

Alison M. Ravenscraft

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INTERESTS: Interactions between symbiotic microbial communities and their hosts; currently focused on the insect gut flora. Also entomology, community ecology, and nutritional ecology.

CURRENT POSITION

Postdoctoral Research Associate, University of Arizona, July 2016-Present.

NIH Postdoctoral Excellence in Research and Teaching Fellowship

Mentor: Dr. Martha Hunter

EDUCATION

Stanford University. PhD in Ecology and Evolution, 2016.

Coadvised by Drs. Carol Boggs and Kabir Peay.

Dissertation: "A nutritional perspective on the lepidopteran gut microbial community"

Harvard University. AB *magna cum laude* in Organismic and Evolutionary Biology, 2009.

Advised by Dr. Brian Farrell.

Honors Thesis: "Acoustic communities exhibit temporal patterns in frequency partitioning."

EXPERIENCE

PERT Postdoctoral Fellow, Hunter Lab, University of Arizona, July 2016- present.

I am currently studying the costs and benefits of environmental or "horizontal" symbiont transmission, using the stilt bug *Jalysus wickhami* and symbiotic *Burkholderia* bacteria housed in its gut crypts as a study system. My research addresses the potential for horizontal symbiont acquisition to provide instantaneous "adaptations" to the specific conditions of a host's local environment, including local climate, host plants, and pathogens.

Graduate student, Boggs and Peay Labs, Stanford University, September 2010 – June '16.

Employed field experiments, high-throughput sequencing, and culture-based metabolic profiling to research the ecological and evolutionary interactions between butterflies and their gut flora and to test the effects of the gut microbiota on host reproductive fitness.

Benjamin A. Trustman Traveling Fellow, Harvard University, July 2009 - August 2010.

Developed a proposal to conduct a year of research at Los Amigos Biological Research Station in Peru, studying the costs and benefits which the tree *Cordia nodosa* incurs from hosting mutualistic ants. Won a competitive \$18,000 grant to support the work.

Contributed to the design of the project, served as on-site project manager, and contributed to the writing of two peer-reviewed publications to date.

Research Assistant, Farrell Entomology Lab, Harvard University. March 2007 - June '09.

Conceived, designed and executed an honors thesis project on frequency partitioning in natural acoustic communities. Performed 28 overnight site visits to collect acoustic recordings. Developed a quantitative method to analyze the data in collaboration with a programmer.

GRANTS AND HONORS

NIH Postdoctoral Excellence in Research and Teaching Fellowship, 2016-2019.
Fellow, Stanford Center for Computational, Evolutionary and Human Genomics, 2015-2016.
American Society of Naturalists Student Research Award, 2014.
NSF Graduate Research Fellow, Stanford University, 2012-2015.
Excellence in Teaching Award, Stanford Biology Dept. Spring 2011.
Benjamin A. Trustman Traveling Fellow, Harvard University, 2009-2010.

PUBLICATIONS

Ravenscraft A, Kish N, Peay K, Boggs C. "Direct and trans-generational fitness effects of gut bacteria on an adult butterfly." (*In review.*)

Ravenscraft A, Boggs C. 2016. "Nutrient acquisition across a dietary shift: Fruit feeding butterflies crave amino acids, nectivores seek salt." *Oecologia* 181(1): 1-12.

Hoopes MF, Marsh DM, Beard KH, Goldberg N, Aparicio A, Arbuthnot A, Hixon B, Laflower D, Lee L, Little A, Mooney E, Palette A, **Ravenscraft A**, Scheele S, Stowe K, Sykes C, Watson R, Yang B. 2013. "Invasive plants in U.S. National Wildlife Refuges: A coordinated research project with undergraduate ecology students." *BioScience* 63: 644-656.

Frederickson ME, **Ravenscraft A**, Hernández LMA, Booth G, Astudillo V, Miller GA. 2012. "What happens when ants fail at plant defense? *Cordia nodosa* dynamically adjusts its investment in both direct and indirect resistance in response to herbivore damage." *Journal of Ecology* 101: 400-409.

Frederickson ME, **Ravenscraft A**, Miller GA, Hernández LMA, Booth G, Pierce NE. 2012. "The direct and ecological costs of an ant-plant symbiosis." *American Naturalist* 179(6): 768-778.

PUBLICATIONS IN PREP

Ravenscraft A, Berry M, Hammer T, Peay K, Boggs C. "Structure and function of the bacterial and fungal gut flora of Neotropical butterflies." In prep for submission to *Ecological Monographs*.

Berry M, **Ravenscraft A**, Peay K, Boggs C. "Host phylogenetic relationships predict variation in the gut microbial communities of frugivorous lepidopterans." In prep for submission to *FEMS Microbiology Ecology*.

