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Jamaican Cave Vertebrates

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Jamaican Cave Vertebrates

Limestone caves in the tropics are typically associated with a more diverse assemblage of vertebrates than are caves in temperate regions. Chapman [87] for example, has reported 37 species from the caves of Gunung Mulu National Park, Sarawak, whereas Bailey [43] lists only 13 for the equally cavernicolous Guadeloupe Mountains National Park, New Mexico, USA. Twenty-eight vertebrate species have been recorded from Jamaican caves. The relative importance of the five Classes differ in these three areas as shown in Table 1 (overleaf).

Class Pisces

A number of troglomorphic fish have been reported from Jamaican caves. Peck [374] reported the guppy (*Gambusia gracilor?*) from the flooded entrance to **Wyslip Cave** and sleepers, *Eleotris pisonis*, from **Jackson's Bay Great Cave, Runaway Bay Caves,** and **Dairy Bull Cave**. Eigenmann [145] reported but did not describe a blind fish from an unknown Jamaican locality, and an undescribed blind fish was captured in **Jackson's Bay Great Cave**, but subsequently lost [23].

Classes Amphibia and Reptilia

Frogs of the genus *Eleutherodactylus* occur in damp cave entrances including those of **Jackson's Bay Great Cave, Cousins Cove #2,** and **Monarva Cave** [374]. *E. cavernicola* has been collected only from the caves of the northern perimeter of **Portland Ridge** [287]. *E. sisyphodemus* is an endemic species from the Cockpit Country that has been found in close association with caves although not, as yet, within them [100].

Reptiles are not recorded as habitually occupying Jamaican caves. However, the Jamaican boa *Epicrates subflavus* was seen deep in **Monarva Cave** and had presumably been feeding on bats. Late Quaternary fossils of this snake are almost ubiquitous in sediments of **Portland Ridge** caves which

probably reflects the greater role of this predator in the recent past. Fresh remains of the crocodile *Crocodylus acutus* were observed in **Worthy Park #2** in 1981 [241], and fossil specimens have been recovered from **Lloyd's Cave** (Mantrap Pit).

Class Aves

Two species of bird typically roost in the threshold zone of Jamaican caves. The cave swallow, *Petrochelidon fulva*, nests in small colonies and builds a crescent shaped mud nest high on cave walls. It is known from numerous sites including **Oxford Cave, Windsor Cave, Jackson's Bay Cave** and **Wild Goat Cave**.

Barn owls, *Tyto alba*, roost on ledges within undercut cave shafts and, less commonly, in the entrances of caves with high ceilings. In the caves of Jackson's Bay (**Arrow, Somerville, Drum**) regurgitated owl pellets form extensive deposits of rodent, bird, and bat bones [318] and are often responsible for accumulations of paleontological significance.

Class Mammalia: Orders Rodentia and Carnivora

Although the fossil record evidences a more diverse community in the past, the sole extant native rodent is the Jamaican hutia, *Geocapromys brownii*. Hutias have suffered through hunting pressure and habitat destruction in Post-Columbian times, but their habit of nesting amongst limestone boulders makes cave entrances attractive to them and their bones are commonly seen in Jamaican caves. The ship rat (or black rat), *Rattus rattus*, was introduced into the Caribbean in Post-Columbian times and was a serious pest on some islands as early as 1654 [33]. It is exceedingly common on Jamaica and is the main prey of cave-roosting barn owls. Skeletal remains of ship rats and to a lesser extent of the house mouse,

Mus musculus, form extensive floor deposits below owl roosts in some caves – notably **Somerville** and **Drum Caves** in the **Jackson's Bay** area.

Several of Jamaica's major bat caves support populations of ship rats that feed on large guano arthropods and dead bats. Such populations have been reported from **St Clair Cave, Windsor Cave and Oxford Cave**. It is unclear whether these populations are truly self-sustaining or whether they are maintained by continuous immigration from the surface, but there is no evidence to suggest that the animals ever return to daylight.

