

Notes on the Indo-West Pacific genus *Ctenogobiops* (Teleostei: Gobiidae), with descriptions of three new species

by

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ABSTRACT

The prawn-associated goby genus *Ctenogobiops* is shown to contain six valid species from the Indo-West Pacific: *C. aurocingulus* (Herre), *C. crocineus* Smith, *C. maculosus* (Fourmanoir), *C. pomastictus* n. sp., *C. feroculus* n. sp., and *C. tangaroai* n. sp. Illustrations are provided of all these species, as well as descriptions of the three which are new.

INTRODUCTION

The genus *Ctenogobiops* Smith includes a distinctive group of spotted gobies found in association with alpheid prawns in the Indo-West Pacific region.

Smith (1959) established the genus to include *C. crocineus* Smith and "probably" *Aparrius aurocingulus* Herre (1935). Klausewitz (1960) referred *Cryptocentroides maculosus* Fourmanoir (1955) to *Ctenogobiops*, but incorrectly asserted that *C. maculosus* was synonymous with *C. crocineus*. Work by the present authors as well as by D. F. Hoese (MS) indicates that no further *Ctenogobiops* have been described to date. In addition to the three previously known species, we have found a further three undescribed species.

There are thus six known species of *Ctenogobiops*: *C. aurocingulus* (Herre), *C. crocineus* Smith, *C. maculosus* (Fourmanoir), *C. pomastictus* n. sp., *C. feroculus* n. sp., and *C. tangaroai* n. sp. These species are most easily identified by head colour pattern and profile and by the nature of the gill opening. Figures 1-6 illustrate diagrammatically the head colour patterns and profiles of preserved adults of the six species of *Ctenogobiops*; the point to which the gill opening extends forwards ventrally is marked by an arrow. We have collected the above species at the following localities; *C. aurocingulus*: Fiji, Samoa; *C. crocineus*: Red Sea, Seychelles, Great Barrier Reef; *C. maculosus*: Red Sea; *C. pomastictus*: Great Barrier Reef; *C. tangaroai*: Samoa; *C. feroculus*: Red Sea, Seychelles, New Caledonia. All *Ctenogobiops* were found in association with alpheid prawns.

Full descriptions are given below of *C. pomastictus*, *C. feroculus* and *C. tangaroai*; type specimens are deposited at the British Museum (Natural History) (BMNH) and at the Muséum d'histoire naturelle Genève (MHNG).

Ctenogobiops Pomastictus n. sp.

Plate 1, Figures 4 and 7

DESCRIPTION

Dorsal fin rays VI and I 11 (last ray divided to base); anal fin rays I 11 (last ray divided to base); pectoral fin rays 19 or 20; pelvic fin rays I 5, fins united. 55-59 rows of scales in lateral series from dorsal angle of branchial opening to base of caudal fin, latter with an additional 5-7 rows basally; 21-25 transverse scale series, counted forwards and upwards from first anal spine to approximately below sixth dorsal spine; 15 or 16 scales in a zigzag series around narrowest part of caudal peduncle. Gill rakers on lower limb of first arch, including elongate raker at angle, 9 or 10 (all elements counted). Maximum size examined 45.7 mm S.L., 58.2 mm T.L.

The following measurements are presented as percentages of the S.L. Snout length 6.5-7.2, mean 6.8; orbit diameter 7.0-8.4, mean 7.5; head length 29.5-32.3, mean 30.8; predorsal length, 35.0-37.6, mean 36.2; snout to origin of second dorsal fin 55.1-56.4, mean 55.8; snout to anal fin origin 57.6-60.0, mean 59.0; body depth at origin of pelvic fin 20.1-21.8, mean 20.7; dorsal fin base length 46.1-46.3, mean 46.2; anal fin base length 22.3-23.1, mean 22.5; pelvic fin length 22.5-24.6, mean 23.3; pectoral fin length 27.5-29.7, mean 28.6; least depth of caudal peduncle 10.3-11.1, mean 10.6; first dorsal spine length 18.4-20.9, mean 20.0; second dorsal spine length 19.6-22.7, mean 21.1; third dorsal spine length 18.8-21.6, mean 20.4; total length (= snout to posterior tip of caudal fin) 127.3-130.7, mean 129.1.

