Guanapo Cave

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Guanapo Cave is a small, easily accessible cave occupied by roosting bats. The cave is well known and often visited, but has not previously been surveyed or studied in detail.

Location and Access

The cave is situated in the Heights of Guanapo, a steep-sided valley on the south side of the Northern Range, Trinidad. The cave is on the hillside to the west of the Guanapo River, a short distance above the top of a disused quarry. It can be found by following the track to the top of the quarry, then following the bed of a small dry stream into the edge of the forest. The cave mouth is a few metres upslope on the right and is not directly visible from the stream bed. Its approximate position is 10° 41' N; 61° 16' W, and its altitude probably 220-250 m (700-800 ft).

I visited the cave at least seven times in 1967-68 and four times in 1989, on each occasion observing and sampling the invertebrates present (Table 1). On the last visit I surveyed the cave using a linen measuring tape and a magnetic compass (Figure 1). On the last two visits, light traps were used to sample the aerial fauna as part of a larger survey of caves in the Northern Range, the results of which will be published later.

Cave Topography and Ecology

The entrance is a low arch 1.3 m high and 2.5 m wide opening on to a moderately steep slope down to the stream bed. The entrance leads into a short passage 2.5 to 3.5 m wide and a maximum of 1.5 m high. This opens into a single chamber 6-7 m in diameter with an arched roof reaching 2 m high with a few pockets rising to 2.5 m high. The combined length of passage and chamber is 13 m (Fig.1). The total area of the floor, which is almost level, is estimated to be 54 sq m, 31 sq m being in the chamber and 23 sq m in the passage. The walls are fairly smooth, seamed by cracks and crevices, and having small stalactites and other dripstone formations on the roof and upper walls. The cave is generally dry, but slight seepage produces moist patches on the roof and walls at times.

The cave is occupied by roosting bats. The most common species is *Carollia p. perspicillata,* a small fruit-eating bat that roosts over most of the chamber roof. The highest pockets of the chamber roof contain clusters of the large fruit-eating bat *Phyllostomus h. hastatus*. This population has been the subject of detailed studies by McCracken and Bradbury (1977, 1981). Insectivorous bats have also been seen in this cave occasionally.

The whole floor of the cave is covered in a layer of debris, consisting of bat guano and rejected fruit pulp, seeds, nuts and other vegetable fragments brought in by the bats. To this are added bat corpses and the bodies of various invertebrates. In the chamber the debris is crumbly, very rich in organic

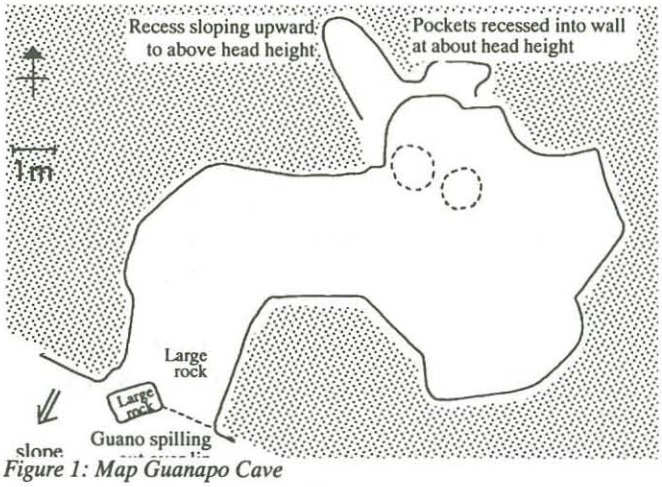

Figure 1: Map Guanapo Cave

matter including seeds, and swarming with invertebrates especially insects. Beneath the clusters of *Phyllostomus* the debris accumulates in piles of a pasty consistency. Debris deposited in the chamber flows very slowly out towards the cave entrance, gradually loosing its richness to become a dry powdery deposit full of empty seed husks.

The fresh debris in the chamber supports a dense population of cockroaches. The dominant species is the blaberine cockroach *Eublaberus distanti*. The adults are about 5 cm long, cream coloured with black patterns on the pronotum, and rest in crevices or wander on the walls or floor. The nymphs, glossy chestnut with bright yellow spots, swarm on and in the layer of debris on the floor which is so light and loose they can easily burrow through it. Four samples, each of one litre of debris, were collected in July 1968 and all the cockroaches collected and weighed. The biomass was 25.3, 29.7, 36.1 and 43.3 g fresh weight giving a mean biomass of 33.6 g per litre. The depth of the debris layer was variable, but assuming a conservative mean depth of 10 cm, the estimated biomass of nymphs in the chamber was 104 kg fresh weight The density of cockroaches appeared to be much lower in 1989, but the biomass was not measured.

