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Synopsis of the Nepidae of Arkansas

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General Notes

Table 1. A list of Albino Birds recorded from Arkansas

Species	Complete and Incomplete	Dilute	Partial
Mallard	5	4	0
Wild Turkey	0	0	1
Common Bobwhite	1	2	1
Northern Harrier	1	0	0
Red-tailed Hawk	1	0	1
Bald Eagle	0	1	0
Yellow-billed Cuckoo	1	0	0
Ruby-throated Hummingbird	0	1	0
Red-headed Woodpecker	1	0	0
Pileated Woodpecker	0	0	1
Horned Lark	0	0	1
Purple Martin	1	0	0
Tree Swallow	1	0	1
American Crow	1	1	1
Blue Jay	2	1	4
Northern Mockingbird	2	0	1
Eastern Bluebird	0	1	0
American Robin	4	0	11
Loggerhead Shrike	1	0	0
Cedar Waxwing	1	0	1
Red-winged Blackbird	0	1	3
Brown-headed Cowbird	0	1	0
Brewer's Blackbird	0	1	0
Common Grackle	5	3	27
Western Meadowlark	0	1	0
European Starling	2	1	7
House Sparrow	13	2	10
Northern Junco	1	0	2
Northern Cardinal	3	5	3
Purple Finch	0	1	0
White-throated Sparrow	1	0	3
Field Sparrow	0	1	0
Song Sparrow	1	0	0
Total Species (33)	49 (31.3%)	28 (17.0%)	79 (50.5%)

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A SYNOPSIS OF THE NEPIDAE OF ARKANSAS

There have been no studies treating specifically of the Nepidae of Arkansas. Pertinent information is either in taxonomic studies which include Arkansas material (Hungerford, 1922) or lists of aquatic macroinvertebrates from particular sites within the state (Harp and Harp, 1980; Farris and Harp, 1982; Huggins and Harp, 1983). The purposes of this paper are to present the first statewide species list, to delineate geographic distributions, and to define preferred habitats for nepid species, insofar as present knowledge will allow. Arkansas species may be identified by using Gonsoulin's (1975) key to Louisiana species.

The information presented has been synthesized from specimens made available by those sources listed in the Acknowledgments, published works, and my personal collections. The museum collections at the University of Arkansas-Fayetteville and -Little Rock have been examined. The specimens I collected are preserved in 70% ethanol and housed in the Aquatic Macroinvertebrate Collection of the Arkansas State University Museum of Zoology (ASUMZ).

Nepa apiculata was first reported from Arkansas by Farris and Harp (1982). It is our least common nepid species, being represented by 21 specimens from 12 collections in six counties (Fig. 1). Hungerford (1920) characterized this species as mud loving, most often being collected in mud and trash near water's edge. In Arkansas all collections have been from shallow waters, such as cut-off pools or at stream's edge, but from diverse habitats. It has been collected from bogs (three times), springs (twice), a river, creek, lake and swamp. The collections thus far are from Crowley's Ridge and the Ozark Plateaus. Each habitat has possessed clear water of good quality. I have seen no reference to seasonal occurrence, other than Hungerford's (1920) statement that this species overwinters as an adult in Ithaca, NY. Arkansas specimens have been collected during every month but January, May and June.

Harp and Harp (1980) first reported *Ranatra australis* Hungerford in Arkansas. It is a common and widespread species with 212 individuals having been taken during 81 collections in 27 counties representing all five natural divisions, as defined by Foti (1974) (Fig. 2). Our collections are most often from ponds (40%) with 20% each of the collections occurring in lakes and creeks. Other collections have been from swamps, rivers, sewage lagoons, a bog and a ditch, in order of descending frequency. Gonsoulin (1975) thought this species to be the most common one in Louisiana. He reported its occurrence primarily along the deltaic plains and Mississippi Alluvial Plain, although several collections were made in the higher mixed woods areas of that state. His observations describe our situation well. More collections and more specimens of this species have been taken in Arkansas than any other nepid. Further, while most collections are from the Mississippi Alluvial Plain to date, I expect that this adaptable species can be found in any county. Gonsoulin (1975) in 17 collections found *R. australis* during all months except February, May, September and December. Wilson's (1958) few specimens were collected during September-November in Mississippi. This species has been collected in Arkansas from February through December.

