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Arkansas Range Extensions of the Seminole Bat (Lasiurus seminolus) and Eastern Big-eared Bat (Plecotus rafinesquii) and Additional County Records for the Hoary Bat (Lasiurus cinereus), Silver-Haired Bat (Lasionycteris noctivagans) and Evening Bat...

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ARKANSAS RANGE EXTENSIONS OF THE SEMINOLE BAT *(Lasiurus seminolus)* AND EASTERN BIG-EARED BAT *(Plecotus rafinesquii)* AND ADDITIONAL COUNTY RECORDS FOR THE HOARY BAT *(Lasiurus cinereus)*, SILVER-HAIRED BAT *(Lasionycteris noctivagans)* AND EVENING BAT *(Nycticeius humeralis)*

Arkansas is within the geographic range of 16 species of bats, 15 of which are classified in the Family Vespertilionidae and one in the Family Molossidae (Sealander, 1979). Historically, research on bats in Arkansas has been in the Ozark region (Dellinger and Black, 1940; Sealander and Young, 1955; Sealander, 1960; Harvey, 1976; McDaniel and Gardner, 1977; Harvey et al., 1981). A few studies have been done in the Delta and Coastal Plain (Sealander and Hoiberg, 1954; Baker and Ward, 1967; Gardner and McDaniel, 1978); however, virtually nothing is known from the Ouachita region (Sealander, 1954, 1979). The data presented in this paper are the results of extensive mist netting of creeks and mine and cave entrances, investigation of roosting sites in buildings, caves and mines, records of bats tested for rabies by the Arkansas Department of Health and examination of skeletal and mummified remains in caves. In addition, the data represent a part of a large scale investigation of the bats in the Ouachita region.

To date, these investigations have established Arkansas range extensions for the seminole bat *(Lasiurus seminolus)* and the eastern big-eared bat *(Plecotus rafinesquii)* and additional county records for the hoary bat *(Lasiurus cinereus)*, silver-haired bat *(Lasionycteris noctivagans)* and the evening bat *(Nycticeius humeralis)*.

Arkansas Range Extensions

Lasiurus seminolus (Rhoads). Typically a tree dwelling species found most often in the deep south, the seminole bat's range coincides with that of spanish moss *(Tillandsia usneodes)* in which it prefers to roost. In the summer, the bat ranges from South Carolina along the Atlantic Coast into the gulf coast area of Texas and Mexico. In late summer, after the young are weaned, some individuals may wander north into Oklahoma, Arkansas, Pennsylvania and New York (Barbour and Davis, 1969). In Arkansas, the seminole bat was formerly recorded from Ouachita and Bradley counties, but probably occurred over most of the lower two tiers of counties (Baker and Ward, 1967; Sealander and Hoiberg, 1954; Sealander, 1979; Hall, 1981). On 3 September 1982 an adult female specimen was captured in a mist net outside the entrance to an abandoned mine shaft in Polk County (T3S, R30W, S10). This specimen extends the range of *L. seminolus* approximately 57 km to the north of its previously recorded marginal records (Fig. 1). The skin and skull preparation of this specimen has been placed in the Zoology Museum Collection at the University of Arkansas at Little Rock (#2583).

Plecotus rafinesquii (Lesson). This species is found only in southeastern United States and little is known of its natural history (Barbour and Davis, 1969). The bat had formerly been reported from Bradley, Craighead, Cross, Drew, Greene, Jackson, Miller, Sebastian and Sevier counties (Gardner and McDaniel, 1978; Sealander, 1979). From Arkansas Department of Health records we recorded the bat from Faulkner and Lawrence counties. The Faulkner County record is significant in that it represents a geographic area that Sealander (1979) had not included in the bat's distribution, thus representing a range extension in Arkansas (Fig. 2).

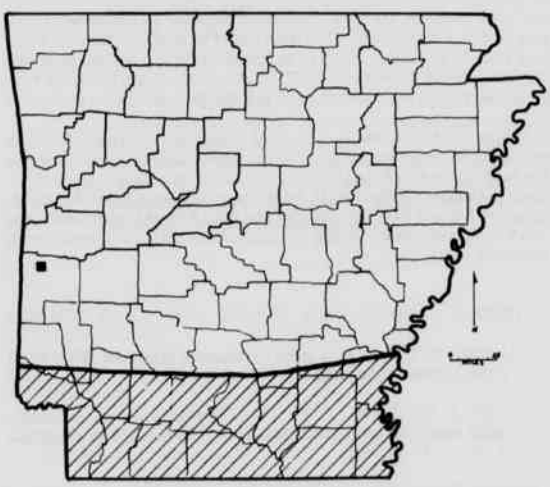

Figure 1. Arkansas distribution of the seminole bat *(Lasiurus seminolus)*. Shaded area represents geographic range according to Sealander (1979) and Hall (1981). The square indicates the locality record extending the range northward.

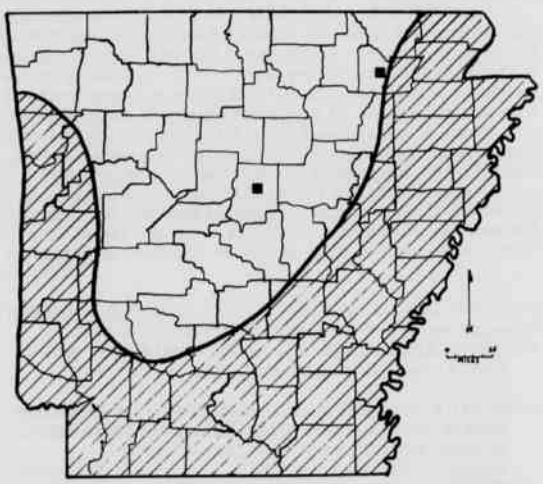

Figure 2. Arkansas distribution of the eastern big-eared bat *(Plecotus rafinesquii)*. Shaded area represents geographical range according to Sealander (1979). The squares represent new locality records, indicating geographic areas not previously included in the bat's distribution.

