NUMBER 731 July 27, 2001

OCCASIONAL PAPERS OF THE MUSEUM OF ZOOLOGY
THE UNIVERSITY OF MICHIGAN

ANN ARBOR, MICHIGAN

OPSANUS DICHROSTOMUS, A NEW TOADFISH (TELEOSTEI: BATRACHOIDIDAE) FROM THE WESTERN CARIBBEAN SEA AND SOUTHERN GULF OF MEXICO

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ABSTRACT. — Opsanus dichrostomus, *a new toadfish (Teleostei: Batrachoididae) from the western Caribbean Sea and southern Gulf of Mexico. Occ. Pap. Mus. Zool. Univ. Michigan,* 731: 1-16, 5 figs. *Opsanus dichrostomus* n. sp. differs from other species of *Opsanus* by the narrow interorbital distance (29-65 thousandths of SL), usually less than the diameter of the orbit (60-104 thousandths of SL), versus usually equal to or wider than orbit diameter in other species of *Opsanus. Opsanus dichrostomus* is closely related to *O. phobetron,* morphologically and genetically. Both species usually have the lower half of the mouth darkly pigmented in specimens over 70 mm SL, whereas *O. phobetron* also has the upper half pigmented. These species form a southern species pair within the genus: *O. phobetron* occurs in the Bahamas and on the north coast of Cuba; *O. dichrostomus* has been found in the Mexican states of Veracruz Campeche, Yucatan, and Quintana Roo, plus Belize on the Yucatan Peninsula and also in the Gulf of Batabanó and the Isle of Pines, off southwestern Cuba.

Key words: *Opsanus dichrostomus,* toadfish, Teleostei, Batrachoididae, Caribbean Sea, Gulf of Mexico.

INTRODUCTION

While participating in a Food and Agriculture Organization, United Nations (FAO) workshop in Belize in July, 1999, I examined three toadfish specimens selected by a tester because the fish would not key out in the key to west central Atlantic Batrachoididae that I had prepared (a revision of Collette, 1978). Three described species of *Opsanus* have unpigmented mouths. The fourth, *O. phobetron,* has both upper and lower portions of

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the inside of the mouth heavily pigmented (Walters & Robins, 1961). The Belize specimens had intermediate pigmentation, the lower part of the mouth was pigmented, the upper part unpigmented. These specimens re-opened the question of identification of other specimens of *Opsanus* from Yucatan and Cuba that had occurred to Reeve Bailey in 1961 and to George Burgess and me in the 1980s. Many lots of the undescribed species were subsequently located in the collections of the Instituto de Oceanología during a visit to Havana in January 2000 forŸ symposium in honor of Felipe Poey's 200th birthday. The last review of *Opsanus* was a two-page key with material examined (Schultz & Reid, 1937) expanded from Goode & Bean (1879). Walters & Robins (1961) described *O. phobetron* from the Bahamas, summarized geographic ranges of the four known species, but were uncertain about the identity of *O. phobetron* from Cuba and the Isle of Pines. Freshwater *et al.* (2000) inferred a phylogeny of the described species of *Opsanus* based on multiple mtDNA sequences and Freshwater (pers. comm.) has added Belize specimens of the new species to their tree. Problems still remain within the genus and this paper is not a revision of the genus, but this species needs to be described promptly so that it can be included in the revised FAO identification guide.

MATERIALS AND METHODS

Institutional abbreviations follow Leviton *et al.* (1985). Counts of dorsal and anal-fin rays and vertebrae were made from radiographs. Methods follow Collette (1974). In distinguishing between *Opsanus* and *Sanopus* (Collette, 1974), I miscounted the number of precaudal vertebrae in *Opsanus*. The first precaudal centrum bears a flattened neural spine that closely contacts the supraoccipital crest making it difficult to see on radiographs, so my counts were one vertebra too few. There are 11 precaudal vertebrae in two species of *Opsanus,* 10 in the other three species, not nine or 10 as I stated previously. Measurements are expressed as thousandths of standard length (SL).

Key to species of *Opsanus*

1a. Second dorsal-fin rays 23-25, rarely 26; pectoral-fin rays usually 17 or 18, occasionally 19; precaudal vertebrae 10; head narrow, 195-301 thousandths of SL; lower half of mouth usually darkly pigmented in larger specimens 2

1b. Second dorsal-fin rays 25-27, usually 26; pectoral-fin rays usually 20 or 21, occasionally 19; precaudal vertebrae 11; head wide, 246-366 thousandths of SL; neither upper nor lower half of mouth pigmented 3

2a. Interorbital distance 43-79 thousandths of SL, about equal to orbit diameter (52-92 thousandths of SL); both upper and lower halves of

mouth usually pigmented in specimens over 80 mm SL ..... *Opsanus phobetron*

2b. Interorbital distance 29-65 thousandths of SL, less than orbit diameter (60-104 thousandths of SL); posterior part of lower half of mouth usually pigmented in specimens over 70 mm SL ..... *Opsanus dichrostomus*

3a. Background body pigmentation light, overlain with brown spots as large as pupil or a little larger on head, body, and fins, those on dorsal and anal arranged in more or less oblique rows; snout to anal distance longer, 586-648 thousandths of SL ..... *Opsanus pardus*

