

New Species of *Haemulon* (Teleostei: Haemulidae) from the Northeastern Brazilian Coast

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Haemulon squamipinna n. sp. is described from the northeastern Brazilian coast. It is distinguished from its congeners by the combination of the presence of 10-12 yellow stripes on the body (the broadest midlateral) a black blotch below the lower edge of the preopercle, and scales covering more than three-quarters of the pectoral fins. *Haemulon squamipinna* occurs in the depth range of 2-30 m. At depths below 10 m, during the day, adults form schools which may number in the thousands.

Haemulon squamipinna n. sp. é descrita da costa do Nordeste do Brasil. Ela se distingue dos seus congêneres pela combinação da presença de 10-12 faixas amarelas, a mais larga sendo a média, uma mancha negra sob a margem inferior do preopérculo e escamas cobrindo mais que tres quartos das nadadeiras peitorais. *Haemulon squamipinna* ocorre entre 2 e 30 m de profundidade. Em profundidades maiores que 10 m, durante o dia, os adultos formam cardumes nos quais o número de individuos pode chegar a milhares.

THE genus *Haemulon*, as presently defined, is comprised of 16 species commonly known as scaled-fin grunts. Fourteen of these are known from the western Atlantic, one of them also occurring on the Pacific Coast of Central and South America. The two remaining species occur in the eastern Pacific (Courtenay, 1961; Randall, 1996). The genus is mainly characterized by having the rays of the second dorsal and anal fins obscured by scales, second anal spine enlarged, generally larger and longer than the third, and inside of mouth commonly bright with red or scarlet in life (Jordan and Swain, 1885; Arnov, 1952; Robins et al., 1986).

In this paper, we describe a new species of *Haemulon* from the reefs of the northeastern Brazilian Shelf, where it is rather common. Despite its abundance, this species was not reported by previous authors who worked in the area (Starks, 1913; Roux, 1973; Rosa, 1980). The description below is part of a broader study of northeastern Brazilian reef fishes.

MATERIALS AND METHODS

Specimens were collected with SCUBA, using fish nets or spear, and with hook and line. Counts and measurements followed the methods described by Courtenay (1961). Measurements were made with dial calipers and recorded to the nearest 0.1 mm. Standard lengths are expressed as SL. Unless stated otherwise, all lengths are SL.

Institutional abbreviations follow Leviton et al. (1985), except for UFPB (which refers to Universidade Federal da Paraíba). Type specimens were deposited at UFPB, MZUSP and USNM.

KEY TO THE WESTERN ATLANTIC SPECIES OF *HAEMULON* [modified from Courtenay (1961) to include *H. squamipinna* and *H. boschmae*] follows:

- 1a. Dorsal spines 13 (12 + 1) 2
- 1b. Dorsal spines 12 (11 + 1) 4
- 2a. Scales around caudal peduncle 22; gillrakers 24 to 28; anal rays usually 9 *aurolineatum*
- 2b. Scales around caudal peduncle 24 or more, usually 26; gillrakers 27 to 36; anal rays 7 or 8 3
- 3a. Scale rows below lateral line oblique; silvery gray with five dusky yellow stripes, the two lowermost the broadest *striatum*
- 3b. Scale rows below lateral line mostly horizontal; yellow to greenish on back, silvery on sides, with four brown to bronze stripes on upper half of body and a large black spot at caudal base *boschmae*
- 4a. Pectoral fins not scaled 5
- 4b. Pectoral fins scaled to at least one-third their length 14
- 5a. Exposed portions of scales above pectoral fin base much higher than wide *flavolineatum*
- 5b. Scales above pectoral fin base normal, not greatly elongated vertically 6
- 6a. A dark stripe along side of dorsum adjacent to base of fin, which then courses across upper side of peduncle and sends a leg out on each caudal lobe *melanurum*
- 6b. Body not marked as in *H. melanurum* 7
- 7a. Scales around caudal peduncle 23 or more; scales below lateral line 13 or 14, usually 14 8
- 7b. Scales around caudal peduncle 22 or fewer; scales below lateral line 11 to 13, usually 12 9
- 8a. Black blotch beneath free edge of preoper-

