

Activity Pattern of Dominica Bats

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Dominica

June12, 2011

Abstract:

The objective of this paper is to observe the activity pattern of male and female bats between different species, beginning at dusk. The species noted for this project are *Artibeus jamaicensis*, *Natalus stramineus*, *Sturnira lilium*, and *Tadarida brasiliensis*. The sex, time and place of capture, reproductive condition, and weight were noted for each bat. The results indicated that female bats venture out of the roost more often than male bats. Within *Artibeus jamaicensis*, this was significantly more prominent. The most active hour for the bats was from eight to nine at night. Only 10/27 bats were in reproductive condition, perhaps attributed to the short dry season.

Introduction:

Of the many islands located in the Caribbean, Dominica is among the few that is environmentally sustainable in preserving its diverse species. Because of the people's traditional belief in natural living, much of its habitat has remained untouched and in perfect condition for studying animals.

It is home to diverse number fauna, twelve of those which are bats (Evans and James 1997). Bats are classified in the Order of Chiroptera, and are separated from all the other mammals by their ability to fly. They are further classified into two suborders, Microchiroptera echolocate for navigation, and Megachiroptera use sight for navigation. The families that call Dominica home are Molossidae, Mormoopidae, Natalidae, Noctilionidae, Phyllostomatidae, and Vespertilionidae. Some are frugivores, which rely more heavily on sight for food location, while others are insectivores, which rely on echolocation (Davis 2010).

In other studies, frugivores have been found to be more active throughout the night than insectivores, due to fruit being energy-poor and the need to increase their forage to make up for the difference (Presley et al, 2009). Insectivores peak activity has been found to be shortly after sunset, and decline throughout the night. This study focuses on *Artibeus jamaicensis*, *Sturnira lilium*, (frugivores), *Tadarida brasiliensis*, and *Natalus stramineus*, (insectivores), and the activity pattern between the sexes, be they frugivores or insectivores.

Materials and Methods:

In order to capture the bats, nets were spread between two 3m. bamboo poles, and set up at the “Bee House” for five nights, and at the Checkhall River for one night, both which are part of Archbold Tropical Research and Education Center. The nets were put up at approximately 6:40pm, and capturing took place from 7:00pm-9:30pm on designated capture days. After freeing the bats, their sex, time of capture, and reproductive condition were noted. They were then placed in pre-weighed numbered socks, weighed using a handheld Pesola scale, and clipped with clothes pins. Some were released at the end of the capturing period while others were flown in the bat tunnel for another project. All the information was stored on an Excel sheet and analyzed for comparison between the species.

Results and Discussion:

Table 1 includes all the data for the four species of bats captured in total, in the “Bee House” and the Checkhall River, with most of the bats being captured in the former location. The data were then summarized and put into a simplified table to show the trends, (Table 2).

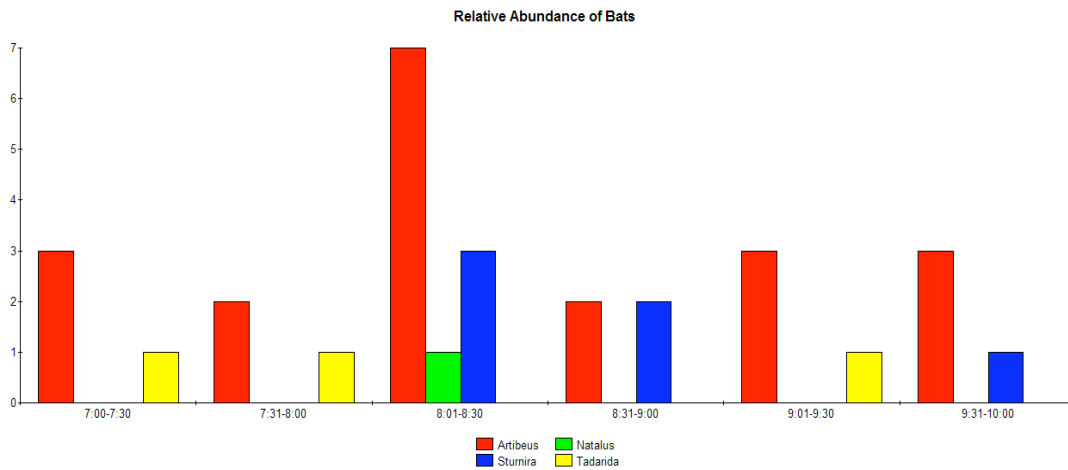
Table 1: Original Data of Captured Dominica Bats

Bat Number	Date	Time	Location	Species	Sex	Repro. Cond.	Weight (g)
1	29-May	8:10 PM	Bee House	Artibeus jamaicensis	F	No	59
2	29-May	9:10 PM	Bee House	Tadarida brasiliensis	M	No	15
3	29-May	9:15 PM	Bee House	Artibeus jamaicensis	F	No	54
4	31-May	7:50 PM	Bee House	Tadarida brasiliensis	M	No	8
5	31-May	8:55 PM	Bee House	Artibeus jamaicensis	F	No	57
6	31-May	9:20 PM	Bee House	Artibeus jamaicensis	F	No	51
7	2-Jun	8:00 PM	Stream	Sturnira lilium	F	No	42
8	2-Jun	8:20 PM	Stream	Sturnira lilium	F	No	43
9	2-Jun	9:45pm-10:45pm	Stream	Artibeus jamaicensis	M	No	46
10	3-Jun	7:15 PM	Bee House	Tadarida brasiliensis	M	No	9
11	3-Jun	7:20 PM	Bee House	Artibeus jamaicensis	M	No	43
12	3-Jun	8:05 PM	Bee House	Artibeus jamaicensis	F	No	58
13	3-Jun	8:05 PM	Bee House	Artibeus jamaicensis	M	Yes	44
14	3-Jun	8:15 PM	Bee House	Sturnira lilium	F	Yes	22
15	3-Jun	8:15 PM	Bee House	Natalus stramineus	M	No	14
16	3-Jun	8:50 PM	Bee House	Artibeus jamaicensis	F	No	58
17	3-Jun	9:14 PM	Bee House	Artibeus jamaicensis	F	Yes	56
18	3-Jun	9:35 PM	Bee House	Artibeus jamaicensis	F	Yes	59
19	3-Jun	9:35 PM	Bee House	Sturnira lilium	F	Yes	22
20	3-Jun	9:35 PM	Bee House	Artibeus jamaicensis	F	No	42
21	5-Jun	8:29 PM	Bee House	Artibeus jamaicensis	F	No	47
22	5-Jun	8:30 PM	Bee House	Artibeus jamaicensis	F	No	51
23	6-Jun	7:15 PM	Bee House	Artibeus jamaicensis	F	Yes	51
24	6-Jun	7:20 PM	Bee House	Artibeus jamaicensis	F	Yes	57
25	6-Jun	7:40 PM	Bee House	Artibeus jamaicensis	M	Yes	47
26	6-Jun	8:13 PM	Bee House	Artibeus jamaicensis	F	Yes	63
27	6-Jun	8:35 PM	Bee House	Sturnira lilium	F	Yes	20
28	9-Jun	7:40 PM	Bee House	Artibeus jamaicensis	M	Yes	51
29	9-Jun	8:00 PM	Bee House	Artibeus jamaicensis	M	No	45
30	9-Jun	8:48 PM	Bee House	Sturnira lilium	F	No	24

