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#### NOTEWORTHY RECORDS OF BATS FROM BOLIVIA

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Bolivia, a land-locked country of approximately a million square kilometers, lies immediately north of the Tropic of Capricorn and has a varied physiography, including high mountains and the Altiplano in the west, low altitude (less than 300 meters) tropical forest in the north and northeast, and the savannas and swamps of the Chaco in the east and southeast. Between the mountains and the eastern lowlands lie the alternating ridges and intermontane valleys of the eastern Andean slope, which form the watersheds of the Beni and Mamoré rivers.

Despite the vastness and varied environments of Bolivia, little mammalogical research has been carried out there. Most records of bats from the country are found in systematic revisions, the only comprehensive checklist being that of Cabrera (1958), which treats all of South America. More recently, a synopsis of the family Phyllostomidae was provided by Jones and Carter (1976), and in the same volume Koopman (1976) listed some new records from Bolivia of species in that family.

In the summers of 1978 and 1979, one of us (Webster) collected more than 500 bats in the upper Río Beni drainage system of northwestern Bolivia. Seven species reported herein are unrecorded previously from that country. Several other records of taxa are included in order to provide representative measurements of Bolivian specimens or to clarify their taxonomic status. All measurements are recorded in millimeters and all weights are in grams; length of forearm includes the wrist. Reproductive data are included to augment those summarized by Wilson (1979). All

specimens are deposited in The Museum, Texas Tech University, or The Muséum, Michigan State University.

Bats were collected from four localities along the Amazonian slope of the Andes in the Departamento de La Paz. Tomonoco (2 km. W Puerto Linares, *ca.* 350 m.) is a small military outpost, enveloped by virgin tropical forest, adjacent to the Río Beni. The surrounding knolls support broadleaf evergreen bushes, a continuous lower canopy, and a broken upper canopy. Serrania Bellavista (35 km. N Caranávi, *ca.* 1650 m.) is a tea plantation, along with banana, citrus, and cacao orchards, that is encircled by tropical cloud forest. Caranávi (606 m.) is a town of approximately 1000 inhabitants in the Andean foothills and is adjacent to the Río Coroico. It is surrounded by banana, citrus, and mango orchards, and disturbed areas of secondary growth. Sacramento Alto (8 km. N. Chuspipata, *ca.* 2575 m.) is an abandoned highway camp that is surrounded immediately by eucalyptus and cypress trees and then by steep slopes of humid subtropical forest. Caranávi and Puerto Linares appear on modern maps of Bolivia; Sacramento Alto is located approximately at latitude 16°15'S and longitude 67°50'W.

Appreciation is extended to J. Van Remsen, Jr., of Louisiana State University, who collected bats at Serrania Bellavista and Sacramento Alta, and to personnel from the University of North Carolina at Wilmington, who assisted in field work at Tomonoco. Financial support was received from The Museum, Michigan State University (1978-1979), and The Museum, Texas Tech University (1979).

#### ACCOUNTS OF SPECIES

*Rhynchonycteris naso* (Wied-Neuwied, 1820).—One male from Tomonoco constitutes the first record of this Amazonian lowland species from Bolivia, although it has been reported previously from as far south as Brazil and Perú. Our specimen was netted over a sand and boulder floodplain of the Río Beni on 28 July. The testes measured 3 by 2.

*Choeroniscus minor* (Peters, 1868).—A male from Tomonoco provides the first record of a bat of this genus from Bolivia. Our specimen (testes 2 by 2) was netted over a recently-bulldozed path in disturbed evergreen forest on 17 July. It is tentatively referred to as *C. minor*, which has been reported in South America from as far south as Brazil and Perú. Selected measurements are: length

of forearm, 35.1; greatest length of skull, 22.0; length of maxillary toothrow, 7.4.

*Rhinophylla pumilio* Peters, 1865.—This common Amazonian lowland species is known from throughout much of northern South America, but has not been recorded previously from Bolivia. At Tomonoco, we netted 12 individuals in banana groves and over a small stream in a dense evergreen forest in late July. No reproductive activity was noted in seven females. Testes averaged 5.8 by 4 in five males. Selected measurements (average, with extremes in parentheses) of the 12 adults are: total length, 50.8 (43-57); length of hind foot, 7.6 (6-9); length of ear from notch, 12.8 (11-14); length of forearm, 34.7 (32.3-36.7); greatest length of skull, 19.3 (18.7-20.0); length of maxillary toothrow, 5.1 (4.9-5.3).

*Sturnira magna* de la Torre, 1966.—This large member of the genus *Sturnira* has been recorded previously from the Amazonian drainage in Columbia, Ecuador, and Perú (Jones and Carter, 1976; Koopman, 1978). An adult male, netted at Tomonoco on 19 July, is the initial record of this species from Bolivia. The testes measured 7 by 4. Selected measurements are: length of forearm, 58.4; greatest length of skull, 29.4; length of maxillary toothrow, 7.5.

*Sturnira ludovici ludovici* Anthony, 1924.—A total of four females and five males from Tomonoco (two females), Serrania Bellavista (a male), and Sacramento Alto (four males, two females), are the first representatives of this bat to be reported from Bolivia. Average length of forearm and weight (extremes in parentheses) of six adults are 45.7 (44.9-46.6) and 21.7 (19.0-23.7), respectively. One female collected on 3 August carried a fetus that was 5 in crown-rump length.