Less abundant, but similarly distributed, was the large blaberine cockroach *Blaberus colloseus*. The adults are about 10 cm long, pale horn colour with a square black patch on the pronotum and the nymphs are a drab matt brown. A smaller blatine cockroach *Xestoblatta immaculata* lives on the walls and on the surface of the debris. The adults are bright redish-brown, the nymphs dark grey-brown, both being slimmer, longer legged and more active than the blaberines.

The floor debris swarmed with millions of tiny lygaeid bugs, *Cligenes subcavicola,* a species originally described from frugivorous bat guano in the Tamana Cave (Scudder et al. 1967) and subsequently found in bat caves in the Northern Range, and inside hollow trees used by roosting bats. The adults are 3 mm long and dark brown, while the nymphs are various shades from cream (first instar) to brick red (fifth

Table 1. Provisional fauna list for the Guanapo Cave, Trinidad.

VERTEBRATA, MAMMALIA	
Chiroptera	
Phyllostomatidae	*Phyllostomus h. hastatus* (Pallas)
Phyllostomatidae	*Carollia p. perspicillata* (L.)
ARTHROPODA, INSECTA	
Orthoptera	
Gryllidae	*Aclodes cavicola* Chopard
Dictyoptera	
Blattidae	*Xestoblatta immaculata* Hebard
Blaberidae	*Blaberus colloseus*
Blaberidae	*Eublaberus distanti* (Kirby)
Dermaptera	(small black earwig)
Hemiptera	
Reduviidae	*Phasmatocoris spectrum* Bredin
Lygaeidae	*Cligenes subcavicola* Scudder
Coleoptera	
Hydrophilidae	*Dactylosternum subdepressum*
Histeridae	*Pseudepierus sp.*
Staphilinidae	*Belonuchus sp.*
Scarabaeidae	*Gymnotus kerremansi* V. do P.
Nitidulidae	*Stelidota* sp
Cerylonidae	*Euxestus erithecus* Chevrolat
Tenebrionidae	*Zophobas atratus* (Fabricius)
Alleculidae	*Listronychus sp.*
Silvanidae	*Ahasuerus sp*
Diptera	
Psychodidae	
Chironomidae	
Ceratopogonidae	
Sciaridae	
Stratiomyidae	*Hermetia*
Bombylidae	
Empididae	
Phoridae	*Puliciphora borinquinensis*
Phoridae	*Megaseliae*
Milichiidae	
Drosophilidae	
Streblidae	
Hymenoptera	
Eveniidae	*Evaniscus tibialis* Szepligeta
Formicidae	*Odontomachus*
Formicidae	*Solenopsis geminata* (Fabricius)
Formicidae	*Wasmannia auropunctata* (Roger)
ARACHNIDA	
Amblypygi	
Tarantulidae	*Tarantula palmata* (Herbst)
Aranaea	
Pholcidae	(web-spinning spiders)
Opiliones, Laniatores	
MOLLUSCA, GASTROPODA	
Prosobranchiata	(two species of snail)

instar). They probably feed on seeds. The debris also contain many fly lavae,and there is a rich fauna of small predators including staphylinid beetles and psuedoscorpions.

Fly lavae hatch to form a major component of the aerial fauna.and may also be hosts of the tiny parasitic hymenoptera caught in the light-trap samples. The large black wasp *Evaniscus tibialis* is a parasitoid of the eggs of cockroaches, and presumably attacks *Xestoblatta,* since the blabberine cockroaches are ovoviviparus. The aerial fauna is preyed upon by spiders and other predators on the walls.

On 11 June 1989 the cave was found to be invaded by vast numbers of small, aggressive black ants *Solenopsis geminata* marching in a broad ribbon along the wall of the passage. They swarmed in the debris of the chamber floor, where not only workers but male and female alates abounded. Such an invasion could well result in a crash in the populations of other invertabrates in the cave. However, on the next visit, on 8 June 1989, the cave fauna still seemed to be abundant, the ants then being present in much smaller numbers.

Discussion

The ease and safety of access make this cave particularly suitable for study . The bats are easy to observe, the guano and debris they drop can be collected and analysed (e.g. to determine food composition, Greenhall 1956), their ectoparasites can be sampled, and various components of the invertebrate fauna of the cave can be studied *in situ* or taken to the laboratory. However, the cave is very small and should be treated with care to avoid excessive disturbance to the roosting bats, and depletion of the invertebrates .

Although free from structural hazards, it is possible that Guanapo cave (like many other Trinidad caves) may contain *Histoplasma capsulatum,* a fungus that can cause fever and respiratory disease if the spores are inhaled. It is also worth remembering that *Carollia* is known to suffer from rabies (Goodwin and Greenhall 1961) and should not be handled without very careful precautions.

Acknowledgements.

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