A Comparison of Maneuverability of Fruit-eating and Insect-eating bats of Dominica

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Abstract

In this study bats were trapped over a two week period in the surrounding areas of Archbold Tropical Research Centre and Guest House. The most commonly trapped insectivorous bat was *Molossus molossus* and the most commonly trapped frugivorous bats were *Sturnira lilium* and *Artibeus jamaicensis*. Insectivorous bats were caught more often than frugivorous bats. Insectivorious bats are thought to be able to detect and avoid mists nets better than frugivorous bats, but this great manuverablilty may not pertain to pregnant female bats.

Introduction

There are twelve known species of bats on the island of Dominica, six of which are insect -eating and four are fruit-eating (Evans and James 1997). The six species of insect eating bats in Dominica belong to the genera *Pteronotus, Tararida, Molossus, Natalus, Eptesicus,* and *Myotis.* Evans and James (1997) provide the following information on these species. Davy's naked-backed bat, *Pteronotusdavyi* is a brown insect eating bat with bare back. It forms few very large roosts in sea caves. The Brazilian (Mexican) free–tailed bat, *Tadarida brasiliensis* is a dark brown insect–eating bat with a wrinkled upper lip and it roosts in bulidings. The Velvety free–tailed bat, *Molossus molossus* is a blackish to reddish brown insect–eating bat. It roosts in buildings with corrugated roofs, or deserted dwellings; also in large open caves. The Mexican funnel eared bat, *Natalus stramineus* is a ginger colored insect–eating bat that roots in sea caves and lime kilns. The Big brown bat, *Eptesicus fuscus* is a brown insect eating bat. It roots in trees. The Mouse eared bat, *Myotis dominicensis* is a tiny dark brown insect – eating bat. It forms a few large open cave roosts. Frugivorous bats of Dominica belong to the genera *Artibeus, Brachyphylla, Ardops,* and *Sturnira*. The Jamaican fruit -eating

bat, *Artibeus jamaicensis*, is a large brown fruit eating bat with a prominant noseleaf. It roosts in sea caves and trees. The Yellow–shouldered bat, *Sturnira lilium* is a small dark brown fruit-eating bat with a prominant noseleaf and reddish or straw–colored epaulettes. It roosts in trees. The Lesser Antillean tree bat, *Ardops nichollsi* is a small pale brown fruit–eating bat with prominant noseleaf and white epaulettes. It roosts in trees, and is widely distributed, mainly in lowland cultivation and dry forest but also in banana plantations adjacent rainforest. The Antillean cave bat, *Brachyphylla cavernarum* is a large grey-brown pug-faced fruit eating bat but may also take nectar. It forms a few very large roots and is confined to the Caribbean.

Insectivorous bats are known to have better mobility than frugivorous bats due to their better echolocation and their body structure. Their excellent echolocation allow them to track winged insects and live prey at night (Msn Encarta 2005). Their free tail and large uropatagium makes them much better fliers. Frugivorous bats will sometimes roost in a tree which means foraging requires less tracking and echolocation. Fruit – eating bats have a very small uropatagium or do not have one at all, which reduces their maneuverability.

Insectivorous bats should therefore be more difficult to trap. The echolocation capablilites of frugivorous bats should result in better detection of the mist net relative to frugivorous bats, resulting in the capture of larger numbers of fruit bats relative to insectivorous bats.

Materials & Methods

To capture bats, mist nets were set up in several locations. Avian mist nets 6 meters long were suspended across an area by two large poles made of wood. The poles were

secured by tying the pole to a nearby tree or similary stable object. Mist nets were set up on seven nights placed in 4 different locations: Springfield Estate Guest House veranda, Check Hall River, Bee House Pond, and a rose apple (*Syzygium jambos*) tree at the base of Fifi trail near a banana plantation. Nets were placed strategically at each location. At the Springfield Estate Guest House the mist net was placed at the northwest end of the veranda. Mist nets were placed across the Check Hall River at the base of the trail leading to the river from the guest house. At the Bee House Pond, a mist net was set up on the northeast side covering a small clearing on one side of the pond. At the rose apple tree, mist nets were set up on the west and southeast sides covering both sides of the tree.

Nets were set up between 5:30 and 6:00 p.m., around dusk. When it became dark, nets were checked every few minutes for trapped bats. When a bat was caught, it was extracted from the net as soon as possible. If the bat was in the net for a long period of time and became too tangled and all our efforts to release the bat failed, the net was cut with a knife in order to release the bat to insure its safety and keep its stress level low. Once the bat was extracted from the net it was identified and then released. The species, sex and time it was caught were recorded. Nets were taken down at 9:00 p.m.

Our nets were set up May 26th at the Springfield Estate Guest House's veranda on the northwest end, May 27th at the Check Hall River at the base of the trail, May 29th at the rose apple tree at base of Fifi trail near a banana plantation on the southeast side, June 1st at theBee House Pond on the northeast side, June 3rd at the Check Hall River at the base of the trail, June 5th at the rose apple tree at the base of the Fifi trail near a banana plantation on the southeast and west side, and June 7th at the Check Hall River at the base of the trail.

Results

Over a two week period 44 bats were captured. Bats were caught only at two of the locations, the rose apple tree and the Check Hall River. Nets set up at the other two locations, the Guest House veranda and the Bee House Pond, failed to catch any bats. Although a few bats were seen in the vacinity of the veranda , the net was set in an area where there was a great deal of human activity which undoubtedly kept the bats away. There was too much vegetation both in the pond and around the edges, largely preventing bats from foraging close to the pond.

