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Henry L. Bart Jr.

Robert C. Cashner

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New Records for the Northern Studfish, *Fundulus catenatus*, in the Lower Mississippi and Gulf Coastal Drainages



Southeastern Fishes Council PROCEEDINGS

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New records for the northern studfish, *Fundulus catenatus*, in the lower Mississippi and Gulf Coastal drainages

by

Henry L. Bart, Jr. and Robert C. Cashner
University of New Orleans

The northern studfish, *Fundulus catenatus*, is a common upland species throughout much of southeastern United States, west of the Appalachian Mountains. Its range comprises several widely disjunct populations (Thomerson 1969, Shute 1980), one of which occurs on the Gulf Coastal Plain of southwestern Mississippi. Its isolated occurrence here parallels that of several other fish species (most notably the rainbow darter, *Etheostoma caeruleum*, and the southern redbelly dace, *Phoxinus erythrogaster*) that are typical of small to medium-sized streams, and which have presumably reached here by active and/or passive movement through the Mississippi River from areas to the north (Guillory 1978).

The range of this species on the Gulf Coastal Plain was thought to be limited to the Homochitto River, a 153 km-long, westward-flowing tributary to the lower Mississippi River, in southwestern Mississippi (Thomerson 1969, Shute 1980). In this report, we extend its range in the area to four additional systems: two tributaries to the lower Mississippi River (Buffalo River [= Buffalo Bayou] and Coles Creek), one tributary to Lake Pontchartrain (Amite River), and a small section of the middle Pearl River (Figure 1). These new records have resulted from studies conducted by Royal D. Suttkus and students at Tulane University from 1968-1974, and students at the University of New Orleans.

Buffalo River and Coles Creek are two separate lower Mississippi River tributaries to the south and north of the Homochitto River, respectively. The northern studfish is widely distributed in Buffalo River, a 74 km-long stream in Wilkinson County, Mississippi, and has been taken at 13 localities in the headwaters and midstream sections. Coles Creek is a smaller tributary, 60 km in length, just to the north of the Homochitto River, and although this creek has not been as thoroughly surveyed as some of the larger streams in the area, *F. catenatus* has been taken at three sites (Figure 1). The northern studfish prefers clear water over sand or gravel substrate in upland areas (Thomerson 1969). The upper sections of all of the above streams are characterized by this type of habitat, in contrast to downstream areas, where lowland conditions prevail.

The upper sections of several other tributaries of

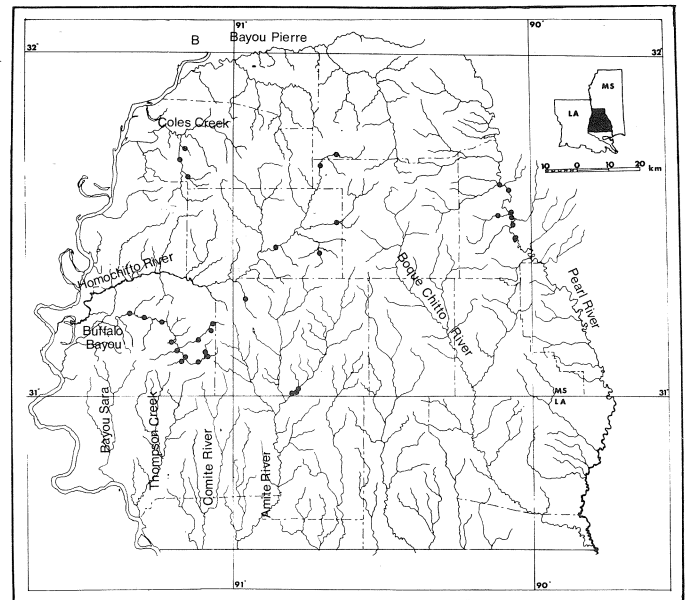


Figure 1. Map of *F. catenatus* distribution in lower Mississippi, Lake Pontchartrain and Pearl River.

the lower Mississippi River (Figure 1) also appear suitable for *Fundulus catenatus*. However, despite extensive ichthyological surveys (lasting from two to five years) of Bayou Pierre (Matthews 1978), Clark Creek (Cashner, Suttkus, Pezold and Grady 1979), Bayou Sara (Grady and Cashner 1980) and Thompson Creek (Guillory and Conner 1973), this species has never been found in any of these streams.

