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GEOGRAPHIC VARIATION IN *MESOGONISTIUS*  
*CHAETODON* (BAIRD), WITH DESCRIP-  
TION OF A NEW SUBSPECIES FROM  
GEORGIA AND FLORIDA\*

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THE blackbanded sunfish, *Mesogonistius chaetodon* (Baird), is a small handsome centrarchid with a coastwise distribution from central New Jersey to northern Florida. Heretofore *chaetodon* has been considered the sole representative of the genus, but specimens now available from the southern part of the range possess characters which seem to justify at least subspecific recognition, and these specimens are herein named *M. c. elizabethae*, in honor of my mother, Elizabeth M. Bailey, whose interest in her sons' naturalistic pursuits has ever been a source of encouragement to us. I wish to thank Dr. Carl L. Hubbs of the University of Michigan and Dr. Edward C. Raney of Cornell University for the loan of specimens in the collections under their care.

Material considered adequate for racial analysis has been available from New Jersey and South Carolina. The meristic counts (Table I) in these areas fail to indicate noteworthy

\* This paper is extracted from a manuscript revision of the Centrarchidae which was submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the University of Michigan.

differences, and the paucity of specimens from the intervening region is probably unimportant. To the south, four specimens are at hand from Mill Dam Lake in northern Florida and two from the Okefenokee Swamp in southern Georgia. These differ from the northern specimens as indicated in Table I and in the diagnosis of the new form. The apparent hiatus in the range, from South Carolina to extreme southern Georgia, is presumably caused by inadequate collecting, and it is in this area that intergradation between the forms is to be expected. They are tentatively assigned subspecific status because of the incomplete differentiation of diagnostic characteristics. It is noted that South Carolina specimens of *chaetodon* approach no closer to *elizabethae* than do those from New Jersey.

*Mesogonistius chaetodon elizabethae*, new subspecies

Southern Blackbanded Sunfish

*Mesogonistius chaetodon*.—Wright, 1923 (southern Georgia); Wright, 1926: 81, Pl. 2, Fig. 7 (in part; Okefinokee Swamp); Carr, 1937: 85 (Florida record based on type specimens of *elizabethae* from Mill Dam Lake, characters based on *M. c. chaetodon*).

HOLOTYPE.—An adult (U.M.M.Z.<sup>1</sup> No. 118294) 42.2 mm. in standard length, collected in Mill Dam Lake, sixteen miles east of Ocala (19.6 miles via Florida Highway 19), Marion County, Florida, on March 11, 1936, by A. D. Hollaway.

PARATYPES.—Mill Dam Lake, taken with the holotype, U.M.M.Z. No. 110641 (1); same locality, September 1, 1939, by Reeve M. and Marian K. Bailey, I.S.C. No. 3 (2). Billy's Lake, Okefenokee Swamp, Georgia, A. H. Wright collector: July 2, 1921, C.U. No. 99 (1); June 28, 1921, C.U. No. 356 (1).

DIAGNOSIS.—A southern representative of *M. c. chaetodon* characterized by 9 dorsal spines and 17 or 18 rows of scales around the caudal peduncle. The dorsal spines are lower (highest, 2.3 to 2.7, mean, 2.57, in distance from tip of snout to origin of dorsal) in *elizabethae* than in *chaetodon* (2.0 to

<sup>1</sup> U.M.M.Z. indicates the University of Michigan Museum of Zoology; C.U., Cornell University; I.S.C., Iowa State College.

TABLE I

FREQUENCY DISTRIBUTIONS OF FIN-RAY AND SCALE ROW COUNTS IN THE SUBSPECIES OF *Mesogonistius chaetodon*  
 Counts of the holotype of *elizabethae* are designated by asterisks.

