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Two New Shrimp Gobies of the Genus *Ctenogobiops* (Perciformes: Gobiidae), from the Western Pacific

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John E. Randall, Kwang-Tsao Shao, and Jeng-Ping Chen (2007) Two new shrimp gobies of the genus *Ctenogobiops* (Perciformes: Gobiidae), from the western Pacific. *Zoological Studies* **46**(1): 26-34. *Ctenogobiops mitodes* is described as a new species of gobiid fish from 12 specimens from Pratas Reef in the South China Sea and the Marshall Is., with nontype specimens from the Solomon Is. and Papua New Guinea, and photographic records from New Caledonia, Fiji, and Flores, Indonesia. Like others of the genus, it shares a burrow with alpheid shrimp. It is most similar to *C. pomastictus* Lubbock and Polunin (type locality, Great Barrier Reef), differing in having an elongate 2nd dorsal spine as an adult, 46-52 scales in longitudinal series on the body (compared to 55-59 for *C. pomastictus*), and 1 instead of 2 rows of dark spots on the cheek. Photographic records are provided for *C. pomastictus* from New Britain; Redang I., Malaysia; Banda Is., Indonesia; and Phuket, Thailand. *Ctenogobius phaeostictus* is described from a single 24.3 mm female specimen collected from the Madang area of Papua New Guinea at a depth of 10 m. It is distinguished from the 8 other species of the genus by having 13 instead of 10-12 soft rays in the dorsal and anal fins, an elongate 3rd dorsal spine, and a unique color pattern of numerous small dark spots, a single longitudinal row of 5 large black spots, and the apparent absence of a white spot on the pectoral fins.
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Key words: Fish taxonomy, Indo-Pacific, Gobiidae, *Ctenogobiops*, New species.

The Indo-Pacific fish genus *Ctenogobiops* Smith is one of 13 gobiid fish genera with species that live symbiotically with alpheid shrimp. In a review of the genus, Lubbock and Polunin (1977) recognized *C. crocineus* Smith, *C. aurocingulus* (Herre), and *C. maculosus* (Fourmanoir), and described *C. feroculus*, *C. pomastictus*, and *C. tangaroai* as new species. Randall et al. (2003) placed *C. crocineus* in synonymy with *C. maculosus*, described *C. formosa* from Taiwan and *C. tongaensis* as new species, and provided a key to the species of the genus.

Ctenogobiops pomastictus was named from 3 specimens from Lizard I., Great Barrier Reef, Australia. Yoshino and Senou (1983: 5) reported it as the most common of the 5 species of the genus from the Ryukyu Is. Yoshino in Masuda et al. (1984: 261, pl. 244P) illustrated it from the Ryukyu Is., noting that it lacks elongate dorsal spines. Allen and Russell (1986: 97) included it in a checklist of fishes from Scott Reef off northwestern Australia, but with a question mark. Myers (1989: 228, pl. 120F) illustrated it from an underwater photograph taken at Guam. Randall et al. (2003) listed Bishop Museum specimens from Palau and Enewetak Atoll, Marshall Is.

Specimens of *Ctenogobiops* that resemble *pomastictus* but have an elongate 2nd dorsal spine were recently collected by the authors at Pratas Reef in the South China Sea and Majuro Atoll in the Marshall Is. Reexamination of the Bishop Museum specimens from Enewetak Atoll

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that had been identified as *pomastictus* revealed that they also have a prolonged 2nd dorsal spine. We compared our underwater photographs of *C. pomastictus* (no elongate spine) to those of fish having the long 2nd dorsal spine. We noticed a difference in the series of dark spots on the cheek. *Ctenogobiops pomastictus* has 2 rows of 3 or 4 dark brown spots on the cheek, the 1st spot of the upper row below the posterior edge of the eye and the last on the opercle; the 2nd row commences with a spot above the rear end of the maxilla, the remaining 2 or 3 spots curve ventrally as they pass posteriorly. The other fish have a single row of 3 spots that slopes slightly upwards, the 1st spot just above the rear of the maxilla, and the last on the opercle. Also the small dark spots between the large dark spots of the midlateral row on the body of *pomastictus* often have yellow centers (true as well of some other small dark spots), whereas those of the long-spine fish are entirely dark (or may be lacking).

