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DESCRIPTION OF FIVE NEW SPECIES OF FISHES FROM MAZATLAN, MEXICO.

By **DAVID S. JORDAN** and **CHARLES H. GILBERT.**

Tylosurus sierrita, sp. nov. (28162, 28265, 29227, 29377, 29378.)

Closely allied to *Tylosurus exilis* (Grd.).

Body very slender, not compressed; caudal peduncle depressed, half wider than deep, the lateral line forming a moderate keel, which is not black.

Jaws very long, slender, and fragile, as in *T. exilis*, *longirostris*, &c., the tip of the lower (as usual) projecting; length of upper jaw from eye $2\frac{3}{4}$ times length of postorbital part of head, 9 times space between nostrils; maxillary scarcely reaching vertical from front of pupil, about half of its posterior portion slipping under the preorbital; preorbital small, not extending backward to tip of maxillary.

Teeth essentially as in *T. longirostris*; an outer band of small acute teeth in each jaw, and an inner series of long, sharp, slender teeth, 50 to 60 in each jaw; middle line of lower jaw in front of tongue with a band of rasp-like teeth; no teeth on vomer; no gill-rakers.

Eye large, contained $2\frac{1}{2}$ times in postorbital part of head; interorbital region with a rather broad and deep, scaly groove, widest anteriorly and extending backward to opposite middle of cheeks; behind this, the middle part of the cranium is somewhat elevated and bounded by two longi-

tudinal ridges, which rise higher than the temporal ridges; this entire region nearly or quite destitute of scales [in *T. exilis* the middle of the top of the cranium is scarcely elevated and without longitudinal ridges, the whole region being more or less closely scaled]; scales of frontal region extending little forward of base of premaxillaries (in *T. exilis*, extending for more than one-fourth the length of the premaxillaries.) Cheeks well scaled; scales on opercle very minute.

Scales not very small, green.

Dorsal fin beginning and ending behind anal, its origin above base of fifth anal ray; anterior rays of both fins produced; median and posterior rays equal, the latter not reaching nearly to base of caudal; anal lobe higher than dorsal lobe, its height four-fifths length of postorbital part of head. Ventrals small, extending about one-third the distance to origin of anal, their insertion midway between base of median caudal rays and middle of cheeks. Pectorals broad, as long as postorbital part of head, the upper ray broad. Caudal lunate, the lower lobe the longer; the middle rays not quite twice as long as eye.

Head $2\frac{4}{5}$ in length; depth nearly 18. D. 1, 16; A. 1, 17; P. 13; Lat. 1. ca. 250.

Color; green above; white below; a dusky dorsal stripe; a silvery lateral stripe; sides of head silvery; upper part of cheeks punctulate; body and fins without dark points; a blackish half-bar between cheeks and opercles; a blackish blotch above eye and one in front of nostrils. Fins olivaceous, all more or less dusky at tip. Posterior portion of pectorals abruptly black.

This species is abundant at Mazatlan, where it is one of the common market fishes. It reaches a length of about two feet, and it is known to the Mexican fishermen as "*Sierrita*."

It resembles its Californian representative, *Tylosurus exilis*, very closely, differing in several details, some of which are noticed above. The two species may be distinguished at sight by the color of the pectorals, which are, in *T. exilis*, plain olivaceous. The dorsal and anal lobes in the latter species are not dusky at tip.

2. *Tylosurus fodiator*, sp. nov. (28190, 28323.)

A species of large size, remarkable for the great strength of its jaws.

Body robust, subterete, as broad as deep; caudal peduncle slightly compressed, as deep or deeper than broad, the lateral line forming a low black cutaneous fold along its length.

Head very broad and strong, the cheeks nearly vertical. Interorbital space very broad, two-thirds length of postorbital part of head. Middle of top of head with a broad, shallow, nearly scaleless, longitudinal groove; sides of top of head obliquely striated and rugose, forming a prominent ridge above the eye; distance between nostrils greater than usual, more than one-sixth length of snout.

Jaws comparatively short, tapering, very stiff and not fragile; lower

jaw wider and longer than upper. Both jaws with broad bands of small rasp-like teeth, which extend as small roughnesses on the sides of the jaw; within these is a series of very large teeth, compressed and knife-shaped, much stronger than in most of the species of this genus. The length of one of these teeth is not more than three times its breadth; posterior teeth in both jaws directed backward, the anterior erect. Number of large teeth about $\frac{30+30}{20+20}$; length of large teeth about one-sixth diameter of eye; no teeth on vomer. Teeth, scales, and probably bones, green. Gill-rakers obsolete.

Upper jaw, from eye, about half longer than rest of head. Eye large, $6\frac{1}{2}$ in snout, 3 in postorbital part of head, and 2 in interorbital width. Only a narrow edge of the maxillary not covered by the preorbital. Cheeks closely scaled; opercles almost wholly naked. Scales extremely small.

