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THE CHESTNUT LAMPREY, *ICHTHYOMYZON CASTANEUS* GIRARD, IN THE MOBILE BASIN

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INTRODUCTION

The chestnut lamprey, *Ichthomyzon castaneus*, is a parasitic freshwater species endemic to rivers of eastern North America. The majority of records of this species are from major rivers and large streams in the Mississippi River Basin where it is fairly common (Rohde and Lanteigne-Courchene, 1980). Often this species is captured in streams during upstream spawning migrations or found attached to host species. In the Mobile Basin, however, the chestnut lamprey is uncommon, if not rare. Rohde and Lanteigne-Courchene (1980) report only eight records of the species from the entire drainage system. Recent collection efforts and examination of previously reported records of the chestnut lamprey in the Mobile Basin provide new distributional information for this rare species. Herein, we evaluate and revise the distribution of the chestnut lamprey in the Mobile Basin.

HISTORICAL MOBILE BASIN RECORDS

Records of the chestnut lamprey from the Mobile Basin have been reported by Gudger (1930), Hubbs and Trautman (1937), Cook (1959), and Rohde and Lanteigne-Courchene (1980). Gudger (1930) and Hubbs and Trautman (1937) reported 7 specimens [American Museum of Natural History 10104(5); University of Michigan Museum of Zoology 97135 (2)] from the upper Coosa River, near Rome, Georgia (Fig.1). Cook (1959) reported two specimens from the Mobile Basin in the Buttachatchie River, Lowndes Co., Mississippi (Colb Lake, Mississippi Mus. Nat. Sci. 6841) (Fig. 1). One of these specimens was reported to have been "attached to a buffalo fish" (Cook, 1959:44)

Other Mobile Basin records of the chestnut lamprey are from Rohde and Lanteigne-Courchene (1980). In Tennessee, a single locality was reported from the Conasauga River based on a voucher specimen collected in1969 from Bradley County (University of Tennessee 2.12). In the account by Rohde and Lanteigne-Courchene (1980), however, three records from Alabama and two records from Mississippi are in error or are unsubstantiated (see their distribution map). In Mississippi, two localities were listed from the upper Tombigbee River, well upstream from Cook's (1959) report of two specimens from the Buttahatchie River System. According to Rohde (pers. comm., 29 April 1988) only the downstream locality was included in their original account; this record was taken from Cook (1959). However, this locality and the second, more upstream locality, were both plotted incorrectly. The actual collection locality is illustrated in Figure 1.

In Alabama, the distribution of the chestnut lamprey as presented by Rohde and Lanteigne-Courchene (1980) includes only the Black Warrior River. A single locality is from what appears to be the Sipsey River Drainage, one from the lower Black Warrior River in Hurricane Creek, Tuscaloosa Co., and three localities from the upper Black Warrior River. To date, only the Hurricane Creek locality, based on a single large adult (University of Alabama Ichthyological Collection 2545.01), has been located to substantiate any records from the Black Warrior Drainage. The only known record from the upper Black Warrior River is a large ammocoete from Rush Creek, Winston Co., Alabama (UAIC 4964.01, re-identified as *I. gagei*.

The Sipsey River record and the two other upper Black Warrior River localities are unsubstantiated. Thus, the only vouchered historical records for *I. castaneus* in the Mobile Basin include specimens from the Buttachatchie River in Mississippi, the Black Warrior River in Alabama, and upper Coosa River in Georgia and Tennessee.

RECENT MOBILE BASIN RECORDS

Several new distributional records of the chestnut lamprey from the Mobile Basin of Alabama have come to our attention. These records substantiate the distribution of *I. castaneus* in drainages previously thought to contain this species, and are the first for the Alabama River Drainage in Alabama.

Black Warrior River Drainage.– Clear Creek, tributary to Sipsey Fork of Mulberry Fork of Black Warrior River, 6.3 km W Double Springs [T10S, R9W, Sec. 28], Winston Co., AL; 11 April 1966 (Tulane University 40603; 1 specimen). Mulberry Fork at Underwood's Ferry, 4.8 km NW Pumpkin Center [T16S, R6W, Sec. 9], Walker Co, AL; 25 March – 8 May 1949 (UAIC 34.01; 1 specimen). Lake Tuscaloosa, near Binnion Creek [T19S, R10W, Sec. 15], Tuscaloosa Co., AL; 20 April 1988 (UAIC 8346.01; 1 specimen). The former two localities are in close proximity to the previously reported upper Black Warrior records of this species, but were not included in Rohde and Lanteigne-Courchene (1980). The later collection represents the first substantiated record from North River; the lamprey was found attached to a bluegill, *Lepomis macrochirus*.

