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SHORT NOTE

Urotrygon cimar, a new eastern Pacific stingray (Pisces: Urolophidae)

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Abstract: A new species of *Urotrygon* is described from the Pacific coast of Costa Rica and Nicaragua. *Urotrygon cimar* is a large species reaching at least 382 mm total length and is recognized by its dense dorsal covering of pungent denticles and dark spotted coloration. It is found in tide pools and to a depth of 85 m and is usually collected in waters shallower than 10 m.

Key words: New species, eastern Pacific, Pisces, Urolophidae, sting ray.

A distinctive large specimen of an undescribed sting ray was donated to the Museo de Zoología in 1987. We originally assigned the specimen to the genus *Urolophus* (Bussing & López 1993) because of the relatively short tail, round disc and large size similar to other members of the genus in the eastern Pacific. At present, studies by Miyake (1988), McEachran & Notarbartolo-di-Sciara (1995) and Lovejoy (1996) support Garman's (1913) decision to distinguish the amphi-American genus *Urobatis* from the Indo-Pacific genus *Urolophus*.

Although there is a fine line distinguishing species of the genera *Urobatis* and *Urotrygon*, we prefer to allocate the large female specimen, its four embryos and other recently collected younger specimens of both sexes to the genus *Urotrygon* on the basis of the absence of the basihyal cartilage (Miyake, 44, 1988; Lovejoy, Fig. 7, 1996); the tail, although short, slightly longer than one-half the total length; non-confluent dorsal and ventral lobes of the caudal fin and two other possible generic skeletal characters (presence of a small intermediate cartilage in the clasper and lack of extension of the vertebral axis to the tip of the tail, (Miyake, Figs. 52, 54, 1988). Agreement is not absolute however, since the new species has a wider caudal fin than characteristic of other known species of *Urotrygon*.

Counts and measurements follow Hubbs & Ishiyama (1968) and Miyake & McEachran (1986). All measurements of length in mm refer to total length (TL). Number of vertebral centra were counted from radiographs to origin of tail spine and to end of vertebral axis.

The pupillary operculum of various flatfishes has been discussed by Walls (1942); Capape & Quignard (1981) also recognized differences in this character in skates of the family Rajidae. The presence or absence of this black shade-like membrane partially obstructing the pupil is diagnostic for species of the tonguefishes *Symphurus* (Mahadeva 1956; Munroe & Mahadeva 1989 and Munroe & Nizinski 1990). We noted a high degree of interspecific variation in the shape of the pupillary opercula of several species of both *Urobatis* and *Urotrygon* (Fig. 5). Only in

