MATTHEW CHOI KUSTRA

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EDUCATION

2018 – 2024 **University of California, Santa Cruz**
Department of Ecology and Evolutionary Biology
Ph.D.
Thesis: *The Evolutionary Consequences of Cryptic Female Choice*
Advisor: Dr. Suzanne Alonzo
Committee: Drs. Bruce Lyon, John Fitzpatrick, Maria Servedio

2014 – 2018 **University of Virginia**
B.S. in Biology, with Highest Distinction, and B.A. in Computer Science
Thesis: *Effects of Local Population Density on Sperm Traits, Growth Rate, and Survival of Anolis sagrei Lizards*
Advisor: Dr. Robert Cox

FELLOWSHIPS, GRANTS, AND HONORS **(Total = $502,500)**

Fellowships (Total = $498,000)
2023 UC Berkeley Postdoctoral Miller Research Fellowship ($321,000)
2022 ARCS Fellow ($10,000)
2018 Dissertation Year Fellowship ($24,000)
2018 NSF Graduate Research Fellowship ($138,000)
2017 NSF Research Experiences for Undergraduates, University of North Carolina at Charlotte ($5,000)

Grants (Total = $4,000)
2022 American Society of Naturalists Student Research Award ($2,000)
2022 International Society for Behavioral Ecology Travel Award ($800)
2017 Rocky Mountain Biological Laboratory REU Travel Grant ($1,200)

Honors
2023 Society for the Study of Evolution Hamilton Award finalist ($500)
2020 “Honors” for Ph.D. qualifying exam
2018 “Highest Distinction” for undergraduate thesis
2017 2nd place in the “Biomedical, Natural Sciences, and Public Health” category at the All-Campus Poster Research Symposium in Charlotte, NC
2016 Intermediate Honors (awarded to students in the top 20% of class rank after sophomore year)

PUBLICATIONS

7. **Kustra, M. C.**, & Alonzo, S. H. (2023). The coevolutionary dynamics of cryptic female choice. *Evolution Letters.* 7 (4): 191-202. https://doi.org/10.1093/evlett/qrad025.

6. **Kustra, M. C.**, Stiver, K., Marsh-Rollo, S., Hellmann, J. K., & Alonzo, S. H. (2023). Social environment influences the temporal dynamics of sneak-spawning in a fish with alternative reproductive tactics. *The American Naturalist.* 202 (2): 181-191. https://doi.org/10.1086/725057.

5. **Kustra, M. C.**, & Carrier, T. J. (2022). On the spread of microbes that manipulate reproduction in marine invertebrates. *The American Naturalist.* 200 (2): 217-235. https://doi.org/10.1086/720282.

4. Kahrl, A. F., **Kustra**, **M. C.**, Reedy, A. M., Bhave, R., Seears, H. A., Warner, D. A., & Cox, R. M. (2021). Selection on sperm count, but not on sperm morphology or velocity in a wild population of Anolis lizards. *Cells*.10 (9): 2369. https://doi.org/10.3390/cells10092369.

3. Cronin. M.R., Alonzo, S. H., Adamczak, S. K., Baker, D. N., Beltran, R. S., Borker, A. L., Favilla, A. B., Gatins, R., Goetz, L. C., Hack, N., Harencar, J.G., Howard, E.A., **Kustra**, **M. C.**, Maguiña, R., Martinez-Esteevez, L., Mehta, R. S., Parker, I. M., Reid, K., Roberts, M. B., Shirazi, S. B., Tatom-Naecker, T. M., Voss, K. M., Willis-Norton, E., Vadakan, B., Valenzuela-Toro, A. M., & Zavaleta, E. S. (2021). Anti-racist interventions to transform ecology, evolution and conservation biology departments. *Nature Ecology & Evolution*. 5: 1213 – 1223. https://doi.org/10.1038/s41559-021-01522-z.

2. **Kustra, M. C.**, & Alonzo, S. H. (2020). Sperm and alternative reproductive tactics: a review of existing theory and empirical data. *Philosophical Transactions of the Royal Society B.* 375: 20200075. https://doi.org/10.1098/rstb.2020.0075.

1. **Kustra, M. C.**, Kahrl, A. F., Reedy, A. M., & Cox, R. M. (2019). Sperm morphology and count vary with fine-scale changes in local density in a wild lizard population. *Oecologia*.191: 555-564. https://doi.org/10.1007/s00442-019-04511-z.

PRESENTATIONS

Kustra, M. C. & Alonzo, S.H. (2023). The role conspecific sperm precedence in maintaining reproductive isolation. Biology of Spermatozoa. Nynäsgård, Sweden.

Kustra, M. C. & Alonzo, S.H. (2023). The coevolutionary dynamics of non-directional cryptic female choice. Evolution. Albuquerque, NM.

Kustra, M. C. & Alonzo, S.H. (2023). The coevolutionary dynamics of non-directional cryptic female choice. American Society of Naturalists. Asilomar, CA.

Kustra, M. C. & Carrier. T.J. (2022). On the spread of microbes that manipulate reproduction in marine invertebrates. Stanford/UCSC Species Interactions Workshop. Santa Cruz, CA.

Kustra, M. C., Stiver, K., Marsh-Rollo, S., Hellmann, J. K., & Alonzo, S. H. (2022). Temporal dynamics of sneak spawning in a fish with multiple alternative reproductive tactics. International Society for Behavioral Ecology Congress. Stockholm, Sweden.

Kustra, M. C. & Alonzo, S.H. (2021). The coevolutionary dynamics of non-directional cryptic female choice. Virtual Evolution.

Kustra, M. C. & Alonzo, S.H. (2021). Non-Directional Cryptic Female Choice Can Maintain Variation in Ejaculate Traits. American Society of Naturalists Virtual Asilomar.

