Rebecca A. Povilus

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Education

2011-2017	Ph.D. in Organismic and Evolutionary Biology, *Harvard University* Thesis title: Evolution of seed development in angiosperms: perspectives from *Nymphaea thermarum* (Advisor: William Friedman)
2009-2011	Ph.D. program in Ecology and Evolutionary Biology, *University of Colorado at Boulder* (Advisor: William Friedman)
2005-2009	B.S. with majors in Plant Biology & Earth Sciences, *University of Michigan*

Appointments

2017-Present	**Postdoctoral Researcher / Fellow**, *Whitehead Institute* Projects: Identifying deeply conserved patterns of epigenetic modification and imprinting during seed development (NSF Postdoctoral Research Fellowship in Biology, Plant Genome Research Program), and characterize computationally defined cell/nuclei types during seed development in *Arabidopsis thaliana. (*Mentor: Mary Gehring)
2013-2017	**Research / Administrative Assistant**, *Harvard University* microMORPH: Microevolutionary Molecular and Organismic Research in Plant History, an NSF Research Coordination Network (CO-PIs William Friedman and Pamela Diggle)
2008-2009	**Undergraduate Research Assistant**, *University of Michigan, Ann Arbor* Independent Research Project: Molecular evolution of meiosis initiation mechanisms in land plants (Supervisor: Yin-Long Qiu)
2008-2009	**Field Assistant**, *University of Michigan, Ann Arbor* CLIMBERS Project: a survey of vine and liana diversity across habitat, geographic area, and time (Supervisor: Robyn J. Burnham)
2007-2008	**Research and Field Assistant**, *University of Michigan, Ann Arbor* Molecular phylogeny of subgroups within the genera *Croton* and *Euphorbia*, and initiation of a digital *Euphorbia* seed photo gallery (Supervisors: Ya Yang and Paul Berry)

Teaching Experience

Co-Instructor (*MIT Biology*): Undergraduate Seminar: Conflicts in plant evolution and development (2021)

Teaching Assistant (*microMORPH, an NSF Research Coordination Network*): Plant Morphology (2016, 2014), Plant Anatomy (2015)

Teaching Assistant (*Harvard University*): Introduction to Botany (2013), Plant Development (2011)

Teaching Assistant (*University of Colorado, Boulder*): Plant Biodiversity and Evolution (2010), Plant Anatomy (2009)

Bibliography: Peer Reviewed Publications, Preprints, and Manuscripts in Review

Povilus RA & Friedman WE (2022). Transcriptomes across fertilization and seed development in the water lily *Nymphaea thermarum* (Nymphaeales): evidence for epigenetic patterning during reproduction. *In Press* at Plant Reproduction; bioRxiv, doi: 10.1101/2021.04.04.438399.

Povilus RA & Gehring M (2021). Maternal-filial transfer structures in endosperm: a nexus of nutritional dynamics and seed development. *Current Opinion in Plant Biology*: 65, 102121. *doi: 10.1016/j.pbi.2021.102121*

Picard CL, **Povilus RA**, Williams BP, and Gehring M (2021). Transcriptional and imprinting complexity in Arabidopsis seeds at single-nucleus resolution. *Nature Plants*: 7, 730-738. *doi: 10.1038/s41477-021-00922-0*

Povilus RA, DaCosta JM, Grassa C, Satyaki PRV, Moeglein M, Jaenisch J, Xi Z, Mathews S, Gehring M, Davis CC, and Friedman WE (2020). Water lily (*Nymphaea thermarum*) genome reveals variable genomic signatures of ancient vascular cambium losses. *PNAS: 17 (15) 8649-8656*. *doi: 10.1073/pnas.1922873117*

- This paper was highlighted in a Commentary article: Crane PR & Else Marie Friis EM (2020). Water lilies, loss of woodiness, and model systems. *PNAS*. *doi: 10.1073/pnas.2005075117*

