



TEXAS TECH UNIVERSITY

Natural Science Research Laboratory

# OCCASIONAL PAPERS

Museum of Texas Tech University

Number 317 10 September 2013

## FISHES OF DEVILS RIVER, VAL VERDE COUNTY, TEXAS

ROYAL D. SUTTKUS AND CLYDE JONES

### ABSTRACT

This paper presents a report on fishes collected from Devils River, Val Verde County, Texas, from 17 July 1948 to 4 April 2003. Most collections were made with a small seine; however, gill nets were used in the deep plunge pool just below Dolan Falls. The 12 collecting efforts resulted in 11,138 specimens that represent 30 species and one hybrid combination. All specimens are housed in the Tulane University Museum of Natural History. Meristics and morphometrics of 23 adult *Carpoides carpio elongatus* are presented.

Key words: Devils River, Dolan Falls, fish, Val Verde County, Texas

### INTRODUCTION

A manuscript detailing the Tulane University holdings of fishes from Devils River, Val Verde County, Texas, was lost during Hurricane Katrina (August 2005), along with pertinent literature, field notes, and most of the first author's library and research files. Much of the important literature with regards to Devils River fishes has been reassembled, thanks to various

friends. All the fish specimens are intact in the Tulane University Museum of Natural History. A paper titled "Distribution and status of the Devils River minnow, *Dionda diaboli*," by Garrett et al. (1992), stimulated us to prepare this manuscript, given the paucity of ichthyological knowledge of this isolated and unique aquatic system.

### MATERIALS AND METHODS

Fishes collected from Devils River were taken primarily with a 10' (3.05 m) long by 6' (1.83 m) deep nylon minnow seine with a 3/16" (1.59 mm) ace mesh. Three collections from just below Dolan Falls were obtained with gill nets. Collection dates extended from July 1948 to April 2003. A total of 12 collections of fishes were taken from Devils River.

The Tulane University Herpetology Field Crew collected the earliest sample in 1948; R. D. Suttkus and Jayson S. Suttkus obtained the 1955 sample; G. G. Henderson obtained a July 1966 sample; the Environmental Biology class obtained seven collections from 9-12 July 1966; J. V. Conner and M. Zeng obtained a collection in 1968; and H. L. Bart, Jr., K. Pillar, and

Mercado-S collected the 2003 samples from Devils River. Collection data are provided for each of the 12 samples and include stream name, field number, date of collection, number of species, number of specimens, and total listing of species in sample. Families listed

in the Appendix are arranged in phylogenetic order and species are arranged in alphabetical order within families as given in the 2004 scientific and common names checklist (Nelson et al. 2004).

## RESULTS AND DISCUSSION

The 12 collections from the Devils River system resulted in 11,138 fish specimens representing 30 species plus one hybrid combination. A listing of species, frequency of occurrence of each species in the 12 samples, total specimens of each species, and percent relative abundance are presented in the Appendix.

*Dionda episcopa* was the most abundant species in our samples with a total of 6,058 specimens and a relative abundance of 54.5%. *Cyprinella venusta* was the next most abundant species with 2,107 specimens and a relative abundance of 18.9%. *Cyprinella proserpina* was the third most abundant species with 888 specimens and a relative abundance of 8.0%, and *Notropis amabilis* was the fourth most abundant species with 878 specimens and a relative abundance of 7.9%. Both *Cyprinella venusta* and *Dionda episcopa* occurred in 10 of the 12 samples and *Notropis amabilis* and *Astyanax mexicanus* occurred in nine of the 12 samples.

The complete loss of field notes due to Hurricane Katrina greatly curtailed matters for discussion. However, we thought it important to present our data, which overlaps Hubbs and Brown (1956) and Hubbs (1958) temporally but precedes Harrell (1978), Davis (1980), Hubbs and Garrett (1990), Garrett et al. (1992), Garrett et al. (2002), and Garrett et al. (2004), all of which dealt with fishes of Devils River.

