

## The University of Southern Mississippi The Aquila Digital Community

---

### Faculty Publications

---

2009

# First Record of *Agonostomus monticola* (Family: Mugilidae) in Mississippi Freshwaters with Notes of its Distribution in the Southern United States

Wilfredo A. Matamoros

Louisiana State University, [W.Matamoros@usm.edu](mailto:W.Matamoros@usm.edu)

Jacob F. Schaefer

University of Southern Mississippi, [Jake.Schaefer@usm.edu](mailto:Jake.Schaefer@usm.edu)

Paul F. Mickle

University of Southern Mississippi

William Arthurs

NCASI, Northwest Aquatic Biology Facility

R. Joan Ikoma

NCASI, Northwest Aquatic Biology Facility

*See next page for additional authors*

Follow this and additional works at: [https://aquila.usm.edu/fac\\_pubs](https://aquila.usm.edu/fac_pubs)

 Part of the [Marine Biology Commons](#)

---

### Recommended Citation

Matamoros, W. A., Schaefer, J. F., Mickle, P. F., Arthurs, W., Ikoma, R., Ragsdale, R. (2009). First Record of *Agonostomus monticola* (Family: Mugilidae) in Mississippi Freshwaters with Notes of its Distribution in the Southern United States. *Southeastern Naturalist*, 8(1), 175-178.

Available at: [https://aquila.usm.edu/fac\\_pubs/1040](https://aquila.usm.edu/fac_pubs/1040)

This Article is brought to you for free and open access by The Aquila Digital Community. It has been accepted for inclusion in Faculty Publications by an authorized administrator of The Aquila Digital Community. For more information, please contact [Joshua.Cromwell@usm.edu](mailto:Joshua.Cromwell@usm.edu).

---

**Authors**

Wilfredo A. Matamoros, Jacob F. Schaefer, Paul F. Mickle, William Arthurs, R. Joan Ikoma, and Renee Ragsdale

**First Record of *Agonostomus monticola* (Family: Mugilidae) in Mississippi Freshwaters with Notes of its Distribution in the Southern United States**

Wilfredo A. Matamoros<sup>1,2,\*</sup>, Jacob Schaefer<sup>1</sup>, Paul Mickle<sup>1</sup>, William Arthurs<sup>3</sup>, R. Joan Ikoma<sup>3</sup>, and Renee Ragsdale<sup>3</sup>

**Abstract** - An individual of *Agonostomus monticola* (Mountain Mullet) was collected in southern Mississippi while conducting a series of community surveys on 7 November 2007. This is the first documented report of Mountain Mullet in Mississippi freshwaters, even though there are reports of three specimens collected in Mississippi estuarine waters in 1937. Given its life history and difficulties in sampling, it is likely that Mountain Mullet has a broader distribution and more frequently occurs in Gulf Coast drainages in the southern US than was previously thought.

*Agonostomus monticola* Bancroft (Mountain Mullet), is a diadromous species found in marine, brackish, and freshwaters from the Atlantic slope of tropical and subtropical North America (Rohde 1976, 1980) to northern South America (Greenfield and Thomerson 1997, Miller et al. 2005). Its Atlantic range includes the West Indies and the Caribbean coast of Mexico to Venezuela (Greenfield and Thomerson 1997, Miller et al. 2005). Along the Pacific slope, it is found from southern California to Ecuador (Thomson 1997). In the US, Mountain Mullet has been recorded in Atlantic (North Carolina, South Carolina, Georgia, and Florida), Pacific (California), and Gulf of Mexico (Florida, Louisiana, and Texas) drainages (Hoehn 1998, Light et al. 1998, Marcy et al. 2005, Menhinick 1991, Pezold and Edwards 1983, Schlicht 1959, Suttkus 1956, Thomson 1997; Fig. 1, Table 1). Although there are reports of Mountain Mullet from Florida, Louisiana, and Texas, it has not been previously reported in