- cle absent; body generally without stripes following scale rows, but when present formed by spots in center of each scale; eye small; pectoral rays 18 or 19 *album*
- 8b. Large black blotch beneath free edge of preopercle; body striped, stripes on scale rows running through each scale; pectoral rays usually 17 or 18 *steindachneri*
- 9a. Dorsal rays 13, rarely 12 or 14; mouth short, nearly always 11% or 12% of standard length *chrysargyreum*
- 9b. Dorsal rays 14 or more; mouth larger, from 14% to 21% of standard length 10
- 10a. Scales above lateral line larger than below and in five oblique rows; head with numerous dark stripes *plumieri*
- 10b. Scales of equal size above and below lateral line 11
- 11a. Gillrakers 26 or fewer; dorsal rays 15 or 16; anal rays usually 8 12
- 11b. Gillrakers 26 or more; dorsal rays 17 or 18; anal rays usually 9 13
- 12a. Lateral line scales 45 to 48; gillrakers 19 to 23; scale rows below lateral line oblique; bluish silver with about 18 blackish yellow oblique stripes on body *bonariense*
- 12b. Lateral line scales 49 to 51; gillrakers 23 to 25; scale rows below lateral line mostly horizontal; bluish silver on back, silver on sides; narrow yellow to bronze stripes on body *carbonarium*
- 13a. Pectoral rays 17 or 18, usually 18; mouth large; lateral line scales 50 to 52; silvery gray with dark stripes on upper half of body *macrostomum*
- 13b. Pectoral rays 16 or 17, usually 16; lateral line scales 48 to 51; body yellow with blue stripes *sciurus*
- 14a. Dorsal rays 16 to 18; lateral line scales 47 to 49; gillrakers 21 to 24, usually 23; predorsal distance 41 to 49% in SL; preanal distance 68 to 75% in SL; snout length 13 to 16% in SL; body silvery white with thin black stripes formed by spots in center of scales above lateral line; dark fins *parra*
- 14b. Dorsal rays 14 to 15; lateral line scales 50 to 54; gillrakers 24 to 27, usually 26; predorsal distance 37 to 40% in SL; preanal distance 61 to 67% in SL; snout length 9 to 12% in SL; body silvery white with 10 to 12 bright yellow stripes, the broadest midlateral; yellow fins *squamipinna*

Haemulon squamipinna, n. sp.

Yellow Grunt

(Portuguese name: Xira amarelo)

Figure 1A–B, Table 1

Holotype.—UFPB 3512 (1), 114.9 mm, Atlantic Ocean off Brazil, Paraíba, João Pessoa, Wreck of "Erie J.N.Y.," 07°05'106"S 35°44'802"W, 16 m, 10 May 1996, L. A. Rocha (LAR).

Paratypes.—UFPB 3370 (3), 97–109.8 mm, Paraíba, Jacumã, 15 m, 29 December 1995, LAR. UFPB 3364 (3), 52.5–74.2 mm, Paraíba, João Pessoa, Picãozinho, 2 m, 24 March 1996, LAR. UFPB 3510 (22), 65–125.5 mm, Paraíba, João Pessoa, Wreck of "Erie J.N.Y.," 16 m, 10 May 1996, LAR. UFPB 3511 (3), 92.6–136.9 mm, Paraíba, Cabedelo, 06°58'566"S, 34°46'883"W, 14 m, 19 May 1996, LAR. USNM 342004 (5), 98.6–134.2 mm, Paraíba, Cabedelo, 06°58'566"S, 34°46'883"W, 14 m, 19 May 1996, LAR. MZUSP 51115 (5), 104.7–128 mm, Paraíba, Cabedelo, 06°58'566"S, 34°46'883"W, 14 m, 19 May 1996, LAR.

Diagnosis.—*Haemulon squamipinna* is distinguished from all other species of *Haemulon* by the following combination of characters: a black blotch below the free edge of the preopercle; pectoral fins entirely scaled, except along edge; scale rows below lateral line parallel to long axis of body; lower half of head silvery white, lacking stripes; fins yellow; body silvery white with 10–12 yellow stripes, the midlateral the broadest.

Description.—SL 52.5 to 136.9 mm. Fin ray counts and measurements for the holotype and 41 paratypes are given in Table 1. Dorsal rays XII, 14–16 (usually 15); anal rays III, 9 (rarely 8); pectoral rays 16–18 (usually 17); lateral line scales 51–54; scales above lateral line 6; scales below lateral line 12–13 (rarely 13); scales around caudal peduncle 21–22 (rarely 23); gillrakers on the first arch 24–27 (usually 26).

Body moderately deep. Mouth low on head and relatively large, posterior margin of upper jaw usually reaching a vertical under center of eye. All teeth conical but none developed as prominent canines; no teeth on vomer or palatines. Opercle scaled; margin of preopercle serrate. Snout comparatively short, its length approximately equal to eye diameter. Pectoral fins entirely covered with scales, except along edge. Pelvic fins completely scaled. Scales below lateral line on pectoral region not enlarged. Scale rows below lateral line parallel to long axis of body.

