

Elena M. Meyer
Plant Evolutionary Geneticist

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PROFESSIONAL SUMMARY

My research is motivated by my lifelong enthusiasm for botany. I am a plant evolutionary geneticist and current PhD candidate at Virginia Commonwealth University. I focus on how reproductive biology can offer insights into patterns of speciation and extinction in angiosperms. In my work, I apply phylogenetic comparative methods, ecological niche modeling, and curation of large datasets to evolutionary questions.

EDUCATION

- 2026** (Expected): PhD in Integrative Life Sciences;
Virginia Commonwealth University, Richmond, VA
Area of Concentration: Evolutionary Genetics
Thesis Advisor: Andrew J. Eckert, PhD
Dissertation: "*Sex in plants: birth, death, and trying to survive in changing climates.*"
- 2019** Bachelors in Biology with Honors, Minor in Chinese Language and Culture
New College of Florida, Sarasota, FL
Thesis Advisor: Brad Oberle, PhD
Honors thesis: "*Dynamics of outcrossing, selfing, and inbreeding depression in conjunction with species rarity in Polygala lewtonii, an endangered Florida scrub endemic.*"

PUBLICATIONS and MANUSCRIPTS

- Meyer, E. M.**; Rosenberg, M.S; Boyd, B.; Eckert, A. J. Traits and hidden states: how avoidance of selfing is associated with rates of diversification across mating and sexual systems. In prep for submission to *Evolution*.
- Meyer, E. M.**; Galloway, L. F.; Eckert, A. J. (2025). The evolutionary dynamics of plant mating systems: how bias for studying 'interesting' plant reproductive systems could backfire, *Annals of Botany* (accepted manuscript), <https://doi.org/10.1093/aob/mcaf031>
- Meyer, E. M.**; Swift, J. F.; Bassüner, B.; Smith, S. A.; Menges, E. S.; Oberle, B.; & Edwards, C. E. (2021). Understanding how an amphicarpic species with a mixed mating system responds to fire: A population genetic approach. *AoB PLANTS*, 13(6). <https://doi.org/10.1093/aobpla/plab067>

PRESENTATIONS

- 2025** Evolution (talk): Meyer, E.M; Eckert, A.J Association between self-fertilization and habitat marginality.
- 2025** Botany (talk): Meyer, E.M; Eckert, A.J Traits, hidden states, and how reproductive biology impacts diversification.
- 2024** Botany (talk): Meyer, E.M; Eckert, A.J Using phylogenetic comparative methods to understand the impact of mating and sexual systems on diversification rates: a multi-family approach.
- 2024** Botany (poster): Meyer, E.M; Eckert, A.J. Selfing in flowering plants: Bias against outcrossing species, dioecious sexual systems, and disproportionate focus on a limited number of families.
- 2023** Evolution (talk): Meyer, E.M; Rosenberg, M.S; Eckert, A.J, Understanding the evolutionary dynamics of plant mating systems: how bias for studying ‘interesting’ plant reproductive systems could backfire.
- 2022** Botany (talk): Meyer, E.M; Eckert, A.J. How do sampling methods impact our understanding of mating system distribution in angiosperms?
- 2019** Botany (talk): Meyer, E.M; Edwards, C.E; Oberle, B. Patterns of genetic structure and reproductive allocation after fire in *Polygala lewtonii*, a federally endangered Florida endemic plant.
- 2018** Botany (poster): Meyer, E.M; Swift, J.F; Smith, S.A; Bassüner, B.; Menges, E.; Edwards, C.E. The trajectory of the mating system and factors affecting selfing and outcrossing rates in an amphicarpic species with a mixed mating system, *Polygala lewtonii*.
- 2017** Calusa Prize Symposium at Marie Selby Botanical Gardens (public event, talk): Meyer, EM. Field guide to the fern genus *Elaphoglossum* of Belize.

