TROPICAL LEPIDOPTERA

LEPIDOPTERA OF BELIZE

1. BUTTERFLIES
2. EMPEROR MOTHS AND HAWK MOTHS

JAN C. MEERMAN
TROPICAL LEPIDOPTERA

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LEPIDOPTERA OF BELIZE
by Jan Meerman

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FRONT COVER: Anaea maerula, puddling, Cayo District, Belize. FRONT COVER (inside): Top: Adelpha massilia, Shipstern Nature Reserve, Corozal District, Belize. Bottom: Siproeta stelenes, Shipstern Nature Reserve, Belize. BACK COVER: 1) Hemileuca sp. (top lt); 2) Copiorhynchus semiramis (top rt); 3) Automeris moloneyi (middle lt); 4) Automeris banus caterpillar on Atalaia cubene (Araceaeae) (middle rt); 5) Callionima parce (bottom lt, top); 6) Pseudophilotes tetro caterpillar on Plumeria rubra (Apocynaceae); 7) Xylophanes porcus continentalis (middle ctr); 8) Manduca lanuginosa (above) and M. florestan, below (bottom rt). Photos: 1, Mountain Pine Ridge, Cayo District, Belize; 2, 4 and 8, Belize Tropical Forest Studies, Cayo District, Belize. 3, 5-7, Shipstern Nature Reserve, Corozal District, Belize (©1999 J. C. Meerman).

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Butterflies are more attractive than most other insects. People that get the shivers at the mere thought of an insect are delighted to observe a butterfly. Because of this, butterflies make useful conservation tools, although it still remains difficult to raise funds for any creature that doesn’t have feathers or fur and big dewy eyes. Still, like any creature on earth, butterflies are under pressure. Results of human activities such as climate change, habitat alteration and pollution are the main culprits, especially in the industrialized world. The historical butterfly fauna of the Netherlands, for example, consisted of only 71 species (Lycaenidae and Hesperiidae included); of these, 15 have become extinct during the past few decades and 22 others have shown alarming declines. The situation in the third world country of Belize is not that dramatic (yet). Slightly smaller than the Netherlands, Belize has about 770 butterfly species and none appear to be in any danger of extinction. But then, do we really know? The publication of these two catalogs is really the first attempt to prepare a contemporary list of certain Lepidoptera families of Belize. But what do we know about the past? We know that the ancient Maya of Belize converted much of Belize into intensive agricultural fields and we can be very certain that the vegetation of Belize (and thus the Lepidoptera fauna) was very different in those days. Even more recently, some of the older butterfly literature reports species from locations which appear very unlikely to me. Are all these unusual records just the result of errors in labeling, or did these species really occur there a century ago and has the habitat changed since then? We really don’t know. That is why catalogs such as these are so important. First one needs to know what there is, and then you can start monitoring and record changes. Even the taxonomic errors that, no doubt, I made while compiling these catalogs will serve a purpose, other researches will, without doubt, criticize me for them (and hopefully correct them) and thereby further increase the understanding of the Lepidoptera fauna of Belize.

These catalogs are not identification guides, although in the catalog of the Saturniidae and Sphingidae of Belize I tried to include some important diagnostic characters: reason being, with these moths it is much more difficult to find a market, and therefore funding, for an identification guide. Some butterfly families are easier in this aspect and some good field guides, such as the DeVries’ Butterflies of Costa Rica (I & II), are available. Currently, I am also preparing a field guide to the Papilionidae, Pieridae and Nymphalidae of Belize and the Yucatán Peninsula. The latter field guide will be a valuable tool in several environmental monitoring efforts in the region. On a 1997 conference on Biological Monitoring in Flores, Petén, Guatemala, biologists from the region agreed that butterflies were one of the most suitable groups of organisms for biological monitoring. And there exists widespread interest in using butterflies as a focal group in monitoring such diverse aspects as ecological change, climate change, biodiversity and the effects of logging.

It is important to point out that the research leading to the compilation of these catalogs was not funded by any conservation or research organization. Again, butterflies don’t have fur or feathers. Obviously, this general lack of funds did put a strain on the whole project; after all, somehow you have to make a living as well. For this reason, I never seriously tried to study the more difficult and time consuming families such as the Hesperioidea, Lycænidae and Riodinidae and this lack of attention shows in the catalog. The Lycænidae in particular are a taxonomic war zone and I have included them here only after considerable hesitation. I didn’t even attempt to include the Hesperioidea. But, I do hope to be able to continue my research and I also hope that the publication of the current catalogs will tempt other researchers to build upon them and expand them. And by using butterflies as a monitoring tool, we should increase our general understanding of Belize’s biodiversity and thus improve it’s management.

