

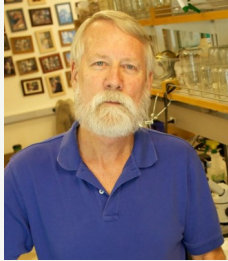


THE BUZZ



2013-2014

Dr. Paine joins UCR Academy of Distinguished Teachers



Professor of Entomology Timothy D. Paine was appointed to the UCR campus' Academy of Distinguished Teachers during 2013. The academy serves as an advisory group to the provost on teaching excellence and provides institutional leadership and guidance. Members serve as teaching mentors for new faculty and by organizing and taking part in seminars, colloquia, and workshops on teaching excellence. The academy de-

signs and produces the Scholarship of Teaching seminars in partnership with the office of the Vice Provost for Undergraduate Education. It also reviews teaching-related initiatives and grant proposals from members of the campus community.

Members of the Academy are often past recipients of major campus teaching awards. Dr. Paine has been a member of the UC Riverside faculty since 1986, developing research programs on the ecology of insect herbivores of woody plants in urban landscapes and forest systems. Paine received the Distinguished Teaching Award in 2004 and the Innovative Teaching Award in 2010. He was

recognized as a National Academies Education Fellow in the Life Sciences in 2008-09. His research contributions were recognized with both the Entomological Society of America Recognition Award in Urban Entomology and the ESA Distinguished Achievement Award in Horticultural Entomology.

An advocate of active learning, he helped develop UCR's Philosophy & Pedagogy of Teaching Undergraduate Life Science class, which helps graduate students interested in pursuing academic careers design life science courses with an active learning approach.

By Ross French, Senior Public Information Officer, UCR

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New technique to help control Argentine ant

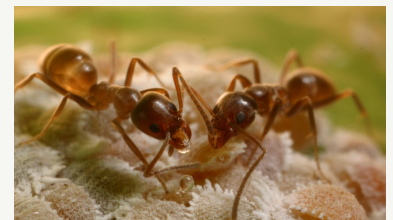
Entomologists lead by Dong-Hwan Choe, assistant professor of entomology at UCR have now developed a pheromone-assisted technique as an economically viable approach to maximize the efficacy of conventional sprays targeting the invasive Argentine ant. They supplemented insecticide sprays with (Z)-9-hexadecenal, a pheromone compound attractive to ants, and were able to divert Argentine ants from their trails and nest entrances. Lured by the pheromone, the ants were

eventually exposed to the insecticide residue, and killed. Study results appeared Dec. 23, 2013, in the online fast track edition of the Journal of Economic Entomology.

"What makes our study unique is that we combine the insecticide sprays and low-dose pheromone to attract ants," Choe said. "Our ultimate goal is to minimize the impact of pest damage on urban life with no or minimal negative impact on the environment, non-target organisms, and human health." The UCR Office of Tech-

nology Commercialization has filed a patent on the pheromone-assisted technique developed by the researchers. Choe was accompanied in the research by UCR undergraduate students Kasumi Tsai and Carlos M. Lopez, and laboratory staff research associate Kathleen Campbell.

By Iqbal Pittalwala, Senior Public Information Officer, UCR.



Argentine ants
Photo credit: D-H Choe Lab, UCR

Letter from the Chair

Alumni and Friends of UCR Entomology,

Welcome to Spring! I hope this newsletter finds you and yours well. And for those of you in the central and eastern portions of the country, I hope you will soon be seeing the last of sub-zero weather and mountains of snow. Since our last communication, the Department continues to be at the forefront of Entomology sciences with many new and exciting discoveries as well as important changes and additions to the Department. The UCR campus continues to grow, and we are close to our build out number of 25,000 students (with a minimum of 5000 graduate students). The new School of Medicine welcomed its entering class and the School for Public Policy opened its doors as well. At the Department level, we eagerly look forward to the completion of our new Environmental Chamber Facility (a.k.a. the “Blockhouse” replacement) which will comfortably house 40 growth chambers and is equipped with a large cold room. From a personnel perspective, the Department is undergoing a rapid turnover in faculty. As you may already know, within the last few years Nancy Beckage, John Klotz, Bob Luck, Mike Rust, Nelson Thompson, and Nick Toscano retired. This last year, both Tom Miller and Brian Federici also decided to retire, and Joao Pedra resigned to take a position at the University of Maryland Medical School. Both Brian and Mike Rust transitioned to “Professor of Graduate Division” which allows them to continue their active research program here at UCR. Tom is continuing his overseas research efforts in solving the Rwandan coffee problem (coffee takes on foul potato taste which may be due to insect pests).

