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by Sydney Anderson**

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# Neotropical Bats from Western México

BY

SYDNEY ANDERSON

UNIVERSITY OF KANSAS  
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Tropical fruit-eating bats of the genus *Artibeus* reach their northern limits on the lowlands of the eastern and western coasts of México. Recent students have placed the species of Mexican *Artibeus* in two groups; one includes bats of small size and one includes bats of large size (Dalquest, 1953:61; Lukens and Davis, 1957:6; and Davis, 1958:163). Three of the small species (*A. cinereus phaeotis*, *A. aztecus*, and *A. turpis nanus*) and three of the large species (*A. hirsutus*, *A. jamaicensis jamaicensis*, and *A. lituratus palmarum*) have been reported as far north as Jalisco along the west coast. *A. cinereus phaeotis* and *A. turpis nanus* are known from as far north as southern Sinaloa, and *A. hirsutus* is known from as far north as southern Sonora (Hall and Kelson, 1959:140, 141). Additional specimens of *A. hirsutus* from Sonora, Sinaloa, and Chihuahua, and specimens of *A. lituratus* and *A. jamaicensis* from Sinaloa that extend the known ranges of these two species northward are reported here; data on variation, distribution, and reproduction concerning these three species are included. Also, specimens of *Sturnira lilium* and of the genus *Chiroderma* from Chihuahua that extend their known ranges northwestward are reported.

Support for field work that yielded the specimens reported came from the National Science Foundation, the American Heart Association, Inc., and the Kansas University Endowment Association. Catalogue numbers of The University of Kansas Museum of Natural History are cited. The latitude (N) and longitude (W) are recorded to the nearest minute for each locality mentioned.

**Artibeus lituratus palmarum** J. A. Allen and Chapman.—Specimens from Eldorado (24°19', 107°20'), Sinaloa, extend the known range of the species approximately 265 miles northwestward from Huajimic (21°37', 104°21'), Nayarit. Skins and skulls of 11 specimens (75211-75221, 7 males and 4 females) taken on November 13, 1957, 1 mi. S Eldorado, were prepared by William L. Cutter. Skeletons of 12 specimens (75222-75233, 3 males and 9 females) from Eldorado were obtained by Cutter on the same day. None of the 13 females was pregnant. One specimen (75211, female) is immature; it has open phalangeal epiphyseal sutures (as do four other larger individuals); this specimen measured 83 mm. in total length, weighed 45 grams, and has a skull 26.6 mm. in greatest length, 22.4 mm. in condylocanine length, 13.4 mm. in lambdoidal breadth, and has unusually small second (last) upper molar teeth, each having about one half the occlusal area of the M2 of the average adult in the series. None of the 23 specimens has a third upper molar. All except one have both third lower molars; one (75233) lacks the third lower molar on both sides of the jaw. Facial stripes vary from conspicuous to inconspicuous, but are evident in each of the 11 skins. The two skins having the darkest pelage are both of males and are the only two skins having open epiphyseal sutures. Five adult males and three adult females are represented by skins. Three of the male skins are slightly darker and less reddish than those of the three females, and the contrast between paler neck and shoulders and other parts is slightly less marked. The other two males are paler and more rufous than the three females; the palest and most rufous of these two males is an old individual having well-worn teeth. Dichromatism is not correlated with age or with sex in this series, which, therefore, differs from specimens reported by Lukens and Davis (1957:9) who observed that dichromatism was correlated with sex. In size, as shown in measurements below, in darkness of ventral pelage, and in cranial features the specimens from Sinaloa agree with those from Guerrero, and differ from specimens of *Artibeus jamaicensis*, in the ways described by Lukens and Davis (*loc. cit.*).

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Average measurements of males and females do not differ significantly. The following are average and extreme measurements in millimeters of 17 adults (lacking epiphyseal sutures): total length, 93.4 (90-99); length of hind foot, 19.8 (19-21); length of ear, 23.8 (23-26); length of forearm, 65.2 (60.1-70.6); greatest length of skull, 29.24 (28.0-30.2); condylocanine length, 25.25 (24.2-26.4); lambdoidal breadth, 15.92 (15.3-16.6); postorbital constriction, 6.29 (5.8-6.9); and weight (in grams), 63.2 (51-69).

**Artibeus jamaicensis jamaicensis** Leach.—A female (61088) obtained on June 18, 1954, by Albert A. Alcorn, from 32 mi. SSE Culiacan (24°26', 107°07'), Sinaloa, extends the known range of the species approximately 415 miles northwestward from 2 mi. N. Ciudad Guzmán (19°43', 103°28'), Jalisco. Two other females (61089-61090) from central Sinaloa, collected on June 19, 1954, by A. A. Alcorn, are from 1/2 mi. E Piaxtla (23°51', 106°38'). Each of the three specimens contained a single embryo. The embryos (in the order the specimens are listed above) measured 28, 26, and 25 millimeters. The Sinaloan specimens are both paler and browner than specimens from Jalisco and from eastern México, and the facial stripes are more distinct, being as distinct in one specimen (61088) as in any of the *Artibeus lituratus* reported here. Four additional specimens from Jalisco are: 34232-34235, 3 males and 1 nonpregnant female taken by J. R. Alcorn at Hacienda San Martín (20°18', 103°30'), 18 mi. W Chapala, 5000 feet, on July 12, 1949. Each specimen of *A. jamaicensis* listed above lacks epiphyseal sutures and both an upper and a lower third molar on each side. In size, coloration of ventral pelage, and configuration of skull,

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the specimens agree with the description of specimens from Guerrero and differ from other species as reported by Lukens and Davis (1957:7, 9).

