

Tupper seminars

No 4pm seminar is scheduled for Tuesday, January 17.

Wed, Jan 18, 6pm talk speaker will be Fernando Manfredo
El desmantelamiento del gobierno de la Zona del Canal y la entrada de Panamá a la administración del Canal

Bambi seminar

Thursday, January 19 Bambi seminar speakers will be David and Jeanne Zeh, University of Nevada, Reno
Maternal inheritance, sexual conflict, and the maladapted male

Arriving next week

Julissa Roncal, Florida International University, to make a revision of the Geonomoid palms, on Bocas del Toro.

Jo Anne Stewart, Lorne Kingwell and Jan Loss, University of Goettingen, to study the NITROF-impact of elevated nitrogen input on the biogeochemistry and productivity of tropical forest, on BCNM, and Fortuna.

John Boylian, US, to study the distribution of *Brachyrhaphis* and *Rivulus* species, in different sites in Panama.

Gregory Willis and Jacalyn Giacalone, Montclair State University, to study mammalian population fluctuations in relation to fruit crop, on BCI.

Julia Arnold, University of Goettingen, to quantify the internal soil nitrogen cycle to evaluate the nitrogen status of tropical forests, on BCNM.

Corinne Richards, University of Michigan, to analyze population structure and dynamics of the Panamanian golden frog, at Tupper.



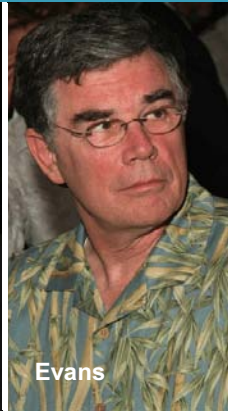
Smithsonian Tropical Research Institute, Panamá

www.stri.org

January 13, 2006



Small



Evans



Regula



Becerra



Kogod

SI regents and officials visit the Isthmus

Congressmen Xavier Becerra and Ralph Regula, and Manuel L. Ibañez, Shirley Ann Jackson, Robert P. Kogod, Roger W. Sant, Allen G. Spoon with members of their families, visited STRI facilities on the Isthmus of Panama with SI secretary Lawrence Small, deputy secretary Sheila Burke, under Secretary David Evans, executive assistant to the Secretary, James Hobbins, and director of Special Events Nikki Krakora.

Secretary Small welcomed the regents at their arrival at the Tupper Center on Tuesday, January 10, and director Ira Rubinoff presented a general overview of STRI history and research.

Researchers and other members of the STRI staff guided and briefed the visitors about our activities and research projects at Tupper, the STRI Library, BCI, Gamboa, Bocas del Toro, Naos Island Laboratory,

Culebra, and Fort Sherman. They also visited Casco Antiguo, the Canal Museum, Miraflores Locks, and took the train to Colon and back to the historical Frijoles Train Station (photo below).

Members of Fundación Smithsonian de Panamá hosted the group at STRI's Marine Exhibition Center in Culebra with members of the local business community, STRI researchers and administration



More arrivals

Timothy Billo, University of Washington, to study the hormonal and neural control of a sexually dimorphic behavior.

Julia Mayo, Universidad Complutense de Madrid, to small-scale architecture in pre-Columbian Panama, at Naos.

Paula Mejia, University of Florida, to study the geological history of Neotropical forests, with the CTFS.

Henry Stockwell and David Grant, Schiele Museum, NC, to study treehoppers of Panama (Hemiptera: Membracidae), on BCNM and other places in Panama.

STRI in the news

“Classic symbiotic relationship between ants, bacteria” by the University of Wisconsin. 2006. *Newswise* Jan 4.

“Study reveals classic symbiotic relationship between ants, bacteria” by the University of Wisconsin. 2006. *EurekAlert!* Jan 5.

“Ants use antibiotics to fight pests” by Bjorn Carey. 2006. *Live Science* Jan 6.

“Do ants hold key to drug resistance?” by Susanne Rust. 2006. *Milwaukee Journal Sentinel, The Kansas City Star, Grand Folk Herald, The Charlotte Observer, Belleville News Democrat, Contra Costa Times, Lexington Herald Leader, The State, The Sun Herald, Ledger Enquirer, The Sun News* Jan 9.

“Encuentro de científicos en Panamá” by Omaira De León. 2006. *Panamá América* Jan 10.

“Clever ants may hold the secret to antibiotic resistance.” 2006. *NewsMedical.com* Jan 11.



Ibáñez



Jackson



Spoon



Sant

officials. The visit to Culebra was attended by former presidents Nicolás Ardito Barletta and Ernesto Pérez Balladares. Panamanian president Martín Torrijos and first lady Vivian de Torrijos held a reception at Palacio de las Garzas on Wednesday night to meet with the regents and SI and STRI officials. US ambassador William Eaton offered a farewell dinner at his residency.



Los congresistas Xavier Becerra y Ralph Regula, y Manuel L. Ibáñez, Shirley Ann Jackson, Robert P. Kogod, Roger W. Sant y Allen G. Spoon y familiares visitaron las instalaciones de STRI en el Istmo de Panamá con el secretario de SI, Lawrence

Small, la subsecretaria Sheila Burke, el subsecretario para Ciencias David Evans, el asistente ejecutivo James Hobbins, y la directora de Eventos Especiales Nikki Krakora.