Small elongate fish, head and body moderately compressed. Mouth rather large, gape oblique; jaws nearly equal anteriorly, reaching posteriorly to a vertical through centre of pupil; upper lip as broad (vertically at front) as lower.

Upper jaw posteriorly with 1 or 2 series of fine sharp subconical teeth, 4-5 series at symphysis, outer series slightly larger and more caniniform posteriorly, increasingly so anteriorly. Low ridge on vomer. Lower jaw posteriorly with 1 series of fine sharp subconical teeth, about 6-7 series at symphysis; anteriorly outer series larger and more caniniform; 1 or 2 enlarged caniniform teeth anterolaterally on each side of jaw. Pharyngeals covered with conical teeth.

Gill membranes rather narrowly attached at isthmus. Gill opening extending forwards ventrally up to, or slightly beyond, a vertical through upper hind margin of preoperculum. Anterior and posterior nostrils separated by a space about equal to length of posterior nostril; posterior nostril round to oval, slightly larger than round anterior nostril, separated from eye by a space slightly greater than its width; anterior nostril with short membranous tube.

Opercular edge entire, preopercular edge smooth. Head partially scaled, but scales partly embedded, difficult to discern; scales not visible on midline of nape. Scales cycloid anteriorly, becoming ctenoid laterally below third or fourth dorsal spine, increasingly ctenoid posteriorly. Dorsal and anal fins naked; pelvic fins mostly naked, possibly a few scales close to base; pectoral fins mostly naked, a few scales close to base; caudal fin with approximately basal sixth scaled.

Sensory papillae on head and anterior portion of body poorly developed (see figure 7).

Dorsal fin divided into 2 parts, not connected by membrane; first part with 6 spines, second and third spines longest, approximately equal in length; second part with a single spine followed by branched rays. Anal fin with single spine followed by branched rays. Origin of anal fin slightly posterior to a vertical through origin of second dorsal fin. Posterior margins of second dorsal and anal fins angular. Caudal fin rounded. Pectoral

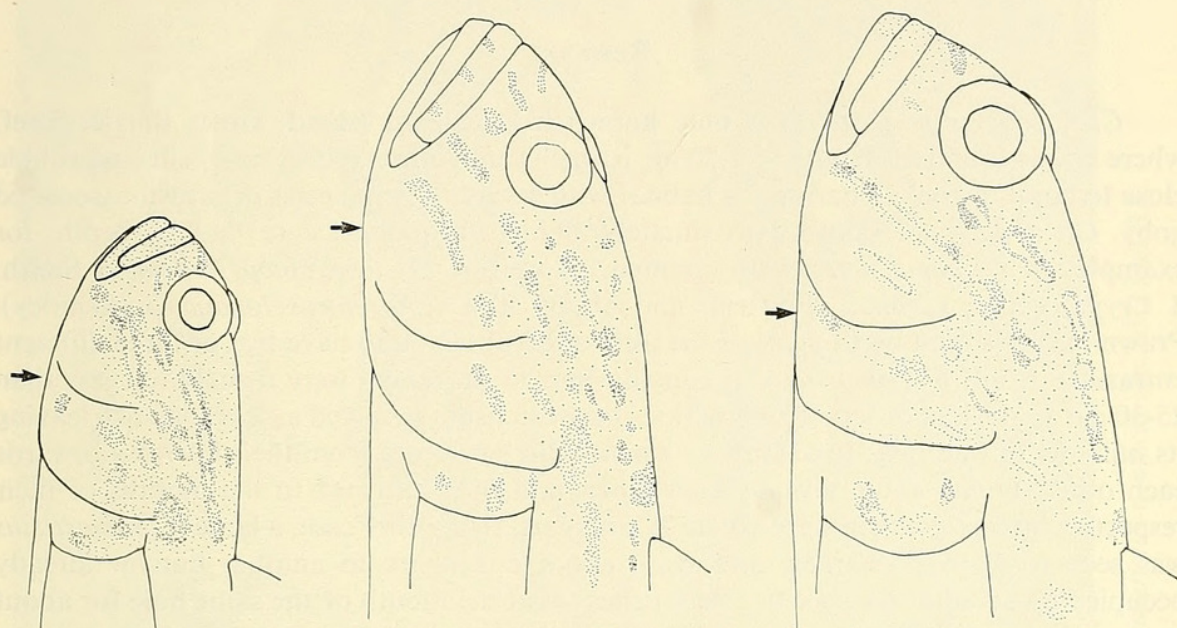


FIG. 1.

