

Survey of Mosquitoes and Larvae in Dominica, W.I.

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Abstract:

Mosquitoes play a very important part in terrestrial and aquatic ecosystems. Mosquito larvae and adults were collected in various parts of Dominica and then identified at Springfield Research Center. Adults were collected by hand, and eggs and larvae were collected by oviposition traps or in vials using turkey basters. Various species were found from different areas of Dominica.

Introduction:

Mosquitoes play a very important role in the chain of life. Many animals feed on them, while for most other animals, mosquitoes can pose problems. They are known to carry different types of vector borne diseases such as Dengue Fever and Yellow Fever. Over the past few years, there have been cases of Dengue Fever in Dominica, specifically in the city of Roseau (Brown, 2007). This is very common in tropical regions, but is relatively new to the island of Dominica. It is extremely important for people to understand the types of mosquitoes that live in their area so they are aware of potential diseases that mosquitoes carry.

Aedes and *Culex* are very common species found in the tropics. *Aedes* lives in close contact with humans, so cities like Roseau and other populous places are bound to have a high abundance in their area (Mortimer, 1995). *Aedes* breeds through artificial containers such as flower pots, old tires, or any small stagnant pools of water in the city.

Culex and other related species are more adapted to living with wildlife, such as birds and other mammals, but will still bite humans when given the opportunity (Mortimer, 1995). These mosquitoes breed in crab holes, tree holes, and any sort of plants that hold water. In my study, the primary goal was to survey mosquitoes and larvae from different environments of Dominica. Many of the mosquitoes collected were from the Archbold Research Center in Springfield.

Methods and Materials:

To collect adult mosquitoes, I walked around catching the specimens on people they fed on. Instead of using an aspirator, Dr. Woolley and I came up with a way of collecting and killing the adults on the spot (Figure 1). First, we put a Kim Wipe or cotton ball soaked in ethyl acetate in a glass vial to use as a temporary kill jar. Next, we cut the tip off of one plastic vial and used that to make a pathway for the ethyl acetate vapors to flow through. Then we used the other end of that plastic vial to catch the mosquito in.



Figure 1

To collect eggs, I used oviposition traps consisting of popsicle sticks or ovipositor paper, black cups, and water infused with grass. I would make sure that the grass used is not lemongrass since this type deters the mosquito from laying her eggs. I filled the cup

up a quarter of the way with the infused water and placed the ovipositor paper or popsicle stick in. When I spotted eggs on the substrate, I placed the ovipositor paper or popsicle stick in a white tray with fresh water until the eggs were fully emerged (Brown, 2007). This is done to keep the eggs from desiccating. Within a few days, the larvae emerge from the eggs. I placed a few of the larvae, from different instars, in vials filled with alcohol to preserve each specimen.

To collect larvae, I walked around the Springfield Research Center with a turkey baster and collected samples of stagnant water. I found many of the larvae in *Heliconia* plants and flooded flower pots. I placed my samples in a vial and let them rear out on their own for about 3 to 5 days.

Results:

In Table 1, I have recorded the types of mosquito species identified from their various locations in the Springfield area, most of which were close to the research center. Since there was not enough time to fully rear them out, I identified the larvae instead. Many of the species I found were quite predictable in the sense that they live in close quarters to humans.

For the adult mosquitoes, I have laid out a photographic guide to help identify each species (Stojanovich, 1960). Since I also looked in areas such as the rainforest, I found many species that are not generally seen in more populated regions. Many of the species that were found were secluded in dense wooded areas adjacent to hiking trails, such as those from Middleham Falls and the Trail to the Commandants Quarter at Cabrit

Table 1: Location of mosquito larvae

Location	Date	# of Specimens	Mosquito Species
Archbold Center	5/28/11-6/2/11	25 eggs	<i>Aedes aegypti</i>
Bee House	5/29/11-5/31/11	27 eggs	<i>Culex Sp.</i>
Flower Pot	6/2/11	10 eggs	<i>Culex quinquefascianus</i>
Heliconia Plant	6/2/11	6 eggs	<i>Aedes buskii</i>



Culex chidersteri



Limatus durhamii



Aedes aegypti



Aedes buskii



Psorophora Sp.

Archbold Research Center: *Aedes aegypti* and *Culex chidersteri*

Middleham Falls: *Limatus durhamii* and 2 *Wyeomyia grayii*

Trail to the Commandants Quarter: 2 *Aedes buskii*, *Aedes tortilis*, *Psorophora Sp.*

Emerald Pool: *Psorophora Sp.*

Discussion:

The eggs and larvae that I collected around the area of the Archbold Tropical Research and Education Center were overall what I expected to see. After reading through previous research papers, *Aedes aegypti* and *Culex quinquefasciatus* are what were usually found by the station we stayed in. The adults I collected from around Dominica were interesting to see however, many of which I was not expecting to find. The adults from hikes such as Middleham Falls were found in deep forests relatively close to some small bodies of water, like streams. This was the typical environment for species like *Wyeomyia grayii*.

The oviposition traps with the actual ovipositor strips, instead of popsicle sticks, worked best for me in collecting eggs. Mosquitoes laid more eggs, up to 20 eggs, on this than any other substrate. The only downfall to this trap was that my larvae never fully reared into adults due to the limited time available. As for collecting larvae, I found this to be efficient. I was able to find an abundance of instars within the *Heliconia* plants and flooded flower pots around the station. This may have been due to the fact that we had some rain while we were here. I also felt that collecting adults was the best method used for this study because I did not have to worry about the eggs completing their life cycle. The one thing I wish I could have done different was collect and set out traps in the city of Roseau. I feel that this would have given me even more proof of *Aedes aegypti* and their association with humans. Overall, I feel that this study was a success in identifying some of the mosquitoes of Dominica.

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