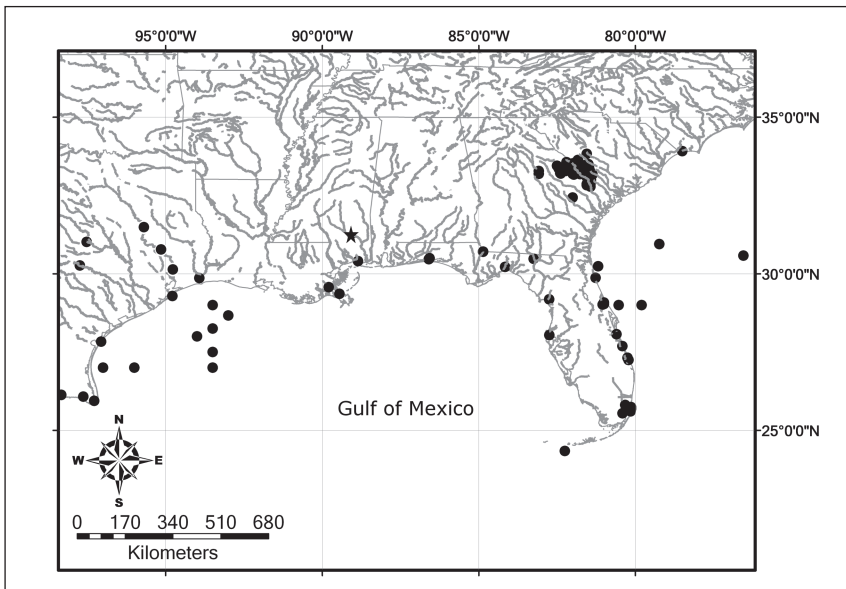


Figure 1. Map of southeastern United States showing museum and literature collection localities of *A. monticola*. Multiple records in close geographic proximity may be represented by a single symbol. The recent collection in Mississippi freshwater is designated by a star.

either Mississippi or Alabama inland waters. We report the first record of Mountain Mullet in Mississippi freshwaters and review its range in freshwater habitats within southern US.

Mountain Mullet is commonly found in tropical freshwater systems and it seems to prefer high-gradient streams with fast-moving waters (Carr and Goin 1955, Cruz 1987), even though it has also been found in lentic waters (Loftus et al. 1984). It is considered a generalist that feeds mainly on filamentous algae and aquatic insects, but it also consumes detritus, snails, plant material, mollusks, and small fishes (Aiken 1998, Cruz 1987, Loftus et al. 1984, Phillip 1993, Torres-Navarro and Lyons 1999). In the tropics, the spawning season of Mountain Mullet appears to coincide with the local rainy season (Aiken 1998, Cruz 1987). However, juvenile Mountain Mullet have been found year round in the coastal lagoons of Costa Rica's Pacific slope (Chicas 2001). Furthermore, in Honduras, juveniles smaller than 30 mm SL have been collected throughout the year in freshwater streams, suggesting that spawning may occur year round in some portions of the range (W.A. Matamoros, unpubl. data).

Table 1. Existing collection records for Mountain Mullet in the US listed by state and county. Collections queried and abbreviations as follows: Harvard University Museum of Comparative Zoology (HMCZ), Mississippi Museum of Natural Science (MMNS), Museum National de l'histoire Naturelle (MNHN), North Carolina State Museum of Natural Science (NCSMNS), Texas A&M University (TAMU), Texas Natural History Collection (TNHC), Tulane University Museum of Natural History (TU), University of Florida, Florida State Museum (UF), University of Louisiana Monroe (ULM), and The University of Southern Mississippi Museum of Ichthyology (USM). Citations indicate Mountain Mullet records found in the scientific literature but not museum records. Additional collections reviewed that contained no records include: California Academy of Science (CAS), Gulf Coast Research Laboratory (GCRL), Natural History Museum of Los Angeles County (LACM), and The University of Kansas (KU).

State	County or parish	Museum number/source
California	Pacific Ocean - open water	MNHN-1894-0044, MNHN-1894-0045, MNHN-1894-0046, MNHN-1894-0047, MNHN-1894-0054, MNHN-1894-0055, MNHN-1894-0056, MNHN-1894-0057, MNHN-1894-0058
Florida	Brevard, Dade, Gadsden, Hamilton, Indian River, Keys, Levy, Liberty, Madison, Martin, Okaloosa, Palm Beach, Pinellas, St. Lucie, St. Johns, Volusia	HMCZ-36297, UF-87919, UF-105964, UF-207953, UF-205749, UF-209035, UF-34916, UF-33933, UF-40906, UF-234402, UF-166098, UF-115476, UF-55971, UF-57835, TU-24279, TU-22385, TU-39592, TU-22481, UF-47345, UF-21078, UF-44918, NCSMNS-31849, UF-16656, UF-79993, UF-87882, UF-129614
Georgia	Burke, Columbia, Jefferson, McDuffie, Richmond, Screven	UF-107063, Marcy et al. 2005
Louisiana	Cameron, Plaquemines	TU-1160, TU-146916, TU-147051, TU-156292, ULM-33490, ULM-33610
Mississippi	Harrison, Perry	MMNS-5876, MMNS-5877, MMNS-5878, USM-31633
North Carolina	Brunswick	NCSM-10444
South Carolina	Aiken, Allendale, Barnwell	Marcy et al. 2005
Texas	Aransas, Bell, Brazos, Cameron, Galveston, Hidalgo, Jefferson, Liberty, Madison	TNHC-28665, TNHC-10490, TNHC-1054, TU-22052, TNHC-11716, TNHC-24842, TNHC-24934, TAMU-847, TAMU-1429

