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Arkansas Academy of Science

HOVERING FLIGHT IN RED-TAILED HAWKS (*Buteo jamaicensis*)

"Hovering" is defined as wing-flapping flight which has the purpose of holding a bird stationary in the air. It is commonly used by those species of raptors which hunt over open country where no perches exist, such as kestrels (*Falco* spp.) over field or moor. Rough-legged Hawks (*Buteo lagopus*) or Snowy Owls (*Nyctia scandiaca*) over tundra, Ospreys (*Pandion haliaetus*) over water. The Red-tailed Hawk (*B. jamaicensis*), which hunts by preference from a perch at the edge of a field, or sometimes soaring on thermals, hovers only rarely. Red-tails which hunt in mountains or along coasts, regularly take advantage of the up-draft over cliffs to hang in one position, with wings spread and motionless, while they survey the cliff for prey. This does not, however, constitute true hovering. The general lack of hovering in the Red-tail, and the presence of hovering in the Rough-legged, is so regular that it is often used as a diagnostic character to separate these two species (see, e.g., Peterson, R. T., 1947. A field guide to the birds. Houghton Mifflin Co., Boston; or Robbins, C.S. et al. 1966. Birds of North America. Golden Press, N.Y.). The following observation is therefore of interest as it describes what could be considered aberrant behavior in a large number of birds.

On 22 December 1977, Cheryl Lavers and I went to the vicinity of the Craighead/Poinsett County, Arkansas line on Highway 49 to investigate the report of a Rough-legged Hawk. Four Rough-leggeds were seen within a mile (perhaps a record concentration for Arkansas), all persistently hovering at distances of ten to forty feet from the ground over stubble fields. A 10-15 mph wind from the south no doubt gave the birds more lift, but they still flapped their wings rapidly to maintain their position. These birds were loosely associated with about 15 Red-tailed Hawks, four or five of which were also persistently hovering, at the same heights as the Rough-leggeds. Although on rare occasions Red-tails have been observed hovering, it is usually at a much higher altitude (150-200 feet).

The area where these birds were congregated, one known to be particularly rich in small rodents (Van Rick McDaniel, *pers. comm.*), consisted of fields lined with tall trees (chiefly *Quercus* spp.), interspersed with patches of deciduous woodland. Therefore, it does not seem that competition for scarce prey items, or an absence of perches, occasioned this unusual behavior in the Red-tails.

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CAVE FAUNA OF ARKANSAS: ADDITIONAL INVERTEBRATE AND VERTEBRATE RECORDS

This report represents the third in a series of papers describing the fauna of Arkansas caves. The first paper included records of selected invertebrate taxa (McDaniel and Smith, 1976); the second included a summary of vertebrate records (McDaniel and Gardner, 1977). In this paper, we bring previous records up to date with regard to collections and/or identifications made during the past 2 years.

The number of troglobites (obligate cavernicoles) known to inhabit any one cave continues to increase, as does the total number of troglobitic taxa reported from the caves of Arkansas. Certainly the cave fauna of Arkansas represents a unique and fragile element of Arkansas heritage - an element in need of accurate definition and description, and subsequent protection.

Methodology was as reported earlier (McDaniel and Smith, 1976) in which collection of specimens was minimal and usually for the purpose of identification only. All forms collected by the authors are represented by voucher specimens in the collections at Arkansas State University, or in the taxonomic collections of other recognized researchers. Taxa and localities reported are the result of collection efforts by the authors or their agents.

Related literature was reviewed in earlier papers (McDaniel and Smith, 1976; McDaniel and Gardner, 1977), with the exception of a recent paper (Youngsteadt and Youngsteadt, 1978) containing notable invertebrate records from northwestern and northcentral Arkansas. In some cases, our records overlapped theirs, and were therefore omitted from this paper.

For newly reported taxa, we have again included probable ecological position in the cave environment, and we continue to utilize the terms "troglobite," "troglophile," "trogloxene," and "accidental" to describe this position (Barr, 1963). Furthermore, to emphasize the cavernicole status of organisms, we have limited our ecological notation to the cave environment (e.g., *Stygobromus a. alabamensis* is actually a phreatobite/troglobite, but is herein considered a troglobite). Records of taxa not previously recorded from Arkansas caves are included in the following annotated list; new records for previously recorded taxa are included in Table 1.

PHYLUM ARTHROPODA

Class Crustacea

Order Amphipoda

Family Crangonyctidae

Stygobromus alabamensis alabamensis (Stout), Troglobite. Jackson Co.: Mason's Cave. Earlier records of this species are listed under *Stygobromus*, now included in *Stygobromus* (Bousfield, 1973; Peck and Lewis, 1978). The significance of this record lies in the location of this cave at the extreme eastern edge of the Ozark uplands in Arkansas. The Mississippi Embayment is within 300-400 meters of the cave.

Stygobromus clantoni (Creaser), Troglobite. Izard Co.: Clay Cave. An intriguing specimen, since according to Holsinger (*pers. comm.*) "if this population is in fact conspecific with *S. clantoni* s. str., it extends the range of the species some 150 miles south from central Missouri to northern Arkansas." A single female only was found in a stream having a dense population of *S. a. alabamensis*.

