



# THE BUZZ



2012-2013

## Entomological Society of America honors Dr. Morse



For his outstanding contributions to entomology, Joseph Morse, a professor of entomology at the University of California, Riverside, has been elected a fellow of the Entomological Society of America.

Morse and nine others were elected to this honor and were recognized on Nov. 11, 2012 at the annual meeting of the Entomological Society of

America in Knoxville, TN.

Over the past 20 years, Morse's laboratory has focused on applied and fundamental research dealing with the management of arthropod pests of citrus and avocados in California.

Morse has specialized in the areas of integrated pest management, invasive species research, applied biological control, parasitoid behavior and ecology, insectary rearing of natural enemies, the acute and sub-lethal impact of pesticides on both target pests and non-target organisms, modeling and computer simulation, and pesticide resistance.

He also has an interest in international agriculture and has been involved in citrus and avocado pest management and/or cooperative projects with researchers and industry personnel in Arizona, Florida, Hawaii, Texas, Argentina, Australia, Brazil, Chile, Cyprus, Egypt, Israel, Japan, Mexico, New Zealand, South Africa, and Spain, and in a 1996 FAO-sponsored analysis of citrus integrated pest management in 13 countries of the Near East.

See page 5 of this newsletter for a list of current department faculty who are honored as Fellows of the Entomological Society of America.

## The red palm weevil invasion in Laguna Beach

In September 2008, inspection of a dead Canary Islands palm in Laguna Beach, revealed the presence of the red palm weevil, *Rhynchophorus ferrugineus*. The color morph for this global invader is orange with red spots, and closest population to the USA is in the Caribbean. Consequently, the first incursion into North America was expected to be Florida. However, the detection in Laguna of a color morph that was black with a red stripe was surprising. This color morph, previously known

as *R. vulneratus*, was synonymized with *R. ferrugineus* in 2004. DNA work has revealed that these two weevils are indeed separate species and *R. vulneratus* was found in Laguna and it likely originated from Indonesia. Pheromone traps have failed to detect adult weevils for more than 1 year now and it is possible that focused pesticide applications to infested palms may have eliminated incipient populations. More information can be found at: [http://cislr.ucr.edu/red\\_palm\\_weevil.html](http://cislr.ucr.edu/red_palm_weevil.html) and

on the associated blog: <http://cislr.ucr.edu/blog/>

**By Mark Hoddle**  
Director, Center for Invasive Species Research



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*Letter from the Chair*

Alumni and Friends of UCR Entomology,

I hope that you will enjoy the rebirth of the UCR Entomology newsletter. Starting with this 2012/2013 newsletter, I anticipate annual publication of this newsletter to keep you connected with your UCR Entomology family.

If you have not been on the UCR campus in a while, the changes over the last decade may shock you! The campus now has approximately 21,000 students (over 18,000 undergraduates) and numerous new buildings, including a new Genomics building that opened in 2009 and houses several faculty of the Entomology Department. The face of the Department continues to change as well, with seven new faculty members hired in the last five years. Our new faculty are a tremendous crop of young scientists bringing to the Department new skills, new ideas, and the energy to excel in our research, teaching, and community engagement missions.

UCR Entomology continues to be one of (if not the) very best entomology programs in the country. During 2010, the National Research Council ranked UCR Entomology as one of the top 1-2 programs of 27 entomology programs evaluated nationally. Our success reflects the strength of our faculty, students, and staff. This recognition of our Department ensures that we continue to recruit the very best faculty into the Department as well as the top students nationally into our graduate program.

The last few years have been a challenging period for the University of California. State support for higher education continues to shrink, and all campuses have had to navigate severe cuts to funding as California has struggled with a reduced economy. The recent voter-approved tax increase in California has helped to stabilize the UC budget, providing the critical funding needed to keep higher education at UC somewhat affordable. State support also provides funding necessary to support research programs, classroom instruction, community engagement, and knowledge transfer and extension efforts. I would also like to sincerely thank all of you who have 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 dwindled. To donate to UCR Entomology, please visit [http://www.entomology.ucr.edu/supporting\\_entomology/](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 two favorite funds. The first is 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. The second is the general support fund for the Department of Entomology. This fund is largely unrestricted and can be used to support students and faculty with their research endeavors. 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 adjacent page for a complete listing of opportunities that allow you to assist the Department and its programs.

