

## CAM 2010

Monday, March 22 through Wednesday, March 24, STRI will hold the

**International Workshop on Crassulacean Acid Metabolism: Evolution, Metabolic Control, Ecophysiology, Climate Change, Biofuels**

organized by Klaus Winter, at the Tupper Center. See the program at:

[www.stri.org/english/PDFs/Program\\_CAM2010.pdf](http://www.stri.org/english/PDFs/Program_CAM2010.pdf)

## Tupper 4pm seminar

Tuesday, March 23, Tupper seminar speaker will be Amalia Herrera, STRI

**Phylogeny of the genus Cupuladria (Bryozoa: Cheilostomata) in the Neogene of tropical America**

## Paleo-Talk

Wednesday, March 24, Paleo-talk speaker will be Juan Camilo Restrepo, Centro de Investigaciones Oceanográficas e Hidrográficas de Colombia, 4pm, CTPA **Deltas del Pacífico suroccidental de Colombia: morfodinámica y cambio ambiental reciente**

## Bambi seminar

Please check your e-mails for information on the next Bambi seminar on BCI.

## Charla del Mes

Thursday, March 25, the monthly talk speaker will be Giselle Muschett, Fundación Smithsonian

**Los manatíes del Lago Gatún**

Hotel Meliá Panama Canal, 7pm, Colón



Smithsonian Tropical Research Institute, Panamá

[www.stri.org](http://www.stri.org)

March 19, 2010

## Royal secrets to guard the 'family jewels'

Leafcutter ant queens can live for twenty years, fertilizing millions of eggs with sperm stored after a single day of sexual activity.

Danish researchers who have studied ants at STRI discovered that in the case of and ant and bee species in which queens have multiple mates, a male's seminal fluid favors the survival of its own sperm. However, once sperm has been stored, leafcutter ant queens neutralize male-male sperm competition with glandular secretions in their sperm-storage organ.

According to Jacobus Boomsma professor at the University of Copenhagen and research associate at STRI, there are two things going on here: "Right after mating, there is competition between sperm from different males. Sperm is expendable. Later, sperm becomes very precious to the female who will continue to use it for many years to fertilize her own eggs, producing the millions of workers it takes to maintain her colony."

Together with Susanne den Boer in Copenhagen and Boris Baer at the University of



Photos: Boris Baer

Western Australia, Boomsma studied sperm competition in sister species of ants and bees that mate singly or with several males. Their results, published in *Science* (March 19), offer two novel insights into the way in which sexual conflict may have affected the management of these remarkable natural sperm banks inside queens.

Las reinas de las arrieras pueden vivir hasta por 20 años, y fertilizar millones de huevos con espermatozoides almacenados luego de un solo día de actividad sexual.

Investigadores daneses que han estudiado hormigas en STRI, descubrieron que en especies de hormigas y abejas donde las reinas copulan con múltiples machos, el fluido seminal de un macho solo favorece la supervivencia de la vida de su propio espermatozoides. Sin embargo, una vez las reinas de las arrieras almacenan el espermatozoides en su órgano especializado, se producen secreciones glandulares para

para neutralizar la competencia de espermatozoides de diferentes machos.

De acuerdo a Jacobus Boomsma, profesor en la Universidad de Copenhague e investigador asociado en STRI, hay dos procesos andando: "Justo después de copular hay competencia entre el espermatozoides de machos diferentes. Luego, el espermatozoides es muy valioso para la reina que continuará usándolo por muchos años para producir los millones de obreras que deberán mantener su colonia."

Junto con Susanne den Boer en Copenhague y Boris Baer en la Universidad del Oeste de Australia, Boomsma estudia la competencia del espermatozoides en especies hermanas de arrieras y abejas que copulan con uno o varios machos. Sus resultados, publicados por *Science* (19 de marzo) arrojan luces sobre cómo la competencia sexual ha afectado la conducta en estos maravillosos bancos naturales de espermatozoides dentro de las reinas.

## Arrivals

Bart Kranstauber, Max-Planck-Institute for Ornithology, to participate, as an instructor, in the 2010 Princeton Field Course.