FIG. 2.

FIG. 3.

FIG. 1. — *Ctenogobiops aurocingulus*, 30.0 mm S.L.

FIG. 2. — *Ctenogobiops crocineus*, 40.5 mm S.L.

FIG. 3. — *Ctenogobiops maculosus*, 45.8 mm S.L.

fins rounded, reaching posteriorly approximately to a vertical through base of third soft anal fin ray. Origin of pelvic fins just posterior to a vertical through base of pectoral fins; fourth pelvic soft ray marginally longer than fifth (fifth just longer in smallest specimen), reaching to half way or more from anus to anal fin origin (up to anal fin origin in smallest specimen), about $2\frac{1}{2}$ times as long as pelvic spine; fins united.

Coloration : In life, head and body pale brownish grey with 4 series of brown spots on body running onto base of caudal fin; uppermost series from nape along dorsal body contour, consisting of 11-13 spots; second series from upper margin of operculum, consisting of 11 spots; third series from centre of pectoral fin base, consisting of 7 large spots, and 2 small spots slightly above intervals between first and second and second and third larger spots; lowermost series from behind lower margin of pectoral fin base, consisting of about 5 small round spots. Head with 3 approximately horizontal rows of brown spots; uppermost row with 3 spots running posteriorly from hind margin of orbit; second row with 3 spots running from ventral margin of orbit onto operculum;

lowermost row with 4 spots running posteriorly from hind margin of maxilla (see figure 4). Dark brown "V" on snout. Faint blue specks in predorsal area. Iris golden with black dorsal, anterior and posterior margins; ventral margin light bluish. Pectoral fins hyaline with single bright white spot, and 1-2 brown spots on base. Pelvic fins hyaline. Caudal fin hyaline with a few irregular brown speckles near base. Dorsal fins hyaline with faint horizontal brown median stripe. Basal half of anal fin hyaline, distal half brown.

In alcohol, head and body beige; brown spots and other brown markings remain prominent.

REMARKS

Ctenogobiops pomastictus is only known from Lizard Island, Great Barrier Reef, where it was found at depths of 1-20 m; it was usually observed in sand, silt and rubble close to coral or rocks, sharing the habitat with several other species of prawn-associated goby. On a patch of sand (approximately 30 m²) in amongst coral at 5 m depth, for example, 15 *C. pomastictus* were counted, as well as 5 *Ctenogobiops crocineus* Smith, 4 *Cryptocentrus guttatus* (Fowler), and about 50 *Cryptocentrus koumansi* (Whitley). Prawn burrows used by *C. pomastictus* were often observed to have two or three different entrances. Adult *C. pomastictus* occupying burrow entrances were usually not less than 25-30 cm apart, and observed interactions between fishes involved at least one fish leaving its burrow. In one case, two adult *C. pomastictus* swam out from their burrows towards each other, briefly swam around each other, and then returned to the mouths of their respective burrows, which were about 25 cm apart. In another case, a large *C. pomastictus* was seen to leave its burrow and swim about one metre to another burrow already occupied by an adult conspecific; both fishes sat at the mouth of the same hole for about one minute, and then the visitor returned by a circuitous route to the burrow where he had first been seen. *Ctenogobiops pomastictus* was observed associating with at least three types of alpheid prawn (prawns could be distinguished by their distinctive colour patterns) but the prawns were not collected.

Ctenogobiops pomastictus is closest to *C. feroculus*, but may easily be distinguished by head colour pattern (see figures 4 and 5), dorsal fin base length (46.1-46.3% of S.L. for *C. pomastictus*, 49.4-51.7% for *C. feroculus*), and the length of the first dorsal spine (18.4-20.9% of S.L. for *C. pomastictus*, 28.7-31.0% for *C. feroculus*); in addition, the second and third dorsal spines are longest in *C. pomastictus*, while the first dorsal spine is longest in *C. feroculus*.

