

OBSERVATIONS ON THE VAMPIRE BAT WITH SPECIAL REFERENCE
TO LONGEVITY IN CAPTIVITY

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In the course of studies on the transmission of *Trypanosoma hippicum* Darling, the pathogen of a fatal disease of horses and a number of other animals in Panama (Clark and Dunn, 1933), collections of vampire bats, *Desmodus rotundus murinus* Wagner, were made at a number of localities in Panama by Lawrence H. Dunn, Carl M. Johnson, and their associates. Captive *Desmodus* were kept alive in the animal house of the Gorgas Memorial Laboratory. While the first bats were taken in January 1932, the writer found some of the colony still surviving when he came to the Laboratory in July 1944. Herbert C. Clark, Director, kindly turned over to me all the laboratory records of the *Desmodus* colony and further made available to me observations from his own experience.

In all 261 *Desmodus* are listed in the laboratory records. Additional specimens have been taken by the writer, but sacrificed for certain studies. The vampire bats were secured from localities in Panama and the Canal Zone as follows: Chepo, Pacora, Rio Abajo, Sabanas, Miraflores, La Chorrera, near Mt. Hope, Chilibrillo Caves, and San Marcelo and Santa Catalina Caves on Taboga Island in Panama Bay. I have also found them in a hollow tree in the forest near Juan Mina, C. Z. With the exception of the Chilibrillo Caves and the Taboga Island Caves, the specimens were taken either in hollow trees or in houses. While hollow trees in this area are frequently inhabited by other species of bats, most notably *Carollia perspicillata azteca*, they seem never to be associated with *Desmodus*. Even in the Chilibrillo Caves which support a population of over a thousand *Carollia p. azteca*, several hundred *Phyllostomus hastatus panamensis*, as well as small numbers of other species, the *Desmodus* occur in underground passageways separate from the nearby caves occupied by the other species.

Several observations by Clark on the feeding of these bats are of considerable interest. The natives inhabiting Taboga Island say that before horses and cattle were brought to the island the vampires inhabiting the sea caves there fed on nesting or roosting sea fowl. Clark and Dunn brought a pelican into the laboratory and left it trussed up in a room with a vampire. A blood meal had been withheld from the vampire for one night. The bat fed on the web of the foot of the pelican. One evening at dusk on Taboga Island, Clark also observed a vampire bite and feed from the comb of a chicken. On another occasion the feeding of both mother and young was observed: A female carrying a young bat crosswise on her breast lifted the edge of the scab of an ulcerous sore on a horse, and then both mother and young drank from the blood of the wound. This observation was made at Guayabalito on the Chagres River.

At the Gorgas Memorial Laboratory, metal number tags are suspended by wire around the necks of the bats which are kept in cages 18 inches square. These cages are wooden frames covered with one quarter inch wire mesh on five

sides and a canvas sleeve on the sixth, through which the bats and their food and water dishes may be handled. The cages are arranged in rows in one of the rooms of the animal house which is an open screened structure with a galvanized iron roof. Thus the bats are subject to the local temperature and humidity conditions, but sheltered from sun and rain. Each afternoon a stender dish of defibrinated beef blood, secured from a local slaughter house, is placed in each cage, along with a dish of water. Blood and water are changed daily. The

TABLE 1.—*Desmodus rotundus murinus* living more than five years in captivity at the Gorgas Memorial Laboratory

BAT NO.	SEX	TIME IN CAPTIVITY		
		Years	Months	Days
30	♂	12	9	—
51	♂	11	2	4
73	♂	10	6	—
36	—	9	5	25
177*	♂	9	1	4
77	♂	8	11	27
170	♂	8	10	7
98	♀	8	9	2
181	♂	8	1	22
254	♀	7	9	19
178*	♀	7	6	18
101	♀	7	1	26
70	♂	7	—	—
76	♀	6	11	2
62	—	6	10	16
83	♀	6	6	17
253	♀	6	6	6
95	♂	6	5	18
91	♀	6	4	2
249	♀	6	1	1
190	♂	±6	—	—
119	♀	5	4	18
140	♀	5	3	11
116	♀	5	1	26
125	♀	5	1	6
126	♀	5	0	25
32	♂	5	0	1

* Immature at time of capture.

routine feeding activities of these bats in captivity have already been described by Ditmars and Greenhall (1935).

In view of the paucity of information on the longevity of bats, the records of the *Desmodus* kept at the Gorgas Memorial Laboratory are of particular interest. The banding of bats will, over a period of years, provide an excellent source of information on this point. We already have recovered vespertilionid bats (*Myotis l. lucifugus*) banded some five years previous. Donald Griffin has

informed me in correspondence that he has made recoveries considerably exceeding this period. For the *Desmodidae* there is the record of Bridges (1943) of a specimen of *Desmodus rotundus murinus* surviving for 6 years 3 months and 17 days at the New York Zoological Park. He also lists six other individuals that were held in captivity for more than one year. In Table I are listed those bats of the Gorgas Memorial Laboratory Colony that survived five years or more. The ages of these bats at the time of capture is unfortunately not known, beyond the fact that they were adults at the time of capture, with the exception of numbers 177 and 178 which were immature.

In four cases the exact date of death is not recorded, and it is unfortunate that one of these four should be that with the longest record in captivity. This bat was taken on Taboga Island on September 7, 1932, and died in June 1945, after 12 years and 9 months in captivity. A review of the sex of these long lived bats presents a point of interest. Of the eight bats with the sex recorded, which lived for more than 8 years in captivity, seven were males. There is thus some indication that the males may be longer lived than females.

The fact that only 27 out of a population of 261 vampires lived for more than 5 years in captivity is not particularly significant, since the colony was not maintained with a longevity study in mind. Specimens were sacrificed in various experiments concerned with the transmission studies of *Trypanosoma hippicum*. Furthermore it is reasonable to assume that of the random sample caught, a significant proportion were elderly individuals that had lived the greater part of their life span.

Early in the history of the colony several young were born when males and females were kept in screened horse stalls about 10'x10'x10' at the Miraflores Veterinary Station of the Gorgas Memorial Laboratory. Among the bats confined in the 18" square cages in the Laboratory animal house no births were recorded until recently. In 1943 and 1944 five individuals were born. Since even in such a confined state matings and births occurred, it is reasonable to suppose that under good conditions it would be possible to maintain a colony of *Desmodus* indefinitely.

In recent years the *Desmodus* colony has received little attention since no active investigations involving these bats have been in progress. The refrigerated defibrinated blood stocks were held for considerable periods and may have, on occasion, spoiled. In any event the most recent additions to the colony (other than by births) were made in September 1937, and the last surviving bats finally perished in June 1945, so that the colony is no longer extant.

LITERATURE CITED

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