Dorsal fin rather high in front, becoming low posteriorly, its longest rays two-fifths the length of its base, a little shorter than the postorbital part of the head. Caudal lunate, its lower lobe about one-third longer than the upper, the middle rays half longer than eye. Anal falcate, low posteriorly, its longest rays about equal to postorbital part of head.

Ventral fins long, inserted midway between middle of caudal base and middle of orbit, their length a little more than length of pectorals and equal to postorbital part of head; upper ray of pectorals broad, sharp-edged.

Head $3\frac{2}{3}$ in length; depth 15. D. I, 19; A. I, 17; V. 6; P. 14; Lat. l. about 440.

Color green above, silvery below; fins somewhat dusky, except the anal, which is pale; cheeks and lower jaw silvery; middle line of back darker.

This species is abundant in the harbor of Mazatlan, where it is known to the fishermen as "*Aguja*." It is seldom brought to the market, as it is not considered a good food-fish. Its strong jaws are dreaded by the fishermen, who say that it is able to thrust through the bottom of a boat. The largest specimen obtained by Mr. Gilbert (No. 28190) was 43 inches in length, and has served particularly as the type of the present description. A smaller specimen is numbered 28323.

3. *Cynoscion xanthulum*, sp. nov. (28109.)

Body moderately slender, compressed; head rather long, compressed and pointed; caudal peduncle rather slender. Eye large, 6 in head; a fourth less than interorbital width, which is slightly less than length of snout. Maxillary broad and truncate, its tip as wide as eye and reaching to just beyond its posterior margin; length of maxillary a little less than half length of head; mouth moderately oblique, the lower jaw prominent; premaxillaries in front, below level of lower edge of eye. Band of teeth in front of lower jaw narrow, becoming a single series

laterally; the outer series of teeth in the upper jaw and the lateral series of teeth in the lower jaw larger than the others; upper jaw with two series of small teeth behind the outer series, and with two canines (sometimes but one), which are smaller than is usual in this genus. Gill-rakers rather short and strong, as long as pupil. Pseudo-branchiæ present.

Scales small; lateral line well arched in front, becoming straight opposite the vent. First dorsal high, the spines not very slender, the third spine a little less than half length of head, nearly equal to the fourth and not very much longer than the second; soft dorsal rather high, the longest rays $2\frac{2}{3}$ in length of head, not scaly, but with a distinct high basal sheath. Caudal fin double concave, the middle rays considerably produced, their length about two-thirds that of head. Anal rather short and high, its longest ray two-thirds length of head, its spines small but rather stout. Ventrals a little more than half length of head, reaching about half way to vent. Pectorals $1\frac{2}{3}$ in head, not quite reaching tips of ventrals.

Head, $3\frac{1}{3}$ in length; depth, $4\frac{1}{3}$. D. IX-I, 20; A. II, 8; Lat. l. 86 (vertical rows of scales, the number of pores about 66); about 12 rows of scales between front of dorsal and lateral line.

Bluish above, silvery below, upper parts and more conspicuously the middle of sides, punctate with dark points; upper fins dark, their margins dusky; lining of opercle black; peritoneum white; inside of mouth bright yellow in life.

This species has many points in common with *C. album* Gthr., but is readily distinguished by its much smaller scales (about 65 in *C. album*). It is very abundant at Mazatlan, where it is one of the most highly valued and most common food-fishes.

The type (28109) is 15 inches in length.

4. *Culius æquidens*, sp. nov. (28268, 29240.)

Body elongate, depressed anteriorly, much slenderer than in *C. fuscus*, the head especially very broad and flat, longer and more depressed than in *C. fuscus*. Mouth large, broad, very oblique, the maxillary reaching nearly or quite to opposite posterior margin of eye; lower jaw considerably projecting. Length of maxillary $2\frac{1}{3}$ in length of head. Teeth in jaws all equal, in broad bands, the outer not at all enlarged. Eye small, anterior, its length in the adult, equal to half the width of inter-orbital space, which is nearly one-third the length of head; a conspicuous knob at upper anterior and posterior angles of orbit; preopercular spine (as in all species of the genus) well developed, strong, compressed, directed downwards and forwards.

Scales on head very small, mostly cycloid, covering cheeks and opercles, and upper part of head to the eyes. Scales on body smaller and smoother than in most other species of the genus, those on belly much smaller than those on sides; scales on back and belly cycloid, only those on the sides of the body being distinctly ctenoid.

Pectoral fins moderate, reaching to near end of base of first dorsal, $1\frac{2}{3}$ in head; ventrals inserted just behind axil, reaching half way to vent, and about half length of head. Interspace between dorsals about equal to diameter of eye. Soft dorsal and anal short and high, very similar, coterminous; last ray of anal a little more than half length of head. Caudal peduncle long, a little shorter than head. Caudal fin rounded, $1\frac{1}{3}$ in head.

Head $3\frac{1}{2}$ in length to base of caudal; greatest depth about 6.