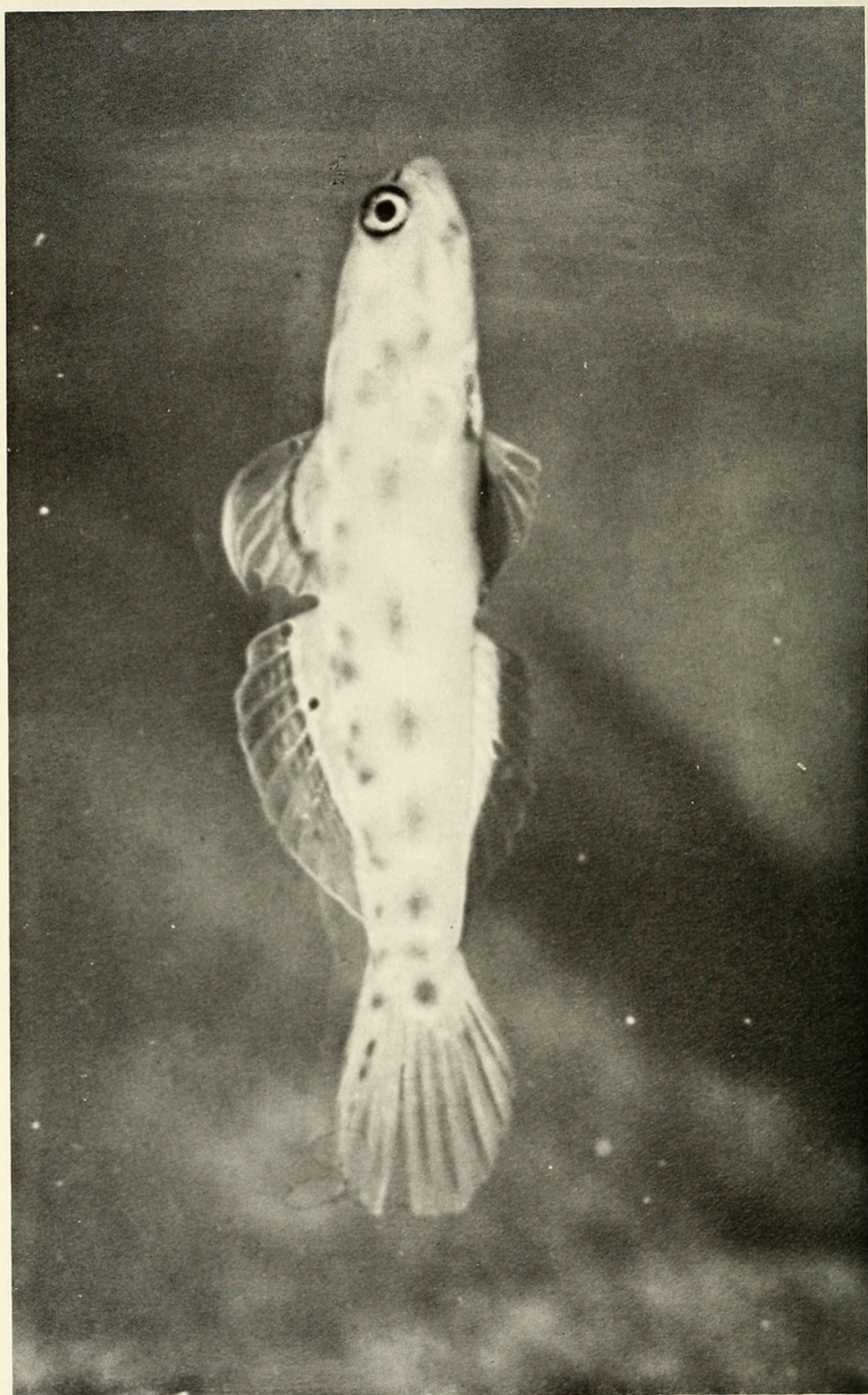
The name *pomastictus* is derived from the Greek *πωμα*—lid and *στικτος*—spotted, and refers to the distinctive colour pattern of the operculum.

MATERIAL EXAMINED

- a. Holotype, 43.0 mm S.L., on sand with isolated coral heads at base of steep coralline cliff, at 6-9 m, North Point, Lizard Island, Great Barrier Reef, coll. R. Lubbock and G. Loomis on 15.5.1975, station RL 11-6; BMNH. 1976.9.22.3
- b. 1 Paratype, 45.7 mm S.L., on sand and rubble near coral, at 0.2 m, S.W. Point, Lizard Island, Great Barrier Reef, coll. R. Lubbock on 23.5.1975, station RL 11-12; MHNG. 1545 38.
- c. 1 Paratype, 26.0 mm S.L., coll. with (a); BMNH. 1976.9.22.4.



