



THE BUZZ

Looking back on 2019



UCR ENTOMOLOGY

Training the next generation of agricultural scientists

Announcing a new training program for transfer students!

The Entomology Department is proud to begin a new student training program, thanks to funding from the USDA National Institute of Food and Agriculture Hispanic-Serving Institution Education Grants program. *Six Legs, Endless Possibilities* is led by six UCR professors (Purcell, Mauck, Walton, and Redak in Entomology and cooperating faculty members Rafferty and Brelsford) and one professor from each of three local community colleges (Riverside City College, Moreno Valley College, and Norco College), this program will engage community college students who are interested in learning about careers in agricultural research.

UCR faculty members are working closely with community college partners to develop cutting-edge, research-based laboratory activities that will be delivered in community college classrooms jointly with visiting scholars from UCR. During these visits, we will also provide information about career opportunities in the biological sciences (with an emphasis on non-biomedical careers). Students interested in learning more will be encouraged to transfer to UCR and to apply our more intensive training program.

Notably, transfer students from any community college are encouraged to

contact us if interested- enrollment is not limited to students from our local college partners. Students entering the training program will be paired with a faculty advisor and will have the option of having a funded position in an entomology research lab the summer before their first quarter at UCR. During the academic year, the program coordinators and participating graduate students will offer a series of short skill-building and professional development workshops. The following summer, participants will receive funded summer internships with our USDA or industry partners, so that they can gain relevant work experience and enhance their resués.

During participants' final year as undergraduates, we will invite them to become ambassadors for this program, through helping to coordinate labs at their community college alma maters, assisting with skill building workshops for the next *Six Legs* cohort, and participating alongside graduate students in our popular Entomology Outreach program, which provides science education to K-12 students in the Inland Empire. Throughout the training program, we will evaluate student interest in subject matter and their knowledge of relevant career options; this information will be used to inform future efforts to improve introductory biology curricula to better engage students by linking biological concepts to practical applications.

Above all, our whole team is excited to enrich the educational experience for students at all levels, and to provide funded internship and professional development opportunities to many of our undergraduate and graduate students.



Dr. Walton helps students sample aquatic insects

SEPT. 2020

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For more information about the transfer student program visit

six-legs.ucr.edu

Letter from the Chair

Alumni and Friends of UCR Entomology,

The newsletter is late, late, late! I know you all have been sitting on pins and needles waiting, but more than a few crises have kept us from going to print. And, unfortunately, you already know what they are! With the pandemic upon us last March, we were all ordered home and the campus closed. This was about a week before the quarter started and you can well imagine the scrambling to secure labs, keep research going off-site, shift to online teaching with seven days' notice, etc. Things did not start to settle down until June at which time some of us were allowed back on campus for research purposes under strict safety protocols. Having said all of that, we persevered, many of us learned how to teach effectively on line, and our research programs are as strong and productive as ever. I cannot tell you how proud I am of our faculty, and staff, for putting their heads down and simply working through this!

Since our last newsletter in 2019, despite the pandemic, the Department continues to flourish with new scientific discoveries, the addition of new faculty members and new students. And of course we continue to be incredibly proud of our graduating undergraduate and graduate students. As there were no formal campus-based graduation ceremonies, the Department held our own online ceremony. [You can see it here](#) (password UCRENTM2020!).

We welcome Drs. Ysabel Giraldo and Amy Murillo into the Department! Both joined the Department this last July and are settling in to their new labs in the Entomology Building and the Entomology Research Museum. Dr. Giraldo comes to us from CalTech where she was working on the neural control mechanisms of insect flight. Dr. Murillo was a UCR Chancellor's Postdoctoral Fellow working in the lab of Alec Gerry developing new approaches to controlling ectoparasites of domestic animals. Look for our next newsletter for full write-ups of these two exciting additions to our faculty.

Both graduate and undergraduate Entomology programs remain strong as well as our participation in several interdepartmental graduate programs. We "survived" our external graduate review with glowing marks. Both graduate and undergraduate programs remain strong and growing. We welcomed our first 4+1 BS/MS student into our graduate program with several more senior undergraduates joining the program.

Once again, I cannot thank you, our alumni and friends, enough for generously supporting our programs. Your donations have been important to support our Entomology graduates and undergraduates in pursuing their research activities and allowing them to travel to meetings and conferences to present their exciting results. I would like to point out that we have established a new endowment, [Advancing Inclusivity in Entomology Scholarship Fund](#). This funds necessary to establish this endowment were contributed by our Faculty and students demonstrating our commitment to supporting those undergraduates who have faced systemic barriers in their scientific careers. Proceeds from this endowment will support undergraduates working in Entomology labs such that they gain the valuable research experience that is so critical to advancing their careers. I urge you to please consider making a donation to this very worthy cause.

