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CICADA RESEARCH SUGGESTS COMPLEX GENETIC HERITAGE IN THREE SPECIES

A paper co-authored by Professor Chris Simon, two UCONN research associates, and other colleagues, offers genetic proof that three common species of cicada, although each has 13- and 17-year life cycles and each is found in eastern, middle, and western geographic regions, evolved independently and at different times from each other.

The paper, "*Independent divergence of 13- and 17-year life cycles among three periodical cicada lineages,"* was published in the March 18 2013 issue of the *Proceedings of the National Academy of Sciences (PNAS).*

The research presented indicates the presence of a common genetic basis for the three species groups of periodical cicadas (Decim, Cassini, Decula) – all members of the genus *Magicicada* – but it also shows there has been considerable genetic divergence leading to separate 13- and 17-year populations among the species despite the fact that each group exhibits similar phylogeographic patterning.

"Originally it was thought that the three different species groups must have developed simultaneously," says Simon, "because members of all three species groups emerge together every 13 or 17 years in multiple broods (or year-classes) located throughout the U.S., east of the Great Plains. The three species groups have pretty much the same geographic distribution, and they do everything together. But in our lab we were able to determine that the 13- versus 17-year Decim DNA divergence was much deeper than the 13- versus 17-year Cassini or Decula divergence, so I knew they hadn't developed at the same time as the others."

Working with colleagues in Japan, the UCONN researchers looked at DNA from the 30 years of samples represented in frozen collections at UCONN. They did geographic sampling of all three species, and when they compared them using nuclear and mitochondrial DNA markers they discovered that the three species groups had first diverged about 3.9 million years ago.

Initially, the Decim group diverged from the ancestor of Cassini and Decula, and then Cassini and Decula separated into different species groups about 2.5 million years ago. The mitochondrial gene genealogy shows further divergence associated with geographic regions and, partly, with life cycles.

The paper further reports that all three species groups experienced at least one episode of life cycle divergence since the last glacial maximum – the end of the ice ages – some 20,000 years ago.

"In the Decim species, the 13-year Decim in the southern region – roughly North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana, Tennessee, and Arkansas – actually survived as a separate group during the last ice age," Simon says. "The comparative DNA divergences tell us that the 13-year Decim formed earlier than the 13-year Cassini and the 13-year Decula."

Earlier, the UCONN research group found two independent derivations of the 13-year form life cycle in the Decim group, one of which was after the end of the ice ages. The current work adds that there were three independent derivations of the Decula 13-year life cycle (east, middle, and west) but only one derivation of the Cassini 13-year life cycle (from the west). All Casini and Decula 13-year cicadas that exist today were derived after the end of the ice ages from the 17-year memberships of their species groups.

The major implication of this work is that life cycle genetics, with the tendency for four-year time jumps and a long, synchronized life cycle, evolved in the common ancestor of all three species groups, but that the 13- and 17-year lineages of Decim, Cassini, and Decula seen today evolved not only later but at different times in each species.

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CICADA RESEARCH SUGGESTS COMPLEX GENETIC HERITAGE IN THREE SPECIES

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Brood II nearing 17-year cycle

The timing of the research paper coincided with the adult emergence of 17-year Brood II – of 15 known existing broods – in states including Connecticut, New York, Pennsylvania, New Jersey, Delaware, Maryland, and North Carolina. *Magicicada* periodical cicadas are seen in the spring and early summer when adults emerge from underground where they have undergone five different developmental stages, or instars, during their 17-year development. During this time they grow from approximately the size of an ant to their adult size of 25-50 mm – approximately one to two inches – depending on the species.

Nymphs emerge, sometimes by the millions, and find vegetation where they molt into mature adults. This process usually occurs in hardwood trees, where the adults then mate and the females lay their eggs. As part of this process males 'sing' to attract mates. This is done by vibrating ridged membranes, or tymbals, and the resulting cacophony is often described as "deafening" by those within hearing range of an emerging colony.

In Connecticut, Brood II was located west of the Connecticut River around New Haven, North Haven, and northward toward interstate 84. The insects emerged in early June, once the soil temperature reached approximately 55 degrees Fahrenheit. They lived approximately three weeks during which time they completed their life cycle.

