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Distribution and Status of *Etheostoma cragini* Gilbert and *E. microperca* Jordan and Gilbert in Arkansas

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Arkansas Academy of Science

Hagen was collected on the Caddo R. at St Hwy 84, approximately 2½ mi NE Amity, Clark County, on 23-V-84. These additions bring the Arkansas Anisoptera species list to 91.

The increase in our distributional knowledge is placed in perspective by two observations. Harp and Rickett's (1977) paper listed 656 county records, while this paper lists 1451 county records (Tables 1-3). Our most common species, *Erythemis simplicicollis*, was recorded from 32 counties in 1977, but it is now listed for all 75 counties. Distributional data are becoming sufficiently extensive that some analyses for individual species can now be attempted. Nevertheless, much information remains to be collected. Harp and Rickett (1977) predicted the eventual listing of an additional nine anisopteran species, based on lists from contiguous states. Of the nine species added to the state list since then, only two are among those predicted - seven are not.

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DISTRIBUTION AND STATUS OF *ETHEOSTOMA CRAGINI* GILBERT AND *E. MICROPERCA* JORDAN AND GILBERT IN ARKANSAS

Etheostoma cragini, the Arkansas darter, is endemic to the Arkansas River system in Colorado, Kansas, Oklahoma, Missouri, and Arkansas (Cloutman, 1980) and a member of the recently erected subgenus *Ozarka* (Williams and Robison, 1980). Recent distribution and status reviews of Arkansas' ichthyofauna did not include *E. cragini* as a component (Buchanan, 1973, 1974; Robison, 1974). Cloutman (1980) plotted the first known locality for the species in Arkansas but did not discuss the range extension. This locality was discovered in 1979 by Arkansas Highway and Transportation Department personnel during construction of the U.S. Highway 71 Bypass around Fayetteville, Washington County (Buchanan, pers comm; Cloutman, pers comm).

Habitat of the Arkansas darter is most often reported as small spring branches or spring-fed creeks with thick growths of aquatic macrophytes such as *Nasturtium officinale*, *Ranunculus sp.*, and *Myriophyllum sp.* (Pflieger, 1971, 1975; Cross and Collins, 1975; Williams and Robison, 1980). Captures of Arkansas darters from the Chikaskia River, Kansas and the mainstream Arkansas River indicate this species can exist, at least temporarily, in large stream habitat (Cross, 1967; Matthews and McDaniel, 1981).

Etheostoma microperca, the least darter, is a member of the subgenus *Boleichthys* (Page, 1981) and is widely distributed from the Great Lakes region and Minnesota southward to Missouri, Oklahoma, and Arkansas (Burr, 1980). Buchanan (1973, 1974) and Robison (1974) listed localities for *E. microperca* in the Arkansas River drainage in Benton County and in the Saline River of the Ouachita River system. Burr (1978) reviewed the Saline River specimens and concluded they were actually *E. proeliare*, a closely related member of the subgenus *Boleichthys*.

Burr (1980) and Pflieger (1971, 1975) describe the habitat of *E. microperca* as clear, quiet, heavily vegetated waters such as pools of small sized creeks with permanent flow, pothole lakes, spring pools, and seeps.

To locate additional populations and determine the overall status of both species within Arkansas, we examined over 50 localities in Washington and Benton counties. This two county area, which forms the northwestern corner of the state, has an abundance of limestone springs draining into the Illinois River of the Arkansas River system. Sample sites were located using U.S. Geological Survey 7.5' topographic quadrangles. Accessible springs and spring-fed streams were sampled by seining with 1.2 meter x 1.5 meter nets having 4.5 mm mesh. Population estimates were made by determining the amount of suitable habitat and applying the densities observed from a subsample. Specimens were preserved in 10 percent formalin and stored in 45 percent isopropanol. Specimens have been deposited in the vertebrate collections of the Arkansas State University Museum of Zoology (ASUMZ); the Museum of Zoology, Northeast Louisiana University (NLU); and the Westark Community College Zoology collection (WZC).

A summary of new localities found in our survey, date of collection, and disposition of specimens is presented for each species. This is followed by a description of habitat where populations currently exist. Reference is made in this section to materials catalogued at Cornell University (CU) and the University of Michigan (UMMZ).

