Exhibit of Dominican Moths Found at Springfield Plantation

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Abstract

I collected 84 moths of 66 different species of Lepidoptera, specifically moths. I used a light and sheet trap to collect the specimens. I pinned the specimens, dried them, and created an exhibit for the Dominican Division of Forestry and Wildlife.

Introduction

Archbold Tropical Research Center, located on Springfield Plantation, Dominica, is one of the few remaining places where scientists can research the activities that occur in untouched habitats, such as primary rainforest. Insects are the most diverse group of organisms on the planet, so it should not come as a surprise that moths are incredibly diverse around Springfield Plantation. Little is known about the moths of this area. The Dominican Division of Forestry and Wildlife asks scientists to present them with any findings and materials to use as educational tools for adults as well as children. For some time now, this division has asked Texas A&M Study Abroad students for new specimens due to the rapid deterioration of specimens in older collections. With this in mind, I chose to make a permanent exhibit of moths.

Materials and Methods

Collecting and drying the specimens was the first step in creating an exhibit. I collected the moths using a sheet and light system in which I tied a sheet from two rafters on the balcony, securing it with clothes pins, and hung two lights in front of the sheet. I used a mercury vapor light as the main light source and an additional black light. By using both lights, I was able to bring in more moths than when using either light by itself, since some moths will respond more to one than the other. The sheet trap was set up in three

areas. The first area was on the balcony above the veranda facing west. After five days, I moved the trap to the balcony above the veranda facing north. The next day, I moved the sheet trap to the Bee House, which is Northeast of the Springfield Plantation. There were not many specimens in that area, so I moved the trap back to the second site. The trap stayed at the second site for seven days. In addition to these sites, some of the students gathered specimens at the Stream House dormitory. I collected the specimens by carefully placing each moth in a killing jar saturated with ethyl acetate. In the killing jar, I placed Kim Wipe tissues to prevent the moths from damaging themselves. The moths were left in the jars overnight or over a day. The moths were then pinned on a styrofoam insect pinning board to dry. Pinning the moths was an intricate procedure. I used two sizes of insect pins. I used size 3 pins for the permanent pin through the middle of the thorax. I used size 2 pins to hold the wings and body in place. First, I pushed a size 3 pin though the center of the thorax. The pin was centered from all angles. The moth was then placed in the correct size grove on the drying board. The body of the moth had to be inserted into the grove deep enough to let the wings lay flat when they are spread. The body is held in place with two pins, one on either side of the abdomen. Then, I took one pin and spread the forewing till the bottom most edge of the wing was perpendicular to the body. The lower hind wing was placed so that the top most vein was perpendicular to the body as well. I repeated the process on the other side of the moth. The wings were held in place by strips of paper, wide enough to cover the majority of the wing, which were pinned down across both the fore and hind wing. If the antennae needed to be held in place, they were pinned as well. The moths were stored in the herbarium to prevent insect destruction and to allow the specimens to dry.

The next step in forming the exhibit is to identify the specimens. I had limited resources in identifying the moths. The only book I had was on the moths of Eastern North America, so instead of trying to identify all the specimens down to the species, Dr. Woolley and I separated the moths into families. We took close-up pictures of each specimen on a traditional 18% photographic gray card with color slide film and a macro lens providing up to 1:1 magnification. The larger moths were photographed on a lighter gray background due to complications with the size of the moths and the camera set up. We will send the photographs to a Lepidopterist to be identified. A key will be typed and sent to the Division of Forestry and Wildlife. During the process of photographing, I assigned the specimens exhibit numbers.

Placing the specimens in the display case was the final step. I separated the moths into three 45 cm x 60 cm glass front display cases. In one case, I placed all the Sphingidae moths. In another display case, I placed all the Noctuidae moths, and in the last case, I placed all the rest of the specimens. I organized the moths in a way to create a pleasant visual appearance. For the lighter colored moths, I attached thick, colored art paper beneath the specimens. I printed the assigned numbers out on the computer, and pinned the numbers to the foam that was in the bottom of the cases. I used pins to secure a mothball in each corner to keep out hungry insects. I used a removable sealant to secure the lid of the display case to the rest of the frame.

Species of Lepidoptera*****UPDATE********

15 Sphingidae (Sphinx or Hawk Moths)

10 Pyralidae (Pyralid Moths)

10 Geometridae (Inchworm or Geometer Moths)

9 Arctiidae (Tiger, Lichen, Wasp Moths)

31 Noctuidae (Owlet or Noctuid Moths)

1 Yponomeutidae (Ermine Moths)

3 unknown

5 possible Cossidae (Carpenterworm and Leopard Moths)

Discussion

During the course of the assignment, I overcame some problems. The first major concern that I had was that the specimens were not going to dry in time to finish the exhibit. Most of the moths did dry quickly in the herbarium where I placed them for storage. A few specimens that were collected later during the trip could not be helped. Another conflict that I overcame was that I could not identify to species most of the moths I had collected due to the limited resources. With the help of Dr. Jim Woolley, I organized the moths into families and photographed each specimen for later identification back in the United States. A key for the exhibit will be sent back to the Division of Forestry and Wildlife upon completion. One issue that I found hardest to overcome was that the fragile condition of the specimens. The wings of the moths tore so easily. While pinning the specimens, the holes that the pins made were sometimes visible on different backgrounds. In addition to wings tearing, the moths sometimes were damaged in the killing jar from thrashing around. I made sure that there was enough ethyl acetate to kill the specimens quickly, so they would not damage themselves while keeping in mind that too much ethyl acetate would condense on the bottom of the killing jar and saturate the collected specimens. Another problem that I dealt with was one of gruesome reality. Apparently

one of the moths that I pinned was not completely dead, and the next day was moving its antennae. From that day on, I made sure to leave the moths in freshly saturated killing jars for 24 hours.

