Biodiversity of Arthropods in the Canopy at the Archbold Tropical Research and Education Center

By

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Archbold Tropical Research and Education Center

Abstract

Little is known about the canopy of Dominica's secondary rainforest, especially not the disturbed rainforest at the Archbold Tropical Research and Education Center. This study found that the majority of the arthropods were from the orders Diptera, Hemiptera, and Lepidoptera of the class Hexapoda.

Introduction

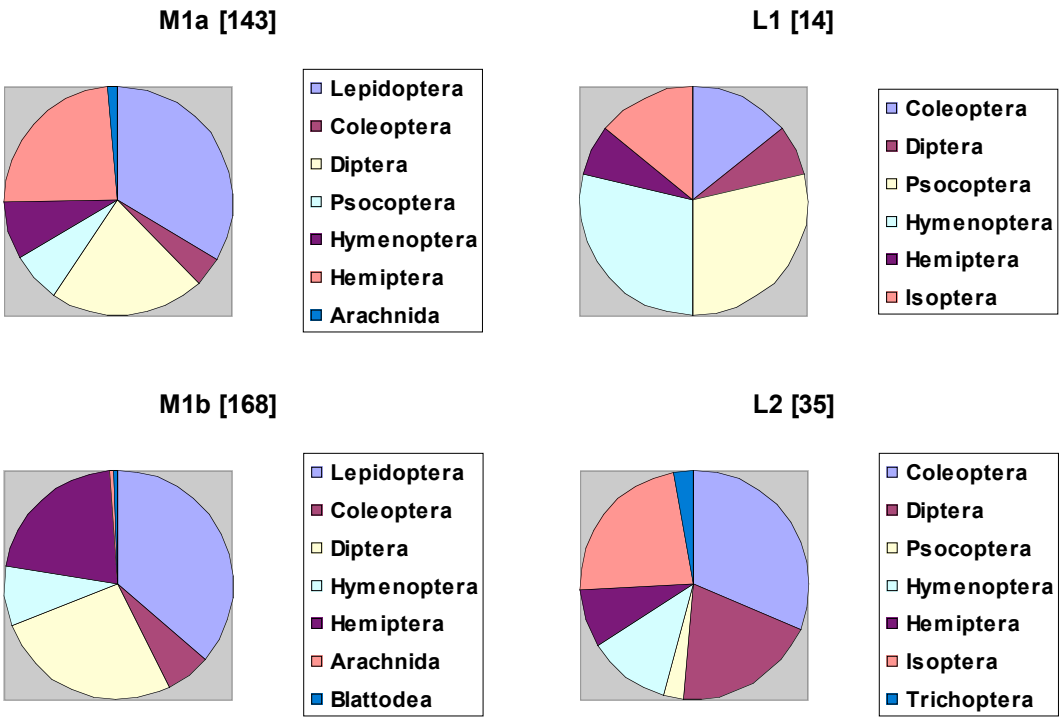
When the opportunity presented itself to set insect traps in the canopy, I quickly selected that as my individual project. There had not been a study of insects above 30 feet in the canopy, so that was the requirement that I wanted to fulfill. The objective was to sample the richness and diversity of anything that could be captured with either an aerial malaise or a lingren funnel trap in *Ficus insipida* or *Samanea saman*.