Color in life.—Body silvery white, with 10 to 12 yellow stripes, the one through eye widest, running from tip of snout to caudal peduncle. Stripes above the midline forming pattern of three fine lines alternating with two wide stripes. Four to six thin stripes on lower half of body, the one immediately below midline widest. Fins yellow except for translucent lower half of pectorals and white spine of pelvics. Lower half of head silvery white, lacking stripes. A



Fig. 1. (Top) Holotype of *Haemulon squamipinna* n. sp. UFPB 3512. (Bottom) Underwater photo of *Haemulon squamipinna* n. sp. at Erie Wreck, off João Pessoa, PB, Brazil.

black blotch beneath free edge of preopercle. Inside of mouth bright red.

Color in alcohol.—Mainly pale brown with indications of a darker middle stripe, and two others on upper half of body. Prominent black blotch beneath free edge of preopercle.

Habits.—*Haemulon squamipinna* typically occurs in reefs, at depths of 2–30 m, where it forms large schools during the day. The smaller schools, with less than 100 individuals, mostly juveniles, were seen on shallow reefs (2–6 m), whereas larger ones, with thousands of individuals, were observed in deeper waters (10–30 m).

TABLE 1. MEASUREMENTS AND COUNTS FOR THE HOLOTYPE AND 41 PARATYPES OF *Haemulon squamipinna* n. sp., 28 SPECIMENS OF *H. aurolineatum*, 37 OF *H. flavolineatum*, AND 10 OF *H. parra*.

Characters	<i>Haemulon squamipinna</i>			<i>H. aurolineatum</i>			<i>H. flavolineatum</i>			<i>H. parra</i>		
	Paratypes (n = 41)			(n = 28)			(n = 37)			(n = 10) and from Courtenay (1961)		
	Holotype	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	
Morphometrics												
Standard length	114.9	52.5-136.9	96.7	54.7-152	82.2	51.2-176.5	146.3	30.2-124.6	72.4	30.2-124.6	72.4	
Total length	142.5	65-179.2	125.4	68.9-158	93.4	63.5-200.4	162.4	43.3-142.8	91.2	43.3-142.8	91.2	
Body depth (% SL)	35.8	31.6-38.4	35.2	27-38	33.8	36-40	38.8	33-38	35.6	33-38	35.6	
Head length (% SL)	34.7	32.2-35.9	34.6	32-38	35.6	35-39	38.4	35-39	36.9	35-39	36.9	
Upper jaw length (% SL)	17.4	13.5-17.7	16.2	15-23	17.4	14-16	15.3	14-16	15.2	14-16	15.2	
Snout length (% SL)	11.4	9.7-12.6	11.2	11-17	13.8	13-16	14.3	10-15	13.6	10-15	13.6	
Eye diameter (% SL)	11.3	9.6-2.4	11.4	9.1-12.1	10.1	9.2-13.4	12.2	9.1-12.1	10.0	9.1-12.1	10.0	
Predorsal length (% SL)	40	37.5-40.6	39.2	37-43	40.2	41-47	49.8	40-46	41.4	40-46	41.4	
Precanal length (% SL)	65.9	61.6-67.7	66.1	67-74	70.7	68-75	72.3	65-75	71.8	65-75	71.8	
Counts												
Dorsal spines	XII	XII	XII	XIII	XIII	XII	XII	XII	XII	XII	XII	
Dorsal rays	15	14-15	14.8	14-16	14.8	16-19	17.5	14-15	14.7	14-15	14.7	
Anal spines	III	III	III	III	III	III	III	III	III	III	III	
Anal rays	9	8-9	8.9	7-9	8.8	8-9	8.1	7-8	7.9	7-8	7.9	
Pectoral rays	17	16-18	16.8	16-18	17.3	16-17	17	16-17	16.2	16-17	16.2	
Lateral line scales	52	50-54	52.5	49-52	51.3	47-50	48.6	47-50	48.8	47-50	48.8	
Scales above lateral line	6	6	6	6	6	6	6	6	6	6	6	
Scales below lateral line	12	12-13	12.1	11-13	12.1	12	12	9-10	9.1	9-10	9.1	
Circumpeduncular scales	22	20-23	21.6	22	22	21-22	21.9	22	22	22	22	
Gillrakers in first arch	26	24-27	25.8	24-28	26.1	21-24	23.1	20-25	22.7	20-25	22.7	

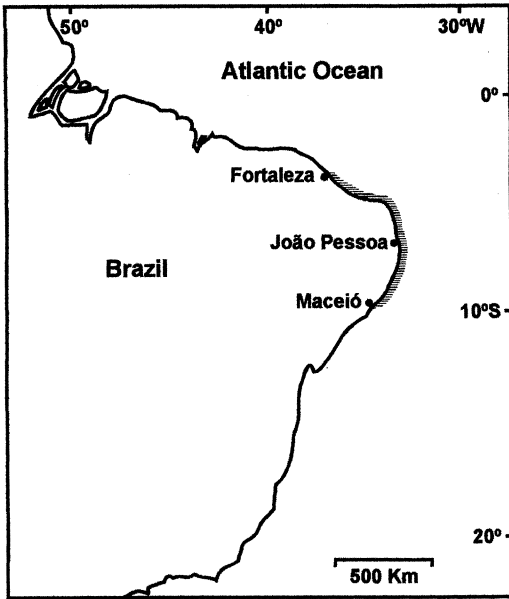


Fig. 2. Distribution of *Haemulon squamipinna* n. sp. (shaded area) along Brazilian Coast.