3b. Background body pigmentation dark, cross bands on body instead of dark spots on a light background; snout to anal distance shorter, 551-609 thousandths of SL 4

4a. Pectoral fin with definite cross bars, which are not composed of a series of round or nearly round light spots, the light areas continuous across the fin; sides and belly with brownish to blackish reticulations, or finely mottled, especially on sides of belly; no round light spots on sides of body; pectoral-fin rays usually 20 or 21; second dorsal-fin rays 25 or 26, usually 26 ..... *Opsanus tau*

4b. Pectoral fin with definite light cross bars made up of a series of distinct nearly round light spots; darkish background pigment of sides with small light spots; sides and belly without any trace of reticulations; pectoral-fin rays 18 or 19; second dorsal-fin rays 24 or 25 ..... *Opsanus beta*

Opsanus dichrostomus new species
Figs. 1 and 2a

Opsanus tau (not of Linnaeus, 1758) Hubbs 1936: 283 (description of specimen [UMMZ 102169] from Progreso.
Opsanus beta (not of Goode & Bean, 1879) Greenfield & Greenfield 1973: 564 (FMNH specimen from Drowned Cay).

Diagnosis.–A species of *Opsanus* as defined by Collette(1974) distinguished from other species of *Opsanus* by the relatively narrow interorbital distance (29-65 thousandths of SL), usually less than the diameter of the orbit (60-104 thousandths of SL), vs. interorbital distance usually equal to or wider than orbit diameter in the other species (Table 1). The mouth is usually bicolored in specimens larger than 70 mm SL (Fig. 2a), dark posteriorly below and light above, never dark above as in *O. phobetron* (Fig. 2b).

Description.–Dorsal spines III; second dorsal-fin rays 24-25, rarely 23 or 26 (Table 2); anal fin-rays 20-22, usually 21; pectoral fin-rays 17-19;

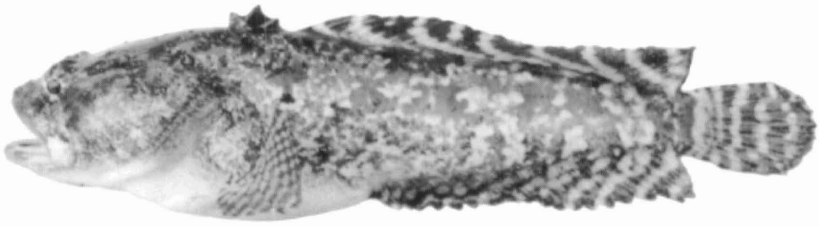

Fig. 1. *Opsanus dichrostomus* n. sp., USNM 361063, 121 mm SL, holotype, Belize City, photograph by Jon A. Moore.

precaudal vertebrae 10; caudal vertebrae 22-25, usually 23; total vertebrae 32-34; upper lateral-line papillae 24-29 (Table 3); lower lateral-line papillae 20-26; pectoral-fin glands 6-12. Head length 350-410 thousandths of SL (Table 1); head width 225-301; orbit diameter 60-104; interorbital distance 29-65; snout to second dorsal origin 418-489; snout to anal origin 514-598; pectoral-fin length 183-259; pelvic-fin length 162-226.

Relationships.–Based on some meristic features and head width, the genus is divisable into two species groups: the *tau*-group contains *O. tau* and *O. pardus;* the *beta*-group, *O. beta, O. phobetron,* and *O. dichrostomus.* The *tau*-group has 11 instead of 10 precaudal vertebrae (Table 2); tends to have more second dorsal-fin rays, 25 or 26, usually 26, compared to usually 23-25 in the *beta*-group; more pectoral-fin rays, usually 20 or 21 vs. 17-19; and a wider head, 246-366 thousandths of SL vs. 195-324. A strict consensus tree of relationships based on mtDNA (Freshwater *et al.,* 2000; Fig. 3) shows a different pattern with *O. beta* clustering with *O. pardus* and then *O. tau.* Both morphological and molecular data show *O. dichrostomus* to be closest to *O. phobetron.* Both species have narrow interorbital distances and eyes that appear to project more dorsally in lateral view (Figs. 1, 4) and usually have the lower half of the mouth darkly pigmented in specimens over 70 mm SL (*O. phobetron* also has the upper half pigmented in specimens over 80 mm SL). *Opsanus phobetron* and *O. dichrostomus* form a southern species pair within the genus: *O. phobetron* occurs at several localities in the Bahamas (Dennis *et al.,* 1998) and on the north coast of Cuba; *O. dichrostomus* has been found at Campeche and at Yucatan, Quintana Roo, and Belize on the Yucatan Peninsula, and also in the Gulf of Batabanó and the Isle of Pines, off southwestern Cuba (Fig. 5).

Etymology.–The name *dichrostomus* refers to the bicolor mouth, a diagnostic character of the species. This name was first applied as a manuscript name to a specimen from Yucatan (Hubbs, 1936; UMMZ 102169) by Reeve Bailey in 1961.

