

### Relationship

This species appears closest to *Stenogobius alleni*. At present no other close relative can be ascertained, a presently undescribed form from nearby Kusaie, Caroline Islands does not appear to be closely related.

### Description

D VI-1,11; A I,11 to I,12, almost always I,11; P 14 to 16, usually 15; first dorsal fin often with filamentous spines in males that may reach to seventh or eighth rays of second dorsal fin. LS 46 to 51, usually 48 to 50; TRB 11 to 13, usually 12; PD nine to 19, almost always fully scaled; cheek almost always naked; opercle may or may not be scaled; lower pectoral base naked; belly scaled close to pelvic base; breast always with scales present. Jaw extending under pupil in females to beyond posterior edge of eye in males. Upper jaw teeth, males 2-3+1-2, usually 2-3+1; females 1-2+0-1, usually 1+0. Lower jaw teeth, males 3-5+2, usually 4+2; females 2-3+0-2, usually 2-3+1.

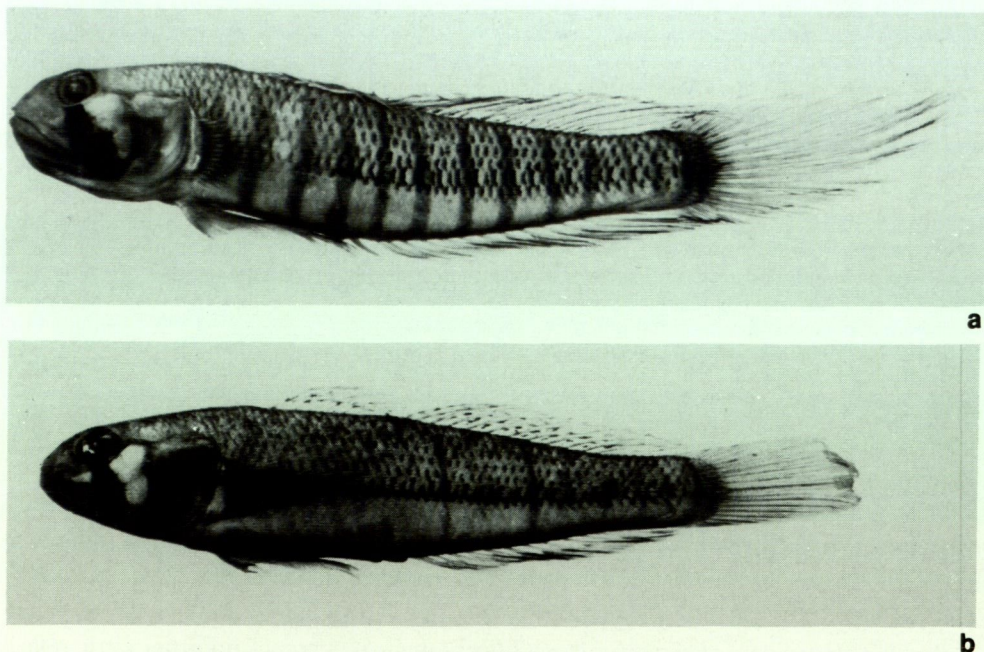
Color in preservation: Patterns of both sexes similar to those described for *Stenogobius genivittatus*. In males head slightly dusky. Females may or may not have lateral trunk bars; first dorsal fin with dusky midlateral band; second dorsal fin with many dusky spots forming irregular rows.

### Remarks

Distribution: Known from the Palau Islands and Yap Island of the Caroline Islands.

Ecology: Reported from fresh and brackish water streams over sand and mud.

Etymology: This species is named for H. Adair Fehlmann for his contributions to ichthyology, as well as collecting most of the type material.



**Figure 27** a: *Stenogobius fehlmanni*, sp. nov., CAS 51193, HOLOTYPE, male (74.4), Babelthuap Island, Palau Islands; b: *Stenogobius fehlmanni*, sp. nov., CAS 58052, PARATYPE, female (57.2), Babelthuap Islands, Palau Islands.

***Stenogobius (Insularigobius) hoesei*, sp. nov.**  
(Figures 28a & 28b)

*Stenogobius (Insularigobius) hoesei*, sp. nov. (type locality: Manus Island, Admiralty Islands, Papua New Guinea)

**Material examined**

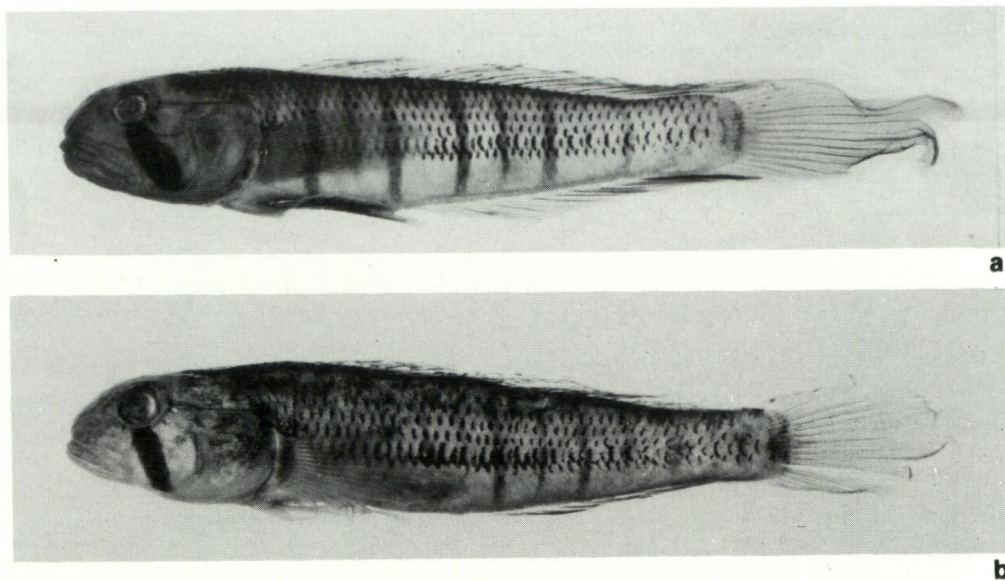
Fifty eight specimens from the Admiralty Islands, Solomon Islands and Bismarck Archipelago of the western Pacific, totalling 21 males, 29 females, eight juveniles; size range 18.8 to 60.8, largest male 60.8, largest female 55.6, no gravid material.

**Holotype**

WAM P.27829-015, male (59.6), small fresh water creek, 1.5 km southeast of Lorengau, Manus Island, Admiralty Islands, Papua New Guinea, 10 October 1982, G.R. Allen & R. Knight.

