

EEB STUDENTS — MAKING A DIFFERENCE

ANDREW FRANK, working in Elizabeth Jockusch's lab received a Gaige Award from the American Society of Ichthyologists. These funds provide support for museum or laboratory study, travel, fieldwork, or any other activity that will enhance professional careers by contributing to the science of herpetology. Thanks to this award, Frank will continue his field work in CA on his project, "Testing maintenance of phenotypic diversity in a North American skink (*Plestiodon gilberti*).

JOHANA GOYES-VALLEJOS, working in Kent Wells' lab, had her research on the mating behavior of the Guardian Frog published by the Universitii Brunei Darussalam. A link to that publication can be found here: <http://www.ubd.edu.bn/news-and-events/highlights-archive/2014/december/devoted-dads-why-some-male-frogs-care-for-their-young/>

JESSIE RACK, working in Mark Urban's lab, received the prestigious AAAS Mass Media and Science and Engineering Fellowship. This 10-week summer program places science, engineering, and mathematics students at media organizations nationwide. Fellows use their academic training as they research, write, and report today's headlines, sharpening their abilities to communicate complex scientific issues to the public. Jessie received the coveted internship with National Public Radio.

MANETTE SANDOR, working in Chris Elphick's lab, is a 2015 recipient of a grant from the Lewis and Clark Fund for Exploration and Field Research. The Lewis and Clark Fund encourages exploratory field studies for the collection of specimens and data and to provide the imaginative stimulus that accompanies direct observation. Thanks to this grant, Manette will continue her field research on the effects of climate change on shrub-bird interactions in the Sierra Nevada mountains

In addition, **Manette**, received an Outstanding Graduate Teaching Award from UConn's Institute for Teaching and Learning. This award is the highest teaching awards a graduate student can earn at UConn.

Manette also received an award from the Valentine Eastern Sierra Reserve (CA) for the second year in a row; this award will support her field research in the Sierra Nevadas.

ANNA SJODIN, working in Mike Willig's lab, received several awards this spring. She received a Sigma Xi Grant-in-Aid of Research to support her work on the ecology of infectious disease in Bolivian bats.

Anna also received a research award from the Explorers Club. The Explorers Club provides support for exploration and field research for those just beginning their research careers.

In addition, **Anna** was awarded a Grant-in-Aid of research from the American Society of Mammalogists.

KATIE TAYLOR received an Alumnae Fellowship from her alma mater, Mount Holyoke College to fund an experiment to explore the degree of hybridization risk experienced by native North American species of *Chrysoperla carnea*-group lacewings in the face of the mass release of non-native cryptic species by commercial agricultural biocontrol programs. Katie is working in Charlie Henry's lab.

TANISHA WILLIAMS was awarded a 2015-2016 Fulbright Award to support her research in South Africa. Tanisha is co-advised by Kent Holsinger and Carl Schlichting.

PLANT RESPONSE TO CLIMATE CHANGE STUDIED

A study spearheaded by Nora Mitchell (Ph.D. student in Kent Holsinger's lab) and Timothy Moore (Ph.D. student in Carl Schlichting's lab) was published in the April in The American Naturalist (<http://www.jstor.org/stable/full/10.1086/680051>). The study revealed species of two plant families sharing the same habitat sometimes respond in different ways to key climate changes.

The findings suggest that trait diversity may be the result of individual responses to the environment rather than all members of a plant species responding in a similar way to a specific environmental factor — which is more commonly assumed.

The research represents an advance in the understanding of the relationship between ecological and evolutionary processes. It may shed light on the past evolution of plant characteristics in relation to environmental change and what the future may hold for those plants.



The co-authored paper was based on two important plant lineages in South Africa, *Protea* and *Pelargonium*. Utilizing complex statistical analysis, they evaluated the effects of key climate variables on multiple traits across the two families. Sometimes *Protea* and *Pelargonium* exhibited similar characteristics in response to an environmental factor such as rainfall, but not always. These findings demonstrate that trait diversity within two plant lineages may reflect both parallel and idiosyncratic responses to the environment, rather than conforming to a global-scale pattern.

Their study was conducted in a region of South Africa that is one of the world's biodiversity hotspots and home to approximately 9,000 plant species, many of which are found nowhere else. Over a three-year period, the researchers measured more than 1,200 individual plants to study traits important to the plants' survival, and also looked at how these traits responded to six different environmental variables.

"Beyond its sheer size, what sets this research apart is that we are looking at these plants as an integrated whole instead of doing what many previous studies have done which is to take one measurement or one particular characteristic and plot that against a single variable, such as rainfall," said Moore.

Although the research is ongoing, one of the most significant conclusions from Mitchell and Moore's study is that there are multiple strategies of evolutionary response to climate change, says Carl Schlichting, EEB Department Head and an investigator on the study. "Nora and Tim, and others working on this project, are collecting data on a scale that hasn't been done before," he says. "They are challenging traditional assumptions of trait analysis."

