

Chlorostoma Pfeifferi.
Surcula Carpenteriana.
Conus californicus.
Neverita Recluziana.

Mitra maura.
Monoceros engonatum.
Purpura crispata.
Fusus Harfordi.

Near Santa Barbara, the outcrop (C²) upon the seabeach afforded a few fossils, some of which were similar to species obtained from the San Diego well. Among these were the following, all recent species:—

Venericardia monilicosta.
Bittium quadrifilatum.
Bittium asperum.
Lacuna vineta.

Astyris gausapata.
Amphissa versicolor.
Trophon orpheus? jun.

The formation within whose limits the beds above described are to be included extends from the Pribiloff Islands southward, at least to Yesso Island, Japan, on the west, and to Chili on the east. A fruitful locality is at Cerros Island, Lower California, from whence *Waldheimia Kennedyi* Dall, and also a number of the species referred to in the preceding article, have been obtained, some of which are described by Gabb in the Paleontology of California.

Jurassic or Cretaceous beds appear to exist at Todos, Santos Bay, Lower California, not far from San Diego. Mr. Hemphill collected here, and has presented to the National Museum, half a dozen species not yet critically examined, but containing a fine specimen belonging to the *Rudistæ*, which have hitherto been hardly known as American fossils.

MARCH 2, 1878.

A REVISION OF THE AMERICAN SPECIES OF THE GENUS BREVOORTIA, WITH A DESCRIPTION OF A NEW SPECIES FROM THE GULF OF MEXICO.

By G. BROWN GOODE.

The type of the genus *Brevoortia* of Gill is the species described in 1802 by Latrobe under the name of *Clupea tyrannus*, and later by Mitchell under the name of *Clupea menhaden*. As has been already indicated,* the former name has the prior claim to adoption, and the species must be called *Brevoortia tyrannus*. Of this species, there appear to be two geographical races or varieties. One of these is the typical form of the Atlantic coast of the United States, the other a closely allied form from the coast of Brazil, already described by Spix under the name of *Clupanodon aureus*. For the northern form, the name of Mitchell should be retained, and the two varieties may be distinguished as *Brevoortia tyrannus* var. *menhaden*, and *Brevoortia tyrannus* var. *aureus*. On the coast of Patagonia and Paraguay occurs a well-marked species described by Jenyns under the name of *Alosa pectinata*. This species is readily

*Vide supra, p. 8.

distinguished by its larger scales, which are arranged in 18 to 20 lateral rows, instead of 25 to 27, as in *B. tyrannus*. The generic relations of this species were recognized many years ago by Professor Gill, and its name should stand as *Brevoortia pectinata*, (Jenyns) Gill.

A third species occurs in the Gulf of Mexico. It is distinguished by its larger head and fins. It appears to have never been described, and for this form the name *Brevoortia patronus* is proposed. It is accompanied by the same Crustacean parasite that is found in the mouths of *B. tyrannus*, to which Latrobe gave the significant specific name of *prægustator*.

Brevoortia tyrannus, (Latrobe) Goode.

Diagnosis.—Head and jaws short, the length of the head less than one-third of the length of the body, less the caudal fin, especially short in var. *aurea*; the maxillary in length much less than three-twentieths of the length of the body. Height of body about one-third of total length, in very fat individuals three-eighths. Fins comparatively short, the height of the dorsal less than length of maxillary, and considerably less than three-tenths of length of body, that of the anal usually less than half that of maxillary, that of ventral always less than one-tenth of total length, the length of middle caudal rays one-fifth that of body and less, that of exterior caudal rays usually about three-fourths, often less than two-thirds, and rarely more than five-sixths of total length. Fins all shorter in var. *aurea*. Insertion of ventral far behind tip of pectoral. Insertion of dorsal about equidistant from snout and base of middle caudal rays, but varying two or three one-hundredths to either side of the median point, and always slightly behind the vertical from insertion of ventrals.

Scales of medium size, much serrated, arranged very irregularly in 24–26 transverse and 60–80 longitudinal rows. Scales forming sheath at base of pectoral not large. Squamation of caudal lobes moderate.