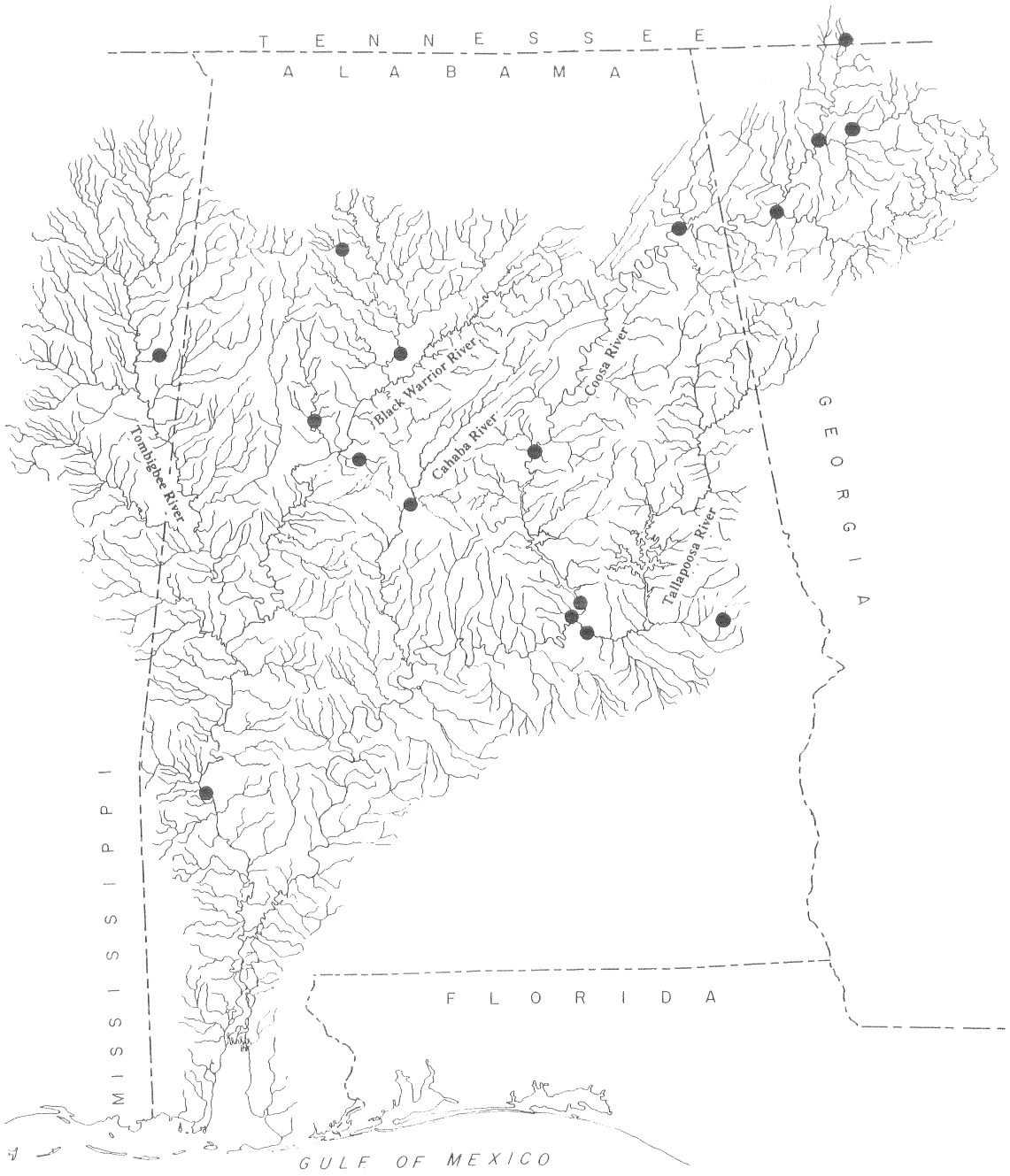

Figure 1. Distribution of the chestnut lamprey *Ichthyomyzon castaneus* in the Mobile Basin. Vouchered localities are repesented by dots and are discussed in text.

Lower Tombigbee River Drainage. – Tombigbee River at Coffeeville, mouth of Turkey Creek [T10N, R2W, Sec. 34], Choctaw Co., Al; 20 April 1988 (UAIC 8465.01; 1 specimen). This specimen was caputred while electrofishing blacktail redhorse, *Moxostoma poecilurum*, from the Tombigbee River. Although the chestnut lamprey is known from the Tombigbee River Drainage, this is the first record from the lower portion of the river as well as the first record from the Costal Plain.

