

# ANNALS of CARNEGIE MUSEUM

CARNEGIE MUSEUM OF NATURAL HISTORY

4400 FORBES AVENUE • PITTSBURGH, PENNSYLVANIA 15213

VOLUME 50

14 APRIL 1981

ARTICLE 4

## THE MAMMALS OF NORTHEASTERN BRAZIL: A PRELIMINARY ASSESSMENT

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### ABSTRACT

Mammals were collected in northeastern Brazil between 1975 and 1978. Research was concentrated in the State of Pernambuco in the environs of the Municipality of Exu and in the State of Ceará, in the Municipality of Crato. Additionally, a representative sample of mammals collected throughout the Caatingas and housed in the National Museum in Rio de Janeiro and the Museum of Zoology of the University of São Paulo was examined. Distributional data as well as ecological notes are presented in this preliminary report. Major collecting localities are also described.

### INTRODUCTION

#### *Background*

In 1974, initial efforts were made to examine various aspects of mammalian biology in the semiarid Caatingas of northeastern Brazil. This area is of particular interest because it is an extensive tropical

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Submitted 22 July 1980.



pocket of aridity bordered by more mesic habitat and may be important from a biogeographic perspective (Müller, 1973). Although the Caatingas has long played an important role in the culture and economy of Brazil (see for example James, 1942), the region has not been well studied, particularly from the point of view of its mammal fauna. Further, the entire region is greatly affected by human activities (agriculture, ranching, hunting), making it imperative to examine the area as soon as possible. Despite its broad extent and unique climate, previous studies have found that the Caatingas does not support significant numbers of endemic bird species (Sick, 1965) or lizards (Vanzolini, 1974). In this report we give a preliminary accounting of the mammals of the Caatingas, particularly those inhabiting the geographical center of the region near Exu, Pernambuco, and Crato, Ceará. We also include habitat descriptions and ecological notes on several species.

### *Objectives*

The major objective of our research was to examine the distribution and ecology of the mammals of the Caatingas. Although we originally intended to continue the field research beyond 1978, difficulties in funding ended field work in May of that year. During the two years of greatest activity (1976–78), we were able to examine the mammal fauna of the environs of the Municipality of Exu in some detail. We were also able to initiate detailed treatments of the behavioral ecology of *Kerodon rupestris*; the habitat selection and interspecific aggression of *Thrichomys apereoides*, *Galea spixii*, *Monodelphis domestica*, and *Didelphis albiventris*; and the community ecology and reproductive biology of the bat faunas of habitats supporting Caatingas and Cerrado vegetation. Finally, we hope to be able to clarify various taxonomic problems concerning Caatingas species, as well as to offer new data on the distribution and natural history of many species of mammals from this largely unstudied region. This preliminary report on the mammals of the Northeast will be a forerunner of more extensive faunal analyses which will appear as the final preparation of specimens is completed.

### *Personnel*

The primary field researchers involved in this study were Michael R. Willig, Karl E. Streilein, and Thomas E. Lacher, Jr. In addition, some specimens were collected by Michael A. Mares, and all of the above examined various localities throughout much of the Caatingas. Employees of AGGEU, under the direction of Celio Rodrigues de Almeida, occasionally provided specimens collected from the Municipality of Exu. Several specimens were collected by Alfred L. Gardner during a visit to Exu. Finally, some specimens were collected by Laurie J. Vitt. The project was coordinated by Mares, and at least one full-time field assistant was available for each investigator.



### Collections

Most of our collecting was done in the immediate area of the Municipality of Exu, Pernambuco, and the Municipality of Crato, Ceará, particularly on the Chapada do Araripe. Occasional collecting trips were made to other areas, but in comparison with the work performed in the Exu-Crato area, these were minor in scope. In order to obtain a better idea of mammal distribution patterns in the Caatingas, we examined the extensive collection of Caatingas mammals housed in the National Museum of Rio de Janeiro and the Museum of Zoology of the University of São Paulo. We also attempted to collect specimens in most of the major macrohabitats of the Northeast. The Northeast of Brazil contains five principal vegetation zones including: Rainforest along the Atlantic coast, Cerrado, Caatingas, Cerrado-Caatingas contact zone, and Palm Forest. We were able to do some collecting in each of these regions, but our samples are far from adequate to arrive at a definitive faunal assessment for any region.

During this study, 6576 mammal specimens representing seven orders, 21 families, 56 genera, and 74 species were collected. An additional 630 specimens representing four orders, six families, 16 genera, and 17 species were examined in museum collections. Upon completion of museum specimen processing, half of our collection will be housed in the Zoology Museum of the University of São Paulo and half will be housed in the Carnegie Museum of Natural History, Pittsburgh, Pennsylvania.

A complete list of species, including those observed but not captured, is as follows:

#### Order Marsupialia

##### Family Didelphidae

- Monodelphis domestica*
- Marmosa cinerea*
- Marmosa karimii*
- Didelphis albiventris*

#### Order Chiroptera

##### Family Emballonuridae

- Saccopteryx bilineata*
- Saccopteryx leptura*
- Peropteryx macrotis*

##### Family Noctilionidae

- Noctilio leporinus*

##### Family Mormoopidae

- Pteronotus davyi*
- Pteronotus parnellii*
- Pteronotus personatus*

##### Family Phyllostomatidae

##### Subfamily Phyllostomatinae

- Micronycteris minuta*
- Micronycteris* sp.
- Lonchorhina aurita*
- Tonatia bidens*
- Tonatia brasiliense*
- Mimon crenulatum*
- Phyllostomus discolor*
- Phyllostomus hastatus*
- Trachops cirrhosus*

##### Subfamily Glossophaginae

- Glossophaga soricina*
- Lonchophylla mordax*
- Anoura geoffroyi*

##### Subfamily Carolliinae

- Carollia perspicillata*

##### Subfamily Sturnirinae

- Sturnira lilium*

##### Subfamily Stenoderminae

- Uroderma bilobatum*
- Uroderma magnirostrum*
- Vampyrops lineatus*

- Artibeus cinereus*

- Artibeus concolor*

- Artibeus fuliginosus*

- Artibeus jamaicensis*

- Artibeus lituratus*

##### Subfamily Desmodontinae

- Desmodus rotundus*

- Diaemus youngii*

- Diphylla ecaudata*

##### Family Natalidae

- Natalus stramineus*

##### Family Furipteridae

- Furipterus horrens*

##### Family Vespertilionidae

- Myotis nigricans*

- Eptesicus furinalis*



- Rhogeessa tumida*  
*Lasiurus borealis*  
*Lasiurus ega*  
 Family Molossidae  
*Molossops abrasus*  
*Molossops greenhalli*  
*Molossops planirostris*  
*Molossops temminckii*  
*Neoplatymops mattogrossensis*  
*Tadarida laticaudata*  
*Tadarida* sp.  
*Eumops* sp.  
*Molossus ater*  
*Molossus molossus*  
*Promops* sp.
- Order Primates  
 Family Cebidae  
*Cebus apella*  
 Family Callithricidae  
*Callithrix jacchus*
- Order Edentata  
 Family Myrmecophagidae  
*Tamandua tetradactyla*  
 Family Dasypodidae  
*Euphractus sexcinctus*  
*Dasypus novemcinctus*
- Order Lagomorpha  
 Family Leporidae  
*Sylvilagus brasiliensis*
- Order Rodentia  
 Family Muridae  
 Subfamily Cricetinae  
*Oryzomys eliurus*  
*Oryzomys subflavus*
- Rhipidomys mastacalis*  
*Akodon* sp.  
*Akodon arviculoides*  
*Bolomys lasiurus*  
*Oxymycteris angularis*  
*Calomys callosus*  
*Calomys* sp.  
*Wiedomys pyrrhorhinos*  
*Holochilus brasiliensis*  
 Subfamily Murinae  
*Rattus rattus*  
*Mus musculus*  
 Family Caviidae  
*Kerodon rupestris*  
*Galea spixii*  
 Family Dasyproctidae  
*Dasyprocta prymnolopha*  
 Family Echimyidae  
*Proechimys* sp.  
*Thrichomys apereoides*
- Order Carnivora  
 Family Canidae  
*Cerdocyon thous*  
 Family Procyonidae  
*Procyon cancrivorus*  
 Family Mustelidae  
*Galictis vittata*  
*Conepatus semistriatus*  
 Family Felidae  
*Felis concolor*  
*Felis onca*  
*Felis yagouaroundi*
- Order Artiodactyla  
 Family Cervidae  
*Mazama gouazoubira*

### *Description of Study Sites*

The Caatingas is a vast semiarid region of northeastern Brazil (Fig. 1), occurring between approximately 35° and 45° west longitude and 3° and 16° south latitude (Reis, 1976). The area encompasses about 650,000 km<sup>2</sup> (Frota-Pessoa et al., 1971), or about 10% of the territory of Brazil (Reis, 1976). The region is rather anomalous in that it is the largest dry region contained within the tropics and is bordered by much more mesic habitats.

The climate of the Caatingas has been extensively studied by Markham (1972; see also Markham and McLain, 1977). Most of the Caatingas receives less than 500 mm of precipitation per year, although some areas receive more than 1600 mm of rain per year. The whole region is subject to unpredictable periods of aridity when rainfall over large areas will not exceed 200 mm per year. This has given the Caatingas the name Polygon of Drought (for example, Frota-Pessoa et al., 1971), and the effects of the periodic extreme aridity on the human populace are pronounced (James, 1942), particularly in localities in which annual rainfall plummets to zero for an entire year. Gener-



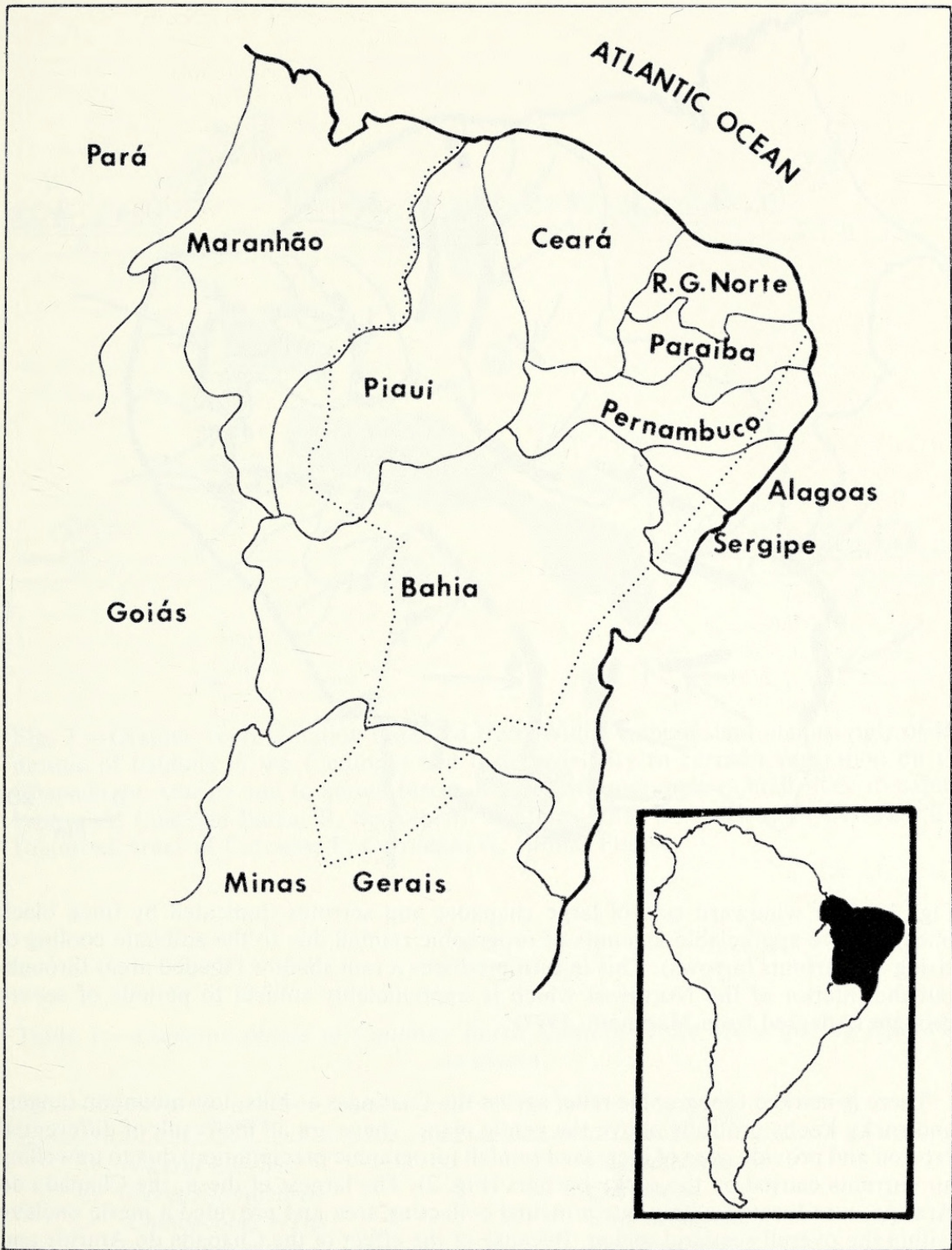


Fig. 1.—The Caatingas of Brazil (area enclosed by the dotted line) occupies an area of 650,000 km<sup>2</sup>, contained for the most part in the nine states of the Northeast.

ally, most rainfall over much of the Caatingas falls between December and April or May, with showers commencing in October (James, 1942). In particularly wet years, there may be no drought period at all, although usually each year contains at least several months with little or no precipitation when deciduousness is pronounced.



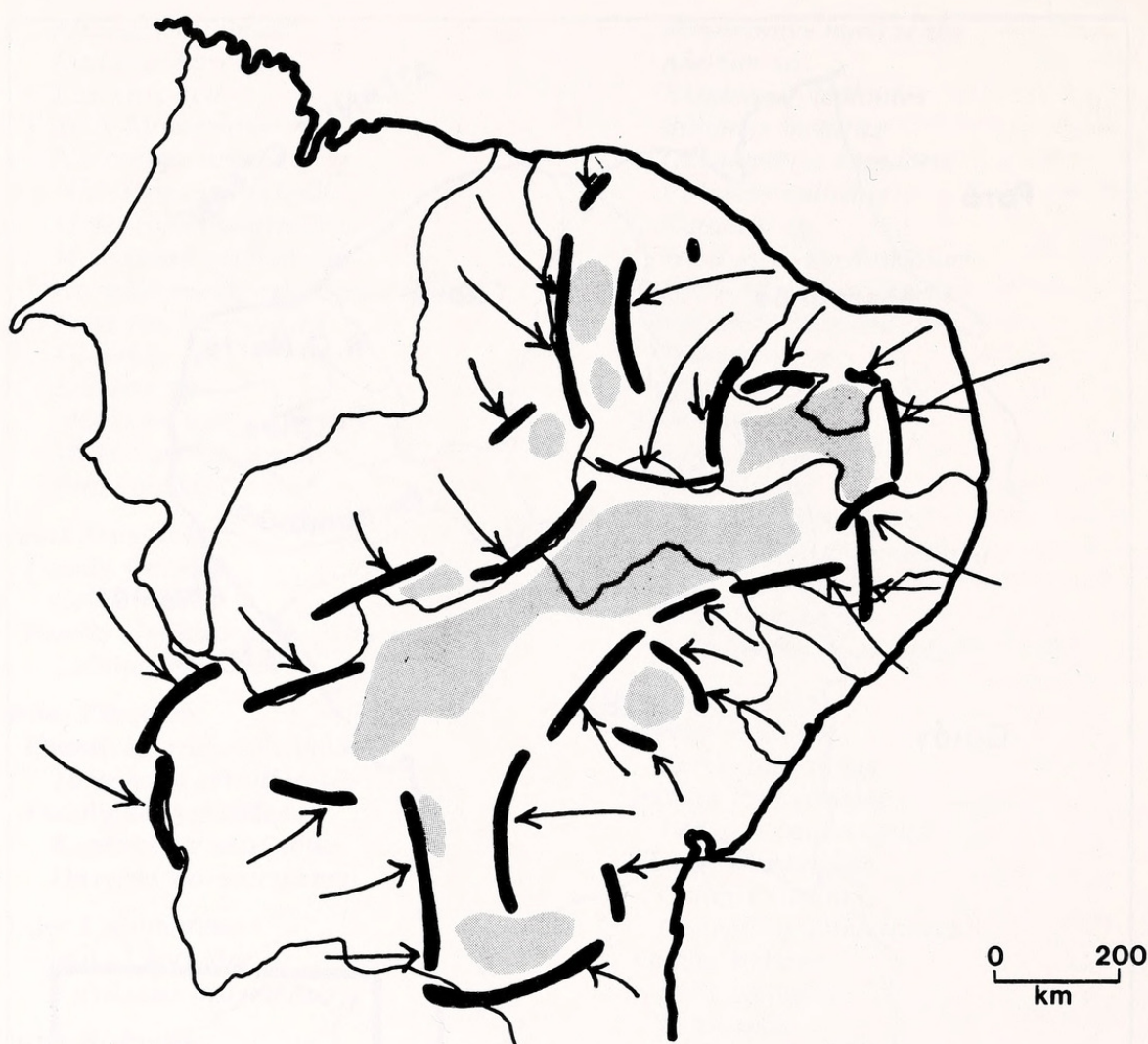


Fig. 2.—The windward side of large chapadas and serrotes (indicated by thick black lines) receive appreciable amounts of orographic rainfall due to the adiabatic cooling of rising air currents (arrows). This in turn produces a rain shadow (shaded area) throughout the interior of the Northeast which is unpredictably subject to periods of severe drought (Adapted from Markham, 1972).

There is marked topographic relief across the Caatingas as hills, low mountain ranges, and rocky knobs protrude above the gentle plain. These are all the result of differential erosion and provide sites of increased rainfall (orographic precipitation) due to upwelling air currents caused by the rocky barriers (Fig. 2). The largest of these, the Chapada do Araripe, was located within our principal collecting area and provided a mesic enclave within the overall semiarid region. Because of the effect of the Chapada do Araripe and other associated rocky hills, the Exu-Crato region provides a large diversity of habitat types, varying from very dry localities to quite mesic sites; vegetation on these sites varies in accordance with precipitation and is described below (Fig. 3). During the period of intensive study (1976–78), the Exu-Crato region experienced two years of high precipitation without a well-delineated drought period. The vegetation during this time did not undergo pronounced deciduousness.

A description of each collecting locality and a faunal list for each area follow.