As you read through the 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 is having an 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.

Lastly, 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](mailto:richard.redak@ucr.edu) - perhaps you will be our next featured alumni in the "where are they now" section of the newsletter!

**Dr. Rick Redak**  
**Chair of the Department**

## *A Special Thank you to all of our Contributors in 2012!*

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/](http://www.entomology.ucr.edu/supporting_entomology/) and then choose among the many Entomology funds that support our students and programs.

### URBAN ENTOMOLOGY CHAIR FUND FOUNDERS CIRCLE (\$25,000)

CLARK PEST CONTROL, Joe Clark  
CORKY'S PEST CONTROL, Corky Mizer  
DEWEY PEST CONTROL, Brock & Chip Dewey  
LLOYD PEST CONTROL, Jim and Jamie Ogle  
MEGA FUME, INC., David Wadleigh  
PAYNE PEST MANAGEMENT, Willie & Kathleen Payne  
PESTAGON, David Baro  
STATEWIDE FUMIGATION, William Lawson  
WESTERN EXTERMINATOR COMPANY, Michael Katz

### MONARCH LEVEL (\$1000 and above):

C.A.P.C.A. Ventura County Chapter  
Robert & Carol Hardison  
Robert & Susan Krieger  
Leavens Ranches, Leslie Leavens-Crowe  
James A. Ogle, Jr.  
Mark Pomerantz & Deborah Ford  
Powerful Pest Management, Inc.  
Riley & Associates CA/NV,  
*In honor of Mike Rust*  
Target Specialty Products  
Gary & Kathy Veeh  
Western Exterminator Company

### QUEEN LEVEL (\$500 - \$999):

Dewey Pest Control  
Randolph & Linda Malone  
Morgan Stanley

### QUEEN LEVEL (continued):

Mud Creek Ranch, Steve & Robin Smith  
Northstar Exterminators-West  
Frederick Pratt  
The Estates C.O.A.

### VICEROY LEVEL (\$100 - \$499):

Gregory R. Ballmer  
Mark K. Blake  
California Exterminators Alliance  
Laura L. Coy  
Donald & Susan Deardorff  
Jane Delahoyde  
Eugene Drake  
J. R. Essick  
Carol C. Fujita  
General Electric Foundation  
William A. Gregory  
Marc & Christine Halbritter  
Dirk Jenkins & Corinne Parker  
Linda R. Jones  
Sylvia J. Kenmuir  
Robert & Lynn Kimsey  
Lyla J. Lampson  
James & Carolyn Leesch  
John C. Luhman  
Ronald W. Lyons  
Dale & Nancy Meyerdirk  
Gregg S. Nuessly  
Oro Del Norte, LLC  
Thomas & Alice Payne  
Gary & Patricia Platner  
Dale & Jun Powell

Arnold & Phyllis Rowe  
*In memory of Professor Ralph B. March*  
Neil & Eva Snyder  
Daniel & Linda Strickman  
Kouichi R. Tanaka  
Richard S. Vetter  
Rufina N. Ward  
Robert &Carolynn Zuparko

### DEPARTMENT SUPPORTERS:

Anonymous  
John R. Attaway  
Terry L. Bishop  
Jared P. Bond  
Rebecca A. Brawner  
Glen & Ann Forister  
Saul & Susan Frommer  
Armando & Aida Gonzalez  
Henry & Rebecca Hesperheide  
John A. Immaraju  
Michael & Bonnie Irwin  
Mazin M. Kashou  
Dana M. Klatt  
Alejandro Luna  
Peter K. Miller  
Robert & Martha Orth  
Anne-Marie Patterson  
Frank & Beverly Pelsue  
Damon Pollock  
Carolyn Sagara  
James N. Saxon  
Sony Pictures Entertainment  
Stotelmyre Pest Control  
Peggy A. Yacono

## *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 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.

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

### Departmental Scholarly Activities Funds

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

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

### Endowments for Student Support

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

**Theodore Fisher Family Endowment Fund in Entomology**—provides research, curatorial, and student support for the UCR Entomology Museum and Insect Collection.

