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A NEW SPECIES OF TILEFISH (PISCES: BRANCHIOSTEGIDAE)  
FROM THE WESTERN TROPICAL ATLANTIC<sup>1</sup>

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**ABSTRACT:** A new species of the new world tilefish genus *Caulolatilus* (family Branchiostegidae), *C. williamsi*, is described from off Cay Sal Bank and off St. Croix, Virgin Islands. The new species differs from its congeners in having alternating narrow yellow and broad dark body bars and a large yellow spot on the lower part of the rounded caudal fin. The western Atlantic species are identified in a key.

*Caulolatilus* is a new world genus of tilefish represented by nine species, three species in the eastern Pacific and six species in the western Atlantic. The genus is characterized by presence of a predorsal ridge, operculum with a single strong, blunt spine (usually toothed), combined length of single dorsal and anal fin bases usually more than 100% of standard length (SL), and 11 + 16 vertebrae. Species of *Caulolatilus* are generally offshore fishes found on the bottom from 10 to 495 meters depths (usually greater than 50 m), both continental and insular in distribution. These fishes are becoming more important as sport and commercial catches increase from deeper offshore waters. The senior author has recently completed a world revision of the tilefish families

Branchiostegidae and Malacanthidae (Dooley, in press).

Our knowledge of the new species described here is based on records from two sources. The holotype was caught by Captain Frank Williams on his commercial fishing vessel ARGO, brought to Miami on ice, and given to the junior author. Photographs of two specimens caught off St. Croix, Virgin Islands, were sent by J. Yntema, Department of Conservation at St. Croix, and R. O. Smith, Christiansted, St. Croix, to C. Richard Robins, Rosenstiel School of Marine and Atmospheric Sciences, University of Miami, and given to the senior author.

#### METHODS

Measurements were made to the nearest 0.5 mm and generally conform to those defined by Hubbs and Lagler

<sup>1</sup>Contribution number 77-03m, Southeast Fisheries Center, Miami Laboratory.

