# STRI news 2008

Smithsonian Tropical Research Institute, Panamá **www.stri.org** September 12, 2008

## Tupper 4pm seminar

Tuesday, September 16, 4pm seminar speaker will Egbert Giles Leigh, Jr., STRI
**What we have learned from CTFS plots?**

## Paleo-Talk

Wednesday, September 24, Paleo-talk speaker will be Nikki Strong, post-doctoral fellow at the CTPA
**Physical experiments in fluvial landscape dynamics**

## Bambi seminar

Thursday, September 18, Bambi seminar speaker will be Chava Weitzman.
**Conservation in the Bale Mountains National Park: A statistical analysis of population trends of the Ethiopian Wolf (*Canis simensis*)**

## Arrivals

Brendan Biggs and Heidi Guenther, Florida State University, to study the influence of competition, mutualism, and physical environment on patterns of sponge diversity and co-occurrence on Caribbean coral reefs and mangroves, on Bocas del Toro.

Benjamin Mason, Vassar College, and Rebecca Albright, University of Miami, to study the molecular ecology of photo reception in coral larvae, at Bocas.

## On leave

Marialuz Calderon and Marcos Guerra will be on leave from Monday, September 15 through Friday, September 26. Please send your news to Mónica Alvarado and your photo requests to Steve Paton

## STRI scientists named by Panama as distinguished and national researchers

STRI archaeologist and staff scientist Richard G. Cooke (right) and research associate Mahabir Gupta (not shown) from the University of Panama were named as distinguished researchers by Panama´s Sistema Nacional de Investigación 2008 [National Research System] of the National Secretariat for Science, Technology and Innovation (SENACYT.) The nominations were approved by Panama´s National Directive Council.

STRI postdoctoral fellow Hermógenes Fernández from the University of Puerto Rico (left), postdoctoral fellow Eloisa Lasso (above) working at Naos Island Laboratories and

postdoctoral research associate Omar López (shown on the next page) were nominated and accepted the category of national researcher.

Additional candidates that were nominated are under study. If accepted will also be announced by SNI, SENACYT.

El arqueólogo y científico permanente de STRI, Richard G. Cooke y el investigador asociado Mahabir Gupta, de la Universidad de Panamá fueron

# More arrivals

Gregory Goldsmith, University of California at Berkeley, to study plant responses to changes in cloudiness of a tropical montane cloud forest: connecting climate change to plant ecology in a sensitive ecosystem, in Fortuna.

Nicole Fogarty, Casey Terhorst and Don Levitan, Florida State University, to study coral spawning in *Montastraea annularis* complex, at Bocas.

Maya deVries, University of California at Berkeley, to study if morphological and functional specialization always go hand-in-hand. Feeding morphology and ecology in mantis shrimp (Stomatopoda), at Galeta, Naos and Bocas.

Michael Draney, Vicky Medland, Ronald Eichhorn, Andrew Mckenna Foster, Joan Berkopec from the University of Wisconsin-Green Bay, Glavis Edwards, Florida State Collection of Arthropods, and Junxia Zhang, British Columbia University, to study rapid assessment protocols for spiders and millipedes, in Galeta, Gamboa, Bocas and Fortuna.

# Departures

Elizabeth Sanchez, Ricardo Beteta and Joyce Robert to Washington DC, on official business at SI.

José Ramón Perurena to Las Vegas, Nevada, to participate a at radiation safety officer training course.

# New publications

Adair Gotaway, Patricia. 2008. "Reproductive compensation." *Journal of Evolutionary Biology* 21(5): 1189-1200.

nombrados como investigadores designados por el Sistema Nacional de Investigación-SNI 2008 de la Secretaría Nacional de Investigación, Ciencia y Tecnología (SENACYT) y aprobados por el Consejo Directivo Nacional.

