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Two new records of uncommon deep-sea perciform fishes from the Southwestern Atlantic

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Abstract

This is the third in a series of reports describing new or rare records caught with circle hooks, a method only recently being employed in exploratory fishing in Brazilian deep waters. Here we report the presence of one family and two species of perciform fishes new to, or never formerly reported from, Brazilian waters: the longfin escolar, *Scombrolabrax heterolepis* (Scombrolacidae), and the extremely rare ocean bass *Verilus sordidus* (Acropomatidae). The specimens were collected in outer shelf and slope areas at depths between 300 and 500 meters. Given the rarity of the species reported herein, we also provide an updated diagnosis for each species. We also discuss the need of adequate reports when new records are added to such a large ocean area as the Southwestern Atlantic.

Key words: *Scombrolabrax, Verilus,* Acropomatidae, Scombrolabracidae, deep-sea fishes, Brazil

Introduction

In the last decade, a steady increase of new records of marine fishes along the Brazilian coast has been observed. During this time, 38 new species were described and 11 revalidated, while at least another 40 species likely represent undescribed species and several works dealing with them are in preparation. In the same period dozens of described species were also added to the Brazilian fauna due to an increase of scientific expeditions and surveys, mainly the REVIZEE Program and the PROJETO TAMAR (e.g. Bernardes *et al.*, 2005; Caires *et al.*, 2008; Campos *et al..*, 2009; Carvalho-Filho *et al.*, 2009, 2010-A, 2010-B; Melo, 2009; Melo *et al..*, 2009; Mincarone *et al.*, 2008; Rotundo & Vaske, 2009; Santos *et al..*, 2009).

The Scombrolabracidae is the only family that belongs to the perciform suborder Scombrolabracoidei, and has one single, marine, almost worldwide species, *Scombrolabrax heterolepis* Roule, 1921 (Nelson, 2006). The peculiar and unique swim bladder of the adults supports the placement of this monotypic species and family in a unique suborder (Bond & Uyeno, 1981). To date no adult specimens were ever formerly reported from Brazilian waters or the Western South Atlantic. Several larval and adult specimens collected off the Brazilian coast are deposited in institutions around the world and discussed below. The records formerly reported in this paper confirm the presence of the species in Brazil.

The ocean bass, *Verilus sordidus,* belongs to the usually deep-sea, pelagic, tropical to subtropical marine family Acropomatidae (Perciformes, Percoidei), which contains seven genera and 32 species (Heemstra, 2010) or eight genera and about 33 species depending on the classification used (Nelson, 2006). Several genera placed in Acropomatidae by Nelson (1994) are now recognized in other families (Polyprionidae and Symphysanodontidae; Nelson, 2006, and Howellidae; Froese & Pauly, 2010). The family had only three species reported from Brazil, all of the genus *Synagrops: S. bellus* (Goode & Bean, 1896), *S. spinosus* Schultz,

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1940, and *S. trispinosus* Mochizuki & Sano, 1984 (Moura & Menezes, 2003, Lopes *et al.*, 2003). The record herein of *Verilus sordidus* from Bahia presents not only a new genus and species for the Brazilian marine fish fauna and the Southwestern Atlantic, but also extends the range of the species by about 3,800 km southwards in a straight line and about 4,600 km along the South American coastline.

Material and methods

Measurements of fishes were taken with a digital caliper to the nearest hundredth of a millimeter (mm); measurements between 150 mm and 300 mm were taken with a manual caliper to the nearest tenth of mm. For fish weight we used a hand-scale to tenths of kilograms; for stomach contents and gonads, an analytical digital precision scale with an error of 0.001 g was used. Digital pictures were taken of the examined specimens. For further details about fishing sets, circle hooks and the research program that has been carried out by the TAMAR aiming to evaluate the circle hook´s efficiency in pelagic longline fisheries, see Carvalho-Filho *et al.* (2009). Institutional abbreviations follow Sabaj Pérez, 2010.