*Sturnira erythromos* (Tschudi, 1844).—Four August-taken individuals from Sacramento Alto constitute the first record of this species from Bolivia. Length of forearm (extremes in parentheses) of three adult females and one adult male averaged 40.7 (38.8-42.4). All females were pregnant (crown-rump lengths of fetuses 14.5, 14, 10). The one male weighed 15.4.

The genus *Sturnira* is represented in Bolivia by at least four species. *Sturnira magna* is distinguished easily from the others by its large size. Among the smaller *S. ludovici*, *S. lilium*, and *S. erythromos*, lingual cusps on the lower molars are prominent in *lilium*, but absent in *ludovici* and *erythromos*. The latter two spe-

cies can be recognized on the basis of size (see measurements and weights).

*Chiroderma trinitatum trinitatum* Goodwin, 1958.—Koopman (1976) reported this lowland species from three localities in northern Beni. We collected five adults at Tomonoco that provide the southernmost record for this bat. No reproductive activity was noted in three July-taken females. Selected measurements (average, with extremes in parentheses) of three females and two males are: length of forearm, 41.6 (39.7-43.2); greatest length of skull, 23.3 (22.9-23.5); length of maxillary tooththrow, 7.8 (7.7-8.0).

*Mesophylla macconnelli macconnelli* Thomas, 1901.—This widespread Amazonian species also was recorded by Koopman (1976) from northern Beni. In late July, we collected eight adults at Tomonoco, which locality represents the southernmost known distribution of this species. One female had a fetus with a crown-rump length of 6; testes of four adult males average 3 by 2.3. Selected measurements (average, with extremes in parentheses) of four females and four males are: length of forearm, 31.6 (30.4-32.7); greatest length of skull, 18.5 (18.3-18.8); length of maxillary tooththrow, 6.3 (6.1-6.4).

*Artibeus anderseni* Osgood, 1916.—Six specimens of small *Artibeus* representing two species were collected at Tomonoco in late July. These are referable to *A. anderseni* and *Artibeus cinereus pumilio* on the basis of meristic and morphological differences (see Koopman, 1978). *A. anderseni* lacks a third lower molar and has a short rostrum and an abrupt forehead; *A. c. pumilio* possesses a small third lower molar and has a less abruptly rising forehead and a longer rostrum. In addition, specimens in our sample of *A. anderseni* are conspicuously smaller than those representing *A. c. pumilio*.

Selected external and cranial measurements of an adult male and female of *A. anderseni* are, respectively: length of forearm, 37.2, 37.4; greatest length of skull, 19.3, 19.1; length of maxillary tooththrow, 6.2, 5.9. Averages of the same measurements (extremes in parentheses) of four adult *A. c. pumilio* (three females and one male) are: 40.2 (39.7-40.6); 20.5 (20.1-20.6); 6.6 (6.5-6.7).

*Artibeus fuliginosus* Gray, 1838.—We collected three large species of the genus *Artibeus* in northern Bolivia. The largest of these, *Artibeus lituratus lituratus*, has prominent facial stripes and a conspicuous supraorbital shield, but lacks a third upper molar and frosting on the abdominal pelage. The other two species are

TABLE 1.—Some external and cranial characteristics of three species of large *Artibeus* from Bolivia.

Characteristic	<i>A. lituratus</i> (3 ♀, 9 ♂)	<i>A. planirostris</i> (8 ♀, 7 ♂)	<i>A. fuliginosus</i> (5 ♀, 14 ♂)
Length of forearm	71.4 (68.6-74.7)	64.6 (60.2-67.2)	59.8 (55.7-61.6)
Greatest length of skull	32.3 (31.3-33.2)	30.8 (29.9-31.7)	27.9 (27.1-28.9)
Zygomatic breadth	19.4 (18.2-20.1)	18.7 (17.8-19.5)	16.7 (15.8-17.2)
Maxillary tooththrow	11.2 (10.8-11.7)	11.0 (10.6-11.3)	9.8 (9.4-10.2)
Length of dorsal fur	7-9	7-10	8-12
Color of tragus	yellow tipped	brown	dark brown to blackish
Color of dorsum	reddish brown	grayish brown	dark brown to blackish
Color of shoulder	paler than dorsum	frosted	about same as dorsum
Eye stripes	prominent	usually faint	usually absent
Third upper molar	absent	present	present

smaller, lack prominent facial stripes and a distinct supraorbital shield, but possesses the third upper molar and a frosted venter; these two are distinguishable by size and coloration of pelage. The smaller of the two is dark brown to blackish dorsally, whereas the larger is generally grayish brown.

Tuttle (1970) recorded three large species of *Artibeus* from Perú, allocating these to *A. lituratus*, *A. jamaicensis*, and "*A. species.*" Jones and Carter (1976) listed *A. l. lituratus* and *A. j. planirostris* from Bolivia, in addition to "an undescribed species from Amazonian Ecuador, Perú, and adjacent areas." Koopman (1978) subsequently concluded that the long-named *A. fuliginosus* was in fact the "undescribed" Amazonian species. He also found that Peruvian specimens of *A. planirostris* were distinct from *A. jamaicensis* of northern South America. Following Koopman, we refer the small blackish brown species to *A. fuliginosus* and the medium-sized grayish brown species to *A. planirostris*. Diagnostic characters for three species of large *Artibeus* from Tomonoco and Caranavi are in Table 1.

*Enchisthenes hartii* (Thomas, 1892).—An adult male from Tomonoco is the first specimen of this species to be reported from Bolivia. It was netted over a small creek in dense evergreen forest on 2 August. The testes measured 8 by 5. Selected measurements are: length of forearm, 40.8; greatest length of skull, 21.1; length of maxillary tooththrow, 6.3.

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