**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.

*Bar Flies? Fruit flies like the taste of beer!*

Anupama Dahanukar is an assistant professor of entomology at UC Riverside and a recipient of the prestigious NSF CAREER award. Photo credit: UCR Strategic Communications

“INSECTS USE THEIR TASTE SYSTEM TO GLEAN IMPORTANT INFORMATION ABOUT THE QUALITY AND NUTRITIVE VALUE OF FOOD SOURCES,”

EVER wondered why flies are attracted to beer? Entomologists at the University of California, Riverside have, and offer an explanation. They report that flies sense glycerol, a sweet-tasting compound that yeasts make during fermentation.

“Insects use their taste system to glean important information about the quality and nutritive value of food sources,” said Anupama Dahanukar, an assistant professor of entomology, whose lab conducted the research. “Sugars signal high nutritive value to flies, but little is known about which chemical cues flies use for food sources that are low in sugar content – such as beer.”

Dahanukar’s lab examined the feeding preference of the common fruit fly for beer and other products of yeast fermentation, and found that a receptor (a protein that serves as a gatekeeper) that is associated with neurons located in the fly’s mouth-parts is instrumental in signaling a good taste for beer.

The receptor in question is Gr64e. Once a fly has settled on beer, Gr64e detects glycerol and transmits this information to the fly’s neurons, which then influences the fly’s behavioral response.

Dahanukar explained that flies use other receptors in their sensory organs to find food from a distance.

“Taste becomes important only after the fly makes physical contact with food,” she said. “A fly first locates food sources using its odor receptors – crucial for its long-range attraction to food. Then, after landing on food, the fly uses its taste system to sample the food for suitability in terms of nutrition and toxicity.”

Dahanukar, a member of the Department of Entomology as well as UCR’s Institute for Integrative Genome Biology, explained that taste receptors also come into play when a female fly has to locate a suitable site for laying eggs.

“Females come to a decision after they have conducted intense probing of various potential sites,” she said.

Study results appeared online Nov. 6 in Nature

Neuroscience.

Dahanukar was joined in the project by Zev Wisotsky, Adriana Medina, and Erica Freeman – all of whom work in her lab.

Wisotsky, a neuroscience graduate student and the first author of the research paper, performed the imaging, taste electrophysiology and behavior experiments. He was joined in his efforts by Freeman, a bioengineering graduate student, who performed the olfactory recordings; and Medina, a junior specialist in entomology, who performed the feeding preference experiments and molecular analysis.

The lab is poised now to move the research forward.

“How do you get information from the chemical environment to the brain – not just in flies but other insects as well?” Dahanukar said. “How is that information processed to give rise to appropriate behavior? How does feeding behavior change with hunger? These are some questions we would like pursue.”

The research project was supported in part by a Whitehall Foundation research grant to Dahanukar and a fellowship from the National Science Foundation Integrated Graduate Education Research and Training Program in Video Bioinformatics to Freeman.

**By Iqbal Pittalwala**, Senior Public Information Officer, UC Riverside



Graduate student Zev Wisotsky and Assistant Professor Anupama Dahanukar. Photo credit: UCR Strategic Communications

## Recent Honors and Awards

### FACULTY

**Ring Cardé:** Elected President of the International Society of Chemical Ecology  
**Anupama Dahanakur:** National Science Foundation Career Award  
**Alec Gerry:** Elected to Publications Council, Entomological Society of America  
**Dan Hare:** Distinguished Campus Service Award  
**Mark Hoddle:** Plant-Insect Ecosystems Award (Entomological Society of America, Pacific Branch)  
**Marshall Johnson:** Distinguished Scientist of the Year Award (International Organization for Biological Control)  
**Jocelyn Millar:** US Department of Agriculture Recognition Award for Contributions to Exploratory Work on Passionvine Mealybug  
**Joe Morse:** Award for Excellence in Integrated Pest Management (Entomological Foundation), Elected Fellow of the Entomological Society of America, Albert G. Salter Award (California Citrus Quality Council)  
**Mir Mulla:** Elected President of the International Congress of Vector Ecology  
**Rick Redak:** National Academy of Sciences Teaching Fellow  
**John Trumble:** IPM Team Award (Entomological Foundation)  
**Bill Walton:** National Academy of Sciences Teaching Fellow, Elected President of the Society for Vector Ecology