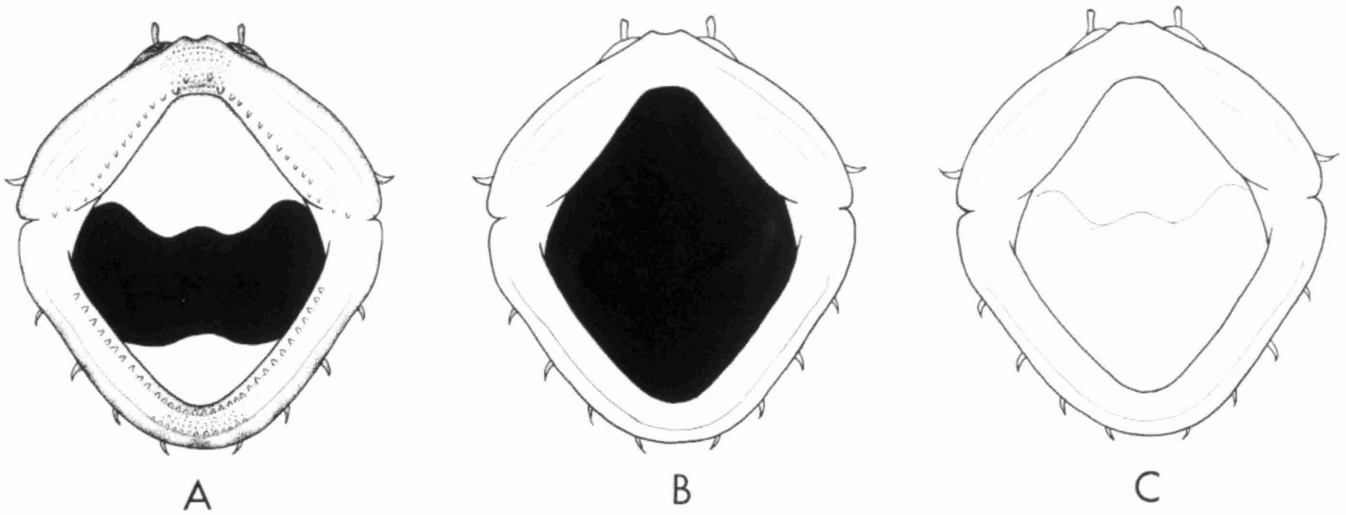

Fig. 2. Diagrams of **A**, *Opsanus dichrostomus* n. sp.; **B**, *O. phobetron;* and **C**, *Opsanus* sp. (to represent the other three species of the genus) to show pigmentation of their mouths.

TABLE 1. Proportions (in thousandths of standard length, SL) in species of *Opsanus*.

Species	SL (mm)		Head L		Head W		Orbit L		Interorb		Snout -2D		Snout- A		Pectoral L		Pelvic L		N
	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	
O. pardus	67.4	324	347	413	312	333	47	78	78	93	451	495	586	648	200	230	186	199	7
O. tau	74.3	210	377	409	299	366	62	72	62	96	452	475	572	609	209	242	167	200	7
O. beta	77.5	200	367	412	246	324	63	92	54	86	471	486	551	600	196	223	160	182	7
O. phobetron																			
Bahamas	86.7	129	367	385	259	290	55	65	62	79	442	485	518	570	199	226	157	201	6
Cuba	55.6	154	346	425	195	282	52	92	43	75	435	488	534	585	212	237	163	228	12
Total	55.6	154	346	425	195	290	52	92	43	79	435	488	518	585	199	237	157	228	18
O. dichrostomus																			
Yucatan	39.3	125	350	396	263	301	72	94	37	47	432	478	537	598	183	238	162	221	7
Belize	60.5	121	360	382	251	296	60	89	29	48	428	479	530	580	209	245	165	219	13
Cuba	38.5	121	367	410	225	299	65	104	41	65	418	489	514	579	211	259	185	226	19-22
Total	38.5	125	350	410	225	301	60	104	29	65	418	489	514	598	183	259	162	226	39-42

TABLE 2. Counts of fin rays and vertebrae in species of *Opsanus*.

Species	Fin Rays												
	Dorsal					Anal			Pectoral				
	23	24	25	26	27	20	21	22	17	18	19	20	21
O. pardus			1	4	1	2	1	4			1	2	1
O. tau			2	14		2	11	4			1	3	3
O. beta		1	7			1	6	1		5	3		
O. phobetron													
Bahamas		7	1			4	4		2	5	1		
Cuba	2	4	10	1		2	15	1	3	7	1		
Total	2	11	11	1		6	19	1	5	12	2		
O. dichrostomus													
Yucatan	1	3	17	1		3	16	3	3	3	4		
Belize	1	9	9			7	10	2	5	3	1		
Cuba		4	13				17		2	10			
Total	2	16	39	1		10	43	5	10	16	5		

Species	Vertebrae										
	Precaudal		Caudal				Total				
	10	11	22	23	24	25	32	33	34	35	36
O. pardus		7		1	6				1	6	
O. tau		22		2	16	2			2	16	2
O. beta	8			1	7			1	7		
O. phobetron											
Bahamas	8		1	7			1	7			
Cuba	19		1	12	6		1	12	6		
Total	27		2	19	6		2	19	6		
O. dichrostomus											
Yucatan	21		1	12	6	1	1	13	6		
Belize	18		2	13	3		2	13	3		
Cuba	19		1	13	5		1	13	5		
Total	58		4	38	14	1	4	39	14		

Holotype.–USNM 361063 (121 mm SL); Belize City near island across from Fisheries Laboratory; 1-3 m depth; BBC 99-42, B.B. Collette, T.R. Wasaff, J. Moore and N.V. Parin; 15 Jul 1999. D III, 25; A 22, P_1 17; upper lateral-line papillae 26, lower 23; pectoral-fin glands 12, starting between uppermost two P_1 fin-rays; vertebrae 10 + 24 = 34; head length 46.2 mm;

TABLE 3. Counts of upper and lower lateral line papillae and pectoral fin glands in species of *Opsanus*.

