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New species of gobiid fishes of the genera *Lythrypnus, Elacatinus* and *Chriolepis* from the eastern tropical Pacific

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Abstract: Eight new gobies are described. *Lythrypnus lavenbergi, L. alphigena* and *L. cobalus* were collected in deep waters around Isla del Coco; *L. insularis* was taken at the Islas Revillagigedo. The first two species were captured at ca. 140 m and 91 m depth respectively and do not appear to be closely related to other known species. The color pattern of *L. cobalus*, also from Isla del Coco is very similar to that of *Lythrypnus dalli* (Gilbert), but it appears to be a pygmy species and presents distinctive meristic values. The nominal species *Lythrypnus crinitus* Ginsburg and *L. latifascia* Ginsburg are considered junior synonyms of *L. dalli*. The mainland *Lythrypnus pulchellus* Ginsburg is tentatively retained as distinct from the insular *L. rhizophora* (Heller & Snodgrass) from Isla del Coco and the Islas Galápagos pending confirmation of differences in live coloration.
A mainland species, *Elacatinus inornatus* and *E. nesiotus* from Isla del Coco constitute a pair of geminate species. *Chriolepis cuneata* from the mainland is most similar to other mainland forms and *C. dialepta* from Isla del Coco is closely related to *C. lepidota* from Isla Malpelo.

Key words: Pacific fishes, Gobiidae, Cocos Island

During more than twenty years of intermittent collecting on the Pacific coast of Costa Rica and at Isla del Coco, a considerable number of undescribed species have accumulated (López & Bussing 1982). It is not surprising to find that a considerable number of these new forms are members of the Gobiidae, the most speciose of fish families. A distinctive recently described species, *Elacatinus janssi* is relatively common on the Pacific coast of Costa Rica (Bussing 1982). Sufficient material of other diminutive gobies has now made it possible to confirm the validity of several of these forms. However, two of the present new species are represented by only one specimen each and were taken below depths usually sampled by SCUBA gear.

Also, in line with the objectives of the proposed Instituto Nacional de Biodiversidad (INBio) in Costa Rica, an effort is being made to make names available for the numerous known, but undescribed species of the Costa Rican ichthyofauna. INBio proposes to inventory the entire Costa Rican biota within the next decade in order to accumulate the knowledge necessary to preserve and utilize this natural resource in a rational manner.

MATERIAL AND METHODS

Counts and measurements were made following Böhlke and Robins (1968). Predorsal distance is taken from snout tip to origin of first dorsal fin; preanal distance, to origin of anal fin. Head width is the greatest distance between opercula. Head depth is taken at a vertical passing through the posterior edge of opercular membrane. Pterygiophore formulae follow Birdsong (1988). Terminology of pores of the cranial canal system follow Hoese (1971). All measurements of length in mm refer to standard length.

In color descriptions of alcohol-preserved material, crossbars refer to vertical bars of pigment alternating with interspaces usually of greater width. In species of *Lythrypnus* whose live

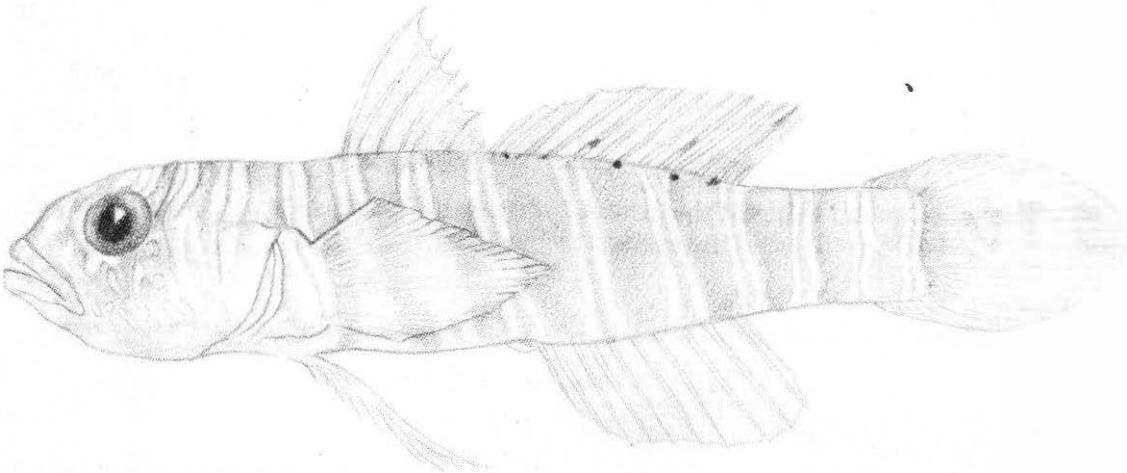

Fig. 1 *Lythrypnus lavenbergi*, n. sp., LACM 32264-7, male holotype, 21.0 mm from Isla del Coco, Costa Rica

coloration was recorded, the areas of darker pigment in preservative were blue in life, whereas pale areas were red in life.

Rows of head papillae and linear pigment patterns are referred to as longitudinal, transverse or oblique with respect to the long (horizontal) axis of the fish.

In those data that accompany the lists of type material, ichthyocides were utilized when no other method is mentioned.

Materials are deposited in the following institutions: Academy of Natural Sciences of Philadelphia (ANSP), Natural History Museum of Los Angeles County (LACM) and Museo de Zoología, Universidad de Costa Rica (UCR).

Lythrypnus lavenbergi, new species (Fig 1.)

Holotype: LACM 32264-7, a male 21.0 mm, collected at Isla del Coco 2.6 km WNN of Punta Gissler (5°33'N, 87°05'W). Collected with 30' otter trawl between 137-146 m depth on 3 April 1972 by R.J. Lavenberg and W. A. Bussing aboard R/V Searcher (Cruise 72-4, Sta. 521).

Diagnosis: A cross-barred species of *Lythrypnus* characterized by its slim body crossed by ten narrow, light crossbars alternating with wider, dark interspaces. Narrow bars with several median rows of closely spaced melanophores; interspaces uniformly dark. Nape without crest, with four narrow bars; subocular and opercular markings forming nearly vertical bars without spotting.

Description: Body slender, laterally compressed; greatest body depth at dorsal fin origin, 19.5 percent of SL. Dorsal and ventral body profiles slightly convex, nape concave (perhaps distorted). Least depth of caudal peduncle 11.4 percent of SL.

Head length 32.4 percent of SL, head depth 21.4 percent of SL. Eyes not protruding above dorsal head profile, horizontal eye diameter 9.5 percent of SL. Snout length less than eye diameter, 8.1 percent of SL.

Head pores of lateral line system absent. Head papillae pattern consisting of relatively large and sparse cutaneous papillae. Curved longitudinal row of five subocular papillae; two additional transverse papillae below posteriormost. Four papillae in an oblique row above posterior half of upper jaw. A longitudinal row of six papillae behind eye extending to above opercular opening. Two papillae close to and dorsad of posterior nostril. A transverse row of eight papillae running along posterior border of preopercle curving anteriorly to form a longitudinal row of 11 papillae along anterior branch of preopercle; an additional five papillae parallel and immediately ventrad of anterior branch of preopercle. An oblique row of 11 papillae below posterior two-thirds of dentary; a parallel row of three papillae immediately ventrad of this row. Two papillae centered on upper margin of eye.

Mouth inclined, upper jaw reaching to vertical below anterior margin of eye; length of upper jaw 11.9 percent of SL. A row of six recurved, widely spaced canine teeth along the premaxillary enclosing a broad band of minute, pointed teeth. Dentary with an outer row of four recurved canines with an inner band as on premaxillaries. Tongue free and pointed anteriorly. Both anterior and posterior nostrils tubular.

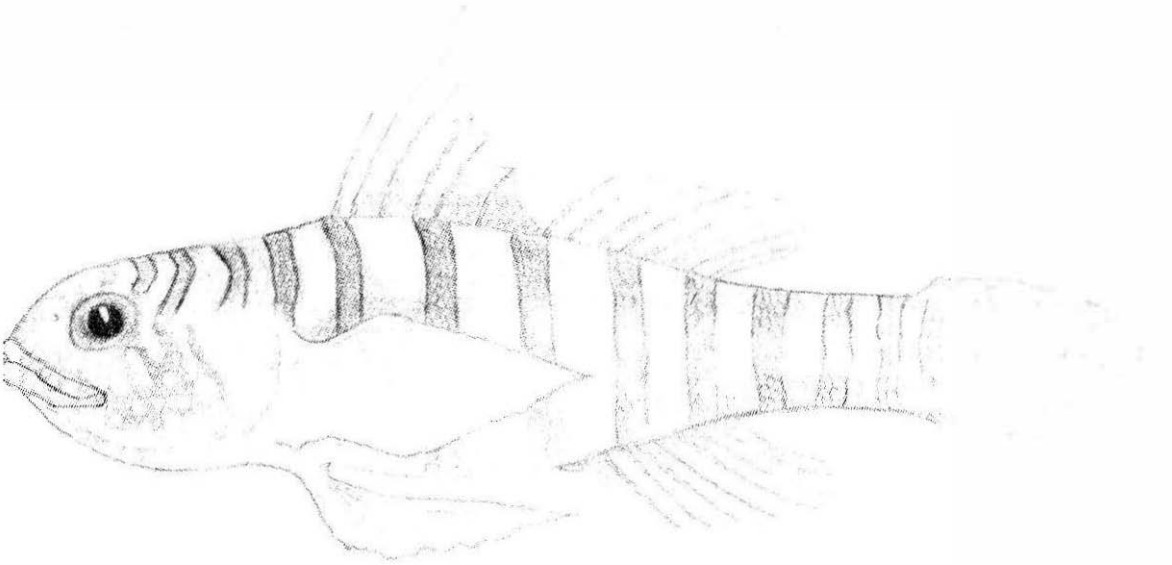

Fig. 2 *Lythrypnus alphigena*, n. sp., LACM 44827 -1, male holotype, 35.0 mm from Isla del Coco, Costa Rica

No body scales remaining and condition of fish does not permit an estimate of scale numbers based on scale pockets. Total gill rakers on first arch 8. Dorsal pterygiophore formula 3-22110; vertebral formula 10 + 16.

Six dorsal-fin spines, sixth separated by a wide gap from first five. First dorsal spine filamentous, extending to second dorsal soft ray. Second dorsal-fin rays 14. Predorsal distance 40.0 percent of SL. Anal-fin rays 10. Preanal distance 62.9 percent of SL. Pectoral fin rays 20 on each side; longest rays reaching to anal-fin origin, 31.0 percent of SL. Pelvic fins joined, one spine, five rays in each fin; small frenum present; fins reaching to urogenital papilla, 26.2 percent of SL. Segmented caudal rays 17, branched 11; length of fin 25.7 percent of SL; tip of fin pointed (?).

Ground color in alcohol, brown, head and body cross-barred. Body with ten narrow, pale bars beginning with bar over base of pectoral fin; last bar mostly on base of caudal fin; dark interspaces approximately twice as wide as pale bars. Head crossed by two oblique bars behind eye that cross over nape; a shorter bar between these on preopercle. Four bars above eye on nape and interorbital space. Two transverse bars below eye, other irregular blotches on snout and lips. Interspaces on head becoming less pigmented than bars anteriorly. Narrow bars on body with eight to twelve median rows of closely spaced melanophores; this darker median streak becoming narrower on head bars. Dark interspaces with larger, more evenly spaced melanophores. No dark blotches below head or on base of pectoral fin. Color in life not noted.

All vertical fins dusky, soft dorsal and midcaudal rays with diffuse bars. A few intensely black melanophores irregularly distributed along base of soft dorsal fin. Paired fins dusky near bases. A discontinuous, pale, longitudinal streak on midsides apparently resulting from abrasion of this slightly raised area.

