

Stephanie E. Castillo

Department of Entomology, University of California, Riverside | scast032@ucr.edu | 619-318-5963

Education

Ph.D., Entomology, University of California, Riverside, CA Expected June 2023
B.S., Biology - Evolution and Systematics, San Diego State University, San Diego, CA 2016

Research Statement

Using systematics to understand the biodiversity and evolution of Heteroptera with innovative phylogenomic techniques and natural history collections as well as using technology and social platforms to disseminate natural history information to researchers and the public.

Research Experience

Dept of Entomology, UC Riverside Riverside, CA
Graduate Student Researcher July 2017 – Present

Advisor: Dr. Christiane Weirauch, Professor of Entomology

Project: Taxonomy, phylogenetics, and documentation of salivary proteins in assassin bugs (Reduviidae: emphasis on Pseudocetherinae and Peiratinae)

Dept of Biology, San Diego State University San Diego, CA
Initiative for Maximizing Student Development Scholar October 2015 – December 2016
Undergraduate Research Assistant January 2015 – October 2015

Advisor: Dr. Marshal Hedin, Professor of Biology

Project: Phylogenetics of Travunioidea (Arachnida: Opiliones)

Dept of Entomology, National Museum of Natural History, Smithsonian Institution Washington, DC
Natural History Research Experiences Intern May – August 2016

Advisor: Dr. Torsten Dikow, Curator of Diptera

Project: Taxonomic revision of *Plyomydas* (Diptera: Mydidae)

Dept of Entomology, California Academy of Sciences San Francisco, CA
Summer Systematics Institute Intern June – August 2015

Advisor: Dr. Charles Griswold, Professor Emeritus, Schlinger Chair of Arachnology (retired)

Co-Advisor: Darrell Ubick, Senior Curatorial Assistant (retired)

Project: Comparative morphology of Paranonychidae (Opiliones: Travunioidea) male genitalia for species delimitation

Museum Experience

UC Riverside, Entomology Research Museum (ERM) Riverside, CA
Graduate Student Researcher July 2017 – Present

- Using the collection for research, teaching, and outreach

- Recruiting and training student volunteers to assist in collection initiatives
- Implementing museum standards and practices for collection care and specimen preparation
- Dissecting and harvesting tissues for genomic and morphological studies
- Recording specimen occurrence data in the Arthropod Easy Capture database and lab spreadsheets
- Capturing specimen data using a Leica Imaging System and Hitachi TM4000PLUS tabletop electron microscope

Graduate Student Researcher for the ERM

Winter 2019, 2020

- Providing taxonomic and curatorial support for the ERM and teaching collections
- Improving and increasing accessibility of the teaching collection by acquiring, preparing, and sorting specimens, as well as organizing and moving this entire collection within the museum

Entomological Collections Management Workshop

Tempe, AZ

Workshop participant

July 2022

- Learning collections management workflows, policies, curation, digitization techniques, moving collections, collections pest management, building issues and physical planning, risk assessment and emergency planning, personnel management, and much more.

UC Riverside, Herbarium

Riverside, CA

Volunteer

October 2019 – Present

- Using the collection for outreach and recruiting students to assist in collection initiatives
- Databasing specimen occurrence data in the Consortium of California Herbaria database
- Digitizing specimens for the California Phenology Network (NSF-funded collaboration)
- Mounting herbaria specimens on sheets with associated labels

UC Riverside, Earth Sciences Collection

Riverside, CA

Volunteer

April 2018 – Present

- Using the collection for outreach and recruiting students to assist in collection initiatives
- Recording inventory of minerals, fossils, and modern shells for the department
- Using safety precautions for hazardous materials handling
- Packing xenoliths for cross-country shipment

Dept of Entomology, National Museum of Natural History, Smithsonian Institution Washington, DC

