

OCCASIONAL PAPERS OF THE MUSEUM OF
ZOOLOGY

UNIVERSITY OF MICHIGAN

ANN ARBOR, MICHIGAN

UNIVERSITY OF MICHIGAN PRESS

STUDIES OF THE FISHES OF THE ORDER CYPRINO-
DONTES. XIII. *QUINTANA ATRIZONA*,
A NEW POECILIID

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AMONG the most interesting scientifically of the recent "importations" by aquarists is an attractive little viviparous cyprinodont, received from Cuba. This fish, representing a very distinct new genus of the Poeciliidae, has naturally confused the aquarists. It has been advertised for sale by dealers under the misidentifications of *Toxus riddlei* and *Limia heterandria*. Very recently it has been prettily pictured and recognizably described in an aquarium-fish book by Peters (1934: 92) under the latter name. The fish, however, is not very closely related to *Toxus* and is not even referable to the same subfamily (Poeciliinae) as *Limia*.

This new fish has also been given a troublesome pseudo-scientific appellation, "*Limia eptomaculata lara*." So far as I have determined, this name has, fortunately, not been accompanied by a description or reference which would qualify it for scientific use. The name is mentioned by Mr. J. Louis Troemner, under "Notes" in *The Fish Culturist*,¹ with the remark that:

¹ Philadelphia, 12, No. 10, June, 1933: 266.

Another fish Mr. Walker has bred in large numbers is the new Cuban live bearer, *Limia eptomaculata lara*. This fish was sent hither by Mr. Emilio Masnata, of Havana, it having been collected near that city, and when Mr. Masnata, was unable to tell what it was, he sent a specimen to Dr. La Torre, who upon examination, found that the fish had never been listed and so named it for the Mexican collector, Lara, who discovered it. This is a very dainty little fish, quite in general appearance like our *Heterandria formosa*.

A variation in nomenclature used by aquarium dealers in advertising this species is *Eptomaculata lara*. This name likewise is unavailable.

Part of the type specimens, kindly furnished by Mr. F. H. Stoye, are offspring from the shipment referred to by Troemner. Others were donated by the proprietor of the Everglades Aquatic Nurseries of Tampa, Florida, Mr. Albert Greenberg, who writes that the collector reported obtaining them at Baracoa, a port near the eastern end of Cuba. Most of the types were bred in the Experimental Aquarium of the University of Michigan, from one pregnant female of the Everglades Aquatic Nursery stock, donated to the University by Mr. E. W. Clark, Jr., of Detroit, Michigan.

The large, commercial trade in "tropicals" casts a measure of doubt on the original locality of the new poeciliid. It was surely sent from Cuba to the American dealers, but might have been obtained by the Cuban collectors or dealers from Mexico or South America. From circumstantial evidence this seems improbable, but I hesitate to state the habitat as Cuba, without this reservation.

Quintana, new genus

Orthotype, *Quintana atrizona*, new species.

The genus, like others in the family, is characterized by peculiarities in the structure of the gonopodium, the anal fin of the male modified as an intromittent organ (see Regan, 1913; Hubbs, 1924, etc.). Several features of *Quintana* are so unique that its immediate relationships are not apparent. It enters the subfamily Gambusiinae but does not fit the diag-

nosis of any of the tribes into which this subfamily is currently divided. In the thickened subterminal node of ray 4a (anterior branch of the fourth anal ray), it resembles the members of tribe Gambusiini, though certain features suggest that this node, like a similar structure in *Allogambusia*, originated independently of the gambusiin elbow. Ray 5a is modified distally into a structure which resembles the terminal hook of *Gambusia*, but is obviously not homologous since it points forward instead of backward. In having serrae on ray 5p (posterior fork of fifth ray), the new genus resembles the three genera, perhaps significantly all Cuban, which are classed in tribe Girardinini, but again certain differences, especially the terminal rather than subterminal and posterior position of these serrae suggest that the resemblance is due to convergence rather than common origin. In other respects the peculiar and relatively constant gonopodial features of the Gambusiini and Girardinini are not reproduced in *Quintana*. Unless a new tribe be erected solely for the reception of this genus, it may be placed in the more generalized and variable tribe Heterandriini (Hubbs, 1924: 7). Including the genus in that tribe necessitates an emended diagnosis for the tribe: the statement "ray 5 always smooth on posterior edge" should be followed by the exception or reservation, that "a few terminal segments modified into serrae at extreme tip of gonopodium, not along its posterior edge, in *Quintana*." The alternative statement for the Girardinini should be made to read "ray 5 with numerous subterminal segments along the posterior edge, not tip, of gonopodium modified into serrae."

