

A Survey of the Order Lepidoptera on the Island of Dominica

Stephen Powell
Texas A&M University
Dr. Tom Lacher
Dr. Jim Woolley
Dominica Study Abroad 2008

A Survey of the Order Lepidoptera on the Island of Dominica

Abstract

I collected 47 different specimens with 44 different species altogether, 12 species of moths are not in the catalog for the Moths of Dominica, and 1 butterfly was a rare hairstreak. I used an aerial net to catch the butterflies, and a mercury vapor light sheet as well as just fluorescent lights on the veranda to collect the moths. I pinned and dried the specimens and then took them back to Texas A&M University to identify them and add them to the insect collection.

Introduction

Dominica is one of the few Caribbean islands that is virtually untouched by human influence. It is said that if Columbus were alive today, this would be the only island he would recognize. The tropical biodiversity here is just astounding, especially in the Lepidoptera, however, not much information is known about the Lepidoptera of this tropical island. There are around 160,000 described species worldwide, and estimates are that there are around 500,000 total species with 340,000 just waiting to be discovered. This project was an attempt to take an overall survey of the Lepidoptera of the island, and to just get a rough estimate of the diversity of species on the island.

Materials and Methods

The first step in making the Lepidoptera collection was catching the specimens. I collected on 11 days which were the 22nd, 24th, 25th, 26th, 27th, 28th, 29th, and 30th of May and the 2nd, 3rd, and 4th day of June. The butterflies were caught using a 15'' aerial insect net, and a sweeping motion was performed to ensure the capturing of the specimen. After the butterfly was caught in the net, one hand was used to hold the net shut while a killing jar was being obtained. This action was

done very quickly to prevent as much wing scale damage as possible. A BioQuip killing jar with a plaster wick was utilized to temporarily store the specimens until they could be pinned and dried. Ethyl acetate was the killing agent of choice because of its ability to kill the insects fast with a suffocating vapor. Several drops were placed on the wick, and then the lid was screwed on tight to prevent the loss of the vapor. I kept a 2 oz bottle filled with the killing agent at all times to make sure that I would not run out of the solution. The jar was slid into the net bit by bit and opened so that the specimen would fly into the killing jar and have no chance of escape. The lid was then carefully and quickly slid into the net and placed on top of the jar after the butterfly was inserted inside. While most were caught at the station, several were caught at Cabrits National Park, the Middleham Falls trail near Cochrane, and Batalie Beach. The moths were caught using a mercury vapor light sheet trap method. The sheet was tied up rope on the top and plastic clothespins were used to fasten the sheet to the rope. The light was then hung over the top of the sheet in such a way that the light wouldn't touch the sheet for extended periods of time. This was necessary because the bulb got very hot and I didn't want to burn the sheet. On windy nights, the bottom of the sheet was tied as well using the same rope as the top one. During every night but one, the light sheet was set up between two pillars on the veranda facing the Massacre trail. On the other night the trap was set up between a palm tree and the wall of the garden facing the same direction as the previous nights. A net was not used to capture the moths, but a simple scooping action using the jar was sufficient. The moth was scooped from below, and each moth would just fall in disoriented. The lid was then shut rapidly before the moth decided to take flight. The same killing agent and jars were used to kill the moths from the sheet. When a light sheet wasn't set up, many moths readily came to the fluorescent lights on the veranda and were captured there using the same scooping method as the sheet. The specimens

were then stored in the jars until they were pinned and spread. Pinning and spreading was a very tedious process, and it was probably the most difficult part of the project. Both a Styrofoam and three wooden adjustable spreading boards were used when preparing the specimens. Size 3 pins were used to pin larger specimens through the middle of the thorax, and size 2 pins were used to pin smaller specimens and to pin the wings in place of all the Lepidopterans. The moth or butterfly was first pinned through the center of the thorax onto the pinning board in the correct sized groove which was determined by the size of the abdomen. A pin was then used to align each of the forewings at a 90 degree angle relative to the body. The hindwings were then brought up next to and partly under the forewings and another pin was used to secure each wing in place. Strips of paper were used to prevent actually having to pin the wings themselves, and they were also used to stop the curling of the wings that happens often when they start drying. If the antennae were uneven they were pinned as well. Later during the drying process, the spreading boards were placed in plastic Ziploc bags and provisioned with mothballs to keep ants and other insects from eating the specimens. The moths were allowed no less than three days to dry, and some of the larger moths took up to five days to dry. After completing the drying process, each pin holding the wings was carefully removed to prevent scale loss, and the insects were then placed in Schmidt boxes for storage. Mothballs were also placed in these boxes as well because I didn't want to take any chances. The butterflies were identified using a Dominican insect book, and the moths were then identified using the Moths of the French Antilles website(<http://www.inra.fr/papillon/indexeng.htm>), the Moths of Dominica website(http://dominica.tamu.edu/moths%20of%20Dominica/Start_Here.html), and a book on the moths of Eastern North America(Covell 1984). Each moth and butterfly was then photographed individually on a white poster board background by Dr. James Woolley using a