Natural History Research Experiences Intern

May – August 2016

- Using the collection for research and museum outreach
- Attending internship lectures, tours, and activities related to natural history collections care and research
- Illustrating specimens using a stereo microscope with an ocular grid and digitally re-drawing with Adobe Illustrator
- Databasing specimen occurrence data in custom FileMaker Pro database
- Imaging specimens with a Visionary Digital Passport II system and HeliconFocus Pro

Dept of Entomology, California Academy of Sciences

San Francisco, CA

Summer Systematics Institute Intern

June – August 2015

- Designing micro cleaning and dissecting tools for precise work with small specimens

- Improving and maintaining computerized records of *Zuma* (Opiliones) in the collection by capturing specimen data using a Leica Imaging System and an Excel sheet with specimen information
- Attending internship lectures, tours, and activities to maintain knowledge of best practices in systematics research
- Trained in scanning electron microscopy protocols including critical point drying specimens with a Denton Vacuum DCP, sputter coating with gold palladium, and capturing images with a Leo 1450VP Scanning Electron Microscope

San Diego State Terrestrial Arthropod Collection

San Diego, CA

Undergraduate Researcher

January 2015 – December 2016

- Dissecting genitalia and harvesting tissues for phylogenetic studies
- Trained in scanning electron microscopy protocols including critical point drying specimens with a Samdri-790, sputter coating with platinum in an EMS 150 Sputter Coater, and capturing images with an FEI Quanta 450 FEG Scanning Electron Microscope
- Collecting in microhabitats of temperate coniferous forests for *Zuma* (Opiliones)
- Recording specimen occurrence data in electronic database in Excel

Student

August – December 2014

Acquiring, identifying, and curating terrestrial arthropods (e.g., arachnids and insects)

Publications

1. **Castillo S.**, Rédei D., Weirauch C. 2022. Pseudocetherinae (Hemiptera: Reduviidae) revisited: phylogeny and taxonomy of the lobe-headed bugs. *European Journal of Taxonomy*, 788: 1–95.
2. Derkarabetian S., **Castillo S.**, Koo P.K., Ovchinnikov S., Hedin M. 2019. A demonstration of unsupervised machine learning in species delimitation. *Molecular phylogenetics and evolution*, 139: 106562.
3. Derkarabetian S., Starrett J., Tsurusaki N., Ubick D., **Castillo S.**, Hedin M. 2018. Phylogenetic revision of Travunioidea (Arachnida, Opiliones, Laniatores) using sequence capture of ultraconserved elements. *ZooKeys*, 760: 1–36.
4. **Castillo S.**, Dikow T. 2017. Taxonomic revision of *Plyomydas* Wilcox and Papavero, 1971 with the description of two new species and its transfer to Mydinae (Insecta: Diptera: Mydidae). *Revista Brasileira de Entomologia*, 61(2): 192–202.

In prep.

5. **Castillo S.**, Knyshov A., Weirauch C. In prep. Molecular phylogenomics of Peiratinae (Heteroptera: Reduviidae) and ancestral character state reconstruction of male and female genitalic structures. Target journal: *Molecular Phylogenetics and Evolution*. Target date: 2023.
6. **Castillo S.**, Weirauch C. In prep. Phylogenetic comparative analysis of aposematic color patterns in Peiratinae (Heteroptera: Reduviidae). Target journal: *Invertebrate Systematics*. Target date: 2023.

Presentations

Invited Presentations

- 2022 **Castillo S.**, Knyshov A., Weirauch C. Evolution of raptorial legs in assassin bugs (Hemiptera: Heteroptera: Reduviidae). XXVI International Congress of Entomology, Helsinki, Finland.

Oral Presentations – Conferences

- 2022 **Castillo S.**, Weirauch C. Investigating the evolutionary history of the corsairs (Heteroptera: Reduviidae). Entomological Society of America, Vancouver, BC, Canada.
- 2022 **Castillo S.**, Weirauch C. Investigating the evolutionary history of the corsairs (Heteroptera: Reduviidae). Seventh Quadrennial International Heteropterists' Society Meeting, Barcelona, Spain.
- 2021 **Castillo S.**, Weirauch C. Pirate Pursuit: Investigating the evolutionary history of the corsairs (Hemiptera: Reduviidae: Peiratinae). Entomological Society of America, Denver, CO.
- 2018 **Castillo S.**, Weirauch C. Connecting the pieces: Evolution of genitalia in Peiratinae (Heteroptera: Reduviidae). Entomological Society of America, Vancouver, BC, Canada.

