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RABIES IN *Myotis thysanodes*, *Lasiurus ega*, *Euderma maculatum* AND *Eumops perotis* IN CALIFORNIA

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Abstract: Rabies is reported for the first time in bats of the species *Myotis thysanodes*, *Lasiurus ega*, and *Eumops perotis* from California, and a second infected spotted bat, *Euderma maculatum*, is reported.

INTRODUCTION

Bats suspected of infection with rabies are routinely submitted to public health laboratories to be tested for rabies viral infection. A program to determine the species of bats tested in California has disclosed infection in three species from which the virus has not been reported previously and a second case in the spotted bat.

MATERIALS AND METHODS

Direct fluorescent rabies antibody (DFRA) tests,^{1,2} were performed on brain tissue from bats. Positive results were confirmed by intracerebral inoculation tests in suckling mice,⁴ whose brains were subsequently tested by DFRA tests. Bats were speciated by the senior author, except where noted, utilizing criteria reviewed by Barbour and Davis.¹

RESULTS

A rabies-infected fringed myotis (*Myotis thysanodes*) was found lying on a riverside near Apple Hill, El Dorado County on 11 October 1970. This species has not been previously reported as infected with rabies. Another infected fringed myotis, an adult female, landed on the face of a man outside his home near Forks of Salmon, Siskiyou County, about midnight on 4 October 1976. Although the bat suspended itself from

the man's upper lip, it did not inflict a bite. The man brushed it off and killed it.

Eight rabies-infected southern yellow bats (*Lasiurus ega*) were received. An adult male bat landed on the bare foot of a woman walking outdoors in Thermal, Riverside County, at 1000 hours on 7 March 1973, puncturing the large toe. It was uncertain if the puncture was from a bite or a claw penetration. This constituted the first knowledge of rabies infection in this species. A second infected adult male bat was observed flying at noon on 2 June 1976 at Palm Desert, Riverside County, when it fell to the ground, appearing to be ill. A third infected adult male bat was picked up from the ground by a man at Thermal, Riverside County, the morning of 27 July 1976; he was subsequently bitten. A fourth infected adult male bat was brought into a residence by a dog about 5 km southwest of El Centro, Imperial County, on 25 April 1977. The resident stated that bats lived in the fan palms near the house, and they would fly away when the children threw rocks at them. An infected immature female bat was found dead at Calexico, Imperial County, on 12 August 1977. An infected male of uncertain age fell from shrubbery onto the back of a boy who had run against the shrubbery about 2000 hours on 4 November 1977, at Indian Wells, Riverside County. The boy removed his shirt. No bites or scratches were felt or ob-

served. An infected adult female bat was found at San Jacinto, Riverside County, 18 May 1978, and a cat was found chewing on the wing of a dead infected adult male bat at Redlands, San Bernardino County, 26 October 1978.

The southern yellow bat was not detected in the United States until 1945;² subsequently it was found in Arizona and New Mexico, an extension of its previously known distribution from Mexico to Argentina.¹ Therefore, it is of epidemiological interest to record the following rabies-negative southern yellow bats, which with the foregoing reports suggest a greater abundance of the species than heretofore thought and extends the known geographic range of the species. During 1969, three bats were identified (by Keith F. Murray) from Riverside County: an adult bat and a suckling bat were submitted from Thermal on 15 July, and an adult of unrecorded sex was found in the City of Riverside 28 April. Other Riverside County records are: an immature female from La Quinta, 6 August 1975; an adult female, killed by a cat at Thermal, 14 April 1976; an adult male, found dead near Thermal 17 August 1976; an adult male, retrieved from a cat at San Jacinto, 20 January 1977; an adult male, taken from a cat at Palm Desert on 16 September 1977; an adult male, removed from a swimming pool by a dog at Indio, 4 October 1977. An adult female bat was brought into a home by a cat at Holtville, Imperial County, on 18 May 1977. Three bats were found in San Bernardino, San Bernardino County in 1977: an ill adult female was found on a sidewalk on 5 May; individual live adult males were taken from cats on 22 August and on 17 September. Two dead bats were found in San Diego County in 1977: an adult male at Spring Valley on 16 September; a male of uncertain age at Vista on 1 October 1977.

Although a rabies-infected spotted bat (*Euderma maculatum*) has been reported previously from Fresno County, California,⁶ the rarity of this species makes the

present record noteworthy. A dead, infected adult female bat was brought to a residence in Bishop, Inyo County by the resident cat on 11 May 1977. Thus, both spotted bats known to have been tested for rabies in California proved to be positive for the viral infection.

A rabies-infected immature female western mastiff bat (*Eumops perotis*) was found alive in a yard at Sherman Oaks, Los Angeles County, on 16 October 1977. An infected male of undetermined age was recovered from several dogs at Porterville, Tulare County, on 25 October 1977. These are the first infected bats of this species to be reported.

DISCUSSION

Until recently, most local laboratories have discarded rabies-negative bats without submitting them for speciation, so ratios of positives to negatives could not be calculated on a species basis.

There is a marked tendency to restrict laboratory testing to bats that have contacted persons or pets. Therefore, the foregoing reports, which show a high frequency of contact, must be regarded as a biased sample in reference to contact. Similarly, such samples are biased in reference to the health status of the bat, because laboratories test many bats that are ill or dead, and the resulting samples contain a high proportion of rabies-positive bats, about ten percent in California. Such figures are commonly published in some states, conveying the erroneous impression that the sample is unbiased and that a similarly high proportion of bats is infected in nature. However, the prevalence of infection in unbiased samples is usually one-half of one percent or far less,³ with few exceptions. Reports of higher levels can easily result where a small sample contains one infected bat or when samples are taken from bat roosts, where ill bats are readily collected, and healthy bats readily escape.

The 23 yellow bat records reported herein indicate this species is now relatively common and widespread in Southern California, contrasting with its absence or scarcity prior to 1945. The bats were found throughout the year, the eight infected bats between March and November.

The foregoing reports are characterized by a lack of recognized aggressive behavior by the infected bats with one possible exception. They are consistent with earlier observations of non-aggressiveness in infected bats that are closely related to the species reported herein.¹

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