Etymology: The species is named for Robert J. Lavenberg, frequent companion in ichthyological endeavors, who has contributed greatly to our knowledge of eastern Pacific fishes and who organized and participated in the expedition that collected this and several other undescribed species.

Distribution: *L. lavenbergi* is known only from the holotype collected at Isla del Coco at a depth of 137-146 m.

Lythrypnus alphigena, new species (Fig. 2)

Holotype: LACM 44827-1, a male 35.0mm, collected at Isla del Coco 2.5 km off Chatham Bay. Collected with tangle net at 91 m depth on 27 March 1989 by Michel Montoya (ex UCR 2106).

Diagnosis: A species of *Lythrypnus* with 10 narrow, uniformly dark crossbars on body. Wider interspaces pale, with uniformly distributed melanophores. Nape without crest; head barred above, with pale spots on dark background below. Spinous dorsal fin black posteriorly. Soft dorsal and anal fins dusky with faint streaks, caudal fin with six faint bars.

Description: Body deep and wide, laterally compressed urosome; body depth at dorsal-fin origin, 26.3 percent of SL, greatest body depth at distended belly 27.4 percent of SL. Dorsal and ventral body profiles evenly convex; lower jaw slightly in advance of tip of snout. Least depth of caudal peduncle 12.6 percent of SL.

Head pores of lateral line system absent. Head papillae pattern not highly developed. Longitudinal row of five subocular papillae, four centered below middle, fifth papilla below posteroventral margin of eye; two papillae forming a short longitudinal row below fourth subocular papilla. Six papillae in oblique row along lip fold of upper jaw. A longitudinal row of seven papillae between eye and opercular opening, two anterior papillae separated by wide space from five posterior ones. Two papillae on snout above anterior nostril. A transverse row of seven papillae along posterior margin of preopercle, continuing forward as an oblique row of 14 papillae along anterior branch of preopercle; parallel to and just below oblique row, a row of five papillae along first branchiostegal ray. An oblique row of nine papillae below dentary; parallel to and below this a row of five papillae. Two papillae centered on upper margin of eye.

Mouth oblique, upper jaw reaching to vertical below anterior margin of pupil; length of upper jaw 13.0 percent of SL. Outer row of 11 well spaced recurved teeth on each premaxillary; anterior three pair caniniform, these enclosing a band of minute pointed teeth. Dentary with outer row of two pairs of recurved canines anteriorly and an inner band as on premaxillary. Tongue free and pointed. Both anterior and posterior nostrils tubular.

Squamation nearly complete; a naked region above a line extending between base of fourth dorsal-fin spine to upper base of pectoral fin. Scalation irregular; longitudinal scale count about 37. Total gill rakers of first arch 10 on right side. Vertebral and dorsal pterygiophore formulae not determined.

Six dorsal-fin spines, first two spines filamentous, first reaching fourth dorsal soft ray; second spine shorter, reaching first element of soft dorsal fin. Second dorsal-fin rays 13. Predorsal distance 38.0 percent of SL. Anal-fin rays 11. Preanal distance 62.3 percent of SL. Both pectoral fins with 21 rays; fin almost reaching anal-fin origin, length 31.4 percent of SL. Pelvic fins joined, a conspicuous frenum anteriorly, one spine and five rays in each fin; tip of fins reaching posterior edge of anus, 28.6 percent of SL. Segmented caudal-fin rays 17, branched rays 11; length of fin 25.7 percent of SL.

Color pattern of body gray with dark narrow crossbars. Wide interspaces gray, consisting of discrete evenly-distributed melanophores slightly more crowded on posterior interspaces. Narrow crossbars much darker, uniform russet ground color with thin black margins; 10 to12 rows of minute melanophores on middle one-third of crossbars not discernable with naked eye. Anterior crossbars one-half as wide as interspaces, penultimate bar as wide as last interspace.

Head crossed by two dark-edged oblique bars extending to mid-eye level; one bar continuing onto cheek as part of brown reticular pattern, posterior bar fading and continuing to lower margin of opercle. Four bars above eye on nape and interorbital space. Cheeks, lips, upper branchiostegal membranes and anterior portion of isthmus brown with conspicuous cream-colored spots about one-half the size of pupil diameter. No dark blotch on base of pectoral fin. All fins dusky. Spinous dorsal becoming nearly black on last interradial membranes. Soft dorsal with some darker diffuse streaks. Six faint vertical bars on caudal fin produced by larger melanophores on interradial membranes. Anal and paired fins without other markings.

Etymology: From the Latin *alphus* meaning white spots on the skin and *gena* meaning cheek, to be treated as a noun.

Distribution: The species is known only from the holotype collected at Isla del Coco at a depth of 91 m.

Lythrypnus cobalus, new species
(Fig. 3)

Holotype: LACM 32271-22, a male 18.5 mm, collected at Isla del Coco off Isla Iglesias (5°33'N, 87°03'W). Collected with ichthyocides at 30 m depth on 4 Apr. 1972 by R. J. Lavenberg and W. A. Bussing aboard R/V Searcher (Cruise 72-4, Sta. 531).

Paratypes: LACM 32271-21, 29 (12.0-15.9) same data as holotype. LACM22448, 1 (23.5), Isla del Coco, 57-93 m, dredge, 13 Jan. 1938. UCR 729-6, 2 (11.9-12.2, alizarin spec.), same data as holotype. LACM 32268-4, 3 (13.7-14.0), 1 km ESE of Isla Montagene, 91 m, trawl, 3 Apr. 1972. UCR 2106-2, 2 (15.5-15.7), 2.5 km off Chatham Bay, 91 m, tangle net, 27 Mar. 1989. UCR 2108-3, 1 (20.4), Bajo Alcyone off Bahía Iglesias, 35 m, shake net, 27 Mar. 1989. UCR 2109-6, 1 (15.4), Bajo Alcyone, 36 m, shake net, 25 Mar. 1989. UCR 2110-9, 11 (13.0-20.2), Bajo Alcyone, 30-33 m, shake net, 29 Mar. 1989.

Diagnosis: A species of *Lythrypnus* with a predorsal crest, body with 4 to 6 (rarely 7) dark narrow bars and unpigmented interspaces. Caudal fin truncate. Dorsal soft rays modally 19, anal-fin rays usually 15 or 16 and pectoral-fin rays usually 21 or 22. Color in life red with blue bars on head and body. Possibly a pygmy species (2 specimens, 17.6 and 19.0 mm with well developed ova).

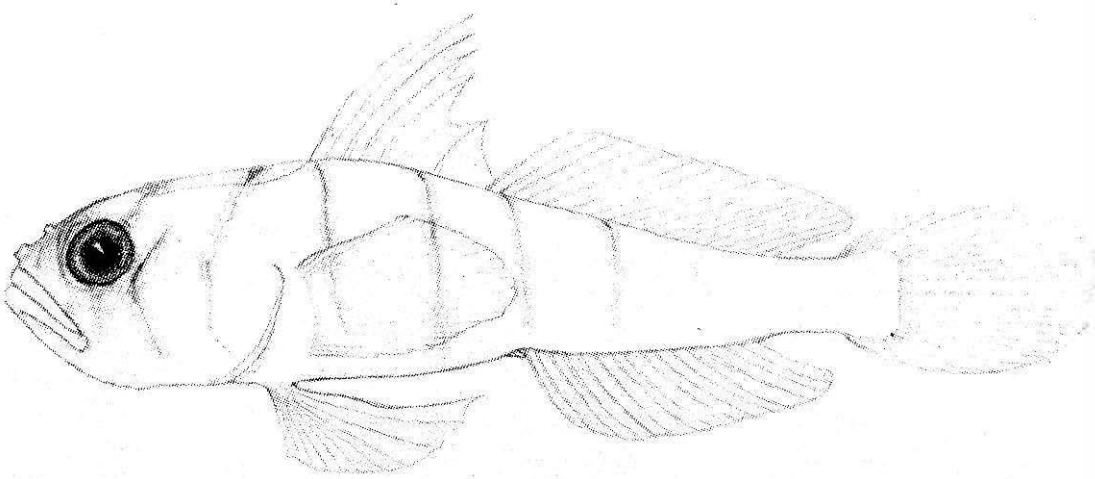

Fig. 3 ***Lythrypnus cobalus***, **n. sp., LACM 32271-22, male holotype, 18.5 mm, from Isla del Coco, Costa Rica.**

Description: Body of moderate depth, laterally compressed; greatest depth at dorsal-fin origin, 3.8-4.4 times in SL. Predorsal profile markedly convex; dorsal profile below dorsal fins nearly straight. Ventral profile of body nearly straight, slightly convex along anal-fin base. Lower head profile straight, lower jaw projecting sharply upwards from articular process to tip of jaw. Least depth of caudal peduncle 8.0-9.7 times in SL. (Table 1).

Head length 3.0-3.2 times in SL. Eyes well forward and below dorsal profile of head, horizontal eye diameter 2.8-3.3 times in HL. Snout length much shorter than eye diameter, 4.5-5.3 times in HL.

TABLE 1

Proportional measurements in percent of SL for the holotype and five paratypes (LACM 32271-21 of Lythrypnus cobalus, *new species.*

	Holotype	Paratypes				
SL (mm)	18.5	15.9	15.4	15.2	14.4	13.5
Head length	31.9	31.5	32.5	32.9	31.3	31.1
Eye diameter	9.7	10.7	11.0	10.5	10.4	11.1
Snout length	7.0	6.3	6.5	6.6	6.3	5.9
Upper jaw length	11.4	12.0	13.0	11.2	11.8	11.9
Body depth	23.8	25.8	25.3	24.3	26.4	23.0
C peduncle depth	10.3	10.7	11.0	10.5	12.5	11.1
Pre D distance	36.2	36.5	39.6	38.2	37.5	37.0
Pre A distance	57.8	59.1	59.1	58.6	57.6	58.5
P1 fin length	28.1	28.9	31.8	31.6	27.8	29.6
P2 fin length	24.3	28.3	27.3	27.6	28:5	26.7
C fin length	24.3	25.2	25.3	25.0	24.3	23.0

Head pores of lateralis system absent. Cutaneous papillae few in number and patterns vary individually. Papillae present include the following groups or series: A longitudinal row of three papillae below lower margin of eye; a transverse row of three papillae along posterior border of eye; an oblique row of two papillae behind preceeding transverse row. Two widely-spaced papillae in an oblique row above anterior half of upper jaw, six others above posterior one third of upper jaw. A longitudinal row of five papillae along upper margin of opercle; an additional papilla above posteriormost papilla of this row. A transverse row of three papillae above pectoral-fin base. Two papillae dorsad of space between nostrils. A transverse upper row of three papillae separated from a lower series of eleven papillae along posterior margin of preopercle. Two parallel rows of papillae along anterior branch of preopercle, 13 in upper row, seven in lower row. An oblique row of 12 papillae below dentary. Three papillae on upper margin of eye; one centered, two others nearer posterior margin of eye.

Mouth sharply inclined upward, reaching to vertical below middle of eye; lower jaw in advance of upper. Upper jaw 2.5-2.9 times in HL. Premaxillaries with outer row of six recurved, well-spaced canine teeth and one or two inner rows of small pointed teeth. Dentary with outer row of six (sometimes eight) enlarged canines and one or two inner rows of small pointed teeth. Tongue free, thick and pointed anteriorly. Anterior nostril tubular, posterior nostril with anterior margin produced.

