Tupper 4pm seminar

Tue, May 8, 4pm seminar speaker will be William Laurance, STRI
Impacts of roads and hunting on African rainforest mammals

Paleo-Talk

Wed, May 9, 4pm, Paleo-Talk speaker is Alexander Correa
8000 years of climatic variability in the Amazonian Piedmont in Peru

Bambi seminar

Thu, May 10, Bambi seminar speaker will be Andrew Ugan, University of Utah
How low can we go? Testing the use of stable carbon and nitrogen isotopes from prehistoric animal bone as markers of short-term climate change

Arriving next week

Noelle Beckman, University of Minnesota, to study "What are the relative roles of mammals, insects, and pathogens in seed removal and seed survival at the pre-dispersal stage", in Gamboa.

Natalia Biani, University of Texas at Austin, to study interspecific social parasitism in nocturnal bees: *Megalopta ecuadoria*, *M. genalis* and *M. byroni* (Hymenoptera, Halictidae), at Naos.

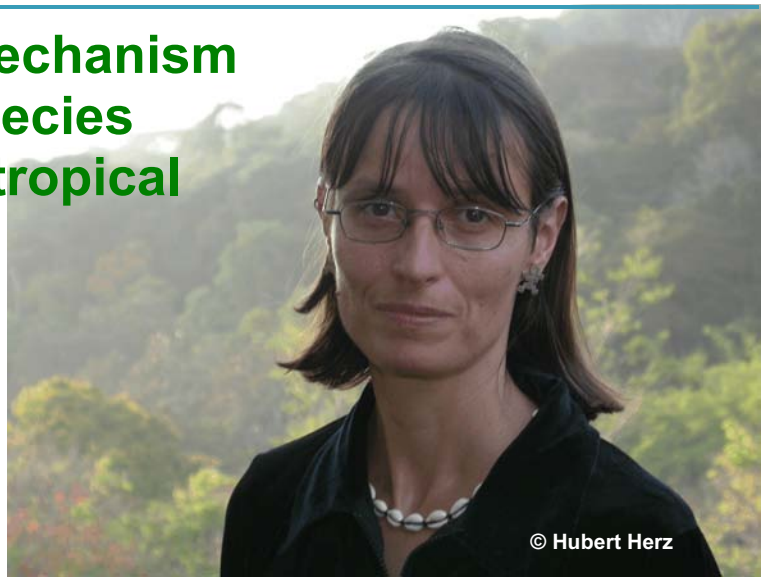
Jonathan Shik, to carry out a study of army ant diversity and impact across four tropical forests, on BCI.

Boris Baer, Jacobus Boomsma and Henrik De Fine, to study the evolutionary ecology of fungus growing ants, in Gamboa.

Jonathan Drury, to work on BCI Forest Dynamics Plot.

Smithsonian Tropical Research Institute, Panamá www.stri.org May 4, 2007

Drought is a mechanism determining species distribution in tropical rain forests



Drought tolerance is a critical determinant of tropical plant distributions, reports the article in *Nature* (May 3) "Drought sensitivity shapes species distribution patterns in tropical forests" by Bettina Engelbrecht, research associate at STRI and the University of Kaiserlauten in Germany (photo at right), Lisa Comita, from the University of Georgia, STRI scientists Rick Condit, Ben Turner and Steve Hubbell and STRI research associates Tom Kursar, and Melvin Tyree.

The authors examined the role of drought for the distribution of tropical rainforest shrubs and trees. Tropical forests are not usually associated with drought, but actually most tropical forests are exposed to one or even two dry seasons, and during these dry periods, plants can suffer from the lack of water. They grow less, wilt or even die.

The authors examined to what extent the tolerance of plants to drought, combined with the variation of the availability of water at different scales—both local and regional— is important for the distribution of plant species in humid forests, or if other factors such as light or nutrients might be more important.

"The key novelty of our study is that we were able to quantitatively link experimental and observational results to examine if drought tolerance really is a 'mechanism' determining the distribution of species in tropical rain forest" said Bettina.

"In the tropics, climate change does not just mean temperature change-dramatic shifts in rainfall patterns also are expected to occur" said Turner, "Our research shows that changes in rainfall patterns will have considerable consequences for tropical forests."

The article, distributed by Neal Smith, has been reviewed in many important news services including *Nature podcast*, at: **www.nature.com/nature/podcast/v447/n7140/nature-2007-05-03.html**

La tolerancia a la sequía es una determinante clave en la distribución de plantas tropicales, informa el artículo "La tolerancia a la sequía moldea los patrones de distribución de especies" publicado por *Nature* (mayo 3) por Bettina Engelbrecht, investigadora asociada a STRI y la Universidad de Kaiserlauten (en la foto), Lisa Comita, de la Universidad de Georgia, los científicos de STRI Rick Condit, Ben Turner y Steve Hubbell, e investigadores asociados Tom Kursar y Melin Tyree.

