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A NEW SPECIES OF TILEFISH (PISCES: BRANCHIOSTEGIDAE) FROM THE BAHAMA ISLANDS¹

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ABSTRACT: A new species of tilefish, *Caulolatilus dooleyi* (family Branchiostegidae), is described and distinguished from its nine congeners by a combination of external morphological characters. The description is based on three specimens caught bottom fishing in depths of 219 to 256 meters at three locations on the slopes of the Bahama Islands.

The tilefish genus *Caulolatilus* (family Branchiostegidae), marine and benthic (10 to 495 meters), is found in tropical to temperate areas off both sides of the North American continents, in some areas of the West Indies, and at Bermuda in the western Atlantic, and off the Galapagos and Revillagigedo Islands in the eastern Pacific. Seven valid species, described between 1833 and 1937, were recognized and diagnosed in a recent revision (Dooley, 1974), with five species in the western Atlantic and two in the eastern Pacific. Since then an eighth species has been described from the western Atlantic (Dooley and Berry, 1977), and a ninth species from the eastern Pacific (Dooley, 1978). The tenth species is described here, based on three specimens taken recently off the Bahama Islands, representing the first records of the genus from that area. An undescribed species may occur around Bermuda (J. K. Dooley, personal communication).

METHODS

Counts and measurements follow

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Dooley (1978) with the following exceptions: suborbital depth was taken from the lower margin of the fleshy orbit to the bottom of the fleshy fold above the upper jaw; diagonal orbit diameter was measured across the fleshy orbit and aligned with the measurement of the suborbital depth; caudal fin shape was determined with the dorsal and ventral lobes extended to an angle of 90° to 115° (tip to tip from middle of caudal base). The holotype and smaller paratype were originally frozen and subsequently thawed, refrozen, rethawed, and preserved in 50% isopropyl alcohol. They shrank to 96 and 98% of their first thawed length after preservation and similarly lost 12 and 22% in weight; lengths and weights recorded in the text are those taken after preservation.

Caulolatilus dooleyi, New Species
Bankslope Tilefish
Fig. 1

Diagnosis

A *Caulolatilus* with fresh coloration consisting of light yellow areas on posterior parts of dorsal and anal fins, variable light yellow areas on caudal fin, a

reduced and dusky pectoral fin axillary spot, and ca 22 vague narrow yellow bars along body (with no pronounced coloration elsewhere); preserved pigmentation consisting of a small and diffuse dusky pectoral fin axillary spot and head and body dusky above grading to clear below (with no other pronounced pigmentation); interopercle scaled; eye large and suborbital distance small (suborbital into eye diagonal diameter 1.7 to 2.3 times); caudal fin shape double emarginate; dorsal fin spines 7, pectoral fin rays 16-17, total lateral first arch gillrakers 17-18, and outer row jaw teeth 23-27.

Description

The following counts and measurements record in sequence values for the holotype followed in parentheses by values for the smaller and the larger paratype, with only a single number when the values are the same for the three specimens.

Dorsal fin rays VII, 24; anal fin rays I, 22; pectoral fin rays 16 (17 left and 16 right, 16); pelvic fin rays I, 5. Cheek scales from preopercular angle to orbital rim 11 (10); opercular scale rows 8 (8, 9); lateral line scale rows about 100; pored lateral line scales to caudal base 85 (83, 85); scales above lateral line 12 (11); scales below lateral line 37 (32, 39). Gillrakers 7 (7, 6) upper and 11 lower on lateral side of first arch, 84 (85, 82) total on both sides of four arches. Pseudobranch filaments 37 (36, 39); gill filaments 120 (118, 126) on lateral side of first arch. Outer row teeth on each side of upper jaw 25-27 (23-23, 26-27), of lower jaw 23-26 (23-24, 25-26). Branchiostegal rays 6 each side. Vertebrae 11 + 16.

