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CICHLID FISHES (GENUS *CICHLASOMA*) OF
THE RIO PANUCO BASIN, EASTERN MEXICO,
WITH DESCRIPTION OF A NEW SPECIES

BY

JEFFREY N. TAYLOR¹ and ROBERT RUSH MILLER²

The Río Pánuco (Fig. 1), the first major river south of the Río Grande (Río Bravo del Norte) and the second largest drainage basin on the Atlantic slope of Mexico (Tamayo and West, 1964:90), enters the Gulf of Mexico at Tampico. Its northern arm is the Río Tamesí whose fishes have been studied by Darnell (1962) and Hubbs and Miller (1974, 1975, 1977). Of the 25 families represented in the Pánuco basin, four—the Characidae, Cyprinidae, Catostomidae, and Ictaluridae—are primary and five—the Lepisosteidae, Cyprinodontidae, Goodeidae, Poeciliidae, and Cichlidae—are secondary freshwater fishes. Among the *ca.* 75 species known from the basin are 25 endemic forms, all of which are included in the nine families just listed.

The cichlids of the Pánuco system comprise two widespread species—*Cichlasoma cyanoguttatum* (Baird and Girard), which ranges north and south of the basin, and *C. labridens* (Pellegrin), which is found in both montane and lowland habitats within the basin—and three with restricted distributions—*C. bartoni* (Bean), *C. steindachneri* (Jordan and Snyder), and *C. pantostictum*, described as new herein. One exotic cichlid, *Tilapia aurea* (Steindachner), has recently become established in the upper Río Verde drainage, San Luis Potosí (Hubbs and Miller, 1977:320), where it

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is reportedly undergoing a population explosion (I. Kornfield, pers. comm., 1981).

The primary purpose of this paper is to clarify the status of *Cichlasoma steindachneri*, a name currently applied to three distinct species. Each of these is discussed and illustrated. A key to the native cichlids of the Pánuco basin is given; *Tilapia aurea* is readily distinguished from them by having only three anal spines.

Counts and measurements were taken as in Taylor and Miller (1980). The following museum abbreviations are used: CAS (SU),

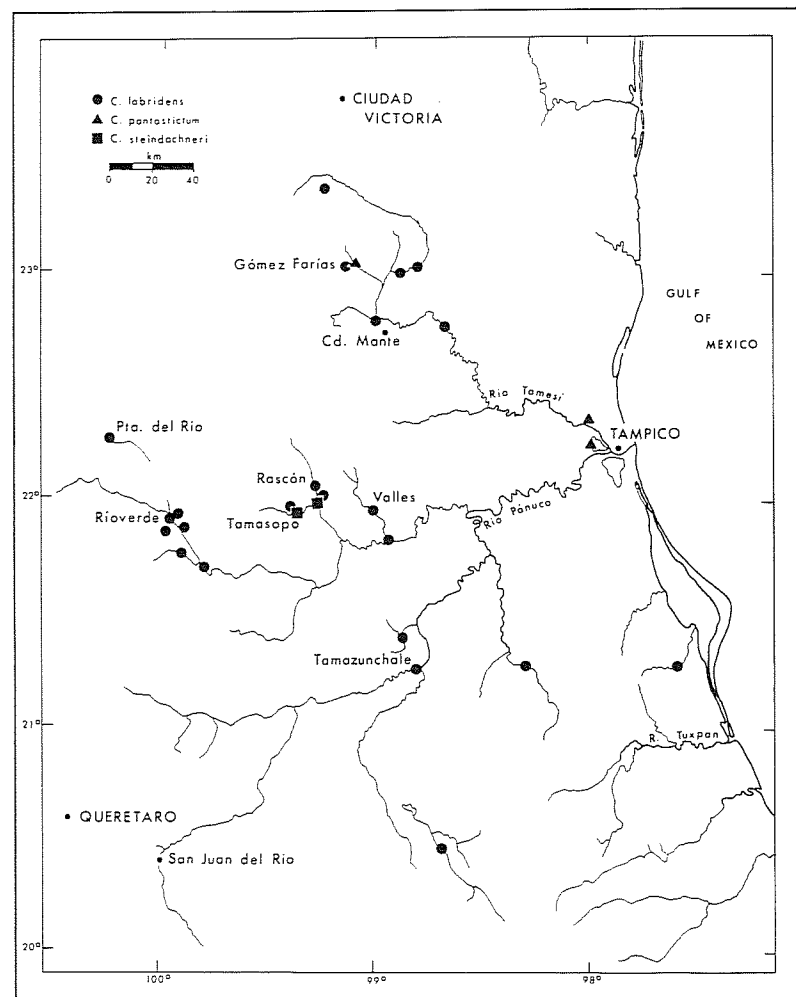


FIGURE 1.—Distribution records for three species of *Cichlasoma* in the Río Pánuco basin. Drafted by Michael L. Smith.

California Academy of Sciences (Stanford University); FMNH, Field Museum of Natural History; KU, Museum of Natural History of The University of Kansas; TU, Tulane University Museum of Natural History; UMMZ, The University of Michigan Museum of Zoology; USNM, United States National Museum.

Key to the Pánuco Species of *Cichlasoma*

- 1a. Outer, enlarged series of jaw teeth compressed, incisor-like (*Herichthys* group); D. XV-XVII, (9) 10-12; A. V-VI, (8) 9-10; total gill rakers 10-12 *C. cyanoguttatum*
- b. Jaw teeth all conical or cylindrical; anterior pair in upper jaw and two on each side of anterior pair in lower jaw more or less strongly enlarged and canine-like (*Parapetenia* group) 2
- 2a. Anal spines IV, rarely V (20 of 480 counts); pelvic fin short, not extending beyond tip of pectoral fin; pharyngeal teeth conic *C. bartoni*
- b. Anal spines V or VI (rarely IV); pelvic fin longer, extending as far as or farther than tip of pectoral fin; pharyngeal teeth conic or molariform 3
- 3a. Head long, length usually greater than body depth over pelvic base; lower jaw projecting (jaws equal in juveniles), mouth oblique; pharyngeal teeth conic *C. steindachneri*
- b. Head shorter, length usually less than body depth over pelvic base; jaws equal or upper projecting slightly; mouth horizontal or angled downward anteriorly; pharyngeals with few to many molariform teeth 4
- 4a. Speckling restricted to nape and sides of head or, less frequently, absent; sides with conspicuous dark markings, including a caudal spot or blotch, present at all sizes .. *C. labridens*
- b. Head, body, and fins profusely speckled with small, dark, regularly-spaced spots; lateral blotches and caudal spot absent in specimens larger than 70 mm SL .. *C. pantostictum*, n. sp.

Cichlasoma steindachneri

Fig. 2

Cichlasoma steindachneri Jordan and Snyder, 1900:143-144, fig. 20 (original description; type locality Río Verde [=Río Gallinas] at Rascón, San Luis Potosí).

Diagnosis.—A slender-bodied member of the *Parapetenia* group (Regan, 1906-08:26) with a long, pointed head, its length usually greater than body depth over base of pelvic fin; predorsal contour gradual, slightly convex or straight, becoming concave over the orbit in adults; mouth large, oblique, lower jaw projecting; teeth on lower pharyngeal plate conical, pointed; caudal peduncle rather slender, its length greater than or equal to least depth; body in

life olive-yellow, sometimes very pale, approaching whitish-yellow, with numerous, fine, black punctulations over side and top of head; a small dark blotch present in axil of pectoral fin (see Fig. 2 and Table 2).