We continue to use the name *Dionda episcopa* Girard 1856 for the earlier described form in the Devils River. The extant syntypes of *Dionda episcopa* in the United States National Museum are labeled as having come from the Upper Pecos River. Girard described another form, *Dionda argentosa*, in the same 1856 paper. This latter form was taken in San Felipe Creek

and Devils River. Girard (1856:13), in his description of *Dionda episcopa*, stated “the head is large, forming about the fifth of the length.” In his description of *Dionda argentosa*, Girard (1856:14) stated the species “has a small head and obtuse snout, a rather slender and compressed body. The head constitutes 2/11ths of the total length.” We know of no written evidence that either Hubbs and Brown (1956) or Mayden et al. (1992) examined the syntypes of the two nominal forms. Both *D. episcopa* and *D. argentosa* are represented by a dozen plus syntypes (Eschmeyer 1998). It would not surprise us if the *D. argentosa* syntypes were a mixed series. Hubbs and Brown (1956) emphasized the small and narrow head of *D. diaboli* in their diagnosis. We suggest a careful examination of the two sets of syntypes to clarify the situation.

During August 2005, Suttkus studied the 23 adult *Carpiodes carpio elongatus* that were obtained from Devils River below Dolan Falls in RDS 3936 and RDS 3937 samples. Meristics and morphometrics are presented in Tables 1 and 2, respectively. Hubbs and Black (1940) determined the status of *Carpiodes carpio elongatus* Meek, and Suttkus and Bart (2002) did a preliminary analysis of the river carspsuckers, *Carpiodes carpio* (Rafinesque 1820) in the southern portion of its range.

Fortunately, the two 5-gallon glass jugs and the one plastic bucket that contained the suckers floated some distance from the storage place without breaking or spilling their contents during the 20-foot surge caused by Hurricane Katrina. All specimens were retrieved and are in the Tulane University Museum of Natural History.

Table 1. Frequency distributions of number of fin rays and scale counts in 23 specimens of *Carpiodes carpio elongatus* (18: TU42888; 5: TU44522) from Devils River, Val Verde Co., Texas. Specimens collected from just below Dolan Falls on 10 July 1966.

Characteristic	Number	Frequency
Dorsal Fin Rays	21	1
	22	3
	23	12
	24	6
	25	1
Anal Fin Rays	6	1
	7	18
	8	4
Left Pectoral Fin Rays	15	2
	16	19
	17	2
Pelvic Fin Rays	8-8	3
	9-7	1
	9-9	17
	9-10	1
	10-10	1
Caudal Fin Rays	17	2
	18	21
Lateral-line Scales	34	3
	35	8
	36	11
	37	1
Body Circumference Scales	29	4
	30	15
	31	3
	32	1
Caudal Peduncle Scale Rows	17	1
	18	21
	19	1

Collections from Devils River System Northwest of Del Rio in Val Verde County, Texas:

1. Devils River at foot of Walk Lake, F16, 17 July 1948; 11 species, 159 specimens. Species: *Dorosoma cysedianum*, *Campostoma anomalum*, *Cyprinella lutrensis*, *C. venusta*, *Dionda episcopa*, *Notropis amabilis*, *N. jemezianus*, *N. stramineus*, *Astyanax mexicanus*, *Morone chrysops*, and *Percina macrolepidia*.

2. Devils River, 8 miles NW of Del Rio at US Hwy 90, RDS 2493, 22 June 1955; 10 species plus one hybrid combination, 347 specimens. Species: *Campostoma anomalum*, *Cyprinella venusta*, *C. lutrensis* x *C. venusta*, *Dionda episcopa*, *Notropis stramineus*, *Pimephales vigilax*, *Astyanax mexicanus*, *Ictalurus punctatus*, *Gambusia affinis*, *Lepomis macrochirus*, and *Micropterus salmoides*.

