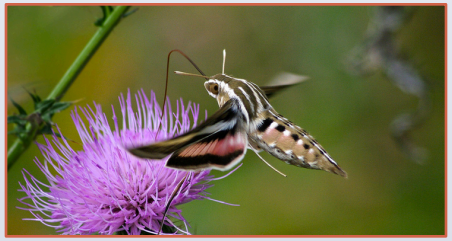
Types of flora in relation to lepidoptera abundance

Claudia Donofrio, Ashley Kurian, Ziva Rubinstein

William E. Macaulay Honors College

Introduction

The New York Botanical Garden contains millions of different species of organisms. On September 6th and 7th 2014, the Macaulay Honors College conducted a BioBlitz, a 24-hour long catalogue of the species present in the New York Botanical Gardens. One of the most abundant species encountered there are lepidoptera, consisting of moths and butterflies. Lepidoptera tend to gravitate towards plants that provide food, like nectar from flowers and tree sap. They also look for habitats to lay their eggs, known as host plants. We propose that lepidoptera will be more likely to inhabit a zone in the NYBG with a larger abundance of feeding plants than host plants.



Objective

- Characterize the flora found in locations corresponding to lepidopteran sightings
- Determine if feeding plant and host plant species could help predict lepidoptera abundance in a certain area

Procedure

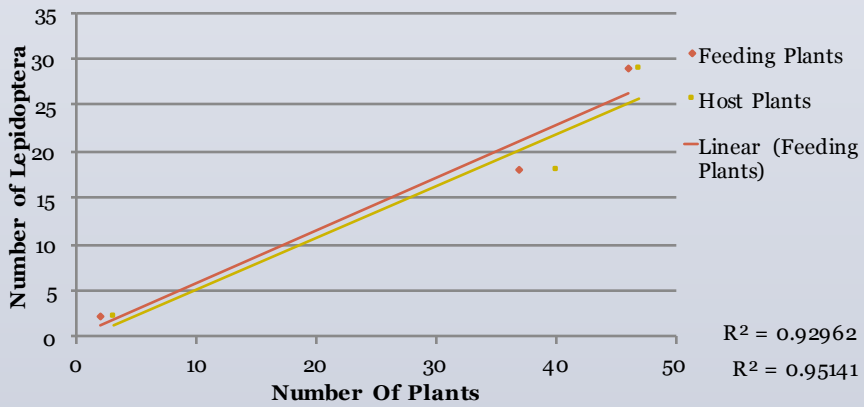
- Compared lepidoptera and plant species composition data collected from the 2014 BioBlitz and NYBG's plant identification data concerning the types of plants in different areas of the gardens.

Data

The BioBltiz data shows that lepidoptera are predominantly found in zones 6 & 9, which are the Rock and Native Plant Gardens, Wetlands, and the Children's & Azalea Gardens.

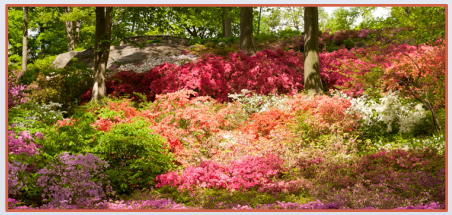
- In Rock Gardens: cardinal flowers (Lobelia cardinalis), Acer rubrum (red maple), Acer saccharum (sugar maple), Prunus serotina (black cherry), all of which grow fruit.
- In Azalea Gardens & Wetlands: native oaks, tulip trees, and sweet gums, rhododendrons, daffodils and crocus, vast sweeps of ferns and hostas, and grassy glades, which secrete sap.

Relationship Between # of Lepidoptera and Type of Plant (Feeding v. Host)



Results/ Conclusion

- Cross-referencing areas where lepidoptera tend to be found, zones 2, 6 and 9, with the host and feeding plants in those zones demonstrate a significant positive correlation between feeding plants and lepidoptera abundance
- Sources of error include being unable to have an exact number of flora or lepidoptera in one area as well as a minimal number of data points.
- From this preliminary data, we can conclude that both host plants and feeding plants may be a good predictor of lepidoptera distribution in the NYBG.



References

1. Scott, Thomas (1995). Concise Encyclopedia Biology. Walter de Gruyter. ISBN 3-11-010661-2
2. Atwater, M. M. (2013). Diversity and nectar hosts of flower-settling moths within a Florida sandhill ecosystem. Journal Of Natural History, 47(43/44), 2719-2734. doi:10.1080/00222933.2013.791944
3. New York Botanical Gardens Website
4. Pieceoface. "White-lined sphinx moth." 12 September 2013. Online image. Flickr. 18 November 2014

Acknowledgements

We would like to thank the William E. Macaulay Honors College, the New York Botanical Gardens, Professor Brian Ford, and our ITF, Bronwyn Dobchuk-Land.