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New Records and Comments on the Distribution of Blair's Starhead
Topminnow, *Fundulus blirae* (Fundulidae)

New Records and Comments on the Distribution of Blair's starhead topminnow, *Fundulus blairae* (Fundulidae).

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INTRODUCTION

Blair's starhead topminnow, *Fundulus blairae*, is distributed primarily on the Gulf Coastal Plain. The range presented by Wiley and Hall (1975) extended from northwestern Louisiana, northwestward to the Red River drainage of southeastern Oklahoma, southwestward to the Middle Brazos River drainage in eastern Texas, and along the Gulf Coast from the Galveston Bay drainage, to the Atchafalaya River in Louisiana. *Fundulus blairae* was later reported in the tributaries of the Little River (Red River drainage) in southwestern Arkansas (Robison 1977), and east of the Mississippi River in the Pearl, Pascagoula, and Mobile Bay drainages (Wiley, 1977; 1980).

In this report we extend the range of *F. blairae* to the eastern embayment of the lower Mississippi River in southwestern Mississippi and eastern Louisiana, and comment on records for *F. blairae* from the Conecuh-Escambia River drainage in Alabama and Florida.

RESULTS

Collections

Two of the new records of *F. blairae* are from the Homochitto and Buffalo rivers, both tributaries to the lower Mississippi River in southwestern Mississippi. The first record was a single male specimen (30.3 mm SL) collected from an unnamed tributary to the lower Homochitto River on 12 March 1988 near a cypress swamp, on Woodlawn Rd., 13.7 km northwest of Lanhart, Wilkinson County, MS, (Sec. 11, T3N, R3W) (Figure 1). Due to recent rainfall, the water was high and the slow-moving stream was approximately 7.6m wide with a clay-mud substrate. Submerged riparian vegetation was abundant, but no aquatic vegetation was present. The specimen was collected at a water depth of 0.5m in a clump of dead vegetation at a small inlet along the shore.

The Buffalo River is the lowermost major westward flowing tributary to the Mississippi River (Figure 1), and its 87 km length is wholly contained in Wilkinson County, MS. From September 11, 1986 to March 12, 1988, during a year-long stream survey, 289 specimens of *F. blairae* were collected at three sites from the lower Buffalo River (Figure 1). Two specimens were taken on March 28, 1987 from a locality 8.0 km N of U.S.Hwy 24 at Lessley, MS. on Southland Rd., (Sec. 25, T3N, R3W), six more specimens were collected on March 12, 1988, from a lower section of the river, 4.0 km N of US Hwy 24 at Pleasant Valley Plantation, and at the same time 281 specimens were taken in a cypress swamp lake, 11.1 km W of Lessley, MS (Sec. 10, T2N, R4W).



Figure 1. Distribution of *Fundulus blairae* in the eastern embayment drainages of the lower Mississippi River.

The uppermost site on the Buffalo River is characterized by a flat, sandy, shifting substrate with little emergent aquatic vegetation and a slow to moderate water flow. The river at the lowermost sites is a slowly moving meandering bayou with bald cypress (*Taxodium distichum*) and black willow (*Salix nigra*) comprising most of the terrestrial cover.

In addition to our recent collections, we report four other localities for *F. blairae* from the eastern embayment based on museum records. We examined and identified eight specimens of *F. blairae* (LSUMZ 394) from Thompson Creek col-

lected on October 27, 1972 at the US. Hwy 61 bridge, 10km southeast of St. Francisville, West Feliciana Parish, LA. One of four males had 6 prominent vertical bars across the mid-flank. A single adult male of *F. blairae* (TU 112455), 31mm SL, was collected on April 12, 1979 along the west bank of the Mississippi River at river mile 262.6 near St. Francisville, West Feliciana Parish, LA. We identified three specimens of *F. blairae* (LSUMZ 4780) collected from the Tunica Swamp area of Blind Bayou, West Feliciana Parish, LA on November 12, 1972. Two of the the three male specimens had 4-5 prominent vertical bars. We examined 14 specimens of *F. blairae* (UT 60.421), collected from a swamp .27 km west of the Big Black River at the US Interstate 20 bridge, Warren County, MS on May 20, 1988. The four localities are to the west of the range reported by Wiley (1980).

The specimens of Blair's starhead topminnow generally conformed to the description reported by Wiley and Hall (1975). They were identified as members of the *F. notti* species group by the presence of a subocular teardrop in both males and females, and numerous stripes on the flanks between the scale rows of females (Wiley and Hall 1975; Wiley 1977). All specimens examined showed the G-type head squamation and two-pore pattern (4a and 4b widely separated) diagnostic of the *F. blairae* – *F. dispar* clade (Wiley and Hall 1975; Wiley 1977). The adult males generally lacked vertical bars, the diagnostic character separating *F. blairae* from *F. dispar*. However, the series of 281, from the lowermost station in the Buffalo River, exhibited more variation in pigmentation than reported by Wiley and Hall (1975) with 44 adult males (29.1% of total) exhibiting vertical bars. The bars were thin, usually not extending anteriorly past the insertion of the pelvic fin or past the pectoral fin tip, and numbered between 2-8 (Table 1). By contrast, Wiley and Hall (1975) found vertical bars on only two males and one juvenile in 245 specimens from throughout the range of *F. blairae*.