Class Arachnida

Order Pseudoscorpionida

Family Chernetidae

Hesperochernes sp., Troglophile or Troglaxene. Marion Co.: Summit Cave. A dense population of these arachnids was found associated with several decaying bat carcasses.

Order Phalangida

Family Ischyropsalidae

Sabacon cavicolens (Packard), Troglaxene. Stone Co.: Roasting Ear Cave, unnamed cave. A common opilionid throughout much of the eastern U. S., but not often found in caves (Shear, 1975).

Family Phalangodidae

Phalangodes spinturnis Crosby and Bishop, Troglaxene. Independence Co.: Cushman Cave; Izard Co.: Clay Cave; Sharp Co.: Center Cave. All our records are from the front 200 m of these caves.

Order Araneae

Family Theridiidae

Achaearanea tepidariorum (Koch), Troglaxene. Randolph Co.: Ravenden Springs Cave. An extremely common spider often associated with human habitations.

Family Agelenidae

General Notes

- Cicurina* sp., Troglophile (?). Independence Co.: Dodd Cave. A juvenile was removed from the anterior chamber of this cave. The genus includes several cave species.
Family Araneidae
- Meta menardi* (Latreille), Troglophile. Izard Co.: Needles Cave. The cave orb weaver is found in caves, mines, and similar habitats throughout the eastern U. S.
Family Ctenidae
- Ctenus* n. sp., Troglophile. Stone Co.: Roasting Ear Cave. Ctenids are foraging spiders, and our specimen was found in the dry front chamber of this cave.
Family Linyphiidae
- Meioneta* sp., Troglophile. Independence Co.: Dodd Cave. Collected from a dry guano pile near the center of the cave.
Porhomma cavernicolum Keyserling, Troglophile. Searcy Co.: Davis Pit. A widespread cave inhabitant.
Family Lycosidae
- Lycosa* sp., Troglaxene. Searcy Co.: Davis Pit; Sharp Co.: Center Cave. Wolf spiders were found associated with leaf litter on the floor of the cave.
Family Nesticidae
- Eidmannella pallida* (Emerton), Troglophile. Izard Co.: Vickery Cave. Formerly *Nesticus*. This spider is widespread and a common cave inhabitant.
Class Diplopoda
Order Chordeumida
Family Conotylidae
- Trichopetalum* sp., Troglophile. Searcy Co.: Davis Pit. *T. unicum* was previously reported from Sharp Co. (McDaniel and Smith, 1976).
Class Insecta
Order Diptera
Family Campodeidae
- Plusiocampa* n. sp., Troglophile. Fulton Co.: Richardson Cave; Izard Co.: Clay Cave; Stone Co.: Hell Creek Cave, Roasting Ear Cave, Roland Cave. Although a very common cave inhabitant, dipturans are taxonomically very poorly known.
Order Diptera
Family Heleomyzidae
- Amoebalaria defessa* (Osten Sacken), Troglaxene. Independence Co.: Cushman Cave; Stone Co.: Roasting Ear Cave. All specimens of this common cave inhabitant were found in the front chamber of caves.
Acothaea specus (Aldrich), Troglaxene. Izard Co.: Clay Cave. Found only in the front chamber of the cave.
Heleomyza brachypterna Loew, Troglaxene. Sharp Co.: Center Cave. Another of the flies that overwinters in Arkansas caves.
- PHYLUM CHORDATA
Class Amphibia
Order Anura
Family Hylidae
- Hyla versicolor versicolor* LeConte, Accidental. Stone Co.: Hell Creek Cave. A single specimen of this frog was found at the bottom of a shaft into the cave.
- Assistance in collecting specimens is gratefully acknowledged from S. Clark, G. Gardner, T. Gardner, D. Saughey, and K. Sutton. We especially acknowledge and appreciate the contributions of each of the following systematists in identification of specimens: T. C. Barr, carabids; N. B. Causey, millipedes; J. C. Cokendolpher, arachnids; W. R. Elliot, arachnids and records for Davis Pit; W. R. Gertsch, arachnids; C. J. Goodnight, opilionids; J. R. Holsinger, amphipods; J. M. Kingsolver, leiodids; L. Knutson, insects; W. M. Muchmore, pseudoscorpions; J. R. Reddell, arachnids; G. Steyskal, heleomyzids.

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LICHENS OF ARKANSAS I: A SUMMARY OF CURRENT INFORMATION

The earliest publications on lichens in this country included only a few references to these plants from Arkansas. The earliest of these, written by the "Father of American Lichenology," Edward Tuckerman (1882), listed three species from Arkansas which were collected by Dr. Peters. Much later, Bruce Fink (1935) listed a total of five species from the state, including those mentioned by Tuckerman. Edward C. Berry (1941) listed 18 specimens from Arkansas in his monograph of the genus *Parmelia*. This included two new species of *Parmelia* which he had collected about 11 miles south of Harrison in Newton County. The type specimen for *Parmelia erecta* Berry was placed in the Missouri Botanical Garden herbarium