With all of the recent retirements, one would hope for new positions to come into the department and that has certainly been the case. Erin Wilson-Rankin (Invasion Biology) joined the faculty late last spring and Naoki Yamanaka (insect molecular physiology) will join us this April. Currently, the Department is also conducting three faculty searches: arthropod-symbiont interactions, evolutionary genomics, and pathogen-vector interactions. If all goes well, we will have hired a dozen new faculty in the last seven years. Adding to that, are pending requests for up to six additional positions over the next four years. As chair, my primary goal is to maintain both the breadth and the depth of scientific expertise across the biological disciplines that are represented by Entomology; so far, so good.

UCR Entomology continues to be one of the best entomology programs in the country. Since our last newsletter, the graduate program underwent an extramural review. The review team reasserted that the graduate program remains as the preeminent program of its kind in the country. Indeed one reviewer referred to our program as the “crown jewel” of UCR’s life science graduate programs. Currently, Entomology faculty members are mentoring over 40 students in the Entomology graduate program and over 30 students in other life science graduate programs. Our undergraduate program remains relatively small but strong with 30-40 students. The size of the undergraduate program allows each student the opportunity to gain valuable research experience with one or more faculty members.

The University of California has begun the recovery process from the last few years of draconian budget cuts. State support for higher education appears to have stabilized. It is not growing significantly, but thankfully, it has stopped declining. A big “thank you” goes out to the citizens of California for approving a small tax increase to stabilize the UC budget. I am also extremely grateful to those of you who have generously donated funds to the Department in the last year. Your donations have been important to support our entomology students through numerous research support programs. These donations have allowed the Department to continue recruiting the very best students even while state funds to support these students have been curtailed or limited. To donate to UCR Entomology, please visit http://www.entomology.ucr.edu/supporting_entomology/ and choose among the many Entomology funds that support our students. As Chair, I am biased and have my favorite fund: the Entomology Fund for Excellence. This fund is used to support our seminar program and to assist our graduate students with their research and research related travel needs. And of course there are several other targeted endowments for both faculty and students in need of your support; please take a look at the endowment page for a complete listing of opportunities that allow you to assist the Department and its programs. THANK YOU in advance!!!

So grab a cup of coffee or tea and peruse your newsletter. You will find articles highlighting some of the recent activities and achievements of our Department members. From cutting edge research to student-organized community outreach, UCR Entomology continues to have a world-wide impact! Please join me in celebrating the successes achieved by our faculty, students, and staff as the Department continues on its path of excellence in research, teaching, and community engagement.

As usual, I would like to hear from you, our alumni and friends. Please share with me your own story of success, and the role that UCR had in your achievements by emailing me at richard.redak@ucr.edu - perhaps you will be our next featured alumni in the “where are they now” section of the newsletter!

A Special Thank you to all of our Contributors in 2013!

The UCR Entomology Department would like to thank the many supporters of our students and departmental programs. The number of individuals and companies that have provided financial gifts is remarkable, and the funds provided are used to keep the Entomology Department one of the best in the world! If you would like to give a tax deductible donation to UCR Entomology, please visit our website at http://www.entomology.ucr.edu/supporting_entomology/ and then choose among the many Entomology funds that support our students and programs. (See page 9 for a list of funds)

URBAN ENTOMOLOGY CHAIR FUND FOUNDERS CIRCLE (≥ \$5000)

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DEWEY PEST CONTROL, Brock & Chip Dewey
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PAYNE PEST MANAGEMENT, Willie & Kathleen Payne
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WESTERN EXTERMINATOR COMPANY, Michael Katz
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& Mrs. Patricia A. Platner
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& Dr. Michael E. Irwin
Ms. Vicki L. Broach
& Mr. Timothy M. Kelley
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UC Riverside Wins 2013 Linnaean Games

From L to R: Graduate students Eric Gordon, Kim Hung, Genevieve Tauxe and Parry Kietzman participated in the finals of the 2013 Linnaean Games.