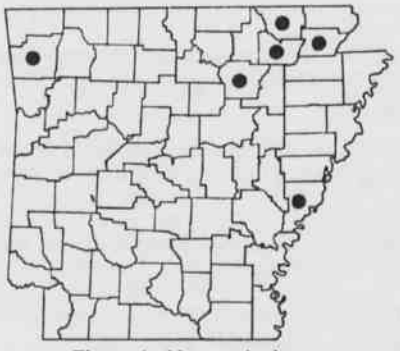

Figure 1. *Nepa apiculata*

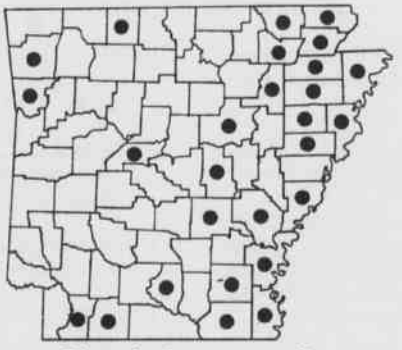

Figure 2. *Ranatra australis*

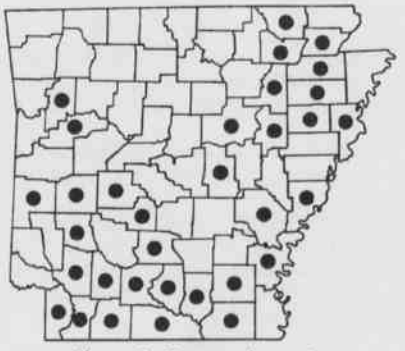

Figure 3. *Ranatra buenoi*

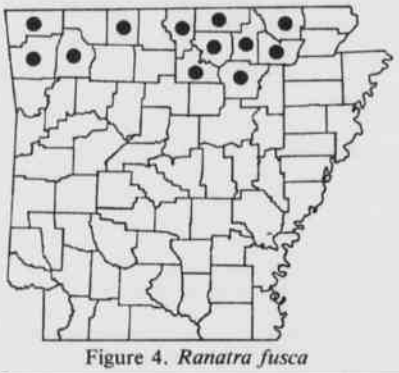

Figure 4. *Ranatra fusca*

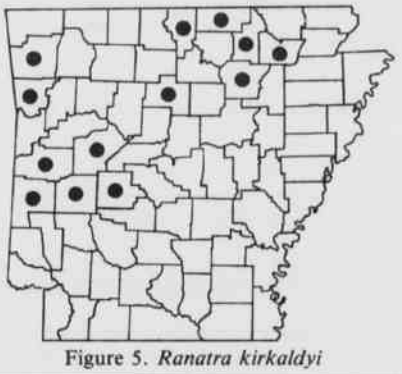

Figure 5. *Ranatra kirkaldyi*

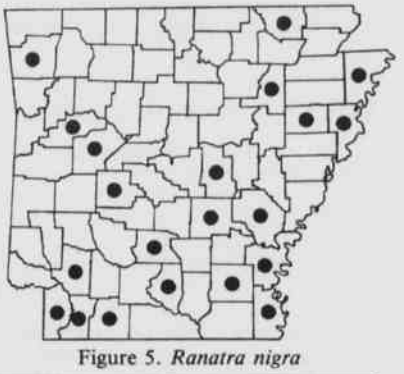

Figure 5. *Ranatra nigra*

Ranatra buenoi Hungerford was first reported from Arkansas by Harp and Harp (1980). Like *R. australis*, it is a plastic species. It is known from 113 specimens taken during 71 collections in 33 counties throughout Arkansas' five natural divisions (Fig. 3). Locality data are available for 62 specimens in 40 collections. Of these, 32 specimens in 17 collections are from creeks. Other habitats, in order of descending frequency, are rivers, ponds, lakes, swamps, and a spring. The apparent preference for creeks may be the result of biased sampling. Dr. Henry Robison kindly retains aquatic insects which appear in the seine as he collects fishes. Since he is a stream ecologist, most of the aquatic insects he contributes are from streams. He has sent several nepids from southern Arkansas, and with one exception they have been *R. buenoi.* Gonsoulin (1975) noted that this species has been recorded in a variety of habitats in Louisiana but seems to occur more frequently in low lying areas in which the waters are quite turbid and contain abundant aquatic vegetation. This species has been collected in all five natural divisions in Arkansas. Gonsoulin (1975) made 14 collections of *R. buenoi,* during January, June-August, October and November. In Arkansas it has been collected from February through December.

Ranatra fusca Palisot de Beauvois has not been recorded from Arkansas previously. The 30 collections in 12 counties have provided 90 specimens (Fig. 4). Of the 14 collections for which there are locality data, 9 collections were from streams, 2 each from lakes and ponds, and 1 from a slough. All locations are in the Ozark Plateaus. Froeschner (1962) reported this species to be quite common in Missouri ponds, but it was not often collected in Mississippi or Louisiana (Wilson, 1958; Gonsoulin, 1975). Froeschner (1962) had specimens from every month of the year. In Arkansas specimens have been collected from February through November, excepting May.