AWARDS, HONORS and FUNDING

- 2024** **Infographics Conference Travel Funding, Virginian Commonwealth University**
Travel support for Botany 2024, provided by a VCU Quest grant awarded to C.M Hulshof.
- 2022-2025** **Integrative Life Sciences Travel Funding, Virginia Commonwealth University**
Received travel support for conferences and related travel: Botany 2022 and 2024; Evolution 2023 and 2025.
- 2018** **Student Travel and Research Grant, New College of Florida**
Highly competitive research and travel grant for New College students funded by the New College Foundation, funding my attendance to Botany 2018.
- 2018** **Council of Academic Affairs (CAA) Allocation, New College of Florida**

Funding received from the New College CAA to fund fieldwork at Archbold Biological Station and surrounding properties to collect data for my senior thesis.

2017 Calusa Prize, Marie Selby Botanical Gardens

Privately funded research prize for students rewarding research and collaboration between Marie Selby Botanical Gardens and New College of Florida. Worked with Selby Gardens professional staff on plant science, conservation and public outreach.

2015 Isermann Medal, New College of Florida

Award for academically talented first-year students from outside the state of Florida. Awardees participate in collaborative research during their first year in college.

TEACHING

2025 Guest Lecturer, Virginia Commonwealth University

BIOL 475: Capstone Seminar: Genotypes, Phenotypes, & Environments.

Lecture: *The impact of genetics and social factors on mathematical abilities.*

2019 Guest Lecturer, New College of Florida

BIOL 101: Introduction to Biology.

Lecture: *How ecological factors drive genetic change: a case study with Polygala lewtonii.*

PROFESSIONAL EXPERIENCE

2021- Present: Graduate Teaching Assistant

Virginia Commonwealth University, Richmond, VA

- Teaching assistant instructor for BIOZ 151: Introduction to Biological Sciences (2021-2025) and BIOZ 310: Genetics Laboratory (2025-present). Typically, 40-60 undergraduates per semester across two to three lab sections.
- Independently led laboratory sections for the above courses and introduced students of diverse backgrounds to both fundamental biology concepts and upper-level genetics.
- Developed course materials for both introductory and advanced undergraduate levels, with a focus on teaching statistical concepts and scientific writing skills.

2019-Present: Graduate Research Assistant

Virginia Commonwealth University, Richmond, VA

- Member in Andrew Eckert's evolutionary genetics and genomics laboratory at VCU.
- Researched in plant reproductive biology and how mating and sexual systems in plants impact their evolution.
- Assisted with mentoring undergraduate and master's level students, including individually mentoring an undergraduate in data management and introductory programming in R and R Studio.

2023-2024: Master's Program Revision

Virginia Commonwealth University, Richmond, VA

- Worked as part of a team with the Director of Graduate Studies to implement revision to the VCU Biology M.S. program.

- Compiled a new student handbook for the M.S. program: created graphics and logos, assisted with social media management, and worked collaboratively with staff, faculty, and students to facilitate ongoing changes to the program.

June-August 2022: COVES Science Policy Fellow

Virginia Department of Environmental Quality, Richmond, VA

- Policy fellows in the Commonwealth of Virginia Engineering and Science Fellowship (COVES), placed with the Virginia Department of Environmental Quality (DEQ).
- At DEQ, I worked on the House Bill 206 stakeholder Regulatory Advisory Panel for HB 206 (“Small renewable energy projects; impact on natural resources, report”).
- Utilized background in ecology and plant science to prepare scientific briefings for policy stakeholders and coordinated between an external facilitation team (Institute for Engagement and Negotiation, University of Virginia) and DEQ to manage research needs throughout the project.

August 2018-May 2018: Teaching Assistant – Biology I

New College of Florida, Sarasota FL

- Assisted with teaching Biology I.
- Duties include grading papers, coordinating and leading TA sessions and review sessions for exams with students, and creating in-class activities.