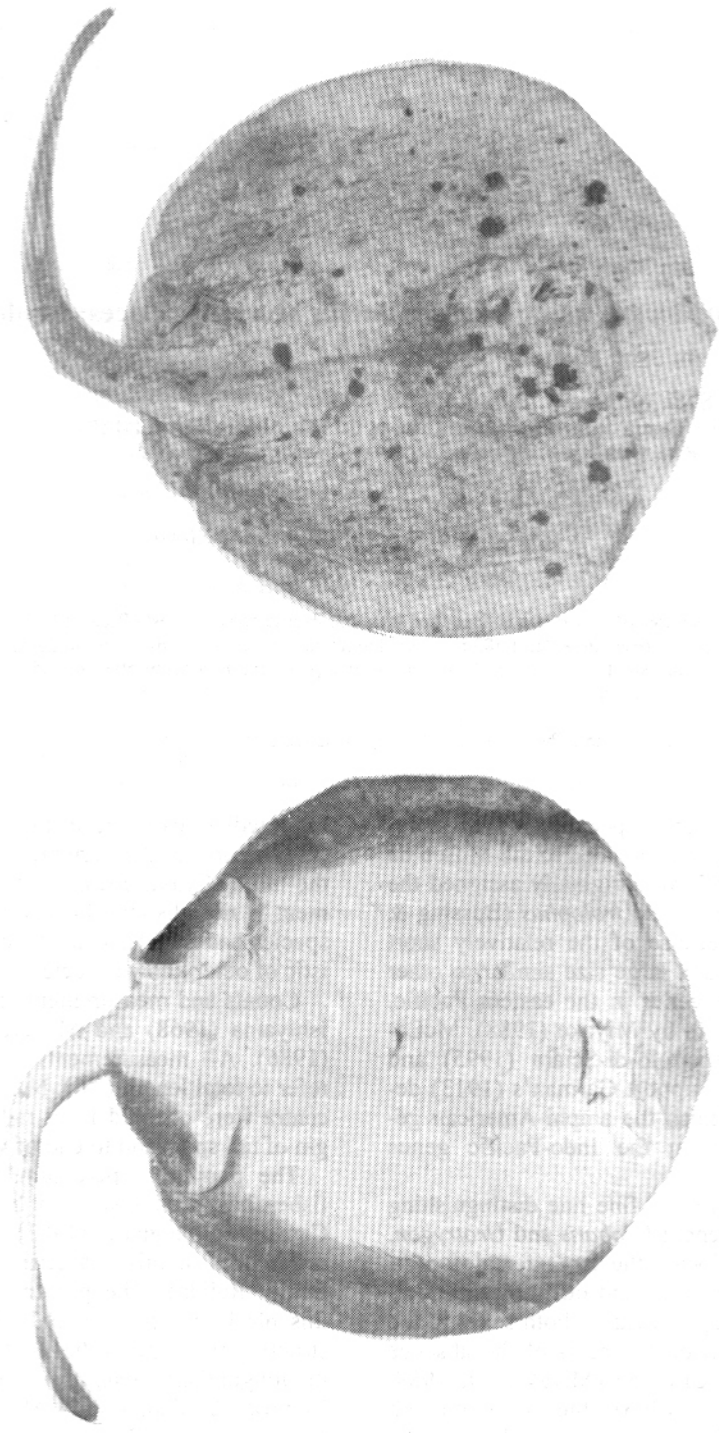

Fig. 1. *Urotrygon cimar* n. sp., LACM 47363-1, holotype, 382 mm TL, from Punta Matapalo, Nicoya Peninsula, Costa Rica. Dorsal view above; ventral view below.

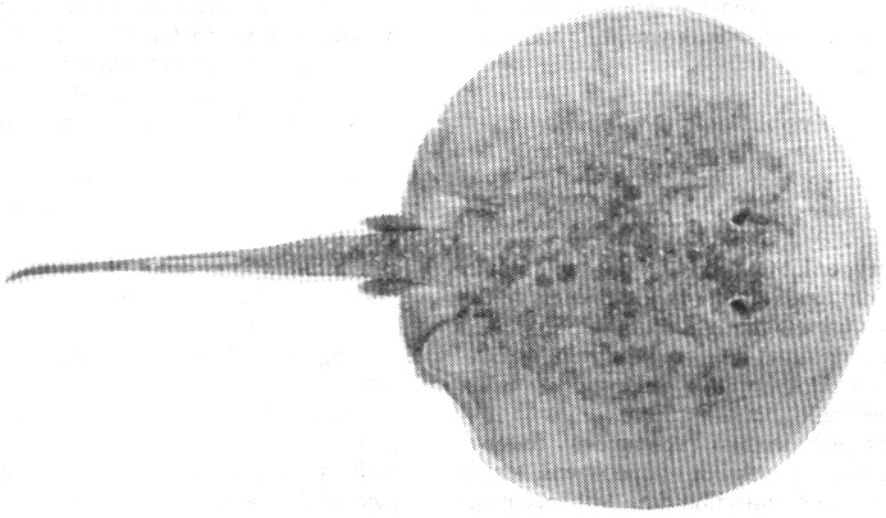

Fig. 2. *Urotrygon cimar* n. sp., UCR 2386-1, young male paratype, 195 mm TL, from Manzanillo, Gulf of Nicoya, Costa Rica.

