UCR ENTOMOLOGY

THE BUZZ

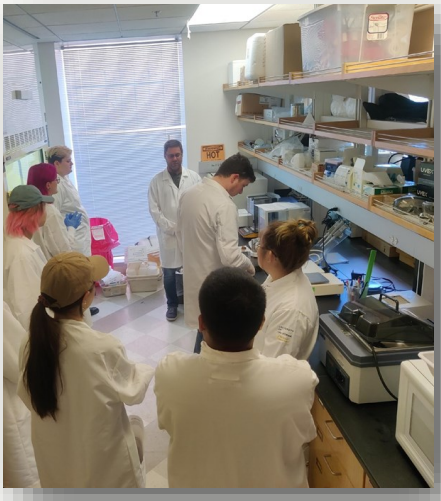
Looking back on 2022-2023

DECEMBER 2023

Undergraduate Internship in Public Health Entomology

D-SIPHER interns, program instructors, and participating public health professionals in front of UCR Agricultural Experiment Station Building

The benefits to human health and economic development are enormous when vector-borne diseases are effectively managed. However, in the United States the threat of vector-borne disease is growing while our capacity to respond to these threats is becoming more limited due to loss (through retirements) of trained professionals working in public health entomology. Currently, in the USA there are few training programs providing hands-on training for students in vector-borne disease prevention and management or that provide opportunity and motivation for students to consider careers in vector management and public health. In response, the CDC's National Center for Emerging and Zoonotic Infectious Disease (NCEZID) has recognized a need for increased student training in vector-borne disease prevention and control to strengthen the workforce of prepared professionals in this field.



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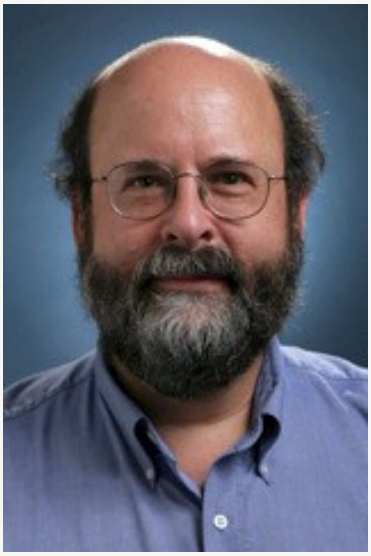
INSIDE THIS ISSUE:

Letter from the Chair



Alumni and Friends of UCR Entomology,

Welcome to the 2023 UCR Entomology Newsletter. I hope you are all doing well, and for those of you up "North", stay warm! I am sure I sound like a broken record, but our Graduate and undergraduate Entomology programs continue to remain strong as well as our participation in several interdepartmental graduate programs. There are currently 42 Entomology graduate students in the program and approximately 39 undergraduate majors. Additionally, our 4+1 BS/MS program (5 years to earn both degrees) has proven to be a great success and is serving as a model for other programs across campus. Currently there are two students finishing up their MS degrees with 15 more in the "pipeline" as Freshman and Sophomores. For those of you interested in graduation ceremonies, we continue to hold our own small and personnel ceremony in the Spring quarter (complete with bagpipes, date and time TBA). The campus graduation ceremonies are no longer held on the campus Quad, but have moved to the Toyota Arena in Ontario. We lost some of our personnel touch, but now have air conditioning on those 95°F June days. Plus, we can handle almost unlimited seating for families and friends. The 2023 ceremonies at the new venue were a great success.

We have had some changes in our Faculty line up this year. Both Richard Stouthamer and Tom Perring retired this summer, and we wish them nothing but the best in their retirement. They will be missed. We also hired three new faculty members. Bo Cass started in July; her areas of research is integrated pest management of subtropical crops. Kathik Chandrasegaran started in October and will be investigating mosquito biology and ecology with an eye towards management. Finally, Ikju Park also started in October and his research is focused on biological control of both insects and plants. Please join me in welcoming them to UCR.

As usual, I would like to emphasize our recently established endowment, *Advancing Inclusivity in Entomology Scholarship Fund*. This endowment supports those undergraduates who have faced systemic barriers in their scientific careers. Please consider making a donation and help us to grow our support funds to great heights! This year's internship recipients are Nathan Olvera in Ysabel Giraldo's lab and Patricia Sanchez in Erin Rankin's lab. Please take a moment to read about their accomplishments further in this newsletter. I also want to send a special shout-out to Jessica Purcell, Kerry Mauck, Amy Murillo, Kim Hammond, Erin Rankin, and Christiane Weirauch for organizing our second annual Holiday fund raiser for this scholarship fund. They brought in $3000 in contributions. Once again, I cannot thank you, our alumni and friends, enough for generously supporting our programs.

If you would like to donate 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 !!

As usual, if you want to keep up with the activities of the Department, feel free to drop into the Entomology Department News website at *https://entomology.ucr.edu/department-news.* It is constantly updated with new items about the Department and the people that make is special.

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

UCR Entomology Department, photographed during Student Seminar day, September 2023

A Special Thank you to all of our Contributors in 2023!

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.

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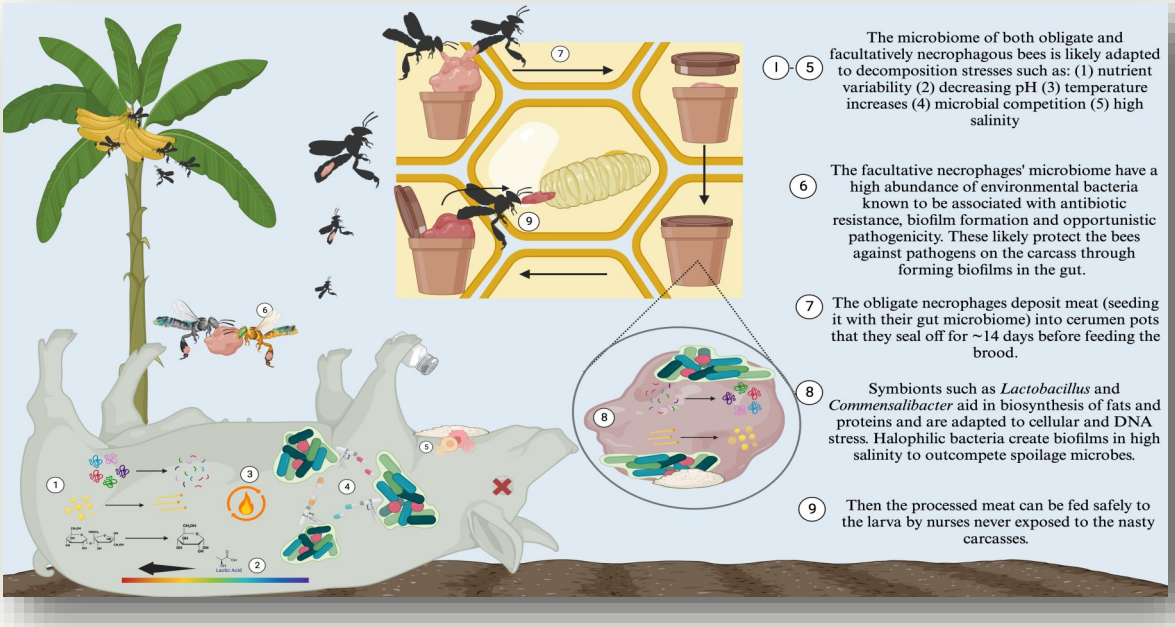
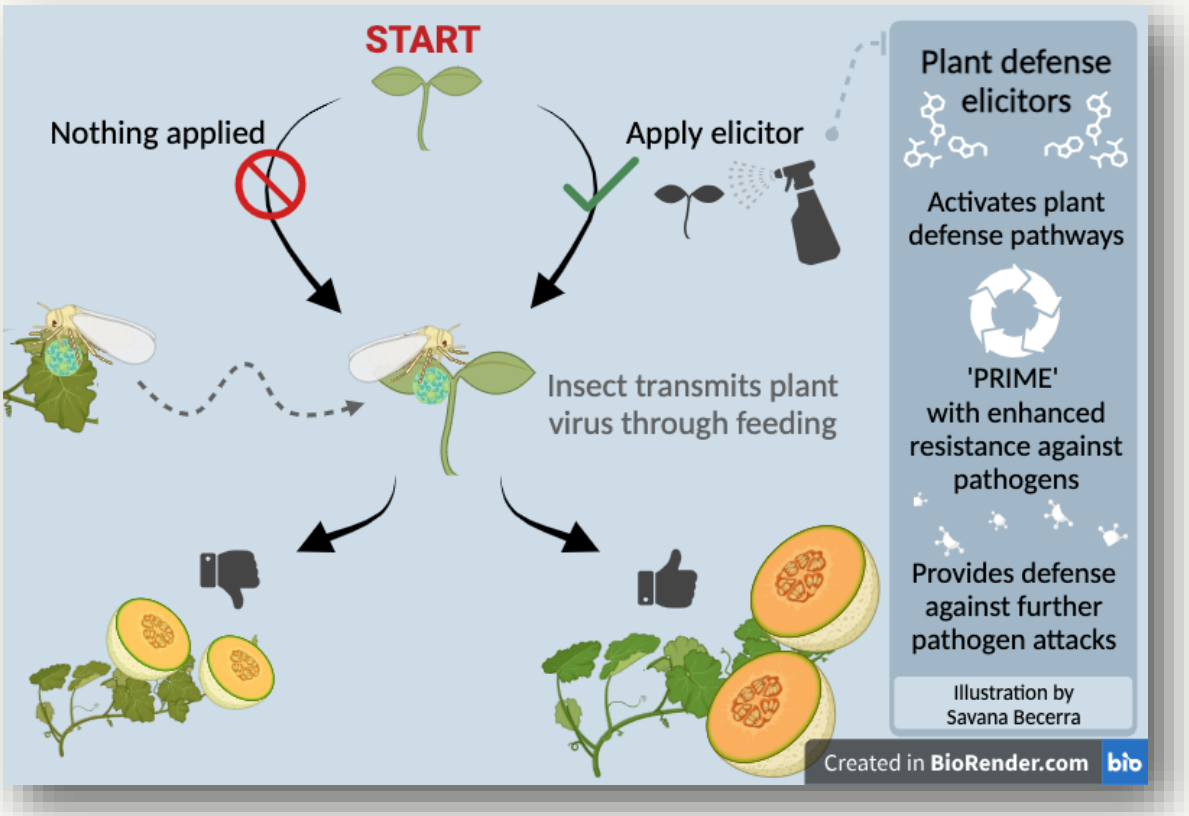
Graphical Abstracts - A Visual Summary of Graduate Student Research



