How Many Species of Fungus are Among Us: Distinguishing between different species of Fungus.

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Abstract:

The climate in our community is perfect for fungal growth Fungi can be important in ecosystems and can be beneficial to the organisms including humans. There is a lot of fungus present throughout our community and they are difficult to identify. This study anticipated discovering a number of beneficial fungi and sought to find out more about each species role in the environment once they were identified. Most samples were growing on live or dead trees and just a few were growing from the soil. Three samples were successfully Barcoded and two provide species identifications revealing that we have Trametes Versicolor and Trichaptum biforme in our community. Those two species seem to come in a variety color variations and appear similar in appearance to other fungi species, so Barcoding was essential in order to identify each species. The third species is showing a less definitive match and will require more attention to determine whether this species is in the database, or may be a novel sequence that may potentially be added to the database.

Introduction:

The question this project seeks to investigate is how many species of fungi we can find. We will focus on more wooded areas and try to find species in the school grounds and local backyards. We aim to find how these species of fungi exist with the other biodiversity in Farmingdale.

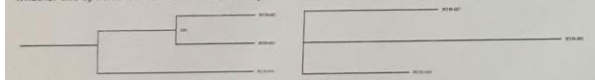
Barcoding Long Island's project mission is for students to gain an intuitive understanding of the crucial interdependence between humans and the natural environment. The purpose of this investigation is to study the biodiversity of Long Island. Fungi samples were collected in order to determine the different types of species in Farmingdale.

Materials and Methods

You would think that spotting fungi is an easy task because we practically walk past mushrooms and all kinds of fungi all the time, but it's not that easy. To begin this project we're going to be looking literally almost everywhere. Some specimens we could collect are already located on our school property but our search for another two specimens will proceed by searching around plants, under rocks, maybe on trees, or we could even climb for them! Basically anything that's fungus looking could become part of this assignment and/or a possible specimen. After we've collected all of our specimens we will freeze them to ensure no contamination. Of course we will analyze and collect the basic data necessary prior to the isolation of DNA during sample collection. The beginning of the isolation will be carried out and lead to amplification of the DNA by PCR so we can then analyze it by gel electrophoresis to confirm our sample is ready for sequencing. DNA subway will be used after results are given to us in order to determine the species of each sample. After the species is known we can do some research to determine the fungi's role in the environment.

Results:

Three samples were successfully Barcoded and two provide species identifications revealing that we have Trametes Versicolor and Trichaptum biforme in our community. Those two species seem to come in a variety color variations and appear similar in appearance to other fungi species, so Barcoding was essential in order to identify each species. The third species is showing a less definitive match and will require more attention to determine whether this species is in the database, or may be a novel sequence that may potentially be added to the database.



The results provide some insight into what fungi are present in our community. The two species that were identified can be similar in appearance and were distinguished from each other using the DNA sequences allowing even fungi novices to identify each species. Separating the DNA from the fungi was hard due to the spongy nature of fungi. The samples were hard to crush up, which created a significant problem when we were trying to isolate the DNA from the sample. The results of the barcoding are important because it helps us identify if there are any harmful species of fungi on Long Island. That way, people are able to identify if a species of fungi is safe or harmful. The samples collected for this project resembled each other physically, but were different species, so Barcoding samples allows species to be distinguished from one another to allow for further classification of the species role in the environment.

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Acknowledgements

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BARCODE LONG ISLAND

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CSH Cold Spring Harbor Laboratory
DNA Learning Center

Identifying Plant Species Found in the Lawns in Our Community

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Abstract

Background research revealed that there are many species of grass that exist, and our investigation was intended to identify what species of grass exist within our community in Farmingdale. The results included many non grass species and revealed a misconception that everything on our lawns is grass. One species even turned out to be a seedling of a juniper tree. Species like the tree may be short-lived in the lawn, while others may be permanent parts of lawns that were more diverse than we anticipated. None of the species collected or barcoded were native species of grasses such as those present in the hempstead plains.

Introduction:

Are there grasses that are native to Long Island on our lawns?

