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ON THE BATS OF WESTERN MINAS GERAIS, BRASIL

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From February through May 1978, the authors surveyed the mammal fauna in the vicinity of Serra da Canastra National Park and São Roque de Minas in the state of Minas Gerais, Brasil. The areas studied lie about 250 km. W Belo Horizonte, the state capital, at approximately 21°S, 47°W. This paper reports on the bats collected during the survey period.

A search of the published literature revealed only one record of a bat from the region, a specimen of *Myotis nigricans* reported from Piumí, about 60 km. E São Roque, by LaVal (Sci. Bull., Los Angeles Co. Mus. Nat. Hist., 15:1-54, 1973). It therefore seems timely to record the occurrence of additional species from that area.

Serra da Canastra is a high, narrow plateau, with an east-west orientation, varying between 1033 and 1493 meters in elevation; the highest points are on the east end. On the north, east, and south, the plateau border consists of steep slopes and cliffs some 300 or more meters high. The Rio São Francisco, one of eastern Brasil's principal rivers, has its source on the southeastern part of the plateau, and leaves it via a narrow gorge and a 200-meter waterfall, the Casca d'Anta (See Fig. 1).

The village of São Roque lies about eight kilometers northeast of the eastern tip of the plateau and is approximately 400 meters lower in elevation. The terrain surrounding São Roque is hilly, dissected by streams in steep-sided valleys. The original vegetation seems to have been continuous forest. Although lower slopes of the hills have been cleared for pasture, and the less declivitous

areas are planted to a great variety of crops, many of the hilltops still retain caps of dense forest. Road cuts in this populous area reveal a sandy topsoil of great depth, usually without any evident subsurface horizons. As one would expect, erosion is severe during the rainy season, and the streams carry a heavy silt burden.

By contrast, the plateau itself has a rocky core (principally of Precambrian rock), with much of the median ridge covered with a layer of lateritic iron nodules, either at or near the surface. This impervious crown capping the plateau resists water penetration, resulting in rapid runoff during the summer rainy season, which in turn produces steeply sloping stream banks. These streams end in falls or cataracts where they finally reach the border of the rocky uplift.

The vegetation of the plateau is principally grassland, and records of early exploration indicate that it was the same as early as 1814. Several individual ranches (*fazendas*) occupy the plateau, and grazing seems to have been continuous for at least 150 years. During that time, frequent burning in the dry season seems to have become a general practice, and in recent years has been so extensive that any part of the plateau could be expected to have been burned within the previous three to five years. As a result, even those upland areas with sufficient depth of soil to support tree growth are vegetated mostly with shrubs, and the few trees present are fire scarred. True forest, consisting of tall trees, palms, tree ferns, and vines, is limited to the vicinity of streams and is only a few meters wide, except in the few places where the confluence of two or more large streams converge. At those points, forest areas are often more extensive and encompass several hectares. Near the sources of small streams, the woody vegetation has become progressively reduced until nothing but shrubs remain. The branches of these shrubs interlock over the water to form a green tunnel.

The only parts of the plateau where there has been any cultivation is adjacent to the scattered ranch houses, where the occupants maintain small kitchen gardens and orchards. Brazilian orchards nearly always contain citrus trees of several varieties, and often have mangoes, cashews, and other tropical fruiting trees as well. Bananas are often planted adjacent to woody orchards, but are usually peripheral, and one often finds clumps of bananas where there are no other fruit-bearing plants. Spaces between clumps of bananas, as well as the areas below the branches of large trees and between rows of fruit trees, are excellent places to set mist nets.

Other good netting spots include places where trails cut through the shrubby cover along small streams. By contrast, no bats were taken in nets set in dry forest, along the forest edge adjacent to grassland, or in the vicinity of large rocky outcrops.

One small cave harboring a colony of vampires, *Desmodus rotundus*, was discovered. However, it is located on a cliff near the north park boundary (Fig. 1, site A) and is accessible only by rope; thus, mist netting was impractical. Furthermore, the narrow confines of the cave made hand-netting impossible. With the exception of these vampires, all bats discussed in this paper were taken in mist nets.

Collecting sites included seven localities within the park boundaries (see Fig. 1) and four in the vicinity of São Roque. The localities within the park are as follows: *Station 1*, Fazenda Chico Cera; two nets were set in the orchard on 29 March and one was set across the headwater stream of Corrego Mata Cavalo on 4 April. *Station 2*, Campsite beside riverine forest near headwaters of Corrego do Barbaro; one net was set along a path through the forest on 7 and 8 April. *Station 3*, Fazenda das Pedras at the junction of Corrego das Rolinhos and Corrego dos Cochos; one net was set beside the riverine forest and another was set between two clumps of banana plants on the evenings of 15, 16, and 8 April. *Station 4*, A fazenda called "weather station" about 5 km. W headwaters of Rio São Francisco, alongside a large brush-covered rockpile; two nets were set beside the rocks on 23 February. *Station 5*, Campsite above Casca d'Anta waterfall; one net was set on 10 and 13 May across the Corrego das Lavras. *Station 6*, Fazenda Casca d'Anta about 2 km. below waterfall; nets were set on 20, 21, and 23 May and at campsite one kilometer upstream from Fazenda Casca d'Anta (not marked separately from Station 6); two nets were set on 19 May, one across a road and one across a path entering the forest below the waterfall.