Species	Upper Lateral Line Papillae								Lower Lateral Line Papillae									Pectoral Fin Glands										
	24	25	26	27	28	29	30	N	19	20	21	22	23	24	25	26	N	6	7	8	9	10	11	12	13	14	15	N
O. pardus			2	1	2	--	1	6						3	3		6			1	--	2	1	1	--	--	1	6
O. tau			2	-	3	1	1	7			2	-	-	2	3		7				1	2	2	1	-	-	1	7
O. beta		3	-	2	1	1		7				3	1	1	2		7	1	-	2	1	1	3	1				9
O. phobetron																												
Bahamas	3	1	2	1	1			8			4	2					6	2	1	3	--	1	--	--	1			8
Cuba	4	3	1	2	1	1		12	1	2	3	2	1	2			11		1	1	4	3						9
Total	7	4	3	3	2	1		20	1	2	7	4	1	2			17	2	2	4	4	4	-	-	1			17
O. dichrostomus																												
Yucatan			3	3	6	1		13		1	1	1	4	2	2	1	12	2	4	1	2	1	1					11
Belize	1	1	3	4	--	1		10		1	1	3	1	1			7			1	1	3	4	2				11
Cuba		2	2	3	2	1		10				1	1	4			6		1	1	7	3	1					13
Total	1	3	8	10	8	3		33		2	2	5	6	7	2	1	25	2	5	3	10	7	6	2				35

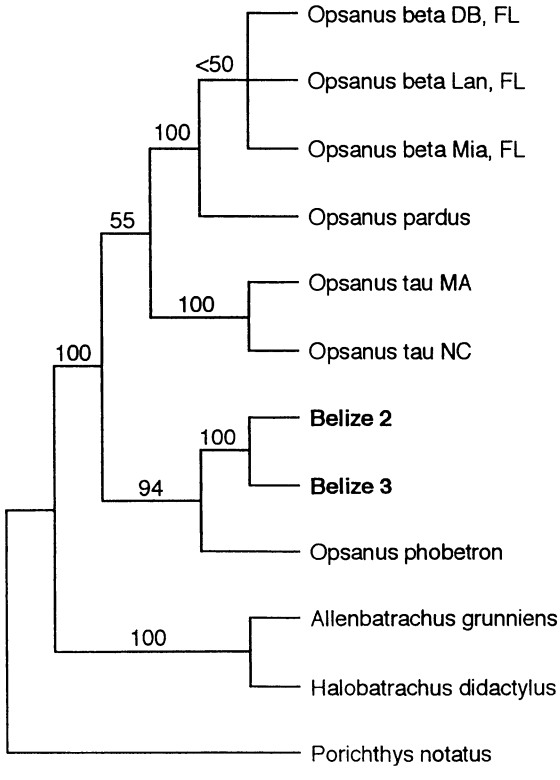

Fig. 3. Strict consensus of two minimal trees showing relationships among species of *Opsanus* resulting from parsimony analysis of mitochondrial data (D. W. Freshwater, pers. comm., Nov. 1999). "Belize" represents two specimens of *Opsanus dichrostomus*. Bootstrap proportions based on 1000 replications shown above branches.

head width 34.8, orbit 7.2, interorbital distance 5.6; snout-2 dorsal 56.7; snout-A 67.1; P_1 26.2; P_2 22.4.

Paratypes.–Belize.–Nineteen specimens (22.4-114 mm SL) from six collections. USNM 361064 (3, 78.1-114); same data as holotype. USNM 361065 (2, 40.3-106) and MCZ 157324 (1, 90.6); Belize City near island across from Fisheries Laboratory; T.R. Wasaff and M. DeGravelle; 1 Jul 1999. FMNH 72-31 (1, 95.0); Big Bogue between North Drowned Cay and Swallow Cay; 5 m; G 72-31, D.W. and T.A. Greenfield; 1 Aug 1972. FMNH 80-57 (1, 60.5); Chetumal Bay, Cayo Negro; G 80-57, D.W. and T.A. Greenfield, R.K. Johnson; 7 Jul 1980. FMNH 80-58 (10, 22.4-73.3); Chetumal Bay, Punta Allegru, ESE of Cayo Negro; G 80-58, D.W. and T.A. Greenfield, R.K. Johnson; 9 Jul 1980. ANSP 100481 (1, 86.8); W of

Fig. 4. Illustration of *Opsanus phobetron*, presumably from the Havana area, drawn by Otto Siebermann. Illustration shows the pattern very well, but incorrectly shows the two dorsal fins as connected at the base.

Congrejo Cay, 17°51'10" N, 88°6'30" W; 12.5 ft; RR61-29, R. Robertson; 30 Jul 1961.