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LEPIDOPTERA OF BELIZE

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INTRODUCTION

DESCRIPTION OF BELIZE AND ITS TERRESTRIAL HABITATS

Belize is a small Central American country, situated on the Caribbean coast and bordering both Mexico and Guatemala. Most of the country consists of lowland habitats but it also contains the Maya Mountains (highest point 1124m) which are isolated from other Central American mountain ranges.

Belize has a land area of 22,963 km², and stretches from 16°N to 19°N, and from 88°W to 90°30'W. The northern half of the country is flat to undulating, with some hills in the west that barely reach above 200m. These hills show great affinity to the Petén area of Guatemala, while northeastern Belize is very similar to parts of the Yucatán Peninsula, Mexico. The southern half of the country is characterized by the presence of the Maya Mountains which reach to an altitude of 1124m.

Belize has a tropical climate, with an average annual rainfall varying from 1100mm in the north to over 4000mm in the south, with a very distinct dry season from January to June. Although the dry season in southern Belize is less rigid, smaller streams can dry up during the dry season, especially where the bedrock is limestone. Mean monthly maximum temperatures range from 28°C in winter to 33°C in summer, and of course night temperatures are cooler in the mountains.

One of the most striking features of Belize is the extent (74%) that is still dominated by natural vegetation. The natural vegetation of Belize consists of a tight mosaic of highly variable vegetation types, according to underlying geology, terrain, soil-type, wetness, salinity, altitude and rainfall pattern. The rate of deforestation is currently about 15,600 hectares on an annual basis (University of Texas, Austin, unpublished data). For a description of the different vegetation types in Belize see Programme for Belize (1995).

Belize is divided into 6 administrative Districts which, fortunately for biogeographical purposes, to a certain extent also following ecological divisions. A short summary of each District, listed generally from north to south, is given below (see map 1).

Corozal District. – The driest district of Belize (see rainfall figures in Catalog 2, Table 1). Rather flat, bedrock mainly limestone, some rivers but the number of streams is limited. Much of the eastern part is still covered by subtropical moist forest but the western half has been almost completely converted to sugarcane fields.

Orange Walk District. – Bedrock limestone hills in the west and alluvial sand and gravels in the east. This district has relatively undisturbed subtropical moist forest in the west but large sections of the district have been converted to sugarcane or other agricultural lands. Along the Northern Highway, vast expanses of "pine savanna" can be found.

Belize District. – The district with the lowest number of Lepidoptera species recorded, most likely because this district is under-sampled. Although rather flat, it contains a high variety of habitats, from pine savanna and subtropical moist forests, to mangrove swamps.

Cayo District. – Probably the most diverse district. Much of the Belize River valley has been transferred to agricultural lands but more to the south, large areas with natural subtropical moist forests remain. The major part of the Maya Mountains is situated in this district, with the Mountain Pine Ridge (mostly managed pine forest) as its most accessible component. Because of the relative accessibility of many interesting habitats, this district is well sampled and has the greatest number of species recorded.

Stann Creek District. – This district contains some large river-basins, most of them with granite underground. This district is relatively under-sampled, partly due to the limited road system which makes inland access difficult. The coastal plain consist of pine savanna with some broadleaf forest along the rivers.

Toledo District. – This southern district includes the foothills of the Maya Mountains but is otherwise dominated by lowlands and steep limestone hills. Rainfall is high and biodiversity is high. Unfortunately, the natural vegetation of tropical wet forest in this district is severely impacted by slash and burn agriculture and large areas exist where not a single mature tree is left. This district is still under-sampled and should be more thoroughly investigated before it is too late.

HISTORY OF LEPI DOPTERA STUDIES IN BELIZE

Until recently, Belize (formerly known as British Honduras) has been only fragmentarily researched by lepidopterists. There are only a few locality records in Godman and Salvin (1879-1901) and in Seitz (1923).

F. L. Davis, of the British Honduras Medical Service, after having arrived before the turn of the 20th century, lived for more than 30 years in the colonies and collected mainly in the Corozal, Orange Walk, Cayo and Toledo Districts. Davis' work was published in 1928.

A. E. Gibbs published two papers on Belizean and Guatemalan butterflies in 1912 and 1914.

G. N. Ross, in 1961, spent one month collecting in Belize. Principal collecting sites included Augustine (now named: Douglas D'Silva Forest Station) in the Mountain Pine Ridge Forest Reserve and Melinda Forest Station in the Stann Creek District. Considering the previous work, Ross concluded that the total known species list included 259 species and estimated that another 100, yet to be collected, species existed. Ross' work was published in 1964. In the current work, I expand the Belize species list from Ross' 259 to 436.

E. C. Welling visited Belize on several occasions and collected among others, also Saturniidae and Sphingidae. He collected mostly in the Stann Creek District (Middlesex) and in the Cayo District during the 1970s. Reports by Welling were published in 1963, 1970, 1977 and 1992).