St Clair Cave also supports a small population of feral house cats, *Felis catus*. These animals undoubtedly prey on both the rats and bats in the total darkness of the deep cave. There are no reports of the cats returning to daylight or frequenting the threshold zone of the cave but they must be presumed to do so since the population density on the surface is probably inadequate to maintain constant immigration.

The Indian mongoose, *Herpestes auropunctatus*, was introduced into Jamaica in 1872 [220] and is now a serious predator of terrestrial native wildlife. There are no true cave records of this species but it has been observed in an entrance collapse of the Jackson's Bay system and is undoubtedly attracted to the entrances of major bat caves. Mongoose bones are also known as intrusives in the surface layers of paleontological excavations in **Long Mile Cave**.

Class Mammalia: Order Chiroptera

Fifteen of Jamaica's 21 bat species are known to depend entirely or significantly on underground roosts, and their colonies occupy approximately 17% of the island's documented caves. Of these bats, two are endemic species and a further seven are endemic subspecies.

There have been few studies on the ecology of Jamaica's cave bats. Goodwin [195] visited several of the most important bat caves but his species lists and population estimates have since been shown to be of limited value. McFarlane [314] has summarized what is known of the more vulnerable cave species.

The largest bat colonies seem to be dominated by the moustached bats of the genus *Pteronotus*, of which three species occur in Jamaica. The commonest, *P. parnelli*, is responsible for large accumulations of guano in some caves. Goodwin [195] suggested that it often roosts with *Monophyllus redmani*, a phytophagous species that also occurs in large numbers in some caves. Other species associations have been proposed, but at the present time it is unclear as to whether these relationships are casual, commensal, or merely artifacts of the very limited sampling.

The Jamaican fruit bat, *Artibeus jamaicensis*, is unusual in that it roosts in the dimly lit threshold zone of caves with high ceilings. These bats feed heavily on wild figs (*Ficus* sp.) and the cave floors beneath their roosts typically accumulate quantities

Table 1
Systematic representation of vertebrates in three karst regions

Area	Bats	Other Mammals	Birds	Reptiles	Amphibians	Fish	Totals
Jamaica	53.6	14.3	7.1	7.1	7.1	10.7	28
Sarawak	35.1	16.2	8.1	10.8	5.4	24.3	37
Carlsbad ¹	46.1	30.7	23.0	0.0	0.0	0.0	13

1. Carlsbad Caverns National Park, New Mexico, USA.

of discarded fruits and germinating seedlings (see picture below). Similar *gardens* that occur in the dark zones of caves are more likely to be attributable to the buffy flower bat, *Erophylla sezekorni*. This bat, and the Jamaican flower bat, *Phyllonycteris aphylla*, are seemingly rare species that are presently known only from a few of the most important bat caves. The two species of funnel-eared bats, genus *Natalus*, are known from just three caves (*N. micropus*) and a single cave (*N. major*). The uniquely adapted fishing bat, *Noctilio leporinus* is common in some coastal caves, particularly on the south coast.

Most published accounts of Jamaica's cave bats have been based on very limited collecting, often for strictly taxonomic research. These collections have been repeatedly taken from a small number of well-known caves whilst the species composition of 90% of the known bat caves remains completely unknown. Until data are accumulated on a representative sample of these caves, the true status of most of Jamaica's cave bats cannot be realistically judged. Current knowledge of Jamaican cave bat distributions is summarized in Table 2 (see also Appendix No. 9).

