Emily Leggat

PhD Student • Ecology and Evolution
Columbia University • New York, NY 10027
el3258@columbia.edu • LinkedIn

EDUCATION

Columbia University, New York, NY   September 2023 - Present
  PhD, Ecology and Evolution, Naeem-Palmer Lab Group
Wesleyan University, Middletown, CT   August 2018 - May 2021
  BA, Biology, GPA: 3.92/4.00
The George Washington University, Washington, DC   August 2016 - May 2017
  Columbian College of Arts and Sciences, GPA: 3.83/4.00

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 2022 - 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, PhD
- 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

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

PUBLICATIONS

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
George Washington University Presidential Academic Scholarship	2016 - 2017

ADDITIONAL EXPERIENCE

Madagascar Research and Conservation Institute, Madagascar   September 2017 - 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

SKILLS

Computer: R, ArcGIS, QGIS, Benchling, Smartsheets
Lab: Nucleic acid extraction, qPCR
Language: French (conversational)
Certifications: PADI Advanced Open Water Diver (2017)