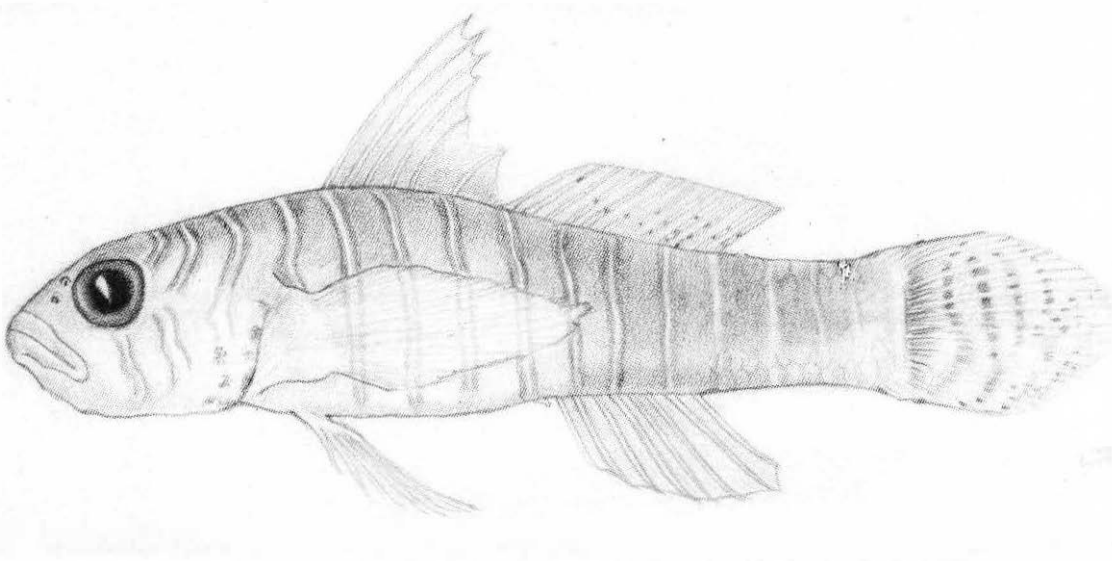

Fig. 4 *Lythrypnus insularis*, n. sp., LACM 31780-110, male holotype, 17.7 mm from Islas Revillagigedo, México.

Scales minute and deciduous, anterior scales (based on scale pockets) larger than those on urosome; estimated longitudinal scale count 43 on one paratype (UCR 2106-2). Total gill rakers on first arch of holotype 7, paratypes 7 (1), 8 (1), 9 (2). Vertebral and dorsal pterygiophore formulae for holotype and 15 paratypes 10 + 16 and 3-22110 respectively.

First dorsal fin with six flexible spines, second and third spines prolonged into filaments only on larger males; reaching to base of third dorsal ray of holotype, to base of fifth dorsal ray in a male of 15.5 SL. Dorsal-fin rays of holotype 19; paratypes 18 (9), 19 (14), 20 (7). Predorsal distance 2.5-2.8 times in SL; a raised fleshy crest extending from interorbital space to base of first dorsal fin. Anal-fin rays of holotype 16; paratypes 14 (2), 15 (13), 16 (13), 17 (2). Preanal distance 1.7 times in SL. Pectoral-fin rays of holotype 23 on right side, 22 on left side; paratypes 20 (13), 21 (20), 22 (19), 23 (8). Length of pectoral fin 3.1-3.6 times in SL; extending to base of first to fourth anal-fin rays. Pelvic fins joined, with short frenum, one spine and five rays in each fin; medial rays reaching to base of first anal-fin ray, length of longest ray 3.5-4.1 times in SL. Segmented caudal rays of holotype and 5 paratypes 17. Branched caudal rays of holotype and 5 paratypes 11. Length of caudal fin 4.0-4.5 times in SL.

In alcohol-preserved specimens, body and head with dark narrow transverse bars alternating with wide straw-colored interspaces. Body of holotype with 5 crossbars on each side; paratypes with 4 (6), 5 (40), 6 (10), 7 (2) dark crossbars from pectoral fin origin to posterior one-third of body, rarely to caudal peduncle; bars not quite reaching ventral midline. Two oblique crossbars on head behind eye; first bar from lower margin of preopercle to behind upper margin of eye, rarely crossing over head, second bar from lower margin of opercle to predorsal midline. A third oblique bar from upper margin of eye crossing over head. Crossbars divided by a median, wide, transverse area of closely concentrated black melanophores; this transverse streak equal to one-third of width of crossbars anteriorly; areas on either side of streak uniformly dusky. Interspaces pale with widely dispersed brown melanophores. Fins uniformly dusky; one specimen with proximal dark spots on dorsal fins above each of first four crossbars; five black dots on ventral midline of caudal peduncle. Smaller specimens retain postlarval pigmentation of up to eight proximal dots along base of anal fin.

Colors in life, crossbars blue with darker margins. Broad interspaces on head and body orange-red, most intense anteriorly. Vertical fins orange proximally, fading distally. Pectoral fins pale blue-gray, pelvic fins darker gray.

Etymology: From the Greek *kobalos* meaning knave, to be treated as a noun.

Distribution: *L. cobalus* was collected only at Isla del Coco between 30 and 91 m depth.

Lythrypnus insularis, new species (Fig. 4)

Holotype: LACM 31780-110, a male 17.7 mm, collected on NW side of Grayson's Ensenada on SW side of Socorro Island, Islas Revillagigedo, Mexico. Taken at depths up to 3 m, aboard R/V Searcher (Sta. 51) on 13, 14 Feb. 1971 by C. Swift.

TABLE 2

Proportional measurements in percent of SL for the holotype and five paratypes (LACM 31780-35) of Lythrypnus insularis, *new species*

	Holotype	Paratypes				
SL (mm)	17.7	17.2	16.3	15.7	13.9	12.8
Head length	30.5	29.1	27.0	30.6	31.7	31.3
Eye diameter	8.5	9.3	9.2	9.6	11.5	10.9
Snout length	6.8	7.0	8.0	7.6	7.2	7.0
Upper jaw length	10.7	11.6	11.7	11.5	12.2	11.7
Body depth	23.7	22.1	24.5	24.8	24.5	23.4
C peduncle depth	13.0	12.2	12.3	12.7	13.0	13.3
Pre D distance	38.4	36.1	36.8	37.6	40.3	39.8
Pre A distance	57.6	57.0	62.0	61.2	59.0	59.4
P1 fin length	29.4	25.6	30.1	-	34.5	36.7
P2 fin length	28.3	33.1	30.7	32.5	30.2	33.6
C fin length	27.1	26.2	-	24.2	25.2	25.0

Paratypes: LACM 31780-35, 44 (11.0-20.3), same data as holotype; LACM 32097-32, 51 (10.5-17.3), Clarion Island, Islas Revillagigedo, Mexico, 15-18 m, 11 Nov. 1971.

Diagnosis: A species of *Lythrypnus* usually bearing 14 (13-15) crossbars on body. Narrow bars darkest, with a light median streak containing one or two rows of distinct melanophores, with areas on either side of streak darker and uniformly dusky. Wider interspaces with pale ground color and uniformly distributed melanophores. Posterior bars and interspaces of nearly equal intensity, the light median streaks of these crossbars with a melanophore row usually visible. Some dusky spots on lower head. Soft dorsal and caudal fins barred. Nape without crest.

Description: Body moderately slender, laterally compressed; greatest depth at dorsal-fin origin, 3.9-4.5 times in SL. Dorsal and ventral profiles of body slightly convex. Upper head profile sharply convex from eye to snout tip; lower head profile equally convex. Least depth of caudal peduncle 7.5-8.2 times in SL (Table 2).

Head length 3.2-3.7 times in SL. Eyes just below dorsal profile of head, horizontal eye diameter 2.8-3.6 times in HL. Snout length less than eye diameter, 3.4-4.5 times in HL.

Head pores of lateral line system absent. Head papillae pattern reduced to a few rows. Most specimens examined have the following series: A longitudinal row of six or seven papillae below lower margin of eye; a longitudinal row of two additional papillae below posterior two of preceeding series. Seven papillae in an oblique row above posterior two-thirds of upper jaw. A longitudinal row of six papillae extending between eye and opercular opening. Two papillae dorsad of space between nostrils; another papilla between snout tip and anterior nostril. A transverse row of six to eight papillae along posterior margin of preopercle, continuing forward forming a longitudinal row of six papillae along anterior branch of preopercle. An oblique row of seven papillae below dentary. Two well-spaced papillae centered on upper margin of eye.

Mouth inclined, upper jaw reaching to a vertical below anterior margin of eye; lower jaw slightly in advance of upper. Upper jaw 2.3-2.8 times in HL. Premaxillaries with an outer row of six recurved, well-spaced canine teeth and a broad inner band of minute, pointed teeth. Dentary with three or four pairs of well-spaced outer canines anteriorly and a broad (4-5 rows) inner band of small pointed teeth. Tongue free, thick and pointed anteriorly. Anterior nostril tubular, posterior nostril slightly produced.

Scales remaining only on urosome of most specimens. A specimen of 13.4 mm with squamation intact has 29 lateral scales between gill opening and base of caudal fin. Total gill rakers on first arch of holotype 10, paratypes 6 (1), 7 (2), 9 (1). Vertebral formula of holotype 10 + 16; paratypes 10 + 16 (14), 10 + 17 (1). Dorsal pterygiophore formula of holotype and 14 paratypes 3-22110.

Six flexible dorsal-fin spines, first and second spines prolonged in males, reaching to base of fourth ray of holotype (probably damaged); first dorsal spine more prolonged than second spine and reaching to base of seventh dorsal ray in larger males. First two spines not notably prolonged in females. Dorsal rays of holotype 12; paratypes 11(1), 12 (24), 13 (5). Predorsal distance 2.5-2.8 times in SL. Anal-fin rays of holotype 9; paratypes 9 (3), 10 (25), 11 (2). Preanal distance 1.6-1.8 times in SL. Pectoral-fin rays of holotype 18 on right side, 19 on left side; paratypes 17(5), 18 (24), 19 (28), 20 (3). Length of pectoral fin 2.7-3.9 times in SL; reaching to base of first few anal-fin rays. Pelvic fins with frenum, fins joined, one spine and five rays in each; medial rays reaching to first few anal-fin rays, length of longest ray 3.0-3.5 times in SL. Segmented caudal rays of holotype 17; paratypes 17 (4), 16 (1). Branched caudal rays of holotype slightly damaged; paratypes 11 (4), 12 (1); length of caudal fin 3.7-4.1 times in SL.

Body and head of preserved material with alternating narrow, dark crossbars and wide, pale interspaces; distinction of color intensity between the two less marked posteriorly. Body of holotype with 13 crossbars on each side; paratypes with 13 (12), 14(43), 15 (5) dark crossbars from origin of pectoral fin to caudal base. Narrow bars brown with a light median streak

containing usually one, sometimes two rows of darker brown or black melanophores. Interspaces paler than brown crossbars because pale ground color overlain by fewer uniformly distributed melanophores. Head crossed by two V-shaped bars behind eye that cross overnape. Two bars on interorbital space. One oblique bar below eye and indistinct dark blotches on snout. Dark spots on lower half of head and on branchiostegal membranes. No dark blotch on base of pectoral fin.

Proximal half of spinous dorsal fin black, distal half dusky. Interradial membranes of second dorsal fin dusky, darker proximally; dark spots on dorsal rays forming two irregular longitudinal stripes. More numerous dark spots on caudal-fin rays, forming about five irregular crossbars. Interradial membranes of anal fin dusky, more intense anteriorly. Paired fins with few melanophores. Color in life unknown.

Etymology: From the Latin *insularis* meaning of an island, to be treated as a noun in the genitive case.

Distribution: The species is known only from the Islas Revillagigedo, Mexico and between a depth of 3 to 18 m.

Comments on the genus *Lythrypnus*

The Atlantic species of *Lythrypnus* were treated by Böhlke and Robins (1960). They defined the genus based on Atlantic material and considered them very similar to eastern Pacific species, which were included in the genus.

Ginsburg (1938), in his long-term studies of American gobies, described in considerable detail *Lythrypnus pulchellus* from the Gulf of California. He contrasted *L. pulchellus* with *L. zebra* (Gilbert) and recognized the new form only tentatively due to the poor condition of the four specimens available. The succeeding year Ginsburg (1939) described briefly two additional new species of *Lythrypnus, L. latifascia* from southern California and *L. crinitus* from the Galapagos Archipelago, while planning a future revision of the genus.