June-August 2018: Field Technician, Flory Lab

University of Florida, Gainesville FL

- Worked in a field team based out of University of Florida on a multi-university research project funded by the Department of Defense’s Strategic Environmental Research and Development Program (SERDP).
- Plant identification lead. Identified species in the field to study of the dynamics of tick-borne disease risk, invasion by exotic species, fire management, and climate change.

November 2017-May 2018: Lab Assistant, Oberle Lab

New College of Florida, Sarasota, FL.

- Lab assistant to Dr. Brad Oberle in his research laboratory.
- Duties include data entry, lab organization, horticultural tasks maintaining live plant specimens, and assistance with long-term research projects, especially focusing on mangrove ecosystems.

June-August 2017: NSF-REU Student, Edwards Lab

Center for Conservation and Sustainable Development, Missouri Botanical Garden, St. Louis, MO.

- Examined impacts of fire on the genetics of *Polygala lewtonii*, an endangered Florida endemic.
- Performed molecular genotyping for over 200 individuals, conducted data analysis, scientific writing.

January 2016: Independent Study Project, Flora of Occoquan Bay National Wildlife Refuge

Smithsonian National Museum of Natural History, Department of Botany, Washington D.C.

- New College of Florida (NCF) has a January program for independent study projects (ISPs). For this, I worked cataloging plant specimens collected as part of survey work at Occoquan Bay National Wildlife Refuge.
- The work resulted in the accession of specimens to the U.S National Herbarium representing over 200 species. These specimens were collected by myself and my mentor from my 2013 internship.

June-July 2013, July 2016: Environmental Surveyor

Independent Contractor, Woodbridge, VA.

- Worked under my mentor from the Smithsonian National Museum of Natural History to assist in field survey work for environmental impact assessments focusing on *Isotria medeoloides*, a threatened native orchid species in Virginia.
- Project spanned over several weeks each summer during the growing season for *I. medeoloides*.

June-August 2014: Earth Sangha Wild Plant Nursery

Intern, Wild Plant Nursery, Springfield VA.

- Assisted in the day-to-day functioning of the Earth Sangha nursery, which is a specialty nursery for local-ecotype plants for Northern Virginia.
- Participated in horticulture tasks working with native plants as part of a team.

May-August 2013: Smithsonian Summer Internship Program

Smithsonian National Museum of Natural History, Department of Botany, Washington D.C.

- Worked on a multi-year project cataloguing, organizing, and databasing the *Bambosa* (bamboo) specimen collection in the U.S National Herbarium, focused on specimens donated from China.
- Utilized my language skills to translate specimen labels and notes from Chinese.

SERVICE AND OUTREACH

2025-Present: Peer Reviewer. Provided peer review at Annals of Botany.

2022-2024: Inclusion, Diversity and Equity Committee (IDEC) at VCU. Served as graduate student liaison to the committee.

2020-2022: Integrative Life Science Student Association. Served as president of the Integrative Life Science Student association at VCU (2019-20), and as member-at-large (2021-22). As president, I organized a virtual research symposium with talks and research posters, with an attendance of ~70 individuals. I also allocated funds (>\$1000) and managed social media and publicity.

2020-2023: Skype A Scientist. Participated in science outreach to classrooms through the Skype a Scientist program (<https://www.skypeascientist.com/>), discussing my research to classrooms virtually.

2012-2015, Seasonally: Audubon of Northern Virginia. Worked as part of a weekly citizen science survey (<https://www.nvbirdalliance.org/natural-resource-surveys>) with a botanical focus. These weekly surveys have been taking place in the Occoquan Bay area for over 30 years, and generate data on insect, plant, bird, and mammal species.

SKILLS AND PROFICIENCIES

Programs: R and RStudio, Adobe Illustrator, ArcGIS, Tableau, Slack, Microsoft Office Suite.
Languages: English (native speaker), Chinese (conversational).

PROFESSIONAL ASSOCIATIONS

Botanical Society of America; Society for the Study of Evolution; Society of Systematic Biologists

REFERENCES AND SUPERVISORS