Differences in Reproductive Cycles and Pregnancy Affecting Foraging Heights in Dominican Bats

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ABSTRACT

The height at which bats were captured near foraging sites was recorded using standard mist nets. For the dominant bat captured *Molossus molossus*, the data showed a tendency of pregnant female bats to fly lower than either males or non-pregnant females. In addition, data were collected to determine if pregnancy terms coincide in five species of bats: *Molossus molossus, Artibeus jamaicensis, Sturnira lilium, Monophyllus plethodon,* and *Pteronotus davyi*.

INTRODUCTION

There are twelve species of bats on the island of Dominica, West Indies. Included among these species are *Molossus molossus,* the Velvety free-tailed or Pallas' Mastiff Bat, *Artibeus jamaicensis,* the Jamaican Fruit-eating Bat, *Sturnira lilium,* the Yellow-shouldered Bat, *Monophyllus plethodon,* the Antillean Long-tongued bat, and *Pteronotus davyi,* the Naked-backed bat (Evans & James 1997). *Molossus molossus* (figure 3), of the family Molossidae, is a dark brown to black insectivorous bat, which is fairly common on Dominica and throughout the Lesser Antilles. *Sturnira lilium* (figure 4), *Monophyllus plethodon,* and *Artibeus jamaicensis* (figure 5) belong to the family Phyllostomidae. The flap of skin on top of the nose easily identifies members of this family, often called the "leaf nosed bats". These fruit eating bats are found all over the island. *Pteronotus davyi* is of the family Mormoopidae. Perhaps the most easily identified bat on the island, *P. davyi* has a large flap of skin, (extension of the tail membrane), which covers the fur over its back (Baker et al. 1984).

Our study was focused on *M. molossus,* testing the hypothesis that pregnant bats fly lower over foraging sites than non-pregnant females and males. In addition, we observed the possible differences in reproductive stages between the five different species caught.

METHODS AND MATERIALS

Data were collected at two sites on the Springfield Plantation, Dominica. The first site was across the Check Hall River, at the base of the trail leading to the river from the guesthouse. The second site was at the base of Mt. Joy at a pond next to a guesthouse

named the “Bee House”. Mist nets were used to capture bats at both sites. Nets were held up by poles cut from nearby bamboo thickets. Each net was comprised of four pockets/panels two feet apart, and the bottom of the net was set at one foot off the ground. One 6m net was used at the Check Hall River site and two nets (one 6m and one 12m) were used at the Bee House site. Rabies vaccinations, gloves and a reliable headlamp were essential for handling the bats. Bats were caught, measured, and released during a two-week period, May 22nd through June 5th.

As bats flew into the net, they were removed and processed as quickly as possible to cause the least amount of stress. If more than one bat was caught at a time, the individuals were placed in a large sock or a cloth bag until the bats could be processed. When removing a bat from the net, the panel on which it was captured was recorded. Then species, sex, and pregnancy/lactation, (if applicable), were noted and recorded. Other data such as wing punches (for future DNA sequencing), and body measurements were also collected for other projects. The bats were then immediately released away from the net to prevent recapture.

RESULTS

Data were collected over a period of eight days, but only four days of data were used in the height determination hypothesis due to complications in data collection. Table one shows the panel data for *M. molossus*. Included are, sex, location, panel caught, and if the bats were pregnant. Figure one illustrates the correlation between male and pregnant female *Molossus molossus* and the panel they were caught in. Percentages were used to show the density of bats captured in each panel. Figure two shows all of the female bats caught during the data collecting period. Species, date, pregnant/lactating, and location were also noted.

DISCUSSION

During our project we found a correlation between pregnancy and height in which the bats were caught. Figure one shows that most pregnant *M. molossus* bats were caught in the lower two panels as compared to the males, which were caught in the upper two panels of the mist nets. This leads us to believe that pregnant bats may fly lower during

their gestation period. This could be a result of stress and having more weight to carry. During our field work we found it was difficult to collect panel data on every bat caught due to confusion during removal of the bats. This was our group's first experience in handling the bats and recording the data. We feel that more experience may be beneficial for any further study. Even though our data is relevant to the question, it is somewhat inconclusive due to the low numbers of individuals recorded. More fieldwork is therefore needed. Overall there appears to be a strong correlation (in our data) between flight height and pregnancy of Dominican bats.