Abstract by Jessica Maccaro



Abstract by Savana Becerra

Targeted Opportunities for Giving to UCR Entomology

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

Featured: 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

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 pre-sent 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 sup-port 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 2023

STUDENTS

Savana Becerra

Student Competition Poster, 1st Place, Entomological Society of America

David Canseco

Best Undergraduate Evolution Poster at SACNAS 2023 Meeting by Society for the Study of Evolution

Tzu Chia Chen

Student Competition Paper, 1st Place, Entomological Society of America

Genesis Chong

Alate Award, Entomological Society of America

Hannah Chu

GWIS Fellowship Honorable Mention, Graduate Women in Science

Lauren and Mildred Anderson Immature Insects Award, UCR Entomology

NAFEA Best PhD Student Talk, North American Forensic Entomology Association

NAFEA Travel Award, North American Forensic Entomology Association

RADCamp Travel Award, Columbia University

Student Research Rapid Grant, California Institute of Biodiversity

Carl Storm/Western Exterminator Scholarship, Western Exterminator/UCR

Jamie Kenney

Graduate Fellowship, USDA-NIFA

Jun-Yin Lum

Pest Management Foundation Scholarship

Tobias Moyneur

Student Competition Paper, 1st Place, Entomological Society of America

Benjamin Nyman

MUVE Travel Award, Entomological Society of America

Julie Tsecouras

Science of Sustainability Fellowship

Inclusive Excellence Travel Fund

Sarah Elise Schroeder

Student Competition Paper, 2nd Place, Entomological Society of America

Sakshi Watts

Science of Sustainability Fellowship

Sydney Wilson

Student Competition Paper, 2nd Place, Entomological Society of America

DEPARTMENT STAFF AND RESEARCHERS

Serguei V Triapitsyn

Systematics, Evolution, and Biodiversity Award from the Pacific Branch of the Entomological Society of America

POSTDOCTORAL RESEARCHERS

Claudinéia Costa

UCR Postdoctoral Award, Riverside Postdoctoral Association, UCR RED

Christina Hoddle

Entomological Society of America, Pacific Branch Entomology Team Member Award for biological control of Asian citrus psyllid in California, April 2023

FACULTY

Brian Federici

UCR Academic Senate Edward A. Dickson Endowed Emeritus Award for 2023 - 2024

Ysabel Giraldo

Hellman Fellow

Mark Hoddle

Entomological Society of America, Pacific Branch Entomology Team Leader Award for Biological Control of Asian citrus psyllid in California, April 2023

Kerry Mauck

EGSA Outstanding Faculty Award

Selected as Boyce Chair, UCR Department of Entomology

Quinn McFrederick

Plant-Insect Ecosystems Award, Pacific Branch of the Entomological Society of America

Ikju Park

Early Career Travel Award for Underrepresented Professionals, California Invasive Plant Council

Jessica Purcell

Distinguished Achievement in Teaching Award, Entomological Society of America, Pacific Branch

We would to share that The Riverside Insect Fair organized and run by the UCR Entomology Department was recognized with the Downtown Event Award by the Riverside Downtown Partnership (www.riversidedowntown.org). Thanks to all members of the Department that assisted with this annual event this past year!

New Research Support Buildings

Entomology Has Two New Research Support Buildings

Entomology has two new buildings that were constructed during the past year. Both buildings replaced older structures supporting Department research activities that were removed as part of the ongoing expansion of the UCR Business School along West Campus Road near College Building North.

The Department's new Incubator Facility is an upgrade of the Department's former facility used for this same purpose. This building is located between the main Entomology building and the Genomics building. Work crews had to clear part of the vegetated area between these two building prior to construction of the new building. However, the nice Entomology courtyard which is adjacent to the new building is unchanged and still provides an enjoyable place for students, staff, and faculty to have lunch. In the image below, you can see the main Entomology building behind the new Incubator facility.

The Department's new Storage Facility, located uphill from the old Entomology Shop, provides lab-specific storage areas for general research supplies and equipment. Although this building is a direct replacement of the department's previous storage facility that was above parking lot 8, and is of approximately the same size and construction, the new location provides easier vehicle access compared to the old storage facility. And there is a nice view down onto campus from up there as well!

New Entomology Incubator Facility

New Entomology Storage Facility

Check out our other Facilities here:
https://entomology.ucr.edu/facilities

News From EGSA (Entomology Graduate Student Association)

Our community continues to evolve and with the many new faces joining us, we are proud to have our graduates continue the passion we share. This year, we reunited as a department at our welcome back picnic, with one of the largest turnouts ever. We have had many of our students present and win at Entomology 2023 in National Harbor, Maryland, in addition to the other countless conferences. We look forward to our favorite holiday in April, the Insect Fair, where we continue to expand our knowledge and appreciation of insects. We have lots of outreach events this year and will end the school year with our annual summer camp. Keep an eye out for registration! As we move forward in the year, building our community within ourselves and others is a priority. We look forward to the rest of the year and can't wait to share our progress for next year!

-Savana Becerra
EGSA Representative, Entomology Newsletter & Website Committee

Designed by Ashley Bui

Designed by Savana Becerra

The ode below honors the prosperity and hardships graduate students go through:

"An Ode to Graduate Life"
By Savana Becerra

My head aches, in pride and glory
My senses tingle, neverending mosquitos
We reunite, with seminar day momentos
New faces, research, and goals, quite exploratory

Trapped for months, our wings itching
Really, it was that long ago?
Now, department traditions continuing
A suitable picnic, a welcome back amigo
Burgers, hot dogs, the largest turnout ever seen
Never forget the first Fridays, you'll hear a scream

And with the heart of April
Our favorite holiday in town
Larger crowds than ever
Follows a camp enlightened in summer
To tap into the heart of a young soul
Who is a bug lover from head to toe
Well maybe just the toe
Nevertheless, learning avails

We unite, ring the siren
Study, research, teach, mentor, outreach: an omen
We can do it all over and again
As our wings itch in our cocoon
Our final emergence will come soon
–

Alumni and Associates, Tell us your News!

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

Email us at richard.redak@ucr.edu

News From BEUSA (Botany and Entomology Undergraduate Student Association)

The Botany and Entomology Undergraduate Student Association (BEUSA) is about uniting the Botany and Entomology undergraduate students by providing a space for learning and friendship. Currently, we have the highest number of undergrads than we have had in recent years! We hope to continue to grow our club and bring more opportunities and interesting activities to our members!

We've had lots of fun these past few quarters! Our most notable event was "Language Inclusivity Day" where we invited Moon Feris from the California School for the Deaf (CSD) and Gabriella San Jose (now alumni) to teach us basic conversational words and phrases, as well as insect and plant-related words in American Sign Language (ASL) and Spanish. "Research Opportunities Day " was also very popular and exciting as we invited our graduate students to come talk about their research to give undergrads the opportunity to join to help with their research.

None of this would have been possible without our incredible team of officers: Emilia Burnham (Co-President, C/ O 2024), Jaden Kim (Co-President, C/ O 2024), Bethany Johnson (Secretary, C/ O 2025), Joshua Santos (Treasurer, C/ O 2025), Max Guiditta (C/ O 2025) and Mona Tran (former Co-President, alumni C/ O 2023).

BEUSA is open to all majors who are interested in entomology or botany and we meet weekly, as it changes per quarter to meet the needs of the students. Come to our meetings, have some pizza, and have a good time with people who love insects and plants too!

-Emilia Burnham & the BEUSA Team

The Department Research Social event organized by Emilia Burnham and Mona Tran, co-presidents of Botany Entomology Undergraduate Student Association (BEUSA). The event facilitated faculty, graduate student and undergraduate interactions and helped undergraduates find exciting research opportunities in Entomology labs.

Gabriella San Jose is presenting to BEUSA members about Spanish conversational phrases and insect words

Bite Me if You Can: The saga of Aedes mosquito menace in California's changing landscape

Buzzing across borders: *Aedes* mosquitoes and global alarm

Over the last few decades, the global landscape has been under siege from an insidious invasion that does not involve armed forces or territorial ambitions but rather a minuscule yet potent adversary, the *Aedes* mosquito. Known as the yellow fever mosquito (*Aedes aegypti*) and the Asian tiger mosquito (*Aedes albopictus*), respectively, these two species are among the most critical vectors of arthropod-borne viruses to humans in tropical and semitropical regions worldwide, raising alarms not only on a global scale but also within the United States and, more acutely, in the states of Florida, Texas, and California. The diseases vectored by these mosquitoes, which include dengue, chikungunya, yellow fever, and Zika viruses, collectively afflict millions of people annually, with approximately 40% of the world's population residing in areas vulnerable to these infections. These mosquitoes' strong preference for feeding on humans and remarkable adaptability to urban environments make them particularly menacing.

Image Credit: US Centers for Disease Control and Prevention

California's mosquito odyssey: A historical timeline of *Aedes* invasion

While historical accounts trace the arrival of *Aedes aegypti* in port cities during the early 16th century aboard European trade ships, *Ae. albopictus*, a recent invader, first ventured into the United States in 1985. The global trade in used automobile tires largely facilitated its introduction. Once established in the USA, these species displayed no restraint in their territorial ambitions. California, a state once perceived as an inhospitable haven for invasive mosquitoes due to its arid climate and harsh temperatures, underwent a seismic shift in perception when *Ae. albopictus* was discovered in Los Angeles County, in 2011. This localized problem rapidly metastasized into a region-wide infestation. Vigorous vector control measures revealed a harrowing infestation zone covering 52 km2. In subsequent years, additional infestation discoveries, demonstrated expanded reach of this invasive species to 109 km2. The relentless expansion of *Ae. albopictus* extended its reach into Kern County, San Diego County, San Bernardino County, and Orange County. In a synchronized invasion, *Ae. aegypti* was first reported in California in 2013 in the city of Madera. Soon, it became evident that *Ae. aegypti* had established footholds beyond Madera, infiltrating nearby areas such as Parkwood, Madera Ranchos, and the city of Clovis.

Notably, 2015 witnessed a surge in detections, marking *Ae. aegypti's* footprint in 12 counties. Subsequent years brought additional sightings, solidifying the fact that these populations of *Ae. aegypti* and *Ae. albopictus* not only survived but thrived through the winter months. Despite concerted efforts to curtail its spread, these mosquitoes' adaptability and rapid expansion at unprecedented rates raised substantial concerns for both vector control and public health authorities in California, necessitating heightened surveillance and intensified control measures to mitigate the associated risks stemming from these invasive mosquito species.

Mosquito surveillance showdown: Navigating challenges

The *Aedes* invasion in California necessitated a significant shift in the mosquito surveillance practices of local vector control agencies. Traditional traps, designed for different mosquito species, proved ineffective in capturing the elusive container-breeding *Aedes* mosquitoes, sparking the adoption of specialized surveillance techniques for early detection, presence/absence determination, and population estimation. Ovitraps are simple in design and became a cornerstone of invasive *Aedes* surveillance due to their cost-effectiveness, small size, and public acceptance. Customized ovitrap designs optimized effectiveness while using *Aedes*-specific BG-Sentinel (BGS) adult traps confirmed the presence of these invasive mosquitoes. Despite their efficacy, BGS traps pose logistical challenges, mostly linked to the sourcing and storing of dry ice (carbon dioxide source) under appropriate conditions and the need for discreet placement to prevent vandalism. In response, a new, cost-

Continued on page 11

Bite Me if You Can: The saga of Aedes mosquito menace in California's changing landscape continued...

effective, highly sensitive *Aedes*-specific adult trap, known as the CDC-AGO, was introduced in 2013 by the California Department of Public Health (CDPH). These traps demanded minimal maintenance and offered a flexible inspection schedule.

Recently, vector control districts have begun using In2Care mosquito traps. These traps attract female mosquitoes looking to lay their eggs and expose them to a juvenile hormone mimic known as pyriproxyfen and a fungus called *Beauveria bassiana*. Once infected, these *Aedes* mosquitoes carry pyriproxyfen to other water sources before eventually dying from the fungal infection. The In2Care traps have had reasonable success in controlling *Aedes* populations because of their efficiency in attracting and killing adult female mosquitoes. Furthermore, In2Care is fully registered in the US and California, thus making them suitable for wider use.

Buzz-worthy allies: How communities take on *Aedes* mosquitoes

Undoubtedly, the most challenging aspect of invasive *Aedes* surveillance is the detection of mosquitoes in new areas. Public engagement plays a pivotal role, with nearly half of the new infestation sites arising from residents reporting day-biting or suspect mosquitoes. Alongside trap deployment, *Aedes* surveillance involves trained vector control professionals from vector control districts conducting thorough property inspections. Given the peridomestic habit of *Aedes* mosquitoes, this step is vital for promptly identifying new infestations. Property inspections reveal cryptic and transient water sources housing eggs, larvae, and pupae, thereby facilitating the capture of host-seeking females. These combined methodologies led to the detection of *Ae. aegypti* and *Ae. albopictus* in various California regions from 2011, with a distinct surge in discoveries occurring between August and October, underscoring the severity of the mosquito menace.

Concrete jungles and mosquito mayhem: *Aedes* in California's Urban Safari

The emergence of invasive *Aedes* mosquitoes is intertwined with the complex interplay of various factors. In California, urbanization trends parallel global patterns, fostering the proliferation of the *Aedes* mosquitoes. Urban environments offer numerous artificial breeding sites like discarded containers, creating ideal conditions for mosquito reproduction. Factors such as increased waste production, higher temperatures in urban heat islands, and altered ecosystems further contribute

Image Credit: US Centers for Disease Control and Prevention

Continued on page 12

Bite Me if You Can: The saga of Aedes mosquito menace in California's changing landscape continued...

to the thriving mosquito population. Insecticide resistance, on the other hand, poses a significant challenge in controlling *Aedes* mosquitoes. To counter this challenge, biochemical assays and genetic data come to the forefront, enabling the development of tailored control strategies. As *Aedes* mosquitoes adapt and expand, the battle against them takes on new dimensions, with urbanization and global changes inadvertently creating environments conducive to their survival.

Recent instances of local dengue transmission in California, specifically in Pasadena and Long Beach, add urgency to the mosquito-borne disease concern. Despite attributing these cases to factors like record rainfall and humid conditions, health officials stress their rarity and isolated nature, minimizing the risk to residents. However, the incidents underscore the potential threat of mosquito-borne illnesses in California, prompting authorities to recommend preventive measures such as eliminating standing water and using insect repellent to mitigate public health risks.

Swatting Tales: *Aedes* mosquitoes and the perpetual public health puzzle

In conclusion, the invasion of *Aedes* mosquitoes poses a multifaceted challenge, entwining climate change, urbanization, and insecticide resistance. These three elements emphasize the need for comprehensive efforts in effective control and preparedness within the realm of public health. This narrative unveils an unyielding battle that harmonizes science, surveillance, and public engagement in a relentless quest to mitigate mosquito-borne diseases. As we stand at the crossroads of this ongoing struggle, it's crucial to acknowledge that the story is far from over. *Aedes* mosquitoes persistently adapt, spread, and present new challenges, reminding us that even the smallest adversaries can pose significant threats to public health.

The *Aedes* mosquitoes' story serves as a reminder of the ever-evolving challenges that public health faces in our dynamic and interconnected world. It encapsulates a narrative of resilience, adaptability, and the unyielding commitment of public health professionals to confront and overcome the most daunting adversaries. As the battle rages on, one thing remains clear: the fight against the *Aedes* mosquitoes is a battle for public health, and it is a battle that must be won.

By Dr. Karthikeyan Chandrasegaran
Edited by Dr. Michelle Brown, District Manager, West Valley Mosquito & Vector Control District

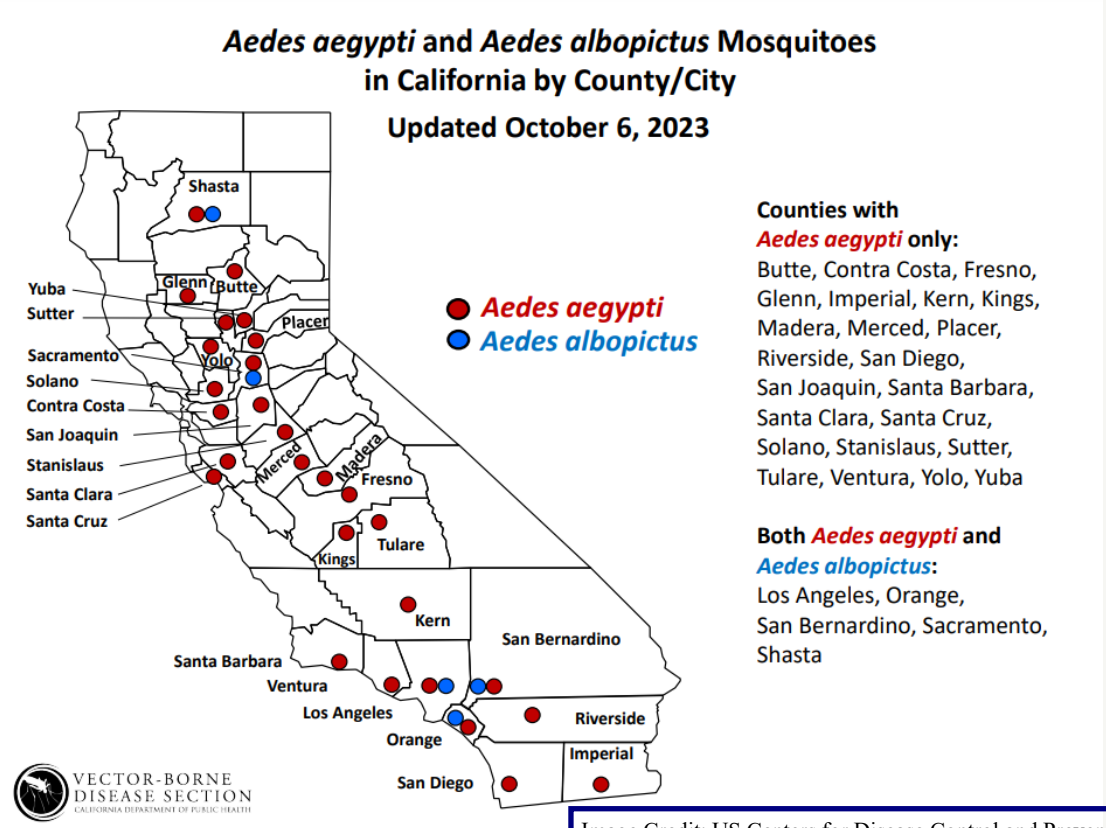


Image Credit: US Centers for Disease Control and Prevention

Welcome to Our New Faculty

Dr. Bodil Cass

I am joining the University of California Agriculture and Natural Resources and the Department of Entomology at the University of California, Riverside, as an Assistant Professor/Extension Specialist in Integrated Pest Management (IPM) of Subtropical Fruit Crops. This appointment has statewide research and extension responsibilities to improve the sustainability of citrus, avocado, dates, and other specialty fruit crop production in California through better management of arthropod pests and vectors of plant pathogens. My research program will build on previous ecoinformatics research I conducted in citrus IPM as a Postdoctoral Scholar at UC Davis and the UC Lindcove Research and Extension Center. I originally studied Genetics at the University of Queensland, Australia, and moved to the USA about 15 years ago for graduate studies in Entomology at the University of Arizona. I most recently worked for the County of San Diego Department of Agriculture/ Weights & Measures managing the local Apiary Program and Plant Pest Diagnostics Laboratory, responding to local agricultural insect pest issues.

Dr. Karthikeyan Chandrasegaran

I am enthusiastic about joining the Department of Entomology at UCR, where my research will focus on mosquito ecology and its implications for disease transmission dynamics. I received my undergraduate degree in Biotechnology at SASTRA University in India, where I conducted research on bacterial quorum sensing in the context of cystic fibrosis. During my undergraduate studies, I had the opportunity to participate in a transformative summer fellowship program. This experience introduced me to studying predator-prey interactions in aquatic environments, igniting my passion for evolutionary ecology. It ultimately steered me towards pursuing a Ph.D. in evolutionary ecology and animal behavior at the National Center for Biological Sciences and SASTRA University, India. As a Fulbright Doctoral Fellow at Illinois State University, I studied the influence of larval predation on mosquito demography. Subsequently, during my postdoctoral tenure at Virginia Tech, I investigated the mechanistic links between larval ecology and traits, behavior, and the vector potential of adult mosquitoes. In my role at UCR, my research group will be dedicated to exploring the effects of urbanization on invasive mosquito population dynamics, interactions with hosts, and epidemiological outcomes. Our interdisciplinary approach will encompass field ecology, molecular biology, neuroethology, and agent-based modeling to address this overarching goal. Besides contributing to devising ecologically relevant vector control strategies, our group's research aims to address fundamental questions in behavioral, evolutionary, and community ecology.

Dr. Ikju Park

As a new faculty member of the Department of Entomology at UC Riverside, I bring a lifelong passion for entomology that was ignited during my childhood encounters with Jean-Henri Fabre's "Book of Insects." This fascination has driven my career journey, culminating in my role as an assistant professor specializing in classical biological control of invasive pests and weeds, not cannabis, at Kyungpook National University in South Korea. I have returned to my California roots by joining this esteemed department on October 1, 2023. At the Insect Sensory and Behavioral Ecology Laboratory (ISABEL), my team and I are dedicated to exploring three vital themes: conducting pre-release risk assessments of potential biocontrol candidates for safety, improving mass-rearing and quality assurance of biocontrol agents, and monitoring the effectiveness of released biocontrol agents. While my primary research interest lies in invasive plants and noxious weeds, ISABEL actively seeks opportunities for collaborations in biological control of unexplored study systems in California.

Welcome to the UC Riverside Entomology Department!

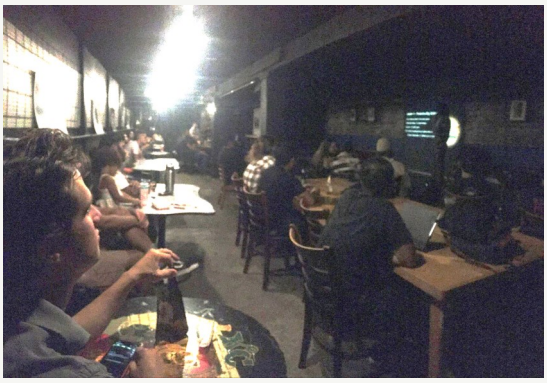
Science Communication

Creative, Community Building Forms of Science Communication

SciComm@UCR is a graduate student-run organization dedicated to promoting science communication training and experience. It has been run primarily by graduate students from the Entomology department including Jessica Maccaro (President), Joshua Reger (Podcast chair and treasurer), Hannah Chu (Social media and marketing chair), and Houston Wilson (faculty representative). In this last year they have been focused on building community around science communication and fostering more trans-disciplinary approaches and collaborations. Below are a few projects that have been getting at this:

Artistic Expression of Original Research Workshop

Graduate students in the sciences learned how to translate their science into art by learning from artists across mediums from poetry to ceramics and beyond for 10 weeks. All the lectures can be found on the YouTube channel "SciComm@UCR". We had a retreat to finish up pieces, then two art shows last Spring at Back To The Grind and The Barn. Across both, 200 people from the community came and talked to the artists/scientists about their pieces (like a poster session). Hannah Chu created a Zine to highlight the artists and their work found here. For 2024, Jessica Maccaro has received a Gluck Fellowship of the art to run this again in the Spring but this time as a 3 day retreat with artists and scientists. This will allow the graduate students to build community with local artists and work on their pieces together for the art shows in mid-April. Email jmacc003@ucr.edu to get involved.



Monthly "Science Nights" at Back to the Grind

Here (every first Tuesday of the month at 7 pm) we have informal lectures and discussions on a diversity of scientific subject matters from insects to space and beyond! Jessica Maccaro works with the speakers the week before to help them communicate their science in an interactive way. Between 30-40 people come every month to have a beer or coffee and learn from the speakers and hangout with them after. This began Sept 2022 and has become an important space for science enthusiasts in Riverside to build community around science and get to know researchers at UCR.

Continued on page 15

Science Communication

Across The Cline Podcast:

Cline – A continuous gradient from one extreme to another

What if those two extremes were different areas of knowledge? What would we find if we were to cross from one end to the other? In the podcast, *Across the Cline*, Entomology graduate student, Jessica Maccaro, and EEOB graduate student, Catherine Nguyen, do just that! In each episode, Jess and Catherine pair two guests from different fields to uncover the connections between those two areas. Together with producer and Entomology graduate student, Joshua Reger, they have released 10 episodes and have had guests including ecologists, statisticians, fantasy writers, and dancers. Find us on Spotify or Apple music!

Coming up soon:

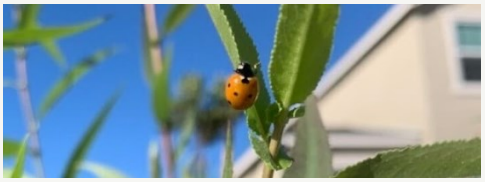
Drag your dissertation:

We are excited to present a new collaboration between QueerGSA and SciComm@UCR called "Drag Your Dissertation": A drag show where graduate students communicate their research or concepts related to their research through the medium of drag performance. To prepare for the show, we will host 5 workshops during winter quarter to learn about drag, create your own routine and outfit. You can take these workshops without participating in the show if you just want to learn more about the intersection of performance and communication. This workshop and event will be completely free and open to any graduate students across disciplines. Please email jmacc003@ucr.edu if you are interested in participating.

Not through SciComm@UCR but related to artistic modes of science communication:

Poetry and science communication:

As a Gluck Fellow last year Jessica Maccaro worked with students from Peralta Elementary school to explore their relationship to insects through poetry. You can find the book here with the kids' poems and illustrations as well as an introduction with more information about the project as a whole. Through Gluck she has also been tabling at music events (Pentland Hills Music Series) helping people create poetry about insects and learn more about them. She continues to explore this intersection of poetry and science communication by publishing her own science-related poetry for instance in Consilience for their issue on measurement (found here).



Illustrations and Poems From K-12 Students

The Metamorphosis of a New Perspective:

Poems and illustrations were produced during an insect poetry workshop held by Jessica Maccaro, a Ph.D. candidate, compassionate about combining the arts and science for others to explore the fascinating relationship of insects. She shares with us how students transformed their fear of insects through direct interaction and learning. Through education and poetry, Jessica is interested in tracking how feelings and opinions about insects change as we grow older. The real-life metamorphosis.

The use of poetry to metamorphose negative relationships with insects into positive ones.

Poems and illustrations exploring our relationship with insects by 5th and 6th graders of Peralta Elementary

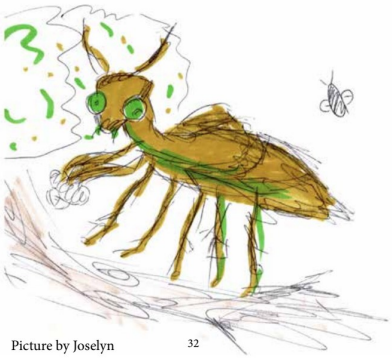
Cricket, Cricket, why do you tweep?
Tweep at night, I cannot sleep,
Where are you, cricket, so I can put you outside.
Alexsandro

Picture by Anon

The spikey stick bug
Is that a stick? Oh, it's a stick bug!
His little spikes are very pointy. I wonder if he can see me?
A stick bug with his stick like spikes
I wonder what he will eat tonight.
He's a brown bug with a spikey back
Will the lady bug survive his unholy attack?
The stick bug will camouflage away
It's just that time of day.
Have you seen the stick bug on this gloomy day?
Whether he is high, or he is low, his legs still go on
This gloomy day he'll yell "hip hooray"
Carter

The colored butterfly
Colored butterflies where do their colors come from?
Yet some colors shine, some colors whine
Yet all colors tend to shine
Butterflies can fly as high as the sky
No idea where they go, yet their colors shine us
As they guide us
As I end this to say, the butterflies say
Shine brighter than the sky
The higher they tend to fly
Ruby

The fighting mantis
Swoosh! Goes the arm of the praying mantis.
Grabbing the fly and pulling toward the mandible of the mantis
The praying mantis still feels hungry and leaves for more.
Never seen again.
Joselyn



Picture by Joselyn 32

https://gluckprogram.ucr.edu

UC RIVERSIDE Gluck Fellows Program of the Arts

Fun in Entomology

BEUSA Meeting

Welcome Back Picnic

Welcome Back Picnic

Museum Class 103

Photos from Tom Perring's Retirement Party

Entomology Research Museum News

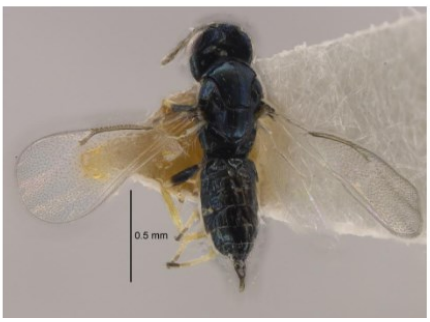
Picture 1: *Anaphes (Patasson) baqueroi Triapitsyn,* 2023 (Hymenoptera: Mymaridae) identified from Navarra, Spain.

The Museum has gotten back up to speed, post-pandemic, with the hiring of some undergraduates - Paulo Padilla, Jessica Simons, and Hana Mancia - to assist with the mounting and labeling of specimens, after the departures of Yanira Herrera and Victoria Osio. Using funds liberated by the survey project of pollinators at Edwards Air Force Base, Cole Watson has been hired on as a temporary assistant curator, and has been dehydrating and mounting specimens, in addition to other minor curatorial duties. All told, we added roughly 27,000 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 640,000 records, with ~195,000 that are IDed to genus-level or better, georeferenced and available online via DiscoverLife and SCAN. We've also had temporary help from a pair of "Transitional Return to Work" workers, Patrick Gephart and Sheila Anthony, who have been assisting with the databasing of our massive slide-mounted thrips collection. Adriean Mayor has continued as a volunteer, working on melyrid beetles.

By processing Malaise trap samples from two UC reserves, (one at the Pinyon Flats area of the Boyd Deep Canyon Desert Research Center in Riverside County and the other from Kenneth S. Norris Rancho Marino Reserve in Cambria, San Luis Obispo County), plus donations of numerous malaise trap samples from the Owens Valley and Mendocino county from Greg Ballmer, the museum contributed hundreds of thousands of specimens to the large barcoding project at the Christiane Weirauch and John Heraty labs, which is also sponsored by the California Institute for Biodiversity, as well as many thousands of specimens from these bulk samples directly into the Museum collection.

This year, we had relatively little physical loan activity. Most of our potential loans were avoided by sending label data, or database information, instead of physical specimens. As in past years, loan material was included in revisions by external authors, including several new species. The demand for things like data sharing, crowdsourcing, social media, and remote ID is considerable; many of these contacts are resulting in loan/data requests, donations, acknowledgments in publications, or even co-authorship. We also retrieved a small "lost" loan from Jack Bath's nephew, about a drawer full of bombyliids that had been borrowed from UCR some 50 years ago and facilitated the return of other material with the cooperation of Brian Brown at the LACM.