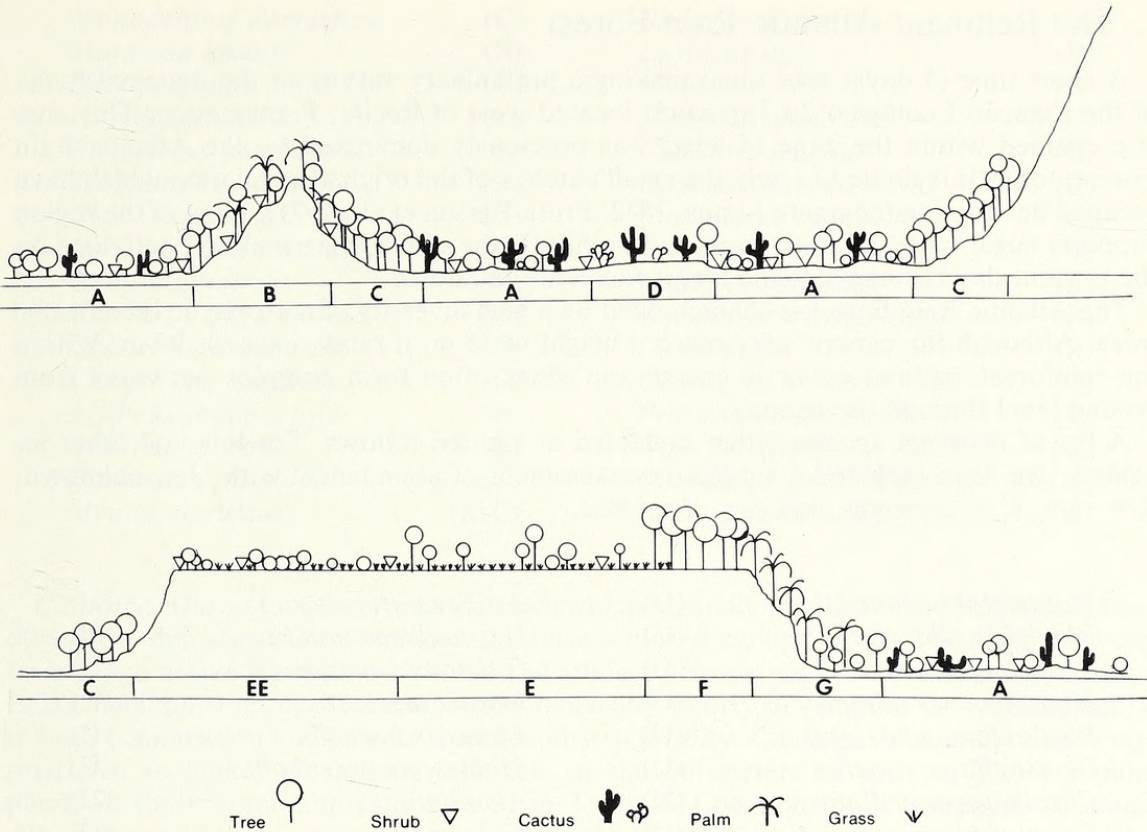


Fig. 3.—Graphic representation (adapted from Willig, unpublished manuscript) of the mosaic of habitats in the Caatingas and their proximity to cerrado vegetation on the Chapada do Araripe and to humid forest in areas of orographic rainfall. Key to habitat types—A, Caatinga Baixa; B, Serrote; C, Caatinga Alta; D, Lajeiro; E, Cerrado; EE, Disturbed areas of Cerrado; F, Cerradão; G, Humid Forest.

Table 1.—Common plants of Caatinga Baixa habitats in the Município de Exu, Pernambuco.

| Species                       | Family                     |
|-------------------------------|----------------------------|
| <i>Cassia excelsa</i>         | Leguminosae                |
| <i>Cereus jamacaru</i>        | Cactaceae                  |
| <i>Cnidoscolus urens</i>      | Euphorbiaceae              |
| <i>Cordia globosa</i>         | Boraginaceae               |
| <i>Croton campestris</i>      | Euphorbiaceae              |
| <i>Croton jacobinensis</i>    | Euphorbiaceae              |
| <i>Phaseolus peduncularis</i> | Leguminosae, Papilionaceae |
| <i>Piptadenia</i> sp.         | Leguminosae, Mimosoideae   |
| <i>Piptadenia zehntneri</i>   | Leguminosae, Mimosoideae   |
| <i>Ziziphus joazeiro</i>      | Rhamnaceae                 |



## I. The Remnant Atlantic Rain Forest

A short time (5 days) was spent making a preliminary survey of the mammal fauna of the Estação Ecológica do Tapacurá, located west of Recife, Pernambuco. This area is contained within the zone of what was previously dominated by the Atlantic Rain Forest; today it is limited to only the small patches of the original vegetation which have escaped destruction (compare James, 1942; Frota-Pessoa et al., 1971). Most of the region supports sugar cane or other crops and orchards; the effect of agricultural activities on the present-day remnants of the forest fauna are unknown.

The Atlantic Rain Forest is characterized by a high diversity of mesophytic broadleaved trees. Although the canopy may reach a height of 35 m, it rarely exceeds 25 m. Within the rainforest, ground cover is sparse and vines often form complex networks from ground level through the canopy.

A list of mammal species either collected or sighted follows. For this and other localities, we have included a subjective assessment of abundance, with U = unknown, R = rare, C = common, and A = abundant.

|                               |     |                             |     |
|-------------------------------|-----|-----------------------------|-----|
| <i>Monodelphis domestica</i>  | (U) | <i>Artibeus lituratus</i>   | (U) |
| <i>Didelphis albiventris</i>  | (U) | <i>Desmodus rotundus</i>    | (U) |
| <i>Peropteryx macrotis</i>    | (U) | <i>Diaemus youngii</i>      | (U) |
| <i>Micronycteris minuta</i>   | (U) | <i>Myotis nigricans</i>     | (U) |
| <i>Phyllostomus hastatus</i>  | (U) | <i>Lasiurus borealis</i>    | (U) |
| <i>Glossophaga soricina</i>   | (U) | <i>Molossops greenhalli</i> | (U) |
| <i>Carollia perspicillata</i> | (U) | <i>Akodon</i> sp.           | (U) |
| <i>Sturnira lilium</i>        | (U) | <i>Galea spixii</i>         | (U) |
| <i>Artibeus cinereus</i>      | (U) | <i>Trichomys apereoides</i> | (U) |
| <i>Artibeus jamaicensis</i>   | (U) |                             |     |

## II. Caatingas

The semiarid region of anomalous drought in the Northeast of Brazil encompasses a wide range of plant communities which are collectively known as Caatingas (Fig. 3). In general, Caatingas are assemblages of xeric-adapted plants, however, these communities need not be dominated by members of the Cactaceae.

*Caatinga Baixa*.—Throughout the lower elevations in Pernambuco and parts of Ceará and Bahia, Caatinga Baixa, or Low Caatinga communities predominate. Although the species composition may shift considerably between widely separated localities, trees are generally xerophytic and reach a height of 3 to 5 m with occasional emergents reaching a height of 8 m. Large cacti, such as *Cereus jamacaru* (Mandacaru), *Cephalocereus gounellei* (Xique-Xique), and *Zehntherella squamulosa* (Facheiro), are common components in Low Caatinga communities (Figs. 4 and 5). Substantial variation in the types of vegetation within a single locality is the rule rather than the exception in Caatinga Baixa. Minor differences in topography, variation in soil parameters, prior utilization by man, and differential exploitation by domestic animals are among the primary factors which generate the characteristic microhabitat mosaics. This complex of microhabitats is often too diverse to be easily categorized with a few broad generalizations. Some of the more common plants in Caatinga Baixa are listed in Table 1. The mammals of Caatinga Baixa are as follows:



|                               |       |                                |       |
|-------------------------------|-------|--------------------------------|-------|
| <i>Monodelphis domestica</i>  | (C)   | <i>Rhogeessa tumida</i>        | (U)   |
| <i>Marmosa karimii</i>        | (R)   | <i>Lasiurus ega</i>            | (R)   |
| <i>Didelphis albiventris</i>  | (C)   | <i>Molossus ater</i>           | (R)   |
| <i>Noctilio leporinus</i>     | (C)   | <i>Molossus molossus</i>       | (R-C) |
| <i>Pteronotus personatus</i>  | (R)   | <i>Callithrix jacchus</i>      | (R)   |
| <i>Trachops cirrhosus</i>     | (R)   | <i>Dasytus novemcinctus</i>    | (C)   |
| <i>Glossophaga soricina</i>   | (C)   | <i>Euphractus sexcinctus</i>   | (C)   |
| <i>Lonchophylla mordax</i>    | (C)   | <i>Sylvilagus brasiliensis</i> | (U)   |
| <i>Anoura geoffroyi</i>       | (R)   | <i>Calomys callosus</i>        | (R)   |
| <i>Carollia perspicillata</i> | (C)   | <i>Wiedomys pyrrhorhinos</i>   | (R)   |
| <i>Uroderma bilobatum</i>     | (R)   | <i>Galea spixii</i>            | (R)   |
| <i>Vampyrops lineatus</i>     | (C)   | <i>Cerdocyon thous</i>         | (C)   |
| <i>Artibeus jamaicensis</i>   | (R)   | <i>Procyon cancrivorus</i>     | (R)   |
| <i>Artibeus lituratus</i>     | (R)   | <i>Galictis vittata</i>        | (U)   |
| <i>Desmodus rotundus</i>      | (C)   | <i>Conepatus semistriatus</i>  | (U)   |
| <i>Myotis nigricans</i>       | (R-C) | <i>Felis yagouaroundi</i>      | (U)   |

*Caatinga Alta*.—Large xerophyllic trees which annually lose their leaves in synchrony during the dry season predominate and form a closed canopy in the wet season. These trees range in size from 10 to 12 m tall and are less densely packed than trees in *Caatinga Baixa* habitats (Fig. 6). The understory is usually poorly developed, but varies greatly in both composition and density from locality to locality. *Caatinga Alta* communities are restricted to higher elevations, hillsides, or the perimeters of valleys. The common plants in these communities are listed in Table 2. Locations which support *Caatinga Alta* communities are generally more mesic than Low *Caatinga* sites, but are drier than nearby *serrotes*. Rock outcroppings are often dispersed throughout the forest floor, but they are rarely very large. A list of mammals occurring in *Caatinga Alta* is as follows:

|                               |       |                                     |       |
|-------------------------------|-------|-------------------------------------|-------|
| <i>Monodelphis domestica</i>  | (C)   | <i>Desmodus rotundus</i>            | (A)   |
| <i>Didelphis albiventris</i>  | (C)   | <i>Diphylla ecaudata</i>            | (R)   |
| <i>Noctilio leporinus</i>     | (C)   | <i>Myotis nigricans</i>             | (R-C) |
| <i>Pteronotus davyi</i>       | (R)   | <i>Molossops planirostris</i>       | (R)   |
| <i>Micronycteris minuta</i>   | (R)   | <i>Neoplatymops mattogrossensis</i> | (R)   |
| <i>Micronycteris</i> sp.      | (R)   | <i>Molossus molossus</i>            | (R-C) |
| <i>Tonatia bidens</i>         | (C)   | <i>Cebus apella</i>                 | (R)   |
| <i>Tonatia brasiliense</i>    | (R)   | <i>Callithrix jacchus</i>           | (C)   |
| <i>Mimon crenulatum</i>       | (R)   | <i>Tamandua tetradactyla</i>        | (R)   |
| <i>Phyllostomus discolor</i>  | (R)   | <i>Euphractus sexcinctus</i>        | (R)   |
| <i>Glossophaga soricina</i>   | (C-A) | <i>Dasyprocta prymnolopha</i>       | (R)   |
| <i>Lonchophylla mordax</i>    | (C)   | <i>Cerdocyon thous</i>              | (C)   |
| <i>Carollia perspicillata</i> | (C-A) | <i>Galictis vittata</i>             | (U)   |
| <i>Sturnira lilium</i>        | (R)   | <i>Felis yagouaroundi</i>           | (U)   |
| <i>Vampyrops lineatus</i>     | (C)   | <i>Felis onca</i>                   | (U)   |
| <i>Artibeus jamaicensis</i>   | (C)   | <i>Mazama gouazoubira</i>           | (R)   |
| <i>Artibeus lituratus</i>     | (R-C) |                                     |       |

*Serrotes*.—The relatively flat terrain of the *Caatingas* contains a large number of small granitic mountains known as *serrotes* (Fig. 7). These *serrotes* appear to function as mesic refugia during the dry season. Palms, such as *Syargus oleracea* and *Accrocomia intumescens*, are typically restricted to *serrotes*. In many places, *serrotes* contain the



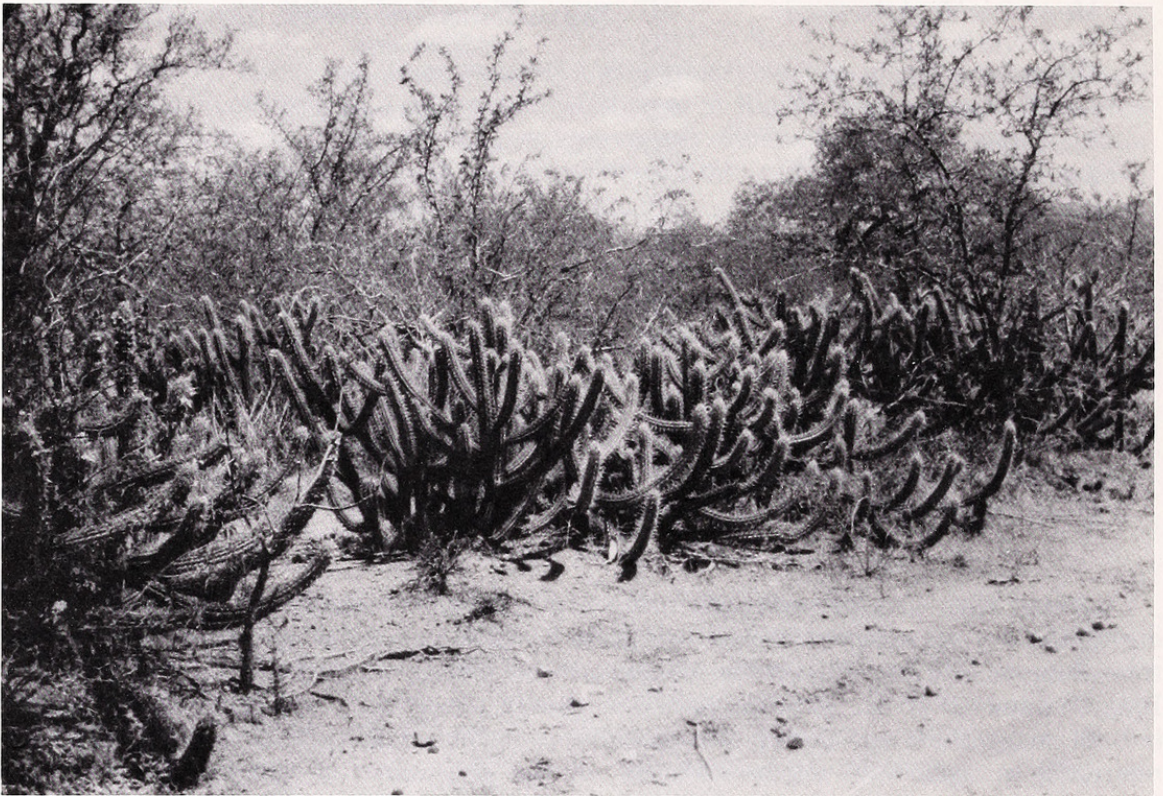


Fig. 4.—Although dense deciduous trees and shrubs form the dominant thorn scrub component of Caatinga Baixa, cacti such as Xique-Xique (shown in this photograph) are prevalent in many localities. Município de Serra Talhada, Pernambuco.



Fig. 5.—Much of the Caatingas is being altered by human activities. The effects of slash and burn agriculture (on the right of the photograph) are contrasted with the dense vegetation of Caatinga Baixa. Município de Exu, Pernambuco.





Fig. 6.—Granitic substrates (seen in the foreground) often delimit the edge of Caatinga Alta habitats at higher elevations on serrotes. Notice the large trees (seen in the background) typical of Caatinga Alta vegetation. Município de Exu, Pernambuco.



Fig. 7.—A rocky serrote interrupts the flat plain of Caatinga Baixa habitat. Photograph taken during the dry season of 1975. Município de Serra Talhada, Pernambuco.





Fig. 8.—Extensive lajeiros studded with cacti (Mandacaru and Palma) and bromeliads are frequently encountered in the Caatingas. At this particular site, the top of the lajeiro is slightly elevated above the plain of the surrounding thorn scrub. Depressions and crevices on the surface often fill with water in the wet season and persist for a variable amount of time in the dry season. Município de Senhor do Bom Fim, Bahia.

upper limit of Caatinga Alta habitat; hence the vegetation of the serrotes may be considered a mixture of Caatinga Alta and more mesic elements such as palm trees. The mammals of the serrotes include the following:

|                               |       |                                     |       |
|-------------------------------|-------|-------------------------------------|-------|
| <i>Monodelphis domestica</i>  | (A)   | <i>Artibeus lituratus</i>           | (C)   |
| <i>Didelphis albiventris</i>  | (A)   | <i>Desmodus rotundus</i>            | (A)   |
| <i>Peropteryx macrotis</i>    | (R)   | <i>Diphylla ecaudata</i>            | (R)   |
| <i>Micronycteris</i> sp.      | (R)   | <i>Furipterus horrens</i>           | (R)   |
| <i>Tonatia bidens</i>         | (C)   | <i>Myotis nigricans</i>             | (R-C) |
| <i>Tonatia brasiliense</i>    | (R)   | <i>Molossops temminckii</i>         | (R)   |
| <i>Phyllostomus discolor</i>  | (R)   | <i>Neoplatymops mattogrossensis</i> | (R)   |
| <i>Phyllostomus hastatus</i>  | (R)   | <i>Euphractus sexcinctus</i>        | (R)   |
| <i>Trachops cirrhosus</i>     | (C)   | <i>Kerodon rupestris</i>            | (A)   |
| <i>Glossophaga soricina</i>   | (A)   | <i>Thrichomys apereoides</i>        | (A)   |
| <i>Lonchophylla mordax</i>    | (C)   | <i>Cerdocyon thous</i>              | (C)   |
| <i>Anoura geoffroyi</i>       | (R-C) | <i>Galictis vittata</i>             | (C)   |
| <i>Carollia perspicillata</i> | (A)   | <i>Conepatus semistriatus</i>       | (U)   |
| <i>Vampyrops lineatus</i>     | (A)   | <i>Felis yagouaroundi</i>           | (U)   |
| <i>Artibeus jamaicensis</i>   | (A)   |                                     |       |

*Lajeiros*.—Lajeiros are rock outcroppings primarily distributed throughout low lying areas of the Caatingas. They vary in complexity from simple unbroken rock faces, to





Fig. 9.—Lajeiros composed of large boulders are also common in the Caatingas (background of photograph). The foreground is occupied by an abandoned agricultural field which is in an early successional stage of development, while the lajeiro harbors a flora more typical of Caatinga Baixa vegetation. Município de Senhor do Bom Fim, Bahia.

a complex of many fissured rock faces studded with cacti and strewn with boulders of variable sizes and shapes (Figs. 8 and 9). The predominant cacti associated with these outcroppings are *Pilosocereus gounellei*, *Cereus jamacaru*, and *Opuntia palmadora* (Palma). Most lajeiros are located near serrotes; however, some may be isolated by a distance of several kilometers from other lajeiros or serrotes. Lajeiros occupy a broad

Table 2.—Common plants of Caatinga Alta habitats in the Município de Exu, Pernambuco.

| Species                         | Family                        |
|---------------------------------|-------------------------------|
| <i>Bauhinia</i> sp.             | Leguminosae, Caesalpinioideae |
| <i>Cavanillesia arborea</i>     | Bombacaceae                   |
| <i>Cordia</i> sp.               | Boraginaceae                  |
| <i>Craetava tapia</i>           | Capparaceae                   |
| <i>Croton argyrophylloides</i>  | Euphorbiaceae                 |
| <i>Croton jacobinensis</i>      | Euphorbiaceae                 |
| <i>Erythroxylum</i> sp.         | Erythroxylaceae               |
| <i>Piptadenia zehntneri</i>     | Leguminosae, Mimosoideae      |
| <i>Pterogyne nitens</i>         | Leguminosae, Papilionoideae   |
| <i>Schinus terebinthifolius</i> | Anacardiaceae                 |





Fig. 10.—A planted agricultural field dominates the foreground, with characteristic Caatinga vegetation occupying steep slopes on the sides of hills (seen in the background). Município de Senhor do Bom Fim, Bahía.

range of sizes whose upper limit includes extensive formations best measured in hectares. Complex *lajeiros* greatly enhance the horizontal and vertical complexity of the Caatingas. Mammals frequenting *lajeiros* include the following:

|                               |       |                                     |     |
|-------------------------------|-------|-------------------------------------|-----|
| <i>Monodelphis domestica</i>  | (A)   | <i>Molossops temminckii</i>         | (R) |
| <i>Didelphis albiventris</i>  | (A)   | <i>Neoplatymops mattogrossensis</i> | (C) |
| <i>Peropteryx macrotis</i>    | (R)   | <i>Kerodon rupestris</i>            | (A) |
| <i>Micronycteris</i> sp.      | (R)   | <i>Galea spixii</i>                 | (C) |
| <i>Glossophaga soricina</i>   | (C)   | <i>Trichomys apereoides</i>         | (A) |
| <i>Carollia perspicillata</i> | (C-A) | <i>Cerdocyon thous</i>              | (C) |
| <i>Vampyrops lineatus</i>     | (C)   | <i>Galictis vittata</i>             | (C) |

*Areas dominated by human activity.*—Agricultural practices have greatly altered the natural state of the Caatingas (Fig. 10). Fruit orchards may predominate in the more mesic areas, especially along streams, where a wide variety of fruits such as oranges, papayas, bananas, and mangos are cultivated.

