

Special seminars

Mon, Feb 14, 3:30-5:30pm at the Tupper Center:

—James Maguire, Centers for Disease Control and Prevention

Visceral leishmaniasis in Brazil and Bangladesh: spatial considerations

—Robert E. Klein, Centers for Disease Control and Prevention

Research, training and surveillance in human infectious diseases

Tupper 4pm seminar

Tue, Feb 15, 4pm seminar speaker will be Rosemary Gillespie, University of California at Berkeley
Title to be announced

Bambi seminars

—Thu, Feb 17, Bambi seminar speaker will be Rosemary Gillespie, University of California at Berkeley
Title to be announced

Correction

The photo of professor Ernst Mayr published last week in the *STRI news* was



taken by M. Ross Lein, in Bedford, Massachusetts.

La foto del profesor Ernst Mayr publicada la semana pasada en el *STRI news*, fue tomada por M. Ross Lein, en Bedford, Massachusetts.



Smithsonian Tropical Research Institute, Panamá

www.stri.org

February 11, 2005

Jacquelyn Giacalone and Gregory Willis from Montclair University, visit BCI every year in January, to carry out a project supported by STRI's Environmental Studies Project (ESP). With cameras, videotapes and radio-tracking, Giacalone and Willis monitor mammals within a perimeter of 100km on the Island. In 1999, they designed an on-line project with schools connected electronically, to reach the students. Later a website was established, and the *Rainforest Connection* became live.

This year, from January 25-29, the program included six to seven daily 40-min sessions on tropical processes like food webs and decomposition, tropical biodiversity, bats, invertebrates, mutualism, adaptation, predators and prey, conservation and medicine from plants, the use of technology for science, and how to interview a scientist. Other researchers collaborating with Giacalone and Willis are Lissy Coley from the University of Utah, Charlotte Jander, Cornell, Christoph Meyer, University of Ulm, Anna Mazzaro, Katrina Macht, Anders Hedberg and Robert Prezant, from Montclair.

The *Rainforest Connection* broadcasts are designed for students to assess problems, formulate questions, conduct observations, interpret data, draw conclusions and communicate the results.



Jackie Giacalone y Gregory Willis de la Universidad de Montclair, visitan BCI en enero todos los años, para llevar a cabo un proyecto del Programa de Monitoreo Ambiental de STRI (ESP).

Con cámaras, videograbadoras y radio-transmisores, Giacalone y Willis monitorean mamíferos en un perímetro de 100km en BCI. En 1999, los Willis diseñaron una herramienta para llevar a cabo un proyecto en línea con escuelas conectadas electrónicamente, para compartir sus investigaciones con los estudiantes. Pronto se creó una página web, y se estableció *Rainforest Connection* en vivo.

Este año, del 25 al 29 de enero, el programa incluyó de seis a siete sesiones diarias de 40 minutos sobre procesos tropicales como la cadena

alimenticia y la descomposición, biodiversidad tropical, murciélagos, invertebrados, mutualismo, adaptación, depredadores y sus presas, medicamentos que se obtienen de las plantas, el uso de la tecnología para la ciencia, y cómo entrevistar a un científico.

Otros investigadores que colaboran con los Willis son Lissy Coley de la Universidad de Utah, Charlotte Jander de Cornell, Christoph Meyer, Universidad de Ulm, y Anna Mazzaro, Katrina Macht, Anders Hedberg y Robert Prezant, de Montclair.

Las transmisiones de *Rainforest Connections* están diseñadas para que los estudiantes evalúen los problemas, formulen preguntas, lleven a cabo observaciones, interpreten la información y comuniquen los resultados.

Arrivals

Benjamin Hancock, University of Illinois Urbana-Champaign, Feb 13 - Sep 30, to work with Jeffrey Brawn, on BCI.

Melissa Meadows, University of Illinois Urbana-Champaign, Feb 13 - Aug 30, to work with Jeffrey Brawn, on BCI.

Milene Castellen, Empresa Brasileira de Pesquisa Agropecuária, Feb 15 - Apr 15, to study population genetics and phylogeography of tropical trees, on BCI.

Sharon Gill, Princeton University, Feb 15 - Apr 30, to work with Michaela Hau, in Gamboa.

Fabrice De Clerck, University of California at Davis, Feb 16-22, to work with STRI's Project of Reforestation with Native Species (PRORENA), at Tupper.

Frauke Barthold, University of Postdam, Germany, Feb 17 - Aug 30, to conduct a soil mapping survey of Barro Colorado Nature Monument.

Julie Velasquez-Runk, predoctoral fellow from Yale University, Feb 17-24, to study the historical ecology of Wuonaan forest use in eastern Panama, at Tupper.