Scombrolabrax heterolepis: Specimens deposited in the following institutions under collection numbers: TAMAR 030 (1 ex, female: 238.9 mm SL), 12º 39´911"S – 37º 54´302"W, Brazil, Bahia, São João da Mata, Praia do Forte, collector G. Marcovaldi, depth about 350 m, 11 December 2008; MNRJ 33607 (1 ex:117.6 mm SL), oceanographic research vessel Thalassa, Station E-0499 (13º20´872"S–38º35´922"W),off Bahia, Brazil, Revizee program, collector G. Nunan, depth about 761 m, 06 June, 2000; MNRJ 33608 (1 ex: 95.1 mm SL), oceanographic research vessel Thalassa, Station E-0522 (13º29´472"S–38º37´943"W),off Bahia, Brazil, Revizee program, collector G. Nunan, depth about 1143 m, 21 June, 2000; MNRJ 33609 (6: 102.4-131.6 mm SL) oceanographic research vessel Thalassa, Station E-0523 (19º42´685"S–38º36´961"W),off Espirito Santo, Brazil, Revizee program, collector G. Nunan, depth about 922 m, 27 June, 2000; MNRJ 33610 (1 ex: 163.6 mm SL) oceanographic research vessel Thalassa, Station E-0524 (19º42´684"S–38º44´568"W),off Espirito Santo, Brazil, Revizee program, collector G. Nunan, depth about 924 m, 27 June, 2000; MNRJ 33611 (1 ex: 210.0 mm SL) oceanographic research vessel Thalassa, Station E-0528 (19º47´581"S–38º59´827"W),off Espirito Santo, Brazil, Revizee program, collector G. Nunan, depth about 1237 m, 29 June, 2000; MNRJ 33612 (1 ex: 151.3 mm SL) oceanographic research vessel Thalassa, Station E-0535 (19º56´087"S–39º35´408"W),off Espirito Santo, Brazil, Revizee program, collector G. Nunan, depth about 1001 m, 01 July, 2000.

Verilus sordidus: Specimens deposited in the following institutions under collection numbers: TAMAR 006 (1 ex, male: 232.2 mm SL), 12º 39´911"S – 37º 54´302"W, Brazil, Bahia, São João da Mata, Praia do Forte, collector G. Marcovaldi, depth about 430 m, 18 May 2006. UFBA 02818 (1 ex, male: 233.3 mm SL), Brazil, same data as above.

Results and discussion

Scombrolabracidae

***Scombrolabrax heterolepis* Roule, 1921.**
(Plate 1)

Longfin escolar, Black mackerel (English); Grilo-Preto (Portuguese, Brazil); Escolarín (Spanish, Spain).

On December 11, 2008, a small "gempylid" was caught by the TAMAR. The fish was caught 10 miles off Praia do Forte, (12º39´911"S; 37º54´302"W), Mata de São João, Bahia, Brazil, at 350 meters, with an electric reel, circle carbon steel hooks n. 12/0, 0.60 multifilament line, 01 kg sinker, and sardines (*Sardinella* spp.) as bait. It was a mature female which measured 239 mm SL. A photograph was taken and the fish preserved. Eleven other specimens were collected off Bahia and Espírito Santo in 2000, in an oceanographic survey aboard the French oceanographic research vessel Thalassa, to provide data to the Brazilian Program

REVIZEE; the specimens are deposited at the MNRJ and were also examined by us. The meristic and morphometric data of all specimens examined, and that of selected literature, are displayed in Table 1.A–B.

TABLE 1-A. *Scombrolabrax heterolepis.* Meristic data of adults.

Counts	Roule (1921)	Grey (1960)	Fujii (1983)	Cervigón (1996)	Present Study
Number of specimens	1	1	5	1	12
Dorsal fin spines and rays	XII + I, 14	XII + I, 14 or 15	XII + I, 14–15	XII + I, 14	XII + I, 14–15
Anal fin spines and rays	14 or 15*	II,18	III, 16–18	III, 15	III,15–17
Pectoral fin rays	17	18	18–19	20	18
Lateral line scales	48–50	44–46	46–50	46	47–50
Lower gill rakers	-	4	5-6	6	4–6

*: No spines mentioned.

TABLE 1–B. *Scombrolabrax heterolepis.* Selected proportional measurements in rounded percentage of SL.