Poster Presentations – Conferences

- 2017 **Castillo S.**, Weirauch C. Investigating the evolutionary history of the pirate assassin bugs (Hemiptera: Reduviidae: Peiratinae). Entomological Society of America, Denver, CO.
- 2016 **Castillo S.**, Derkarabetian S., Ubick D., Griswold C., Hedin M. Morphological studies of short-range endemic Japanese and Californian harvestmen (Opiliones: Laniatores: Travunioidea). Society for Advancement of Chicanos/Hispanics and Native Americans in Science, Long Beach, CA.
- 2016 **Castillo S.**, Ubick D., Derkarabetian S., Griswold C., Hedin M. Morphological studies of short-range endemic Japanese and Californian harvestmen (Opiliones: Laniatores: Travunioidea). Society for Integrative and Comparative Biology, Portland, OR.

Departmental Presentations

- 2022 **Castillo S.**, Weirauch C. Pirate assassin bugs: An evolutionary tale of funky spots and wacky genitals (Reduviidae: Peiratinae). Student Seminar Day, UCR. *Oral presentation.*
- 2022 **Castillo S.** Smooth and deadly: A sip of the salivary cocktails in Hemiptera. Systematics Seminar, UCR. *Oral presentation.*
- 2021 **Castillo S.**, Weirauch C. Testing hypotheses on male genitalic evolution in corsair assassin bugs (Reduviidae: Peiratinae). Student Seminar Day, UCR. *Lightning talk.*
- 2021 **Castillo S.**, Weirauch C. Testing hypotheses on male genitalic evolution in corsair assassin bugs (Reduviidae: Peiratinae). Student Seminar Day, UCR. *Poster presentation.*
- 2021 **Castillo S.** Sharing and using entomological collections to document diversity in a changing world. Systematics Seminar, UCR. *Oral presentation.*
- 2019 **Castillo S.**, Redei D., Weirauch C. Revising the classification of the lobe-headed bugs (Heteroptera: Reduviidae: Pseudocetherinae). Student Seminar Day, UCR. *Poster presentation.*
- 2019 **Castillo S.** Substitution modeling. Systematics Seminar, UCR. *Oral presentation.*
- 2018 **Castillo S.**, Weirauch C. Pursuing pirates: Evolutionary history of the corsairs (Hemiptera: Reduviidae: Peiratinae). Student Seminar Day, UCR. *Oral presentation.*
- 2018 **Castillo S.** Reconstructing ancestral character states. Systematics Seminar, UCR. *Oral presentation.*

- 2016 **Castillo S.**, Dikow T. Taxonomic Revision of the mydas-fly genus *Plyomydas* Wilcox & Papavero, 1971 (Insecta: Diptera). Undergraduate Research Symposium, SDSU. *Oral presentation.*
- 2016 **Castillo S.**, Dikow T. Taxonomic Revision of the mydas-fly genus *Plyomydas* Wilcox & Papavero, 1971 (Insecta: Diptera). Natural History Research Experience Symposium, Smithsonian Institution NMNH. *Poster presentation.*
- 2016 **Castillo S.**, Ubick D., Derkarabetian S., Griswold C., Hedin M. Morphological studies of short-range endemic Japanese and Californian harvestmen (Opiliones: Laniatores: Travunioidea). Student Research Symposium, SDSU. *Poster presentation.*
- 2015 **Castillo S.**, Ubick D., Griswold .C, Hedin M. Assembling the puzzle: morphology and biogeography of short-range endemic Japanese and Californian harvestmen (Opiliones: Laniatores: Travunioidea). Summer Systematics Institute Symposium, CAS. *Oral presentation.*