**Paratypes**

AMS I.25437-007, 2(47.2-50.1), one male, one female, same collection data as holotype; BPBM 30850, 2(43.6-49.6), one male, one female, near Bunia Point west of Honiara, Guadalcanal, Solomon Islands, 20 March 1965, D. Cohen; NTM S.11677-001, 2(44.9-49.7), one male, one female, same collection data as holotype; NTM S.11678-001, 2(43.6-52.2), one male, one female, same collection data as BPBM 30850; ROM 48511, 2(43.5-49.1), one male, one female, same collection data as BPBM 30580; USNM 114892, 3(23.2-36.7), one female, two juveniles, Tei River, Manus Island, Admiralty Islands, 15 January 1946, D.S. Frey; USNM 273480, 11(39.1-60.8), four males, seven females, same collection data as BPBM 30850;



**Figure 28** **a:** *Stenogobius hoesei*, sp. nov., USNM 273480, PARATYPE, male (60.8) Guadalcanal, Solomon Islands; **b:** *Stenogobius hoesei*, sp. nov., USNM 273480, PARATYPE, female (55.6) Guadalcanal, Solomon Islands.

USNM 276275, 2(47.5-52.9), one male, one female, same collection data as holotype; WAM P.27829-017, 12(22.8-46.6), three males, four females, five juveniles, same collection data as holotype; WAM P.27830-009, female (42.3), Lorengau River at base of falls, Manus Island, Admiralty Islands, Papua New Guinea, 10 October 1982, G.R. Allen & R. Knight; WAM P.28163-003, three females (28.2-34.3), small stream crossing on Arawa Road at Borora Point, Bougainville Island, Papua New Guinea, 3 October 1983, G.R. Allen & R.C. Steene; WAM P.28164-007, three females (26.5-50.1), Tekan River on road crossing west of Arigua Plantation, Bougainville Island, Papua New Guinea, 3 October 1983, G.R. Allen & R.C. Steene; WAM P.28185-015, 2(36.2-41.8), one male, one female, small creek 25 km south of Kavieng, New Ireland, Bismarck Archipelago, Papua New Guinea, 14 October 1983, G.R. Allen & R.C. Steene; WAM P.28453-001, 2(52.6-56.3), one male, one female, same collection data as BPBM 30850; ZMA 119.418, 2(42.6-48.4), one male, one female, same collection data as BPBM 30850.

#### Additional material

AMNH 16616, female (34.9), Los Negros Island, Admiralty Island, 1944, O. Barton; ANSP 95518, 4(31.0-57.1), three males, one female, Poha River, Guadalcanal, Solomon Islands, 11 September 1953, M. & E.A. Laird; WAM P.28162-003, juvenile (18.8), small stream three km southeast of Wakunai, Bougainville, Solomon Islands, Papua New Guinea, 3 October 1983, G.R. Allen & R.C. Steene.

#### Diagnosis

Predorsal midline almost always with naked patches, four to 18 scales; pectoral base almost always naked; opercle almost always naked; breast naked; third and fourth spines of first dorsal fin may be slightly filamentous on males; body anteriorly, head and pectoral fin dusky in both sexes.

### Relationship

*Stenogobius hoesei* appears most closely related to *S. marinus*. It differs by being dusky anteriorly in both sexes, slightly longer fins, slightly shorter caudal peduncle, slightly greater predorsal length, slightly greater preanal length, slightly fewer scales in horizontal series, and by habitat preference; females possess more trunk bars and slightly thicker caudal peduncle. At present a close relationship with any other species cannot be determined.

### Description

D VI-1,10 to VI-1,12, almost always VI-1,11; A 1,11 to 1,12, almost always 1,11; P 15 to 16, almost always 15; third and fourth spines of first dorsal fin may be slightly

**Table 8** Pectoral ray counts in species of the subgenus *Insularigobius*.

	Pectoral rays			
	13	14	15	16
<i>S. alleni</i>			10	
<i>S. beauforti</i>	1	4	19	3
<i>S. blokzeyli</i>			2	
<i>S. caudimaculosus</i>		1	40	2
<i>S. fehlmanni</i>		3	45	10
<i>S. genivittatus</i>			50	5
<i>S. hawaiiensis</i>		5	102	14
<i>S. hoesei</i>			42	2
<i>S. kyphosus</i>		1	11	1
<i>S. marinus</i>		6	26	3
<i>S. marqueti</i>			56	1
<i>S. polyzona</i>		3	29	1
<i>S. randalli</i>			4	3
<i>S. squamosus</i>		1	38	
<i>S. zurstrasseni</i>		1	28	3

filamentous on males. LS 44 to 49, usually 47 to 48; TRB 11 to 13, usually 11 to 12; PD usually with naked patches; cheek naked; opercle almost always naked; upper pectoral base almost always naked; lower pectoral base naked; belly anteriorly with large naked patch close to pelvic base; breast usually naked, may have few embedded scales. Jaw extending under pupil in females and beyond posterior edge of eye in males. Upper jaw teeth, males 2-4+1-2, usually 2+1-2; females 1+0-1. Lower jaw teeth, males 3-4+2-3, usually 3+2; females 2-3+1-2, usually 3+2. Teeth on outer row of upper and lower jaws enlarged in males.

Color in preservation: Background brownish to grayish, body anteriorly and head dusky; pectoral fin dusky in both sexes. Coloration strongly sexual dichromatic and described as follows: Males; first and second dorsal fins with blackish pigmentation on membrane between rays and spines appearing as scribbles, both fins with a weak dusky margin; caudal and anal fins and pelvic disk dusky; upper fourth of caudal fin with some dusky spotting; blackish vertical trunk bars originate behind pectoral base and end near

caudal fin base, these being slightly crescentic and alternate in width numbering six to 10. Females; first dorsal fin with black midlateral band and dusky margin; second dorsal fin with black spots on membrane between rays and spines that form two to three rows; vertical dusky trunk bars usually limited to area between second dorsal and anal fins, numbering three to 10.

#### Remarks

Distribution: Known from the Admiralty and Solomon Islands and the Bismarck Archipelago in the western Pacific.

Ecology: All specimens reported from small fresh water streams.

Etymology: This species is named in honor of Douglass F. Hoese for his contributions to gobioid systematics and for his encouragement throughout the course of this study.

#### *Stenogobius (Insularigobius) kyphosus*, sp. nov. (Figures 29a & 29b)

*Stenogobius (Insularigobius) kyphosus*, sp. nov. (type locality: Camiguin Island, Philippines)

#### Material examined

Fourteen specimens from the Philippines totalling four males, nine females, one juvenile; size range 16.8 to 90.4, largest male 90.4, largest female 87.7, no gravid material.