The research is part of a \$3 million grant awarded to UConn by the NSF as part of its Dimensions of Biodiversity program, a program that focuses on the intersection of genetic, phylogenetic, and functional dimensions of biodiversity. The long-term goal of the program is transforming our understanding of the scope and role of life on earth by the year 2020.

—adapted from an article in *UConn TODAY*
March 31, 2014 by Shelia Foran

UNDERGRADUATE RESEARCH SYMPOSIUM

On April 28, 2015 EEB hosted its inaugural EEB Undergraduate Research Symposium where six EEB majors presented their research.

REBECCA COLBY, working in Eric Shultz's lab, "Physiological Response to Salinity Challenge is Mediated by Na⁺, K⁺ - ATPase Isoform Switching in a Euryhaline Fish, the Alewife."

ZACHARY SKELTON, working in Eric Shultz's lab, "Gene Expression of Important Osmoregulatory Ion Transporters in the Threespine Stickleback (*Gasterosteus aculeatus*)."

MATTHEW STROBEL, working in Yaowu Yuan's lab, "Developmental Genetics of Corolla Tube Formation in *Mimulus lewisii*."

EMILY BEHLING, working in Bernard Goffinet's lab, "Migratory Birds Carry Plant Diaspores in their Feathers."

TEMINA KUSI, working in Elizabeth Jockusch's lab, "Correlations Between Body Parts in Hemimetabolous vs. Homometabolous insects."

EMILY LEWSON, working in Chris Elphick's lab, "Do Ecosystem Services Provided by Tidal Marshes Affect Property Values in Coastal Connecticut?"

UNDERGRADUATE AWARDS

The Biology Honors Committee made 3 awards this spring to undergrads for the research they completed in EEB. All of the student dedicated several years to their projects.

REBECCA COLBY was named the **Outstanding Senior in EEB** for her work in Eric Shultz's lab to understand osmoregulation in Alewife.

EMILY BEHLING received the **Connecticut Museum of Natural History Award** for her work in Bernard Goffinet's lab on diaspore dispersal by migratory birds.

EMILY LEWSON received the **Honors Award in the Life Sciences**, which recognizes outstanding interdisciplinary work, for her research in Chris Elphick's lab on how ecosystem services provided coastal marshes are valued by the housing market.

ALISON KOONTZ was selected as the undergraduate student recipient of the 2015 American Society of Parasitologists **Willis A. Reid, Jr. Student Research Award**. This award will help support her research on cophylogenetic associations of a new genus of tapeworm and its batoid hosts. Alison, a junior at UCONN, also receive a University Scholar award. She is working in Janine Caira's lab.

KAITLIN GALLAGHER received the **Outstanding Student Paper Award** at the New England Association of Parasitologists meeting in April, 2015.

TEACHING RESEARCH FUNDAMENTALS TO YOUNG SCIENTISTS

When James Bernot (M.S. 2015) stood in front of a room of scientists at the annual meeting of the American Society of Parasitologists in Anchorage, AK he suddenly realized that he “knew this system better than anyone else in the room. I am a world expert on this small subject, and I’m sharing new knowledge with people. And that makes me a scientist.”

To get to this realization, Bernot spent two years studying parasites with Janine Caira, one of the world’s foremost tapeworm biologists.

Bernot is one among hundreds of students who have passed through Caira’s laboratory in the past 30 years. Many show up for the sharks, Caira says – “we get a lot of shark groupies,” she jokes – but even when they realize the lab is all about parasites, they stay for the experience of discovery. They stay to become scientists.”

At the heart of training young scientists, says Caira, is the idea of fundamental research. Her laboratory focuses on the taxonomy, or the family trees, of tapeworms. Of the some 7,000 identified tapeworm species, about 1,000 live and evolve in the guts of sharks and rays, making them an ideal system to study the coevolution of parasites and their hosts.

In the past five years alone, Caira and her students journeyed to the shores of Chile, Ecuador, Senegal, South Africa, Portugal, India, and Vietnam, where they collected sharks, often bycatch from local fishermen’s boats. The researchers dissect the fish, pull out their tapeworms, and bring the parasites back to Caira’s UConn laboratory.

There they wait, preserved in jars, for a student like Bernot, or Carrie Fyler (Ph.D. 2009) to identify them. “When you’re in the field, you’re out on a beach in the sun working for 10 hours each day – there’s a very raw element to it,” says Fyler. “And then when you get back to the lab, you have your microscope and your slides, and you spend hours just drawing, looking, analyzing, and learning.”