Researchers have differing opinions on the migratory habits of this species. Some authors believe Mountain Mullet is amphidromous (Erdman 1972), with spawning occurring in freshwater, eggs drifting to sea where they hatch, and larvae growing at sea before returning to freshwater as juveniles (McDowall 2007). Others (Anderson 1957, Cruz 1987, Phillip 1993) believe the species to be catadromous, with adults returning to sea to spawn. Further, some researchers discuss the possibility of mixed strategies (Marcy et al. 2005).

Mountain Mullet is an important part of the local fisheries in southern Mexico (Torres-Navarro and Lyons 1999) and Honduras (Cruz 1987). Conservation and fisheries management efforts in these areas have focused on factors influencing habitat quality and availability, pollutants, and anthropogenic obstacles to migration (Anderson et al. 2006, Cruz 1987, March et al. 2003).

On 7 November 2007, a single juvenile Mountain Mullet (31 mm standard length) was captured as a part of an electrofishing survey of the Leaf River (31.223°N, 89.076°W) in Perry County, MS. The specimen has been deposited in the University of Southern Mississippi Museum of Ichthyology (USM-31633). The specimen was identified based on the keys by Greenfield and Thomerson (1997) and Miller et al. (2005). Identification was further confirmed by T. Slack, Mississippi Museum of Natural Science (MMNS).

To determine the distribution of Mountain Mullet in southern US waters, we compiled locality data from museums and the literature. Of the fourteen museums queried, ten had records for Mountain Mullet (Table 1). Six of these had three or fewer records (HMCZ, MMNS, NCSMNS, TAMU, ULM, USM) and one (MNHN) did not contain any freshwater samples.

Occasional misidentification and difficulties in sampling may have led to a lack of representation of this species in the literature. Collection records at MMNS (Jackson, MS) indicate a single collection of Mountain Mullet ( $n = 3$ ) in Mississippi coastal waters from 1937 (MMNS-5876–5878). These specimens were originally misidentified and catalogued as *Menidia* sp. (T. Slack, pers. comm.). A number of authors have commented on the difficulty in sampling this species (Lyons and Navarro-Perez 1990, Pezold and Edwards 1983), with Carr and Giovannoli (1950) speculating that the fish was only susceptible to capture with dynamite. However, in surveys of freshwater streams along the Honduran Caribbean coast, electrofishing has proven to be effective while other fishing gear has failed (61 sites sampled yielded 195 Mountain Mullet captured at 25 sites; W.A. Matamoros, pers. observ.). Sporadic occurrences in the literature, difficulties in capture, and a lack of basic life-history information have resulted in a poor understanding of this species. It is possible that the Mountain Mullet is more abundant and more widely distributed than previously thought.

*Acknowledgments.* We thank R.H. Robins of the Florida Museum of Natural History (UF), N.E. Rios of Tulane University Museum of Natural History (TU), W.C. Starnes of the North Carolina State Museum of Natural Sciences (NCSM), and J. Carr of the University of Louisiana Monroe (ULM) for their assistance with database queries of collections. Two anonymous reviewers assisted with an earlier draft.

### Literature Cited

- Aiken, K.A. 1998. Reproduction, diet and population structure of the Mountain Mullet, *Agonostomus monticola*, in Jamaica, West Indies. *Environmental Biology of Fishes* 53:347–352.
- Anderson, E.P., M.C. Freeman, and C.M. Pringle. 2006. Ecological consequences of hydropower development in Central America: Impacts of small dams and water diversion on neotropical stream fish assemblages. *River Research and Applications* 22:397–411.

