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**RANGE EXTENSIONS OF WESTERN
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SOME SOLES OF THE GENUS *GYMNACHIRUS***

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RANGE EXTENSIONS OF WESTERN NORTH ATLANTIC
FISHES WITH NOTES ON SOME SOLES OF THE
GENUS *GYMNACHIRUS*

DAVID K. CALDWELL AND JOHN C. BRIGGS¹

A considerable quantity of littoral fishes taken from the Atlantic in the vicinity of Brunswick, Georgia, and from the Gulf of Mexico in the vicinity of Panama City and Destin, Florida, and a small collection of pelagic fishes taken off the Mississippi Delta, have recently been added to the University of Florida Collections. We wish to express our thanks to Frederick H. Berry and Edwin H. Chandler, both of Brunswick; to Winfield Brady and Mr. and Mrs. J. B. Siebenaler, of the Gulfarium at Fort Walton Beach, Florida; and to Harvey R. Bullis, Jr., of the United States Fish and Wildlife Service at Pascagoula, Mississippi; for their assistance in obtaining this material.

Of the fifteen species listed below, one is reported from the North American continent for the first time; another involves a range extension from the Atlantic coast into the Gulf of Mexico and is only the second record of its occurrence; another is a range extension from the West Indies and the Gulf of Mexico to the Atlantic coast; nine represent range extensions from the Caribbean, the Atlantic, and the Florida Keys into the northern Gulf of Mexico; one, *Gymnachirus williamsoni*, has its range extended within the Gulf as well as to the Atlantic coast, and it is also discussed in relation to other members of its genus; the range of another is clarified; and one is a notable occurrence of a deepwater species in a littoral area within the Gulf.

Apogon pigmentarius (Poey)

We collected three individuals of this species on 8 October 1955, at the jetties at Panama City, Bay County, Florida. They are now UF 5389 (26, 27, and 27 mm. standard length).

A. pigmentarius has previously been recorded in the Gulf of Mexico from only as far north as Tortugas (Longley and Hildebrand, 1941:84). Beebe and Tee-Van (1933:114) record it from Bermuda and note that it also occurs at various West Indian localities and in Panama. These specimens thus represent a range extension of approximately 525 shoreline miles into an area usually considered more temperate than tropical.

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Apogon pseudomaculatus Longley

A single individual was collected by the Gulfarium staff under the bridge (U.S. Highway 98) over East Pass at Destin, Okaloosa County, Florida, in February 1956. The specimen, UF 5600, is 72 mm. standard length.

This species is also recorded from Tortugas by Longley and Hildebrand (1941:88) and apparently from Bermuda—as *A. maculatus*—by Beebe and Tee-Van (1933:116). This range extension, approximately 575 shoreline miles, is similar to the preceding one.

Pterycombus goodei (Jordan)

Two individuals of this rare species—there is only one specimen previously recorded—were found in the stomach of an *Alepisaurus ferox* Lowe which was, in turn, taken on a long line set at a depth of about 50 fathoms in the northeastern Gulf of Mexico (lat. 28° 17' N., long. 88° 33' W.) by the U. S. Fish and Wildlife Service vessel *Oregon* on 23 July 1956, (Station 1588).

This species is the same as the *Pteraclis carolinus* reported by Goode and Bean (1895, pl. 58, fig. 218); the appearance of the larger of the two individuals (62 mm.) is virtually identical with their illustration. There is a strong resemblance to *Pterycombus falcatus* Barnard from South Africa and also to *Centropholis ledanoisi* Belloc and *Pterycombus brama* Fries from the eastern North Atlantic. It is quite possible that these names may all be referable to the same species. In that case the last designation would be the correct one.

Pteraclis Grönow 1772, and the genera which are related to it, are still in a confused state. There is little doubt that *Centropholis* Hilgendorf 1878 and *Centropholoides* Smith 1949 belong in the synonymy of *Pterycombus* Fries 1837. Furthermore, the possibility that the species of *Pterycombus* are simply the young of *Pteraclis* or of *Bentenia* Jordan and Snyder 1901 is certainly not too remote.