In their description of *C. pomastictus*, Lubbock and Polunin gave the number of scales on the body from the upper end of the gill opening to the base of the caudal fin as 55-59. We confirmed this count from specimens we examined, including ones collected by the 1st author from the type locality. Our counts of specimens of the long-spine fish range from 46 to 52. We therefore concluded that the latter represents an undescribed species.

As will be noted in the photographs, both species live in close symbiotic association with snapping shrimp of the genus *Alpheus*. The shrimp shown in figures 3, 4, 9, and 10 are what the 1st author identified previously as *Alpheus ochrostriatus*; however, Arthur Anker (pers. comm.) has informed us that this is an invalid manuscript name. Furthermore, there are different color forms which he believes represent different species. He identified the shrimp of figure 2 as *A. rapacida* or a close relative. The alpheid of figure 8 is an undescribed species similar to *A. djiboutensis*. This same shrimp was visible in a 2nd underwater photograph of the same goby as figure 5 from the Marshall Is. Specimens of these shrimps are needed by Anker for study.

Specimens of the new species of *Ctenogobiops* collected by the 1st author in the Solomon Is. and Papua New Guinea are listed as nontypes. They were sent on loan to a colleague who returned them completely dried.

A 2nd new species is described from a specimen collected by the 1st author in Papua New Guinea in 1987, but not realized until recently as a species of *Ctenogobiops*. It is easily distinguished from the remaining species of the genus.

MATERIALS AND METHODS

Type specimens of the 1st new species of *Ctenogobiops* have been deposited in the Australian Museum, Sydney (AMS); Museum of the Research Center for Biodiversity, Academia Sinica, Taipei (ASIZP); Natural History Museum, London (BMNH); Bishop Museum, Honolulu (BPBM); California Academy of Sciences, San Francisco (CAS); National Museum of Marine Biology and Aquarium, Checheng, Pingtung, Taiwan (NMMBP); National Science Museum, Tokyo (NSMT); and the US National Museum of Natural History, Washington, DC (USNM). The holotype of the 2nd species is in the Bishop Museum.

Lengths of specimens are given as standard length (SL), measured from the median anterior end of the upper lip to the base of the caudal fin (posterior end of the hypural plate); body depth is the maximum depth, and body width the maximum width just behind the gill opening; head length was taken from the upper lip to the posterior end of the opercular membrane, and head width the maximum width, adjusting for any flaring of the operculum; orbit diameter is the greatest fleshy diameter, and interorbital width the least fleshy width; snout length was measured from the median anterior point of the upper lip to the nearest fleshy edge of the orbit; upper-jaw length from the same anterior point to the posterior end of the maxilla; caudal-peduncle depth is the least depth, and caudal-peduncle length the horizontal distance between verticals at the rear base of the anal fin and the caudal-fin base; lengths of spines and rays were measured to their extreme bases; caudal- and pectoral-fin lengths are the length of the longest ray; pelvic-fin length was measured from the base of the pelvic spine to the tip of the longest pelvic soft ray. Morphometric data presented in tables 1 and 2 are given as percentages of SL. Proportional measurements in the text are rounded to the nearest 0.05.

The count of scales in the longitudinal series was made from above the upper end of the gill opening to the base of the caudal fin; scales in transverse series were counted from the origin of the anal fin obliquely upward to the base of the 1st dorsal fin; gill rakers were counted on the 1st gill

arch, with those on the upper limb given first. Meristic and morphometric data shown in parentheses refer to paratypes.

Ctenogobiops mitodes, sp. nov.

(Table 1; Figs. 1-5)

Ctenogobiops pomastictus (non Lubbock and Polunin) Myers 1989: 228, pl. 120F (Guam).
Ctenogobiops pomastictus (non Lubbock and Polunin) Randall, Shao, and Chen 2003: 511 (Marshall Is.).

Holotype: ASIZP 65069, ♂, 34.0 mm, South China Sea, Pratas Reef, 3 km N of Pratas I., 10 m, rotenone, J.P. Chen, 22 Aug. 2004.