	McEachran & Fechhelm* (2005)	Grey (1960)	Cervigón (1996)	Present Study
Number of specimens	No mentioned	1	1	12
Head Length	34–35	34	34	30–34
Snout Length	09–11	09	08	09–10
Eye diameter, horizontal	09–10	10	11	08–11
Upper jaw length	16–17	16	15	13–15
Depth	24–25	24	29	22–24
Predorsal length	40–43	40	--	38–39
Preanal length	--	68	--	67–73
Pectoral fin length	30–36	35	36	31–37
Pelvic fin length	14–15	13	14	10–13
2nd. dorsal fin base	--	16	--	15–18
Anal fin base	--	19	--	19–22

* No original data; data of several authors, including juveniles and larvae.

Diagnostic characters. Based on examined specimens and literature (Roule, 1921; Grey, 1960; Bond & Uyeno, 1980; Fujii, 1983; Nakamura, 1991; Cervigón, 1996; Nakamura & Parin, 2002; McEachran & Fechhelm, 2005) (Table 1.A & B). Our data wide the range of some counts and body proportions.

Body moderately elongate and compressed; head large, the interorbital region flat; eye very large, its diameter almost as long as the conical snout; mouth large, terminal, the upper jaw protractile, the lower projecting slightly beyond the upper; teeth in upper jaw in a row of small to moderate, compressed canines, with one or two very large, stout canines on either side of symphysis; teeth of lower jaw larger than those of upper, but none large canine present; first gill arch lower limb with 4 or 6 well developed denticulate gill rakers, one of them at the angle, and the upper limb with about 10 clusters of minute spines; opercle with two flat spines on posterior border. Two dorsal fins, the first with 12 spines and almost continuous with the second that has 1 spine and 14 or 15 soft rays; base of first dorsal fin almost twice the base of the second; anal fin with 2 or 3 spines and 15–18 soft rays, opposite and similar to second dorsal fin; caudal fin forked, moderately small; pectoral fin very long with 17–19 rays and almost reaches the anal fin origin; pelvic fin below origin of pectoral fin. Scales cycloid, irregular in size and shape and very deciduous; lateral line high on body, running close to the dorsal profile, ending slightly before the end of the second dorsal fin, and with 44–50 large, not deciduous scales. Vertebrae 30, 13 precaudal and 17 caudal. The gas bladder of adult specimens has bubblellike evaginations that fit into large lateral swellings with hollows (bullae) of the 5th to 12th vertebral

parapophyses, a unique character among fishes. Color dark brown to grayish brown, the fins darker and the mouth lining black. Grows to about 30 cm SL.

FIGURE 1. *Scombrolabrax heterolepis*. A. TAMAR 030, female, 238.9 mm SL. B. MNRJ 33610 , 163.6 mm SL. C. Close-up of upper fangs of the TAMAR specimen.

Range. Atlantic, Pacific and Indian Oceans, in tropical and subtropical waters between 100 and 1,374 m of depth. According to several authors (e.g. McEachran & Fechhelm, 2005; Froese & Pauly, 2010) it wouldn´t occur in the Eastern Pacific and Southeastern Atlantic, but its presence there is well documented off the west coast of South America, at about 21ºS and 80ºW, and with a sample from Easter Island deposited at the Museo Nacional de Historia Natural de Chile (MNHNC P. 6415) (Melendez *et al.*, 1993; Parin, 1986; Parin *et al.* 1997; Evseenko at al. 2004). In the Atlantic, it has been collected at sites very close to the African coast as MCZ 84369 (20º2´S and 6º59´W) and RUSI 48874 (off West Coast, SE Atlantic, Cape Province, South Africa), and probably also occurs in the southeastern Atlantic as well (http://collections.mcz.harvard.edu/Fish/FishSearch.htm and Anonymous, 2000-A).

In the Western Atlantic it occurs from Canada to, at least, southern Bahia, in Brazil, including the Gulf of Mexico, Bermuda, the Bahamas, Caribbean, Lesser Antilles, Venezuela, French Guiana and Suriname (Coad, 2008; McEachran & Fechhelm, 2005; Costa *et al.*, 2007; Fujii, 1983; Cervigón, 1996; Nakamura & Parin, 2002; Smith-Vaniz *et al.*., 1999).

