



A Comparison of Lichen Biodiversity between Glen Cove High School and Garvies Point Preserve



Sabrina Backiel, Leila Cullen, Lily Duche, Natalia Piasta
Mentor: Kerry Bunyan

Glen Cove High School

Abstract

A lichen is a life form that is made up of a species of fungus and algae. Lichen are commonly found on trees, rocks, and soil. In our research project, we are looking to compare the biodiversity of lichen between Glen Cove High School campus and Garvies Point Preserve. We will be collecting lichen from trees and rocks around Glen Cove High School campus and Garvies Point Preserve. Based on our research, we hypothesize that we will find more diverse species of lichen in Garvies Point Preserve because it's closer to a body of water and has more diverse plant life. (U.S Forest Service)

Introduction

A bioindicator is a living organism that can indicate the health of an ecosystem. For our project we will be focusing on lichen and how they are a bioindicator of air quality and environmental pollution. Lichen are organisms made up of fungi and algae. Lichen can grow on trees, rocks, soil, and are a bioindicator of air quality and pollution. Lichens are also a bioindicator of ecological continuity or the long term presence of a specific environment. They are able to gain nutrients such as oxygen, hydrogen, and nitrogen, which are necessary for their survival directly from the air, meaning that a rapid change in air quality due to climate change can greatly increase or decrease the population of a lichen species. In this project we are comparing the biodiversity of lichen growing around Glen Cove campus to lichen growing in Garvies point nature preserve. In order to do this we will be collecting 10 lichen samples from Glen Cove High School campus and ten lichen samples from Garvies Point preserve. We predict that we will find more diverse lichen in Garvies point because there is a higher variety of plants and more moisture because it is near a body of water. The plant life by Glen Cove High School isn't as varied, therefore trees at Glen Cove may not be able to host a wide variety of lichen species.

Materials & Methods

- collecting 10 samples from the Glen Cove High School campus
- 10 samples from Garvies Point Preserve
- first spray the lichen with water using a spray bottle
- use paint scrapers to extract the lichen and place them in separate ziploc bags
- brought back to the lab, they will be cut into smaller pieces
- stored in microtubes, and kept in the freezer until DNA barcoding

Results

CWR-001/CWR-009/CWR-012 *Physcia Stellaris*, Rosette Lichen, 0 mismatches
CWR-002 *Stereum Lobatum*, False Turkey-Tail, 1 mismatch
CWR-003 *Aspicilia Cuprea*, Sunken Disk, 30 mismatches
CWR-004 *Proliferadiscus*, Spooner Sacc, 1 mismatch
CWR-008 *Phaeophyscia Rubropulchra*, Orange-Cored Shadow Lichen, 1 mismatch
CWR-010/CWR-015/CWR-017/CWR-020 *Punctelia Rudecta*, Speckleback Lichen, 0 mismatches
CWR-014 *Myelochiza irriguans*, Axil-Bristle, 5 mismatches



Discussion

We collected 20 samples in total, 10 of the samples were collected from the Glen Cove High School campus and the other 10 were collected at the Garvies Point Preserve. At Cold Spring Harbor Labs the 20 samples underwent DNA extraction only 14 were successful. There were 4 samples of *Punctelia Rudecta*, or Speckleback Lichen. Speckleback Lichen most commonly grow on bark and are sensitive to air pollution. There was one sample of *Myelochiza irriguans*, or Axil-Bristle lichen. They are also located on bark and are air pollution sensitive. The next lichen we found was Proliferodiscus which is a genus of fungi in the Hyaloscyphaceae family, and also commonly called Spooner Sacc. There was one sample of *Phaeophyscia Rubropulchra* which is most commonly found throughout Eastern North America, found on bark, rocks or over moss in shaded forests. We found 3 samples of *Physcia Stellaris* which is commonly known as Rosette lichen. Rosette lichen is a common lichen found on the trunks of trees, this indicates that rosette lichen needs more water than other lichen. One of the samples we found is *Stereum Lobatum* also known as False Turkey-Tail this sample was not a lichen but instead a type of mushroom. Another sample we collected known as *Aspicilia Cuprea* most commonly known as Sunken Disk lichen is most commonly found on rocks and is very. Sunken Disk is very sensitive to air pollution, therefore its presence shows positive air conditions. The lichen at Glen Cove High School were more diverse than the samples found at Garvies Point Preserve.

References

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