Coosa River Drainage. – Coosa River at Centre, Cherokee Co., AL; 21 October 1954 (Auburn University 1639; 1 specimen). Coosawattee River, 18.8 km NE Calhoun at St. Rd. S1800, Gordon Co., GA; 16 March 1978 (AU 19132; 2 specimens). Coosa River, mouth of Yellowleaf Creek at Gaston stream plant, Shelby Co., AL; 12 June 1978 (AU 17039; 1 specimen). Oostanaula River, 8 km N Calhoun at US 41, Gordon Co., GA; 14 October 1978 (AU 19134; 4 specimens). Same locality as above; no date (AU 19150; 4 specimens). Coosa River, 2.9 km W Wallsboro and 4.2 km below Jordan Dam [T19N, R18E, Sec. 35], Elmore Co., AL; 7 May 1985 (UAIC 8440.01; 1 specimen). Coosa River, 5.6 km SW Wetumpka at Ft. Toulouse [T18N, R18E, Sec. 27], Elmore Co, AL; 17 March 1988 (no voucher specimen). The first specimen was attached to a specimen of *Ictalurus furcatus*. The S

Shelby Co. specimen was removed from the intake screen at the Gaston steam plant. The chestnut lamprey collected in Elmore Co. was 204 mm, free swimming, and captured from beneath a log while electrofishing. The last specimen represents a sight identification. This lamprey was approximately 250 mm and escaped from a gill netted, 2.2 kg common carp, *Cyprinus carpio*.

Cahaba River Drainage. – Cahaba River, Hwy 27 bridge [T24N, R10E, Sec. 33], Bibb Co., AL; 2 April 1988 (no voucher specimen). This record is based on the capture of a 320 mm, recently parasitized *Moxostoma poecilurum* (UAIC 8339.19) from this locality. The redhorse, when removed from the seine, had a large, open, semi-circular, bleeding wound in the breast region (Fig. 2). Bleeding around the wound ceased within a few minutes after the specimen had been placed in a separate container of river water. From these observations it was clear that the lamprey detached from the redhorse and escaped the seine during our collecting effort. Identification of this species as the chestnut lamprey is not controversial since this is the only parasitic lamprey in the Mobile Basin.

The size of the wound on the *M. poecilurum* measured 23.5 mm in width and 22.2 mm in length, indicating that the lamprey was quite large. Two regression equations were calculated using the width (W) and length (L) of the oral disc against body length (TL/T) of adult *I. castaneus* specimens (N = 6, TL = 104-248 mm) to predict the body size of the lamprey attached to the redhorse. Based on width of wound, the lamprey is predicted to have been 336 mm in length (TL/T = 77.8 + 11.1 W, r = 0.844). Using length of wound as a predictor of body length the lamprey would have been 327 mm (TL/T = 79.9 + 11.1L, r = 0.874). These predictions are very similar and well above the maximum body length of 310 mm reported for the species by Rohde and Lanteigne-Courchene (1980). Both predictors, however, are well within the maximum length of 380 mm reported for *I. castaneus* by Moore and Kernodle (1965) and Scott and Crossman (1973) for Mississippi River populations of this species.

Tallapossa River Drainage. – Barrow pit along Chewacla Creek, 15.8 km E of Tuskegee along Hwy 80, Macon Co., AL; 18 February 1978 (AU 16179; 1 specimen). Tallapossa River, 4.8 km WNW Bingham, near Hwy 231 [T17N, R18E, Sec. 20], Elmore Co., AL; 29 March 1989 (UAIC 9106.01; 1 specimen). The former specimen was found attached to a *Minytrema melanops*. The latter specimen was 179 mm TL and was attached to a 545 mm *Cyprinus carpio*. These collections represent the first and only records of the chetnut lamprey from this river system.

SUMMARY

Relative to other drainages inhabited by the chestnut lamprey in the eastern United States, this species is not a common member of the ichthyofauna of the Mobile Basin. This is evidenced by the obvious disparity in collections of *I. castaneus* from the Mobile Basin compared to most drainages of the Mississippi River Basin, even after extensive surveys of many Gulf Coastal rivers. Recent collections and an evaluation of previous reports of this species indicate that only 18 substantiated records are known from the Mobile Basin (Fig 1). Included are records from the following rivers: Buttahatchie, North, Black Warrior, Cahaba, Coosa, Coosawattee, Oostanaula, and Tallapoosa. Previous reports of *I. castaneus* from some of these drainages are not considered valid because no voucher specimens are available.

