Emily Leggat

PhD Student • Ecology and Evolution
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EDUCATION

PhD, *Columbia University*, New York, NY — September 2023 – Present
Ecology and Evolution, Naeem-Palmer Lab Group

BA, *Wesleyan University*, Middletown, CT — May 2021
Biology

RESEARCH EXPERIENCE

Ag Biologicals Engineer 1 - Microbiology, *Ginkgo Bioworks*, Boston, MA — October 2022 – July 2023

- Optimized corn biomarker assay for gene expression analysis in response to soil and microbial nitrogen presence
  - Established best mRNA extraction and preservation methods for cDNA synthesis
  - Created and wrote protocols for high-throughput RNA → cDNA → qPCR sample processing
  - Ran qPCR and analyzed data in R to calculate fold gene expression
- Validated DNA extraction protocols for microbial strains in plant tissues
  - Tested various methods to optimize DNA yield and ran qPCR and gel electrophoresis on samples to confirm results
- Planned workflows for sequential sporulation and *in planta* assays
- Continued responsibilities from Joyn Bio following acquisition and the creation of the Agriculture Division

Plant-Microbe Interactions Research Associate, *Joyn Bio*, Boston, MA — March – October 2022
Microbial Discovery Biologist Contractor — October 2021 – March 2022

- Performed *in planta* assays to determine microbial colonization of shoots and roots in V1 corn and VC soybean
  - Planted seeds, watered, and harvested up to 200 plants per experiment, with two experiments per week
  - Separated, dried, ground, and resuspended plant tissues for long-term storage and downstream analysis
- Extracted microbial DNA from plant tissue samples to perform qPCR
  - Prepared qPCR plates both by hand and using a Hamilton robot for analysis in a LightCycler
- Grew, diluted, and plated experimental microbial strains for sporulation assays and later use in *in planta* assays
  - Prepared several types of media to determine each strain's preferred media for sporulating

Undergraduate Research Fellow, *Singer Lab*, Wesleyan University — April 2019 – May 2021
Biology Department, PI: Michael Singer

- Analyzed the effects of forest fragmentation on parasitism of caterpillars during the 2019 field season
  - Systematically sampled red maple and witch hazel branches for caterpillars in sixteen sites in midland Connecticut
  - Reared collected caterpillars to monitor for emerged parasitoids, and preserved them for future identification
- Conducted a literature review examining the research on the enemy-free space hypothesis as it pertains to caterpillar diet breadth since the publication Bernays & Graham 1988

    - Wrote and edited a book chapter in collaboration with other lab members, published in *Caterpillars in the Middle: Trophic Interactions in a Changing World* (2022)
- Presented research findings at the Wesleyan Research in Sciences poster session in the 2019 and 2020 summers

TEACHING EXPERIENCE

Graduate Teaching Assistant, *Introduction to Statistics*, Columbia University September 2024 – Present

- Runs weekly lab sessions teaching undergraduate and graduate students how to use R for statistical analyses of ecological questions

Course Assistant, *Principles of Biology Laboratory*, Wesleyan University September 2019 – May 2021

- Guided 10-15 students in BIOL 191 and 192 through wet lab exercises including, but not limited to, pipetting, making agarose gels, conducting PCR, performing Bradford assays, bacterial transformations, and dissections
- Coordinated directly with Professor and Lab Coordinator weekly to assess students' performances, improve lab activities for subsequent semesters, and troubleshoot conducting labs with COVID-19 safety measures

LEADERSHIP EXPERIENCE

Committee Co-Chair, *Outreach Committee*, Columbia University May 2024 – Present
Committee Member September 2023 – May 2024

- Organized and presented professional development workshops for undergraduates, with topics including CVs and getting involved with research
- Organized and moderated a career panel for current Ecology and Evolution students, with department alumni working outside of academia as panelists

PhD Representative, *Arts and Sciences Graduate Council*, Columbia University January – May 2024

- Represented Ecology and Evolution PhD student interests at Graduate Council meetings
- Served on the Finance Committee

PUBLICATION

Singer, M.S., Anderson, R.M., Hennessy, A.B., **Leggat, E.**, Prasad, A., Rathe, S., Silverstone, B., and Wyatt, T. J. (2022). Predators and caterpillar diet breadth: appraising the enemy-free space hypothesis. In R.J. Marquis. & S. Koptur (Eds.), *Caterpillars in the middle: Trophic interactions in a changing world* (pp. 273-96). Springer.

HONORS AND AWARDS

Phi Beta Kappa 2021
Wesleyan College of the Environment Summer Research Fellowship 2019, 2020

ADDITIONAL EXPERIENCE

Volunteer, *Madagascar Research & Conservation Institute*, Madagascar September – November 2017

- Surveyed herpetofaunal distribution and habitats in the forests of Nosy Komba
- Analyzed sea turtle habits and populations on the Nosy Komba reef
- Studied wild black lemur behavior through prolonged observation
- Transcribed survey data in a master spreadsheet for trend analysis