If you would like to make a donation to support any of our programs, please visit <https://entomology.ucr.edu/giving> and choose among the many Entomology funds that support our students. And of course, I am always available to talk to those interested in establishing new endowments; if you have ideas, let's talk. Once again, *THANK YOU!!!*

And don't forget, 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!

Dr. Rick Redak
Chair of the Department

A Special Thank you to all of our Contributors in 2019!

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 <https://entomology.ucr.edu/giving> and then choose among the many Entomology funds that support our students and programs.

A special thank you to Frank Gilstrap and Marilyn McLaughlin for their generous donation to establish the Kenneth W. Gilstrap Endowed Memorial Fund to serve as a perpetual legacy that honors their brother, Ken, and his long-standing interest in all things scientific, and especially his keen interest in the natural history of insects.

MONARCH LEVEL (\$1000 and above):

Mr. & Mrs. Donald Dearthorff
 Mr. Brock Dewey
 Drs. Brian & Claire Federici
 Dr. & Mrs. Randolph S. Malone
 Dr. George Patrick Markin
 Mr. & Mrs. Robert E. Orth
 Mr. Mark Pomerantz and Mrs. Deborah Ford
 Mr. Thomas G. Wilson and Mrs. Jane K. Wilson
 Nobunari Yao
 Agri-Turf Distributing, LLC
 Alliance for Food & Farming
 Atlas Obscura Inc.
 BASF Corporation
 Bayer
 California Avocado Commission
 California Cherimoya Association
 California Date Commission
 Control Solutions Incorporated
 Dewey Pest Control
 FMC Corporation
 Georgia Pest Control Association, Inc.
 ISCA Technologies, Inc.
 Lehigh Agricultural & Biological Services, Inc.
 Marrone Bio Innovations, Inc.
 Oro Del Norte, LLC
 Rentokil North America, Inc.
 SC Johnson
 Semco Co., Ltd.
 Syngenta Crop Protection, LLC
 US Poultry
 Vestaron Corporation

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

Mrs. Retha E. Keenan
 Mr. John Pavela and Mrs. Pamela Pavela
 Dr. & Mrs. Nick C. Toscano
 Mr. Kuanwen Wang and Ms. Ya-yen Lee
 Dr. Rufina N. Ward
 Benevity

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

Dr. Charles Beesley and Mrs. Deborah Beesley
 Ms. Rachael Dzikonski
 Mr. Glen W. Forister and Mrs. Ann C. Forister
 Mrs. Carol C. Fujita
 Dr. Alec C. Gerry and Mrs. Cheryl L. Gerry
 Mr. Charles R. Giardina and Mrs. Claudia M. Giardina
 Mr. & Mrs. Armando G. Gonzalez
 Dr. L. Hannah Gould
 Mr. Henry A. Hesperheide, III
 Dr. Michael E. Irwin and Ms. Bonnie J. Irwin
 Mr. & Mrs. Robert B. Kimsey
 Dr. Larry F. LaPre and Ms. Marilyn J. Morris
 Ms. Marian D. Larson
 Dr. James G. Leesch and Mrs. Carolyn Leesch
 Dr. John C. Luhman
 Mr. Ronald W. Lyons
 Mr. Paul Madonna and Mrs. Kathryn F. Madonna
 Mr. Richard Marrocco and Mrs. Gayle J. Marrocco
 Mrs. Stephanie Pacheco and Mr. Porfirio Pacheco
 Dr. & Mrs. Timothy D. Paine
 Dr. John D. Pinto and Mrs. Diana G. Pinto
 Mr. Gary R. Platner and Mrs. Patricia A. Platner
 Dr. Dale A. Powell and Mrs. Jun R. Powell
 Dr. David L. Ryan
 Mr. Craig Stowell and Mrs. Deidre Stowell
 Dr. Kouichi R. Tanaka
 Mr. Richard S. Vetter
 Dr. & Mrs. Robert L. Zuparko
 McEwen Nursery
 Rainbow Treecare Scientific Advancements
 Tognazzini Avocado Partnership

DEPARTMENT SUPPORTERS:

Mr. Guy P. Bruyey
 Mr. Robert B. Cooley and Mrs. Susan M. Cooley
 Dr. John F. Emmel
 Mr. Saul I. Frommer and Mrs. Susan L. Frommer
 Mr. Vladimir A. Kokoza
 Mr. Kurt Leuschner
 Mr. & Mrs. Robert E. Orth
 Mrs. Dana M. Risch
 Mr. T. H. Runholt and Mrs. Muriel J. Runholt
 Mr. Lyle M. Stotelmyre and Mrs. Chau J. Stotelmyre
 Mr. Michael T. Umeda and Ms. Deborah J. Louie
 Mr. Leonard Vincent
 Mr. Keith Willingham
 Mr. Chuck Wrench and Mrs. Catherine Wrench

Department Photo from Student Seminar Day, September 2019*Targeted Opportunities for Giving to UCR Entomology*

Visit <https://entomology.ucr.edu/giving>

NEW: Advancing Inclusivity in Entomology

Scholarship Fund — supports undergraduate students who experience social, cultural, and financial barriers with a scholarship that will support their ability to participate in laboratory research

NEW: Kenneth W. Gilstrap Endowed Memorial Fund

— established by Frank Gilstrap and Marilyn McLaughlin to honor their brother Kenneth W. Gilstrap (November 25, 1947 – December 11, 2011). This perpetual legacy fund provides support for students in their professional activities including travel expenses for meetings

Distinguished Speakers Fund—supports invitation of notable scientists to present their research at a formal seminar to the students and faculty. Distinguished speakers include an eminent scholar selected jointly by students and faculty to present the “Boyce Lecture” each spring since 1977

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 educational activities for both graduates and undergraduates

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.

Honors and Awards received during 2019

FACULTY

Beth Grafton-Cardwell: C. W. Woodworth Award, Pacific Branch of the Entomological Society of America

Alexander Raikhel: 5-year NIH grant for studying mosquito microRNAs and their role in reproduction

RESEARCH STAFF

Serguei Triapitsyn: Short-term Invitational Fellowship for Research in Japan from the Japan Society for the Promotion of Science, for research on biological control of agricultural pests by natural enemies

STUDENTS

Chris Allen: Shipley-Skinner Riverside County Endowment

Magda Argueta-Guzmán: UC Mexus - CONACYT fellowship

NatGeo Early Career Grant

Gilstrap travel award to attend ESA

Austin Baker: UCR Graduate Division Dissertation Year Program Fellowship

Jacob M. Cecala: USDA NIFA Predoctoral Fellowship 2nd place, PhD Student 10-min oral presentation, ESA Pacific Branch 2019

Chrissy Dodge: Poster competition winner, ESA Pacific Branch

Krissy Dominguez : Robert & Peggy van den Bosch Memorial Scholarship (Center for Biological Control at UC Berkely)

Dr. Janet M. Boyce Memorial Endowed Award for Women in Science (CNAS Scholarship)

Deena Husein: Robert & Peggy van den Bosch Memorial Scholarship

Jaimie Kenney: 2nd Place, Student Competition, ESA National Meeting 2019

Laura Leger : NSF Graduate Research Fellowship Program Award

Paul Masonick: UCR Graduate Division Dissertation Year Program Fellowship

Kelsey McCalla (Schall): Student Leadership Award, ESA Pacific Branch,

Kaleigh Russell: USDA NIFA AFRI Pre-Doctoral Fellowship

Madison Sankovitz: 1st place, Student Competition, ESA national meeting

Boulder County Parks & Open Space research grant

Jacqueline Serrano: UCR Graduate Division Dissertation Year Program Fellowship

Tessa Shates: Outstanding Teacher Assistant Award, 2018-2019 academic year

Shipley-Skinner Reserve – Riverside County Endowment for 2019-2020

Rob Straser: UC Global Food Initiative Ambassador CDFA Healthy Soils Program Award

Julie Tsecouras: American Mosquito Control Association Young Professional Industry Shadowing Program Travel Grant

Ian and Helen Moore Marine and Aquatic Entomology Award

Xinmi Zhang: Ian and Helen Moore Marine and Aquatic Entomology Scholarship

1st place, Student Presentation, ESA national meeting 2019
Mayhew Graduate Research Award

UNDERGRADUATE STUDENTS

Tiffany Domer: 1st place for ESA undergraduate competition for the Systematics Evolution and Biodiversity section

Cebrina Nolan: Student Talk Award, 20th World Congress of the International Society on Toxinology

Gina Zhuo: Undergraduate poster competition winner, ESA Pacific Branch

Alumni and Associates, Tell us your News!