The larger of the two specimens at hand may be characterized as follows: standard length 62.0 mm., standard length/head length ratio 3:2, head length/eye diameter ratio 2:6, dorsal spines 50, anal spines 41, pectoral rays 22, scales of dorsal sheath 49, scales of anal sheath 45, 48 scales along side from opercle to end of hypural plate, branchiostegals 7, and 8 well-developed rakers on the first gill arch. The second individual is considerably smaller and in poorer condition. It has a standard length of 24.6 mm., a standard length/head length ratio of 2:3, and a head length/eye diameter ratio of 2:4. The remaining characters cannot be described with any real reliability. It may be noted that the eye and head are comparatively larger at this size.

The locality of the specimen figured by Goode and Bean (1895) is simply given as the "Gulf Stream." It was most likely taken somewhere off the coast of the Carolinas. The range of *Pterycombus goodei* may now be stated as extending from the Carolinas to the northeastern Gulf of Mexico.

Recently six additional specimens of *P. goodei* were made available through the kindness of Giles W. Mead. This material was also taken by the U.S.F.W.S. vessel *Oregon*. Four individuals 27.5 mm. to 44.0 mm. in standard length, were removed from the stomach of an *Alepisaurus ferox* that had been captured on a long line in the Caribbean just below the Cayman Islands (lat. 19° 30' N., long. 81° 50' W.). One, 56.0 mm. in standard length, was taken from a tuna stomach from the northern Gulf of Mexico (lat. 27° 43' N., long. 88° 43' W.); and another, 16.5 mm. in standard length, was taken by dip net from a nearby locality (lat. 28° 36' N., long. 87° 58' W.).

Eques punctatus (Bloch and Schneider)

There is an individual (120 mm. standard length) of this species in the University of Florida Collections (UF 4074) collected in October 1938, by L. A. Burry at Pompano Beach, Broward County, Florida. According to the original label, the fish was found washed up on the beach after a storm.

This is a West Indian form apparently unrecorded from the mainland of the United States.

Chaetodon ocellatus Bloch

A single individual (UF 5370), 88 mm. in standard length, was collected by the Gulfarium staff under the bridge (U.S. Highway 98) over East Pass at Destin, Florida, in August 1955.

This apparently extends the recorded range of this species—primarily known from the Caribbean and Florida Keys—from Tortugas into the northern Gulf of Mexico (about 575 shoreline miles), though it is known from as far north as Cape Cod in the Atlantic (Longley and Hildebrand, 1941:149).

We have been told by reliable observers that this species is often seen in inshore waters in the vicinity of Pensacola, Florida, about 40 miles west of Destin.

Chaetodon striatus Linnaeus

Though conditions prevented their collection, two juvenile individuals (hardly over 25 mm. standard length) were clearly observed by Caldwell and Thomas R. Hellier, Jr. on 27 May 1956, in water less

than 3 feet deep at the jetties at Panama City, Florida. It was possible to make a careful study of the fish at close range through a face plate, and they fit perfectly the description of the young by Longley and Hildebrand (1941:148) and the illustration by Borodin (1928:23, pl. 4, fig. 2), labelled *C. consuetae* Mowbray.

This record apparently extends the range of this species to the northern Gulf of Mexico from Tortugas, the Bahamas, and tropical America.

Holocanthus ciliaris (Linnaeus)

There is an individual referable to this species (based on color description) being maintained alive at the Gulfarium. The fish, approximately 90 mm. in standard length, was collected by the Gulfarium staff in early October 1956, at the jetties at Panama City. It apparently constitutes a range extension into the northeastern Gulf of Mexico from the Florida Keys. Another (UF 5685) has the same data.

Abudefduf saxatilis (Linnaeus)

A single example (UF 5420), 42 mm. standard length, was taken by Caldwell and Brady on 30 July 1956, at the Panama City jetties.

This record constitutes a range extension in the Gulf of Mexico of about 525 shoreline miles from Tortugas, Florida, where it was recorded by Longley and Hildebrand (1941:183).

Pomacentrus xanthurus Poey

On 8 October 1955, we collected 51 individuals (UF 5386), 11 to 59 mm. standard length, which we tentatively ascribe to this species. They seem to fit best the description of *P. xanthurus*, as differentiated from the other species of this genus from south Florida by Longley and Hildebrand (1941:178-183). This record constitutes a northward range extension in the Gulf of Mexico from Tortugas to Panama City, Florida. They differ from specimens of *P. xanthurus* from southern Florida in being somewhat darker with less clear-cut differentiation between the blue and the yellow, and in having more definite vertical stripes on the sides. This is particularly true of the larger examples. In the specimens from Panama City there is also a black axillary pectoral spot which becomes more conspicuous with increase in size.