Kustra, M. C. (2020). The Evolutionary Consequences of Cryptic Female Choice. Proposal Seminar. Virtual.

Kustra, M. C., Kahrl, A. F., Reedy, A. M., & Cox, R. M. (2018). Local Density of Conspecifics Affects Sperm Phenotypes in Wild *Anolis sagrei* Lizards. Society for Integrative and Comparative Biology annual meeting. San Francisco, CA.

Kustra, M. C., Macrander, J., Reitzel, A. M. (2017). Every sperm protein is sacred: a characterization of a cnidarian sperm proteome. Biological Sciences Oral Research Symposium. Charlotte, NC.

TEACHING EXPERIENCE

Santa Cruz R User Base Co-leader *Sept. 2019 – Current*
Department of Ecology and Evolutionary Biology, University of California, Santa Cruz

Co-lead a weekly R workshop for postdocs, graduate students, and undergraduate students. I have made lessons on topics such as conducting basic statistics, basic programming, making graphs using ggplot2, supercomputing, and R markdown.

Graduate Teaching Assistant *Sept. 2018 – Current*
Department of Ecology and Evolutionary Biology, University of California, Santa Cruz

- *Introduction to ecology and evolution (Fall 2018)*
- *Marine invertebrate zoology (Winter 2019)*
- *Modeling evolution and ecology (Winter 2021)*
- *Ecosystems of California (Fall 2023)*
- *Population Genetics (Winter 2024)*

Undergraduate Teaching Assistant *Aug. 2016 – May 2018*
Department of Biology, University of Virginia

- *Introductory to biology laboratory: Cell Biology and Genetics (Fall 2016, 2017)*
- *Introductory to biology laboratory: Organismal and Evolution (Spring 2017, 2018)*

PROFESSIONAL EXPERIENCE

Institute of Marine Science, Fisheries Data Analyst *Nov. 2022 – Current*
University of California, Santa Cruz

I write R scripts to analyze and visualize fishery data. This project is helping inform California Department of Fish and Wildlife's implementation of the Marine Life Management Act and other policies. We are specifically focusing on the socioeconomic and behavioral impacts of domoic acid-related management measures on the state's crab and urchin fisheries and seafood supply systems.

Fish Innovations Lab, *R Shiny web app developer* *June 2021 – Aug. 2023*
Mississippi State University

I am developing a bilingual R Shiny web app for USAID-Feed the Future Initiative project, "Increasing sustainability of fisheries for resilience of Cambodian communities." This tool empowers community fisheries management councils in Cambodia to better assess trends in their fishery and make more informed management decisions. This web app features interactive graphs, maps, and allows users to translate between English and Khmer.

AMPEL BioSolutions, Investigative Research Analyst Intern *May 2018 – Aug. 2018*
Charlottesville, VA

I characterized the genetic signature of circulating plasma cells in Systematic Lupus Erythematosus and helped Identify candidate drugs that target this genetic signature.

OUTREACH AND MENTORSHIP

Ecology and Evolutionary Biology Mentor Match *Sept. 2021 – Current*

As a mentor in this program, I assist my assigned mentee with applying to graduate programs in Ecology and Evolutionary Biology.

Science Internship Program Mentor *May 2020 – Aug. 2022*
University of California, Santa Cruz

I have led teams of high school students in summer research projects on animal behavior in the ocellated wrasse as well as modeling sexual selection. As part of this program, I mentored the students in reading scientific papers, formulating research questions, conducting research, performing basic statistical analyses, and programming simulations. Through this program I have mentored seven students.

Peer-to-Peer Mentor *Oct. 2020 – Oct. 2021*
University of California, Santa Cruz

As a mentor for the Peer-to-Peer Mentorship Program, I helped first-year graduate students transition into grad school and build connections within the Ecology and Evolutionary Biology community.

Consilience Research Art Gallery *March 2021*
University of California, Santa Cruz

I worked with an undergraduate artist to develop artwork inspired by my research with the ocellated wrasse.

Santa Cruz Museum of Natural History Docent *Oct. 2018 – Dec. 2019*

I led inquiry-based learning field trips at Neary Lagoon for third grade classes. Students act as community scientists by making observations of wildlife and recording bird count data.

Evolution Education *July 2016*

Evolution Education is a project organized by the Cox lab and funded by the NSF that aims to improve K-12 science education by integrating research into the classroom. I presented a Data Nugget that I co-wrote using data from the Cox lab (http://datanuggets.org/2017/11/is-it-better-to-be-bigger/).

SERVICE

Faculty Search Graduate Student Representative *Oct. 2022 – Feb. 2023*
University of California, Santa Cruz

I served as the graduate student representative on an animal behavior faculty search committee.

MANUSCRIPT REVIEWER

Evolution (x1)

The American Naturalist (x1)

PROFESSIONAL WORKSHOPS AND TRAININGS

Research
2022 Evolutionary Quantitative Genetics – University of Washington

Teaching, mentorship, and diversity

2022 Supporting Our International Students and Scholars – Office for Diversity, Equity, and Inclusion; University of California, Santa Cruz

2022 Understanding Religious Beliefs and Believers – Office for Diversity, Equity, and Inclusion; University of California, Santa Cruz

2022 Diversity Inclusion and Certificate Program Mandatory Orientation: Power, Privilege & Positionality – Office for Diversity, Equity, and Inclusion; University of California, Santa Cruz

2020 Preparing for Supporting STEM Identity Workshop – Institute for scientist and engineer educators; University of California, Santa Cruz

2018 Making the CAISE: Creating Active and Inclusive Section Experiences – Ecology and Evolutionary Biology Department; University of California, Santa Cruz