Partial Survey of Ant Species at the Florida Atlantic University's Preserve

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Abstract

The gopher tortoise (*Gopherus polyphemus*) is considered a threatened species throughout much of its range. Their decline is mainly attributed to habitat fragmentation and destruction. These habitat disturbances commonly favor invasive species such as the imported red fire ant (*Solenopsis Invicta*). Red fire ants are known to predate on sea turtle hatchlings as they emerge from the eggs (Allen et al., 2013) and to cause severe damage to their overall populations. The red fire ant has been detected on aprons of gopher tortoise burrows at the FAU preserve and we **would like to evaluate whether the distribution of red fire ants overlaps with that of the tortoises burrows.** Ant distribution was accessed at the FAU preserve by running 10 random 100m transect lines and placing sardine baits at every 20m interval. Preliminary data suggests that red fire ants were abundant in 80% of the transects; however, we were unable to establish a direct correlation between the distribution of gopher tortoise burrows and that of red fire ants. The ants were tentatively identified to subfamilies and further identification will be performed.

Introduction

Study Site:

- Florida Atlantic University Preserve at the Boca Raton campus.
- 90 acres of preserved vegetation
- Home of the Gopher Tortoises

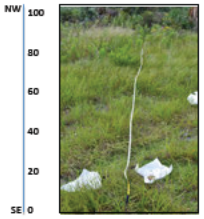
Brushy

Grassy

•The red fire ant has been observed to predate on sea turtle hatchlings and cause severe decline in their overall population. Small red ants were detected on aprons of gopher tortoise burrows at the FAU preserve, which inspired this **survey to collect, identify and evaluate whether the distribution of these ants overlaps with that of the gopher tortoises burrows.**

Sampling Technique

Transect Line & Baits



Methods of Data Analysis:

- The study was performed in the fall of 2013 and spring of 2014 in the FAU preserve.
- 10 random transect lines (100m) were placed within the FAU preserve with sardine baits at every 20m interval.
- The baits were left for two hours and collected into plastic bags labeled with the transect number, date and GPS coordinates.
- In the laboratory the ants were separated, counted and preserved in 70 % alcohol. Each vial was labeled with the transect number, date, number of ants and GPS location.

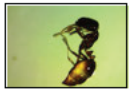
Sampling Technique (continuation)

A. Line Transects at FAU Preserve

Figure 1. Map of the N.W. line transects (100m) and gopher tortoise burrows at the FAU preserve (Scholl et al 2012).

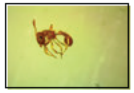
B. Ant Identification by Subfamilies

Myrmicinae *Solenopsis sp1*



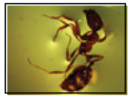
Myrmicinae *Pheidole sp*

Myrmicinae *Temnothorax sp*



Dolichoderinae

Myrmicinae *Solenopsis sp2*



Formicidae

Figure 2. The six different species identified by subfamilies collected along 10 line transects (100m) at the FAU preserve.

C. Species Composition of Line Transects - FAU Preserve

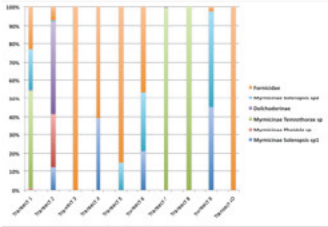


Figure 3. The analysis of the data revealed that *Myrmicina* were present in 60% of the transect samples collected. The most abundant ant throughout the preserve was Formicidae (orange) which was found in 80% of the samples collected.

Discussion

- This partial survey of the ant species inside the FAU preserve revealed that 60 percent of the sampled locations contained red fire ant colonies.
- Surprisingly the most common ant present within transects was the Formicidae (80%).
- The information collected is not sufficient to conclude whether the distribution of red fire ants overlaps with that of the gopher tortoises.
- We will continue this study by placing sardine baits on gopher tortoise burrow aprons and compare the ant species composition on aprons to that of transects throughout the preserve.
- Also the transect lines were randomly placed thought-out the preserve, however, some locations were difficult to access making the transect data hard to attain. We will place more transects as well as pit fall traps at the FAU preserve.
- We will only be able to determine which ant species are native after species have been identified by a taxonomist.

Future work

Since this is one of the first studies performed on the ant species composition present inside the FAU preserve, this will allow other research opportunities such as:

- Different sampling techniques should be used to conduct a more thorough ant survey.
- The ants collected will be further identified to species by a taxonomist.
- Sardine baits should be placed on gopher tortoise aprons so that we can further test whether the distribution of ant species on gopher tortoise aprons overlaps with that of ants within the preserve.
- Anther study can be performed on the effects of the fire ants on the gopher turtles burrows and hatchlings.

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