

**Diet Study of *Eleutherodactylus martinicensis* and *Anolis*
*oculatus***

Brooke Bayless

Study Abroad, Dominica 2005

May 24, 2005- June 15th, 2005

Dr. Robert Wharton

Dr. Anthony Cognato

Diet Study of *Eleutherodactylus martinicensis* and *Anolis oculatus*

Abstract:

During a four day period using two sets of different *Eleutherodactylus martinicensis* and *Anolis oculatus cabritensis* every two days, preferences of different insects for their diet were observed. I first started out my project using only the *Eleutherodactylus martinicensis*, also known as the tink frog, but I decided using both an amphibian and reptile would suit better. I changed this because the tink frogs that were used for the experiment were so small that I was limited in size to what was fed to them. The anoles were large enough where their diets were not restricted and could try many more insects and even worms.

Introduction:

There are four species of frog that have been recorded in Dominica, but only two endemic. The Tink Frog, *Eleutherodactylus martinicensis*, can be found in the Lesser Antilles in all habitats. *Leptodactylus fallax*, also known as the Mountain Chicken, are found usually in valleys, but here recently most of the population has been killed off due to an unknown disease. Before this disease struck, the mountain chicken was used as a food source for the people who are now warned not to feast upon them due to disease. There are still a few populations around, but they are greatly reduced in numbers. There is also the Johnstone's whistling frog, *Eleutherodactylus johnstoneii*, which was introduced, and also the *Eleutherodactylus amplinympha* which are found in high elevation sites. This experiment focuses on the tink frog.

Tink frogs can be found in leaf litter during the day and on perches 1-2 meters above the ground at night. They have a very distinctive call, hence the name tink frog, that is a short single rising note that can reach up to 100 decibels.

These whistling frogs can be heard after rain and throughout the night. *Eleutherodactylus martinicensis* are relatively small, but



large for a whistling frog, the females having a SVL of 47 mm. The dorsal background color varies ranging from reddish, brown, yellow-brown, or dark-brown, and grey with red on the hind limbs and groin. The dorsal pattern includes a dark interocular bar and one or two dark chevrons. There may also be a wide vertebral stripe, pale dorsolateral stripes and a single wide crural crossbar. The ventral surface and throat are pale sometimes having dark strippling or spots.

The tree lizards, *Anolis oculatus*, are Dominica endemics. They are widespread among the island and very abundant. They are found throughout dry forest, shrub and woodland. They can vary in color and also change color to camouflage themselves while preying for food or protecting themselves. This subspecies of tree



lizard is endemic to the northwestern side of the island at Cabrits National Park. This lizard looks different in the different habitats it can live in, which has resulted in descriptions of different subspecies. In the rain forest it is large with a deep green color with bluish white spots on it. On the east coast of Dominica it is intermediate in size and has a dark orange/brown color to it with scattered white spots. On the west coast they are much smaller and paler being light tan to yellow color.

The frogs and anoles used for this experiment were gathered from the Springfield Plantation in Dominica near the Checkhall River. This area is made up of many various plants throughout the forest. They were collected mainly on the trail from the guesthouse to the stream. The frogs that were collected were rather small.

Materials:

For this experiment 2 aquariums were used to contain the anoles. Leaf litter was used for the bottom of the habitat. Wooden sticks were gathered from around Springfield for perches in both the frog and anole cages. Also, plastic bowls were gathered from the kitchen for a supply of water for all cages. The frog cage was made out of acetate and a towel was placed over the top to restrain the frogs from getting away. To gather the anoles and frogs a net was used. Also, pictures were taken using a digital camera.



Anolis oculatus habitat



Eleutherodactylus martinicensis habitat

Methods:

Data were collected for the anoles daily for four days. Each day there was a different number of anoles tested. The amount of anoles tested for each day were as followed:

Day 1- 2 anoles

Day 2- 1 anole

Day 3- 3 anoles

Day 4- 3 anoles

Each day there were different numbers of anoles tested due to some not adapting to the habitat. Consequently, they would not eat and usually hid. Those individuals were released soon after showing signs of not adapting. One anole, which was caught the first day, adapted well and was kept throughout the whole experiment. Each anole had a separate habitat. Each habitat was closely watched at feeding time to see exactly what was consumed. Food was collected daily, which was fed that day, and nightly, for the next morning. Daily feedings were around mid morning and then fed again around mid afternoon. During the day their activity and territorial behaviors were observed.

The data for the tink frogs were gathered daily for four days also. The first set of frogs gathered were rather small. These were kept for the first two days. Day three and four, larger frogs were gathered which increased the variety and size of food that was fed. Food was also collected daily for the tink frogs. Also the tink frog's food needed to be fed so bread was added to the cage. The food was smaller than what was fed to the anoles, therefore it was much harder to see exactly what the frogs were eating. Also, due to the tink frogs being in a cage all together, it was difficult to tell which frog ate which item.

Results and Discussion:

Results of the feeding trials are listed in tables 1-3.

Eleutherodactylus martinicensis lay their gelatinous eggs under or on vegetation. The frogs were mainly collected during the day where they were hiding in leaf litter along the trail to the stream. Most of the frogs collected were rather small and looked as if they had just hatched.