Total length 115% SL. Body depth maximum 27 (29, 30) % SL; body

depth at anal fin origin 25 (26, 25) % SL; body width 12 (15, 13) % SL; predorsal length 32 (32, 31) % SL; caudal peduncle length 9 (11, 9) % SL; caudal peduncle depth 8% SL; dorsal fin base length 59 (62, 62) % SL; anal fin base length 37 (36, 38) % SL; anal fin base length into dorsal fin base 1.6 (1.7, 1.6) times; dorsal fin height 12% SL; pectoral fin length 25 (27, 28) % SL; pelvic fin length 16 (15, 16) % SL; head length 28 (29, 29) % SL. Head depth 78 (81, 80) % HL; snout length 33 (34, 34) % HL; snout to dorsal margin of operculum 74 (74, 73) % HL; opercle length 31 (34, 31) % HL; cheek depth 27 (27, 29) % HL; upper jaw length 39 (39, 37) % HL; lower jaw length 37 (38, 36) % HL; fleshy orbit diameter 30 (30, 27) % HL horizontal, 29 (28, 26) % HL oblique; suborbital depth 13 (14, 15) % HL oblique; suborbital depth into orbit oblique 2.3 (2.0, 1.7) times.

Jaws extending posteriorly to under anterior margin of fleshy orbit. Teeth conical and most slightly curved. Upper jaw with an outer row of 23 to 27 larger teeth (the anterior four teeth and the terminal antrorse tooth the largest), and an inner band of smaller retrorse teeth narrowing posteriad to an irregular row extending to antepenultimate tooth of outer row. Lower jaw with an outer row of 23 to 26 larger teeth (the middle ninth to fourteenth the largest) with the terminal tooth antrorse, and an inner band of smaller retrorse teeth tapering to end at about the anterior half of the jaw.

Lateral line pores recessed. Cephalic pores on snout, supraorbital, on lower jaw, lower preopercle, and isthmus. Mandibular pores 5 each side.

Gill membranes free from isthmus. Predorsal ridge slightly raised. Anterior

nostril circular with a large posterior flap; posterior nostril elliptical with a small anterior flap. Preopercle with serrations along posterior margins and smaller serrae on ventral margin. Pseudo-branch well-developed. Gillrakers moderate.

Scales ctenoid on head and body; lower jaw and snout scaleless to above anterior orbit and around orbit and sub-orbital; interorbital scaled; scales extending onto caudal fin between rays to near posterior margin; scales on lateral base of pectoral fins; other fins scaleless.

Dorsal fin spines graduated to dorsal softrays; antepenultimate dorsal and anal softrays elongated; pectoral and pelvic fins pointed, pectoral fins subfalcate; caudal fin double emarginate.

Coloration

Recorded after being fresh-frozen two to four weeks and thawed (holotype and smaller paratype). Head and body dusky white, darker on upper sixth and graduating to white belly and throat; very vague narrow yellow bars (ca 22) on body; dusky pectoral axillary spot; no markings around eye or on predorsal area. Dorsal fin slightly dusky to clear with yellow areas on most of interradi al membrane of posterior half and a narrow light distal margin on posterior third. Anal fin clear with light yellow areas on interradi al membrane of posterior one-fourth (holotype) to three-fourths (paratype) and a narrow whitish distal margin along most of fin. Caudal fin variable, dusky along base and dorsal and ventral margins, clear over rest of fin with vague yellow areas (holotype), or mainly clear with light yellow over most of fin with narrow white dorsal and ventral margins. Pectoral fins clear. Pelvic fins white to clear.

Pigmentation (in 50% isopropyl alcohol)

Head and body dark to dusky above

grading to clear below. Pectoral fin axillary spot small and diffuse; dorsal and caudal fins slightly dusky, other fins clear. No suborbital or nasal markings; no dark predorsal ridge or dark lines along dorsal fin base.