El secretario Small le dió la bienvenida a los regentes a su llegada al Tupper el martes, 10 de enero, y el director Ira Rubinoff presentó un panorama general de la historia y las investigaciones de STRI.

Investigadores y otros miembros del personal de STRI guiaron a los visitantes y les hablaron de proyectos de investigación y otras actividades de STRI, en Tupper, la Biblioteca, BCI, Gamboa, Bocas del Toro, el Laboratorio de Isla Naos, Culebra y Fuerte Sherman. También visitaron el Casco Antiguo, el Museo del Canal, las Esclusas de Miraflores, y tomaron el tren a Colón y de vuelta hasta la histórica Estación de Tren de Frijoles.

Miembros de la Fundación Smithsonian de Panamá recibieron al grupo en el Centro de Exhibiciones Marinas de



Culebra y otros miembros de la comunidad empresarial de Panamá, los investigadores de STRI y funcionarios de la administración. En la visita a Culebra estuvieron presentes los ex-presidentes Nicolás Ardito Baletta y Ernesto Pérez Balladares. El presidente Martín Torrijos y la primera dama Vivian de Torrijos ofrecieron una recepción en el Palacio de las Garzas para reunirse con los regentes y funcionarios de SI y STRI el miércoles por la noche. El embajador de EU, William Eaton, los despidió con una cena en su residencia.



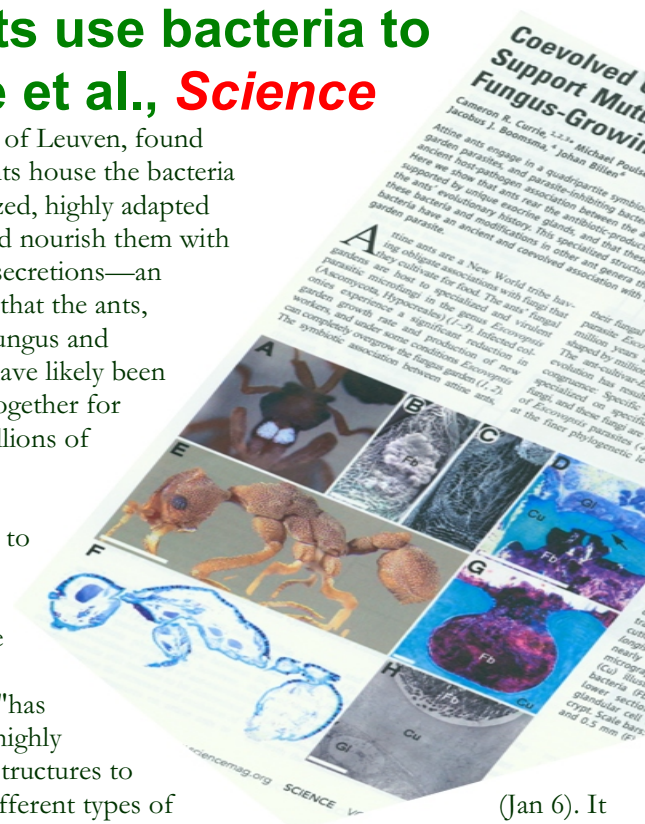
Fungus-growing ants use bacteria to kill parasites: Currie et al., *Science*

Ants that tend and harvest gardens of fungus have a secret weapon against the parasites that invade their crops: antibiotic-producing bacteria that the insects harbor on their bodies.

The article "Coevolved crypts and exocrine glands support mutualistic bacteria in fungus-growing ants" authored by Cameron Currie, with the University of Wisconsin, Madison, the University of Kansas, and STRI, Michael Poulsen from the University of Wisconsin, John Mendenhall, from the University of Texas at Austin, Jacobus J. Boomsma STRI visiting scientist from the University of Copenhagen, and Johan Billen from the Catholic

University of Leuven, found that the ants house the bacteria in specialized, highly adapted cavities and nourish them with glandular secretions—an indication that the ants, bacteria, fungus and parasites have likely been evolving together for tens of millions of years.

According to Currie, every ant species the team has examined "has different, highly modified structures to support different types of bacteria." The article was published in *Science*



(Jan 6). It was distributed by staff scientist Neal G. Smith.

Zeh and Zeh: Outbred embryos rescue inbred half-siblings in mixed-paternity broods of life-bearing females: *Nature*



Jeanne A. Zeh and David W. Zeh, former STRI fellows and visiting scientists from the University of Nevada doing research in Gamboa just published "Outbred embryos rescue inbred half-siblings in mixed-paternity broods of life-bearing females in this week's issue of *Nature* (January 12).

The following "Editor's summary" was taken from www.nature.com

"The ins and outs of breeding
Females that mate promiscuously can produce broods of young fathered by

more than one male. New research in a live-bearing pseudoscorpion indicates that multiple paternity can be beneficial for females that cannot avoid mating with close relatives. In live-bearing species, inbreeding not only increases the risk of recessive diseases but can also disrupt the cross-talk between mother and fetus necessary for embryonic development. Inbreeding results in high rates of spontaneous abortion in live-bearing pseudoscorpions. However, when females are mated to both a brother and a non-relative, the presence of outbred embryos rescues inbred half-siblings and carries the entire brood successfully to term."

