

# What Effect Does The Type Of Tree That Fungus Grows On Have On Its Appearance?



## Abstract:

Our group was interested in discovering whether or not there was any relationship between types of fungus and the tree species that they grow on. Our gel electrophoresis failed to show banding and hence is why we have little data available. RbcL and ITS primers were used in our gel but they must have been unfit for the fungus/lichen samples because no results were obtained. Our data was collected from the Fire Island Forest and Long Island area with the use of a key to collect the specimen from the several trees we took from. The purpose of the experiment was to try and find information on the relationship between fungus type and tree species. Lichens share a symbiotic relationship with one another because the algae and fungi coexist as one organism. The fungal species acts as a strong structure and support system for the sensitive alga that provides energy for the creature (Trees for Life, 2015). Lichen are composite organisms that work together, in unity, to remain alive. The relationship between trees and lichen almost never harms the host plant and they definitely live together peacefully with the exception of arboreal lichen which would make insects lay eggs on the lichen rather than the tree, thus providing an insect infestation. The fungus benefits from the constant supply of food produced by the photo-synthesizer. The photosynthesizer benefits from the water and nutrients absorbed by the fungus. Various other scientists have also concluded that fungus and lichen are hard to work with. Maybe our project will have an impact on what other scientists interested will accomplish.

## Bibliography:

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“Symbiotic Relationships of Fungi." Symbiotic Relationships of Fungi. Ck-12, 2016. Web. 6 Apr. 2016.

Shaw, Ethan. "Symbiotic Relationships Between Trees & Lichens." EHow. Demand Media, n.d. Web. 06 Apr. 2016.

## Procedure/Methods:

We went to Fire Island and found a spot in the forest where we would collect fungus and lichen within the parameters.

We used a key to scrape off the lichen from the tree trunks and we carefully placed it into plastic bags (each bag labeled Sample 1,2,3,...).

For each sample we recorded the latitude and longitude of where we collected them. We also collected from a house on Long Island so we could have more variation with location.

The samples were stored for a short period of time before we extracted the DNA. We extracted the DNA from the samples by using lysis solution to break down the material into smaller pieces so that we could grind them and incubate them. After this we centrifuged the product, transferred the supernatant to a fresh tube, added silica resin, mixed, incubated, and centrifuged the sample. Following this we removed the supernatant, added wash buffer, mixed, centrifuged, and removed the leftover supernatant once again. Then we added wash buffer, mixed, centrifuged, and then removed the remaining supernatant. Next we centrifuged, and removed the supernatant again. Afterwards we added dH2O, mixed and incubated. Later we centrifuged, transferred the supernatant to a fresh tube. We amplified the DNA by PCR machine and performed a gel electrophoresis

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## Introduction

Does the location of a tree have an effect on fungus appearance and DNA structure? If a fungus is grown in a specific area then the appearance and binomial classification will vary.

## Purpose:

Our aim for the experiment was to collect a number of fungi specimens from the several ecosystems of the Sunken Forest of Fire Island and Long Island to identify if the type of tree has an affect on the fungus appearance and its DNA structure. we collected lichen and other fungi, like mushrooms. Since lichen is made out of two species, we only focused on the fungi aspect of lichen. We measured the size of each specimen and collected data of the surrounding area in which it was taken from. Also, we used the data to evaluate what the type of tree the fungi was growing on. To be precise, we also provided information about the weather and the location. We performed the protocol for the DNA extraction for DNA barcoding results.

<u>Specimen Number</u>	<u>Geographical Location</u>	<u>Physical Characteristics</u>
<u>#1</u>	(40.655534), (-73.112220)	Lichen (Crumb sized samples)
<u>#2</u>	(40.665390), (-73.112420)	Brown Fungus
<u>#3</u>	(40.665390), (-73.112420)	White Fungus
<u>#4</u>	(40.655587), (-73.112402)	Dark Brown Fungus
<u>#5</u>	(40.655431), (-73.114063)	Fungus (collected from dirt pile)
<u>#6</u>	(40.827982), (-73.376400)	Lichen (on oak tree)
<u>#7</u>	(40.827982), (-73.376400)	Lichen (on oak tree)
<u>#8</u>	((40.665704), (-73.112579)	Fungus (White & Brown colored)
<u>#9</u>	(40.655751), (-73.112534)	Lichen (Crumb sized samples)
<u>#10</u>	(40.827982), (-73.376400)	Lichen (on oak tree)
<u>#11</u>	(40.827982), (-73.376400)	Fungus (on fallen oak)
<u>#12</u>	(40.827982), (-73.376400)	Red/Orange Fungus (on oak tree)
<u>#13</u>	(40.827982), (-73.376400)	(on sassafras)

## Analysis:

Lichen are made up of polysaccharides and have a high content of protein. It is used mostly for its medicinal properties with some species with metabolites having a diverse selection of antibodies, anti-tumor, and antioxidants activities. Some lichen listed to be found within Long Island include *Parmeliopsis placorodia*, *Parmelia saxatilis*, and *Bacidia chlorantha*. The relationship or symbiosis between lichen and trees is that neither of them harm each other, during the lichens time of decomposing it contributes to the nutrients the tree obtains, rain can take nitrogen from the lichen and the tree would be able to obtain it, due to lichens ability to expand and contract based on moisture it can pry open areas where tree couldn't before, lichen prevents insects from laying eggs into trees and makes insects lay it onto the insects protecting the tree from harm, and the lichen can obtain energy from the trees when they perform photosynthesis.

## Conclusion:

Hopefully this experiment will interest others in testing out our primer theory. Are rbcL and ITS primers adequate enough for lichen? Other researchers found that lichen is indeed difficult and complicated to barcode. They found that lichen provided many problems for sequencing and analysis. Although we did not receive any results from our DNA extraction of the thirteen samples, we have found some reasons why this occurred.. We might have made errors during the DNA extraction portion of the protocol. Specifically not being able to grind lichen well and our pipetting techniques. This might have been a disadvantage on our part due to the lack of research, we do not know if using both ITS and rbcL for the lichen was appropriate.

## Citations:

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## Gel Electrophoresis:

