Butterfly paradise' in the South of Brazil

For more than 20 years, UFRGS' Insect Ecology Lab has been recording, cataloging, and storing butterflies from the South of Brazil. Its collection and database, which are open to researchers, have information on more than 900 species

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Photo: Gustavo Diehl

Recorded in 1952 in the city of Porto Alegre, the butterfly *Vanessa carye* is just one of more than 900 species cataloged and stored at the Universidade Federal do Rio Grande de Sul's LEI – Laboratório de Ecologia de Insetos (Insect Ecology Lab). The glass box, carefully handled by the student Flora Dresch, holds only two samples of *Vanessa carye*, the second having been found in 2004 close to the university's Campus do Vale.

From 1993 until now, the collection, which is part of a research project studying butterfly species from the Atlantic Forest and Pampa, has doubled in size. The number of species living in the South of Brazil is believed to be over 900. Helena Piccoli Romanowski, coordinator of the research project, says that, out of the total number of records, 400 were collected in the area around Porto Alegre. "North America has less than 800 butterfly species; Europe has about 500; Australia, 400. Recording all this natural wealth in our area is extremely important."

The 'butterfly paradise' consists of two biomes: the Atlantic Forest and the Pampa. The diversity of fauna and flora in these environments meet in the area surrounding Porto Alegre, allowing some butterfly species to be recorded there once but never seen in the region again. This is the case with *Vanessa carye*. "I had never seen one of these before because this isn't their habitat, they live in colder areas. Maybe with the global warming those butterflies will become less and less likely to be sighted here," explains Lucas Augusto Kaminski, PNPD-Capes research graduate student.

Butterfly paradise, is that so?

Given this scenario, the finding that the South of Brazil is a 'butterfly paradise' might not be that positive after all. The unpredictability of the climate and the increase in deforestation affect the evolutionary process of insects, butterflies among them. This finding exposes the misinformation of global warming denial. "Having a database like this is precious, it's essential. If we're talking about climate change, first we need to know what the existing weather patterns are. One hypothesis that needs to be tested is if, with the Atlantic Forest growing warmer, more tropical species are occurring in the South of Brazil," says Lucas Kaminski.

The researchers have been recording alarming cases of environmental degradation, increasing in a short span of time. "Countless places we've been visiting for more than 20 years are no longer healthy environments able to harbor native fauna, be it due to urbanization, deforestation, the unchecked advance of monoculture farming, or the indiscriminate use of pesticides. And this scenario shows up again and again in all regions of the South of Brazil," states Helena Romanowski.

The destruction of native habitats, the indiscriminate use of pesticides, and global warming are all factors that endanger the lives of butterflies and other insects. "We must understand this shortage impacts us, too, it's also a threat to us: insects are pollinators, they're extremely important to the maintenance of soil structure, they're food for other species, they help control plant growth, we couldn't live without insects. This is also a threat to us. We're heading towards a dire future," stresses Kaminski.

Open database

The first record of the university's butterfly and moth collection dates from 1947, from UFRGS' former Institute of Natural Sciences. Today, more than 15 thousand specimens are stored at UFRGS' Insect Ecology Lab, which is one of the main centers for butterfly research in Brazil.

The more-than-40-year research has resulted in a physical open database available both to scientists from Brazil and other countries for various purposes. More than 900 species of butterflies have been recorded with their name, the date and the place where they were collected, which allows the researcher to identify patterns through time.

Helena Romanowski lists each step in a study of butterfly communities: "The researchers take samples, collect the species, and analyze their distribution, how many butterflies of each species were in the place, how balanced the community is. This database will be useful in the future, as the collection is kept in the Department under the care of professors, students, and volunteers."

Butterflies are one of the most studied animal groups due to their being model organisms and—given their aesthetic appeal—also useful tools in environmental education. Besides, they provide information on the health of the environment and other groups of living beings.

The diversity of butterflies in the South of Brazil allows researchers to learn about new species and understand what determines each one's choice of habitat and lifestyle. Unfortunately, LEI's researchers have been registering the loss of species. "Looking at the data over the years allows us to examine variations, cycles, number of species, climatic interference, migration paths. With this data, we can take action about climate change, for example," says Lucas Kaminski.

The researchers have taken samples from more than 40 regions of the South of Brazil and neighboring countries (Argentina, Paraguay and Uruguay). One of the main achievements of these studies has been identification and charting of the butterfly species that live in the South of Brazil, since the fauna of the southern hemisphere is little known.

In LEI's collection, one will find multiple types of butterflies, from the smallest species—like the *Zizula cyna,* measuring less than an inch (1-2cm)—to the largest—like the *Caligo* or 'owl butterfly', measuring 4 to 5 inches (11-13cm). Some are flagship species for environmental conservation, such as the *Euryades corethrus* or 'Campoleta', which is native to the South of Brazil. "This species was the focus of a doctoral study by Guilherme Atencio. The South of Brazil is probably the only place where it can still be found, because it's at risk of extinction," explains Helena Romanowski.

The *Pseudolucia parana,* recorded in Porto Alegre, was found to be a species that currently lives only in granite hills. "We have recorded it in four locations, one of which is Morro Santana, behind the university's Campus do Vale," says Romanowski. The researchers have also identified a new kind of butterfly, the *Prenda clarissa,* an endangered species found only in the highlands of the South of Brazil.

Broadening the knowledge of the fauna and flora of a place—any place—is essential. In the case of butterflies, they also indicate the health of the environment and other groups of living beings. The loss of diversity and number of insects may cause chain effects on the food web and put whole ecosystems at risk. "Human life on earth without insects would be unimaginable," says Romanowski. The post-graduate student Lucas Kaminski concludes, "This is the primary role of the scientist: doing research. But also, above everything else, debating what's happening to our planet is what real science does."

The butterfly collection and its database are open to researchers and to any interested parties, upon request to the LEI. Access to the Lab must be supervised by a UFRGS' researcher.

What can we do to protect the butterflies?

1. Preserve their natural habitats;

2. Plant native species in our garden;

3. Use less pesticides;

4. Practice sustainable agriculture, avoiding monocultures;

5. Respect the laws regarding the preservation of native vegetation;

6. Understand that native grassland is also native vegetation, and it is important to native species.

Access LEI's Database: http://www.ufrgs.br/zoobflies/index.php?option=com_content&view=article&id=9&Itemid=10

Read the full article: https://www.ufrgs.br/ciencia/rio-grande-do-sul-o-paraiso-das-borboletas-projeto-aponta-mais-de-900-especies-no-estado/.

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