Table 2: Summarized Activity Pattern Data of Captured Dominica Bats

Species	Sex	Repro. Cond.	Weight (g)	Activity Pattern
Artibeus jamaicensis	F	No	59	Artibeus jamaicensis
Tadarida brasiliensis	M	No	15	Tadarida brasiliensis
Artibeus jamaicensis	F	No	54	Artibeus jamaicensis
Tadarida brasiliensis	M	No	8	Tadarida brasiliensis
Artibeus jamaicensis	F	No	57	Artibeus jamaicensis
Artibeus jamaicensis	F	No	51	Artibeus jamaicensis
Sturnira lilium	F	No	42	Sturnira lilium
Sturnira lilium	F	No	43	Sturnira lilium
Artibeus jamaicensis	M	No	46	Artibeus jamaicensis
Tadarida brasiliensis	M	No	9	Tadarida brasiliensis
Artibeus jamaicensis	M	No	43	Artibeus jamaicensis
Artibeus jamaicensis	F	No	58	Artibeus jamaicensis
Artibeus jamaicensis	M	Yes	44	Artibeus jamaicensis
Sturnira lilium	F	Yes	22	Sturnira lilium
Natalus stramineus	M	No	14	Natalus stramineus
Artibeus jamaicensis	F	No	58	Artibeus jamaicensis
Artibeus jamaicensis	F	Yes	56	Artibeus jamaicensis
Artibeus jamaicensis	F	Yes	59	Artibeus jamaicensis
Sturnira lilium	F	Yes	22	Sturnira lilium
Artibeus jamaicensis	F	No	42	Artibeus jamaicensis
Artibeus jamaicensis	F	No	47	Artibeus jamaicensis
Artibeus jamaicensis	F	No	51	Artibeus jamaicensis
Artibeus jamaicensis	F	Yes	51	Artibeus jamaicensis
Artibeus jamaicensis	F	Yes	57	Artibeus jamaicensis
Artibeus jamaicensis	M	Yes	47	Artibeus jamaicensis
Artibeus jamaicensis	F	Yes	63	Artibeus jamaicensis
Sturnira lilium	F	Yes	20	Sturnira lilium
Artibeus jamaicensis	M	Yes	51	Artibeus jamaicensis
Artibeus jamaicensis	M	No	45	Artibeus jamaicensis
Sturnira lilium	F	No	24	Sturnira lilium

Graph 1: Relative Abundance of Bats by Time of Capture



Overall, the results suggest that more female bats fly out of the nest than male bats. This was particularly true for frugivores, (20/20 females), but not so for insectivores, (4/4 males). The reproductive condition seemed to have some effect in the weight of the bats, those in proper condition, (lactating, pregnant, or testicles dropped), weighed more than those not in proper condition, within their same species. Only about 37% of the bats, were in reproductive condition, so other factors may be in effect. The peak activity hour for the bats, male or female, was an hour after dusk, at 8:00pm.

Because unequal amounts of each species were captured, a comparison of the activity pattern between species could not be made. It was noted though, that *Artibeus jamaicensis*, which was caught most often, supported the trend that females leave the roost most often than males. This might also be the result of a biased sex ratio in Artibeus.

Conclusion:

The trend that females seem to travel out most may be due to their reproductive condition. If they are lactating for example, they may be induced, (by instinct), to seek out

food first in order to return and keep feeding their young. The reproductive condition, of both male and female bats, may also attribute to them eating more, hence their increase in weight. The island had a delayed dry season in 2011, which could be a cause to the decrease in the amount of bats in reproductive condition in late May, early June. Further studies should be done: to compare the activity pattern within species with other bat species by attempting to capture the same amount of each species through constant netting; to see if the reproductive condition affects male or female bats more; or to see if there is a correlation between the weight and the reproductive condition of bats.

Acknowledgements:

I would like to show my thanks and appreciation to Dr. Lacher, whom without his experience, knowledge, and patience, this project will not have been possible. I would also like to thank Heather Medina, who helped in the capturing, measuring, and weighing of the bats. My thanks extend to Zachary Zemanek, Heather Woods, and Michele Horner, for helping set up and take down the bat tunnel. I would like to send my regards and gratitude to the Archbold Tropical Research and Education Center for their generous hospitality and service. Lastly, I would also like to thank Dr. Ivie and Dr. Woolley, for much needed advice. A special thanks to my peer counselor, Rene Sullins, and my parents, Mario and Rosalba Jimenez, whose immense aid enabled me to come to this trip.

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