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The Clay Way in Rock Spring Caverns, St Mary, showing a 'garden' created by fruits dropped by bats
(photo. author)

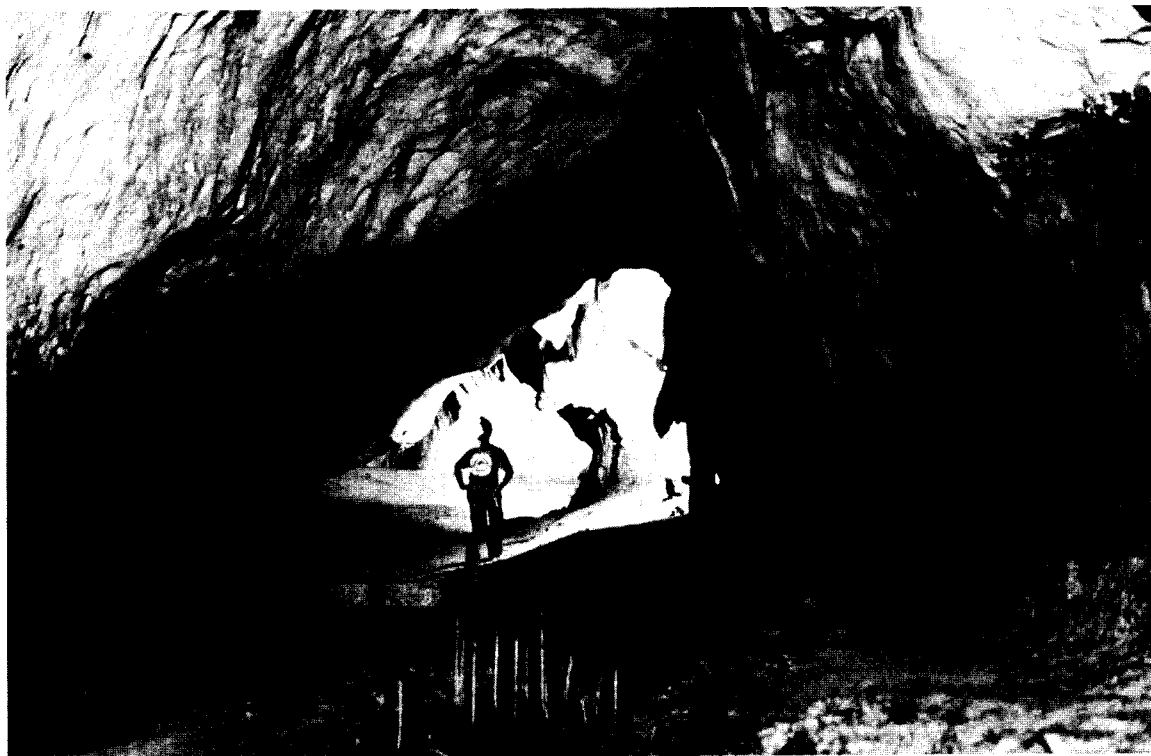


Table 2
Known Distributions of Jamaican Cave Bats

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
<i>Pteronotus quadridens</i> X	X																
<i>Pteronotus macleayii</i>	X	X	X	X													
<i>Pteronotus parnellii</i>	X	X	X	X			X		X		X						
<i>Moormops blainvillii</i>	X	X		X					X		X						
<i>Macrotus waterhousii</i>			X							X					X		
<i>Glossophaga sorcina</i>							X		X	X	X		X				
<i>Monophyllus redmani</i>	X	X	X	X				X	X								
<i>Artibeus jamaicensis</i>				X			X	X	X		X			X		X	X
<i>Erophylla sezekomi</i>	X			X			X					X					
<i>Phyllonycteris aphylla</i>	X	X		X							X						
<i>Natalus major</i>	X																
<i>Natalus micropus</i>	X		X		X												
<i>Eptesicus lynni</i>			X								X						
<i>Molossus molossus</i>					X												
<i>Noctilio leporinus</i>										X							
<i>Tadarida macrotus</i>						X											

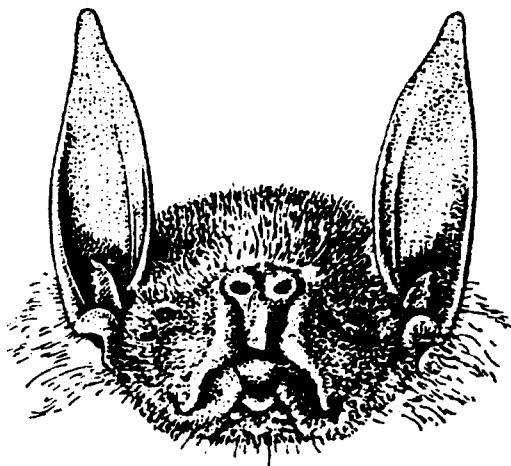
* Listed by Goodwin [195], but exact location uncertain.