Please share your note-worthy happenings, we'd love to spotlight you in "The Buzz"

Email us at richard.redak@ucr.edu

Entomology Research Museum News

Doug supervised curation of cerambycids and mutillids by volunteer Cole Watson, curatorial work on elaterids by Jackie Serrano, and a visiting bee curator, Joel Gardner, who worked with Timberlake's *Dialictus* bees, who confirmed that there were nearly 100 undescribed species that need to be included in revisionary work. Adrican Mayor, a retired former UCR grad, continues curating our melyrid beetles, which may now be the world's largest collection of this group. We notably incorporated a massive donation from Frank Pelsue, mostly weevils, comprising some 40 drawers of material. We are also presently making room for a large donation of preserved spiders that Rick Vetter intends to deposit here; Rick has also been generously contributing time and effort to move the spider collection into new jars that don't allow ethanol to evaporate. Alumnus Greg Ballmer generously donated a large amount of material from Laos, and from Malaise trap samples that he and alumnus Mike Irwin have been running in CA, OR, UT, and NV.

Ana Mendez and Cristina Carranza have been doing labeling, making significant progress with the older backlog, and also labeled several donations to the museum. Mike Bellinger Jones had also been working with HMDS, and the processing of donations from alumnus Gevin Kenney. All told, we added some 30,000 specimens to the database, from either recent donations or processed backlog, in the past year, so the Museum's regular database has grown to roughly 590,000 records, with ~180,000 that are IDed to genus-level or better, georeferenced and available online via DiscoverLife.

There has been a fair bit of activity in the teaching collections over the past year, mostly by Stephanie Castillo and Luke Kresslein (plus students from the NHMC), and they've done a great job. This includes integration of specimens from student class collections, plus material donated by Lauren Ponisio.

This year, as typical, a number of potential loans were avoided by sending label data, or database information, instead of physical specimens. These have increased to the point where they exceed the number of traditional loans. Many new loans are being generated by non-targeted requests via social media (mailing lists, Facebook, etc.), rather than direct solicitation; fewer than half of the loans or data requests originated through conventional channels. As in past years, loan material was included in revisions by external authors, including several new species. Aside from increasing numbers of information requests from researchers, the number of such requests from the public continues to increase; the number of such requests directed to Doug, personally, typically ranges from 5-10 per day (this is not counting general requests for ID assistance). There has also been a fair amount of time spent consulting with a professional photographer, Andre Duman, who

Southwest Research Station in the Chiricahua Mts of southeast Arizona, site of collection for Mark Hoddle's spotted lanternfly biocontrol project.



has been trying to use UCR specimens for an ultra-high-resolution macrophotography project. The demand for things like data sharing, crowdsourcing, social media, and remote ID continues to increase; it is also very important to note that increasing numbers of these contacts are resulting in loans, data requests, donations, acknowledgments in publications, or even co-authorship.

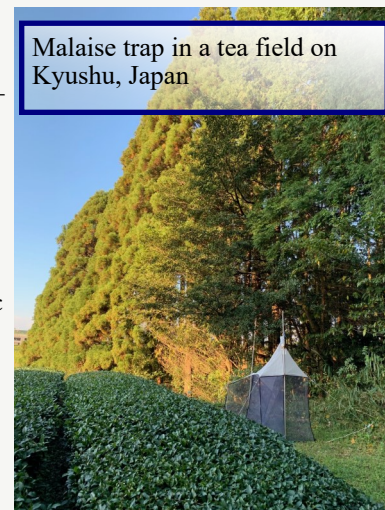
Doug has been assisting with various projects in the department; (1) research on lanternflies in Arizona in collaboration with the Hoddle lab, as part of work on biocontrol for Spotted Lanternfly (2) work in the Ponisio lab that require expert ID of bee specimens, and (3) a pollinator survey grant with Erin Rankin-Wilson, on Edwards AFB.

Serguei has been helping the Perring lab in figuring out the identity and origin of the economically important natural enemy *Anagyrus callidus* Triapitsyn, Andreason & Perring (Encyrtidae), a mass-reared and established parasitoid of pink hibiscus mealybug in California and Mexico (it turned out to be from Taiwan originally), and also in identifying and describing two new species of *Ooencyrtus* (Encyrtidae), one local (the type locality is UCR Ag. Ops. in Riverside) and the other from Pakistan (currently in quarantine), egg parasitoids of the invasive bagrada bug in California, both of which needed scientific names.

