Insect Biodiversity in a Rewilded Garden

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Abstract

Succession is the change in species in an ecosystem over a period of time. Secondary succession occurs when an ecosystem has been disturbed by a certain event. We aim to find the impact of secondary succession on insects, and biodiversity of a rewilded garden. The study plots were located in previous school gardens along the south shore of Long Island. They have not been disturbed since the garden was left fallow June 2015. Different species can appear because of the changes occurring over time within different ecosystems. We compared the diversity of life. The rewilded garden area, site #4 was most diverse.

Introduction

- A rewilded garden has gone through secondary succession and is in effect, becoming ecologically restored.
- Insect biodiversity is important for ecological restoration of ecosystems by building links into food chains, nutrient cycling, and improving productivity.
- The objective of this project is to investigate how diverse a rewilded garden is, as well as what organisms are found there.
- Our hypothesis is that there will be more diversity in the rewilded garden that has undergone some secondary succession.
- Our null hypothesis states that there will be no difference any of the four locations.

Materials & Methods

- Insects were collected in the rewilded garden are and the area not effected by secondary succession by using four coffee cans as kill jars, letting the insects fall inside.
- Pictures were taken of the insects collected and identification was attempted
- Used Simpsons index to calculate the diversity. $D=N(N-1)/\Sigma n(n-1)$
- Insects that could not be identified were barcoded to try to identify them.
- Using the DNA subway, we used BLAST to compare barcode sequences to a known database.

Results

- There were too few specimens to calculate a Simpson's Index for site #1 and site #2.
- Site #3 has an index of 0.06 and site #4 had an index of 0.25.
- Our original hypothesis was supported.
- There was a higher diversity in the rewilded garden areas.
- This shows that because of succession, diversity of insects increases and also shows that areas can change over time.

DNA BLASTN Sequences (Trimmed)

- **NTS-111**

TTTGTTTCCGGANAATTCTTATTGGTGGATTTGGAAATTGATTAGTTCCTTTAATATT

- **NTS-112**

AAAGAATGAAGTATTAATATTACGGTCTGTTAATAACATTGTGATAGCTCCTGCTAGA

- **NTS-114**

GGAGGTNCCGGACTTGAATTAAGTTCCTGTGGTTCNTNAATTAATGACGACCAAGTATA

- **NTS-115**

GNTGTTTCCTGAATTAGAACTTTCTTACCCGGGGAGTTTAATCGGCGACGACCAAATCTA

- **NTS-902**

AAGGAGCGCAAGGTGAGTTCAAAGAATCAATGATTCACTGAATTCTGCANTTCACATTAC

Discussion

- We found higher diversity in the fpurth site which was the grassy area, and found *Sitona hispidulus*, known as the clover weevil, in site #4 as well.
- There is a biologically rich source of colonizing insects from local suburban habitat on a barrier island.
- The trap collected solely ground-dwelling organisms.
- The grass area may have had a higher diversity due to the fact that taller grasses in the rewilded garden may have contained organisms in the grass itself since the habitat is more suited to insects that inhabit niches in the plants themselves and the plants provide the habitat for flying insects.

References

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Organism	Collected	Barcoded	Successful Barcodes
Brachyiulus bagnalli	2	1	1
Pardosa milvina	7	2	1
Tetramorium caespitum	2	1	1
Geocoris bullatus	4	2	1
Sitona hispidulus	6	3	1
Unknown	18	4	

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