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BATS OF GUADELOUPE

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The island of Guadeloupe is centrally located in the Lesser Antillean chain over 500 kilometers north of South America and 450 southwest of Puerto Rico; it is the largest of the Lesser Antilles (Trinidad is not herein considered one of the Antillean islands). Guadeloupe is composed of two major land masses connected by a low mangrove swamp. The northeastern end of the island is Grand-Terre, a low (maximum elevation 108 meters) limestone outcrop that is approximately 32 by 34 kilometers; Basse-Terre to the southwest is volcanic, approximately 20 by 44 kilometers, with a chain of mountains (1465 meters in elevation) oriented north to south. Grande-Terre is highly cultivated whereas Basse-Terre contains agricultural areas only along the coastal plains, native vegetation remaining in the more mountainous area.

The bat fauna of the Lesser Antillean chain is of considerable interest because it is composed of a depauperate extension of the South American fauna, species that have a widespread distribution in the Antilles, and a few species that are endemic to the Lesser Antilles (Baker and Genoways, 1978). Relative to bat speciation and diversity, Guadeloupe is probably the most important island of the Antillean chain.

This report is concerned with the natural history and systematics of the 11 chiropteran species known from Guadeloupe, three of which are endemic. Comments concerning systematic relationships are based on specimens that we collected from the island between 20 and 31 July and also on the examination of museum specimens previously taken from there. A total of 391 bats was studied.

In the following pages, descriptions of collecting localities are followed by species accounts, which are arranged in systematic order. Museums serving as depositories for specimens used in this work are: American Museum of Natural History (AMNH); Albert Schwartz Collection (AS); Texas Tech University (TTU); and U.S. National Museum of Natural History (USNM). All specimen measurements are given in millimeters. Distances are recorded in kilometers (km.) and elevations in meters (m.).

Collecting Sites

2 km. S, 2 km. E Baie-Mahault, Basse-Terre.—This locality was at sea level (Fig. 1) near the mangrove swamps that join Basse-Terre and Grand-Terre. Trees, approximately 15 meters high, were in a swampy area where the forest formed a solid canopy with no understory; pastures were adjacent to the forest. Nets were placed in the pastures and under the trees in the swamps. Fruit was not noted on trees in the swamp.

Bains Jaunes, 2.5 km. E Saint-Claude, Basse-Terre.—This was the highest locality (950 meters) netted by us. Vegetation was low, typical of a cloud forest, and covered with epiphytes; tree ferns were common. The night that we netted there was cold and windy, and few bats were observed. Nets were set over cleared paths and a pool at a spring.

2 km. N Ballif, Basse-Terre.—At this locality, approximately 50 meters in elevation, dominant vegetation was low (5 meters), dry thorn forest, with maximum height of a few trees approximately 15 meters. A wet stream bed with intermittent pools was netted. This was the dryest area observed on Basse-Terre.

Bananier, Basse-Terre.—This locality is at sea level where a stream forms an estuary before entering the ocean. Houses were adjacent to the stream, and the area contained numerous fruit trees and cultivated plants. Nets were placed over the beach and the estuary.

1 km. S Basse-Terre, Basse-Terre.—This locality was along a stream bed that traverses the city of Basse-Terre (Fig. 2). Considerable erosion had made the walls of the stream high, often more than 30 meters; some trees and brush grew along the bottom. Nets were placed along the stream bed and around a large fig tree that grew in a widened portion of the stream bed.

2 km. E Saint-Claude, Basse-Terre.—This was a picnic area in a National Forest where mature forest formed a solid canopy; the

FIG. 1.—Collecting site at 2 km. S, 2 km. E Baie-Mahault. Nets were placed in the forest and from its edge into the field. Holotypes of *Chiroderma improvisum* and *Eptesicus guadeloupensis* were taken at this location.

understory had been removed to accomodate picnic tables and campsites. Adjacent to the collecting site, at lower elevations, was a large stand of bananas. Even though it rained much of the night, many bats were observed. However, most were flying 10 meters or higher, well above our nets.

1 km. S, 4 km. W Vernou, Basse-Terre.—Here we found a large stream (15 to 20 meters wide), the bed of which was strewn with boulders, in an undisturbed mature tropical rain forest. The terrain was steep, as this locality was on the eastern slope of the central mountain range of Basse-Terre. There were some quiet pools, but most open surface water flowed too rapidly to allow bats to drink.