Subspecies and Locality	Number of Dorsal Spines					Number of Dorsal Soft Rays						Number of Anal Soft Rays					
	9	10	11	No.	Mean	10	11	12	13	No.	Mean	11	12	13	14	No.	Mean
<i>M. c. chaetodon</i>																	
New Jersey .....	17	109	1	127	9.87	.....	51	72	4	127	11.63	1	58	75	1	135	12.56
South Carolina .....	1	13	.....	14	9.93	.....	7	6	.....	13	11.46	.....	9	3	.....	12	12.25
All material .....	18	122	1	141	9.88	.....	58	78	4	140	11.61	1	67	78	1	147	12.54
<i>M. c. elizabethae</i>																	
All material .....	6*	.....	.....	6	9.00	1	1	4*	.....	6	11.50	.....	4	1*	1	6	12.50

	Number of Pectoral Rays (Both Fins)					Number of Lateral Line Scales						Number of Scales Above Lateral Line					
	10	11	12	No.	Mean	26	27	28	29	30	No.	Mean	4	5	6	No.	Mean
<i>M. c. chaetodon</i>																	
New Jersey .....	16	200	14	230	10.99	3	18	32	33	6	92	28.23	2	44	4	50	5.04
South Carolina .....	.....	16	4	20	11.20	2	.....	1	6	2	11	28.55	.....	10	1	11	5.09
All material .....	16	216	18	250	11.01	5	18	33	39	8	103	28.26	2	54	5	61	5.05
<i>M. c. elizabethae</i>																	
All material .....	.....	5	7*	12	11.58	.....	1	5*	.....	.....	6	27.83	.....	6*	.....	6	5.00

	Number of Scales Below Lateral Line						Number of Rows of Scales on Cheek					Number of Scales Around Caudal Peduncle								
	10	11	12	13	No.	Mean	2	3	4	No.	Mean	17	18	19	20	21	22	No.	Mean	
<i>M. c. chaetodon</i>																				
New Jersey .....	.....	10	36	3	49	11.86	3	100	3	106	3.00	.....	2	21	15	14	2	54	19.87	
South Carolina .....	.....	1	8	1	10	12.00	.....	10	3	13	3.23	.....	.....	2	5	4	.....	11	20.18	
All material .....	.....	11	44	4	59	11.88	3	110	6	119	3.03	.....	2	23	20	18	2	65	19.92	
<i>M. c. elizabethae</i>																				
All material .....	1	4*	1	.....	6	11.00	3*	3	.....	6	2.50	1	5*	.....	.....	.....	.....	6	17.83	

## Meristic Index\*

	39	40	41	42	43	44	45	46	47	No.	Mean
<i>M. c. chaetodon</i>											
New Jersey ...	.....	.....	.....	1	5	1	8	9	3	27	45.04
South Carolina ...	.....	.....	.....	.....	1	1	1	7	.....	10	45.50
All material ...	.....	.....	.....	1	6	2	9	16	3	37	45.14
<i>M. c. elizabethae</i>											
All material ...	2	1*	2	1	.....	.....	.....	.....	.....	6	40.33

\* This index is the sum of the numbers of dorsal spines, scale rows below lateral line, scale rows on cheek, and scale rows around caudal peduncle.



2.5,<sup>2</sup> mean, 2.12). The spinous dorsal is less sharply angulate in *elizabethae* (lowest spine at emargination, 1.2 to 1.6, mean, 1.37, in highest) than in *chaetodon* (1.5 to 1.9, mean, 1.71). In *elizabethae* only the first two dorsal spines and their membranes are black, and there is no pink or red pigment in the dorsal fin; in *chaetodon* the first three spines and their membranes are black, bordered behind by pinkish on the membrane between the third and fourth spines.

DESCRIPTION.—The fin ray and scale counts (Table I), the proportionate measurements (Table II), and the photograph (Pl. I) portray most of the salient characteristics of *elizabethae*.

The strongly compressed body is subcircular, with dorsal and ventral curvatures equal. The depth of the short and compressed caudal peduncle is nearly as great as its length (from posterior base of anal to intersection of lateral line and base of caudal). The head is rather long, its width about half its length. The predorsal contour is straight from the snout to above eye, thence gently rounded and concurrent with dorsal curvature. The large orbit is much longer than the snout and greater than the interorbital distance. The terminal mouth is small; the maxilla extends to below the anterior margin of the eye. The lower projection of the emarginate opercle exceeds the upper; otherwise the bones of the opercular series and the preopercle are entire. The sensory cavities of the head bones are fairly well developed. The gill-rakers are slender, of moderate length, the longest when depressed extends to the base of the second raker below; gill-rakers 2 or 3 + 10 or 11 = 12 to 14.