Hermógenes Fernández (izquierda, primera página), becario postdoctoral de STRI de la Universidad de Puerto Rico, Eloisa Lasso (centro, primera página), becaria postdoctoral en los Laboratorios de Isla Naos y Omar López (a la derecha), investigador asociado postdoctoral fueron nominados y aceptados en la categoría de investigadores nacionales. Otros candidatos que fueron nominados se encuentran aún bajo consideración. De ser aceptados, SNI, SENACYT anunciará sus nombres.

# From the Office of BioInformatics (OBio)

The Office of Bioinformatics (OBio) would like to announce two new web sites.

The first site **(biogeodb.stri.si.edu/bioinformatics/croat/home)** is based on the Thomas Croat book, "The Flora of Barro Colorado Island" The entire book as been scanned and converted to text and is searchable by family, genus and species. The site also includes all introductory sections, keys and appendices.

The second website is our new GIS Data Portal **(mapserver.stri.si.edu/geonetwork).**

The objective of the web site is to become the central location for all of STRI's geospatial resources. By providing easier and more comprehensive access to STRI's geospatial data, we hope to greatly facilitate GIS activities at STRI. The portal currently hosts all of the OBio's georeferenced maps and GIS coverage.

Contributions are welcome. For questions and comments please contact Milton Solano at solanom@si.edu.

La Oficina de BioInformática (OBio) se complace en anunciar dos nuevos sitios de web.

El primero es: **biogeodb.stri.si.edu/bioinformatics/croat/home**

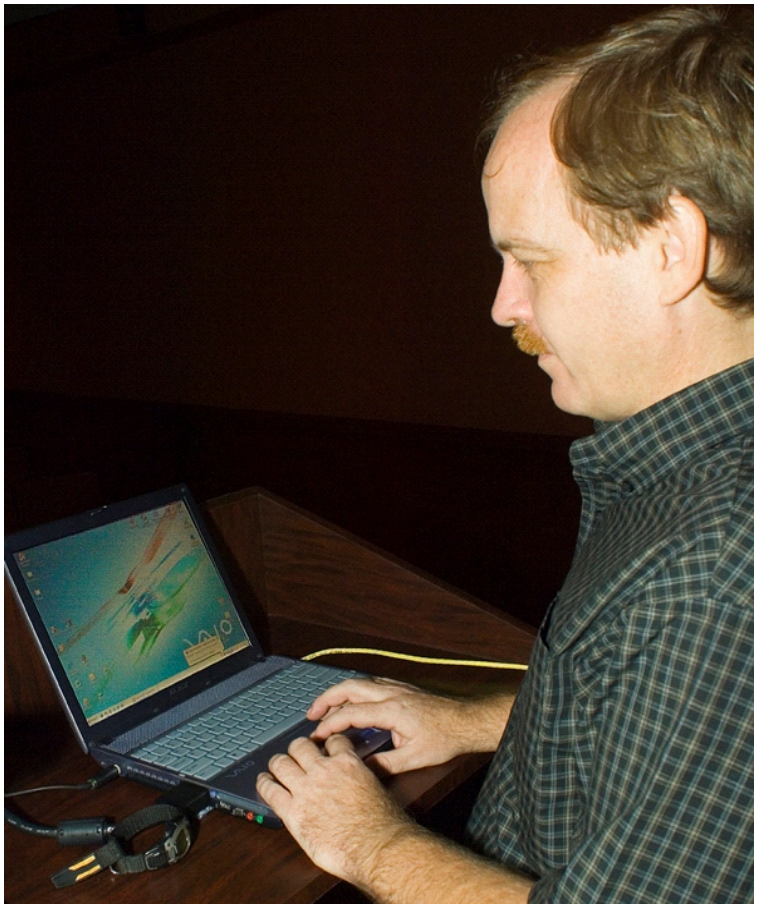
La página tiene base en el libro de Thomas Croat, *Flora of Barro Colorado Island* [La flora de la Isla de Barro Colorado]. Todo el contenido del libro está escaneado y convertido a texto y se puede buscar por familia, género y la especie.

El sitio también incluye todas las secciones introductorias, claves y apéndices.