While collecting the specimens, I made some observations. One observation that I made was that I was flooded with moths just from collecting around Springfield Plantation. The diversity of this area alone is outstanding. Also, I collected more Sphingidae moths from the second collecting site facing the North hills. The sphinx moths were flying right into me and were easily caught. More of the smaller moths were collected at the first site facing the western valley and Caribbean Ocean. This may be connected to the different habitats that different moths are found in. In my experience, I found that using both the black light and the halogen light at the same time brought in more moths to trap than using one or the other.

References

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

Acknowledgments

I would like to thank Dr. Woolley for his patience and his help with the collection, identification, and the photography of the specimens. He has gone the extra mile to make this exhibit presentable, to say the least.

Jennifer Morrison
Dominica 2002

Appendix

Moth Photographs					
Roll	Case	Exhibit #	Exposure	Family	Description
A	1	1	1 - 3	Pyralidae	Light wings, dark markings, small
A	1	2	4 - 6	Pyralidae	Dark wings, snout, small
A	1	3	7 - 9	Pyralidae	White wings w/ black tips, small
A	1	4	10 - 12	Pyralidae	Yellow Wings w/ dark tips, small
A	1	5	13 - 15	Pyralidae	Completely white, dark line on top of wing
A	1	6	16 - 18	Pyralidae	Completely white
A	1	7	19 - 22	Geometridae	Light lime green wings, small
A	1	8	23 - 25	Geometridae	Dark patterns on wings, small
A	1	9	26 - 28	Geometridae	Yellow wings w/ distinct brown markings
A	1	10	29 - 31	Geometridae	Yellow wings w/ faded brown markings
A	1	11	32 - 34	Geometridae	Light wings, dark markings, male, medium sized
A	1	12	35 - 37	Geometridae	Light wings, small dark markings, female, medium sized
B	1	13	1 - 3	Geometridae	Tan/dark wings, dark markings
B	1	14	4 - 6	Geometridae	Dark wings, tan banding, medium->large sized
B	1	15	7 - 9	unknown	Light orange wings, small, 3 holes in the middle of fore wing
B	1	16	10 - 12	unknown	Dark orange wings, small
B	1	17	13 - 15	unknown	Light orange/pink wings, small
B	1	18	16 - 18	Arctiidae	Orange/black/clear wings w/ white tips
B	1	19	19 - 21	Arctiidae	Black/clear wings, orange body with bright blue spots on abdomen
B	1	20	22 - 24	Arctiidae?	White wings, pink and black spots on tips, pink underwings
B	1	22	25 - 27	Arctiidae	Black wings, white tips, flourescent blue body
B	2	29	28 - 30	Noctuidae	Tiny light colored wings
B	1	24	31 - 33	Yponomeutidae	Black wings, yellow/orange dots on fore wings
B	1	23	34 - 36	Arctiidae	Tiger moth, orange wings, medium->large sized
C		23*	1 - 3	Arctiidae	*Redo due to film exposure
C		19*	4 - 6	Arctiidae	*Redo due to film exposure
C		18*	7 - 9	Arctiidae	*Redo due to film exposure

