

*Elacatinus janssi*, a new gobiid fish  
from Costa Rica

by

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**Abstract:** A new seven-spined goby, *Elacatinus janssi*, is described from 203 specimens collected at thirteen localities along the Pacific coast of Costa Rica. It is distinguished from its congeners and compared to a similar western Atlantic species.

The genus *Elacatinus* although speciose in the western Atlantic, is represented by only two valid described species and possibly three or four undescribed forms from the eastern Pacific (Thomson *et al.*, 1979). During February and March 1972, scientists aboard the R/V Searcher made intensive collections of reef fishes using SCUBA and ichthyocides at rocky shores along the entire coastline of Costa Rica. Among the approximately 200 species collected were several lots of an undescribed goby referable to the subgenus *Tigrigobius*, genus *Elacatinus* and described herein.

*ELACATINUS JANSSEI*, new species  
(Fig. 1)

**Holotype:** LACM 32524-45 an adult male 21.9 mm standard length, collected at Bahía Herradura just south of the Gulf of Nicoya (9°38'45"N, 84°40'55"W), Pacific coast of Costa Rica. Taken with ichthyocides between 14 and 20 m depth on 9 March 1972 by R.H. Rosenblatt, J. E. McCosker, M.M. Murillo and W.A. Bussing aboard the R/V Searcher.

**Paratypes:** UCR 618-23: Bahía Jobo; 11°02'40"N, 85°45'32"W; depth 5-11 m; 15 February 1972; 9 specimens (21.4-14.7 mm SL-standard length). UCR 628-11: Bahía Los Huevos; 10°38'50"N, 85°42'06"W; depth 5-6 m; 18 February 1972; 1 specimen (17.8 mm SL). LACM 32509-37: Bahía Ballena; 9°44'28"N, 84°59'23"W; depth 3-6 m; 21 February 1972; 9 specimens (9.2-14.4 mm SL). UCR 638-3: Bahía Ballena; 9°44'04"N, 84°58'40"W, depth 8-12 m; 22 February 1972;

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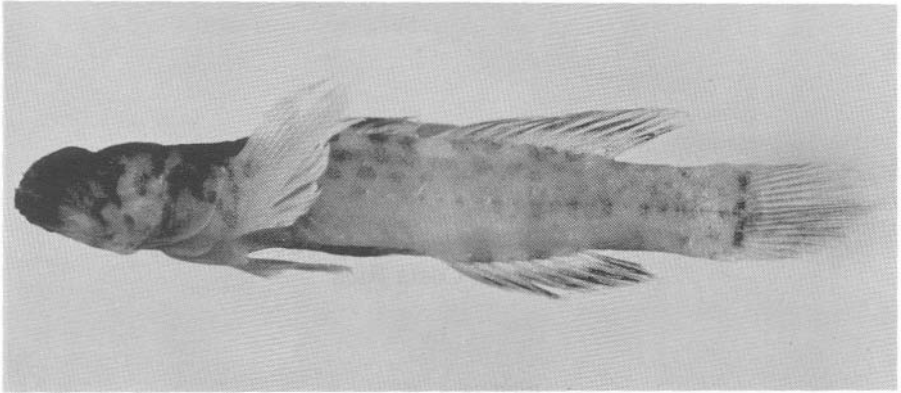


Fig. 1. *Elacatinus janssi*, new species, LACM 32524-46, a male paratype 21.6 mm SL, collected at type locality in Bahía Herradura, Pacific coast of Costa Rica.

