

Bambi seminar

Monday, February 1st, Bambi seminar speaker will be Sebastian Wolfe, Institute of Plant Sciences, Zurich, Switzerland

Carbon cycling of two tropical ecosystems

Tupper 4pm seminar

Tuesday, 4pm seminar speaker will be Daniel Rincon Martinez, Instituto Colombiano del Petróleo

Plio-Pleistocene easternmost equatorial Pacific paleoceanography — causes, consequences and the Andean uplift

Bambi seminar

Thursday, February 4, Bambi seminar speaker will be Luis Mejia, Penn State University

Evolution and Ecology of host-fungal interactions

Arrivals

Julia Barske, and Francesca Coccon, University of California, Los Angeles, to study the hormonal and neural control of a sexually dimorphic behavior, in Gamboa.

Eduardo Medina, University of Panama, to participate in the 2010 Princeton Field Course.

Andrew Sellers, Coastal Carolina University, to study the roles of the Panama Canal in species invasions, at Naos Island Laboratories.

Linda McCann, Smithsonian Environmental Research Center, to join the study of the roles of the Panama Canal in species invasions, at Naos Island Laboratories.



Smithsonian Tropical Research Institute, Panamá

www.stri.org

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SI undersecretary for Science visits STRI

Eva J. Pell, former senior vice president for Research and Dean of the Graduate School at Pennsylvania State University, was named Under Secretary for Science at SI. Pell has been Vice President and Dean since 2000 and was promoted to Senior Vice President for Research and Dean of the Graduate School at the university in 2006. Her appointment at SI was announced in August, 2009 and became effective on January 4.

At Penn State, Pell spearheaded the development of cross-disciplinary institutes for life sciences, materials, energy and environment, social sciences, cyber science, and arts and humanities. She was also responsible for sponsored research, compliance and the university's animal research center. She holds a bachelor's degree in science from the City College of New York and a doctorate degree in plant biology from Rutgers University.

Accompanied by Stacy Cavanagh, senior executive officer at SI's Office of the Under Secretary for Science, Pell is visiting Panama from January 27 through February 2, to visit STRI facilities and interact with staff scientists and members of the administration,

in order to learn about STRI's research mission and vision.

Pell and Cavanagh will visit the Tupper Center, stay overnight on BCI, and visit the Agua Salud Reforestation Project, the Canopy Crane in Fort Sherman, the Panama Canal Watershed Experiment, STRI's Bocas del Toro Research Station and the Punta Culebra Nature Center, as well as the most visited sites in Panama.

Javier Arias, minister of Panama's National Environmental Authority Esteban Saenz, of the Panama Canal Authority Oscar Vallarino, executive manager of the environment department of the Panama Canal Authority are scheduled to meet with undersecretary Eva J. Pell.

Eva J. Pell, hasta hace poco vice presidenta para Investigaciones y decana de Postgrado en Pennsylvania State University, fue seleccionada para ocupar la posición de Subsecretaria para las Ciencias en SI. Pell fue vicepresidenta y decana desde 2000 y promovida a vicepresidenta para Investigaciones y Postgrado en Penn State en 2006. Su nombramiento en SI fue anunciado en agosto de 2009, aunque asumió la posición el



pasado 4 de enero.

En Penn State, Pell fue la líder del desarrollo de institutos multidisciplinarios en ciencias vivas, materiales, energía y ambiente, ciencias sociales, computación, y artes y humanidades. También fue responsable por el apoyo a la investigación y el rendimiento del centro de investigaciones animales de la Universidad. Tiene una licenciatura en Ciencias de City College of New York, y un doctorado en Biología Vegetal de Rutgers University.

En compañía de Stacy Cavanagh, directora ejecutiva senior de la Oficina del Smithsonian de la Subsecretaría para Ciencias, Pell visita Panamá desde el 27 de enero hasta el 2 de febrero, para conocer las instalaciones de STRI e interactuar con los científicos del Instituto y con miembros de la

Departures

Director Eldredge Bermingham to Washington DC, on official business at SI.

David Roubik to Belem, Brazil, to participate in the 28th Brazilian Congress of Zoology and present a plenary lecture on the impact of Africanized bees in America with emphasis on native bees.