3. Devils River just above Dolan Falls, 20.7 miles SW of Loma Alta, G.G.H., 9 July 1966; 8 species, 529 specimens. Species: *Cyprinella venusta*, *Dionda episcopa*, *Notropis amabilis*, *Moxostoma congestum*, *Lepomis auritus*, *L. megalotis*, *Micropterus salmoides*, and *Cichlasoma cyanoguttatum*.

4. Devils River just above Dolan Falls, RDS 3935, 9-10 July 1966; 12 species, 2,254 specimens. Species: *Cyprinella proserpina*, *C. venusta*, *Dionda episcopa*, *Notropis amabilis*, *N. stramineus*, *Moxostoma congestum*, *Astyanax mexicanus*, *Ictalurus lupus*, *Gambusia affinis*, *Lepomis auritus*, *Etheostoma grahami*, and *Cichlasoma cyanoguttatum*.

5. Devils River, just below Dolan Falls, RDS 3936, 9-10 July 1966; 6 species, 41 specimens. Species: *Lepisosteus osseus*, *Carpiodes carpio*, *Moxostoma congestum*, *Ictalurus lupus*, *Pylodictis olivaris*, *Lepomis megalotis*, and *Cichlasoma cyanoguttatum*.

6. Devils River, just below Dolan Falls, RDS 3937, 10 July 1966; 5 species, 10 specimens. Species: *Carpiodes carpio*, *Moxostoma congestum*, *Ictalurus lupus*, *Pylodictis olivaris*, and *Cichlasoma cyanoguttatum*.

7. Devils River 1.5 miles above Dolan Falls, at springs and rapids, RDS 3938, 10 July 1966; 12 species, 1,440 specimens. Species: *Cyprinella proserpina*,

Table 2. Measurements (in thousandths of standard length) for 23 *Carpionodes carpio elongates* (18: TU42888; 5: TU44522) from Devils River, Val Verde Co., Texas. Specimens collected from just below Dolan Falls on 10 July 1966.

Characteristic	Range	Mean	Standard Deviation
Standard length (mm)	278-346	312.3	17.52
Body depth	272-314	292	12.32
Body width	161-186	167	5.46
Head length	225-250	235	7.68
Head width	154-170	163	4.44
Head depth	170-197	185	6.19
Caudal peduncle length	124-156	140	9.16
Caudal peduncle depth	118-132	126	3.98
Snout length	76-95	82	4.19
Orbit length	42-55	47	3.10
Postorbital bony length	112-131	121	5.45
Dorsal fin base length	322-380	350	15.08
Dorsal fin height	184-257	225	17.88
Caudal fin length	218-345	297	27.69
Pectoral fin length	161-184	173	6.81
Pelvic fin length	174-208	191	8.73
Anal fin height	171-203	189	8.92
Dorsal origin to orbit rim	357-394	382	9.71
Predorsal length	461-506	484	10.05
Postdorsal length	561-620	592	13.36
Prepelvic length	503-538	518	9.80
Pectoral base to pelvic base	280-310	292	9.07

*C. venusta*, *Dionda episcopa*, *Notropis amabilis*, *N. stramineus*, *Moxostoma congestum*, *Astyanax mexicanus*, *Ictalurus lupus*, *Gambusia affinis*, *Micropterus salmoides*, *Etheostoma grahami*, and *Cichlasoma cyanoguttatum*.

8. Devils River, 1.5 miles above Dolan Falls, CDB 66-2, 10 July 1966; 15 species, 2,074 specimens. Species: *Cyprinella proserpina*, *C. venusta*, *Dionda episcopa*, *Notropis amabilis*, *N. stramineus*, *Carpionodes carpio*, *Moxostoma congestum*, *Astyanax mexicanus*, *Ictalurus lupus*, *Gambusia affinis*, *Lepomis auritus*, *L. megalotis*, *Micropterus salmoides*, *Etheostoma grahami*, and *Cichlasoma cyanoguttatum*.