PRESENTATIONS

Ravenscraft A, Kish N, Peay K, Boggs C. "Gut bacteria are related to host fitness in the butterfly *Speyeria mormonia*." Poster: Stanford Center for Computational, Evolutionary and Human Genomics Symposium, February 2016

Ravenscraft A, Kish N, Peay K, Boggs C. "Context-dependent effects of the gut flora on host fitness in the butterfly *Speyeria mormonia*." Poster: Gordon Research Conference on Animal-Microbe Symbioses, June 2015.

Ravenscraft A, Boggs C. "Nutrient preferences differ among neotropical butterflies of different sexes and feeding guilds." Poster: Association for Tropical Biology and Conservation Conference 2013, P2e-6.

Ravenscraft A, Boggs C. "Puddling Amazonian butterflies prefer sodium and urea." Poster and published abstract: Ecological Society of America Conference 2012, PS 36-175.

Ravenscraft A, Shnayder V, Farrell B. "Acoustic Niche Partitioning on the Boston Harbor Islands and Beyond." Invited oral presentation: Boston Harbor Islands Science Symposium, Oct 2011.

Ravenscraft A, Shnayder V, Farrell B. "The Acoustic Niche Hypothesis: Frequency Partitioning in Bioacoustic Communities." Invited oral presentation: Soundscape Ecology Symposium, International Association of Landscape Ecologists Conference, April 2009.

Ravenscraft A, Farrell B. "The Acoustic Niche Hypothesis: Sound Spectrum Partitioning in Bioacoustic Communities." Oral presentation: Boston Harbor Islands Science Symposium, October 2008.

TEACHING AND MENTORING

Teaching Assistant, *Evolution of Life in Neotropical Forests of Ecuador*. Summer 2014.

Led 14 undergraduates on a 3-week experiential learning course in Ecuador with Dr. Matthew Scott. Wrote the syllabus and assignments. Supervised lectures by scientific experts and discussions with native peoples, including four days with the Huaorani in Yasuni Nat'l Park.

Research mentor. Spring 2012-2014.

I helped master's student Michelle Berry develop an investigation of the relationship between host evolution and the lepidopteran gut flora, and trained her in the associated field, laboratory, and analytical techniques. I also advised her on four successful small research grant applications to support her work.

Stanford BioCore TA Mentor. Spring 2012.

Based on outstanding teaching evaluations, I was selected to serve as a mentor for new teaching assistants in Stanford's introductory biology course (Bio 43).

Teaching Assistant, *Ecology* (Bio 101). Fall 2011.

Administered a 25-person course; ran a bi-weekly section; hosted office hours; wrote and graded student assignments and exams; delivered a lecture; organized field trips.

Teaching Assistant, *Evolution, Ecology, and Plant Biology* (Bio 43). Spring 2011.

Taught two weekly hour-long sections; hosted office hours; wrote and graded exams.

Teaching Assistant, *Conservation Biology* (Bio 144). Winter 2011.

Administered a 30-person course; hosted office hours; wrote and graded student assignments and exams; delivered a lecture. **NCEAS Collaboration:** Directed Stanford's portion of a collaborative project assimilating data and analyzing factors affecting invasive species in National Wildlife Refuges. This was coordinated by the National Center for Ecological Analysis and Synthesis (NCEAS). Traveled to NCEAS with a student to collaborate with representatives from 7 other universities. This led to a publication that included undergraduates as coauthors.

OUTREACH

Stanford Splash instructor. Fall and spring, 2013-2015.

Co-taught a biannual one-day class, "Microbes and Mud," for Stanford Splash, an enrichment program for students in grades 7-12. We constructed Winogradsky columns (self-sustaining microbial ecosystems) to demonstrate alternatives to aerobic metabolism and introduce students to the amazing microbial diversity at their feet.

Stanford BioCore Explorations Instructor. Fall 2011-2014.

Co-taught an annual weekend workshop for undergraduates: “SchLEPping around: case studies in butterfly ecology and evolution.” Lectured on lepidopteran ecology and evolution and organized a field trip to observe the fall monarch migration.

Volunteer teacher, Sábado Científico (Science Saturday). August 2009 - August 2010.

Volunteer teacher for “Sábado Científico” (Science Saturday), a science education program for children living in a remote mining village near the Los Amigos Field Station in Peru.

ACADEMIC SERVICE

Peer reviewer for Molecular Ecology, Molecular Ecology Resources, Ecology and Evolution, Ecological Entomology, and PLOS ONE.

LANGUAGES

Spanish: Conversationally fluent, proficient at technical writing for permits.