The four collecting sites outside the park do not appear on Fig. 1. They are: 1) In the yard of a home in São Roque; two nets were set on 3 March. 2) Fazenda Itamar about 5 km. S São Roque on the park road; two nets were set on 16 and 17 March. 3) Fazenda Rio do Peixe, 1 km. W São Roque; one net was set in a banana orchard 26 and 27 February, and one was set beside a cattle shed on 26 February and moved to a mango orchard on 27 February. 4) Fazenda Estiva about 6 km. NE São Roque; two nets were set in an orchard of mixed large fruit trees on 18 and 20 February.

Family PHYLLOSTOMIDAE

Phyllostomus hastatus.—Four specimens were collected as follows: Station 1, Faz. Chico Cera orchard (1); Faz. Itamar (1); and Faz. Rio do Peixe (2). One male from Rio do Peixe had testes measuring 16 by 6 mm.

Miconycteris minuta.—A single specimen of this species was taken at Station 6 above Casca d'Anta.

Glossophaga soricina.—Four of these bats were taken, all at Faz. Estiva.

Anoura geoffroyi.—Eighteen bats of this species were collected at Station 1, Faz. Chico Cera over Corrego Mata Cavallo (2); São Roque (1); Faz. Itamar (6); and Faz. Estiva (9).

Anoura caudifer.—Fourteen individuals were obtained as follows: Station 6, Faz. Casca d'Anta (2), one male with testes 6 by 6 mm.; Station 3, Faz. das Pedras (1), male with testes 6 by 5 mm. and epididymides partly distended; and Faz. Estiva (11).

Carollia perspicillata.—Seven specimens were collected: Station 1, Faz. Chico Cera over Corrego Mata Cavallo (4); and Faz Estiva (3).

Sturnira lilium.—Thirty-eight of this common phyllostomid were netted at the following localities: Station 1, Faz. Chico Cera in the orchard and over Corrego Mata Cavallo (7), one male had testes 6 by 4 mm.; Station 3, Faz. das Pedras (3), two males were juveniles with swollen knuckles; Station 6, Faz. Casca d'Anta (9), two males had testes 2 by 3 and 5 by 4 mm., respectively; Faz. Itamar (5); Faz. Rio do Peixe (3), one a lactating female; and Faz. Estiva (11), one a lactating female.

Artibeus lituratus.—Four of these bats were collected: Faz. Itamar (1); Faz. Rio do Peixe (1); and Faz. Estiva (2). These specimens seem large for *A. lituratus*, one with a forearm of 73 mm. and the others measuring approximately 78.

Vampyrops lineatus.—Ten specimens were taken as follows: Station 1, Faz. Chico Cera orchard (1); Station 3, Faz. das Pedras (5); Station 6, Faz. Casca d'Anta orchard (1); and Faz. Rio do Peixe (3).

Desmodus rotundus.—Ten vampires were captured: Station 1, Faz. Chico Cera over Corrego Mata Cavallo (1); Station 6, Faz. Casca d'Anta orchard (4), one male with testes 9 by 8 mm., one with testes 8 by 7, and one female carrying a full-term fetus; and Faz. Rio do Peixe (5). As previously mentioned, about 25 of these bats were seen in the cave at Site A (Fig. 1). Horses with vampire bites were observed at Faz. Rio Peixe, Faz. Estiva, and at Faz. dos

Candidos, which lies inside the park boundary about 15 km. W Casca d'Anta.

Family VESPERTILIONIDAE

Myotis nigricans.—Three of these small bats were collected: one, which escaped from a holding cage, was netted over the Corrego Mata Cavallo at Faz. Chico Cera (Station 1); and two were taken from Station 5 above Casca d'Anta. A fourth specimen escaped from a net set beside a house in São Roque, the roof of which harbored a small colony of bats presumed to be this species. LaVal (*op. cit.*) indicated that *nigricans* is the only species of *Myotis* known to occur in western Minas Gerais.

Lasiurus ega.—Three specimens were netted, all from around banana plants at Station 3, Faz. das Pedras. One male had large testes and engorged epididymides.

DISCUSSION

A total of 116 specimens of 12 species was collected during 37 net nights, for an average of 3.14 bats per net night. However, nets set at Station 6 (not in the orchard), at Stations 2 and 4, a total of six net nights, yielded no bats. Productive nets caught an average of 3.74 bats per night. All productive nets were set either in or near orchards, or were across streams bordered by bushes.

Of the species taken, five are frugivorous (*Phyllostomus hastatus*, *Carollia perspicillata*, *Artibeus lituratus*, *Vampyrops lineatus*, and *Sturnira lilium*) and three (*Glossophaga soricina*, *Anoura geoffroyi*, and *Anoura caudifer*) are nectarivorous; of these, *Sturnira lilium* and *Anoura geoffroyi* were the only ones captured both in orchards and over water. Vampires were netted over water, in orchards, and around banana plantings. Of the 12 species collected, eight occurred both on the plateau and at lower elevations; two (*Micronycteris minuta* and *Lasiurus ega*) were taken only on the plateau, and two (*Glossophaga soricina* and *Artibeus lituratus*) were netted at a lower elevations. Of interest is the observation that all vampire bites observed were on horses. The residents of this part of Brasil insist that no animals except horses are ever bitten by vampires; no cattle or swine with vampire bites were observed during this study.

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Specimens are on deposit in the collections of IBDF (Minas Gerais), Cx. Postal 1304, 30.000 Belo Horizonte, MG, Brasil.

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