9. Devils River, just above Dolan Falls, RDS 3939, 11 July 1966; 13 species, 2,410 specimens. Species: *Cyprinella proserpina*, *C. venusta*, *Dionda episcopa*, *Notropis amabilis*, *N. stramineus*, *Carpionodes carpio*, *Moxostoma congestum*, *Astyanax mexicanus*, *Gambusia affinis*, *Lepomis auritus*, *L. megalotis*, *Micropterus salmoides*, and *Cichlasoma cyanoguttatum*.

10. Devils River and springs, just below Dolan Falls, RDS 3940, 12 July 1966; 11 species, 1,161 specimens. Species: *Cyprinella venusta*, *Dionda episcopa*, *Notropis amabilis*, *N. stramineus*, *Astyanax mexicanus*, *Gambusia affinis*, *Lepomis auritus*, *L. cy-*

*nellus*, *Micropterus salmoides*, *Etheostoma grahami*, and *Cichlasoma cyanoguttatum*.

11. Devils River, just above Dolan Falls, JVC 326, 12 April 1968; 10 species, 563 specimens. Species: *Cyprinella proserpina*, *C. venusta*, *Dionda episcopa*, *Notropis amabilis*, *Carpionodes carpio*, *Astyanax mexicanus*, *Ictalurus lupus*, *Gambusia affinis*, *Lepomis megalotis*, and *Etheostoma grahami*.

12. Devils River at Bakers Crossing, Hwy. 163, N of Comstock, HLB 1392, 4 April 2003; 16 species, 151 specimens. Species: *Cyprinella proserpina*, *C. venusta*, *Dionda diaboli*, *D. episcopa*, *Notropis amabilis*, *Moxostoma congestum*, *Astyanax mexicanus*, *Ictalurus lupus*, *Pylodictis olivaris*, *Gambusia geiseri*, *Lepomis auritus*, *L. megalotis*, *L. miniatus*, *Micropterus salmoides*, *Etheostoma grahami*, and *Cichlasoma cyanoguttatum*.

#### ACKNOWLEDGMENTS

The Environmental Biology Training Grant financed by the National Institute of Health (1963-1968) described by Suttkus and Jones (2006) enabled the Environmental Biology class of 1966 to spend several days collecting along Devils River, both above and below Dolan Falls. We are most appreciative of John Van Conner's efforts to make arrangements with Mr. H. K. Fawcett, Sr., to allow the Environmental Biology Class to trespass and camp on his property; Mr. Fawcett was a wonderful host. We thank Henry L. Bart for the inclusion herein of his collection data (HLB 1392). We extend our gratitude to Michael M. Stevenson and Bruce A. Thompson for their identification of the logperch in the early sample (F16) (Stevenson and Thompson 1978). We especially appreciated the cata-

loged Devils River data that Nelson Rios downloaded from the computerized files in the Tulane University Museum of Natural History and made available to us. Last but not least, RDS is most grateful for the reprints and copies of papers on Devils River fishes that were received from Gary P. Garrett, Henry L. Bart, Jr., and Bruce A. Thompson, and state treatises of fishes that were received from Maurice F. Mettee (Alabama), Noel M. Burkhead (Virginia), William T. Slack (Mississippi), David A. Etnier (Tennessee), and Atlas of North American Freshwater Fishes, plus Supplements, from Wayne C. Starnes. We are grateful to Jeanne Suttkus, Henry L. Bart, Jr., and Glenn H. Clemmer for suggesting some major additions to the original manuscript.

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*Addresses of authors:*

**ROYAL D. SUTTKUS**

*Deceased*

**CLYDE JONES**

*Natural Science Research Laboratory  
Museum of Texas Tech University  
Lubbock, TX 79409  
cjmajones@aol.com*

## APPENDIX

Checklist of fishes collected from Devils River system, with frequency of occurrence (F), number of specimens (N), and percent relative abundance (% RA).

