Ticks of Dominica and Evaluation of Current Treatments in Place

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Abstract

Dominica is a small island in the Carribean that, due to it's geographical location, is very susceptible to problems with ticks. The two known ticks in Dominica are of the genera Amblyomma and Boophilus. I hope to identify these ticks as well as develop a protocol to control them while minimizing the amount of problems that the Caribbean Amblyomma Program suffered from.

Introduction

According to Dr. Reginald Thomas, the two main types of ticks that they are present in Dominica are the *Amblyomma* and *Boophilus* ticks. The majority of the ticks on the island seem to be on ruminants, while there seem to be few instances of problems with dogs and cats. The location and importation practices that Dominica is uses as a result of its location seem to be a possible place to head off many of these problems. A good way to develop a proper protocol is to look at the the two varieties of ticks that are on the island and see why they are such a problem.

The ticks that belong to the genus of *Amblyomma* cause a great problem in the Caribbean region. The *Amblyomma variegatum* has been in the Caribbean for 150 years, but was relatively isolated until the 1960s when it began to spread. This eventually drew the attention of the USDA when it became a problem for the USA and its territories. The characteristics of this tick are: an anal groove below anus, eyes present, palpi longer than wide, ornate, festoons present, rectangular basis capituli, oval idiosoma, and striated legs (http://webpages.lincoln.ac.uk/fruedisueli/FR-webpages/parasitology/Ticks/TIK/tick-key/index.htm). The *A. variegatum* is located in Africa and in Mauritius up to the West Indies. It is a three host tick that primarily uses cattle as its host. However, it appears that a tick of the genus Amblyomma has been affecting the Boas on the island. This particular species of tick is a vector for several diseases ranging from heartwater to dermatophilosis. The economic impact of this tick is huge. In 1993, Gersabeck "Estimated a potential losses of US$762 million annually if the tick and its associated diseases were to become established in the mainland countries" (Pegram et. Al, 1998).

The second genus common to Dominica is *Boophilus*. The characteristics of this genus are: anal groove below anus, eyes present, palpi wider than long, not ornate, no festoons, and hexagonal basis capituli (http://webpages.lincoln.ac.uk/fruedisueli/FR-webpages/parasitology/Ticks/TIK/tick-key/index.htm). The *Boophilus microplus* is the most common tick in Dominica. It is a one host tick that is primarily found on cattle, but it is also found on sheep, goats, and the like. *B. microplus* serves as a vector for Anaplasma and Barbesia This tick may not be as big of an economic threat as *Amblyomma variegatum*, but it is still present and deserves attention as well.

Materials and Methods

The materials that I used include a flag, which is a crude instrument composed of two pieces of wood, a yard of material (flannel), and a rope. In my replication of this tool I also included duct tape to keep everything together since power tools were not available to me at the

time. I then drug this apparatus behind me at Batali beach, the ATREC, and other locations. Another unexpected tool that I ended up using was a friend from Clemson University who ended up finding a tick on herself. I was also able to meet with and receive samples from Dr. Reginald Thomas. Other materials that I used were keys from the Univerisity of Lincoln, the CAP website, and a pictoral key from the Journal of Medical Entomology. I had the opportunity to get photos of the *Boophilus microplus* with a Nikon D1X 60mm macro lens and 110mm of lens extension by Dr. J.B. Woolley. When I get back to the United States I plan to verify the identity of my ticks.

Results

Table 1: Summary of Ticks Collected on Island

Genus	Species	Number of Ticks	Method of Collection
Amblyomma	*variegatum (possibly)*	13	Samples
Boophilus	*microplus*	1	Erin

Discussion

I finally ended up collecting 14 ticks total. One of these ticks I believe to be the *Boophilus microplus*, while the other 13 appear to be a form of *Amblyomma* (possibly *A.* variegatum). I plan to further evaluate these results after my arrival back in the states by checking them with more keys and sending them to the National Tick Collection for further verification.

Although my initial collecting efforts are less than successful, I do believe that there are several factors contributing to that. The first factor is the time of year that I am collecting (late May through mid-June). Dr. Thomas says that the ideal time to collect ticks on the island is during and immediately after the rainy season here. Another factor that comes into play is the livestock handling practices on the island. It is very common here to tie your livestock up to a tree and let it graze around that area with little human contact. This makes the cattle very weary of any humans that approach it. This problem also aids to my third problem, cattle is randomly placed throughout the island without any large quantities of cattle gathered in one common place. This makes it extremely difficult to find and search the needed number of cattle to get very thorough data. A fourth problem is that due to the lack of centralization and socialization of cattle with humans is that it is almost imperative to have the proper equipment to handle these cattle and keep them under control while checking them for ticks. The ticks I possess seem to be the B. Microplus and some form of Amblyomma. I plan to verify these when I return to the states.

All things withstanding, I do believe that my research is a step in the right direction. In the movie Tin Cup the main character Roy "Tin Cup" McAvoy says "Greatness courts failure". This could not be any truer for me, I do believe that I am on the verge of some excellent findings, and by learning from the mistakes I made on this trip, and I can make the needed corrections. I think that by coming in the rainy season and working with Dr. Thomas we could do a better survey of the ticks present on this island and come up with more specialized methods of control. I would also like to begin a correspondence with Dr. Thomas and continue to receive species from for further identification of any ticks he comes into contact with.

As far as the treatment and possible control of the ticks and their diseases, I do believe that CAP is making excellent advances in the control of this problem, and it would be best to stick with their current protocol. It seems that they have found a way to consolidate their funds into one agency and provide their executive branch with the needed power to enforce their regulations. They have many of the main islands within the Caribbean under control thanks to the help of stronger import/export policies and quarantine practices. Islands without control of the Tropical Bont Tick are not allowed to export livestock. They have also switched to a bi-monthly acaracide for islands that when it is deemed necessary, as opposed to the original use of a bi-weekly one. The governments within these countries are working together with governments around the world to eliminate this threat and to delegate power to teams within these countries to ensure farmers remain in compliance with these regulations. They are constantly evaluating the status of these islands to ensure their progress. They are experiencing more success now do to the greater amount of communication and their improved abilities to deal with this problem. They have reduced the amount of fatalities and lower reproductive abilities of livestock due to these methods of control. However, they focus their efforts on livestock and it appears that a new unidentified tick is affecting the Boas on the island of Dominica. I think this would be an excellent area for research after or during a second evaluation of the species on this island.

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