

Aggression and Territoriality Among Three Dominican Hummingbirds

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Abstract

Three hummingbird species reside at the Archbold Tropical Research and Education Center in Dominica. Since the area is relatively small for birds that have a similar diet, aggression and territoriality were studied. The Purple-throated Carib is known for its aggression towards other birds, but I also wanted to see the interactions of the Green-throated Carib and Antillean Crested Hummingbird. Tripods made of bamboo sticks were set up from which to hang the hummingbird feeders. A sugar water mixture was distributed evenly to attract the hummingbirds. Chasing competitors away from the feeders was the preferred method of aggression since it was the quickest way to drive them away. As a result of the Purple-throated Carib's display of aggression, the Green-throated Carib retaliated in order to secure a food source. The Antillean Crested Hummingbird did not display any aggression, and was easily driven away by the Purple-throated Carib. Territoriality appeared to remain consistent throughout all days of observation.

Introduction

There are four species of hummingbirds found in the Commonwealth of Dominica, and three can be found at Archbold Tropical Research and Education Center. They are the Purple-throated Carib (*Eulampis jugularis*), Green-throated Carib (*Sericotes holosericeus*) and the Antillean Crested Hummingbird (*Orthorhyncus cristatus*). The Purple-throated Carib is the largest of all the hummingbirds on the island, and is known for its aggression and territoriality (Wilkins 2009). The species has an iridescent purple throat that is only visible in direct sunlight and a down-curved bill. The plumage is dark except for the green wings and bluish green tail. The Green-throated Carib is mostly green with a blue breast and tail. This species has a similar

diet to the Purple-throated Carib, and both may be seen in the same type of habitat. The Antillean Crested Hummingbird is the smallest hummingbird on the island, and is known for its pronounced green and blue crest on the male. The female lacks a crest, and the breast is a pale grey as opposed to the male's blackish breast. This species often displays aggression towards other birds many times its size such as the broad-winged hawk or the grey kingbird (Baptiste et al. 2005). Since all three species share the same habitat around the field station, aggression and territoriality will be observed among the hummingbirds.

Materials and Methods

To attract the hummingbirds, I set up six hummingbird feeders behind the field station filled with a sugar mixture that consisted of a 4:1 ratio of water to sugar. Three were placed beyond the terrace, and the other three were placed in the lawn in front of the Archbold Research Center. Bamboo sticks and other sturdy sticks were used to hang most of the hummingbird feeders, and the branches of some trees were also utilized. Rope secured the sticks together to create a tripod for the feeders. A tape measure was used to place the hummingbird feeders three meters away from each other. I determined this distance after reading a previous paper stating that there was aggression displayed at that distance (Wilkins 2009). Binoculars, a stopwatch, a notebook and a pencil were used during observations to record the data.

★ Hummingbird Feeders

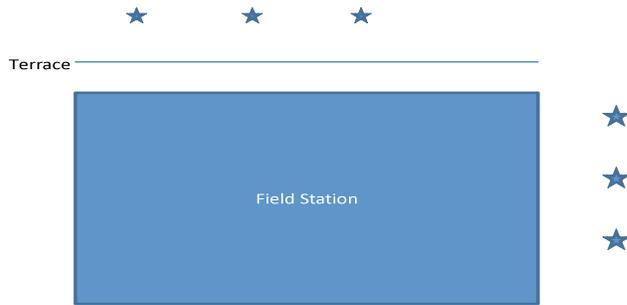


Figure 1: The hummingbird feeders were spaced 3 meters apart. Three feeders were placed beyond the terrace, and the other three were in the lawn in front of the Archbold Research Center.

Results

Table 1:

Columns are species exhibiting aggressive behaviors. Rows represent recipients of the aggressive behaviors. F = chase away. D = defend feeder. C = chirp.

	Antillean Crested	Green-throated Carib	Purple-throated Carib
Antillean Crested	N/A	N/A	N/A
Green-throated Carib	N/A	N/A	F – 1 second F – 2 seconds F – 1 second F – 1 second
Purple-throated Carib	N/A	F – 1 second F – 2 seconds F – 1 second F – 1 second F – 3 seconds	F – 2 seconds F – 1 second D – 2 seconds D – 1 second F – 3 seconds F – 2 seconds F – 4 seconds C – 2 seconds F – 3 seconds F – 2 seconds F – 1 second F – 3 seconds
Means	N/A	G-P: F – 1.6 seconds	P-G: F – 1.25 seconds P-P: F – 2.3 seconds P-P: D – 1.5 seconds P-P: C – 2 seconds

Table 2:

Columns are species exhibiting aggressive behaviors. Rows represent recipients of the aggressive behaviors. F = chase away. D = defend feeder. C = chirp.

