Survey of Mosquito Population of Dominica by Use of Larval Rearing

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Abstract:

The island of Dominica has recently acquired the Chikungunya virus in addition to Dengue. The residents of Dominica need to know how to eliminate the breeding sites of these vectors. This experiment was performed on the Archbold Tropical Research and Education Center to assess what species of mosquitoes present. After eleven days of collecting, it was found that the main species present in plant held waters, also known as Phytotelmata, on the station was *Aedes busckii*.

Keywords: Dominica, Chikungunya, *Aedes busckii*

Introduction:

On the island of Dominica, there are multiple species of mosquitoes that carry vector-borne pathogens. Some genera that carry the vector-borne pathogens on Dominica include *Aedes* and *Culex*. *Aedes* is a carrier of multiple diseases, including two diseases known as, Dengue and recently found Chikungunya virus (CDC 2013). In order to be able to help the people of Dominica, they need to know what these vectors are and what they can do to prevent themselves from being infected.

It takes a significant amount of time and resources to help with finding the cure for these diseases. With the limited amount of time and resources for the trip, this individual project will be a general survey of the mosquitoes found on the Archbold Tropical Research and Education Center in Springfield, Dominca. The research center has made a rigorous effort to eliminate breeding sites, but is still finding mosquitoes on a regular basis.

In the tropics *Aedes* is very common and often in close contact with humans in cities such as Roseau (Mortimer, 1995). *Aedes* breeds mostly in artificial containers. Roseau is a perfect habitat for these vectors is because of the multitude of breeding spots like flowerpots, trash, and tires. In order to decrease the amount of vectors, the city needs to be proactive on removing these breeding areas (Mann, 2011).

This project will be very similar to one conducted by Alyssa Mann (2011) in regards to where the larvae will be collected but this project will only be dealing with catching larvae, not adults. Also this project will focus on plants that hold water creating a perfect breeding environment, also known as Phytotelmata. Phytotelmata were aobserved from the research center and from the surrounding areas that have any freestanding water.

Objectives:

The purpose of this experiment was to collect data on what species of mosquitoes are present on the Archbold Tropical Research and Education center to be certain if any vectors of diseases are present. The data recorded will also be used to create references for future projects on mosquitoes.

Methods and Materials:

To perform this experiment, I collected at multiple spots and different occasions. Only samples from the research site and the surrounding area were collected and placed into the mosquito breeding jars. The larvae were collected from local Phytotelmata, such as *Heliconia caribea* and ornamental bromeliads, using a turkey baster. Larvae were then placed into Bioquip Mini Mosquito breeding jars and given fish food (amount of fish food depends on amount of larvae) until ready to identify. Ideal time to identify larvae is third or fourth instars. When the larvae reached the ideal instars, they were placed in a glass dish with 95% ethanol. To identify, the key used was the Mosquitoes of Dominica report by Yale University School of Public Health (Brown, 2007).

Results:

Data Table 1:

Date collected	Mosquito genus and species collected	Plant genus and species collected from
5/21/2014	*Aedes busckii*	Ornamental bromeliad
5/22/2014	*Aedes busckii*	*Heliconia caribea*
5/22/2014	*Aedes busckii*	Leaf of *Musa sp.(Banana)*
5/23/2014	*Aedes busckii*	*Heliconia caribea*
5/25/2014	*Aedes busckii*	*Heliconia caribea*
5/28/2014	*Aedes busckii*	*Heliconia caribea*
6/1/2014	*Aedes busckii*	Ornamental bromeliad

Full body *Aedes busckii* larvae

Siphon and anal saddle of *Aedes busckii* larvae

Aedes busckii adult

Aedes busckii adult

Discussion:

The species found was exclusively *Aedes busckiii*, but the number of individuals caught was very large. *Aedes buscki* was collected from the plants around the field station. Most of the larvae were collected from *Heliconia caribea,* which provides a perfect breeding site for the larvae.

Despite other colleagues finding *Aedes aegypti* adults on the research site, the larvae could not be found in any Phytotelmata. This experiment was a good reference for the removal of breeding sites that contain, which will diminish *Aedes aegypti*.

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