#### Holotype

USNM 99878, male (90.4), Mahinog River, Camiguin Island, Philippines, 3 August 1909, Albatross Expedition.

#### Paratypes

AMS 1.25439-001, 2(79.5-82.9), one male, one female, same collection data as holotype; ANSP 156992, 2(72.2-80.2), one male, one female, same collection data as holotype; ROM 48510, three females (54.2-87.7), same collection data as holotype; USNM 99929, 2(16.8-45.8), one female, one juvenile, Baganga River, Mindanao, Philippines, 13 May 1909, Albatross Expedition; USNM 99930, female (52.2), Nonucan River near Camp Overton, Iligigan Bay, Mindanao, Philippines, 6 August 1909, Albatross Expedition; USNM 120323, female (53.9), Malaga River, Leyte, Philippines, 30 July 1909, Albatross Expedition; USNM 274590, 2(80.2-83.2), one male, one female, same collection data as holotype.

#### Diagnosis

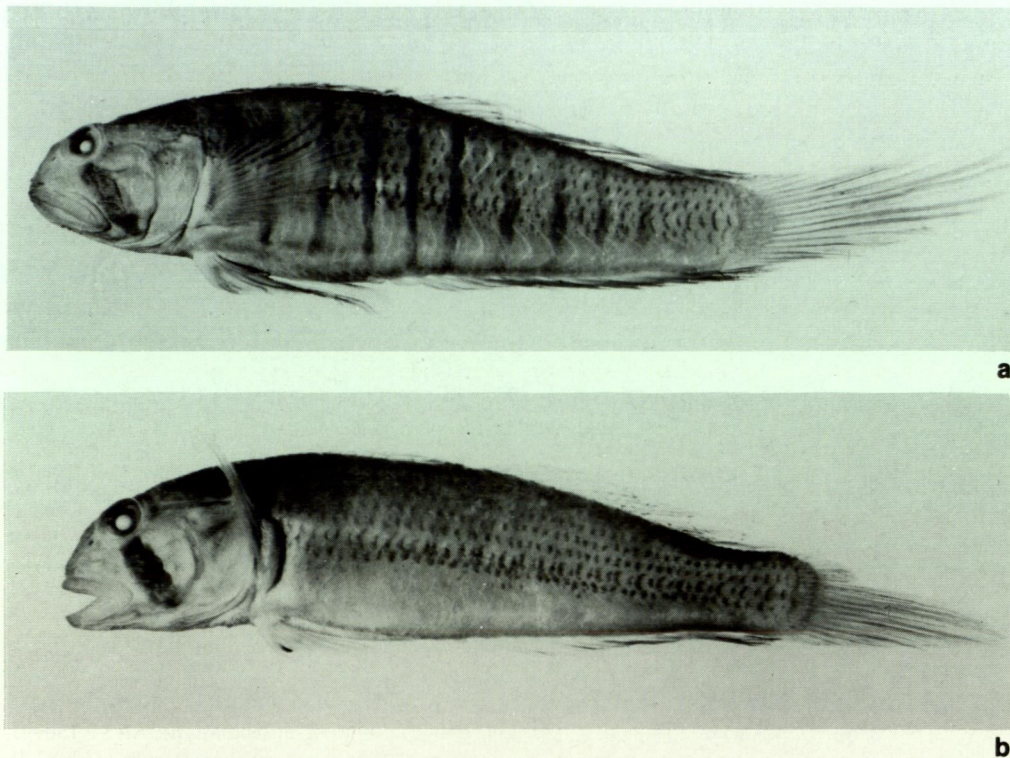
A very robust species, males 22 to 24% of SL at origin of second dorsal fin; steep snout; breast scaled; predorsal scales 15 to 21, usually 17 to 18, always fully scaled.

#### Relationship

*Stenogobius kyphosus* shows no close affinities with any species described or undescribed.

#### Description

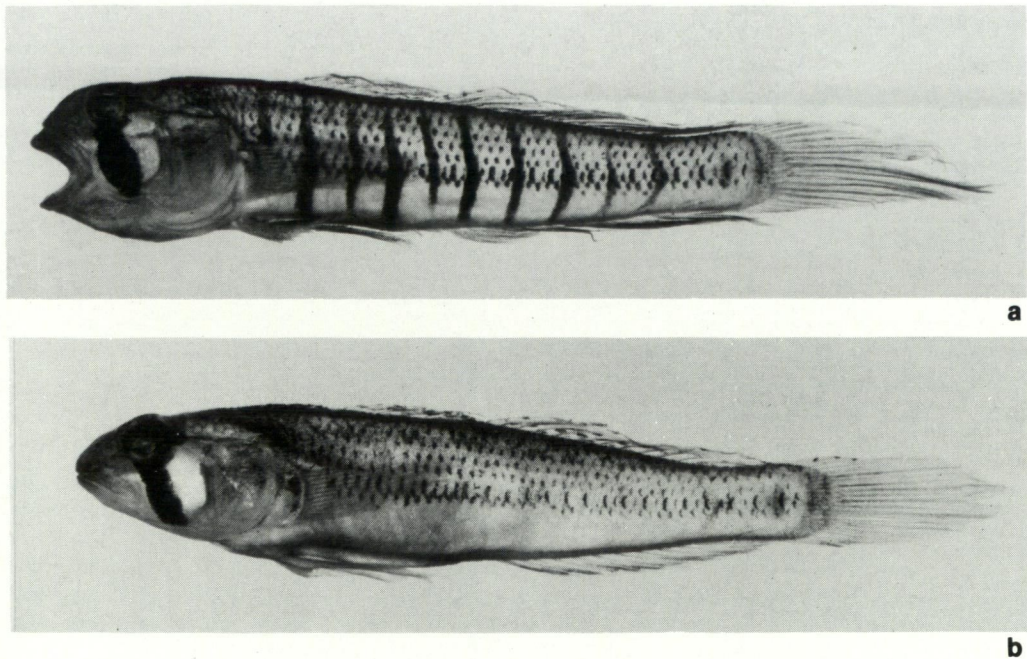
D VI-1, 11; A I, 11; P 14 to 16, usually 15. LS 45 to 51, usually 48; TRB 11 to 13, usually 12; PD 15 to 21, usually 17 to 18, always fully scaled; cheek almost always naked; opercle may or may not be scaled; upper pectoral base may or may not be scaled; lower pectoral base usually naked; belly anteriorly scaled close to pelvic base; breast scaled. Jaw reaching under pupil in females and beyond posterior edge of eye in males. Upper jaw teeth, males 3-5+2, usually 3+2; females 1-2+0-1, usually 1-2+1. Lower jaw teeth, males



**Figure 29** **a:** *Stenogobius kyphosus*, sp. nov., USNM 99878. HOLOTYPE, male (90.4), Camiguin, Philippines; **b:** *Stenogobius kyphosus*, sp. nov., ROM 48510, PARATYPE, female (87.7), Camiguin, Philippines.

