Smithsonian Tropical Research Institute, Panamá www.stri.org February 10, 2006

Tupper 4pm seminar

Tuesday, February 14, 4pm seminar speaker will be James Harrington, DFG Water Pollution Control Laboratory
The use of freshwater invertebrates as a tool to assess, improve and maintain healthy streams and rivers in the Republic of Panama

Bambi seminar

Thursday, February 16, Bambi seminar speaker will be David Roubik, STRI
Euglossines: guilding the orchid

Arriving next week

Fernando Zapata, Universidad del Valle, to estimate the size of the tropical eastern Pacific fish fauna, at Naos.

Gerardo Sánchez-Azofeifa, University of Alberta, to study leaf and canopy spectral reflectance from Metropolitan Natural Park and Ft. Sherman canopy cranes.

Jamie Theobald, University of Lund, to study the visual performance of nocturnal bees and wasps, on BCI.

Henry Milne and David Marsland, SI´s National Resources Research Center, Patricia Williams, Ramapo College of New Jersey and George Cauttero and Stephen Antonucci, Rainforest Connection, to participate in videoconferences between researchers on BCI and students in the USA that will enable live demonstrations and discussions of research methods and findings, on BCI.

Deadly fungus threatens Panama´s golden frog

A deadly fungus is killing hundreds of thousands of amphibians and putting the golden frog at risk of extinction. "...the golden frog was already in critical danger, however, the advance of the fungus outbreak makes matters worse to a point that this species is likely to become extinct," said STRI research associate Roberto Ibáñez to Reuters. According to popular beliefs in Panama, those that see the golden frog—that graces Panama's lottery tickets and tourism brochures—will be blessed with good luck. The mysterious mold threatening the frog is spreading quickly in Panama, according to a group of scientists including Karen Lips, STRI visiting scientist from Southern Illinois University, to be published anytime in the *Proceedings of the National Academy of Sciences* (Check Neal Smith´s sendings).

"Many frogs use their skin as we use our lungs. If it gets blocked up, they die," explains Lips. A separate study published last month in *Nature* cited global warming as a probable cause for the proliferation of the fungus.

"We don't have actual numbers on population size. Such figures are notoriously difficult to confirm," said Ibáñez. "But the fungus has the capacity to completely wipe out populations of any size, and if the fungus doesn't kill them, the areas where they can be found are being deforested and polluted or developed," he said.

Researchers say the fungus, which causes the infectious disease chytridiomycosis that affects amphibians, arrived in Panama in 1993 and was detected in El Copé, near the Caribbean with many frogs, in October 2004. Within four months, it had wiped out 57 out of a total of 70 frog, toad and salamander species, including many golden frogs, in the area. "It was one of the species we found dead and infected with the fungus at El Copé. As far as we know, every species at the site was probably infested with it and died," added Lips.
The fungus exists in much of the world and the Panama study is the latest example of its potential to wipe out entire amphibian populations. Scientists do not know where the fungus came from, but it has been spreading through the Americas, Australia and Europe since 1970. Its first documented appearance was in South Africa

The family of Stan Rand would like to thank the STRI community for the many expressions of support and sympathy we received throughout his illness and his death.

Sincerely,

Pat, Hugh, Margaret and Katherine

More arrivals

Benjamin Lascelles, University of Illinois Urbana-Champaign, to monitor the dynamics of avian communities and population in Central Panama, in Gamboa.

Leonida Fusani, Julia Barske and Virginia Belloni University of Siena, to study the evolution of manakin displays, in Gamboa.

Silvia Libro, Italy, to study the reproductive isolation between two Caribbean sea urchins, at Naos.

STRI in the news

"Study shows diversity is an advantage, by Mary Cann. 2006. *Epoch Times*, February 6.

"Deadly fungus threatens beloved Panamanian frog" by Mike Power. 2006. Reuters Foundation Alert Net **http://www.alertnet.org/thenews/newsdesk/B20870.htm**

"Can't log the forest for the trees?" by Roger Haris. 2006. American Scientist Online **http://www.americanscientist.org/template/AssetDetail/assetid/49614**

"Mars, Incorporated: groundbreaking cocoa science research revealed at The National Academies; New research presented at 'Theobroma cacao: The tree of change' elevates cocoa's role in cardiovascular health and sustainable agriculture." 2006. Business Wire: **http://home.businesswire.com/portal/site/google/index...ndmViewId=news_view&newsId=20060209005256&newsLang=en**

in the 1930s, Lips said. "It's as if we came across a disease that regularly kills everyone in a city, but also dogs, cats, horses, whales, bats and so on. It's a very unusual pathogen, with an incredible impact."