Los autores examinaron el rol de la sequía en la distribución de árboles y arbustos tropicales. Los bosques tropicales no se asocian usualmente con sequías, pero en realidad, más bosques tropicales están expuestos a una o dos estaciones secas, y durante estos períodos, las plantas pueden sufrir mucho

More arrivals

Judy Guinan, Eileen Hudson and Beth Meyer, Michigan State University, to participate at an Environmental Biology course in Panama, in Gamboa.

STRI in the news

"Forest tree distribution affected by drought, study says" by By Greg Lavine. 2007. *The Salt Lake Tribune* May 3.

"Water main: precipitation –not light or nutrients- determines which tropical trees thrive" David Biello. *Scientific American.com*

"Drought limits tropical plant distributions, scientists report." 2007. Physorg.com "Drought tolerance limits tropical plant distributions" 200. *Scientific bloging*: May 3.

New publications

Engelbrecht, Bettina M. J., Comita, Liza S., Condit, Richard, Kursar, Thomas A., Tyree, Melvin T., Turner, Benjamin L., and Hubbell, Stephen P. 2007. "Drought sensitivity shapes species distribution patterns in tropical forests." *Nature* 447(7140): 80-82.

Kuris, Armand M., Goddard, Jeffrey H.R., Torchin, Mark E., Murphy, Nicole, Gurney, Robert, and Lafferty, Kevin D. 2007. "An experimental evaluation of host specificity: The role of encounter and compatibility filters for a rhizocephalan parasite of crabs." *International Journal for Parasitology* 37(5): 539-545.

Marussich, Wendy A., and Machado, Carlos A. 2007. "Host-specificity and coevolution among pollinating and nonpollinating New World fig wasps." *Molecular Ecology* 16(9): 1925-1946.

por falta de agua: crecen menos, se debilitan e incluso mueren.

Los autores examinaron hasta qué punto la tolerancia de las plantas a la sequía, combinada con la variación en la disponibilidad de agua a diferentes escalas—local y regional—es importante para la distribución de especies de plantas en los bosques húmedos, o si otros factores como la luz o los nutrientes son más importantes.

"La novedad clave de nuestro estudio es que pudimos asociar cuantitativamente los resultados experimentales y de observaciones para examinar si la tolerancia a la sequía es realmente un mecanismo que determina la distribución de especies en los bosques tropicales" asegura Engelbrecht.

"En los trópicos, el cambio climático no sólo significa temperatura, también debemos esperar la sucesión de cambios dramáticos en los patrones de lluvia" comenta el científico de STRI, Ben Turner.

El artículo, distribuido por Neal Smith ha sido reseñado por varios servicios de noticias importantes, incluyendo *Nature podcast.*

Five new species from the tropical eastern Pacific

Five new species of aeolid nudibranchs are described in the article "Five new species of aeolid nudibranchs (Mollusca, Opisthobranchia) from the tropical eastern Pacific" by STRI visiting scientist Alicia Hermosillo from the University of Guadalajara, Mexico, and Angel Valdés from the Natural History Museum of Los Angeles County, California. The article was published by the *American Malacological Bulletin* (22: 119-137). Available from: **calderom@si.edu**

The new species are described based on specimens collected at several localities of the tropical eastern Pacific, from Isla Isabela, Nayarit, Mexico to Parque Nacional de Coiba, Panama. Three of the new species belong to the genus *Cuthona* Alder and Hancock, 1855: *Cuthona destinyae*, *Cuthona millenae* and *Cuthona behrensi*; one to *Eubranchus* Forbes, 1838: *Eubranchus yolandae*, and one to *Cerberilla* Bergh, 1873, la *Cerverilla chavezi*. An additional species, possibly belonging to the genus *Herviella* Baba, 1949 is not named because of the lack of adequate anatomical information.

Roberto Chavez and Buceo Vallartech, Puerto Vallarta, México and Ross Robertson and STRI funded the fieldwork onboard the *R.V. Urracá.*

Cinco nuevas especies de nudibranquios aeólidos (babosas de mar) aparecen descritas en el artículo "Five new species of aeolid nudibranchs (Mollusca, Opisthobranchia) from the tropical eastern Pacific" [Cinco especies nuevas de nudibranquios aeólidos (Mollusca, Opistobranquia) del Pacífico oriental tropical] de Alicia Hermosillo visitante en STRI de la Universidad de Guadalajara, México, y Angel Valdés, del Museo de H istoria Natural del Condado de Los Angeles, California. El artículo es del *American Malacological Bulletin* (vol. 22:119-137).