Richard Tankersley, postdoctoral visiting scientist from Florida Institute of Technology, Feb 18 - Feb 17, 2006, to make a comparison of the circa tidal swimming behaviors of fiddler crab (*Uca* spp.), on Bocas del Toro.

Lela Stanley, Princeton University, Feb 18 - Apr 22, to study the patterns and controls on nitrogen fixation in a tropical forest, on BCI.

Safety number: 212-8211

Fungi control crop diversity, by Poulsen and Boomsma: *Science*

Former STRI fellow Michael Poulsen and STRI visiting scientist Jacobus Boomsma, from the University of Copenhagen, published "Mutualistic fungi control crop diversity in fungus-growing ants" in *Science* (Feb 4, 307: 741-744).

Leaf-cutting ants have been cultivating fungi for 50-60 millions years, but every colony raises only one particular crop.

In this article, Poulsen and Boomsma explain how the different strains compete, forcing the the ants to grow just one. Benefits of ant fungiculture are mutual. The leaf-cutting ants don't eat the leaves. They carry them to their nest to feed this special fungus. As it grows, the fungus is fed to members of the colony, and is carried by virgin ant queens when they leave to mate and disperse.



STRI visiting scientist Steve Yanoviak from the University of Texas, research associates Robert Dudley, from the University of California, and Michael Kaspari from the University of Oklahoma published "Directed aerial descent in canopy ants" in *Nature* (Feb 10, 433: 624-626).

Many tree-dwelling animals use gliding flight to get from tree to tree, like lizards and ar-

Poulsen and Boomsma observed fungus gardens of 18 ant colonies cultivated by colonies of two sympatric species of leaf-cutting ants *Atta echinator* and *Atta octospinosus*, collected in Gamboa from 1994 to 2002.

"When they placed ant feces from one colony onto the fungus of another, the fungus became discolored and grew slower. In addition, when ants from one colony were fed fungi from another, their feces caused a similar reaction on their own fungi. This did not happen when they were fed fungus from their own garden. These findings led the researchers to suspect that compounds specific to the foreign fungus were inhibiting the growth of the in-house fungus."

According to Poulsen, interviewed by *Science Now*, "This

Wingless ants that fly, by Yanoviak, Kaspari and Dudley: *Nature*

boreal snakes. Now, similar behavior was observed in wingless ants living on rainforest canopies on BCI, La Selva and near Iquitos, Peru. With simple experiments and videos, the researchers show that after jumping or falling off a branch the ants avoid landing on the vegetation or the ground beneath by visually aligning themselves with the 'home' tree and gliding backwards to the trunk. Tropical forest canopies maintain a large percentage of the planet's species, including ants, an important part of their associated organisms. They have developed numerous adaptations for their arboreal lifestyle, but many ants fall from the canopy as result of being dislodged by wind, arboreal mammals or birds. Workers of *Cephalotes atratus* will also voluntarily drop



makes it necessary that ants rear clones of the same fungi. Otherwise, the competition would stunt fungal growth and reduce the ants' food supply. So in terms of farming, it's really the fungus that's running the show."

The article in *Science* and its review in *Science Now* were distributed last week by staff scientist Neal G. Smith to his Science Group.

off tree trunks when approached by a foreign object. This behavior is paradoxical because worker ants lack wings, and the possibilities of falling into the forest floor and find their way to their colony is low. In their article, Yanoviak *et al.* show how these ants rarely reach the forest floor. Instead, they control their aerial descent such that they glide back to their host tree trunk, preventing a landing in the understory and facilitating a return to the nest in minutes.

(Information taken from *Nature* and Yanoviak *et al.*)

The discovery was picked up by a large number of news services. MSNMB provides easy access to the video "When ants fly" featuring Yanoviak, at: <http://msnbc.msn.com/id/6940729/>

More arrivals

Steve Cafferty, Natural History Museum, London, UK, Feb 18-21, for a Flora Mesoamericana collecting trip to Cerro Fábrega, in Bocas del Toro.

April Reside, volunteer from Australia, Feb 18 - Apr 13, to work with Christoph Meyer, on BCI.

Alexander Barron, predoctoral fellow from Princeton University, Feb 18 - Apr 18, to study the pattern and controls on nitrogen fixation in a tropical forest, on BCI.

Available

The new BCI weather report for 2004 is available at <http://striweb.si.edu/esp/>

New publications

Fornara, D.A., and Dalling, James W. 2005. "Post-dispersal removal of seeds of pioneer species from five Panamanian forests." *Journal of Tropical Ecology* 21: 79-84.

Heckadon Moreno, Stanley. 2005. "El naturalista H.E. Anthony en Cerro Tarcarcuna, Darién, en 1915." *"Epocas" Segunda Era* (Supplement to *La Prensa*) 20(1): 14-14.

