



*C. terminalis* © C. Loiz

## Diversity and level of endemism of Arctiinae (Lepidoptera: Erebidae) in relation to the diversity and level of endemism of the vegetation in Western Cuba

# community ecology # biodiversity

### Context

The Arctiinae (Lepidoptera: Erebidae) are a group of moths from the Neotropics. In Cuba, 102 species have been recorded, 50 of which are endemic, making it the group with the highest number of endemic species within the Lepidoptera in the island. Most species of this clade use plants as food source in both larval and adult stages of their life cycle and have high levels of feeding specialization. Due to this close relationship between Arctiinae and plants, sites with high diversity and level of endemism of plants should harbor a high diversity and level of endemism of Arctiinae. Thorny Xeromorphic Serpentine Shrublands (TXSS) are among the plant formations with higher diversity and endemism of plants in Cuba. Thus, a high level of diversity and endemism of Arctiinae is expected around them as well. However, very little information is available on Arctiinae species, host plants and their geographic distributions, which makes it difficult to assess this relationship correctly.

### Objectives

We expected to find a relationship at assemblage level between the diversity and endemism of Arctiinae and the diversity and endemism of plants in TXSS. Moreover, the flora of the TXSS located at Sierra de Cajálbana (Pinar Del Río) is more diverse and has a higher level of endemism than that of Lomas de Galindo. For that reason, we expected to find higher diversity and level of endemism of Arctiinae in Sierra de Cajálbana than in Lomas de Galindo. Therefore, the objectives of this study were:

- To compare the diversity and level of endemism of the assemblages of Arctiinae and plants of Lomas de Galindo and those of Sierra de Cajálbana;
- To determine if there is a relationship at assemblage level between diversity and level of endemism of Arctiinae and plants in these TXSS.

### Methods

#### *Arctiinae* survey

A total of 19 sites were surveyed (10 in Sierra de Cajálbana and 9 in Lomas de Galindo) using a light trap to record the Arctiinae species richness and their abundances. The light trap consisted of a 2m<sup>2</sup> white sheet used as a reflecting surface and a 250 W mercury vapor bulb powered by an electricity generator.

DATES  
2018-2019

COUNTRY  
Cuba

STUDENT  
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EDUCATION LEVEL  
Master



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### Plant survey

To quantify the vegetation, two plots were examined in each site where Arctiinae were sampled. The 38 vegetation plots had an area of 10×3m and the richness and abundance's distribution of plants were recorded in each one.

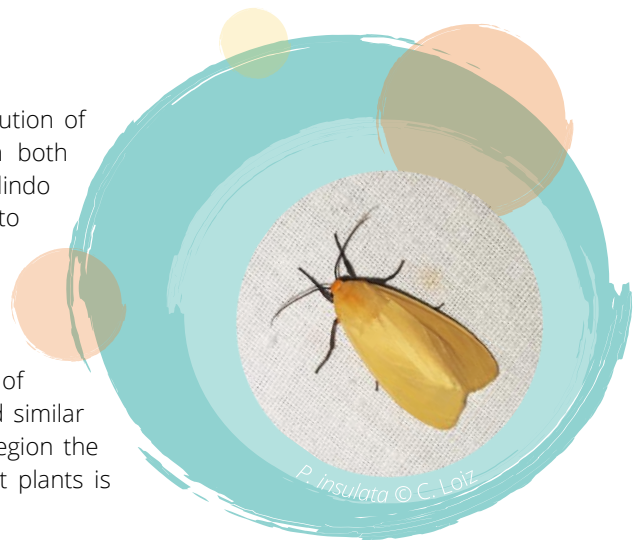
### Data Analysis

In order to represent the distribution of the abundances of plants and Arctiinae species of each locality, abundance – range curves were constructed, Hill numbers (of order 0, 1 and 2) were calculated and used to construct rarefaction-extrapolation curves for each locality. Pearson's correlation coefficients were calculated to test if there was a correlation between the diversity and the endemism of the flora with the diversity and the endemism of Arctiinae.

## Results

There were clear differences in species composition and distribution of abundances between the two sites. The dominant species in both locations was *Pareuchaetes insulata*, especially in Lomas de Galindo where it represented in more than 50% of the records. According to Hill numbers, the diversity of the assemblages of Arctiinae in Sierra de Cajálbana is higher than that of Lomas de Galindo and the same occurs with the assemblages of plants.

A significant positive correlation was found between the diversity of plants and Arctiinae of both sites. Various studies have detected similar results suggesting that the greater the diversity of plants in a region the more insects will colonize it, since the number of potential host plants is greater.



## About the research team

Claudia Loiz is currently a PhD student at the Université de Bourgogne, France. Her thesis about the effects of urbanization in the ecology of moths in Havana is co-supervised by Dr. Marie-Jeanne Perrot-Minnot (Université de Bourgogne Franche-Comte) and Dr. Alejandro Barro Cañamero (Universidad de La Habana) and is funded by Caribaea Initiative and the UBFC Excellence Initiative Project ISITE-BFC.

Claudia is supported by Caribaea Initiative since 2018 with a scholarship to enroll in the Behavioral Ecology and Wildlife Management master of the Université de Bourgogne. This research was conceived as the final report necessary for the culmination of her master studies. Furthermore, she occupies a position as “aspiring researcher” at the Institute of Ecology and Systematics in Havana, Cuba, where she is assisted by several colleagues in her with field work: Manuel A. Bauzá, Gustavo Blanco, Daniel Font, Arturo Hernández and Maike Hernández. In addition, Gabriela Molina, Juan L. Hecheverría and Diego Alameda, colleagues from University of Havana, also helped the student with field work.