Paratypes: BPBM 28780, 53.4 mm, ♂, Marshall Is., Enewetak Atoll, lagoon off Inedral (Uriah) I., 9-18 m, rotenone, P.L. Colin, 23 Feb. 1981; USNM 383798, 2: 24.2 and 37.1 mm, Marshall Is., Enewetak Atoll, Enewetak I., lagoon off Mid-Pacific Research Laboratory, *Halimeda-Dictyota* bed, 21 m, rotenone, J.E. Randall, P.L. Colin, L.J. Bell, and S.R. Johnson, 24-25 Sept. 1982; NMMBP 8629, 32.0 mm, ♀, South China Sea, Pratas Reef, 1 km E of Pratas I., 12 m, J.P. Chen, 16 May 2004; CAS 223098, 31.0 mm, ♂, Marshall Is., Majuro Atoll, lagoon off Uliga I., silty sand and rubble, 7 m, rotenone, J.E. Randall, 18 May 2004; NSMT-P 71497, 34.9 mm, Pratas Reef, 11 km NE of Pratas I., J.P. Chen, 21 Aug. 2004; ASIZP 65070, 2: 33.2 and 33.7 mm, same data as holotype; BMNH 2005.8.5.1, 40.7 mm, ♀, Majuro Atoll, lagoon off Djarrit (Rita) islet, near small boat pier, silty sand bottom, spear, B.D. Greene, 5 Jan. 2005; AMS I.43740-001, 35.1 mm, ♀, Majuro Atoll, lagoon off Uliga, 7°6'27.4"N, l71°22'7"E, sand and rubble, 18 m, spear, B.D. Greene, 9 Jan. 2005; BPBM 39669, 42.9 mm, Marshall Is., Majuro Atoll, lagoon off Uliga I., 7°6'33.2"N, 171° 22'7.1''E, rubble and sand, 8 m, spear, J.E. Randall, 10 Jan. 2005.

Table 1. Proportional measurements of type specimens of *Ctenogobiops mitodes* as percentages of standard length

	Holotype	Paratypes							
	ASIZP 65069	USNM 383798	CAS 223098	ASIZP 65069	AMS I.34740	USNM 383798	BMNH 05.8.5.1	BPBM 39669	BPBM 28780
Sex	male	female	male	female	female	male	male	female	male
Standard length (mm)	34.0	24.2	31.0	34.9	35.1	37.1	40.7	42.3	53.4
Body depth	23.1	20.8	20.0	21.9	23.0	21.8	22.7	23.4	21.6
Body width	14.9	14.4	14.4	15.0	14.2	15.1	13.5	14.3	13.3
Head length	33.8	33.2	33.3	33.7	31.4	32.6	32.2	32.4	32.3
Head width	16.4	16.5	15.3	16.3	15.7	15.8	15.1	15.6	15.3
Snout length	8.1	7.8	7.2	7.3	7.3	8.3	8.4	7.6	7.9
Orbit diameter	8.2	9.4	9.1	9.2	8.0	8.2	7.5	7.3	7.1
Interorbital width	1.7	1.7	1.7	1.6	1.8	1.7	1.8	1.7	1.6
Upper-jaw length	12.9	12.8	12.9	13.7	12.8	13.5	13.1	13.8	13.1
Caudal-peduncle depth	11.6	11.5	11.7	11.5	11.4	12.1	10.9	11.6	12.4
Caudal-peduncle length	17.4	17.7	18.7	17.5	17.7	18.8	18.9	18.8	18.7
Predorsal length	34.6	36.6	36.0	35.8	36.4	36.4	34.7	36.4	35.0
Preanal length	58.2	58.3	58.1	60.6	59.0	59.3	60.1	59.8	59.1
Prepelvic length	36.8	34.3	35.5	34.7	35.4	36.7	36.0	33.4	34.2
First dorsal spine	17.6	17.5	17.0	18.6	19.4	18.5	17.7	19.1	20.3
Second dorsal spine	32.4	17.7	18.1	31.5	37.5	29.9	41.5	broken	34.8
Third dorsal spine	20.0	18.3	22.7	22.3	25.3	23.5	29.1	34.5	20.8
Fourth dorsal spine	15.3	15.6	15.2	16.4	16.7	15.6	15.5	18.6	18.4
Spine of second dorsal fin	14.7	broken	14.8	14.7	14.3	broken	14.4	14.0	14.5
Longest dorsal ray	19.1	17.0	18.9	18.7	17.3	19.3	18.4	20.1	21.2
Anal spine	8.5	8.3	9.0	8.9	8.7	9.0	9.1	7.5	7.6
Longest anal ray	18.7	16.6	18.8	18.3	17.2	18.0	17.2	18.6	18.5
Caudal-fin length	29.6	28.7	29.4	31.1	30.1	29.9	30.2	30.2	30.7
Pectoral-fin length	28.9	29.1	29.0	30.0	30.8	28.6	27.7	27.9	26.0
Pelvic spine length	10.3	9.9	9.8	10.7	9.7	9.5	10.0	10.2	10.1
Pelvic-fin length	23.7	23.8	22.9	26.2	24.8	23.2	23.9	25.3	23.4