Acanthurus chirurgus (Bloch)

We collected one individual of this species (UF 5385), 165 mm. standard length, on 8 October 1955, at the jetties at Panama City, Florida. Five additional specimens (UF 5415), 42 to 89 mm. standard

length, were taken at this locality on 30 July 1956, by Caldwell and Brady.

These records constitute a range extension in the Gulf of Mexico of about 525 shoreline miles from Tortugas. Here the species was recorded by Longley and Hildebrand (1941:155) as *A. hepatus*. These authors and Beebe and Tee-Van (1933:179) record it from the Atlantic coast of tropical America northward in the Atlantic to Cape Cod, and from Brazil through the West Indies to Bermuda, respectively.

Acanthurus coeruleus Bloch and Schneider

A single individual (UF 5417) referable to this species was collected at the Panama City jetties by Caldwell and Brady. The fish, 56 mm. standard length, was taken on 30 July 1956, and the record constitutes the same range extension from the Tortugas as that reported above for *A. chirurgus* (Longley and Hildebrand, 1941:155).

Otophidium welshi Nichols and Breder

Though Fowler (1952:134) records this species from New Jersey, we include the following record as a point of reference between that point and the nearest recorded locality of Cedar Key, on the northern peninsular Gulf coast of Florida (Reid, 1954:63).

A single, somewhat damaged individual (UF 5526) was taken off the mouth of St. Simons Sound, on the Atlantic coast of Georgia, by a commercial shrimp trawler on 15 October 1955. It is not possible to make a thorough comparison with specimens from the Gulf of Mexico because of the poor condition of the single individual. However, the typical color pattern—longitudinal dark lines on the body—which serves to readily distinguish *O. welshi* from the other western Atlantic members of this genus, could be seen clearly.

Palinurichthys bythites Ginsburg

Two individuals (UF 5595), 53 and 134 mm. standard length, were collected in the vicinity of Destin, Florida, in February 1956, by the Gulfarium staff.

This species has apparently been recorded definitely only from deep water (200-220 fathoms) in the Gulf of Mexico off both Pensacola, Florida and the Mississippi Delta (Ginsburg, 1954:262). These records are of particular interest in their extension of the depth range to approximately 15 fathoms or less; unfortunately the exact locality of capture is unknown, but trawling by the Gulfarium crew had not been carried on in greater depths.

Prionotus punctatus (Bloch)

Two individuals (UF 5473), 98 and 100 mm. standard length, were taken by a commercial shrimp trawler off the mouth of St. Simons Sound, Georgia, between 20 September and 12 October, 1955. The record extends the range of this species north from the West Indies and from the Gulf of Mexico.

The specific designation of these particular individuals requires some explanation because of the state of the literature on this genus of triglids. In spite of the fact that two modern revisions have been published (Ginsburg, 1950, and Teague, 1951), a good deal of confusion still exists. As far as this species is concerned, one is presented with a choice of whether to follow Ginsburg (1950:512) and use the specific name *punctatus* or to accept Teague's (1951:56) designation of *maculatus*.

The propriety of attempting to associate Bloch's (1793:125) *punctatus* with a recognized species of *Prionotus* has been discussed from two different viewpoints, first by Teague and Myers (1945:4) and second by Ginsburg (1950:514). We have decided to accept *punctatus* as the specific designation simply because we think that modern ichthyologists should make a strong effort to see that such old names, which could not be synonyms, are applied to good species, even if the decision has to be somewhat arbitrary. Thus we agree with Ginsburg on this point, but we do not consider *P. alipionis* Teague and Myers to be synonymous with *P. punctatus*. Unless the variation within the latter species is considerably greater than is apparent so far, *P. alipionis* should remain as a perfectly recognizable entity.

Gymnachirus williamsoni (Gunter)

A single individual (UF 5556) was collected approximately 3 miles off St. Simons Island, near the mouth of the bay at Brunswick, Georgia, on 23 October 1955, by Caldwell and Frederick H. Berry. The individual was taken in a commercial shrimp trawl in about 3 fathoms.

