



# The Impacts of Various Fungi Species on Soil Quality in Central Park vs. Black Rock Forest

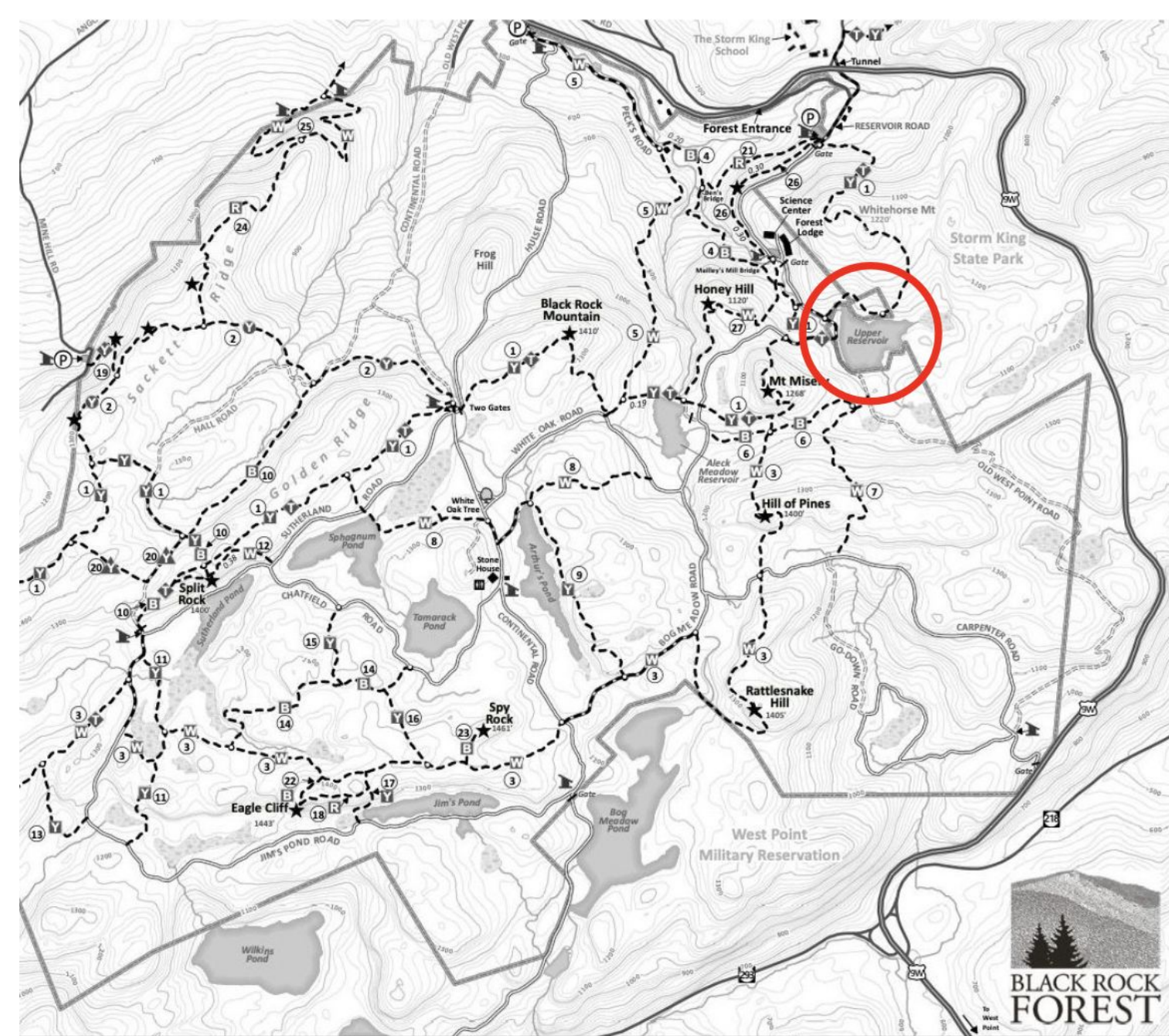
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## Abstract

In this experiment, our goal was to compare the effects different fungi species have on Central Park and Black Rock Forest. Both of these places had different environments and several components made our samples differ. At both Black Rock Forest and Central Park, we collected ten samples of preferably different species of fungi to test the soil quality of the different places. Firstly, we tested to find if the soil is affected when fungus is growing. Second, we observed the difference in soil quality in fungi in two different environments.