This species has been confused with *C. labridens* for many years. Meek's (1904:210-211) description is based on a composite of two species; his collection from Rascón (FMNH 4516, UMMZ 176672), the type locality of *C. steindachneri*, contains both species (as pointed out by Miller, 1976:20). Regan's (1905:444) account is probably based on *C. labridens*. *Cichlasoma steindachneri* is a rare (or at least not easily collected) species that occurs only in the Río Tamasopo-Gallinas and the Río Ojo Frío (near and above Rascón), San Luis Potosí, where it is sympatric with *C. labridens*, a more abundant species. Further, the original description of *C. steindachneri* was based on 10 specimens, the largest of which (Fig. 2) was only 61 mm total length. The restricted range of *C. steindachneri*, its rarity relative to sympatric *C. labridens*, and superficial similarities in appearance in small individuals of the two species have all contributed to the general failure by most workers to recognize the true *C. steindachneri*. However, as described in the account of *C. labridens* and summarized in the accompanying key, larger specimens of the two species are easily distinguished by general body form, pharyngeal dentition, and breeding coloration.

Material Examined.—All specimens are from San Luis Potosí, Mexico. UMMZ 176672 (5), 30-40 mm, S. E. Meek, 6 May 1903, 196700 (5), 31-90 mm, R. R. and F. H. Miller, 20 Mar. 1974, and 203214 (3), 32-47 mm, J. M. and N. Humphries, and M. L. Smith, 18 May 1976, from Río Gallinas or Ojo Frío just N. of Rascón; UMMZ 193514 (18), 30-201 mm including skeleton, Millers and N. A. Neff, 17 Dec. 1972, UMMZ 196348 (22), 46-150 mm including 3 skeletons, R. R., F. H., and G. H. Miller, 7 Feb. 1974, and

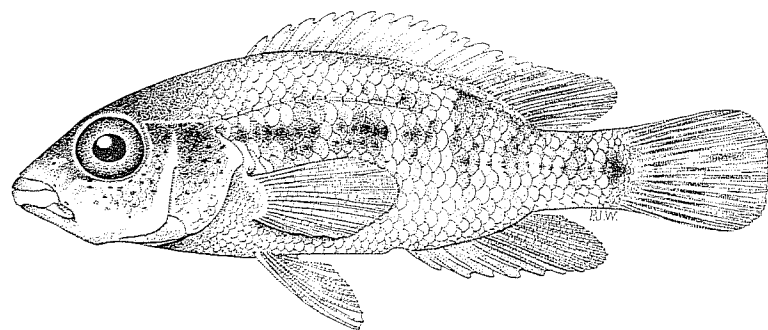


FIGURE 2.—*Cichlasoma steindachneri*, holotype, CAS (SU) 6164, 61 mm TL, from Río Verde at Rascón; redrawn by Patricia J. Wynn from original drawing by Chloe Leslie Starks.

TABLE 1. Measurements of *Cichlasoma labridens* in per mille of standard length from Mexico (Río Verde specimens: UMMZ 188801, 192331, 193305, 193450, 193476; non-Río Verde specimens: UMMZ 161653, 186282, 192509, 192901, 193512, 196349, 196929, 198798, 203215). Figures in parentheses are means.

Measurement	Río Verde specimens		non-Río Verde specimens	
	n=10	n=12	n=14	n=16
Standard length, mm	43.2-61.7(51.6)	68.5-121.8(92.2)	43.1-64.6(53.6)	68.3-123.0(90.2)
Predorsal length	434-482(451)	435-465(453)	436-467(452)	428-469(451)
Preanal length	660-700(676)	652-696(674)	644-712(680)	644-685(667)
Prepelvic length	393-447(421)	394-436(415)	387-431(407)	374-416(399)
Body depth	420-481(444)	447-476(459)	380-440(413)	382-447(420)
Head length	367-408(385)	354-400(376)	361-386(373)	348-385(370)
depth	342-386(367)	359-398(378)	304-350(324)	306-384(339)
Postorbital length	160-177(168)	156-176(163)	137-153(143)	137-167(147)
Snout length	124-147(135)	140-169(151)	113-144(132)	138-169(152)
Preorbital depth	64-78 (71)	78-96 (88)	52-70 (60)	73-104 (88)
Interorbital bony width	100-107(103)	97-123(111)	58-82 (74)	75-103 (88)
Orbit diameter	89-122(105)	79-102 (91)	84-106 (94)	72-99 (83)
Cheek depth	122-138(131)	137-168(152)	102-125(115)	120-159(138)
Mandible length	132-147(140)	123-145(133)	131-146(138)	129-152(141)
Upper-jaw length	95-104(100)	101-115(106)	92-110(101)	99-121(111)
Mouth width	97-112(104)	105-133(116)	81-111 (96)	91-123(107)
Caudal-peduncle length	144-157(151)	153-173(161)	132-162(151)	137-178(158)
least depth	152-160(156)	151-164(157)	133-150(143)	139-157(147)
Dorsal-base length	536-583(550)	543-583(562)	501-565(530)	505-560(539)
Longest (=last) dorsal spine length	139-164(155)	147-166(158)	118-147(129)	127-159(139)
Anal-base length	216-246(229)	212-248(229)	190-253(217)	193-246(222)
Pectoral length	255-300(274)	256-286(271)	240-276(251)	246-282(260)
Pelvic length	239-278(256)	226-278(248)	204-270(232)	220-290(249)

198800 (9), 37-210 mm including 2 skeletons, Millers and D. I. Lyons, 29 Jan. 1976, from Río Tamasopo (trib. R. Gallinas) 1.5 km N. of Tamasopo.

Distribution.—*Cichlasoma steindachneri* occurs only in the montane portion of the Río Ojo Frío drainage, which joins the Río Santa María southwest of Ciudad Valles (Fig. 1). Specimens have been taken in the Río Gallinas near Rascón, the Ojo Frío north of Rascón, and the Río Tamasopo (ca. 15 km west of Rascón) near Tamasopo—all in San Luis Potosí.

Cichlasoma labridens

Figs. 3-4

Heros (Cichlasoma) labridens Pellegrin, 1903:122 (original description; type locality "Huasteca Potosina," Guanajuato³=Río Verde drainage near Río Verde, San Luis Potosí—see Miller, 1956:15).

Cichlasoma labridens Pellegrin, 1904:55, 171-172, Pl. VI, Fig. 1 (redescription, with illustrations of dentition and syntype); Meek, 1904:211 (incorrectly synonymized with *C. bartoni*); Regan, 1905:443 (redescription; synonymy); 1906-08:18, 20 (in key; listed; range); de Buen, 1940:60 (listed); Alvarez, 1950:116 (in key; range); 1970:143 (in key; range); Miller, 1956:15 (regarded as confined to upper Río Verde drainage); Hubbs and Miller, 1977:274 (confined to upper Río Verde drainage).

Cichlasoma steindachneri Meek (1904:210, misidentification, in part; some from Rascón, all from Valles and Forlón—see Miller, 1976:20); de Buen (1940:60, misidentification in part; from Meek, 1904); Darnell (1962:345-347, misidentification in part; all specimens except those from Laguna de Chairel and two from Río Sabinas).

Cichlasoma sp. Miller (1976:20, reference to material listed from Forlón and Valles by Meek, 1904).

Parapetenia labridens Jordan, Evermann, and Clark, 1930:419 (listed; range).

Diagnosis.—A moderately elongate species of the *Parapetenia* group (Regan, 1906-08:26) most closely related to *C. pantostictum* (described below), distinguished from it and other *Parapetenia* species by the following combination of characters: mouth small to moderate in size, angled downward anteriorly, upper jaw usually projecting beyond lower; molariform teeth well-developed on lower pharyngeal plate; caudal peduncle long, length usually greater than or equal to least depth; sides of head and nape usually speckled with fine, dark spots which do not extend onto the body; a magenta spot (in life) in the axil of the pectoral fin; and a conspicuously-contrasting pattern of black and white blotching in breeding adults (Figs. 3-4).

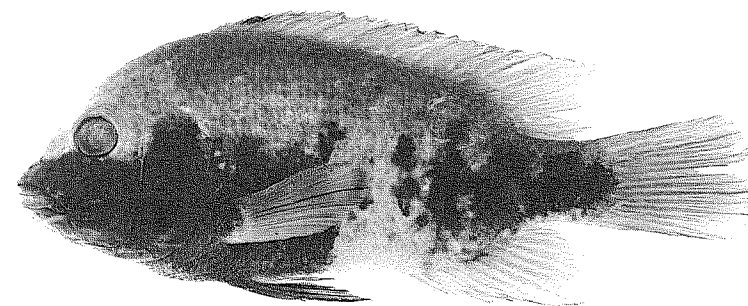
Material Examined.—Samples examined are deposited in The University of Michigan Museum of Zoology (UMMZ) and are listed below by state.

³ Prof. Alfredo Dugès of Guanajuato sent the types of this species to Pellegrin (and of *C. bartoni* to Bean) from Guanajuato with the locality Huasteca Potosina; this explains how this material was thought to have come from Guanajuato.

Hidalgo: 196684 (5), 51-101 mm, R. R. and F. H. Miller, 18 Mar. 1974, Río Venados on hwy. 105; 196690 (33), 26-67 mm, Millers, 19 Mar. 1974, Río Amasa 9.7 km W. of Huejutla.

Querétaro: 193446 (1), 28 mm, Millers and N. A. Neff, 24 Nov. 1972, Río Santa María at Concá, ca. 27 km N. of Jalpan.

San Luis Potosí: 97681 (27), 13-41 mm, E. Creaser, M. Gordon, and Ostos, 28 Apr. 1930, Río Valles at Valles; 124176 (1), 24 mm, Gordon and J. Atz, 14 Jan. 1939, 124370 (5), 28-72 mm, Gordon and Atz, 14 Apr. 1939, Río Axtla at Axtla; 124332 (12), 28-105 mm, Gordon and Atz, 13 Apr. 1939, Arroyo Palitla at Palitla, 13 km N. of Tamazunchale; 124343 (3), 28-62 mm, Gordon and Atz, 14 Apr. 1939, Río Matlapa at Matlapa, 21 km N. of Tamazunchale; 124356 (3), 51-93 mm, Gordon and Atz, 14 Apr. 1939, Arroyo Plan de Jalpilla 29 km N. of Tamazunchale; 124377 (6), 55-105 mm, Gordon and Atz, 14-15 Apr. 1939, Arroyo Matlapa at Comoca, 35 km N. of Tamazunchale; 124381 (3), 31-40 mm, Gordon and S. Coronado, 15 Apr. 1939, Río Ojitipa 1.6 km E. of Santa Isabel near Tancanhuitz; 124385 (1), 11 mm, Gordon and Atz, 16 Apr. 1939, Arroyo Sta. Isabel 3.2 km N. of Tancanhuitz; 161653 (9), 23-80 mm, J. Greenbank and party, 11 Feb. 1951, Río Axtla ca. 48 km NW. of Tamazunchale; 161660 (28), 24-60 mm, Greenbank and party,



see
for

FIGURE 3.—*Cichlasoma labridens*, from canal from La Media Luna crossed by highway just south of Río Verde, UMMZ 193305, collected 19 July 1968. Above, nuptial male 96.7 mm SL; below, nuptial female 95.5 mm SL. Photograph by E. C. Theriot.

5 Mar. 1951, Río Salto 11 km W. of Nuevo Morelos; 164867 (1), 36 mm, R. J. Dontzin, ca. 5 Sept. 1942, Arroyo del Limoncito ca. 16 km N. of Valles; 172192 (127), 15-108 mm, Miller and Greenbank, 19 Mar. 1955, 192331 (88), 20-81 mm, C. D. Barbour and R. J. Douglass, 11 May 1969, 193305 (3), 95-100 mm, S. Contreras et al., 19 July 1968, 193307 (7), 76-93 mm, S. Contreras, 19 July 1968, 202974 (12), 42-92 mm, and 202977 (20), 33-68 mm, Miller, Smith, and E. Marsh, 17 May 1978, La Media Luna ca. 16 km by road S. of Rioverde; 173959 (1), 70 mm, N. Hartweg and native, 9 Aug. 1958, stream in wooded ravine ca. 8 km N. of Tamazunchale; 176664 (7), 40-88 mm, W. L. Tower, Aug. 1903, Río Verde at Rioverde; 180038 (1), 17 mm, O. Sanders, 11 July 1937, 189571 (1), 65 mm, Miller and J. M. Fitzsimons, 12 Feb. 1970, Río Moctezuma at Moctezuma; 181778 (28), 33-91 mm, Clifton and Kuhn, 12 Dec. 1955, 193306 (2), 70 and 87 mm, S. Contreras et al., 16 July 1968, Río El Salto at falls; 182558 (1), 33 mm, R. Wakefield and G. Stratton, 24 Dec. 1964, Río Axtla above ferry to Xilitla; 186282 (21), 14-74 mm, Miller and H. L. Huddle, 28 Apr. 1966, La Presa El Salto ca. 7.7 km by road above base of falls; 188801 (16), 26-74 mm, G. Mendoza and J. Pizza, 11 July 1959, canal in Rioverde connecting with La Media Luna; 191754 (63), 32-97 mm, Miller and K. Kurawaka, 8 Mar. 1971, 192516 (78), 15-98 mm, C. D. Barbour and R. J. Douglass, 9 June 1969, ditch from La Media Luna, 7.7 km S. and 4 km W. of Río Verde; 193450 (64), 25-116 mm, Millers and Neff, 25 Nov. 1972, trib. Río Verde 16 km SE. of Río Verde; 193453 (41), 24-111 mm, Millers and Neff, 25 Nov. 1972, ditch 1 km SE. of Río Verde; 193476 (41 including 1 skeleton), 24-122 mm, Millers and Neff, 9 Dec. 1972, 196707 (14), 34-111 mm, Millers, 21 Mar. 1974, spring-fed marsh 10 km S. of Río Verde; 193512 (177), 25-115 mm, Millers and Neff, 17 Dec. 1972, 196349 (109), 32-115 mm, Millers, 7 Feb. 1974, 198798 (56 including 1 skeleton), 31-123 mm, Millers and Lyons, 29 Jan. 1976, Río Tamasopo ca. 1.5 km N. of Tamasopo; 196260 (11), 31-67 mm, Meek, 6 May 1903, 196698 (22), 22-78 mm, Millers, 20 Mar. 1974, 203215 (35), 25-71 mm, J. M. and N. Humphries and M. L. Smith, 18 May 1976, Río Gallinas just N. of Rascón; 196343 (22), 38-110 mm, Millers, 5 Feb. 1974, Puerta del Río, 20 km SE. of Cerritos; 196902 (1), 80 mm, N.Y. Aquarium Exped., 15 Mar. 1940, Río Tampaón, Pujal; 196915 (1), 26 mm, N.Y. Aquarium Exped., 16 Mar. 1940, pond at Pujal; 196926 (3), 49-53 mm, N.Y. Aquarium Exped., 25 March 1940, arroyo between Río Axtla and Río Moctezuma; 198794 (4), 53-73 mm, Millers and Lyons, 28 Jan. 1976, Río Ojo Frío ca. 11 km N. of Rascón; 202823 (6), 20-32 mm, D. E. Rosen and Gordon, 19 Jan. 1957, Río Choy at Rcho. Colandria; 203181 (2), 44 and 68 mm, Atz, F. G.

Wood, and Gordon, 7 Apr. 1948, Río Axtla at Danubio 6.4 km above Axtla.