While feeding the crickets and grasshoppers, it was decided that the “food” also needed to be fed. Bread was placed into the tink frog habitat to feed the food. A few hours after the bread was placed into the habitat, many Azteca ants were attracted to the cage to feed on the bread. The tink frogs then freely fed on the ants, therefore the number of ants consumed by the frogs was difficult to count and had to be estimated.

Anolis oculatus cabritensis, anole, were captured and two males were placed together. I quickly learned how territorial they are. When showing territorial signs the dewlap is extended trying to warn the other male. Also, the anole will do push-ups showing signs of territory. This all led up to a quarrel. The larger anole latched onto the smaller anole’s dewlap for about 5 seconds and released. After this the medium sized anole was trying to retreat, but did not go far enough for the larger anole and so the latter went after him again. I soon separated the anoles into two different cages and made two habitats for them.

Anolis oculatus cabritensis size ranged from 10.2 cm to 13.1 cm. A fairly large kadydid, about the same size of the anole, was placed into the habitat for the day. The anole was never interested or bothered by the insect, therefore it is believed that the anoles do not try to eat prey that is approximately the same size or larger than them. Also, a small, deceased scarab beetle was placed into the cage and never touched. This shows that the anoles like to hunt their prey and feed on fresh live insects.

Eleutherodactylus martinicensis was interested in the ants much more than any other insect during feeding time. This is probably due to the small size of the frogs. In the area searched for tink frogs, only one large one was found. The tink frog would just wait for the ant to come by and expand the tongue to catch the prey. While observing the

feeding techniques it seemed as if everytime the frog would chew or swallow the eyes would close. During one feeding an ant was placed in and immediately eaten, next a termite was placed in and no action was taken place, then another ant was placed in and immediately ate. This alone indicated the tink frog favored the ants.

Anolis oculatus preferred grasshoppers more than any other food placed into the cage. After a grasshopper was placed into the habitat the anole would immediately attack it. Crickets were placed into the cage and left in there. Some stayed in the cage for days before they were eaten. One anole would kill the cricket first and set it back down in the cage and go eat it about five minutes later. Crickets can regurgitate and the taste may have something to do with the anole going back to it later. The anoles were not interested in the earthworm, katydid, centipede, millipede, junebug, or stinkbug.

Literature cited:

Evans, P.G.H. and A, James. 1997. Dominica Nature Island Wildlife Checklists. Roseau: Ministry of Tourism. Vol. 2.

Malhorta, Anita and R. S. Thorpe. 1999. Reptiles and Amphibians of the Eastern Caribbean. London and Hong Kong: The Macmillan Press Ltd.

Stiling, P.D. 1986. Butterflies and other insects of the Eastern Caribbean. London and Basingstoke: The Macmillan Press Ltd.

Table 1 Species Consumed by *Anolis oculatus*

	Grasshopper	Cricket	Roach	Grub	Earthworm	Katydid	Millipede	Centipede	June Bug	Stink Bug
Day 1	3	2	1	1	0	0	0	0	0	n/a
Day 2	2	1	n/a	n/a	n/a	n/a	0	n/a	n/a	0
Day 3	2	1	n/a	n/a	n/a	n/a	0	n/a	n/a	0
Day 4	5	1	n/a	n/a	n/a	n/a	0	n/a	0	n/a

-(n/a)- not fed that day

Table 2 Species Consumed by *Eleutherodactylus martinicensis*

	Azteca	Mymicine	Cricket	Grasshopper	Odontomachus
Day 1	4	2	1	n/a	n/a
Day 2	6	2	0	0	0
Day 3	+	n/a	0	n/a	n/a
Day 4	+	n/a	0	2	n/a

-(+)- food was consumed

-(n/a)- not fed that day

Table 3 Species Used During Experiment

Common Names	Kingdom	Phylum	Class	Order	Family	Genus	Species
Tink Frog	Animalia	Chordata	Amphibia	Anura	Leptodactylidae	Eleutherodactylus	martinicensis
Anole	Animalia	Chordata	Reptilia	Squamata	Iguanidae	Anolis	oculatus
Grasshopper	Animalia	Arthropoda	Insecta	Orthoptera	Acrididae	n/a	n/a
Cricket	Animalia	Arthropoda	Insecta	Orthoptera	Gryllidae	n/a	n/a
Roach	Animalia	Arthropoda	Insecta	Dictyoptera	Blattidae	Peripianeta	americana
Grubworm	Animalia	Arthropoda	Insecta	Coleoptera	Passalidae	n/a	n/a

Earthworm	Animalia	Annelida	Oligochaeta	Haplotaxida	Lumbricidae	n/a	n/a
Katydid	Animalia	Arthropoda	Insecta	Orthoptera	Tettigoniidae	Philophyllia	guttulata
Centipede	Animalia	Arthropoda	Chilopoda	n/a	n/a	n/a	n/a
Millipede	Animalia	Arthropoda	Diplopoda	n/a	n/a	n/a	n/a
June Bug	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Rutelinae	n/a
Stink Bug	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae	Edessa	meditabunda
Termite	Animalia	Arthropoda	Insecta	Isoptera	Termitidae	n/a	n/a
Azteca	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Azteca	n/a
Mymicine	Animalia	Arthropoda	Insecta	Hymenoptera	Myrmicinae	n/a	n/a
Odontomachus	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Odontomachus	n/a