On the other hand, *The Washington Times* recently published the efforts by the Maryland Zoo, the first to breed Panamanian golden frogs in captivity. "The only hope is for us to keep them going", said the zoo spokesman Kerry Graces. "In a few years, we may actually go back to Panama to create a conservatory there."

According to St. Louis Zoo, golden frogs could become extinct in five years. They survive by eating small insects and other invertebrates. Females lay their eggs in water, where they hatch, usually within 24 hours. Adults have a poisonous chemical in their skin that protects them from predators. Last year, the National Zoo in the District borrowed four males and four females from the Maryland Zoo. They laid a "clutch" of golden frog eggs, all of which hatched in just a few hours.

The Maryland Zoo, as well as the Detroit Zoo—that reported on February 6 the hatching of hundreds of Panamanian golden frog tadpoles—are members of the Project Golden Frog, established in collaboration with STRI. See: **http://www.ranadorada.org/goldenfrog.htm**

Un hongo mortal está matando cientos de miles de anfibios y pone en peligro de extinción a la rana dorada "...la rana dorada ya se encontraba en peligro crítico, sin embargo, el avance del hongo empeora las cosas al punto de que es probable que la especie se extinga" dijo a *Reuters* Roberto Ibáñez investigador asociado a STRI.

De acuerdo a creencias populares en Panamá, aquellos que vean una rana dorada—que adorna billetes de lotería y panfletos turísticos—recibirá buena suerte. El misterioso y amenazante hongo se prolifera rápidamente en Panamá, de acuerdo a un estudio realizado por un grupo de científicos incluyendo a Karen Lips, científica visitante de STRI de Southern Illinois University, que aparecerá en cualquier momento en *Proceedings of the Nacional Academy of Sciences* (vea los correos de Neal Smith).

"Muchas ranas usan su piel como nosotros usamos nuestros pulmones. Si se bloquean, se mueren" explica Lips. Un estudio publicado el mes pasado por *Nature* citó al calentamiento global como una causa probable de la proliferación del hongo.

"No tenemos las cifras reales sobre el tamaño de la población. Estas cifras son muy difíciles de confirmar" dijo Ibáñez. "Pero el hongo tiene la capacidad de arrasar con poblaciones de cualquier tamaño, y si el hongo no los mata, las áreas donde se encuentran se están deforestando, contaminando o desarrollando" confirmó.

Los investigadores dicen que el hongo que causa la enfermedad infecciosa chitridomicosis que afecta los anfibios, llegó a Panamá en 1993 y se detectó en El Copé, un área cerca del Caribe con muchas ranas, en octubre de 2004. En cuatro meses arrasó con 57 de 70 especies de ranas, sapos y salamandras, incluyendo las ranas doradas, en el área. "Fue una de las especies que encontramos muertas e infectadas con el hongo en El Copé. Hasta donde sabemos, todas las especies del lugar estaban infectadas y murieron" agregó Lips.

El hongo existe en gran parte del mundo y el estudio en Panamá es el más reciente sobre su potencial de arrasar con poblaciones enteras de anfibios. Los investigadores no saben de dónde vino, pero se ha estado propagando a través de las Américas, Australia y Europa desde 1970. Se documentó por primera vez en Suráfrica en la década de 1930, de acuerdo a Lips. "Es como si encontráramos una enfermedad que mata a todos en una ciudad, pero también a los perros, gatos, caballos, ballenas, murciélagos y más. Es un patógeno muy poco común, con un impacto increíble."

Por otro lado, el *Washington Times* publicó recientemente los esfuerzos que se realizan en el Zoológico de Maryland, el primero en criar ranas doradas en cautiverio. "La única esperanza es que las mantengamos", dijo el vocero del zoológico, Kerry Graces. "En algunos años, podríamos volver a Panamá y crear un santuario allá." De acuerdo al Zoológico de St. Louis, las ranas doradas se extinguirán en cinco años. Ellas viven de comer insectos pequeños y otros invertebrados. Las hembras ponen sus huevos en el agua, donde eclosionan en 24 horas. Los adultos tienen un químico venenoso en la piel que los protege de depredadores. El año pasado, el Zoológico Nacional en Washington DC pidió prestado cuatro machos y cuatro hembras del Zoológico de Maryland. Las parejas pusieron una nidada de ranas doradas, y todas eclosionaron en pocas horas.