No schools were seen at night, when grunts are known to disperse to feed.

Distribution.—Known from reefs off Fortaleza (3°42'S, 38°31'W), State of Ceará, to the coast of Maceió, (9°45'S, 35°44'W), State of Alagoas (Fig. 2).

Comparisons.—*Haemulon squamipinna* and *H. parra* are the only *Haemulon* species that have scales on pectoral fins, but they differ in body color pattern (white with black markings and no stripes in adult *H. parra*), in the number of soft dorsal fin rays (16–19 in *H. parra*), in the number of lateral line scales (47–50 in *H. parra*), and in the number of gillrakers (21–24 in *H. parra*). Fin ray counts and measurements for *H. parra* are given in Table 1.

The color pattern of *H. squamipinna* resembles *H. aurolineatum*, and occasionally the two species form mixed schools. Their main differences are the number of dorsal fin spines (13 in *H. aurolineatum*), fin color (translucent in *H. aurolineatum*), number of yellow stripes (seven to eight in *H. aurolineatum*), and absence of the black blotch beneath free edge of preopercle in *H. aurolineatum*. Fin ray counts and measurements for 28 specimens of *H. aurolineatum* are given in Table 1.

Haemulon boschmae, a grunt with parallel brown to bronze stripes on body, can be distinguished from *H. squamipinna* by having only

four stripes, a large black spot at caudal base, and 13 (rarely 14) dorsal spines. The yellow fins and parallel stripes of *H. squamipinna*, resemble *H. chrysargyreum*, but the latter species, besides lacking scales on the pectoral fin, has fewer dorsal fin rays (13) and more gillrakers (30–33) than *H. squamipinna*.

Haemulon flavolineatum differs from *H. squamipinna* in having oblique scale rows below lateral line making up a pattern of oblique yellow stripes, in the number of anal fin rays (7 to 8), and in the number of gillrakers (20 to 25). Fin ray counts and measurements for 37 specimens of *H. flavolineatum* are given in Table 1.

Other *Haemulon* species possessing parallel yellow stripes are *H. carbonarium*, *H. melanurum*, and *H. striatum*, but none of them possesses yellow fins. Furthermore, *H. carbonarium* is distinct by its narrower stripes on body and by having fine lines on lower half of head; *H. melanurum* can be easily separated from *H. squamipinna* by having a sharp black demarcation from front of dorsal fin to lower center of caudal rays; and *H. striatum* has a shallower body (26–32% SL) and no yellow stripes on belly. The remaining *Haemulon* species (*H. album*, *H. bonariense*, *H. macrostomum*, *H. plumieri*, *H. sciurus*, and *H. steindachneri*) have distinct color patterns, without yellow stripes, or with an entirely different pattern of stripes.

Etymology.—From the Latin *squama* (scale) and *pinna* (fin), an allusion to the scaled pectoral fin of the species. To be treated as a noun in apposition.

MATERIAL EXAMINED

Haemulon aurolineatum: Brazil: UFPB 0565 (07), UFPB 3508 (1), UFPB 3509 (1); UFPB 0072 (7). Florida: USNM 185359 (01), USNM 315757 (02). South Carolina: USNM 325835 (01). Bermuda: USNM 330047 (06). Belize: USNM 300524 (01). Tobago: USNM 319211 (01).

Haemulon chrysargyreum: Brazil (Atol das Rocas): UFPB 3140 (01), (Fernando de Noronha): USNM 342005 (04). St Lucia: USNM 41314 (01). Tobago: USNM 319005 (100), USNM 319212 (04), USNM 319213 (04).

Haemulon flavolineatum: Florida: USNM 53395 (04), USNM 143741 (01). Bermuda: USNM 178664 (13). Cozumel: USNM 37086 (06). Panama: USNM 80608 (01). Haiti: USNM 89606 (01). Anguilla: USNM 183514 (01). Belize: USNM 198809 (08). Tobago: USNM 319206 (02).

Haemulon parra: Brazil: UFPB 3498 (01). Florida: USNM 339818 (02), USNM 339819 (02). Cuba: USNM 331929 (04). Panama: USNM 80568 (01)

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