In describing the present four species, I have examined specimens of all nominal Pacific species of *Lythrypnus* and I am unable to accept the validity of two of the three species described by Ginsburg. I examined specimens of *L. dalli* (Gilbert) from southern California, the Gulf of California, the outer coast of Baja California, Isla del Coco and Panama and found only minute differences in color pattern. The population from Isla del Coco, however, is quite distinctive in meristic counts (Table 3) and diminutive size and merits specific recognition. Ginsburg (1939) detected only feeble traces of crossbars on *L. crinitus* from the Galapagos. I have observed numerous collections of *Lythrypnus* in which specimens have faded color patterns, due perhaps to fixing and preservation techniques or exposure to intense light. I expect that additional material from the Galapagos will prove *L. crinitus* to be a synonym of *L. dalli*. I also do not recognize *L. latifascia* as distinct from *L. dalli*. It is possible that this widespread species, extending from southern California to Ecuador, maintains a rather homogeneous population by means of its pelagic larvae.

Another widespread species complex revealing little color and also little meristic variation, except in number of crossbars, is *Lythrypnus rhizophora* (Heller & Snodgrass) and allies. A study of specimens from Isla del Coco, Galapagos Archipelago and the tropical eastern Pacific mainland reveals little variation in details of coloration of the alternating dark and light crossbars, although the number of crossbars amongst individuals from four sites in the Galápagos showed a high degree of individual variation. Two lots of specimens from the northern Galápagos (Pinta Island, LACM 43695-11 and Marchena Island, LACM 43684-41) contain individuals in which the number of narrow cross bars varies from 9 to 12 (Table 4). In two other lots from Wenman Island (LACM 43680-5) and Darwin Island (LACM 43684-41) the bar counts number 10 to 14; several of these specimens have different counts on each side of the body and others possess anomalous Y-shaped and half-bars. Specimens with 9 crossbars on the body appear conspicuously different from specimens with the more typical 12 or 13 bar pattern. However, no other differences were noted and specimens with all intermediate numbers of bars are present in the same lots. Specimens from Indefatigable Island (LACM 22003) and South Seymour Island (LACM 22002) in the southern Galápagos typically have 12 or 13 crossbars (Table 4).

The mainland populations of this *Lythrypnus* complex from both Mexico and Central America are referable to *L. pulchellus* (Ginsburg, 1938), although López & Bussing (1982) considered the Costa Rican population a possible new species. *L. pulchellus* is meristically similar to *L. rhizophora,* although some Costa Rican specimens have slightly higher pectoral-fin ray counts (Table 4). The Isla del Coco population of *L. rhizophora* is also modally distinct from both the Galápagos and mainland populations in pectoral-ray counts and in number of crossbars on the body. Although Ginsburg (1938) stated that *L. pulchellus* was very closely related to *Lythrypnus zebra* (Gilbert), it is curious he did not also compare it to the even more similar *L. rhizophora*. Preserved specimens of *L. pulchellus* usually present narrow crossbars on the body of equal intensity as the wider interspaces, as Ginsburg indicated. On a small percentage of others the bars are slightly lighter than the interspaces. Specimens of *L. rhizophora* typically have light narrow bars with dark wider interspaces; although some large males of *L. rhizophora* have bars and interspaces of equal intensity, I have seen none with bars darker than interspaces. The live coloration of mainland *L. pulch-*

TABLE 3

Comparison of meristic data for the Lythrypnus dalli *complex.*

	Dorsal-fin rays					Anal-fin rays					
	16	17	18	19	20	12	13	14	15	16	17
L. dalli											
So. Cal.	2	2	17	7	2			8	20	1	1
Gulf Cal.	10	18	4			1	14	14	2	1	
Baja Cal.		2	15	3	1			15	7		
Panama	2					1					
L. crinitus *		1					1				
L. cobalus			9	14	7			2	13	13	2

	Pectoral-fin rays							No. of crossbars				
	17	18	19	20	21	22	23	3	4	5	6	7
L. dalli:												
So. Cal.	10	18	24	8				26	34			
Gulf Cal.	8	29	25	2				2	32	30		
Baja Cal.	2	13	24	5				12	30	2		
Panama		1	2	1					4			
L. crinitus *			1									
L. cobalus				13	20	19	8		6	40	10	2

* Holotype (USNM 107281) data based on original description.

TABLE 4

Comparison of meristic data for the Lythrypnus rhizophora *complex*

	Dorsal-fin rays			Pectoral-fin rays					
	11	12	13	16	17	18	19	20	21
L. rhizophora:									
No. Galápagos	4	42	3		35	47	13	1	
So. Galápagos	6	22	2		15	34	10		
Isla del Coco	6	24		2	30	26	2		
L. pulchellus:									
Cent. Am.	4	14	3		11	14	2	7	1
Mexico	2	11	7		3	24	11	1	

	Anal-fin rays			# of crossbars					
	9	10	11	9	10	11	12	13	14
L. rhizophora:									
No. Galápagos	2	44	3	5	14	8	71	71	3
So. Galápagos	2	26	2			3	62	135	2
Isla del Coco	4	26				14	76	30	
L. pulchellus:									
Cent. Am.	7	14	1			2	3	33	
Mexico	2	17					1	9	2

ellus is most strikingly distinguished by its narrow blue crossbar pattern alternating with wide red interspaces (Burgess & Axelrod, 1984: 2110); the iris is red and lower head and median fins have bright red spots. A freshly preserved specimen (perhaps a juvenile) of *Lythrypnus* from Isla del Caño, 17 km offshore from the Costa Rican mainland, had straw-colored crossbars with yellow interspaces; median fins and pectoral fins were also yellow. Conversely, a freshly preserved specimen of *L. rhizophora* from Isla del Coco had a light blue bar pattern withdrab brown interspaces; head and median fin spotting was also brown. Further confirmation of the live coloration of these two insular *Lythrypnus* populations and from the type locality, the Galápagos, is clearly indicated in order to determine the validity of *L. pulchel*lus and the relationships of the other populations of *L. rhizophora.*

Comparative material

Lythrypnus dalli (Gilbert)

California: LACM 6577-7, 38646-2.
Gulf of California, Mexico: LACM 31775-29, 24104, 22218, 6964-16.
Baja California, Mexico: LACM 32045-7.
Panama: LACM 22447.

Lythrypnus gilberti (Heller & Snodgrass)

Islas Galápagos: LACM 8150, 23281, 43846-4.

Lythrypnus pulchellus Ginsburg

Mexico: LACM 21698 (paratype), 21703 (paratype), 22225, 6966-15, 31775-30, 22449.
Costa Rica: LACM 32192-51, 32493-41, 32499-46, 32503-17, 32531-5, 32548-54, 32561-17, 32566-46, UCR 382-43, 432-25, 433-39, 660-1, 664-1, 673-14, 701-22

Lythrypnus rhizophora (Heller & Snodgrass)

Islas Galápagos: LACM 22003, 22002, 22006, 22001, 22004, 22005, 22222, 43680-5, 43695-11, 43661-18, 4393-2, 43684-41,43682-13; UCR 770-34.
Isla del Coco: LACM 32253-36, 32254-32, 32256-26, 32257-15, 32260-26, 32272-19, 32275-9, UCR 719-2, 729-7, 741-18, 857-18, 863-9, 1156-22.

Lythrypnus solanensis Acero

Colombia: LACM 38222-1 (Holotype).

Lythrypnus zebra (Gilbert)

California: LACM 65771.

A key to the eastern Pacific species of *Lythrypnus**

A. A low predorsal crest on head; dorsal-fin rays 15 to 20; anal-fin rays 12 to 16 ..... *B*

AA. No predorsal crest; dorsal-fin rays 11 to 14; anal-fin rays 9 to 11 ..... *D*

B. Body with 9 narrow light bars, bordered by dark pigment rows and with several median rows of melanophores ..... *L. gilberti*

BB. Body with 7 or fewer narrow dark (blue in life) crossbars, wide interspaces light (red in life) ..... *C*

C. Pectoral-fin rays 20 to 23, usually 21 or 22; dorsal-fin rays modally 19, anal-fin rays modally 15.5... *L. cobalus*

CC. Pectoral-fin rays 17-20, usually 18 or 19; dorsal-fin rays modally 18, anal-fin rays modally 14 ..... *L. dalli*

D. Narrow and broad crossbars with median rows of melanophores ..... *L. zebra*
DD. Narrow crossbars only with median rows of pigment ..... *E*

E. Narrow crossbars lighter or of equal intensity as wider interspaces ..... *F*

EE. Narrow crossbars darker than wider interspaces ..... *H*

F. Narrow crossbars with 8 to 12 median rows of closely spaced melanophores; dorsal-fin soft rays 14 ..... *L. lavenbergi*

FF. Narrow crossbars with 2 or 3 median rows of melanophores; dorsal-fin soft rays 11 to 13, usually 12 ..... *G*

G. Live coloration narrow blue crossbars with wider red interspaces; narrow crossbars typically of same (rarely less) intensity as interspaces of preserved specimens .... *L. pulchellus*

GG. Live coloration pale blue crossbars with drab brown interspaces; narrow crossbars usually lighter (rarely of equal) intensity as preserved specimens with interspaces ..... *L. rhizophora*

H. Longitudinal scales about 37; cheeks and lower head with large white spots ..... *L. alphigena*

HH. Longitudinal scales 27 to 29; lower head with brown spots I

I. Pectoral-fin rays 17 to 20; narrow crossbars on body 13 to 15; 1 (rarely 2) median rows of melanophores on each crossbar ..... *L. insularis*

II. Pectoral-fin rays 21 or 22; narrow crossbars on body 12; typically 3 rows of melanophores on each crossbar ..... *L. solanensis*

*Based in part on a manuscript key written by D. F. Hoese

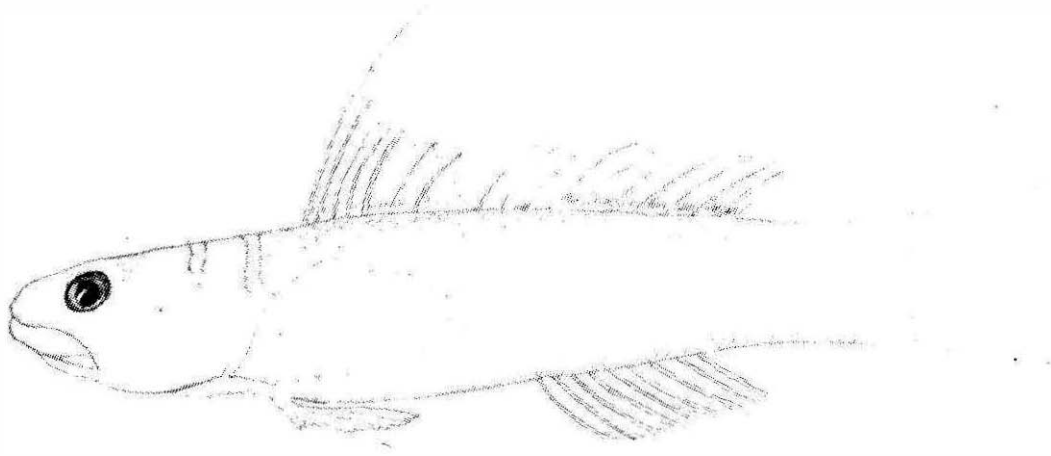

Fig. 5 *Elacatinus inornatus*, n. sp., LACM 32493-32493-43, male holotype, 29.0 mm from Costa Rican mainland

Elacatinus inornatus, new species
(Fig. 5)

Gobiosoma brocki, (not Ginsburg) Böhlke and Robins (in part) 1968: 67-69 (Isla Gorgona, Colombia; not including Panama specimen).