Tamaulipas: 97679 (11), 21-55 mm, Creaser, Gordon and Ostos, 26 Apr. 1930, 192509 (29), 69-103 mm, Barbour and Douglass, 9 June 1969, 192901 (16), 21-73 mm, R. M. Darnell, J. S. Balsano, D. R. Martinson, and M. W. Hostetter, 20 June 1968, Río Guayalejo near Llera; 97680 (81), 13-22 mm, Creaser, Gordon and Ostos, 27 Apr. 1930, Río Guayalejo at Limón 19 km S. of Xicoténcatl; 162114 (1), 50 mm, W. McLane and N. Marshall, 22 Dec. 1939, Río Guayalejo at Magiscatzin; 162120 (2), 39 and 69 mm, McLane, 24 Dec. 1939, drainage canal 1.6 km N. of Juarez (=Monte); 167449 (2), 25 and 44 mm, P. S. Martin and E. P. Edwards, 16 Apr. 1948, Río Sabinas 8 km NE. of Gómez Farías at Pano Ayuctle; 183888 (101), 21-92 mm, Miller and W. D. Sable, 22 Mar. 1965, spring-fed ditch ca. 0.8 km E. of Jaumave; 184408 (4), 21-23 mm, Miller and R. J. Schultz, 23 Jan. 1959, Río Tigre just N. of Aldama; 186501 (61), 13-77 mm, Miller and W. L. Minckley, 21 Dec. 1966, canal from Río Mante, 3-4 km N. of Cd. Mante; 192882 (26), 16-56 mm, Balsano, Martinson and Hostetter, 18 June 1968, Río Guayalejo at Xicoténcatl; 192891 (16), 22-116 mm, Darnell and Martinson, 18 June 1968, Río Mante at dam; 203203 (17), 40-64 mm, Humphries and Smith, 13 May 1976, 203205 (44), 7-62 mm, Humphries and Smith, 15 May 1976, Río Guayalejo ca. 10 km NE. of Xicoténcatl.

Veracruz: 97682 (1), 17 mm, Creaser, Gordon and Ostos, 5 May 1930, Río de los Hules ca. 18 km SW. of Tantoyuca; 97683 (2), 22 and 91 mm, Creaser, Gordon, and Ostos, 6 May 1930, Jct. Río de los Hules and Río Calaboza 14.5 km SW. of Tantoyuca; 97684 (7), 14-78 mm, Creaser, Gordon, and Ostos, 7 May 1930, trib. Río Calaboza at Chapopoti 32 km S. of Tantoyuca; 97685 (5), 13-50 mm, Creaser, Gordon, and Ostos, 9 and 19 May, 1930, trib. Estero de Tancochín 40 km from mouth.

Description.—Body form and color pattern are illustrated in Figures 3 and 4. Proportional measurements in samples from the Río Verde and elsewhere in the Pánuco basin are summarized and compared in Table 1. Meristic data appear below and in Table 2.

Dorsal spines, XIV(1), XV(60), XVI(172), XVII(53); dorsal soft rays, 9(5), 10(128), 11(133), 12(20); anal spines, IV(12), V(311), VI(73), VII(1); anal soft rays, 7(9), 8(174), 9(100), 10(2); pectoral rays (both fins counted in 36 specimens), 15(21), 16(51).

Scales: lateral series, 28(4), 29(17), 30(9); upper lateral line, 16(1), 17(3), 18(9), 19(9), 20(8); lower lateral line 7(1), 8(2), 9(8), 10(10), 11(7), 12(2); transverse series, 17(6), 18(15), 19(9); rows between base of soft dorsal and upper lateral line, 1 1/2(1), 2(9), 2 1/2(20); rows between anal base and upper lateral line,

8(8), 9(18), 10(4); rows between pectoral and pelvic bases, 5(3), 6(10), 7(13), 8(4); rows around caudal peduncle, 16(3), 17(7), 18(14), 19(4), 20(2); scale rows on cheek, 5(1), 6(15), 7(9), 8(5); overlap between upper and lower lateral lines, -4(2), -3(4), -2(5), -1(6), 0(9), 1(4). Supplementary lateral lines absent.

Gill rakers on first arch: upper limb, 2(13), 3(171), 4(32); lower limb, 5(4), 6(50), 7(128), 8(32), 9(2); total, 8(6), 9(53), 10(107), 11(39), 12(10), 13(1).

Vertebrae: precaudal, 12(2), 13(142), 14(49); caudal, 14(1), 15(89), 16(102), 17(1); total, 28(47), 29(139), 30(7).

Body moderately elongate, though variable, depth generally increasing with age; head length less than or equal to body depth over pelvic base; predorsal contour moderately steep, ranging from smoothly convex in small individuals to straight to above orbit then weakly convex to dorsal origin in adults (narrow, keel-like nuchal hump infrequently developed in adults of both sexes); prepelvic contour nearly horizontal, straight to slightly convex. Mouth small to moderate in size, usually angled slightly downward anteriorly; snout bluntly pointed; jaws equal anteriorly or upper jaw projecting. Premaxillary process relatively short, extending little, if any, beyond vertical through anterior rim of orbit. Gill rakers on first arch well-spaced, gradually decreasing in size anteriorly, varying in shape from short and knob-like in smallest individuals, longer and more finger-like in intermediate-sized individuals, and becoming broad and flattened in large adults. Frenum usually present, width less than space between anterior pair of mandibular pores. Caudal peduncle length usually greater than or equal to least depth (SL>70 mm).

Dorsal-fin base of moderate length, originating above or slightly in advance of pectoral axis; spines increasing in length rapidly to

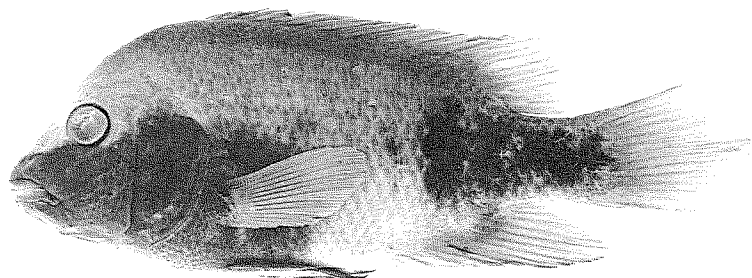


FIGURE 4.—*Cichlasoma labridens*, from Río Tamasopo just north of Tamasopo, UMMZ 198798, nuptial female, 89.0 mm SL, collected 29 January 1976. Drawn by Mark Orsen.

TABLE 2. Meristic variation exhibited in populations of three species of *Cichlasoma* from the Río Pánuco-Tamesí drainage.

Species	Dorsal spines				Dorsal soft rays				Anal spines				Anal soft rays				Total gill rakers				Total vertebrae			
	XIV	XV	XVI	XVII	9	10	11	12	IV	V	VI	VII	7	8	9	10	8	9	10	11	12	28	29	30
<i>C. steindachneri</i>	-	4	49	1	1	50	3	-	3	50	1	-	1	41	12	-	-	2	16	15	2	11	31	1
<i>C. labridens</i>																								
Río Tamasopo	1	7	53	-	1	45	15	-	3	57	1	-	3	42	16	-	1	3	21	7	2	8	40	1
Río Salto (above falls)	-	10	14	1	-	12	13	-	3	20	2	-	-	15	10	-	3	12	10	-	-	20	3	-
Río Valles	-	-	6	19	1	18	6	-	-	6	19	-	-	21	4	-	-	7	4	1	-	-	23	4
Río Verde	-	38	30	1	-	4	46	19	6	169	5	-	2	29	36	1	2	24	21	3	-	1	10	-
Río Axtla	-	1	19	8	-	13	14	1	-	16	12	-	1	17	9	1	-	3	18	4	2	3	15	1
Río Temporal	-	2	21	2	-	9	16	-	-	18	7	-	-	15	10	-	-	-	13	10	2	7	19	-
Río Tamesí	-	2	29	22	3	27	23	-	-	25	27	1	3	35	15	-	-	4	20	14	4	8	29	1
TOTALS:	1	60	172	53	5	128	133	20	12	311	73	1	9	174	100	2	6	53	107	39	10	47	139	7
<i>C. pantostictum</i>	-	1	17	5	-	6	15	2	-	3	20	-	3	19	1	-	-	-	5	8	10	7	12	2

fourth or fifth, then more gradually to last (longest). Soft portions of dorsal and anal fins when laid back not extending beyond anterior third of caudal fin. Pectoral fin rounded, asymmetric, equal to or greater than two-thirds head length, usually not extending beyond level of anus; pelvic fin extending to or beyond tip of pectoral, rarely reaching to anal origin. Caudal fin rounded.