### STUDENTS

**Sarah Davenport:** NSF Graduate Research Fellowship  
**Dagne Duguma:** Ian and Helen Moore Scholarship; Ronald E. Neumann Graduate Student Scholarship  
**Panchali Ekanayake:** Outstanding Teaching Assistant  
**John Hash:** First place, ESA poster competition  
**Rochelle Hoey-Chamberlien:** Carl Strom Scholarship  
**Kim Hung:** NSF Graduate Research Fellowship  
**Ricky R. Lara:** van den Bosch Scholarship; First place, ESA Pacific Branch student presentation  
**Jason Mottern:** First place, International Society of Hymenopterists student competition  
**Elizabeth Murray:** van den Bosch Scholarship; Second place, ESA student presentation  
**Maiara Severo:** Outstanding Teaching Assistant; American Association of University Women International Fellowship  
**Andrew Soeprono:** Carl Strom Scholarship  
**Genevieve Tauxe:** Second place, ESA student presentation  
**Adena Why:** Second place, ESA student presentation; van den Bosch Scholarship  
**Guanyang Zhang:** van den Bosch Scholarship; First place, Willi Hennig Society poster competition; Outstanding Overseas Student (Chinese Government)

## 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 Entomological Society of America:** Ring Cardé, Brian Federici, Marshall Johnson, Tom Miller, Joseph Morse, Brad Mullens, Mir Mulla, Tim Paine, Alex Raikhel, Mike Rust, Nick Toscano, John Trumble

### STAFF

*STAR Award Recipients (2010-2011):*

**Bill Carson**  
**Lisa Forster**  
**Kathrine Fruge**  
**Chris Hanlon**  
**Regina Hazlinger**  
**Steve McElfresh**  
**Darcy Reed**  
**Bill Sutton**  
**Serguei Triapitsyn**

\* STAR awards were not offered during 2011-2012

*Entomology Research Museum News*

The ERM has been busy over the last few years, and while most of our activity is internal, sometimes it can attract attention. In 2011 and 2012, some news stories originating in the ERM appeared in the mainstream international media (mostly online, but also print and television), and recently we've documented some new first findings of exotic pest species in California, getting attention from the USDA and CDFA. We've also been discovering new insect species on a regular basis (several a month, on average), ranging from parasitoid wasps to flies to bees, from all around the world.

For the past two years, museum personnel led Joshua Tree National Park BioBlitz collecting teams which produced valuable specimens, and Doug Yanega has given presentations for the Agua Caliente Cultural Center and the Living Desert. Updates on things of public interest like these appear on the FER (Friends of the Entomology Research Museum) Facebook page – and we encourage interested department members to “Like” us.

Less visibly, a major NSF-funded four-year project (PIs: S. Triapitsyn and J. Heraty) has just been completed in the museum. Altogether, project personnel (especially Vladimir Berezovskiy and Christopher Jordan) re-mounted, labeled, and databased over 14,000 specimens of parasitoid wasps from about 4,000 original slides. Serguei is currently working on IDing and incorporating the remounted specimens in the main collection. The data are now part of the Discover Life website dataset, and form a significant part of the over 150,000 specimen records we have available online.

Another NSF-funded project (PI: D. Yanega) is ongoing; its aim is to develop a network of databases for 10 of the country's bee collections. At UCR we'd already databased some 70,000 of Timberlake's bees, and now we're databasing other people's collections in addition to ours - UCR is processing specimens for the LACM, the CSCA, and UC Berkeley, doing the bumblebees from these collections first, then moving on to other groups. Keve Ribardo, a former Senior Curatorial Assistant at the CAS, handles the bulk of data entry, while Doug does specimen IDs and error-checking (especially georeferences). These records are

also available online via Discover Life, and we even have a Facebook page for the project, which is called DBCNet.