Operculum strongly striated in var. *menhaden*, almost smooth in var. *aurea*.

Scapular blotch conspicuous.

This species is easily distinguished from *Brevoortia patronus* by its shorter head and fins, by its slenderer body, and its pectinated scales, and from *B. pectinata* by its smaller, less regularly arranged, and more numerous scales, and its shorter, less furcate caudal fin.

INDIVIDUAL VARIATIONS AND SPECIAL CHARACTERS.

Head.—The length of the head varies from 0.28 to 0.33. The posterior end of the maxillary extends to a point in the vertical from the centre of the orbit. The length of the skull, as indicated by the "distance from snout to nape", varies from 0.19 to 0.23. The length of snout, measured from a line drawn perpendicularly through the centre of the orbit, varies from 0.09 to 0.11. The length of maxillary varies from

0.12 to 0.145; that of mandible from 0.15 to 0.18. The diameter of the eye enters $4\frac{1}{2}$ times in the length of the head. Its width varies from 0.11 to 0.15 in very fat individuals.

Shape of Body.—This is exceedingly variable, and the variation is caused largely by the fatness of the individual. In very plump ones, the expansion of the belly throws back the origin of the ventrals and anal, and greatly changes the appearance of the fish. In the specimens before me, the height of the body ranges from 0.31 to $0.38\frac{1}{2}$. The table of measurements subjoined shows the effect of increased height of body upon the other measurements of proportion.

Fins.—The range of variation in the position of the dorsal is indicated in the diagnosis. There is no appreciable correlation between the positions of the dorsal and anal in the same specimen. The insertion of the anal is distant from the snout from 0.68 to 0.75. The lengths of the rays in dorsal, anal, ventral, and caudal vary much, as the table of measurements indicates. In the caudal, the upper lobes vary from 0.16 to 0.25; the lower lobes from 0.18 to 0.27. The relation of the pectoral and ventral fins is much affected by the length of the head, the insertion of the former being thrown much further back in long-headed individuals.

Scales.—The degree of serration varies much in individuals as well as the squamation of the bases of the vertical fins and the number and regularity of the body-scales. In young individuals, the scales are arranged with much regularity; but, in adults, I have strong reason to believe that scales are intercalated here and there, throwing the arrangement into great disorder, and rendering an accurate enumeration impossible.

Varieties.—The series before me embraces some two hundred specimens of *Brevoortia tyrannus* of various ages, seasons, and localities. Almost every feature is subject to wide variations, and there is usually no decided correlation between different characters except that a long head is accompanied usually by long jaws, and a pectoral set farther back and extending more nearly to the insertion of the ventral. There are, however, certain groups of individuals which can be included within a diagnosis which may serve to distinguish them from all the others of the same species. To what extent it is desirable to define varieties which are not separated geographically, I am not well satisfied. The exact meaning of the terms "sub-species" and "variety" as employed by Cope, Cones, Gill, Yarrow, and other recent writers has not been definitely interpreted. It seems desirable, however, to designate in some way the limits of variation from the normal specific type in different directions. With this purpose, and premising that by a variety I mean simply a divergent form, connected by intermediate forms with the typical specific form, I have thought it desirable to name provisionally two varieties, and to call attention to others which may possibly exist. This is done with much hesitation, and only with a view to an attempt to

formulate the minor differences to be observed between fish of the same species on different parts of our coast. A precisely parallel case is to be found in the shad of the different Atlantic rivers, which are well known to exhibit strong distinctive marks. Very possibly every school of menhaden has its own characteristics. In every case where I have had an opportunity to observe them, the individuals composing the same school were closely similar to each other.

The typical form of the species as now defined is taken from the coast of Southern New England and the Middle States. It has the height of the body about one-third of the total length, the head three-tenths of the total length, or a little more, the maxillary long (0.14 to 0.14½) and exceeding the height of the dorsal.