Comparing pregnancy status proved to be more challenging, with the data difficult to interpret. Figure 2 shows the percentage of pregnant females separated by species during the two-week session of data collection. One hundred percent of the *M. molossus* females caught were pregnant, while the other four species appeared to be a combination of pregnant, lactating, or not pregnant. The bats that were listed as not pregnant or unknown were evaluated on visual inspection only and the pregnancy may not have been visible at the time of capture. More data would be needed to justify any trends in data.

If this research were done in the future we believe late spring/early summer would be the most relevant period to collect data. This time of year appears to be when the female bats seem to be the furthest along in pregnancy. Two of the female *Molossus* specimens captured on June 3rd, the last day of collecting data, had enlarged vulvas and their fetuses had turned. Both appeared to be ready to give birth. In conclusion, we feel that our data does show possible differences in reproductive cycles however, due to limited time we were unable to collect a sufficient sample size to justify any definite conclusions.

REFERENCES

Baker, Robert J., Jane A. Groen, and Robert D. Owen. 1984. Field Key to Antillean Bats. Occasional Papers; The Museum Texas Tech University, 94.

Evans, Peter G.H., and Arlington James. 1997. Dominica Nature Island of the Caribbean; Wildlife Checklist.

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Table 1. *M. molossus* with recorded panel number collected during May 22 through June 3, 2003.

Species	Sex	Location	Height	Pregnant	Weather condition	Time/Date
Molossus molossus	M	Check Hall River	2	N/A	Still	22-May
Molossus molossus	F	Check Hall River	2	Yes	Still	22-May
Molossus molossus	F	Check Hall River	3	Yes	Still	3-Jun
Molossus molossus	F	Check Hall River	4	Yes	Still	3-Jun
Molossus molossus	F	Check Hall River	3	Yes	Still	3-Jun
Molossus molossus	F	Check Hall River	2	Yes	Still	3-Jun
Molossus molossus	M	Check Hall River	1	N/A	Still	3-Jun
Molossus molossus	F	Check Hall River	4	Yes	Still	3-Jun
Molossus molossus	F	Check Hall River	4	Yes	Still	3-Jun
Molossus molossus	M	Check Hall River	2	N/A	Still	3-Jun
Molossus molossus	F	Check Hall River	3	Yes	Still	3-Jun

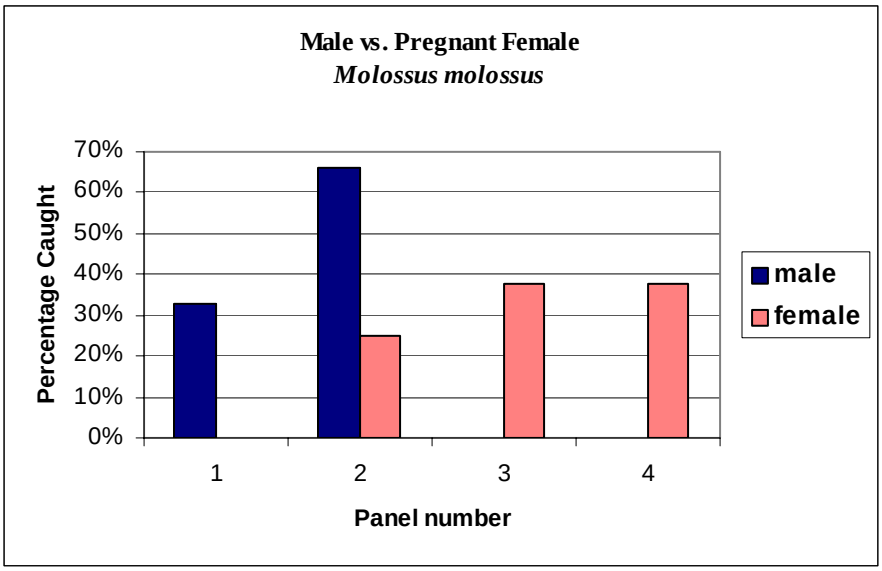

Figure 1. Percentage of *Molossus molossus* male vs. pregnant female captured, compared to panel caught.

