

**A Survey to Assess Mites Associated with
Dominican Ants**

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Abstract

Ants may find themselves hosts of phoretic mites at one point or another in their life cycle. These mites are often believed to be harmless and only using ants for dispersal. The diversity of mites found on ants has the potential to tell a lot not only about an ant colony and its health but about the health of the environment in which the ant colony inhabits. Currently there are no papers about mites on ants in Dominica. This study intended to amend that gap in scientific knowledge by luring and collecting ants with baited note cards in order to inspect them for mites but it produced unexpected results as there were no mites to be found.

Introduction

Ants may often find themselves the host of a mite, or many, riding on their abdomen or other spots they can grab hold of. When a mite rides on an ant or other organism it is called phoresy. A phoretic mite will use an ant population in order to be dispersed to a new environment (OConnor, 1982). This dispersal occurs during certain developmental stages of a mite's life cycle, so it is possible that while on Dominica that this stage is not present in certain species. No papers on mites associated with Dominican ants were found. Kaitlin U. Campbell and Thomas O. Crist's "Species traits and environmental characteristics together regulate ant-associated biodiversity" takes a look at how host-traits and environment characteristics play a role in impacting the characteristics of ant-associated mites (Campbell and Crist, 2016). Their research is based on an understanding of mites found on specific ants in their area. Since there is no such data for Dominica that could be found this project attempted to create a foundation of what mites can be found on ants, allowing others to follow later and investigate further. In the future this

could mean that phoretic mites could be a potential indicator species for the health or other characteristics of the ecosystem.

Materials and Methods

Folded cardstock was used as a note card substitute and placed on the ground in a highly ant trafficked area (ants were visibly traversing the area) with bait on top. In this case the bait was sardines and peanut butter. The card was then collected after some time and put into a sealed bag so that it may be frozen later to kill the ants and any potential mites. Originally the card was collected after 20 minutes, another was immediately placed down in the same spot and it was collected after 40 minutes and then repeated for 60 minutes. This would mean 3 samples were taken from 1 location. This technique was intended to collect different types of ants over a period of time, but greater ant numbers were collected by simply picking the card up when it was covered in ants regardless of time. This was then the method used for the rest of the collection. To collect different types of ants new cards were simply placed in front of a different ant colony. After note cards were frozen in a bag the contained ants were removed by hand via forcep and arranged in a grid in an isopropyl alcohol filled petri dish. The ants were then inspected under a dissecting microscope and a compound microscope for mites.

Identification of ants to genus was accomplished using papers written by A&M Students about Dominican ants (Woolley, 2004; Marable, 2002) and additionally the book “Identification Guide to the Ant Genera of the World” by Barry Bolton.

Results

I inspected 1592 ants under a dissecting microscope. Anything that appeared as if it could be a mite was inspected closer under a compound microscope.

No mites were discovered on any of the 7 species of ants collected. (**Table 1.**)

Ant Genus	# of Ants	# of Mites
<i>Azteca sp.</i>	3	0
<i>Camponotus sp.</i>	237	0
<i>Dermodex sp.</i>	3	0
<i>Pheidole sp.</i>	563	0
<i>Solenopsis sp. 1</i>	22	0
<i>Solenopsis sp. 2</i>	761	0
<i>Tapinoma sp.</i>	3	0

Table 1. Ant Species collected, # of specimens and # of mites.

Discussions

No phoretic mites were found. There could be a number of reasons for this including that ant colonies that happened to be sampled did not have mites, ants did not have mites at an infestation level high enough for mites to be discovered outside of the colony and were contained within; or the mites in the ant colonies were not at a phoretic stage. It is also possible that some of the mites could have broken from the ants in transport to the freezer. Though this surely would not have happened to every mite collected and if they were present they would have been discovered on at least some of the ants.

Ants were spot picked from the bags with forceps so any mites that detached would not have been recovered. The bags were full of bait particulate, another survey attempt that may be

slightly more accurate or successful would ideally involve some sort of liquid bait so that the entire bag may be rinsed into a receptacle and searched via microscope ensuring that nothing interfered with the collecting or viewing of potential mites. It is also a possibility that some mites were present, they were simply beyond the viewing capabilities of the stations equipment and why they snuck by undetected.

Future endeavors to discover Dominican ant mites could attempt to go straight to the source and dig up an ant colony and search within for mites, bypassing the phoretic stage issue that might have been present here.

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References

Barry Bolton, 1994, Identification Guide to the Ant Genera of the World Harvard University Press, Cambridge, MA.

Kaitlin U. Campbell & Thomas O. Crist, September 2016, Species traits and environmental characteristics together regulate ant-associated biodiversity, Ecology & Evolution: Volume 6 Issue 17 pages 6397-6408

B. M. OConnor, 1982, Evolutionary Ecology of Astigmatid Mites, Ann. Rev. Entomol. 27:385-409

Dominica Projects:

Andrew J. Woolley, Photographic Guide to the Ant Genera of the Commonwealth of Dominica, 2004,

http://bug.tamu.edu/dominica/student%20projects/Dominica%20Projects%20pdf%20copy/Woolley_Andrew.pdf

Seth Marable, Field Guide to Ants that Live in Wood and Within Termite mounds of Springfield Research Station, 2002,

http://bug.tamu.edu/dominica/student%20projects/Dominica%20Projects%20pdf%20copy/Marable_Seth.pdf