Species Associates

Fundulus blairae is a component of a lowland fauna typical of the lower Mississippi River basin, tributaries, and backwaters. Species associates in the Homochitto and Buffalo rivers include: *Lepisosteus oculatus*, *Dorosoma cepedianum*, *D. petenense*, *Esox americanus*, *Cyprinella camura*, *C. lutrensis*, *C. venusta*, *Hybognathus hayi*, *H. nuchalis*, *Hybopsis longirostris*, *Lythrurus fumeus*, *Notemigonus crysoleucas*, *Notropis atherinoides*, *N. emilae*, *N. maculatus*, *N. texanus*, *Pimephales notatus*, *P. vigilax*, *Minytrema melanops*, *Ictalurus punctatus*, *Noturus gyrinus*, *Aphredoderus sayanus*, *Fundulus chrysotus*, *F. notatus*, *F. olivaceus*, *Gambusia affinis*, *Labidesthes sicculus*, *Menidia beryllina*, *Syngnathus scovelli*, *Chaenobryttus gulosus*, *Lepomis humilus*, *L. macrochirus*, *L. megalotis*, *L. microlophus*, *L. punctatus*, *L. symmetricus*, *Micropterus punctulatus*, *M. salmoides*, *Pomoxis annularis*, *P. nigromaculatus*, *Ammocrypta beani*, *Etheostoma chlorosomum*, *E. fusiforme*, *E. gracile*, *E. proeliare*, *E. stigmaeum*, and *Percina caprodes*.

DISCUSSION

Wiley (1977) discussed the systematics of the *Fundulus notti* species group. He concluded that *F. blairae* and *F. dispar* were sister species, and that in the Mississippi River and

Mobile Bay drainages, *F. blairae* preferred the lower reaches of rivers, while *F. dispar* was usually found farther upstream. The starhead topminnows in the lower Buffalo River occurred in a stream section and habitat more typical of *F. blairae* than *F. dispar*. Still, the higher incidence of barring in these specimens raises several questions about the taxonomic status of the Buffalo River population of starhead topminnows. Given the close proximity of the southern limit of the range of *F. dispar* (Wiley 1980), the barred specimens might represent *F. dispar* occurring sympatrically with *F. blairae*, or they may represent *F. blairae* x *F. dispar* hybrids. More likely perhaps, the expression of a few bars in some male *F. blairae* in a small, relatively isolated population is due to genetic drift. The resolution of the problem is difficult using only morphological characters. *Fundulus blairae* and *F. dispar* share the same head pore and squamation pattern (Wiley, 1977), and differ primarily in the absence versus presence of vertical bars, respectively, in male specimens only. Perhaps some biochemical genetic technique could be employed to resolve the problem, but for the present it seems most parsimonious to identify the lower Buffalo River starheads as *F. blairae*.

The occurrence of *F. blairae* in the lower reaches of the Buffalo River system could likely be the result of natural dispersal across the Gulf Coastal Plain during one of the three lowerings of sea level during the Pleistocene, and/or the subsequent flooding of the interconnecting swampy regions (Smith-Vaniz 1968; Swift et al., 1985). In a previous survey of the Buffalo River, *F. blairae* was not among the 75 species reported (Cashner et al., 1976). The lower sections of several other lower Mississippi tributaries seem suitable to support populations of *F. blairae*, but surveys of Bayou Pierre (Matthews, 1978), Clark Creek (Grady and Cashner, 1988), and Bayou Sara (Grady et al., 1983) failed to recover this species, possibly due to limited access to collecting sites in the lower sections. Most of the previous surveys mentioned were concentrated in the headwater and middle portions of the streams. New populations of *F. blairae* might be discovered if collecting efforts were intensified in the lower sections of these and other lower Mississippi tributaries.

Fundulus blairae has recently been found to occur syntopically with *F. escambiae* in the Conecuh-Escambia River system in Alabama and Florida (Robert C. Cashner, pers. comm.). This record extends the range eastward from the Mobile Bay drainage as reported by Wiley (1977; 1980).

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Table 1. Frequency of barred and unbarred males of *Fundulus blairae* from populations distributed across the Gulf Coastal Plain.

<u>Population</u>	<u>Barred</u>	<u>Unbarred</u>
Texas and Louisiana *	2	245
Buffalo River, MS	44	107
Alabama – Florida	0	22

* From Wiley and Hall (1975).