Feeding and Foraging Behaviors of Dominican Hummingbirds and the Bananaquit in Relation to Feeder Height

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Abstract

Three species of nectar-feeding hummingbirds inhabit the area around the Archbold Tropical Research and Education Center on the island of Dominica. The Bananaquit was also included in the study because of its nectar feeding behavior and abundance in the area. The location to set the stand with feeders and sucrose solution were chosen due to their success in past studies. A sucrose concentration of 4:1 was used and the feeders were placed in front of the veranda at the field station on the lower patio level. Through observation, preference or non-preference of feeding height was determined. As a result, only two out of three hummingbird species used the feeders and only two out of the three species that fed demonstrated a statistically significant preference of feeder height. The Bananaquit did not show a preference for the different feeder heights.

Introduction

There are four species of hummingbirds in Dominica: the Purple-throated Carib (*Eulampis jugularis),* the Green-throated Carib (*Sericotes holosericeus),* the Antillean Crested Hummingbird *(Orthorhyncus cristatus),* and the Blue-headed Hummingbird (*Cyanophaia bicolor).* Only thee species are found at the Archbold Tropical Research and Education Center in Dominica. The Blue-headed Hummingbird is not present on the Station and therefore will be excluded from this study. Also, the Antillean Crested Hummingbird was seen during research but never fed from the feeders that were set up during the experiment so it will be excluded as well. The Bananaquit (*Coereba flaveola*) is one of the most widely distributed birds in the Caribbean. Because of its abundance on the island of Dominica and attraction to the hummingbird feeders that were set up, the Bananaquit was included in the study.

The Purple-throated Carib, which is the largest of all the hummingbird species on the island, has an iridescent purple throat that is visible only in direct sunlight as well as metallic green wings and a dark body and tail. It has been observed feeding in both the canopy and understory and its diet includes insects as well as nectar from flowering plants. The Green-throated Carib, which is slightly smaller than the Purple-throated Carib, is completely green except for a patch of violet-blue on the breast and a violet-black tail. Its feeding habitats are

similar to the Purple-throated Carib and it habituates in lowlands, gardens and cultivation as well as in mountain regions occasionally. The Bananaquit, whose size ranges from smaller than the Green-throated Carib to larger than the Purple-throated Carib, has a very recognizable coloration. The throat and head are grey or black and the breast and belly are yellow with the rump being yellow or greenish-yellow. The habitat of the Bananaquit is broad and they are present in virtually any habitat, but they occur most abundantly in secondary vegetation, plantations, and gardens (Evans, 1990). They feed not only on nectar, but also on seeds, the juices of fruits, and a variety of small insects. Because all three species share the same habitat and feed on nectar, the preferred feeding height of each species will be examined to determine if a trend is present.

Materials and Methods

In order to attract hummingbirds and organize feeders at different heights, a bamboo stand was made. To make a stand for the feeders, I lashed three 25-foot long bamboo poles together. Once the poles were cut and moved to the area where the feeders were going to be placed, I lashed together the tops of three poles to make a tripod and raised the stand up. The stand and feeders were placed on the lower level of the property in front of the veranda at the Archbold Tropical Research and Education Center (Wilkins, 2009). After proper placement and arranging the poles for optimum viewing of the feeders, a rock with a rope attached was thrown over the top of the tripod to hang the feeders. The feeders and rope were measured out with a tape measure to ensure exact height placement of all the feeders, and the rope and feeders were strung together. The feeders were hung exactly 4 feet from each other at heights of 4, 8, 12, and 16 feet from the ground. Once the stand and feeders were complete, I filled two 32 oz Nalgene bottles with a 4:1 water to sugar ratio as found in previous student projects to be optimal (Barrera, 2002). For the sugar water mixture, I wanted to make sure that the sugar concentration was the same for each feeder. A refractometer was used to determine Brix percent and for each reading taken of all of the mixtures used in the study, the Brix concentration was always within one percent of twenty percent. The feeders were filled and restrung at the proper heights and observations were made with binoculars from either the