Nontype specimens: BPBM 16164, 4: 35-49 mm, Solomon Is., Guadalcanal, off W end of Honiara, sand adjacent to reef, 10 m, rotenone, J.E. Randall, 21 July 1973; BPBM 15793, 3: 24.5 mm, Papua New Guinea, Madang Province, Kranket I., lagoon, reef and sand in 2-3 m, rotenone, J.E. Randall, 13 Aug. 1973.

Diagnosis: Dorsal and anal soft rays 11; pectoral rays 18 or 19; lateral-line scales 46-52; gill rakers 4 or 5 + 10-12; body depth 4.3-5.0 in SL; gill opening extending forward to a vertical slightly anterior to hind edge of preopercle; 2nd dorsal spine of adults elongate; caudal fin shorter than head; body with 4 longitudinal rows of dark brown

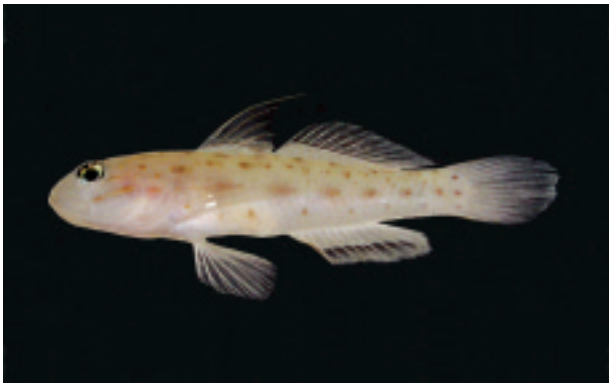

Fig. 1. Holotype of *Ctenogobiops mitodes*, ASIZP 65069, 34.0 mm SL, Pratas Reef, South China Sea.

Fig. 2. *Ctenogobiops mitodes*, about 60 mm TL, New Caledonia.

Fig. 3. *Ctenogobiops mitodes*, about 35 mm TL, Fiji.

Fig. 4. *Ctenogobiops mitodes*, about 50 mm TL, Flores, Indonesia.

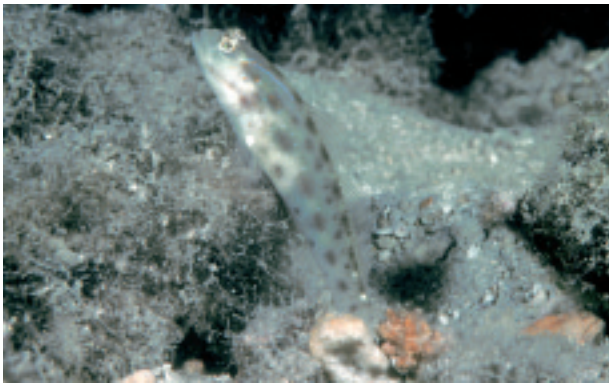

Fig. 5. *Ctenogobiops mitodes*, 55 mm TL, Majuro, Marshall Is.

Fig. 6. *Ctenogobiops pomastictus*, BPBM 27841, 56 mm SL, Lizard Is., Great Barrier Reef.

spots, those of 3rd (midlateral) row largest and horizontally elongate, except for last 1 or 2; large anterior dark spots of midlateral row often encircled by blue dots; 1 row of 3 dark spots on cheek, often joined by a light-brown band, 1st spot above posterior end of maxilla, 2nd obliquely dorsoposterior on preopercle, and 3rd at same level on opercle; an oblique blue and yellow mark behind lower edge of eye, followed by a similar smaller mark on preopercle and 1 on opercle, these marks often associated with a small dusky to brown spot; a curved blue and yellow line or series of dashes from behind upper part of eye to below origin of 1st dorsal fin; an elliptical bright white spot on lower

Fig. 7. *Ctenogobiops pomastictus*, about 50 mm TL, Palau.

