

2016

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Recommended Citation

Graves, G. R. (2016) "Geographic Range of the Western Harvest Mouse (*Reithrodontomys megalotis*) in Arkansas," *Journal of the Arkansas Academy of Science*: Vol. 70, Article 44.

<https://doi.org/10.54119/jaas.2016.7036>

Available at: <https://scholarworks.uark.edu/jaas/vol70/iss1/44>

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Geographic range of the Western Harvest Mouse (*Reithrodontomys megalotis*) in Arkansas

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Running Title: Western Harvest Mouse in Arkansas

The Western Harvest Mouse (*Reithrodontomys megalotis*) ranges widely in western North America from southern Mexico north to southern Canada and eastward across the Great Plains to Indiana and south in the Mississippi Valley to eastern Arkansas (Webster and Jones 1982). Knowledge of the distributional range of *R. megalotis* in Arkansas has grown incrementally since the first specimens were collected at Leachville, Mississippi County in 1951 (Sealander 1954, 1956). A truer picture of the distribution in northeastern Arkansas emerged in the 1960s and 1970s from field activities of faculty and students of Arkansas State University. By 1978, *R. megalotis* had been reported from 13 counties (Clay, Craighead, Cross, Greene, Jackson, Lawrence, Lee, Mississippi, Monroe, Phillips, Poinsett, St. Francis, Woodruff) in the Mississippi Embayment east of the White River (McDaniel et al. 1978). Specimens were subsequently reported from Randolph and Crittenden counties with a questionable occurrence west of the White River in Jefferson County (Sealander and Heidt 1990). Neither McDaniel et al. (1978) nor Sealander and Heidt (1990) mentioned specific collecting locations.

An updated annotated list of Arkansas mammals (Connior 2010) presented a much different distributional range for *R. megalotis* with records reported from Greene, Lee, and Mississippi counties in the eastern portion of the state and from Columbia and Sebastian counties in western Arkansas. However, it appears that Connior's (2010) account was based on the range map for the Eastern Harvest Mouse (*R. humulis*) in Sealander and Heidt (1990). The range of this harvest mouse was further confused by the publication of a distributional map (Connior et al. 2012) similar to that presented by Sealander and Heidt (1990), but adding Sharp County and omitting Jefferson, Monroe, and Phillips counties. The purpose of this note is to review the distribution of *R. megalotis* in Arkansas and to provide information on the sole

specimen collected in Phillips County, the southernmost location for the species in the lower Mississippi Valley.

I compiled data for Arkansas specimens of *R. megalotis* from mammal collection databases at Arkansas State University Museum of Zoology (ASUMZ), University of Arkansas at Little Rock (UALR), University of Arkansas at Fayetteville (UAF), and Louisiana State University (LSUMNS). No specimens were found in the collections of the University of Arkansas at Monticello (UAM), the National Museum of Natural History (USNM) or in the other vertebrate collections indexed in VertNet <http://www.vertnet.org/index.html>. I approximated geographic coordinates of specimen localities with Google Earth Pro. Collecting sites within 1 km of one another were lumped.

The southernmost specimen from Arkansas (Fig. 1) was collected in Phillips County at Hudson Landing (34° 11.29' N; 91° 4.26' W) on the White River levee, about 200 m south of the pumping station on 14 March 1973 (UALR 236; ♂; collected by Gary R. Graves, catalog number 20), as compared to McDaniel et al. (1978). This location lies 77 km southeast of the nearest collection site in Lee County. The trap was set in a Hispid Cotton Rat (*Sigmodon hispidus*) runway in a dense stand of grass and forbs at the edge of a blackberry (*Rubus* sp.) thicket at the base of the levee.



Figure 1. Southernmost specimen (UALR 236) of *Reithrodontomys megalotis* collected in the Mississippi Valley, obtained at Hudson Landing, Phillips County, Arkansas, on 14 March 1973.

Western Harvest Mouse in Arkansas

External measurements (total length = 113 mm; tail length = 54 mm; hind foot length = 16 mm; ear length = 9 mm) and pelage color pattern of the specimen closely resemble those of *R. megalotis*, but the skull could not be located for confirmation in 2013.

In order to document the identity of the Phillips County specimen, a 307 base-pair section of the mitochondrial cytochrome b gene was sequenced from a toe sample (Appendix 1). DNA was extracted using a Qiagen DNeasy Blood & Tissue kit (Qiagen). Digestion time was extended from 24 to 48 hours due to the age and condition of the specimen. PCR and Sanger sequencing followed standard protocols and primers L14841 and H15149 (Kocher et al. 1989). Raw sequence data were cleaned and verified by eye using Sequencher 5.3 (Gene Codes Corporation, Ann Arbor, Michigan, 2014). A BLAST search in GenBank (<http://blast.ncbi.nlm.nih.gov>) revealed the sequence to be identical to that of *R. megalotis* (GenBank: AF108707.1), which differs by more than 10% from comparable sequences of the Fulvous Harvest Mouse (*R. fulvescens*) and *R. humulis*, both of which occur in eastern Arkansas (McDaniel, et al. 1978, Sealander and Heidt 1990).