2 specimens (12.7-14.1 mm SL). GCRL 17427: Islas Tortugas;  $9^{\circ}46'57''\text{N}$ ,  $84^{\circ}53'43''\text{W}$ ; depth 2-5 m; 23 February 1972; 18 specimens (8.4-19.8 mm SL). USNM 228001: Same data as preceding; 16 specimens (8.8-19.5 mm SL). LACM 32516-48: Islas Tortugas;  $9^{\circ}46'58''\text{N}$ ,  $84^{\circ}53'30''\text{W}$ ; depth 2-6 m; 24 February 1972; 27 specimens (8.7-20.8 mm SL). UCR 646-9: Islas Tortugas;  $9^{\circ}47'02''\text{N}$ ,  $84^{\circ}53'32''\text{W}$ ; depth 0.5-5 m; 24 February 1972; 5 specimens (9.2-12.0 mm SL). LACM 32524-46: Same data as holotype; 41 specimens—1 cleared & stained (8.5-22.7 mm SL). UCR 652-7: Bahía Herradura;  $9^{\circ}38'51''\text{N}$ ,  $84^{\circ}41'28''\text{W}$ ; depth 9-11 m; 9 March 1972; 61 specimens—2 cleared and stained (8.1-16.6 mm SL). LACM 32527-34: Bahía Herradura;  $9^{\circ}38'45''\text{N}$ ,  $84^{\circ}40'55''\text{W}$ ; depth 14-17 m; 10 March 1972; 8 specimens (12.0-18.2 mm SL). LACM 32537-36: Punta Quepos;  $9^{\circ}22'43''\text{N}$ ,  $84^{\circ}09'41''\text{W}$ ; depth 18-21 m; 11 March 1972; 3 specimens (11.1-14.5 mm SL). UCR 666-11: Isla Salera, Quepos;  $9^{\circ}22'12''\text{N}$ ,  $84^{\circ}09'15''\text{W}$ ; depth 12-18 m; 12 March 1972; 1 specimen (13.0 mm SL). UCR 673-36: Isla del Caño;  $8^{\circ}43'15''\text{N}$ ,  $83^{\circ}53'07''\text{W}$ ; depth 8-9 m; 14 March 1972; 1 specimen (11.1 mm SL). Type material deposited at the Gulf Coast Research Laboratory (GCRL), Natural History Museum of Los Angeles County (LACM), Museo de Zoología, Universidad de Costa Rica (UCR) and the National Museum of Natural History (USNM).

**Diagnosis:** A small spotted species of *Elacatinus* distinguished from its congeners by its broad head and two modified basicaudal scales; usually with 10 second dorsal fin-rays and 9 anal fin-rays. Adult males without a filamentous first dorsal spine, but with enlarged, recurved canines in both jaws.

**Description:** Proportions in permillage of standard length are shown in Table 1. Body slender, laterally compressed; greatest body depth (at anal fin origin) 5.1-6.3 times in SL (standard length). Dorsal body profile slightly convex; ventral profile straight, but projecting slightly at pelvic and anal fin bases. Least depth of caudal peduncle 7.0-9.2 times in SL.

Head length 3.1-3.5 times in SL. Head broad due to bulging cheek muscles, greatest fleshy head width (4.1-5.2 times in SL) greater than head depth at preopercular margin (5.2- 6.3 times in SL); greatest skull width equal to or only slightly greater (in large adults) than head depth. Eyes large, protruding above

dorsal head profile, horizontal eye diameter 3.2-4.8 times in HL (head length). Snout length equal to or less than eye diameter, 4.1-4.9 times in HL.

Head pores of lateral line system distributed as follows: a pair of posterior nasal pores; two medial interorbital pores; on each side of head a supraorbital, infraorbital, terminal lateral canal pores and two preopercular pores. No lateral canal tube, no lateral canal pore (anterior branch), and two rather than three preopercular pores.

Head papillae pattern subject to some individual variation and reduced to a few rows (*cf.* Hoese, 1971: 44, 146). Two papillae between anteroventral margin of eye and upper jaw; three transverse rows of two to four papillae each below posteroventral margin of eye; a longitudinal row of four papillae behind eye and directly above third transverse row; a transverse row of five papillae behind posterodorsal margin of eye; a transverse row of about 10 papillae running parallel to and immediately behind posterior border of preopercle; a longitudinal row of seven papillae along anterior branch of preopercle; and a longitudinal row of four papillae on upper part of opercle.