As to why the insects live carefully regulated lives and emerge from the soil for a roughly 20 to 30 day period every 13 to 17 years, Simon comments, "There is safety in numbers. There are two published studies that strongly support the idea of a complex strategy of predator avoidance. Everything likes to eat Cicadas … birds, box turtles, and in certain societies, even people. By emerging by the millions, there are bound to be some that survive long enough to lay eggs and perpetuate the species."

Not all species of cicadas are of the 13- or 17- year variety, according to Simon, and many live more typical non-synchronized life cycles lasting anywhere from two to eight years, meaning that every year some individuals appear. However, it is the periodical cicadas, often incorrectly referred to as 'locusts', that capture the imagination due to their huge numbers, long absence, loud songs, and interesting black and orange markings.

For the most up-to-date information on Dr. Simon's cicada research, visit the website www.magicicada.org created by one of the paper's co-authors, John Cooley, a former postdoctoral research associate and a current lecturer in EEB.

— ***Adapted from UCONN TODAY article by Sheila Foran***

HISTORY MEETS HIGH TECH AT EEB'S HERBARIUM

EEB's George Safford Torrey Herbarium, with 200,000 specimens of plants, is a leading source of information for botanists throughout the world. Its state-of-the art facility contains herbaceous and woody plants collected over the past 100-plus years both locally and from around the world. And now that its records have been digitized thanks to a National Science Foundation grant, the herbarium can be accessed by researchers, teachers, and students anywhere in the world, who can explore the collection online.

The global scope of the 21st-century herbarium in Storrs would have been unimaginable to those who started the collection back in 1898, when the first specimen, a cinquefoil, was officially accessioned. That cinquefoil (*Potentilla canadensis*) came from the collection of H.A. Ballou. An entomologist by training, Ballou was hired by the Storrs Agricultural College (precursor to the University of Connecticut) to teach freshman classes in the Department of Botany and Military Science. He was the first on campus to treat the study of botany as an important part of the curriculum of the day, considering it just as worthy as the more favorably considered studies in horticulture, for which the college was known.

In botanical parlance, the collection became known by the acronym 'CONN,' and it is at once an active site for current academic pursuits and a valuable lesson in the history of the University

It is named after George Safford Torrey, a botanist who oversaw the collection from 1915 to 1956 and for whom the Torrey Life Sciences Building is also named. Torrey became head of the Department of Botany in 1929 and served in that role until 1953. During his tenure, the herbarium made significant strides in the number, variety, and quality of its samples.

Donald Les, current director of the herbarium and professor of ecology and evolutionary biology, says that UCONN's collection has grown from 100,000 items in 1992 to more than 200,000 over the past two decades. "Our collection is intermediate in size [compared to other herbariums], with about 200,000 items," Les says. "What sets us apart, thanks to a nearly $500,000 grant from the National Science Foundation, is that over 165,000 of our specimens have already been captured with digital imaging and are available on our database. This means that anyone, anywhere in the world, can go online and access the information."

He explains that although herbariums such as UCONN's are used to lending items to researchers, similar to the inter-library loan service for books, it is safer for the specimens and much more efficient for scholars to be able to view high-resolution images that have been digitally scanned or photographed. Every item is geo-referenced and accompanied by detailed information, including date and time of collection, soil conditions, the name of the person who collected the specimen, and more.

The NSF grant received in 2009 provided the funds for the project, but it was UCONN staff and students who put in endless hours photographing and scanning specimens and deciphering hand written notes dating back over a hundred years. Included were the records of Ballou, Torrey, famed geneticist and plant scientist Albert Francis Blakeslee, who taught in Storrs from 1907 to 1915, and the late Les Mehrhoff, plant collections manager from 1996 to 2001 and longtime research associate and educator, who donated more than 20,000 of his own specimens to the herbarium.

During the past four years, Robert Capers, current manager of plant collections, led a group of more than 50 students, who worked hard to get the collection into its present format. While the actual specimens are carefully preserved in climate-controlled files in the Biology/Physics Building, the entire collection can now be instantly shared online with scientists, teachers, and students throughout the world at http://bgbaseserver.eeb.uconn.edu/index.htm.

— Adapted from UCONN TODAY article by Sheila Foran

FROM LAB TO DINNER TABLE

Charlie Yarish pulls a long strand of kelp out of the chilly waters of Long Island Sound and takes a bite. "Oh, that's good," he says. "Crisp and sweet. You can't beat it when it's fresh."

It's just another day at the office for Yarish – "Captain Seaweed" – a professor in UCONN's departments of Ecology and Evolutionary Biology and Marine Sciences, who is using the expertise that's made him a globally renowned seaweed specialist to help birth an entirely new industry up and down the East Coast.

