

Sample Representation of the Ant Population in Caumsett State Park

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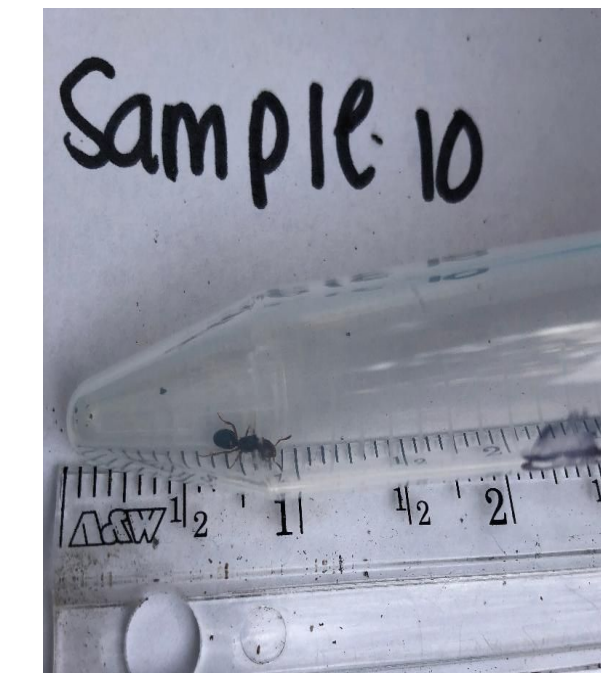
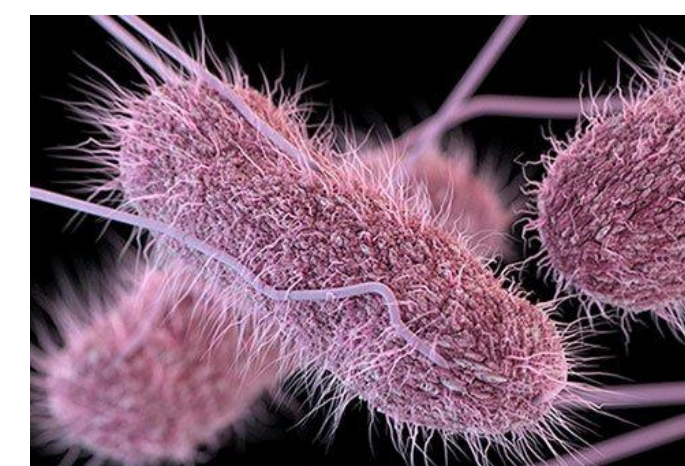
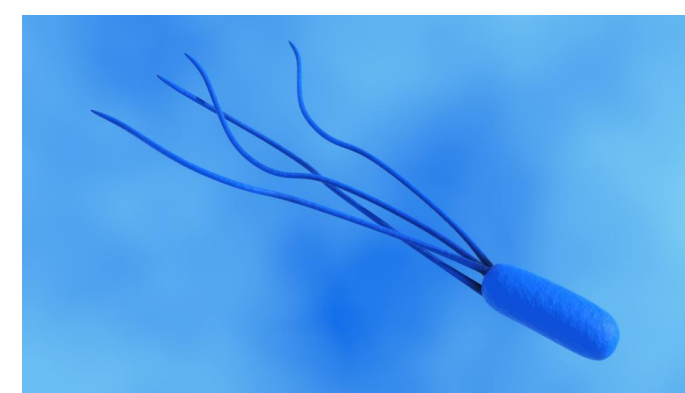


Abstract

The objective of this study was to compare the biodiversity of ants across a contained area of Caumsett State Park. Ants are very influential factor to environmental and human health. Along with aerating the soil, they can carry many diseases such as *E. coli* and *Salmonella*, which is why it is crucial to be conscious of the ant population in our immediate surroundings. We questioned as to how diverse the ant population would be in this area. Therefore, we collected samples from Caumsett State Park located in Lloyd Harbor, New York. This is a very unique location within itself. This park contains various types of ecosystems such as a freshwater pond, woodland areas, coastal areas, and salt marshes. We collected our samples from a woodland area near a stream due to the probability of an ant population being present in this area. We accumulated abiotic samples including temperature, salinity of water, and soil composition. We also obtained biotic samples, which will consist of the ant samples in this ecosystem. Through the use of DNA isolation and analysis we had the ability to identify ants present in this area. The results we found showed minimum biodiversity within the area that was sampled. The majority of the ants found were of the scientific name *Lasius claviger* (with the exception of two samples). This is based on the fact that our samples were most likely concentrated to one ant colony. In the future, this could be solved by taking samples from many of the environments at Caumsett State Park or from multiple quadrats in a singular location. This will contribute to the information concerning biodiversity across Long Island.

Introduction

- over one quadrillion ants
- 10,000 species of ants
- known to aerate the soil allowing the water and oxygen to reach plant roots.
- allow for seed dispersal
- decomposers by feeding on organic waste, insects, or other dead animals
- large food source
- carry many diseases such as *E. coli*, *Salmonella*, and *Shigella*
- goal of this study was determining the biodiversity in this area



Materials & Methods

Test Tubes, Soil Kits, Collecting Instruments Such As Buckets, Scissors, Tweezers, pH Kit, Soil Kit (potassium, nitrogen), Water Kit, Freezer, Gel Electrophoresis Kit, Various Chemicals to Isolate DNA, Centrifuge, Water Bath, Animal Primers to Separate DNA

1. A 1x1 meter quadrat was used to isolate an area in the woodlands near a small stream.
2. Various tools were used to take samples of 13 organisms, after receiving permission from the park.
3. The samples were frozen until all of the DNA extraction equipment had arrived from Cold Spring Harbor Laboratories.
4. Several steps were used to isolate and combine DNA from each organism with a primer.
5. Gel electrophoresis was performed; samples that could be sent to Genewiz were determined.
6. After the samples were sequenced by Genewiz, DNA Subway was utilized to identify the plants.

Results

- eight of the samples were sent for sequencing
 - 1, 3, 4, 5, 8, 10, 12, and 13
- part of the same species
- samples PHE-003, PHE-005, PHE-008, PHE-010, PHE-012, and PHE-013 are all *Lasius claviger*
- samples that are not *Lasius claviger* are Samples PHE-001 which is *Nylanderia parvula* and PHE-004 which is *Lasius alienus*

Discussion

- most are *Lasius claviger* due to the parameters of the quadrat
- it appears to be an area lacking biodiversity
- it is evident that this park is not lacking in biodiversity
- our results alone are not viable to make a conclusion concerning the biodiversity of the area
- it would be helpful to sample from many areas within Caumsett State Park
 - we would be able to get an increased amount of knowledge on each of the areas within Caumsett

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