El Zoológico de Maryland que se encuentra en Baltimore, así como el Detroit Zoo— que reportó el 6 de febrero que cuenta con cientos de ranacuajos de la rana dorada de Panamá— pertenecen al Proyecto Rana Dorada, establecida en colaboración con STRI. Visite su página en: **http://www.ranadorada.org/goldenfrog.htm**

Neogastropod meeting gathers specialists from around the world

The Origin and Evolution of the Neogastropoda Congress, held at STRI from January 27 to February 6, gathered specialists from around the world. STRI´s Helena Fortunato (in the photo) and Ellen Strong and Jerry Harasewych from SI´s National Museum of Natural History organized the event at the Naos Island Laboratories.

Invited speakers were Yuri Kantor from Moscow, Russia, Luiz Ricardo Simone from Sao Paulo, Brazil, Marco Oliverio and Vittoria Modica, from Rome, Italy, Gregory S.Herbert, Florida, Baldomero Olivera and Jason Biggs, Utah, Marta J. deMaintenon, Hawaii, Guido Pastorino and Gregorio Bigatti from Buenos Aires, Argentina, John Taylor from London, UK, and Philippe Bouchet, from Paris, France.

El Congreso "Origen y Evolución de Neogastrópoda, llevado a cabo en STRI del 27 de enero al 6 de febrero, reunió especialistas provenientes de alrededor del mundo. Helena Fortunato (en la foto), de STRI y Ellen Strong y Jerry Hartasewych del Museo Nacional de EU de Historia Natural del Smithsonian organizaron el evento en los Laboratorios de Isla Naos.

Los conferencistas invitados fueron Yuri Kantor de Moscú, Rusai, Luiz Ricardo Simone de Sao Paulo, Brazil, Marco Oliverio y Vittoria Modica de Roma, Italia, Gregory S. Herbert de Florida, Baldomero Olivera y Jason Biggs de Utah, Marta J. deMaintenon de Hawaii, Guido Pastorino y Gregorio Bigatti de Buenos Aires, Argentina, John Taylor de Londres, Reino Unido, y Philippe Bouchet, de París, Francia.

CTFS-AA: International Field Biology Course

The Center for Tropical Forest Science - Arnold Arboretum Asia Program (CTFS-AA) will run the sixth International Field Biology Course in summer 2006 (July 30 - Aug 29) at the Sinharaja World Heritage Site, Sri Lanka.

Sinharaja is the best preserved area of rainforest in Sri Lanka, and contains many endemic species. In 1993 the Sinharaja Forest Dynamics Plot was founded by the University of Peradeniya, the Sri Lankan Department of Forestry, and CTFS-AA. The plot harbours half the tree species found in Sinharaja and one quarter of the species found in Sri Lanka. Sinharaja has long been a focus for research on silviculture and forest restoration, and the establishment of the plot has galvanized research on topics ranging from soils and hydrology to plant population dynamics, entomology and plant-insect interactions.

The field course will be aimed at graduate entry-level students and will provide a broad-based introduction to the ecology of tropical forests in SE Asia. It will include a strong practical element and students will learn to develop research ideas through independent projects. At the end of the course students will analyze and present their results in both oral and written reports. The course will be taught by local and international researchers who are experts in their respective fields.

The course is fully funded by the CTFS-AA program, although some students may be requested to pay their international travel.

Application forms and a draft program for the course will be posted on the CTFS-AA website (www.ctfs-aa.org) shortly. Prospective students are also advised to look at the reports from previous years, which can be downloaded from the website.

Applicants should be graduate entry-level students (Master's course or 1st year Ph.D. candidates) in tropical biology/ecology, who are either from SE Asia or will base their research in the region. Students will be selected to provide a broad international representation and preference will be given to those conducting research at CTFS-AA sites.

Students should send a completed application form to Rhett D. Harrison, CTFS-AA at:

ctfs_aa_fieldcourse@yahoo.com by 31 March 2006.