- Anderson, W.W. 1957. Larval forms of freshwater mullet (*Agonostomus monticola*) from the open ocean off the Bahamas and south Atlantic coast of the USA. *Fishery Bulletin* 57:415–425.
- Carr, A.F., and L. Giovannoli. 1950. The fishes of the Choluteca drainage of southern Honduras. Occasional Papers of the Museum Zoology, The University of Michigan 523:1–38.
- Carr, A.F., and C.J. Goin. 1955. Guide to the Reptiles, Amphibians, and Fresh-Water Fishes of Florida, University of Florida Press, Gainesville, FL. 341 pp.
- Chicas, F.A. 2001. Juvenile fish in a tidal pool, Terraba-Sierpe Forest Preserve, Puntarenas, Costa Rica. *Revista de Biología Tropical* 49:307–314.
- Cruz, G.A. 1987. Reproductive biology and feeding habits of Cuyamel, *Joturus pichardi*, and Tepemechin, *Agonostomus monticola*; (Pisces; Mugilidae) from Río Plátano, Mosquitia, Honduras. *Bulletin of Marine Science* 40:63–72.
- Erdman, D.S. 1972. Inland game fishes of Puerto Rico. Department of Agriculture, Commonwealth of Puerto Rico, San Juan, Puerto Rico.
- Greenfield, D.W., and J.E. Thomerson. 1997. Fishes of the Continental Waters of Belize. University Press of Florida, Gainesville, FL. 311 pp.
- Hoehn, T. 1998. Rare and imperiled fish species of Florida: A watershed perspective. Florida Fish and Wildlife Conservation Commission, Tallahassee, FL. 60 pp.
- Light, H.M., M.R. Darst, and J.W. Grubbs. 1998. Aquatic habitats in relation to river flow in the Apalachicola River floodplain, Florida. US Geological Survey Professional Paper 1594, US Geological Survey and Northwest Florida Water Management District, Washington, DC. 77 pp.
- Loftus, W.F., J.A. Kushland, and S.A. Voorhees. 1984. Status of the Mountain Mullet in southern Florida. *Florida Scientist* 47:256–263.
- Lyons, J., and S. Navarro-Perez. 1990. Fishes of the Sierra de Manantlan west-central Mexico. *The Southwestern Naturalist* 35:32–46.
- March, J.G., J.P. Benstead, C.M. Pringle, and F.N. Scatena. 2003. Damming tropical island streams: Problems, solutions, and alternatives. *BioScience* 53:1069–1078.
- Marcy, B.C., D.E. Fletcher, F.D. Martin, M.H. Paller, and M.J.M. Reichert. 2005. Fishes of the Middle Savannah River Basin: With Emphasis on the Savannah River Site. The University of Georgia Press, Athens, GA. 462 pp.
- McDowall, R.M. 2007. On amphidromy, a distinct form of diadromy in aquatic organisms. *Fish and Fisheries* 8:1–13.
- Menhinick, E.F. 1991. The Freshwater Fishes of North Carolina. North Carolina Wildlife Resources Commission, Raleigh, NC. 227 pp.
- Miller, R.R., W.L. Minckley, and S.M. Norris. 2005. Freshwater Fishes of Mexico. The University of Chicago Press, Chicago, IL. 490 pp.
- Pezold, F.L., and R.J. Edwards. 1983. Additions to the Texas marine ichthyofauna, with notes on the Rio Grande estuary. *The Southwestern Naturalist* 28:102–105.
- Phillip, D.A.T. 1993. Reproduction and feeding of the Mountain Mullet, *Agonostomus monticola*, in Trinidad, West Indies. *Environmental Biology of Fishes* 37:47–55.
- Rohde, F.C. 1976. First record of the Mountain Mullet, *Agonostomus monticola* (Bancroft), from North Carolina. *Florida Scientist* 39:126.
- Rohde, F.C. 1980. *Agonostomus monticola* (Bancroft), Mountain Mullet. P. 778, In D.S. Lee, C.R. Gilbert, C.H. Hocutt, R.E. Jenkins, D.E. McAllister, and J.R. Stauffer, Jr. (Eds.). Atlas of North American Fishes. North Carolina State Museum of Natural History, Raleigh, NC. 854 pp.
- Schlicht, F.G. 1959. First record of the Mountain Mullet, *Agonostomus monticola* (Bancroft), in Texas. *The Texas Journal of Sciences* 11:181–182.
- Suttkus, R.D. 1956. First record of the Mountain Mullet, *Agonostomus monticola*, (Bancroft), in Louisiana. *Proceedings of the Louisiana Academy of Sciences* 29:43–46.
- Thomson, J.M. 1997. The Mugilidae of the world. *Memoirs of the Queensland Museum*. 41:457–562.
- Torres-Navarro, C.I., and J. Lyons. 1999. Diet of *Agonostomus monticola* (Pisces: Mugilidae) in the Río Ayuquila, Sierra de Manantlan Biosphere Reserve, Mexico. *Revista de Biología Tropical* 47:1087–1092.

<sup>1</sup>The University of Southern Mississippi, Department of Biological Sciences, 118 College Drive Box 5018, Hattiesburg, MS 39406. <sup>2</sup>Instituto Regional para la Biodiversidad (IRBIO), Escuela Agrícola Panamericana El Zamorano, El Zamorano, Francisco Morazán, Honduras. <sup>3</sup>NCASI, Northwest Aquatic Biology Facility, 1219 Q Avenue, Anacortes, WA 98221. \*Corresponding author - wilfredo.matamoros@usm.edu.