



Insect Biodiversity

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Funded by the
Thompson Family
Foundation

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Abstract

This study was conducted to figure out if there was a difference in biodiversity of insects between Queens and Brooklyn parks. This was done by extracting the DNA from the insects and bugs and then scanning them for DNA. If there are more insects and bugs that have different characteristics in Queens then there will be more biodiversity than Brooklyn. The significance of the study is to figure out if there are any dangerous species in Queens or Brooklyn so that it can be fixed and there won't be any people getting poisoned from these bugs. The materials that were used in this study were ziploc bags, DNA sequencing machine, centrifuge, pliers, gloves, GPS or mapping tools, and a camera. Our results that this study has produced are we got seven of the twenty four samples of DNA.

Introduction

Biodiversity is the variety of life on Earth (What Is Biodiversity?, n.d.). There are many species that are diverse from one another. Think about how polar bears and regular bears are different. The environment of these animals changes and shapes their characteristics or features. But what does biodiversity have to do with bugs? Well these diversities are important to bugs because they all have different for similar features to other bugs. The insects have a body that is divided into 3 parts (head→thorax→abdomen) (How to Make an Awesome Insect Collection | Purdue | Entomology | Insect | Collect | Supplies | Specimen | Mounting | Identifying | Displaying | Preserve | Labels, n.d.). Using these body parts will help us determine if the insects are different or not. DNA barcoding is the major key element that will be used in our research. It is a method of species identification using a short section of DNA from specific gene or genes (Wikipedia contributors, 2023).

Determining the DNA barcode of these bugs and figuring out if they are different in separate regions is the research that will be carried out. This research will be conducted in a lab and will require special machines to complete. These bugs are found in Brooklyn and Queens this is where the collecting of samples for this test will occur. This will pinpoint where we got the bugs at the exact latitude and longitude with an app. There may be some species of bug that is different from Brooklyn compared to Queens that have different DNA sequences. This information will be used to determine if the two environments are similar or different. Biodiversity, ecosystem, habitat, environmental factors are all the main science concepts that we will use for this project. Being able to differentiate the different species of insects in order to find the roles of the insects. Dna is a molecule that carries genetic information that develops an organism (Bates 2023). This is the information that will be gathered and compared between Brooklyn and Queens to see how the different bugs and insects DNA are different to see how biodiversity affects insects.

