

James G. DuBose

Ph.D. Student
Population Biology, Ecology, and Evolution
Emory University

jdubos2@emory.edu
james.g.dubose@gmail.com
903-946-6255

Education

Ph.D. in Population Biology, Ecology, and Evolution
Emory University

Currently enrolled

M.S. in Bioinformatics
Georgia Institute of Technology

December 2022

B.S. in Biology (Minors: Chemistry and Anthropology)
University of Central Arkansas

May 2021

Appointments

NSF Graduate Research Fellow
U.S. National Science Foundation/Emory University

2023 – Present

Graduate Teaching Assistant
Emory University

2023 – Present

Graduate Research Assistant
Georgia Institute of Technology

2021 - 2022

Graduate Teaching Assistant
Georgia Institute of Technology

2022

ADS Student Undergraduate Research Fellow
Arkansas Department of Higher Education

2019 – 2020

Research Synopsis

My primary research interest is in understanding the generation of biodiversity and biological complexity, and I approach this through studying what facilitates and constrains evolutionary change. I have explored this interest in several topics and model systems, but I mostly study life cycle evolution and the evolution of endosymbiotic interactions. I predominately approach my work on life cycle evolution from an evolutionary genetics and organismal perspective, while I predominately approach my work the evolution of endosymbioses from an ecological perspective. In addition to my core research, I am also interested in developing computational and statistical approaches for improving inferences regarding evolutionary patterns and processes.

Publications

- DuBose, J.G.**, de Roode, J.C. (2025) Extensive transcriptional differentiation and specialization of a parasite across its host's metamorphosis. *International Journal for Parasitology* (in press).
DOI: 10.1016/j.ijpara.2025.01.006
- DuBose, J.G.**, Crook, T.B., Matzkin, L.M., Haselkorn, T.S. (2025) The relative importance of host phylogeny and dietary convergence in shaping the bacterial communities hosted by several Sonoran Desert *Drosophila* species. *Journal of Evolutionary Biology*. 38 (2): 180-189.
DOI: 10.1093/jeb/voae143
- Junker A.D., Chen J.Z., **DuBose, J.G.**, Gerardo N.M. (2025) Dynamic reciprocal morphological changes in insect hosts and bacterial symbionts. *Journal of Experimental Biology*. (in press)
- DuBose, J.G.**, de Roode, J.C. (2024) The link between gene duplication and divergent patterns of gene expression across a complex life cycle. *Evolution Letters*. 8 (5): 726-734.
DOI: 10.1093/evlett/qrae028
- Pentz, J.T., MacGillivray, K., **DuBose, J.G.**, Conlin, P.L., Reinhardt, E., Libby, E., Ratcliff, W.C. (2023) Evolutionary consequences of nascent multicellular life cycles. *eLife*. 12:e84336.
DOI: 10.7554/eLife.84336
- DuBose, J.G.**, Robeson, M.S., Hoogshagen, M., Olsen, H., Haselkorn, T.S. (2022) Complexities of Inferring Symbiont Function: *Paraburkholderia* Symbiont Dynamics in Social Amoeba Populations and Their Impacts on the Amoeba Microbiota. *Applied and Environmental Microbiology*. 88 (18): e01285-22.
DOI: 10.1128/aem.01285-22
- Submitted or in review*
- DuBose, J.G.** (2025) Evaluating the use of Monte Carlo simulation for statistically assessing topological congruence of phylogenetic trees. *In review at Bioinformatics Advances*
DOI: 10.1101/2025.02.07.637028
- DuBose, J.G.**, Morran, L.T. (2025) Reduced signatures of gene duplication and non-random gene organization in shaping stage-specific patterns of gene expression across a relatively simple life cycle. *In review at Evolution*.
DOI: 10.1101/2024.12.21.629888
- Catano C.P., **DuBose, J.G.**, Fuller-Hall L., Chavez J., de Roode J.C., (2025) Experimental immigration mediates ecological selection and stochasticity in monarch microbiome assembly. *In review at Ecology Letters*.
- DuBose, J.G.**, Hoogshagen, M., de Roode, J.C. (2025) The role of a non-native host plant in altering the seasonal dynamics of monarch development. *Submitted to Ecological Entomology*.
DOI: 10.1101/2024.08.23.609406

Teaching

- Graduate Teaching Assistant, Regression Analysis** Spring 2025
Emory University: QTM 220
Responsibilities: Weekly lab instruction, office hours, grading
- Graduate Teaching Assistant, Foundations of Modern Biology** Fall 2024
Emory University: BIOL 141
Responsibilities: Lecturing, office hours, grading
- Co-instructor, Microbial Ecology** Spring 2024
Emory University: BIOL 470W/IBS 539
Responsibilities: Course design, primary instruction, lecturing, discussion leading
- Graduate Teaching Assistant, Foundations of Modern Biology** Fall 2023
Emory University: BIOL 141
Responsibilities: Lecturing, office hours, grading
- Graduate Teaching Assistant, Biological Principles** Fall 2022
Georgia Institute of Technology: BIOS 1107
Responsibilities: Office hours, supplemental instruction, grading