Quintana Roo.–Three specimens (72.9-126 mm SL) from three collections. USNM 192217 (1, 101); Ascension Bay; 15 Apr 1960; Bredin Exped. USNM 192218 (1, 72.9); Ascension Bay; 16 Apr 1960; Bredin Exped. MPM 30780 (1, 126); 5 mi N Cancun; Spieler, Jass, Lupton, and Reimer; 27 Mar 1985.

Yucatan.–Three specimens (101-125 mm SL) from three collections. IPN P-4033 (1, 101); Puerto de Abrigo "Yucalpetén," 4 km SW Progreso; 15 Aug 1979; M. Favila *et al.* UMMZ 102169 (1, 125); Cienaga 2 km SW Progreso, near Cerro Isla; Creaser and A.S. Pearse; 1 Aug 1932. UF 13365 (1, 110); Progreso, E.S. Wing ZEWS 13365; 28 Jun 1966.

Campeche.–UMMZ 184702 (1, 100); Laguna del Pom at Atasta, about 14 mi W of ferry crossing to Ciudad Carmen; RRM 59-13, R.R. Miller and R.J. Schultz; 13 Feb 1959.

Other material.–Not considered part of the type series because the specimens are either too small to show the diagnostic mouth coloration or are from the Cuban population which might turn out to be distinct.

Quintana Roo.–Twenty specimens (12.2-67.2 mm SL) from seven collections. USNM 192354 (2, 44.1-57.8); Isla Mujeres harbor; Bredin Exped.; 30 Mar 1960. GCRL 3006 (10, 16.2-41.4); Laguna de Isla Mujeres, approx. 21°13'48" N, 86°45'08" W; 16 Jun 1968; C.E. Dawson. GCRL 5053 (3, 37.1-52.6); Isla Mujeres, N shore, at E end of airstrip; 8 May 1970; C.E. Dawson and A. Resendez. GCRL 5801 (3, 12.2-12.7); Isla Mujeres, Laguna Makaxi, approx. 21°13'18" N, 86°45'08" W; 9 May 1970; C.E. Dawson and A. Resendez. UF 77288 (1, 35.9); C.F. Duggins and K. Relyea, CFD 47; 28

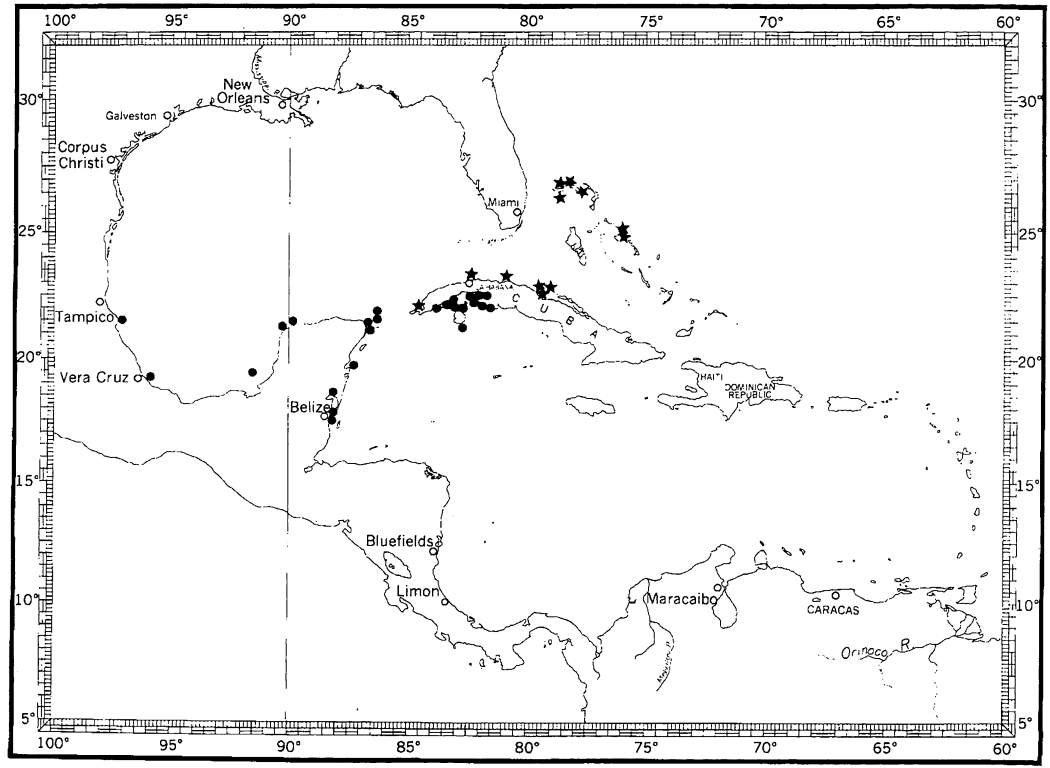

Fig. 5. Distribution of *Opsanus dichrostomus* (dots) and *O. phobetron* (stars), based on material examined (some symbols represent more than one collection).

Mar 1979. UF 77296 (1, 67.2); C.F. Duggins and K. Relyea, CFD 46; 28 Mar 1979.