The species described by Spix under the name of *Clupanodon aureus* cannot be distinguished by any apparent specific characters from *Brevoortia tyrannus*, since one or more of the specimens of the latter species before me partake of some of the peculiarities of the Brazilian form. There is, however, a general average of characters exhibited by the Brazilian specimens as well as by the figure of Spix, with which they closely agree, which seems to me to entitle them, for the present at least, to recognition as belonging to a distinct geographical variety. The distinctive characters appear to consist in (1) a greater average height of body; (2) a lesser length of head; (3) a lesser average length of maxillary and mandible; (4) a slightly lower anal and dorsal fin; (5) a greater average distance of anal from snout; (6) a greater average length of the middle caudal rays; (7) a shorter average pectoral; (8) a more regular arrangement of the scales, and a more luxuriant growth of small scales at the bases of the fins.

A number of specimens from Noank, taken in 1874, vary quite as much from the normal type and in almost the same respect as the variety just described. The maxillary and mandible are shorter, however, than in the Brazilian form, the anal fin lower, and the lobes of the caudal are extremely short, sometimes hardly exceeding in length the pectoral fin. But for the fact that these specimens show almost all the characters of the Brazilian *Brevoortia*, and in some cases exaggerations of them, I should be inclined to consider the *aurea* a distinct species. Having with some hesitation allowed it the rank of a variety, the question must be decided as to the propriety of also allowing varietal rank to this peculiar form from Noank. The exact meaning of the terms *subspecies* and *variety* as recently employed by zoologists is not very clear to my mind, but I infer that a "variety" is composed of an assemblage of individuals varying uniformly from the typical specific form in a degree sufficient to be susceptible of description and definition, though not necessarily separated from it by the absence of connecting forms. Premising then that in giving to the Noank specimens a varietal name my object is simply to define the limits of variation from the normal

Table of Measurements—Continued.

Current number of specimen.....	20,666 b.		18,049 b.		1,696 a.	
Locality.....	Wood's Holl, Mass.		Saint John's River, Florida.		Indian River, Florida.	
	Millim.	100ths.	Millim.	100ths.	Millim.	100ths.
	<i>Fat.</i>					
Extreme length.....	132	.....	140	.....	196	.....
Body:						
Greatest height.....		34		34		37
Head:						
Greatest length.....		32		30		30
Distance from snout to nape.....		23		21		20
Greatest width.....				11		
Length of snout from perp. from centre of orbit.....		11½		10		10
Length of operculum.....		9		9½		9
Length of maxillary.....		14½		13		13½
Length of mandible.....		17½		16		17
Distance from snout to centre of orbit.....		12				
Dorsal:						
Distance from snout.....		53		49		50
Length of base.....		19		18		17
Origin of pectoral to origin of dorsal.....		35		34		36
End of dorsal to end of anal.....		24		26		30
Length of longest ray.....		12		12		13
Length of last ray.....		6		6½		5
Anal:						
Distance from snout.....		72		71		72
Length of base.....		15		16		16
Origin of anal to origin of dorsal.....		34		36		38
Length of longest ray.....		6½		8		*5+
Length of last ray.....		5		5		*3+
Caudal:						
Length of middle rays.....		6		6½		*4+
Length of external rays, superior.....		22½		24		*22
inferior.....		27		27		*24
Pectoral:						
Distance from snout.....		32		30		30
Distance of tip from snout.....		48½		47		
Length of longest axillary appendage.....		18		17		
Ventral:						
Distance from snout.....		52		50		50
Length.....		9½		9		
Origin of ventral to end of dorsal.....		33		33		35
Dorsal rays.....	20	.....	19	.....	18	.....
Anal rays.....	21	.....	20	.....	20	.....