Jaw teeth moderately-spaced, conical, curved, with pointed tips, those anteriorly enlarged to form weak canines (often worn or broken in large specimens), each with a posterior cusp; central pair in upper jaw largest, flanked on each side by one or two weaker canines, then 8 to 12 distinctly smaller non-caniniform teeth; central pair of canines in lower jaw equal to or slightly shorter than second pair, which are flanked by 6 to 12 distinctly smaller, evenly-spaced conical teeth.

Occlusal surface of lower pharyngeal plate with dentigerous portion 1.2 to 1.7 times broader than long (in 12 individuals, 45-138 mm SL); 5 to 8 teeth in each of the two median rows, conical anteriorly, increasing in size posteriorly, the last 3 or 4 becoming enlarged and flattened to form distinct molars (penultimate usually largest); a similar pattern occurs in the two rows flanking the median pair, though these teeth are not so enlarged; both size of molars and degree of flattening increase with standard length. In addition, development of the pharyngeal apparatus appears to be strongly correlated with the presence of mollusks in the diet. For example, specimens from La Media Luna in the upper Río Verde basin commonly have many crushed snails in the gut; such individuals not only exhibit greatly enlarged molars and massive pharyngeal plates, but also display enhanced development in other morphological characters associated with the trophic apparatus (e.g., head depth, interorbital width, and cheek depth; see Table 1).

Coloration.—Body (in preservation) medium brown to grey-brown dorsally, shading to light brown on the flanks and light grey or tan on the belly. Head medium brown (except in breeding adults; see below), usually speckled with tiny, dark, regularly-spaced spots; density and extent of speckling variable (often obscure and concentrated in postorbital region—or lacking—in upper Río Verde samples), but rarely extending posteriorly beyond nape or opercle. Spots on flanks, when present, larger, less distinct, and irregularly-spaced. A dark, crescent-shaped mark in axil of pectoral fin, and a round or vertically oblong spot at base of caudal fin. Unpaired fins dusky, often spotted though faintly in juveniles; dark pigment often forming an irregular blotch in spinous dorsal of breeding adults. Paired fins hyaline (pelvics black in breeding adults). Pattern on flank variable, depending upon age and reproductive condition, as described in the next three paragraphs.

Breeding adults.—Reproductively active males and females dis-

play characteristic markings (Figs. 3-4) consisting of a blackening of the underside of the head below the level of the nostril and bottom of the orbit, which extends as a rectangular blotch over the opercular series, breast, and anterior flank to a point approximately centered under the spinous dorsal; a comparable darkening occurs on the caudal peduncle, extending anteriorly above the soft anal as an irregular, discontinuous blotch; in addition, some individuals exhibit dark markings in the membranes of the posterior spinous dorsal, as well as along the base of the soft dorsal fin. The region of the lower flank between the two large blotches is conspicuously light, as is the nape and dorsum above the anterior blotch. In life, darkly pigmented regions are black; light areas are chalky white to yellow.

Non-breeding adults.—The flank pattern usually consists of a series of 3 to 7 black, squarish blotches or partial vertical bars, best developed from mid-flank posteriorly to the prominent caudal spot, and often preceded by a fainter, narrower, irregularly-continuous longitudinal stripe, commencing behind the orbit and extending to the series of blotches. Among the samples examined are individuals that are completely dark or, alternatively, blanched such that the pattern on the flank is obscured; large adults, in particular, frequently have faded flank markings. In life, the ground color of non-breeding adults is olive to grey-green above, becoming greenish gold on the flank and dingy grey on the belly. The head is grey-green with dark brown or black speckling; the sides of the head are at times marked with chalky blue and the lips appear bluish. Dark markings on the flank are black in life. The iris is amber; the crescent-shaped mark bordering the pectoral axil (posteriorly) is magenta or reddish brown, as are the tips of the interradiar membranes of the dorsal fin. The unpaired fins are olive-yellow.

Juveniles.—The flank pattern is highly variable; some individuals have only 2 or 3 squarish blotches centered on the flank, plus a caudal spot; in others, several blotches are apparent, each co-occurring with a fainter vertical bar; finally, some specimens show a well-developed longitudinal stripe running the length of the body and passing through the series of lateral blotches. Speckling on the head is least developed or absent in most juveniles, but becomes more conspicuous with increasing size.

Habitat and Associates.—This widely distributed species occurs in a variety of habitats. Except in the La Media Luna region of the upper Río Verde (near the town of Río Verde, San Luis Potosí; see Fig. 1), it shows a general preference for rocky riffles and pools in clear rivers and streams that vary from 3 to 40 m wide, have moderate to rather strong currents (the young in quiet water), bottoms of sand, gravel, rocks and boulders, and depths

generally less than a meter. Vegetation consisted chiefly of free-floating and attached green algae, but submerged macrophytes—*Potamogeton*, *Ceratophyllum*, *Chara*, and *Myriophyllum*—were noted in areas where patches of mud substrate occurred. Water temperatures varied from 18° to 30.5°C. At some stations the water was slightly murky to greenish blue or milky, but visibility was rarely less than 0.6 m.

The species commonly occurs at altitudes from about 50 to 460 m, and has been collected at 600 m in the Río Santa María, 1000 m at La Media Luna, and 1100 m at Puerta del Río, the source of the Río Verde.

At La Media Luna, an extensive marsh-lagoon area fed by warm springs that lies some 11 airline km south-southwest of Río-verde, San Luis Potosí, the water is very clear, bluish, and has a strong sulfur odor; temperatures vary from about 27° to 30°C. The bottom is flocculent silt, and marl is common. Water lilies and dense submerged vegetation are abundant in the main lagoon. A salinity of 1.3 ppt was recorded on 17 May 1978.

Tropical streamside vegetation is common at lowland habitats in the more southerly parts of the Pánuco drainage, whereas at either higher or more northerly stations streams are wholly unshaded. In the Río Tamesí drainage the species was noted to forage in weedy backwaters (Darnell, 1962:346).

Most of the fishes known from the Río Pánuco basin have been collected from the same stations as *Cichlasoma labridens*. These are included in 10 families as follows, with only the genera and number of species listed if the genus (as represented in the Pánuco basin) is polytypic: Clupeidae, *Dorosoma cepedianum*; Characidae, *Astyanax mexicanus*; Cyprinidae, *Dionda* (6-see Hubbs and Miller, 1977), *Notropis* (2); Catostomidae, *Ictiobus* (2); Ictaluridae, *Ictalurus* (2); Cyprinodontidae, *Cualac tessellatus*; Goodeidae, *Ataeniobius toweri*; Poeciliidae, *Gambusia* (5), *Heterandria jonesi*, *Poecilia* (3), *Xiphophorus* (2); Mugilidae, *Agonostomus monticola*; Cichlidae, *Cichlasoma* (3); and Eleotridae, *Gobiomorus dormitor*.

Comparisons.—*Cichlasoma labridens* displays extensive geographic variation in morphometric and meristic characters (Tables 1-2) throughout the Pánuco system; extensive variation is also seen in many aspects of its color pattern. However, the development of molariform pharyngeal teeth and the conspicuous double-blotched flank pattern noted in breeding adults (Figs. 3-4) are characteristic of the species over its entire range. Its closest relative appears to be *C. pantostictum* of the lower Pánuco-Tamesí system, with which it is compared in the species account that follows.

C. labridens occurs sympatrically with two other species of the *Parapetenia* group. *C. steindachneri*, endemic to the Río Tamasopo-Río Ojo Frío (San Luis Potosí; see above), is distinguished by its

more slender body, longer head, large, oblique mouth and strongly projecting lower jaw. Further, *C. steindachneri* lacks molariform pharyngeal dentition, and breeding adults have not been observed to develop the double-blotch flank pattern characteristic of *C. labridens*. These same two features distinguish *C. labridens* and *C. bartoni*, a species endemic to the upper Río Verde basin (San Luis Potosí); in addition, the latter species almost always has four, rather than five or more, anal spines and shorter pelvic fins (see key). Interestingly, in breeding condition *C. bartoni* develops a strongly contrasting pattern of white (dorsally) and black (ventrally) markings; however, unlike the disrupted pattern seen in *C. labridens* (Figs. 3-4), the entire lower half of the head and body is uniformly black in *C. bartoni*. Also, *C. bartoni* lacks the magenta blotch in the pectoral axil that commonly occurs in live, non-breeding individuals of *C. labridens*. Finally, electrophoretic comparisons of *C. labridens* and *C. bartoni* from La Media Luna (I. Kornfield, pers. comm., 1981) indicate that the genetic similarity (Nei's I_N) between these two species is 0.887, based on 21 loci, a level of differentiation similar to that observed previously for pairs of Israeli cichlids (Kornfield *et al.*, 1979).