Veronika Cottontail and Sarah Grun, University of Ulm, Germany, to participate in comparisons of behavior, physiology and ecology of sympatric bat species, on BCI.

Xiaojuan Liu, Institute of Botany, Chinese Academy of Sciences, to participate in a collaborative research on seed dispersal by wind and plant recruitment in tropical forests: An interdisciplinary investigation across multiple scales, on BCI.

Thomas Eltz and Klaus Lunau, University of Duesseldorf, Germany, to study fragrance biology and reproductive genetics of orchid bees, in Gamboa.

Stuart Altmann, Princeton, to join the Automated Telemetry System, on BCI.

Javier Tellechea, University of Puerto Rico-Río Piedras, to study marine communities using novel acoustic remote monitoring technology, on Bocas del Toro.

Gerhard Zotz, University of Oldenburg, Germany, to study the growth and demography of epiphytic and epilithic plants and lichens at the tree line, in Fortuna.

Giovanni Ramón, Pontificia Universidad Católica del Ecuador, to work on the project "Toward a stoichiometric theory of ant ecology--from colony performance to community composition", on BCI.

Dina Dechmann, University of Konstanz, Germany, to participate, as an instructor, in the 2010 Princeton Field Course.

## Brian D. Keller (1948-2010)

Brian D. Keller, 61, Regional Science coordinator for the Southeast Atlantic, Gulf of Mexico, and Caribbean Region of the National Oceanic and Atmospheric Administration's (NOAA) Office of National Marine Sanctuaries, died on Wednesday, March 10, due to a massive brain hemorrhage, in St. Petersburg, Florida. He is survived by wife Fiona Wilmot.

Keller worked at STRI as project coordinator of the Oil Spill Project from 1987 through 1994. Together with Jeremy B.C. Jackson, he edited the volumes *Long-term Assessment of the Oil Spill at Bahía Las Minas, Panama* 1993.

Our heartfelt condolences go out to Fiona, his friends and colleagues around the world.

Brian D. Keller, 61, coordinador científico regional del Suroeste Atlántico y la región del Caribe de la Oficina Nacional de Santuarios Marinos de EU, de National Oceanic and Atmospheric Administration (NOAA), falleció el miércoles 10 de marzo debido a una hemorragia cerebral masiva, en St. Peterbug, Florida. Keller deja a su esposa, Fiona Wilmot.

Keller trabajó en STRI como coordinador del Proyecto de Derrame de Petróleo de 1987 hasta 1994. Con Jeremy B.C.



Jackson, editó los volúmenes de *Long-term Assesment of the Oil Spill at Bahía Las Minas, Panamá* 1993.

Expresamos nuestras condolencias a Fiona, sus amigos y colegas alrededor del mundo.

## Bassan presents his Harpy Eagles to STRI

Nessim Bassan, former director of the Colon Free zone and avid nature photographer, presented two very beautiful renderings of a harpy eagle to STRI director Eldredge Bermingham on Monday, March 15 at the Tupper Exhibit Hall. One of the photographs will be exhibited at Tupper and the other will be to BCI. Bassan expressed his gratitude for all that STRI has done for Panama.

Nessim Bassan, ex-director de la Zona Libre de Colón y ávido fotógrafo de la naturaleza, presentó dos bellas fotografías de una águila harpía al director de STRI, Eldredge Bermingham, el lunes, 15 de marzo en el Salón de Exhibiciones del Centro Tupper. Una de las fotos se



exhibirá en Tupper y la otra será expuesta en Barro Colorado. Bassan expresó su gratitud a STRI por todo lo que el Instituto ha hecho por Panamá.