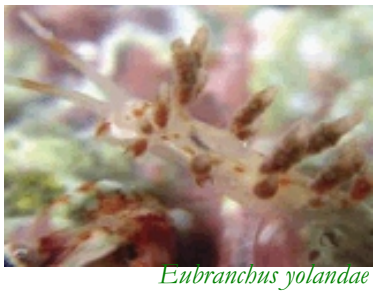
La descripción de las nuevas especies se llevó a cabo con especímenes encontrados en varios lugares en el Pacífico oriental tropical, desde Isla Isabella en México hasta el Parque Nacional de Coiba en Panamá. Tres de las nuevas especies pertenecen al género *Cuthona* Alder y Hancock, 1855: *Cuthona destinyae*, *Cuthona millenae* y *Cuthona behrensi*: uno a *Eubranchus* Forbes, 1838: *Eubranchus yolandae*, y uno a *Cerberilla* Bergh, 1873: *Cerverilla chavezi*. Una especie adicional, posiblemente del género *Herviella* Baba, 1949 no ha sido bautizada debida a la falta de información anatómica.

Roberto Chávez y Buceo Vallartech de Puerto Vallarta, México y Ross Robertson y STRI patrocinaron el trabajo de campo a bordo del *R.V. Urracá.*

Cuthona destinyae

Cuthona millenae

Cuthona behrensi



Eubranchus yolandae

Cerverilla chavezi

More publications

Morris, W.F., Hufbauer, R.A., Agrawal , A.A., Bever, J.D., Borowicz, V.A., Gilbert, Gregory S., Maron, J.L., Mitchell, C.E., Parker, Ingrid M., Power, A.G., Torchin, Mark E., and Vázquez, D.P. 2007. "Direct and interactive effects of enemies and mutualists on plant performance: a meta-analysis." *Ecology* 88(4): 1021–1029.

Quek, S. Peck, Davies, Stuart James, Ashton, Peter S., and Pierce, Naomi E. 2007. "The geography of diversification in mutualistic ants: a gene's-eye view into the Neogene history of Sundaland rain forests." *Molecular Ecology* Online.

Smith, Adam R., Wcislo, William T., and O'Donnell, Sean. 2007. "Survival and productivity benefits to social nesting in the sweat bee *Megalopta genalis* (Hymenoptera: Halictidae)." *Behavioral Ecology and Sociobiology* Online.

Sousa, Wayne P. 2007. "Mangrove forest structure and dynamics, Punta Galeta, Panama." Bulletin of the Ecological Society of America 88(1): 46-49.

Sousa, Wayne P., Kennedy, P.eter G., Mitchel, Betsy J., and Ordonez, Benjamin. 2007. "Supply-side ecology in mangroves: Do propagule dispersal and seedling establishment explain forest structure?" *Ecological Monographs* 77(1): 53-76.

Wishnie, Mark H., Dent, D.H., Mariscal, E., Deago, Jose, Cedeno, Norma, Ibarra, D., and Ashton, Peter S. 2007. "Initial performance and reforestation potential of 24 tropical tree species planted across a precipitation gradient in the Republic of Panama." *Forest Ecology and Management* 243(1): 39–49.

STRI hosts ANAM officials

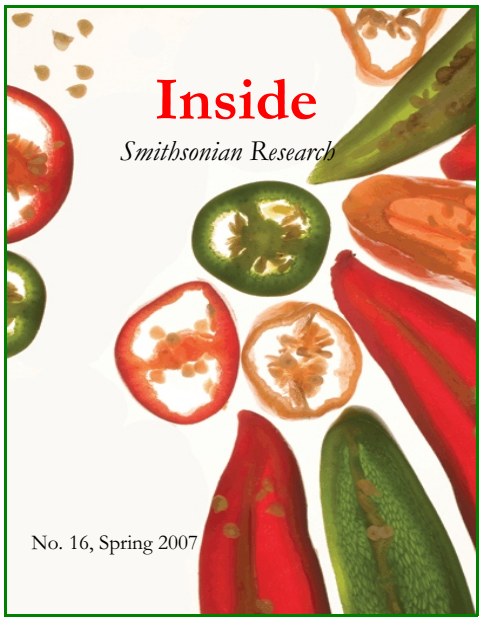
Forty officials from Panama´s Environmental Authority (ANAM) organized a visit STRI on Tuesday, April 24th, to meet with STRI scientists and discuss topics relevant to their work as decision makers and technicians.