The standard procedure for establishing an agricultural field entails clear-cutting sections of Low or High Caatinga, removing the large pieces of wood for fuel, and burning the remaining material on the site. Subsequent utilization varies, depending upon both the site and crop planted. Corn and beans are the most common and transient crops grown in Low Caatinga habitats, whereas cotton and *Opuntia* plantings may persist for years. Grass pastures also last for many years, due in part to occasional burning and constant grazing by cattle and horses, which prevent the reestablishment of Caatinga vegetation.



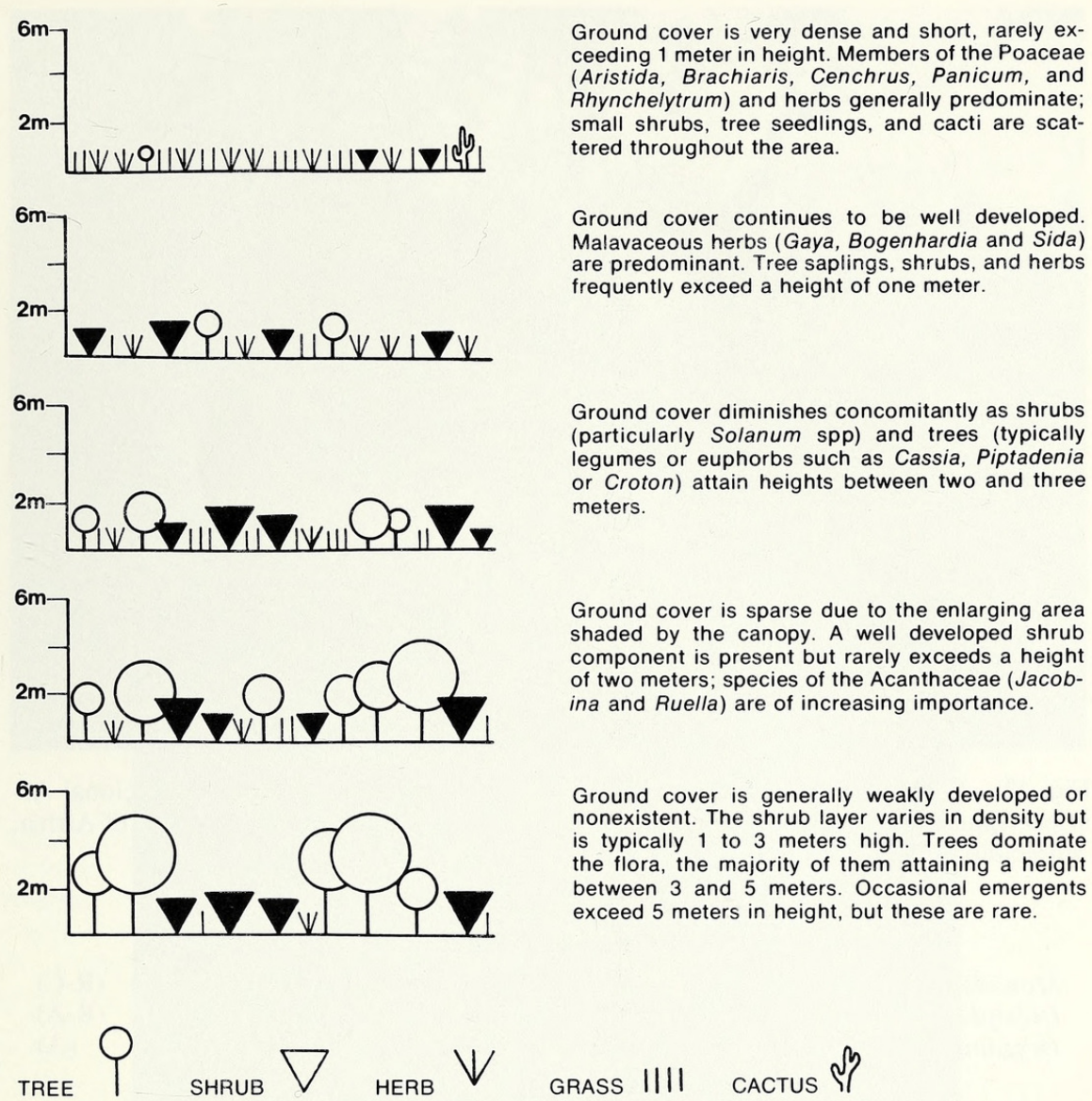


Fig. 11.—Much of the Caatingas occurs in one of the seral stages of ecological succession graphically illustrated above. (Adapted from Willig et al., unpublished manuscript.)

Abandoned agricultural fields proceed through a number of successional stages. The amount of time during which a particular sere persists is extremely variable, primarily because vegetative growth is directly linked to the amount and timing of annual rainfall. Due to the magnitude of human activity in recent history, much of the Caatingas is in a disturbed state, existing in one of the seral stages discussed in Fig. 11. Mammals found in disturbed habitats include the following:

| Buildings                     |       |                             |     |
|-------------------------------|-------|-----------------------------|-----|
| <i>Monodelphis domestica</i>  | (R)   | <i>Tadarida laticaudata</i> | (R) |
| <i>Didelphis albiventris</i>  | (R)   | <i>Molossus ater</i>        | (R) |
| <i>Peroptryx macrotis</i>     | (R)   | <i>Molossus molossus</i>    | (A) |
| <i>Glossophaga soricina</i>   | (A)   | <i>Promops</i> sp.          | (R) |
| <i>Carollia perspicillata</i> | (C)   | <i>Rattus rattus</i>        | (A) |
| <i>Myotis nigricans</i>       | (C-A) | <i>Mus musculus</i>         | (R) |





Fig. 12.—Cerrado vegetation on the Chapada do Araripe in the Floresta Nacional Araripe-Apodí is dominated by grass and trees and is quite similar to the savanna of Africa. Município de Crato, Ceará.

#### Agricultural fields

|                              |     |                           |       |
|------------------------------|-----|---------------------------|-------|
| <i>Monodelphis domestica</i> | (R) | <i>Oryzomys subflavus</i> | (R-C) |
| <i>Didelphis albiventris</i> | (R) | <i>Bolomys lasiurus</i>   | (R-A) |
| <i>Oryzomys eliurus</i>      | (R) | <i>Galea spixii</i>       | (A)   |

#### Fruit orchards

|                              |     |                               |     |
|------------------------------|-----|-------------------------------|-----|
| <i>Monodelphis domestica</i> | (R) | <i>Anoura geoffroyi</i>       | (R) |
| <i>Didelphis albiventris</i> | (C) | <i>Carollia perspicillata</i> | (C) |
| <i>Phyllostomus discolor</i> | (C) | <i>Vampyrops lineatus</i>     | (C) |
| <i>Glossophaga soricina</i>  | (C) | <i>Lasiurus ega</i>           | (R) |

#### Abandoned fields

|                              |     |                         |       |
|------------------------------|-----|-------------------------|-------|
| <i>Monodelphis domestica</i> | (C) | <i>Bolomys lasiurus</i> | (R-A) |
| <i>Marmosa karimii</i>       | (R) | <i>Calomys callosus</i> | (R)   |
| <i>Didelphis albiventris</i> | (C) | <i>Galea spixii</i>     | (A)   |
| <i>Dasyus novemcinctus</i>   | (U) | <i>Cerdyon thous</i>    | (C)   |
| <i>Euphractus sexcinctus</i> | (U) |                         |       |

### III. The Chapada do Araripe

The Floresta Nacional Araripe-Apodí contains most of the collection sites examined on the Chapada do Araripe. The topography of the plateau is exceedingly flat, with a thin layer of sandy red soil covering a hard sandstone substrate. Permanent bodies of





Fig. 13.—Humid forest occupies areas of orographic rainfall on the windward side of the Chapada do Araripe. Município de Crato, Ceará.

water of any size are absent from the Chapada do Araripe; during the rainy season, temporary pools of water may form in low-lying depressions. There are no rocks, boulders or even stones on the top of the Chapada. In general, the vegetation is sclerophyllous and semideciduous. Trees and shrubs may lose their leaves each year, but leaf loss is asynchronous both inter- and intraspecifically.

*Cerrado*.—The Cerrado of the Chapada do Araripe is physiognomically an open tree and shrub woodland with a pervasive grass component (Figs. 3 and 12). Taller trees, rarely exceeding a height of 15 m, are scattered throughout the area. Smaller trees of various sizes (3 m to 5 m) and shrubs (.5 m to 3 m) comprise about 50% of the plant



Table 3.—Common plants in Cerrado and Cerradão habitats of the Chapada do Araripe in the Floresta Nacional Araripe-Apodí.

| Species                             | Family                        |
|-------------------------------------|-------------------------------|
| <i>Annona</i> sp.                   | Annonaceae                    |
| <i>Byrsonima sericea</i>            | Malpighiaceae                 |
| <i>Caryocar coreaceum</i>           | Caryocaraceae                 |
| <i>Casearia dentata</i>             | Flacourtiaceae                |
| <i>Casearia grandiflora</i>         | Flacourtiaceae                |
| <i>Cassia speciosa</i>              | Leguminosae, Caesalpinioideae |
| <i>Cassia splendida</i>             | Leguminosae, Caesalpinioideae |
| <i>Dioclea bicolor</i>              | Leguminosae, Papilionoideae   |
| <i>Fagara gardneri</i>              | Rutaceae                      |
| <i>Hirtela glandulosa</i>           | Chrysobalanaceae              |
| <i>Hirtela racemosa</i>             | Chrysobalanaceae              |
| <i>Hyptis umbrosa</i>               | Labiatae                      |
| <i>Miconia</i> c.f. <i>albicans</i> | Melastomaceae                 |
| <i>Miconia ligustroides</i>         | Melastomaceae                 |
| <i>Myrcia</i> sp.                   | Myrtaceae                     |
| <i>Ocotea pallida</i>               | Lauraceae                     |
| <i>Parkia platicephala</i>          | Leguminosae, Mimosoideae      |
| <i>Stygmaphyllon</i>                | Malpighiaceae                 |
| <i>Vismia</i>                       | Guttiferae                    |

cover, while grass species occupy the remaining area. As such, the canopy is irregular and undulating in profile, with numerous areas lacking woody plants. Taller trees and shrubs often have characteristically twisted trunks and branches. The most common trees, shrubs, and grasses are noted in Table 3, while the mammals of the Cerrado portion of the Chapada do Araripe include the following:

|                               |       |                               |       |
|-------------------------------|-------|-------------------------------|-------|
| <i>Didelphis albiventris</i>  | (A)   | <i>Eptesicus brasiliensis</i> | (R)   |
| <i>Pteronotus davyi</i>       | (R)   | <i>Lasiurus borealis</i>      | (R)   |
| <i>Micronycteris</i> sp.      | (R)   | <i>Lasiurus ega</i>           | (R)   |
| <i>Micronycteris minuta</i>   | (R)   | <i>Molossops temminckii</i>   | (R)   |
| <i>Phyllostomus discolor</i>  | (A)   | <i>Molossus molossus</i>      | (R-C) |
| <i>Phyllostomus hastatus</i>  | (A)   | <i>Callithrix jacchus</i>     | (U)   |
| <i>Glossophaga soricina</i>   | (A)   | <i>Tamandua tetradactyla</i>  | (U)   |
| <i>Anoura geoffroyi</i>       | (A)   | <i>Euphractus sexcinctus</i>  | (A)   |
| <i>Carollia perspicillata</i> | (A)   | <i>Dasybus novemcinctus</i>   | (A)   |
| <i>Sturnira lilium</i>        | (R-C) | <i>Oryzomys eliurus</i>       | (R)   |
| <i>Uroderma bilobatum</i>     | (R)   | <i>Bolomys lasiurus</i>       | (R)   |
| <i>Vampyrops lineatus</i>     | (A)   | <i>Wiedomys pyrrhorhinos</i>  | (R)   |
| <i>Artibeus concolor</i>      | (R)   | <i>Dasyprocta prymnolopha</i> | (U)   |
| <i>Artibeus jamaicensis</i>   | (A)   | <i>Cerdocyon thous</i>        | (C)   |
| <i>Artibeus lituratus</i>     | (A)   | <i>Felis concolor</i>         | (U)   |
| <i>Desmodus rotundus</i>      | (R)   | <i>Felis onca</i>             | (U)   |
| <i>Natalus stramineus</i>     | (R)   | <i>Mazama gouazoubira</i>     | (C)   |
| <i>Myotis nigricans</i>       | (R-C) |                               |       |

**Cerradão.**—Certain sections in the Floresta Nacional Araripe-Apodí differ substantially from the Cerrado vegetation in both density, physiognomy, and species compo-



sition. Stands with many trees, few shrubs and little grass are herein referred to as Cerradão. The Cerradão is composed of larger trees which form a more or less continuous canopy between 12 and 17 m high, and the trees do not have the twisted appearance characteristic of the Cerrado. Tree density is much greater in the Cerradão than in the Cerrado. The understory may vary considerably from quite dense to sparse; in either case however, shrubs less than 1 m in height and grasses are quite rare. Mammals of the Cerradão portion of the Chapada are as follows:

|                               |       |                               |       |
|-------------------------------|-------|-------------------------------|-------|
| <i>Didelphis albiventris</i>  | (A)   | <i>Artibeus jamaicensis</i>   | (A)   |
| <i>Saccopteryx bilineata</i>  | (R)   | <i>Desmodus rotundus</i>      | (R)   |
| <i>Noctilio leporinus</i>     | (R)   | <i>Myotis nigricans</i>       | (R-C) |
| <i>Pteronotus davyi</i>       | (R)   | <i>Eptesicus brasiliensis</i> | (R)   |
| <i>Micronycteris</i> sp.      | (R)   | <i>Lasiurus borealis</i>      | (R)   |
| <i>Micronycteris minuta</i>   | (R)   | <i>Molossops temminckii</i>   | (R)   |
| <i>Phyllostomus discolor</i>  | (A)   | <i>Tadarida</i> sp.           | (R)   |
| <i>Phyllostomus hastatus</i>  | (A)   | <i>Molossus molossus</i>      | (R-C) |
| <i>Glossophaga soricina</i>   | (A)   | <i>Callithrix jacchus</i>     | (R-C) |
| <i>Anoura geoffroyi</i>       | (A)   | <i>Euphractus sexcinctus</i>  | (U)   |
| <i>Carollia perspicillata</i> | (A)   | <i>Dasyprocta prymnolopha</i> | (C)   |
| <i>Sturnira lilium</i>        | (R-C) | <i>Proechimys</i> sp.         | (U)   |
| <i>Vampyrops lineatus</i>     | (A)   | <i>Cerdocyon thous</i>        | (C)   |
| <i>Artibeus concolor</i>      | (R)   | <i>Felis concolor</i>         | (U)   |
| <i>Artibeus lituratus</i>     | (A)   | <i>Mazama gouazoubira</i>     | (R-C) |

#### IV. Cerrado-Caatingas Contact Zone

The area around Valença do Piauí, Piauí, was chosen as a Caatingas-Cerrado contact zone because it had been previously used by Vanzolini (1976) in his analysis of the herpetofauna of the Caatingas and Cerrado of Brasil. Vanzolini discussed the flora and geomorphology of the area in some detail; it is sufficient here to point out that the area contains a number of contact zones between Caatingas and Cerrado habitats (that is, Cerrado without Caatingas enclaves, Cerrado with Caatingas enclaves at upper elevational limits, and Cerrado with Caatingas enclaves at the lower elevational limits). The total amount of time spent in the area of Valença do Piauí was limited, hence the absence of a species from the collection is not indicative of its absence from the area. More intensive field work is required to substantiate the abundance and distribution of mammals in these contact zones. Mammals whose occurrence in this region we were able to document include:

|                              |     |                              |     |
|------------------------------|-----|------------------------------|-----|
| <i>Monodelphis domestica</i> | (U) | <i>Lasiurus ega</i>          | (U) |
| <i>Didelphis albiventris</i> | (U) | <i>Molossops abrasus</i>     | (U) |
| <i>Pteronotus davyi</i>      | (U) | <i>Molossus ater</i>         | (U) |
| <i>Pteronotus parnellii</i>  | (U) | <i>Molossus molossus</i>     | (U) |
| <i>Pteronotus personatus</i> | (U) | <i>Eumops</i> sp.            | (U) |
| <i>Phyllostomus discolor</i> | (U) | <i>Kerodon rupestris</i>     | (U) |
| <i>Lonchorhina aurita</i>    | (U) | <i>Galea spixii</i>          | (U) |
| <i>Glossophaga soricina</i>  | (U) | <i>Thrichomys apereoides</i> | (U) |
| <i>Artibeus jamaicensis</i>  | (U) |                              |     |