Paratype of *Ctenogobius pomastictus* n. sp. in life. 45.7 mm S.L.



Holotype of *Ctenogobius ferox* n. sp. freshly dead. 34.0 mm S.L.



Holotype of *Ctenogobiops tangaroai* n. sp. in life. 39.9 mm S.L.

Ctenogobiops Feroculus n. sp.

Plate 3, Figures 5 and 8

DESCRIPTION

Dorsal fin rays VI and I 11 or 12 (last ray divided to base); anal fin rays I 11 (last ray divided to base); pectoral fin rays 19 or 20; pelvic fin rays I 5, fins united. 54-67 rows of scales in lateral series from dorsal angle of branchial opening to base of caudal fin, the latter with an additional 5 or 6 rows basally; 21 or 22 transverse scale series, counted forwards and upwards from first anal spine to approximately below sixth dorsal spine; 14-15 scales in a zigzag series around narrowest part of caudal peduncle. Gill rakers on lower limb of first arch, including elongate raker at angle, 9 (all elements counted). Maximum size examined 44.5 mm S.L., 58.3 mm T.L.

The following measurements are presented as percentages of the S.L. Snout length 4.7-6.4, mean 5.5; orbit diameter 6.5-8.2, mean 7.0; head length 28.0-31.1, mean 29.5; predorsal length 32.8-35.3, mean 34.1; snout to origin of second dorsal fin 54.2-57.5, mean 55.9; snout to anal fin origin 57.0-58.4, mean 57.6; depth at origin of pelvic fin 17.6-20.2, mean 18.8; dorsal fin base length 49.4-51.7, mean 50.8; anal fin base length 24.1-24.7, mean 24.3; pelvic fin length 22.0-23.5, mean 22.9; pectoral fin length 26.9-29.4, mean 28.6; least depth of caudal peduncle 11.2-11.7, mean 11.5; first dorsal spine length 28.7-31.0, mean 30.0; second dorsal spine length 21.4-26.5, mean 23.7; third dorsal spine length 17.3-21.1, mean 19.3; total length (=snout to posterior tip of caudal fin) 131.0-133.9, mean 132.2.

Small elongate fish, head and body moderately compressed. Mouth rather large, gape oblique, jaws nearly equal anteriorly, reaching posteriorly to a vertical through centre or posterior margin of pupil; upper lip as broad (vertically at front) as lower.

Upper jaw posteriorly with 1 or 2 series of fine, sharp, subconical teeth, about 6 series at symphysis; outer series slightly larger and more caniniform posteriorly, increasingly so anteriorly. Low notched ridge on vomer. Lower jaw posteriorly with 1 series of fine, sharp, subconical teeth, about 6 series at symphysis; anteriorly outer series larger and more caniniform; 1-3 large caniniform teeth anterolaterally on each side of jaw. Pharyngeals covered with conical teeth.

Gill membranes rather narrowly attached at isthmus. Gill opening extending forwards ventrally to below upper hind margin of preoperculum. Anterior and posterior nostrils separated by a space about equal to length of posterior nostril; posterior nostril round to oval, slightly larger than round anterior nostril, separated from eye by space slightly greater than its width; anterior nostril with a short membranous tube.

Opercular edge entire, preopercular edge smooth. Head partially scaled, but scales partly embedded, difficult to discern; scales not visible on midline of nape. Scales cycloid anteriorly, becoming ctenoid below third or fourth dorsal spine, increasingly ctenoid posteriorly. Dorsal and anal fins naked; pelvic fins mostly naked, possibly a few scales close to base; pectoral fins mostly naked, a few scales close to base; caudal fin with basal fifth scaled.

Sensory papillae on head and anterior part of body poorly developed (see figure 8).