Besides the well-publicized trip of both Museum Scientists to Arizona to help with Mark Hoddle's spotted lanternfly biocontrol project (an invasive pest in the eastern United States which could be a significant potential threat to agriculture in California), Serguei made extensive insect collections in Japan in tea, rice, grape, and okra fields, particularly targeting leafhopper pests and their egg parasitoids. His trip was sponsored by the prestigious Short-term Invitational Fellowship for Research in Japan from the Japan Society for the Promotion of Science. Earlier, Serguei described a new species of fairyfly from Japan, *Anagnus rugmanjonesi* Triapitsyn & Adachi-Hagimori (Mymaridae), named in honor of Paul Rugman-Jones. This wasp is an egg parasitoid of the green tea leafhopper *Empoasca onukii*, an economically important pest of tea plants in Japan, mainland China, Taiwan, and Vietnam. However, moderate leafhopper damage is required for production of some very expensive organic oolong teas, particularly in Taiwan, such as dongfang meiren tea.

by Serguei Triapitsyn and Doug Yanega

Malaise trap in a tea field on Kyushu, Japan



New Alumni (Students graduating during 2019)

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

**Graduate Students:**

Christine E. Dodge
Do Hyup Kim
Paul Masonick
Kelsey A. McCalla
Daniel T. Perry
Jacqueline M. Serrano
Margaret W. Thairu
Joshua D. Wemmer
Levi K. Zahn

Undergraduate Students:

Ariana M. Ellis
Henderson S. Hsu
Andrew Garcia
Madison R. Hernandez
Evangeleena E. Otero
Cebrina A. Nolan
Tyler M. Bradshaw

*Welcome to our newest students!***Graduate Students:**

Christopher Allen
Hannah Chu
Rebecca Keim
Younghwan Kwak
Meghan Moore
Nicholas Poulos
Danielle Ruais
Jessica Webb

Undergraduate Students:

Christian T. Schmitt
Aria S. Krohne
Jun Yin Lum
Kira J. Riechman
Trang T. Nguyen
Jaqueline N. Torres
Lauren M. Yee
Stephanie Cabrera
Madeline C. Matheson
James L. Heydon
Stoyan K. Tsvetkov
Sydney Y. Mun

Where are they now?

Fun! This “where are they now” made me reminisce about my UCR time, 1998-2002. I met Prof. Ring Cardé in 1997 when I was engaged in mosquito research projects in Africa. He was looking for a PhD student on mosquito behavior and offered me the opportunity to ‘drag’ my family across the Atlantic to California for my PhD studies. I have very fond memories of UCR Entomology: fellow students, advisors, the wonderful atmosphere in the department, and of course the great science. Since my skeeter years in the Cardé lab, I have diverged geographically (Swedish University of Agricultural Sciences, many collaborations worldwide) and scientifically: my research includes basic and applied topics in entomology and chemical ecology, and on a diverse insect taxa. If interested google “researchgate Teun Dekker” and check out some of the research on

the evolutionary neuroethology of odor coding, lure development for moths and flies, and insect olfactomics (an exciting new co-creation platform to accelerate insect olfaction into application). I love my research. We truly have one of the best jobs imaginable: getting paid for what we love to do: to explore and move the knowledge frontier. Let’s also relentlessly engage in translating our findings into impacts that matter beyond publications, citation indices and awards. Too little time to waste.

Thanks to RTC and the whole of UCR Entomology.

Teun Dekker (Who misses UCR, CA, particularly in winter at around 60° latitude)

teun.dekker@slu.se

*Recently Retired...***Faculty**

John Trumble

*26th annual UC Riverside
Dept. of Entomology
Student Seminar Day*

Oral Presentation:

1st: Adriana Lomeli
2nd: Nancy Powers

Poster Presentation:

Tie for 1st:
Madison Sankovitz
Erica Sarro

Undergraduate
Danella Baronia

Introducing Our Newest Faculty...



Chow-Yang Lee: After spending nearly 25 years as a faculty member of Universiti Sains Malaysia in the beautiful resort island of Penang in the Malaysia peninsular, I made a big career decision to uproot and joined UC Riverside as the inaugural Endowed Presidential Chair in Urban Entomology. My research focuses on investigating the behavioral, ecological, and physiological adaptations of major urban insect pests, and understanding how these adaptations help them to thrive as perennial pests in the urban environment. I am also interested in the roles of human activities and propagule pressure in the invasion history of insect pests. Using the research findings obtained, my students and I evaluate and integrate management strategies to provide a system-level solution for urban pest management. Our recent research activities focus on morphological and biological traits, insecticide resistance and its underlying mechanisms, roles of gut microbiomes, population genetics, environmental physiology, and novel and non-toxic management strategies against bed bugs, termites, cockroaches, pest ants, and vector mosquitoes.