Previous records from the Southwestern Atlantic. According to the ISH collection (Anonymous, 2000-B), the MCZ collection (http://collections.mcz.harvard.edu/Fish/FishSearch.htm) and Costa *et al.*. (2007), several specimens of the longfin escolar were collected off the Brazilian Coast since 1966. No work dealing with it had ever being published other than simple listing of the species and not formerly reporting it from the area and widening its range. Costa *et al.* (2007) report the capture of the specimens deposited at the MNRJ,

from the Abrolhos Bank, off Bahia coast, between 922 and 1374 m, and list them amongst one of the most abundant species (*Scombrolabrax "heterurus"* in the text), a novelty for the adults elsewhere in the world. Parin *et al.*, 1995, reported this species from the Rio Grande Rise.

Nomenclature note. Several authors consider the year of Roule´s description as 1922 (e.g. Grey, 1960; Potthoff *et al..*, 1981; Fujii, 1983; Parin, 1986 and 1990; Melendez *et al..*, 1993; Santos *et al..*, 1997; Richards, 2006) while others consider 1921 (Boschung, 1992; Smith-Vaniz *et al..*, 1999; McEachran & Fechhelm, 2005; Froese & Pauly, 2010). The very first description of the species comes in 1921 followed in the next year by another article, in a different journal (see References). So the correct date for the first description is 1921, not 1922.

Proposed Brazilian name. "Grilo-preto", meaning "black cricket" in Portuguese. This name is adopted by the local fishermen due to its color and morphological resemblance with the Gempylidae "Grilo-branco" (white cricket), *Neopinnula americana* (Grey, 1953), another uncommon, silvery-white fish, collected at their main research area, Praia do Forte, Bahia.

Biology data. Habitat and depth. The specimen was caught at 350 m depth, and about 100–150 m from the ocean floor. It is a mesopelagic and benthopelagic species that inhabits the open ocean and the outer shelf and slope areas as well as underwater rises (Parin, 1990; Cervigón, 1996; Boschung, 1992; Parin *et al.*, 1997; Evseenko at al., 2004). The capture of the species at 1,374 m reported by Costa *et al.* (2007) represents a new depth record.

Diet. Examining the stomach contents of Praia do Forte´s specimen we found that it preyed recently on fishes, cephalopods, and crustaceans, but the remains were not identifiable. The same diet items were already reported by Parin (1990). The stomach contents weighted 0.61g and in it we also found four Nematoda parasites.

Reproduction and spawning season. The specimen from Praia do Forte was a ripe female. Egg diameter was between 0.23 and 0.31 mm and we estimated about 220/250,000 in both ovaries that were full and had about the same size (9,000 mm^3) and weight (4.86 g). According to Potthoff *et al.* (1980), the "spawning probably occurs throughout the species range and the year", because the larvae examined by them from the Atlantic Ocean were collected from February to April and from July to December.

Acropomatidae

***Verilus sordidus* Poey, 1860.**
(Plates 2 & 3)

Black Verilus (English), João-Mole (proposed Portuguese name, Brazil), Escolar Chino, Berregüello (Cuba); Pargo Negro (Venezuela).

In May 18, 2006, two small and unusual fishes were collected by the TAMAR,10 miles off Praia do Forte, Mata de São João, Bahia, Brazil, in 430 m deep (12º39´91"S and 37º 54´30"W), with electric reel, circle carbon steel hooks n. 12/0, a 0.60 multifilament line, 1 kg sinker and sardines as bait. They measured 245 and 224 mm SL and were identified by the first author as the extremely rare acropomatidae *Verilus sordidus*.

This fish is very rare and only a few specimens are deposited in collections around the world besides the Brazilian pair. The meristic and morphometric data for these specimens and that of selected literature are in Tables 2.A–B.

The specimens from Bahia are the 12th and 13th ever deposited in scientific institutions, (not considering USNM 271959 (1, skull, dry osteological preparation, SL unknown, off Cuba, coll. by F. Poey, apparently the same specimen of USNM 271973), and present the first record of the species for the Southwestern Atlantic Ocean and Brazil. The species range is extended by about 3,800 km southwards in a straight line and 4,600 km along the South American coastline.

