Recovery of Rabies Virus from the Mexican Freetail Bat in Oklahoma[1]

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Since the summer of 1954 the writer has been collecting bats of various species in the state of Oklahoma. The work was done in connection with a survey aimed at determining whether or not the local populations were infected with rabies virus. The study also provided an opportunity to learn more about the occurrence and distribution of various species within the state. As a result, 22 species and subspecies are now known to occur within the political boundaries of Oklahoma, whereas only 16 had previously been reported. Thirteen of these species have been tested for rabies and are discussed in this report.

To date 1338 specimens have been collected and tested. Of these 1062 were tested by mouse inoculation alone, 161 were examined by microscopy only, and 100 were examined by both methods. Inoculations were made into 18-to-21-day-old mice using the procedures worked out by Irons and his associates at the Texas State Health Department Laboratory. Smears were stained with modified Seller's stain. Bats were collected in the field and either brought fresh to the laboratory, or the brains were removed and stored in glycerine and water under refrigeration until they could be delivered to the laboratory. Tests were made by Mr. William Schmieding, of the Oklahoma State Health Department Laboratory, under direction of Dr. F. R. Hassler.

Species examined total as follows: *Antrozous pallidus*, 14; *Corynorhinus townsendi*, 11; *Eptesicus fuscus*, 19; *Lasiurus borealis*, 51; *Myotis austroriparius*, 10; *Myotis grisescens*, 141; *Myotis keeni*, 15; *Myotis velifer*, 238; *Myotis yumanensis*, 5; *Nycticeius humeralis*, 20; *Pipistrellus subflavus*, 153; *Tadarida brasiliensis*, 654; *Pipistrellus hesperus*, 2; Unidentified, 5.

At the beginning of the project all brains were smeared and stained. However, the process proved to be so time-consuming both in the field and laboratory, that it was abandoned in favor of mouse inoculation. No positives were identified in 1955, and none in 1956 until the month of August.

On July 9, 1956 two sick *Tadarida brasiliensis mexicana* were found on the floor of Selman's Cave, in northern Woodward County. One of these died shortly after capture and was putrefied before its death was noted. The other was taken to Oklahoma City where the brain was put into mice. On July 23 the mice succumbed. Confirmatory tests at the Communicable Disease Center in Montgomery, Alabama, indicated clinical rabies.

The second case in which rabies was demonstrated was among nine sick bats recovered from Reed Cave in Greer County, the night of August 14, 1956. The cave was examined carefully after the evening exodus was over and only a few adults remained inside. This made it possible to scrutinize the interior patiently and with a minimum of inconvenience. Because of a misunderstanding, for which the writer must assume responsibility, the brains were pooled into two groups of five and four, instead of being kept separate and tested individually. The pool of five proved negative, but mice inoculated from the pool of four contracted rabies on Sep-

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tember 7. It cannot safely be assumed that more than one of the four bats was rabid.

Testing was continued in the summers of 1957 and 1958. During this period 34 Mexican freetail bats were taken in a moribund condition from caves in Oklahoma. None of these bats proved to be rabid when tested by mouse inoculation. These were the only sick bats encountered in caves during the two summers. Tests on tree-dwelling bats and other cave-dwelling species were uniformly negative.

The hoary bat *(Lasiurus cinereus)* that came from Enid, Oklahoma in July 1957 (Hassler, 1957) is not included in the above totals, as it was sent in through local health authorities. This is the only bat other than *Tadarida brasiliensis mexicana* in which the disease has been reported for Oklahoma. *L. cinereus* ranges over all of the United States and much of Canada, and may perform longer migrations than any other species of bat native to this continent. Its rarity, coupled with its habit of living in trees, make precise study of its migration most difficult. It could possibly serve as the vector that has transmitted the disease to sedentary species of bats in relatively high latitudes (e.g., Colorado, Montana).

For Oklahoma it seems safe to say that, on the basis of present evidence, rabies may be expected to occur at very rare intervals in bats of the family Vespertilionidae and that its appearance in them will be unpredictable as to place and time. In the bats of the family Molossidae, of which the Mexican freetail is the chief example, rabies may be expected to occur infrequently, and it will be largely confined to the western half of the state. There are very few records of the species occurring east of the meridian that passes through Oklahoma City. The disease is found much more rarely than in comparable colonies in Texas (Eads et al., 1955). The numbers of bats examined as yet is too small to allow any valid comparisons of incidence of the disease. However, the discrepancy between numbers of moribund bats found in Oklahoma caves and those farther south is a real one. No great epidemics resulting in fatalities among bats have been observed in Oklahoma, and sick bats, rabid or otherwise, are not at all common. This does not compare with accounts of moribund individuals to be found in Ney, Bracken, and other caves of the Edwards Plateau area. Further study of the population dynamics and migratory pattern of the species may reveal the reason for this.

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