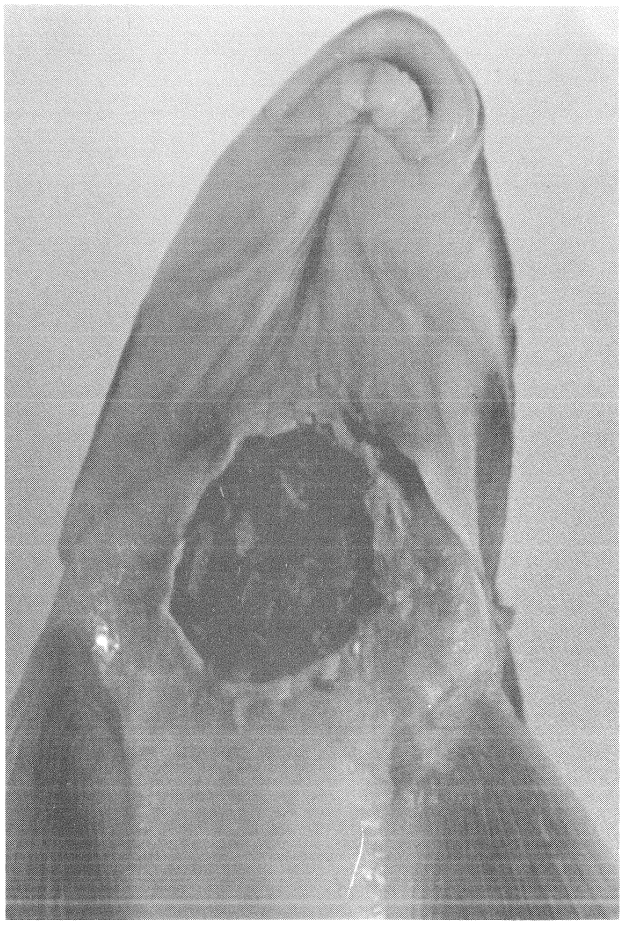

Figure 2. Breast region of 320 mm specimen of *Moxostoma poecilurum* collected from the Cahaba River, Bibb Co., AL (UAIC 8339.19), illustrating area of attachment by an *Ichthyomyzon castaneus*.

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DIET OF JUVENILE BOWFIN, *AMIA CALVA* Linnaeus, IN THE SIPSEY RIVER, ALABAMA

by

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INTRODUCTION

The bowfin, *Amia calva* Linnaeus, is one of only a few living holostean fishes, and the only extant Amiiform fish (Nelson, 1984). It is widespread in the lowlands of eastern North America, from the St. Lawrence River and Great Lakes south to the Gulf of Mexico (Burgess and Gilbert, 1980). Adult bowfin are notorious predators, and feed on many vertebrate species, including salamanders, frogs, snakes, and lizards, but mostly other fishes. They also eat crayfishes, insects, and leeches (Lagler and Applegate, 1942; Berry, 1955; Diana, 1966). Adult bowfin are undoubtedly sight feeders that will eat anything appearing to be food, including artificial fishing worms (Diana, 1966).

Food habits of young bowfin are poorly known. Schneberger (1937) reported that bowfin between 45 and 70 mm total length (TL) feed on planktonic crustaceans and small insect larvae, but he did not quantify the food items. Pflieger (1975) noted that young bowfin, at approximately 100 mm TL, switched from a primarily invertebrate diet to eating vertebrates. Herein, we report on the gut contents of 50 juvenile bowfin from the Sipsey River, Alabama.

METHODS

Twenty five specimens in each of two size classes were examined. The smaller fish ranged from 21 to 23 mm TL ($\bar{x}$=21.96); the larger fish varied from 39 to 59 mm TL ($\bar{x}$=49.88). Fish to make up the two size groups were randomly selected from two collections made in a flooded area by the Sipsey River, Tuscaloosa County, Alabama [University of Alabama Ichthyological Collection 800.01 (284 specimens) and 4503.01 (76)]. Each fish's stomach was excised, flushed, and its contents identified and counted. Food from each bowfin size class was pooled by taxon, dehydrated at 60°C for 48 hours and weighed.

RESULTS AND DISCUSSION

Gut contents of young bowfin were quite varied (Table 1, Figure 1). Fish in both size classes had eaten invertebrates almost exclusively. A single 46 mm specimen did contain one poeciliid fish, *Gambusia affinis*. Young bowfin most often eat cladocerans, copepods, isopods, amphipods, and dipterans. The relative abundance of each of these and other taxa differed, however, between size classes and depending on whether number or weight was considered. Cook (1959) stated that bowfin consumed vegetable matter, but we found none. The presence of some terrestrial arthropods, one aphid and one pseudoscorpion (Table 1), suggests that juvenile bowfin will eat almost any appropriate size arthropod they encounter.

Diet did not vary within a size class. This was also noted by Schneberger (1937), and is related to the compact schooling behavior of juvenile bowfin, which are herded into cohesive schools by the male parent until they reach 100 mm TL (Pflieger, 1975). Diet composition did differ appreciably between the two size classes (Table 1, Figure 1). The most conspicuous difference between the two was the infrequent number of insects in the smaller size class. Insects accounted for only 1.4% of the diet among smaller bowfins, but was nearly 23% of the diet for the larger size group. This difference may be size related, because larger insects, such as *Siphlonurus*, Macromiidae, *Chauliodes*, and *Deronectes*, were present only in the stomach of the larger class. Perhaps members of these taxa are too large or evasive for the smaller bowfin. Alternatively, the discrepancy may be related to differences in