Ranatra kirkaldyi Bueno is also newly reported for Arkansas. It is perhaps the least common *Ranatra* species, being known from 51 individuals in 16 collections from 13 counties (Fig. 5). Of the 16 collections, 12 are from streams and 4 from lakes. Most collections, 11, are from the Ozark Plateaus, and the remainder are from the Ouachita Uplands. Froeschner (1962) reported one specimen from a streamside pond, Wilson (1958) reported it from a lake, and Gonsoulin (1975), while listing it, had no records of its occurrence. Wilson (1958) and Froeschner (1962) each reported a September collection of this species. In Arkansas it has been collected from March through November.

Ranatra nigra Herrich-Schaffer was first recorded from Arkansas by Hungerford (1922). Materials at hand include 65 individuals in 33 collections from 21 counties (Fig. 6). Lakes provided 9 of the collections, while other habitats included swamps, bayous, streams, ponds and a sewage lagoon, listed in order of descending frequency. Most specimens were collected in the Gulf Coastal Plain, but they were taken in all five natural divisions. It is my impression that in Arkansas, *R. nigra* will most likely be found in lowland aquatic ecosystems that are relatively undisturbed or still possess waters of fairly good quality. Froeschner (1962) listed a pond as the habitat site for his only collection of this species. Gonsoulin (1975) collected the species in a wide variety of habitats, including temporary waters. Froeschner (1962) collected this species in October in Missouri, Wilson (1958) reported January, July, October and November collections, and Gonsoulin (1975) listed March, April, June-August and October-November collections. In Arkansas it has been collected from March through December.

It is to be anticipated that all six nepid species can be collected during any month of the year in Arkansas. The small number of collections during the winter months probably reflects the bias of the collectors. Further, most species probably can be found in all counties of the state. *R. fusca* and *R. kirkaldyi* may be more restricted in their distribution, however, appearing to prefer upland waters.

ACKNOWLEDGMENTS

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General Notes

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A SYNOPSIS OF THE HYDROMETRIDAE OF ARKANSAS

Information pertaining to the Hydrometridae (marsh treaders) of Arkansas is restricted to their infrequent listing among aquatic macroinvertebrates from particular sites within the state (Harp and Harp, 1980; Farris and Harp, 1982; Huggins and Harp, 1983). The purposes of this paper are to report the occurrence of a second hydrometrid species in Arkansas, to delineate the distribution of both species, and to state their preferred habitats, insofar as current knowledge will allow. Froeschner's (1962) key to Missouri species is suitable for identification of Arkansas' species as well.