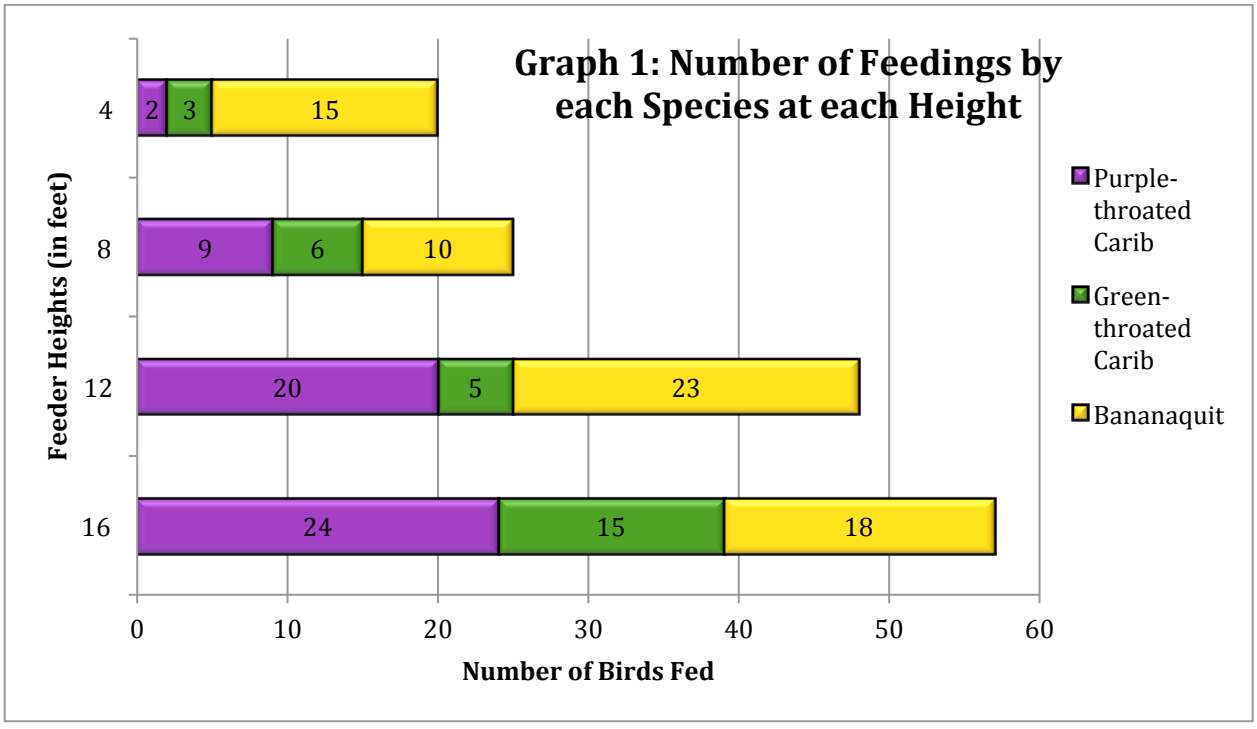
bottom of the stairs at the veranda or from inside the lab when it was raining. When any of the feeders' sugar-water mixture got low, they were all emptied out and refilled with fresh mixture.

Results

Table 1: Height * Species Crosstabulation

Feeder Height (ft)	Purple-throated Carib	Green-throated Carib	Bananaquit	Total at Each Feeder Height
16	**24**	**15**	**18**	**57**
12	**20**	**5**	**23**	**48**
8	**9**	**6**	**10**	**25**
4	**2**	**3**	**15**	**20**
Total for Each Species	**55**	**29**	**66**	**150**

Table 1: Height * Species Crosstabulation: The table above shows the number of birds that fed at each feeder height arranged by species and height.



Graph 1: Number of Feedings by Each Species at each Height: The table above shows the number of birds that fed at the different feeder heights arranged by species and color.

Table 2: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.181[a]	6	.019
Likelihood Ratio	16.437	6	.012
N of Valid Cases	150		

a. 2 cells (16.7%) have expected count less than 5. The minimum expected count is 3.87.

Table 2: Chi-Square Tests: The table above shows the Chi-Square value and level of significance.

Discussion

Table 2 shows that feeding behavior by height of feeder was not independent of species. The Green-throated Carib and the Purple-throated Carib showed statistically significant trends regarding feeder height preference, avoiding low feeders and preferring those near the top. The Chi-Square value is significant at less than 0.05. The Bananaquit showed no preference in feeder height and used each feeder impartially. Graph 1 shows that overall, more birds preferred to feed at the higher feeders than the lower feeders. Even though the Bananaquit showed no preference, the Green-throated Carib and the Purple-throated Carib preferred the feeders placed at 16’ high and 12’ high to the feeders placed at 8’ high and 4’ high. Table 1 shows that the number of birds that fed at the top two feeders was double the number of birds that chose the bottom two feeders.

I hypothesize that the reason for the hummingbirds’ common preference is due to the fact that both species have similar feeding habitats. One possible reason for the hummingbirds’ height preference could be due to the fact that they are both known to be very territorial and the higher feeders could possibly leave them less vulnerable to conspecific competitors. Because the Bananaquit’s habitat and food preferences are so broad, this could be a plausible reason for its lack of feeder height preference. Occasionally two Bananaquits would feed at the same feeder. The hummingbird species would never use the same feeder as another hummingbird but would occasionally use the same feeder as a Bananaquit.

References

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