#### V. Humid Forest

The plant community along the base of the Chapada do Araripe in the Municipality of Crato, Ceará, may be classified as a humid forest. The forest forms an irregular band





Fig. 14.—More mesic inland portions of the Northeast may support extensive palm forests such as that seen here. The sandy area in the foreground is a dried river bed. Across the state border from Teresina, Piauí, in the state of Maranhão.

which circumscribes the base of the Chapada do Araripe in the state of Ceará. Precipitation on the Crato side of the Chapada do Araripe is higher than in contiguous areas due to orographic rainfall patterns (Markham, 1972). Only a small amount of time was spent in the area, so extensive information about the vegetation is lacking. Many planted palms were evident, and the vegetation was dense and luxuriant (Fig. 13). Substantial areas that were once forested have been altered by human activity. A preliminary list of mammals of the humid forest is as follows:

|                               |     |                             |       |
|-------------------------------|-----|-----------------------------|-------|
| <i>Didelphis albiventris</i>  | (U) | <i>Vampyrops lineatus</i>   | (C)   |
| <i>Saccopteryx leptura</i>    | (U) | <i>Artibeus jamaicensis</i> | (C)   |
| <i>Micronycteris</i> sp.      | (U) | <i>Artibeus lituratus</i>   | (U)   |
| <i>Phyllostomus hastatus</i>  | (C) | <i>Desmodus rotundus</i>    | (U)   |
| <i>Glossophaga soricina</i>   | (A) | <i>Myotis nigricans</i>     | (U)   |
| <i>Lonchophylla mordax</i>    | (U) | <i>Molossus molossus</i>    | (C-A) |
| <i>Anoura geoffroyi</i>       | (U) | <i>Callithrix jacchus</i>   | (U)   |
| <i>Carollia perspicillata</i> | (A) | <i>Cerdocyon thous</i>      | (U)   |
| <i>Sturnira lilium</i>        | (U) |                             |       |

## VI. Palm Groves

In the extreme northwest of the Caatingas an extensive forest of palm groves occurs in the more mesic areas (Fig. 14). In an attempt to make a preliminary collection of specimens from the area and select possible future study sites, we visited a few locations in the Municipality of Terezina, Piauí. More extensive work is required to characterize



the flora and fauna of the area, although we were able to establish the occurrence of a few species of mammals, including:

|                               |     |                             |     |
|-------------------------------|-----|-----------------------------|-----|
| <i>Glossophaga soricina</i>   | (U) | <i>Artibeus fuliginosus</i> | (U) |
| <i>Carollia perspicillata</i> | (U) | <i>Artibeus jamaicensis</i> | (U) |
| <i>Uroderma magnirostrum</i>  | (U) | <i>Artibeus lituratus</i>   | (U) |
| <i>Artibeus cinereus</i>      | (U) |                             |     |

## ACCOUNTS OF SPECIES

### Order Marsupialia

### Family Didelphidae

#### ***Monodelphis domestica* Wagner, 1842**

This marsupial is a common inhabitant of the Caatingas. Favored habitats include rocky serrotes and lowland rock outcroppings. Reproduction is relatively aseasonal; the young are not protected by a marsupium. Although they are good climbers, they are principally terrestrial; they are also nocturnal. Laboratory animals accepted a wide variety of food items including various vertebrates, invertebrates, and fruits.

*Specimens collected*.—PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (26); Fazenda Batente, 5.5 km SE of Exu (12); Fazenda Pinheira, 1.5 km SW of Exu (13); Município de Exu (11); (Município de Serra Talhada), Fazenda Saco, 6.6 km N of Serra Talhada (5). PIAUÍ (Município de Valença do Piauí), Fazenda Olho da Água, 2 km N of Valença do Piauí (1).

*Specimens examined*.—ALAGOAS (Limoeiro da Anadia), Sítio Barracão (1); (Palmeira dos Índios), Sítio Capuma (1); Sítio Dormião (1); Sítio Panelas (1); Sítio Riveira (1); Sítio Sabiá (3); (Santana do Ipanema), Sítio Lagoinha (1); (Viçosa), Sítio Cachoeira Grande (1). BAHIA (Feira), Fazenda Capoeira do Rosario (1); Fazenda Cazumba (1); Fazenda Jacú (1); Fazenda Salgado (1); (Serrinha), Fazenda Cacuá (1); Fazenda Oiteiro (2); Fazenda Umburana (1); no locality (2). CEARÁ (Campo Sales), Sítio Volta (1); (Crato), Sítio Constantino (1); no locality (1); Sítio Olaria (1); (Jardim), Sítio Cereado (1); (Milagres), Sítio Camara (1); (Missão Velho), Sítio Araruna (1); Sítio Emboscada (1); Sítio Lapinha (1); (São Benedito), Sítio Cinta da Solidade (1). PERNAMBUCO (Bodocó), Sítio Belem (1); Sítio Lopes (1); Sítio Paus Preto (1); Sítio São Gonçalo (1); Sítio Xique-Xique (1); (Garanhuns), Sítio Riacho Fundo (1); no locality (1); (Pesqueira), Fazenda Caianinha (1); Fazenda Sororoca (1); (Triunfo), Sítio Boa Esperança de Jerico (1); Sítio Borgens (2); Sítio Cana Brava de Jerico (2); Sítio Corredor do Vento (1); Sítio Macaco de Baixa Verde (1); Sítio Novo (1); Sítio Oiti (2); Sítio São Mateus (1).

#### ***Marmosa cinerea* Temminck, 1824**

*Specimens examined*.—BAHIA (Ilheus), Aritaqua Urucutuca (1); Banco da Vitoria, Pirataquisse (1); Buerarema Ribeirão da Fortuna (1); Rio do Braço, Fazenda Almeida (1); No locality, (11). PERNAMBUCO (dois Irmãos) (1).

#### ***Marmosa karimii* Petter, 1968**

This small marsupial was rare. Specimens were collected only in Low Caatinga and perennial shrub/low tree dominated successional



stages. An individual kept in the laboratory was adept at capturing insects and subsisted on insects and occasional hylid frogs and geckos; small amounts of fruit were eaten at times.

*Specimens collected*.—PERNAMBUCO (Município de Exu), 0.5 km S of Exu (1); Escola Agrícola de Exu, 0.7 km S of Exu (1); Fazenda Guaraní, 2.9 km N of Exu (1); Município de Exu (1).

### ***Didelphis albiventris* Lund, 1841**

This large marsupial is a habitat generalist and ranges throughout the Caatingas. In the Exu area, it inhabited all microhabitats in addition to more mesic Cerrado localities, such as the Chapada do Araripe (occurring there both in Cerrado and Cerradão habitats). Microhabitat utilization and population density may exhibit seasonal shifts in Caatinga habitats corresponding to seasonal climatic changes. Reproduction is strongly synchronized, with the birth peak occurring during November and December; a marsupium is present. This species is mostly nocturnal and terrestrial in the Caatingas, and is broadly omnivorous.

*Specimens collected*.—CEARÁ (Município de Crato), Floresta Nacional Araripe-Apodí (13). PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (3); Fazenda Batente, 5.5 km SE of Exu (5); Fazenda Uruguai, 4.8 km NE of Exu (1); Município de Exu (9); Serrote das Lages, 18 km S of Exu (3).

*Specimens examined*.—PERNAMBUCO (Garanhuns) (1).

## **Order Chiroptera**

### **Family Emballonuridae**

#### ***Saccopteryx bilineata* (Temminck, 1838)**

Absent from the Caatingas; rare on the Chapada do Araripe.

*Specimens collected*.—CEARÁ (Município de Crato), Floresta Nacional Araripe-Apodí, 9 km S of Crato (1); Floresta Nacional Araripe-Apodí, 10 km SW of Crato (1).

#### ***Saccopteryx leptura* Schreber, 1774**

*Specimen collected*.—CEARÁ (Município de Crato), Sítio Luanda, 4 km S of Crato (1).

#### ***Peropteryx macrotis* (Wagner, 1843)**

Uncommon in the Caatingas. Roosts in small groups of up to 10 individuals, often occupying large openings inside rockpiles or culverts. Absent from Cerradão and Cerrado habitats on the Chapada do Araripe.

*Specimens collected*.—BAHIA (Município de Senhor do Bom Fim), Fazenda Lajeido, km 147 on Route BA 130 (5). PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (1); Fazenda Batente, 5.5 km SE of Exu (3); Fazenda Pomonha,



21 km SSW of Exu (7); Serrote Gambá, 19 km SSW of Exu (4); (Município de São Lourenço da Mata), Estação Ecológico do Tapacurá (2); Mata do Camocim (7).

### Family Noctilionidae

#### **Noctilio leporinus** (Linnaeus, 1758)

Rare in the Cerradão of the Chapada do Araripe where it probably occurs as a transient in the dry season. Common in the Caatingas where it roosts during the day in groups of up to 30 individuals in large hollow hardwood trees. A single night roost under a bridge containing over 100 individuals was consistently utilized from 1976 to 1978. The large accumulation of fecal material under the roost suggests that it had been in use for many years previous to our arrival in 1976.

*Specimens collected.*—CEARÁ (Município de Crato), Floresta Nacional Araripe-Apodí, 9 km S of Crato (4); Floresta Nacional Araripe-Apodí, 21 km SSW of Crato (1). PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (1); Fazenda Alto de Ferreira, 5 km SW of Exu (14); Fazenda Batente, 5.5 km SE of Exu (1); Fazenda Colônia, 5.5 km S of Exu (136); Fazenda Guarani, 2.9 km N of Exu (6); Fazenda Pinheira, 1.5 km SW of Exu (12); Fazenda São José, 1.5 km N of Exu (2).

### Family Mormoopidae

#### **Pteronotus davyi** Gray, 1838

Very rare in the Caatingas where it is found only in Caatinga Alta habitats. Also rare in Cerrado and Cerradão habitats of the Chapada do Araripe.

*Specimens collected.*—CEARÁ (Município de Crato), Floresta Nacional Araripe-Apodí, 8 km S of Crato (1); Floresta Nacional Araripe-Apodí, 9 km S of Crato (4); Floresta Nacional Araripe-Apodí, 8 km SSW of Crato (5); Floresta Nacional Araripe-Apodí, 17 km SSW of Crato (1). PERNAMBUCO (Município de Exu), Fazenda Cantareno, 4.5 km NNE of Exu (1). PIAUÍ (Município de Valença do Piauí), Fazenda Olho da Água, 2 km N of Valença do Piauí (1).

#### **Pteronotus parnellii** (Gray, 1843)

Absent from the Chapada do Araripe and the Caatingas. Netted only in a mesic Caatinga-Cerrado contact zone in Piauí.

*Specimens collected.*—PIAUÍ (Município de Valença do Piauí), Fazenda Olho da Água, 2 km N of Valença do Piauí (2).

#### **Pteronotus personatus** (Wagner, 1843)

Absent from the Chapada do Araripe; present, but rare, in some localities of the Caatingas. In all cases it has been netted near streams or lakes.

*Specimens collected.*—PERNAMBUCO (Município de Serra Talhada), Fazenda Saco (I.P.A.), 6.6 km NNE of Serra Talhada (1). PIAUÍ (Município de Valença do Piauí), Fazenda Olho da Água, 2 km N of Valença do Piauí (3).



## Family Phyllostomatidae

## Subfamily Phyllostomatinae

**Micronycteris minuta** (Gervais, 1855)

*Specimens collected*.—CEARÁ (Município de Crato), Floresta Nacional Araripe-Apodí, 9 km S of Crato (1); Floresta Nacional Araripe-Apodí, 8 km SSW of Crato (1). PERNAMBUCO (Município de Exu), Fazenda Cantareno, 4.5 km NNE of Exu (2); Serrote das Lajes, 17 km S of Exu (5); Serrote Gamba, 19 km SSW of Exu (1); (Município de São Lourenço da Mata), Estação Ecológica do Tapacurá (1).

**Micronycteris** sp.

Rare in the Caatingas where it was usually captured near serrotes or lajeiros. Rare on the Chapada do Araripe. This group of specimens appears not to conform in detail with the presently recognized species in the genus; further analysis is required to define the systematic affinities of this collection.

*Specimens collected*.—CEARÁ (Município de Crato), Floresta Nacional Araripe-Apodí, 8 km SSW of Crato (1); Sitio Luanda (Itaiteira), 4 km S of Crato (1); (Município de Nova Olinda), km 19 on Route CE 96, 4 km SE of Nova Olinda (3). PERNAMBUCO (Município de Exu), Fazenda Alto de Ferreira, 5 km SW of Exu (2); Fazenda Cantareno, 4.5 km NNE of Exu (1); Fazenda Pomonha, 21 km SSW of Exu (5); Serrote das Lajes, 17 km S of Exu (2).

**Lonchorhina aurita** Tomes, 1863

Absent from the Chapada do Araripe and the Caatingas. Present in areas of the Caatinga-Cerrado contact zone in Piauí.

*Specimen collected*.—PIAUÍ (Município de Valença do Piauí), Fazenda Olho da Agua, 2 km N of Valença do Piauí (1).

**Tonatia bidens** (Spix, 1823)

Absent from the Chapada do Araripe. Distribution primarily restricted to serrotes in the Caatingas.

*Specimens collected*.—PERNAMBUCO (Município de Exu), Fazenda Maniçoba, 13.7 km SSW of Exu (5); Fazenda Pomonha, 21 km SSW of Exu (5); Serrote das Lajes, 17 km S of Exu (8); Serrote das Lajes, 17.7 km S of Exu (21); Serrote Gamba, 19 km SSW of Exu (6); Serrote Gritadeira, 18 km SSW of Exu (4).

**Tonatia brasiliense** (Peters, 1866b)

Absent from the Chapada do Araripe. Uncommon in the Caatingas where it is found either in Caatinga Alta habitats or near serrotes.

*Specimens collected*.—PERNAMBUCO (Município de Exu), Fazenda Batente, 5.5 km SE of Exu (1); Fazenda Cantareno, 4.5 km NNE of Exu (2); Fazenda Guarani, 2.9 km N of Exu (1); Serrote Gritadeira, 18 km SSW of Exu (2).



**Mimon crenulatum** (E. Geoffroy, 1810)

Rare in the Caatingas where it is found almost exclusively in Caatinga Alta habitats. Absent from the Chapada do Araripe.

*Specimens collected*.—PERNAMBUCO (Município de Exu), Fazenda Cantareno, 4.5 km NNE of Exu (3); Fazenda Colônia, 5.5 km S of Exu (1); Fazenda Paus Grandes, 14.2 km E of Exu (3).

**Phyllostomus discolor** (Wagner, 1843)

Locally common in banana and mango orchards in the Caatingas. Abundant and widespread throughout both Cerrado and Cerradão habitats of the Chapada do Araripe. It feeds primarily on fruits, although at least part of the year it appears to be nectarivorous and/or pollenivorous.

*Specimens collected*.—CEARÁ (Município de Crato), Aeroporto de Crato, 10 km SW of Crato (3); Floresta Nacional Araripe-Apodí, 8 km S of Crato (7); Floresta Nacional Araripe-Apodí, 9 km S of Crato (113); Floresta Nacional Araripe-Apodí, 10 km SSW of Crato (3); Floresta Nacional Araripe-Apodí, 11 km SSW of Crato (1); Floresta Nacional Araripe-Apodí, 13 km SSW of Crato (5); Floresta Nacional Araripe-Apodí, 17 km SSW of Crato (18); Floresta Nacional Araripe-Apodí, 21 km SSW of Crato (1); Floresta Nacional Araripe-Apodí, 10 km SW of Crato (14). PERNAMBUCO (Município de Exu), Fazenda Alto de Ferreira, 5 km SW of Exu (1); Fazenda Bom Jesus, 8 km NNW of Exu (11); Fazenda Manicoba, 13.7 km SSW of Exu (9); Fazenda São José, 1.5 km N of Exu (4); Serrote das Lajes, 17 km S of Exu (1); Serrote das Lajes, 17.7 km S of Exu (1); Serrote Gambá, 19 km SSW of Exu (3); Serrote Gritadeira, 18 km SSW of Exu (1). PIAUÍ (Município de Valença do Piauí), Fazenda Olho da Água, 2 km N of Valença do Piauí (1).

**Phyllostomus hastatus** (Pallas, 1767)

Occasionally present in the Caatingas, but probably a transient from the Chapada do Araripe. Widespread and common throughout the Chapada in both Cerrado and Cerradão habitats. A colony of over 100 individuals of both sexes was found roosting inside an archway at the entrance to the Colégio Agrícola de Crato. The diet appears to be primarily frugivorous, although some insect remains were observed in its feces.

*Specimens collected*.—BAHIA (Município de Juazeiro da Bahia), Fazenda Barrinha (2). CEARÁ (Município de Crato), Colégio Agrícola de Crato, 5 km W of Crato (102); Floresta Nacional Araripe-Apodí, 8 km S of Crato (1); Floresta Nacional Araripe-Apodí, 13 km SSW of Crato (3); Floresta Nacional Araripe-Apodí, 17 km SSW of Crato (1); Floresta Nacional Araripe-Apodí, 9 km SW of Crato (1); Floresta Nacional Araripe-Apodí, 10 km SW of Crato (16); Floresta Nacional Araripe-Apodí, 9 km W of Crato (1); Floresta Nacional Araripe-Apodí, 10 km W of Crato (2). PERNAMBUCO (Município de Exu), Fazenda Bom Jesus, 0.8 km NNW of Exu (1); Fazenda Colônia, 5.5 km S of Exu (1); Serrote das Lajes, 17 km S of Exu (1); Serrote Gambá, 19 km SSW of Exu (1); (Município de São Lourenço da Mata), Estação Ecológico do Tapacurá (3).



**Trachops cirrhosus** (Spix, 1823)

Absent from the Chapada do Araripe. Distribution in the Caatingas restricted to serrotes or areas containing rocky outcroppings.

*Specimens collected.*—BAHIA (Município de Juazeiro da Bahia), Fazenda São Raimundo, km 216 on Route BA 130 (1). PERNAMBUCO (Município de Exu), Fazenda Batente, 5.5 km SE of Exu (5); Fazenda Colônia, 5.5 km S of Exu (1); Fazenda Guarani, 2.9 km N of Exu (3); Serrote das Lajes, 17 km S of Exu (26); Serrote das Lajes, 17.7 km S of Exu (1); Serrote Gritadeira, 18 km SSW of Exu (2).

**Subfamily Glossophaginae****Glossophaga soricina** (Pallas, 1766)

Abundant and ubiquitous in Cerrado, Cerradão, and most habitats of the Caatingas. At times found roosting with *Carollia perspicillata* in caves and man-made structures. Present in all other major vegetation zones of the Northeast.