Additional County Records.

Lasiurus cinereus (Palisot de Beauvois). The hoary bat probably occurs statewide in Arkansas (Sealander, 1979). However, it has previously been recorded only from Bradley, Craighead, Drew, Garland, Greene, Pulaski, Sebastian, Stone, Washington and Woodruff counties (Gardner and McDaniel, 1978; Sealander, 1979). We have recorded this species in eight additional counties: Logan, Polk, Montgomery, Saline, White, Lawrence, Marion and Newton.

General Notes

Lasionycteris noctivagans (LeConte). The silver-haried bat probably occurs statewide but has only been collected from Bradley, Craighead, Greene, Marion, Stone and Washington counties (Gardner and McDaniel, 1978; Sealander, 1979). To this list we have added: Independence, Polk and Pulaski counties.

Nycticeius humeralis (Rafinesque). The evening bat is very common in Arkansas, particularly in the southeastern corner of the state. It has been recorded from 14 counties: Ashley, Baxter, Bradley, Carroll, Craighead, Desha, Drew, Greene, Independence, Pope, Sebastian, Stone, Washington and Yell (Gardner and McDaniel, 1978; Sealander, 1979). We have collected specimens from the following 12 additional counties: Clark, Cleburne, Garland, Hempstead, Lawrence, Logan, Marion, Montgomery, Newton, Pulaski, Polk and Sharp. Thus, the evening bat has now been recorded in 26 of the 75 Arkansas counties.

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LITERATURE CITED

BAKER, R. J., and C. M. WARD. 1967. Distribution of bats in southeastern Arkansas. J. Mamm. 48:130-132.

BARBOUR, R. W., and W. H. DAVIS. 1969. Bats of America. Univ. Kentucky Press, Lexington. 286 pp.

DELLINGER, S. C., and J. D. BLACK. 1940. Notes on Arkansas mammals. J. Mamm. 21:187-191.

GARDNER, J. E., and V. R. MCDANIEL. 1978. Distribution of bats in the Delta Region of Northeastern Arkansas. Proc. Ark. Acad. Sci. 32:46-48.

HALL, E. R. 1981. The mammals of North America. John Wiley and Sons, New York. 2 vols., 1181 pp.

HARVEY, M. J. 1976. Endangered chiroptera of the southeastern United States. Proc. 29th Ann. Conf. S. E. Assoc. Game and Fish Comm., pp. 429-433.

HARVEY, M. J., J. J. CASSIDY, and G. G. O'HAGAN. 1981. Endangered bats of Arkansas: distribution, status, ecology and management. Occ. Papers Ecol. Res. Center, Memphis State Univ. 80 pp.

MCDANIEL, V. R., and J. E. GARDNER. 1977. Cave fauna of Arkansas — vertebrate taxa. Proc. Ark. Acad. Sci. 31:68-71.

SEALANDER, J. A. 1954. New mammal records for Arkansas. J. Mamm. 35:430.

SEALANDER, J. A. 1960. Some noteworthy records of Arkansas mammals. J. Mamm. 41:525-526.

SEALANDER, J. A. 1979. A guide to Arkansas mammals. River Road Press, Conway. 313 pp.

SEALANDER, J. A., and A. J. HOIBERG. 1954. Occurrence of the seminole bat in Arkansas. J. Mamm. 38:584.

SEALANDER, J. A., and H. YOUNG. 1955. Preliminary observations on the cave bats of Arkansas. Proc. Ark. Acad. Sci. 7:21-31.

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MICROCOMPUTER-ASSISTED COLORIMETRIC DETERMINATION OF IRON

Courses in quantitative analysis often include standard colorimetric procedures, in which a series of solutions is used to prepare a calibration curve, with the unknown read from the curve. An experiment of this type is the iron-phenanthroline determination which is described in the manual by Day and Underwood (Day and Underwood, *Quantitative Analysis Laboratory Manual,* 4th Ed., p. 125, 1980). This procedure has been modified in the present application, so that commercially-prepared unknowns can be used. The spectrophotometer is interfaced with a microcomputer for reading and manipulation of the absorbance-concentration data. The experiment not only provides an example of microcomputer application and serves to eliminate human error in data acquisition, but allows performance of repetitive tasks which are nearly impossible by hand.

The student needs no computer capability, since the entire procedure is screen-prompted. The following are features of the experimental procedure:

1) The computer accepts absorbance data for each standard solution 100 times, averages the readings then presents the average to the student. This alleviates the indecision some students have when reading a needle that sometimes flickers.
2) Solution concentrations are entered following each averaging, with the values entered based on student preparation of solutions of ferrous ammonium sulfate.
3) When all known solutions are completed, the computer gives a screen which lists the concentrations of the solutions provided, the absorbance value on the best-fit line for those concentrations, and the slope and intercept of the best-fit line.
4) Best-fit and raw data points are then screen-graphed. This shows the scatter of the student's data and allows immediate judgment of the necessity for repetition of the work.
5) The student then reads any number of unknowns and the computer calculates their iron concentration from the least-square slope and intercept values.

With the computer-based procedure, no significant improvement in accuracy was noted, as compared to classes that took data by hand (Hoyt, Unpublished Data, 1982). There have been significant improvements in speed (or spectrophotometer use-time), calculation accuracy (particularly