TABLE 1

*Body proportions in permillage of standard length of holotype and selected paratypes (UCR 618-23, UCR 628-11, LACM 32516-48 and LACM 32524-47) of Elacatinus janssi, new species*

	Holotype (male)	Paratypes (12 males)	Paratypes (8 females)
Standard length	21.9 mm	15.1-22.7 mm	14.0-18.8 mm
Head length	315	304-321	287-318
Head depth	146	159-187	160-193
Head width	215	191-235	197-243
Eye diameter	68	66-93	73-93
Snout length	68	65-74	59-74
Length of upper jaw	174	132-176	114-135
Body depth (at anal origin)	169	159-187	162-195
Least depth of caudal peduncle	123	108-140	115-143
Predorsal distance	352	361-391	354-405
Preanal distance	584	581-642	596-631
Length first dorsal-fin spine	196	146-193	135-191
Length base second dorsal fin	251	226-260	223-250
Length base anal fin	192	185-222	173-207

Mouth large in males, moderate in females; slightly inclined. Upper jaw reaching to vertical below posterior margin of eye in females (2.3-2.6 times in HL) and well beyond eye in mature males (1.8-2.4 times in HL). Upper and lower jaw teeth in several anterior rows, becoming uniserial posteriorly. Premaxillary with a row of enlarged and recurved outer canines and four rows of long, slender pointed inner teeth becoming uniserial posteriorly; posteriormost pair of canines fang-like in mature males. Dentary teeth similar to those of premaxillary except in males where one to three pairs of inner-row fangs oppose upper jaw fangs. Tongue broad and truncate in front.

Two small basicaudal scales with prominent ctenii at upper and lower base of caudal fin. Gill rakers small, 6 (6), 7 (7), 8 (7), frequency in parentheses. Vertebrae  $11 + 17 = 28$  in three cleared and stained and 12 radiographed specimens. On the basis of three cleared and stained specimens: last vertebra with dorsal ribs is the twelfth or thirteenth vertebra; last vertebra with anterior zygapophyses is the tenth or eleventh vertebra; length of pelvic girdle in width of pelvic girdle 0.36-0.44; dorsal flange of sphenotic not in contact with supraoccipital.

First dorsal fin with 7 (49) or 8 (1) spines; first spine not filamentous in either sex, length 5.2-7.4 times in SL. Second dorsal fin-rays (first ray actually a flexible spine, last ray divided to base and counted as one) 9 (4), 10 (45), 11 (1); length of fin base 3.9-4.5 times in SL. Predorsal distance 2.5-2.8 times in SL. Anal fin-rays (first ray a flexible spine, last ray divided to base) 8 (6), 9 (42), 10 (2); length of fin base 4.7-5.8 times in SL. Preanal distance 1.6-1.7 times in SL. Pectoral fin rays 16 (1), 17 (10), 18 (30), 19 (9). Segmented caudal rays 16 (4), 17 (16); branched caudal rays 11 (4), 12 (8), 13 (7), 14 (1); 6 or 7 upper and 6 or 7 lower procurrent caudal rays on three cleared and stained specimens.

Color of live and preserved material similar. Ground color pale, dorsum with four longitudinal rows of brown spots subequal to pupil diameter; dorsum and sides of head with irregular brown blotches (Fig. 1). Mid-dorsal series of 15 spots between nape and caudal fin base; first three spots laterally elongate on predorsal region; spots on base of dorsal fins in pairs of closely approximated spots separated from succeeding pairs by wider and paler interspaces; last four spots on caudal peduncle less distinct. An upper dorsolateral series of 19 spots extending from above opercle to caudal base. A lower dorsolateral series of about 13 spots sometimes merging posteriorly with upper dorsolateral spots. A series of about 11 spots on lateral midline extending from behind pectoral fin base to caudal base.