The University of California, Riverside has won the Linnaean Games, a national insect trivia competition held at the annual meetings of the Entomological Society of America (ESA). UC Riverside faced Mississippi State University in the finals on Nov. 13 in Austin, Texas. This year marks the 30th anniversary of the games. The ESA meeting highlighted the games with a historical display of past winning teams.

The Linnaean Games, one of the meetings' best-attended events, are a lively question-and-answer, college bowl-style competition on entomological facts played between university-sponsored student teams. Named after the botanist and zoologist Carl Linnaeus, the games are an occasion for graduate students to show off their knowledge in entomology. Ten university teams competed this year. Four players make up each team. The teams score points by answering questions correctly.

The winning team from UCR – comprised of Eric Gordon, Kim Hung, Genevieve Tauxe and Parry Kietzman (Amelia Lindsey competed in preliminary rounds instead of Kim Hung; Adena Why was the alternate) – won an inscribed trophy cup for each team member and a plaque for the Department of Entomology. UCR won the games also in 2008, 2000 and 1998, and was runner-up in 2009 and 1996.

The graduate students were coached and quizzed by Darcy Reed, an administrative specialist in the Department of Entomology. They studied various areas of entomology, including medical and veterinary entomology, physiology, morphology, and toxicology, taxonomy and systematics, ecology, agricultural and applied entomology as well as various aspects of cultural entomology, including poetry, literature and music. They also had to be up-to-date with current events and be well-versed with the histories of entomology and the Entomological Society of America.

“Congratulations to the UCR team!” said Rick Redak, the chair of the Department of Entomology. “The students worked hard for several months to prepare for the games. We in the department were thrilled that they made it to the finals and are very proud of their victory.”

Any student wishing to participate in the games is eligible to do so as long as he/she is in a degree program or has completed a degree within one year prior to the contest.

By Iqbal Pittalwala, Senior Public Information Officer, UCR

Recent Honors and Awards

FACULTY

John Trumble

2012 Entomological Society of America Integrated Pest Management Team Award Presented by the Entomological Foundation

2012 Texas A&M Vice Chancellor's Award in Excellence for Partnership Collaboration

2013 Oscar Lorenz award. UC Vegetable Crops Workgroup

Jocelyn Millar

2013: Elected as Fellow of the ESA

Dong-Hwan Choe

Endowed Term Chair in Urban Entomology

Alexander Raikhel

Mir Mulla Endowed Chair in Entomology

The University Research Lecture

The Karlson lectureship for outstanding achievement in insect endocrinology

Timothy D. Paine

2013 Pacific Branch Entomological Society of America Distinguished Teaching Award

2013 Entomological Society of America Distinguished Achievement Award in Teaching

2013 Selection to UCR Academy of Distinguished Teachers with title UCR Distinguished Professor of Teaching

John Heraty

2013 UCR Entomology Graduate Student Association Outstanding Faculty Award

2013 Pacific Branch ESA Recognition Award for Systematics, Evolution, and Biodiversity

STUDENTS

The Linnaean Games Team, Winners for ESA 2013: Genevieve Tauxe, Eric Gordon, Parry Kietzman, Kim Hung, Amelia Lindsey, Adena Why, coach Darcy Reed

Genevieve Tauxe

April 2013. Don Tucker Memorial Award from the Association for Chemoreception Sciences for outstanding graduate student presentation

Outstanding Teaching Assistant, UCR Graduate Division

Amy C. Murillo

Pacific Egg & Poultry Association Scholarship

Second place, ESA presentation competition

Michael Forthman

First place, ESA presentation competition, Systematics, Evolution and Biodiversity section

Adena Why

First place, ESA presentation competition

John Hash

Second place, ESA presentation competition, Systematics, Evolution and Biodiversity section

Ryan Neff

Second place, ESA presentation competition

Sarah O'Neill

March 2013: NSF Graduate Research Fellowship Program

February 2013: UCR CNAS Center for Conservation Biology Shipley-Skinner reserve fund

January 2013: Desert Legacy Fund, The Community Foundation

Elizabeth Murray

van den Bosch Fellowship

Tina Kim

May 2013: CNAS Outstanding Achievement Award

Spring 2013: 2012-2013 Undergraduate Research/Creative Activity Mini Grant -Spring Quarter "Water Loss Studies on the Turkestan Cockroach"

April 2013: Pacific Branch Entomological Society of America, Undergraduate Student Paper Competition First Place