*Specimens collected.*—BAHIA (Município de Senhor do Bom Fim), Fazenda Flamengo, km 150 on Route BA 130 (1); Fazenda Morro da Imburana, km 145 on Route BA 130 (1). CEARÁ (Município de Crato), Aeroporto de Crato, 10 km SW of Crato (14); Colégio Agrícola de Crato, 5 km W of Crato (285); Fazenda Fundão, 3 km SSE of Crato (11); Floresta Nacional Araripe-Apodí, 8 km S of Crato (21); Floresta Nacional Araripe-Apodí, 9 km S of Crato (52); Floresta Nacional Araripe-Apodí, 8 km SSW of Crato (25); Floresta Nacional Araripe-Apodí, 10 km SSW of Crato (10); Floresta Nacional Araripe-Apodí, 11 km SSW of Crato (1); Floresta Nacional Araripe-Apodí, 13 km SSW of Crato (35); Floresta Nacional Araripe-Apodí, 17 km SSW of Crato (3); Floresta Nacional Araripe-Apodí, 21 km SSW of Crato (3); Floresta Nacional Araripe-Apodí, 9 km SW of Crato (1); Floresta Nacional Araripe-Apodí, 10 km SW of Crato (18); Floresta Nacional Araripe-Apodí, 11 km SW of Crato (3); Floresta Nacional Araripe-Apodí, 14 km SW of Crato (10); (Município de Nova Olinda), km 19 on Route CE 96, 4 km SE of Nova Olinda (9). PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (236); Fazenda Barracão, 19.8 km SW of Exu (2); Fazenda Batente, 5.5 km SE of Exu (3); Fazenda Bom Jesus, 0.8 km NNW of Exu (23); Fazenda Colônia, 5.5 km S of Exu (1); Fazenda Guarani, 2.9 km N of Exu (3); Fazenda Maniçoba, 13.7 km SSW of Exu (3); Fazenda Pomonha, 21 km SSW of Exu (13); Fazenda São José, 1.5 km N of Exu (22); Serrote das Lajes, 17 km S of Exu (22); Serrote das Lajes, 17.7 km S of Exu (3); Serrote Gamba, 19 km SSW of Exu (5); Serrote Gritadeira, 18 km SSW of Exu (12); (Município de São Lourenço da Mata) Estação Ecológico do Tapacurá (13); (Município de Serra Talhada), Fazenda Salto, 35 km NNE of Serra Talhada (1). PIAUÍ (Município de Teresina), km 18 on Route BR 316 (1); (Município de Valença do Piauí), Fazenda Olho da Água, 2 km N of Valença do Piauí (2); (Watering hole), 5 km W of Valença do Piauí (1).

**Lonchophylla mordax** Thomas, 1903

Common in the Caatingas, especially near serrotes. Absent from Cerradão and Cerrado habitats of the Chapada do Araripe.

*Specimens collected.*—BAHIA (Município de Juazeiro da Bahia), Fazenda São Raimundo, km 216 on Route BA 130, (1). CEARÁ (Município de Nova Olinda), km 19 on Route CE 96, 4 km SE of Nova Olinda (9). PERNAMBUCO (Município de Exu), Fazenda



Cantareno, 4.5 km NE of Exu (1); Fazenda Colônia, 5.5 km S of Exu (2); Fazenda Guarani, 2.9 km N of Exu (1); Fazenda Manicoba, 13.7 km SSW of Exu (2); Fazenda Pomonha, 21 km SSW of Exu (9); Serrote das Lajes, 17 km S of Exu (41); Serrote das Lajes, 17.7 km S of Exu (6); Serrote Gambá, 19 km SSW of Exu (5); Serrote Gritadeira, 18 km SSW of Exu (5).

### **Anoura geoffroyi** Gray, 1838

Uncommon in the Caatingas where it is usually associated with serrote habitats. Locally abundant in more open areas of Cerradão or in the Cerrado areas of the Chapada do Araripe.

*Specimens collected.*—CEARÁ (Município de Crato), Floresta Nacional Araripe-Apodí, 8 km S of Crato (1); Floresta Nacional Araripe-Apodí, 9 km S of Crato (3); Floresta Nacional Araripe-Apodí, 8 km SSW of Crato (59); Floresta Nacional Araripe-Apodí, 10 km SSW of Crato (1); Floresta Nacional Araripe-Apodí, 21 km SSW of Crato (1); Floresta Nacional Araripe-Apodí, 11 km SW of Crato (1); Floresta Nacional Araripe-Apodí, 10 km W of Crato (1); Sítio Luanda (Itaiteira), 4 km S of Crato (1); (Município de Nova Olinda), km 19 on Route CE 96, 4 km SE of Nova Olinda (23). PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (1); Fazenda Bom Jesus, 0.8 km NNW of Exu (4); Fazenda Pomonha, 21 km SSW of Exu (10); Fazenda São José, 1.5 km N of Exu (1); Serrote das Lajes, 17 km S of Exu (1); Serrote das Lajes, 17.7 km S of Exu (1).

### Subfamily Carolliinae

#### **Carollia perspicillata** (Linnaeus, 1758)

Abundant and ubiquitous in all habitats of the Caatingas, Cerrado, and Cerradão. Present in all other major vegetation zones. Found roosting in both man-made structures and caves, sometimes in association with *Glossophaga soricina*.

*Specimens collected.*—CEARÁ (Município de Crato), Aeroporto de Crato, 10 km SW of Crato (19); Colégio Agrícola de Crato, 5 km W of Crato (19); Fazenda Fundão, 3 km SSE of Crato (1); Floresta Nacional Araripe-Apodí, 8 km S of Crato (51); Floresta Nacional Araripe-Apodí, 9 km S of Crato (181); Floresta Nacional Araripe-Apodí, 8 km SSW of Crato (58); Floresta Nacional Araripe-Apodí, 10 km SSW of Crato (37); Floresta Nacional Araripe-Apodí, 13 km SSW of Crato (22); Floresta Nacional Araripe-Apodí, 17 km SSW of Crato (23); Floresta Nacional Araripe-Apodí, 21 km SSW of Crato (7); Floresta Nacional Araripe-Apodí, 9 km SW of Crato (16); Floresta Nacional Araripe-Apodí, 10 km SW of Crato (120); Floresta Nacional Araripe-Apodí, 11 km SW of Crato (12); Floresta Nacional Araripe-Apodí, 9 km W of Crato (36); (Município de Nova Olinda), km 19 on Route CE 96, 4 km SE of Nova Olinda (1). PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (10); Fazenda Alto de Ferreira, 5 km SW of Exu (1); Fazenda Cantareno, 4.5 km NNE of Exu (11); Fazenda Colônia, 5.5 km S of Exu (14); Fazenda Guarani, 2.9 km N of Exu (5); Fazenda Manicoba, 13.7 km SSW of Exu (22); Fazenda Paus Grandes, 14.2 km E of Exu (1); Fazenda Pomonha, 21 km SSW of Exu (26); Fazenda São José, 1.5 km N of Exu (2); Fazenda São Pedro, 1 km ESE of Exu (1); Fazenda Santa Helena, 1 km NE of Exu (1); Serrote das Lajes, 17 km S of Exu (108); Serrote das Lajes, 17.7 km S of Exu (35); Serrote Gambá, 19 km SSW of Exu (5); Serrote Gritadeira, 18 km SSW of Exu (28); (Município de São Lourenço da Mata), Estação Ecológico do Tapacurá (19). PIAUÍ (Município de Teresina), km 18 on



Route BR 316 (9); (Município de Valença do Piauí), Fazenda Olho da Agua, 2 km N of Valença do Piauí (15).

### Subfamily Sturnirinae

#### ***Sturnira lilium* (E. Geoffroy, 1810)**

Uncommon in the Caatingas where it is primarily restricted to Caatinga Alta habitats. Uncommon in both Cerradão and Cerrado habitats of the Chapada do Araripe.

*Specimens collected*.—CEARÁ (Município de Crato), Aeroporto de Crato, 10 km SW of Crato (2); Floresta Nacional Araripe-Apodí, 9 km S of Crato (4); Floresta Nacional Araripe-Apodí, 8 km SSW of Crato (7); Floresta Nacional Araripe-Apodí, 10 km SSW of Crato (1); Floresta Nacional Araripe-Apodí, 10 km SW of Crato (2); Floresta Nacional Araripe-Apodí, 11 km SW of Crato (4); Floresta Nacional Araripe-Apodí, 9 km W of Crato (1); Sítio Luanda (Itaiteira), 4 km S of Crato (9). PERNAMBUCO (Município de Exu), Fazenda Batente, 5.5 km SE of Exu (1); Fazenda Cantareno, 4.5 km NNE of Exu (3); Fazenda Maniçoba, 13.7 km SSW of Exu (3); (Município de São Lourenço da Mata), Estação Ecológico do Tapacurá (4).

### Subfamily Stenodermatinae

#### ***Uroderma bilobatum* Peters, 1866a**

Very rare both in the Caatingas and on the Chapada do Araripe.

*Specimens collected*.—CEARÁ (Município de Crato), Floresta Nacional Araripe-Apodí, 8 km SSW of Crato (1); Floresta Nacional Araripe-Apodí, 11 km SW of Crato (1). PERNAMBUCO (Município de Exu), Açude Itamaragí, 0.5 km S of Exu (1); Fazenda Pomonha, 21 km SSW of Exu (1).

#### ***Uroderma magnirostrum* Davis, 1968**

*Specimen collected*.—PIAUI (Município de Terezina), km 18 on Route BR 316 (1).

#### ***Vampyrops lineatus* (E. Geoffroy, 1810)**

Very abundant and widespread in both Caatingas and Chapada habitats. In the Caatingas, it has been found roosting in caves in groups of no more than 12 individuals.

*Specimens collected*.—CEARÁ (Município de Crato), Aeroporto de Crato, 10 km SW of Crato (31); Colégio Agrícola de Crato, 5 km W of Crato (18); Floresta Nacional Araripe-Apodí, 8 km S of Crato (4); Floresta Nacional Araripe-Apodí, 9 km S of Crato (18); Floresta Nacional Araripe-Apodí, 8 km SSW of Crato (35); Floresta Nacional Araripe-Apodí, 10 km SSW of Crato (43); Floresta Nacional Araripe-Apodí, 13 km SSW of Crato (6); Floresta Nacional Araripe-Apodí, 17 km SSW of Crato (16); Floresta Nacional Araripe-Apodí, 21 km SSW of Crato (8); Floresta Nacional Araripe-Apodí, 9 km SW of Crato (4); Floresta Nacional Araripe-Apodí, 10 km SW of Crato (9); Floresta Nacional Araripe-Apodí, 11 km SW of Crato (20); Floresta Nacional Araripe-Apodí, 9 km W of Crato (6); Sítio Luanda (Itaiteira), 4 km S of Crato (10); (Município de Nova Olinda), km 19 on Route CE 96, 4 km SE of Nova Olinda (6). PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (4); Fazenda Batente, 5.5 km SE of Exu (4); Fazenda Bom Jesus, 0.8 km NNW of Exu (8); Fazenda Cantareno, 4.5 km



NNE of Exu (2); Fazenda Colônia, 5.5 km S of Exu (4); Fazenda Gravata, 3.1 km NW of Exu (2); Fazenda Guaraní, 2.9 km N of Exu (16); Fazenda Maniçoba, 13.7 km SSW of Exu (9); Fazenda Pomonha, 21 km SSW of Exu (49); Fazenda São José, 1.5 km N of Exu (42); Fazenda Santa Helena, 1 km NE of Exu (8); Serrote das Lajes, 17 km S of Exu (108); Serrote das Lajes, 17.7 km S of Exu (20); Serrote Gambá, 19 km SSW of Exu (13); Serrote Gritadeira, 18 km SSW of Exu (13).

### **Artibeus cinereus** (Gervais, 1856)

Absent from habitats in both the Caatingas and the Chapada do Araripe. Present in remnant Atlantic Tropical Forest and in palm groves.

*Specimens collected.*—PERNAMBUCO (Município de São Lourenço da Mata), Estação Ecológico do Tapacurá (6). PIAUÍ (Município de Teresina), km 18 on Route BR 316 (5).

### **Artibeus concolor** Peters, 1865a

Present but rare on the Chapada do Araripe in Cerrado habitats. Absent from all habitats of the Caatingas.

*Specimens collected.*—CEARÁ (Município de Crato), Aeroporto de Crato, 10 km SW of Crato (1); Floresta Nacional Araripe-Apodí, 8 km SSW of Crato (3); Floresta Nacional Araripe-Apodí, 10 km SSW of Crato (3); Floresta Nacional Araripe-Apodí, 10 km SW of Crato (4); Floresta Nacional Araripe-Apodí, 11 km SW of Crato (1).

### **Artibeus fuliginosus** Gray, 1838

Present in palm groves but absent from all habitats of the Caatingas and Chapada do Araripe.

*Specimen collected.*—PIAUÍ (Município de Teresina), km 18 on Route BR 316 (1).

### **Artibeus jamaicensis** Leach, 1821

Abundant and ubiquitous in both Cerrado and Cerradão habitats; present throughout the Caatingas but locally abundant on, or near, serrotes. Present in all other major vegetation zones.

*Specimens collected.*—BAHIA (Município de Juazeiro da Bahia), Fazenda Barrinha (5); Fazenda São Raimundo, km 216 on Route BA 130 (1). CEARÁ (Município de Crato), Colégio Agrícola de Crato, 5 km W of Crato (10); Floresta Nacional Araripe-Apodí, 8 km S of Crato (37); Floresta Nacional Araripe-Apodí, 9 km S of Crato (66); Floresta Nacional Araripe-Apodí, 8 km SSW of Crato (1); Floresta Nacional Araripe-Apodí, 10 km SSW of Crato (50); Floresta Nacional Araripe-Apodí, 11 km SSW of Crato (1); Floresta Nacional Araripe-Apodí, 13 km SSW of Crato (3); Floresta Nacional Araripe-Apodí, 17 km SSW of Crato (8); Floresta Nacional Araripe-Apodí, 21 km SSW of Crato (3); Floresta Nacional Araripe-Apodí, 10 km SW of Crato (11); Floresta Nacional Araripe-Apodí, 11 km SW of Crato (4); Floresta Nacional Araripe-Apodí, 9 km W of Crato (5); Sítio Luanda (Itaiteira), 4 km S of Crato (5); (Município de Nova Olinda), km 19 on Route CE 96, 4 km SE of Nova Olinda (9). PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (1); Fazenda Alto de Ferreira, 5 km SW of Exu (1); Fazenda Cantareno, 4.5 km NNE of Exu (5); Fazenda Colônia, 5.5 km S of Exu (4);



Fazenda Guaraní, 2.9 km N of Exu (4); Fazenda Pomonha, 21 km SSW of Exu (44); Fazenda São José, 1.5 km N of Exu (2); Serrote das Lajes, 17 km S of Exu (79); Serrote das Lajes, 17.7 km S of Exu (34); Serrote Gamba, 19 km SSW of Exu (5); Serrote Gritadeira, 18 km SSW of Exu (28); (Município de São Lourenço da Mata), Estação Ecológico do Tapacurá (23). PIAUÍ (Município de Teresina), km 18 on Route BR 316 (2); (Município de Valença do Piauí), Fazenda Olho da Água, 2 km N of Valença do Piauí (17).

### **Artibeus lituratus (Olfers, 1818)**

Abundant and widespread on the Chapada do Araripe in both Cerradão and Cerrado habitats. Widespread, but uncommon, throughout the Caatingas. Present in remnant Atlantic Forest and palm grove habitats.

*Specimens collected.*—CEARÁ (Município de Crato), Aeroporto de Crato, 10 km SW of Crato (24); Floresta Nacional Araripe-Apodí, 8 km S of Crato (24); Floresta Nacional Araripe-Apodí, 9 km S of Crato (43); Floresta Nacional Araripe-Apodí, 8 km SSW of Crato (8); Floresta Nacional Araripe-Apodí, 10 km SSW of Crato (5); Floresta Nacional Araripe-Apodí, 13 km SSW of Crato (8); Floresta Nacional Araripe-Apodí, 17 km SSW of Crato (14); Floresta Nacional Araripe-Apodí, 21 SSW of Crato (12); Floresta Nacional Araripe-Apodí, 9 km SW of Crato (5); Floresta Nacional Araripe-Apodí, 10 km SW of Crato (90); Floresta Nacional Araripe-Apodí, 11 km SW of Crato (16); Floresta Nacional Araripe-Apodí, 14 km SW of Crato (1); Floresta Nacional Araripe-Apodí, 19 km SW of Crato (1); Floresta Nacional Araripe-Apodí, 9 km W of Crato (25); (Município de Nova Olinda), km 19 on Route CE 96, 4 km SE of Nova Olinda (2). PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (2); Fazenda Bom Jesus, 0.8 km NNW of Exu (2); Fazenda Cantareno, 4.5 km NNE of Exu (9); Fazenda Guaraní, 2.9 km N of Exu (12); Fazenda Maniçoba, 13.7 km SSW of Exu (2); Fazenda Paus Grandes, 14.2 km E of Exu (2); Fazenda Pomonha, 21 km SSW of Exu (11); Fazenda São José, 1.5 km N of Exu (3); Serrote das Lajes, 17 km S of Exu (2); Serrote Gamba, 19 km SSW of Exu (2); (Município de São Lourenço da Mata), Estação Ecológico do Tapacurá (2). PIAUÍ (Município de Teresina), km 18 on Route BR 316 (4).

### **Subfamily Desmodontinae**

#### **Desmodus rotundus (E. Geoffroy, 1810)**

Common in the Caatingas where it is locally abundant on serrotes. Rare on the Chapada do Araripe, perhaps due to the paucity of livestock.

*Specimens collected.*—BAHIA (Município de Senhor do Bom Fim), Morro da Imburana, km 145 on Route BA 130 (1). CEARÁ (Município de Crato), Floresta Nacional Araripe-Apodí, 8 km S of Crato (1); Floresta Nacional Araripe-Apodí, 9 km S of Crato (4); Floresta Nacional Araripe-Apodí, 8 km SSW of Crato (2); Floresta Nacional Araripe-Apodí, 10 km SSW of Crato (1); Floresta Nacional Araripe-Apodí, 13 km SSW of Crato (1); Floresta Nacional Araripe-Apodí, 17 km SSW of Crato (3); Floresta Nacional Araripe-Apodí, 10 km SW of Crato (1); (Município de Nova Olinda), km 19 on Route CE 96, 4 km SE of Nova Olinda (32). PERNAMBUCO (Município de Exu), Fazenda Alto de Ferreira, 5 km SW of Exu (3); Fazenda Batente, 5.5 km SE of Exu (2); Fazenda Bom Jesus, 0.8 km NNW of Exu (3); Fazenda Cantareno, 4.5 km NNE of Exu (1); Fazenda Maniçoba, 13.7 km SSW of Exu (73); Fazenda Paus Grandes, 14.2 km E of Exu (4);



Fazenda Pomonha, 21 km SSW of Exu (2); Serrote das Lajes, 17 km S of Exu (49); Serrote das Lajes, 17.7 km S of Exu (225); Serrote Gamba, 19 km SSW of Exu (4); Serrote Gritadeira, 18 km SSW of Exu (5); (Município de São Lourenço da Mata), Estação Ecológico do Tapacurá (5).

***Diaemus youngii* (Jentink, 1893)**

Absent from both Caatinga and Chapada habitats. Present in remnant Atlantic Rain Forest.

*Specimen collected*.—PERNAMBUCO (Município de São Lourenço da Mata), Estação Ecológico do Tapacurá (1).

***Diphylla ecaudata* Spix, 1823**

Rare in the Caatingas; absent from the Chapada do Araripe.

*Specimens collected*.—PERNAMBUCO (Município de Exu), Fazenda Manicoba, 13.7 km SSW of Exu (2); Serrote das Lajes, 17 km S of Exu (1); Serrote Gritadeira, 18 km SSW of Exu (1).

**Family Natalidae**

***Natalus stramineus* Gray, 1838**

Rare on the Chapada do Araripe; absent from the Caatingas.

*Specimens collected*.—CEARÁ (Município de Crato), Floresta Nacional Araripe-Apodí, 8 km S of Crato (2); Floresta Nacional Araripe-Apodí, 9 km S of Crato (1).

**Family Furipteridae**

***Furipterus horrens* (F. Cuvier, 1828)**

Absent from the Chapada do Araripe. Rare in the Caatingas, where it was only captured on serrotes. Flies at dusk.

*Specimens collected*.—PERNAMBUCO (Município de Exu), Serrote das Lajes, 17 km S of Exu (1); Serrote das Lajes, 17.7 km S of Exu (1).

**Family Vespertilionidae**

***Myotis nigricans* (Schinz, 1821)**

Rare to common in both Caatinga and Chapada habitats where it was found to roost in buildings under roofing tiles.

*Specimens collected*.—CEARÁ (Município de Crato), Aeroporto de Crato, 10 km SW of Crato (9); Floresta Nacional Araripe-Apodí, 9 km S of Crato (13); Floresta Nacional Araripe-Apodí, 8 km SSW of Crato (10); Floresta Nacional Araripe-Apodí, 11 km SSW of Crato (1); Floresta Nacional Araripe-Apodí, 13 km SSW of Crato (2); Floresta Nacional Araripe-Apodí, 17 km SSW of Crato (1); Floresta Nacional Araripe-Apodí, 10 km SW of Crato (12); Sítio Luanda (Itaiteira), 4 km S of Crato (8). PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (184); Fazenda Batente, 5.5 km SE of Exu (11); Fazenda Bom Jesus, 0.8 km NNW of Exu (1); Fazenda Cantareno, 4.5 km NNE of Exu (5); Fazenda Pomonha, 21 km SSW of Exu (1); Fazenda São José, 1.5 km



N of Exu (2); Serrote das Lajes, 17 km S of Exu (2); (Município de São Lourenço da Mata), Estação Ecológico do Tapacurá (3); (Município de Serra Talhada), Fazenda Saco (I.P.A.), 6.6 km NNE of Serra Talhada (2).

***Eptesicus furinalis* D'Orbigny and Gervais, 1847**

Absent from the Caatingas. Present on the Chapada do Araripe where it is found roosting in buildings.

*Specimens collected*.—CEARÁ (Município de Crato), Aeroporto de Crato, 10 km SW of Crato (2); Floresta Nacional Araripe-Apodí, 9 km S of Crato (4); Floresta Nacional Araripe-Apodí, 10 km SW of Crato (16); Floresta Nacional Araripe-Apodí, 11 km SW of Crato (1).

***Rhogeessa tumida* H. Allen, 1866**

Absent from habitats of the Chapada do Araripe and from the Caatingas in the vicinity of Exu, Pernambuco.

*Specimen collected*.—BAHIA (Município de Juazeiro da Bahia), Fazenda São Raimundo, km 216 on Route BA 130 (1).

***Lasiurus borealis* (Müller, 1776)**

Absent from the Caatingas; rare on the Chapada do Araripe.

*Specimens collected*.—CEARÁ (Município de Crato), Aeroporto de Crato, 10 km SW of Crato (1); Floresta Nacional Araripe-Apodí, 9 km S of Crato (2); Floresta Nacional Araripe-Apodí, 10 km SW of Crato (2); Floresta Nacional Araripe-Apodí, 9 km W of Crato (5).

***Lasiurus ega* (Gervais, 1856)**

Present, but rare, in both Caatinga and Chapada habitats.

*Specimens collected*.—CEARÁ (Município de Crato), Aeroporto de Crato, 10 km SW of Crato (1); Floresta Nacional Araripe-Apodí, 10 km SW of Crato (1). PERNAMBUCO (Município de Exu), Fazenda Batente, 5.5 km SE of Exu (1); Fazenda Bom Jesus, 0.8 km NNW of Exu (3); Fazenda São José, 1.5 km N of Exu (1). PIAUÍ (Município de Valença do Piauí), Fazenda Olho da Agua, 2 km N of Valença do Piauí (1).

**Family Molossidae**

***Molossops abrasus* (Temminck, 1826)**

Absent from both the Chapada do Araripe and the Caatingas. Present in the Caatinga-Cerrado contact zone of Piauí.

*Specimens collected*.—PIAUÍ (Município de Valença do Piauí), Fazenda Olho da Agua, 2 km N of Valença do Piauí (3).

***Molossops greenhalli* (Goodwin, 1958)**

Absent from both Caatinga and Chapada habitats. Present in remnant Atlantic Rain Forest.



*Specimen collected.*—PERNAMBUCO (Município de São Lourenço da Mata), Estação Ecológico do Tapacurá (1).

***Molossops planirostris* (Peters, 1865)**

Rare in the Caatingas; absent from the Chapada do Araripe.

*Specimens collected.*—PERNAMBUCO (Município de Exu), Fazenda Pau Ferrado, 2.6 km E of Exu (3).

***Molossops teminckii* (Burmeister, 1854)**

Rare in the Caatingas, caught exclusively on serrotes or near rocky outcroppings. Most active at dusk and early evening.

*Specimens collected.*—CEARÁ (Município de Crato), Floresta Nacional Araripe-Apodí, 9 km S of Crato (4); Floresta Nacional Araripe-Apodí, 10 km SSW of Crato (2); Floresta Nacional Araripe-Apodí, 8 km SSW of Crato (1). PERNAMBUCO (Município de Exu), Fazenda Batente, 5.5 km SE of Exu (2); Serrote Gambá, 19 km SSW of Exu (2).

***Neoplatymops mattogrossensis* (Vieira, 1942)**

Absent from the Chapada do Araripe. Common in rocky habitats and on serrotes in the Caatingas. Roosts in low-lying rock crevices; flies at dusk and early evening.

*Specimens collected.*—PERNAMBUCO (Município de Exu), Fazenda Batente, 5.5 km SE of Exu (23); Fazenda Cantareno, 4.5 km NNE of Exu (11); Fazenda Manicoba, 13.7 km SSW of Exu (5); Fazenda Pinheira, 1.5 km SW of Exu (1); Fazenda Pomonha, 21 km SSW of Exu (1); Serrote Gambá, 19 km SSW of Exu (3); Serrote Gritadeira, 18 km SSW of Exu (8).

***Tadarida laticaudata* (Geoffroy, 1805)**

*Specimens collected.*—PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (3).

***Tadarida* sp.**

*Specimens collected.*—CEARÁ (Município de Crato), Floresta Nacional Araripe-Apodí, 9 km W of Crato (1).

***Eumops* sp.**

Absent from the Chapada do Araripe and the Caatingas. Present in the Caatinga-Cerrado contact zone of Piauí.

*Specimen collected.*—PIAUI (Município de Valença do Piauí), (Watering hole), 5 km W of Valença do Piauí (1).

***Molossus ater* (E. Geoffroy, 1805)**

Rare in the Caatingas.



*Specimens collected*.—CEARÁ (Município de Nova Olinda), km 19 on Route CE 96, 4 km SE of Nova Olinda (1). PERNAMBUCO (Município de Exu), Fazenda Batente, 5.5 km SE of Exu (1); Fazenda Guarani, 2.9 km N of Exu (1). PIAUÍ (Município de Valença do Piauí), Fazenda Olho da Agua, 2 km N of Valença do Piauí (1); (Watering hole), 5 km W of Valença do Piauí (3).

### **Molossus molossus** (Pallas, 1766)

More or less common in both the Caatingas and Chapada habitats. It may, however, be locally abundant in either habitat near man-made structures which it utilizes as roosts.

*Specimens collected*.—CEARÁ (Município de Crato), Aeroporto de Crato, 10 km SW of Crato (11); Colégio Agrícola de Crato, 5 km W of Crato (138); Floresta Nacional Araripe-Apodí, 10 km SW of Crato (4). PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (62); Fazenda Batente, 5.5 km SE of Exu (1); Serrote das Lajes, 17 km S of Exu (1); (Município de Serra Talhada), Fazenda Saco (I.P.A.), 6.6 km NNE of Serra Talhada (45). PIAUÍ (Município de Valença do Piauí), Fazenda Olho da Agua, 2 km N of Valença do Piauí (13); (Watering hole), 5 km W of Valença do Piauí (2).

### **Promops** sp.

Very rare in the Caatingas; found only in association with man-made structures. Absent from the Chapada do Araripe.

*Specimens collected*.—PERNAMBUCO (Município de Exu), Cidade de Exu (1); Escola Agrícola de Exu, 0.7 km S of Exu (2).

## **Order Primates**

### **Family Cebidae**

#### **Cebus apella** Linnaeus, 1758

In general, *C. apella* is currently restricted to the more extensive, remnant pockets of Caatinga Alta. In the past, this species probably occurred in areas with riverine vegetation and palm forests (associated with the higher serrotes) which are contiguous with high Caatinga.

*Specimens collected*.—PERNAMBUCO (Município de Exu), Fazenda Cantareno, 4.5 km NNE of Exu (3).

### **Family Callithricidae**

#### **Callithrix jacchus** Linnaeus, 1758

This species may be locally abundant in the remaining pockets of Caatinga Alta which also harbor *Cebus apella* and in smaller pockets where *Cebus* is absent. The ability to utilize Caatinga Baixa to some extent accounts in part for the greater abundance of *C. jacchus*. Laboratory specimens accepted various insects and fruits as food.



*Specimens collected*.—PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (2); Fazenda Paus Grande, 14.2 km E of Exu (1); Fazenda Cantareno, 4.5 km NNE of Exu (8).

*Specimens examined*.—ALAGOAS (Manga Beiras), Usina Sinimbu (3); (Quebrangulo), Engenho Riachão (1). BAHIA (No locality), (1); (Rio Preto), Santa Rita de Cassia (1). CEARÁ (Crato), Chapada Araripe (1); (Pacoti), Sítio Alvoredo (1); Sítio Baixa Verde (3); Sítio Boa Vista (1); Sítio Coati (1); Sítio Flor (3); Sítio Goiabeira (2); Sítio Lorena (2); Sítio Mendoza (1); Sítio Umquaiana (5).

## Order Edentata

### Family Myrmecophagidae

#### **Tamandua tetradactyla** Linnaeus, 1758

Occurs primarily in pockets of Caatinga Alta and in the Cerrado portions of the Chapada do Araripe. Its distribution in the Caatingas is limited due to heavy hunting pressure.

*Specimens collected*.—PERNAMBUCO (Município de Exu), Fazenda Cantareno, 4.5 km NNE of Exu (2); Município de Exu (1).

### Family Dasypodidae

#### **Euphractus sexcinctus** Linnaeus, 1758

This armadillo may be found in a wider range of habitats and soil types than *Dasypus* and may even extend onto the bases of rocky serrotes. It is not as readily eaten as is *Dasypus*, and thus it experiences less hunting pressure.

*Specimen collected*.—PERNAMBUCO (Município de Exu), Município de Exu (1).

#### **Dasypus novemcinctus** Linnaeus, 1758

Uncommon in Caatingas and Cerrado habitats due to heavy hunting pressures. In protected areas, such as the Floresta Nacional Araripe-Apodí, it may be locally abundant. Prefers open areas with soft soils.

*Specimen collected*.—PERNAMBUCO (Município de Exu), Município de Exu (1).

## Order Lagomorpha

### Family Leporidae

#### **Sylvilagus brasiliensis** Linnaeus, 1758

The single specimen was collected in a complex area of interdigitating cultivated fields, abandoned fields of various ages and low Caatinga.

*Specimen collected*.—BAHIA (Município de Senhor do Bom Fim), Route BA 130 (1).



*Specimens examined*.—ALAGOAS (Quebrangulo), Engenho Juliana (1); (Viçosa), Fazenda São José (1). BAHIA (Campo Formosa), Fazenda Rapousa (1). PERNAMBUCO (Garanhuns), Sítio Cavaquinho (1); Sítio Inhumas (1).

### Order Rodentia

### Family Muridae

### Subfamily Cricetinae

### ***Oryzomys elurus* Wagner, 1845**

Found in interface areas of thick brush and cultivated fields of grass with a relatively mesic microclimate. This species is less frequently encountered than *O. subflavus*.

*Specimens collected*.—CEARÁ (Município de Crato), Colégio Agrícola de Crato, 5 km W of Crato (1); Floresta Nacional Araripe-Apodí (2). PERNAMBUCO (Município de Exu), Município de Exu (1).

*Specimens examined*.—ALAGOAS (Limoeiro de Anadia), Sítio Brêu (2); (Quebrangulo), Fazenda Lagoa dos Bois (2); (Viçosa), Sítio Canárias (1); Sítio Cachoeira Grande (1); Fazenda Pedra de Fogo (4). BAHIA (Seabra), Fazenda Cochó do Malheiros (2); Fazenda Furados (8). CEARÁ (Itapagé), Sítio Bom Jesus (1); Sítio Maia (2); Sítio Trata (1); Itapipoca, Sítio Jacú (1); (Pacoti), Sítio Boa Esperança do Lapis (2); Sítio Espinho Vermelho (2); Sítio Ouro (1). MINAS GERAIS (Belo Horizonte), Bairro Gameleira (1); Secão Formecimento Agrícola (1); (Jaboticabas) (1); (Ouro Preto) (1). PERNAMBUCO (Garanhuns), Fazenda Caldeirão (1); Sítio Canhoto (1); Sítio Capim (1); Sítio Cavaquinho (1); Sítio Frexeira (1); Sítio Jambelo (1); Sítio Lajeiro (1); Sítio Riacho Seco (1); Fazenda São Paulo (1); Fazenda Velha (1).

### ***Oryzomys subflavus* Wagner, 1842**

This rodent is essentially a commensal. The distribution typically is limited to plots of sugarcane although other cultivated fields may harbor a few individuals.

*Specimens collected*.—CEARÁ (Município de Crato), Colégio Agrícola de Crato, 5 km W of Crato (1); Floresta Nacional Araripe-Apodí (1). PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (1); Município de Exu (25); Fazenda Cana Mansa, 13.4 km SW of Exu (1); (Município de Serra Talhada), Fazenda Saco (I.P.A.), 6 km N of Serra Talhada (2); SUCAM (in the town of Triunfo), 28 km NNE of Serra Talhada (8).

*Specimens examined*.—ALAGOAS (Anadia), Sítio Brejo do Boi (1); (Palmeira dos Índios), Sítio Ribeiro (1); (Quebrangulo), Sítio Barro Preto (1); Sítio Olho d'Água do Monteiro (1); Fazenda Peri-peri (1); (Santana do Ipanema), Sítio Goiabeira (1); (Viçosa), Sítio São José (1); Fazenda São Pedro (1); Sítio Tangil 2° (2). BAHIA (Feira), Fazenda Cazumba (1); Sítio Tomba (1); Fazenda Três Riachos (3); (Serrinha), Sítio Baixa d'Água (1); Fazenda Outeiro (1); Fazenda Tiririca (8); Fazenda Umburana (1). CEARÁ (Crato), Sítio Arisco (2); Sítio Constantino (1); Sítio Crispin (1); Sítio Grangeiro (1); Sítio Passagem (2); (Guaraciaba), Sítio Mazagão (1); (Pacoti), Sítio Ladeira (1); (São Benedito), Sítio Barra (1); Sítio Chora (3); Sítio Piraguara (1). PERNAMBUCO (Garanhuns), Sítio Cajarana (1); Sítio Cavaquinho (1); Fazenda Colônia da Serra (1); Sítio Engenho do Maneão (1); Sítio Flamengo (1); Sítio Inhumas (1); Sítio Saco (1); Fazenda Serra da Pedra (1); Sítio Varzea-Ingá (1); Sítio Varzea-Redonda (1).



**Rhipodomys mastacalis** Lund, 1841

*Specimens examined*.—CEARÁ (Crato), Sítio Belo Horizonte (2); Sítio Caiano (1); Sítio Parque (1); Sítio Passagem (1); (São Benedito), Sítio Barros (1); Sítio Cantinho (1); Sítio Cegarro (1); Sítio Guaribas do Amaral (2); Sítio Macapá (1); Sítio Piraguará (3); Sítio São José da Boa Vista (1). PERNAMBUCO (Caruaru), Sítio Brejo do Buraco (3); Sítio Quandús (5); Fazenda Santa Maria (3); Sítio Serra dos Cavalos (4).

**Akodon** sp.

*Specimens collected*.—PERNAMBUCO (Município de São Lourenço da Mata), Estação Ecológico do Tapacurá (20).

**Akodon arviculoides** (Wagner, 1842)

*Specimens examined*.—ALAGOAS (Anadia), Sítio Brejo do Boi (1); (Viçosa), Fazenda Gitirana (4); Sítio Pedra da Fazenda dos Pereiras (3); Fazenda Poço-Feio (1); Sítio Timbó 2° (1). BAHIA (Serrinha), Fazenda Alagadiço Grande (1); Fazenda Europa (1); Fazenda João Congo (2); Fazenda Montanha (1); Fazenda Riacho Grande (1); Fazenda Tiririca (2). MINAS GERAIS (Conceição do Mato Dentro), Boca da Mata (2); Bocada Mulata (1); Mata do Dr. Daniel (7). PERNAMBUCO (Garanhuns), Sítio Brejo Grande (1); Sítio Camaratuba (1); Sítio Cavaquinho (3); Sítio Varzea do Ingá (3).

**Bolomys lasiurus** (Lund, 1841)

This species undergoes population eruptions of great magnitude at irregular intervals. Individuals inhabit cultivated (especially corn) and grass (maintained by grazing) fields or recently abandoned fields with thick ground cover. They are strictly terrestrial and sometimes construct "runways." Captive specimens were essentially omnivorous.

*Specimens collected*.—CEARÁ (Município do Crato), Floresta Nacional Araripe-Apodí (1). PERNAMBUCO (Município de Exu), 0.5 km SW of Exu (3); 1 km S of Exu (10); 1 km SW of Exu (4); 1.5 km S of Exu (2); 1.5 km SW of Exu (6); Escola Agrícola de Exu (AGGEU lab specimens), 0.7 km S of Exu (429); Fazenda Pinheira, 1.5 km SW of Exu (12); Município de Exu (60); Town of Exu (6); (Município de Serra Talhada), Fazenda Saco, 6 km N of Serra Talhada (10); SUCAM (in the town of Triunfo), 28 km NNE of Serra Talhada (9).