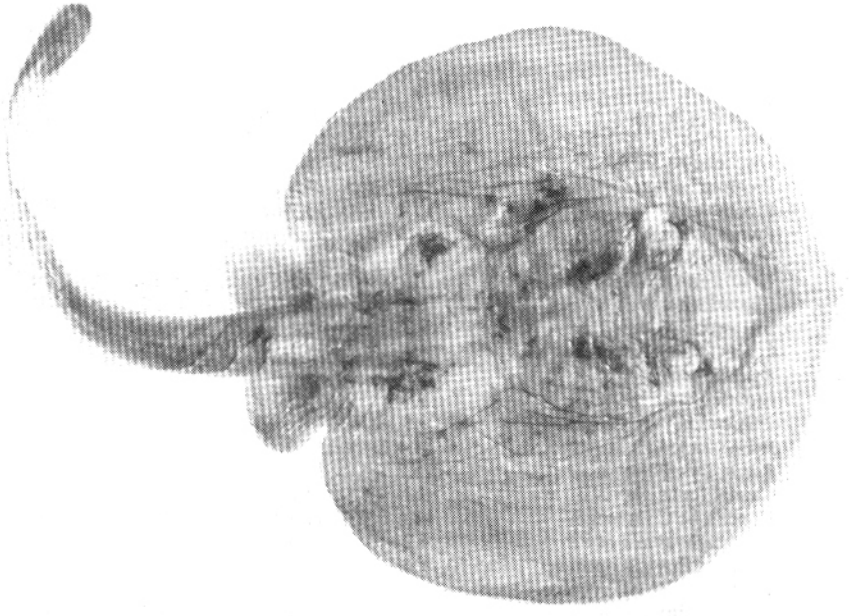

Fig. 3. *Urotrygon cimar* n. sp., UCR 2010-2, near term embryo paratype, 106.9 mm TL, from Punta Matapalo, Nicoya Peninsula, Costa Rica.

Urotrygon nana was this structure absent and intraspecific variation was small when comparing well-preserved specimens of the same species. Institutional acronyms follow Leviton *et al.* (1985).

***Urotrygon cimar*, new species**
(Figs. 1-5)

Urolophus sp. nov. Bussing & López 1993 (figure & notes).

Holotype: LACM 47363-1, an adult female of 382 mm total length (TL). Off Punta Matapalo, Nicoya Peninsula, Costa Rica. Collected with benthic trawl at 85 m depth on 18 Dec. 1987 by Carlos Gamboa and crew of Nishin Marú (ex UCR 2010-1).

Paratypes: Data is presented as follows: catalog number, number of specimens, length in mm TL and collection data. All specimens are from Costa Rica. Additional data are available on the Internet. UCR 2010-2, 4 embryos (101.2-106.9 mm), same data as holotype; LACM 47364-1, (exUCR 1290-15), 2 (135-163 mm) off Manzanillo in upper Gulf of Nicoya, 8 m, 26 Jul. 1979; UCR 2386-1, 2 (195-269 mm) off Manzanillo in upper Gulf of Nicoya, 10 m, 15 Feb. 1994; LACM 47365-1, (exUCR 2386-1), 1 (221 mm), same data as UCR 2386-1.

Other material: UCR 559-11, 1 (227 mm) distorted specimen from off Corinto, Nicaragua, 9 m, 7 Mar. 1970; UCR 128-24, 1 (250 mm estimated, as most of tail missing), tide pools at Playa Tamarindo, 0.5 m, 27 Jan. 1967.