Distribution.—This species is widespread in the Río Pánuco basin from the lowlands to as high as 1100 m, in the Mexican states of Tamaulipas, San Luis Potosí, Veracruz, Querétaro, and Hidalgo (Fig. 1).

Cichlasoma pantostictum, new species

Figs. 5-6

Cichlasoma steindachneri.—Darnell, 1962:318, 345-347 (misidentification, in part; material from Laguna de Chairel and Río Sabinas).

Diagnosis.—A cichlid of the *Parapetenia* group (Regan, 1906-08:26) most closely related to *Cichlasoma labridens*, from which

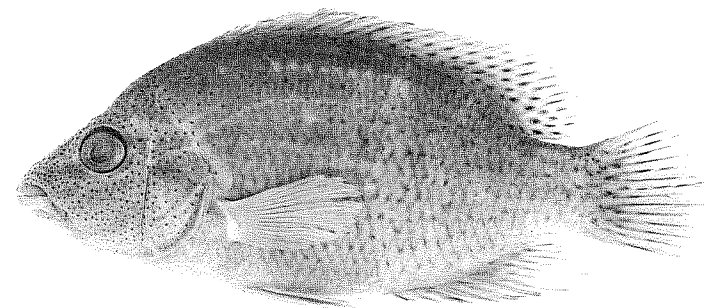


FIGURE 5.—*Cichlasoma pantostictum*, n. sp. Holotype, UMMZ 207699, non-gravid female, 79.5 mm SL, from Laguna de Chairel near Tampico, collected 29 December 1952. Photograph by E. C. Theriot.

it differs in having the entire body (except abdomen and ventral surface of head) covered with small, dark brown spots; longer basal lengths of dorsal and anal fins; and a shorter caudal peduncle. Although the anal spines predominantly number VI, one population of *C. labridens* also has a strong mode at VI (Table 2).

Material.—All specimens are from Tamaulipas, Mexico. Holotype, UMMZ 207699, a non-gravid female 79.5 mm SL, and 13 paratopotypes, UMMZ 170951 (8), 44-126 mm, KU 19112 (2), 81 and 85 mm, and TU 5640 (3), 55-115 mm, from Laguna de Chairel at the mouth of the Río Tamesí, Tampico, lat. 22° 15' N., long. 96° 04' W., elevation ca. 2 m, R. M. and J. H. Darnell and E. Liner, 29 Dec. 1952. Paratypes: UMMZ 157315 (1), 81 mm, Río Sabinas 9.6 km NE. of Gómez Farías, C. R. Robins and W. B. Heed, 8 Mar. 1949; UMMZ 164782 (1), 65 mm, Río Sabinas at Rancho Pico de Oro, 3.5 km NE. of Gómez Farías, R. M. Darnell, 30 Apr. 1951; UMMZ 192877 (1), 33 mm, Laguna de la Puerta along west side of hwy. 80 in Altamira, ca. 18 km NNW. of Tampico, R. M. Darnell, J. S. Balsano, D. R. Martinson, and M. W. Hostetter, 17 June 1968; UMMZ 207700 (3), 34-61 mm, and UMMZ 209431 (3), 23-45 mm, Laguna de Chairel at public swimming beach at west end of Calle Zapote, Tampico, J. N. Taylor, B. L. Brett, and D. Grosse, 15 Jan. 1979, and B. L. Brett, P. J. Monaco, and N. M. Burkhead, 28 Oct. 1981, respectively.

Description.—Body form and color pattern are shown in Figures 5-6 and proportional measurements in Table 3. Meristic data are given below.

Dorsal spines, XV(1), XVI(17), XVII(5); dorsal soft rays, 10(6), 11(15), 12(2); anal spines, V(3), VI(20); anal soft rays 7(3), 8(19), 9(1); pectoral rays (both fins counted in 23 specimens), 14(16), 15(30).

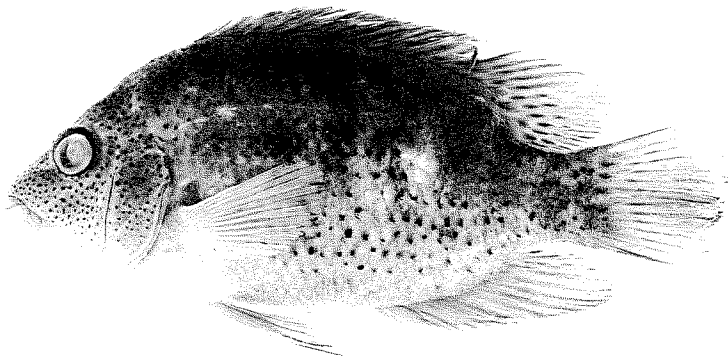


FIGURE 6.—*Cichlasoma pantostictum*, n. sp. Paratype, UMMZ 157315, immature, 80.7 mm SL, from Río Sabinas, collected 8 March 1949. Photograph by E. C. Theriot.

TABLE 3. Measurements of *Cichlasoma pantostictum* in per mille of standard length from Tamaulipas, Mexico (UMMZ 157315, 164782, 170951, 207699-700, 209431, KU 19112, TU 5640). Figures in parentheses are means. Measurements from a Río Sabinas specimen (=UMMZ 157315) are compared with those from the holotype in the two columns on the right.

Measurement	(n=9)	(n=12)	Holotype	UMMZ 157315
Standard length, mm	34.1-64.9(50.2)	78.0-126.3(89.4)	79.5	80.7
Predorsal length	422-459(438)	425-469(443)	429	425
Preanal length	644-701(675)	660-722(679)	664	682
Prepelvic length	393-433(419)	407-444(423)	420	413
Body depth	414-460(436)	424-519(469)	448	466
Head length	350-394(376)	352-393(370)	365	356
depth	311-350(333)	323-381(347)	325	341
Postorbital length	139-163(147)	139-161(148)	140	139
Snout length	111-138(125)	138-154(146)	138	139
Preorbital depth	44-75 (62)	75-96 (83)	75	78
Interorbital bony width	76-98 (86)	86-107 (95)	95	93
Orbit diameter	96-120(102)	78-94 (87)	86	89
Cheek depth	109-134(123)	129-150(140)	133	134
Mandible length	140-157(147)	138-155(147)	152	140
Upper-jaw length	97-109(103)	106-118(111)	113	113
Mouth width	70-100 (86)	87-110 (99)	87	93
Caudal-peduncle length	135-152(143)	138-156(146)	153	151
least depth	131-154(141)	141-162(152)	147	147
Dorsal-base length	543-584(562)	565-606(588)	582	606
Longest (=last) dorsal spine length	117-160(144)	141-169(156)	145	141
Anal-base length	233-259(248)	243-271(259)	255	259
Pectoral length	226-264(251)	244-284(263)	244	253
Pelvic length	227-268(249)	239-290(263)	254	255

Scales: lateral series, 28(5), 29(11), 30(4), 31(1); upper lateral line, 18(2), 19(9), 20(8), 21(2); lower lateral line, 7(2), 8(1), 9(8), 10(8), 11(1), 12(1); transverse series, 17(1), 18(11), 19(9); rows between soft dorsal base and upper lateral line, 2(11), 2 1/2(10); rows between anal base and upper lateral line, 9(9), 10(12); rows between pectoral and pelvic bases, 5(9), 6(12); rows around caudal peduncle, 16(2), 17(6), 18(7), 19(5), 20(1); scale rows on cheek, 5(3), 6(16), 7(2); overlap between upper and lower lateral lines, -4(1), -3(2), -2(3), -1(2), 0(5), 1(7), 2(1). Supplementary lateral lines present or absent.