The pectorals are obtusely pointed. In the pelvic fins the soft rays are sharply graduated in length; the anteriormost is the longest and extends to the third anal spine (occasionally to the first anal soft ray). The pelvic spine is contained 1.6 times in the length of the fin. The dorsal is somewhat emarginate; the shortest spine (eighth) is contained 1.2 to 1.6 times in the longest, and the longest is contained 2.3 to 2.7 times in the distance from the tip of the snout to the origin of the fin.

<sup>2</sup> This measurement is 2.5 in a single specimen, all others are 2.3 or less.

TABLE II

PROPORTIONATE MEASUREMENTS (TAKEN WITH DIVIDERS) OF SIX SPECIMENS OF *Mesogonistius chaetodon elizabethae*

The localities and museum numbers of the specimens are: 1. Okefenokee Swamp, Georgia, C.U. No. 99. 2. Holotype, Mill Dam Lake, Florida, U.M.M.Z. No. 118294. 3. Mill Dam Lake, I.S.C. No. 3. 4. Mill Dam Lake, U.M.M.Z. No. 110641. 5. Okefenokee Swamp, C.U. No. 356. 6. Mill Dam Lake, I.S.C. No. 3.

	1	2	3	4	5	6
Standard length (in mm.)	46.0	42.2	39.5	36.0	36.0	32.0
In standard length:						
Length of head .....	2.8	2.65	2.7	2.8	2.65	2.7
Depth of body .....	1.85	1.8	1.95	1.85	1.85	1.9
Length of caudal peduncle .....	5.7	4.8	5.8	5.0	5.5	5.0
Length of pectoral fin .....	.....	3.35	3.3	3.45	3.5	3.6
Length of caudal fin .....	.....	2.7	2.8	3.0	.....	2.95
In length of caudal peduncle:						
Depth of caudal peduncle	1.1	1.1	1.05	1.1	1.05	1.15
In depth of body:						
Width of body .....	3.4	3.0	3.1	3.65	3.6	3.25
In highest dorsal spine:						
Lowest dorsal spine .....	1.4	1.3	1.2	1.4	1.6	1.3
In distance from tip of snout to origin of dorsal fin:						
Highest dorsal spine .....	2.6	2.5	2.6	2.7	2.3	2.7
In base of dorsal fin:						
Highest dorsal soft ray .....	.....	1.8	1.6	1.85	.....	1.95
In highest anal spine:						
Lowest anal spine .....	1.95	2.1	2.1	2.6	2.1	2.0
In distance from origin of anal fin to insertion of pelvic:						
Highest anal spine .....	1.2	1.05	.85	1.15	1.0	1.0
In base of anal fin:						
Highest anal soft ray .....	1.2	1.05	1.05	1.15	1.1	1.1
In length of head:						
Width of head .....	2.15	2.0	2.0	2.1	2.15	2.0
Length of orbit .....	3.25	3.2	2.8	3.2	2.9	2.8
Width of bony interorbit	4.3	4.1	3.8	4.0	4.0	4.1
Length of snout .....	4.3	4.0	4.1	4.0	4.3	4.0
Length of upper jaw .....	3.8	3.85	3.75	3.85	3.9	3.5
Length of lower jaw .....	2.65	2.65	2.5	2.6	2.6	2.35

The soft dorsal and anal fins are rather high and rounded posteriorly; the anal is somewhat larger. There are three anal spines. The caudal outline is straight to slightly convex posteriorly.

COLORATION.—In life the body is dark olive green above with

golden reflections on the sides and a white breast and belly. Six prominent vertical black bands constitute the most characteristic feature of coloration (see Pl. I). The first of these passes through the eye and is inclined backward both above and below; it is incomplete ventrally. The second lies just behind the preopercle, but is interrupted over the opercles and across the mid-ventral line. The third and broadest extends from the anterior rays of the dorsal fin to just behind the base of the pelvics; it is incomplete ventrally. The fourth extends from the third and fourth dorsal soft rays to the second to fourth anal rays. The fifth encircles the body just behind the dorsal fin, and the sixth is anterior to the caudal base. Opposed dark spots on the bases of the dorsal and anal fins and on the lower sides between the third and fourth and the fourth and fifth bands apparently represent incipient or reduced bands. The round black opercular spot with a light crescent (marking edge of bone) near its center is slightly smaller than the pupil.