Proactive Biocontrol of Spotted Lantern Fly

Adult spotted lantern flies clustered on tree trunk. Credit: USDA, Lance Cheung



SLF egg mass laid on a wooden pallet. Credit: USDA, Lance Cheung

Spotted lantern fly (SLF), *Lycorma delicatula* (Hemiptera: Fulgoridae), native to China, was first detected in Pennsylvania in 2014. SLF is spreading rapidly on the east coast of the USA. Established populations are now found in New York and Delaware (both in 2017), New Jersey, Maryland, and Virginia (all 2018). Rapid spread is most likely occurring because of indiscriminant egg laying on non-plant material, such as rail cars, that could be facilitating spread of this pest over distances far greater than SLF is capable of flying. This type of spread increases greatly the risk of SLF being inadvertently introduced into California.

SLF has emerged as a serious grape pest in the NE USA. It has been implicated in the near complete mortality of possibly two vineyards in Pennsylvania, despite regular pesticide use to knock down populations. Additionally, it has been reported that SLF is a pest of walnuts in South Korea, another country where this pest is invasive. Consequently, SLF is considered a significant invasion threat to California grape and nut growers. Dead SLF adults have been found numerous times in aircraft landing in Southern California (e.g., San Bernardino Airport). In response to this obvious invasion threat we have begun a proactive biocontrol program. To do this we are evaluating in quarantine the safety of a SLF egg

parasitoid, *Anastatus orientalis*, which is native to China, in advance of the anticipate invasion of SLF into California. We are doing this work in collaboration with the USDA and the CDFG has provided funding for this proactive work. An important aspect of this project is assessing the risk *A. orientalis* presents to lantern flies native to the southwestern USA. These insects are very poorly studied and the mountainous “sky islands” of southern Arizona are regions of high native lantern fly biodiversity. We are currently working in the Chiricahua Mountains identifying native lantern fly species, the native plants they feed and breed on, and aspects of their population phenology (e.g., egg laying periods). The purpose of this field work is to obtain eggs of native lanternfly species so they can be used in experiments in quarantine to determine whether *A. orientalis* will attack them or not, and if they are attacked, whether Chinese parasitoids can successfully develop in these novel hosts and emerge as functional adult parasitoids. For a great video on this work in Arizona click on this link:

<https://magazine.ucr.edu/fly>

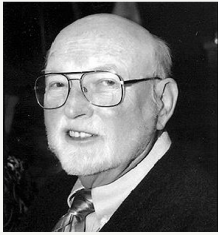
By Dr. Mark Hoddle



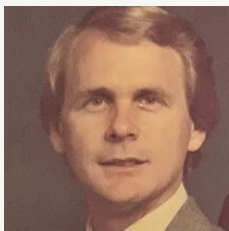
Anastatus orientalis, an egg parasitoid that attacks SLF eggs. Credit: Nehme Malek, University of Trento



A native lantern fly captured using a black light at night in the Chiricahua Mountains in Southern Arizona. Credit Jules Bernstein, UCR.

In Memoriam

Fred Gordon Andrews passed away in May, 2019, after a long illness. He was born in Los Angeles, and was raised in Glendale, CA. Fred spent his growing up years rescuing and bringing home strange animals, working for his grandfather as a carpenter, surfing, hiking & backpacking with his friends. After getting his BA in Education from Los Angeles State College and teaching 5th graders for a few months, he found that his passion for nature led him to return to LA State to work on a Master's Degree on Biology, and to UC Riverside for his Doctoral program to study insects, specializing in beetles. He moved to Sacramento in 1969 where he began his 32-year career as an Entomologist at the Dept of Food & Agriculture. He was a world-renowned authority on beetles. He published numerous scientific research papers and books, and helped develop the California State Collection of Arthropods where he distinguished himself as Curator. He has several claims to fame: he has been bitten by both a scorpion & a rattlesnake, and he has an endangered beetle that he discovered named after him. He will be greatly missed.



Dr. Steven J. Castle passed away in October, 2019 after a year-long illness. Dr. Castle earned a B.A. and M.A. in Biology at Cal State Chico and a Ph.D. in Entomology at UC Riverside while working as a technician in the USDA-ARS Boyden Lab in Riverside. He joined USDA-ARS as a post-doctoral associate in 1992 where he was stationed in Brawley, California to work on the notorious sweetpotato whitefly, a newly invasive pest that was devastating multiple crops. In 1998, he permanently joined the ARS Western Cotton Research Laboratory in Phoenix, which became the Arid-Land Agricultural Research Center in Maricopa, AZ in 2006. Dr. Castle made numerous contributions towards understanding the biology and ecology of key pests of vegetable and melon crops, cotton, citrus, and table and wine grapes. He was an expert in the areas of insect population dynamics, population ecology, insects as vectors of plant pathogens and associated epidemiology, insecticide resistance management, sampling, cultural control, and development of control strategies for exotic pests. Dr. Castle retired in March of 2018 after 33 years of service with ARS. He was a great friend and colleague to many. He will be dearly missed.