Most of Nassau County, New York was once a massive and open grassland known as the Hempstead Plains. It was estimated to be almost 60,000 acres in area.[3] It was the home to Long Island's many native plants, animals, insects, etc. In order for Long Island to become the populous and sprawling suburb it is today, much of the landscape had to be utilized. Today, not much of the native grassland remains.

As the population of Long Island significantly increased, the diversity of the population did as well. Being an extension of the New York City metropolitan area, Long Island is a popular destination for the millions of immigrants coming into and around New York City from all around the world. It is also a popular tourist destination for people within our own country. Due to this population and tourist pressure, Long Island lost a lot of its native species of grasses, trees, and insects. Some species' habitats were utilized for development, and some areas were repopulated by introduced species, like when we clear land and plant grass for lawns. An introduced species is defined as a species living outside its native distributional range, which has arrived there by human activity, either deliberate or accidental.[4] Unlike an invasive species, these do not pose a natural threat, but human use of non native species can consume large expanses of habitat.

An example of these introduced species affecting us Long Islanders is the grass in our front yards. The grass found in the Hempstead Plains consisted of Switchgrass and Pennsylvania Sedge.[7] Yet, many of the popular grasses people use in their yards tend to be Kentucky Blue Grass, Zoysia, and Ryegrass.[7] Our goal of the project is to investigate a few lawns within our community and analyze them to determine if these popular grasses that were introduced to Long Island are the only grass species present. Working on a much smaller scale than analyzing all of Long Island, we will try to find introduced species on our own lawns within our own community. The Poaceae also called Gramineae or true grasses are a large and nearly ubiquitous family of monocotyledonous flowering plants.[8] This large family group and our limited experience with identifying different grass species can be overcome by using DNA Barcoding to identify different grass samples taken from each lawn.

Materials and Methods:

We sampled grasses in November because everyone was able to easily find a sample of grass near them. We wanted to look for diversity on the lawns so the sampling effort looked for different types of grasses or plants living in among the lawn. We obtained these samples at our own houses and the school grounds. We chose this area because we didn't have to travel far to obtain these samples. We used a plastic bag and gloves to make sure the grass was properly collected, stored, and labeled. We collected 18 different samples.

Results

Sample # NYY001 Arabidopsis thaliana - large subunit gene, partial cds; chloroplast

Sample # NYY-002 Veronica arvensis - ribulose-1,5-bisphosphate carboxylase/oxygenase large subunit (rbcL) gene, partial cds; chloroplast

Sample # NYY-003 Ficaria verna - ribulose-1,5-bisphosphate carboxylase/oxygenase large subunit (rbcL) gene, partial cds; chloroplast

Sample #NYY-006 Chrysoblastella chilensis - gene for ribulose 1,5-bisphosphate carboxylase/oxygenase large subunit, complete cds

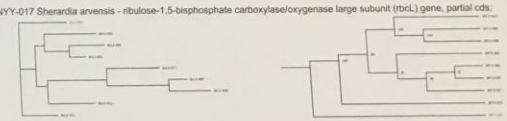
Sample #NYY-007 Lamium purpureum - gene for ribulose-1,5-bisphosphate carboxylase/oxygenase large subunit, partial cds; specimen_voucher: Jap06/78 BO (Herbarium Bogoriense)

Sample #NYY-008 Platygyrium repens - gene forribulose-1,5-bisphosphate carboxylase/oxygenase large subunit, partial cds; specimen_voucher: A. Tanaka 3154 (TNS)

Sample # NYY-012 Juniperus convallium - ribulose-1,5-bisphosphate carboxylase/oxygenase large subunit (rbcL) gene, partial cds; chloroplast

Sample #NYY-013 Prunus dulcis - ribulose-1,5-bisphosphate carboxylase/oxygenase large subunit (rbcL) gene, partial cds; chloroplast

Sample # NYY-017 Sherardia arvensis - ribulose-1,5-bisphosphate carboxylase/oxygenase large subunit (rbcL) gene, partial cds; chloroplast



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