March 2013: The Carl Strom/Western Exterminator Company Scholarship in Urban Entomology

Fallon Fowler

UCR Chancellor's Research Fellowship for undergraduate research

National Scientific Societies

National Academy of Sciences: Alex Raikhel

American Association for the Advancement

of Science: Mike Adams, Ring Cardé, Brian Federici, Dan Hare, Marshall Johnson, Bob Krieger, Jocelyn Millar, Tom Miller, Joe Morse, Mir Mulla, Tim Paine, Alex Raikhel, Mike Rust, Richard Stouthamer, Nick Toscano, John Trumble

Jefferson Science Fellow: Tom Miller

Fellows of the American Entomological Society:

Ring Cardé, Brian Federici, Marshall Johnson, Jocelyn Millar, Tom Miller, Joseph Morse, Brad Mullens, Mir Mulla, Tim Paine, Alex Raikhel, Mike Rust, Nick Toscano, John Trumble

STAFF SERVICE AWARDS

Lisa Forster, 30 yr

Diane Soto, 5 yr

Entomology Research Museum News

Holotype specimen of *Arthracanthus fossicollis* Broun, a New Zealand melyrid beetle, part of an ongoing revision

Learn more
about the
**Center for
Integrative
Biological
Collections**
at
cibc.ucr.edu

A lot has happened in the Entomology Research Museum since the last newsletter. One recent development was the inclusion of the ERM in the new UCR Center for Integrative Biological Collections (CIBC), along with the Nematode Collection, Herbarium, Botanic Gardens, Citrus Variety Collection, and Earth Sciences Collection. We're hopeful this new Center may increase our collective visibility, and attract new or different types of interest in our activities. Trends from the past year continued pretty much on pace, including numerous discoveries and descriptions of new species from among our holdings, especially Hymenoptera. Our big bee databasing grant expired, and with it we lost the services of Keve Ribardo. There's a slim chance we might get some money to do additional databasing out of a newly-submitted NSF proposal, but that's a long while in the future, assuming it even passes review. What has been done so far is all available online as part of the Discover Life website dataset.

There has been a large amount of assistant activity over the past year. Cole Watson (though no longer a student) was working to sort our miscellaneous backlog to Order, and also spent a considerable effort on the databasing of an extremely large donation (over 40 drawers) of desert insect survey vouchers from Gordon Pratt, as well as labeling of over 10,000 specimens from the unlabeled backlog. Jee Park (a student) was working part-time dehydrating ethanol samples using HMDS, and then point-mounting the resulting specimens. She mounted well over 10,000 specimens, nearly all of which have been labeled. She has been succeeded recently by Andy Duong, who is doing a fantastic job so far and we hope to give him some assistance by hiring a work-study student to help with labeling. Grad students from the department have also made significant contributions, the most recent being Eric R.L. Gordon, who reorganized our entire mirid collection, which was no small feat. The ERM has also begun the process of incorporating portions of an enormous set of insect survey voucher specimens from various pro-

jects in Dr. Rick Redak's lab, comprising tens of thousands of vials of insects and other arthropods sorted to morphospecies. The most recent donation was some 20 drawers of voucher specimens from Dr. Mir Mulla, a number of which have already been incorporated into the collection.

We awarded a FERM Curator grant this past year to Michael Orr, a student from Utah State, for revising and describing bees in the genus *Anthophora*, one of the most diverse bee genera in the New World. He identified all of our specimens, and found several new species among them. We also very recently have welcomed back Adrican Mayor, a former UCR grad student (working under John Pinto in the early '80s) who has now retired and hopes to do some major revisionary work with melyrid beetles as an ERM volunteer. He's spending the winter back in SoCal and has been coming in every day and plowing through our melyrid collection, which he says may be the best in the world for the US fauna, and contains a large number of undescribed species, with specimens dating back nearly a century.

The Museum's specimen database has grown considerably as a result of all this activity (including the bee grant, which includes many records of specimens that do not belong to us). We now have some 472,000 records, which is 77,000 new records in the past year, the largest single-year increase since our database was created in 1999, and continuing the trend from last year. Unfortunately, the coming field season promises to be poor given the ongoing drought, so we might not be adding quite so many specimens this coming year.