## Figures



Upper Reservoir (Black Rock Forest)



Bridal Path (Central Park)

## Introduction

Fungi, as essential decomposers, play an important role in maintaining the balance of ecosystems worldwide. However, when invasive species infiltrate new habitats, they can disrupt this ecosystem, potentially posing threats to native organisms. Yet, amidst these invasive species, there exist indigenous fungi that coexist simultaneously with their surroundings, exerting minimal impact on the local vegetation.

In our experiment, we ventured to Black Rock Forest and Central Park to collect our fungi and the soil they inhabited. Black Rock forest is a privately owned research-based forest dedicated to educating students and preserving wildlife. Central Park is the largest urban park in NYC located in the heart of Manhattan. Our aim was to assess soil quality and compare the biodiversity of invasive species in Black Rock and Central Park. We noticed there was an abundance of fungi in Black Rock Forest while there was significantly less fungi found in Central Park.

One of our hypotheses was that in comparison to Central Park, an urban public park, invasive species would be more prevalent in Black Rock Forest, a rural biological field because it has comparatively lower human activity and contamination, providing an environment more suitable for the spread of invasive species. Our second hypothesis was that invasive species of fungi would have a negative impact on their surrounding soils quality whereas indigenous fungi species would have a minor impact on their surrounding soils quality.

By collecting and analyzing fungi samples from Black Rock and Central Park, we aimed to bring awareness to the intricate relationship between fungi and ecosystem health. Through this exploration, we seek to deepen our understanding of fungal diversity and its role in maintaining the ecological balance of these diverse environments.

## Materials & Methods

In this experiment, our group collected fungi and soil samples from Black Rock Forest, located in upstate New York, and Central Park, located in New York City, to compare the biodiversity of invasive species, specifically fungi found in a rural area compared to an urban area. The materials needed to collect the fungi were 15 sterilized containers to store the fungi, several extra test tubes, two paper bags, and a shovel. To start, we found the first fungi sample, and we used the shovel to carefully collect the fungi and placed it into a sterilized air-tight container which was labeled with the fungus's location (Black Rock forest or Central park), and which number sample it was. This process was repeated 11 times so that we were able to find various types of fungi, including ones growing on tree barks, in the ground, and on plants. The fungi were preserved in a freezer where they stayed for one week before the testing process began. We followed the urban barcode rapid isolation processes to replicate the fungi's DNA and perform gel electrophoresis on the samples.

## Results

Out of the 41 fungus that was extracted, only 16 of them were used. Through the DNA extraction process, none of the results were shown on the gel electrophoresis. Because of this, none of the samples were sent to the Urban Barcode Project for sequencing the DNA.

## Acknowledgments & References

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## Discussion

Our goal was to investigate the effects of invasive fungi species on the soil quality in Central Park and Black Rock Forest and Central Park. Since Black Rock Forest is in a less polluted and urban environment than Central Park, we hypothesized that its soil quality would be greater.

Unfortunately, after amplifying the fungi samples and subjecting them to gel electrophoresis, the results showed that other than the ladder, none of our samples exhibited any DNA bands. We could not decipher any band lengths and segments because they were all either extremely blurry or showed nothing on the gel. As a result, we were unable to interpret any results. The absence of DNA bands suggests the possibility of experimental errors present in the procedure. During the lab procedure, there were several errors made such as some of the primer leaking out of the wells. Also, when cutting off a piece of each of our fungi samples, the sample might not have had enough DNA in it, resulting in no DNA showing up on the gel electrophoresis. Another possible error could be waiting too long between starting the PCR and running our DNA samples through gel electrophoresis. The samples could have been contaminated during that period, leading to no visible DNA bands. Additionally, when collecting our samples, we stored them in different containers, some in test tubes, some in plastic bags, and some in paper bags. The samples in paper bags could have easily been contaminated since liquids could seep into the bag onto the sample.

If our procedure had worked, we could have distinguished between the different types of fungi to see which ones were specifically invasive and non-invasive and how this impacted the soil quality and biodiversity of both Central Park and Black Rock Forest.