The fish, 123 mm. standard length, agrees with the descriptions for this species as presented by Gunter (1936:203; 1939:188) except as follows: The mouth is turned down posteriorly on both sides, though only slightly so on the eyed side. This character is at variance with Gunter's (1936:204) description of a straight mouth on the eyed side. However, in comparing this specimen with two others in the University of Florida Collections from the Gulf of Mexico (UF 4553, one, from just off Destin, Florida, taken in January 1955, by the Gulfarium staff; and UF 3637, one, from lat. 29° 50' N., long. 86° 30' W., taken

at Oregon station 944 on 21 March 1954) we found this character to be the same, and it is assumed that Gunter meant the mouth on the eyed side does not turn down *sharply* on this side as it does on the blind side.

Gunter (1939:193) thought that *G. williamsoni* differed from all other naked soles in having a color pattern of black, white, and gray, rather than any brownish tones. However, both the Georgia and the two Gulf of Mexico specimens noted above have definite pinkish-buff tones instead of white in the interspaces, and the dark bands appear to be dark brown rather than black. This was also true of the specimen from Georgia when alive. The dark splotches which Gunter describes as occurring on each side of the lateral line on the blind side are present in our specimens, but they are faint, and most can be seen as small patches of melanophores only under magnification.

The presence of accessory lateral lines, the loose wrinkled skin, the dark splotches noted above, colorless fin tips, no nasal openings on the blind side, and the number of dorsal fin rays seem to be the only published characters which serve to distinguish this species from the rare (only two specimens recorded) *Gymnachirus fasciatus* Günther, which is diagnosed by Günther (1862:488) and Kendall (1911:201). Gunter (1936:208) compared his type of *G. williamsoni* with the specimen of *G. fasciatus* which Kendall (1911:201) reported. He found the two individuals to differ, though he noted that Kendall's specimen was dried up, and it may well be that some of the characters could not be determined accurately. Kendall described "transverse rows of cilia on body [which were] white tipped." However, he may have overlooked the accessory lateral-line pores, and he may have been looking actually at the lines seen by Gunter (1939:192), which are described as being traced by papillae and which in his and our specimens are colorless tipped. If the accessory lateral lines are actually present in *G. fasciatus*, then this major distinguishing character for *G. williamsoni* cannot be considered valid. The coloration of the fin tips could well have been described by Kendall and Günther as being "white" rather than "colorless," and the dark splotches along the lateral line on the blind side are, as noted above, often pale, and they could easily be overlooked if one was not searching carefully for them. The wrinkled skin might be dehydrated in alcohol preservation and not be noted. The probable invalidity of dorsal ray number as a character is noted below. Gunter (1936:209) found no nasal openings on the blind side of the specimen of *G. fasciatus* he examined, but notes that he could not be sure of their presence or absence due to the condition of the specimen. However, we miss the significance of this character since it is mentioned in neither Günther's (1862) nor Kendall's (1911)

description of *G. fasciatus*, nor do we see such openings in our specimen of *G. williamsoni*. All other counts, proportions, and miscellaneous characters not noted above as being distinguishing, seem to overlap considerably. Future study of large series of naked soles, and particularly a careful comparison of the types of both these nominal species, may well prove them synonymous. Unfortunately the type of *G. fasciatus*, if it exists at all, is not available in this country for study. Günther notes it as on deposit in the collection of the "Zoological Society" and of unknown origin. *G. nudus* Kaup and *G. melas* Nichols may refer to this same species. For the present, however, since all the types are not readily available, it seems best to recognize all four species, and our specimen from Georgia seems to best fit the description of *G. williamsoni* (Gunter).

Kritzler (1951:245) reported a naked sole, which he tentatively identified as *Nodogymnus fasciatus* (= *Gymnachirus fasciatus*), from off Matanzas Pass, near St. Augustine, Florida, approximately 100 shoreline miles south of our Georgia record for *G. williamsoni*. Through the courtesy of Francesca LaMonte, we have had the opportunity to examine this specimen which is now in the collections of the American Museum of Natural History (No. 18889). We think that it should be reidentified as *G. williamsoni* for the following reasons: Kritzler apparently overlooked Gunter's second paper (1939) on this species and the paper by Longley and Hildebrand (1941:49) describing other specimens, for he states that the counts and proportions which he gives for his specimen agree most closely with *G. fasciatus*. Actually, all but one fall within the ranges given by the above authors for *G. williamsoni*, most of which, in turn, do overlap (as noted above) with those of *G. fasciatus*. The only character which Kritzler gives which does seem to agree with the descriptions given for *G. fasciatus* by Günther (1862) and Kendall (1911) is that of the number of dorsal fin rays. This count is hard to make, however, and the character is probably of doubtful value in distinguishing the species except perhaps when the count is made by X-ray or made in the same precise manner by the same person. The fin rays are often enveloped in skin (Longley and Hildebrand, 1941:49) and the most anterior ones are easily confused with the numerous papillae anterior to them. The normal count expected for *G. williamsoni* is about 60 (56 to 64 in published descriptions and on our specimens) and 68 for *G. fasciatus* (according to published descriptions). The count of 68 rays given by Kritzler (1951) for his specimen is a mistake however; we can count a maximum of only 64, and this may be an overstatement since we counted every projection which could possibly