3-5+2, usually 3+2; females 2-3+1. Teeth on outer row of both jaws enlarged in males. Body depth between origin of second dorsal fin and belly in males 22-24% of SL, greater than any other *Insularigobius* examined.

Color in preservation: Background brownish; body and head not dusky. Color sexually dichromatic: Males; first and second dorsal fins with some blackish pigmentation on membrane between spines and rays appearing as scribbles; caudal fin dusky; pectoral fin translucent; dusky vertical trunk bars originate behind pectoral base and terminate between second dorsal and anal fins, being slightly crescentic, those anterior almost vertical, these do not reach dorsal or ventral surfaces, numbering 10 to 11. Females; first and second dorsal fins with several rows of fine blackish spots on membrane; caudal fin with no detectable markings and is slightly dusky; anal fin light with a dusky margin; pelvic disk and pectoral fin translucent; vertical trunk bars usually absent or indistinct, numbering zero to eight.



**Figure 30** a: *Stenogobius marinus*, sp. nov., USNM 274586, HOLOTYPE, male (55.3), Irian Jaya, Indonesia; b: *Stenogobius marinus*, sp. nov., MZB 5649, PARATYPE, female (45.5), Irian Jaya, Indonesia.

### Remarks

**Distribution:** Known from the rivers entering the Mindanao Sea and eastern Mindanao of the Philippines.

**Ecology:** Reported from rivers and estuaries over sand and mud bottoms.

**Etymology:** Name is taken from the Greek word *kyphos* meaning humpback, in reference to the high back of this species when compared to other species of *Insularigobius*.

***Stenogobius (Insularigobius) marinus*, sp. nov.**  
(Figures 30a & 30b)

*Stenogobius (Insularigobius) marinus*, sp. nov. (type locality: Irian Jaya, Indonesia)

### Material examined

Thirty five specimens from Irian Jaya, Indonesia, totalling 26 males, nine females; size range 33.9 to 55.2, largest male 55.2, largest female 45.5, no gravid material.

### Holotype

USNM 274586, male (55.2), between Tandjung Manganeki and Tandjung Boropen off northern Tjendrawasih, Irian Jaya, Indonesia, 1 July 1979, B.B. Collette.

**Table 9** Trunk bars on species of the subgenus *Insularigobius*.

Species	Trunk bars on males																		
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
<i>S. alleni</i>							1	—	1	1									
<i>S. beauforti</i>				1	1	2	2	—	—	1	1								
<i>S. caudimaculosus</i>					2	1	1	2	1	7	2	2	—	1					
<i>S. fehlmanni</i>						1	—	2	10	9	6								
<i>S. genivittatus</i>								3	11	11	7	1							
<i>S. hawaiiensis</i>		2	—	—	1	—	3	15	22	3									
<i>S. hoesei</i>					3	1	—	2	12										
<i>S. kyphosus</i>									3	1									
<i>S. marinus</i>					3	3	2	6	9	2	1								
<i>S. marqueti</i>					1	—	1	1	8	10	6	2							
<i>S. polyzona</i>							1	—	2	11	6	—	2	—	—	—	—	1	
<i>S. randalli</i>									1	2	—	1							
<i>S. squamosus</i>			1	1	—	1	—	1	6	3	5	1							
<i>S. zurstrasseni</i>	1	1	—	4	2	—	2	1											

Species	Trunk bars on females												
	0	1	2	3	4	5	6	7	8	9	10	11	12
<i>S. alleni</i>				2	1	3	1						
<i>S. beauforti</i>				1	4	4	3	6	—	—	1		
<i>S. caudimaculosus</i>					3	1	5	4	5	1	2		
<i>S. fehlmanni</i>	1	—	4	10	9	7	5	—	2	1	1		
<i>S. genivittatus</i>				3	3	5	6	4	3	2	1		
<i>S. hawaiiensis</i>	3	1	1	9	3	4	6	11	5	5	3	1	
<i>S. hoesei</i>				10	4	1	3	—	2	1	1		
<i>S. kyphosus</i>	3	—	—	—	2	1	—	1	2				
<i>S. marinus</i>	5	—	1	2	—	1							
<i>S. marqueti</i>				6	1	5	6	3	—	2	—	2	2
<i>S. polyzona</i>	2	1	—	2	1	1	—	2					
<i>S. randalli</i>						1	1	1					
<i>S. squamosus</i>					2	8	4	1	2	3			
<i>S. zurstrasseni</i>			1	3	9	2	2	1	1				

**Paratypes**

AMS 1.25438-001, 2(37.4-50.2), one male, one female, same collection data as holotype; MZB 5649, 2(45.5-52.3), one male, one female, same collection data as holotype; USNM 274588, 28(33.9-45.3), 22 males, six females, same collection data as holotype; ZMA 113.659, 2(45.2-47.2), one male, one female, Hollandia Bay, West New Guinea, Dutch East Indies, 7 July 1911, K. Gjellerup.

**Diagnosis**

Predorsal midline usually with naked patches, two to 19 scales in midline; pectoral base almost always naked; opercle almost always naked; belly anteriorly naked close to pelvic base; breast naked or with few embedded scales; spines slightly filamentous on first dorsal fin in males; body anteriorly and head slightly dusky in males, not at all in females; females with few or no vertical trunk bars.



### Relationship

This species is most closely related to *Stenogobius hoesei* and possibly to an undescribed form from the Maluku Islands, Indonesia. It differs by features detailed in *Stenogobius hoesei*.

### Description

D VI-1,10 to VI-1,11, almost always VI-1,11; A I,10 to I,11, almost always I,11; P 14 to 16, usually 15; spines on first dorsal fin may be slightly filamentous in males. LS 44 to 50, usually 48 to 49; TRB 11 to 12; PD two to 19, almost always with naked patches; cheek naked; opercle almost always naked; upper pectoral base almost always naked; lower pectoral base naked; breast naked or with few embedded scales; belly anteriorly naked close to pelvic base. Jaw reaching under pupil in females and beyond posterior edge of eye in males. Upper jaw teeth, males 2-3+1-2, usually 2-3+1; females 1+0. Lower jaw teeth, males 3-4+2, usually 3+2; females 2+1-2, usually 2+1. Teeth on outer row of both jaws slightly enlarged in males.

