Plant Biodiversity on the East Side of Manhattan

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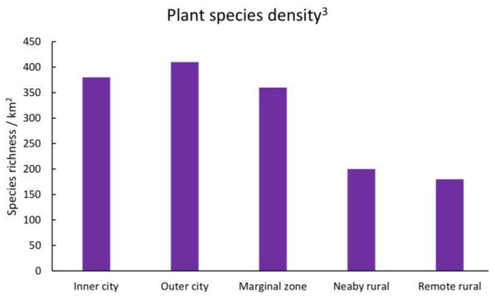
Abstract

Biodiversity in urban areas is difficult to maintain, so cities have created green spaces. Green spaces, such as parks, replicate natural conditions to promote biodiversity. Our research aims to analyze plant biodiversity in eastern Manhattan compared to western Manhattan (completed by another group). Our 30 plant samples were collected from Central Park and Carl Schurz Park. After the samples were collected, we extracted DNA, ran PCR, and did gel electrophoresis. Of the 30 samples, only half were successful. We then sent the samples for sequencing, and six returned for identification. Based on our phylogenetic tree, we identified the species of the samples. No identifications were repeated, which proves that eastern Manhattan has some plant biodiversity, but not enough samples were collected to make a definitive judgment. Unfortunately, we were unable to compare our results with samples from the West side, due to complications in their experiment.

Introduction

-Biodiversity is the variety of organisms in an area

-Rural and suburban areas are falsely assumed to have larger amounts of biodiversity than urban areas



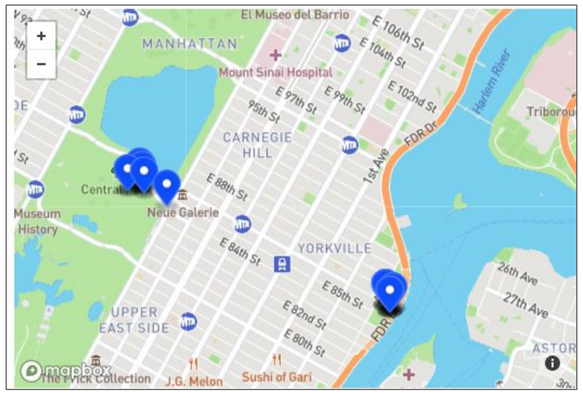
-Green spaces replicate natural conditions in hopes of creating flourishing ecosystems and more biodiversity in urban areas

-Urban settings provide unique challenges that threaten plant diversity

-Our research aims to analyze plant biodiversity in eastern Manhattan compared to western Manhattan (completed by another group).

Methodology

1. Collected samples from two ideal parks in eastern Manhattan



-15 samples from Central Park near 86th St

-15 samples from Carl Schurz Park near 86th St

2. Loaded our samples into the Barcode Sample Database

3. Performed DNA extraction, PCR, and gel electrophoresis

The silica method of DNA extraction.

One of our gels. Samples 8,7, and 13 were successful.

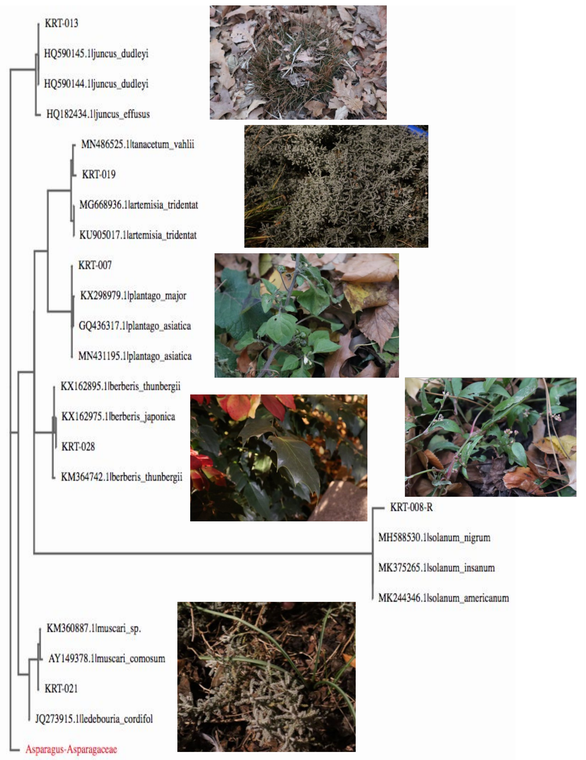
4. Made identifications with DNA Subway

Results

- 15 samples successfully underwent PCR: 9 from Central Park and 6 from Carl Schurz Park.

-6 were successfully sequenced, a 20% success rate

-Through DNA subway we generated identifications for the successful samples: 007, 008, 013, 019, 021, and 028 with a maximum likelihood phylogeny tree.



Sample Number	Identification	Common Name
007	Plantago (genus)	Plantain
008	Solanum (genus)	Nightshade
013	*Juncus dudleyi*	Dudley's Rush
019	*Artemisia tridentata*	Sagebrush
021	Muscari (genus)	Grape Hyacinth
028	*Berberis japonica*	Japanese barberry

Discussion and Conclusion

-Most of the six samples grew in different ecosystems as demonstrated by samples 013 and samples 007.

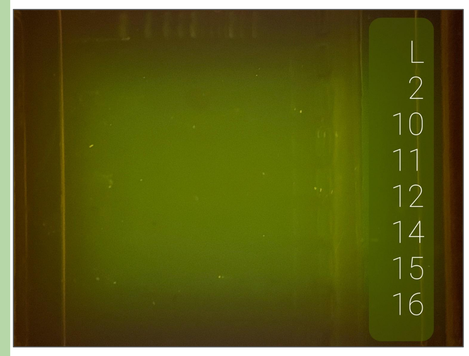
-Biodiversity in cities has been gradually increasing due to green spaces

-Green Spaces provide many benefits in a city

Error:

-There was issues during the extraction and sequencing

-We did not receive data from the group in the west which prevented us from comparing the biodiversity, our aim.



One of the unsuccessful gels.

References

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