Current number of specimen.....	5,152.		17,927.		19,046.	
Locality.....	West Florida.		Saint John's River, Florida.		Saint John's River, Florida.	
	Millim.	100ths.	Millim.	100ths.	Millim.	100ths.
Extreme length.....	101	.....	178	.....	230	.....
Body:						
Greatest height.....		38		34½		32
Least height of tail.....				10		9
Length of caudal peduncle.....				8		8
Head:						
Greatest length.....		29		31½		33
Distance from snout to nape.....		20		20½		20½
Greatest width.....				12		12
Length of snout from perp. from centre of orbit.....		10		10		10½
Length of operculum.....		9½		9½		9½
Length of maxillary.....		13		14		14½
Length of mandible.....		15		18		18
Distance from snout to centre of orbit.....				11½		10½
Dorsal:						
Distance from snout.....		48		52		52½
Length of base.....		18		21		17
Origin of pectoral to origin of dorsal.....		36		34½		34
End of dorsal to end of anal.....		30		26		25
Length of longest ray.....				12		12
Length of last ray.....				5		

* Broke

Table of Measurements—Continued.

Current number of specimen	5,152.		17,927.		19,046.	
Locality	{ West Florida.		{ Saint John's River, Florida.		{ Saint John's River, Florida.	
	Millim.	100ths.	Millim.	100ths.	Millim.	100ths.
Anal:						
Distance from snout				68		72
Length of base				16		16
Origin of anal to origin of dorsal				38		32½
Length of longest ray				6½		6
Length of last ray				5		6½
Caudal:						
Length of middle rays				5		5½
Length of external rays, superior				21		20
inferior				23		24
Pectoral:						
Distance from snout				31½		32
Distance of tip from snout				49		50
Length				19		18
Length of longest axillary appendage				12		
Ventral:						
Distance from snout				49		48
Length				9		9
Origin of ventral to end of dorsal				33½		30
Dorsal rays	20		21		18 or 19	
Anal rays	21		21		21	

Current number of specimen	19,044.		18,049 a.		19,468.	
Locality	{ Saint John's River, Fla.		{ Saint John's River, Fla.		{ Virginia.	
	Millim.	100ths.	Millim.	100ths.	Millim.	100ths.
Extreme length	192		144		234	
Body:						
Greatest height		34		34		32
Least height of tail						9
Length of caudal peduncle						9
Head:						
Greatest length		29		29		32½
Distance from snout to nape		19		19		20½
Greatest width		12		11		12
Width of interorbital area						7
Length of snout from perp. from centre of orbit		9½		10		10
Length of operculum		10		10		9
Length of maxillary		13		13		14
Length of mandible		16		16½		18
Distance from snout to centre of orbit		10		11		11
Dorsal:						
Distance from snout		49		49		51
Length of base		17		17		18½
Origin of pectoral to origin of dorsal		35		35		34
End of dorsal to end of anal		27		29		23
Length of longest ray		12		12¼		11
Length of last ray		6		6½		5½
Anal:						
Distance from snout		71		71		72
Length of base		17		17½		14½
Origin of anal to origin of dorsal		34		37		33
Length of longest ray		6		7		5½
Length of last ray		5		4		6
Caudal:						
Length of middle rays		6		5		4
Length of external rays, superior				25		
inferior		23		27		24
Pectoral:						
Distance from snout		30		30		32
Distance of tip from snout		45		45		49
Length		16		17		18
Length of longest axillary appendage						12
Ventral:						
Distance from snout		49		50		51
Length		9		8½		9
Origin of ventral to end of dorsal		34		34		39
Dorsal rays	19		18		19	
Anal rays	23		21		21	

Table of Measurements—Continued.

Current number of specimen.....	14,846 a.		14,846 b.		Var. <i>aurea</i> .	
Locality	Noank, Conn.		Noank, Conn.		M. C. Z. Rio Janeiro.	
	Millim.	100ths.	Millim.	100ths.	Millim.	100ths.
Extreme length.....	157		156		236	
Body:						
Greatest height.....		34		34½		35
Head:						
Greatest length.....		29		28		27½
Distance from snout to nape.....		20				21
Length of snout from perp. from centre of orbit.....		10		9		10
Length of operculum.....		9½				
Length of maxillary.....		13		12		12
Length of mandible.....		14½		14		15
Distance from snout to centre of orbit.....		10				
Dorsal:						
Distance from snout.....		49		47		51
Length of base.....		19		20		
Origin of pectoral to origin of dorsal.....		35		34		
End of dorsal to end of anal.....		25		25		
Length of longest ray.....		10		9		10
Length of last ray.....		6		6		4
Anal:						
Distance from snout.....		74		72½		73
Length of base.....		15		16		
Origin of anal to origin of dorsal.....		36½		37		
Length of longest ray.....		4½		5		5
Length of last ray.....		4		4½		4
Caudal:						
Length of middle rays.....		4½		5½		5
Length of external rays, superior.....		17		16		23
inferior.....		18		20½		
Pectoral:						
Distance from snout.....		28		28		28
Distance of tip from snout.....		41		43		42
Length.....		12		15		15
Ventral:						
Distance from snout.....		52		50		49
Length.....		7		7		8
Origin of ventral to end of dorsal.....		34		36		
Dorsal rays.....	20		20		II. 17	
Anal rays.....	19		20		19	

Current number of specimen	Var. <i>aurea</i> .		Var. <i>aurea</i> .		Average of <i>aurea</i> .
Locality	M. C. Z. a. Sambaia, Thayer Exp.		M. C. Z. b. Sambaia, Thayer Exp.		
	Millim.	100ths.	Millim.	100ths.	100ths.
Extreme length	164	.....	154	.....	.....
Body:					
Greatest height		37		34	35
Head:					
Greatest length'		28		29	28
Distance from snout to nape		19		22	21
Length of snout from perp. from centre of orbit		9		10	9 $\frac{2}{3}$
Length of maxillary		13		14	13
Length of mandible		15		17	15 $\frac{2}{3}$
Dorsal:					
Distance from snout		49		48	49 $\frac{1}{2}$
Length of longest ray		12		10	10 $\frac{2}{3}$
Length of last ray		5		5	4 $\frac{1}{2}$
Anal:					
Distance from snout		75		73	73 $\frac{3}{8}$
Length of longest ray		6		5	5 $\frac{1}{2}$
Length of last ray		4		3	3 $\frac{2}{3}$
Caudal:					
Length of middle rays		6		5	5 $\frac{2}{3}$
Length of external rays, superior		25		23	23 $\frac{1}{3}$
Pectoral:					
Distance from snout		29		30	29
Distance of tip from snout		44		47	44 $\frac{1}{2}$
Length		16		16	15 $\frac{2}{3}$
Ventral:					
Distance from snout		53		52	51 $\frac{1}{2}$
Length		7		7	7 $\frac{1}{2}$
Dorsal rays	II. 17		II. 17		
Anal rays	20		22		

Brevoortia pectinata, (Jenyns) Gill.

Diagnosis.—Proportions of head and jaws as in *B. tyrannus*. Height of body almost three-eighths of total length, and greater proportionally than in *B. tyrannus*. Fins nearly as in *B. tyrannus*, but uniformly averaging slightly more; the height of the dorsal somewhat less than three-twentieths of total length; that of the anal equal to or slightly less than half the length of the maxillary. The caudal fin is somewhat longer and more furcate, the length of the external rays never being less than five-sixths of the length of the head, while that of the medial rays remains proportionally the same as in the species first described. Insertion of ventral somewhat behind tip of pectoral, this fin and the dorsal being uniformly somewhat farther back than in *B. tyrannus*; the insertion of the latter from one to four one-hundredths posterior to a point equidistant from the snout and the base of the median caudal rays, and, as in *B. tyrannus*, behind the vertical from the insertion of the ventrals.

Scales very large, considerably serrated, and arranged regularly in 18 to 20 transverse and 50 longitudinal rows. Scales forming sheath at base of pectoral not large. Operculum smooth, or with inconspicuous and few striations. Squamation upon lobes of caudal extensive and conspicuous.

Variations.—The variations in the individual specimens studied are not of great importance, and are indicated in the table of measurements.

Table of Measurements.