El segundo sitio de web es nuestro Portal de Data GIS: **mapserver.stri.si.edu/geonetwork**

El objetivo de este sitio es convertirse en el punto central de todos los recursos geoespaciales de STRI. Al suministrar total acceso a la información geoespacial de STRI, esperamos facilitar las actividades GIS del Instituto. El portal maneja actualmente todos los mapas georeferenciales de OBio y las cuberturas GIS.

Se agradecerán las contribucines. Para comentarios y preguntas, favor ponerse en contacto con Milton Solano a solanom@si.edu.



# More publications


Baker, Timothy R., Phillips, Oliver L., Laurance, William F., Pitman, Nigel C.A., Almeida, Samuel, Arroyo, Luzmila, Di-Fiore, Anthony, Erwin, Terry L., Higuchi, Niro, Killeen, Timothy J., Laurance, Susan G., Nascimento, Henrique E.M., Monteagudo, Abel, Neill, David A., Silva, Jose Natalino Macedo, Malhi, Yadvinder, Lopez-Gonzalez, G., Peacock, J., Quesada, Carlos Alberto, Lewis, Simon L., and Lloyd, Jon. 2008. "Do species traits determine patterns of wood production in Amazonian forests?" *Biogeosciences Discussions* 5(4): 3593-3621.

Bayona, German, Cortes, Martin, Jaramillo, Carlos, Ojeda, German, Aristizabal, John Jairo, and Reyes-Harker, Andres. 2008. "An integrated analysis of an orogen- sedimentary basin pair: Latest Cretaceous-Cenozoic evolution of the linked Eastern Cordillera orogen and the Llanos foreland basin of Colombia." *Geological Society of America Bulletin* 120(9-10): 1171-1197.

Cernusak, Lucas A., Winter, Klaus, Aranda, Jorge, and Turner, Benjamin L. 2008. "Conifers, angiosperm trees and lianas: growth, whole-plant water and nitrogen use efficiency, and stable isotope composition ($\delta^{13}C$ and $\delta^{18}O$) of seedlings grown in a tropical environment1[W][OA]." *Plant Physiology* 148(1): 642-659.

MacDonald, James A. 2008. Variation among mangrove forests as fish habitat: The role of prop-root epibionts, edge effects and behavior in Neotropical mangroves. Rutgers University, New Brunswick, NJ.

Taylor, Ryan C., Klein, Barrett A., Stein, Joey, and Ryan, Michael J. 2008. "Faux frogs: multimodal signalling and the value of robotics in animal behaviour." *Animal Behaviour* 76(3): 1089-1097.


# Sand sculpture workshop at Culebra

A sand sculpture workshop took place at the Crab Beach at Punta Culebra Nature Center in preparation for today´s contests in Veracruz, for students from schools in Casco Antiguo, Veracruz and San Carlos. The activity is part of the program to celebrate September, as Month of the Oceans.

A total of 46 children representing seven schools are participating in the contest.

Before starting the workshop, students and teachers were introduced by Culebra nature guides and docents to the subject of sand formation, since sand is not only to construct houses and buildings but is also part of the constant process of nature. Sand is formed by mineral and animal matter, and is habitat to many marine organisms. It protects the coasts from waves and high tides.

Un taller para esculpir figuras de arena se llevó a cabo en la Playa de los Cangrejos en el Centro Natural de Punta Culebra, en preparación para el concurso de hoy, viernes 12 de septiembre en Veracruz, con estudiantes de escuelas del Casco Antiguo, Veracruz y San Carlos. Este concurso es parte de las actividades que se realizan en celebración del mes de los océanos.

En total están participando 46 niños pertenecientes a siete escuelas. Antes de comenzar el ejercicio, los guías naturalistas y docentes de STRI introdujeron a los estudiantes y maestros ta Culebra al tema de la formación de la arena, ya que es un recurso importante no solo para construir casas y edificios sino también porque la arena es parte integral del proceso constante de la naturaleza, que esta formada por material de origen mineral y animal; es también el hábitat de muchos organismos marinos y es protector de las costas contra el oleaje.