Fig. 8. *Ctenogobiops pomastictus*, about 40 mm TL, New Britain.

Fig. 9. *Ctenogobiops pomastictus*, about 60 mm TL, Redang.

Fig. 10. *Ctenogobiops pomastictus*, about 55 mm TL, Banda.

Fig. 11. *Ctenogobiops pomastictus*, about 50 mm TL, Phuket, Thailand.

Fig. 12. Holotype of *Ctenogobiops phaeostictus*, BPBM 32488, 24.3 mm SL, Madang Province, Papua New Guinea.

1/3 of pectoral fins.

Description: Dorsal rays VI + I,11; anal rays I,11; all dorsal and anal soft rays branched, the last to base; pectoral rays 18 (18 or 19), the uppermost and lower 1 or 2 unbranched; pelvic rays I,5, branched, united as a disk, with a well-developed frenum; segmented caudal rays 17, the middle 13 (13 or 14) branched; upper and lower procurrent caudal rays 7 (6 or 7); longitudinal scale series 47 (46-52); transverse scale rows about 17; no scales on head, nape, pectoral-fin base, or chest; scales progressively larger posteriorly; scales cycloid anteriorly on body, becoming ctenoid posterior to base of 4th or 5th dorsal spine; no scales on fins except basally on caudal fin; gill rakers 5 + 11 (4 or 5 + 10-12).

Body depth 4.35 (4.3-5.0) in SL (smaller specimens generally more slender); body width 1.55 (1.4-1.7) in body depth; head length 2.95 (2.95-3.2) in SL; head width 2.05 (2.0-2.2) in head length; snout length 4.2 (3.85-4.5) in head length; orbit diameter 4.1 (3.55-4.55) in head length; upper edge of eye extending slightly above dorsal profile of head; interorbital width 20.0 (17.5-21.0) in head length; caudal-peduncle depth 8.6 (8.4-9.2) in SL; caudal-peduncle length 5.75 (5.3-5.7) in SL.

Mouth oblique, forming an angle of about 25° to horizontal axis of head and body, with lower jaw slightly projecting; maxilla reaching or slightly posterior to a vertical through center of eye, upper-jaw length 2.6 (2.35-2.6) in head length; a band of villiform teeth in jaws, broadest anteriorly, where innermost teeth are strongly retrorse; front of upper jaw with 2 pairs of strongly retrorse slender canine teeth separated at symphysis by a gap about equal to 1/2 pupil diameter; side of jaw with an outer row of smaller strongly incurved canines, progressively shorter posteriorly; front of lower jaw with an outer row of small slender retrorse canines; 2 or 3 large strongly retrorse canine teeth about halfway back in jaw; no teeth on palate; tongue slightly bilobed; edge of lips finely crenulate. No obvious difference found in the pattern of cephalic sensory pores and papillae from *C. pomastictus*, as illustrated by Lubbock and Polunin (1977: fig. 7).

Origin of 1st dorsal fin over pelvic-fin base, predorsal length 2.9 (2.75-2.9) in SL; 1st dorsal spine 5.7 (4.95-5.9) in SL; longest dorsal spine (variably 2nd or 3rd), 3.1 (2.4-3.35) in SL; spine of 2nd dorsal fin 2.3 (2.2-2.3) in head length; longest dorsal soft ray 5.2 (4.7-5.9) in SL; origin of anal fin below base of 1st to 2nd dorsal soft rays, preanal length 1.7 (1.65-1.7) in SL; anal spine 4.0 (3.55-4.3) in head length; longest anal soft ray 5.35 (5.3-6.0) in SL; caudal fin rounded, shorter than head, 3.4 (3.25-3.5) in SL; pectoral rays moderately pointed, middle rays longest, 3.45 (3.25-3.85) in SL; prepelvic length 2.7 (2.7-3.0) in SL; 4th or 5th pelvic soft ray longest, 4.2 (3.8-4.35) in SL; pelvic frenum well developed.