Table 2. Female bats caught and pregnancy stage

#	Species	Sex	Location	Pregnant	Weather condition	Time/Date
3	*Molossus molossus*	F	Check Hall River	Yes	Still	22-May
5	*Sturnira lilium*	F	Bee House N	Yes	Windy	23-May
6	*Molossus molossus*	F	Check Hall River	Yes	Still	25-May
7	*Molossus molossus*	F	Check Hall River	Yes	Still	25-May
11	*Molossus molossus*	F	Check Hall River	Yes	Still	25-May
20	*Artibeus jamaicensis*	F	Bee House N	Lactating	Calm, light breeze	27-May
23	*Monophyllus plethodon*	F	Stinking Hole	Lactating	Still	28-May
24	*Sturnira lilium*	F	Bee House N	Lactating	Calm, light breeze	27-May
26	*Sturnira lilium*	F	Bee House N	Lactating	Calm, light breeze	27-May

29	*Monophyllus plethodon*	F	Stinking Hole	Yes	Still	28-May
30	*Monophyllus plethodon*	F	Stinking Hole	Lactating	Still	28-May
31	*Artibeus jamaicensis*	F	2nd Stream (wet)	Lactating	Still	28-May
34	*Sturnira lilium*	F	2nd Stream (wet)	No	Still	28-May
35	*Artibeus jamaicensis*	F	Bee House N	Unknown	Calm	1-Jun
37	*Pteronotis daveyi*	F	Champagne Beach	Yes	Caught in cave	2-Jun
38	*Pteronotis daveyi*	F	Champagne Beach	No	Caught in cave	2-Jun
40	*Sturnira lilium*	F	Check Hall River	Lactating	Still	3-Jun
42	*Molossus molossus*	F	Check Hall River	Yes	Still	3-Jun
44	*Molossus molossus*	F	Check Hall River	Yes	Still	3-Jun
46	*Molossus molossus*	F	Check Hall River	Yes	Still	3-Jun
47	*Molossus molossus*	F	Check Hall River	Yes	Still	3-Jun
49	*Molossus molossus*	F	Check Hall River	Yes	Still	3-Jun
50	*Molossus molossus*	F	Check Hall River	Yes	Still	3-Jun
52	*Molossus molossus*	F	Check Hall River	Yes	Still	3-Jun

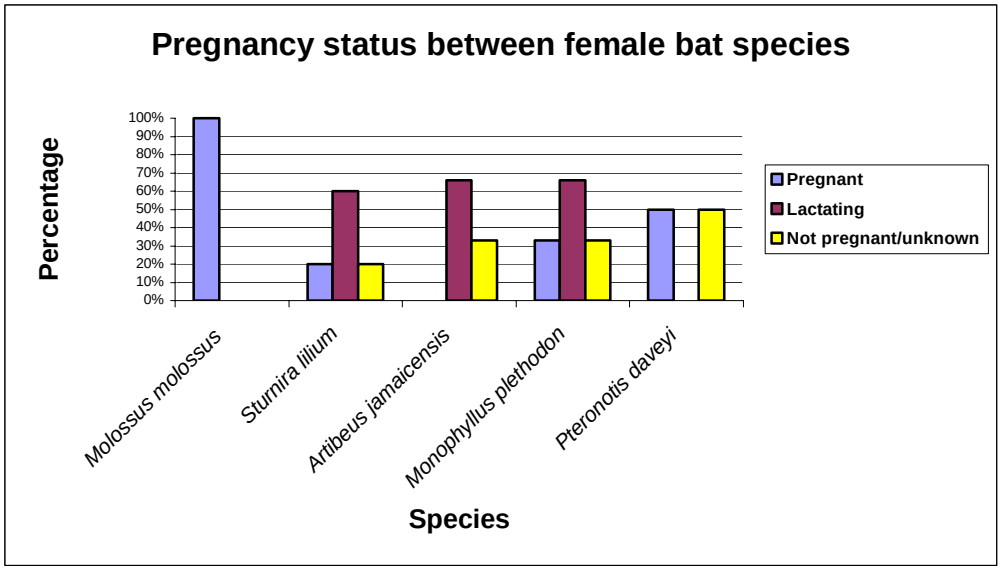

Figure 2. The five female species caught and the percentage of pregnant/lactating/or not pregnant/unknown during May 22nd through June 5th

Figure 3 *Molossus molossus*

Figure 4 ***Sturnira lilium***

Figure 5 ***Artibeus jamaciensis***