

UF Guantanamo Bay Lepidoptera study sets baseline for future research

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This specimen of the lime swallowtail, an invasive species that is a threat to citrus plants, was collected at the Guantanamo Bay Naval Station in January 2012. University of Florida researchers published the first study on Lepidoptera found at the naval station in the *Bulletin of the Allyn Museum* Sept. 5, 2012, creating a baseline for understanding how different plant and animal species have spread throughout the Caribbean. (Photo by Deborah Matthews Lott)

University of Florida scientists publishing the first study on butterflies and moths of Guantanamo Bay Naval Station have discovered vast biodiversity in an area previously unknown to researchers.

Appearing in the *Bulletin of the Allyn Museum* Sept. 5, the study creates a baseline for understanding how different plant and animal species have spread throughout the Caribbean.

"Biodiversity studies are extremely important because they give us clues about where things were and how they evolved over time so we can better understand what may happen in the future," said study co-author Jacqueline Y. Miller, curator of *Lepidoptera* at the [Florida Museum of Natural History](#)'s McGuire Center for *Lepidoptera* and Biodiversity on the UF campus. "We're also looking at climate change over time, and butterflies are biological indicator species since they are associated with particular plants as caterpillars and often found in particular habitats."

During a seven-day trip to the site in January, researchers collected 1,100 specimens representing 192 moth and 41 butterfly species, including the invasive lime swallowtail whose proximity to the U.S. poses a threat to citrus plants. Researchers are freezing tissue samples from many of the collected specimens for future [DNA analysis](#) and expect to later describe new species, said lead author Deborah Matthews Lott, a biological scientist at the museum.

"Guantanamo is a special area because it's a desert-type habitat due to the rain shadow effect from the mountains," Lott said. "There's fewer species there, but there's going to be a tendency for more specialized endemic species."

Leased to the United States in 1903, the land has unintentionally become a wildlife refuge, offering researchers the opportunity to better understand the island's natural habitats. Located in the southeast corner of Cuba, its unique and complex [geological history](#) of volcanic activity, erosion and shifting sea levels resulted in geological deposits closely associated with marine environments.

"We are comparing the moths and butterflies collected at GTMO to those recorded from the U.S., Bahamas, other nearby islands and Central America," Miller said. "With the historical geology of the area, there are some potentially new species and such surveys enable us to better

understand the evolutionary history of butterflies and moths."

Cuba is the largest island in the West Indies and researchers' knowledge of its geological and paleontological history is mainly based on published articles, said co-author Roger Portell, the Florida Museum's invertebrate paleontology collections manager. Portell has led fieldwork on the naval station since 2007.

"Because it is a military base—and this is true for many military bases, which typically have large areas of land—people are not trampling, bulldozing or developing the land," Portell said. "So there is a large area of land in the southeast corner of the island that has basically been untouched for 100 years."

Portell and other museum researchers will continue studying biodiversity at the naval station to create a repository of specimens and information for scientists, as well as to help develop a plan for conserving the natural habitat, Portell said. By incorporating information about the geology, paleontology and animals inhabiting the land today, the study creates a 'ground zero' image of the area that is useful as a baseline for continuing research, said Daniel Janzen, a professor of conservation biology at the University of Pennsylvania.

"In the tropics, there are very few places where people have invested a lot of time, over time, and pooled the information together about one place like that," Janzen said. "What they did was pick out one spot, try to learn everything they could and put it all together into one paper, so anybody working there has got the whole package of information at one time. That, to me, is one of the major significances of the study."

Museum researchers plan to conduct additional fieldwork on the base in December.

"The military is working to preserve the [natural habitats](#), so they're interested in knowing about the animals, the plants and what's native and non-native," Portell said. "Now that we have really good comparative material, we can compare that to Florida and other states in the southeast U.S., the Caribbean, Central America and South America and basically fill in some of the blanks in our knowledge."

Provided by University of Florida

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