Color of holotype in alcohol pale yellowish with 4 longitudinal rows of brown spots on body, those of 3rd (midlateral) row largest, consisting of 6 spots, progressively smaller posteriorly, and horizontally oval except last 1 or 2; first 2 dark spots of 3rd row beneath pectoral fin; a small brown spot between upper edge of spots of 3rd row, except for last pair of spots; dark spots of first 2 rows of body forming triangles, except posteriorly; 4th row of 7 small spots at level of ventral edge of pectoral-fin base, the last on base of caudal fin in alignment with 2 spots above; a brown spot above posterior end of maxilla, joined by a double dusky band to a brown spot in middle of preopercle, followed at same level by a brown spot on opercle; a smaller brown spot dorsally on opercle, and another more dorsally above upper end of preopercular margin; a small oblique dark brown spot behind lower edge of eye followed by a faint narrow dusky band; a curving, partly double, narrow brown band from behind upper edge of eye to below origin of dorsal fin; a pair of brown spots just anterior to1st dorsal spine, preceded by 2 median dark spots; fins translucent without markings except for the vertical row of 3 small spots on scaled basal part of caudal fin.

Color of holotype when fresh (though with blue and yellow markings faded) shown in figure 1 from Pratas Reef, South China Sea. Color in life depicted in figure 2 from Flores, Indonesia, figure 3 from New Caledonia, figure 4 from Fiji, and figure 5 from Majuro Atoll, Marshall Is.

Etymology: The name *mitodes* is from the Greek meaning "threadlike" , in reference to the filamentous 2nd dorsal spine of adults.

Remarks: This species was initially misidentified by us as *C. pomastictus* Lubbock and Polunin. The similarity in the color patterns can be seen by comparing the photographs of *pomastictus* of figures 6-11 with those of *C. mitodes*. Figure 6 is a fresh specimen collected by the 1st author at Lizard I., Great Barrier Reef, the type locality. The remaining figures are underwater photographs, which represent new records for *C. pomastictus* except for the one from Palau.

Both species have the same 4 rows of dark

spots on the body, with the first 2 rows not in alignment, so they form a series of triangles. Both have the intense elliptical white spot on the pectoral fin about 1/3 of the distance to the tip, and the series of 7 or 8 whitish blotches dorsally on the body is a little smaller than the pupil; the last 1 or 2 are usually conspicuously white. Both have the arc of blue and yellow dashes on the nape, and they may have blue dots encircling the 1st few dark brown spots of the midlateral series.

The most important difference in color is the pattern of spots on the cheek. *Ctenogobiops mitodes* has 1 row of 3 spots from above the rear of the maxilla to the middle of the opercle, whereas *C. pomastictus* has 2 rows, the upper row of 3 spots dorsally on the cheek, the anterior spot from below the rear edge of the eye, and the 3rd spot on the opercle; the 2nd row is a series of 3 or 4 spots extending posteriorly and curving ventrally from just above the end of the maxilla. Also noteworthy are the yellow centers of many of the small spots on the side and ventrally on the body of *C. pomastictus*. In addition, *C. pomastictus* has a semicircular dark mark dorsally on the snout that links the posterior nostril and anterior interorbital pores of each side; this is faint or absent in *C. mitodes*.

The morphological difference that first caught our attention was the elongate 2nd dorsal spine of adults of *C. mitodes*; this spine is subequal to the 3rd spine in *pomastictus*. We later found complete separation in the longitudinal series of scales on the body. *Ctenogobiops mitodes* has 46-52 scales, compared to 55-59.

Ctenogobiops feroculus Lubbock and Polunin, with a range from the Red Sea to the Society Is., is also similar in color to *C. pomastictus* and *C. mitodes*. The first 2 longitudinal rows of dark spots on the body form a series of triangles; the large elliptical white spot is present on the pectoral fin; and the series of small whitish blotches may be seen along the back. It can also have a circle of blue dots around the 1st few large dark spots of the midlateral series. It differs in lacking a full series of dark spots in the 4th (ventralmost) series on the body; there are only l or 2 anterior spots of this series. Also it has a row of 3 or 4 small dark spots dorsally on the caudal fin. Lubbock and Polunin noted that it has the highest count of scales in the longitudinal series on the body, of 54-67. In addition, it lacks an elongate 2nd dorsal spine.