1 km. W Vernou, Basse-Terre.—Situated at the foot of a mountain, this locality was less steep than the one above. Trees in this region were components of a gallery forest situated along a slow moving stream. Areas away from the water were pasture land, meadows, and sugar cane fields; cultivated fruit trees (guava) were growing in some of the meadows.

1 km. N, 1 km. W Saint-François, Grande-Terre.—Open farmland and pastures predominated at this low-lying (20 meters in elevation) site. Some of the few trees were mango. Nets were placed over an open pond and in a dry canyon around scattered fruit trees. Native vegetation was low, dry scrub.

FIG. 2.—Town of Basse-Terre facing inland toward the mountains. Numerous molossids were observed emerging from these buildings at dusk. Netting was also conducted in the montane native forest in the background.

SPECIES ACCOUNTS

Noctilio leporinus mastivus (Dahl, 1797)

Specimen examined (1).—Basse-Terre: Bananier, 1 (TTU).

Noctilio leporinus is known from most of the Antillean islands and probably occurs on all that furnish adequate roosting sites. Gundlach (1872:246; 1877:25) reported this species from an unspecified locality on Guadeloupe, but to our knowledge no specimens exist. Our single specimen (a nonpregnant female) was taken over an estuary; other individuals were observed flying in the same general area. Measurements of the specimen (Table 1) are in agreement with those reported for *N. l. mastivus* by Davis (1973).

Monophyllus plethodon luciae Miller, 1902

Specimens examined (6).—Basse-Terre: Bains Juanes, 2.5 km. E Saint-Claude, 950 m., 2(TTU); Bananier, 1(TTU); 1 km. W Vernou, 3(TTU).

Our specimens, the first reported for Guadeloupe, were mist-netted at sea level at Bananier and at the highest elevation netted (on side of tallest volcano, Grand Soufriere, of the island). This species was one of the rarer ones that we collected; only six specimens were taken, and these were caught on only three of the eight nights on which we netted. Measurements for these bats (Table 1)

are in close agreement with those reported by Schwartz and Jones (1967) for specimens of *M. p. luciae* from other parts of its geographic range.

One specimen was molting on the shoulders and neck; on the others, new hair was present under the old. Of the two females taken, one was lactating, the other was neither pregnant nor lactating. Testicular measurements for two adult males were 3 and 4 millimeters.

Ardops nichollsi annectens Miller, 1913

Specimens examined (57).—Basse-Terre: 2 km. S, 2 km. E Baie-Mahault, 11(TTU); Bananier, 2(TTU); 1 km. S Basse-Terre, 5(TTU); Matouba Forest Station (between Saint-Claude and Soufriere), 3000 ft., 1(AMNH); Saint-Claude, 1(AMNH); 2 km. E Saint Claude, 1(TTU); Trois-Rivieres, 1(AMNH); 1 km. W Vernou, 10(TTU); 1 km. S, 4 km. W Vernou, 11(TTU). Grand-Terre: Saint-François, 1(AMNH); 1 km. N, 1 km. W Saint-François, 8(TTU). No specific locality, 5(USNM).

Additional record.—Basse-Terre: Sainte-Rose (Jones and Schwartz, 1967).

Ardops nichollsi appears to be a common, fruit-eating species distributed at lower elevations throughout the island. The only locality at which this species was not taken was Bains Jaunes, 950 m. Our observations and those reported by Allen (1942) indicate that this species roosts in trees. Allen (1942) stated that Dr. G. K. Noble secured an adult and well-grown young on Guadeloupe as they hung over a path. For additional data on the ecology of this species, see Jones and Genoways (1973).

Of the fourteen adult females in our July sample, six were neither pregnant nor lactating, two were lactating but not pregnant, and two others were in an early stage of pregnancy with the embryos too small to measure. The remaining four females were pregnant with a single embryo measuring 8, 10, 16, and 20 millimeters in crown-rump length. These data suggest that the reproductive season for *Ardops* on Guadeloupe is not synchronized. Furthermore, the fact that some of the pregnant females were postlactating, suggests that this bat might be polyestrous. Testicular length for 10 adult males was 3 millimeters for one, 4 for two, 5 for six, and 6 for one. It is difficult to determine when this species is molting because of the nature of the pelage—long fuzzy guard hair overlies short, tightly curled under fur; however, six of the specimens collected in July are believed to have been molting.