Serguei and Doug have both been author or co-author on several publications this past year, with more in press or submitted. Among the newly discovered and identified species during 2023 of note are some newly described taxa such as the pictured *Anaphes (Patasson) baqueroi* Triapitsyn (Hymenoptera: Mymaridae) from Navarra, Spain (Triapitsyn, S. V. 2023. Taxonomy of the Palaearctic species of *Anaphes* Haliday, 1833 (Hymenoptera: Mymaridae), with special focus on their identity and diversity in Finland. Annales Zoologici Fennici 60: 127-197) and *Baryscapus rugglesi* Rohwer (Hymenoptera: Eulophidae) (O'Dea, J. K., J. M. Milnes, S. V. Triapitsyn & P. F. Rugman Jones. 2023. *Baryscapus rugglesi* (Rohwer, 1919) (Hymenoptera: Eulophidae) discovered in western North America: Redescription, notes on biology, and implications as a parasitoid of its host, *Agrilus cuprescens* (Ménétries, eoptera: Buprestidae). Pan-Pacific Entomologist, in press). The



Picture 2: *Baryscapus rugglesi* (Rohwer) (Hymenoptera: Eulophidae) identified from the Pacific Northwest - a parasitoid of the invasive rose stem gridler, *Agrilus cuprescens* (Coleptera: Buprestidae).

Continued on page 20

Entomology Research Museum News

latter is a larval parasitoid of the invasive rose stem girdler within canes of *Rubus* and stems of Rosa planting in the Pacific Northwest of the USA. Another paper, with Doug as senior author, describing 15 new species of fulgorid planthoppers, is also presently under review, and will hopefully be published in the near future.

The museum scientists have each received a rapid collection rescue grant from the California Institute for Biodiversity: Serguei to mount, label, identify, and database a large collection of Mymaridae from all over California (currently stored in ethanol), and Doug to integrate and database an important collection of immature Lepidoptera generously donated by Greg Ballmer. This collection contains well curated specimens from California and all over the world, particularly from Thailand. It is a nice addition to the existing vast collection of immature insects in the museum.

The grants provide funding for salary for a curatorial assistant, Cole Watson, who will be working on these projects.

In September 2023, Serguei visited Japan's Ogasawara (Bonin), Honshu, and Kyushu islands to collect egg parasitoids of leafhopper pests of okra, kiwifruit, and grapes. The short trip, during which material for at least four forthcoming scientific publications was obtained, was sponsored by a "Bridge" Fellowship from the Japan Society for the Promotion of Science. Vouchers and other specimens will be deposited in the Entomology Research Museum.

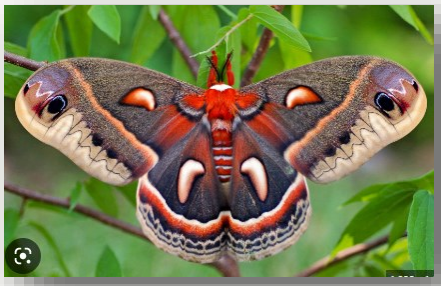
Doug has been assisting with various projects in the department; (1) research on lanternflies in Arizona in collaboration with the Hoddle lab, as part of work on biocontrol for Spotted Lanternfly (now completed) (2) as co-PI on a pollinator survey grant with Erin Rankin-Wilson, on Edwards AFB (now completed) (3) helping a number of students and postdocs from UCR and elsewhere with identifications of bees and other pollinators, for three different projects. One of these projects, with Natasha de Manincor from Nicole Rafferty's lab, required a considerable amount of effort, but also yielded a large amount of high-quality material for the research collection, and an associated database already largely completed and which will be ready to add to the museum database with a little manipulation. This project should also eventually result in a coauthorship.

Doug's activities with the International Commission on Zoological Nomenclature (ICZN) have been heavy over the past year, as he is now on the editorial board of the BZN. The number of external requests for assistance with ICZN-related concerns was quite significant this past year. Also, the Commission has seen a high level of activity over the past year and into the foreseeable future, due to ongoing controversies over scientific names and the impending release of a new Code edition.

By Douglas Yanega and Serguei Triapitsyn

New Alumni and Students

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



Graduate Students:

Iris Chien
Natalie Fischer
Jacqueline Holquinn
Deena Husein
Younghwan Kwak
Shao-Hung Lee
Madison Sankovitz
Sam Standring
Laura Leger

BS+MS Students

Tatiana Bush
Jamie Ramirez

Undergraduate Students:

Clarence Cole
Jordan Jones
Andrew Her
Gabriella San Jose
Jaqueline Torres
Sydney Wilson

Welcome to our newest students!

Graduate Students:

Tzu-Chia Chen: **(Lee Lab)**
Jacqueline Holquinn: **(Murillo Lab)**
Soon Kwon: **(Hoddle Lab)**
Yadira Romero Diaz: **(Woodard Lab)**
Emily Ta: **(Lee Lab)**
Mona Tran: **(Mauck Lab)**
Veronica Tyts: **(Weirauch Lab)**
Sydney Wilson: **(Gerry Lab)**
Molly Barber: **(Rankin Lab)**

Undergraduate Students:

Anderson, Aleja J.
Breeze, Leah M.
Chapman, Alexis B.
Couzens, Lucian F.
Gonzalez, Alondra
Grembowiec, Michael A.
Griffin, Abigail C.
Jennings, Jack S.
Lee, Michael
Phillips, Rachel A.
Saunders, Camryn R.
Smith, Adria L.
Watts, Seth A.
White, Kennedy M.

Inclusivity Scholar Awards

Advancing Inclusivity in Entomology Scholarship

This year the Department was able to make **TWO** Inclusivity Scholar awards to very outstanding students! Congratulations to both the students and their selected mentors. As of October 30 the fund is currently just over $70k (and it has grown since then!). Please consider making a donation to https://cnas.ucr.edu/giving-ent – it is making a difference!!!

Nathan Olvera (Ysabel Giraldo lab)

Nathan is a Biology major and will graduate in Spring 2024. Since joining the Giraldo lab in Fall 2023, Nathan has been investigating how exposure to high gravity levels (hypergravity) affects activity levels and circadian rhythms in *Drosophila melanogaster*. As he pursues a career in medicine, Nathan has been excited to pursue research in insect locomotion, all while adding skills in high-throughput data collection and analysis. Beyond his impact on research, as a first-generation Mexican American student, Nathan is passionate about serving as a role model for success in research and fostering representation and inclusivity in STEM.

Patricia Sanchez (Erin-Wilson-Rankin lab)

Patty is a Biology major & Entomology minor, who will graduate in Winter 2024. Since joining the Wilson-Rankin lab in 2021, Patty has been investigating the aggressive interactions between the native *Forelius pruinosis* (high noon ant), and the invasive *Linepithema humile* (Argentine ant), looking for the factors influencing the initiation and intensity of aggression. She recently presented her research at the 2023 UCR Undergraduate Research Symposium and won a 2023 SACNAS Student Presentation Award for her poster at the 2023 Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) meeting in Portland, OR.

Sanchez photo credit: UCR/Stan Lim

To address the need for increased training in public health entomology, Dr. Alec Gerry and Dr. Amy Murillo developed a 2-week student summer internship program that was offered in July 2023 to expose undergraduate students to the field of public health entomology and to provide students with hands-on experience in vector identification, surveillance, and management. UCR Graduate Student Ben Nyman also assisted with the course development and course instruction. The internship program was called "Developing Student Interest in Public Health Entomology @ UC Riverside (D-SIPHER)" with the acronym suggesting interns would both decipher how to identify and manage vector arthropods while also deciphering how they might find a career in the field of public health entomology. The internship was funded by a curriculum enhancement grant from the Pacific Southwest Center of Excellence in Vector-borne Diseases (https://pacvec.us/).

The 2-week paid internship consisted largely of hands-on training with vector surveillance and management tools in addition to experience conducting vector surveillance and vector identification. Undergraduate interns (Natalie Chan, Aly Doeve, Jordan Jones, Sydney Wilson, Jay Chang, Indigo Talley, Mona Tran, and Jesse Garcia) were UCR students from diverse backgrounds and several campus departments (entomology, biology, plant biology, neuroscience). Interns also had the opportunity to meet with managers and other representatives from several local Vector Control Districts (West Valley MVCD, Northwest MVCD, Coachella Valley MVCD) and from the California Department of Public Health. Tours of the local Vector Control District facilities were one of the highlights of the internship!

