

## Diversity of the assemblages of moths in Havana city and its relationship with the degree of urbanization

# conservation # urban ecology



*S. albula* © L. Buss

DATES  
2021-2024

COUNTRY  
Cuba

STUDENT  
Claudia Loiz Leiva

EDUCATION LEVEL  
Doctorate



CONTACT  
clauloizbio@gmail.com

### Context

In the past 50 years, urban expansion has accelerated globally as people chose to live in cities rather than rural areas. Therefore, knowing the patterns and mechanisms that shape biodiversity in urban ecosystems is essential to increase the sustainability of cities. In addition, urban areas are a source of strong selective pressures, which is why they constitute a good setting to study the ecological and evolutionary processes of many organisms. Insects are a good group for that as they are diverse, easy to sample, and respond quickly to environmental changes. In particular, the Lepidoptera have been considered as indicators of habitat quality. In particular, nocturnal Lepidoptera respond quickly to anthropic disturbances, changes in vegetation and processes of ecological succession. Furthermore, urbanization does not only affect the diversity of moths but also appears to have a negative impact on their pollinating function. However, the existing information is scarce, especially in tropical regions.

In Cuba, Havana is the largest and fastest growing city. Only three studies were conducted on the diversity of Lepidoptera, which have focused on butterfly communities. In fact, to date there is no study on urban moth communities in the Caribbean region.

### Objectives

The aims of the project are the following:

- To characterize the structure and composition of the nocturnal macrolepidopteran assemblages of Havana.
- To determine the biotic and abiotic factors that most influence the diversity of the nocturnal macrolepidopteran assemblages of the city of Havana.
- To evaluate how the degree of urbanization influences the transport of pollen by nocturnal macrolepidopterans in Havana.

### Methods

Moth samplings will take place during the rainy season of 2022 and 2023. We will select 24 sites in Havana and we will sample three times in each one for a total of 72 samplings. They will be carried out using Robinson light traps. The moth species captured will be identified through the use of guides, reference collections, and by DNA analysis if necessary.

Range-abundance curves and Hill numbers will be used to characterize the structure and composition of the moth assemblage. To evaluate the biotic and abiotic factors that have a higher influence in the diversity of the nocturnal macrolepidopteran assemblage, several variables will be measured at each sampling site:

- influence of artificial light
- car traffic from each site
- composition and structure of the vegetation
- vegetation cover and building cover

Mathematical models and multivariate statistical analyzes will be used to examine the relationships between the assemblages of moths and to determine which independent variables contribute the most to moth diversity.

Lastly, to evaluate how the degree of urbanization influences the transport of pollen by moths in Havana, pollen samples will be taken from the individuals captured by the light trap. With the data from the collected pollen grains, an interaction diagram between Lepidoptera species and plant species will be made. The moth species that contribute the most to pollen transport and the plants that are most frequently visited will be identified. In addition, statistical analyzes will be carried out to detect if there is a relationship between the number of moth species and individuals that carry pollen and the variables mentioned above.

## About the research team

Claudia Loiz is carrying out this project as a PhD student at the Université de Bourgogne, France. Her thesis is co-supervised by Dr. Marie-Jeanne Perrot-Minnot (Université de Bourgogne Franche-Comté) and Dr. Alejandro Barro Cañamero (Universidad de La Habana) and is funded by Caribaea Initiative and the UBFC Excellence Initiative Project ISITE-BFC.

The student has been a member of Caribaea Initiative since 2018 when she was awarded with a scholarship to enroll in the Behavioral Ecology and Wildlife Management master of Université de Bourgogne. Furthermore, she occupies a position as “aspiring researcher” at the Institute of Ecology and Systematics in Havana, Cuba, where she has a number of colleagues who have assisted her with field work: Manuel A. Bauzá, Gustavo Blanco, Daniel Font, Arturo Hernández and Maíke Hernández. In addition, Gabriela Molina, Juan L. Hecheverría and Diego Alameda, colleagues from the University of Havana, also helped the student with field work.