Materials

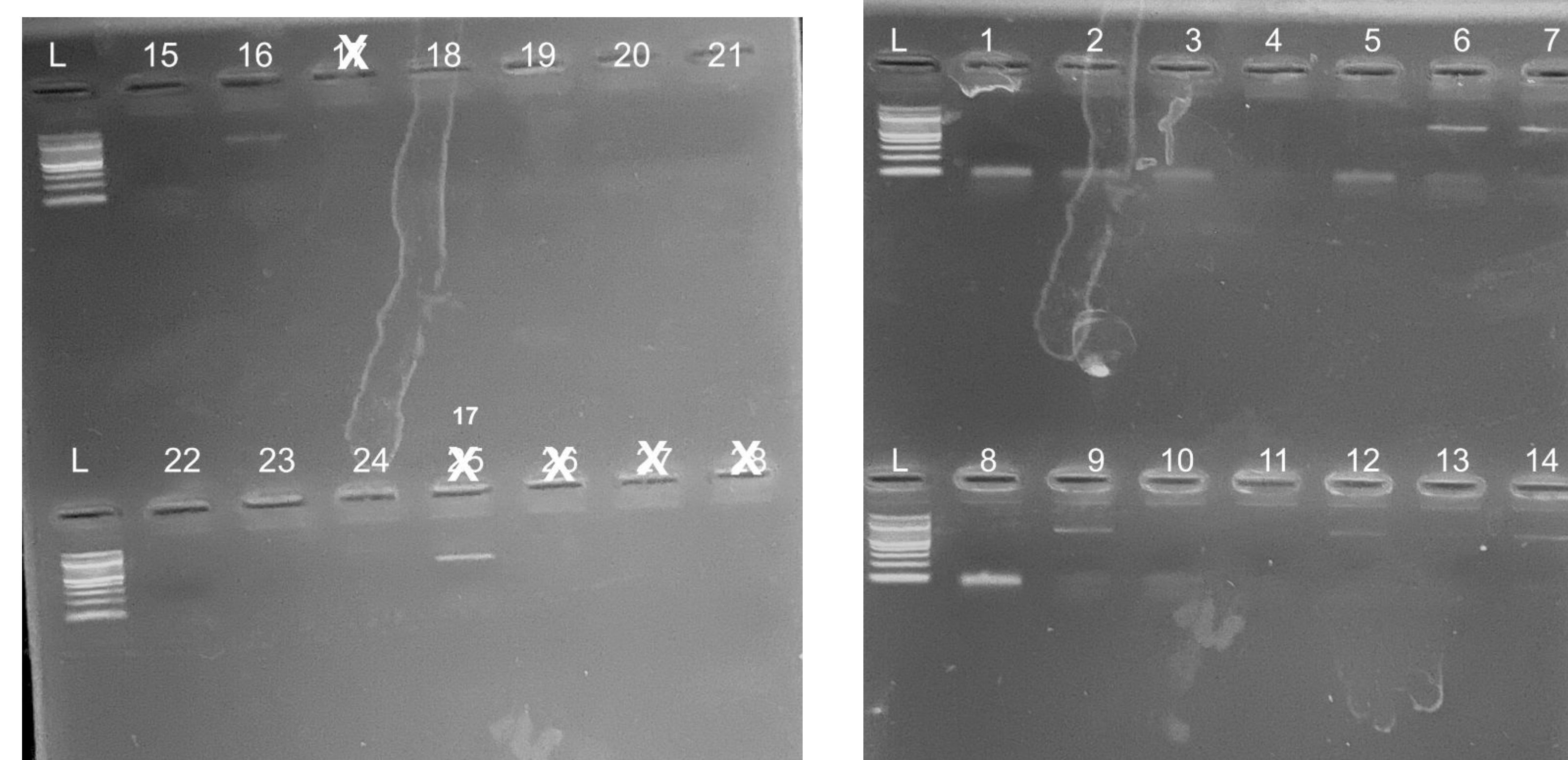
- The materials that will be used are pliers, gloves, and insect collection containers, GPS or mapping tools, camera, identification guide/books.

Results

In total 20 insect samples were collected, but of those 20, only 7 samples were identified through DNA extraction.

Sample #	Species of Bug from Queens, Astoria	Species of Bug from Brooklyn
6		Chrysoperla rufilabris
7		Miridae
9		Mecinus pyraster
12		Adalia bipunctata
14		Adalia bipunctata
16		Adalia bipunctata
17	German cockroach	

Tables & Figures



In these BLASTs 7 DNA samples were collected. In order to identify each sample we had to look at the sample name and its sequencing data using a site called DNA subway. In this site it will show you all of the samples where DNA was identified. You just click on the sequencing data for the sample you are looking for and it will show you what species this sample belongs to. In order to find the most effective species, you have to click on the sequencing with the least amount of mismatches because the more mismatches it has, it indicates that they have no record of that species.

Discussion

In the BLASTINGs several columns were with some smudge, this smudge indicated DNA sequencing found in the samples. Notice that not all samples were smudged. This shows that not all samples were identified through DNA sequencing. Our objective of study was to figure out if there are dangers species in Queens and/ or Brooklyn. Once the sample is identified, we can then figure out if they are a dangerous species or not, and where they reside.

References

- [DNA barcoding 101 \(2023\). Using DNA Barcodes to Identify and Classify Living Things](#)
- [Deoxyribonucleic Acid DNA \(2023\).](#)
- [What is biodiversity? \(n.d.\). Smithsonian National Museum of Natural History.](#)
- [How to Make an Awesome Insect Collection | Purdue | entomology | insect | collect | supplies | specimen | mounting | identifying | displaying | preserve | labels. \(n.d.\). Here's how insects help keep ecosystems in balance. \(n.d.\). World Wildlife Fund.](#)
- [What are Independent and Dependent Variables?-NCES Kids' Zone. \(n.d.\).](#)
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Acknowledgements