*Specimens examined*.—ALAGOAS (Capela), Fazenda Serra Alegre (1); (Quebrangulo), Fazenda Dourado (4); Sítio Olho d'Água do Monteiro (1); Fazenda Peri-peri (1); Fazenda Poço da Serra (1); Fazenda Santa Cruz (3). BAHIA (Conquista), Fazenda Barra Moranga (1); (Palmeiras), Sítio Bouqueirão (6); Campo de São João (3); Fazenda Conceição (1). CEARÁ (Itapagé), Camará (3); Sítio São João II (7). MINAS GERAIS (Alem Paraíba), Fazenda São Geraldo (5); (Volta Grande), Fazenda Paraíso (1); Fazenda Pombal (1). PERNAMBUCO (Caruaru), Sítio Pitombeira (1); Sítio Riacho dos Mocós (2); Fazenda Salgado (1); (Triunfo), Sítio Brejinho (1); Sítio Monte Alegre (1); Sítio Novo (1); Sítio Peri-peri (1); Sítio Salva Terra (1); Sítio São Bartolomeu (1).

**Oxymycteris angularis** (Thomas, 1909)

*Specimens examined*.—ALAGOAS (Quebrangulo), Engenho Riachão (2); (Viçosa), Sítio Amazonas (3); Sítio Bauauas (1); Fazenda Cachoeira Grande (1); Sítio Cambuim II (2); Sítio Engenho São José (1); Sítio Estrada Nova (2); Sítio Gravatá (2); Sítio Pedra de F. dos Pereiros (1); Fazenda Pindobinha (2); Fazenda Poço Feio (1); Fazenda Riachão



II (1); Fazenda São Manoel (3); Sítio Tamandua (1); Sítio Urucuba (1); Sítio Vila Maria Lia (2). CEARÁ (São Benedito), Sítio Pedra de Côco (1). PERNAMBUCO (Bonito), Sítio Rodiadouro (1); (Caruaru), Sítio Brejinho de Serra dos Cavalos (1); Sítio Brejo do Buraco (2); Sítio Capoeira (1); Fazenda Caruaru (7); Fazenda Santa Maria (3); Sítio Serra dos Cavalos (9).

### ***Calomys callosus* Rengger, 1830**

Caatinga Baixa and the latter stages of old field succession are preferred habitats. *Calomys* is nocturnal and an agile, active climber.

*Specimens collected*.—PERNAMBUCO (Município de Exu), 0.5 km S of Exu (1); Escola Agrícola de Exu, 0.7 km S of Exu (8); Fazenda Santa Helena, 1 km N of Exu (1); Município de Exu (7).

### ***Calomys* sp.**

*Specimens examined*.—BAHIA (Conquista), Fazenda Agrião (3); Sítio Batalha (2); Fazenda Espírito Santo (6); Fazenda Felícia (2); (Jequié), Fazenda Santa Maria (11); Fazenda Pedra Redonda (1); (No locality) (14).

### ***Wiedomys pyrrhorhinos* (Wied, 1821)**

Caatinga Baixa is the typical habitat of *Wiedomys*. This species is nocturnal and relatively rare.

*Specimens collected*.—BAHIA (Município de Juazeiro da Bahia), Fazenda São Raimundo, km 216 on Route BA 130 (1). CEARÁ (Município de Crato), Floresta Nacional Araripe-Apodí (1). PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (12); Fazenda Pinheira, 1.5 km SW of Exu (3); Município de Exu (2).

*Specimens examined*.—ALAGOAS (Palmeira dos Índios), Sítio Ribeira (1); (Quebrangulo), Fazenda Lagoas dos Bois (1); Fazenda Santa Cruz II (6); (Santana do Ipanema), Sítio Lagoinha (2). BAHIA (Feira), Fazenda Tanque do Pasto (1); Fazenda Trez Riacho (3); (Seabra), Lagoa Seca (3); Varzea da Canabrava (3). CEARÁ (Campo Sales), Sítio Cantos (1); (Ipú), Cidade (1); Fazenda Lages (3); Sítio Pereiros (1); (Missão Velha), Sítio Açude Velho (1); Sítio Cachoeira (1); (São Benedito), Sítio Alto (1); Sítio Barros (1). PERNAMBUCO (Caruaru), Sítio Canhoto (2); Sítio Gravatá (2); Pingueiras (6); Sítio Preguiça (6); Sítio Roncaria (1); Fazenda Serraria (4).

### ***Holochilus brasiliensis* (Desmarest, 1819)**

*Specimens examined*.—ALAGOAS (Quebrangulo), Fazenda Bento de Barros (2); Sítio Mauiras (1); Fazenda Peri-peri (3); (Viçosa), Fazenda Pindobinha (1); Sítio Tangil (3). BAHIA (Bom Jesus-Lapa), Ilha do Medo (7). CEARÁ (Barbalha), Sítio Barreiras (1); Sítio Tupinamba (3); (Crato), Sítio Passagem (4); (Ipú), Sítio Gagas (1); (Joazeiro), Sítio Boca das Cobras (5); (Pacoti), Sítio Espinho Vermelho (2); (São Benedito), Sítio Carangueijo (1); Sítio Catinguinha (1); Sítio Muricatuba (1). MINAS GERAIS (Santa), Bicas Lagoa (3). PERNAMBUCO (Garanhuns), Sítio Cavaquinho (1); Fazenda Cristovão (1); Sítio Frixeira (1); Sítio Inhumas (5); Sítio Laranja (1); Fazenda Trairas (1).

### **Subfamily Murinae**

### ***Rattus rattus* Linnaeus, 1758**

This species is a common commensal. The current distribution includes man-made dwellings in towns and outlying fazendas. *R. rattus*



is of particular interest because it is a vector of an endemic form of bubonic plague.

*Specimens collected*.—PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (4); Fazenda Batente, 5.5 km SE of Exu (2); Fazenda Pinheira, 1.5 km SW of Exu (7); Município de Exu (170).

### **Mus musculus** (Linnaeus, 1758)

This species is another commensal. Populations are concentrated in towns, but population levels are much lower than those of *Rattus*.

*Specimens collected*.—PERNAMBUCO (Município de Exu) (23).

### Family Caviidae

### **Kerodon rupestris** (Wied, 1820)

This species is normally found only on lajeiros and rocky serrotes. A population was established near Parnamirim, Pernambuco, in an old quixaba forest by introducing individuals. The relatively large size (up to 1,000 g), hunting pressure, and restrictive habitat requirements have contributed to localized extirpations throughout much of the Caatingas. Reproduction is not synchronized and animals are active both day and night. This species may be the only endemic Caatinga rodent.

*Specimens collected*.—PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (4); Fazenda Batente, 5.5 km SE of Exu (5); Fazenda Cantareno, 4.3 km NE of Exu (5); Município de Exu (9); Serrote das Lages, 17.7 km S of Exu (1); (Município de Parnamirim) (1).

*Specimens examined*.—ALAGOAS (Santana do Ipanema), Sítio Goiabeira (1); Sítio Lagoinha (12); Sítio Riacho do Bode (2). BAHIA (Joazeiro) (1); (Vila Nova) (2). CEARÁ (Araripe), Sítio Cachoeira (1); (Assaré), Sítio Caraco (1); Sítio Manuel Inácio (2); (Campo Sales), Sítio Acoci (18); Sítio Canto (8); (Crato), Serra do Juá (1); Sítio Boa Vista (2); (Itapagé), Sítio São João (1); (Milagres), Sítio Espinho de Judeu (2); (Missão Velho), Sítio Lapinha (2). MINAS GERAIS (Barro Alto) (1); (Riacho da Cruz) (1). PERNAMBUCO (Bodocó), Sítio Belem (2); Sítio Lopes (2); Sítio Riacho da Melancia (1); Sítio Sabonete (6); Sítio Serra do Brejo (2); (Exu), Sítio Gravatá (4); (Pesqueira), Sítio Ceguinha (1).

### **Galea spixii** (Wagler, 1831)

This is the only rodent in the Caatingas which utilizes a network of well-worn runways. Individuals are found only in low-lying areas. Peak densities are reached in certain cultivated or recently abandoned fields. Reproduction occurs throughout the year. Activity is mostly crepuscular although short periods of activity may occur at any time.

*Specimens collected*.—PERNAMBUCO (Município de Exu), 0.5 km S of Exu (3); 0.5 km SW of Exu (4); 1.0 km S of Exu (5); 4.0 km S of Exu (1); Escola Agrícola de Exu, 0.7 km S of Exu (27); Fazenda Batente, 5.5 km SE of Exu (10); Fazenda Pinheira, 1.5 km SW of Exu (6); Fazenda Manicoba, 10 km S of Exu (1); Município de Exu (106); (Município de São Lourenço da Mata), Estação Ecológico do Tapacurá (170 m) (1).

*Specimens examined*.—ALAGOAS (Limoeiro de Anadia), Sítio Brejo (2); Sítio Brêu



(3); Sítio Gameleira (1); (Quebrangulo), Fazenda Poço da Serra (1); Sítio Barra (1); Sítio Olho d'Água do Monteiro (2). BAHIA (Mundo Novo), Sítio Barra de Mundo Novo (1); (Serrinha), Fazenda Cruzeiro (3); Sítio Totonio (1). CEARÁ (Barbalha), Sítio São Pedro (1); (Brejo Santo), Sítio Cancela (3); Sítio Massape (1); (Crato), Sítio Fabrica (1); Sítio Miranda (1); Sítio Oiteiro (1); Sítio Sapinho (2); (Jardim), Sítio Engenho d'Água (1); Sítio Olho d'Água (1); (Missão Velho), Sítio Yamaleira (1); (Santana do Cariri) (1); (Solonopole), Sítio Cedão (1); Sítio Inhuma (1); Sítio Passa Corrente (1); Sítio Veneza (4). PERNAMBUCO (Exu), Sítio Alto do Umbuzeiro (1); Sítio Gravatá (1); (Bodocó), Sítio Roncador (3); (Pesqueira), Fazenda Caçimba Nova (1); Fazenda Caianinha (1); Sítio Carrapato (1); Sítio Isabel Dias (1); Sítio Maravilha (2); Fazenda Pitanquinha (6); Fazenda Quatro Cantos (1); Sítio Serrinha (1); (Triunfo), Sítio Lagoa do Almeida (1).

### Family Dasyproctidae

#### *Dasyprocta prymnolopha* (Wagler, 1831b)

Heavy hunting pressure has greatly reduced or eliminated populations in many localities. Remnant populations still persist in some pockets of Caatinga Alta and on isolated serrotes. In areas subject to minimal hunting pressure, such as the Floresta Nacional Araripe-Apodí, these large rodents may still be common residents.

*Specimens collected*.—PERNAMBUCO (Município de Exu), Fazenda Marçal, 14.2 km NW of Exu (2).

*Specimen examined*.—PERNAMBUCO (Dois Irmãos) (1).

### Family Echimyidae

#### *Thrichomys apereoides* Lund, 1841 (see Petter, 1973)

This echimyid is strictly associated with rocky habitats, such as serrotes and lajeiros. Reproductive periods are relatively synchronized and the young are very precocial. *Thrichomys* may be active for brief periods at any time but it is generally crepuscular. These animals are scansorial and are good climbers.

*Specimens collected*.—BAHIA (Município de Senhor do Bom Fim), Fazenda Flamengo, 10 km N of Jaguarari (3); Fazenda Morro da Imburana, 15 km N of Jaguarari (2). PERNAMBUCO (Município de Exu), Escola Agrícola de Exu, 0.7 km S of Exu (25); Fazenda Batente, 5.5 km SE of Exu (13); Fazenda Guaraní, 2.9 km N of Exu (5); Fazenda Pinheira, 1.5 km SW of Exu (4); Fazenda Santa Helena, 1 km N of Exu (2); Município de Exu (48); (Município de São Lourenço da Mata), Estação Ecológico do Tapacurá (170 m) (3).

### Order Carnivora

#### Family Canidae

#### *Cerdocyon thous* (Linnaeus, 1766)

This species is ubiquitous and fairly common. Currently, *Cerdocyon* is the most abundant terrestrial predator (placental) in the Caatingas and on the Chapada do Araripe.



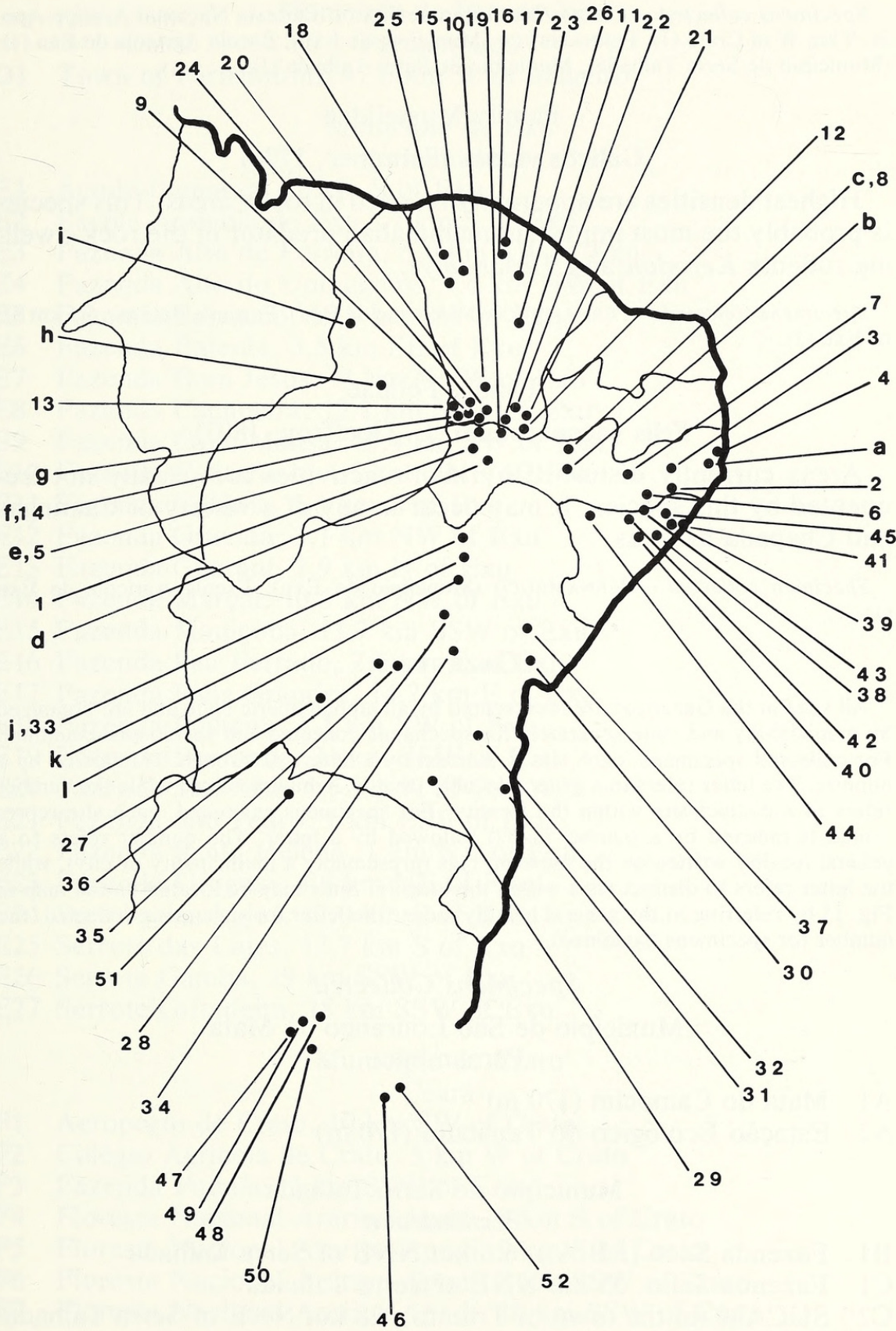


Fig. 15.—Mammal specimens were examined or collected from a broad area throughout most of the Northeast of Brazil. Major localities are indicated by a dot, with the appropriate numeral referencing the set of specific sites enumerated in the Gazetteer.



*Specimens collected*.—CEARÁ (Município de Crato), Floresta Nacional Araripe-Apodí, 9 km W of Crato (1). PERNAMBUCO (Município de Exu), Escola Agrícola de Exu (1); (Município de Serra Talhada), Município de Serra Talhada (1).

### Family Mustelidae

#### *Galictis vittata* (Schreber, 1776)

Highest densities are apparently reached in rocky areas. This species is probably the most important mammalian predator of the rock-dwelling rodents *Kerodon* and *Thrichomys*.

*Specimens collected*.—PERNAMBUCO (Município de Exu), Fazenda Batente, 5.5 km SE of Exu (2).

### Family Felidae

#### *Felis yagouaroundi* (E. Geoffroy, 1803)

Areas currently disturbed by man's activities are usually not frequented by this species. It may occur in any of a variety of Caatingas and Chapada habitats.

*Specimen collected*.—PERNAMBUCO (Município de Exu), Escola Agrícola de Exu (1).

### GAZETTEER

All sites in the Gazetteer are represented by an alphanumeric code and are organized by municipality and state separately for specimens collected and specimens examined. For collected specimens, each site is indexed by a letter (A through L) followed by a number. The letter refers to a general locality (that is, a municipality), while the number refers to a distinct site within the locality. For specimens examined, each site represented is indexed by a number (1–52) followed by a letter. The number refers to a general locality written on the museum tags (presumably a municipality or city), while the letter refers to distinct sites within the locality. Sites may be located on the map in Fig. 15 by referring to the general locality index (the letter for specimens collected, the number for specimens examined).