Minimum and maximum measurements in millimeters for the three *A. jamaicensis* from Sinaloa, followed by corresponding figures for the four from Jalisco, are: total length, 80-82, 82-84; length of hind foot, 15-16, 16-17; length of ear, all 20, 20-21; length of forearm, 54.7-55.9, 54.7-58.5; greatest length of skull, 26.6-27.3, 26.5-28.2; condylocanine length, 22.6-23.2, 22.5-23.9; lambdoidal breadth, 13.9-14.5, 13.7-15.1; and postorbital constriction, 6.2-6.6; 6.3-6.7.

**Artibeus hirsutus** Andersen.—One specimen (25053, in preservative) of a series from 1/4 mi. W Aduana (27°02', 109°03'), 1600 feet, Sonora, was cited by Hall and Kelson (1959:136) and reproductive data from two skins (24841-24842) were mentioned earlier by Cockrum (1955:490). In addition to these three specimens the series includes 20 specimens in preservative (25052, 25054-25072). All were collected on May 16, 1948, by J. R. Alcorn. Number 25070, on deposit in the Institute of Biology in Mexico City, and two others (25053-25054) are not on hand as I write this, and have not been examined by me. *Artibeus hirsutus* has recently been found in northern Sinaloa and in southwestern Chihuahua. Three males (75208-75210) from El Fuerte (26°24', 108°41'), Sinaloa, were obtained on December 10, 1957, by William L. Cutter. Four specimens (79441-79444, 2 males and 2 females) were captured in mist nets on the north bank of the Río Septentrión, 1-1/2 mi. SW Tocuina (27°07', 108°22'), 1500 feet, Chihuahua, on July 18, 20, and 21, 1958, by Kenneth E. Shain and me. I captured another (79445, a male) in a hand net in an abandoned, horizontal mine shaft on the north side of the Río Batopilas, at about 3500 feet elevation, across the canyon from the village of La Bufa (27°09', 107°33'), Chihuahua, on July 10, 1958. Eight specimens (12406-12413) in the Museum of Natural History at the University of Illinois were collected on July 22 and 23, 1956, in Santo Domingo Mine (26°55', 109°05'), 7 mi. SW Alamos, Sonora, by W. Z. Lidicker, W. H. Davis, and J. R. Winkelman. Eight specimens (9981-9988) in the Los Angeles County Museum were collected on July 26, 1953, by Kenneth E. Stager, 5 mi. W Alamos in an old mine tunnel at Aduana. One (36581) of six specimens (36581-36586, 4 males and 2 pregnant females) from 2 mi. ENE Tala (20°39', 103°40'), 4500 feet, Jalisco, was reported by Hall and Kelson (1959:136); the locality being erroneously cited as 8 mi. ENE Tala. These six specimens were collected by J. R. Alcorn on February 28, 1950.

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The 59 specimens from Guerrero are distributed by localities as follows: 8 mi. N, 1 mi. W Teloloapan (Teloloapan is at 18°18', 99°54'), 3600 feet, 15 specimens (66432-66446, all males, including one skeleton and two in preservative) obtained by Robert W. Dickerman on February 7, 1955; Alpixafia, 4 kms. NW Teloloapan, 1540 M., 16 specimens (35219-35234, 5 males and 11 females) obtained by Bernardo Villa R. on May 22 and 23, 1949; 1 mi. N Teloloapan, 7 specimens (66447-66453, all males, including one in preservative) obtained by Dickerman on February 8, 1955; 4 kms. SE Teloloapan (Cerro Piedras Largas), 1760 M., 15 specimens (35310-35324, 12 males and 3 females) obtained by Villa R. on October 20 and 21, 1948; Puente de Dios, 1700 M., Yerbabuena (= 8 mi. N, 1 mi. W Teloloapan), six specimens (28408-28413, 4 males and 2 females) obtained by Villa R. on July 25 and 29, 1948. Six of the 16 Guerreran specimens taken in May are young as shown by the open epiphyseal sutures; all other Guerreran specimens lacked these sutures. Of 13 adult females from Guerrero, only two, taken in May, contained embryos (one embryo in each).

Average and extreme measurements in millimeters of 28 adult Guerreran *A. hirsutus* of both sexes (the sexes are not significantly different) are as follows: total length, 79.5 (69-90); length of hind foot, 15.1 (12-17); length of ear, 21.1 (19-24); length of forearm, 55.8 (53.1-57.8); greatest length of skull, 27.11 (26.3-28.0); condylocanine length, 22.92 (22.1-23.5); lambdoidal breadth, 14.23 (13.7-14.6); postorbital constriction, 6.51 (6.2-6.8); and weight (in grams), 37.4 (34.0-42.6).