The Museum's in-house database has grown tremendously as a result of these two grants, plus the addition of newly mounted, labeled and databased specimens (at least 25,000 last year alone); we now have some 350,000 specimen records, representing an estimated 10% of our entire museum holdings. Not surprisingly, the number of requests to use our data has also been steadily increasing.

Grad students assigned to museum duty over the last two years have done a lot of work organizing and collating the teaching collection materials. Other student assistants have helped curate the collection, such as Ryan Neff, who worked on ants, and Elizabeth Murray, who worked on chalcidoid wasps. We have two part-time curatorial assistants, Cole Watson and Jee Park (both of whom started as volunteers, along with Esther Chuang), working hard at mounting and labeling specimens (including significant backlog). Cole is also sorting the museum's backlog to order, including the incorporation of several donations (from Gordon Pratt, Jason Mottern, John Rotenberry, and the late Rod McDonald).

**By Serguei Triapitsyn & Doug Yanega**



Newly described ectoparasitic sweat bee *Eupetersia yanegai* Pauly, 2012. Collected in Thailand. Photo credit: Doug Yanega.

THE ENTOMOLOGY  
RESEARCH MUSEUM  
DISCOVERS SEVERAL  
NEW INSECT SPECIES  
FROM AROUND THE  
WORLD EACH MONTH!

### *New Alumni (Students graduating during 2011-2012)*

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

#### **Graduate Students:**

Sonali Deshpande, PhD  
Panchali Ekanayake, MS  
Kristen Hladun, PhD  
Johnathan Lytle, PhD  
Dustin VanOverbeke, PhD  
Adena Why, MS  
Jennifer Wright, PhD

#### **Undergraduate Students:**

Nicholas Michael Duncan  
Stephanie Leon  
Thien-Kim Van Nguyen  
Adam Eric Olguin  
Aaron Ford Pomerantz  
Kaleigh Amanda Russell  
Angela Michelle Williams



“GREAT WORKS ARE  
PERFORMED NOT BY  
STRENGTH, BUT BY  
PERSEVERANCE”

- SAMUEL JOHNSON

### *Welcome to our newest students!*

#### **Graduate Students:**

Sarah Davenport  
Lucy Gagnon  
Eric Gordon  
Judith Herreid  
Amelia Lindsey  
Emily McDermott  
Lee McPhatter  
Ryan Perry  
James Ricci  
Kevin Welzel

#### **Undergraduate Students:**

Richard Jeming Chen  
Taehwan Son  
Jacob Tarango  
Scott Andrew Heacox  
Gabrielle Christine Martinez  
Amy Marie Michael  
Christopher An Doan Thie Nguyen  
Trinity Ly Nguyen  
Jessica Rose Zuccaire



### *Recently Retired...*

Nancy Beckage  
Tom Bellows  
Vladimar Berezovsky  
Cherie Cooksey  
Cassandra Hadnot  
John Klotz  
Robert Luck  
Gregory Montez  
Thomas Prentice  
Michael Rust  
Nelson Thompson  
Nick Toscano

**Cherie Cooksey** has been hired back by recall to serve as part-time FAO for Entomology until a new FAO can be hired. **Mike Rust** accepted an appointment as a Professor of the Graduate Division and continues to perform laboratory research in urban entomology. **Nick Toscano** still haunts the halls of Chapman where he continues to conduct research on crop pests. **Rick Vetter** continues his research on spiders, and is a featured speaker on spider ecology at scientific meetings and industry workshops.