Jones and Schwartz (1967) reviewed the systematics of this species, and measurements of our specimens (Table 1) are in accord

TABLE 1.—*External and cranial measurement of eleven species of bats from Guadeloupe.*

Museum catalogue number and sex	Locality	Total length	Length of tail	Length of hind foot	Length of ear	Length of forearm	Greatest length of skull	Condylobasal length	Zygomatic breadth	Postorbital breadth	Breadth of braincase	Length of maxillary toothrow	Breadth across upper molars
		Noctilio leporinus											
TTU 20794 ♀	Bananier, Basse-Terre	112	26	30	29	84.1	26.2	23.7	18.6	7.0	13.5	9.9	12.2
		Monophyllus plethodon											
TTU 20795 ♂	Bains Jaunes, Basse-Terre	79	13	17	15	40.1	23.5	21.4	10.3	4.5	9.5	7.8	5.5
TTU 20796 ♂	Bains Jaunes, Basse-Terre	81	13	13	16	42.8	23.7	21.9	10.4	4.8	9.6	8.0	5.5
TTU 20800 ♂	1 km. W Vernou, Basse-Terre	74	11	13	16	41.8	23.3	21.7	10.2	4.6	9.3	7.9	5.6
TTU 20798 ♀	1 km. W Vernou, Basse-Terre	79	12	9	15	41.2	23.5	22.0	10.0	4.5	9.5	7.9	5.4
TTU 20799 ♀	1 km. W Vernou, Basse-Terre	80	13	13	13	41.7	23.5	21.6	10.0	4.6	9.5	8.2	5.6
		Ardops nichollsi											
TTU 20824 ♂	1 km. W Vernou, Basse-Terre					49.6	22.4	19.4	14.7	5.6	10.4	7.1	9.8
TTU 20826 ♂	1 km. W Vernou, Basse-Terre					49.2	21.4	18.9	14.4	5.6	10.0	7.0	9.4
TTU 20806 ♂	2 km. S, 2 km. E Baie-Mahault, Basse-Terre					47.9	22.3	18.7	14.9	5.9	10.6	6.8	9.7
TTU 20808 ♂	2 km. S, 2 km. E Baie-Mahault, Basse-Terre					47.3	22.6	19.3	15.0	5.7	10.7	7.1	9.8
TTU 20809 ♂	2 km. S, 2 km. E Baie-Mahault, Basse-Terre					47.4	22.3	19.4	15.0	5.8	10.4	7.0	9.6
TTU 20820 ♀	1 km. W Vernou, Basse-Terre					48.8	23.2	20.2	15.0	5.8	10.5	7.5	10.1
TTU 20821 ♀	1 km. W Vernou, Basse-Terre					50.8	23.4	20.2	15.3	5.8	10.7	7.5	10.3
TTU 20822 ♀	1 km. W Vernou, Basse-Terre					51.4	24.4	20.8	15.8	5.7	10.6	7.8	10.4
TTU 20832 ♀	1 km. S, 4 km. W Vernou, Basse-Terre					50.8	23.3	20.5	15.5	5.7	10.5	7.7	10.2
TTU 20802 ♀	2 km. S, 2 km. E Baie-Mahault, Basse-Terre					49.3	23.5	19.9	15.0	5.6	10.2	7.4	10.0
		Artibeus jamaicensis											
TTU 20586 ♂	Bananier, Basse-Terre					61.1	28.8	24.9	16.9	7.4	12.6	9.8	12.7