The first specimens of *F. catenatus* outside the Mississippi River basin and in rivers draining the eastern Gulf slope were taken by R. D. Suttkus from the Pearl River drainage in February, 1973. Subsequent collections showed the species to be present at a total of eight localities in the Pearl River proper and one in Hall Creek, a small tributary, all located in Lawrence County, Mississippi. Doshier (1976) did not report *F. catenatus* in her study of the Bogue Chitto River, the largest western tributary to the Pearl River. The Pearl River, especially the lower section, has been extensively surveyed by Royal D. Suttkus for

nearly 30 years. Under the circumstances, it is remarkable that such a readily-collected species as the northern studfish would remain undiscovered for over 20 years.

The most recent record for *F. catenatus* is from the Amite River, the largest freshwater tributary to Lake Pontchartrain. The species was first recorded from the lower East Fork of the Amite River in March 1979 by Greg S. Laiche, of the University of New Orleans. A study of Amite River fishes has been conducted by Laiche since June 1978, and will continue until August 1980. A total of 80 collections at 64 localities throughout the system indicates that the northern studfish is restricted to the East Fork of this river (Figure 1). A survey of the Tickfaw River (Saul 1978) and an examination of Tulane Museum of Natural History records for the other Lake Pontchartrain tributaries reveals no other records for *F. catenatus* from the Lake Pontchartrain drainage.

Thomerson (1969) noted that the Homochitto population of *F. catenatus* was distinguishable from other, more contiguous, populations to the north by its smaller size, absence of a black marginal band in the caudal fin of adult males, and certain meristic differences. Specimens from the Buffalo River, Coles Creek, Amite and Pearl rivers are similar to those from the Homochitto River with regard to these characters (Figure 2).

The Homochitto population is dwarfed in body size compared to other populations of *F. catenatus* to the north. Thomerson (1969) indicated that male individuals occasionally exceed 100 mm SL; however, in the Homochitto River the largest specimen recorded was only 76 mm SL. We found a relatively small size also to be characteristic of specimens from adjacent systems, with the maximum size of males from each as follows: Coles Creek (58 mm), Buffalo River (60 mm), Amite River (66