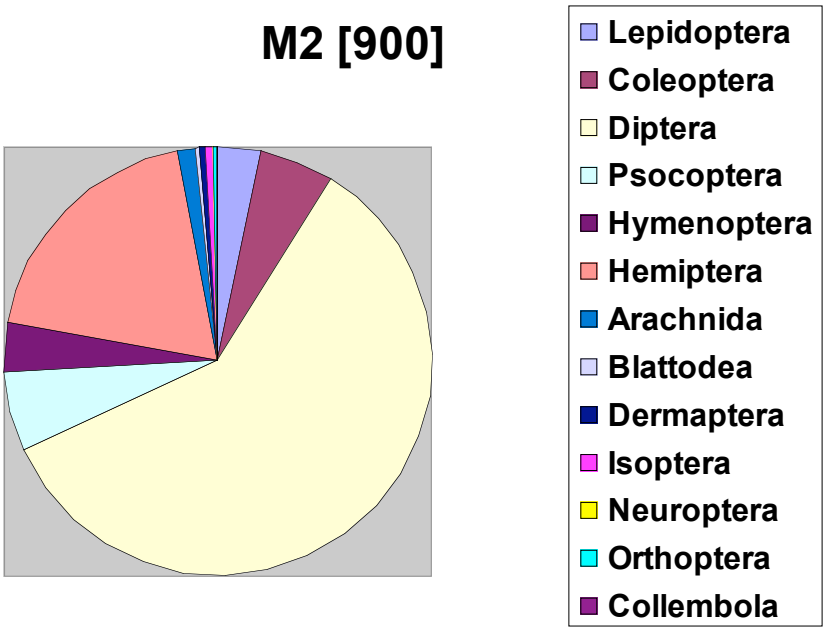
Methods and Materials

There were five different collecting events and methods from three malaise traps and two Lingren funnel traps. The two tree climbers in the 2008 TAMU Study Abroad group had a special 'slingshot' device that allowed them to shoot a line into a tree to whichever branch they wanted to climb. For the first collecting event, we hoisted a Lingren funnel approximately 40 feet into the *Samanea saman*, or rain tree, and left it there for five days. The second collection point was another lingren trap and a malaise trap about 55 and 60 feet high in the tree, respectively. This took place in *Ficus insipida* close to the

Checkhall River. The Lengren funnel trap was left for eight days, but the malaise sample was collected after two days (M1a) and then again when it was taken down after another seven days (M1b). I considered this three separate collecting events. The fifth and final collecting event was an aerial malaise trap on *Ficus insipida*, but deeper into the woods of the Springfield Estate. This trap was placed about 40 feet in the canopy. The elevation at Springfield is 1147 feet.

Results [sample size in brackets]





While I identified every insect to order, I also tried to identify the largest number of families in each of the most abundant orders.

Top three orders in each sample:

For M1a: Micro-Lepidoptera, mainly Opostegidae
Diptera (I did not key out any Diptera)
Hemiptera – Lygaeidae
For L1: Psocoptera (Didn't key)
Hymenoptera (one of genus *Tetrapus* was identified)
Isoptera (Didn't key)
Coleoptera (Didn't key)
For M1b: Lepidoptera – Opostegidae, but the majority were unidentified
Diptera
Hemiptera – Cercopidae and Delphacidae
For L2: Coleoptera – Curculionidae
Isoptera
Diptera
For M2: Diptera
Hemiptera – Lygaeidae, Cercopidae, Delphacidae
Psocoptera

Discussion

I did not have a control for this study, since I had nothing to compare my results to or with. The number ratio of each order and family most likely differed because of height,

tree species, and trap differences. The range of heights was 40 to 60 feet, though the insects I found appeared to be the same kinds with the only difference across traps being the ratios. Comparing the difference between tree species I don't think is attainable because there was only one type of trap and collecting event in *Samanea saman,* but there were multiple traps and collecting events in *Ficus insipida.*

The largest discrepancy in insect ratios was between the traps. The Lingren trap, compared to the malaise trap, did not produce the diversity, richness, or the numbers that the malaise was able to offer. Not only were there fewer numbers or arthropods, but it attracted more Isoptera than the malaise. It was expected that because the lingren was supposed to imitate a tree trunk, that it would attract more beetles, but also catch fewer things because of the height. However, the lingren caught the same numbers of Coleoptera and Isoptera, presumably because the alate termites were flying around in mating pairs.

Another important factor was location. *Samanea saman* is in the driveway of the Springfield guesthouse, and was the most sterile of the three locations. The next tree, *Ficus insipida* by the Checkhall River, had the most numerous catches, presumably because it was near the river, an ecological corridor. The third location was *Ficus insipida* in the deeper forest of Springfield. This location had the most species richness, though only one sample was taken.

In the future, it would be best if more samples could be taken, and more time to analyze them down to family or even further. Also, a bigger variety of tree species would better analyze the canopy of Springfield.

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Citations

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