End of course assessments indicated the program was very effective at providing vector surveillance and management skills to the interns. Most importantly, interns reported a change in their awareness and interest of careers in public health entomology from few considering careers in the field at the beginning of the internship to all interns interested in this career field at the end of the internship.

Where are they now?

Dr. Vanessa Lopez

After defending her dissertation, "Developing a biological control program for the invasive goldspotted oak borer in southern California" Vanessa graduated with her PhD in Entomology in 2013 under Dr. Mark Hoddle at the University of California, Riverside. As a postdoc at UCR, she continued her work on goldspotted oak borer to investigate the presence of potential biological control agents throughout the beetle's native and introduced range. In 2014, Dr. Lopez moved to Cincinnati, OH, where she completed a second postdoc under Dr. Ann Ray at Xavier University through a cooperative agreement with USDA APHIS. There, her research focused on Asian longhorned beetle dispersal potential and emerald ash borer biology and management.

In 2016, Vanessa joined the USDA Forest Service as the Invasive Species Program Manager for the Forest Health Assessment and Applied Sciences Team in Fort Collins, Colorado under Forest Health Protection within State, Private, and Tribal Forestry. There, she focused on managing funding programs aimed at developing technologies and methodologies to improve forest health management.
In 2018, Dr. Lopez became the USDA Forest Service National Invasive Plants and Biological Control Program Manager in Forest Health Protection within State, Private, and Tribal Forestry in Washington, DC. In this role, she oversees several national programs aimed at preventing and reducing the impact of invasive species across the United States.
Dr. Lopez currently lives in Washington, DC where she enjoys doing yoga and visiting museums, theaters, concert halls, and restaurants. If you would like to learn more about federal career opportunities, please feel free to contact Dr. Lopez at vanessa.lopez@usda.gov.

Dr. Jacqueline "Jackie" Serrnao

Jackie is a two-time UC Riverside alumnus, earning a B.S. in Biology (2012) and Ph.D. in Entomology (2019). For her dissertation research, Jackie examined the chemical ecology of click beetles (Elateridae), publishing the first conclusive pheromone identifications for species from North America. Her graduate research, service to the department, and professional societies earned her the John Henry Comstock Graduate Student Award from the Entomological Society of America in 2020.

After completing her PhD in Entomology with Dr. Jocelyn Millar, Jackie joined the USDA Agricultural Research Service (USDA-ARS) as a Postdoctoral Research Associate at the Temperate Tree Fruit and Vegetable Research Unit, in Wapato, Washington. One year later, Jackie transitioned into her current role as a Research Entomologist where she runs an insect chemical ecology research program. Her research is focused on finding ways to use chemical ecology to aid pest management in tree fruit and potato systems, which can be anything from identifying pheromones or attractants to understanding behavior and developing trapping programs.

In 2020, she was approached by Washington State Department of Agriculture (WSDA) to develop attractive lures to detect the invasive northern giant hornet (NGH) with trapped hornets used to locate the first nest in Washington state. Since then, Jackie's work with NGH has been highlighted by USDA-ARS and featured in the media, including NPR. Jackie is currently working on a pheromone lure for the hornets, with the hopes that it will be an effective monitoring tool in states at risk of NGH invasion. Recently, the Federal Laboratory Consortium, (Far West Region) awarded Jackie with a Technology Transfer Award in State and Local Economic Development for her collaboration with WSDA and contributions to NGH eradication. Taking the knowledge she has gained from her NGH research, Jackie is now also working with entomologists in Guam to combat the invasive greater banded hornet.

In her spare time, Jackie enjoys spending time with her wife and their pets, watching baseball games, gardening, and gaming. For those who knew her dog Charles, he is also doing great and misses the love and attention he got from the department. Jackie can be reached at Jacqueline.Serrano@usda.gov

Alfred M. Boyce Lecture

Dr. David L. Wagner

The 2023 Alfred M. Boyce Lecture was delivered by Dr. David L. Wagner (Professor, Department of Ecology & Evolutionary Biology, University of Connecticut). The title of the lecture was "Insect Decline in the Anthropocene: Death by a Thousand Cuts". During this lecture, Dr. Wager discussed how human activities are affecting the World's ecosystems and placing nature under siege, with insects among the animal taxa at the forefront of this crisis. Loss of insect diversity has recently captured much scientific and even media attention, with well-document insect declines in areas with high human activity being very worrisome. Dr. Wagner specifically focused his lecture on the increasing threat of climate change to the insect biota of the American Southwest.

Dr. Wagner earned a B.S. in 1978 from Colorado State University and a Ph.D. in 1985 from UC Berkeley. He has served or is currently serving on boards for Connecticut State Museum of Natural History, The Nature Conservancy, Wedge Entomological Foundation, and several state, regional, and national committees assessing the conservation status of insects. In 2020, he led an international group committed to preserving funding for field stations that were shuttered by the COVID-19 pandemic, authoring an opinion in BioScience and an editorial in Science. As a University of Connecticut Senator, he led a multi-year effort to get Environmental Literacy added to UConn's general education requirements—as of fall 2020, all incoming UConn students must take a course in Environmental Literacy. Currently, he is helping to initiate a consensus study on the global status of insects by the National Academy of Sciences, Engineering, and Medicine. As time allows, he is scratching away at a four-volume (>18,000-page) series on the caterpillars of western North America for Princeton Univ. Press.

The Boyce Lecture series was established in honor of Dr. Alfred M. Boyce who served the UC Citrus Experiment Station and later UC Riverside campus from 1927 to his retirement in 1968. During this time, Dr. Bocye served as Chair of the Department of Entomology and as Director of the Citrus Experiment Station. Dr. Boyce conducted world-renowned research in across a wide range of entomological subfields including biological control, insect toxicology and physiology, and insecticide resistance. You can find more information on Dr. Boyce in his autobiography "Odyssey of an Entomologist – Adventures on the Farm, at Sea, and in the University".

Department of Entomology
College of Natural and Agricultural Sciences
University of California, Riverside

Alfred M. Boyce

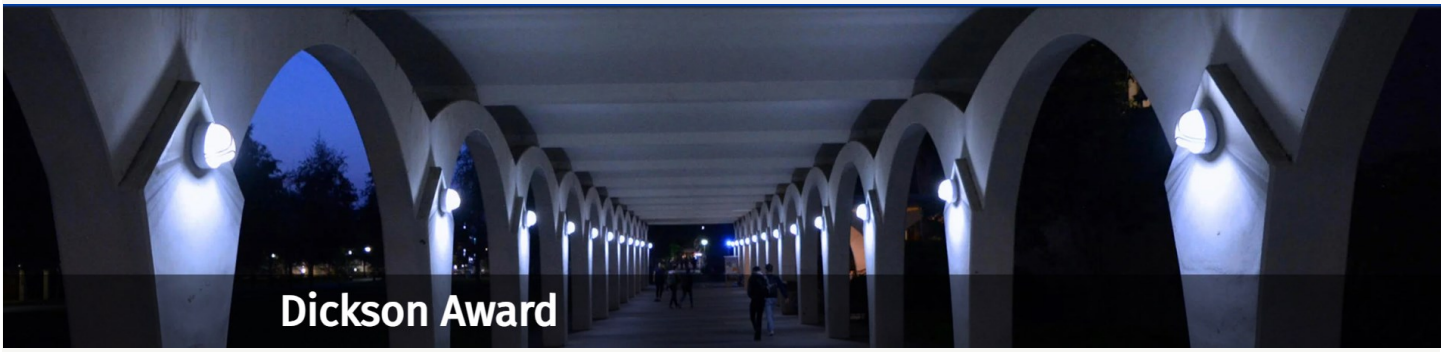
Brian Federici receives an Edward A. Dickson Award for 2023-2024

UC Riverside's Academic Senate has awarded an Edward A. Dickson Endowed Emeritus Award for 2023–2024 to Brian A. Federici, Distinguished Professor of the Graduate Division in our department and member of the Institute for Integrative Genome Biology. This award provides a stipend of approximately $10,000 to as many as three professors annually per UC campus who remain active in research after retirement, and was endowed during the 1940's by Edward A. Dickson, a former UC Regent. Professor Federici will use this award to disprove the symbiotic virus paradigm used by polydnavirus (PDV) researchers to explain the evolution and function organelles produced by parasitoid wasps, which insert wasp genes into their caterpillar hosts to suppress their innate immune response, thereby enhancing survival of parasitoid eggs and larvae.