C		24*	10 - 12	Yponomeutidae	*Redo due to film exposure
C		22*	13 - 16	Actiidae	*Redo due to film exposure
C		20*	17 - 19	Arctiidae?	*Redo due to film exposure
C		20**	20 - 22	Arctiidae?	** Photographs of underwings
C	2	30	23 - 25	Noctuidae	Fawn colored w/ central anterior patches on forewing
C	2	31	26 - 28	Noctuidae	Light wings, apical dark patches
C	2	32	29 - 31	Noctuidae	Light wings, medial dark streak
C	2	33	32 - 34	Noctuidae	Triangular anterior dark patches on forewing
C	2	34	35 - 37	Noctuidae	Dark wing, light band in apical 4/5
D	2	35	1 - 3	Noctuidae	Smokey wings, apical anterior dark patch
D	2	36	4 - 6	Noctuidae	Satiny white/gold hindwing, dark/gold brushstrokes on forewing
D	2	37	7 - 9	Noctuidae	Gray wings, 2 central gold spots on forewings
D	2	38	10 - 12	Noctuidae	White/gold hindwing, purple/mauve/tan/gold forewing patches
D	2	39	13 - 15	Noctuidae	Dark wings, forewings dark purple towards the body, dark outside bands
D	2	40	16 - 18	Noctuidae	Brown, dorsal tan triangles on wings, dark vertical lines
D	2	41	19 - 21	Noctuidae	Dark wings, flourescent purple patches on hindwing tips, diagonal lines away from body
D	2	42	22 - 24	Noctuidae	Oblique lines towards the body, lighter hindwings, brown forewings
D	2	43	25 - 27	Noctuidae	Oblique lines towards the posterior, fawn colored wings, lighter hindwings
D	2	44	28 - 30	Noctuidae	Dark wings, half circle design on anterior of fore wing, dark/light/dark pattern
D	2	45	31 - 33	Noctuidae	Brown forewing, lower forewing cut half circle, large yellow spots on hindwings
D	2	46	34 - 36	Noctuidae	Brown forewing, lower forewing cut half circle, small yellow spots on hindwings
E	2	47	1 - 3	Noctuidae	Fawn body, fawn/blk/gray/brown forewings, white/brown hindwings
E	2	48	4 - 6	Noctuidae	Large->medium sized, like Blk Witch, but no ovals in hindwings
E	2	49	7 - 9	Noctuidae	Black Witch
E	3	54	10 - 12	Sphingidae	Pink/gray body, blk/gray forewings, yellow/gray hindwings
E	3	55	13 - 15	Sphingidae	Brown/dark wings w/ half oval on anterior tips of the wings, white dot on posterior hindwings
E	3	56	16 - 18	Sphingidae	Gray/black wings, yellow/blk bands on abdomen
E	3	57	19 - 21	Sphingidae	Triangular markings on the thorax and wings, pink on lower hindwings, fawn stripe down abdomen
E	3	58	22 - 25	Sphingidae	Green body and forewings, blk w/ yellow spots on hind wings
E	3	59	26 - 28	Sphingidae	Brown with half oval on anterior forewing, brwn/blk diagonal bands toward tail
E		1	29*		*Redo without lens filter

E		2	30*		*Redo without lens filter
E		3	31*		*Redo without lens filter
E		4	32*		*Redo without lens filter
E		5	33*		*Redo without lens filter
E		7	34*		*Redo without lens filter
E		8	35*		*Redo without lens filter
F**		11	29*	**Middle of roll	*Redo without lens filter
F		12	30*		*Redo without lens filter
F		13	31*		*Redo without lens filter
F		14	32* - 33*		*Redo without lens filter
F		15	34*		*Redo without lens filter
F		16	35*		*Redo without lens filter
F		17	36*		*Redo without lens filter
G		18	1*		*Redo without lens filter
G		19	2* - 4*		*Redo without lens filter
G		20	5*		*Redo without lens filter
G		22	6*		*Redo without lens filter
G		29	7*		*Redo without lens filter
G		24	8*		*Redo without lens filter
G		23	9*		*Redo without lens filter
G		30	10*		*Redo without lens filter
G		31	11*		*Redo without lens filter
G		32	12*		*Redo without lens filter
G		33	13*		*Redo without lens filter
G		34	14*		*Redo without lens filter
G		35	15*		*Redo without lens filter
G		36	16*		*Redo without lens filter
G		37	17*		*Redo without lens filter
G		38	18*		*Redo without lens filter
G		39	19*		*Redo without lens filter
G		39	20*		*Redo without lens filter

G		40	21*		*Redo without lens filter
G		41	22*		*Redo without lens filter
G		42	23*		*Redo without lens filter
G		43	24*		*Redo without lens filter
G		44	25*		*Redo without lens filter
G	2	50	26 - 28	Noctuidae	Light wings, dark spotson the thorax, dark half moons/on forewings
G	2	51	29 - 31	Noctuidae	Dark red hindwings, green/dark forewings
G	2	52	32 - 34	Noctuidae	Dark gold forewings w/ darl markings, gray hindwings
G	2	53	35 - 37	Noctuidae	Light tipped gray hindwings, two half circle dark marks on anterior of forewing
H	1	25	1 - 3	Cossidae	Light hindwings, gray marked forewings, tan/gray stripes down abdomen
H	1	26	4 - 6	Cossidae	Light hindwings, gray marked forewings, tan/gray stripes down abdomen, morw brownish markings
H	1	27	7 - 9	Cossidae?	Dark red abdomen, light hindwings, dark/green forewings
H	1	28	10 - 12	Cossidae?	Green /brown head, light hindwings, distinct eyemarkings on forewings, dark/green
H	1	21	13 - 15	Arctiidae	White wings, lwopard markings, spotted thorax, orange abdomen
H	3	60	16 - 18	Sphingidae	Brown, large half oval on anterior of forewings, white dot on posterior of hindwings
H	3	61	19 - 21	Sphingidae	Green forewings, blue/blk/red hindwings
H	3	62	22 - 24	Sphingidae	Black/orange spotted and striped
H	3	63	25 - 27	Sphingidae	Green/orange, light green abdomen
H	3	64	28 - 30	Sphingidae	Pink on hindwing, light/dark lines on wing
H	3	65	31 - 33	Sphingidae	Green body, black/yellow hind wings, green forewings
H	3	66	34 - 36	Sphingidae	Small tan/brown body, black/yellow hindwings, white lines down side of head and thorax