Yarish, a tall, gregarious New York native with a brushy mustache and an infectious enthusiasm for his work, envisions a day when seaweed farms, using techniques developed at the University of Connecticut, stretch from one end of Long Island Sound to the other, producing a crop worth potentially more than $47 million annually. But first, he's got to get that strand of kelp off the boat and onto your dinner plate.

Growing sea vegetables

The process starts in the waters of Long Island Sound, where Yarish, assistant research professor of marine sciences Jang Kim, and others harvest the reproductive tissue from the seaweed that they then transport to Yarish's lab at UCONN's Stamford campus. There, the tissue releases hundreds of thousands of spores that are grown under ideal lab conditions until they're ready to be taken back out to sea and planted on a seaweed farm.

Yarish's lab produces summer and winter varieties of different seaweeds, meaning the industry can function year-round. Once the plants are ready for harvest, fishing boats use grappling hooks to haul up long lines covered in crisp seaweed, which is then cut, bagged, and taken to Bridgeport for processing. From there, it goes to a growing number of restaurants and chic markets, where the flavorful, nutritious plant is gaining in popularity. "I call them sea vegetables rather than seaweed," Yarish says, "because that's a more accurate description. Just like vegetables, they're high in nutrients, vitamins, and trace elements, and they're good for you, and they're delicious. They can be made into pasta noodles and are gluten free."

They're also coming along at a time when more and more Americans are thinking hard about what goes onto their plate, from whether it's healthy, to how it was produced. Seaweed pushes all those locavore, organic, health-conscious, and foodie buttons, which is what drew Bren Smith to Yarish's research.

Smith is the owner of the Thimble Islands Oyster Co. and captain of the fishing boat on which Yarish was happily crunching away on some kelp recently. Having done longline fishing in the Bering Sea and lobstering off Massachusetts, Smith, in his flannel shirt and Whalers cap, looks every inch the classic New England fisherman. But he's also business-savvy and environmentally conscious, two traits that make seaweed farming a natural fit. "We're hoping seaweed is going to be the next kale," Smith says, referring to the once-doughty winter vegetable which has become trendily omnipresent in recent years.

In trendy Manhattan restaurants like Louro, seaweed-featuring dishes have ranged from kelp pasta with crab to pork belly with kelp salad to scallops and rice tossed in a kelp vinegar. The ritzy New York City "cocktail consultants" Evoe recently teamed with Louro and Smith to offer a special night of seaweed dishes and cocktails, like the Green Blood Maria, with kelp, chilies, and tomatoes, and the Sovereign Remedy, made with kelp-infused whiskey. Seaweed can be used in countless other recipes, too, from wraps to soup to scrambled eggs, but the interest in cutting-edge New York eateries is an important step, Smith says.

"When something catches on in New York, it usually spreads pretty quickly to the rest of the country," he says.

— Adapted from UCONN TODAY article by Tom Breen

KENTWOOD WELLS HONORED FOR SEMINAL PAPER ON SOCIAL BEHAVIOR OF FROGS

At age 14, Kentwood Wells of Springfield, Va. could rattle off the Latin names of all 100 toads and frogs found in the United States. He had a basement full of cages housing frogs, salamanders, and snakes he'd collected in the woods and streams of his family's three-acre property. And when he left home to study zoology at Duke University, he left a large, colorful tiger salamander (*Ambystoma tigrinum*, to be precise) in his mother's care.

Fifty years later, Wells, professor and former head of UCONN's Department of Ecology and Evolutionary Biology, is being honored for his foundational contributions to the fields of animal behavior and ecology.

His scientific paper, titled "*The social behaviour of anuran amphibians,"* published in 1977, is among the most-read and frequently-cited articles published in the 60-year history of the prestigious journal *Animal Behaviour*. And this year, it's the first of 12 papers to be honored with an essay on its impact by the Animal Behavior Society and the Association for the Study of Animal Behaviour, which will commemorate one each month over the course of 2013.

"Wells's review has played a critical role in the inception of scores of research programs over the past 36 years," wrote journal editor Mark Bee of the University of Minnesota in his essay, which is titled, "All's well that begins Wells: celebrating 60 years of Animal Behaviour and 36 years of anuran behavioural ecology."

