

Using DNA Barcoding to Investigate the Biodiversity of Butterfly Species

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Abstract

This project will expand on the limited knowledge of the biodiversity of butterfly species. The butterfly species being analyzed look similar because they live in isolation and adapt to similar habitats. We will be trying to identify several different types of butterflies and hope to create a DNA database for these unknown species by using DNA barcoding, which is a method of specimen identification using short, standardized segments of DNA. We also hope to help find a habitat for these species since their biodiversity is decreasing due to habitat loss and destruction. The purpose of this project is to continue constant measure of the biodiversity of these species since we rely on and we hope to help protect and continue the biodiversity. We expect to see and identify multiple species using the DNA barcoding system and even hope to discover new species in the process.

Introduction

The project we are working on is the discovery and organizing of biodiversity in butterfly species. In this project, we will be using DNA barcoding which is the use of short, standardised genetic material specific regions that help us identify and discover species. We use the barcoding to create a database of our species so we can identify unknown species. Our Research is to provide an answer to why there is limited knowledge on the biodiversity of butterflies and we suspect that the biodiversity is decreasing, hence there being less knowledge on it. Our interest in this project is to provide more knowledge on butterfly biodiversity and to create a DNA database for every butterfly species we can find. Our project is a public interest or should be because we rely on biodiversity to survive. Without it, we wouldn't have as fortunate life as we do with things such as food, clean water, medicine, etc.

Materials and Methods

Samples were collected from long island aquarium and stored in a freezer prior to processing.

Took pictures of organisms and prepared for DNA extraction.

Extracted small tissue samples from organisms.