The presence or absence of the third molar tooth was recorded for 88 specimens (28 from Sonora, Sinaloa, and Chihuahua, and 60 from Guerrero and Jalisco). The third molar tooth is present on both sides of the lower jaw in all specimens except one (12413 Univ. Illinois) from Sonora which lacks both upper and lower third molars. The upper third molar is usually present on both sides. The exceptions are as follows: the above mentioned Sonoran specimen and one other Sonoran specimen, one specimen from La Bufa, Chihuahua, two from Jalisco, and five from Guerrero lack the tooth on both sides; two specimens from Guerrero and one from Sonora lack the tooth on only one side. Facial stripes are absent or present but inconspicuous in all specimens recorded here. The generally grayish hue, hairiness of interfemoral membrane, and configuration of skull described by Lukens and Davis (1957:7) for *A. hirsutus* are evident in all the specimens reported here. Skins of three adults from Sonora and Chihuahua are slightly browner and somewhat paler than skins of adults from Jalisco and Guerrero.

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Reproductive data from Sonora and Chihuahua are as follows: of the five Chihuahuan specimens, two are immature (open epiphyseal sutures); the one adult female (79443) contained a single embryo 28 mm. in crown-rump length. Eight of 20 Sonoran specimens taken in May are females, each of which lacks epiphyseal sutures, and each contained one embryo. One embryo measured 8 mm. in length of uterine enlargement; all others are longer than 20 mm. from crown to rump, but vary in stage of development, some having no pigmentation in the membranes and others having pigmentation. The forearm is only 42 mm. long in one young male from Sonora. Three of 8 Sonoran specimens taken in July had open epiphyseal sutures but were of adult size. In summary of the reproductive data by states, *Artibeus hirsutus* is known to bear embryos in the following months: May in Sonora, July in Chihuahua, February in Jalisco, and May in Guerrero. These data,

along with the presence of embryos and young of various ages among specimens taken at the same place and time, indicate that the species does not have a restricted breeding season.

A geographic overlap of the ranges of *A. hirsutus* and *A. jamaicensis* from Guerrero to central Sinaloa is now known. But the two species have not been taken at the same place within this region of overlap.

**Other species.**—At the locality on the Río Septentrión, 1500 feet, 1-1/2 mi. SW Tocuina, Chihuahua, from which specimens of *A. hirsutus* were obtained as mentioned previously, several other species of tropical bats were captured, including *Desmodus rotundus murinus* Wagner, *Glossophaga soricina leachii* (Gray), *Chilonycteris parnellii mexicana* Miller, *Sturnira lilium parvidens* Goldman, and *Chiroderma* (specimens not yet certainly identified to species). The canyon of the Río Septentrión is steep and rocky, the tropical vegetation occurs only in the bottom of the canyon, and unless construction of a railroad had been in progress the area could have been reached only after several days by means of a pack train. From a distributional standpoint the occurrence of *Sturnira* and *Chiroderma* 1-1/2 mi. SW of Tocuina is of unusual interest.

The published record of *Sturnira lilium* nearest to Tocuina is from 2 mi. N Ciudad Guzmán (19°43', 103°28'), Jalisco, and the nearest published record of the genus *Chiroderma* is of *Chiroderma isthmicum* from Presidio (18°37', 96°47'), Veracruz (Hall and Kelson, 1959:126, 134). The Chihuahuan specimens extend the known range of *Sturnira lilium* approximately 585 miles northwestward and that of the genus *Chiroderma* approximately 920 miles northwestward from the localities noted above. Five specimens (79434-79438) of *Sturnira lilium*, two adults and three immature individuals, were taken from July 18 to July 22, 1958, by the author and Kenneth E. Shain, as also were the two (79439-79440) *Chiroderma*.

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To the list given by Koopman and Martin (1959:9) of neotropical genera known to range farther north on the west coast of North America than on the east coast there can now be added *Artibeus*, *Sturnira* and *Chiroderma* (as noted above), *Anoura*, *Choeronycteris* and *Leptonycteris* (Hall and Kelson, 1959:119, 120, 122; Hoffmeister, 1959:18), and *Liomys* (Hall and Kelson, 1959:536).

In view of these additional genera, and others that almost certainly remain to be discovered farther north on the west coast, the suggestion by Koopman and Martin (1959:11) that species inhabiting humid tropical habitats, in general extend farther north on the east coast of Mexico than on the west coast may need to be reconsidered. On the west coast, areas of more humid tropical vegetation and climate are more distant from the coastline as one proceeds northwestward from Nayarit to Sonora. The broad band of humid tropical vegetation along the coast is progressively reduced in width, and crowded back against the mountains, and still farther north consists of only small scattered remnants that are difficult to visit, in the bottoms of deep canyons.

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Both variations, Mexico (3 times) and México (4 times) are used.

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