Material

Three type specimens from off the Bahama Islands, all caught on the bottom with baited hook. HOLOTYPE, USNM 218354, 279 mm SL; 322 mm TL; 352 g round weight; Bahama Islands, caught on bottom with baited hook SSE of Ambergris Cays off Caicos Bank, 21°03.5'N, 71°32.7'W, in 256 m (140 fms), 26 September 1977, by the commercial fishing vessel ARGO and saved by Frank J. Williams. PARATYPE, CAS 40761; 268 mm SL; 308 mm TL; 391 g RD; off Bimini, ca 25°44'N, ca 79°22'W, 232 m (127 fms), 4 August 1977, by a sport fishing boat and saved by Thomas Chewning, Jr. PARATYPE, ANSP 136528; 305 mm SL; 350 mm TL; 490 g RD; south side of Tongue of the Ocean, ca 23°24'N, ca 76°52'W, 219 m (120 fms), 12 May 1976, by the ARGO and Capt. Williams.

Etymology

Named *dooleyi* as a patronymic to James Keith Dooley of Miami, Florida, and Adelphi University, New York, who has researched and illuminated the taxonomic relationships of the fish families Branchiostegidae and Malacanthidae.

Relationships and Distinguishing Characters

Phyletic relationships of *Caulolatilus dooleyi* within the genus are not adequately apparent from the gross external morphological study of this report. This species will be included in a study in progress on the phyletic re-

Figure 1. *Caulolatilus dooleyi*, Holotype, USNM 218354, 279 mm SL, 322 mm TL, 352 g round weight; from 256 meters off Caicos Bank, Bahama Islands, Kodachrome slide taken after thawing from two weeks freezing soon after capture. Right side show, left side damaged.

lationships of the genera and families of tilefishes, to be based on comparative myology and other characters (J. K. Dooley and R. P. Marino, personal communication). Superficially, *C. dooleyi* appears to be phyletically closest to *C. cyanops* and *C. princeps*.

The characters in the new species diagnosis collectively distinguish *C. dooleyi* from all other *Caulolatilus* (Dooley, 1978). *C. dooleyi* differs from the three Pacific species in having a lower number of dorsal fin spines (7 vs usually 8 or 9) and a lower total number of lateral first arch gillrakers (17-18 vs 20-27). *C. dooleyi* differs from four of the six other Atlantic species, *C. microps*, *C. williamsi*, *C. intermedius*, and *C. guppyi*, in having scales on the interopercle, which these four lack; *C. dooleyi* shares the scaled interopercle character with the other two Atlantic species, *C. chrysops* and *C. cyanops*, and with an unidentified specimen from Bermuda. *C. dooleyi* differs from *C. chrysops* in having fewer pectoral fin rays (16-17 vs 18-19) and fewer outer row jaw teeth (23-27 vs 28-32) and in lacking the brilliant yellow suborbital color. *C. dooleyi* differs from *C. cyanops* in lacking the dark pigment stripe along each side of the dorsal fin base and the dark reticulations along the upper body (preserved specimens), and in lacking the brilliant orange-yellow color on the upper part of the spinous dorsal membrane and on the caudal fin lobes (fresh specimens).

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Addendum: *Caulolatilus williamsi* Dooley and Berry (1977) was described from a single specimen (the holotype, 385 mm SL, 1075 g round weight) taken in 219 meters off Cay Sal Bank and from photographs of two specimens taken off St. Croix, Virgin Islands. A second specimen is now recorded (USNM 218624). The specimen was taken off Guinchos Cay, Old Bahama Canal, 22°43'N, 78°07'W,

on the bottom at 238 meters (130 fathoms) with a baited hook, 4 July 1978, by Capt. Frank Williams on the fishing vessel ARGO; 520 mm SL, 610 mm TL, 2.4 kg round weight. It is 1.4 times longer and 2.2 times heavier than the holotype, but very similar in most other characters (differing in having one spine and 24 softrays in the anal fin). Supplemental coloration notes from the fresh-iced specimen are: 22 yellow, wavy or bent vertical body bars; the last 4 or 5 bars graduated shorter and

the last on the anterior peduncle nearly merging with a yellow horizontal stripe extending to the median tip of the caudal fin; a second yellow stripe below the first, extending from the caudal base to near the end of the fin; the brilliant yellow caudal blotch beneath these, covering most of 4 of the lower rays of the fin; a small white area on the distal third of the dorsal principal ray of the caudal fin; spot in upper axil of pectoral fin moderately dark black and grading dorsally into a larger olivaceous area.