Dr. Nilima Castle passed away in January, 2020, just 3 months after the passing of her husband of 35 years, Dr. Steven J. Castle. Nilima and Steve resided in Phoenix, AZ, where Steve was an ARS scientist at the Arid-Land Agricultural Research Center in Maricopa, AZ. Nilima was a Research Specialist in the UCR Entomology Department, yet she spent much of her time at the USDA lab in Arizona. She retired from UCR in 2018 after a career of service spanning some 30 years. Nilima was born in Hyderabad, Telangana, India, the second oldest in a family of five; her father was a Methodist Minister. She attended a Methodist Mission school in Hyderabad, after which she completed undergraduate and graduate studies at the University in Hyderabad. She earned her PhD in Entomology at UCR in 1982 under the mentorship of Dr. George Giorghiou, studying organophosphate resistance in mosquitoes. She met Steve, a doctoral student in Dr. Tom Perring's lab, and they were married in 1985. After postgraduate positions in Idaho and southern California, they moved to Arizona in 1992, but Nilima continued her research efforts at UCR working with Drs. Nick Toscano, Joe Morse, and Tom Perring; she funded her own position over this time through grants and industry support. She authored over 50 scientifically reviewed articles on whiteflies, sharpshooters, aphids, mealybugs, bagrada bug, and various natural enemies. While known for her excellence in research, Nilima also will be remembered for her modesty and extreme generosity. She went overboard to make you feel comfortable and welcomed. She was gracious in her social interactions and her professional relationships. She will be greatly missed.



James Daniel Ricci passed away at age 30 from influenza in January, 2020. He was a past graduate student in Entomology and one of the first main organizers of the Riverside Insect Fair. James grew up in Woodridge, Illinois. He received his Bachelor of Science in Integrative Biology at University of Illinois in Champaign (2012) and then joined UCR Entomology to pursue his Masters degree. He enjoyed living and working as an entomologist, with his most recent endeavor as a co-founder at Ovipost, an insect farm in Florida. He will be deeply missed.

News from EGSA (Entomology Graduate Student Association)

EGSA has been working hard this past year, focusing heavily on bringing the science of insects to the general public. The Riverside Annual Insect fair, an event started by EGSA members, has reached a record number of community members with an estimated 16,000 attendees in 2019. This event has enabled the entire Entomology department to communicate their science with the people of Riverside. In exciting news, EGSA has introduced an insect themed summer camp, where budding scientists come to campus for a week and learn basic (and not so basic) skills to become an entomologist. The summer camp was also created and run by EGSA members, and all activities, curriculum and events are developed by graduate students. This event is geared to 4th and 5th graders (ages 10-11), and includes activities such as insect collecting and curating, and even DNA extractions with Dr. Naoki Yamanaka. Next summer, 2021, will be the 3rd Entomology Summer Camp and we are working on more fun activities for the students. Bringing the exciting world of entomology to young students interested in STEM is extremely important to EGSA. These two events have been instrumental in widening the broader impact our science has on the community at large.

UCR Entomology Outreach

2019 was another great year for the UCR Entomology outreach program. Led by our outstanding graduate students, our outreach program connects our Department to the community by communicating the importance of science, entomology, and our student's research. Importantly, our students share entomology and science as a viable career path for all students in the diverse Inland Empire.

Our graduate students are dedicated to our outreach program. In 2019, we were able to present at over 60 schools, science fairs, and community events. Our presentations typically include a brief introduction to insects, a description of what it is like to be an entomologist, and the opportunity to touch insects and learn more about them close up. Like the Inland Empire, our graduate students are diverse. In the words of our student scientists: "As a minority in the field of entomology, engaging in outreach has allowed me to interact with and inspire kids who look like me to explore fields that they have an interest in but may be discouraged from pursuing because of lack of representation." and "The Entomology outreach program has not only been enriching for me because I get to teach the public about insects but because I have seen girls become inspired to go into the sciences (specifically entomology in many cases). During these events, I often experience newfound excitement from girls who are inspired to study science further, and this is one of the most rewarding parts of doing outreach!" Our outreach program inspires young scientists and changes lives.