TABLE 1.—*Continued.*

TTU 20859 ♂	Bananier, Basse-Terre				60.7	28.8	25.4	17.1	7.0	12.0	10.3	13.2
TTU 20869 ♂	2 km. E Saint-Claude, Basse-Terre				58.2	29.9	25.6	17.2	7.3	12.2	10.3	13.1
TTU 20871 ♂	2 km. E Saint-Claude, Basse-Terre				59.0	28.8	25.3	17.1	7.2	12.6	9.6	12.5
TTU 20872 ♂	2 km. E Saint-Claude, Basse-Terre				58.8	29.2	25.7	17.1	7.4	12.1	10.4	12.9
TTU 20852 ♀	2 km. N Ballif, Basse-Terre				59.8	29.1	25.8	17.0	7.2	12.1	9.9	12.7
TTU 20855 ♀	2 km. N Ballif, Basse-Terre				62.2	28.6	25.7	16.8	7.2	12.2	9.9	12.6
TTU 20860 ♀	Bananier, Basse-Terre				62.3	29.5	25.8	18.0	7.2	13.0	10.0	13.0
TTU 20861 ♀	Bananier, Basse-Terre				57.7	28.7	25.8	17.8	7.3	12.1	10.1	12.9
TTU 20862 ♀	Bananier, Basse-Terre				59.7	29.6	25.9	17.7	7.2	12.5	10.2	13.3
USNM 361883 ♂	Sofaïa, Basse-Terre	80	16	18	48.1	26.2	24.7	12.7	6.0	9.9	7.7	8.2
		Chiroderma improvisum										
TTU 1[illegible]00 ♂	2 km. S, 2 km. E Baie-Mahault, Basse-Terre	87	15	21	57.5	29.9	27.7	18.9	6.5	12.2	10.7	7.2
		Sturnira thomasi										
AMNH 234950 ♂					46.5	25.1	23.7	12.2	5.7	9.5	6.7	8.2
TTU 19904 ♀	2 km. E Saint-Claude, Basse-Terre	82	13	19	45.9	25.3	23.3	12.1	5.7	9.8	7.0	8.1
TTU 19905 ♀	1 km. W Vernou, Basse-Terre	73	13	16	46.4	24.4	22.4	11.9	5.6	9.5	6.7	7.7
TTU 19906 ♀	1 km. W Vernou, Basse-Terre	80	15	17	46.1	24.9	22.9	12.2	5.5	9.8	6.9	8.0
TTU 19907 ♀	1 km. S, 4 km. W Vernou, Basse-Terre	81	15	19	47.7	25.1	23.6	12.5	5.9	9.6	6.9	8.0
		Brachyphylla cavernarum										
TTU 20970 ♂	1 km. N, 1 km. W St.-François, Grand-Terre				63.5	31.1	27.9	17.2	6.5	12.6	11.0	11.7
TTU 20977 ♂	1 km. N, 1 km. W St.-François, Grand-Terre				68.7	32.6	29.0	16.9	6.3	12.8	11.0	11.6
TTU 20980 ♂	1 km. N, 1 km. W St.-François, Grand-Terre				66.4	31.8	28.2	17.6	6.5	12.4	10.7	12.1
TTU 20985 ♂	1 km. N, 1 km. W St.-François, Grand-Terre				65.3	31.1	27.1	16.6	6.6	12.5	11.2	11.7
TTU 20988 ♂	1 km. N, 1 km. W St.-François, Grand-Terre				65.3	31.4	27.9	17.4	6.4	12.5	10.7	11.5
TTU 20972 ♀	1 km. N, 1 km. W St.-François, Grand-Terre				66.4	32.1	28.7	17.9	6.3	13.1	11.2	12.3
TTU 20989 ♀	1 km. N, 1 km. W St.-François, Grand-Terre				63.3	30.9	27.4	16.6	6.2	12.7	10.7	11.6
TTU 20991 ♀	1 km. N, 1 km. W St.-François, Grand-Terre				64.2	32.3	28.8	17.3	6.3	13.0	11.0	12.1
TTU 20995 ♀	1 km. N, 1 km. W St.-François, Grand-Terre				66.0	31.0	27.7	17.2	6.5	12.6	10.7	11.6
TTU 20996 ♀	1 km. N, 1 km. W St.-François, Grand-Terre				66.3	31.8	28.7	17.3	6.2	13.0	10.8	11.5