The paper, which Wells wrote when he was in graduate school at Cornell, tackled big questions about frog behavior and how these amphibians interact with one another and their surroundings. It summarized what scientists knew – and what they didn't yet know – about how frogs choose mates, why they're aggressive toward each other, how they croak, and how they care for their young. "I feel privileged to have been in on the ground floor of the emerging field of behavioral ecology," says Wells. "It was an exciting time, and many new ideas were coming out in the field."

Ecology evolves

Ecologists traditionally focused on particular groups of animals. But when Wells's paper came out, scientists were beginning to look more broadly at the way animals behave, asking scientific questions and testing them with experiments. "Animal behavior was shifting to a hypothesis-driven science," he says. "The paper was important because it could be applied to other taxonomic groups," or many other groups of animals.

Susan Herrick, Ph.D. 2013, and a former student of Wells's, says the paper was written in a clear "Kentwood style" – that is, comprehensive but clear enough to be understood by any reader. The paper was written at a time when people were first developing solid ideas and core research questions about the social behavior of many animal groups," she says. "Anyone who works, even peripherally, in the field of animal behavior would be familiar with this paper."

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KENTWOOD WELLS HONORED FOR SEMINAL PAPER ON SOCIAL BEHAVIOR OF FROGS

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Wells came to UCONN as an assistant professor in 1977, the year his seminal paper was published. At UCONN, Wells embarked on what would become the largest endeavor of his life: a comprehensive book about amphibian ecology.

A life's work

His book, published in 2007 and titled *The Ecology and Behavior of Amphibians* (University of Chicago Press), took him 20 years to write, clocks in at 1,148 pages, and weighs more than six pounds. It's a far cry from the 28-page article that started it all, he says.

Herrick says Wells's "encyclopedic knowledge about all things herpetological is legendary and, at first, intimidating. In fact, I was terribly intimidated by him until I sat one-on-one with him to discuss my potential to complete my graduate work with him. It was then that I realized that he is amazingly humble and down-to-earth."

Wells teaches classes in vertebrate social behavior and herpetology. "Students today have to be even more successful than I was," he says. "If you want to do research and be competitive at a place like UCONN, you have to start really early. I tell students to read everything in sight."

When teaching a class like herpetology, there's one thing that will never change, and that's Wells's favorite part of the class: the field trips.

"The nice thing about teaching herpetology is that in the spring you get to get out at night and go herping," he says. "We go out with headlamps and boots, and many of the students have never done anything like that, and they love it, looking around in ponds for frogs. Someone almost always ends up coming back soaking wet because they fell in."

— Adapted from UCONN TODAY article by Christine Buckley

ROBIN CHAZDON RECEIVES ROYAL SOCIETY SUMMONS

In early May, 2013 EEB Professor Robin Chazdon, a tropical ecologist, was one of 18 scientists from around the world summoned to a special committee on tropical forest ecology and climate change at the Royal Society and St. James's Palace in London. Prince Charles attended the presentation of the group's final memorandum. The committee included 21 scientists from the U.S. and around the world, government officials, and other leaders from civil society and the private sector. In the meeting, the committee discussed the current state of science and politics surrounding tropical forest conservation. Several members of the Prince's Sustainability Unit were also present.

Robin's interview with UCONN TODAY is excerpted here:

How were you chosen to serve on this committee?

I study tropical forest regeneration and succession at La Selva, a research field station in Costa Rica, and have been monitoring tree growth, survival, and recruitment in a series of eight one-hectare forest plots of different age that were formerly pastures. Three of these plots are within La Selva, and five are on farms in the region (Chilamate, La Virgen, Tirimbina). We're trying to understand the factors that affect forest succession, and are testing whether successional changes in forests of different age are consistent with patterns we observe over time. I am also heading up a project that includes similar studies in Mexico and Brazil. Basically, we are finding that temporal patterns are highly variable and do not follow the predictions based on static data.

How had they heard about you?

I am becoming known as an expert on tropical forest regrowth following major disturbances, and have just written a scholarly book on the subject, called "Second Chance: Tropical Forest Regeneration in an Age of Deforestation," which will be published in 2014 by the University of Chicago Press.

Of the climate and tropical forest ecology concerns discussed at the meeting, what do you think is the most pressing?

What stood out to all of us is the difficulty of understanding how multiple factors are affecting tropical forests. Things like land-use change, forest fragmentation, and logging are all big factors, and then there's climate change on top of all of this. We still don't understand what factors lead to forest recovery in some areas but not in others. We are concerned that multiple stressors are bringing tropical forests closer to their "tipping points."