The distinctive features of the gonopodium of *Quintana*, by which the genus may be set apart as a primary division of the Heterandriini, are as follows.—The very wide ray 3 is abruptly constricted just within a large subtriangular, almost plate-like distal segment, which impinges at its anterior angle against an otherwise free wedge-shaped segment lying in a projecting lobe. Ray 4a is expanded into a subterminal node, but is finally constricted toward the terminal segment, which is moderately elongated, pointed, and somewhat hooked for-

ward. Ray 4p is not quite so long as the others; it is much slenderer than 4a distally but much wider basally; it is provided with subterminal serrae which shift basad from a posterolateral direction to a lateral and then an anterolateral angle, finally reverting, where becoming rudimentary, to a posterior direction. Both branches of ray 5 extend to the extreme tip of organ, and are diagnostically modified. Ray 5a is specialized distally into a long pointed structure, with partly consolidated segments, closely resembling the terminal hook of this ray in *Gambusia* (*Arthrophallus*) *affinis affinis*, except that the point of the hook is directed forward instead of backward. Ray 5p has a few of the distalmost segments, along the tip of the gonopodium, opposite the modified tip of ray 5a, modified into rather strong serrae. Ray 5p has several segments just distal to the tip of ray 6 consolidated and swollen.

In some of its general external features this small fish is rather distinctive. The body is sharply compressed, with outlines approaching a rhombic form, especially in the males. The caudal peduncle is long and rather slender. The dorsal fin in the female is about opposite the anal. The chin is vertical when the mouth is tightly closed. The rather short, almost strictly transverse jaws are connected around the corners of the mouth by a twisted membrane. The uniserial teeth—oddly for a poeciliid with transverse mouth and rather soft and not very tightly conjoined mandibles—are sharply conical. The sharply banded coloration, the prettily marked dorsal fin, and the fine margining of the scale pockets over all or almost all the body give this fish character.

Quintana: that which pertains to the fifth, in reference to the unique modification of ray 5 of the gonopodium.

Quintana atrizona, new species

Holotype, Cat. No. 106459, Museum of Zoology, University of Michigan, an aquarium bred fish, a descendant of aquarium stock said to have been collected in the vicinity of Baracoa, eastern Cuba; a mature male 19.5 mm. long to caudal fin. Numerous paratypes, with similar history, and others reported

to be of stock collected near Havana, Cuba, are in the collections of the Museum. A pair of paratypes, presumably from the latter stock, is in the United States National Museum.

The counts and measurements were made on the holotype, on several adult male paratypes 14 to 19 mm. long and on several adult female paratypes 19 to 25 mm. long. Throughout the description the count or measurement of the holotype is given first, followed in parenthesis by the determinations for the male and for the female paratypes. The ratios were obtained by "stepping" the measurements, made with dividers, over the curve of the head or body.

The largest male specimen at hand is the holotype, 19.5 mm. long to caudal, just one inch long with caudal. The largest female, the mother or grandmother of most of the type specimens, is 34 mm. long to caudal, about 1.6 inches over all. Peters (1934: 92) gives the size as "male 1 inch, female almost 2 inches."

Consistent with its observed midwater swimming habits, this pretty little fish does not have the angulated axis characteristic of the surface-feeding cyprinodonts. The dorsal and ventral profiles slope and curve forward symmetrically from the origins of the dorsal and anal fin to the mouth, which is on the median horizontal axis of the body. The bases of these fins are strongly oblique. The dorsal contour behind the dorsal fin is moderately concave, whereas the ventral edge of the caudal peduncle is straight in females, and straight or very slightly convex in males. The males are rather sharply rhombic in form, the females less so. The males average the deeper, not only in the greatest, but especially in the least depth measurement, and are much more strongly compressed than the females,—as the following measurements show:

Greatest depth in standard length, 3.15 (2.8 to 3.3; 2.9 to 3.7,—the deeper females pregnant, the slenderer ones spent).

Least depth in head, 1.65 (1.5 to 1.75; 1.75 to 2.25).

Greatest width in projection of greatest depth, 2.1 (1.9 to 2.3; 1.4 to 1.8).