# John Gibbons, science P.R.

Science Public Affairs specialist at the Smithsonian Institution Office of Public Affairs, was in Panama in August to attend the tropical extinction debate hosted by Bill Laurance and S. Joseph Wright and to visit STRI facilities.

Gibbons will encourage media coverage of the extinction debate in Washington at the National Museum of Natural History on January 12, 2009, which is being organized by STRI and the Office of the Undersecretary for Science.

John Gibbons, especialista en Relaciones Públicas de la Oficina de Asuntos Públicos de SI, estuvo en Panamá en agosto para asistir al debate sobre extinción tropical organizado por Bill Laurance y S. Joseph Wright, y para visitar STRI.

Gibbons promoverá la cobertura de los medios sobre el debate de extinción en Washington en el Museo de Historia Natural, el 12 de enero de 2009, que organiza STRI y la Oficina del Subsecretario para Ciencias.

Story: Katya Silvera
Edited by M Alvarado
ML Calderon
& Beth King
Photo: MA Guerra

# Tropical orchids: enjoying the Panamanian nightlife

Many tropical orchid species perform a unique type of photosynthesis called Crassulacean Acid Metabolism (CAM), whereby CO2 is taken up during the night rather than during the day as in most plants. This photosynthetic pathway is commonly associated with cactus and succulent species of the desert, and it helps plants deal with drought conditions. In tropical orchids, nocturnal CAM activity allows them to cope with intermittent water supply associated with living as epiphytes in the canopy.

PhD Candidate Katia Silvera, from the University of Nevada Reno, is studying the evolution of CAM in tropical orchids, by using stable isotopes to survey photosynthetic pathways in the complete flora of orchids of Panama and Costa Rica, and measuring the amount of organic acids accumulated in the leaves during the night to determine CAM activity. Her work also uses molecular approaches and phylogenetic analysis to understand the genetic mechanisms needed to evolve CAM photosynthesis in plants. Katia's work, in collaboration with Klaus Winter from STRI, has shown that up to 50% of tropical orchid species perform CAM, and that this pathway has evolved multiple times within the orchid family and has contributed to a large radiation event early in the Tertiary.

Orchids are a key focal group because they are the largest family of flowering plants, and because they exhibit a continuous distribution of C3 to CAM photosynthetic pathways in the tropics that can be used to understand photosynthetic plasticity in plants and explain adaptation to changing climatic conditions.

Muchas especies de orquídeas tropicales llevan a cabo un tipo único de fotosíntesis llamado Metabolismo de Acido Crasuláseo (CAM), donde el CO2 se obtiene durante la noche en vez del día, como en la mayoría de las plantas. La vía fotosintética se asocia comúnmente con cactus y especies suculentas del desierto, y ayuda a las plantas a lidiar con condiciones de sequía. En orquídeas tropicales, la actividad nocturna de CAM les permite lidiar con el suministro intermitente de agua asociada con la vida como epífitas en el dosel.

Katia Silvera, candidata a doctorado de la Universidad de Nevada en Reno, estudia la evolución de CAM en orquídeas tropicales usando isótopos estables para estudiar las vías fotosintéticas en toda la flora de orquídeas de Panamá y Costa Rica, y medir la cantidad de ácidos orgánicos acumulados en las hojas durante el tiempo de la noche para determinar la actividad CAM. Su trabajo también usa métodos moleculares y análisis filogenéticos para entender los mecanismos genéticos necesarios para llegar a la fotosíntesis en plantas.

El trabajo de Katia, en colaboración con Klaus Winter, de STRI, ha encontrado que hasta el 50% de las especies de orquídeas utilizan CAM, y que esta via ha evolucionado múltiples veces dentro de la familia de orquídeas y ha contribuido al extenso evento de radiación a principios del Terciario.

Las orquídeas son el grupo focal clave debido a que son una extensa familia de plantas con flores y porque exhiben una distribución continua de C3 a las vías de fotosíntesis CAM en los trópicos que se pueden usar para entender la plasticidad fotosintética en las plantas y explicar la adaptación a las condiciones de cambio climático.