

**Analysis of Claw Size in *Guinotia dentata***

**Neil Sheppard Cort Jones**

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Submitted to: Dr. Lacher & Dr. Jim Woolley

Texas A&M University

## **Abstract**

Dominica is home to a wide variety of crab species. Little is known about the morphology of these crabs that inhabit the island. This study looked specifically at a species of terrestrial land crab, *Guinotia dentata*. The sizes of the left and right claws were measured to determine if one claw was consistently larger than the other. Data showed that the larger claw size was not associated with *Guinotia dentata*.

## **Introduction**

The island of Dominica sits 15° north and 61° west in the Lesser Antilles. The “Nature Island”, as referred to by the locals, is just a few miles from Martinique to the south and Guadeloupe to the north. Dominica was many diverse environments and contains over 1,200 species of plants (Dominica.dm, 2013). Dominica is the only island in the Caribbean that has streams that are not polluted or man-made (Chace and Hobbs, 1969). Dominica has been referenced to be home to 19 species of freshwater and terrestrial crabs (Chace and Hobbs, 1969). Freshwater terrestrial land crabs on the island of Dominica are poorly studied. Previous work has been published over freshwater terrestrial crabs and other species of the West Indies (Dominica included) in great detail in a book by Chace and Hobbs, (1969).

The research for this paper was conducted on the Springfield Archbold Tropical Research and Education Center. Crabs were procured from the mature secondary rainforest found below the station and Mount Joy just above. *Guinotia dentata* is a freshwater species of crab found in the family Pseudothelphusidae in the order Decapoda (Chace and Hobbs, 1969). Different locations around the Archbold Springfield research station were visited to catch crabs. *Guinotia dentata* is one of the few species that does not have larval stages that require marine habitats (Chace and Hobbs, 1969). The Cyrique completes its entire life cycle in and around freshwater. The distribution ranges from Guadeloupe, Dominica, Martinique to Saint Lucia. The cyrique is readily found in most parts of the island where freshwater is accessible in streams, ditches, ponds, lakes, seepage areas, or burrows (Chace and Hobbs, 1969). In the field on the Morne Trois Pitons, Middleham Falls trail individuals were seen crossing. Cyriques have been spotted all the way to Boeri Lake at an elevation of 2,850 (Chace and Hobbs, 1969). It was hypothesized that

the larger claw size within the species *Guinotia dentata* is consistent across all specimens and that one side would be dominant.

### **Materials and Methods**

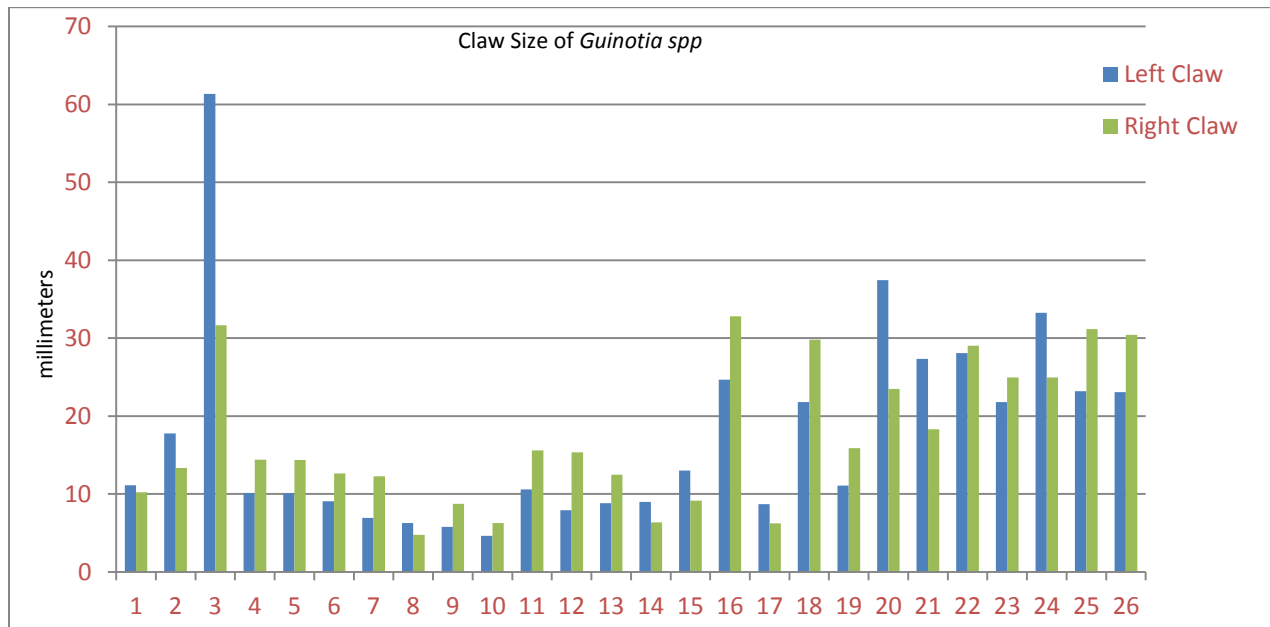
A pair of leather gloves was used to handle and catch crabs. A dip net was used to capture crabs in the river bottom that were out of reach. A headlamp and flashlight were also used during night captures. The crab was placed in a plastic bag to hold for weighing. A 100 gram scale and a 500 gram scale were used to measure the weight of the crabs. A digital caliper was used to take measurements of the claw size and carapace. All of the specimens were caught near the Check Hall River and Mount Joy trail. Long rains that saturated the earth would entice the Cyrique crabs to come out of their burrows and explore the newly moistened ground. Cyriques could easily be captured when found out of their burrows. Many were observed after a hard rainfall crossing trail heads and coming on to the veranda. If the rain was not heavy, a boulder flipping method was used. I would look for crab signs such as broken claws or holes leading under the rock. I grabbed the rock with a firm grip and gingerly but swiftly flip the boulder over. Many times the crab would be surprised and was easily captured.

### **Results**

In the species *Guinotia dentata* there was always, had one larger claw in comparison to the other in each specimen, but it was not consistent whether it was the left or right. Figure 1 below showed the left and right claw sizes of the twenty six specimens caught.

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**Figure 1.**



The claw sizes were compared using a paired t-test (Figure 2). If there was no consistent handedness in claw size, then the paired t would be non-significant, as seen in my results.

**Figure: 2**

**Paired Samples Test**

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Left Claw - Right Claw	-.0676923	8.3519963	1.6379612	-3.4411366	3.3057520	-.041	25	.967

## **Discussion**

The data showed that there was consistently a larger claw size in *G. dentata*. What the data did not show was a consistent left or right claw that was larger. A paired T-test resulted in no significant difference. The random left or right claw being larger was not expected. The hypothesis that other forces at the beginning of each crabs life are acting on which claw happened to be larger. It was thought earlier in the data sampling process that it was perhaps sexual dimorphism between males and females, but was ruled out after a greater sample size was collected.

In the field there were a few crabs that were captured with a very dark coloring on the carapace and there were thought to be a different species, but the white on the claw tips ruled that out. Future research projects could analyze the phenotypic differences of *G. dentata*, particularly to the variety of color schemes.

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