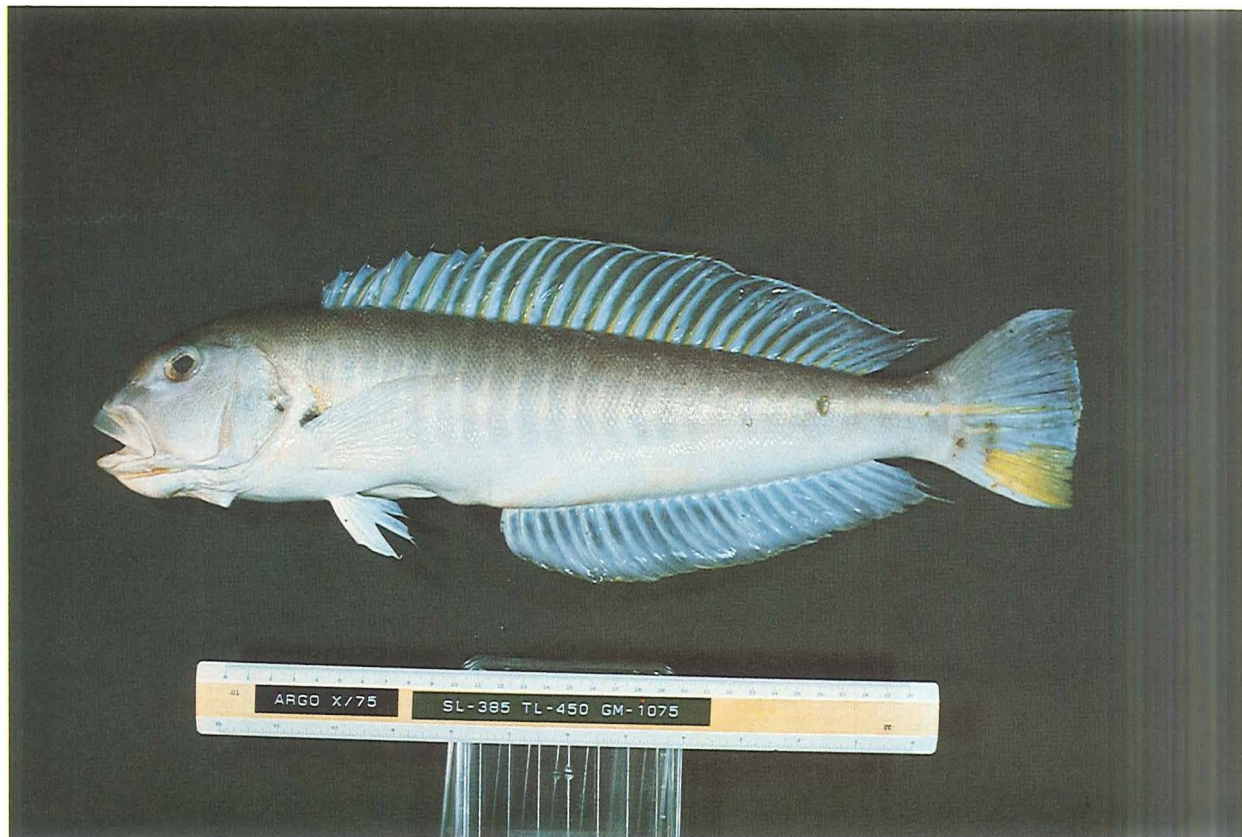


Fig. 1. Holotype of *Caulolatilus williamsi*, from Cay Sal Bank in 219 meters; USNM 216073; 385 mm SL, 450 mm TL, 1075 gm. Kodachrome slide (35 mm) taken about one week after capture and keeping on ice.

(1958). Measurements are expressed as per cent standard length (SL) or per cent head length (HL). Head length was taken from the tip of the snout to the tip of the opercular spine. Cheek depth was measured vertically from the lower rim of the orbit to the lower margin of the preoperculum to the tip of the opercular spine; the opercular scale count was taken along this line. Vertebral and other osteological counts were taken from radiographs.

*Caulolatilus williamsi*, New Species

Fig. 1

**Diagnosis:** A *Caulolatilus* with caudal fin margin double emarginate; relatively large mouth extending to below pupil; about 17 to 20 narrow yellow bars on sides; a thin yellow stripe extending through the upper part of the caudal peduncle and the middle of the caudal fin; a broad yellow patch on lower part of caudal fin; lacking a dark predorsal ridge and dark suborbital bars; dorsal fin rays VIII, 23; pored lateral line scales 96 or more.

**Description:** The following counts and measurements were taken from the holotype.

Dorsal fin rays VIII, 23; anal fin rays I, 25; pectoral fin rays 17; pelvic fin rays I, 5; caudal fin rays 17; cheek scales from preopercular angle to orbital rim 12; opercular scale rows 12; pored lateral line scales (difficult to count) to hypural fold 96 + 6 on tail; scales above lateral line 14; scales below lateral line 34; total first arch gill rakers 21; branchiostegal rays 6; vertebrae 11 + 16.

Body depth 23% SL (other *Caulolatilus* 21-34%, modally 28% SL); body width 14% SL; caudal peduncle length 11% SL; peduncle depth 10% SL; head length 25% SL (other *Caulolatilus* 23-34%, modally 29% SL); predorsal length 29% SL (other *Caulolatilus* 28-39%, modally 32% SL); head depth 85% HL; snout

length 43% HL; length of upper jaw 42% HL (other *Caulolatilus* 28-42% HL); length of lower jaw 45% HL; cheek depth 34% HL (possibly allometric); opercular length 25% HL; snout to dorsal margin of preoperculum 76% HL; orbit diameter 19% HL (possibly allometric); suborbital depth 20% HL (possibly allometric).

Jaws extending posteriorly to under mid-pupil; teeth mostly moderately large canines; each jaw with a large patch of villiform teeth at symphysis, narrowing to a single row of canines posteriorly with a single enlarged antrorsely curved canine at the rear; about 15 teeth along outer row of upper jaw, 13 teeth along outer row of lower jaw; no teeth on palatines, vomer, or tongue; well-developed pharyngeal teeth.

Lateral-line pores nearly in a straight line. Cephalic pores numerous; lower jaw with six pores unilaterally from symphysis to preopercular margin (4-6 in other *Caulolatilus*).