New publications

Andersen, Kelly M., Turner, Benjamin L., and Dalling, James W. 2010. "Soil-based habitat partitioning in understory palms in lower montane tropical forests." *Journal of Biogeography* 37(2): 278-292.

Calderon Moreno, Isabel, Ventura, C.R.R., Turon, X., and Lessios, Harilaos A. 2010. "Genetic divergence and assortative mating between colour morphs of the sea urchin (*Paracentrotus gaimardi*)." *Molecular Ecology* 19(3): 484-493.

Coronado-Rivera, James. 2009. "Filogenia de avispas del género *Netelia* (Hymenoptera: Ichneumonidae) con énfasis en las especies costarricenses." *Revista de Biología Tropical* 57(Supl. 1: 50 Aniversario de la Escuela de Biología (1957-2007), Editores: José A. Vargas y Julián Monge): 213-238.

Eberhard, William G. 2010. "Recovery of spiders from the effects of parasitic wasps: Implications for fine-tuned mechanisms of manipulation." *Animal Behaviour* 79(2): 375-383.

[See story in the fourth page: "Fine-tuned manipulation"]

administración, para familiarizarse con la misión y visión de STRI.

Pell y Cavanagh visitaron el Centro Tupper, pasaron una noche en BCI, conocieron el Proyecto de Reforestación de Agua Salud, la Grúa del Dosel

en Fort Sherman, el Experimento de la Cuenca del Canal de Panamá, la Estación de Investigaciones en Bocas del Toro, y el Centro Natural de Punta Culebra, así como los sitios más visitados en Panamá.

Se espera que Javier Arias,

ministro de la Autoridad Nacional del Medio Ambiente, Esteban Saenz, de la Autoridad del Canal de Panamá y Oscar Vallarino, gerente ejecutivo para el Ambiente, se reúnan con la subsecretaria Eva J. Pell.

A rare silky anteater added to Bocas biodiversity database

This rare silky anteater was photographed at STRI's Bocas del Toro Research Station by Adam von Haden, a graduate student from the University of Wisconsin, Green Bay, who participated in a Green Bay class in Bocas earlier in January. This is the first report of one of these anteaters on Isla Colon. The Bocas del Toro biodiversity database is a large collection with hundreds of photos gathered by STRI affiliates and friends. See

http://biogeodb.stri.si.edu/bocas_database/

Este oso hormiguero fue fotografiado en la Estación de Bocas del Toro por Adam von Haden, estudiante de la Universidad de Wisconsin, Green Bay, quien participó en una clase de Green Bay en Bocas, a principios de enero. Esta es el primer registro de uno de estos hormigueros en Isla Colón. La base de datos de biodiversidad de Bocas del Toro es una extensa colección con cientos de fotografías obtenidas por afiliados de STRI y sus amigos. Visite:

http://biogeodb.stri.si.edu/bocas_database/



New study suggests insect societies operate like a single superorganism

A team of researchers including Michael Kaspari a STRI research associate and a presidential professor of zoology, ecology and evolutionary biology at the University of Oklahoma, and led by James Gillooly, from the University of Florida, has shown that insect colonies follow some of the same biological "rules" as individuals, a finding that suggests insect societies operate like a single "superorganism" in terms of their physiology and life cycle.

For more than a century, biologists have marveled at the highly cooperative nature of ants, bees and other social insects that work together to determine the survival and growth of a colony. The social interactions are much

like cells working together in a single body, hence the term "superorganism" — an organism comprised of many organisms, according to James Gillooly, an assistant professor in the department of biology at University of Florida's College of Liberal Arts and Sciences.

By analyzing data from 168 different social insect species including ants, termites, bees and wasps, the authors found that the lifespan, growth rates and rates of reproduction of whole colonies, when considered as superorganisms, were nearly indistinguishable from individual organisms.

The findings are published online in the *Proceedings of the National Academy of Sciences*.

"Certainly one of the reasons folks have been interested in social insects and the

consequences of living in groups is that it tells us about our own species," said Kaspari, "There is currently a vigorous debate on how sociality evolved. We suggest that any theory of sociality be consistent with the amazing convergence in the way nonsocial and social organisms use energy."

In addition to James Gillooly and Kaspari, Chen Hou from the Albert Einstein College of Medicine, and Hannah B. Vander Zanden of the University of Florida participated in the study.

