Lack of Ant Biodiversity at Friends Academy Forest School Caz Costagliola, Marina Krichmar CSH Cold Spring Harbor Laboratory Mentors: Jennifer Newitt, Vijay Suthar References





Abstract

About three years ago, Friends Academy converted a part of the forest near its nature trails into a forest school. However, the school has yet to see if this transformation could have affected what ant species are present in the area. The reason we decided on ants is because they are accessible and definitely live in this environment, and we as a group have a great interest in ants. We did a bioblitz to catalog the ant species in Friend's Academy's forest school. We wanted to see if the recent change in the environment may have had a novel effect on the biodiversity of ants in this area compared to species on the rest of Long Island. Twenty specimens were collected in the forest school using pitfall traps. Then, these ant specimens were preserved for DNA extraction, amplification, and analyzed. From this, we found that Brachyponera chinensis is the main species in this transformed environment. This forest school lacks biodiversity, and houses an invasive species.

Introduction

Due to the man-made nature of the forest school, we found that it was a perfect place to conduct a bioblitz to see what species would become dominant in a relatively new environment. With the constant loss of habitat occurring globally due to human activity, these species would theoretically become the first to recolonize the area. Human activity includes foot traffic, habitat loss due to housing, noise pollution, garbage pollution, and air pollution. All of these can destroy natural habitats or alter animal behavior, which in turn makes it harder for a diversity of species to survive. The presence, or lack thereof, of a diversity of species would in turn point to the effect human destruction of habitat has had on biodiversity, even with forest restoration projects. By performing this bioblitz, we hoped to answer the question of which species would thrive in human-made environments, specifically those present in new forest restoration projects. We aimed to see the amount of biodiversity present in this environment.

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Brachyponera Brachyponera chinensis worker Materials and Methods 20 samples were with Pitfall Traps All 20 were uploaded Database DNA was extracted using silica-based protocol¹ COI DNA was amplified by PCR and confirmed using Gel Electrophoresis Subway Blue Line

chinensis alate collected at the Friends Academy Forest School to the Barcode Sample DNA was sequenced by the DNA Learning Center and analyzed with DNA



Figure 4. Distribution of Brachyponera Chinensis. Red indicates it is an invasive species in this area.

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18 out of 20 samples were successfully sequenced with two being rejected; CXY-015 and CXY-016. Other than this, every sample turned out to be *Brachyponera chinensis*, aside from sample CXY-014, which found three different matches and could not be definitely identified.



Figure 1. Sequence alignment of samples CXY-001 to CXY-020 compared to Brachyponera chinensis, excluding CXY-014 and failed sequences

Discussion

- it is invasive.
- America with humid climates and no predators.
- $\sim 65\%$.



Results



We were aiming to find the biodiversity of this area which was once a typical deciduous forest and is now a cleared out, classroom area. From this project, we see that *Brachyponera chinensis* dominates this area, and

17 of our samples are *Brachyponera chinensis*, which is heavily invasive to New York, this means it is detrimental to the environment and wiping out other species of ants as it thrives too well in Northeastern

Brachyponera chinensis, called the Asian Needle Ant, was introduced from Japan in the 1930s.² Climate Change has helped it spread, and it is estimated that climate change will increase its suitable habitat by

Our research suggests that there is in fact a lack of biodiversity in the Friends Academy Forest School, despite our relatively small sample size, and that in fact the creation of this school has allowed invasive species to thrive, as it is said they thrive in dark, damp urban habitats or disturbed rural/forest habitats.