Material of *C. pomastictus* examined: Australia, Great Barrier Reef, Lizard I., BPBM 27841, 56 mm; BPBM 15549, 36 mm, Carter Reef (near Lizard I.); Capricorn Group, One Tree I., BPBM 14382, 3: 35-45 mm. Palau, Aurapushekaru I., 45 mm. Japan, Ryukyu Is., Amamioshima I., 48.5 mm.

Ctenogobiops phaeostictus, sp. nov.

(Table 2; Fig. 12)

Holotype: BPBM 32488, ♀, 24.3 mm SL, Papua New Guinea, Madang Prov., lagoon side of Pig I. (Tab I.), silty sand, 10 m, quinaldine, J.E. Randall, 2 Nov. 1987.

Diagnosis : Dorsal and anal soft rays 13; pectoral rays 18 or 19; lateral-line scales 49; gill rakers 2 + 8; body slender, depth 5.6 in SL; head length 3.6 in SL; gill opening extending forward to a vertical at upper end of posterior margin of preopercle; 3rd dorsal spine elongate; caudal fin slightly longer than head length; color of body in alcohol pale yellowish with numerous very small brown spots, 1 per scale, mainly dorsally; a midlateral row of 5 large dark brown spots, the 2nd and 3rd horizontally elongate; a dark brown spot on opercle, 1 directly above in line with eye, and 1 behind upper end of gill opening; no markings on fins; color when fresh pale gray, white on abdomen, chest, and ventrally on head; most small brown spots mixed with yellow, a few small yellow spots, the largest in a row of 4 on lower side, 2 with black centers; head with dark-edged oblique yellow lines; broad central part of caudal fin with longitudinal orange streaks.

Description: Dorsal rays VI + I,13; anal rays I,13; all dorsal and anal soft rays branched, the last to base; pectoral rays 18 (18 or 19), the uppermost and lowermost unbranched; pelvic rays I,5, branched, united as a disk, with a well-developed frenum; segmented caudal rays 16, middle 14 branched; upper and lower procurrent caudal rays 6; longitudinal scale series 49; transverse scale rows 14; no scales on head, pectoral-fin base, nape except above pectoral-fin base, or chest; scales progressively larger posteriorly (anterior scales above pectoral-fin base about 1/2 height of posterior scales on body); scales cycloid anteriorly, becoming ctenoid posterior to base of 3rd dorsal spine on side of body (cycloid farther back dorsally and ventrally); no scales on fins except basally on caudal fin; gill rakers 2 + 8.

Body slender, depth 5.6 in SL; body width 1.6 in body depth; head length 3.6 in SL; head width 1.8 in head length; snout length 4.5 in head length; orbit diameter 3.45 in head length; upper edge of

eye extending very slightly above dorsal profile of head; interorbital width 17.4 in head length; caudal-peduncle depth 10.2 in SL; caudal-peduncle length 6.0 in SL.

Mouth oblique, forming an angle of about 40° to horizontal axis of head and body, with lower jaw slightly projecting; maxilla nearly reaching a vertical through center of eye, upper-jaw length 2.7 in head length; a band of retrorse villiform teeth in jaws in at most 4 rows anteriorly; front of upper jaw with 2 pairs of slender retrorse canine teeth, followed on side of jaw with a row of about 12 smaller incurved canines, progressively shorter posteriorly; front of lower jaw with an outer row of 5 slender retrorse canines on each side, progressively larger laterally; 4 teeth from a more-medial row in lower jaw enlarged along middle of side of jaw (posterior to anterior canines); remaining teeth on side of lower jaw small; no teeth on palate; tongue truncate with rounded corners; edge of lips finely crenulate. Cephalic sensory pores as illustrated by Lubbock and Polunin (1977: fig. 7) for 3 species of *Ctenogobiops*; sensory papillae damaged, but appear to be most like *C. pomastictus*, with the upper of 2 horizontal rows of suborbital papillae extending slightly beyond eye.