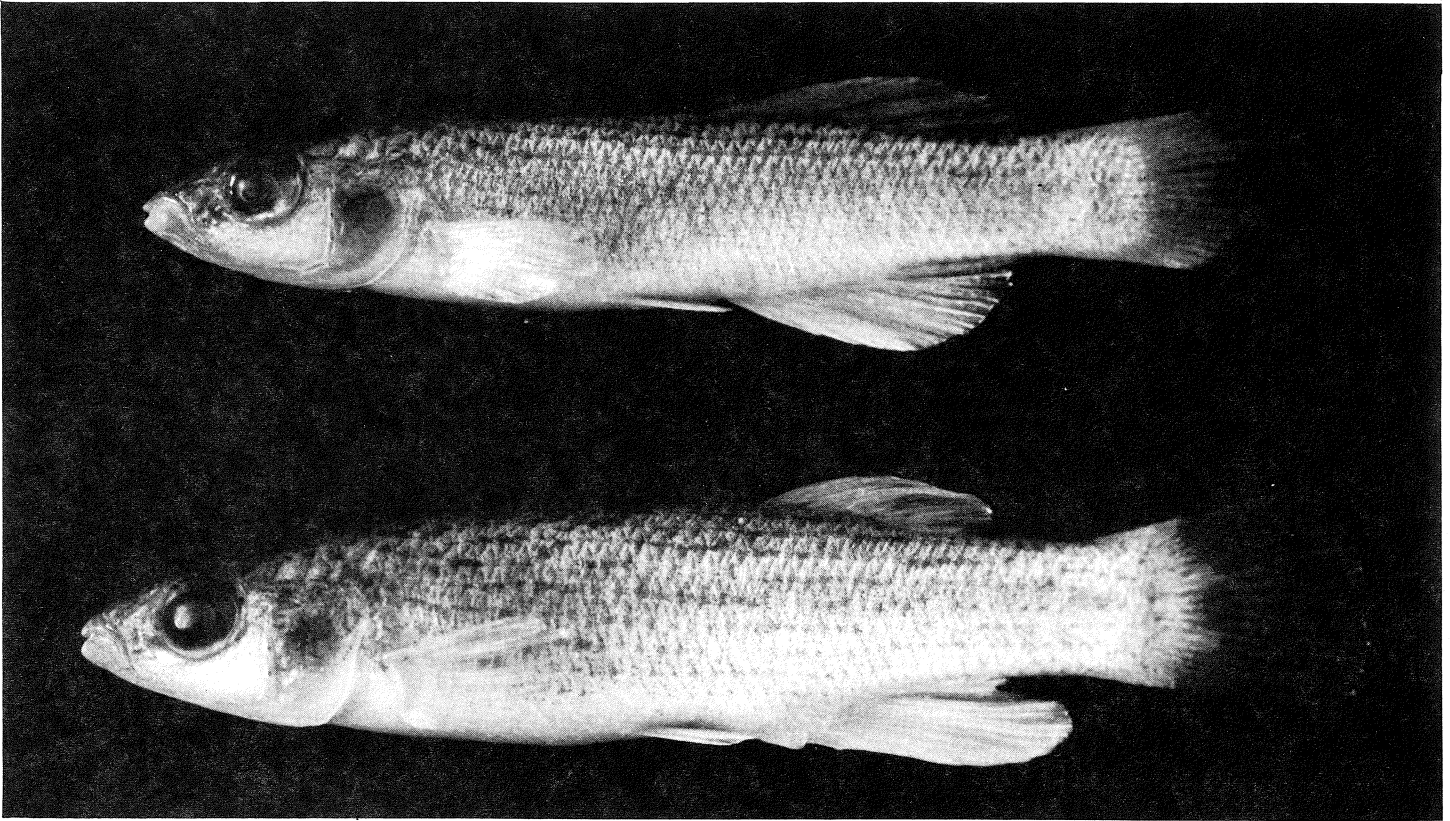


Figure 2. Specimens of *Fundulus catenatus*: 54 mm male (above) and 61 mm female (below) from East Fork Amite River, Amite Co., Miss.

mm), and Pearl River (65 mm). The black band in the caudal fin of male *F. catenatus* may be either subterminal or terminal. The percentage of individuals exhibiting a caudal band for the more northern populations ranged from 12-44%, with expression of this feature not observed among any Homochitto River specimens (Thomerson 1969). The dark band is also not expressed in any of the 295 specimens we have observed from the new localities (Figure 2). Meristic characters for northern studfish from Coles Creek and from the Buffalo, Amite and Pearl rivers also are in close agreement with those reported by Thomerson (1969) for the Homochitto population (Tables 1-4).

The new distribution records of *Fundulus catenatus* may indicate a much wider distribution in the past, may have resulted from introduction and subsequent dispersal, or may be based on a combination of both. The wide distribution and relative abundance of the northern studfish in the Buffalo

River could indicate that the species reached this area at the same time it entered the Homochitto River. The species is also common, though less widely distributed, in Coles Creek. The restricted occurrence of *F. catenatus* in the Amite and Pearl rivers, its reduced abundance, and its absence from numerous earlier collections from these drainages all suggest recent introductions from closely adjacent areas. Furthermore, there appears to be no ecological barrier to prevent the spread of this species beyond the areas presently occupied. Conversely, natural dispersal by lateral stream capture should not be discounted as an explanation for the present distribution pattern of *F. catenatus*. The close proximity of the lower Mississippi River tributaries, the Lake Pontchartrain drainage, and the Pearl River makes this plausible, especially for the Pearl River population. Suttkus and Clemmer (1977) discussed the possible role that Bayou Pierre may

(continued on page 4)

TABLE 1. Number of dorsal rays

	13	14	15	16	N	X	SD	2SE
Coles Creek	7	17	2		26	13.8	.57	.22
Buffalo River	2	18	9	1	30	14.3	.65	.23
Amite River	9	17	4		30	13.8	.65	.23
Pearl River	4	16	3	1	24	14.0	.69	.28
Homochitto River (Thomerson, 1969)	10	71	19		100	14.1	.53	.11

TABLE 2. Number of anal rays

	13	14	15	16	N	X	SD	2SE
Coles Creek		11	15		26	14.6	.50	.20
Buffalo River		1	21	8	30	15.2	.50	.18
Amite River		12	16	2	30	14.6	.61	.22
Pearl River		10	13		23	14.6	.51	.21
Homochitto River (Thomerson, 1969)	1	13	78	8	100	14.9	.50	.10