## Annual Health Fair at STRI

STRI's Office of Human Resources and SI and STRI's Safety Offices held the Annual Health Fair for employees at Tupper, BCI and Naos this past week. The photo shows (from the left) Marty Arthur, SI, Mercedes Paniza, STRI's insurance broker, Mirza Murillo, Human Resources, STRI, Rebecca Jarandari, SI, and Julia Areas, STRI's Security Office.

oficinas de Seguridad Ocupacional de STRI y SI llevaron a cabo la Ferias Anual de la Salud de STRI en Tupper, Barro Colorado y Naos, la semana pasada. La foto muestra (desde la izquierda) a Marty Arthur, SI, Mercedes Paniza, corredora se seguros de STRI,



Mirza Murillo, de Recursos Humanos, Rebecca Jarandari, SI, y Julia Areas, de la Oficina de Seguridad de STRI.

## More arrivals

Emilia Tarland, University of Konstanz, Germany, to study the costs and benefits of sociality in bats - looking at the example of a tropical species with a temperate-like social structure, in Gamboa.

## New publications

Askew, Graham N., Tregear, Richard T., and Ellington, Charles P. 2010. "The scaling of myofibrillar actomyosin ATPase activity in apid bee flight muscle in relation to hovering flight energetics." *Journal of Experimental Biology* 213(7): 1195-1206.

Den Boer, Susanne P.A., Baer, Boris, and Boomsma, Jacobus J. 2010. "Seminal fluid mediates ejaculate competition in social insects." *Science* 327(5972): 1506-1509.

Vincent, A. Gregoire, Turner, Benjamin L., and Tanner, Edmund V.J. 2010. "Soil organic phosphorus dynamics following perturbation of litter cycling in a tropical moist forest." *European Journal of Soil Science* 61(1): 48-57.

Yanoviak, Stephen P., Munk, Yonatan, Kaspari, Mike, and Dudley, Robert. 2010. "Aerial manoeuvrability in wingless gliding ants (*Cephalotes atratus*)." *Proceedings of the Royal Society B: Biological Sciences*.

Zhik, Jonathan Z., and Kaspari, Michael. 2010. "More food, less habitat: How necromass and leaf litter decomposition combine to regulate a litter ant community." *Ecological Entomology* 35(2): 158-165.

Zimmermann, Beate, Zimmermann, Alexander, Lark, Richard Murray, and Elsenbeer, Helmut. 2010. "Sampling procedures for throughfall monitoring: A simulation study." *Water Resources Research* 46: W01503-W01503.



## Climate change and REDD workshop for Panama's indigenous leaders

STRI's Environmental Leadership & Training Initiative (ELTI) and McGill University hosted the "IV Workshop on Climate Change and REDD for Panama's Organized Indigenous Society" from Friday, February 26, to Sunday, February 28, in Puerto Indio, Darien.

Collaborating in the workshop, which attracted 80 participants, were the National Coordinating Body of Indigenous Peoples (COONAPIP) and the Organization of Embera-Wounaan Youth (OJEW).

Reduced Emissions from Deforestation and Forest Degradation (REDD) is a mechanism that aims to mitigate the impacts of global climate change by providing a competitive income to those who conserve tropical forests. Panama's indigenous peoples are the stewards of nearly 50% of the country's remaining forests.

STRI research associate Catherine Potvin from McGill University presented the

outcome of recent climate change negotiations in Copenhagen, Denmark, including the evolution of REDD discussions, which will have significant implications for Panama's indigenous communities. Their leaders presented their REED-related activities and concluded with a declaration about climate change.

La Iniciativa de Capacitación y Liderazgo Ambiental de STRI (ELTI, por sus siglas en inglés) y la Universidad de McGill llevaron a cabo el IV Taller sobre el Cambio Climático y REDD, para la Sociedad de Indígenas Organizados de Panamá, del viernes 26 al domingo 28 de febrero en Puerto Indio, Darién. El taller, que reunió a 80 participantes, contó con la colaboración de la Coordinadora Nacional de Pueblos Indígenas de Panamá y la Organización de Jóvenes Emberá y Wounaan de Panamá (OJEW).

El proyecto de reducción de

emisiones por deforestación y degradación de bosques (REDD, por sus siglas en inglés) es un mecanismo diseñado para mitigar los impactos del cambio climático, ofreciendo ganancias competitivas a aquellos que conservan los bosques tropicales. Los grupos indígenas de Panamá son los custodios de cerca del 50% del remanente de los bosques del país.