Ninety-one percent of the bats were caught at the Check Hall River. Only four bats were trapped at the rose apple tree, while 40 bats were trapped at the Check Hall River (Table 1). A high percentage of female bats were caught (Table 1), most of which were *Molossus*. Figure 1 shows the difference in fruit–eating and insect–eating bats. Eight bats were frugivorous and 35 were insectivorous bats. The only one nectivorous species was caught on the last night of trapping.

Discussion

Results show that insect-eating bats were caught more often than fruit eating bats. Bats were also caught more often at the Check Hall River than at the rose apple tree. There were probably fewer bats caught at the rose apple tree because the nets were too low. At the rose apple tree the net was placed in front of a fruit-bearing tree, therefore it would be unexpected to trap an insectivorous bat. There was a low amount of edible fruit left on the tree within the range of our net. We observed bats foraging higher in the tree,

which was out of the range of our net.

At the Check Hall River there is a more diverse habitat and a better flight path relactive to the placement of the net, attracting both frugivorous and insectivorous bats. A fig tree is located above the north bank of the river. Figs were found on the ground with bite marks from a bat, verifying the presence of frugivorous bats in the area. A high percentage of insect-eating bats were caught at the Check Hall River, specifically female *Molossus*. Most of the females caught were pregnant. Pregnant bats are likely to be slower, with less maneuverability, and this may help explain why so many insectivorous bats were caught. These results are comparatively similar to those of Hunter (2001), studying ectoparasites on Dominican Bats. They caught a high number of female *Molossus* at the Check Hall River but relatively few frugivorous bats (*Artibeus* and *Sturnira)*.

The results suggest that insect-eating bats are easier to trap than frugiverous bats. The null hypothesis can be rejected.

References

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Evans, Peter G.H.; James, Arlington. 1997. Dominica Nature Island of the Caribbean: Wildlife Checklists. Ministry of Tourism Government Headquarters. Roseau, Commonwealth of Dominica. First Edition . pgs 44-46

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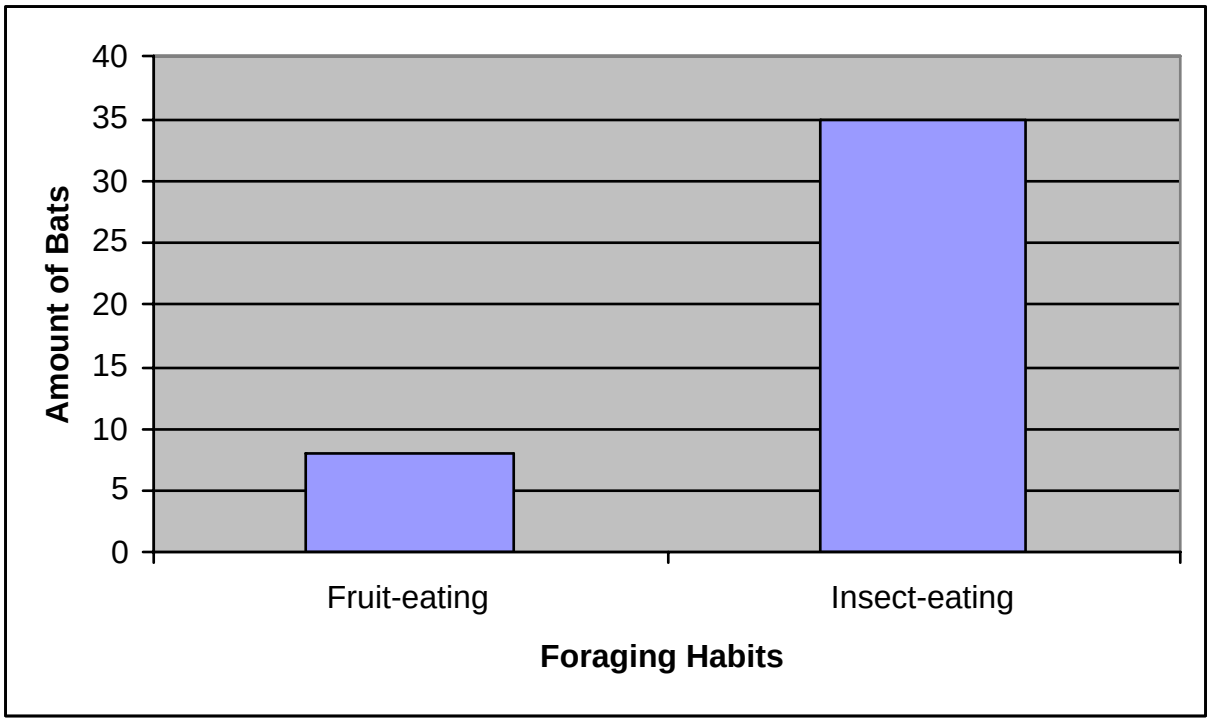
Figures and Tables

Table 1: Summary of Bats Caught in the Different Locations

Location	Species	# of Males	#of Females	Insect/Fruit eating bat
Guest House Veranda	n/a	n/a	n/a	n/a
Bee House Pond	n/a	n/a	n/a	n/a
Rose Apple Tree	*Sturnira lilium*	1	1	Fruit
	Artibeus jamaicensis	0	1	Fruit
	Ardops nichollsi	0	1	Fruit
Check Hall River	*Molossus molossus*	6	28	Insect
	Tararida brasiliensis	1	0	Insect
	Sturnira lilium	0	1	Fruit
	Atribeus jamaicensis	0	2	Fruit
	Ardops nichollsi	1	0	Fruit
	Monophyllus plethodon	1	0	Nectar

Figure 1: Comparison of Frugivorous and Insectivorous Bats Caught


40
35
30
25
20
15
10
5
0
Amount of Bats
Fruit-eating
Insect-eating
Foraging Habits