



# Habitat Fragmentation of Ants North and South of the Long Island Expressway

Nicholas Krall, James Latini, Ayaan Shaikh  
John Halloran  
Connetquot High School

**Abstract:** When looking at the ant population it is known that biodiversity is important. This is because when researching past studies, they use this as an indicator and data set to show whether or not the region has a significant general biodiversity. The investigation was made to determine, does the Long Island Expressway act as a physical boundary for ants? And does habitat fragmentation in turn affect biodiversity?

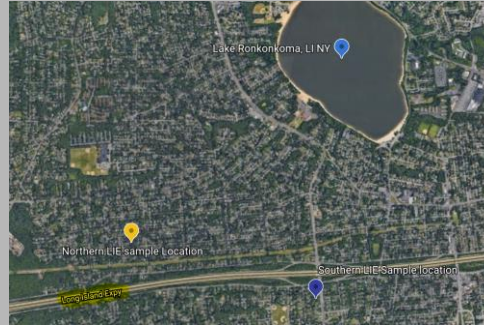
## Introduction:

- Biodiversity of the ant population on Long Island can be used as a major indicator to the general health of its ecosystem (Crist, Thomas. "Biodiversity, Species Interactions).
- A healthy ant ecosystem will aerate surrounding soil allowing water and oxygen to reach plants roots.
- Using relatively recent DNA barcoding technology ("DNA Learning Center Barcoding 101."), it is possible to approximate the biodiversity of the Long Island ecosystem by using species identification.
- After DNA sequencing, data will be used to determine differences in biodiversity between two different geographic locations ("DNA Barcoding" Biology Animation Library)
- The Long Island Expressway (a major infrastructure barrier) can potentially act as a barrier between a habitat, and create habitat fragmentation.

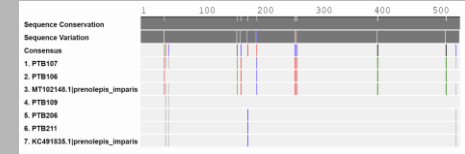
**Materials and Methods** A pecan sandie was broken in half and set on index cards at the collection location. Each trap was one foot apart from each other. Traps were set level to the base of the ground. After waiting an hour, traps were placed inside a plastic ziplock bag and placed in home freezer. Upon returning to school, ants were separated into respective test tubes, while labeling each test tube with their trap number. Using the camera/microscope that is hooked up to the computer, photos were taken. Care was taken to limit the time that the ants are unfrozen in order to minimize the decay of the ant's dna. The location to the North of the LIE is at the bottom of a hill and is in a suburban area with light vegetation, the traps were placed near a fence. The location to the South of the LIE is also in a suburban area but with light forestation and various vegetation, the traps were placed near shrubbery between two trees.

**Results:** Most of the samples failed to produce bands in gel electrophoresis with the exception of 7 samples. These samples were sent for sequencing and all came back as the same species (Prenolepis Imparis). The mistake was found later on and the sequences returned to normal. Despite both locations producing the same species from collection, there were slight differences in the sample sequences despite being the same species. This can be analyzed further to discuss this topic of biodiversity in Long Island's ant population.

## Map of Collection Locations:



## Muscle Table Results:



**Discussion:** Most of the samples failed to produce bands in gel electrophoresis with the exception of 7 samples. These samples were sent for sequencing and all came back as the same species (Prenolepis Imparis). The mistake was found later on and the sequences returned to normal. Despite both locations producing the same species from collection, there were slight differences in the sample sequences despite being the same species. This can be analyzed further to discuss this topic of biodiversity in Long Island's ant population

**References:** The results were not very helpful in determining whether or not habitat fragmentation affects biodiversity in terms of the LIE. More sampling locations would be needed to produce valid results. However it was found that even with the same species, there were differences within the sequences of the ants found in different sides of the expressway. These could just be differences in terms of colonies or there could be an effect of habitat fragmentation on the ants. For further studies, far more samples from many different locations should be taken in order to produce better results.

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