

Kristina McIntire

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Education

Illinois State University, Normal IL

Ph.D. Biological Sciences. Behavior, Ecology, Evolution, & Systematics Dec. 2020

Dissertation: Invaders Dilute, Co-Invaders Inhibit: Community Change Drives Infection Differences in *Aedes triseriatus* & *Ascogregarina barretti*

Advisor: Dr. Steven A. Juliano

Illinois State University, Normal IL

B.S. Biological Sciences May 2014

Heartland Community College, Normal IL

A.S. May 2011

Research Experience

Graduate Research 2014-2020

Illinois State University, Normal IL

- Designed and conducted laboratory-based experiments exploring the potential for patterns of local adaptive variation, and the scale at which they may occur, in the host-parasite relationship, *A. triseriatus* and *A. barretti*. Fit models to analyze data using SAS and R. Results indicated that this relationship may be life-stage dependent as well as scale dependent
- Designed and conducted field survey exploring the potential for community composition to alter parasitic infection rates of *A. barretti* in *A. triseriatus*, causing a dilution effect. Analyzed data using piecewise Structural Equation Modeling in R.
- Evaluated the mechanism-specific potential for an invasive host to affect the native host-parasite relationship, and the potential for a co-invasive parasite to impact the native host-parasite relationship through competition or immune induction. Conducted data analysis in SAS and R.
- *Resulted in 2 first author publications, 2 more first author publications in prep, an invited talk at a national conference, and 4 contributed presentations at national conferences.*

Undergraduate Research

2012-2014

Illinois State University, Normal IL

- Used experimental manipulations to determine if overcompensation is likely dependent on timing of extrinsic mortality relative to development and/or behavioral change due to sublethal predator effects. Results indicated that mortality occurring early in *Aedes* development is likely to contribute to overcompensation.
- Conducted field-based investigation of community-level interaction of spatial scale and herbivory risk on *P. clavata* behavior, indicating behavioral change due to territorial response, not risk of host tree herbivory. Conducted at La Selva Biological Research Station, Costa Rica.
- *Resulted in 2 first author publications and 3 national conference presentations*

Teaching Experience

Classroom:

Adjunct Instructor of Biology

2021-2021

Lincoln Land Community College, Lincoln IL

- Designed and taught Biology 101 course for first-year college students
- Developed syllabus, assignments, and grading rubrics
- Used online learning and meeting platforms to organize and provide course content, and increase student contact

Head Teaching Assistant, Ecology

2017- 2020

Illinois State University, Normal IL

- Received Outstanding Biology Teaching Assistant award (2017 & 2019)
- Designed modules to meet course curriculum objectives
- Developed laboratory syllabus, assignments, and grading rubrics
- Coordinated instruction and supplies across 5 sections

Teaching Assistant

2014-2018

Illinois State University, Normal, IL

- *Rainforest Ecology* – Team TA taught upper-level major lecture & lab. Mentored students through development of independent research projects, including data collection in the field at La Selva Biological Research Station in Costa Rica.
- *Graduate Biostatistics* - Assisted students in coding, analysis, interpretation and communication of results, created rubrics and graded assignments.
- *Biological Diversity* – Taught laboratory portion of lower-level major course.

Mentorship

Graduate Mentor

2016-2020

Illinois State University, Normal IL

- Mentored 1 undergraduate student in experimental design, data collection and analysis, and writing to produce a publication-ready manuscript on the interaction of nutrition and parasite dosage on host fitness. *Resulted in 1 second author publication in prep*
- Mentored 2 undergraduate students in data collection and analysis for investigation of the impact of density-dependent mortality on parasitism

Publications (Undergraduate coauthors underscored)

Published:

McIntire, K.M., Chappell, K.M., & Juliano, S.A. 2021. How do noncompetent hosts cause dilution of parasitism? Testing hypotheses for native and invasive mosquitoes. *Ecology* Jun 24:e03452.

McIntire, K.M. & Juliano, S.A. 2021. Detrimental effects of a failed infection by a co-invasive parasite on a native congeneric parasite and its native host. *Biological Invasions*

McIntire, K.M. & Juliano, S.A. 2018. How can mortality increase population size? A test of two mechanistic hypotheses. *Ecology* 99(7):1660-1670.

McIntire, K.M. & Juliano, S.A. 2018. How can mortality increase population size? A test of two mechanistic hypotheses. *Bulletin of the Ecological Society of America* 99(3):340-342. Photo-essay for publicizing the peer reviewed paper in *Ecology* with the same title

In preparation:

McIntire, K.M., Chappell, K.M., Gonzalez, M., & Juliano, S.A. Local adaptation within the host/parasite relationship, *Aedes triseriatus* and *Ascogregarina barretti*: scale dependence and life stage dependence.