Gill membranes free from isthmus; predorsal ridge slightly raised (ridge common to all branchiostegids) and extending from dorsal fin to over mid-orbit; anterior nostril within a thin cutaneous tube, posterior nostril open; preopercular angle approximately 95° with large serrae on upper limb and very fine serrae on lower limb; operculum ending in a single stout notched spine; pseudobranch well-developed; gill rakers moderate, about six times longer than wide.

Scales mostly ctenoid, cycloid on head; mostly replacement scales; scales extending on top of head to over anterior portion of pupil; caudal finely scaled; pectorals with fine scales covering their base; all other fins naked.

Dorsal fin height nearly 11% SL (7-10% SL in other *Caulolatilus*); fin broken after preservation; spinous portion of dorsal slightly lower than soft portion. antepenultimate ray elongate; dorsal fin base 62% SL; first and second spines

joined to a common pterygiophore; two predorsal interneural bones present as in other species of *Caulolatilus*; dorsal origin over upper margin of pectoral fin base.

Anal fin height 9% SL (partly broken after preservation); single spine about same length as first dorsal spine; all rays branched, no elongate rays; origin under a vertical below fourth dorsal ray; anal fin base 44% SL.

Pectoral fins broad and pointed; reaching a vertical with anus, length from axil to tip of longest ray 21% SL.

Pelvic fins I, 5; spine about 1.8 in length of fin; fin not reaching anus; length 12% SL.

Caudal fin slightly double emarginate (a character shared with *C. intermedius* and *C. guppyi*) with the dorsal tip slightly elongate; 17 principal rays, 15 branched; 11 procurrent rays on dorsal lobe, 9 procurrent rays on ventral lobe; rays badly broken on type.

The following notes were supplied by J. A. Yntema from one of the specimens caught off St. Croix: 348 mm SL; body depth 73 mm (21% SL); dorsal fin elements VIII, 22; anal fin elements I, 24; ventral fin II, 4 (probably I, 5); lateral line scales about 120.

Color description based on the holotype (both from color transparencies taken after about one week on ice and after preservation in 10% formalin and transfer to 50% isopropyl alcohol) and on notes and a color photograph of one of the two specimens caught off St. Croix. Most subtle yellow faded with preservation, only the dusky color of the snout, spinous dorsal and above pectoral axil remaining obvious; a trace of the yellow remaining as light markings vertically on the body and along the tail. Coloration before preservation as follows: upper body violaceous-grey with 17-20 pale yellow vertical bars blending ventrally into solid pale yellow and finally

white on belly; anterior portion of head, snout and upper lip dusky, lower lip lighter, chin white; small patch of white under anterior suborbit; dark area above pectoral fin axil (other dark areas figured on operculum, lateral line near peduncle, and tail are artifacts); predorsal ridge not differently pigmented from surrounding area (predorsal ridge very dark in both *C. intermedius* and *C. guppyi*); spinous dorsal with a dusky upper margin, yellow along anterior portion of both spines and rays; soft dorsal with a golden-yellow margin, membrane translucent with a thin dusky vertical line between each ray; pectoral fin with upper rays slightly opaque, lower membrane clear; pelvic fins milky white; anal fin membrane clear with golden-yellow edge; caudal fin with characteristic large yellow area on ventral portion, a thin short (about 20 mm) yellow line above followed by a broader yellow horizontal stripe extending from about below 18th dorsal ray medially along peduncle to nearly posterior caudal margin; remainder of caudal fin gray.

**Material:** HOLOTYPE, USNM 216073, 385 mm SL; 450 mm TL; 1075 gm round weight; Cay Sal Bank, caught bottom fishing with baited hook in 219 meters (120 fathoms), October 1975, by Captain Frank Williams on the commercial fishing vessel ARGO. Photographs of two specimens; off St. Croix, Virgin Islands; one of 348 mm SL caught by handline 6 April 1972, probably between 126 and 180 meters (70 to 100 fathoms) by T. Skov; the specimens not saved.