The fins are all tinged with olive in life. The pectorals are plain. In the pelvics the spine, the first soft ray, and the included membrane are orange-red (white in preservation), the second soft ray and the basal portions of the remaining rays are black with the distal half of the last three rays pale olive. The dorsal, anal, and caudal are light with dark mottlings, especially on the rays. The first two dorsal spines and the membranes between spines one and two and two and three are black, but there is no red in the dorsal fin (in two specimens seen alive; I.S.C. 3). The iris is bronze-yellow.

HABITAT.—Ecological data are available only for the two specimens collected by me in Mill Dam Lake. The water here was clear and colorless, and the fish were seined near shore at a depth of about a meter over a bottom of mixed sand and organic detritus. The abundant aquatic vegetation included *Potamogeton*, *Sagittaria*, *Juncus*, *Nymphaea*, and *Castalia*. Associated fishes included such typically quiet or sluggish water weed-bed inhabitants as *Erimyzon s. succetta*, *Esox americanus*, *E. niger*, *Chriopeops goodei*, *Gambusia affinis*

*holbrookii*, *Huro salmoides*, *Lepomis macrochirus*, *L. marginatus*, and *Enneacanthus gloriosus*. It is questionable whether this habitat was optimum for *elizabethae*, since only two were secured in over two hours seining, while numerous individuals of each of the above named species were caught.

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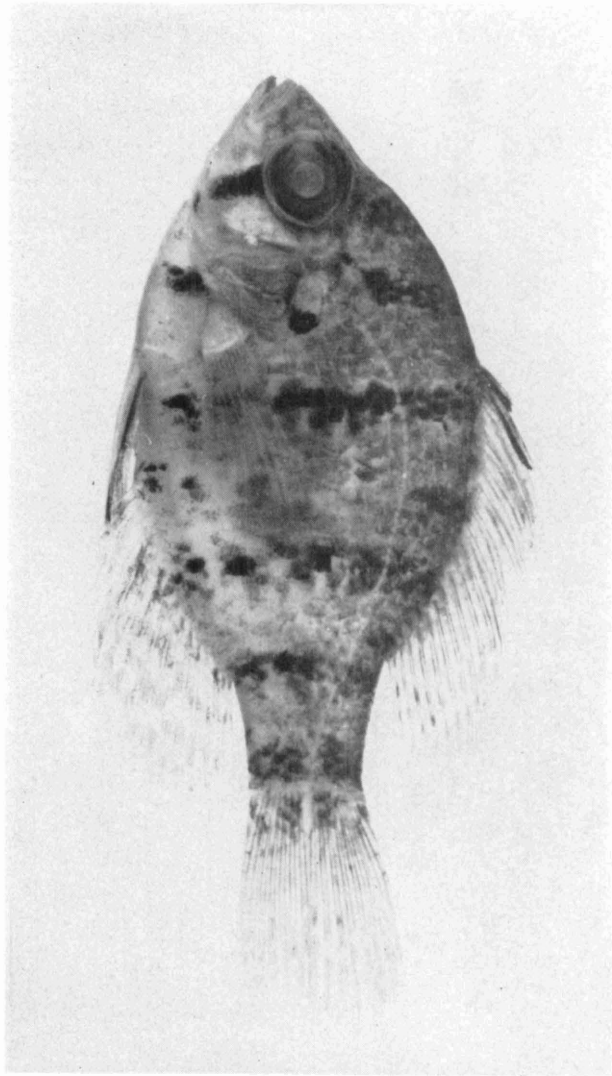
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VARIATION IN MESOGONISTIUS CHAETODON

PLATE I



## PLATE I

*Mesogonistius chaetodon elizabethae*: a paratype (I.S.C. 3), 39.5 mm.  
in standard length, from Mill Dam Lake, Marion County, Florida.  
Photograph by Max E. Davis.