McIntire, K.M., Prader, L., & Juliano, S.A. Effects of density and parasitic infection in *Aedes triseriatus*: interactive mechanisms yielding compensation

Chappell, K.M., McIntire, K.M., & Juliano, S.A. Interactive effects of parasite dosage and host nutrition abundance on host fitness

Recent Presentations

Invited:

McIntire, K.M., Prader, L., & Juliano, S.A. Do you know your enemy? Local adaptation of *Aedes* hosts & *Ascogregarina* parasites. Entomological Society of America Annual Meeting, St Louis, MO. (2019)

Contributed:

McIntire, K.M., Chappell, K.M., & Juliano, S.A. Dilution of *Ascogregarina* infection of native *Aedes triseriatus* by other mosquitoes: Tests for hypothesized mechanisms in the field. Entomological Society of America Annual Meeting, Virtual. (2020)

McIntire, K.M. & Juliano, S.A. Impacts of a co-invasive parasites on the native host-parasite relationship, *Aedes triseriatus* and *Ascogregarina barretti*. Ecological Society of America Annual Meeting, Virtual. (2020)

McIntire, K.M. Gonzalez, M., Prader, L., & Juliano, S.A. A case for dilution? *Aedes triseriatus*, *Ascogregarina barretti* & *Aedes albopictus*. Ecological Society of America Annual Meeting, Louisville, KY. (2019)

McIntire, K.M. & Juliano, S.A. Studies on the host-parasite relationship: Effects of parasite abundance on *Ascogregarina barretti* infection of *Aedes triseriatus*. Ecological Society of America Annual Meeting. (2017)

McIntire, K.M. & Juliano, S.A. The Hydra Effect: Controlling mosquitoes as a labor of Hercules. International Congress on Entomology, Orlando. (2016)

Internal:

McIntire, K.M. A case for dilution? *Aedes triseriatus*, *Ascogregarina barretti* & *Aedes albopictus*. Integrative Biology Seminar. ISU. (2019)

McIntire, K.M. & Juliano, S.A. Effects of an invasive parasite on a coevolved host-parasite system: *Ascogregarina barretti* & *Aedes triseriatus*. University Symposium, ISU. (2018)

McIntire, K.M. & Juliano, S.A. Studies on the host-parasite relationship: Effects of parasite abundance and dilution on *Ascogregarina barretti* infection of *Aedes triseriatus*. Phi Sigma Symposium, ISU. (2017)

Grants Received

- 2019 R.D. Weigel Research Grant, Phi Sigma Biological Honor Society
- 2019 Rillett Travel Scholarship, Phi Sigma Biological Honor Society
- 2018 R.D. Weigel Research Grant, Phi Sigma Biological Honor Society
- 2015 Rillett Travel Scholarship, Phi Sigma Biological Honor Society

Awards & Fellowships

- 2021 Outstanding PhD Student, School of Biological Sciences, ISU
- 2019 Outstanding Biology Teaching Assistant Award, Phi Sigma Biological Honor Society
- 2018 Dr. Robert H. Gray Ecology/Biology Scholarship, ISU
- 2017 Outstanding Biology Teaching Assistant Award, Phi Sigma Biological Honor Society
- 2014 RSP Undergraduate Research Fellowship, ISU
- 2013 Honorable Mention, Illinois Mosquito and Vector Control Annual Meeting
- 2013 RSP Undergraduate Research Fellowship, ISU
- 2013 Dr. David W. Borst, Jr. Memorial Endowed Scholarship

Service & Outreach

- 2021-present Skype a Scientist Speaker
- 2021 Speaker and Spotlight Contributor. Society for Advancement of Chicanos/Hispanics & Native Americans in Science
- 2018-2019 Speaker. Fox Creek Elem. School, Normal IL, Bloom Community School, Normal IL
- 2018-2019 Habitat Restoration Volunteer, Phi Sigma Honor Society, ISU
- 2017-2018 Biological Science Student Association Symposium Judge, ISU
- 2017-2020 Reviewer – PLOS One, Parasites & Vectors, Journal of Medical Entomology

Skills

Classroom: cooperative course development, laboratory module development, independent student research mentorship, course implementation through Sakai, Canvas, and Blackboard, lecture planning

Data Analysis: SAS, R, NetLogo. Structural Equation Modeling, Piecewise Structural Equation Modeling, Survival Analysis, Sensitivity and Elasticity analysis, agent-based modeling, building life tables, PCA, MANOVA

Laboratory: PCR, spectrophotometric assays, dissection (avian, mammal, & insect), micro-pipetting, light microscopy, hemocytometer use, mosquito colony husbandry, protozoan parasite culture, fine needle aspiration, cell staining, hemocyte identification, mosquito species identification, microscopic imaging and measurement, mammal and amphibian phlebotomy.

Field: design of appropriate field experiment size and technique, coordinating team data collection, larval and egg mosquito collection, aquatic invertebrate sampling, quadrat sampling, mark-recapture sampling.

Languages: English: Native. Italian: Proficient. Spanish: Basic

References

Steven A. Juliano, PhD

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