*Introducing Our Newest Faculty...*

**Dr. Matt Daugherty (hired in 2009):** My research focuses on population and community ecology, particularly as they relate to the management of non-native arthropod pests and pathogens. This work employs field and laboratory experiments complemented by population dynamics and statistical modeling to provide an integrative understanding of population and disease dynamics. Current and recent research topics include: the role of climate in plant disease severity, how vector behavior mediates disease spread, effects of resource productivity on pest population dynamics, and the significance of food web complexity for pest management. Right now that entails studying the transmission ecology and epidemiology of Pierce's disease in vineyards, the invasion of the Asian citrus psyllid in California, and providing outreach to growers and the general public about the impacts and control of non-native insects.



**Dr. Anupama Dahanukar (hired in 2009):** We are interested in how chemicals in the environment are detected by insect sensory neurons and how this information is processed to specify distinct behaviors. We focus on the gustatory system of the fruit fly, *Drosophila melanogaster*, which has a remarkable repertoire of physiological and behavioral responses to contact stimuli present in sources such as food substrates as well as con-specific individuals. Assessment of taste chemicals is crucial for the fruit fly and other insects to make behavioral decisions in the context of acquiring nutrition, courting individuals and selecting sites to lay eggs. We use a combination of molecular, genetic, electrophysiological, behavioral and imaging techniques to investigate the peripheral and central mechanisms that guide contact chemosensory behaviors of *Drosophila* and other insects. We expect to employ some of the principles that emerge from our studies to develop novel strategies for control of agricultural pests.

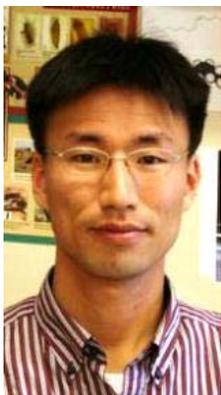


**Dr. Joao Pedra (hired in 2009):** The Pedra laboratory studies the mechanisms of immunity and pathogenesis triggered by tick-borne pathogens. Three broad questions are currently under investigation in the Pedra laboratory: i) What are the mechanisms of pathogen immunity in the mammalian host and the tick vector? ii) Are the mechanisms of innate immunity evolutionarily conserved in ticks and mammals? iii) What are the molecular and cellular events that enable pathogens to evade host and vector immunity? We envisage that deciphering the mechanisms of pathogenesis and immunity triggered vector-borne pathogens may lead to the development of novel strategies that prevent or delay the onset of arthropod-borne diseases.



**Dr. Brad White (hired in 2011):** Broadly, my lab performs research on the genetic basis of phenotypic diversity in *Anopheles* malaria mosquitoes. We are particularly interested in studying traits of medical and/or ecological importance. To do this we utilize a variety of techniques ranging from experimental genetics to computational genomics to field studies. Below is further background on the two main research topics currently under investigation. **1) Vectorial Capacity.** *Anopheles* mosquitoes are the exclusive vectors of human malaria. However, not all anophelines are created equal with respect to this trait. We aim to identify the genetic polymorphisms that contribute to natural variation in "vector phenotypes" such as host preference and susceptibility to *Plasmodium* infection. **2) Speciation.** *Anopheles* mosquitoes have undergone recent, rapid diversification resulting in numerous complexes of morphologically indistinguishable species, which has positioned them as an excellent model to answer fundamental questions about how new species are formed and maintained. Currently, we are working towards characterizing the genetic architecture of species boundaries between diverging taxa with varying levels of gene flow.

## New Faculty



**Dr. Dong-Hwan Choe (hired in 2011):** My research focuses on three major areas: urban entomology, insect behavior, and chemical ecology. In particular, my research has focused on exploring innate and learned behaviors of economically or environmentally important insect species to develop more effective integrated pest management (IPM) programs. I use manipulative laboratory studies to investigate how the behaviors of pest insects can be exploited to improve management and to develop novel management techniques. I also use field studies to test the feasibility of these new techniques in real-world conditions. I draw upon my expertise in behavioral ecology, experimental design, chemical ecology and analytical chemistry to illuminate the biology of target insects, and to inform the design of new approaches for control. In addition to the bioassays involving chemistry, physiology, behavior, and toxicology, the effort to incorporate the behavioral information of target species into the working IPM program often requires extensive design, manufacturing, and testing of devices in the field. To meet these goals, I work with other researchers especially from industries and other academic disciplines when possible.

