

Rabies in Bats of Indiana: 1968-1972

JOHN O. WHITAKER, JR.

Department of Life Sciences

Indiana State University, Terre Haute, Indiana 47809

and

WALTER A. MILLER

Indiana State Board of Health

1330 West Michigan Street, Indianapolis, Indiana 46206

Abstract

A total of 689 bats from Indiana taken from 1968 through 1972 was examined for rabies, bringing to 1,315 the number examined for this virus since 1965. Of the 1,315, 67 were rabid (5.1 per cent). The greatest number of cases was in red bats, *Lasiurus borealis*, and big brown bats, *Eptesicus fuscus*, but these were submitted in the greatest numbers. The greatest percentage infection occurred in the hoary bat, *Lasiurus cinereus*. Of 51 examined 10 were rabid (19.6 per cent). Bats of the genus *Myotis* were seldom rabid. Rabies was more prevalent in southern than in central or northern Indiana and occurred most often in summer and fall. There were rabies "outbreaks" in Jefferson County in 1967, and in Vanderburgh County in 1967 and 1970, when relatively large numbers of rabid bats were found. However, these cases were widely publicized inducing people to submit large numbers of bats.

Introduction

The first reported case of bat rabies in Indiana was in 1960, in Tippecanoe County. It occurred in the red bat, *Lasiurus borealis*. Information on bat rabies in Indiana was summarized for the years late 1965 through most of 1968 (1) when a total of 626 bats was examined. Of these, 42 (6.7%) were rabid, mostly red and big brown bats (*L. borealis* and *Eptesicus fuscus*), two of the most common bats of Indiana. Cases were also reported in *Myotis lucifugus*, *Pipistrellus subflavus* and *Lasiurus cinereus*. Rabies was more common in southern than in northern Indiana, and was more common in summer and fall than at other times.

The purpose of the present paper is to present information on rabies in bats of Indiana for the period late 1968 through 1972.

Materials and Methods

The methods are the same as in the previous study (1). Bats submitted by citizens of Indiana to the Indiana State Board of Health were examined for negri bodies, then tested by the fluorescent antibody method. Bats were then sent to the senior author for identification and further study.

Again, relatively large numbers of bats came from a few counties, Jefferson, Johnson, Marion, St. Joseph and Vanderburgh. The greatest number was from the latter county because of a publicized "outbreak" in 1970.

A total of 689 bats was examined during this phase of the study, bringing to 1,315 the number of bats from Indiana submitted by citizens and examined for rabies since 1965.

Species of Bats Infected

The greatest number of cases of rabies in bats in Indiana occurred in *Eptesicus fuscus* and *Lasiurus borealis* (Table 1), while the greatest percentages of infection were in *Lasiurus cinereus* and *Pipistrellus subflavus*. Over the country the greatest rates of infection were in *Lasiurus borealis* (1). The incidence of infection in *L. borealis* in Indiana is much greater than that in *E. fuscus*.

TABLE 1. Rabies in bats collected by citizens of Indiana, summarized by species, 1968 through 1972, and totals 1965 through 1972.

| Species | 1968-1972 | | | 1965-1972 | | |
|------------------------------------|--------------|-----------|---------|--------------|-----------|---------|
| | No. Examined | No. Rabid | % Rabid | No. Examined | No. Rabid | % Rabid |
| <i>Eptesicus fuscus</i> ----- | 412 | 5 | 1.2 | 776 | 29 | 3.7 |
| <i>Lasiurus borealis</i> ----- | 186 | 13 | 7.0 | 338 | 24 | 7.1 |
| <i>Myotis lucifugus</i> ----- | 30 | 0 | 0 | 80 | 1 | 1.3 |
| <i>Lasiurus cinereus</i> ----- | 35 | 6 | 17.1 | 51 | 10 | 19.6 |
| <i>Pipistrellus subflavus</i> ---- | 8 | 1 | 12.5 | 24 | 3 | 12.5 |
| <i>Myotis sodalis</i> ----- | 11 | 0 | 0 | 23 | 0 | 0 |
| <i>Nycticeius humeralis</i> ---- | 1 | 0 | 0 | 10 | 0 | 0 |
| <i>Lasionycteris noctivagans</i> - | 4 | 0 | 0 | 7 | 0 | 0 |
| <i>Myotis keenii</i> ----- | 2 | 0 | 0 | 6 | 0 | 0 |
| Totals ----- | 689 | 25 | 3.6 | 1315 | 67 | 5.1 |

The two species with the highest incidences were both taken in low numbers. Only 24 pipistrelles, *Pipistrellus subflavus*, were examined, but 3 were infected. Ten hoary bats, *Lasiurus cinereus*, of 51 examined were rabid (19.6%). This sample is large enough to tentatively conclude that the hoary bat has the highest incidence of rabies of any Indiana bat, with about 1 of 5 being infected.

Bats of the genus *Myotis* (including most cave bats), are seldom infected (1 of 109, or 0.9%).

Geographic Distribution of Bat Rabies in Indiana

Over the entire study (1965-1972) bat rabies has been found in 23 counties (Table 2), with 6 new county records occurring during 1968-72. They are Clark, Jackson, Madison, Porter, Wabash and White.