What do you think was the biggest takeaway from the meeting?

The committee agreed that we need increased attention to the bulk of tropical forests – about 70 percent – that are affected by human activities such as logging and secondary forest regeneration. I've been saying this for years, but this statement emerged from the consensus of ecologists at the meeting.

Who were you most interested to meet at the meeting?

I enjoyed meeting the members of the Prince's Sustainability Unit. They are very knowledgeable. I also enjoyed meeting several colleagues who work in Amazonia and whom I have published with but never met personally. I prepared a poster about a new initiative I am organizing called the Tropical Reforestation Network. It's a research coordination network to investigate the socio-ecological aspects of reforestation in the tropics and it has been recommended for funding by the National Science Foundation. The sustainability unit asked if they could keep the poster to put up in their offices, so it's there now. I hope they bring wealthy donors to walk by it on occasion!

— Adapted from UCONN TODAY article by Christine Buckley

GREENHOUSE FRIDAYS — A GOOD REASON TO COME IN FROM THE COLD

Greenhouse Fridays – a chance to experience the sights, sounds, and scents of the Ecology and Evolutionary Biology Greenhouses during these cold winter months – welcomes visitors to informal lunch time tours with emeritus professors Terry Webster and Gregory Anderson on the first and third Friday of each month, through March. The next tour takes place on Jan. 17, beginning at 12:15 p.m. Topics vary from Friday to Friday, but each and every tale told by these eminent botanists is guaranteed to be informative and fun.

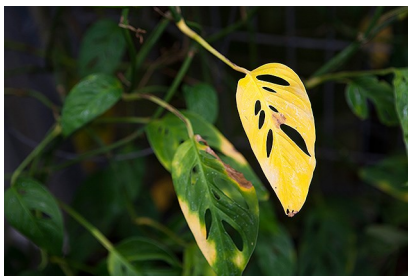
Terry Webster began his career at UCONN in 1965, two years after the greenhouses opened. He says, "The older a greenhouse gets, the more it acclimates. It settles into a maturity that lends itself to the plants growing there."

— UCONN Photo by Sean Flynn

Visitors are encouraged to ask questions during the tours. It is common to have discussions about the many species in the greenhouse. One discussion in January was about epiphytes, or air plants, which includes some orchids. The name 'epiphyte' comes from the Green words 'epi' meaning 'upon' and 'phyton' meaning point.

When asked what the "best thing about the EEB greenhouse," Terry said it's diversity. "We have so much diversity here, there's something for everyone. You don't have to know a lot about plants...just look around...and see the differences in leaves, in flowers, in color, and size. The greenhouses have thousands of different kinds of plants, so there's really something to appeal to everyone."

This ceriman, or swiss cheese plant, is a species native to tropical rainforests of southern Mexico and south to Columbia. The adaptive reason for the holes in the leaves is unknown, but some speculate that it looks as if a hungry predator has already been at work eating the best part of the leaves so other predators don't bother.



—Adapted from UCONN Today article by Sheila Foran

EEB WELCOMES NEW FACULTY

Dr. Yaowu Yuan: In August 2013 Dr. Yuan joined EEB as our newest Assistant Professor. Dr. Yuan comes to EEB from the University of Washington .

Before coming to UCONN, Yaowu worked as a Postdoc on the genetic basis of floral trait variation with Dr. Toby Bradshaw at the University of Washington (UW, 2011-1013), and transposable elements and plant genome dynamics with Dr. Sue Wessler at the University of Georgia (UGA, 2009-2010). Before that he trained in plant molecular systematics with Dr. Richard Olmstead at UW (2004-2008) as a graduate student. Outside of the lab, he enjoys reading, sport fishing, roller-skating, playing table tennis and card games.

Dr. Pam Diggle: In January 2014 EEB Dr. Diggle joined EEB as our newest Professor and Assistant Department Head. Dr. Diggle comes to EEB from The University of Colorado. Her research focuses on the combined effects of genotype, environment, and ontogenetic history on the development and evolutionary diversification of plant phenotypes with a particular interest in the role of developmental plasticity in morphological diversification and intra-individual variation among metamers as the raw materials for the evolution of floral specialization.