be considered a ray; our number should be nearer 60 perhaps. Thus, this character for his specimen is within the range of *G. williamsoni*. The form of the mouth and the position of the eyes in Kritzler's specimen agree with our specimen from Georgia and are within the variation of *G. williamsoni* in the Gulf of Mexico as shown by us above. Agreement is also shown with Gunter's description (1939:189) for the eyes. The position of the nasal tubes, the color pattern, the nature of the lateral line system, and pattern of sensory hairs on the blind side are, as Kritzler notes, in agreement with the descriptions of *G. williamsoni*. We do not hesitate, therefore, in referring this specimen to *G. williamsoni* instead of to *G. fasciatus*.

These two specimens apparently extend the range of *G. williamsoni* to the Atlantic coast of northern Florida and southern Georgia. They are also the first records for the Atlantic. The species was previously recorded only from the Gulf of Mexico, from Tortugas (Longley and Hildebrand, 1941:48), northward and westward along the Gulf coast to Pensacola, Florida, and on the Campeche Bank (Hildebrand, 1955:204). Though Hildebrand states that it has not been taken off the Texas coast, there are specimens in the Chicago Natural History Museum² from the following localities in Texas waters, all south of Rockport: latitude 28° 2' N., longitude 96° 4' W., 22 fathoms; latitude 27° 42' N., longitude 96° 44' W., 19 fathoms; latitude 27° 39' N., longitude 96° 30' W., 37 fathoms. It is also recorded in the species list of the vessel *Oregon*³ as taken at station 652, 11 October 1952, at latitude 22° 55' N., longitude 97° 36' W., in 23 fathoms. This is off the Mexican coast approximately 40 miles north-northeast of Tampico. This specimen was identified by Woods (personal communication) and is now in the Chicago Natural History Museum collections. These records, thus, extend the published range of this species into the coastal waters of northern Mexico and southern Texas in the western Gulf of Mexico. The complete known range may now be stated as extending from off Rockport, Texas southward and eastward to the Campeche Bank, along both coasts of Florida to Pensacola in the Gulf of Mexico, and to off Brunswick, Georgia, in the Atlantic. It is apparently gradually replaced on the coasts of Texas, Louisiana, and perhaps Mississippi and Alabama by the very similar *G. texae* (Gunter), which at present

²We wish to thank Loren P. Woods, curator of fishes, for making these records available to us.

³Appreciation is expressed to Stewart Springer of the United States Fish and Wildlife Service for allowing us to cite this record from the as yet unpublished species list of the *Oregon*.

is recorded from the Campeche Bank westward and northward into Texas and Louisiana (Hildebrand, 1954:296).

Since there has been some confusion as to the separation of *G. texae* and *G. williamsoni*, we present the following table of counts from the two species as they are represented in the western Gulf of Mexico (table 1). The counts were all made by Loren P. Woods, curator of fishes at the Chicago Natural History Museum. We are especially indebted to him for allowing us to include them here.

TABLE 1.

COUNTS FOR TWO SPECIES OF NAKED SOLE (*Gymnachirus texae* AND *G. williamsoni*) FROM THE WESTERN GULF OF MEXICO.

Number of dorsal fin rays	57	58	59	60	61	62	63	64	65	66	
<i>texae</i>	1	3	2		2	2	1				
<i>williamsoni</i>						1	2	3		1	
Number of anal fin rays	39	40	41	42	43	44	45	46	47	48	49
<i>texae</i>	1		3	5	8	4	3				
<i>williamsoni</i>						1	2		2	1	1
Number of transverse lateral-line branches					6	7	8	9			
<i>texae</i>					4	3					
<i>williamsoni</i>							4	1			

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