D. VI—I, 8; A. I, 8; Lat. 1. 60; 24 scales in an oblique series from front of soft dorsal downward and backward to anal; about 20 in a vertical series.

Color, dark, dull, olivaceous brown, paler below; younger specimens mottled below with bluish and speckled with dark brown. Sides without longitudinal stripes. Fins dusky, all of them finely mottled and speckled with darker; the dark markings on dorsal and anal forming undulated longitudinal stripes; on pectorals and ventrals forming dark bars.

This species is known to us from three specimens, the longest about a foot in length. They were obtained from near Mazatlan; according to fishermen from fresh-water at Presidio.

Culius æquidens apparently differs from other species of the group in the large mouth with small equal teeth, and in the small smoothish scales.

Culius belizanus, lately described by M. Sauvage* from Belize, is very similar, but has the teeth of the outer row enlarged.

5. *Centropomus robalito*, sp. nov. (28102, 28132, 28150, 28310, 28321, 29562, 29564.)

Allied to *Centropomus armatus* Gill; belonging to the division of the genus with large scales, and very large anal spine.

Body comparatively elongate, the back little elevated; profile from snout to base of dorsal more nearly straight than in most of the species; upper outline of head somewhat concave; nuchal region little gibbous. Mouth smaller than in *C. armatus*, the maxillary barely reaching the vertical line from the front of pupil (in *C. armatus* of the same size reaching past front of pupil), the gape contained nearly 3 times in length of head; snout long, longer than in *C. armatus*, $3\frac{1}{2}$ in head; eye moderate, a little more than half length of snout; preorbital with strong retrorse serræ. Top of head narrower than in *C. armatus* and more strongly ridged; the two interior ridges on the interorbital space separated by a space little wider than the nostril, coalescing opposite the nostrils and forming a single ridge for a little distance forward to near the base of the spines of the premaxillary. Preopercle with rather distant teeth of nearly equal size on the entire length of its vertical margin; similar teeth on the horizontal part, growing larger backward; about two teeth at the angle much longer and stronger than the others.

* Bull. Sco. Philom., Paris, 1879, 16 (reprint).

Suprascapula with five or six strong teeth. Opercular flap reaching about to front of spinous dorsal. Gill-rakers long, about two-thirds diameter of orbit.

Dorsal spines high and rather strong, but distinctly slenderer and more flexible than in *C. armatus*, their tips when depressed reaching considerably farther back than the tips of the pectorals or ventrals; third spine longest, a little less than half length of head; fourth spine but little shorter than third. Insertion of first dorsal spine a trifle nearer last ray of second dorsal than tip of snout. Second anal spine very long (slender and perfectly straight in two specimens, strong and curved in the others,) its tip about reaching base of caudal. It is much longer than third dorsal spine or than third anal spine, and is about $1\frac{1}{2}$ in length of head. Third anal spine about equal to first soft ray. Caudal fin well forked. Ventral fins long, reaching in most cases scarcely to the vent. Pectorals about equalling ventrals, $1\frac{2}{3}$ in length of head, not reaching tips of ventrals. Vent about midway between base of ventrals and middle of base of anal.

Scales large, those in front of dorsal not crowded, 10 to 14 in number (16 to 18 in *C. armatus*); 5 series between lateral line and front of spinous dorsal.

Head (with opercular flap) $2\frac{2}{3}$ in length; depth $3\frac{1}{2}$ ($3\frac{1}{4}$ in *C. armatus*). D. VIII-I, 10; A. III, 6; scales, 5-51-9.

Color olivaceous, white below; lateral line pale. Membrane of anterior dorsal spines and of second and third anal spines blackish, as in *C. armatus*; pectorals and soft parts of vertical fins somewhat dusky; ventrals plain yellowish.

This species is rather common at Mazatlan, where numerous specimens were obtained. It reaches a length of about a foot, and is known to the fishermen as "*Constantino*" or "*Robalito*", the larger species of the genus, *C. undecimalis* and *C. nigrescens*, being called "*Robalo*".

Two specimens, 29228 from Mazatlan, and 28245 taken by Lieutenant Nichols at Acapulco, differ from the others in the following respects: The anal spine is shorter, slenderer, and perfectly straight, and the ventral fins are longer, reaching well past the vent, as in *C. armatus*.

INDIANA UNIVERSITY, December 2, 1881.

NOTES ON A COLLECTION OF FISHES MADE BY CAPTAIN HENRY E. NICHOLS, U. S. N., IN BRITISH COLUMBIA AND SOUTHERN ALASKA, WITH DESCRIPTIONS OF NEW SPECIES AND A NEW GENUS (*Delolepis*).

By TARLETON H. BEAN.

In the summer of 1881 Captain Nichols made a voyage in command of the United States Coast and Geodetic Survey steamer Hassler, through the inland waters of British Columbia and Southern Alaska, during which he preserved for the United States National Museum 31 species



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