

<sup>1</sup>The Dwight School

# Abstract

Collection of ant samples from different areas across New York City with the intention to discover the impact of human interaction with genetic diversity. We found greater diversity in areas with less human interaction.

## Introduction

#### We hypothesized that we would find a variety of species of ants including those from other regions due to the diversity of New York City.

In this project we aimed to find and analyze the various species of ants populating New York City. We searched different areas in Manhattan. With this project we studied the impact of human activity on the species of ants residing in a given location through observing the outcome of increased level of human interaction on the species of ant present. Our main goals were finding which species of ant is most prevalent, which species live in the city, and what differences or --

### The Effects of Increased Human Activity On The Biodiversity Of Ant Species In Manhattan Authors: Grace Gurthart<sup>1</sup>, Bennet Haden<sup>1</sup>, Leia Immanuel<sup>1</sup>, Ella Sheppard<sup>1</sup>

### Mentor: Michael Paul

similarities exist between the different species. Through genetic barcoding we were able to determine the genetic diversity across different types of ants. Just as a universal product code (UPC) identifies each commercial product, a DNA barcode can potentially identify each species of ant.<sup>1</sup>

# Materials & Methods

- Samples obtained from areas in Central and Riverside Parks.
- DNA Isolated using the chelex technique
- DNA amplified using the ant primer cocktail (primers targeted various cytochrome oxidase genes commonly found in ants).
- Electrophoresis conducted to ensure successful sample amplification prior to sending the samples off for sequencing.

# Results

We found four total species of ants and one species of termite throughout our collection. We collected ants from a wood pile near the Reservoir in Central Park, rocks on a slope in Central Park, and areas in Riverside Park. Camponotus sp. bold 2016 and Nylandenia parvula were found in the wood pile in Central Park. Camponotus sp. Bold 2016, Reticulitermes flavipes, Lasius claviger, and Lasius emarginatus were all found under rocks in Central Park. Lasius emarginatus was found in Riverside Park.



CSH Cold Spring Harbor Laboratory DNA LEARNING CENTER

Funded by the Thompson Family Foundation

### Discussion

• The wood pile in Central Park is in an area with high human interactions. This leads us to believe that the species found there have a high tolerance to human contact.

• The species found on the embankment of Central Park and Riverside Park were in an area with lower incidences of human interaction. Therefore, we believe these species have a lower tolerance for human

contact.

• An interesting finding was the potential temporary social parasitism exhibited by the Lasius claviger queen found with

the Lasius emarginatus workers.<sup>2</sup>

## Acknowledgements

We'd like to thank the Thompson Family Foundation, Louise Bodt, Jenny Hackett, Allison Mayle and **Cold Spring Harbor Laboratory's DNA** Learning Center.

### References

Micklos, D. (2020, June 5th). U.S. Ants: Citizen Science DNA Barcoding. DNA Learning Center.

- https://www.bio-link.org/blog/us-ants-citizen-science-dn a-barcoding
- . Raczkowski, J.; Luque, G. (2010, December 25th). Colony Founding and Social Parasitism in Lascius. Insect. Soc. 58: 237 - 244.