Diana Laguna, ANAM director of Informatics (left) and Nélida Gómez, STRI Academic Programs Coordinator, welcomed the group, followed by talks by Jefferson Hall, director of STRI´s PRORENA on environmental services provided by the Panama Canal Watershed; Rolando Péerez, on studies and long-term tree censusses of tropical forests, Milton García, on the generation of basic information as an useful tool in decision making for environmental issues, and Catherive Potvin, on avoided deforestation. Each talk was followed by a stimulating session of questions and answers. Fifteen members of the STRI staff participated in the event.

Cuarenta funcionarios de la Autoridad Nacional del Ambiente de Panamá (ANAM) organizaron una visita a STRI el martes 24 de abril, para reunirse con investigadores de STRI y discutir tópicos relacionados con su trabajo como tomadores de decisiones y técnicos ambientales.

Diana Laguna, directora de Informática de la ANAM (a la izquierda en la foto) y Nélida Gómez, coordinadora de la Oficina de Programas Académicos de STRI les dieron la bienvenida a los participantes. Seguidamente escucharon charlas por Jefferson Hall, director de PRORENA de STRI, sobre los servicios ambientales que presta la Cuenca del Canal de Panamá; Rolando Pérez, del Centro de Ciencias Forestales del Trópico de STRI, sobre estudios y censos de árboles a largo plazo en bosques tropicales; Milton García, del Proyecto de Fisiología Vegetal de STRI, sobre la generación de información básica útil como herramienta en la toma de dediciones en temas ambientales; y Catherine Potvin, de la Universidad de McGill, sobre la deforestación evitada.

Al final de cada charla se dieron estimulantes sesiones de preguntas y respuestas. Quince miembros del personal de STRI participaron en el evento..



STRI in the News

***Inside Smithsonian Research*, published quarterly by the Smithsonian Office for Public Affairs, published two articles about STRI:**

Chili pepper starch grains linked to ancient settlement sites across the Americas, by Donald Smith
http://www.si.edu/opa/insideresearch/articles /V16_ChiliPepper.html

Forest Science
http://www.si.edu/opa/insideresearch/articles /V16_NewsNotes.html

Workers of the World: Unite!

Story: Bill Wcislo
Edited by M Alvarado & ML Calderon
Photos: MA Guerra

Social insects are among the most ecologically dominant and evolutionarily successful terrestrial animals. Why? Their success is thought to be associated with their way of organizing work within their social systems: only one or a few individuals reproduce, while the others cooperate as non-reproductive workers.

This division of labor is thought to generate efficiencies due to the economics of large-scale organization. It also has consequences for how organisms gather information about their world.

The goal of a Panama´s SENACYT-funded project by Bill Wcislo (inset photo at right) and Adam Smith (shown looking for nests along with an intern on the project, Margarita Lopez) is to study factors associated with the transition from solitary living to social cooperation among nocturnal sweat bees, and the consequences of such a transition.

Such studies are possible with *Megalopta* bees (inset photo) because females either live alone, or in social groups. The project aims to answer three questions:

Why do some bees start their own nests rather than staying at home with their mothers as oppressed workers?

What factors shape the expression of social behavior?

Do bees of different behavioral classes exhibit different patterns of brain development?

Ecológica y evolutivamente, los insectos sociales están entre los animales más exitosos de la tierra.

¿Por qué? Se cree que su éxito se relaciona con la forma en que organizan su trabajo dentro de sistemas sociales: solo uno o pocos individuos se reproducen, mientras que los demás cooperan como trabajadores. También se piensa que esta división del trabajo genera eficiencia al ser económica para organizaciones de gran tamaño. También tiene consecuencias en la forma en que los organismos obtienen la información sobre su ambiente.

El objetivo de un proyecto financiado por SENACYT de Panamá, con Bill Wcislo (recuadro superior) y Adam Smith (quien observa nidos en la foto, junto con Margarita López, pasante del proyecto) es estudiar los factores asociados con la transición de una vida solitaria a la cooperación social entre abejas dulces nocturnas, y las consecuencias de dicha transición.

Estos estudios son posibles con abejas *Megalopta* (recuadro) debido a que sus hembras viven ya sea solas o en grupos sociales. El proyecto busca resolver tres interrogantes:

¿Por qué algunas abejas construyen sus propios nidos en vez de quedarse en casa con sus madres como obreras oprimidas?

¿Qué factores moldean la expresión del comportamiento social?

¿Exhiben las abejas que se comportan de forma diferente patrones de desarrollo cerebral diferentes?