The head is a deep wedge, with the margins almost straight and about equally oblique, and with the tip vertically truncated when the mouth is tightly closed. The interorbital is slightly to moderately convex, and much wider in females than in males. The snout is very short, on account of the vertical chin and narrow preorbital, which is distinctly narrower than the pupil. The structures of the mouth and teeth are indicated briefly in the generic description. The usual head measurements follow:

Length of head including opercular membrane in length to caudal, 3.9 (3.6 to 3.8; 3.4 to 3.8).

Depth of head below occiput in length of head, 1.25 (1.15 to 1.3; 1.2 to 1.3).

Width of head, 1.9 (1.7 to 1.9; 1.5 to 1.75).

Least fleshy interorbital width, 2.9 (2.6 to 3.1; 2.0 to 2.3).

Length of free orbit, 3.0 (2.6 to 3.1; 2.6 to 3.3).

Length of snout, 4.0 (3.7 to 4.3; 3.8 to 4.3).

Scales in 29 (27 to 29) rows from head to end of hypural, and usually in 9 rows from origin of dorsal to origin of the anal, not including the scale on the mid-dorsal line (sometimes an extra small scale is developed next to the dorsal origin, and two instead of one small row next the anal origin,—in extreme instances increasing the maximum count to 11).

Dorsal rays, 8 (varying to 9 in two specimens out of 25 counted); principle caudal rays, 14 (12 branched); anal, 10 (the last ray almost rudimentary in the gonopodium); pectoral, 10; pelvic, 7.

The dorsal fin is inserted approximately over the end of the anal base in males, but only slightly behind vertical from origin of anal in females; midway between base of caudal and tip of snout (or nostril) in males, and midway between base of caudal and posterior margin of orbit (plus or minus one diameter of pupil) in females. The dorsal fin is subtriangular, with a pointed or rounded tip at end of third or fourth ray and with a rather short last ray. The caudal fin is slightly rounded on the posterior edge. The gonopodium (male anal fin) when fully elaborated extends straight back-

ward to within an eye's length of the vertical from the caudal base; the structure of its most modified rays (3 to 5) is indicated in the generic description and in the figures. Ray 6 is slender throughout but lies in a thickened region of the fin membrane. The anal fin of the female is somewhat pointed, and has a moderately convex to slightly concave posterior edge. The weak pectoral fin is rather narrow, though strongly rounded posteriorly; it extends in the male farther backward than the pelvic, to above middle of anal base, and in the females almost to above middle of pelvic. The weak and pointed pelvic fin extends a little beyond the anal origin in males, and to or almost to the anus in females. In the males the membrane about the outer pelvic ray is thickened though sharp-edged, and is folded over, beneath the second ray. The proportionate sizes of the fins are as follows:

Length of depressed dorsal fin in head, 1.0 (1.0 to 1.3; 1.2 to 1.3).

Length of middle caudal ray, 0.9 (0.9 to 1.1; 1.1 to 1.2).

Length of depressed anal fin, in length to caudal, 2.25 (2.0 to 2.3,—only perfect gonopodia measured; 5.0 to 5.5).

Length of pectoral fin in head, 1.35 (1.25 to 1.4; 1.4 to 1.7).

Length of pelvic fin, 1.6 (1.4 to 1.7; 2.0 to 2.3).

In life the body is very transparent: the air-bladder, vertebrae, and other organs show distinctly through the flesh, especially in the thin males. The sides are strongly washed with amber-olive, but become more silvery on belly and cheeks. The sides are crossed by 3 to 9 vertical to slightly oblique sooty black bars, usually reaching almost to the contours of the body. The bars are often more or less irregular in height, position, and direction. Those toward the caudal fin tend to be most irregular, even spot-like in some specimens, or **V**-shaped, with the point forward. The scale pockets over the sides are conspicuously marked off by finely pencilled lines, forming a regular network of subhexagons about twice as high as long. The pattern is undeveloped only over the silvery abdominal region in the females, but is well marked even over the breast in fully adult males. The scale-pocket

