Marc A. Beer

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Personal Website

EDUCATION

Washington State University — Pullman, WA
Doctor of Philosophy in Biology, focus in genomics & bioinformatics, GPA: 4.00/4.00 — 2019 - Present

- National Science Foundation Graduate Research Fellowship (NSF GRFP) (2020 - Present)
- Philip H. Abelson Graduate Fellowship (2019 - 2021)

University of Iowa — Iowa City, IA
Bachelor of Science in Biology, Minor in Environmental Science, GPA: 4.19/4.00 — 2015 - 2019

- *Summa cum laude*, Honors in Major, University Honors, Phi Beta Kappa, President's List (2016-2019), Dean's List (2015-2019)
- University of Iowa Tuition Scholarship (2016-2019), Old Gold Scholarship (2015-2019), National Scholars Award (2015-2019), Bill and John Fenton Scholarship (2018), Lowden Prize in Biology (2018), Rhodes Dunlap Second and Third Year Awards (2017-2018), Classics Departmental Latin Award (2017), Myrna Lee Sprengeler Memorial Scholarhsip (2017), Ralph K. and Maxine J. Hibbs Scholarship (2016)

SKILLS

Technical Skills

- R
- Linux command line
- GIS
- Adobe Creative Suite
- GitHub
- SQL (familiar)

Research Skills

- Statistical analysis
- Technical writing
- High performance computing
- Research / experimental design
- Research synthesis
- Critical thinking
- Project management
- Science communication
- Graphic design
- Data visualization

RESEARCH EXPERIENCE

School of Biological Sciences, Washington State University — Pullman, WA
Graduate Research Fellow — Aug. 2019 - Present

- Used redundancy analysis to identify environmental correlates of multiple-response genetic data in relation to Tasmanian spotted-tailed quoll populations. Manuscript submitted to Science.
- Used dimensionality reduction approaches, including principal components analysis, to characterize genetic relationships among invasive cane toad populations in Australia. Manuscript in preparation.
- Implemented regression analyses including latent factor mixed models to explore environmental correlates of genetic variation among populations of a near-threatened salamander. Published in Evolutionary Applications.
- Used GIS and associated tools such as SQL to integrate geographic data from multiple sources.
- Developed a genetic algorithm to optimize hyperparameters for an existing Markov chain Monte Carlo based population genetics analysis.
- Used R data visualization techniques alongside Adobe Creative Suite to regularly present scientific findings to an international, interdisciplinary research group.
- Maintained scripts and code associated with data analysis on GitHub to ensure reproducibility.

Department of Biology, University of Iowa — Iowa City, IA
Undergraduate Research Assistant — Feb. 2017 - May 2019

- Used principal components analysis and ANOVA to characterize morphological differences among closely related agricultural pest species. Manuscript submitted to Evolutionary Ecology.

- Assisted generation of genetic data to resolve relationships among agricultural pest species, leading to publication in Journal of Evolutionary Biology.
- Employed regression analysis to characterize thermodynamic properties of agricultural pest species using time series data.
- Created and presented PowerPoint presentation of above findings to supervisors within the Department of Biology.

PUBLICATIONS

Beer MA, Kane RA, Micheletti SJ, Kozakiewicz CP, Storfer A. (2022). Landscape genomics of the streamside salamander: Implications for species management in the face of environmental change. *Evolutionary Applications* 15(2): 220 - 236. Link.

Hippee AC, **Beer MA**, Bagley RK, Condon MA, Kitchen A, Lisowski EA, Norrbom AL, Forbes AA. (2021). Host shifting and host sharing in a genus of specialist flies diversifying alongside their sunflower hosts. *Journal of Evolutionary Biology* 34(2): 364 – 379. Link.

Piscopo A, Seaman SC, **Beer MA**, Torner JC, Greenlee JDW. (2021). A meta-analysis of proportions of single arm observational series for anterior skull base meningiomas comparing supraorbital craniotomy to the endoscopic endonasal approach. *Interdisciplinary Neurosurgery* 26: 101303. Link.

Storfer A, Kozakiewicz CP, **Beer MA**, Savage AE. (2020). Applications of population genomics for understanding and mitigating wildlife disease. In Population Genomics: Wildlife (P Hohenlohe and OP Rajora, eds.).

Forbes AA, Bagley RK, **Beer MA**, Hippee AC, Widmayer HA. (2018). Quantifying the unquantifiable: why Hymenoptera - not Coleoptera - is the most speciose animal order. *BMC Ecology* 18:21. Link.