Yucatan.–IPN P-3389 (1, 67.5); Dzilain, E of Progreso; 1 Sep 1961; R. Ramírez G.

Veracruz.–UMMZ 167532 (1, 50.8); 55 mi. S of Tampico along Laguna de Tamiahua; 5 Sep 1951; HEW 51-13, H.E. Winn and C.L. Smith.

Cuba.–185 specimens (23.0-121 mm SL) from 49 collections. USNM 107433 (2, 46.8-80.3); Isle of Pines, 22°05'47" N, 82°28'16" W; P. Bartsch; 15 Apr 1937. USNM 107435 (2, 70.5-72.0); Siguanea Bay; 12-16 ft; P. Bartsch; 12 Apr 1937. IOH uncat. (8, 39.3-83.7); 22°21' N, 83°02' W; sta. 15; 29 May 1983. IOH uncat. (10, 33.6-90.7); 22°06' N, 83°23' W; sta. 15; 26 Aug 1981. IOH uncat. (16, 23.0-79.3); 22°21' N, 83°02' W; sta. 15(1); 26 Aug 1981. IOH uncat. (8, 39.1-103); 22°10' N, 81°50' W; sta. 9(1); 10 May 1981. IOH uncat. (1, 48.6); 21°46' N, 82°30' W; sta. 10(4). IOH uncat. (2, 52.7-53.0); 22°02' N, 82°43' W; sta. 11(4); 9 May 1981. IOH 1895 (6, 50.0-100); 21°57' N, 83°03' W; sta. 13; 26 May 1983. IOH uncat. (14, 34.5-72.1); Retinga Prieta, 22°16' N, 82°01' W; 3.4 m; 18 May 1983. IOH uncat. (1, 77.5); 22°06' N, 83°23' W; sta. 14(5); 7 May 1981. IOH 1870 (4, 36.0-45.8); 22°35' N, 82°17' W; 6.6 m; sta. 11a; 25 May 1983. IOH uncat. (1, 121); 22°06' N, 83°34' W; sta. 3; 16 Feb 1970. IOH 1536 (1, 121); near Pta. San Cristobal, 22°12' N, 81°51' W; 28 Apr 1967. IOH uncat. (1, 76.6); 22°16' N, 82°01' W; 3.5 m; sta. 4(3); 12 May 1981. IOH uncat. (1, 88.0); 22°21' N, 82°02' W; 7.5 m; sta. 15(4); 6 May 1982. IOH uncat. (1, 90.2); 22°21' N, 82°02' W; 8 m; sta. 15(1); 24 May 1982. IOH 1491 (2, 18.2-77.1); 22°10' N, 81°50' W; 25 m; sta. 5; 4 Aug 1980. IOH uncat. (1, 61.7); 22°05' N, 83°03' W; sta. 13; 21 Aug 1981. IOH 1896 (2, 50.4-61.4); Gulf of Batabanó; 5.0 m; 30 May 1983. IOH uncat. (1, 58.1); 22°16' N, 82°01' W; 3.0 m; sta. 4(1); 5 Dec 1981. IOH uncat. (2, 39.3-70.4); Gulf of Batabanó; 6.5 m; sta. 12; 5 May 1981. IOH uncat. (3, 39.8, 58.0-60.4); Gulf of Batabanó; 4.5 m; sta. 12; 29 May 1983. IOH 1886 (1, 87.0); Gulf of Batabanó; 4.5 m; sta. 16; 27 May 1983. IOH uncat. (11, 30.7-72.5); 22°10' N, 81°50' W; sta. 9(4); 10 May 1981. IOH uncat. (1, 61.3); 22°04' N, 82°43' W; 5.6 m; sta. 11(2); 28 May 1982. IOH 1506 (12, 24.5-76.5); 22°10' N, 81°50' W; sta. 9(3). IOH uncat. (8, 41.1-47.4); 22°10' N, 81°50' W; sta. 5(5); 10 May 1981. IOH 1502 (7, 23.8-102); 20°10' N, 81°50' W; sta. 5(1); 10 May 1981. IOH 1507 (1, 100); 22°10' N, 81°50' W; sta. 9(3). IOH uncat. (10, 33.5-111); 22°10' N; 81°50' W; sta. 9(3). IOH uncat. (5, 24.6-60.0) and IOH uncat. (1, 69.1); 22°09' N, 82°43' W; 5.0 m; sta. 11(4); 4 Dec 1981. IOH uncat. (2, 58.5-61.3); 22°04' N, 82°43' W; sta. 11(1); 28 June 1982. IOH 1489 (4, 24.8-42.9); 22°01'36" N, 81°45.24' W; 3 m; sta. 4; 4 Aug 1980. IOH uncat. (4, 58.2-83.9); 22°21' N, 83°02' W; sta. 15(4); 2 Dec