Color in preservation: Background color light tan; head and body anteriorly generally not dusky. Coloration sexually dichromatic and is described as follows: Males; first and second dorsal fins with numerous blackish bars between rays and spines that appear as scribbles, small dusky spots may be present on spine of second dorsal fin; pelvic disk and pectoral fin slightly dusky; caudal fin dusky, there are few weak dusky spots on upper anterior portion of fin; dusky vertical trunk bars originate behind pectoral base and end near caudal fin base, these being slightly crescentic and tend to alternate in width, numbering six to 12. Females; first dorsal fin with blackish midlateral band and dusky margin, second dorsal fin with dusky spots on membrane forming two to three rows; caudal fin with few dusky spots on upper anterior margin of fin, rest of fin slightly dusky; anal fin light along base, dusky distally with a light margin; pectoral fin and pelvic disk translucent; dusky vertical trunk bars limited to area between second dorsal and anal fins, when present usually short, numbering zero to three.

### Remarks

Distribution: Northwestern coast of the island of New Guinea.

Ecology: Brackish and near marine waters in intertidal streams and estuaries.

Etymology: The name of this species comes from the Latin word *marinus* which means the sea, this is in reference to this species apparent habitat preference.

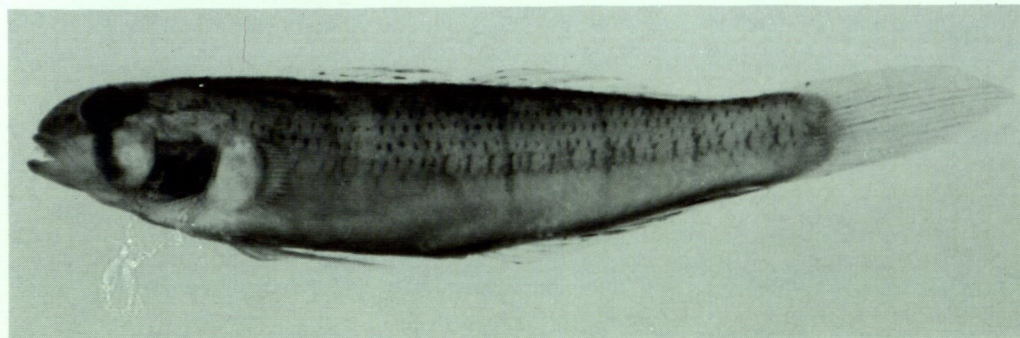
### *Stenogobius (Insularigobius) zurstrasseni* (Popta 1912)

(Figure 31)

*Gobius zurstrasseni* Popta, 1912: 15 (type locality: Lombok)

### Material examined

Thirty five specimens from the Lesser Sunda Islands, Indonesia, totalling 11 males, 18 females, six juveniles; size range 16.5 to 53.3, largest male 36.8, largest female 53.3, no gravid material.



**Figure 31** *Stenogobius zurstrasseni* (Popta), UF 40846, female (50.3), Flores Islands, Indonesia.

### Holotype

SMF 17481, female (32.4), Sembalun, Lombok, Sunda Islands, Dutch East Indies, 24 May 1909, J. Elbert.

### Additional material

SMF 21386, female (53.3), same collection data as holotype; UF 40846, female (50.3), oxbow lake, Kali Pesi, four km south of Reo, Flores, Lesser Sunda Islands, Indonesia, 24 July 1971, F.G. Thompson; UF 40861, 8(16.5-36.7), one male, three females, four juveniles, oxbow lake, Wai Mokol, five km west northwest of Aimere, Flores, Lesser Sunda Islands, Indonesia, 2 August 1971, F.G. Thompson; UF 44277, 24(18.2-41.1), 10 males, 12 females, two juveniles, oxbow lake, Nanga Boa at Nangaboa, Flores, Lesser Sunda Islands, Indonesia, 3 August 1971, F.G. Thompson.

### Diagnosis

Scales in horizontal series 47 to 51, usually 48 to 50; opercle may or may not be scaled; pectoral base usually naked; scales in predorsal midline 11 to 19, usually 16.

### Relationship

This species may be synonymous with *Stenogobius blokzeyli*. At present it differs by having fewer teeth in both jaws, but this may be due to most specimens being small and immature.

### Description

D VI-1, 10 to VI-1, 11, almost always VI-1, 11; A I, 10 to I, 11, almost always I, 11; P 14 to 16, almost always 15. LS 47 to 51, usually 48 to 50; TRB 12 to 13, usually 12; PD 11 to 19, usually 16 to 18, fully scaled; cheek naked; opercle may or may not be scaled; upper pectoral base almost always naked; lower pectoral base naked; belly anteriorly naked close to pelvic base; breast with few embedded scales. Jaw length not greatly pronounced in sexes. Upper jaw teeth, males 1-2+0-1; females 1+0. Lower jaw teeth, males 3+1-2; females 3+1.

Color in preservation: Background coloration tan; head does not appear dusky. Males with vertical trunk bars beginning behind pectoral base continuing onto caudal