Collecting Experience

- 2017–Present **California:** Many trips to collect Heteroptera for phylogenetic research, teaching a Heteroptera short course, and providing specimens for the California Insect Barcode Initiative. Many trips for general insect collecting to improve the UCR teaching collection and for collections-based courses.
- 2022 **Arizona:** General insect collecting in Pinal County.
- 2018 **Mexico:** Hand collecting of Reduviidae in Mexican High Plateau in Jalisco.
- 2017 **Arizona:** Collection of *Homalocoris* sp. (Reduviidae) and other Heteroptera in bark, foliage, and traps.
- 2016 **California:** Collecting in the Sierra Nevada and extended Bay Area for Paranonychidae (Opiliones) and collecting in Death Valley National Park for *Habronattus* spp (Arachnida: Salticidae) for phylogenetic research.
- 2014 **California:** Sweep sampling arthropods for an ecological survey in Mission Trails Regional Park.

Service and Leadership

Natural History Museum Club at UCR Riverside, CA

2022–Present **President**

2021–2022 **Vice President**

2019–2020 **Secretary**

2018–2019 **Co-founder & Vice President**

- Setting the goals and direction of the club to provide undergraduates multidisciplinary training in collections.
- Facilitating interactions between students and faculty utilizing natural history collections, resulting in volunteer and research positions being filled by our participants.
- Advertising and maintaining activity on the NHMC’s Instagram, UCR’s Highlander Link, email, and campus events, thus increasing membership and member participation.
- Promoting leadership roles in the club for undergraduates to enhance their experience.
- Participating and collaborating with UCR’s eight interdisciplinary collections for outreach events and to further the goals of campus collections.

- Collaborate with the NHM Los Angeles County collections to expose students to research collections in museums which are otherwise inaccessible to the public.
- Planning events and logistics to delegate tasks including scheduling, transportation for participants, facilities, catering, signage, displays, and purchases.
- Leading officer meetings and creating meeting agendas, resulting in efficient meetings that stay on track, on time, and facilitate discussions on club objectives.
- Listening and collaborating with officers to find solutions and alternatives to increase cohesion, positivity, and teamwork.
- Developing yearly budget proposals and monitoring expenses and income.
- Maintaining records including volunteer progress and achievements, minutes, attendance, and Google calendar.
- Designed a new logo, flyers, and merchandise to increase club influence.
- Attended Student Organization Leadership Development Seminar to ensure maintenance of a positive work environment and compliance with university policies.

Entomology Graduate Student Association (EGSA) at UCR Riverside, CA

2022–Present **Camp director**, Junior Entomologist Summer Camp

2022–Present **Chair**, Educational Events Planning Committee

2017–Present **Member**

- Recruiting and overseeing a team of camp volunteers while setting goals and priorities for each camp committee.
- Consulting with UCR’s youth programs coordinator and safety manager to ensure camp volunteers follow appropriate requirements, training, and safety protocols.
- Managing payments, expenditures, and ordering equipment and supplies.
- Managing registration and presenting information and updates to parents.
- Documenting and keeping records, including incident reports and medical/emergency records.
- Developing a curriculum with level-appropriate hands-on activities that encourage campers to learn entomological topics through the scientific method.

Dept of Entomology, UC Riverside Riverside, CA

2021–Present **Committee member**, Entomology Research Museum Committee

- Providing liaison support between EGSA and the museum.

International Heteropterists’ Society (IHS) Riverside, CA

2022–Present **Co-organizer**, True Bug Tuesday Presentation Series

- Planning and advertising heteropteran systematics and biodiversity virtual talks to enhance communication among researchers and students, attract new IHS members, and enhance inclusivity.
- Helping manage community science platforms on Instagram and Facebook.

Center for Integrative Biological Collections at UCR Riverside, CA

2018–Present **Member**

- Provide liaison support with the Natural History Museum Club.