Current number of specimen.....	1709.		M. C. Z. a.		M. C. Z. b.		Aver-
Locality.....	Paraguay.		Rio Grande.		Rio Grande.		age.
	Millim.	100ths.	Millim.	100ths.	Millim.	100ths.	100ths.
Extreme length	250	.....	224	.....	209	.....	.....
Body:							
Greatest height.....		36		36½		36	36
Head:							
Greatest length		33		30		30	31
Distance from snout to nape.....		21		21		21	21
Length of maxillary.....		14½		13		14	14
Length of mandible.....		18		16		16½	17
Dorsal:							
Distance from snout.....		54		53		51	52½
Length of longest ray		12½		12		12	12
Length of last ray.....		6		6		6	6
Anal:							
Distance from snout.....		70½		70		72	71
Length of longest ray		7		6		5	6
Length of last ray.....		6		4		4	4½
Caudal:							
Length of middle rays.....		6½		6		6	6
Length of external rays, superior		24+		25		25	25
inferior.....		26		27		28	27
Pectoral:							
Distance from snout.....		32		29		30	30½
Distance of tip from snout		50		47		47	48
Length.....		18		17		18	17½
Ventral:							
Distance from snout.....		51½		48		49	49½
Length.....		9½		8		8½	8½
Dorsal rays.....	II. 17	.....	II. 17	.....	II. 17	.....	.....
Anal rays.....	I. 21	.....	I. 20	.....	I. 20	.....	.....
Number of scales in lateral line.....	abt. 50	.....	49	.....	49	.....	.....
Number of transverse rows.....	abt. 20	.....	20	.....	20	.....	.....

Brevoortia patronus, *sp. nov.*, Goode.

Diagnosis.—*Head* larger than in the other American forms, its length usually more than one-third that of the body, the maxillary about three-twentieths of the length of the body. *Height* of body always more than three-eighths of its total length, its anterior inferior profile cultrate, convex, giving an obtusely rounded profile to the subpectoral outline, and throwing the snout above the median horizontal axis of the body. *Fins* long and powerful; the height of the dorsal usually equal to the length of the maxillary, and about three-tenths of total length of body; that of the anal equal to or greater than half the length of the maxillary; that of the ventral one-tenth of body-length; length of middle caudal rays always more than one-fifth and often more than one-fourth the length of the head, that of the exterior rays almost equal in length to the head and rarely less than five-sixths of its length. Insertion of the ventral under or slightly posterior to the tip of the pectoral. Insertion of dorsal always posterior to a point on the dorsal outline, equidistant from the snout and the base of the medial caudal rays (sometimes as much as seven one-hundredths of total length), and always in advance of the vertical from the insertion of the ventrals.

Scales of medium size, with entire, fluted margins, arranged regularly (in young) in 24 to 25 transverse and 50 to 70 longitudinal rows. Scales forming sheath at base of pectoral very large, round. Squamation of caudal lobes inconspicuous. Axillary appendages large. Operculum smooth or very delicately striated. Scapular blotch inconspicuous.

The variations of individuals are sufficiently indicated in the subjoined table of measurements. The most characteristic specimens occur at Brazos Santiago, Tex., and the more northern specimens show a tendency to shortening up of the head, jaws, and fins.

Description.*—The body is much compressed, especially below and in advance of the pectorals; the contour of the belly between the ventrals and the gill-opening is cultrate, projecting, obtusely rounded. The height of the body equals two-fifths of its length, and the least height of the body at the tail is one-fourth of its greatest height in front of the pectorals. The length of the caudal peduncle, from the end of the anal to the base of the exterior lobes of the caudal, is one-fifth of the height of the body, and one-twelfth (0.08) of its length.

The head is elongated and large, triangular; its length is more than one-third (0.35 and 0.34) that of the body, and its height at the nape is slightly more than its length. The length of the skull, as indicated by the distance from snout to nape, is about one-fourth (0.24 and 0.24½) of the length of the body, and the greatest width of the head (0.13) slightly exceeds the half of this. The width of the interorbital is about equal to the diameter of the orbit, and slightly more than one-fourth the length of the head. The maxillary reaches to the vertical from the posterior margin

* To avoid confusion, this is drawn up from the Brazos Santiago specimens, which are most characteristically developed.