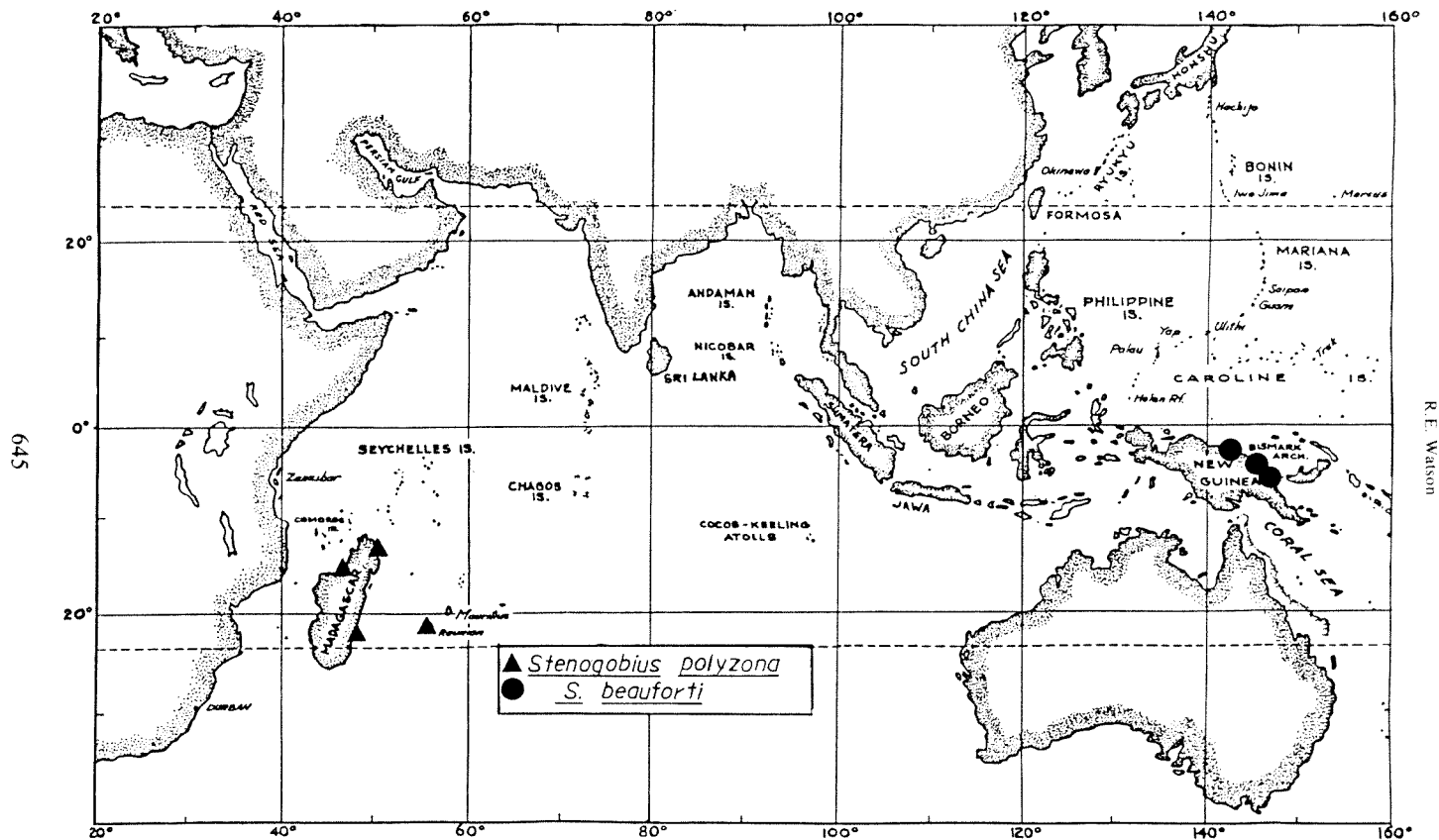


Figure 32 Distributional map of *Stenogobius polyzona* species group.

peduncle; first and second dorsal fin with some spotting, possibly due to male specimens being young. Females with short trunk bars limited midlaterally between second dorsal and anal fins; second dorsal fin with two rows of spots on membrane between rays and spines, first dorsal fin with midlateral band.

### Remarks

Distribution: Lesser Sunda Islands, Indonesia

Ecology: Reported from oxbow lakes in fresh water.

### *Stenogobius (Insularigobius) polyzona* species group.

(Figure 32)

This group is known from the western Indian Ocean and northern coastal streams on the island of New Guinea. It is identifiable by almost always lacking short transverse rows of sensory papillae below lower preopercular cutaneous sensory papillae row (Figure 4b). Females with first dorsal fin spotted.

### *Stenogobius (Insularigobius) polyzona* (Bleeker 1867)

(Figures 33a & 33b)

*Gobius polyzona* Bleeker, 1867: 413 (type locality: Madagascar)

*Gobius polyzona*. — Sauvage, 1891: 370

*Gobius polyzona*. — Pellegrin, 1933: 148

*Stenogobius genivittatus*. — Koumans, 1935: 124 (in part)

*Stenogobius genivittatus*. — Koumans, 1953: 35 (in part)

### Material examined

Thirty three specimens from Madagascar and Reunion, totalling 24 males and nine females; size range 35.8 to 110.7, largest male 110.7, largest female 66.0, smallest gravid female 50.8.

### Syntypes

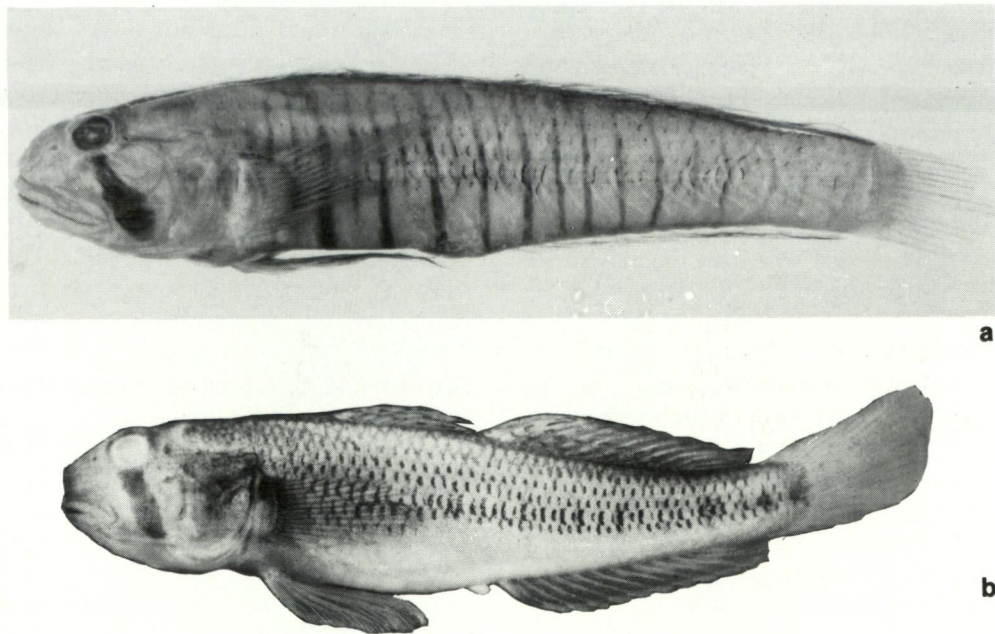
RMNH 4844, two males (110.5-110.7), Samberano River, Madagascar.

### Additional Material

MNHN 1933-51, male (66.2), Faraony River, Madagascar; MNHN 1960-226, female (62.4), eastern Madagascar; MNHN 1966-993, 13(35.8-79.6), nine males, four females, Bakora River six km from confluence with Maroka River near Antesevoly, Mananjary, Fianarantsoa, Madagascar, 1 December 1962, Kiener & Therezien; MNHN 1982-127, 3(44.3-50.8), one male, two females, Reunion Island; MNHN 1984-803, 3(46.2-74.3), two males, one female, Etang Bois Range, Reunion; NHRM KAU/1912.051.3545, male (73.4), Tamatave Market, Madagascar, 29 January 1912, W. Kaudern; NHRM KAU/1912.078.3530, male (47.3), Tamatave, Madagascar, February 1912, W. Kaudern; RUSI 16820, male (96.4), Reunion, December 1975; ZMH 19306, two males (49.8-70.8), Jvoiloina River, Madagascar, October 1864, Majastre.