TABLE 2-A. *Verilus sordidus.* Meristic data of selected papers.

Counts	Poey. (1861)	Yamanoue *et al.*. (2009)	Cervigón (1993)	Jordan & Evermann (1898)	Ruiz-Carus (2006)	Present Study
Number of specimens	01	05	01	01	02	02
Dorsal fin elements	IX-I,10	IX-I,10	IX-I,9	IX-I,10	(IX-X)-I,10	IX-I,9-10
Anal fin elements	III,7	III,7	III,7	III,7	III,7	III,7
Pectoral fin rays	15	15	15	No data	14–15	15
Lateral line, scales	45	43–45	42	43	42	43–44
Lower gill rakers	No data	14–16	16	17	15–17	16

TABLE 2-B. *Verilus sordidus.* Selected proportional measurements in thousands of SL. Number of specimens as in Table 2-A.

	Yamanoue *et al.*. (2009)	Cervigón (1993)	Jordan & Evermann (1898)	Ruiz-Carus (2006)	Present Study
Head Length	375–384	365	384.6 *	365–401	341.8–379.6
Snout Length	98–102	92	96.1 *	92	84.8–97.7
Eye, horizontal	133–145	129	134 *	129	113.8–125.3
Interorbital	82–86	78	87.4 *	78	66.9–71.8
Postorbital	154–155	--	149.4 #	--	124.8–156.6
Body depth	326–337	341	333.0 *	341–395	299.3–330.1
Upper jaw	182–194	184	192.3 *	167–184	163.9–188.2
Dorsal-fin base	423–437	--	375.0 #	--	331.5–385.8
Anall-fin base	121–125	--	125.0 #	--	105.6–112.4
Predorsal length	415–427	414	397.7 #	414–435	391.9–442.5
Preanal length	697–756	--	659.1 #	716	705.2 –741.4
Pectoral fin length	297–320	317	316.3	317	308.3–313.6
Ventral fin length	131–145	221	192.3 #	221	170.1–184.2

Obs: Poey did not published proportions in his description. Proportions from text (*) and from plate (#), grossly rounded

Diagnostic characters. Based on the examined specimens and literature data (Poey, 1860; Jordan & Evermann, 1898; Cervigón, 1996; Cervigón *et al.*, 1993; Heemstra & Yamanoue, 2002; Ruiz-Carus, 2006; Yamanoue *et al.*, 2009). For counts and proportions see Table 2.A–B.

Body compressed, moderately deep; head moderate, covered, as the body, with somewhat caducous cycloid and very weakly ctenoid scales; bases of soft portions of dorsal fin, anal fin, pectoral fin, pelvic fin and caudal fin covered with scales. Spinous and soft dorsal fins nearly separate, the last two spines very small and connected with first soft ray by a rather low membrane; anal fin shorter than soft dorsal-fin, its origin under the third or fourth dorsal fin soft ray; proximal-middle radial of first anal-fin pterygiophore slender and without a hollow or trough. Mouth oblique and reaching to a point below pupil; a pair of canine teeth near symphysis of both jaws, eventually with a second large tooth behind in upper jaw; villiform and conical canine-like teeth posterior to the large teeth in upper and lower jaws, respectively; villiform teeth on vomer and palatine, and conical teeth on posterior surface of vomer. Preopercular margin smooth, the opercle with two weak spines and a membranous edge. Anus near origin of anal fin. Caudal fin forked. Color of fresh specimens dull black, darker on dorsum and lighter on belly; cheeks and belly suffused with purple; lower part of head with golden to yellowish cast; preserved specimens with body yellowish to dusky, darker on dorsum and silvery on belly. Grows to about 30 cm SL.