A: St. Clair Cave	G: Sewell Cave	M: Idlewild Cave-1
B: Oxford Cave	H: San Souci Grotto*	N: Worthy Park-1
C: Windsor Cave	I: Mosely Hall Cave	O: Grove Cave*
D: Mt. Plenty Cave	J: Portland Ridge-1	P: Claremont Cave
E: Monarva Cave	K: Riverhead Cave	Q: Ferry Cave*
F: Wallingford Roadside	L: Runaway Bay Cave	

Field Key to Jamaican Bats

- 1a** Tip of snout with obvious, vertical 'noseleaf' – **2**
1b Noseleaf absent – **7**
- 2a** Tail absent – **3**
2b Tail present – **4**
- 3a** Forearm greater than 50mm – *Artibeus jamaicensis*
3b Forearm less than 45mm – *Artibeus flavescens* (not known from caves)
- 4a** Ears very large, extending far beyond muzzle if laid forward – *Macrotus waterhousei*
4b Ears unremarkable, not extending beyond muzzle if laid forwards – **5**
- 5a** Tail not extending beyond the margin of the interfemoral membrane, but its tip emerging from the dorsal surface of the membrane – *Glossophaga soricina*
5b Tail extending the full length of the interfemoral membrane and beyond – **6**
- 6a** Noseleaf with small notch in tip, forearm greater than 43mm – *Erophylla sezekorni*
6b Noseleaf without notch, forearm less than 43mm – *Monophyllus redmani*
- 7a** Muzzle elongate with fleshy pad, giving appearance of a pig-like snout – *Phyllonycteris aphylla*
7b Muzzle not elongate and without fleshy pad – **8**
- 8a** Forearm greater than 65mm, hind feet and claws greatly enlarged – *Noctilio leporinus*
8b Forearm less than 65mm, hind feet and claws unremarkable – **9**
- 9a** Tail thick, extending for more than half its length beyond interfemoral membrane – **10**
9b Tail entirely within interfemoral membrane – **13**
- 10a** Lips heavily wrinkled – **11**
10b Lips not heavily wrinkled – **12**
- 11a** Ears joined at bases on top of head – *Tadarida macrotis*
11b Ears closely adjacent but not joined at bases on top of head – *Tadarida brasiliensis*
- 12a** Forearm greater than 45mm – *Eumops glaucinus*
12b Forearm less than 45mm – *Molossus molossus*
- 13a** Ears large, funnel-like and extending forwards over the eyes – **14**
13b Ears unremarkable – **15**

- 14a Forearm less than 40mm – *Natalus micropus*
 14b Forearm greater than 40mm – *Natalus major*
- 15a Lower lip with fleshy plate ornamented with papillae or with grotesque folds – 16
 15b Lower lip unremarkable – 19
- 16a Lower lip thrown into grotesque folds, ears joined by a prominent band – *Moormoops blainvilli*
 16b Lower lip with fleshy plate ornamented with papillae – 17
- 17a Forearm more than 50mm – *Pteronotus parnelli*
 17b Forearm less than 50mm – 18
- 18a Forearm more than 40mm – *Pteronotus macleayi*
 18b Forearm less than 40mm – *Pteronotus quadridens*
- 19a Interfemoral membrane thickly furred. Fur rusty red – *Lasiurus borealis* (not known from caves)
 19b Interfemoral membrane sparsely furred or naked. Fur brown – *Eptesicus lynni*.



Noctilo leporinus
 Jamaican fishing bat.
 Modified from Goodwin & Greenhall, 1961