Catherine Potvin, investigadora asociada a STRI de la Universidad de McGill presentó los resultados de las recientes negociaciones de Copenhague en Dinamarca, incluyendo las discusiones relacionadas con REDD, que tendrán implicaciones importantes para las comunidades indígenas de Panamá.

Los líderes de dichas comunidades indígenas presentaron sus actividades relacionadas con REDD y concluyeron el taller con una declaración frente el tema de cambio climático.

# CAM 2010

## Workshop on Crassulacean Acid Metabolism

Evolution, Metabolic Control, Ecophysiology, Climate Change, Biofuels



March 21-24, 2010

Earl S. Tupper Research and Conference Center  
Smithsonian Tropical Research Institute  
Panama City, Republic of Panama  
[www.stri.org](http://www.stri.org)

Open to the STRI community  
See the program at:

[www.stri.org/english/PDFs/Program\\_CAM2010.pdf](http://www.stri.org/english/PDFs/Program_CAM2010.pdf)

Organizer: Klaus Winter (STRI) [winterk@si.edu](mailto:winterk@si.edu)

Story: Richard Cooke  
Edited by M Alvarado  
and ML Calderon  
Photo: MA Guerra

If large numbers of people were living on the Pearl Islands in 1515, farming, hunting and fishing, it is no surprise that archaeological sites are plentiful. Knowing that a development project had already destroyed some of these sites, STRI staff scientist Richard Cooke (in part one of this story, published on Mrch 12) requested funds from Panama's National Secretariat for Science, Technology and Innovation for a rapid survey of islands where tourist projects were planned.

Pre-Spanish activities have been recorded in over 150 localities on ten islands since 2007, by a research team led in the field by Colombian archaeologists Juan Guillermo Martín (Patronato Panamá Viejo), Fernando Bustamante (Universidad de Antioquia), Ilean Isaza (Universidad de Boston) and Ana Celis (Universidad de Baja California). They have been assisted at various times by STRI student fellows Diana Carvajal (Colombia),

Alexandra Lara (Nicaragua), Eugenia Mellado (Argentina), Yahaira Núñez from Costa Rica, in the photo, and María Eugenia Sáez (Costa Rica). Two students from the University of El Salvador (Yessenia Ortiz and Ariana Ninel Pleítez) spent the month of February on Pedro González Island where the development company Grupo Eleta is coordinating construction plans with our archaeological research team.

Read the third part of this story in the March 26 edition of *STRI News*:

Si vivía mucha gente en Las Perlas en 1515, quienes cultivaban, pescaban y cazaban, no es de sorprenderse que existan allí muchos sitios arqueológicos. A sabiendas de que un proyecto de desarrollo ya había destruido algunos yacimientos, Richard Cooke (Investigador del STRI quien apareció en la primera parte de esta historia publicada el 12 de marzo) solicitó fondos a SENACYT para realizar una prospección rápida en aquellas islas que pronto albergarían proyectos turísticos. El grupo de investigadores liderado



por Juan G. Martín (Patronato Panamá Viejo), Fernando Bustamante (Universidad de Antioquia), Ilean Isaza (Universidad de Boston) y Ana Celis (Universidad de Baja California) ha ubicado más de 150 localidades

con evidencia de actividades precolombinas, en diez islas. Los siguientes estudiantes becarios prestaron ayuda en varias ocasiones: Diana Carvajal (Colombia), Alexandra Lara (Nicaragua), Eugenia Mellado (Argentina),

Yahaira Núñez de Costa Rica (en la foto), y María Laura Sáenz (Costa Rica). Dos estudiantes de la Universidad de El Salvador (Yessenia Ortiz y Ariana Ninel Pleítez) pasaron el mes de febrero en Isla Pedro González donde el

Grupo Eleta está coordina sus planes de construcción con nuestro equipo de arqueólogos.

Lea la tercera parte de esta historia el 26 de marzo en el *STRI news*.

## Advancing archaeology in the Pearl Islands...

Part two of five: sites and the researchers

Smithsonian Tropical Research Institute, March 19, 2010