Gobiosoma sp., Burgess & Axelrod, 1984: 2109 (color plate of freshy preserved specimen).

Elacatinus sp., López & Bussing, 1982.

Holotype: LACM 32493-43, a male 29.0 mm, collected off Isla Cocinero, Islas Murciélagos, Costa Rica (10° 51'N, 85° 54'W). Collected with ichthyocides at 9 m depth on 16 Feb. 1972 by W.A. Bussing *et al.* aboard R/V Searcher (Cruise 72-2, Sta. 404).

Paratypes, COSTA RICA: LACM 32493-42, 10 (11.0-23.2), same data as holotype. LACM 32562-48, 1 (17,4) north side Isla del Caño, 9 m, 18 Mar. 1972. LACM 3248-55, 32 (11.0-23.8, alizarin spec.), east side Isla del Caño, 15 m, 15 Mar. 1972. LACM 32551-39, 1 (9.3), pinnacle 2 km NW of Isla del Caño, 21 m, 16 Mar. 1972. LACM 32546-49, 1 ((11.6), north side Isla del Caño, 9 m, 14 Mar. 1972. UCR 382-1, 19 (11.2-23.5), N side Isla San José, Islas Murciélagos, 10-14m, 7 Dec. 1969. UCR 432-23,2 (16.4-21.3), NW side Isla San José, Islas Murciélagos, 17 m, 12 Sep. 1970. UCR 433-40, 14 (10.7-24.6), Cabo Santa Elena, 23-27 m, 14 Sep. 1970. **COLOMBIA**, ANSP 110683, 5 (20.5-23.6), NE tip of Isla Gorgona, 11-13 m, 21 Sep. 1961. ANSP 110682, 1 (21,0), 0.5 km NNE Punta Mona, 5-6m, 22 Sep. 1961.

Diagnosis: A small species of *Elacatinus*, subgenus *Tigrigobius* with a depressed head crossed by three pale crossbars, body with one or two pale superficial crossbars anteriorly, but internally with five quadrangular areas of dark pigment. Pectoral-fin rays modally 19.

Description: Body slender, laterally compressed; greatest body depth 5.3-6.7 times in SL. Dorsal profile slighty angular at origin of first dorsal fin, predorsal area between eye and origin of first dorsal fin straight, posterior profile straight. Ventral profile straight between base of caudal fin and lower head. Least depth of caudal peduncle 6.9-7.4 times in SL (Table 5).

TABLE 5

Proportional measurements in percent of SL of holotype and five paratypes (UCR 382-1 and LACM 32493-42 of Elacatinus inornatus, *new species.*

	Holotype	Paratypes				
SL (mm)	29.0	23.6	23.6	20.8	16.3	13.8
Head length	27.9	28.4	25.4	28.4	28.8	29.7
Head depth	15.5	16.1	15.3	18.3	17.2	18.1
Head width	18.6	17.4	20.3	20.7	19.6	18.1
Postorbital length	18.3	18.2	16.5	18.3	17.8	17.4
Eye diameter	5.5	6.8	7.2	7.7	8.6	10.1
Snout length	5.9	5.9	6.4	6.7	6.1	7.3
Upper jaw length	12.1	11.4	10.6	11.5	11.7	12.3
Body depth	16.9	17.0	14.8	17.8	16.0	18.8
C peduncle depth	13.8	13.6	13.6	14.4	14.1	13.8
Pre D distance	33.1	34.3	33.5	37.0	38.0	39.9
Pre A distance	57.6	56.4	57.2	58.7	57.7	60.9
P1 fin length	26.6	24.6	25.4	27.9	30.1	31.9
P2 fin length	17.2	17.8	18.2	19.2	20.9	22.5

Head length 3.4-3.9 times in SL, head depth 5.5-6.6 times in SL, head width 4.8-5.8 times in SL. Eyes slighty below head profile, horizontal eye diameter 2.9-5.1 times in HL. Snout length slightly greater than eye diameter in largest specimen (holotype), less than eye diameter in five paratypes, 4.0-4.8 times in HL.

Head pores of lateral line system as follows: one posterior nasal pore on each side of snout; an anterior and posterior interorbital pore; an infraorbital pore on each side of head, one terminal lateral canal pore and two preopercular pores.

Head papillae pattern variable, a composite of papillae as seen on several specimens follows: three papillae in a transverse row just above middle of upper jaw; three papillae in an oblique row along posterior margin of upper jaw. Nine papillae along posterior half of lower jaw margin. A transverse row of ten papillae parallel to and just behind posterior border of preopercle; a longitudinal row of three papillae perpendicular to and just posterior to fourth lowest papilla of preopercular series. Two parallel longitudinal rows of seven papillae each along anterior branch of preopercle.

Mouth slightly inclined, upper jaw reaching to vertical below posterior margin of eye; upper jaw slightly in advance of lower jaw. Upper jaw 2.3-2.5 times in HL. Four distinct rows of minute, pointed teeth on premaxillaries, those of inner and outer rows slightly enlarged; teeth of inner row directed posteriorly. Dentary teeth minute and pointed, in five or six irregular rows; outer row slightly enlarged; males equipped with an additional inner row of two or three pairs of recurved canine teeth posteriorly. Tongue broad and truncate in front. Anterior nostril tubular, edges of posterior opening elevated.

Body entrely naked, but a thick mucous coat covers head and body. Total gill rakers on first gill arch of holotype 6, paratypes 5 (1), 6(2), 7 (1). Vertebral formula of holotype and 21 paratypes 11 + 17. Dorsal pterygiophore formula of holotype and 14 paratypes 3-221110, three paratypes with 3-212110 and an anomalous paratype with eight dorsal-fin spines with 3-2211110.

First dorsal fin with seven flexible spines; first spine filamentous in adults of both sexes, but more prolonged in males; first spine extends to base of second dorsal ray in females, to base of fifth dorsal ray in some males. Second dorsal-fin rays of holotype 11; paratypes 10 (2), 11 (28). Predorsal distance 2.5-3.0 times in SL. Anal-fin rays of holotype 9; paratypes 9 (3), 10 (27). Preanal distance 1.6-1.8 times in SL. Pectoral-fin rays of holotype 20 on right side, 19 on left side; paratypes 18 (16), 19 (34), 20 (9), 21 (1). Length of pectoral fin 3.1-4.1 times in SL; extending nearly to anus in some, far shorter in others. Pelvic fins with frenum, 4.5-5.8 times in SL; fins joined, one spine and five rays on each fin; medial rays falling far short of anus, length of longest ray 5.8 times in SL. Segmented caudal rays of holotype and five paratypes 17; branched rays of holotype 14, paratypes 12 (1), 13 (4). Length of caudal fin 4.1-4.7 times in SL.

Alcohol-preserved specimens with one or two very faint pale crossbars on body immediately behind base of pectoral fins. Three narrow crossbars on head, paler or of equal intensity as wide interspaces; crossbars with dark margins. First bar crossing over head, extending to lower margin of preopercle. Second bar crossing nape and running along posterior half of opercle to lower opercular margin. Third bar between eye and rictus of mouth. Five roughly square internal pigment blotches along vertebral column; these inconspicuous blotches visible by transmitted light and evenly spaced along body, wider than pale interspaces and extending completely between dorsal and ventral margins of body.

Basal one-fifth of dorsal fin hyaline, bordered above by a series of black spots on interradial membranes between first to sixth spines; distal four-fifths of fin dusky. Second dorsal fin with a similar, very narrow hyaline base, above which usually appear spots or slightly darkened areas on interradial membranes; remainder of fin and entire anal fin pale dusky. Caudal and paired fins pale dusky.

Freshly preserved specimens with a bright orange-red head. Wide orange-red interspaces of head divided by three narrow white crossbars; first bar from lower margin of eye to rictus of jaws; second crosses over head and extends to lower preopercle; third crosses nape and reaches lower margin of opercle. A fourth white bar crosses predorsal area of body and extends on both sides behind pectoral bases. Remainder of body with internal pigment producing five dark, diffuse bars extending between dorsal and ventral margins of body. Interspaces narrower and translucent yellowish. Caudal fin bright yellow, other fins pale with melanophore patterns as in preserved material.

Etymology: From the Latin *inornatus* meaning unadorned, to be treated as an adjective.

Distribution. The species is known from Cabo Santa Elena in northern Costa Rica to Isla Gorgona, Colombia between depths of 9 and 27 m.

Elacatinus nesiotes, new species
(Fig. 6)

Holotype: LACM 44821-3, a male 22.9 mm, collected on E side of Isla del Coco, 300 m SW of Cabo Descubierto. Collected with ichthyocides at 20 m depth on 24 Mar. 1978 by R.J. Lavenberg and W. A. Bussing aboard "Jubilee" (ex UCR 1155).

Paratypes, ISLA DEL COCO, COSTA RICA; LACM 44821-1, 6 (10.1-18.5), same data as holotype. LACM 44820-1, 5 (10.9-17.0), N side of Roca Pan de Azúcar, 10 m, 19 Apr. 1975. LACM 32256-27, 6 (10.2-20.6), Chatham Bay, E of Punta Pacheco, 6 m, 1 Apr. 1972. LACM 32272-20, 1 (15.9), Wafer Bay, SE Isla Gissler, 5 m 4 Apr. 1972. LACM 32283-26, 4 (11.5-22.5), Wafer Bay, mid bay, 11 m, 6 Apr. 1972. LACM 32271-20, 5 (10.0-20.5), Isla Iglesias, S of islet,

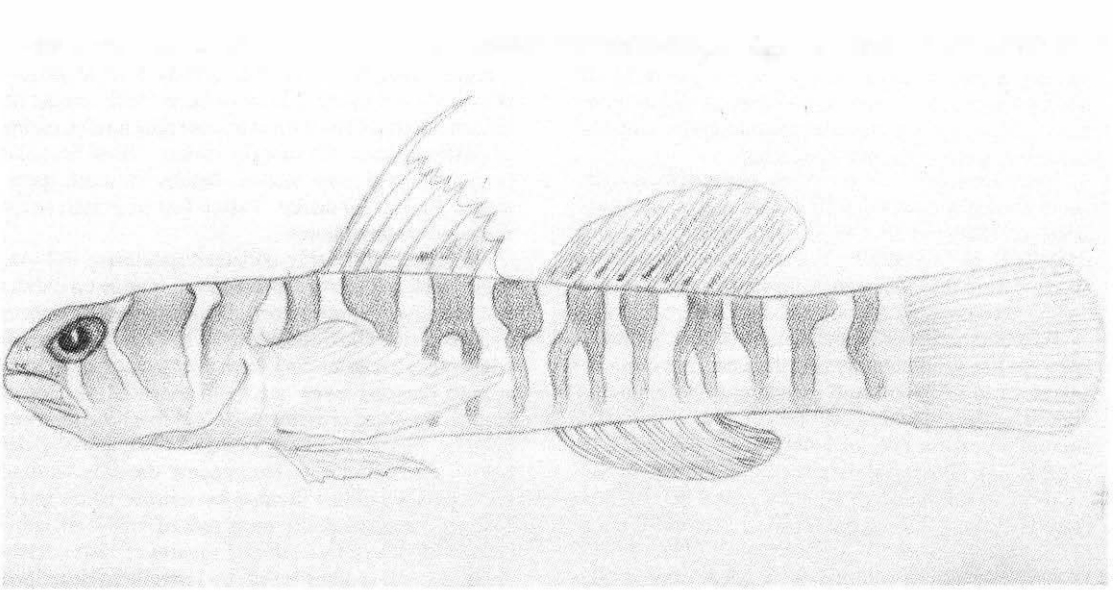

Fig. 6 *Elacatinus nesiotes*, n. sp., LACM 44821-3, male holotype, 22.9 mm from Isla del Coco, Costa Rica.