A greater incidence of bat rabies was found in the southern than in the northern or central counties, but the reason for this is not known, although it should be pointed out that the three Indiana rabies "outbreaks" were in the southern part of the state. Summarized figures currently are:

TABLE 2. Rabies in bats collected by citizens of Indiana, summarized by County, 1965-1972. Number in parentheses under No. rabid column indicates number taken in 1968-1972.

| County | No. Examined | No. Rabid | % Rabid |
|-----------------------------|--------------|-----------|---------|
| Allen | 28 | 0 | 0 |
| Bartholomew | 7 | 0 | 0 |
| Boone | 5 | 0 | 0 |
| Cass | 11 | 0 | 0 |
| ² Clark | 7 | 1(1) | 14.3 |
| Daviess | 11 | 1 | 9.2 |
| Dearborn | 7 | 1 | 14.3 |
| Decatur | 6 | 0 | 0 |
| ¹ Delaware | 14 | 0 | 0 |
| Elkhart | 13 | 0 | 0 |
| Fulton | 6 | 0 | 0 |
| Gibson | 7 | 2(1) | 28.6 |
| Greene | 7 | 2 | 28.6 |
| Hancock | 8 | 0 | 0 |
| Hendricks | 12 | 2 | 16.7 |
| Henry | 7 | 0 | 0 |
| Howard | 10 | 0 | 0 |
| ² Jackson | 15 | 1(1) | 6.7 |
| Jefferson | 192 | 13 | 6.8 |
| Jennings | 8 | 1 | 12.5 |
| Johnson | 91 | 3 | 3.3 |
| Kosciusko | 26 | 0 | 0 |
| Lake | 26 | 0 | 0 |
| LaPorte | 4 | 1 | 25.0 |
| Lawrence | 15 | 0 | 0 |
| ² Madison | 14 | 1(1) | 7.1 |
| Marion | 119 | 3 | 2.5 |
| Marshall | 8 | 0 | 0 |
| Monroe | 28 | 2(1) | 7.1 |
| Montgomery | 18 | 1(1) | 5.6 |
| Morgan | 9 | 0 | 0 |
| Parke | 9 | 0 | 0 |
| ² Porter | 3 | 1(1) | 33.3 |
| Posey | 5 | 0 | 0 |
| Putnam | 5 | 0 | 0 |
| Rush | 6 | 0 | 0 |
| St. Joseph | 82 | 2 | 2.4 |
| Spencer | 7 | 0 | 0 |
| Steuben | 6 | 0 | 0 |
| Sullivan | 5 | 0 | 0 |
| ¹ Tippecanoe | 31 | 0 | 0 |
| Vanderburgh | 281 | 26(16) | 9.3 |
| Vigo | 23 | 0 | 0 |
| ² Wabash | 6 | 1(1) | 16.7 |
| Wayne | 18 | 0 | 0 |
| ² White | 5 | 1(1) | 20.0 |
| ³ Other counties | 84 | 0 | 0 |
| Totals | 1315 | 67(25) | 5.1 |

¹ Counties having rabies reports, prior to, but not during this study.

² New County record for rabies during this study.

³ Other counties in which less than five bats were examined were: Fountain, Grant, Jasper, Knox, LaGrange, (4 each); Clinton, DeKalb, Floyd, Hamilton, Huntington, Miami, Newton, Noble, Randolph, Scott, Warrick (3 each); Brown, Dubois, Fayette, Orange, Perry, Pike, Pulaski, Ripley, Shelby (2 each); Adams, Benton, Clay, Franklin, Harrison, Jay, Martin, Owen, Switzerland, Vermillion, Warren, Washington, Wells (1 each).

| | |
|----------|-----------------|
| North: | 6 of 266, 2.2% |
| Central: | 11 of 411, 2.6% |
| South: | 50 of 638, 8.0% |

Yearly and Seasonal Rates of Infection

Yearly rates of rabies incidence in the bats examined were:

| Year | Per cent Rabid | Number Rabid |
|------|----------------|--------------|
| 1966 | 8.7 | 10 of 115 |
| 1967 | 7.3 | 24 of 328 |
| 1968 | 4.1 | 9 of 220 |
| 1969 | 2.3 | 3 of 129 |
| 1970 | 7.0 | 16 of 229 |
| 1971 | 1.5 | 2 of 132 |
| 1972 | 1.9 | 3 of 162 |

There were 167 bats taken in the spring (March-May) with 5 being rabid (rate of 3.0). During summer (June-August) 835 bats were taken, of which 46 were rabid (rate of 5.5). Comparable figures in fall (September-November) and winter (December-February) were 225, 15, 6.7%, and 88, 1, 1.1%. Thus, summer and fall remain the time of greatest occurrence.

To date, rabid bats have been taken in 8 of the 12 months as follows: January—0, February—0, March—0, April—1, May—4, June—8, July—21, August—15, September—13, October—4, November—1, and December—1.

Jefferson and Vanderburgh Counties

Jefferson and Vanderburgh Counties were the sites of bat rabies "outbreaks" in 1967. Rabies occurred primarily in red bats in Vanderburgh County, and in big brown bats in Jefferson County.

No rabid bats have been found in Jefferson County since 1968 although a total of 53 individuals from there have been examined (including 47 big brown bats and 6 red bats). A total of 155 big brown bats from Jefferson County have been examined (1965-72), of which 12 (7.7%) were rabid. Only 23 red bats have been examined from there, none of which was rabid.

In Vanderburgh County, another "outbreak" occurred in 1970, when 14 of 116 bats submitted were rabid. Seventy-one red bats were included, of which 10 were rabid (14.1%). Also 24 big brown bats were submitted that year, of which only 2 were rabid (8.3%). In 1971 and 1972, 39 red bats were examined from Vanderburgh County, of which only one was rabid (2.6%). Through the entire study, totals of 181 red bats and 43 big brown bats have been examined from Vanderburgh County, of which 18 (9.9%), and 3 (7.0%) were rabid.

Literature Cited

1. WHITAKER, J. O., JR., W. A. MILLER, and W. L. BOYKO. 1969. Rabies in Indiana bats. *Proc. Indiana Acad. Sci.* 78:447-456.