Association for Women in Science at UCR

Riverside, CA

2021–2022 **Secretary**

2020–2022 **Member**

- Collaborating, planning, and participating in community events that promote and support the success of women in STEM.
- Maintaining records including meeting agendas, minutes, attendance, and Google calendar.

Natural History Club at San Diego State University

San Diego, CA

2015–2016 **Vice President**

- Collaborating with officers to set the goals of the club and plan events.
- Inviting guest speakers to educate members about research at SDSU and citizen science.
- Leading field trip to educate members about the native plants in Torrey Pines State Park.

Outreach

- 2022 *NHMC's Four-Day Entomology Workshop, Riverside, CA*
- Designed a workshop where I taught 20+ undergraduate non-majors about collection methods, preparing insects for the museum, digitization, and citizen science, resulting in 176 mounted and labelled insect specimens from bulk ethanol samples for the Entomology Research Museum in three hours.
- 2022 *True Bug Biodiversity Short Course*
- 2022 *AWIS-Association for Young Women in Science mentorship dinner, Riverside, CA*
- 2019 & 2022 *Little Entomologist Camp at UCR for 4th–6th graders, Riverside, CA*
- 2022 *Entomology Outreach Exhibit and Display, Dept of Entomology, Riverside, CA*
- 2018–2022 *Riverside Insect Fair, Riverside, CA*
- 2022 *Involvement Fair at UCR, Riverside, CA*
- 2021 *Virtual Riverside Insect Fair, <https://youtu.be/UYDy9a4lujl>, timestamp 7:36-13:53*
- 2018 *Fiesta Familiar—Explorando La Ciencia Juntos, Riverside, CA*
- 2016 *The Scientist Is In, NMNH, DC*
- 2016 *Qrius, NMNH, DC*
- 2016 *Native Plants of Torrey Pines State Park, Torrey Pines, CA*
- 2016 *Santa Margarita Ecological Reserve Bioblitz, Temecula, CA*

Courses Taught

- Insect Biodiversity & Evolution** Winter 2023
ENTM 202 lab and discussion sections – 6 graduate students
- SciComm: Exploring Effective Communication Methods in the Life Sciences** Fall 2022
ENTM 060W discussion sections – 28 undergraduate students
- Biodiversity of Pentatomomorpha** Spring 2022
True Bug Biodiversity Short Course lecture – 10 participants
- General Entomology** Spring 2021
ENTM 100 virtual lab sections – 60 undergraduate students
- Insect Evolution** Spring 2020
ENTM 106 virtual lab section – 11 undergraduate students

Students Mentored

UCR Graduate MS students: **Tatiana Bush** (2021 – 2022) and **Jamie Ramirez** (2022 – Present)

- Mentored in Sanger-sequencing data analysis in Geneious. Designed a protocol for analysis of Sanger sequence data in Geneious for students, including assembling bidirectional reads, quality control of sequence data, aligning, concatenating, and partitioning data for phylogenetic analysis.
- Demonstrating available tools for research, scientific presentations, and photo plates using various computer programs such as Mesquite, PowerPoint, and Photoshop.
- Providing feedback on best practices for scientific posters, presentations, and writing.
- Revising Ph.D. application materials to help secure positions.

UCR Undergraduate research assistant: **Jaden Kim** (2022 – Present)

- Providing continuous mentorship support.
- Encouraging and exposing student to professional opportunities on- and off-campus for research and funding that will enrich undergraduate experience.
- Created learning objectives alongside activities to process voucher specimens.
- Mentored in general insect morphology.

UCR Undergraduate researchers: **Christian Viduya**, **David Lee**, **Justin Luy**, and **Stephanie Bremer** (Spring 2021)

- Curating citizen science observations of California Reduviidae in iNaturalist.
- Arranging and leading weekly meetings to track progress and provide taxonomic support.