Miscellaneous

White Hyundai Galoper 1996 in excellent conditions \$6,500 negotiable. Interested please call Ubaldo Pimentel at tel. 216-6223, Cel 647-9100.

Happy Hour at Mangos (Eddison Building) Feb 25 at 6 pm, in support of STRI's Cayuco Race team. Half prize drinks, snacks and raffle. Tickets \$6 from Jeanette Egger (or \$6.50 at the door).



Concludes summer camp at Culebra

Nineteen 7-11 year old children participated in STRI's Summer Camp at the Marine Exhibition Center in Punta Culebra, from January 24-28.

The group had the opportunity to get involved in scientific observation, identification and classification of organisms. They also took notes and interpreted the information they gathered. The Summer Camp included graphic exhibits, scouting the different habitats that occur in the area, and an interview with a scientist.

According to one of the parents, the children would not stop talking about their daily activities at Culebra, from collecting ticks, to handling an armless turtle.



Lidia de Valencia, organizer, planner and executor of the camp thanks Annette Aiello, Henry Stockwell, John Christy, Adriana Sautú, Lina González and Dayra Navarro, Anayansi

Valderrama and Rebecca Rissanen for their collaboration during this very successful event.



Diecinueve chicos de 7-11 años participaron en el Campamento de Verano del Centro de Exhibiciones Marinas en Punta Culebra de STRI, del 24 al 28 de enero. El grupo tuvo la oportunidad de participar en observaciones científicas e identificación y clasificación de organismos. También tomaron notas e interpretaron la información que recogieron. El Campamento de Verano incluyó exhibiciones de gráficas, exploración de los diferentes hábitats que ocurren en el área, y entrevistaron a un científico.

De acuerdo a uno de los padres, los chicos no paraban de hablar sobre sus actividades diarias en Culebra, desde coleccionar garrapatas, hasta cargar una tortuga sin un brazo.

Lidia de Valencia, quien

organizó y ejecutó el campamento, agradece la colaboración de Annette Aiello, Henry Stockwell, John Christy, Adriana Sautú, Dayra Navarro, Anayansi Valderrama and Rebecca Rissanen.

UDP and ICAB new book

STRI is pleased to announce a book by the University of Panama and the Institute for Biodiversity and Environmental Sciences (ICAB), *Forest Fragments biodiversity and environmental services in El Montuoso Forest Reserve, Panama*.

STRI se complace en anunciar el libro de la Universidad de Panamá y el Instituto de Ciencias Ambientales y Biodiversidad (ICAB), *Diversidad biológica y servicios ambientales de los fragmentos de bosques en la Reserva Forestal El Montuoso, Panama*.





Do plants become sunburnt?

No, most plants do not, because they protect themselves with ‘sun blockers’.

Effects of high-light stress in leaves of tropical tree seedlings are studied by STRI research associate Heinrich Krause, from the University of Duesseldorf, Germany, Barbara Krause and Aurelio Virgo, STRI, in collaboration with staff scientist Klaus Winter at the new Santa Cruz research site in Gamboa.

Plants may indeed suffer from excess solar radiation including UV light, which inhibits their photosynthetic activities. But plants can acclimate surprisingly well to high sunlight by adjusting the composition of their pigments (carotenoids and chlorophylls), antioxidants (e.g., vitamins C and E) and UV-absorbing phenolic substances (flavonoids). This protects the leaves from severe damage.

The question is now: Do light stress and the extra cost of photo-protection impair growth and biomass accumulation of tropical plants?

¿Sufren las plantas de quemaduras de sol?

No, la mayoría no, porque se protegen con bloqueadores solares. El investigador asociado a STRI Heinrich Krause de la Universidad de Duesseldorf, Barbara Krause y Aurelio Virgo de STRI, estudian los efectos del estrés por exceso de luz solar en hojas de plántulas de árboles en colaboración con el investigador de STRI Klaus Winter, en el nuevo sitio de investigación Santa Cruz en Gamboa.

Las plantas sí pueden sufrir por el exceso de radiación solar incluyendo luz ultravioleta, que inhibe sus actividades fotosintéticas. Pero las plantas se pueden aclimatar sorprendentemente bien a la luz intensa del sol, ajustando la composición de sus pigmentos (carotinoides y clorofila), antioxidantes (vitaminas C y E) y sustancias fenólicas que absorben luz ultravioleta (flavonoides), que protegen las hojas del daño excesivo.

Ahora, la pregunta es: ¿Puede el estrés solar y el costo extra de la foto-protección impedir el crecimiento y la acumulación de biomasa de plantas tropicales?