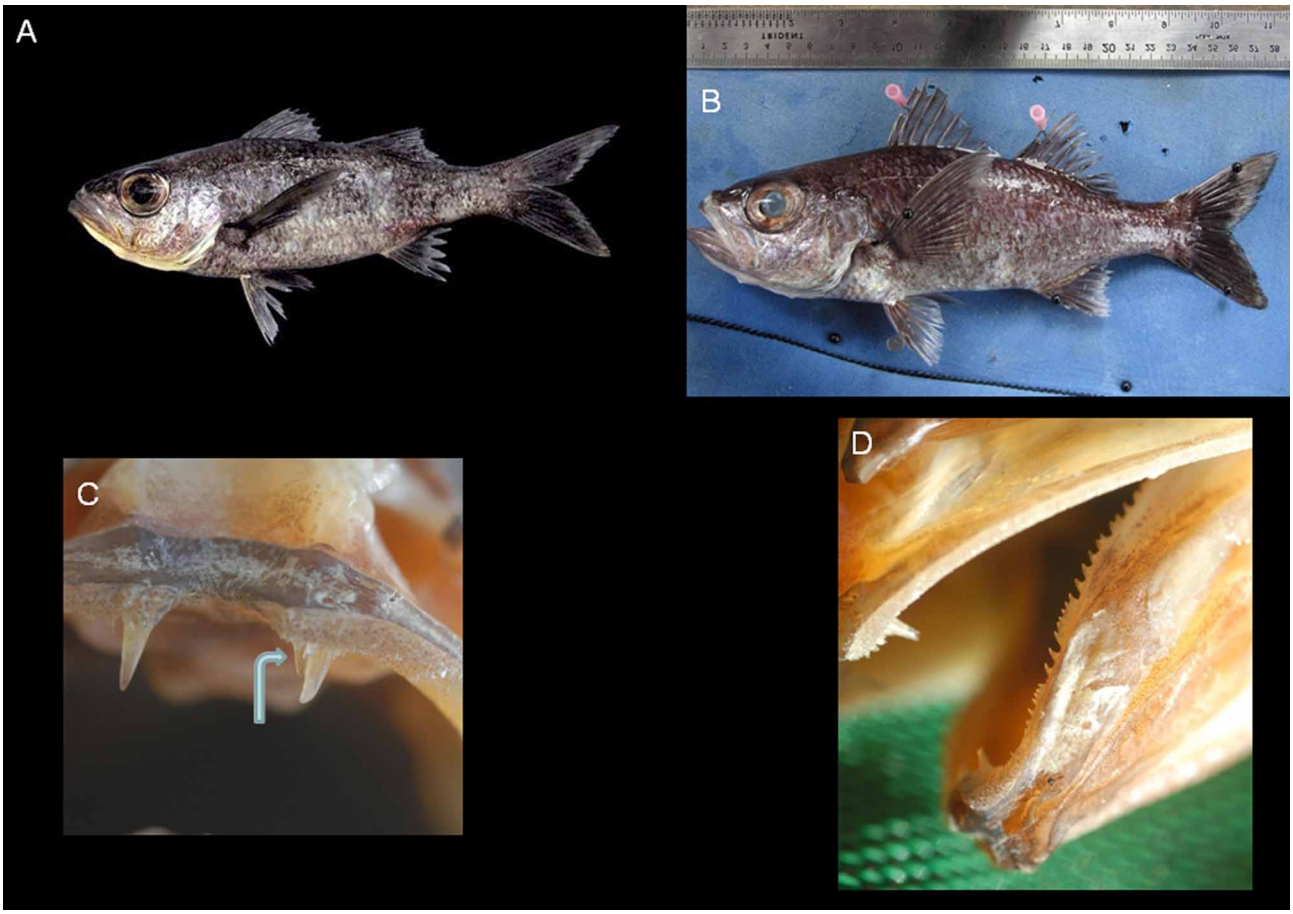

FIGURE 2. *Verilus sordidus.* A. TAMAR 006, male, 232.2 mm SL. B. UFBA 02818, male, 232.3 mm SL. C. Close-up of upper fangs of the TAMAR specimen; note there is a second one behind the left fang. D. Close up of lower teeth series of the TAMAR specimen.

Range. The species is reported from the Western Atlantic: Bahamas, Virgin Islands, Honduras, Puerto Rico, Cuba, Jamaica, Belize, Colombia, Venezuela and Bahia, Brazil.