SUBMITTED MANUSCRIPTS

Beer MA, Proft KM, Veillet A, Kozakiewicz CP, Hamilton DG, Hamede R, McCallum H, Hohenlohe PA, Burridge CP, Margres MJ, Jones ME, Storfer A. Disease-driven top predator decline affects mesopredator genetic structure. Submitted, *Science*.

Kane RA, **Beer MA**, Kozakiewicz CP, Patton AH, Fraik AK, Hohenlohe PA, Margres MJ, Jones ME, Hamede R, McCallum H, Storfer A. Genetic diversity of the Tasmanian devil pre- and post-disease emergence: Implications for genetic rescue. Submitted, *Scientific Reports*.

Hippee AC, **Beer MA**, Norrbom AL, Forbes AA. Stronger sexual dimorphism in fruit flies may be favored when congeners are present and females actively search for mates. Submitted, *Evolutionary Ecology*. Link.

FUNDING ACQUIRED — TOTAL: $148,500.00

National Science Foundation Graduate Research Fellowship (2020 - Present)	$138,000.00
Philip H. Abelson Graduate Fellowship (2019 - 2021)	$8,000.00
Iowa Center for Research by Undergraduates Summer Fellowship (2017)	$2,500.00

PRESENTATIONS

* Presenting researcher

*Beer MA. 2022. The immune system. Guest lecture, BIOL 395: Evolutionary Medicine. Washington State University. Pullman, WA.

*Hippee AC, Beer MA, Bagley RK, Condon MA, Lisowski EA, Norrbom AL, and Forbes AA. 2020. The phylogeny of genus Strauzia (Diptera: Tephritidae) reveals histories of host shifting, including repeated shifts onto the same plant hosts. Plant and Animal Genome Conference. San Diego, CA.

*Hippee AC, Beer MA, Bagley RK, Condon MA, Lisowski EA, Norrbom AL, and Forbes AA. 2019. The phylogeny of genus Strauzia (Diptera: Tephritidae) reveals histories of host shifting, including repeated shifts onto the same plant hosts. Evolution 2019. Providence, RI.

*Beer MA, Hippee AC, Forbes AA. 2019. Evolution of sexual traits in congeneric insects sharing a host plant. Biology Honors Colloquium. University of Iowa, Iowa City, IA.

*Hippee AC, Beer MA, Bagley RK, and Forbes AA. 2019. The phylogeny of genus Strauzia (Diptera: Tephritidae) reveals histories of host shifting, including repeated shifts onto the same plant hosts. DSHB Symposium on Biological Sciences. Davenport, IA.

*Beer MA, Hippee AC, Forbes AA. 2018. Adaptive consequences of color variation among recently diverged varieties of a specialist insect. Iowa Center for Research by Undergraduates 14th Annual Spring Undergraduate Research Festival. University of Iowa, Iowa City, IA.

*Hippee AC, Beer MA, and Forbes AA. 2017. Evolution of adaptive coloration among recently diverged varieties of a specialist insect. DSHB Symposium on Biological Sciences. Davenport, IA.

TEACHING EXPERIENCE

School of Biological Sciences, Washington State University Pullman, WA
Grader Aug. - Dec. 2021, 2022

- Contributed guest lectures to BIOL 395: Evolutionary Medicine.
- Graded exams.

School of Biological Sciences, Washington State University Pullman, WA
Graduate Student Instructor Aug. 2019 - May 2020

- Led two laboratory sections each of BIOL 102: General Biology and BIOL 372: General Ecology
- Supervised laboratory and field experiments, evaluated weekly student reports, and graded exams.

PROFESSIONAL SERVICE AND OUTREACH

***Ad hoc* reviewer** 2021 - Present

- Peer-reviewed submissions to Evolutionary Applications and Conservation Genetics

WSU SBS graduate student orientation 2021

- Mentored new students in a discussion panel entitled ”SBS Graduate Program: Student Perspectives”

Biology Graduate Student Association Family Fun Week 2020

- Designed an ecology-centered activity for children ages 12+; contributed two online video lessons

Palouse Discovery Science Center 2019 - 2020

- Designed and led scientific enrichment activities for children ages 3-13yrs

Invited research talk, WSU Undergraduate Research Club 2020

- Presented doctoral research to promote interest in science

Marc A. Beer

University of Iowa Biological Interests Organization volunteer 2015 - 2019

Fermilab ecological restoration volunteer 2017 - 2018

University of Iowa student garden volunteer 2015 - 2016