## In Memoriam



**Nancy Beckage** passed away on April 2, 2012 soon after retiring from UCR as a Professor of Entomology. Nancy was a graduate of William and Mary College and completed her Ph.D. at the University of Washington. Nancy will be remembered as a distinguished scientist for her work on host-parasite interactions, particularly the use of polydnavirus for pest management. In addition to her many scientific achievements, Nancy was an advocate of community engagement and science education. One of her more recent activities in this area was to assist with the launching of the Mali Agri-Business Network in Bamako, Mali in 2007 where she collaborated in the laboratory phase of the “malaria neem project”. The project provided for the economic empowerment of women in the Mali village and resulted in the end of malaria transmission in the village by 2009. A symposium in her honor was held at the annual Entomological Society of America meeting in 2012. In honor of Dr. Beckage’s devotion to students, the Nancy E. Beckage Scholarship for Women in Entomology (<http://www.entfdn.org/nancybeckagescholarship.php>) has been created to assist women pursuing a career as a biologist emphasizing the study of insect physiology or immunology.



**Jack Clayton Hall** of Reedley passed away on January 16, 2013, at the age of 87. Jack earned a Bachelor of Science degree as well as a Masters of Science degree in entomology from the University of California, Davis. He worked for 35 years at the University of California, Riverside as an entomologist and a Senior Research Assistant and Museum Curator for the biological control collections when Biological Control was a distinct unit. He was known as an expert on bee flies. He has written many books and manuscripts on his research that are held in libraries worldwide. His insect collections have been donated to museums across the globe. He was especially proud of one of his collections being admitted to the Smithsonian Institute in Washington, D.C.

*The Changing Landscape at UCR Entomology*



DEMOLITION OF THE "OLD" ENTOMOLOGY BUILDING

Our alumni and friends who have not been on campus for some time may be surprised at the structural changes that have occurred on campus in the last decade. With the expansion of campus to the north and west, the construction of a new Student Union Building and Commons, and the movement of the Entomology Department from the "old Entomology Building" to the "new Entomology Building", you may need to pick up a campus map to find your way around! Below are highlighted just a few of the changes of most significance to Entomology.



GENOMICS BUILDING

A third new building, the Genomics Building, was constructed in 2007 at a cost of \$53.8 million with research and office space for UCR faculty from several science departments, including Entomology. The Genomics Building also contains a 100-seat auditorium for lectures and department seminars.

With three new buildings completed in the past ten years, the Department of Entomology at UC Riverside has one of the most modern research facilities worldwide. We currently have 35 faculty that bring their individual and collective expertise to bear at the molecular, cellular, organismal and population levels. Our current research specializations include: arthropod vectors of plant pathogens, biological control, insect behavior, chemical ecology, ecology, morphology, pathology, pest management, physiology, insect-plant interactions, systematics, toxicology, insecticide resistance, medical/veterinary entomology, molecular entomology, neuroscience, and urban entomology.



INSECTARY AND QUARANTINE FACILITY

A unique and indispensable facility to the research mission of the Department, is the Insectary and Quarantine Facility constructed in 2001 just south of Picnic Hill. This facility permits researchers to process, study, characterize, and propagate foreign parasites and predators that have been collected abroad and sent to California for research.

This unique building has receiving rooms, five research labs, 10 greenhouses and 52 rearing rooms at Biosafety Levels 1- 3 enabling scientists to safely investigate exotic parasites, microorganisms and predators, as well as genetically engineered organisms.



NEW ENTOMOLOGY BLDG

In early 2002, the Department moved into the new Entomology Building, a \$22 million state of the art building constructed across the parking lot from the old Entomology Building. This building houses 20 research groups spanning a

range of interests from molecular entomology through population biology to systematics. The new building also houses the Department's administrative space and conference rooms for meetings and some class instruction. In 2010, the old Entomology Building adjacent to Picnic Hill was finally demolished and replaced with the School of Medicine Research Building.



THE ENTOMOLOGY DEPARTMENT HAS MOVED!