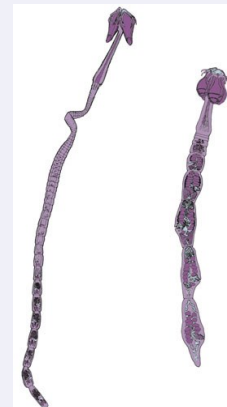
Carrie Fyler (Ph.D. 2009) dissects sharks on a beach in Senegal. (Photo courtesy of Janine Caira)

TEACHING RESEARCH FUNDAMENTALS TO YOUNG SCIENTISTS

One of the biggest thrills of Fyler's graduate work was naming a new species of tapeworm – one of 15 new species she discovered during her graduate work – after Carl Zimmer, author of the book *Parasite Rex*, which first inspired her to study parasites.

Two species of tapeworm discovered in the Caira laboratory. The slender, elongated worm is Megalonchos shawae, named after parasite expert Judith Shaw. The shorter, wider one, Symcalliobothrium peteri, was named after alumnus James Bernot's father, Peter.

(Image courtesy of Janine Caira)



Although Caira's research is funded by grants from the National Science Foundation, her work training students has been exponentially expanded over the years by private support.

A chance encounter between Caira and parasite devotee Judith Shaw '48, who worked on a national parasite catalog at the U.S. Department of Agriculture's Agricultural Research Center in Beltsville, Md., led to Shaw establishing UConn's Judith Humphrey Shaw Parasitology Fund in 1991.

"Judy's generosity has had a phenomenal impact on parasitology and the training of students at UConn," says Caira. "She's made it possible for students to travel nationally and internationally and experience science in the wild, something you just can't replicate here on campus."

More than 200 students and dozens of international researchers have benefited from the fund, Caira says. Its major role has been to enable students to travel to national and international conferences; among other trips, Fyler traveled to Slovakia to attend a workshop.

Says Bernot, "I wouldn't be where I am without that support. The meeting in Anchorage was the experience that changed my future."

Fyler currently teaches biology at Montclair Kimberly Academy in Montclair, N.J. Bernot has been accepted into the Ph.D. program at George Washington University, Washington, DC

—adapted from an article in UCONN TODAY
April 23, 2015 by Christine Buckley

PHIPPS CONSERVATORY ACHIEVES HIGHEST SUSTAINABLE BUILDING CERTIFICATION

A world leader in sustainable innovation, Phipps Conservatory and Botanical Gardens has achieved the Living Building Challenge™ for its Center for Sustainable Landscapes (CSL), a facility that houses groundbreaking sustainability research and science education programs, and serves as a key part of the public garden's immersive visitor experience. In producing all of its own renewable energy, and treating and reusing all water captured on site, the CSL demonstrates the benefits of humanity living in harmony with nature. IT is the first and only project to attain the planet's highest sustainable building certifications:

- Living Building Challenge, the world's most rigorous green building standard
- LEED® Platinum — tied for the highest points awarded under version 2.2
- First and only Four Stars Sustainable SITES Initiative™ (SITES™) for landscapes project (pilot)
- First and only WELL Building Platinum project (pilot)

Richard V. Piacentini (M.S.1984) is the Executive Director of Phipps Conservatory and Botanical Gardens, one of the oldest conservatories in North America (founded in 1893), a position he has held since 1994. During his tenure, Phipps launched the most ambitious expansion project in its 117 year history. The \$36.6 million expansion featured environmentally friendly designs, including the first LEED certified visitor center in a public garden, state-of-the-art energy-efficient Production Greenhouses; and an innovative 12,000-square-foot Tropical Forest Conservatory, the most energy efficient conservatory in the world.

"Phipps' Living Building is one of the most important projects of its kind in the world, demonstrating to the design community and thousands of annual visitors a profound new paradigm for responsible design and construction," says Jason F. McLennan, CEO, International Living Future Institute.

International Living Future Institute is an environmental NGO committed to catalyzing the transformation toward communities that are socially just, culturally rich and ecologically restorative. Composed of leading green building experts and thought-leaders, the Institute is premised on the belief that providing a compelling vision for the future is a fundamental requirement for reconciling humanity's relationship with the natural world. The Institute also runs the Cascadia Green Building Council, Ecotone Press, Declare, JUST and other leading-edge programs. A global network of more than 350 volunteers across nearly 30 countries drive the local adoption of restorative principles in their communities.

The Institute operates the Living Building Challenge, the world's most rigorous building performance standard. The Challenge is a philosophy, an advocacy tool and a certification program. Launched in 2006, more than 250 projects (totaling over 9 million square feet of space) are currently registered for the Challenge. The Living Building Challenge fosters buildings that produce more energy than they consume, avoid known toxins and harmful chemicals, and collect and reuse their own water.

Originally from New York, Richard received his master's degree in botany from the University of Connecticut and an MBA in business administration from Virginia Commonwealth University.