#### *Specimens Collected*

##### Município de São Lourenço da Mata Pernambuco

- A1 Mata do Camocim (170 m)
- A2 Estação Ecológico do Tapacurá (170 m)

##### Município de Serra Talhada Pernambuco

- B1 Fazenda Saco (I.B.A.), 6.6 km NNE of Serra Talhada
- C1 Fazenda Salto, 35 km NNE of Serra Talhada
- C2 SUCAM (in the town of Triunfo), 28 km NNE of Serra Talhada



Município de Parnamirim  
Pernambuco

D1 Town of Parnamirim, 47.6 km W of Salgueiro

Município de Exu  
Pernambuco

- E1 Açude Itamaragí, .5 km S of Exu
- E2 Escola Agrícola de Exu, .7 km S of Exu
- E3 Fazenda Alto de Ferreira, 5.0 km SW of Exu
- E4 Fazenda Alto do Umbuzeiro, 1.4 km NW of Exu
- E5 Fazenda Barracão, 19.8 km SW of Exu
- E6 Fazenda Batente, 5.5 km SE of Exu
- E7 Fazenda Bom Jesus, .8 km NNW of Exu
- E8 Fazenda Cachoeira, 13.1 km SSW of Exu
- E9 Fazenda Cana Mansa, 13.4 km SW of Exu
- E10 Fazenda Cantareno, 4.5 km NNE of Exu
- E11 Fazenda Colônia, 5.5 km S of Exu
- E12 Fazenda Gravatá, 3.1 km NW of Exu
- E13 Fazenda Guaraní, 2.9 km N of Exu
- E14 Fazenda Marçal, 10.5 km NW of Exu
- E15 Fazenda Manicoba, 13.7 km SSW of Exu
- E16 Fazenda Pau Ferrado, 2.6 km E of Exu
- E17 Fazenda Paus Grandes, 14.2 km E of Exu
- E18 Fazenda Pinheira, 1.5 km SW of Exu
- E19 Fazenda Pomonha, 21 km SSW of Exu
- E20 Fazenda São José, 1.5 km N of Exu
- E21 Fazenda São Pedro, 1 km ESE of Exu
- E22 Fazenda Santa Helena, 1 km NE of Exu
- E23 Fazenda Uruguai, 4.8 km NE of Exu
- E24 Serrote das Lajes, 17.0 km S of Exu
- E25 Serrote das Lajes, 17.7 km S of Exu
- E26 Serrote Gambá, 19 km SSW of Exu
- E27 Serrote Gritadeira, 18 km SSW of Exu

Município de Crato  
Ceará

- F1 Aeroporto de Crato, 10 km SW of Crato
- F2 Colégio Agrícola de Crato, 5 km W of Crato
- F3 Fazenda Fundão, 3 km SSW of Crato
- F4 Floresta Nacional Araripe-Apodí, 8 km S of Crato
- F5 Floresta Nacional Araripe-Apodí, 9 km S of Crato
- F6 Floresta Nacional Araripe-Apodí, 8 km SSW of Crato
- F7 Floresta Nacional Araripe-Apodí, 10 km SSW of Crato



- F8 Floresta Nacional Araripe-Apodí, 11 km SSW of Crato
- F9 Floresta Nacional Araripe-Apodí, 13 km SSW of Crato
- F10 Floresta Nacional Araripe-Apodí, 17 km SSW of Crato
- F11 Floresta Nacional Araripe-Apodí, 21 km SSW of Crato
- F12 Floresta Nacional Araripe-Apodí, 9 km SW of Crato
- F13 Floresta Nacional Araripe-Apodí, 10 km SW of Crato
- F14 Floresta Nacional Araripe-Apodí, 11 km SW of Crato
- F15 Floresta Nacional Araripe-Apodí, 14 km SW of Crato
- F16 Floresta Nacional Araripe-Apodí, 19 km SW of Crato
- F17 Floresta Nacional Araripe-Apodí, 9 km W of Crato
- F18 Floresta Nacional Araripe-Apodí, 10 km W of Crato
- F19 Sítio Luanda (Itaiteira), 4 km S of Crato

Município de Nova Olinda  
Ceará

- G1 Km 19 on Route CE 96 (outside of the town of Nova Olinda)

Município de Valença do Piauí  
Piauí

- H1 Fazenda Olho da Agua, 2 km N of Valença do Piauí
- H2 (Watering Hole) 5 km W of Valença do Piauí

Município de Teresina  
Piauí

- I1 Km 18 on Route BR 316 (outside of the city of Teresina)

Município de Juazeiro da Bahia  
Bahia

- J1 Fazenda Barrinha
- J2 Fazenda São Raimundo, Km 216 on Route BA 130

Município de Senhor do Bom Fim  
Bahia

- K1 Fazenda Flamengo, Km 150 on Route BA 130, 10 km N of the town of Jaguarari
- K2 Fazenda Lajeido, Km 147 on Route BA 130
- K3 Fazenda Morro da Imburana, Km 145 on Route BA 130
- L1 Distrito de Juacema (on Route BA 130)

*Specimens Examined*

(National Museum in Rio de Janeiro)  
Bodocó

Pernambuco

- 1a Sítio Belem
- 1b Sítio Lopes



- 1c Sítio Paus Pretio
- 1d Sítio Riacho da Melância
- 1e Sítio Roncador
- 1f Sítio São Gonçalo
- 1g Sítio Sabonete
- 1h Sítio Serra do Brejo
- 1i Sítio Xique-xique

Bonito  
Pernambuco

- 2a Sítio Rodiadouro

Caruaru  
Pernambuco

- 3a Sítio Brejinha de Serra dos Cavalos
- 3b Sítio Brejo do Buraco
- 3c Sítio Canhoto
- 3d Sítio Capoeira
- 3e Fazenda Caruaru
- 3f Sítio Gravata
- 3g Pingueiras
- 3h Sítio Pitombeira
- 3i Sítio Preguica
- 3j Sítio Quandús
- 3k Sítio Riacho dos Mocós
- 3l Sítio Roncaria
- 3m Fazenda Salgado
- 3n Fazenda Santa Maria
- 3o Sítio Serra dos Cavalos
- 3p Fazenda Serraria
- 3q No locality

Dois Irmãos  
Pernambuco

- 4a No locality

Exu  
Pernambuco

- 5a Sítio Gravata
- 5b Sítio Alto do Umbuzeiro

Garanhuns  
Pernambuco

- 6a Sítio Brejo Grande
- 6b Sítio Cajarana



- 6c Fazenda Caldeirão
- 6d Sítio Camaratuba
- 6e Sítio Canhoto
- 6f Sítio Capim
- 6g Sítio Cavaquinho
- 6h Fazenda Colônia da Serra
- 6i Fazenda Cristovão
- 6j Sítio Engenho do Manião
- 6k Sítio Flamengo
- 6l Sítio Frixeira
- 6m Sítio Inhumas
- 6n Sítio Jambelo
- 6o Sítio Lajeiro
- 6p Sítio Laranja
- 6q Sítio Riacho Fundo
- 6r Sítio Riacho Seco
- 6s Sítio Saco
- 6t Fazenda São Paulo
- 6u Fazenda Serra da Pedra
- 6v Fazenda Trairas
- 6w Sítio Varzea do Ingá
- 6x Sítio Varzea-Ingá
- 6y Sítio Varzea-Redonda
- 6z Fazenda Velha
- 6aa No locality

No Area  
Pernambuco

No locality

Pesqueira  
Pernambuco

- 7a Fazenda Caçimba Nova
- 7b Fazenda Caianinha
- 7c Sítio Carrapato
- 7d Sítio Isabel Dias
- 7e Sítio Maravilha
- 7f Fazenda Pitanquinha
- 7g Fazenda Quatro Cantos
- 7h Sítio Serrinha
- 7i Fazenda Sororoca

Triunfo  
Pernambuco

- 8a Sítio Boa Esperança de Jérico
- 8b Sítio Borgens



- 8c Sítio Brejinho
- 8d Sítio Cana Brava de Jérico
- 8e Sítio Corredor do Vento
- 8f Sítio Lagoa do Almeida
- 8g Sítio Macaco de Baixa Verde
- 8h Sítio Monte Alegre
- 8i Sítio Novo
- 8j Sítio Oiti
- 8k Sítio Peri-peri
- 8l Sítio Salva Terra
- 8m Sítio São Bartolomeu
- 8n Sítio São Mateus

Araripe  
Ceará

- 9a Sítio Cachoeira

Assare  
Ceará

- 10a Sítio Caraco
- 10b Sítio Manuel Inacio

Barbalha  
Ceará

- 11a Sítio Barreiras
- 11b Sítio São Pedro
- 11c Sítio Tupinamba

Brejo Santo  
Ceará

- 12a Sítio Cancela
- 12b Sítio Massape

Campo Sales  
Ceará

- 13a Sítio Acoci
- 13b Sítio Canto(s)
- 13c Sítio Volta

Crato  
Ceará

- 14a Sítio Arisco
- 14b Sítio Belo Horizonte
- 14c Sítio Boa Vista
- 14d Sítio Caiano
- 14e Chapada Araripe
- 14f Sítio Constantino



- 14g Sítio Crispin
- 14h Sítio Fabrica
- 14i Sítio Grangeiro
- 14j Sítio Miranda
- 14k Sítio Oiteiro
- 14l Sítio Olaria
- 14m Sítio Parque
- 14n Sítio Passagem
- 14o Sítio Sapuinho
- 14p Serra do Juá
- 14q No locality

Guaraciaba  
Ceará

- 15a Sítio Mazagão

Itapagé  
Ceará

- 16a Sítio Bom Jesus
- 16b Camará
- 16c Sítio Maia
- 16d Sítio São João II
- 16e Sítio São José
- 16f Sítio Trata

Itapipoca  
Ceará

- 17a Sítio Jacú

Ipíu  
Ceará

- 18a Cidade de Ipíu
- 18b Sítio Gagas
- 18c Fazenda Lages
- 18d Sítio Pereiros

Jardim  
Ceará

- 19a Sítio Cereado
- 19b Sítio Engenho d'Agua
- 19c Sítio Olho d'Agua

Joazeiro  
Ceará

- 20a Sítio Boca das Cobras



Milagres  
Ceará

- 21a Sítio Camará
- 21b Sítio Espinho de Judeu

Missão Velho  
Ceará

- 22a Sítio Açude Velho
- 22b Sítio Araruna
- 22c Sítio Cachoeira
- 22d Sítio Emboscada
- 22e Sítio Lapinha
- 22f Sítio Yamaleira

Pacoti  
Ceará

- 23a Sítio Alvoredo
- 23b Sítio Baixa Verde
- 23c Sítio Boa Esperança do Lapis
- 23d Sítio Boa Vista
- 23e Sítio Coati
- 23f Sítio Espinho Vermelho
- 23g Sítio Flor
- 23h Sítio Goiabeira
- 23i Sítio Ladeira
- 23j Sítio Lorena
- 23k Sítio Mendoza
- 23l Sítio Ouro
- 23m Sítio Umquaiana

Santana do Cariri  
Ceará

- 24a Cidade de Santana do Cariri

São Benedito  
Ceará

- 25a Sítio Alto
- 25b Sítio Barra
- 25c Sítio Barros
- 25d Sítio Cantinho
- 25e Sítio Carangueijo
- 25f Sítio Catinguinha
- 25g Sítio Cegarro
- 25h Sítio Chora



- 25i Sítio Cinta da Solidade
- 25j Sítio Guaribas do Amaral
- 25k Sítio Macapá
- 25l Sítio Muricatuba
- 25m Sítio Pedra de Côco
- 25n Sítio Piraguará
- 25o Sítio São José da Boa Vista

Solonopole  
Ceará

- 26a Sítio Cedrão
- 26b Sítio Inhuma
- 26c Sítio Passa Corrente
- 26d Sítio Veneza

Bom Jesus de Lapa  
Bahia

- 27a Ilha do Medo

Campo Formosa  
Bahia

- 28a Fazenda Rapousa

Conquista  
Bahia

- 29a Fazenda Agrião
- 29b Fazenda Barra Morangoa
- 29c Sítio Batalha
- 29d Fazenda Espirito Santo
- 29e Fazenda Felícia

Feira  
Bahia

- 30a Fazenda Capoeira do Rosario
- 30b Fazenda Cazumba
- 30c Fazenda Jacú
- 30d Fazenda Salgado
- 30e Fazenda Tanque do Pasto
- 30f Sítio Tomba
- 30g Fazenda Três Riachos

Ilheus  
Bahia

- 31a Aritaque Urucutuca
- 31b Banco da Vitória, Pirataquissé



- 31c Buerarema Riberão da Fortuna  
31d Rio do Braço, Fazenda Almeida

Jequié  
Bahia

- 32a Fazenda Pedra Redonda  
32b Fazenda Santa Maria

Joazeiro  
Bahia

- 33a No locality

Mundo Novo  
Bahia

- 34a Sítio Barra de Mundo Novo

No Area  
Bahia

No locality

Palmeiras  
Bahia

- 35a Sítio Bouqueirão  
35b Campo de São José  
35c Fazenda Conceição

Seabra  
Bahia

- 36a Varzea da Canabrava  
36b Fazenda Cochó do Malheiros  
36c Fazenda Furados  
36d Lagoa Seca

Serrinha  
Bahia

- 37a Fazenda Alagadiço Grande  
37b Sítio Baixa d'Água  
37c Fazenda Cacuá  
37d Fazenda Bruzeiro  
37e Fazenda Europa  
37f Fazenda João Congo  
37g Fazenda Montanha  
37h Fazenda Oiteiro  
37i Fazenda Riacho Grande  
37j Fazenda Tiririca



- 37k Sítio Totonio  
37l Fazenda Umburana

Vila Nova  
Bahia

No locality

Anadia  
Alagoas

- 38a Sítio Brejo do Boi

Capela  
Alagoas

- 39a Fazenda Serra Alegre

Limoeira de Anadia  
Alagoas

- 40a Sítio Barracão  
40b Sítio Brejo  
40c Sítio Brêu  
40d Sítio Gameleira

Managabeiras (= Manguaba)  
Alagoas

- 41a Usina Sinimbu

Palmeiras dos Indios  
Alagoas

- 42a Sítio Capuma  
42b Sítio Dormião  
42c Sítio Pannels  
42d Sítio Ribeira  
42e Sítio Sabiá

Quebrangulo  
Alagoas

- 43a Sítio Barra  
43b Sítio Barra Preto  
43c Fazenda Bento de Barros  
43d Fazenda Dourado  
43e Engenho Juliana  
43f Engenho Riachão  
43g Fazenda Lagoa dos Bois  
43h Sítio Maurias  
43i Sítio Olho d'Água do Monteiro



- 43j Fazenda Peri-peri
- 43k Fazenda Poço da Serra
- 43l Fazenda Santa Cruz II

Santana do Ipanema  
Alagoas

- 44a Sítio Goiabeira
- 44b Sítio Lagoinha
- 44c Sítio Riacho do Bode

Viçosa  
Alagoas

- 45a Sítio Amazonas
- 45b Sítio Bauauas
- 45c Sítio Cachoeira Grande
- 45d Sítio Cambuim II
- 45e Sítio Canárias
- 45f Sítio Estrada Nova
- 45g Sítio Engenho São José
- 45h Fazenda Gitirana
- 45i Sítio Gravatá
- 45j Sítio Pedra da Fazenda das Pereiras
- 45k Fazenda Pedra do Fogo
- 45l Fazenda Pindobinha
- 45m Fazenda Poço Feio
- 45n Fazenda Riachão II
- 45o Sítio São José
- 45p Fazenda São Manoel
- 45q Fazenda São Pedro
- 45r Sítio Tamanduá
- 45s Sítio Tangil
- 45t Sítio Tangil 2°
- 45u Sítio Timbó 2°
- 45v Sítio Urucuba
- 45w Sítio Vila Maria Lia

Alem Paraiba  
Minas Gerais

- 46a Fazenda São Geraldo

Barro Alto  
Minas Gerais

No locality



Belo Horizonte  
Minas Gerais

- 47a Bairro Gameleira  
47b Secão Fornecimento Agrícola

Conceição do Mato Dentro  
Minas Gerais

- 48a Boca da Mata  
48b Bocada Mulata  
48c Mata do Dr. Daniel

Jaboticabas (=Jaboticatubas?)  
Minas Gerais

- 49a No locality

Ouro Preto  
Minas Gerais

- 50a No locality

Riacho da Cruz  
Minas Gerais

- 51a No locality

Santa  
Minas Gerais

Bicas Lagoa

Volta Grande  
Minas Gerais

- 52a Fazenda Paraíso  
52b Fazenda Pombal

#### ACKNOWLEDGMENTS

This research would not have been possible without the constant and enthusiastic support of Dr. Aristides Azevedo Pacheco Leão, President of the Brazilian National Academy of Sciences. Above everyone else, he has earned our deepest respect and gratitude. Similarly, Dr. Paulo Emilio Vanzolini, Director of the Museum of Zoology of the University of São Paulo, originally suggested that the mammal fauna of the Caatingas be examined, and arranged for Dr. Leão to invite us to Brazil to examine portions of the Caatingas and formulate a research plan. The research was funded by a Brazilian National Academy of Sciences Grant. A smaller portion of the research money was also contributed by Dr. Craig C. Black of the Carnegie Museum of Natural History. Dr. Hugh Genoways and Sue McLaren of the Carnegie Museum aided in museum aspects of research. Dr. Duane Schlitter initially helped us in preparing for the trip to Brazil and made the collection of the Mammal Section of the Carnegie Museum of Natural History available for our study prior to leaving for Brazil. Dr. Alfred Gardner (U.S. Fish and Wildlife Service) made the bat collection of the Smithsonian Institution available for study and collected some specimens during a visit to Brazil in 1978. Dr. Dardano



de Andrade Lima and Marcelo de Ataíde Silva provided the identification of botanical specimens from the Caatingas and Cerrado. José Cruz and Fausto da Cunha were of assistance concerning work done at the National Museum in Rio de Janeiro. Vasconcelos Sobrinho, Tim George, and Tom Gula kindly permitted our use of the facilities of the Estação Ecológica do Tapacurá, while the latter two also assisted with field work in the Atlantic Rain Forest. The administration and staff of the Floresta Nacional Araripe-Apodí (Instituto Brasileiro de Desenvolvimento Florestal) provided accommodations while in Crato, Ceará, and otherwise facilitated our research efforts at the National Forest, while the administration and staff of Fazenda Saco (Instituto Brasileiro de Desenvolvimento Florestal) provided housing and research facilities while in the region of Serra Talhada, Pernambuco. Dr. Nelson, Dona Martha, and Getúlio, all employees of the Academia Brasileira de Ciências, expedited many bureaucratic, logistic, and personal problems throughout our residence in Brazil; to them we extend our sincere thanks. Dr. Laurie Vitt assisted with field work, provided intellectual stimulation and otherwise entertained us during his residence in Exu. Similarly, many people in Exu, Pernambuco, assisted with various phases of our research and/or provided us with the use of their fazendas; particularly the Ventura Family (Fazendas Batente and Colonia), the Teixeira Family, Rejane, "Chame Ana," Soraya, Ricolice, Susana, Suzette, Anna, and Tico deserve our special thanks. Ishmar Sá and Antônio Zilclécio Pinto Saraiva provided assistance beyond that required of their friendship. Dr. Celio, Arcelino, Kim and Wildes (AGGEU) provided guidance and assistance at critical times during the research. João Luna de Carvalho, Antônio Lemos da Silva, Raimundo da Silva, and Francisco Canuto helped with field and lab work; for their dedicated assistance and loyalty throughout our stay in Exu, we are greatly thankful. Without Maria das Neves' assistance, much less would have been accomplished during our stay in Exu. We would also like to express our gratitude to Sandy Wight for working under unusually "difficult" circumstances and still producing a fine product. Finally, we would like to thank the many Brasileiros who made our stay in the Nordeste pleasant and rewarding.

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Mares, Michael A. et al. 1981. "The mammals of northeastern Brazil: a preliminary assessment." *Annals of the Carnegie Museum* 50, 81–137.  
<https://doi.org/10.5962/p.214487>.

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