## Zebra Chip Team wins IPM Award



A research team that includes John Trumble, a distinguished professor of entomology, has won the Integrated Pest Management Team Award from the Entomological Foundation, a national organization that aims to educate young people about science through insects.

The foundation recognized the research team, named the Zebra Chip Research Team, for its research and extension efforts that have had a dramatic effect on the potato industry.

Sponsored by Dow Agro-Sciences, the award “recognizes the successful efforts of a small collaborative work team approach to pest control.” Trumble and the other members of the team will receive the award — an inscribed statue — on Nov. 12 in Knoxville, Tenn., during the annual meeting of the Entomological Society of America.

By the time the team formed in 2008, a new pathogen had devastated the potato industry by spreading zebra chip disease, causing losses in the millions of dollars annually.

The Zebra Chip Research Team developed new techniques to identify the pathogen, allowing researchers to document local, regional, and national movements of the

potato psyllid (*Bactericera cockerelli*) spreading zebra chip disease. The researchers determined both within-plant and within-field movements of the psyllid and the zebra chip pathogen, and developed special sampling programs that enabled potato growers to choose the level of risk they were willing to accept.

Through websites, effective outreach practices, and grower and scientific meetings, the team promoted a sustainable integrated program that today allows the industry to continue to produce potatoes while making a profit and minimizing potential negative effects for the environment.

**By Iqbal Pittalwala**, Senior Public Information Officer, UC Riverside



Potato chips from a healthy (top) and infected tuber. Photo credit: Trumble Lab

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

After graduating with my MS from Bill Walton’s lab in 2000, I completed my PhD in Epidemiology and Public Health at Yale University. My PhD research was on antibodies that can be used to treat West Nile virus infection. After completing my PhD in 2005, I entered a two-year training program at the Centers for Disease Control and Prevention called the Epidemic Intelligence Service (think Kate Winslet’s character in the movie Contagion). I was stationed in Fort Collins, Colorado where I worked on a number of really interesting vector-borne diseases, including plague, Lyme disease, yellow fever, and Rift Valley fever.

In 2007, I moved to Atlanta to work in the enteric diseases epidemiology group. Currently, I manage a surveillance system for food-borne outbreaks; we use the data to help understand what foods are safety risks. I’m also an adjunct faculty member in the School of Public Health at Emory University. Although it seems far-removed from entomology, I am always learning of interesting links with the work that I do—beetles in hen houses, the importance of fly exclusion for preventing *Campylobacter*, and from time to time I am actually called upon to answer ‘bug’ questions (I also keep a small insect collection in my office, always a great conversation piece). Working for CDC has been so much fun; I’ve traveled

to more than 20 countries, interviewed nomads on camels, and participated in important domestic responses like Hurricane Katrina and swine flu.

In 2011, I married my husband Matthew Jones. We live right near downtown Atlanta in a neat old neighborhood that is slowly revitalizing. We are both really involved with the community, and I have kept up my various crafty hobbies, gardening, and cooking. I would love to hear from other UCR Entomology Alums, and there is always a spare room here for anyone who is in Atlanta!

You can reconnect with Hannah through her email:

[lgould@cdc.gov](mailto:lgould@cdc.gov)



Hannah Gould, Ph.D.

**Tell us your News!**

Email us at [richard.redak@ucr.edu](mailto:richard.redak@ucr.edu)

## UCR ENTOMOLOGY

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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 more than 50 events associated with campus and the broader community. University events included homecoming, freshman orientation, campus recruitment days, 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 such as the

insect fair in Pomona and the UCR Botanical Gardens plant sales.

Over the past year we've begun to develop a more formal collaboration with the Riverside Metropolitan Museum. Our animals and displays traveled as far away as Bishop, CA for the Eastern Sierra Tri-County Fair. Two of the more notable new events that we participated in this year include the City of Riverside's Long Night of Arts and Innovation and an event in San Diego for military families.



**Thanks go out to all of the students who helped to further the success of this program!**

**By Matt Daugherty**  
Outreach Committee Chair