Dorsal fin divided in two parts, not connected by membrane; first part with six spines, first spine longest; second part with a single spine followed by branched rays. Anal fin with single spine followed by branched rays. Origin of anal fin slightly posterior

to a vertical through origin of second dorsal fin. Posterior margins of second dorsal and anal fins angular. Caudal fin rounded. Pectoral fins rounded, reaching posteriorly to a vertical through base of second soft anal ray. Origin of pelvic fins below base of pectoral fins; fifth pelvic soft ray longer than fourth, reaching to three-quarters of way from anus to anal fin origin, $2-2\frac{1}{2}$ times as long as pelvic spine; fins united.

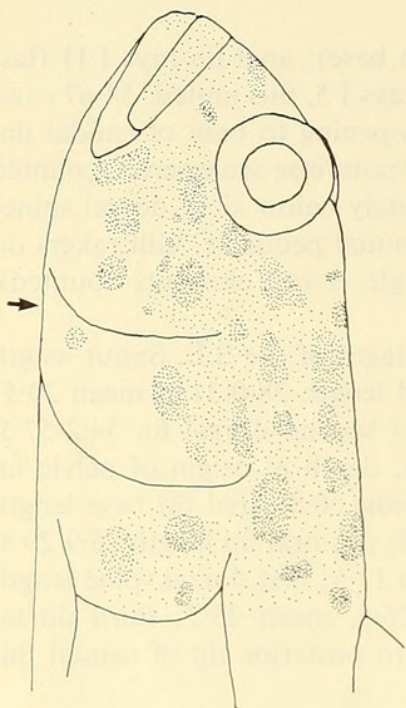


FIG. 4.

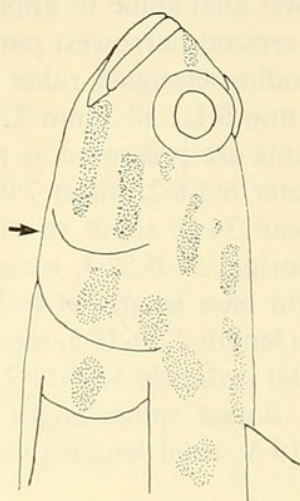


FIG. 5.

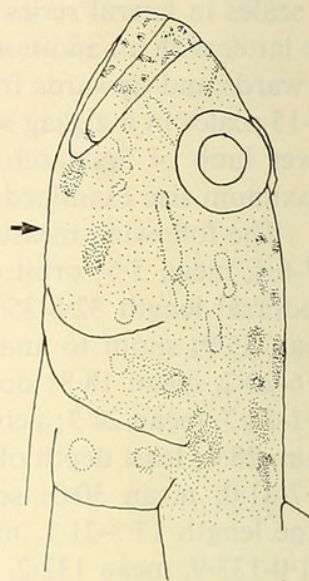


FIG. 6.

FIG. 4. — *Ctenogobiops pomastictus*, 43.0 mm S.L.

FIG. 5. — *Ctenogobiops feroculus*, 34.0 mm S.L.

FIG. 6. — *Ctenogobiops tangaroai*, 39.9 mm S.L.

Coloration: In life, head and body whitish grey with 3 approximately horizontal rows of dark brown spots, continuing onto caudal fin base; first row beginning in pre-dorsal area, along dorsal body contour, with 8-10 spots; second row beginning just above pectoral fin base with 8-10 elongate spots; lowermost row beginning behind pectoral fin, along midline, with 7 elongate spots. A single brown spot posterior to lower margin of pectoral fin base, and approximately vertically below base of sixth dorsal spine. Elongate rather diffuse dark brown spots on pectoral fin base (1), on operculum (1 or 2), and on preoperculum (2 or 3). Dark brown "V" on snout (see Figure 5). Iris light golden, becoming dark brown to black around exterior margin. Basal half of anal fin whitish hyaline, outer half brown to black. Pelvic fins hyaline, membrane becoming brown to black along fourth and fifth soft rays. Dorsal fins with hyaline distal portion, whitish basal portion, and faint brown dividing stripe. Caudal fin hyaline, becoming dusky ventrally. Pectoral fins hyaline, with 1 or 2 prominent bright white spots.

In alcohol, head and body yellowish with pale brown markings.



Lubbock, Roger and Polunin, Nicholas. 1977. "Notes on the Indo-West Pacific genus *Ctenogobiops* (Teleostei: Gobiidae), with descriptions of three new species." *Revue suisse de zoologie* 84, 505–514.

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