Professor Federici hypothesized in 2004 that PDV no longer function as virus virions, i.e., infectious particles, but rather as immunosuppressive organelles. He noted that the evolutionary process of symbiogenesis created these organelles, the same evolutionary process that resulted in mitochondria and chloroplasts, by the fusion of genomes of two different types of bacteria with those of successive prokaryotes. Historically, PDV researchers thought that the DNA in the putative PDV "symbiotic" virions contained viral DNA which coded for virion proteins and genes for all other viral functions, in-cluding genome replication and synthesis of progeny virions in their caterpillar hosts. However, even in the early days of PDV research, it was clear that the wasp particles lacked these important virion functions. Thus, Professor Federici cau-tioned PDV researchers, pointing out that the small and variable size of the wasp particles alone required a better explana-tion. Professor Federici published papers in 1991, 2004, 2010 rejecting the symbiotic virus paradigm, and recommending it be replaced with an organelle paradigm, which suggested the particles contained wasp genes coding for suppression of caterpillar immune responses. These papers and the organelle paradigm were ignored by the PDV community. Ironically, PDV researchers produced a wealth of excellent molecular biological data, unbeknownst to them, that simultaneously support the organelle paradigm while disproving the particles are those of a symbiotic virus.

Recently, two senior virologists at the U.S. National Institute of Health, one a member of both the NAS and Na-tional Academy of Medicine, independently concluded PDV are not viruses because the DNA "genomes" in the putative virions are wasp genes and do not code for viral proteins. Thus, these "symbiotic viruses" evolved from viruses, but are no longer viruses. Rather, they created a taxonomic category for polydnaviruses known as Viriforms. Professor Federici, as part of his Dickson Award, is now working with these and other virologists to formally disestablish the Family Polydnaviridae.

Even more important to Professor Federici is the lesson learned from this disproven symbiotic virus episode; that subfields of science, due to the highly technical aspects of many fields today, can become tribal and unscientific leading to professional biases. In the case of PDVs, these biases favored tradition, yielding an untenable concept that resulted in data misinterpretations that are ongoing today, thereby supporting bad science.



In Memoriam

In Memoriam

Philip S. McNally
November 11, 1953 – May 7, 2023

Dr. Philip S. McNally passed away May 7, 2023 after bravely fighting a mysterious genetic disorder (VEXAS) which was not identified until 2020 when genetic advancement unveiled it. He was born in Portland, Oregon and raised in Orange County, California. He attended UC Berkley and UC Riverside where he received a Ph.D. in Entomology in 1979. After graduating he worked as an Extension Entomologist at the University of Arizona where he conducted research in plant and urban pest protection. In 1981 he became an Integrated Pest Management Specialist for UC Davis. In 1985 he joined Mobay Corporation – later becoming Miles/Bayer Corporation as a Research and Development Scientist where he evaluated candidate pest control products for use in the urban sector as well as agriculture commodities. He moved to Bayer Corporation in Kansas City where for four years he assumed the dual position of National Insecticide Research Product Manager and Insecticide Project Manager. In 2000 he returned to California to work as National Development Coordinator & Development and Technical Service Specialist for the Western US. He was relocated with his family, again, this time to Cary, North Carolina where he led the BayerCropScience Discovery Team in finding and developing new innovative products including experimental botanicals. While in California, Phil did many in-field studies on vegetables, citrus and grapes on the coastal CA and Hawaiian crops. He traveled several times to South America in fellowship especially with Ron Wilson collecting and broadening his experience. He retired to Prescott Arizona with his wife, Paula, and was a great dad to their daughter, Marisa. In Prescott, he obtained his Master Gardner certificate and worked extensively on his book, Butterflies of the Central Arizona Highlands which was published in 2020 and is available on Amazon. As a private consultant he worked with Dr. Ron Rutowski at ASU and Dr. Sangmi Lee at the ASU Entomology Museum, where his extensive collection of butterflies, moths, bees, beetles, ants and more now resides. He presented seminars and workshops on current topics of insect biology and identification for The Highlands Center for Natural History in Prescott. He had so much more to give and it is a great loss that he left us so soon. His infectious *laughter* and great sense of humor is well known. He will be missed. His wife no longer is mysteriously missing tupperware containers.

In Memoriam

Richard Dean Goeden
May 20, 1935 – August 17, 2023

Richard Dean Goeden, was born in Neillsville, Wisconsin on May 20, 1935, to Aleda and Jerome Goeden. After his honorable discharge from the U.S. Air Force, he attended the University of Wisconsin, Madison, where he obtained his undergraduate and graduate degrees. In 1965, he moved to California, to take a position as an Assistant Professor of Entomology, at the newly established University of California, Riverside, campus. He spent 37 years at UCR, conducting original research in the field of biological control, both in the US and abroad. As a UCR professor, Richard also mentored graduate students from around the world, taught the graduate field entomology course every Spring, and took on the occasional undergraduate entomology class. He retired in 2002, retaining the title of Professor Emeritus. Prior to his retirement, he donated portions of his insect collections, along with many of his monographs, to the Smithsonian Institution in Washington, D.C. Richard met his wife, Joan Apazeller, on a blind date arranged by their respective best friends, and they were later married on January 20, 1962. At the time of Joan's death, on October 13, 2022, they had been married for 60 years.

Richard spent a great deal of time outdoors as a function of his job: there were very few parts of wild California that weren't familiar to him on a personal level, and the plants and insects of the state were an endless source of fascination for him. Over the course of his long career, he discovered many previously unknown insect species: he took the opportunities presented by these discoveries to name the lucky bugs (they are all fruit flies) after his wife and each of his children. Richard truly loved his job – he knew how lucky he was to have had exactly the career he did, and he was proud of what he had accomplished for UCR, for his department, and for science in general. He was also proud of his graduate students and remained in contact with many of them for decades. Richard also loved art, gardening, reading (science fiction, historical novels, suspense and mystery), and travel. He taught all three of his kids how to make art and brought the whole family along on his work trips throughout Europe. In his off hours, he painted photo-realistic scenes of the places he had traveled (with the tiniest brushes imaginable and a tackle box full of oil paints) and surrounded the family home with the most complicated garden known to man. Richard was one of a kind, an original, and he will be missed, and remembered, by those of us who remain.

https://cnas.ucr.edu/news/2023/12/04/memoriam-richard-d-goede-1935-2023

The academic year 2022-2023 was another good year for the Entomology Outreach program. Entomology Outreach currently largely relies on graduate and undergraduate student, staff, and faculty volunteers to bring insect-focused science education to schools and the public. Our program is supported by three Entomology undergraduate students, who assist with coordinating events (Emilia Burnham) and maintaining our Living Arthropod Collection (Sydney Wilson and Troy Manzano, with Kalra Lemus taking over for Sydney in summer 2023). A big thank you to everyone who is donating their time to make this program happen!

During 2022-2023, our program organized or participated in 35 outreach events staffed by about 30 volunteers. This is still a far cry from the peak of annual numbers of events held before the pandemic and before the shift to exclusively relying on volunteers (there were 100 events in 2018-2019!), but we are on an upward trajectory. Also on a positive note, and thanks in large part to the ever-popular Riverside Insect Fair, our program continues to impact several thousand participants each year in the Inland Empire and beyond. In addition to a number of on-campus events (i.e. Discover Day, Highlander Day, Homecoming, Fall Harvest Festival), outreach events were held at various elementary, middle, and high schools, but also included library and other community events. The 2023 Riverside Insect Fair was back in full swing, and we are already looking forward to the 2024 edition on April 20, 2024, again coordinated between our program's graduate students and the city of Riverside. Our graduate students also developed a curriculum for a new Entomology Camp titled

"Exploring Careers in Entomology Summer Camp" that was held for the first in June 2023. Several of the 12 students are now more certain that their professional future may involve insects!

Finally, the first time teaching our new "Outreach and Science Communication in Entomology" class in Spring 2023 was exciting. Apart from designing and presenting activities during the Riverside Insect Fair and developing new displays for the 2nd floor, class activities also included conducting school and community outreaches. Co-instructors Quinn McFrederick and Christiane Weirauch hope that this and future offerings of this class will inspire more of our students to get involved in insect outreach and science communication.

Christiane Weirauch, Outreach Committee Co-Chair

Find out more: https://entomology.ucr.edu/engagement/outreach/outreach-program

School Outreach as part of the new Entomology Outreach and Science Communication class.

Entomology Outreach booth at the UCR Fall Harvest Festival

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