By Serguei Triapitsyn & Doug Yanega

New Alumni (Students graduating during 2013)

Congratulations to our recent graduates! We wish you the best as you pursue new opportunities!

Graduate Students:

Jennifer Charles-Tollerup (PhD , Paine)
Dagne Demisse (PhD, Walton)
Holly Hills (MS, Stouthamer)
Rochelle Hoey-Chamberlain (MS, Rust)
Wei Song Hwang (PhD, Weirauch)
Vanessa Lopez (PhD, Hoddle)
Warren MacDonald (MS, Raikhel)
Christina Mogren (PhD, Trumble)
Jason Mottern (PhD, Heraty)
Maiara Severo (PhD, Pedra)
Adena Why (MS, Walton)
Guanyang Zhang (PhD, Weirauch)

Undergraduate Students:

David Theuret
Jonathan Tedjo
Pedro Montes
Ismael Esquivel
Mariam Shafik
Amy Michael

Recently Retired...

Thomas Miller
Brian Federici

Lisa Forster (SRA)



Welcome to our newest students!

Graduate Students:

Austin Baker
Allison Bistline
Yike Ding
Alex Knyshov
Stephanie Leon
Nate McConnell
Korie Merrill
Kelsey Schall
Jacqueline Serrano
Cole Symanski
Levi Zahn

Undergraduate Students:

Christopher An Doan Thie Nguyen
Christina Anh Hong Luu
Anthony Luis Sees
Natalie Debby Wong
Kimberley Grace Garcia
Andy Bao Ly
Valery K Franco
Brandon Charles Flickinge
Alec Aaron Yzaguirre Williams
Jonathan Dean McGhee
Brandon S. Rogers
Kyle Austin Whorrall
Augustine Paolo De Villa
Russell Aaron Jones
Steve Van Truong
Alex Jaehyun Han

Tell us your News!

Email us at richard.redak@ucr.edu

In Memoriam

A memorial bench recognizing the exceptional mentorship and scholarship of Professor Nancy Beckage was placed at the UCR Botanic Gardens by Nancy's friends and colleagues. The bench is positioned along one of the many trails in the Gardens, offering visitors the opportunity to rest and reflect on the positive impacts that Nancy had on our campus community.

Tamarixia radiata, a natural enemy of the Asian citrus psyllid

An Asian citrus psyllid nymph.
Photo credit: Mike Lewis, CISR, UC Riverside.

The Asian citrus psyllid (ACP) can spread the lethal and incurable citrus disease known as huanglongbing (HLB) or citrus greening that threatens the multi-billion dollar global citrus industry. In Southern California, large and widespread populations of ACP have been detected in several counties, which most likely have arrived from Mexico where ACP is widely established.

In 2011, for the first time entomologists at the University of California, Riverside released *Tamarixia radiata*, a wasp that is the natural enemy of the ACP, in a citrus grove in Riverside to help control the psyllid. But is this wasp safe to use? Does its introduction pose any risk to the environment?

Results from Federally mandated tests performed at the University of California, Riverside now show that *Tamarixia radiata* is indeed safe for the environment and poses no undue risk to other insects, humans or pets.

“Our work demonstrates that *Tamarixia radiata* is very specific to the target it is being released to kill — the nymphs of the Asian citrus psyllid in this case,” said Mark Hoddle, the director of the Center for Invasive Species Research, whose lab performed the tests. Study results appear in the February 2014 issue of the *Journal of Economic Entomology*.

Safety testing in biological control is important as the release of natural enemies may pose some type of environmental risk. In this instance, *Tamarixia radiata* were imported from the Punjab region of Pakistan, and tested for safety in quarantine at UCR over an 18 month period. The study is the first published study designed specifically to determine the host range of *Tamarixia radiata*. The results are important as the wasp is being used for ACP biological control in Florida, Texas, the Caribbean, Central and South America, and Mexico.

“These types of studies continue to advance the safety of biological control for suppressing populations of invasive pests thereby greatly reducing reliance on pesticides for control,” said Hoddle, a biological control specialist in the Department of Entomology. “In urban areas, initially pesticide treatments were applied to ACP-infested trees, and chemically-treated buffer zones were established

around sites to control the pest.”