Adapted from information from the University of Florida

Un equipo de científicos incluyendo a Michael Kaspari, investigador asociado a STRI y profesor presidencial de zoología, ecología y biología evolutiva de la Universidad de

New publications

Holford, Mande, Puillandre, Nicolas, Modica, Maria Vittoria, Watkins, Maren, Collin, Rachel, Bermingham, Eldredge, and Olivera, Baldomero M. 2009. "Correlating molecular phylogeny with venom apparatus occurrence in Panamic auger snails (Terebridae)." *Plos One* 4(11): e7667.

Honorio Coronado, E.N., Baker, Timothy R., Phillips, Oliver L., Pitman, Nigel C.A., Pennington, R. Toby, Vasquez Martinez, Rodolfo, Monteagudo, Abel, Mogollan, H., Davila Cardozo, N., Rios, Marcos, Garcia-Villacorta, R., Valderrama, E., Ahuite, M., Huamantupa, I., Neill, David A., Laurance, William F., Nascimento, Henrique E.M., Soares de Almeida, S., Killeen, Timothy J., Arroyo, Luzmila, Nunez-Vargas, Percy, and Freitas Alvarado, L. 2009. "Multi-scale comparisons of tree composition in Amazonian terra firme forests." *Biogeosciences* 6(11): 2719-2731.

Kronauer, Daniel J.C., Schoning, Caspar, d'Ettorre, Patrizia, and Boomsma, Jacobus J. 2010. "Colony fusion and worker reproduction after queen loss in army ants." *Proceedings of the Royal Society B: Biological Sciences* 277(1682): 755-763.

Laurance, Susan G.W., Andrade, Ana C.S., and Laurance, William F. 2010. "Unanticipated effects of stand dynamism on Amazonian tree diversity." *Biotropica* Online.

Pin Koh, Lian, Ghazoul, Jaboury, Butler, Rhett A., Laurance, William F., Sodhy, Navjot, S., Mateo-Vega, Javier, and Bradshaw, Corey J.A. 2010. "Wash and spin cycle threats to tropical biodiversity." *Biotropica* 42(1):



Oklahoma, y liderado por James Gillooly, de la Universidad de Florida, ha mostrado que las colonias de insectos siguen algunas de las mismas reglas biológicas que los individuos, un descubrimiento que sugiere que las sociedades de insectos operan como un solo superorganismo, en términos de su fisiología y ciclo de vida.

Por más de un siglo, los biólogos se han maravillado con la naturaleza altamente cooperativa de las hormigas, abejas y otros insectos sociales que trabajan juntos para determinar la supervivencia y crecimiento de una colonia. Las interacciones sociales se parecen mucho a un solo cuerpo, por eso el término de "superorganismo — un organismo de muchos individuos, de acuerdo a James Gillooly, profesor asistente del departamento de Biología de la Universidad de Florida.

Al analizar data de 168 diferentes especies de insectos sociales incluyendo hormigas, termitas, abejas y avispas, los autores encontraron que el

tiempo de vida, tasa de crecimiento y tasa de reproducción de las colonias como un todo, cuando se consideran superorganismos, eran difíciles de distinguir de los organismos individuales.

Este descubrimiento fue publicado en línea por *Proceedings of the National Academy of Sciences*.

"Ciertamente, una de las razones que algunos han tenido para estar interesados en los insectos sociales y las consecuencias de vivir en grupos es que esto nos habla sobre nuestra propia especie" afirma Kaspari, "Actualmente hay un debate vigoroso sobre cómo la sociabilidad ha evolucionado. Nosotros sugerimos que cada teoría de la sociabilidad debe ser consistente con la sorprendente convergencia en la manera en que organismos sociales y no sociales utilizan la energía.

Además de James Gillooly y Kaspari, Chen Hou de Albert Einstein College of Medicine y Hannah B. Vander Zanden de la Universidad de Florida, participaron en este estudio.

New publications

Poulsen, Michael and Currie, Cameron R. 2010. "Symbiotic interactions in a tripartite mutualism: Exploring the presence and impact of antagonism between two fungus-growing ant mutualists." *Plos One* 5(1): e8748.