Nikon D1X camera. The photos were cropped in Photoshop CS3 and then put on a CD for me to use. Labels were made for each specimen telling the date, locality, geographic coordinates, and trapping method.

Results

<u>Arctiidae</u>
Halysidota squalida
Heilura excavata
Pachydota albiceps
*Unknown brown one
Syntomeida syntomoides
Hyalurga vinosa
Cosmosoma demantria

<u>Noctuidae</u>
*Unidentified
*Unknown moth
*Unknown moth
*Unident. moth
*Unident. moth(leaf-like)
Eulepidotis superior
*Unknown species
*Unknown species
*Unknown species
*Unknown species

<u>Geometridae</u>
*Yellow moth unident.
*Yellow moth unident.
*Yellow moth unident.
Ascalapha odorata
*Unknown species
Nepheloeuca complicata
Oxydia sp. maybe vesulia
Epimecis detexta leduchatae

<u>Pyralidae</u>
Terastia meticulosalis

<u>Lycaenidae</u>
Hemiargus hanno
Leptotes cassius
*Allosmaitia coelebs?

<u>Sphingidae</u>
Pseudosphinx tetrio
Eumorpha vitis
Eumorpha obliqua
Manduca sexta
Protambulyx strigilis
Pachylia ficus
Enyo lugubris

<u>Pieridae</u>
Ascia monuste
Phoebis sennae

<u>Nymphalidae</u>
Junonia evarete
Agraulis vanillae
Anartia jatrophae

<u>Hesperiidae</u>
Urbanus proteus

Pyrgus oileus

Overall species

Moths

Arctiidae: 7

Geometridae: 8

Noctuidae: 10

Pyralidae: 1

Sphingidae: 7

Butterflies

Nymphalidae: 3

Lycaenidae: 3

Pieridae: 2

Hesperiidae: 2



Halysidota squalida



Heilura excavata



Unidentified Noctuid



Unidentified Geometrid



Unidentified Geometrid



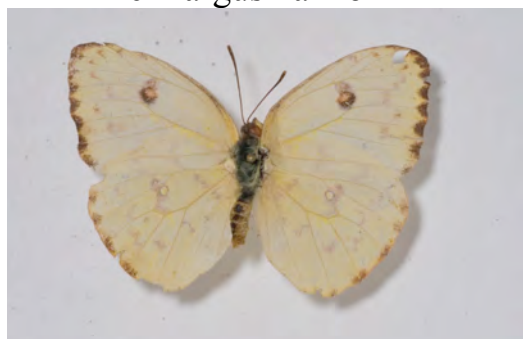
Unidentified Geometrid



Hemiargus hanno



Leptotes cassius



Pheobis sennae



Pseudosphinx tetrio



Unidentified Noctuid



Unidentified Noctuid



Eumorpha vitis



Eumorpha obliqua



Manduca sexta



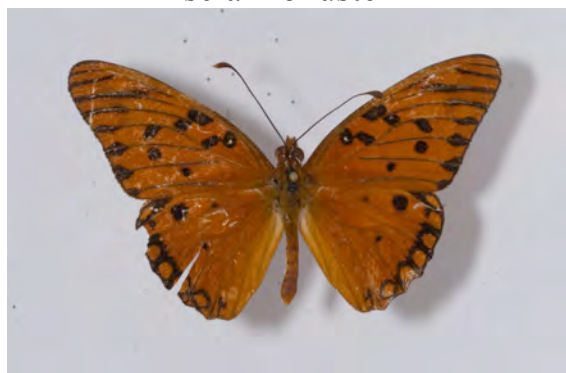
Allosmaitia coelebs?