To test the safety of *Tamarixia*, different species of native California psyllids were exposed to the wasp in a series of tests. The tests were designed to give the wasp a “choice” between ACP and a non-target psyllid species, or there was “no choice” (that is, the wasp was only given access to a non-target species, one it had not evolved with). When given a choice, *Tamarixia* overwhelmingly attacked ACP, the researchers found.

“In only one instance was a non-target species attacked at very low rates, less than 5 percent,” Hoddle said. “This was the native pest potato psyllid, which spreads a bacterium that causes zebra chip disease. Such low attack rates are unlikely to cause population declines of this pest.”

“We have now released more than 200,000 *Tamarixia radiata* in Southern California at more than 350 different sites, mainly in urban areas and spanning six counties — Imperial, Los Angeles, Orange, Riverside, San Bernardino, and San Diego,” Hoddle said. “They have established and are spreading, tracking down ACP on citrus in people’s gardens and orchards.” The *Tamarixia* larvae will eat the ACP nymphs, killing them, and emerge as adults about 12 days later. Adult female *Tamarixia* also eat other ACP nymphs, killing many in the process.

Hoddle was joined in the study by Raju Pandey, a former postdoctoral researcher in his lab and working now with the Citrus Research Board. The research was supported by a California Department of Food and Agriculture Specialty Crops Grant and a Citrus Research Board grant.

By Iqbal Pittalwala, Senior Public Information Officer, UCR



A female *Tamarixia radiata*, highly magnified. The tiny parasitic wasp lays eggs in Asian citrus psyllid nymphs, eventually killing them.
Photo credit: Jason Mottern, UC Riverside.

New Faculty



Erin E. Wilson Rankin

RESEARCH INTERESTS

My research focuses on investigating species interactions and their effects on trophic dynamics and ecosystem services within the contexts of invasion biology and community ecology. Biological invasions, one of the main drivers of global environmental change, disrupt species interactions and contribute to the collapse of trophic systems. Integrating quantitative and molecular approaches, we examine the trophic impacts of invasive generalists, focusing on how invaders disrupt food webs, their stability and the mechanisms underlying these shifts. Current research projects in the lab examine life history evolution of invasive yellowjacket wasps, the non-lethal effects of invasive social insects on native pollinators and their resource collection, and the multi-trophic impacts of invasive omnivores. Our research contributes to the understanding of how species interaction networks respond to perturbations (such as addition or removal of a species of large effect) and the consequences for food web stability in natural and managed ecosystems.

Targeted Opportunities for Giving to UCR Entomology

Endowed Faculty Chairs

Alfred M. Boyce Endowed Chair in Entomology—honoring the memory of professor emeritus Alfred M. Boyce, this chair is currently held by Distinguished Professor of Entomology, Ring Cardé

Mir S. Mulla Endowed Term Chair in Entomology—honoring professor emeritus Mir S. Mulla, this chair furthers instruction in entomology and research in arthropods affecting human and animal health. This chair is currently held by Distinguished Professor of Entomology, Alexander Raikbel

Urban Entomology Chair Fund—gifts to this fund will support faculty chairs in the field of urban entomology

Departmental Scholarly Activities Funds

Entomology Fund for Excellence—supports outstanding seminar speakers and departmental priorities

Entomological Museum and Insect Collection—supports programs and activities of the UCR Entomological Museum and Insect Collection

Endowments for Student Support

Lauren & Mildred Anderson Endowed Graduate Assistantship in Immature Insects—supports graduate students studying immature insects

Carl Strom Western Exterminators Scholarship Fund—supports graduate and undergraduate students working in urban entomology on projects of interest to the structural pest control industry in California

Francis A. & Jane Davies Gunther Endowed Scholarship—supports graduate pursuing research in pesticide chemistry

Ian & Helen Moore Endowment for Marine Entomology—supports graduate students pursuing research on aquatic insects

Dr. Mir S. Mulla & Lelia Mulla Endowed Scholarship Fund—supports students in entomology, bioagricultural, and biomedical sciences

Harry H. Shorey Endowed Scholarship Fund—supports graduate students who are pursuing research on pheromones in entomology

Harry Scott Smith Endowed Fund in Entomology—supports graduate students studying biological control

New wasp species named after UCR



Photo credit: I. Pittalwala, UCR

Serguei V. Triapitsyn, principal museum scientist at the Entomology Research Museum on campus, discovered a new wasp species in Russia and named it after the university, commonly abbreviated as UCR. He had been sorting wasps from the Russian Far East when he discovered several tiny female fairyflies, or mymarid wasps, 1.1 to 1.2 millimeters in body length. He named the species *Gonatocerus ucri* in a research paper he published April 30 in the international scientific journal *Zootaxa*.

