

Ella Segal

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EDUCATION

University of Tennessee at Knoxville, Knoxville, TN

PhD Student, 2022-

Advisor: Dr. Stephanie Kivlin

Rice University, Houston, TX

Bachelor of Science in Ecology and Evolutionary Biology, May 2021

Distinction in Research and Creative Works, May 2021

Advisor: Dr. Tom Miller

Thesis title: *Epichloë* endophytes confer resilience to drought and herbivory but not competition in their cool season grass hosts: a meta-analysis

PUBLICATIONS

Dybzinski R, **Segal E**, McCormack LM, Rollinson CR, Nordgren A, Mascarenhas R, Giambuzzi P, Rivera J, Fitzpatrick L, Wiggins C, Midgley MG. 2022. "Estimating canopy tree nitrogen uptake rate in forests by dimension analysis and tissue nitrogen concentrations: which data must be measured *in situ* and which data can be taken from trait databases to maximize return on research effort?" *New Phytologist*. (manuscript in press).

McCormack L, Tran N, Lo M, Midgley M, Dybzinski R, Rollinson C, Cannon C, **Segal E**. 2022. "Efficient root exploration strategies support greater whole-tree water use during summer drought." (manuscript in preparation).

Segal E. 2019. "The Impacts of Fine Root Mass and Soil Nitrogen Availability on Nitrogen Uptake Rate in Trees." *The Morton Arboretum REU Bulletin*.

RESEARCH EXPERIENCE

Smithsonian Environmental Research Center, Edgewater, MD (Spring 2022)

Molecular and Plant Ecology Program (Supervisor Dr. Melissa McCormick)

- Used DNA extraction, PCR, and Sanger sequencing to demonstrate that orchid mycorrhizae exist as root endophytes in nearby trees
- Created a model in R to relate historical precipitation and temperature data to soil moisture and a crash in a population of *Corallorhiza* orchids

Archbold Biological Station, Venus, FL (2021-2022)

Plant Ecology Program, Vaughn-Jordan Intern (Supervisor Dr. Aaron David)

- Conducted independent research on the vertical stratification of seed banks in the soil
- Assisted laboratory projects focused on the demography and conservation of rare Florida endemic plant species

Rice University, Houston, TX (2019-2021)

Undergraduate Research and Senior Thesis (Supervisor Dr. Tom Miller)

- Assisted in laboratory projects aimed at determining the effects of precipitation and temperature on *Elymus* grass and *Epichloë* fungal endophyte mutualisms
- Completed an independent senior thesis on the impacts of endophyte infection on resilience against drought, competition, and herbivory in cool-season grasses using meta-analysis

Summer 2020 REU (Supervisor Dr. Tom Miller)

- Developed a protocol to analyze the fitness of digitized grass herbarium specimens in ImageJ and linked these data to climate data from the location and decade of the collection

Memorial Park Conservancy and Rice University, Houston, TX (Fall 2020)

- Analyzed usership data, conducted informational interviews, and compiled external literature to create recommendations for Memorial Park Conservancy to protect their trails from environmental degradation exacerbated by increased usership during the pandemic

The Morton Arboretum, Lisle, IL (Summer 2019)

REU, Soils Lab (Supervisors Drs. Meghan Midgley and Ray Dybzinski)

- Conducted an REU project to identify the roles of stand-level fine root mass and soil nitrogen availability on community nitrogen uptake rate in trees
- Continue to assist in analyzing data for this study, as well as for a methods study seeking to identify the stand-in potential of database trait values for the data we collected *in situ*.

TEACHING

Rice University, Houston, TX (2018-2021)

TA, BioSciences Department (Class taught by Dr. Joe Novak)

- Six semesters as a TA for BIOS 204, The Design and Practice of Community Agriculture
- Led three weekly garden skill labs, tied garden activities to the social and ecological benefits of community gardens, kept track of student hours, and maintained the class Canvas page

OTHER EMPLOYMENT

Rice University, Houston, TX (2019-2021)

Student Garden Manager, Betty and Jacob Friedman Holistic Garden (Supervisor Dr. Joe Novak)

- Four semesters as a student garden manager and president of Rice Urban Agriculture.
- Planted, weeded, watered, harvested, and otherwise maintained Rice University's on-campus farm; organized and led Houstonians and student club members in garden activities; hired, trained, and organized student workers; coordinated with campus dining halls to sell produce and collect scraps for compost; partnered with the Rice Farmers Market to hold plant sales; and led informational tours for garden visitors.

PRESENTATIONS

Segal E. 2022. “From Roots to Populations: A Look into SERC’s Orchids.” Smithsonian Environmental Research Center Intern Research Symposium. *PowerPoint presentation*.

Segal E. 2022. “Characterizing the vertical structure of seed banks of endemic herbs in scrub and roadside habitats.” Archbold Biological Station Seminar Series. *PowerPoint presentation*.

Segal E. 2021. “Epichloë Endophytes Confer Resilience to Drought and Herbivory but Not Competition in Their Cool Season Grass Hosts: A Meta-analysis.” Rice Undergraduate Research Symposium, Houston, TX. Poster presentation.

* *Won the RURS Outstanding Poster Award for Ecology and Evolutionary Biology.*

Segal E. 2020. “Analyzing *Elymus virginicus* Across Time and Climate Using Digitized Herbarium Records.” Rice University BioSciences Summer Research Institute Symposium. Houston, TX. *PowerPoint presentation*.

Segal, E., M. Midgley, R. Dybzinski, A. Nordgren, and R. Mascarenhas. 2020. The Impacts of Fine Root Mass and Soil Nitrogen Availability on Nitrogen Uptake Rate in Trees. National Conference on Undergraduate Research, Montana State University, Bozeman, Montana, USA. *Poster presentation*. Canceled due to COVID-19.

Segal E. 2019. “The Impacts of Fine Root Mass and Soil Nitrogen Availability on Nitrogen Uptake Rate in Trees”. The Morton Arboretum Summer Research Symposium. *PowerPoint presentation*.

ACTIVITIES AND LEADERSHIP

Rice Women’s Club Soccer, President, 2020-2021

Rice Urban Agriculture, President, 2019-2021

Rice Eco Reps Program, Co-representative for Wiess Residential College, 2018-2021

AWARDS

Seaton Graduate Fellowship, \$5,000, University of Tennessee at Knoxville, 2022

Graduate Research Fellowship Program Awardee, \$138,000, NSF, 2022

Distinction in Research and Creative Works, Department of BioSciences, Rice University, 2021

Rice Undergraduate Research Symposium Outstanding Poster Presentation in Ecology and Evolutionary Biology, Rice University, 2021

National Merit Scholarship Recipient, 2017