Foraging Time of the Green-Throated Carib Based on Changing Sucrose Levels of Heleconia on the Island of Dominca

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Abstract

The foraging time of the Green Throated Carib was observed along with a survey of sucrose level in Heleconia on which it fed. Correlations were then discovered. Foraging times of the Green-Throated Carib, are based on a pattern of changing sucrose levels of Heleconia found on the island of Dominica, West Indies.

Introduction

There are four species of hummingbirds on the Island of Dominica, WI. Two are endemic to the island, and found at the Archbold Tropical Research Center, the Green-Throated Carib, *(Sericotes holosericeus),* and the Purple-Throated Carib (*Eulampis jugularis).* Hummingbirds forage on a variety of flora and more often on Heleconia *(Heleconia rostrata* and *Heleconia caribea).* I hypothesize, the amount of sucrose the plants produce changes according to the time of day, and the foraging time of the Green-Throated Carib *(S. holosericues)* changes in association with the sucrose level in Heleconia.

Materials ands Methods

I began my experiment at five different sites of *Heleconia rostrata,* only to realize later three of my survey sites were no longer available. Therefore I continued with the latter two. I surveyed approximately every two hours for six days. Between the times of testing sugar concentrations I would watch a nesting site of one female hummingbird. The location of the nest was at the Check Hall River, about 30 feet off the ground. I had originally planned to watch the hummingbirds foraging, and test each specific flower they were feeding on. However, the birds ceased to forage on these same plants I was testing. I believe I may have been disturbing the natural sequence of feeding. Therefore I surveyed two sites of *H. rostrata* and observed one site of nesting. For five days I continued, and on the last day I surveyed the *Heleconia caribea* near the nesting site where feeding took place regularly. I did this to make sure data from *H. rostrata* coincides with *H. caribea.*

To survey sucrose levels in each different flower I used a sugar refractometer , Model ATAGO serial number 53385, capillary tubes, distilled water, and one eyedropper. The capillary tubes were used to extract the sucrose from each different flower. Using capillary action the sucrose would rise to a certain level in the tube. The refractometer was tared by taking the eyedropper

and adding one drop of distilled water to it and balancing it at 0%. From there I would wipe off the lens with Kimwipes and blow through the capillary tube extracting the sucrose from the tube onto the lens. By looking through the refractometer I could see the level rise according to the concentration of sucrose, measuring it by percent. I tried to do this every two hours, when possible.

To survey feeding behavior in *S. holosericeus* I walked down to the Check Hall River between plant surveying times. I would spend approximately one hour at a time watching the nesting site. I recorded every action I felt was relevant to my study, including foraging times, what they were feeding on, whether I suspected their were babies, and any aggressive behavior I saw. From there I made graphs of plant data comparing time and percent sucrose for each site. I consolidated all my behavioral data into five tables. I separated my data into two columns. Foraging behavior includes any times I noticed a period of possible feeding. Least Activity behavior includes any behavior not related to feeding.

Results

Data were collected from May 27th through June 4th. Figure one shows the comparison of each sucrose level and the times I surveyed. In all six graphs there is a slight decline in sucrose level throughout the day, and an increase in the evening. All six of these graphs are for the *Heleconia rostrata,* which I surveyed. Figure two shows the comparison of sucrose level to time for *Heleconia caribea.* As I mentioned earlier, I could only survey these flowers once, so I would not disturb natural foraging times. Table 1 shows foraging behavior by date for the hummingbird that was nesting. The hummingbird was most active from 5-9 am and again in the afternoon.

Discussion

During my project I found certain correlations between sucrose level and foraging time of *S. holosericeus.* During the duration of my fieldwork I had not surveyed consistently. I tested sucrose in blocks of every two hours so I could keep record as to when the sucrose is the most concentrated. I found that in the early mornings both species produced higher concentrations in the morning, perhaps because the afternoons are much more humid, and sunny. The late evening seems to have an effect on sucrose level, as well. I have concluded that Heleconia plants produce most of their sucrose in the morning, with a decrease in the afternoon, and an increase again in the late afternoon. I also watched a

hummingbird nest approximately every two hours, coinciding with surveying times. By watching the nest I came to the conclusion that there were babies present. Even though it was difficult to observe due to the height, I noticed the mother would forage for insects on the trees, especially Bamboo, and go back to the nest, usually at a constant pace. This leads me to believe she was feeding her babies insects, as some nectivorous birds are known to do. If this project were to be repeated in the future, I would advise using a much more consistent time frame. Though my data are inconsistent, they are still relevant to my hypothesis. I believe I do not have enough data to make a cause and effect conclusion, however my data show a strong correlation between sucrose level of *Heleconia rostrata,* and *Heleconia caribea,* and the foraging behavior of the Green-Throated Carib *(Sericotes holosericeus).*

References

Evans, Peter. 1990. Birds of the Eastern Caribbean. Macmillan Education Ltd., Hong Kong

Evans, Peter G. H. and Arlington James. 1997 Dominica Nature Island of the Caribbean: A Guide to Bird Watching Volume 3.

Table 1. Observations of peaks in foraging time

May 30	**Foraging Behavior**	**Least Activity**
5:00-6:00 pm	constant feeding on Heleconia	

June 1	**Foraging Behavior**	**Least Activity**
5:00-7:00 am	Constant Activity	
7:00-9:00 am	Foraging on Branches	
9:00-11:00 am	Activity slows, yet still flying around	
11:00-12:00 am		Flies around in display, no foraging
12:00-2:00 pm	Foraging on Branches, then activity speeds up around 1:30	

June 2	**Foraging Behavior**	**Least Activity**
5:00-7:00 am	Constant Activity	
7:00-9:00 am	Flies around, very active	
9:00-11:00 am		Foraging slows
11:00-1:00 pm		Chases off male hummingbird
1:00-3:00 pm	Forages on Branches/Heleconia	

June 3	**Foraging behavior**	**Least Activity**
5:00-7:00 am	Foraging on Heleconia constantly	
7:00-9:00 am	Looking for bugs	
9:00-11:00 am		Seems to be resting
11:00-1:00 pm		Flying around sporadically
1:00-3:00 pm	Foraging on trees	

June 4	**Foraging Behavior**	**Least Activity**
5:00-7:00 am	Foraging on different flowers	
7:00-9:00 am	Foraging on branches	
12:00-2:00 am		Little Activity
4:00-6:00 pm	Activity speeds up	