Proposed Brazilian name. "João-Mole", as called by local artisanal fishermen.

Depth of occurrence. Both examined specimens were collected at 430 meters of depth. The range of depth from literature is between 100 and 600 meters (Bunkley-Williams & Williams, 2004).

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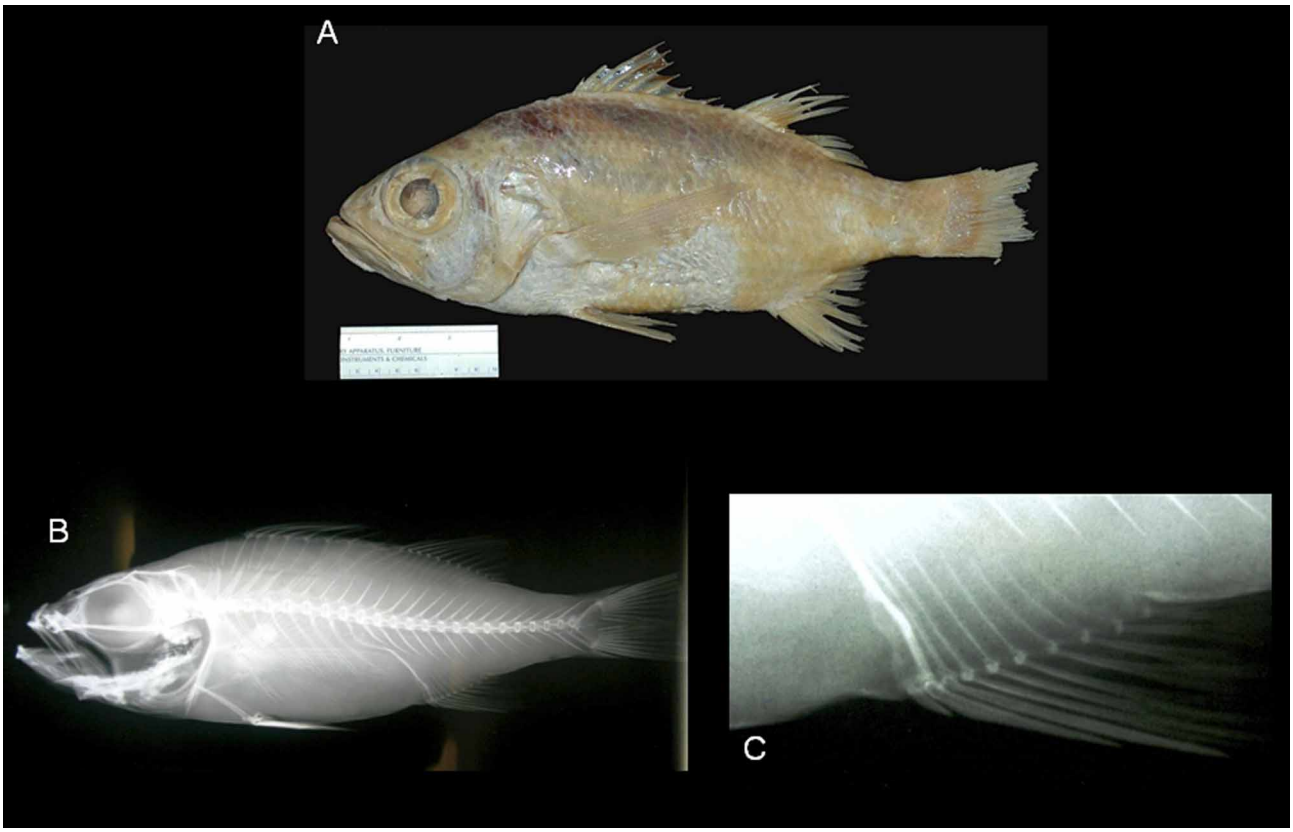

FIGURE 3. *Verilus sordidus*. A. MCZ 21764, neotype, 295 mm SL, courtesy of the Museum of Comparative Zoology, Harvard University. B. TAMAR 030, X ray. C. TAMAR 006, X ray, close-up of first anal-fin pterygiophore, slender and without a hollow or furrow.

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