New publications

Carroll, Chris and Ziegler, Christian. 2005. "A láthatatlan ocelot nyomában." *National Geographic Magyarország* (November): 86-99.

George, T.S., Turner, Benjamin L., Gregory, P.J., Cade-Menun, B.J., and Richardson, A.E. 2006. "Depletionoforganic phosphorus from Oxisols in relation to phosphatase activities in the rhizosphere." *European Journal of Soil Science* 57: 47-57.

Diaz, Sandra, Tilman, David, Fargione, Joseph, Chapin, III, F. Stuart, Dirzo, Rodolfo, Thomas, Kitzberger., Gemmill, Barbara, Zobel, Martin, Vila, Montserrat, Mitchell, Charles, Wilby, Andrew, Daily, Gretchen C., Galetti, Mauro, Laurance, William F., Pretty, Jules, Naylor, rosamond, Power, alison, Harvell, Drew, simon, Potts., Kremen, Claire, Griswold, Terry, Eardley, Connal, Ceballos, Gerardo, Lavorel, Sandra, Orians, Gordon, Pacala, Stephen, and Supriatna, Jatna. 2005. "Biodiversity regulation of ecosystem services." In: Rashid Hassan, Scholes, Robert, and Ash, Neville (Eds.), *Ecosystems and humna well-being: current state and trends: findings of the Condition and Trends Working Group*: I: 297-329. Washington: Island Press.

Villarreal, Carlos A. 2005. Impacto ecológico del magle rojo (*Rhizophora mangle*) sucesivo al derrame de petroleo del Caribe de Panama. Unpublished Master thesis, Universidad Interamericana de Educación a Distancia de Panamá, Panama..

science in progress:

ICBG on Coiba

Story:
Catherina Caballero
Editor: ML Calderon
Photo: MA Guerra

STRI's Cooperative Biodiversity Groups (ICBG) aim to use Panama's biodiversity for human health, conservation and training, through the discovery of novel medicines. Among the organisms studied by the ICBG are endophytic fungi —found in all living plant tissue— since they are a rich source of chemicals compounds, which might have medicinal applications.

To date, the ICBG has obtained 2387 isolates from 103 species of plants in Panama. From those, 12 have proven to be active against cancer and tropical disease. But the program is putting an extra effort in isolating fungi from plants collected in the Coiba National Park—as they may help bolstering interest in protecting the Park. For example, 235 morphotypes have been isolated from *Desmotes*, a genus found only on Coiba.

To maximize chemical diversity, different approaches are used: growth rate, ability to inhibit other fungi, and rare morphotypes.

"Endophytic fungi are enormously diverse, and the fungi that have been cultured represent just the tip of the iceberg," says Catherina Caballero, in charge of the ICBG´s sample preparation program at STRI. The photo shows ICBG´s Carlos Ríos isolating yet another promising ICBG compound.

Los Grupos de Cooperación para la Biodiversidad de STRI (ICBG) tienen como objetivo utilizar la biodiversidad de Panamá en beneficio de la salud humana, la conservación y el entrenamiento, a través del descubrimiento de medicamentos novedosos. Entre los organismos que estudian están los hongos endófitos—que se encuentran en todos los tejidos vivos de plantas—ya que son una rica fuente de compuestos químicos, que pueden tener aplicaciones medicinales.

Hasta la fecha, el ICBG ha logrado aislar 2387 compuestos de 103 especies de plantas en Panamá. De éstos, 12 han demostrado ser activos contra el cáncer y enfermedades tropicales.

Pero el programa está invirtiendo esfuerzos extra para aislar hongos de plantas colectadas en el Parque Nacional Coiba—ya que pueden ayudar a aumentar el interés en la protección del Parque. Por ejemplo, se han aislado 235 tipos morfológicos de *Desmotes*, un género que se encuentra únicamente en Coiba.

Para maximizar la diversidad química se usan diferentes estrategias: la tasa de crecimiento, habilidad de inhibir otros hongos, y tipos morfológicos poco comunes.

"Los hongos endófitos son enormemente diversos, y los hongos que se están cultivando representan solamente la punta del iceberg," dice Catherina Caballero, a cargo del programa de preparación de muestras en STRI. La foto muestra a Carlos Ríos, aislando otro más de los prometedores compuestos del ICBG.