Five localities are now known for *E. cragini* within Arkansas: 1) Benton County: Healing Spring Run and Little Osage Creek at Arkansas Highway 264 crossing (T18N, R31W, sec. 10). 21 August 1981. 5 specimens (ASUMZ 9340). 2) Benton County: Unnamed spring run tributary to Osage Creek near Logan Community (T18N, R32W, sec. 27). 23 March 1982. 12 specimens (NLU 54208). 3) Benton County: Unnamed spring run tributary to Osage Creek near Logan Community (T18N, R32W, sec. 34). 28 July 1982. 3 specimens (ASUMZ 9396). 4) Washington County: Spring run tributary to Wildcat Creek northeast of White Oak Church and cemetery (T17N, R31W, sec. 17). 20 April 1982. 1 specimen (NLU 54206). 5) Washington County: Unnamed spring run at junction of Arkansas Highway 112 and U.S. Highway 71 Bypass in Fayetteville (T17N, R30W, sec. 33). 19 March 1979. 5 specimens uncatalogued, WZC.

Localities 2 and 3 are considered separate spring run populations even though they exist along a continuous stream channel. During summer and fall, the populations are separated by more than one mile of dry streambed. We believe there is little interchange between the two, and thus, they exist as discrete populations.

The largest known populations of *E. cragini* within Arkansas exist in Healing Spring Run (1), unnamed spring run (2), and the Highway 71 spring run (5). The Healing Spring population is estimated at 500-1000 individuals while the unnamed spring run, and Highway 71 populations probably consist of more than 1000 individuals each. The remaining two populations appear much smaller (less than 100 individuals) due to lack of extensive habitat.

All known *E. cragini* sites in Arkansas have the following physical characteristics: first or second order spring runs; aquatic vegetation; and a substrate of fine gravel, sand, and silt. Numerous larger streams were sampled without yielding Arkansas darters. The closely related *Etheostoma punctulatum*, also of the subgenus *Ozarka*, was found in these second to third order streams. Small, apparently pristine, spring branches with aquatic vegetation but coarser substrate were also examined but no Arkansas darters were found. Spring runs used extensively by livestock also seem unsuitable for *E. cragini*.

General Notes

Only one spring (Locality 3) that was used by livestock had Arkansas darters. Substrate in this spring and the springs without Arkansas darters was unlike the substrate in the other springs with *E. cragini* in that it was unusually soft and covered with a layer of fine organic material.

Feedlot runoff and substrate disturbances by livestock seem to constitute the principle sources of danger for existing populations. This situation is not likely to abate due to the continuing agricultural development in northwest Arkansas.

Robison, Moore, and Miller (1974) regarded the Arkansas darter as rare and endangered in Oklahoma. Platt (1974) recommended that special attention be given to the Arkansas darter to assure its survival in Kansas and it was later designated as threatened by Kansas state law (Matthews and McDaniel, 1981). We believe *E. cragini* should be accorded vulnerable (rare) status as defined by Buchanan (1974) in the *Arkansas Natural Area Plan* due to the limited suitable habitat for the species and the probable continued degradation of existing habitat by agricultural development.

Burr (1978) listed three valid localities for *E. microperca* in Arkansas: 1) Benton County: Osage Creek 1.5 miles north of Cave Springs. 6 February 1973. 9 specimens (NLU 25892). 2) Benton County: Wildcat Creek 12 miles west of Springdale. 1 July 1938. 2 specimens (UMMZ 123459). 3) Washington County: Clear Creek at Savoy. 17 April 1960. 1 specimen (CU 35568). Burr also verified the identity of a specimen from the Red River drainage, Hempstead County, Arkansas but considered the locality data questionable.

Our collections revealed two additional populations of the least darter: 1) Benton County: Healing Spring Run and Little Osage Creek at Arkansas Highway 264 crossing (T18N, R31W, sec. 10). 21 August 1981. 1 specimen (ASUMZ 9343). 2) Washington County: Elkhorn Spring Run southwest of Arkansas Highway 16 near Highland Church (T16N, R31W, sec. 18). 13 July 1982. 4 specimens (NLU 54207).

We found the least darter syntopic with the Arkansas darter at the Healing Spring locality. *E. microperca* was collected from first or second order spring runs, generally in pools or stream margin with abundant aquatic vegetation and a detrital substrate. Based on old locality records and our habitat observations, it appears the least darter may be more tolerant of larger stream size and detritus than the Arkansas darter.

The Healing Spring population is the largest known concentration of *E. microperca* within the state and is estimated in excess of 1000 individuals. We revisited the previously known collecting sites to determine the quality of these streams and if populations of *E. microperca* still existed. No least darters were collected and agricultural runoff appeared substantial, especially in Osage and Wildcat creeks. These populations may be in jeopardy or possibly extirpated.

Robison (1974) listed *E. microperca* as rare and Buchanan (1974) considered it vulnerable (rare) in Arkansas. Burr (1978) reviewed the status of the species throughout the remainder of its range. Burr's identification of the Saline River population as *E. proeliare* significantly reduced the range and number of sites known for the least darter in Arkansas. We feel the least darter should continue to be considered vulnerable (rare) with special emphasis on preservation of existing habitat.

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