A Russian Academy of Sciences collaborator of Triapitsyn used a trap during 1999-2002

to collect minute wasps for the Entomology Research Museum in a remote location in Primorsky Kray, Russia, a region that has a largely unknown and very rich fauna of this group of insects. The trap contained alcohol that wasps dropped into, also serving as a preservative for the insects until they could be sent to UCR for study. It took Triapitsyn several years to complete the study, since identification of these minute wasps, which are hardly visible to a naked eye, requires special preparation.

Gonatocerus ucri is mostly brown in color and has long antennae and wings. Its host is unknown but other species in the same genus are beneficial insects known to parasitize eggs of leafhoppers, some of which are economically important agricultural pests worldwide.

"I decided to name it after UCR because that's where I work," Triapitsyn said. "The UCR Entomology Research Museum has extensive collections of parasitoid wasps from throughout the world and I routinely

discover new species among the collected material. I will soon also be describing another new species, this one from southern California, and name it after the Entomology Research Museum."

By Iqbal Pittalwala, Senior Public Information Officer, UC Riverside



Photo shows *Gonatocerus ucri*, named after UCR.

Photo credit: Entomology Research Museum, UC Riverside

Honey Bees Adversely Impacted by Selenium

The honey bee is an important agricultural pollinator in the United States and throughout the world. In areas of Se contamination, honey bees may be at risk because of the biotransfer of the metal from Se-accumulating plants.

Se contamination is a global problem originating from naturally contaminated soils and a multitude of anthropogenic sources including mining and industrial activities such as petroleum refining and coal-power production, as well as where agricultural runoff is collected and can concentrate Se from the surrounding soils. Low Se concentrations are beneficial to many animals; in particular, it is a critical component of an antioxidant enzyme. Slightly higher concentrations, however, are toxic.

Kristen Hladun, a postdoctoral entomologist, explained that honey bees may also be more susceptible than other insects due to a lack of detoxification enzymes that other insects still possess. Further, honey bees at the larval stage are more susceptible to selenium relative to other insect species. "The forager's ability to tolerate high concentrations of selenium may act against the colony as a whole. Honey bees are social animals and their first line of defense against environmental stressors is the foraging bees themselves. High concentrations of Se will not kill foragers outright, so they can continue to collect contaminated pollen and nectar, which will be stored and distributed throughout the colony."

"Beekeepers can take steps to prevent bees from foraging during flowering periods of plants that have exceptional pollutant levels or to move hives away from contaminated areas," she said. "Also,

better management of weedy plant species that are known to be Se-accumulators can prevent them from becoming a route of exposure."

Study results appear in the Oct. 2013 issue of the journal *Environmental Toxicology and Chemistry*. Hladun was joined in the study by Osman Kaftanoglu, a research apiculturalist at Arizona State University, David Parker, a professor in the Department of Environmental Sciences at UCR, and Khoa Tran, a UCR undergraduate student. UCR's John Trumble, a distinguished professor of entomology, is the principal investigator on the project.

By Iqbal Pittalwala, Senior Public Information Officer, UCR



Kristen Hladun looking for the honey bee queen on a hive frame.

Photo credit: Trumble Lab, UCR.

Scientist Honored by City of Riverside

The University of California, Riverside's Anandasankar Ray was recognized (Oct. 8, 2013) as the Innovation Honoree of the Month by the City of Riverside. Ray, an associate professor of entomology, received the award from Mayor Rusty Bailey. In 2010, with help from UC Riverside's Office of Technology Commercialization and the Innovation Economy Corporation, Ray founded Olfactor Laboratories Inc. (OLI), in Riverside. The company is dedicated to insect research, identifying the best odors for behavior control and designing products to protect people from mosquitoes.

Research performed initially in Ray's laboratory — the identification of volatile odor molecules that can impair, if not completely disrupt, mosquitoes' carbon dioxide detection machinery — led to the research and development at OLI of the Kite Mosquito Patch, the world's first product that blocks mosquitoes' ability to efficiently detect carbon dioxide, their primary method of tracking human blood meals. In the City Council

Chambers, where Ray was honored, he said he was pleased to see research get translated into a product that makes it to market. "It's the interest and enthusiasm from the university — professors, postdoctoral scholars, students, the vice chancellor for research — that helped us create a new startup company in the Riverside area," he said. "I thank the city for the support it gives startups to set up here."