Diagnosis: A large species of *Urotrygon* with a round disc (width 55.2-60.1 percent of TL, length 54.3-56.9 percent of TL); tail short (length from midcloaca to tip of caudal fin 50.8-54.0 percent of TL). Color of dorsal surface of disc and tail yellow-brown or tan irregularly spotted with brown or black blotches; color on ventral surface white with

TABLE 1

Proportional measurements of Urobatis cimar *in percentage of total length for holotype and six paratypes from Costa Rica*

	Holotype	Paratypes N = 5	$\bar{x}$	Paratype Embryo
Total length (mm)	382	135-269		106.9
Disc width	55.5	55.2-60.1	57.6	53.4
Disc length	55.2	54.3-56.9	55.8	51.3
Preorbital length	15.6	14.9-17.6	16.4	16.6
Preoral length	13.4	13.9-15.7	14.8	14.1
Prenasal length	17.3	16.3-19.0	17.5	16.6
Nasal curtain length	2.9	2.7-3.5	3.1	2.7
Nasal curtain width	7.6	7.3-8.0	7.5	6.6
Eye diameter	1.6	1.7-2.4	2.0	2.8
Interorbital width	7.2	6.1-6.8	3.4	6.8
Orbit to spiracle length	4.2	4.4-5.4	4.9	5.1
Spiracle length	3.1	3.0-4.7	3.8	4.3
Mouth width	5.9	4.9-6.9	6.1	6.1
Distance between nostrils	5.8	6.1-6.6	6.3	5.8
Pelvic fin length	14.4	11.6-14.6	13.1	11.0
Pelvic fin width	15.7	15.4-16.7	16.0	11.6
Caudal fin height	3.1	4.0-4.7	4.4	5.1
Upper lobe C fin length	11.6	12.3-14.2	13.0	15.0
Tail height at axil of P2	4.2	3.9-4.3	4.2	4.5
Width of first gill opening	1.6	1.5-2.1	1.7	1.9
Width of third gill opening	2.0	1.7-2.0	1.8	1.9
Width of fifth gill opening	0.9	1.1-1.5	1.3	1.3
Distance bet. first gill openings	14.5	15.1-15.6	15.2	15.4
Distance bet. fifth gill openings	10.1	8.9-11.7	9.3	9.8
Distance snout to cloaca	49.0	46.2-49.4	48.2	48.6
Distance cloaca o tail spine	24.0	23.5-26.5	25.3	24.2
Distance cloaca to C fin origin	35.1	34.7-38.6	37.8	38.5
Distance cloaca to tip of C fin	51.3	50.8-54.0	52.8	52.4

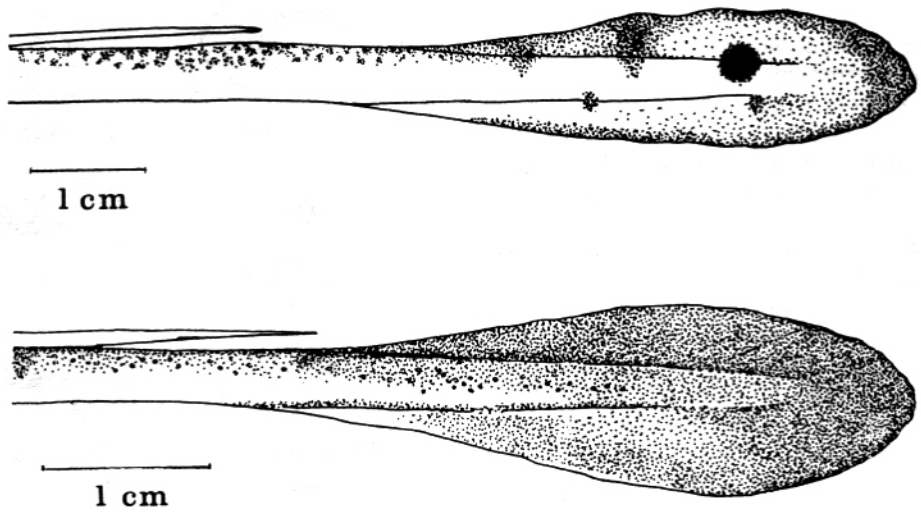

Fig. 4. *Urotrygon cimar* n. sp., caudal fins of holotype LACM 47363-1, above and paratype UCR 2386-1, below.

lateral margins of disc and posterior border of pelvic fins than in juveniles, dark brown or gray in adults. Small, pungent denticles densely cover dorsal surface of disc and tail; denticles only slightly enlarged near midline. Pupillary operculum a small triangle, apex not reaching ventral margin of pupil.