of the pupil; the mandible nearly to the vertical from the posterior margin of the orbit. The length of the maxillary is about equal to that of the longest ray of the dorsal fin (0.15 to 0.16), that of the mandible (0.19) half the distance from the origin of the anal to the origin of the dorsal (0.38) or to the length of the base of the anal (0.18). The distance from the tip of the snout to the centre of the orbit (0.13 to 0.13 $\frac{3}{4}$) equals the greatest width of the head. The length of the operculum is equal to that of the eye: the opercular striations are fine, but distinct and numerous. The dorsal fin is inserted posteriorly to a point equidistant from the snout and the base of the caudal and in advance of the vertical from the insertion of the ventrals. Its length of base (0.20 to 0.21 $\frac{1}{2}$) is double that of the operculum. Its greatest height is nearly half the length of the head. It is composed of 19 rays, of which the third is the longest. Its upper edge is slightly emarginated. The height of the last ray (0.10) is equal to half the length of the base.

The distance of the anal from the snout is slightly less than three-fourths of the length of the body (0.70–0.72), its length of base (0.18–0.18 $\frac{1}{2}$) one-fourth of this distance. The distance from the origin of the pectoral to the origin of the dorsal (0.37–0.37 $\frac{1}{2}$) is about equal to that from the origin of the anal to that of the dorsal (0.38). Its height (.09–.09 $\frac{1}{2}$) is about half its length of base, its least height (at last ray) one-third of the same (.06–.05 $\frac{1}{2}$). The fin is composed of 22 rays, its edges slightly emarginated.

The caudal fin is much forked and elongate, the middle caudal rays (0.08) half the length of the maxillary, the exterior rays above (0.31–0.32) twice that length, the lower exterior rays (0.35–0.34) nearly equal to twice the length of the mandible.

The pectoral fin is strong, falcate, inserted under the angle of the suboperculum, at a distance from the snout (0.35–0.34) about midway to the insertion of the anal. Its tip extends beyond the insertion of the ventrals, its length (0.22) being nearly two-thirds that of the head. The axillary appendages are half as long as the fin, or more.

The distance of the ventral from the snout (0.54–0.55) is about the same as that of the dorsal, though by the contour of the body it is thrown slightly behind the point of dorsal origin. Its length (0.10) is equal to that of the last ray of the dorsal.

The scales are quite regularly arranged in about 24 to 25 horizontal and 50 vertical rows. Their free portion is narrow and high. They are entire at the edges, and fluted or crenulated. There are two rows of differentiated scales upon each side of the dorsal line, but they are scarcely pectinated. The scales forming the sheath at the base of the pectoral are large and round.

Color.—Silvery, with a brassy sheen upon the sides and greenish gray upon the back.

Table of Measurements.

Current number of specimen.....	892 a.		892 b.		891 a.		891 b.	
Locality	{ Brazos Santiago Texas.		{ Brazos Santiago, Texas.		{ Mouth of Rio Grande.		{ Mouth of Rio Grande.	
	Millim.	100ths.	Millim.	100ths.	Millim.	100ths.	Millim.	100ths.
Extreme length.....	106		104		96		90	
Body:								
Greatest height.....		40½		40½		38		41½
Least height of tail.....		11		10		10		11
Length of caudal peduncle.....		8		8				7½
Head:								
Greatest length.....		35		34		33		33
Distance from snout to nape.....		24½		24		23½		23
Greatest width.....		13		13		11		11
Length of snout from perp. from centre of orbit.....		12		11½		12		11
Length of operculum.....		10		10		11		12
Length of maxillary.....		16		15¾		16		14½
Length of mandible.....		19		18½		19		18
Distance from snout to centre of orbit.....		13¾		13		12½		13
Dorsal:								
Distance from snout.....		53		53½		51		52
Length of base.....		24½		20		17		19
Origin of pectoral to origin of dorsal.....		37		37½		37		39
End of dorsal to end of anal.....		25		26		26		28
Length of longest ray.....		15		16		14½		17
Length of last ray.....		16		9		7½		9
Anal:								
Distance from snout.....		72		70		70½		69
Length of base.....		18½		18		19		20
Origin of anal to origin of dorsal.....		38		38		36		39
Length of longest ray.....		9		9½		7½		8½
Length of last ray.....		6		5½		5		4½
Caudal:								
Length of middle rays.....		8		8		8		7
Length of external rays, superior.....						26		25+
inferior.....		31		32		28		27+
Pectoral:								
Distance from snout.....		35		34		33½		32
Distance of tip from snout.....		55		54		53		52
Length.....		22		22		18½		20
Length of longest axillary appendage.....		11		13				
Ventral:								
Distance from snout.....		53		52		54		51
Length.....		10		10		10		9½
Origin of ventral to end of dorsal.....		36		35		33		35
Dorsal rays.....	19		19		18		18	
Anal rays.....	22		22		22		22	
Number of scales in lateral line.....	47 to 50		47 to 50		abt. 65		abt. 65	