IN MEMORIAM—DR. FRANCIS TRAINOR
1929-2013

With sadness, EEB announces the passing of Dr. Francis (Frank) Rice Trainor, Professor Emeritus, who made a unique mark on phycology during a career that spanned more than 60 years. Frank's supreme optimism, kindness, and generosity endeared him to his family and friends, the town of Mansfield, Connecticut, and colleagues around the globe. We also remember his late wife Margaret (Peg) Trainor, n´ee Swanton, to whom he was married for 56 years. Together they shared a love of learning, travel, food and humour with many graduate students and close colleagues.

Frank was born in Pawtucket, Rhode Island. He earned a BS from Providence College in 1950 (where he, later in life, established an endowed chair) and a doctorate from Vanderbilt University (1957), studying with soil algae specialist Harold Bold. Frank launched his career at the University of Connecticut in 1957,and over the next 40 years he trained 19 doctoral students and many master's and undergraduate students. His research on algae covered an extensive range of topics, including phenotypic plasticity and its impact on taxonomy of algae, growth and sexual reproduction in green microalgae and diatoms, temperature tolerance in algae, characterization and long-term survival of soil algae and the impacts of environmental change on algal communities.

Although retired in 1997, Frank remained active teaching computer classes at the Mansfield Senior Center, writing research articles (he came into his EEB office regularly at least once or twice a week) and participating in numerous town and church committees.

Frank was also an artist and an expert on wood identification and carving, especially simple and stylized bird forms.

THE DEPARTMENT OF ECOLOGY AND EVOLUTIONARY BIOLOGY GRATEFULLY ACKNOWEDGES SUPPORT FROM THE FOLLOWING FRIENDS

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Dr. David Wagner

Drs. Kent and Marta Wells

Mr. and Mrs. Blake R. White

FORMER STUDENT OF DR. FRANK TRAINOR ESTABLISHES RESEARCH FUND

Thanks to the generosity of a former student of Dr. Frank Trainor, a new research fund has been established to support academic research related to algae and lichens. A contribution to the UCONN Foundation from Dr. And Mrs. Bertram E. Feingold of Arizona created the Betty Foster Feingold Endowment to the Ecology and Evolutionary Biology Department.

BEQUEST ESTABLISHES AVIAN STUDY FUND

Thanks to the generosity of the late Jeffrey Scott research funds for avian study are now available. A lifelong love of swifts and swallows prompted his bequest for and through the efforts of his sister, Leslie Miller, the UCONN Foundation, and Dr. Margaret Rubega that bequest established the new fund.

ALUMNI NEWS

Sarah Trainor Bois (Ph.D. 2012) accepted a new position as Director of Research and Education at the Linda Loring Nature Foundation on Nantuckett, MA.

Rob Dunn (Ph.D. 2003) Associate Professor, North Carolina State University received a $7.3 million National Science Foundation grant to take a citizen science initiative — called Students Discover — into North Carolina schools.

Dr. Chris Martine (Ph.D. 2006) David Burpee Professor, Bucknell University, is a science blogger at the Huffington Post (www.huffingtonpost.com/dr-chris-martine/) as well as the creator of the web series "Plants are Cool, Too!" You can catch his current and previous episodes of his series at http://www.youtube.com/user/PlantsAreCoolToo

Richard Piacentini (MS 1985) Executive Director, Phipps Conservatory and Botanical Gardens, received a 2013 UCONN Distinguished Alumni award. In addition to his personal award, Phipps Conservatory was selected as a Bronze Award recipient at the International Green Awards.

Frank Smith (Ph.D. 2013) Postdoctoral Associate with Dr. Bob Goldstein, University of North Carolina received a 3-year NSF grant to continue his research on tardigrade development.

GRADUATE STUDENT NEWS

James Bernot, MS student in Janine Caira's lab, received first place in the student paper competition at the annual New England Associate of Parasitologists meeting.

Laura Cisneros, Ph.D. student in Mike Willig's lab, received a highly competitive Travel Grant from the American Society of Mammologists.

Jeffrey Divino, Ph.D. student in Eric Schultz's lab, received a Sigma Xi Grant-in-Aid of Research Award.

Lily Lewis, Ph.D. student in Bernard Goffinet's lab, received a Switzer Fellowship.

Kerri Mocko, Ph.D. student in Cindi Jones's lab, received the Best Student Paper award at the Botanical Society of America's Annual Meeting.

Anna Sjodin, Ph.D. student in Mike Willig's lab, received a NSF Graduate Research Fellowship as well as an Outstanding Scholar Fellowship from UCONN.