31 m, 4 Apr. 1972. LACM 32254-33, 2 (13.2-14.0), Chatham Bay, N Punta Quiros, 11 m, 31 Mar. 1972. UCR 717-1, 2 (17.4-18.7), SSE of Isla Pájara, 12 m, 2 Apr. 1972. UCR 1156-21, 8 (10.5-19.6, 2 alizarin spec.), 850 m N Cabo Atrevida, 7-8 m, 26 Mar. 1978. UCR 1154-1, 1 (16.6), Bahía Iglesias, off Isla Muela, 7-10 m, 23 Mar. 1978. UCR 741-11, 2 (10.8-11.1), same data as LACM 32283-26. **ISLAS GALAPAGOS, ECUADOR:** UCR 770-54, 1 (23.6), Santa Cruz Island, 9 km E of Academy Bay, (ex W64-19), 9 Feb. 1964. LACM 43684-5, 4 (16.5-25.5), Darwin Island, W side of north face, 18-21, 16 May 1984. LACM 43676-25, 1 (23), Darwin Island, S side, 9-12 m, 13 May 1984.

Diagnosis: A small species of *Elacatinus*, subgenus *Tigrigobius* with a depressed head and body with ten irregular dark crossbars that are broader than pale interspaces. Five wide dark bars internal to ten superficial bars. Pectoral-fin rays modally 18.

Description: Body slender, laterally compressed; greatest body depth 5.8-6.4 times in SL. Dorsal and ventral profiles convex. Least depth of caudal peduncle 7.8-8.7 times in SL (Table 6).

Head length 3.3-3.7 times in SL, head depth 5.2-6.7 times in SL, head width 4.5-4.9 times in SL, postorbital head length 1.6-1.8 times in HL. Eyes just below dorsal profile of head, horizontal eye diameter 3.1-3.8 times in HL. Snout length less than eye diameter, 3.6-4.6 times in HL.

Head pores of lateral line system and head papillae pattern as in *Elacatinus inornatus*.

Mouth horizontal, jaws reaching to vertical below middle of eye; upper jaw slightly in advance of lower jaw. Upper jaw 2.1-2.5 times in HL. Premaxillaries with four rows of minute, pointed teeth, those of outer and inner rows slightly enlarged. Five or six irregular

TABLE 6

Proportional measurements in percent of SL of holotype and five paratypes (LACM 32283-26, LACM 44821-1, LACM 44820-1 and UCR 1156-21) of Elacatinus nesiotes, *new species.*

	Holotype	Paratypes				
SL (mm)	22.9	22.5	18.6	17.3	17.1	13.1
Head length	30.0	27.1	28.5	28.9	29.2	30.5
Head depth	14.9	16.0	16.1	17.3	17.5	19.1
Head width	20.5	20.9	22.0	22.0	21.1	21.4
Postorbital length	17.0	16.4	17.7	17.3	17.0	16.8
Eye diameter	7.4	7.6	8.6	9.3	9.4	9.9
Snout length	6.6	6.2	7.0	6.9	6.4	8.4
Upper jaw length	13.1	11.6	12.4	12.7	11.7	12.2
Body depth	15.7	15.6	16.1	17.3	17.0	16.8
C peduncle depth	12.2	12.0	12.9	12.1	12.9	11.5
Pre D distance	34.9	34.2	36.0	37.6	36.3	39.7
Pre A distance	58.1	58.7	59.1	58.4	58.5	57.3
P1 fin length	26.2	26.7	26.3	28.3	26.3	31.3
P2 fin length	17.5	18.7	19.4	19.1	21.1	22.9
C fin length	22.7	22.2	21.5	22.0	22.2	22.9

rows of minute, pointed teeth on dentary; outer row slightly enlarged and in males, an inner row of six widely spaced, recurved canine teeth. Tongue broad and truncate in front. Anterior nostril tubular, edges of posterior opening slightly produced.

Body entirely naked, no scales at base of caudal fin. Head and body covered with a thick mucous coating. Total gill rakers on first arch of holotype 6, paratypes 6 (3), 7 (2). Holotype, 20 specimens from Isla del Coco and five from the Galápagos with similar vertebral and dorsal pterygiophore formulae: 11 + 17 and 3-22 1 10.

First dorsal fin with seven flexible spines, although holotype has a rudimentary eighth spine; first spine filamentous in adults of both sexes, more prolonged in mature males, reaching to base of first dorsal ray. Second dorsal-fin rays of holotype 11; paratypes 10 (2), 11 (34). Predorsal distance 2.5-2.9 times in SL. Anal-fin rays of holotype 10; paratypes 9 (1), 10 (35). Preanal distance 1.7-1.8 times in SL. Pectoral-fin rays of holotype 19 on each side; paratypes 17 (3), 18 (44), 19 (25). Length of pectoral fin 3.2-3.8 times in SL; extending to anus. Pelvic fins with frenum, 5.0-6.4 times in HL; fin joined, one spine and five rays in each fin; medial rays not reaching anus, length of longest ray 4.4-5.7 times in SL. Segmented caudal rays of holotype 16; paratypes, 16 (3), 17 (2); branched rays of holotype 12, paratypes 11 (5). Length of caudal fin 4.4-4.7 times in SL.

Body of alcohol-preserved specimens with ten dark crossbars dorsally that are wider than pale interspaces, counted from base of pectoral fin to base of caudal fin. Several bars on ventral half of body bifurcated or disjointed into half-bars; ventral bars straw-colored and narrower than similar straw-colored interspaces, these bars have dark margins and a few irregularly dispersed melanophores (Fig. 6). Five internal pigment blotches on lower sides; each diffuse blotch corresponding to a pair of dorsal bars; most evident in smaller specimens by transmitted light. Holotype with 14 ventral bars on left side, 12 bars on right side; 10 paratypes with 10 to 14 ventral bars.

Head coloration is as in *E. inornatus* and most easily described in a manner inconsistent with the description of body coloration. That is, pale narrow bars alternating with wide interspaces typically darker or rarely of equal intensity as bars. Three narrow crossbars on head of nearly same intensity as wide interspaces on holotype and some paratypes; paler than interspaces on other specimens. Crossbars with dark margins. First bar crossing over head, and fading on lower preopercle. Second bar crossing nape and fading on lower opercle and anterior base of pectoral fin. Third bar between eye and rictus of mouth. Snout dusky.

First dorsal fin unpigmented proximally, followed by a brown or black longitudinal streak formed by dark blotches on interradial membranes; blotches between fourth and fifth and fifth and sixth spines most prominent; distal four-fifths of fin dusky with a darker margin. Second dorsal fin usually with a narrow proximal unpigmented area; oblique black streaks on interradial membranes most intense proximally, fading to dusky distally, fin margin darker. Anal fin solid brown, slightly more intense distally on some specimens. Caudal fin dusky. Paired fins pale with a few scattered melanophores.

Color of two freshly-collected specimens follows. Head brick red above and on snout; orange on cheeks and opercles, yellow below. Wide orange interspaces of head divided by three narrow white bars with brown edges; first bar extending from eye to rictus of mouth; second crossing over head and extending to lower preopercle; third crossing nape and reaching to lower opercle. First bar on body orange-brown above, paler below; remaining crossbars appear dorsally as nine wide brown saddles divided by narrow white interspaces. Lateroventrally each pair of crossbars coincides with one of five internal squares of diffuse gray color. Dorsal saddles break up laterally as described for preserved material; patches of yellow appearing on ventral half of four white interspaces. Fins as in preserved specimens, no other colors apparent.

Etymology: From the Greek *nesiotes* meaning islander, to be treated as a noun.

Distribution: *E. nesiotes* is known only from Isla del Coco and Islas Galápagos. Collected between 5 and 31 m depth.

Comments on the genus *Elacatinus*

At present the genus *Elacatinus* is represented in the Pacific by *E. (Elacatinus) puncticulatus (Ginsburg)*, *E. (Tigrigobius) janssi* Bussing and at least four cross-barred species of the subgenus *Tigrigobius; E. digueti* (Pellegrin), *E. inornatus n. sp.*, *E. nesiotes* n. sp. and a species referred to as *E. limbaughi* Hoese in a colored photograph in a popular account of Pacific marine fishes (Burgess & Axelrod 1984: 2107). The name of the latter species apparently is a manuscript name as no formal description has been found in the literature. The four cross-barred species have orange heads, similar meristics (but see Table 7 for modal pectoral ray counts) and alternating dark and light crossbars of varying width and configuration on the head and body. *E. "limbaughi"* has straight dark bars broader than white interspaces and lacks a series of dark internal crossbars (colored photo in Burgess & Axelrod 1984: 2107; Thomson *et al.* 1979: pl. 30 a). Internal pigment shows through the translucent bodies of the other three species as diffuse dark bars below the following external markings: *E. digueti* with wavy dark bars narrower than pale interspaces (Burgess & Axelrod, p. 2106 and Thomson el al., pl. 29); *E. nesiotes* with irregular dark bars wider than pale interspaces and *E. inornatus* without external barring on body, but three pale bars on head (Burgess & Axelrod, p. 2109).

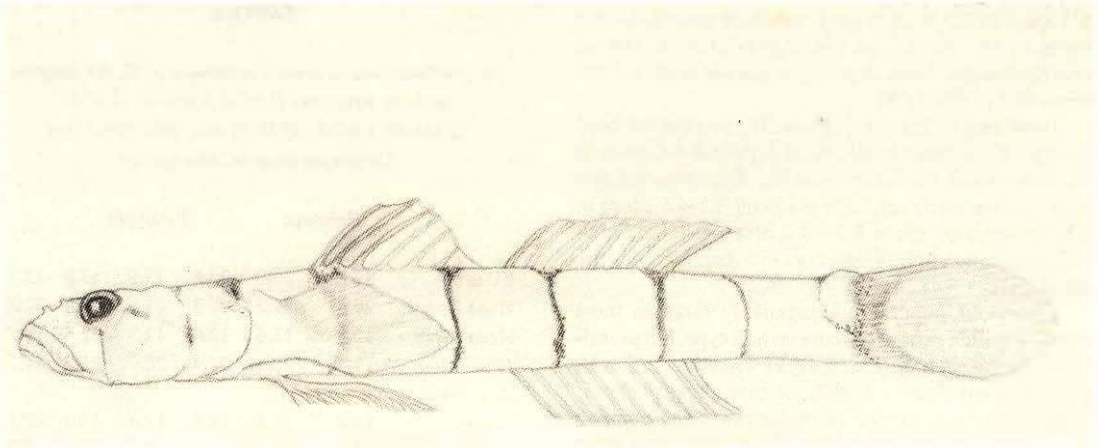

Fig. 7 *Chriolepis cuneata*, n. sp., LACM 44828-1, male holotype, 22.8 mm from Costa Rican mainland

Comparative material

Elacatinus digueti (Pellegrin)

México: LACM W58-5, W55-282

Elacatinus "limbaughi"

México: LACM 31775-14

TABLE 7

Comparison of pectoral-ray counts for some species of Elacatinus, *subgenus* Tigrigobius.

	17	18	19	20	21
E. digueti		2	6	2	
E. nesiotes					
Isla del Coco	3	36	21		
Galápagos		8	2		
E. inornatus					
Costa Rica		16	34	9	1
Colombia		1	9	2	

Chriolepis cuneata, new species
(Fig. 7)

Chriolepis sp., López & Bussing, 1982.

Chriolepis depressus, Findley, 1983, unpublished Ph.D. dissertation, Univ. of Arizona, 193 p.

Holotype: LACM 44828-1, a male 22.8 mm, collected off Isla San José, Islas Murciélagos, Costa Rica. Collected with ichthyocides between 10-14 m depth on 7 Dec. 1969 by W. Bussing, R. Nishimoto, C. Stone (ex UCR 382-5).