Quintero, J.A., Candela, S.A., Rios, C.A., Montes, C., and Uribe, C. 2009. "Spontaneous combustion of the Upper Paleocene Cerrejón Formation coal and generation of clinker in La Guajira Peninsula (Caribbean Region of Colombia)." *International Journal of Coal Geology* 80(3-4): 196-210.

Ricklefs, Robert E. 2010. "Evolutionary diversification, coevolution between populations and their antagonists, and the filling of niche space." *Proceedings of the National Academy of Sciences* 107(4): 1265-1272.

Riehl, Christina and Jara, Laura. 2009. "Natural history and reproductive biology of the communally breeding Greater Ani (*Crotophaga major*) at Gatún Lake, Panama." *The Wilson Journal of Ornithology* 121(4): 679-687.

Rivadia, F., Vicentini, Alberto, and Fleischmann, A. 2009. "A new species of Sundew (*Drosera*, *Droseraceae*), with water-dispersed seed, from the floodplains of the Northern Amazon basin, Brazil." *Ecotropica* 15(1-2): 13-21.

Zotz, Gerhard. 2009. "Growth in the xerophytic epiphyte *Tillandsia flexuosa* Sw. (*Bromeliaceae*)." *Ecotropica* 15(1-2): 7-12.

Story:
William G. Eberhard
Edited by M Alvarado &
ML Calderon
Photo: Dylan Harms

A female wasp traps a spider *Allocyclosa bifurca* on its web and lays an egg on its abdomen. The egg grows into a larva that makes small holes in the spider's skin so it can drink vital juices from the spider to survive.

The larva of *Polysphincta gutfreundii* matures and induces its host to build a modified, physically stable orb web, to which the larva then attaches its pupal cocoon. It also makes it add a linear silk to this web that may camouflage the cocoon that will turn into its killer, drinking its internal fluids until only its outer layer remains.

The effects of the larva are apparently due to chemical products that it introduces into the spider. Behavioral modification is gradual, and various behavioral effects arise in a consistent order.

William G. Eberhard, of the STRI staff, experimentally removed the larva just before it killed the spider. Then the spider's behavior recovers gradually in exactly the reverse order. In addition, a greater delay in removing the larva leads to more pronounced and enduring behavioral changes, so the larval effects may depend on a cumulative or dose-dependent process.

Experiments like these are helpful for studying

future animal behavior because the manipulations parasites make in their hosts' behavior have "been honed by natural selection over long periods of time," Eberhard told the blog *Smithsonian Science*. "Understanding how these mechanisms work promises new, exciting and potentially powerful access into determining how animal behavior is controlled."

See <http://blogs.smithsonianmag.com/science/2010/01/27/spiders-under-the-influence/>

Eberhard, William G. 2010. "Recovery of spiders from the effects of parasitic wasps: Implications for fine-tuned mechanisms of manipulation." *Animal Behaviour* 79(2): 375-383.

Fine-tuned manipulation

Smithsonian Tropical Research Institute, January 29, 2010

lineal a la telaraña para camuflar el capullo, que eventualmente se convertirá en su asesino, tomándose sus fluidos internos hasta dejar solo una cáscara de lo que fue la araña.

Los efectos que produce la larva se deben aparentemente a productos químicos que introduce en la araña. La modificación en su comportamiento es gradual, y varios efectos de su conducta aparecen en un orden consistente.

William G. Eberhard, científico de STRI, retiró de forma experimental a la larva justamente antes de que matara a la araña. Ésta recupera su comportamiento gradualmente en orden reverso exacto. La demora en retirar la larva resulta en cambios de

comportamiento más pronunciados y por más tiempo, lo que puede indicar que los efectos de las larvas pueden depender de un proceso relacionado a la dosis o su acumulación.

Experimentos como este ayudan a estudios futuros de la conducta animal ya que las manipulaciones que los parásitos realizan en sus hospederos se han vuelto más eficientes al pasar largos períodos de tiempo" explicó Eberhard al blog *Smithsonian Science*. "Entender cómo estos mecanismos trabajan promete nuevos, excitantes y potencialmente poderosos accesos para determinar cómo es controlado el comportamiento animal." (Vea <http://blogs.smithsonianmag.com/science/2010/01/27/spiders-under-the-influence/>)

Animal Behaviour, 79(2): 375-383.