Description: A large species of *Urotrygon* with disc round in shape (Figs. 1-3), slightly wider than long in young and near-term embryos (Table 1); anterior margin evenly convex with snout tip projecting slightly; posterior corners of disc rounded. Tail short, from center of cloaca ($\bar{x}$ = 52.3 percent) only slightly greater than distance from center of cloaca to tip of snout ($\bar{x}$ = 48.2 percent); base strongly depressed, without lateral keels. Caudal fin moderately wide with rounded tip (Fig. 4), dorsal lobe slightly shorter than ventral lobe; height 3.7 times in length of dorsal lobe (holotype; possibly shrunken due to partial drying) and (2.9-3.1 times in paratypes). Tip of caudal spine reaching origin of dorsal caudal lobe in some specimens; origin of tail spine 46.7 percent (46.2-50.0 percent) of distance from center of cloaca to tip of caudal fin. The clasper has a small cartilage anterior to the Beta cartilage, which overlies the b1 and b2 cartilages that lie between the basipterygium and the axial cartilage and may be a distinguishing character of species of *Urotrygon* as opposed to members of the genus *Urobatis* (Miyake, Fig. 52, 1988).

Eye with a black triangular pupillary operculum (Fig. 5), eye diameter 9.9 (7.1-9.4) times in preorbital length and 4.6 (2.8-4.0 times in interorbital distance; internarial distance 2.3 (2.3-2.5) times in preoral distance. Length of spiracles 2.3 (1.4-2.3) times in interorbital distance. Nasal curtain fringed, nearly straight posterior margin and concave lateral margins; curtain length 2.6 (2.3-2.7) times in curtain width. Internarial distance 2.5 (2.4-2.5) times in distance between first gill slits and 1.9 (1.4-1.8) times in distance between fifth gill slits.

Dorsal surface of disc, tail and dorsal half of caudal fin uniformly and densely covered with moderate-sized, strong pungent denticles with small stelliform bases; denticles slightly recurved and increasingly larger towards midline of disc, but not forming distinct rows of enlarged denticles or thorns; pelvic fins and ventral surface smooth; no apparent sexual differences in squamation. Denticles of smallest juvenile (135.6 mm TL) fully developed; disc and tail of near-term embryos naked.

The number of vertebral centra to the origin of the tail spine 75, 77 and total centra to tip of vertebral axis 141, 146 on two paratypes

(LACM 47364-1). The lack of extension of the vertebral axis to the tip of the tail may be another distinguishing character of species of the genus *Urotrygon* (Miyake, Fig. 54, 1988).

Coloration: Color unchanged in preservation. Holotype ground color of disc, tail, caudal fin and upper surface of pelvic fins (Fig. 1) pale yellow-brown mottled with small darker brown spots; jet black blotches, varying from size of eye to size of spiracle, scattered over disc; caudal fin dusky with dark spots; ventral surface of disc and tail white, a wide brown lateral margin continuing onto posterior border of pelvic fins contrasting sharply with white belly (Fig. 1). Paratypes disc, tail and upper surface of pelvic fins tan or yellow brown with darker blotches varying in size from eye to spiracle size most densely approximated near the midline of disc; caudal fin dusky, spotted or not; ventral surface of disc and tail white with wide gray or brown lateral margin extending onto posterior margin of pelvic fins, the darkened margin grading into white ventrum. Disc, tail and upper surface of pelvic fins of near-term embryo gray, largest embryo with six irregular dark blotches on disc; ventrum as in other paratypes, caudal fin black.