Talks and Presentations

- The 3rd Joint Congress on Evolutionary Biology, Talk** July 29, 2024
James G. DuBose. *The role of gene duplication in facilitating divergent patterns of gene expression across the monarch butterfly metamorphosis*
- Front Range Microbiome Symposium 2023, Poster** April 28, 2023
James G. DuBose, Thomas B. Crook, Luciano Matzkin, Tamara S. Haselkorn. *Exploring the contributions of host evolutionary history and diet in shaping the gut microbiota of cactophilic flies*
- ASM South Central Branch 2022, Poster** October 27, 2022
Thomas B. Crook, **James G. DuBose,** Luciano Matzkin, Tamara S. Haselkorn. *Comparative Microbiome Analysis of Cactophilic Drosophila Species*
- Arkansas INBRE 2022, Poster** October 21, 2022
Thomas B. Crook, **James G. DuBose,** Luciano Matzkin, Tamara S. Haselkorn. *The Microbiota of Naturally Acquired Cactophilic Drosophila Species*
- Evolution 2021, Talk** June 23, 2021
James G. DuBose, Tamara S. Haselkorn. *The transmission and diversity of Paraburkholderia in natural D. discoideum populations and its impact on the D. discoideum microbiome*
- Asilomar 2021, Talk** January 08, 2021
James G. DuBose, Tamara S. Haselkorn. *The Domination of Paraburkholderia in the Social Amoeba D. discoideum microbiome and its Impact on the Ecological Relevance of the Farming Symbiosis*
- Arkansas INBRE 2020, Talk** November 06, 2020
James G. DuBose, Tamara S. Haselkorn. *The Genetic Diversity of Bacterial Symbionts in Dictyostelium discoideum Social Amoeba and Their Effect on the Amoeba Microbiome*

ASM Microbe, Poster

July 2020

James G. DuBose, Hunter Olsen, Tamara S. Haselkorn. *Prevalence and Genetic Diversity of the Burkholderia Bacterial Farming Symbionts in Dictyostelium Discoideum Social Amoeba Populations and their Effect on the Amoeba Microbiome*

ASM South Central Branch, Poster

November 01, 2019

James G. DuBose, Hunter Olsen, Tamara S. Haselkorn. *Long-term Prevalence Patterns of the Burkholderia Farming Symbiont in Dictyostelium discoideum Social Amoeba Populations*

Grants and Funding Awards

NSF Graduate Research Fellowship

2023-2028

Award: \$159,000 (salary)

Proposal: *Investigating heritable symbiont-mediated adaptation to climate change*

Computational Biology Graduate Research Assistantship

2022

Award: \$4,200

Proposal: *A multi-omics approach for comparing the physiological differences between slow and fast-growing bacteria*

UCA College of Natural Sciences and Mathematics Student Research Funding

2021

Award: \$1,000

Proposal: *The horizontal transmission of the Paraburkholderia bacterial farming symbiont and its effects on the microbiome of the social amoeba D. discoideum*

Advancement of Undergraduate Research in the Sciences (AURS)

2019

Award: \$5,000

Proposal: *Ecological relevance of the amoeba farming symbiosis: the prevalence of the Burkholderia bacterial symbiont in natural populations, and its effect on the amoeba microbiome*

Professional Society Involvement

Society for the Study of Evolution

2024 – Present

Member

American Society of Naturalists

2024 – Present

Member

Entomological Society of America

2025 – Present

Member

International Society for Computational Biology

2025 – Present

Member

American Society for Microbiology

2021 – Present

Member

Outreach and Volunteering

US Fish and Wildlife Service Monarch Butterfly Festival

Each year, the US Fish and Wildlife Service hosts an education-oriented festival in St. Marks, Florida, where monarchs are captured and tagged for research purposes. Each year, the de Roode lab participates with our own educational booth where we discuss and screen for monarch parasites with the general public.

Rosalynn Carter Butterfly Trail

The Rosalynn Cater Butterfly Trail is a program that aims to increase habitat for native pollinators. I am frequently involved in various programs and events organized by the Rosalynn Cater Butterfly Trail, including their annual Spring symposium that is focused on communicating best practices in pollinator habitat construction, as well as various projects that involve planting said habitats.

Programming Education Resources for Historically Minoritized Groups in Computing

In collaboration with DataWorks, a data service provider that employs people from communities that have historically had less access to computational resources and education, I developed and taught an introductory Python course that was specifically designed for people with no prior computational experience.

Employment History

Emory University Department of Biological Sciences	January 2023 – Present
Georgia Institute of Technology School of Biological Sciences	January 2022 – December 2022
Arkansas Department of Health Public Health Laboratories: Molecular Biology Unit, COVID-19 Unit	March 2021 – July 2021
University of Central Arkansas Tutoring Center	August 2019 – May 2021
University of Central Arkansas Biology Department	June 2020 – August 2020

References

Dr. Levi T. Morran
Associate Professor, Department of Biology
Emory University
Email: levi.morran@emory.edu

Dr. Tamara S. Haselkorn
Associate Professor, Department of Biology
University of Central Arkansas
Email: thasekorn@uca.edu

Dr. Christopher P. Catano
Assistant Professor, Department of Botany & Plant Sciences
University of California, Riverside
Email: chcatano@gmail.com