### Diagnosis

On males first dorsal fin same height or higher than second dorsal fin with spines generally filamentous; predorsal midline scales 15 to 19, always fully scaled; caudal peduncle elongate when compared to species of *Stenogobius genivittatus* and *S.*



**Figure 33** a: *Stenogobius polyzona* (Bleeker), RUSI 16820, male (96.4), Reunion Island; b: *Stenogobius polyzona* (Bleeker), MNHN 1982-127, female (50.8), Reunion Island.

*blokzeyli* species complexes; in females first and second dorsal fins with dusky spotting forming two to three rows.

#### Relationship

This species most closely related to *Stenogobius beauforti*. It differs by the first dorsal fin of male, by having eyes facing outward, and having sexually dimorphic jaw lengths.

#### Description

D VI-1,10 to VI-1,11, almost always VI-1,11; A I,11; P 14 to 16, almost always 15; first dorsal fin may be higher than second dorsal fin on males, spines may be filamentous and can extend beyond hypural base. LS 47 to 50, usually 48 to 49; TRB 11 to 14, usually 12; PD 15 to 19, usually 16, always fully scaled; cheek naked; opercle usually naked; upper pectoral base usually naked; lower pectoral base almost always naked; belly anteriorly naked close to pelvic base; breast scaled. Jaw extending under pupil in females and beyond posterior edge of eye in males. Upper jaw teeth, males 1-4+1-2, usually 3+1; females 0-2+0, usually 1+0. Lower jaw teeth, males 2-5+1-2, usually 3+2; females 2-3+1, usually 2+1. Teeth on outer row in both jaws enlarged in males.

Color in preservation: Background brownish; body and head not dusky. Color sexually dichromatic: Males; first and second dorsal fins with some blackish vertical streaking that may appear like scribbles on membrane between rays and spines; caudal fin with some dusky spotting on upper anterior portion of fin; pelvic disk dusky; pectoral fin translucent; blackish vertical trunk bars originate behind pectoral base and terminate near caudal fin base, all bars more or less vertical, nearly touching dorsal surface, but do not cross belly, numbering seven to 19. Females; first and second dorsal fins with dusky spotting forming several rows on both fins; dusky trunk bars short, when present, limited to medial region between second dorsal and anal fins, numbering zero to seven.

### Remarks

Distribution: Known from fresh water streams and rivers of Madagascar and Reunion of the western Indian Ocean.

Note: The syntypes are unique in having all spines filamentous, including those on pelvic disk. More than one species appears to be represented in the above account. It is clear more material is needed in order to better isolate possible differences.

The status of *Stenogobius (Insularigobius) polyzona* may never be resolved as habitat alteration on Madagascar continues to occur at an ever increasing rate.

### *Stenogobius (Insularigobius) beauforti* (Weber 1908) (Figures 34a & 34b)

*Gobius beauforti* Weber, 1908: 261 (type locality: West New Guinea, Dutch East Indies)

*Chonophorus beauforti*. — Fowler, 1928: 410

*Stenogobius genivittatus*. — Munro, 1967: 501

### Material examined

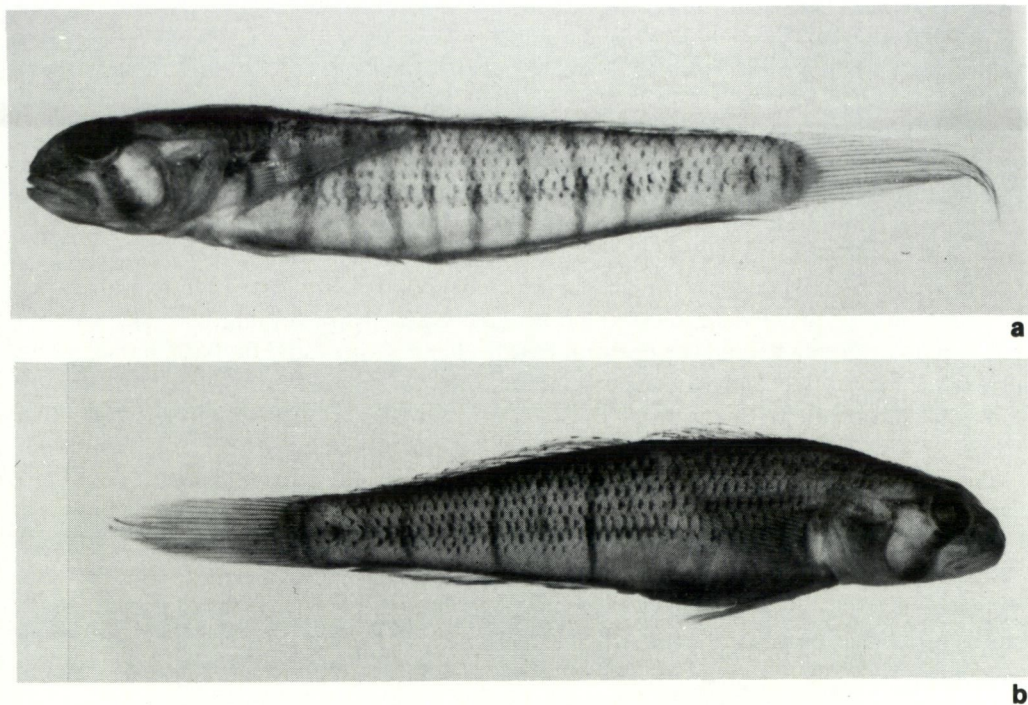
Thirty specimens from the northeastern coastal region of the island of New Guinea, totalling eight males, 20 females, two juveniles; size range 15.0 to 49.8, largest male 48.2, largest female 49.8, smallest gravid female 35.6.

### Syntypes

ZMA 110.943, female (24.6), Klipong (Klifon) River on the east of the Tanah-Merah Creek mouth, West New Guinea, Dutch East Indies, 9 July 1903, L.F. de Beaufort & H.A. Lorentz; ZMA 110.944, two females (35.4-38.1), Mampira Creek, a small brook near the Utuwa River outflow east of Wendesi (?Beek.), West New Guinea, Dutch East Indies, 29/30 July 1903, L.F. de Beaufort & H.A. Lorentz.