The data presented are a synthesis of the contributions from all the sources listed in the Acknowledgments, pertinent published records, and materials collected by myself. The museum collections at the University of Arkansas-Fayetteville and -Little Rock have been examined. The specimens I collected are preserved in 70% ethanol and housed in the Aquatic Macroinvertebrate Collection of the Arkansas State University Museum of Zoology (ASUMZ).

The state's most common marsh treader, *Hydrometra martini* Kirkaldy, was first listed by Farris and Harp (1982). Huggins and Harp (1983) also listed this species. To date 150 collections have provided 376 specimens from 44 counties (Fig. 1). The collection site is known for approximately 85% of this material. The plasticity of *H. martini* is evidenced by several observations. First, although approximately one-third of the individuals have been collected from ponds and another one-third from creeks, the remaining individuals have been collected from springs, rivers, ditches, lakes, swamps, acid bogs, acid bauxite lakes and sewage lagoons, in order of decreasing frequency of collection. Further, they have been taken from creeks in all five natural divisions, as defined by Foti (1974). Wilson (1958) reported that in Mississippi *H. martini* was collected most commonly in clear, shady streams, ponds covered with emergent vegetation, shallow drainage canals, roadside borrow pits covered with vegetation, and shady *Lemna*-covered sloughs in swamps.

Of the 364 adults in this study, 294 (81%) were macropterous. Sprague (1956) reported that between 1-3% of the adult specimens she examined from Kansas, Michigan and Massachusetts were macropterous. European investigators have found brachypterous and apterous forms of some species of Gerridae to be more common in the north, macropterous forms in the south. They correlated wing form with temperature (Sprague, 1956). It is not a matter of temperature strictly with *H. martini.* Macropterous forms were collected every month of the year, and apterous forms were collected during March and from May through November. There is no correlation between the macropterous:apterous ratios and monthly mean temperatures, either in this study or that by Sprague (1956). It may be that latitude was the initial triggering mechanism, but that the frequency of the two forms is now determined genetically.

Twelve early instar nymphs were collected in this study, three in May, six in June, and three in October. Sprague (1956) noted that in northern states this species has three generations per year with adults hibernating. Froeschner (1962) found adults in Missouri from 28 April through 8 October. Nymphs can be expected to be found most of the year in Arkansas, since Hungerford (1920) has observed that under favorable conditions the complete life cycle requires approximately 15 days.

This paper documents the occurrence of one additional marsh treader species in Arkansas, *Hydrometra hungerfordi* Bueno. Its presence is established with 15 collections totalling 20 individuals (Fig. 2). It is obviously an uncommon species, and it may be more restricted as to preferred habitat. All 15 collections are from streams: seven from Ozark streams (tributary of Fourche River in Randolph Co., Eleven Point R., Dry Creek tributary of Eleven Point R., South Fork of Spring R., North Sylamore Creek, and Hell Creek - twice), two from Ouachita streams (Mountain Fork of Little Red R. and Cove Creek) and six from the intervening Arkansas River Valley (Prairie, or Hiatt Creek). Wilson (1958) reported the collection of this species in Mississippi to be generally from cool, clear, shady streams and ponds, and shady clear, spring-fed seepage areas at the base of hills. Froeschner (1962) reported that less than 12 specimens had been collected in Missouri, all from the Ozarks.

Of the 20 *H. hungerfordi* collected in Arkansas, all have been apterous. These were collected in March and from May through November. Wilson (1958) reported their being collected in Mississippi during February and from July through October. Froeschner (1962) reported collections of Missouri specimens from 17 March through 26 May.

A third marsh treader may be found in Arkansas. Drake and Hottes (1952) reported collections of *Hydrometra wileyae* Hungerford from Florida, Mississippi, Texas and Kansas. Herring (1951) collected this species in Florida only from calcareous streams which were characterized by clear, cold water derived from huge springs of a calcareous nature.