Science and Teaching Workshops Attended

2022	Teaching Practicum: Writing Across the Curriculum Program, UCR, CA.
2022	Transforming Teaching Faculty Learning Program, UCR, CA.
2022	Entomological Collections Management Workshop, Tempe, AZ.
2021	Improving Online Discussion Sections, UCR, CA.
2021	Introduction to Python, UCR, CA.
2018	aTRAM Workshop by Dr. Julie Allen, University of Illinois at Urbana-Champaign, IL.
2018	NSF Latin American Macroevolution Workshop, National Autonomous University of Mexico, CDMX, Mexico.
2018	Qiagen 16s/ITS Metagenomics Workshop, UCR, CA.
2017	Insect Mounting and Labeling Workshop, UCR, CA.

Honors and Awards

2023	Nominated for Outstanding Teaching Assistant award by Dr. Erin Rankin
2022	Gilstrap Endowment Travel Award, \$400
2022	Izya Kerzhner Award, 1 st place, outstanding student oral presentation in the Seventh Quadrennial International Heteropterists' Society Meeting, \$200
2022	Nils & Annemarie Møller Andersen Award, \$400

2022	International Heteropterists' Society Student Grant for Congress fees, €140
2022	Entomological Collections Management Workshop, selected and funded participant, \$1000
2018	NSF Latin American Macroevolution Workshop, selected and funded participant
2018	Ernest Propes Endowed Graduate Fellowship, \$312
2018	Honorable Mention, Ford Foundation Fellowship Program
2017–2018	Fletcher Jones Fellowship-Fees, \$10796.12
	Fletcher Jones Fellowship-Stipend, \$9697.51
	Graduate Fellowship Stipend, \$324.49
2017	UCR's GradEdge/JumpStart Summer Internship Program, \$5000
2016	NSF REU Site: Natural History Research Experience at the National Museum of Natural History, funding for research and travel costs and \$6000
2015–2016	NIH Initiative for Maximizing Student Development Scholars Program at San Diego State University, selected and funded participant
2015	BIO-OCE Research Experiences for Undergraduates Travel Scholarship, \$1000
2015	NSF REU Site: Summer Systematics Institute at the California Academy of Sciences, funding for research and travel costs and \$4200

Professional Affiliations

2022	International Heteropterists' Society
2017–2019, 2021–2022	Entomological Society of America
2017–2019, 2022	Entomological Collections Network
2016	Society for Advancement of Chicanos/Hispanics and Native Americans in Science
2016	Society for Integrative and Comparative Biology
2016	American Arachnological Society

Manuscript Reviewer

Annales de la Société entomologique de France (1)

Computer Programs and Languages

- Adobe Illustrator
- Adobe Photoshop
- aTRAM
- CIPRES
- Geneious
- HeliconFocus Pro
- ImageJ
- Linux
- MAFFT
- Mesquite
- Microsoft Office
- NCBI - BLAST
- Lucid Builder
- FigTree
- phytools
- Python
- R
- RAxML
- SequenceMatrix
- SimpleMappr
- TnT
- WinClada

Databases

- Arthropod Easy Capture
- Consortium of California Herbaria
- FileMaker Pro

Imaging Systems

- Leica Imaging Systems
- Visionary Digital Passport II System
- Hitachi TM4000PLUS Tabletop Electron Microscope
- Leo 1450VP Scanning Electron Microscope
- FEI Quanta 450 FEG Scanning Electron Microscope

Languages

Fluent in English and Spanish.

References

Dr. Christiane Weirauch
Professor of Entomology
University of California, Riverside
Tel: (951) 827-5707
E-mail: christiane.weirauch@ucr.edu

Dr. Erin Rankin
Associate Professor of Entomology
University of California, Riverside
Tel: (951) 827-5735
E-mail: erin.rankin@ucr.edu

Dr. John Heraty
Professor of Entomology
University of California, Riverside
Tel: (951) 827-6351
E-mail: john.heraty@ucr.edu

Dr. Marshal Hedin
Professor and Associate Chair of Biology
San Diego State University
E-mail: mhedin@sdsu.edu