### Additional material

AMS I.16668-013, 14(35.6-49.8), four males, 10 females, stream at North Coastal Road three miles north of Maiwara, Papua New Guinea, 20 July 1969, F. Talbot; AMS I.17084-013, female (41.7), backwater and tributary streams of Murnass River downstream from bridge at North Coastal Road 25 miles north of Madang, Papua New Guinea, 24 May 1970, B.B. Collette; BMNH 1974.5.24:3543-45, 4(15.0-45.4), one male, two females, one juvenile, same collection data as AMS I.17084-013; KFRS F02511, female (39.9), same collection data as AMS I.17084-013; USNM 270671, 2 males (36.6-40.2), same collection data as AMS I.17084-013; WAM P.27833-010, male (34.7), Mandi Stream, 15 km southeast of Wewak, Papua New Guinea, 16 October 1982, G.R. Allen & D. Coates; WAM P.29613-013, 2(23.1-38.8), one female, one



**Figure 34** **a:** *Stenogobius beauforti* (Weber), AMS I. 16668-013, male (48.2), Maiwara, Papua New Guinea; **b:** *Stenogobius beauforti* (Weber), AMSI. 16668-013, female (49.8), Maiwara, Papua New Guinea.

juvenile, coastal stream near Bogia, Papua New Guinea, 19 October 1987, G.R. Allen & L. Parenti; ZMA 119.417, 2(45.2-46.0), one male, one female, same collection data as AMS I.16668-013.

### Diagnosis

A small species; eyes appear to face slightly upward; jaw length only slightly sexually dimorphic; predorsal midline fully scaled, 13 to 19.

### Relationship

This species appears to have no known relatives in the western Pacific or eastern Indian Ocean regions. Its closest relative is *Stenogobius polyzona*, but differs by being much smaller, lacking filamentous spines, and by having eyes appearing to face slightly upward.

### Description

D VI-I, 11; A I, 11; P 14 to 16, usually 15. LS 45 to 50, usually 48; TRB 11 to 13, usually 12; PD 13 to 19, always fully scaled; cheek naked; opercle may or may not be scaled; upper pectoral base almost always naked; lower pectoral base almost always naked; belly anteriorly naked close to pelvic base; breast naked or with few embedded scales.

Jaw reaching under pupil in both sexes. Upper jaw teeth, males 1-3+1-2, usually 2+1-2; females 1-2+0-1, usually 1+0-1. Lower jaw teeth, males 3-4+2, usually 3+2; females 2-3+1-2, usually 2+2. Teeth in outer row on both jaws slightly enlarged in males. Sexual dimorphic characteristics most poorly developed of all *Insularigobius* species studied. Fins slightly longer in males; jaw lengths only slightly greater in males.

Color in preservation: Background grayish; head dusky dorsally and light ventrally. Coloration sexually dichromatic and described as follows: Males; first and second dorsal fins with some vertical dusky pigmentation between rays and spines appearing as scribbles, both fins slightly dusky on margin; upper caudal fin with very few small dusky spots or streaks; pelvic disk dusky; anal fin dusky with whitish margin; dusky vertical trunk bars originate behind the pectoral base and end near caudal fin base, bars slightly crescentic between second dorsal and anal fins, anterior bars slightly oblique numbering five to 12. Females; first and second dorsal fins with dusky spotting tending to form two rows on fins; caudal fin with one or two dusky spots near upper margin, rest of fin slightly dusky; anal fin whitish basally with dark band distally and whitish margin; dusky vertical trunk bars short and restricted to midline numbering three to nine.

Color in life: Life color of female based on a color transparency provided by G.R. Allen of a specimen 38.8 SL (WAM P.29613-013). Life color similar to those described in preservation. Margins of both dorsal fins pinkish; belly pinkish; branchiostegal region pinkish; iris of eye golden.

#### Remarks

Distribution: Known from the northern coast of the island of New Guinea east of Djajapura, Irian Jaya, Indonesia.

Ecology: Appears to be limited to small streams close to the coast in fresh and brackish waters.

#### Conclusion

Though this study expands greatly the knowledge of *Stenogobius* it is by no means conclusive. The status of species from the western Pacific, Japan, Taiwan, the Philippines and Indonesia cannot be fully evaluated until the problem with *Stenogobius (Insularigobius) blokzeyli* can be resolved. There are also considerable gaps in collections with wide areas occurring in the Indo-Pacific where little or no collection efforts have taken place in fresh water.

*Gobius gatum* Hamilton (1822: 366), usually regarded as *Glossogobius* in most literature accounts, may actually belong to *Stenogobius* or *Awaous* (D.F. Hoese, pers. comm.). This further adds to nomenclatural problems that persist with *Stenogobius*.

It is not clear why *Stenogobius* is well represented on the island of New Guinea, yet has never been reported from Australia. Australia has many suitable habitats where it could occur, apparently some unknown factor is responsible for its absence. It must be pointed out that other widely distributed genera are also absent. *Eleotris* with a circumtropical fresh water distribution is unknown from Australia, as are the tropical Indo-Pacific genera *Papenua*, *Sicyopterus*, *Sicyopus* and *Stiphodon*. The genera of



freshwater gobioid fishes with tropical Indo-Pacific or wider distribution known from Australia are *Awaous*, *Glossogobius*, *Hypseleotris*, *Ophieleotris*, *Ophiocara*, *Oxyeleotris*, *Pseudogobius* and *Redigobius*. Only seven species of genera with wide Indo-Pacific or circumtropical distribution are not endemic to Australia or share distributions with New Guinea, these being *Butis butis*, *Glossogobius aureus*, *G. giuris*, *Ophieleotris aporos*, *Ophiocara porocephala* and *Redigobius bikolanus*. Note the Australian species of *Awaous* is actually undescribed and has a distribution limited to northeastern Queensland and southern New Guinea. Australia has a number of genera that are endemic or narrowly shared with other locations. *Gobiomorphus* is shared with New Zealand and *Mogurnda* is shared with New Guinea. The remaining genera appear endemic, these being *Chlamydogobius*, *Kimberleyeleotris*, *Milyeringa*, *Philypnodon* and *Tasmanogobius*. The distributional and colonial patterns of freshwater gobioid fishes are poorly known as well as poorly studied, but it is clear some mechanism exists that limits colonization of Australia. It is interesting to note that the wide ranging genus *Hypseleotris*, ranging from the Pacific coast of Central and South America to eastern Africa, has its greatest radiation in Australia being represented by seven nominal species and at least three undescribed, of these only one is not an endemic, *H. compressa* also occurs on New Guinea. The Australian *Hypseleotris* differ from all others of the genus by lacking any cephalic sensory pores on the head. More will likely be learned as genera go through systematic revisions, most genera of freshwater gobioid fishes are currently very poorly known.

One conclusion that can be deduced is *Stenogobius*, as a genus, is wide ranging in the tropical Indo-Pacific. However, the mechanism for wide geographic dispersion among species apparently no longer exists, as is evidenced by the high degree of endemism. There are no species occupying all or large areas of the Pacific or Indian Ocean basins.

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