Povilus RA., Diggle PK, and Friedman WE (2018). Evidence for parent-of-origin effects and interparental conflict in seeds of an ancient flowering plant lineage. *Proc. R. Soc. B.* 285: 20172491. *doi: 10.1098/rspb.2017.2491*

Povilus RA*, Losada JM*, and Friedman WE (2015). Floral biology and ovule and seed ontogeny of *Nymphaea thermarum*, a water lily at the brink of extinction with potential as a model system for basal angiosperms. *Annals of Botany* 115: 211-226. *doi: 10.1093/aob/mcu235*

Contributed Presentations and Posters *(as presenting author)*

Povilus RA & Friedman WE (2021). Gene expression across fertilization and seed development in the minute water lily, Nymphaea thermarum (Nymphaeales): insights on epigenetic regulation during reproduction. Conference of the Botanical Society of America; oral presentation.

Picard CL, **Povilus RA**, Williams BP, and Gehring M (2020). Single nucleus analysis of Arabidopsis endosperm reveals new, transcriptionally distinct cell types. Conference of the Botanical Society of America; oral presentation.

Povilus RA, Diggle PK, and Friedman WE (2020). Evolution of Parental Genome Dosage Sensitivity during Seed Development – a New Perspective from Water Lilies. Plant and Animal Genome Conference; oral presentation.

Povilus RA., Diggle PK, and Friedman WE (2018). Evidence for parent-of-origin effects and interparental conflict in seeds of an ancient flowering plant lineage. Conference of the Botanical Society of America; oral presentation.

Povilus RA & Friedman WE (2015). Reciprocal interploidy crosses in *Nymphaea thermarum* (Nymphaeales) – implications for the evolution of imprinting during seed development. Conference of the Botanical Society of America; oral presentation.

Povilus RA & Friedman WE (2014). Optimizing Whole Mount Confocal Microscopy for Ovules and Seeds. Plant Biology Initiative Annual Symposium; poster presentation.

Povilus RA, Losada JM, and Friedman WE (2014). Pre-fertilization Reproductive Development and Floral Biology in the Remarkable Water Lily, *Nymphaea thermarum*. Conference of the Botanical Society of America; oral presentation.

Povilus RA & Friedman WE (2012). Female Gametophyte Development and Auxin Regulation in *Aquilegia*. Conference of the Botanical Society of America; poster presentation.

Invited and Departmental Presentations

2021	DNA methylation and genetic imprinting in water lily endosperm: insights on the evolution of flowering plant seeds. Cold Spring Harbor Asia Conference: Integrative Epigenetics in Plants (*Virtual*)
2021	Genetic imprinting across seed diversity – perspectives from water lilies. Annual Retreat, Whitehead Institute (Cambridge, MA)
2021	Using biodiversity to illuminate biology: water lilies, seeds, and more. Donald Danforth Center for Plant Science *(St. Louis, MO; virtual)*
2021	Using biodiversity to illuminate biology: water lilies, seeds, and more. USDA-ARS and Cornell School of Integrative Plant Sciences *(Ithaca, NY; virtual)*
2020	Water lilies and genomic signatures of trait loss. Whitehead Forum, Whitehead Institute *(Cambridge, MA; virtual)*
2019	Diving into early flowering plant evolution with water lilies. Invited seminar lecture, *Stonehill College* (*Easton, MA*)
2017	Dissertation Defense: Reproduction and Seed Development in *Nymphaea thermarum*: a new perspective on the evolution of angiosperm seeds, *Arnold Arboretum of Harvard University (Boston, MA)*
2015	Floral Biology and Seed Ontology of *Nymphaea thermarum*. Invited lecture for Sicard Lab meeting, University of California Berkeley *(Berkeley, CA)*
2014	Interparental Conflict in Flowering Plants. PINE (Plants in New England) *(Boston, MA)*