1981. IOH uncat. (2, 30.0-40.7); 22°27' N, 81°24' W; sta. 3(1); 1 Dec 1981. IOH uncat. (1, 50.7); 22°27' N, 81°24' W; 4.4 m; sta. 3(4); 1 Dec 1981. IOH uncat. (1, 33.5); 22°04' N, 82°43' W; 5.0 m; sta. 11(1); 4 Dec 1981. IOH uncat. (1, 29.5); 22°28' N, 81°57' W; 4.3 m; sta. 3(1). IOH uncat. (2, 42.3-89.0); 22°21' N, 83°02' W; 8 m; sta. 15(2); 24 May 1982. IOH uncat. (1, 44.9); 22°16' N, 82°01' W; 3 m; sta. 4(1); 5 Dec 1981. IOH uncat. (3, 27.6-49.5); 22°16' N, 82°01' W; 3 m; sta. 5(4); 8 Dec 1981. IOH 1543 (1, 69.9); 22°16' N, 82°01' W; 3 m; sta. 4(3); 5 Dec 1981. IOH uncat. (5, 57.4-92.5); 21°57' N, 83°03' W; 4 m; sta. 12(1); 26 May 1982. IOH uncat. (7, 52.2-85.5); 22°21' N, 83°02' W; sta 15(3); 26 Aug 1981. IOH uncat. (1, 95.5); 22°16' N, 82°01' W; 3.0 m; sta. 4(1). IOH uncat. (1, 62.3); 22°16' N, 82°01' W; 3 m; sta. 4(4); 5 Dec 1981. IOH uncat. (2, 57.6-74.4); 22°16' N, 82°01' W; 3 m; sta. 4(1); 5 Dec 1981.

Comparative material

Opsanus beta. Nine specimens (77.5-200 mm SL) from seven collections. USNM 21477 (1, 200); FL, Pensacola; S. Stearns; 1878; lectotype of *Batrachus tau beta* Goode & Bean. USNM 23541 (1, 185); FL, Punta Russa; J.W. Velie; paralectotypes of *B. tau beta.* USNM 158548 (1, 186); FL, Clearwater city dock; R.D. & M.G. Suttkus; 4 Jul 1948. ANSP 68629 (1, 175); FL, Sand Key; R.D. Van Deusen; 11 Jul 1935; holotype of *O. vandeuseni* Fowler 1939. USNM 301939 (1, 113); MS, Ocean Springs; 1 Jun 1960. USNM 746 (2, 104-145); TX, Indianola; J.H. Clark; paralectotypes of *B. tau beta.* UMMZ 184510 (2, 77.5-176); Yucatan, Estero de Rio Mandinga, 0.5 mi S Boca del Rio, 8.5 mi S Veracruz, 19°8' N, 96°8' W; RRM 59-16, R.R. Miller, Carranza, Schultz, and Garcia; 30 Jan 1959.

Opsanus pardus. Seven specimens (67.4-324 mm SL) from six collections. USNM 22217 (2, 314-324); FL, Pensacola; S. Stearns; 1878; syntypes of *Batrachus tau pardus* Goode & Bean. USNM 73173 (1, 116); FL, Anclote, W of Tampa; Fish Hawk; 23 Jan 1902. USNM 142837 (1, 76.4); FL, Pepperfish Keys; Fish Hawk; 20 Nov 1901. USNM 301941 (1, 67.4); FL, Gulf of Mexico, 18 mi W off Egmont Key, 27°37' N, 83°7' W; 10 fm; Hernan Cortez; 2 Jul 1966. UF 200189 (1, 182); FL, Dry Tortugas; 24°45-50' N, 82°10-30' W; J. Regan; 16 Feb 1945; orig. UMML 189. UF 204220 (1, 200); FL, Charlotte Harbor, Ft. Myers beach; 10 Mar 1956; orig. UMML 4220.

Opsanus phobetron. Bahamas: eight specimens (24.7-129 mm SL) from eight collections. USNM 170961 (1, 127); N. Bimini, 500 ft N of Lerner Lab dock; 19 Jul 1947; paratype of *Opsanus phobetron* Walters & Robins. USNM 170962 (1, 86.7); Bimini, Tokas Key; 13 Apr 1957; I. Bonnelly; paratype of *O. phobetron.* ANSP 79480 (1, 119); S. Bimini; 28 Feb 1952;

paratype of *O. phobetron.* ANSP 79481 (1, 114); Bimini; paratype of *O. phobetron.* UF 200498 (1, 114); Bimini, Tokas Key; Dec 1950; V. Walters; orig. UMML 498. UF 2027128 (1, 129); Bimini; orig. UMML 27128. UF 227128 (1, 126); Little Bahama Bank 20 mi NW Mangrove Cay; three fms. MCZ 34708 (1, 24.7); Eleuthera, Governor's Harbor; W.J. Clench; May 1936.

Cuba: Twenty-seven specimens (25.9-185 mm SL) from 16 collections. USNM 111300 (1, ca. 185, skeleton); Cuba; F. Poey, 1856-1877. MCZ 12751-4 (4, 55.6-154); Cuba; F. Poey. MCZ 12759 (1, 136); Pinar del Rio, Guadiana Bay; Stimpson. MCZ 30607 (1, 63.0); Habana; T. Barbour; 1913. IOH 2107 (1, 41.4); Cayeria Norte, 23°5'35" N, 80°46'10" W; sta. 7A; 25 Feb 1989. IOH 2147 (2, 52.4-56.2); 22°44'49" N, 79°35'19" W; 2 m; sta. 23; 20 Apr 1991. IOH 2452 (2, 65.5-71.6); 22°37'30" N, 79°22' W; sta. 38; 22 May 1995. IOH 2454 (1, 61.2); 22°34'48" N, 79°27'36" W; sta 40; 22 May 1995 IOH 2476 (7, 30.5-68.3); 22°30'48" N, 79°11' W; 2.7 m; sta. 53; 20 May 1995. IOH 2512 (3, 25.6-87.2) and IOH 2516 (2, 47.5-65.3); 22°23'42" N, 79°8'6" W; 0.5 m; sta. 155; 21 Apr 1996. IOH uncat. (1, 45.1); Cayeria Norte, 22°31'30" N, 79°16'14" W; 2.7 m; sta. 35; 23 Apr 1991. IOH uncat. (1, 71.4); 22°28' N, 79°11' W; sta. 54; 20 May 1993.