New publications

Currie, Cameron R., Poulsen, Michael, Mendenhall, John, Boomsma, Jacobus J., and Billen, Johan. 2006. "Coevolved crypts and exocrine glands support mutualistic bacteria in fungus-growing ants." *Science* 311: 81-83.

Kelber, Almut, Warrant, Eric J., Ptiff, Michael, Wallen, Rita, Theobald, Jamie C., and Weislo, William T. 2006. "Light intensity limits foraging activity in nocturnal and crepuscular bees." *Behavioral Ecology* 17(1): 63-72.

Lewis, Simon L., Phillips, Oliver L., Baker, Timothy R., Lloyd, Jon, Malhi, Yadvinder, Almeida, S., Higuchi, Niro, Laurance, William F., Neill, D., Silva, Natalino A., Terborgh, John W., Lezama, A. Torres, Brown, Sandra, Vasquez, R., Chave, Jerome, Kuebler, C., Nunez, P., and Vinceti, Barbara. 2005. "Late twentieth-century trends in the structure and dynamics of South American forests." In: Yadvinder Malhi, and Phillips, Oliver L. (Eds.), *Tropical forests and global atmospheric change*. 143-154. Oxford: Oxford University Press.

Stapley, Jessica, and Whiting, Martin J. 2006. "Ultraviolet signals fighting ability in a lizard." *Biological Letters Online*.

Styrsky, Jennifer Nesbitt, Brawn, Jeffrey D., and Robinson, Scott K. 2005. "Juvenile mortality increases with clutch size in a Neotropical bird." *Ecology* 86(12): 3238-3244.

Zeh, Jeanne A., and Zeh, David W. 2006. "Outbred embryos rescue inbred half-siblings in mixed-paternity broods of life-bearing females." *Nature* 439(7073): 201-203.

science in
progress:

The future of frogs may lie in studying their past

“My pure research of the origins of frog diversity has taken on a new applied urgency” says Andrew J. Crawford, STRI postdoctoral fellow in Molecular Evolution (at left in the photo).

Crawford uses genetic analyses to understand the historical and ecological forces behind frog diversity and the formation of frog communities. Using molecular tools he and colleagues César Jaramillo (right) and Roberto Ibáñez, are discovering new frog species while witnessing the rapid disappearance of frogs from Panama.

Panama faces decline and possible extinction of entire ecological communities of amphibians by a pathogenic chytrid fungus. The pathogen has not yet crossed the Panama Canal. Species conservation efforts, including captive breeding, focus now on highlands of central Panama. However, explains Crawford, “conserving species will be limited by our

ability to accurately identify species and characterize their geographic ranges.”

Crawford, STRI’s Eldredge Bermingham, and other colleagues have shown through genetic studies that central Panama is often a center of diversity within named species. Especially in frogs, they have found a multiplicity of previously unrecognized species that were obscured by current taxonomy.

This year, Crawford hopes to accelerate the discovery process through DNA bar-coding efforts supported by rigorous, specimen-based systematics and taxonomy, including comparative data from neighboring Costa Rica and Colombia.

“Mis investigaciones básicas sobre el origen de la diversidad de ranas ha adquirido una nueva urgencia aplicada” asegura Andrew J. Crawford, becario posdoctoral de STRI en Evolución Molecular (a la izquierda en la foto).

Crawford utiliza análisis genéticos para entender las fuerzas ecológicas e históricas detrás de la diversidad de ranas y la formación de sus comunidades. Con

herramientas moleculares, Crawford y colegas César Jaramillo (derecha) y Roberto Ibáñez están descubriendo nuevas especies de ranas, mientras que observan la rápida desaparición de ranas en Panamá.

Panama enfrenta una disminución y posible extinción de comunidades ecológicas enteras de anfibios debido a un hongo *Critidiomyceto* patógeno. Este patógeno aún no cruza el Canal de Panamá.

demostrado, que Panamá central es con frecuencia un centro de diversidad dentro de ciertas especies. Estos investigadores han descubierto una multiplicidad de especies previamente desconocidas, particularmente ranas, que la taxonomía actual mantenían en la oscuridad.

Este año, Crawford espera acelerar el proceso para descubrir nuevas especies con el uso de códigos de barras de ADN y el apoyo de una sistemática rigurosa basada en especímenes y taxonomía, incluyendo información comparativa de los vecinos países de Colombia y Costa Rica.

Story:
Andrew J. Crawford
Edited by ML Calderon
Photo: MA Guerra

Los esfuerzos de conservación de especies que incluye la cría en cautiverio, se enfocan ahora en tierras altas de Panamá central. Sin embargo, explica Crawford, “la conservación de especies estará limitada por nuestra habilidad de identificar con certeza a las especies y caracterizar sus rangos geográficos.

A través de estudios genéticos, Crawford, Eldredge Bermingham de STRI, y otros colegas han