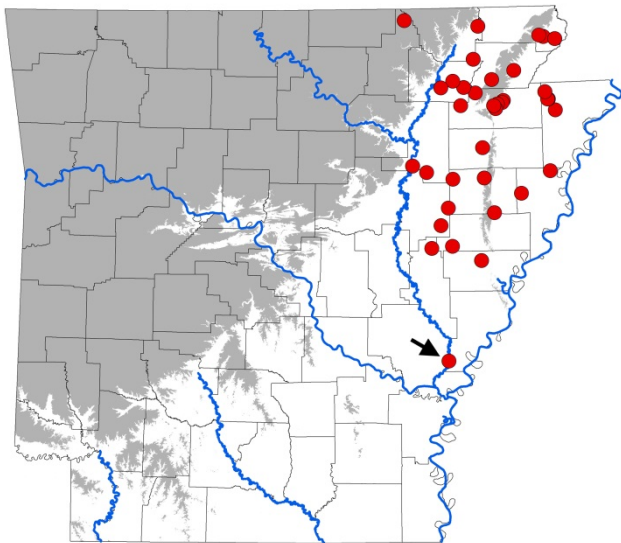


Figure 2. Distribution of vouchered specimens of *Reithrodontomys megalotis* from Arkansas. The Phillips County specimen (UALR 236) is indicated by an arrow. Gray shading represents areas >100 m above sea level. Navigable rivers are shaded in blue.

Reithrodontomys megalotis has been documented by voucher specimens from 16 counties in Arkansas (Clay, Craighead, Crittenden, Cross, Greene, Jackson, Lawrence, Lee, Mississippi, Monroe, Phillips, Poinsett, Randolph, Sharp, St. Francis, and Woodruff). All

collecting sites in the Mississippi Embayment occur east of the White River (Fig. 2) at elevations ranging from 47 to 117 m above sea level. Two specimens (ASUMZ 21155, 21587) from Sharp County (2 miles south of Wirth, 248 m) are the only specimens collected thus far from the Salem Plateau in Arkansas.

Reithrodontomys megalotis, which inhabits weedy pastures, meadows, fallow fields, and fence rows (Webster and Jones 1982), has apparently spread eastward from the Great Plains to Illinois (Hoffmeister and Warnock 1955) and Indiana (Ford 1977, Leibacher and Whitaker 1998) and southward into Arkansas (Sealander 1954) coincident with the clearing of deciduous forest. McDaniel et al. (1978) found *R. megalotis* to be abundant along railroad rights-of-way in northeastern Arkansas and postulated that these provided the primary avenues for dispersal in eastern Arkansas. Elevated levees along the east bank of the White River and the west bank of the Mississippi River also provide dispersal corridors southward into flood-prone lowlands of Phillips County. In any event, *R. megalotis* had dispersed to within 27 km of the Montgomery Point Lock and Dam at the mouth of the White River by 1973. It should be noted that relatively little mammal trapping has been conducted in this area during the past 40 years. The broad channel of the Mississippi River to the east and the flooded and densely wooded corridor along the lower White River to the west may represent insurmountable natural dispersal barriers to this species of open habitat formations (Webster and Jones 1982). This hypothesis should be tested with new distributional surveys west of the lower White River.

Acknowledgements

I thank Bob Sikes (UALR) for permission to take a tissue sample from the Phillips County specimen, Tom Risch and Tracy Klotz (ASUMZ) for providing the catalog of harvest mouse specimens deposited in the Arkansas State University Museum, and Matt Connior and John Hunt (both UAM) for information on other Arkansas collections. Matt Connior and an anonymous reviewer provided helpful comments on the manuscript. I am grateful to Amy Driskell and Tripp Macdonald (Laboratory of Analytical Biology, USNM) for obtaining the cyt b sequence. I acknowledge the continuing financial support of the Alexander Wetmore Fund (Smithsonian Institution) and the Smoketree Trust.

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Appendix 1. Mitochondrial cytochrome b gene (307 bp) from a specimen of *Reithrodontomys megalotis* (UALR 236) collected at Hudson Landing, Phillips County, Arkansas on 14 March 1973.

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TTTTGGATCTTTACTAGGAATCTGCTTAGTTATCCAA
ATTTTAACAGGATTATTTCTAGCTATACATTATACAT
CAGACACATCAACAGCATTTCATCAGTTACACACAT
TTGCCGAGACGTAAACTATGGATGATTTATCCGATAT
ATACATGCAAACGGAGCCTCTATATTTTTTATTTGCC
TTTTTCTTCATGTAGGACGAGGAATATATTATGGTTC
ATATACCTTTACAGAAACATGAAACATTGGAATCGTA
CTATTATTTGCCGTAATAGCCACAGCATTCATAGGAT
ATGTTCTTCCA
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