Gill rakers on first arch: upper limb, 3(14), 4(9); lower limb, 7(9), 8(9), 9(5); total, 10(5), 11(8), 12(10).

Vertebrae: precaudal, 13(17), 14(4); caudal, 15(11), 16(8), 17(2); total, 28(7), 29(12), 30(2).

Body stout, depth approximately 2.0 to 2.5 in SL, increasing with age; head short, length usually much less than body depth over pelvic base; predorsal contour steep, barely convex in individuals <45 mm SL, straight to concave in larger specimens (no nuchal hump evident in specimens examined); prepelvic contour relatively long, straight or slightly convex, nearly horizontal. Greatest body depth under middle of spinous dorsal. Mouth moderate in size, horizontal; snout pointed; jaws approximately equal anteriorly. Preorbital narrow, its depth less than orbit diameter except in the two largest adults in which it is 1.1 to 1.2 times orbit. Premaxillary process not extending beyond anterior third of orbit. Gill rakers on first arch well-spaced, gradually decreasing in size anteriorly, those at junction of upper and lower limbs of first branchial arch broad, short and branched in large adults, more club-like in smaller individuals. Frenum weakly developed or absent. Caudal-peduncle length usually less than or equal to least depth (SL > 80 mm).

Dorsal-fin base long, originating above or slightly posterior to level of upper cleft of opercle; spines increasing in length rapidly to fourth or fifth, then more gradually to last, which is 0.40 to 0.45 head length in individuals >65 mm SL. Soft portions of dorsal and anal fins when laid back not reaching beyond anterior third of caudal fin, except when prolonged in adults. Pectoral fin rounded, asymmetric, equal to or greater than two-thirds head length, extending to or slightly beyond level of anus; pelvic fin usually extending to anal origin. Caudal rounded or subtruncate.

Jaw teeth moderately-spaced, conical, curved, with pointed tips, median teeth enlarged to form canines, each with a posterior cusp; central pair in upper jaw largest, flanked on each side by one or two smaller canines, then 8 to 12 non-caniniform teeth; central pair of canines in lower jaw usually slightly shorter than second pair, which are followed by 7 to 10 small, evenly-spaced, conical teeth.

Occlusal surface of lower pharyngeal plate with dentigerous portion 1.2 to 1.4 times broader than long (in seven individuals, 44-126 mm SL); 6 to 8 teeth in each of the two median rows, conical anteriorly, increasing in size posteriorly, the last 3 or 4 becoming enlarged and flattened to form distinct molars (penultimate usually largest); a similar pattern occurs in the two rows of teeth that flank the median pair, though the teeth are not so enlarged; both size of teeth and degree of flattening increase with SL.

Coloration.—Dorsum and head medium to dark brown (olive-brown in life), shading to medium brown on the flanks; breast and belly dirty white or tan. Entire body, except belly and underside of head, covered with dark brown spots; those on the head and nape are minute and spaced in a dense, regular pattern; on the

body, the spots are larger, less distinct in outline, and arranged in irregular rows, each spot situated at the base of a scale (Figs. 5-6). Interradial membranes of dorsal, caudal, and soft-anal fins are marked with dark spots and streaks (concentrated basally) in both juveniles and adults; the paired fins are hyaline or dusky. Specimens 25 to 35 mm SL display a faint, discontinuous, horizontal stripe, best developed as a series of 3 to 4 squarish blotches along the middle of the flank, and a vertical, oval spot at the caudal base; these markings fade with age and are scarcely visible or completely lacking in adults.

Specimens examined were collected between October and March, and none was found to have ripe gonads; therefore, nothing is known about the nature of breeding coloration in *C. pantostictum* at this time.

Habitat and Associates.—The new species is known from two coastal lagoons near Tampico and from the Río Sabinas in the Río Tamesí drainage (Fig. 1). Darnell (1962:318-319) described the exposed Laguna de Chairel, the type locality, as having a muddy shore, an estimated salinity variation from 1 to 4 ppt, water moderately turbid, no current, a mud bottom, and a depth to 2 m; he noted many beds of aquatic vegetation but also clear areas, and stated "shore conditions variable, including sedge mat, marsh, and mud beach." Our salinity reading at the end of Calle Zapote (public boat launch) was 0.5 ppt on 15 January 1979. At this time the water was fairly clear (visibility to 0.8 m), with some suspended algae, and was easily muddied; vegetation comprised *Eichornia*, *Azolla*, *Vallisneria*, sparse water lilies, and *Chara*; the water was 62°F (16.6°C) and air 67°F (19.5°C). The new species was collected from submerged weed beds in this lagoon in 1979 with a small seine.

The only other known records for the species are in the Río Sabinas northeast of Gómez Farías (see Darnell, 1962: Fig. 2), at Rancho Pico de Oro and farther upstream (UMMZ 164782 and 157315, respectively); only a single specimen was seined from each station. Darnell (1962:314) described the first station as comprising a backwater and pool, the water clear with moderate current along the margin, the bottom of sand, silt, mud and exogenous leaves, the depth up to 1 m, vegetation sparse, and the stream shaded by trees growing on a rocky beach. The current at the upper station was very slow, the bottom gravel and mud, vegetation was sparse (some algae, water plants, and a few pond lilies), the stream 1-3 m wide, and depth of capture 1 m (this collection was made at night).

Fishes recorded by Darnell (1962:318) and taken by Taylor *et al.* in 1979 from Laguna de Chairel included: *Dorosoma cepedianum*, *D. petenense*, *Anchoa mitchilli*, *Astyanax mexicanus*, *Lu-*

cania parva, *Gambusia affinis*, *G. panuco*, *Poecilia formosa*, *P. latipinna*, *P. mexicana*, *Caranx latus*, *Eucinostomus melanopterus*, *Cichlasoma cyanoguttatum*, *Mugil cephalus*, *M. curema*, *Dormitator maculatus*, and *Gobiomorus dormitor*. Fishes associated with the new species in Laguna de la Puerta included *Astyanax mexicanus*, both species of *Dorosoma*, *Strongylura marina*, *Cyprinodon variegatus*, *Gambusia affinis*, *Menidia beryllina*, *Cichlasoma cyanoguttatum*, and *Gobiomorus dormitor*.

In the Río Sabinas the following additional fishes were associated with *Cichlasoma pantostictum*: *Dionda erimyzonops*, *D. ipni*, *Notropis lutrensis*, *N. tropicus*, *Gambusia regani*, *G. vittata*, *Xiphophorus variatus*, and *Cichlasoma labridens*.

Comparisons.—At present, *C. pantostictum* is the only species of the *Parapetenia* group known from the coastal lagoons associated with the lower Río Pánuco-Tamesí near Tampico. In addition, two specimens of *C. pantostictum* (UMMZ 157315 and 164782, 80.7 and 64.9 mm SL, respectively) have been collected from the Río Sabinas, a tributary of the lower Guayalejo, north of Ciudad Monte in south-central Tamaulipas; measurements from the larger specimen are compared with those for the holotype in Table 3, and photographs of the two are shown in Figures 5-6. It is reasonable to expect that the species may occur in coastal lagoons and their tributaries south of Tampico at least as far as Laguna de Tamiahua.