TABLE 1.—*Continued.*

	Natalus stramineus											
AS 6550 ♀	Le Moule, Grand-Terre					37.9	16.4	14.5	8.0	3.1	7.8	6.7	5.1
	Eptesicus guadeloupensis												
TTU 19902 ♂	2 km. S, 2 km. E Baie-Mahault, Basse-Terre	133	60	13	23	49.6	22.5	20.3	13.8	5.0	9.4	8.1	8.6
TTU 19901 ♀	2 km. S, 2 km. E Baie-Mahault, Basse-Terre	129	54	11	22.5	51.1	22.7	20.6	13.7	4.7	9.2	8.1	8.8
TTU 19903 ♀	2 km. S, 2 km. E Baie-Mahault, Basse-Terre	132	60	14	24	51.1	23.1	20.9	13.9	4.9	9.5	8.3	8.9
	Molossus molossus												
TTU 21086 ♂	1 km. N, 1 km. W St.-François, Grand-Terre					38.8	16.9	14.9	10.7	3.5	8.6	5.9	7.3
TTU 21087 ♂	1 km. N, 1 km. W St.-François, Grand-Terre					37.9	17.2	15.2	10.8	3.3	8.6	6.0	7.9
TTU 21088 ♂	1 km. N, 1 km. W St.-François, Grand-Terre					38.7	17.2	15.3	10.6	3.3	8.5	5.9	7.5
TTU 21089 ♂	1 km. N, 1 km. W St.-François, Grand-Terre					38.3	17.2	15.3	10.9	3.4	8.8	5.9	7.3
TTU 21091 ♂	1 km. N, 1 km. W St.-François, Grand-Terre					38.5	17.6	15.2	11.0	3.6	8.5	6.0	7.8
TTU 21105 ♀	1 km. N, 1 km. W St.-François, Grand-Terre					37.6	16.2	14.4	10.4	3.4	8.4	5.7	7.1
TTU 21106 ♀	1 km. N, 1 km. W St.-François, Grand-Terre					37.6	15.9	14.2	10.6	3.4	8.7	5.6	7.1
TTU 21108 ♀	1 km. N, 1 km. W St.-François, Grand-Terre					36.8	16.5	14.5	10.5	3.4	8.5	5.7	7.3
TTU 21109 ♀	1 km. N, 1 km. W St.-François, Grand-Terre					37.7	16.6	14.6	10.4	3.3	8.5	5.7	7.0
TTU 21110 ♀	1 km. N, 1 km. W St.-François, Grand-Terre					37.8	17.0	15.0	10.9	3.6	9.0	5.8	7.3
	Tadarida brasiliensis												
AS 5404 ♂	Sofaïa, Basse-Terre	86	27	9	15	38.9	15.9	14.6	9.5	3.8	7.5	5.5	6.6
AS 5405 ♂	Sofaïa, Basse-Terre	90	31	9	14	39.3	16.2	15.3	9.3	3.6	7.7	5.7	6.6
AS 5407 ♂	Sofaïa, Basse-Terre	85	25	8	14	37.0	15.9	14.8	9.4	3.5	7.2	5.5	6.8
AS 5408 ♂	Sofaïa, Basse-Terre	85	28	9	15	37.4	16.0	14.8	9.4	3.6	7.7	5.5	6.6
AS 5410 ♂	Sofaïa, Basse-Terre	88	28	10	16	38.0	16.0	14.6	9.5	3.6	7.6	5.8	6.6
AS 5409 ♀	Sofaïa, Basse-Terre	88	30	9	15	38.9	15.9	14.9		3.6	7.3	5.7	6.5
TTU 21129 ♀	1 km. N, 1 km. W St.-François, Grand-Terre	89	32	8	16	37.2	15.7	14.5	9.3	3.7	7.7	5.5	6.6

with those presented by these authors. The subspecies *annectens*, originally described by Miller (1913), was based on specimens from an unspecified locality on Guadeloupe. Measurements of the adult female holotype (USNM 113, 502) are: length of forearm, 49.7; greatest length of skull, 23.5; condylobasal length, 20.5; zygomatic breadth, 15.7; interorbital breadth, 7.0; postorbital breadth, 5.9; mastoid breadth, 13.2; palatal length, 5.2; length of maxillary toothrow, 5.8; breadth across upper molars, 10.6. The karyotype of *A. nichollsi annectens* was described by Greenbaum *et al.* (1975).

Artibeus jamaicensis jamaicensis Leach, 1821

Specimens examined (113).—Basse-Terre: 2 km. S, 2 km. E Baie-Mahault, 1(TTU); 2 km. N Ballif, 6(TTU); Bananier, 7(TTU); 1 km. S Basse-Terre, 6(TTU); Saint-Claude, 3(AMNH); 2 km. E Saint-Claude, 69(TTU); Bains-Jaunes, 2.5 km. E Saint-Claude, 950 m., 4(TTU); 1 km. W Vernou, 5(TTU); 1 km. S, 4 km. W Vernou, 3(TTU). Grand-Terre: 1 km. N, 1 km. W Saint-François, 8(TTU). No specific locality, 1(USNM).

Artibeus jamaicensis is the most common species of bat on Guadeloupe. We obtained specimens at all eight localities, and at the majority of net sites it was taken in abundance. At several localities, such as near Saint-Claude, numerous individuals were observed flying high in the forest canopy and bats often were netted with fruit in their mouth. This species obviously functions in distributing the seeds of fruits on which it feeds.