	Antillean Crested	Green-throated Carib	Purple-throated Carib
Antillean Crested	N/A	N/A	F – 1 second
Green-throated Carib	N/A	N/A	F – 2 seconds F – 1 second F – 3 seconds F – 4 seconds D – 1 second F – 1 second F – 3 seconds
Purple-throated Carib	N/A	D – 1 second	F – 2 seconds F – 3 seconds F – 2 seconds F – 1 second
Means	N/A	G-P: D – 1 second	P-A: F – 1 second P-G: F – 2.3 seconds P-G: D – 1 second P-P: F – 2 seconds

Table 3:

Columns are species exhibiting aggressive behaviors. Rows represent recipients of the aggressive behaviors. F = chase away. D = defend feeder. C = chirp.

	Antillean Crested	Green-throated Carib	Purple-throated Carib
Antillean Crested	N/A	N/A	N/A
Green-throated Carib	N/A	N/A	F – 2 seconds F – 1 second F – 2 seconds F – 1 second D – 1 second F – 3 seconds F – 5 seconds F – 3 seconds
Purple-throated Carib	N/A	F – 1 second	F – 3 seconds F – 3 seconds F – 2 seconds F – 2 seconds F – 2 seconds F – 1 second C – 1 second F – 3 seconds
Means	N/A	G-P: F – 1 second	P-G: F – 2.4 seconds P-G: D – 1 second P-P: F – 2.3 seconds P-P: C – 1 second

Discussion

As expected, the Purple-throated Carib displayed the most aggression on all three days around the feeders. Chasing away the competitors was the most common type of aggression because it quickly drove away the other birds. The average time the Purple-throated Carib spent chasing either its own species or the Green-throated Carib was roughly the same all three days. Table 4 shows the average times the Purple-throated Carib spent chasing the other hummingbirds.

Table 4:

	Day 1	Day 2	Day 3
P-P: F	2.3 seconds	2.0 seconds	2.3 seconds
P-G: F	1.25 seconds	2.3 seconds	2.4 seconds

The Green-throated Carib normally did not display any aggression unless it was responding to aggression by the Purple-throated Carib. Without being able to have access to any sugar water, the Green-throated Carib became more aggressive in order to secure its source of energy. At one point, the species tried to chase away a Purple-throated Carib from its feeder (Table 3), but the Purple-throated Carib defended the feeder vigilantly. Unfortunately, the Antillean Crested Hummingbird was only in one aggressive interaction, and it was being chased away by a Purple-throated Carib. The Antillean Crested Hummingbird did not display any aggression towards other individuals during the time I watched the feeders.

Aggression steadily increased between the Purple-throated Carib and Green-throated Carib, but it fluctuated between the Purple-throated Caribs over the course of three days. The hummingbirds were more territorial in the lawn than beyond the terrace. There are a variety of different flowers beyond the terrace, and the hummingbirds have several sources of nectar from which to choose. The lawn in front of the Archbold Research Center has a limited amount of sources of energy for the hummingbirds, and it is possible that the Purple-throated Carib was diligent in defending the territory for that reason.

Table 1 indicates that on average, the Purple-throated Carib spent about the same amount of time chasing away either species. The Purple-throated Carib did spend slightly more time

chasing away its own species than the Green-throated Carib, but the difference is insignificant. Tables 2 and 3 suggest that the Green-throated Carib became more of a threat to the Purple-throated Carib's territory. On average, the time spent in chasing away either species was roughly the same. The data supports the idea that the Green-throated Carib displays aggression in response to aggression by the Purple-throated Carib. There appeared to be no relationship in time and defending or chirping towards other hummingbirds.

During the observations, the Purple-throated Carib was the most common hummingbird found close to the feeders. The Green-throated Carib was relatively common also, but there were not as many individuals observed. The Antillean Crested Hummingbird was rarer, and I only saw them early in the morning before 9:00 am. Both of the caribs were seen throughout the entire day. I made observations both in the morning and in the afternoon to try to gather more data for the Antillean Crested Hummingbird. If they were all relatively common, it would be possible that all three species display some aggression. Based on the observations, it is still evident that the Purple-throated Carib is the most aggressive and territorial hummingbird at the Archbold Tropical Research and Education Center.

If there were more time for observation, interactions between the Antillean Crested Hummingbird and the other two species should be examined more closely. The species does not frequent those parts of the station as often as the caribs, and eventually a pattern of aggression may be seen.

Acknowledgements

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References

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