A V-shaped mark, half covered by opercle, on pectoral fin base; a spot on proximal portion of pectoral rays 3 to 7 and a matching spot on axillary side of fin; remainder of fin clear. A dark transverse bar on base of caudal fin. Dorsal and anal fins dusky on distal half; pelvic fin disk dusky; caudal fin clear.

An internal vertical bar pattern on peritoneum and median skeletogenous septum visible through muscle wall of live specimens and of small preserved individuals; two elongate blotches on peritoneum, two bars extending between dorsal and anal fin bases and a third bar between rear base of dorsal fin and ventral margin of caudal peduncle.

**Etymology:** The species is named for Mr. Edwin Janss, Jr. in acknowledgment of his support and encouragement of research in marine sciences. All known specimens of *E. janssi* were collected from the R/V Searcher of the Janss Foundation.

**Remarks:** Böhlke and Robins (1968) reviewed the western Atlantic *Gobiosoma* and related genera, and although they examined many eastern Pacific relatives, they still considered their conclusions as tentative pending critical treatment of Pacific material. Hoese (1971) revised the eastern Pacific *Gobiosoma* and discussed related groups. These two treatments differ in their proposed phylogenies of *Gobiosoma* and allies and more specifically in the placement of the species belonging to the subgenus *Tigrigobius*. Böhlke and Robins (1968) included *Tigrigobius* and *Elacatinus* as subgenera of the genus *Gobiosoma*. On the basis of numerous features, several not considered by the latter workers, Hoese (1971) united *Tigrigobius* and *Elacatinus* as subgenera of the genus *Elacatinus*. Members of the genus *Elacatinus* differ from those of *Gobiosoma* in vertebral number and structure, head papillae pattern, proportions of the pelvic girdle, proximity of the phenotic and supraoccipital bones, and other features. Hoese also noted that the species of *Elacatinus* are reef dwellers, while most members of *Gobiosoma* inhabit estuarine or muddy areas.

*E. janssi* fits the description of *Tigrigobius* as characterized by Böhlke and Robins (1968) except that it has typically 10 second dorsal elements and mature males do not have any filamentous dorsal spines. The new species has most of the traits considered by Hoese (1971) to be distinctive of members of his expanded genus *Elacatinus*, although it is unique in having an extremely simplified head papillae pattern, a complete outer row of teeth in the upper jaw and a broad head (the skull itself is not broad). In spite of these disparities and in view of the tentative nature of the present classification of *Gobiosoma* and allies, I believe *E. janssi* is best allocated to the subgenus *Tigrigobius* of *Elacatinus*.

Seven species of *Tigrigobius* are recognized from the western Atlantic (Böhlke and Robins, 1968), whereas eastern Pacific representatives are *Elacatinus digueti* (Pellegrin), which includes its synonym *Elacatinus brocki* (Ginsburg) and perhaps three or four undescribed forms (Thomson *et al.*, 1979).

The new form is most similar to the Atlantic *Elacatinus saucrus* (Robins). Although the spotted pattern of *E. janssi* is not as intense, it greatly resembles that of *E. saucrus* in the longitudinal series of spots on the body, the dark marking on the caudal and pectoral fin bases, and the irregular blotches on the head; *E. saucrus* however has four basicaudal scales, a more compressed head and different meristic averages.

**Distribution:** The new species was collected between Bahía Salinas in extreme northwestern Costa Rica and Isla del Caño in southern Costa Rica. It was most common over sand and gravel bottoms associated with rocky reefs at depths of 0.5 to 21 m, but most frequently at depths greater than 5 m.

#### ACKNOWLEDGMENTS

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## RESUMEN

Se describe una especie nueva de gobio, *Elacatinus (Tigrigobius) janssi*. La descripción se basa en 203 ejemplares colectados en 13 localidades a lo largo de la costa Pacífica de Costa Rica. Se distingue de sus congéneros y se compara con una especie parecida del Océano Atlántico occidental.

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