Curriculum Vitae: Matthew Kustra

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Education

2018- current	University of California, Santa Cruz, CA Ph.D., Advisor: Suzanne Alonzo
2014-2018	University of Virginia, Charlottesville, VA B.S. Biology (Distinguished Majors Program), B.A. Computer Science

Honors, Awards, and Fellowships

2022 ARCS Fellow ($10,000)
2022 American Society of Naturalists Student Research Award ($2,000)
2022 International Society for Behavioral Ecology Travel Award ($800)
2020 Received "Honors" for PhD qualifying exam
2018 Dissertation Year Fellowship ($24,000)
2018 NSF-GRFP ($138,000)
2017 Rocky Mountain Biological Laboratory REU Travel Grant ($1,200)
2017 2nd place in the "Biomedical, Natural Sciences, and Public Health" category at the All Campus Poster Research Symposium. Charlotte, NC
2017 NSF-REU Fellow, University of North Carolina at Charlotte ($5,000)
2016 Intermediate Honors (awarded to students in the top 20% of class rank after sophomore year)

Publications

In prep

Kustra, M. C., K. Stiver, S. Marsh-Rollo, J. K. Hellmann, and S. H. Alonzo. *In prep*. Temporal dynamics of sneak spawning in a fish with multiple alternative reproductive tactics.

Submitted

Kustra, M. C., S. H. Alonzo. *In revision*. Non-directional cryptic female choice can maintain variation in sperm traits.

Kustra, M. C., S. H. Alonzo. *In review*. The coevolutionary dynamics of cryptic female choice

Published

Kustra, M. C., T. J. Carrier. 2022. On the spread of microbes that manipulate reproduction in marine invertebrates. *Am. Nat.* 200 (2): 217-235. https://www.journals.uchicago.edu/doi/10.1086/720282

Kahrl, A. F., **M. C. Kustra**, A. M. Reedy, R. Bhave, H. A. Seears, D. A. Warner, R. M. Cox. 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

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

Kustra, M. C., S. H. Alonzo. 2020. Sperm and alternative reproductive tactics: a review of existing theory and empirical data. *Philos. Trans. R. Soc. B.* 375: 20200075. https://doi.org/10.1098/rstb.2020.0075.

Kustra, M. C., A. F. Kahrl, A. M. Reedy, R. M. Cox. 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. K. Stiver, S. Marsh-Rollo, J. K. Hellmann, and S. H. Alonzo. 2022. Temporal dynamics of sneak spawning in a fish with multiple alternative reproductive tactics. [ORAL PRESENTATION] International Society for Behavioral Ecology Congress. Stockholm, Sweden

Kustra, M. C. and Alonzo, S. H. 2021. "The coevolutionary dynamics of non-directional cryptic female choice " [ORAL PRESENTATION] Virtual Evolution

Kustra, M. C. and Alonzo, S. H. 2021. "Non-Directional Cryptic Female Choice Can Maintain Variation in Ejaculate Traits" [ORAL PRESENTATION] American Society of Naturalists Virtual Asilomar

Kustra, M. C. 2020. "The Evolutionary Consequences of Cryptic Female Choice" [ORAL PRESENTATION] Graduate Proposal Seminar. Virtual

Kustra, M. C. and Alonzo, S. H. 2019. "Variation in and Evolutionary Consequences of Cryptic Female Choice" [POSTER] Biology of Spermatozoa. Nynäsgård, Sweden

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

Kustra, M. C., J. Macrander, A. M. Reitzel, M. Q. Martindale, S. Skerget, T. L. Karr. 2018. "Conservation of Proteins in the Evolution of Animal Sperm: A Cnidarian Perspective" [POSTER] Society for Integrative and Comparative Biology annual meeting. San Francisco, CA

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

Kustra, M. C., J. Macrander, A. M. Reitzel. 2017. "Every sperm protein is sacred: a characterization of a cnidarian sperm proteome" [POSTER] All Campus Poster Research Symposium. Charlotte, NC (2nd Place)

Research Experience

Graduate Student, Alonzo Laboratory *Sept. 2018 – Current*
Dept. Ecology and Evolutionary Biology, University of California, Santa Cruz

Researching the interaction between cryptic female choice and sperm competition empirically in the ocellated wrasse, Symphodus ocellatus, and theoretically using individual based models.

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

Characterization of the genetic signature of circulating plasma cells (PC) in Systematic Lupus Erythematosus (SLE). Identified candidate drugs that target this genetic signature. Investigated tissue infiltration of PC in SLE patients.

Undergraduate Research Assistant, Cox Laboratory *July 2015 – June 2018*
Dept. Biology, University of Virginia

Investigation into the spatial distributions and movement of Anolis sagrei (brown anole) and how density affects sperm traits. For these projects, I conducted field sampling (Palm Coast, FL), imaged

and measured sperm cells, and constructed a map using ArcGIS in order to estimate density and measure distance that individuals move between trips.

NSF REU Fellow, Reitzel Laboratory — *May 2017 – July 2017*
Dept. Biology, University of North Carolina at Charlotte

Characterization of Nemtatostella vectensis (starlet sea anemone) sperm proteome and its evolution across Metazoa using bioinformatic methods including gene ontology analyses and gene tree reconstructions.

Teaching Experience

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

Co-lead a weekly R workshop for graduate students, undergraduate students, and postdocs. I have made and implemented lessons on conducting basic statistics in R, basic programming in R, and making graphs using plotly and ggplot2.

Teaching Assistant: BIOE 20C, 122, 138/238 — *Sept. 2018 – April 2021*
Dept. Ecology and Evolutionary Biology, University of California, Santa Cruz

For weekly teaching sections, I made quizzes and review lessons for "introduction to ecology and evolution" (BIOE 20C). Led dissection labs for "invertebrate zoology" (BIOE 122). Led modeling/programing computer labs for "modeling evolution and ecology" (BIOE 138/238).

Undergraduate Teaching Assistant: BIOL 2020 and 2040 — *August 2016 – May 2018*
Dept. Biology, University of Virginia

I implemented weekly teaching plans for introductory biology labs. My role was to teach and explain scientific concepts as well as safe lab practice to my students.

Professional Experience

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

I am developing a 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.

Outreach

Peer-to-Peer Mentor — *Oct. 2020 – Oct. 2021*

As a mentor for the Peer-to-Peer Mentorship Program, I am helping first-year graduate students transition into grad school and build connections within the EEB community.

Science Internship Program Mentor — *Summer 2020, 2021*

I lead a team of high school students in a research project on animal behavior in the ocellated wrasse. As part of this program, I mentored the students in reading scientific papers, formulating research questions, conducting research, and performing basic statistical analyses.

Consilience Research Art Gallery — *March 2021*

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: 2nd annual teacher workshop *July 2016*
http://www.evolutioned.org/

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 class room. 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/

Mentorship

2021	Maithri Muthukumar (Science Internship Program)
2021	Jack Brownfield (Science Internship Program)
2020	Andrew Chinn (Science Internship Program)
2020	Daphney Waller (Science Internship Program)
2020	Joshua Harjes
2020	Kathryn Lewis
2020	Halle Bender
2020	Brennan Wang
2020	Terrance Zeng
2019	Krislyn Jobes

Manuscript reviewer for:

Evolution (x1)