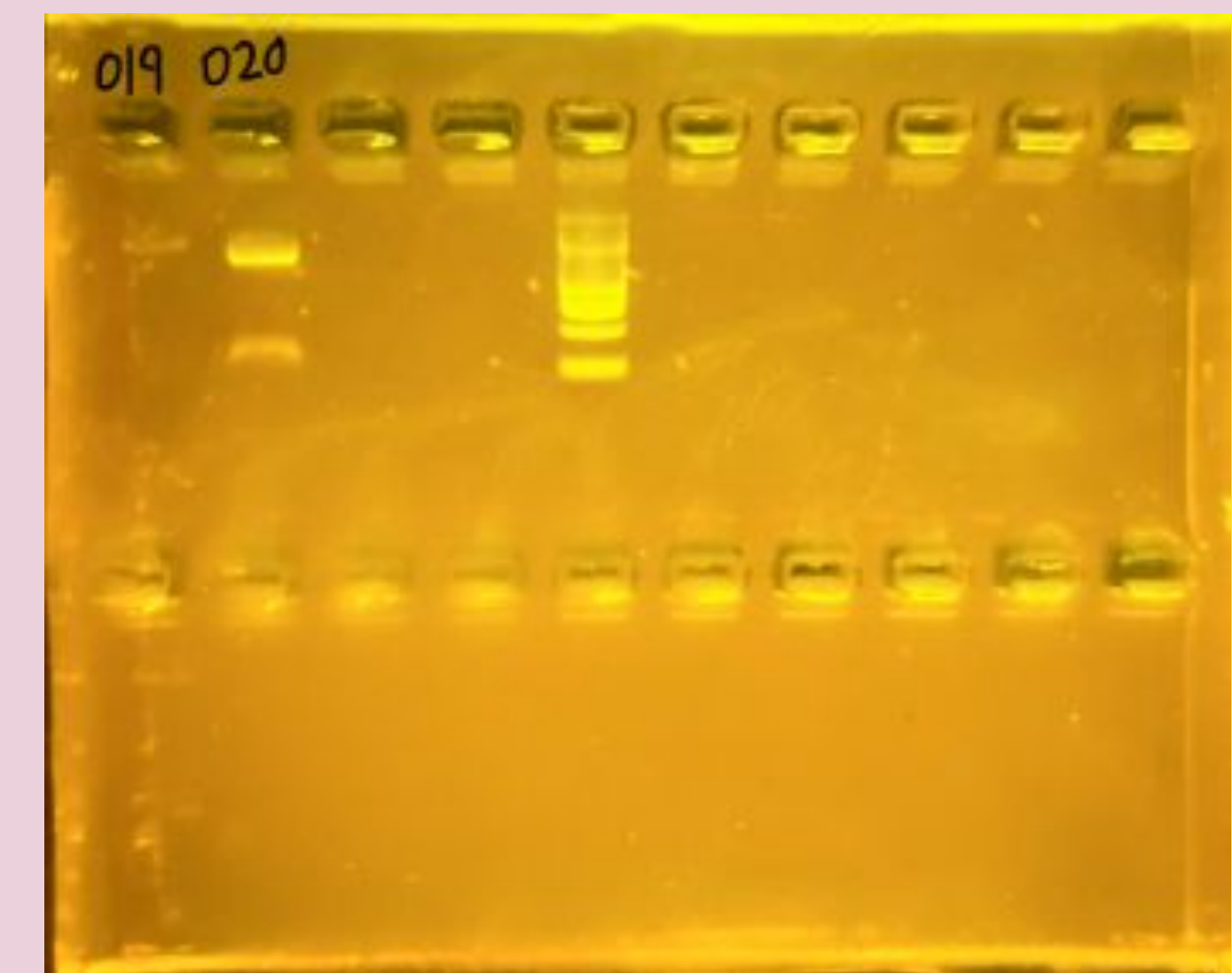
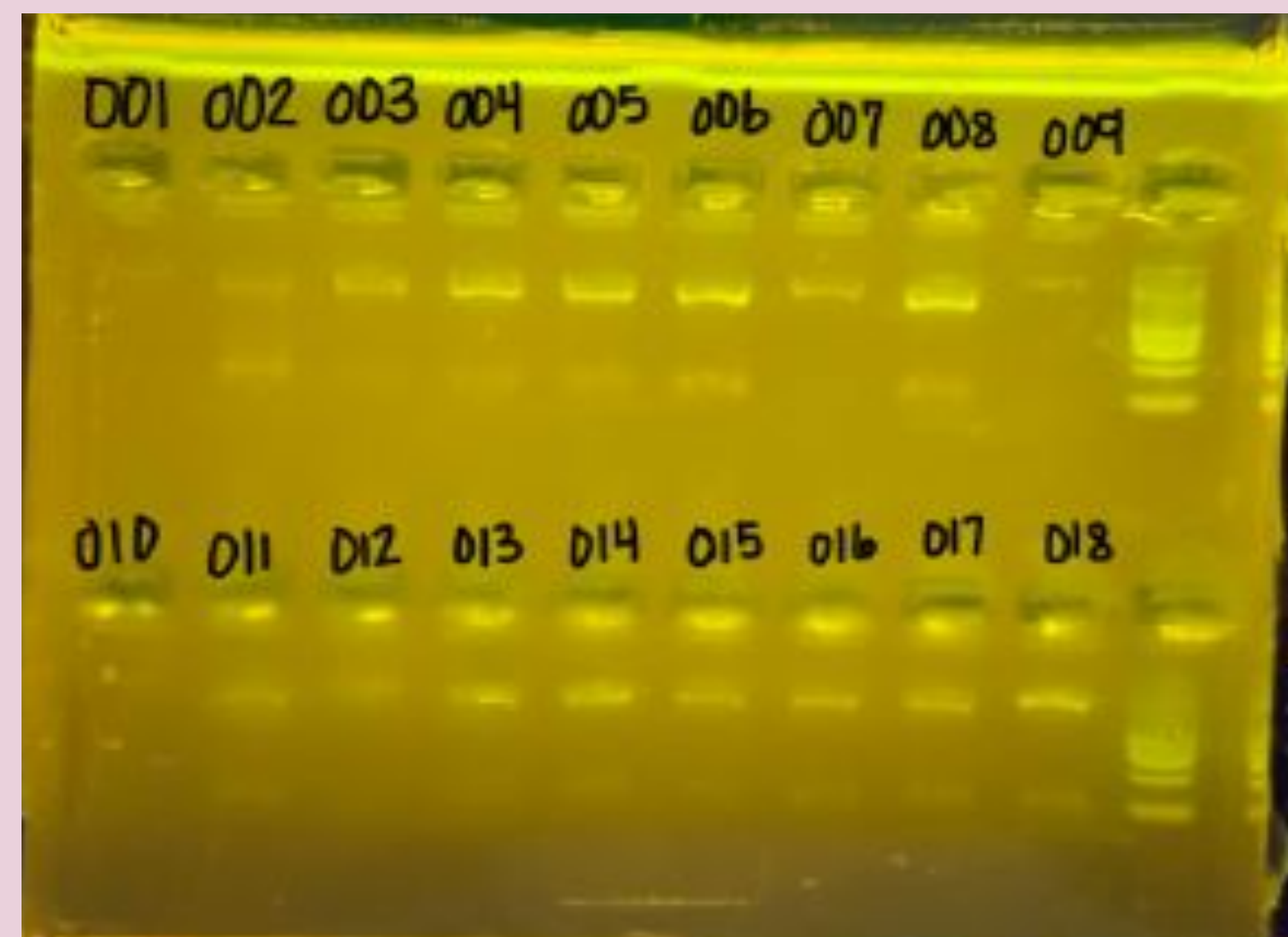
Analyzed and compared the DNA barcodes on DNA Subway with the tissues.