Paratypes, COSTA RICA: LACM 32548-56, 1 (23.4), E side Isla del Caño, 15 m, 15 Mar. 1972. LACM 32546-50, 2 (13.8-17.4), N side Isla del Caño, 9 m, 14 Mar. 1972. LACM 32539-35, 2 (15.3-16.0), W side Isla Salera, 0.5 km SW Punta Catedral, 17 m, 12 Mar. 1972. LACM 32499-47, 2 (23.8-25.0), Cabo Santa Elena, 18 m, 18 Feb. 1972. UCR 689-15, 2 (17.1-17.7), N side Isla del Caño, 9 m, 18 Mar. 1972. UCR 432-22, 1 (16.6, alizarin spec.), Isla San José, Islas Murciélagos, 17 m, 13 Sep. 1970. UCR 631-8, 1 (22.7, alizarin spec.), Islas Viradores Norte, 21 m, 19 Feb. 1972.

Non-type material: UCR 684-8, 1 (14.5), pinnacle 3 km NW Isla del Caño, 37 m, 17 Mar. 1972.

Diagnosis: A small species of *Chriolepis* with a strongly depressed head and body, five dark, narrow crossbars on body sharply contrasting with wide, pale interspaces. Upper half of pectoral fin and proximal one-third of caudal fin dark brown. One narrow and one wide dark bar on nape, a transverse bar below mid-eye, another oblique bar behind eye. Dorsal fin-rays 9 or 10, usually 10; pectoral-fin rays 19; fifth pelvic-fin ray longer than fourth; gill rakers 8-10, usually 10.

Description: Body exceptionally slender, wider than deep anteriorly, becoming compressed at caudal peduncle. Body depth at origin of first dorsal fin, 7.0-

8.3 times in SL; body depth at origin of anal fin 8.1-8.6 times in SL. Dorsal profile slightly convex; ventral profile straight. Least depth of caudal peduncle 8.7-9.9 times in SL (Table 8).

Head length 2.9-3.4 times in SL, postorbital head length 1.6-2.0 times in HL; head depth 6.8-8.6 times in SL, head width 4.6-5.1 times in SL. Eyes entering into head profile, horizontal eye diameter 3.5-4.6 times in HL; interorbital space 8.0-10.2 times in HL. Snout length usually slightly less than eye diameter, 4.1-5.1 times in HL.

Cutaneous papillae comparatively large in most cases. Papillae pattern obscure on holotype, but prominent on a specimen from LACM 32499-47. Eleven elongated papillae in an oblique row along posterior three-quarters of margin of upper jaw. Ten papillae along entire margin of dentary. Three transverse rows of six to eight papillae on cheek; a curved transverse row of five minute papillae between anterior two transverse rows; a longitudinal row of four papillae near rictus of mouth; another oblique series radiating from posteroventral margin of orbit. A transverse row of ten papillae parallel to and immediately behind posterior margin of preopercle. Two parallel longitudinal rows of nine minute (above) and six larger (below) papillae along anterior branch of preopercle. An oblique row of five papillae on upper half of opercle. Three papillae along upper margin of each orbit, two on anterodorsal sector, one centered above mid-eye. Three papillae on each side of snout. Two or three transverse rows of papillae along body below adpressed pectoral fin.

Mouth slightly oblique; upper jaw reaching to a vertical below middle of pupil, 2.2-3.1 times in HL. Lower jaw in advance of upper jaw. Premaxillaries with outer row of well-spaced canines, much enlarged and recurved anteriorly; two intermediate rows (one row posteriorly) of small pointed teeth; an inner row of slightly enlarged pointed teeth. Dentary with four rows of teeth medially; an anterior outer row of several well-spaced canines; two intermediate, irregular rows and an inner row of spaced fang-like canines progressively larger laterally. These lateral, enlarged fangs present in both sexes. Tongue broad and rounded anteriorly. Both anterior and posterior nostrils tubular.

Posterior half of body scaled to a vertical below origin of soft dorsal fin or to its second or third ray. Longitudinal scale rows about 16 or 17. Scales larger and ctenoid posteriorly becoming smaller and cycloid anteriorly. Four ctenoid basicaudal scales, the upper and lower with numerous, excessively elongate ctenii; last five rows of scales on caudal peduncle, especially along midline, with progressively less developed ctenii anteriorly. Rest of body and head scaleless. Total gill rakers on first arch of holotype 12, paratypes 10 (2). Vertebral formula of holotype and nine paratypes 11 + 16, one paratype with 12 + 16. Holotype and one paratype with dorsal pterygiophore formula of 3-221110.

First dorsal fin with seven flexible spines, the last two spines more widely separated. No spines prolonged into filaments in either sex. Second dorsal-fin rays of holotype 10; paratypes 9 (1), 10 (8). Predorsal distance 2.5-2.8 times in SL. Anal-fin rays of holotype 10; paratypes 9 (2), 10 (7). Preanal distance 1.5-1.7 times in SL. Pectoral-fin rays of holotype 19 on each side; paratypes 19 (18). Length of pectoral fin 3.1-4.0 times in SL; adpressed pectoral fins reaching anus or slightly beyond. Pelvic fins separate, but with small frenum; one flexible spine and five rays, tips not reaching anus; length of longest ray 3.7-4.5 times in SL. Segmented caudal rays 17, branched rays 15; length of fin 3.6-3.8 times in SL.

Alcohol-preserved specimens with five brown crossbars on body alternating with much wider straw-colored interspaces without melanophores. Crossbars usually vertical, typically expanded dorsally, especially on dorsal midline giving a saddle-like appearance to each bar. First bar wide, below origin of first dorsal fin. Second bar narrow, sometimes not reaching dorsal midline. Third bar narrow, located below or behind origin of second dorsal fin. Fourth bar usually wide (narrow on holotype), below middle or end of

TABLE 8

Proportional measurements in percent of SL for holotype and five paratypes (LACM 32499-47, LACM 32546-50, LACM 32539-35 and UCR 689-15) of Chriolepis cuneata, *new species.*

	Holotype	Paratypes				
SL (mm)	22.8	25.0	23.8	17.9	17.8	15.7
Head length	29.4	29.2	30.3	31.3	34.3	31.2
Head depth	12.3	11.6	12.6	12.3	12.4	14.7
Head width	19.7	20.4	21.4	20.7	21.4	21.7
Postorbital length	18.0	17.2	18.9	18.4	17.4	17.8
Eye diameter	7.0	6.4	7.1	7.8	7.9	8.9
Interorbital	3.1	3.6	3.8	3.4	3.4	3.2
Snout length	6.6	6.4	6.3	7.3	6.7	7
Upper jaw length	13.2	11.2	11.3	12.3	11.2	11.5
Body depth at D	14.0	12.0	14.3	12.3	13.5	13.4
Body depth at A	12.3	12.0	12.2	11.7	12.4	12.1
C peduncle depth	10.5	10.4	10.9	10.1	10.1	11.5
Pre D distance	36.8	36.0	37.4	38.6	38.8	39.5
Pre A distance	59.7	60.8	60.5	60.3	62.9	66.2
P_1 fin length	28.5	30.8	31.9	26.3	30.3	24.8
P_2 fin length	21.9	22.4	23.0	26.8	22.5	22.3
C fin length	26.3	26.8	27.3	-	28.1	28.0

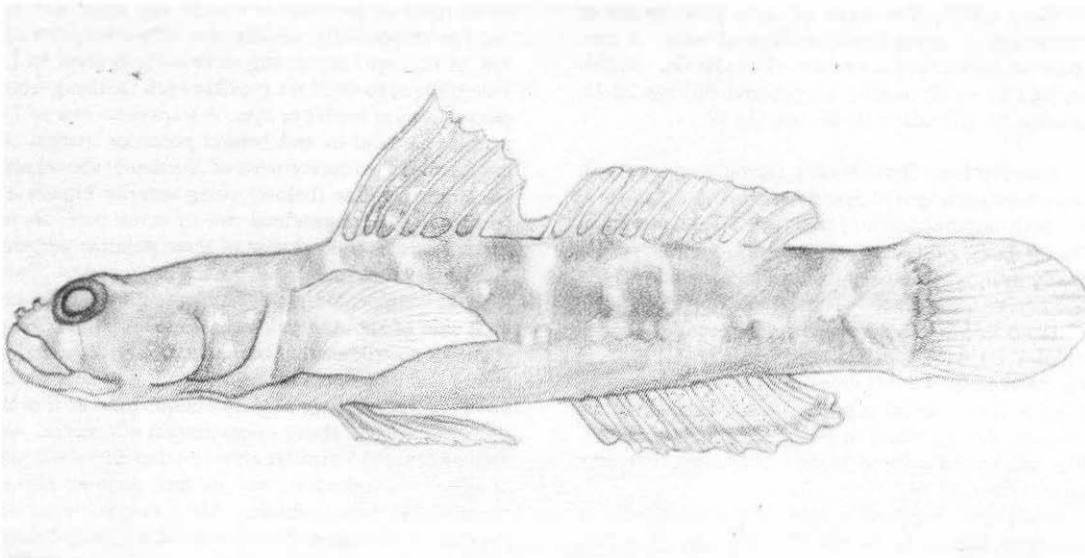

Fig. 8 *Chriolepis dialepta* n. sp., LACM 44821-4, male holotype, 40.5 mm from Isla del Coco, Costa Rica.

second dorsal fin. Last bar very narrow and often curved, unlike first four bars; under posterior end of second dorsal-fin base or on peduncle. Two transverse brown bars on head. A prominent wide bar on nape between upper margins of opercles; another narrow bar or stripe crossing middle of head and continuing along opercular-preopercular groove, not reaching ventral surface of head. A black vertical stripe below anterior margin of pupil ending at rictus of mouth; an oblique brown stripe from posteroventral margin of eye, intersecting with transverse stripe crossing head.

All fins except anal with specific brown pigmented areas (Fig. 7). Spinous dorsal fin with dark triangular patch as an extension of first crossbar, apex near tip of first spine. Second dorsal fin also with subtriangular dark patches above third and fourth crossbars. Proximal fourth of caudal fin brown, posterior margin of patch concave with pigment extending distally along dorsal and ventral margins of fin. Upper half of pectoral fin with curved brown pigment patch.

Etymology: From the Latin *cuneata* meaning wedge-shaped in allusion to the crossbars, to be treated as an adjective.

Distribution: *C. cuneata* is known from the Gulf of California to Costa Rica. Collected at depths of 0-32 m in Mexico (Findley, 1983) and 9-27 m in Costa Rica.

Chriolepis dialepta, new species
(Fig. 8)

Chriolepis walkeri, Findley, 1983, unpublished Ph.D. dissertation, Univ. of Arizona, 193 p.

Holotype: LACM 44821-4, a male 40.5 mm, collected off E side Isla del Coco, 300 m SW Cabo Descubierta, 20 m, ichthyocide, 24 Mar. 1978 by R.J. Lavenberg and W.A. Bussing aboard "Jubilee" (ex UCR 1155).

Paratypes, Isla del Coco, Costa Rica: LACM 44821-2, 13 (11.7-34.9), same data as holotype. LACM 44820-2, 21 (11.9-29.8) Roca Pan de Azúcar, 10 m, 19 Apr. 1975. LACM 32262-2, 1 (16.0), E of Isla Pájara, night light, 2 Apr. 1972. LACM 32275-8, 4 (14.1-30.7), Wafer Bay off Punta Gissler, 24 m, 5 Apr. 1972. LACM 32283-25, 15 (20.4-30.8), middle of Wafer Bay, 11 m, 6 Apr. 1972. LACM 32260-25, 6 (10.4-28.4), SSE of Isla Pájara, 12 m, 2 Apr. 1972. UCR 1154-23, 7 (22.7-27.1), Bahía Iglesias, 7-10 m, 23 Mar. 1978. UCR 867-10, 22 (12.4-32.0), Weston Bay, S side of Isla Pájara, 21 m, 21 Apr. 1975. UCR 1156-33, 4 (12.0-26.1), 850 m N Cabo Atrevida, 10 m, 26 Mar. 1978. UCR 729-5, 10 (10.9-34.9, 2 alizarin spec.), off Isla Iglesias, 31 m, 4 Apr. 1972. UCR 2160-1, 1(31), Chatham Bay, 9m, 29 Apr. 1988.

Diagnosis: A large species of *Chriolepis* with rounded head, extensive scalation from midspinous dorsal fin to base of caudal fin. Ground color light to dark brown; body with irregular dark blotches, usually interconnecting; six small pale blotches along dorsal

midline; usually five pairs of short pale streaks or "apostrophes" along lateral midline of body. A conspicuous dark crossbar on base of caudal fin. Dorsal-fin rays 11 or 12, usually 11; pectoral-fin rays 18-21, usually 20; gill rakers 10-14, usually 12.

Description: Body robust, laterally compressed; body depth at origin of first dorsal fin 5.0-6.3 times in SL; body depth at origin of anal fin 5.3-5.9 times in SL. Dorsal body profile evenly convex, ventral profile nearly straight. Least depth of caudal peduncle 6.7-7.4 times in SL (Table 9).

Head length 3.0-3.3 times in SL, postorbital head length 1.7-1.8 times in HL, head depth 5.6-6.1 times in SL, head width 4.4-5.0 times in SL. Eyes protruding slightly above dorsal profile of head, horizontal eye diameter 3.6-4.2 times in HL, interorbital space 9.4-15.7 times in HL. Snout length less than eye diameter, 4.1-5.0 times in HL.

Cutaneous papillae pattern well developed. A specimen from LACM 44820-2 with the following papillae. Fourteen papillae in a curved row along posterior one-quarter of margin of upper jaw. Seventeen small papillae along posterior one-half of lower jaw; 11 larger papillae below and parallel to preceding row along entire lower jaw; a parallel row of four additional papillae near tip of lower jaw. Three transverse rows of papillae on cheek: six, eight and 11 papillae respectively; middle row with a longitudinal row of six papillae running posteriorly to form an L. Two oblique rows of six papillae each radiating from posteroventral border or eye. A transverse row of 17 papillae parallel to and behind posterior margin of preopercle. Two curved rows of 20 minute (above) and six larger papillae (below) along anterior branch of preopercle. A longitudinal row of seven papillae on upper opercle, another row of three papillae perpendicular to transverse row on lower opercle. Two papillae on upper margin of each eye. Five papillae on each side of snout, a pair near dorsal midline above posterior nostril; another immediately above posterior nostril and one above anterior nostril; one near snout tip. Five transverse or slightly oblique rows of four to six papillae each, above upper margin of opercle. An oblique row of 15 papillae above posterodorsal margin of eye. A longitudinal row of four papillae above opercle near dorsal midline. Six transverse rows of three to six papillae each on lower sides of body below and partially under adpressed pectoral fin; another oblique row of three papillae below origin of spinous dorsal fin. Short transverse rows of three to six papillae crossing each scale on posterior half of body along midlateral row of scales.

TABLE 9

Proportional measurements in percent of SL for holotype and five paratypes (LACM 44821-2 and UCR 867-10) for Chriolepis dialepta, *new species*

	Holotype		Paratypes			
SL (mm)	40.5	35.2	30.9	29.2	25.3	22.7
Head length	30.1	31.5	32.0	32.2	32.0	33.0
Head depth	12.3	17.3	17.8	17.5	17.0	16.3
Head width	21.0	21.6	23.0	21.6	21.7	19.8
Postorbital length	17.5	18.2	19.4	18.5	17.8	19.4
Eye diameter	7.2	8.8	8.1	7.5	8.3	8.8
Interorbital	3.2	2.3	2.9	2.1	2.1	2.2
Snout length	6.4	7.1	7.1	6.9	7.9	6.6
Upper jaw length	14.3	14.2	14.9	14.4	15.0	13.7
Body depth at D	16.5	20.2	18.5	19.9	15.8	16.7
Body depth at A	17.5	18.8	17.8	17.5	17.0	16.3
C peduncle depth	13.6	13.9	14.9	14.7	13.8	14.1
Pre D distance	37.3	37.5	38.5	38.4	40.7	37.0
Pre A distance	60.7	63.1	62.1	61.6	62.9	61.2
P_1 fin length	25.9	28.4	26.5	27.4	29.6	28.6
P_2 fin length	22.7	23.3	24.3	24.0	24.1	26.4
C fin length	23.0	24.2	25.2	25.3	25.3	26.9

Mouth oblique; upper jaw reaching to vertical below posterior margin of pupil or posterior margin of eye, 2.1-2.4 times in HL. Mouth terminal or lower jaw projecting slightly beyond upper jaw. Premaxillaries with several rows of teeth, an outer row of large, well-spaced caniniform teeth, two or three irregular inner rows of much smaller pointed teeth. Dentary with an outer row of six to eight enlarged canines anteriorly only; internal to this another row or two of medium-sized pointed teeth becoming a single row posteriorly; an inner row of long well-spaced canines, the last two or three on each side of dentary much enlarged recurved fangs. Tongue broad and truncate. Both anterior and posterior nostrils tubular.

Body scaled between a vertical below middle of spinous dorsal fin to base of caudal fin. Longitudinal scale rows 27-29. All scales imbedded in thick epidermis. Posterior scales ctenoid to a point at a vertical below origin of second dorsal fin; anterior scales smaller and cycloid. Four large ctenoid scales on base of caudal fin. Remainder of body and head scaleless. Total gill rakers on first arch of holotype 12, paratypes 11 (4), 13 (1). Holotype and 15 paratypes with similar vertebral and dorsal pterygiophore formulae: 11 + 16 and 3-221110 respectively.

First dorsal fin with seven flexible spines, the last two more widely spaced than anterior five; no spines produced into filaments in either sex. Second dorsal-fin rays of holotype 11; paratypes 11 (29), 12 (1). Predorsal distance 2.5-2.7 times in SL. Anal-fin rays of holotype 10; paratypes 10 (30). Preanal distance 1.6-1.7 times in SL. Pectoral-fin rays of holotype 21 on each side; paratypes 18 (2), 19 (12), 20 (35), 21 (11). Length of pectoral fin 3.4-3.9 times in SL; adpressed

fins reaching anus. Pelvic fins separate, but with small frenum; one flexible spine and five rays, medial rays not reaching anus; length of longest (medial) ray 3.8-4.4 times in SL. Segmented caudal fin-rays 17; branched rays of holotype 15, paratypes 14 (2), 15 (3); length of fin 3.7-4.4 times in SL.

Color of alcohol-preserved specimens mottled brown over head and body with variable patches of paler ground color showing through. Typical pattern a series of six pale blotches or small irregular saddles evenly spaced along dorsal midline; beginning at origin of first dorsal fin, last slightly behind posterior end of second dorsal-fin base. Typically a small conspicuous, completely unpigmented circular area on upper hypural rays posterior to sixth blotch on dorsal midline. Five or six pairs of short pale streaks equally spaced along midline of body, a single streak just behind pectoral axil; streaks distinct, diffuse or absent in some specimens. Additional vertically elongate spots or streaks above midline of some specimens; these spots spaced between saddles and/or confluent with saddle markings. A few specimens with pairs of black spots interspaced with pale markings along posterior half of midline.

Head dark mottled brown, a vertical black bar below eye, an oblique black bar extending from anteroventral margin of eye to upper jaw in some specimens. A short black streak running obliquely downward from posteroventral margin of eye, diffuse in some specimens. A black spot behind eye at end of fleshy ridge crossing head posterior to interorbital space; another at posterodorsal corner of preopercle. An irregular group of four or five pale spots on lower half of cheek; three or four unpigmented blotches, sometimes diffuse, on opercle.

Pigmentation of dorsal fins dusky or with a few to many dark and clear spots forming irregular rows. Often a proximal row of spots above base of spinous dorsal fin, two or three longitudinal rows of spots on proximal half of soft dorsal and several larger spots along base of soft dorsal fin, extending somewhat onto dorsum of body. Dorsal fins of holotype dusky with only small hyaline areas. Anal fin typically dusky with a clear margin and a submarginal dark streak running along entire fin. A conspicuous dark brown crossbar on base of caudal rays below four basicaudal scales; rest of fin dusky. Pectoral fins dusky proximally; pelvic-fin rays brown except for clear tips.

Color of two freshly-collected specimens, head and body predominantly russet with contrasting white spots on lower cheek and opercle; eight irregular white bars along lateral midline of body; eight pale dorsal saddles not too conspicuous due to numerous expanded melanophores; circular hyaline area on upper hypurals not apparent. One specimen with diffuse dark blotches on dorsal midline alternating with pale saddles. Spinous dorsal fin with proximal black longitudinal band; soft dorsal fin with five oblique rows of black spots contrasting with small circular hyaline areas. Anal fin with black submarginal band and caudal fin clear except for black basal crossbar.

Etymology: From the Greek *dialeptos* meaning distinguishable, to be treated as an adjective.

Distribution: *C. dialepta* is known only from Isla del Coco, Costa Rica from depths between 2 and 31 m.

Comments on the genus *Chriolepis*

Heretofore four species of *Chriolepis* have been described from the eastern Pacific: *C. minutillus* Gilbert, *C. zebra* Ginsburg, *C. tagus* Ginsburg and *C. lepidota* Findley. With the presently described species and two other undescribed species mentioned by Findley (1983), a total of eight species are now known. *C. cuneata* like *C. zebra* has a depressed head and black crossbars alternating with wider pale interspaces. The latter however has more crossbars (7 or 8 vs. 5 or 6) and three to five oblique black crossbars on the caudal fin, while *C. cuneata* has an unmarked tail. *C. zebra* is a Gulf of California endemic, while *C. cuneata* also inhabits the southern Gulf of California, southern Mexico and Costa Rica (Findley 1983).

Chriolepis dialepta shares several distinctions with another island endemic, *C. lepidota* from Isla Malpelo. Both species have rounded heads and irregular dark saddles or crossbars on the body. *C. lepidota* is more extensively scaled (anteriorly to spinous dorsal-fin origin vs mid spinous dorsal fin) and has numerous black spots on the head including an oblique row on the cheek and a row along the lateral midline. *C. dialepta* has some similar black markings on the head, but also several unique pale spots on the cheek and opercle. Very characteristic of many specimens are five or six pairs of short pale streaks spaced along the lateral midline of the body. Findley (1983) includes a key and descriptions of all eight known species.

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RESUMEN

Se describen ocho especies nuevas de peces de la familia Gobiidae del Pacífic Tropical. Se recolectaron *Lythrypnus lavenbergi, L. alphigena* y *L. cobalus* en aguas profundas frente a la Isla del Coco; *L. insularis* proviene de las Islas Revillagigedo, fuera de la costa mexicana. *L. cobalus* se distingue de *L. dalli* (Gilbert), que habita más al norte, por diferencias en el número de radios y por su tamaño diminuto, pero ambos se parecen por su coloración. Las especies nominales *L. crinitus* Ginsburg y *L. latifascia* Ginsburg se consideran sinónimos de *L. dalli*. *L. pulchellus* Ginsburg de las costas de México y Centroamérica es muy similar a *L. rhizophora* (Heller & Snodgrass) de las islas oceánicas Coco y Galápagos, aunque aparentemente presentan diferencias importantes en la coloración en vida.

Las especies *Elacatinus inornatus*, de la costa centroamericana y *E. nesiotus*, de la Isla del Coco aparentemente son "especies gemelas". *Chriolepis cuneata* de la costa continental se parece más a otras especies del continente y *C. dialepta* de la Isla del Coco es más parecida a otra forma insular, *C. lepidota* Findley de la Isla Malpelo, Colombia.

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