Opsanus tau. Twenty-three specimens (74.3-210 mm SL) from 12 collections. USNM 48976 (1, 131); NY, Peconic Bay, Scallop Pond; 28 Jul 1898; T.H. & B.A. Bean. USNM 4637 (1, 175, skeleton), NJ, Beesley's Point; S.F. Baird. USNM 45460 (1, 143); MD; N Potomac River, Cornfield Harbor; Jul 1894; R. Ridgway. USNM 89808 (11, 21.5-210); MD, Cobb Island near Rock Point; 19-20 Aug 1930; W.L. Brown. USNM 272709 (1, 155, skeleton); MD, Chesapeake Bay, 1 mi N of Dare's Wharf; 31 May 1912; Palmer & Weed. USNM 283609 (1, 155, skeleton); MD, Potomac R., St. Mary's Co., Piney Point; 10 Aug 1941; F.M. Uhler *et al.* USNM 91202 (2, 74.3-83.3); VA, Lewisetta; 6-8 Aug 1921; W.C. Schroeder. USNM 301993 (1, 118); GA, Sapelo I., Doboy Sound, Dean Creek; 10 Aug 1963; T.L. Linton & J. Golden. USNM 18034 (1, 161); FL, Matanzas R. inlet; Feb 1877; J.C. Willets. USNM 301995 (1, 125); FL, Cape Canaveral; 19 Feb 1970. USNM 272707 (1, 195, skeleton), no data. USNM 272710 (1, 230, skeleton), no data.

DISCUSSION

Description of *Opsanus dichrostomus* adds one more species to the already large toadfish fauna (eight species) of the Yucatan Peninsula and associated offshore reefs: *Batrachoides gilberti* Meek & Hildebrand 1928; *Porichthys plectrodon* Goode & Bean 1892; *Sanopus astrifer* (Robins & Starck

1965); *S. greenfieldorum* Collette 1983; *S. johnsoni* Collette & Starck 1974; *S. reticulatus* Collette 1983; *S. splendidus* Collette, Starck & Phillips 1974; and *Triathalassothia gloverensis* Greenfield & Greenfield 1973.

The illustration of *Opsanus phobetron* is included for comparison with the photograph of the holotype of *O. dichrostomus* and also to make more people aware of the illustrations prepared by Otto Siepermann, a German artist who was interned in Havana during World War I. Carlos de la Torre arranged for Siepermann to illustrate fishes from Cuba. There are hundreds of these original illustrations currently housed at the Acuario Nacional de Cuba and in need of modern conservation techniques to preserve them for the future.

ACKNOWLEDGMENTS

Loans and access to specimens were provided by Eugenia Böhlke and Michael Littmann (ANSP), George Burgess (UF), Karsten Hartel (MCZ), Randy Mooi (MPM): C. Richard Robins (University of Miami), Mary Anne Rogers (FMNH), David W. Greenfield (University of Hawaii), the late C.E. Dawson and Stuart G. Poss (GCRL), Elena Guiterrez and Rodolpho Claro (IOH), Joaquín Arroyo-Cabrales (IPN), and William L. Fink and Douglas W. Nelson (UMMZ). Participation in the FAO workshop was made possible by FAO through Pere Oliver and Kent Carpenter and FishBase through Rainer Froese. Martin DeGravelle, Jon Moore and N.V. Parin accompanied me on a brief collecting trip following the FAO workshop in Belize resulting in four fresh specimens. Jon Moore kindly photographed the live specimens. Participation in the visit to Havana was facilitated by Marsha Sitnik at the Smithsonian Institution. Michael Smith took me to visit the Acuario Nacional de Cuba to view the Siepermann illustrations. Permission to reproduce the Siepermann illustration of *Opsanus phobetron* was granted by Guílliermo Garcia Montero, Director of the aquarium through the good offices of the late Darío Guitart Manday. The diagrams of *O. dichrostomus, O. phobetron* and *Opsanus* sp. were prepared by Keiko Hiratsuka Moore. D. Wilson Freshwater graciously furnished the consensus tree (Fig. 3) based on his mtDNA data. Martha Nizinski assisted with preparation of the tables. Radiographs were taken by Ruth Gibbons and La'Shaun Willis. Localities on the map were plotted by La'Shaun Willis. Drafts of the manuscript were read by Reeve M. Bailey, George Burgess, D. Wilson Freshwater, David W. Greenfield, Thomas Munroe, Michael Vecchione, and Patrick J. Walsh.

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