Recently, Ray disclosed a new invention: alternatives to DEET that can be used as insect repellents. These compounds, all of which are found naturally in fruits, plants or animals and activate the same antennal cells in flies as DEET, are approved by the Food and Drug Administration for consumption as flavors or fragrances. They are affordable and safe for human use.

By Iqbal Pittalwala, Senior Public Information Officer, UC Riverside



Ray received his Ph.D. in molecular, cellular and developmental biology at Yale University. He joined UCR in 2007. The main focus of his laboratory is to understand the molecular, neuronal and physiological basis of insect olfaction and behavior.

Where are they now? Spotlight on a former UCR entomology student

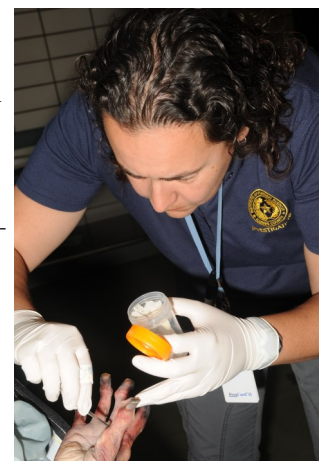
In 2003, after finishing my Master of Science degree in Bill Walton's lab, I had a difficult time leaving the wetlands. I worked in the Coachella Valley Sanitary District's primary treated effluent wetland for another two years with the Walton lab before heading to Texas. Little did I know how useful it would be to learn how to work in very hot and strong smelling environments. I worked on my Ph.D. in Entomology at Texas A&M University with Jeff Tomberlin where I studied learning behavior of mosquitoes and Forensic Entomology. I also had the opportunity to spend 10 months in Thailand with the Fulbright program at Chiang Mai University in northern Thailand. I graduated from Texas A&M in 2010 and went on to spend two and a half years as a post doc in Greg Lanzaro's laboratory at UC Davis where I worked with *Anopheles gambiae* and gained a valuable appreciation of molecular biology.

In the beginning of 2013, I launched my professional career at the Harris County Institute of Forensic Sciences in Houston, TX as the first full-time forensic entomologist to be employed by a medical examiner's office in the United States. I currently work within the Investigations Division and have regular opportunities to participate in death scene investigations and to attend autopsies. I collect insects that may aid in estimating time since death, insects

related to neglect and/or abuse, insects that may be directly related to a cause of death, and other interesting or unusual circumstances related to insects and death investigations. Because this perspective is so new, each day we are learning new things about the insects related to human decomposition and challenging long-held assumptions. One of the most rewarding aspects of my job is to be able to take ideas and methods from literature and test them out in actual application.

If you had asked me back in my UCR days if I would have ever seen myself in the position I am now, I do not think I could have even imagined it. I feel very fortunate to be able to use entomology in my everyday work and to see it applied in real time.

You can reconnect with Michelle at michelle.sanford@ifs.hctx.net



Michelle Sanford, M.S. 2003

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UCR Entomology Outreach



The Department of Entomology continues to maintain an active public outreach program. Over the last year our students have participated in nearly 60 events associated with campus and the broader community. University events included homecoming, freshman orientation, campus recruitment days, UCR's R'garden open house, and the chancellor's new faculty welcome picnic. Off campus we continue to engage with school groups, libraries, and other organizations in the area and participate in certain long-standing events.

We have continued to collaborate with the Riverside Metropolitan Museum at their "First Sunday" and other events. For example, one of our graduate students participated this year at the Museum's "Tarantula Day". Our animals and displays again traveled as far away as Bishop, CA for the Eastern Sierra Tri-County Fair and to events for at risk youth in the San Bernardino Mountains. Some notable new events for us this year included a Bug Fair at Arlington Library, an event at an assisted living center, a local American Indian tutoring group, and an on-campus event for young women in math and sciences.



The rest of this spring is looking to be a busy one for the outreach program, with more than a dozen events already planned within the next couple of months. Many thanks to all of the students whose hard work makes this program possible.



By Matt Daugherty
Outreach Committee Chair