Awards, Grants, and Fellowships

		Total Awarded Funding:	**$230,272**
2020	Margaret Menzel Award, awarded to best presentation in the Genetics section, *Botanical Society of America*		
2018	Post-doctoral Research Fellowship in Biology, Plant Genome Research Program, *NSF, ISO-1812116*		$207,000
2015	Doctoral Dissertation Improvement Grant, *NSF, DEB-1500963.* Evolution of Angiosperm Seed Development: perspectives from *Nymphaea thermarum* (Nymphaeales)		$21,772
2015	Triarch Botanical Images Student Travel Award, Second Place. *Botanical Society of America and Triarch Incorporated.*		
2014	Katherine Esau Award, awarded by the Developmental and Structural Section for best student presentation, *Botanical Society of America*		
2012	Best Student Poster, Developmental and Structural Section, *Botanical Society of America*		
2010	NIH Creative Training in Molecular Biology Fellowship, MCDB Department, *University of Colorado at Boulder*		
2010	EBIO Department Research Grant, *University of Colorado at Boulder*		$500
2008	Slater Scholarship for systematic and field botany, *University of Michigan*		$1,000
2007	NSF Research Experience for Undergraduates, *University of Michigan (Mentor: Paul Berry)*		

Mentoring

2018	Principal mentor for MIT Summer Research Program participant Gabriella Lopez-Perez. Project title: "Creating an imprinted gene mutant in *Arabidopsis thaliana*"
2016-2017	Principal Graduate Student Advisor, undergraduate research project of Guan-Yue Chen. Project title: "Ovule and Seed Development In *Aquilegia caerulea* 'origami'"

Workshop, Symposium, and Professional Development Participation

2020	Workshop organizer: So you want a job in 2020: approaching the academic/research job market. *Conference of the Botanical Society of America (Virtual Meeting)*
2017	Workshop organizer: Cutting the cord: a workshop for computer-free presentation skills. *Conference of the Botanical Society of America (Ft. Worth, TX)*
2016	Workshop organizer: Communicating Broader Impacts of Your Work: *Conference of the Botanical Society of America (Savannah, GA)*
2015	Workshop organizer: Phenotypic Plasticity: Evolution at the Intersection of Ecology, Genetics, and Development. *microMORPH (Arnold Arboretum of Harvard University, Boston MA)*
2015	Symposium organizer: A Broader view for Plant EvoDevo: novel approaches for diverse model systems.*Conference of the Botanical Society of America (Edmonton, Canada)*
2010	Workshop participant: Evolution in Schools, Teaching Evolution: a Workshop for Educators *(University of Colorado at Boulder, Boulder CO)*

Service and Outreach

2018-Present	Whitehead Partner Program: regularly meet with middle-school science teachers to discuss current topics in science, also host lab visits for student groups (including design a hands-on lab activity about pollen function and development during plant reproduction)
2015-2017	Student Representative to the Board of the Botanical Society of America: represent student concerns at board meetings, organize conference events, write articles for the Plant Science Bulletin
2016	Presented a talk and hands-on activity on seed biology, aimed at children and their families, as part of the "I Heart Science Festival" at the Harvard Natural History Museum
2015	Science Olympiad Event Runner for "Green Generation: Principles of Ecology": develop and administer the exam for the state-wide competition, with a focus on data interpretation and critical thinking
2014	Lecture for Arnold Arboretum volunteers: "Botany in an Hour – Using Development to Understand Diversity"
2010-2012	Planting Science mentor: supervise investigation-based plant science projects for middle school through high school students
2009	Greenhouse volunteer, University of Colorado at Boulder

Reviewer Service

Aquatic Botany, American Journal of Botany, BMC Genomics, BMC Plant Biology, JEZ Part B: Molecular and Developmental Evolution, New Phytologist**,** The Plant Cell, Plant Reproduction

Professional Society Membership

2009-Present	Botanical Society of America
2015-2017	Pan-American Society for Evolutionary-Developmental Biology