Samples were sent to DNA lab for DNA Barcoding.

Examined the DNA ourselves and did gel electrophoresis.

Results

This project is currently awaiting DNA Barcoding results. It is anticipated that results will show a great biodiversity of butterfly species in the sample set.



DJA-001



DJA-013



DJA-020

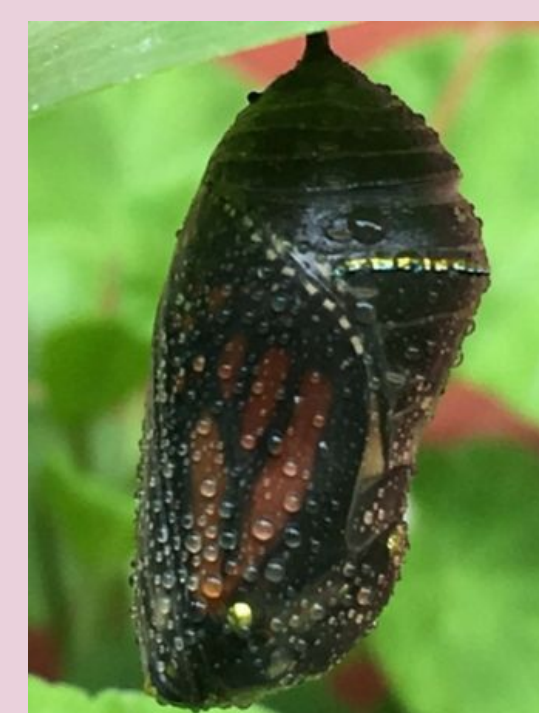


Photo is from <https://thebutterflymusketeers.com/2018/02/21/the-butterfly-musketeers-chrysalides-information/>



Photo is from <https://www.wildlifewatch.org.uk/what-happens-inside-chrysalis>

Discussion

As we can see in our gel electrophoresis photo, the PCR worked and DNA was successfully amplified. We are currently awaiting our finalizing of the DNA barcodes which will be used to confirm or reject our hypothesis. It is anticipated that the DNA barcoding results will show a great biodiversity of butterflies collected at the Riverhead Auqarium.

Future Directions

We hope to continue this project once we receive our DNA and hope to discover new species. The future of this project is discovering and establishing more species DNA to make things easier to idetify. If others would like to continue this project, they may have a bigger sample size and attempt to collect from a different area than where we received our samples from to give a better chance of identify and classifying more species of butterflies.

References



Acknowledgements

Thank you to the DNA Learning Center Staff for support with proposals, providing laboratory equipment, and supporting sequence analysis.

Sample #	Scientific Name	Common Name	Sample #	Scientific Name	Common Name
DJA-001	<i>Hamadryas leodamia</i>	Starry night cracker	DJA-011	<i>Siproeta stelenes</i>	Neotropical brush-footed butterfly
DJA-002	<i>Hamadryas leodamia</i>	Starry night cracker	DJA-012	<i>Siproeta stelenes</i>	Neotropical brush-footed butterfly
DJA-003	<i>Hamadryas leodamia</i>	Starry night cracker	DJA-013	<i>Siproeta stelenes</i>	Neotropical brush-footed butterfly
DJA-004	<i>Hamadryas leodamia</i>	Starry night cracker	DJA-014	<i>Siproeta stelenes</i>	Neotropical brush-footed butterfly
DJA-005	<i>Hamadryas leodamia</i>	Starry night cracker	DJA-015	<i>Siproeta stelenes</i>	Neotropical brush-footed butterfly
DJA-006	<i>Starry night cracker</i>	Starry night cracker	DJA-016	<i>Siproeta stelenes</i>	Neotropical brush-footed butterfly
DJA-007	<i>Starry night cracker</i>	Starry night cracker	DJA-017	<i>Siproeta stelenes</i>	Neotropical brush-footed butterfly
DJA-008	<i>Starry night cracker</i>	Starry night cracker	DJA-018	<i>Dryas iulia</i>	Julia butterfly
DJA-009	<i>Starry night cracker</i>	Starry night cracker	DJA-019	<i>Dryas iulia</i>	Julia butterfly
DJA-010	<i>Hamadryas leodamia</i>	Starry night cracker	DJA-020	<i>Dryas iulia</i>	Julia butterfly