Twenty-two adult females in our July sample revealed that 13 were neither pregnant nor lactating; one was lactating and contained a minute embryo; of the remaining eight, two bore minute embryos and six contained single fetuses measuring 10, 14, 23, 25, 28, and 35 millimeters in crown-rump length. These data indicate that the breeding season for *Artibeus* on Guadeloupe is not synchronized and that it might extend throughout the year, with females being polyestrous. Furthermore, specimens collected varied in all stages from "barely able to fly" to adult. Testicular lengths for 10 adult males were 3 millimeters for one individual, 6 for one, 7 for one, 8 for two, 9 for three, and 10 for two.

Andersen (1906) originally described *A. j. praeceps* based on specimens from Guadeloupe, but Hershkovitz (1949) later assigned the taxon *praeceps* to *Artibeus lituratus*. However, Koopman (1968) did not consider specimens from Guadeloupe to be sufficiently different from other Antillean populations of *A. jamaicensis* to warrant recognition as a distinct subspecies. He therefore assigned material from Guadeloupe to the nominate subspecies. We have

followed this arrangement. Measurement of the adult male holotype of *praeceps* (USNM 113503) are as follows: length of forearm, 59.2; greatest length of skull, 28.5; condylobasal length, 25.3; zygomatic breadth, 17.2; interorbital breadth, 7.9; postorbital breadth, 7.1; mastoid breadth, 14.4; palatal length, 13.8; length of maxillary toothrow, 9.8; breadth across upper molars, 13.0. Karyotypes of individuals from Guadeloupe do not differ from those already described for the species.

Chiroderma improvisum Baker and Genoways, 1976

Specimen examined (1).—Basse-Terre: 2 km. S, 2 km. E. Baie-Mahault, 1(TTU).

This species is known from a single adult male (Baker and Genoways, 1976) that was mist-netted at sea level in an open field adjacent to gallery forest (Fig. 1). The mist net used was 100 by 20 feet, and the bat was caught approximately six meters above the ground and 20 meters from the edge of the forest. This supposed frugivore undoubtedly feeds and roosts in the forest but might fly too high to be obtained in the lower mist nets. Measurements for the holotype are presented in Table 1, and comparative measurements for other species of the genus are given in Baker and Genoways (1976). Testicular length was 5 millimeters. The evolutionary affinity of this species is believed to be with either *Chiroderma villosum* or *C. doriae*; however, measurements for these two species are considerably smaller than those of the holotype of *C. improvisum*.

Sturnira thomasi de la Torre and Schwartz, 1966

Specimens examined (6).—Basse-Terre: Grand Etang, 1(AMNH); 2 km. E Saint-Claude, 1(TTU); Sofaïa, 1(USNM); 1 km. W Vernou, 2(TTU); 1 km. S, 4 km. W Vernou, 1(TTU).

The original description for this species was based on a single specimen from Sofaïa (de la Torre and Schwartz, 1966). Since that time, Genoways and Jones (1975) and Jones and Phillips (1976) have reviewed the status of this species and have concluded that it is distinguishable from its closest evolutionary and geographic relative, *S. lilium*, and merits specific status. *S. thomasi* is characterized by large size and long narrow skull. It was caught by mist-netting a boulder-strewn river in rain forest, a large stream lined with gallery forest, and the slope of the Soufriere where banana groves bordered on tall forest (see also, Jones and Genoways, 1975). We obtained no

specimens from sea level localities or from Grande-Terre. The holotype was taken in dense forest within a deep ravine (de la Torre and Schwartz, 1966). The two mature adult females collected in July were lactating; one young adult female was not pregnant. The fourth specimen collected in July was a young with unfused phalangeal epiphyses.

Brachyphylla cavernarum cavernarum Gray, 1834

Specimens examined (30).—Basse-Terre: 2 km. S, 2 km. E Baie-Mahault, 1(TTU); 2 km. N Ballif, 1(TTU); 1 km. S Basse-Terre, 1(TTU); 1 km. W Vernou, 1(TTU); 1 km. S, 4 km. W Vernou, 1(TTU). Grande-Terre: 1 km. N, 1 km. W Saint-François, 25(TTU).