Cichlasoma pantostictum appears to be most closely related to *C. labridens*, which occurs throughout the Río Pánuco system, except for the coastal lagoons at the mouth. The two species are presently known to occur sympatrically only in the Río Sabinas; however, further collecting efforts in the lower reaches of the Río Tamesí may well reveal greater distributional overlap. Common features in the two species are the presence of molariform teeth on the lower pharyngeal plates, weakly-caniniform jaw teeth, each with a posterior cusp, and a relatively short premaxillary process. In contrast to most samples of *C. labridens*, the new species usually has six anal spines and more gill rakers (see Table 2). Morphometrically, adult *C. pantostictum* tend to have longer dorsal-fin and anal-fin bases and a relatively shorter caudal peduncle than do adult *C. labridens* (Tables 1 and 3). In addition, the new species has a steeper dorsal profile, a slightly deeper body, the jaws about equal rather than the upper jaw projecting, and the mouth horizontal instead of angled downward anteriorly (Figs. 3-6). Finally, the two species differ markedly in color pattern. In *C. labridens*, "speckling," to the degree that it is developed, is almost always restricted to the nape and sides of the head and spots are not so densely concentrated as in *C. pantostictum*; in addition, individuals of all sizes usually exhibit conspicuous, dark markings

on the flank, and a diagnostic pattern is developed in breeding adults (Figs. 3-4). By contrast, the head, body and vertical fins (especially basally) are profusely speckled with dark spots in *C. pantostictum* (Figs. 5-6). Although lateral blotches and a caudal spot are developed in juveniles, such markings fade with age and are absent in individuals more than 70 mm SL.

Distribution.—The new species is known from two coastal lagoons in the lower Río Pánuco-Tamesí drainage near Tampico and from two stations in the Río Sabinas (tributary to Río Guayalejo of the Río Tamesí) near Gómez Farías, in Tamaulipas and extreme northeastern Veracruz, Mexico (Fig. 1).

Etymology.—The specific name is Latinized from the Greek word meaning spotted all over, in reference to the profuse, diagnostic spotting on the body.

Cichlasoma cyanoguttatum

Fig. 7

Herichthys cyanoguttatus Baird and Girard, 1854:25-26 (original description; type locality Brownsville, Texas). Girard, 1859:30, pl. 4, figs. 1-9 (re-description; material listed; syntypes=USNM 851, 852; range, by localities cited, =Devil's River, Texas, to Río San Juan, Nuevo León, Mexico). Regan, 1905:434-435, 445 (in key to *Herichthys*; synonymy; description; range).

Cichlasoma cyanoguttatum, Meek, 1904:206, 215 (in key; synonymy; range; description; sexual dimorphism). Darnell, 1962:343-347 (synonymy; range; habitat; abundance; food and feeding habits; behavior; functional morphology; probably begins to spawn in June in Río Tamesí basin). Reséndez, 1970:131, fig. 48 (Arroyo de Cucharas, trib. to Laguna Tamiahua; measurements, counts, coloration; salinity 13.2 ppt.).

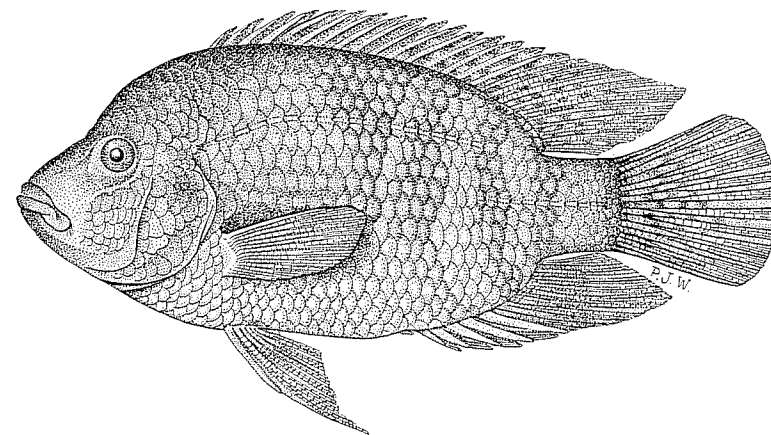


FIGURE 7.—*Cichlasoma cyanoguttatum*, holotype of *Neetroplus carpintis*, CAS (SU) 6162, 184 mm TL, from Laguna del Carpinte near Tampico; redrawn by Patricia J. Wynn from original drawing by Chloe Leslie Starks.

This species, a member of the *Herichthys* group (recognized as a genus by Regan, 1905, but placed in *Cichlasoma* by Meek, 1904), includes the nominal species *Heros pavonaceus* Garman, *Neotroplus carpintis* Jordan and Snyder, *Heros teporatus* Fowler, and *Cichlasoma laurae* Regan (LaBounty, 1974). It is easily distinguished from all other Río Pánuco cichlids by the shape of the outer jaw teeth, which are incisor-like distally (varying from spatulate to chisel-like in *Herichthys*), as indicated in the key.

Diagnosis.—A moderately deep-bodied species of the *Herichthys* group distinguished from other members of the group by the following combination of traits: dorsal elements XV-XVII, (9) 10-12, anal V-VII, (8) 9-10; gill rakers (total) on first branchial arch (9) 10-12; mouth relatively small, jaws approximately equal; pharyngeal dentition variable, posterior teeth in median rows ranging from enlarged, but bluntly conical, to conspicuously flattened to form molars; caudal peduncle short, length usually less than depth; a series of 5 or 6 (rarely 4) lateral blotches (first on mid-flank, most prominent), usually co-occurring with (faint) crossbars, and a dark spot at base of caudal fin.

Because we have not studied variation in this widely ranging cichlid, no description is presented, especially since the status of the samples of *Herichthys* between the Pánuco basin and the Río Misantla is unclear. The record (Evermann and Goldsborough, 1902:157) of this species from Tabasco, Mexico (in the Río Usumacinta basin), was based on *Cichlasoma heterospilum* Hubbs (1936:255).

Distribution.—*Cichlasoma cyanoguttatum* occurs from the Rio Nueces drainage, in southwestern Texas, and from the Rio Grande (Río Bravo del Norte) in Texas (including the lower Pecos River drainage) and Mexico (Coahuila, Nuevo León, and Tamaulipas) southward to the Río Pánuco basin (including the montane Río Frío-Gallinas); possibly it also inhabits coastal streams south to Río Misantla, which lies just south of the Río Nautla, Veracruz. Recently introduced into the upper Río Verde basin (La Media Luna region).

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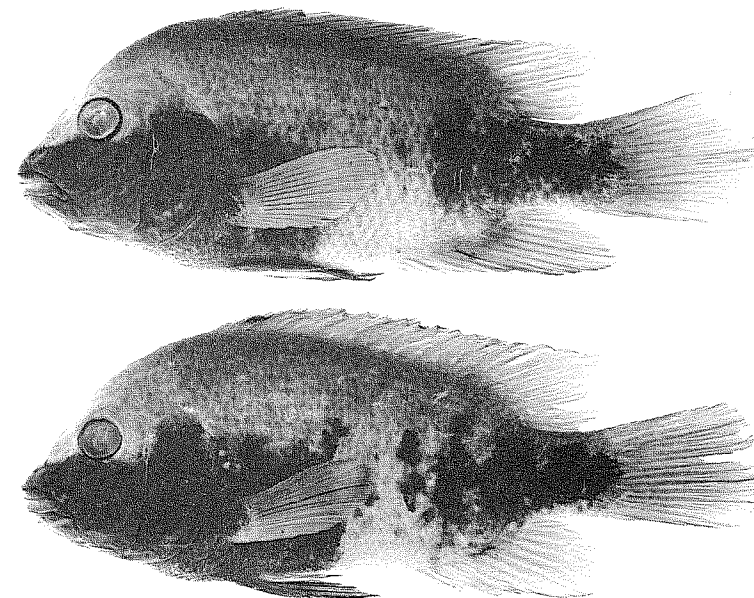
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ERRATA SHEET

for

CICHLID FISHES (GENUS *CICHLASOMA*) OF THE RIO PANUCO BASIN, EASTERN MEXICO, WITH DESCRIPTION OF A NEW SPECIES. By Jeffrey N. Taylor and Robert Rush Miller. Univ. Kansas Mus. Nat. Hist. Occ. Paper, 104: 1-24. August 1, 1983.

Page 7. Replace Figure 3 with the following (caption remains the same):



Page 10. Replace Figure 4 with the following (caption remains the same):