Table of Measurements—Continued.

Current number of specimen.....	891 c.		5,864 a.		5,864 b.		5864 c.	
Locality	Mouth of Rio Grande.							
	Millim.	100ths.	Millim.	100ths.	Millim.	100ths.	Millim.	100ths.
Extreme length.....	73		86		81		74	
Body:								
Greatest height.....		40		38		36		38½
Head:								
Greatest length.....		30		32		30		33
Distance from snout to nape.....		22½		23		21½		24
Length of snout from perp. from centre of orbit.....		11½		12		10		11
Length of operculum.....		10		10		10		10
Length of maxillary.....		14		14		13½		14½
Length of mandible.....		17½		17		16		17½
Distance from snout to centre of orbit.....		12						
Dorsal:								
Distance from snout.....		57		50		57		52
Length of base.....		17		16		18½		19
Origin of pectoral to origin of dorsal.....		37		36		33		36
End of dorsal to end of anal.....		27		31		26		25
Length of longest ray.....		14		14		12		14
Length of last ray.....		7		8		5½		7
Anal:								
Distance from snout.....		69		72		70		70½
Length of base.....		19		19		17		19
Origin of anal to origin of dorsal.....		37		37		36		37
Length of longest ray.....		7		impt. 7		6		9
Length of last ray.....		5		impt. 5		4		6
Caudal:								
Length of middle rays.....		9		7		6		9½
Length of external rays, superior.....		27		27				
inferior.....		27		30		25		
Pectoral:								
Distance from snout.....		30		33		30		32
Distance of tip from snout.....		47		48		47		50
Length.....		17		18		17		19
Ventral:								
Distance from snout.....		52		53		53		52
Length.....		10		9		8		10
Origin of ventral to end of dorsal.....		36		32		32		35
Dorsal rays.....	18		19		18		19	
Anal rays.....	21		22		20		21	
Number of scales in lateral line.....	65 or more.		abt. 70		abt. 55		abt. 55	

DESCRIPTION OF CAULOLATILUS MICRIPS, A NEW SPECIES OF FISH FROM THE GULF COAST OF FLORIDA.

By G. BROWN GOODE and TARLETON H. BEAN.

The Smithsonian Institution has received from Mr. Silas Stearns, of the Pensacola Ice Company, Pensacola, Fla., a fish new to the fauna of the United States, and believed to be new to science. This fish was taken March 18, 1878, on the Snapper Bank, off Pensacola, in 35 fathoms of water. It was packed in ice, and arrived in good condition, March 22, at the National Museum, where it was cast in plaster, and sketched by Mr. Shindler. It is now a fine alcoholic specimen, No. 20,971 of the Fish Catalogue.

Caulolatilus microps is related to the Brazilian form *Caulolatilus chrysops* (Cuvier and Valenciennes) Gill, and the Cuban form *Caulolatilus cyanops* Poey, described in 1867.* Of the former, two specimens only

* Repertorio Físico-Natural de la Isla de Cuba, i, p. 312.



Goode, G. Brown. 1878. "A revision of the American species of the genus *Brevoortia*, with a description of a new species from the Gulf of Mexico." *Proceedings of the United States National Museum* 1(15), 30–42.
<https://doi.org/10.5479/si.00963801.1-15.30>.

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