

THE SISBIOTA-DIPTERA BRAZILIAN NETWORK. A LONG TERM SURVEY OF DIPTERA FROM UNEXPLORED CENTRAL AREAS OF BRAZIL

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Figure 1. Field work in the State of Rondonia

The true flies (Diptera) are one of the four-megadiverse orders of insects, with more than 120.000 extant species, immediately familiar because they are ubiquitous and cosmopolitan, and they have had tremendous impacts on human civilization. They transmit important diseases, such as malaria, yellow fever, leishmaniasis and sleeping sickness, to humans and animals. Flies are among the most abundant arthropods found in biodiversity surveys and have a wide variety of feeding strategies. The menu of fly diets comprises nearly the complete insect smorgasbord: blood feeders, endo- and ectoparasites of vertebrates, gall makers, larval and adult predators, leaf miners, parasitoids, pollinators, saprophages, and wood borers. Magnifying this ecological diversity, Diptera have a complex holometabolous life cycle,

and their larvae (maggots) and adults have entirely different anatomy and behavior, separate ecological requirements, and occupy different niches. The SISBIOTA-BRASIL is a three-year multimillion-dollar research program of the Brazilian government to document plants and animals in endangered/understudied areas and biomes in Brazil. Even in the most studied areas in Brazil, distributional patterns of invertebrates and plants are insufficiently known and the historical events that generated those patterns are even more poorly known. This deficiency brings implications and impediments for conservation policies and for the understanding of evolutionary processes. Conservation decisions are largely dependent upon precise knowledge of the taxonomic and geographic distribution of species. Inside this premise and concerning, the team proposed an ambitious research project to study the Diptera of Central Brazilian areas, in the States of Rondônia, Mato Grosso and Mato Grosso do Sul, which are characterized by four important biomes of the South American continent: Amazon Forest, Cerrado (Brazilian Savannah), Pantanal and Chaco. Besides the ecological relevance, those areas historically lacks satisfactory entomological surveys; therefore, they are much underrepresented in the main collections, and also are being exponentially destroyed by the enlargement of the livestock and agricultural areas. This project involves 24 researchers from 15 different Brazilian institutions, and gathers 36 graduate and undergraduate students and 10 technicians. The project scope comprehends taxonomic, phylogenetic and biogeographical aspects of the studied families. So far, the team have analyzed nearly 300,000 specimens of Diptera, which are being collected with standardized methods along the sampled areas.

SUMMARY OF RESULTS TO DATE AND PERSPECTIVES

In order to survey one of the big four order of insects, in four different biomes, a research network was consolidated. From August 2011 to December 2013, beyond the permanent traps the team left in the field, 13 expeditions were conducted with an average of 10 members in each one. The most important legacy of this project is the collection, unprecedented in the history of Brazilian entomology, which is being formed. The central region of Brazil lacks large entomological inventories and, because of that, it is still very little known. Partial results showed that a huge portion of the Neotropical fauna of Diptera is truly unknown. Just to illustrate, the researchers choose one of the most striking case: the family Cecidomyiidae. The Cecidomyiidae are mosquitoes whose larvae form galls (tumors) in plants, where they feed and spend most of their life cycle. Before starting this project, there was not a single record of species of this family for the three



Figure 2. A female specimen of *Ligyra klugii* (Wiedemann), 1830 sunning herself

studied states. Over the past three years, the team identified over 250 species of host plants with more than 200 kinds of Cecidomyiidae galls (plant tumors), which should result in about 90% of new species and 10% of new records of species, already known, for the studied states.

A project of this nature will continue to generate results for an undetermined

period beyond the expiration of its term. The main numbers are: 9 published papers, 23 in press, and other 37 in preparation. 56 families were recognized, 246 new species are being described and 421 new geographic records are being assigned, so far.

The team also believes that extension activities and the dissemination of results are of paramount importance to projects of scientific research such as the Sisbiota-Diptera. To make the results and news available for the public and for researchers with different degrees of expertise and interest on Diptera, profiles were built for Sisbiota-Diptera on social networks (<http://facebook.com/sisbiotadiptera> and <http://twitter.com/sisbiotadiptera>). Additionally, a blog, bringing longer texts, photos of the expeditions and links, was also created (<http://sisbiotadiptera.blogspot.com>) and is widely publicized in discussions forums in Brazil and abroad.

MAIN PUBLICATIONS

- Wiedenbrug S, Lamas CJE, Trivinho-Strixino S. 2012. A review of the genus *Corynoneura* Winnertz (Diptera: Chironomidae) from the Neotropical region. *Zootaxa*. **3574**: 1-61.
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