Table 2. Proportional measurements of the holotype of *Ctenogobiops phaeostictus* as percentages of standard length

	Holotype
	BPBM 32488
Sex	female
Standard length (mm)	24.3
Body depth	17.9
Body width	11.3
Head length	27.8
Head width	15.6
Snout length	6.2
Orbit diameter	8.1
Interorbital width	1.6
Upper-jaw length	10.3
Caudal-peduncle depth	9.8
Caudal-peduncle length	16.6
Predorsal length	33.1
Preanal length	59.2
Prepelvic length	35.1
First dorsal spine	11.5
Second dorsal spine	15.8
Third dorsal spine	27.6
Fourth dorsal spine	12.4
Spine of second dorsal fin	11.5
Longest dorsal ray	14.9
Anal spine	10.3
Longest anal ray	15.0
Caudal-fin length	28.7
Pectoral-fin length	30.8
Pelvic spine length	9.9
Pelvic-fin length	25.9

Origin of 1st dorsal fin over pelvic-fin base, predorsal length 3.0 in SL; 1st dorsal spine 8.7 in SL; 2nd dorsal spine 6.35 in SL; 3rd dorsal spine elongate, 3.6 in SL; spine of 2nd dorsal fin 2.4 in head length; longest dorsal soft ray 6.7 in SL; origin of anal fin below base of 2nd dorsal soft ray, preanal length 1.7 in SL; anal spine 2.7 in head length; longest anal soft ray 6.65 in SL; caudal fin rounded, a little longer than head, 3.5 in SL; pectoral rays moderately pointed, middle rays longest, 3.25 in SL; prepelvic length 2.85) in SL; 5th pelvic soft ray longest, 3.85 in SL; pelvic frenum well developed.

Color of holotype in alcohol: body pale yellowish with numerous very small brown spots, 1 per scale, mainly dorsally; a midlateral row of 5 large dark brown spots, the 2nd and 3rd horizontally elongate; a dark brown spot on opercle, 1 directly above in line with eye, and 1 behind upper end of gill opening; 4 small median predorsal brown spots, the 2nd with a spot to each side in line with spot above opercle; no markings on fins.

Color of holotype when fresh (Fig. 12): pale gray dorsally, shading to white on abdomen and chest, and ventrally on head; many small dark spots resulting from pigment on each scale, mainly dorsally on body; most small dark spots a mixture of brown and yellow, but some black and a few mainly yellow including 4 in a row on lower side, 2 of which have black centers, a midlateral row of 5 large black spots, the result of merging black spots of individual scales; 1st spot below pectoral fins, the last on base of caudal fin, 2nd and 3rd horizontally elongate; a pupil-sized black blotch behind upper end of gill opening; a row of closely set small white spots, mostly as dashes, dorsally on body below dorsal fins; 2 well-separated small yellowish brown spots, 1 above the other, on pectoral-fin base; head with a dark brown nearly pupil-sized spot on opercle, with a smaller spot directly above in line with upper edge of pupil, and vertically in line with 3 smaller dark brown spots across occiput, middle spot 1 of a series of 4 median predorsal spots; snout, cheek, postorbital head, and opercle with oblique yellow spots and lines partially edged in brown; iris white; dorsal fins whitish, with transparent spots, many partly whitish or yellowish;

anal fin gray with a white band at base that continues out on last ray; caudal fin whitish, grading to translucent distally, broad central part with narrow orange streaks or rows of elongate spots; pectoral fins with whitish rays and transparent membranes; no large bright white spot detected; pelvic fins whitish on spine and 1st ray, rest of fin translucent.

Etymology: This species is named *C. phaeostictus* from the Greek *phaeos* for brown or dusky, and *stictus* for small spots, in reference to the profusion of small dark spots on the body.

Remarks: This goby is evidently a small species; the 24.3 cm holotype is a mature female.

When the holotype was first curated, it was not identified to genus. It was collected before it was determined if it was symbiotic with an alpheid shrimp. Because other species of the genus share burrows with alpheids, it is expected that this one does as well.

Ctenogobiops phaeostictus is readily separated from the 8 other species of the genus by having 13 soft rays in the dorsal and anal fins, compared to 10-12 rays, and an elongate 3rd dorsal spine, as well as in color pattern, especially the numerous small dark spots, only 1 longitudinal row of large black spots, and the apparent lack of a prominent white spot or streak on the pectoral fins.

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