Brachyphylla cavernarum is found as a Recent or Pleistocene species on all islands of the Antillean chain, with the exception of the Grenadines and Grenada. Although we obtained specimens at six of our collecting localities, this species was common only at 1 km. N, 1 km. W Saint-François, Grande-Terre. The area netted near Saint-François was a dry canyon containing low dry scrub, and nets were set beneath native trees. *B. cavernarum* caught were carrying fruit. The relative abundance of this species on Grande-Terre, as opposed to Basse-Terre, is probably related to its limestone composition, which affords caves and rock crevices that can be used as roost sites by *Brachyphylla.*

Of the 15 adult females captured in July, none was pregnant, three were lactating, and four were postlactating. *Brachyphylla* probably has a more synchronized reproductive cycle than, for instance, does *Artibeus.* Testicular length for 10 males, also from the July sample, was 4 millimeters for one individual, 5 for five, and 6 for four. Webb and Loomis (1977) reported the argasid tick *Ornithdoros hasei* from our specimens. Pierre Swanepoel and Hugh H. Genoways currently are studying the systematics of this group.

Natalus stramineus stramineus Gray, 1838

Specimen examined (1).—Grande-Terre: Le Moule, 1(AS).

Natalus stramineus is known from the island of Guadeloupe only by a female taken on 18 August 1964 by Albert Schwartz. This specimen contained a single fetus measuring 15 in crown-rump length. We follow Goodwin (1959) in assigning the population on Guadeloupe to the nominate subspecies.

Eptesicus guadeloupensis Genoways and Baker, 1975

Specimens examined (3).—Basse-Terre: 2 km. S, 2 km. E Baie-Mahault, 3(TTU).

Eptesicus guadeloupensis is known from three specimens (adult male, postlactating adult female, and subadult female) from the type locality (Fig. 1). Its closest phylogenetic relative is *E. fuscus*, which is noticeably smaller. In addition to the measurements given in Table 1, the length of tibia of *E. guadeloupensis* ranges from 24.4-25.7, whereas the same measurement for *E. fuscus* varies between 19.1-21.2 (Genoways and Baker, 1975). The locality where *E. guadeloupensis* was collected is the same as that described for *Chiroderma improvisum*, except two specimens of *E. guadeloupensis* were netted inside the gallery forest and one was taken in the 100 by 20-foot net about three meters from the forest. Many individuals of a large vespertilionid bat (presumed to be *E. guadeloupensis*) were observed flying above the forest at this locality, and based on their abundance (30 to 40 were observed) the species was common at this locality. We assume that this species roosts in the trees of the gallery forest.

Molossus molossus molossus (Pallas, 1766)

Specimens examined (127).—Basse-Terre: 2 km. S, 2 km. E, Baie-Mahault, 4(TTU); 2 km. N Ballif, 53(TTU); Bananier, 4(TTU); 1 km. S Basse-Terre, 12(TTU); 1 km. W Vernou, 2(TTU); 1 km. S, 4 km. W Vernou, 7(TTU). Grand-Terre: 1 km. N, 1 km. W Saint-François, 45(TTU).

Molossus molossus is extremely common in towns and cities and at dusk can be observed flying from numerous buildings. This species' habit of feeding above the treetops makes it easy to observe (Fig. 2). Of 42 adult females collected 23 to 28 July, 18 were pregnant. These females were monotocous, with fetuses ranging in size from microscopic to 30 millimeters. Testicular length for 20 adult males ranged from 4 to 6 (mean, 5). Our data on male and female reproductive condition suggest an asynchronous reproductive season.

We follow Husson (1962) in the use of the name *Molossus molossus* for this species because he presented evidence that the type locality for this taxon is Martinique. A number of subspecific names are available for Antillean populations of this species. However, until our studies of variation in these populations are completed, we have chosen to follow Varona (1974) in assigning specimens from Guadeloupe to the nominate subspecies.

Tadarida brasiliensis antillularum (Miller, 1902)

Specimens examined (46).—Basse-Terre: Bananier, 2(TTU); Sofaïa, 9(AS). Grande-Terre: 1 km. N, 1 km. W Saint-François, 5(TTU). No specific locality, 30(USNM).

Tadarida brasiliensis appears to be much less common than is *Molossus*. Two specimens were collected over an estuary near the town Bananier; the others obtained during our work were taken, along with a much larger number of *Molossus molossus*, over an open pond (12 meters wide) near Saint-François. A female caught on 28 July contained a single embryo measuring 26 millimeters in crown-rump length.