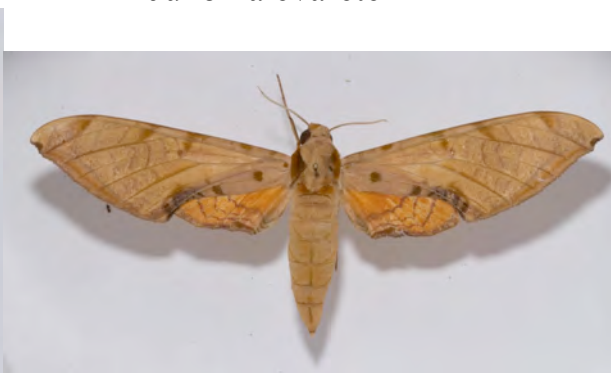
Ascia monuste



Junonia evarete



Agraulis vanillae



Protambulyx strigilis



Ascalapha odorata



Terastia meticulosalis



Unidentified Noctuid



Unidentified Noctuid(leaf-like)



Pachylia ficus



Pachydota albiceps



Urbanus proteus



Pyrgus oileus



Anartus jatrophae



Unidentified Arctiid



Syntomeida syntomoides



Lauron vinosa



Unidentified Geometrid



Nepheloeuca complicata



Cosmosoma demantria



Oxydia sp. maybe *vesulia*

Discussion

Several observations were made during the course of the project. I noticed that there were some butterflies that were widespread in all habitats over the island such as the Pierids, while some were much more scarce and only lived in certain areas of the island. All of the butterflies were caught in an area with sunlight, so none were observed flying very deep into thick rainforest or dry forest. Many butterflies were seen utilizing the ornamental flowers in yards to obtain an easy nectar source. There was not enough time to look at nectar feeding associations, but Lantana was one that a large variety of species were feeding on. Many more butterflies were seen than caught because of either not having a net available at the time or from being unable to catch the faster species. Many of the smaller species such as the Lycaenids were very hard to pin without tearing up the wings. Even while being ever so careful, some of the specimen's wings did tear but were nevertheless used for the project. The moths were much easier to catch because of the night conditions and were much less cantankerous when attempting to collect them. They did flop around in the jars more frequently though. Many of the problems encountered with pinning the tiny butterflies were also experienced when spreading the smaller moths. Also, because the smallest size pins available were size two pins instead of size one, the process was even more time consuming. Nine species caught on the 4th of May were unable to be photographed due to it taking too long for them to dry out. These specimens would be taken back to the U.S. at a later date, though I still used them in the project data because I already identified the ones I could and documented and made labels for them. Another problems encountered was getting the butterfly in the jar from the net without letting it escape. Some of the butterflies would find just the tiniest hole and somehow squeeze through unknowingly until it was too late. Several potential specimens were lost because of this. Other factors such as weather prevented me from collecting

as much as I could have. The wet season also didn't start until about a week after arrival, which is when most of the diversity blossomed. Most of the butterflies were active in the morning, so if I collected in the afternoon there were not as many observed species. Many of the Sphingids also didn't start coming to the light until about midnight to two in the morning, so on days that I went to bed early, potential Sphingid specimens could have been missed. Another interesting thing I observed with the moths is that the next morning after coming to the lights, there would be no more moths resting on the veranda. Back home in the U.S., there were always moths on the wall by the porch light during the next morning. This could be an adapted defense mechanism to prevent birds from eating them in the morning, especially the Brown Trembler which eats every moth it sees and the Gray Kingbird which snatches any flying insects right out of the air. Further study could be done on this area to determine if this is indeed what is going on.

Works Cited

Covell, Charles V., Jr. *A Field Guide to the Moths of Eastern North America*. Boston, Houghton Mifflin Company: 1984.

Stiling, Peter D. 1986. *Butterflies and Other Insects of the Eastern Caribbean*. pp. 51-79

Zagatti, Pierre, Bernard Lalanne-Cassou, and Jeanne le Duchat d'Aubigny. *Catalog of the Lepidoptera of the French Antilles*. Sept. 1985. <http://www.inra.fr/papillon/indexeng.htm>

Woolley, Jim, and Jen Morrison. *Moths of Dominica*. 2002. http://dominica.tamu.edu/moths%20of%20Dominica/Start_Here.html

Acknowledgements

Special thanks goes to Dr. Jim Woolley for his excellent photography and patience while doing it as well as his help in identifying the families of some of the unknown moths. Without his photos and assistance, I wouldn't even have a feasible project.