Family and Species	F	N	% RA
Lepisosteidae - gars			
<i>Lepisosteus osscus</i> (Linnaeus 1758) – longnose gar	1	1	<0.1
Clupeidae – herrings			
<i>Dorosoma cepedianum</i> (Luoneur 1818) – gizzard shad	1	9	<0.1
Cyprinidae – carps and minnows			
<i>Camptostoma anomalum</i> (Rafinesque 1820) – central stoneroller	2	2	<0.1
<i>Cyprinella lutrensis</i> (Baird and Girard 1853) – red shiner	1	1	<0.1
<i>Cyprinella proserpina</i> (Gerard 1856) – prosperine shiner	6	888	8.0
<i>Cyprinella venusta</i> Girard 1856 – blacktail shiner	10	2,107	18.9
<i>Dionda diaboli</i> Hubbs and Brown 1957 – Devils River minnow	1	35	0.3
<i>Dionda episcopa</i> Girard 1856 – roundnose shiner	10	6,058	54.4
<i>Notropis amabilis</i> (Girard 1856) – Texas shiner	9	878	7.9
<i>Notropis jemezianus</i> (Cope 1875) – Rio Grande shiner	7	126	1.1
<i>Pimephales vivifax</i> (Baird and Girard 1853) – bullhead minnow	1	4	<0.1
<i>Cyprinella lutrensis</i> x <i>Cyprinella venusta</i> (hybrid)	1	6	<0.1
Catostomidae – suckers			
<i>Carpionodes carpio</i> (Rafinesque 1820) – river carpsucker	5	99	0.9
<i>Moxotoma congestum</i> (Baird and Girard 1854) – gray redhorse	8	104	0.9
Characidae - characins			
<i>Astyanax mexicanus</i> (De Filippi 1853) – Mexican tetra	9	195	1.7
Ictaluridae – North American catfishes			
<i>Ictalurus lupus</i> (Girard 1858) – headwater catfish	7	59	0.5
<i>Ictalurus punctatus</i> (Rafinesque 1818) – channel catfish	1	1	<0.1
<i>Pylodictis olivaris</i> (Rafinesque 1818) – flathead catfish	3	5	<0.1
Perciliidae – live bearers			
<i>Gambusia affinis</i> (Baird and Girard 1853) – western mosquitofish	7	221	2.1
<i>Gambusia geiseri</i> Hubbs and Hubbs 1957 – largespring gambusia	1	1	<0.1
Moronidae – temperate basses			
<i>Morone chrysops</i> (Rafinesque 1820) – white bass	1	1	<0.1
Centrarchidae - sunfishes			
<i>Lepomis auritus</i> (Linnaeus 1758) – redbreast sunfish	6	50	0.4
<i>Lepomis cyanellus</i> Rafinesque 1819 – green sunfish	1	1	<0.1
<i>Lepomis macrochicus</i> Rafinesque 1819 – bluegill	1	1	<0.1

## APPENDIX (CONT.)

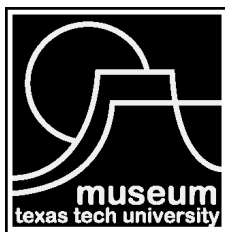
Family and Species	F	N	% RA
<i>Lepomis megalotis</i> (Rafinesque 1820) – longear sunfish	6	25	0.2
<i>Lepomis miniatus</i> Jordan 1877 – redspotted sunfish	1	1	<0.1
<i>Micropterus salmoides</i> (Lacepide 1802) – largemouth bass	7	16	0.1
Percidae – perches			
<i>Etheostoma grahami</i> (Girard 1859) – Rio Grande darter	6	128	1.1
<i>Percina macrolepida</i> Stevenson 1971 – bigscale logperch	1	1	<0.1

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Series Editor: Robert J. Baker  
Production Editor: Lisa Bradley



ISSN 0149-175X

*Museum of Texas Tech University, Lubbock, TX 79409-3191*