Shamel (1931) first reported this species from Guadeloupe. His assignment of the Guadeloupe population to *T. antillularum* was based on a comparison with specimens from Dominica and four other islands. Later, Schwartz (1955) relegated this taxon, as well as several others, to subspecific rank within *T. brasiliensis*. Antillean populations of this species are sedentary and do not migrate as do some mainland populations (Jones and Phillips, 1970).

Discussion

As currently known, the bat fauna of Guadeloupe is composed of one species of noctilionid, six phyllostomatids, one natalid, one vespertilionid, and two molossids. Two New World families of bats, Emballonuridae and Mormoopidae, are noticeably absent from this fauna; Baker and Genoways (1978) discussed the absence of emballonurids on Antillean islands. *Pteronotus davyi* (Mormoopidae) has been reported from the nearby idand of Marie-Galante (Jones and Phillips, 1970), but was not taken on Guadeloupe. Also absent from this bat fauna are members of three subfamilies (Phyllostomatinae, Carolliinae, and Desmodontinae) of the Neotropical family Phyllostomatidae. Phyllostomatines occur on all islands of the Greater Antilles but have been recorded only on Grenada in the Lesser Antilles, as has *Carollia*. There are no living representatives of the Desmodontinae on any of the Antillean islands (Baker and Genoways, 1978).

Over half (six of 11) of the species of bats known from Guadeloupe are endemic to the Antilles. Of these, two, *Brachyphylla cavernarum* and *Monophyllus plethodon*, occur also in the Greater Antilles; one, *Ardops nichollsi*, is found only on other Lesser Antillean islands; and three, *Sturnira thomasi*, *Chiroderma improvisum*, and *Eptesicus guadeloupensis*, are known only from Guadeloupe

(Baker and Genoways, 1978). The six species from Guadeloupe that are endemic to the Antilles represent six separate genera, and three of these genera (*Ardops*, *Monophyllus*, and *Brachyphylla*) are endemic to the Antilles. No genus of bat is endemic to Guadeloupe. Among the species of bats apparently restricted to the Lesser Antilles, only *Myotis dominicensis* and *M. martiniquensis* (see LaVal, 1973) are unreported for Guadeloupe; but, because Guadeloupe is located between known localities for *M. dominicensis* (Baker and Genoways, 1978), it is probable that this small *Myotis* occurs on Guadeloupe. It is much less likely that *M. martiniquensis* will be found on Guadeloupe.

Although additional collecting may reveal species that prove to be endemic to a specific island, no other Lesser Antillean island is known to contain such species, whereas Guadeloupe contains three, and Guadeloupe also has most other Antillean endemics. Guadeloupe is clearly the most important island for speciation and survival of bat populations in the Lesser Antilles. The factors (geology, time, geographic position, size, ecological diversity, and the like) associated with establishing and maintaining bat populations on Guadeloupe are such that they have resulted in a large percentage of the species becoming endemic to the Antilles or to Guadeloupe.

Of the five species from Guadeloupe that are known also from the mainland, three (*Artibeus jamaicensis*, *Noctilio leporinus*, and *Molossus molossus*) have such a widespread distribution that it may be impossible to determine the origin (from the west or south) of the Guadeloupe populations. It would appear that *Tadarida brasiliensis* invaded the Antilles from the north, whereas *Natalus stramineus* invaded from the south.

The composition of the bat fauna of Guadeloupe, based on food habits, is similar to that found by Smith and Genoways (1974) for other Antillean islands. Using the trophic role values of Wilson (1973), the following importance values were obtained: carnivores, 0.0; piscivores, 9.1; sanguinivores, 0.0; foliage gleaners, 2.7; aerial insectivores, 36.4; frugivores, 38.2; nectarivores, 13.6. As Smith and Genoways (1974) found, there are no carnivores or sanguinivores on the smaller Antillean and coastal South American islands. The foliage gleaning trophic role is reduced as was found on all other islands except Trinidad. The aerial insectivores and frugivores dominate the bat fauna of Guadeloupe as is true for Grenada and Dominica (Lesser Antillean islands studied by Smith and Genoways, 1974). However, on the latter two islands, aerial insectivores

are more important than frugivores, whereas on Guadeloupe the two roles are nearly equal. The nectarivorous role on Guadeloupe is similar to that found on other small mesic islands. Clearly, the trophic composition of the bat fauna of Guadeloupe is disharmonic with that found in mainland areas such as Venezuela or Surinam (Smith and Genoways, 1974), but it fits well with other island faunas that have been studied.

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