**Etymology:** Named *williamsi* as a patronymic to Frank Joseph Williams of Miami, Florida, owner and master of the commercial fishing vessel ARGO, who caught and saved the holotype for us, and who has contributed many valuable deep-

water fish specimens to us over the years.

**Relationship:** Phylogenetic relationships of *Caulolatilus williamsi* are unclear as it has not been compared osteologically with the other eight species of *Caulolatilus* (Dooley, in press). *C. williamsi* is more terete than the other species. It is unique in the genus in having body bars and a yellow pigmented spot on the lower part of the caudal fin; in these two characteristics it is similar to some species of the related Indo-Pacific genus *Branchiostegus*. *C. williamsi* has a rounded caudal fin similar to *C. intermedius* and *C. guppyi* and differs from those in several characteristics, including having more dorsal fin spines and more pored lateral line scales. The six western Atlantic species are distinguished in the following key.

KEY TO THE WESTERN ATLANTIC SPECIES OF *CAULOLATILUS*

- 1a. Caudal margin double emarginate or rounded . . . . . 2
- 1b. Caudal margin truncate or emarginate . . 4
- 2a. Predorsal ridge darkly pigmented; dorsal elements VI-VII (rarely VI), 23-26; pored lateral line scales 73-81; dark suborbital bar present; body without yellow vertical bars; no large yellow patch on lower caudal lobe . . . . . 3
- 2b. Predorsal ridge not dark nor differently pigmented; dorsal elements VIII, 22-23; pored lateral line scales 96 or more; no dark suborbital bar; body with 17-20 narrow yellow bars; caudal with large yellow patch on lower lobe. Cay Sal Bank and Virgin Islands . . . . .  
 . . . . . *C. williamsi*, new species
- 3a. Upper body with numerous dark mottlings; mouth relatively large, extending to well under eye; dark predorsal ridge without anterior dark semicircle. Venezuela to Guyana and Trinidad . . . . .  
 . . . *C. guppyi*, Beebe and Tee-Van, 1937
- 3b. Upper body uniformly pale brown without dark markings; mouth relatively small, extending to anterior margin of orbit; dark

- predorsal ridge with anterior dark semicircle. Gulf of Mexico and Cuba . . . . .  
 . . . . *C. intermedius* Howell Rivero, 1936
- 4a. Dorsal fin elements VIII, 23-25; caudal emarginate; body without distinct markings; dorsal fin membrane with yellow and grey pattern, anal fin II, 22-24; broad golden patch under eye to nostril; caudal with small yellow spots. North Carolina to Florida, Cuba, Venezuela, Brazil . . . . .  
 . . . . . *C. chrysops* (Valenciennes, 1833)
- 4b. Dorsal fin elements usually VII (rarely VIII), 23-27; caudal emarginate or truncate; body with or without upper markings; dorsal fin with or without markings; anal fin I or II, 20-24; no broad yellow area under eye; caudal with large yellow areas on each lobe or small yellow spots . . . . 5
- 5a. Jaws extending to below anterior margin of orbit; caudal deeply emarginate with broad yellow areas on each lobe; spinous dorsal membrane brilliant orange-yellow; upper body with dark markings and a dark line below dorsal base; large dark area above pectoral fin axil; orbit large (23-41, modally 31% HL); predorsal ridge bright yellow. North Carolina to Florida, Nicaragua, Colombia, and West Indies . . . . .  
 . . . . . *C. cyanops* Poey, 1866
- 5b. Jaws not extending nearly to orbit; caudal truncate or slightly emarginate with small yellow spots and no large yellow areas; spinous dorsal dusky, soft portion unpatterned; upper body uniformly pigmented, no dark subdorsal line; no dark area above pectoral fin axil; orbit small (15-29, modally 19% HL); dark predorsal ridge. Virginia to Gulf of Mexico . . . . .  
 . . . . . *C. microps* Goode and Bean, 1878

ACKNOWLEDGEMENTS

We gratefully acknowledge Frank J. Williams for catching and saving the holotype. We thank C. Richard Robins, Rosenstiel School of Marine and Atmospheric Sciences, University of Miami, for supplying us with photographs and notes on the tilefish from St. Croix, to Y. A. Yntema, Department of Conservation at St. Croix, for taking those photographs and notes.

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