borders are generally made up of a single file of melanophores, whereas only a few melanophores are scattered within the hexagonal outlines. The axial streak, even finer than the scale pattern, becomes broken up below the dorsal origin and obsolete toward the head. The middorsal line is sooty in the males, wider than the pupil, and almost black before the dorsal; weakly dusky in females. A black streak with diffused borders runs along the lower edge of the caudal peduncle. The belly and cheeks are silvery; muzzle and top of head dusky. The dorsal fin has a jet black front margin, broadening to the width of the pupil toward base; the membrane between the third and fourth rays is blackened subbasally into a somewhat crescentic mark fused medially with the black margin of the fin; on each of the following membranes shorter black dashes are developed, forming a prominent mark, where conspicuous and partly fused, toward the end of the fin; the upper and posterior margins of the fins are darkened, most so in males, becoming more or less jet-black toward the outer posterior angle of the fin; the posterobasal black spot is surrounded by a clear region; the center of the dorsal fin is orange (bright orange in the males), fading outward. The caudal fin is strongly washed with lemon-amber basally. The anal fin of the females is marked like the dorsal, though the dark edgings are less black. The gonopodium is blackened between the rays, especially toward the base of the thick third ray and near the swelling of ray 5p.

LITERATURE CITED

HUBBS, CARL L.

- 1924 Studies of the fishes of the order Cyprinodontes. II. An analysis of the genera of the Poeciliidae. Univ. Mich. Mus. Zool. Misc. Publ. 13: 5-11, pl. 1-4.

PETERS, C. H.

- 1934 Life and Love in the Aquarium. New York City: Empire Tropical Fish Import Co., 1-399, 42 figs., 86 pls.

REGAN, C. TATE

- 1913 A revision of the cyprinodont fishes of the subfamily Poeciliinae. Proc. Zool. Soc. London, 2: 977-1018, pl. 99-101, fig. 168-173.

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PLATE I

Quintana atrizona

FIG. 1. Male paratype, of stock said to have come from Baracoa, Cuba.

FIG. 2. Female paratype, from the same lot.

FIG. 3. Gonopodium of an adult male of same stock, showing the general structure outward from tip of sixth ray.

FIG. 4. Tip of same gonopodium, further magnified to show finer structure. The separated terminal serrae of the two halves of ray 4p are both indicated.

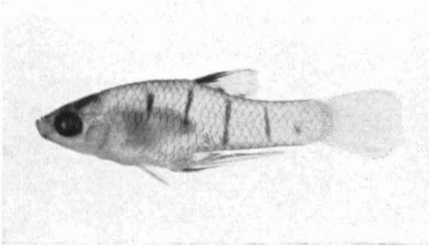


FIG. 1

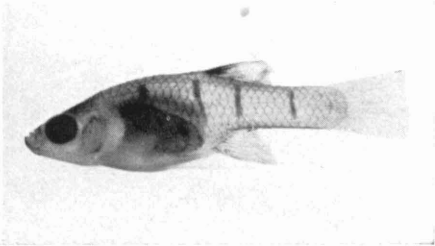


FIG. 2

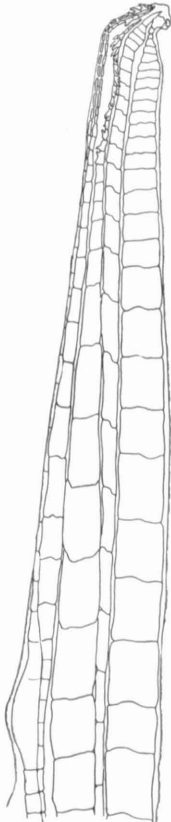


FIG. 3

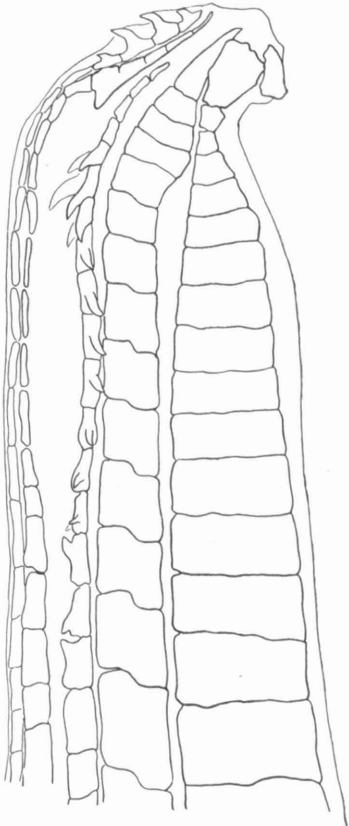


FIG. 4