Etymology: Named for the Centro de Investigación en Ciencias del Mar y Limnología (CIMAR) a research center of the Universidad de Costa Rica during its twentieth anniversary.

Distribution: The species was collected in the eastern Pacific between Corinto, Nicaragua and the Gulf of Nicoya, Costa Rica at depths between 0.5 and 85 m depth.

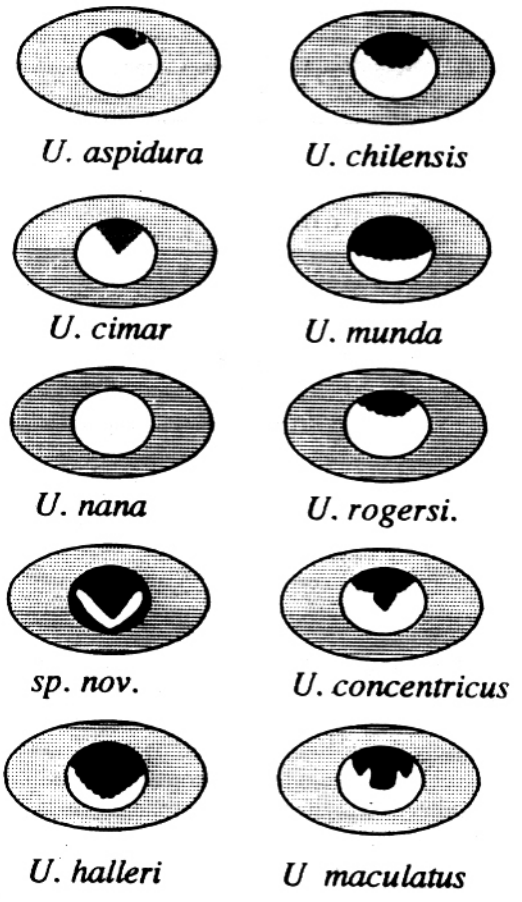

Fig. 5. Comparative drawings of typical pupillary operculum of eastern Pacific species of Urolophidae: above, seven species of *Urotrygon* and below, three species of *Urobatis*.

REMARKS

Miyake & McEachran (1986) recently revised the species of eastern Pacific *Urotrygon* and determined that there were seven valid species, three of which were new to science. *Urotrygon cimar* differs from other described species of *Urotrygon* in having a slightly higher caudal fin, nearly as wide as in members of the genus *Urobatis*; it most resembles *Urotrygon munda* somewhat in squamation, although in *U. munda* the denticles near the midline of the disc gradually increase in length forming several irregular rows of robust thorns; also in *U. munda* the coloration is uniform gray and the huge pupillary operculum nearly covers the pupil (Fig. 5).

Other species of *Urotrygon* differ in their sparse covering of denticles and, in specimens larger than 20 mm TL, presence of thorns along the dorsal midline (except for *U. nana*); also the dorsal coloration is usually uniform gray or brown except for specimens of *U. chilensis* which are covered with irregular black blotches and some examples of *U. rogersi* which may be spotted.

Comparison was also made with species of the similar genus *Urobatis*. *Urotrygon cimar* is similar to the Peruvian stingray *Urobatis tumbesensis* (Chirichigno & McEachran) in

size, body shape, uniform covering of denticles on the disc and similar length of tail. The latter also differs in its coloration of light and dark vermiculations and spots and in a series of thorns along the midline of disc and tail in large individuals. Other species of *Urobatis* also differ in coloration and the presence of a uniform covering of denticles on the disc as discussed by Chirichigno & McEachran (1979).

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RESUMEN

Se describe una especie de raya *Urotrygon* de la costa pacífica de Costa Rica y Nicaragua. *Urotrygon cimar* es una especie grande que alcanza por lo menos 382 mm longitud total y que se conoce por su densa cobertura de dentículos punzantes y su coloración pintada. Se encontró en pozas de marea y hasta los 85 m de profundidad, pero generalmente se encuentra en aguas someras.

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