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April 6, 2010

**Media Web site:** [www.stri.org](http://www.stri.org)

## Sand Fly Survey in Panama Reveals *Leishmania* Strain and Its Potential Control

In the first survey of sand flies in Panama to use genetic barcoding, scientists at the Smithsonian Tropical Research Institute and Gorgas Memorial Laboratories identified 20 sand fly species from Barro Colorado Island. Two species carried *Leishmania naiffi*, a parasite that causes cutaneous leishmaniasis: persistent, itchy skin lesions. Three species carried *Wolbachia*, a bacterial parasite of insects that could contribute to a strategy to control the flies and limit disease transmission.

“We used DNA barcoding—sequencing a particular gene of the blood-feeding flies we collected—to identify the 20 fly species; two species could not be distinguished visually,” said Don Windsor, a Smithsonian scientist, who collaborated with STRI interns Jorge Azpurua, Dianne de la Cruz and Anayansi Valderama. “By characterizing another gene fragment from the nucleus of *Leishmania*, we discovered which fly species carried this disease-causing trypanosome.”

Leishmaniasis is not new in central Panama—it poses a long-standing health risk to residents and visitors in the region. *L. naiffi*, the species carried by the flies in this survey, was previously known only to be in the Caribbean and the Amazon. “Other species of *Leishmania* and the blood-feeding flies that transmit them are endemic in central Panama,” said Windsor. “Either *L. naiffi* was here undetected, or it could be a recent introduction carried by animals or people coming into Panama. Another explanation is that it is gradually moving northward from South America into Central America.”

Researchers hope that the presence of *Wolbachia* in the same species of flies that carry *Leishmania* may be useful in disease control. *Wolbachia* bacteria infect the flies and are passed readily from generation to generation. *Wolbachia* affects the flies’ ability to reproduce and has been proposed as a possible biological control of other insect pests.

Windsor emphasized that common preventative measures such as wearing insect repellent and long-sleeved shirts and pants when going out at dawn or dusk should be standard practice for residents, researchers and tourists who visit lowland tropical forests where *Leishmania* is endemic.

The *Leishmania* study was published in the open access journal PLoS Neglected Tropical Diseases. Funding was provided by the U.S. National Science Foundation and Panama's Fundación Gabriel Lewis Galindo.

First author Azpurua, former STRI intern and short-term fellow, now a graduate student at the University of Rochester, has gone on to co-author "Hypersensitivity to Contact Inhibition Provides a Clue to Cancer Resistance of Naked Mole-rat," which was selected from more than 3,700 research articles published in the journal Proceedings of the National Academy of Sciences to win the 2009 Cozzarelli Prize. The journal will present the award for papers that "reflect scientific excellence and originality" during the National Academy of Sciences Annual Meeting April 25 in National Harbor, Md.

The Smithsonian Tropical Research Institute, headquartered in Panama City, Panama, is a unit of the Smithsonian Institution. The institute furthers the understanding of tropical nature and its importance to human welfare, trains students to conduct research in the tropics and promotes conservation by increasing public awareness of beauty and importance of tropical ecosystems. Web site: [www.stri.org](http://www.stri.org).

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Ref: Jorge Azpurua, Dianne de la Cruz, Anayansi Valderama, Donald Windsor. 2010. *Lutzomyia* Sand Fly Diversity and Rates of Infection by *Wolbachia* and an Exotic *Leishmania* Species on Barro Colorado Island, Panama. PLoS Neglected Tropical Diseases.