TABLE 3. Number of left pectoral rays

	15	16	17	18	19	N	X	SD	2SE
Coles Creek			14	12		26	17.5	.51	.20
Buffalo River		1	4	22	3	30	17.9	.61	.22
Amite River		1	5	19	5	30	17.9	.69	.25
Pearl River			8	15	1	24	17.7	.55	.22
Homochitto River	1	4	21	63	11	100	17.8	.72	.14

TABLE 4. Number of lateral scales

	38	39	40	41	42	43	44	45	46
Coles Creek			1	1	2	5	6	3	6
Buffalo River	1		4	1	3	8	3	2	2
Amite River			3	3	4	5	5	5	2
Pearl River		2		1	6	4	4	7	
Homochitto River (Thomerson, 1969)	3	6	12	5	27	17	12	12	6

	47	48	49	50	N	X	SD	2SE
Coles Creek	2				27	44.2	1.81	.71
Buffalo River	2	1	1	1	29	43.6	2.86	1.06
Amite River	2			1	30	43.5	2.33	.85
Pearl River					24	43.1	1.79	.73
Homochitto River (Thomerson, 1969)					100	42.4	2.01	.40

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Florida State Museum, University of Florida
Gainesville, FL 32611

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have played in the eastward movement of fishes from the Mississippi River to the Pearl River, with *F. catenatus* and *Notropis camurus* being cited as examples of species that might have followed this route. There are no confirmed records for *F. catenatus* in Bayou Pierre (Matthews, 1978; N. H. Douglas and R. D. Suttkus, pers. comm.). However, this does not preclude a dispersal route to the Pearl as suggested by Suttkus and Clemmer (1977).

Guillory and Conner (1973) discussed the distributional patterns of various fish species inhabiting the lower Mississippi River drainage and Lake Pontchartrain tributaries. The present report shows *Fundulus catenatus* to be one of those species (along with *Hypopsis winchelli*, *Noturus miurus*, *N. nocturnus*, *Fundulus notatus*, *Ambloplites ariomus*, *Ammocrypta beani*, *Etheostoma stigmaeum* and *E. zonale*) that occur in the larger, westward-flowing Mississippi River tributaries, skip the southward-flowing Tunica Bayou, Bayou Sara and Thompson Creek, and appear again in the Lake Pontchartrain tributaries and the Pearl River.

ACKNOWLEDGEMENT

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Other Announcements

A button depicting the frecklebelly madtom, *Noturus munitus*, was produced by RARE (Rare Animal Relief Effort, Inc.) to commemorate our fifth annual meeting in Tampa, FL. Our thanks go to RARE and Anita Finlayson, Director; Jan Webber of Starkville, MS, for contributing the art work; and Clyde Jones, U. S. Fish and Wildlife Service, for supporting the effort.

Many SFC members have now received their copy of "Atlas of North American Freshwater Fishes," which had been in preparation for three years. For those who have not ordered this, copies are available for \$23.00 (U.S.) or \$25.50 (Canadian) from the North

Carolina State Museum of Natural History, P.O. Box 27647, Raleigh, NC 27611. This tome, which is over 850 pages long, provides detailed distribution maps, illustrations, and related systematic, distributional and biological information for 777 species that occur permanently, or occasionally, in fresh waters north of Mexico. Although bound in paper back, it is in loose-leaf format, and thus substitute or additional pages (which will appear from time to time) can easily be inserted. The publication is, to say the least, impressive, and, in many individual's opinion, represents the most important contribution to freshwater fishes of this continent since Jordan and Evermann's "Fishes of North and Middle America" over 80 years ago. Partial subsidization by the United States Fish and Wildlife Service has permitted the price to be kept at a level sufficiently low as to be in everyone's reach financially. One of the goals of the atlas is to encourage those who might not otherwise do so to inform curators of recognized fish collections (or other informed individuals) of significant new records, and at the same time to provide substantiating voucher specimens. Although large numbers of nagging little errors were "weeded out" prior to publication, some still remain. A list of these is being assembled at the N.C. State Museum, to be sent to earlier purchasers of the atlas and to be included in copies mailed subsequently. Readers are encouraged to inform David S. Lee or Steven P. Platania (N.C. State Museum) of any undetected errors or changes.