Our largest event continues to be the annual Riverside Insect Fair, which our Entomology Graduate Student Association co-organizes with the city of Riverside. Amazingly, the event continues to grow. The city of Riverside estimated that we had 16,000 visitors in 2019, up from a record-breaking

14,000 in 2018. The diversity of research at UCR Entomology is on full display at the Riverside Insect Fair – where else can visitors be amazed by cage full of thousands of houseflies, learn about parasitoids, and touch live insects? All this and more will happen again in April 2021 on Mission Inn Avenue in downtown Riverside.

The Little Entomologists Summer Camp is another successful venture that was started by our industrious graduate students. 2019 was the second year that we held the camp, which sold out quickly. The campers collected insects, made insect collections, and even performed the polymerase chain reaction (or PCR – a commonly used technique in molecular biology). Unfortunately, camp is cancelled for June 2020 due to COVID-19 concerns, but check for information on 2021 early in the new year at <https://entomology.ucr.edu/junior-entomologist-summer-camp>. The next camp is for kids entering 4th and 5th grade.

The mission of the UCR Entomology outreach program is to promote understanding of our student's, lab's, and department's science in our community. Our students are the ones that get this mission accomplished, and 2019 was successful all around. Unfortunately, UCR's College of Natural and Agricultural Sciences has eliminated the graduate student funding that Entomology used to support our Departmental outreach program. We are working hard to find solutions to keep our outreach momentum going, and if any of you want to pitch in to support our program please contact Quinn McFrederick at quinnmc@ucr.edu.

By Quinn McFrederick, Outreach Committee Chair

Find out more at:

<https://entomology.ucr.edu/engagement/outreach/outreach-program>

R'Garden initiative aims to bolster beneficial insects



Post-doctoral researcher Hamutahl Cohen preparing plants to transfer from greenhouse to R'Garden

The campus community garden, “R’Garden”, serves both members of UCR and the larger Riverside community to provide food growing space and promote education on sustainable food systems. Together with the R’Garden staff and student interns, we identified two primary targets for the garden to improve as a living, learning space for sustainable crop production: (1) leverage management practices that support the beneficial insects that help mediate ecosystem functions in agriculture, such as native pollinators, predators and parasitoids, and (2) foster training opportunities for students and community members in sustainable farming.



PhD candidate Rob Straser organizing plant layout of R'garden hedgerow

Beyond their visual appeal in garden spaces, “hedgerows” – lines and/or groups of managed trees, shrubs, and grasses – provide many benefits to crop production. For instance, hedgerows play an important role in pest management and pollination by providing habitat and nectar resources for beneficial insect communities, and in turn, can help support healthy agroecosystems. In Fall 2019, we installed the R’Garden’s first perennial hedgerow aimed to bolster such ecosystem services on-farm. The newly installed hedgerow contains over 150ft of drought tolerant perennial trees and shrubs known to support beneficial insect communities in Southern California’s hot, dry climate. Beyond supporting the numerous pollinators and biological control agents native to region, we aim to utilize the R’Garden hedgerow as an opportunity to engage garden visitors in the diverse methods used in sustainable crop production. Through garden lectures, workshops, and research projects, students and garden members will gain an improved understanding of the agroecological principles that help support healthy ecosystem functioning.

R’Garden students, staff and interns posing in front of newly installed garden hedgerow.



If you want to learn more about the benefits of hedgerows in California agriculture, visit CAFF.org for additional resource guides and materials. This work was made possible with support from the CDFA Healthy Soils Program and the UC Global Food Initiative (GFI). The GFI aims to align research, outreach, and operations across all 10 UC campus in a joint effort to address food security and sustainability on-campus. To learn more about this and other student-led initiatives through the GFI, visit globalfood.ucr.edu or follow on Twitter @UCRglobalfood.

By Rob Straser, Entomology PhD candidate

UCR ENTOMOLOGY

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5th Annual Insect Fair

In April 2019, the Entomology Graduate Student Association and the City of Riverside hosted the 5th Annual Riverside Insect Fair. Experiences this year included Chef Robert Sevaly cooking with bugs, and readings by Andy Harkness, the author and illustrator of the book “Bug Zoo” and a Disney Animation Studios artist who worked on such films as Pocahontas, Tangled, Frozen and Zootopia. UCR graduate students, faculty and staff hosted many interactive exhibits of current research and opportunities to interact with insects. Unfortunately, The Insect Fair was cancelled for 2020 due to COVID-19 concerns, but look for news about April 2021 on Facebook @AnnualUCRiversideInsectFair

