

# HEATHER PHILLIPS

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## Research Interests

Post doctoral scholar interested in plant morphology, development and evolution. Researching root anatomy and diversity in the Dinneny lab at Stanford.

## Education

**Cornell University** **Aug 2018 – May 2024**  
PhD Student in Specht Lab at the School of Integrated Plant Science

**University of Bath (First Class/Distinction)** **Sep 2016 – Sep 2017**  
MSc, Molecular Plant Sciences  
Dissertation Title: Phenotypic Analysis of Artificially Induced Autopolyploidy in *Arabidopsis thaliana*

**University of California, Davis (GPA 3.6)** **Sep 2013 – Jun 2015**  
BS, Biological Sciences with emphasis in Molecular and Cellular Biology

**Santa Rosa Junior College (GPA 3.4)** **Sep 2007 – Jun 2013**  
UC Transferable Coursework, pertinent to transferring to UC Davis  
High School Concurrent Enrollment Student from 2007-2011

## Research Experience

**Post Doctoral Scholar, Dinneny Lab @ Stanford** **June 2024**  
Investigating root anatomy and diversity across plant species with sequenced genomes. Identifying novel model organisms for further research and performing comparative scRNA-Seq to determine \_\_\_.

**PhD Researcher, Specht Lab @ Cornell** **Jan 2019 – Dec 2023**  
Investigating floral bilateral development (zygomorphy) and fusion (sympetaly) within the Zingiberales – comparative floral development, phylogenetic and expression analysis of gene families relevant to floral development, set up tissue culture for *Costus spicatus* and *Musa acuminata*.

**Rotation Student, Roeder Lab @ Cornell** **Sep – Dec 2018**  
Investigated the transcriptional and protein dynamics of *ATML1* in determining organ size in *Arabidopsis* sepals; designed and cloned *ATML1* vectors tagged with PP7 loops (transcript) and mCherry (protein) via Gibson Assembly.

**Lab Technician, Redwood Toxicology Laboratory** **Jan – Jun 2018**  
Load samples onto HPLC, interpret and write up reports of results.

**Master's Student, Kover Lab @ University of Bath** **Sep 2016 – Sep 2017**  
Investigated the genotype dependent effects of polyploidy and colchicine treatment on *Arabidopsis thaliana* - designed and carried out extensive phenotyping experiment of approximately 500 plant samples; analyzed phenotypic data in R and presented as a master's dissertation.

**Lab Assistant, Eurofins Supplement Analysis Center** **Nov 2015 – Sep 2016**  
Provide support to laboratory chemists; prepare samples and mobile phases for use in HPLC and wet chemistry analysis; receive and process shipments of laboratory reagents and supplies; upkeep laboratory hoods and dispose of hazardous waste.

**Research Assistant, UC Davis Foundation Plant Services****May – Sep 2015**

Developed a protocol for olive variety identification using standard DNA fingerprinting/microsatellite methods; generated and compared genetic profiles of various cultivars with published results.

**Fecal Analysis Intern, UCDSVM Center for Vector Borne Disease****Jan 2014 – Jun 2015**

Managed predator feces study for Amargosa Vole Conservation Project — responsible for sorting, dissecting and cataloguing field samples of common vole predator feces for bone fragment identification and DNA extraction.

**Plant Collecting Intern, UC Davis Center for Plant Diversity****Mar – Jun 2014**

Surveyed controlled burn sites, identified and collected native Californian plants for census data and species lists.

**Publications**

**Heather R. Phillips**, and Chelsea D. Specht. "NAM/CUC3 Gene Evolution and Expression Patterns Explain the Evolution of Novel Floral Structures in the Zingiberales." *Integrative and Comparative Biology* (Forthcoming).

Jacob S. Suissa, Gisel Y. De La Cerda, Leland C. Graber, Chloe Jelley, David Wickell, **Heather R. Phillips**, Ayress D. Grinage, Corrie S. Moreau, Chelsea Specht, Jeff Doyle, and Jacob B. Landis "Comparative phylogenomic analyses of SNP versus full locus datasets: insights and recommendations for researchers." *Applications in Plant Sciences* (In review).

Eugenio Valderrama, Jacob B Landis, Dave Skinner, Paul JM Maas, Hiltje Maas-van de Kramer, Thiago André, Nikolaus Grunder, Chodon Sass, Maria Pinilla-Vargas, Clarice J. Guan, **Heather R. Phillips**, Ana Maria Rocha de Almeida, Chelsea D. Specht. "The genetic mechanisms underlying the convergent evolution of pollination syndromes in the Neotropical radiation of *Costus* L." *Frontiers in Plant Science* (2022).

**Heather R. Phillips**, Jacob B. Landis, and Chelsea D. Specht. "Floral Fusion: The Evolution and Molecular Basis of a Developmental Innovation." *Journal of Experimental Botany* (2020).

**Presentations**

**Phillips, Heather R.**, To Fuse or not to Fuse: Characterizing the Expression of Candidate Fusion Genes in *Musa*. Development and Structure Session Botany Conference; July 25, 2023

**Phillips, Heather R.**, To Fuse or not to Fuse: Characterizing the Expression of Candidate Fusion Genes in *Costus*. Development and Structure Session Botany Conference; July 25, 2022

**Phillips, Heather R.**, To Fuse or not to Fuse: Investigating the Evolution and Development of Floral Fusion in the Zingiberales. Development and Structure Session Virtual Botany Conference; July 21, 2021

**Phillips, Heather R.**, To Fuse or not to Fuse: Investigating the Evolution and Development of Floral Fusion in the Zingiberales. Cornell Plant Biology Student Seminar Series; November 11, Ithaca, NY 2020

**Phillips, Heather R.**, To Fuse or not to Fuse: Investigating the Evolution and Development of Floral Fusion in the Zingiberales. Development and Structure Session Virtual Botany Conference; July 21, 2020

**Phillips, Heather R.**, To Fuse or not to Fuse: Investigating the Evolution and Development of Floral Fusion in the Zingiberales. Evo-Devo Session Virtual Botany Conference; July 28, 2020

**Phillips, Heather**, Foli, Elvis 2020. Using Zoom to record a scientific presentation. Botany 2020 Online Workshop. July 6, 2020. <https://youtu.be/51V5FhZUSEQ>

**Phillips, Heather R.**, To Fuse or not to Fuse: Investigating the Evolution and Development of Floral Fusion in the Zingiberales. Cornell Plant Biology Student Seminar Series; April 17, Ithaca, NY 2020

Specht, Chelsea D., Guan, Clarice, Hernandez, Adriana, Martinez-Gomez Jesus, **Phillips Heather R.**, Salzman, Shayla, Tribble, Carrie. The Critical Nature of Diversity: Thinking Holistically about Plant Form and Function. 9<sup>th</sup> Annual Cornell Plant Breeding Symposium; April 17, Ithaca, NY 2020

**Phillips, Heather**, Bruenn, Riva, Landis, Jacob, & Specht, Chelsea Elucidating the roles of MYB-related transcription factors in Zingiberales Zygomorphy. Botany 2019; July 27-31, Tucson, AZ 2019.

## Honors and Awards

<b>Katherine Esau Award</b> - Developmental & Structural Section (Botany Conference)	July 2022
<b>Outstanding Graduate TA</b> (Cornell Office of Undergraduate Biology)	2021-2022
Schmittau Novak Undergraduate Training Grant	May 2021
Rogers McVaugh Research Grant Award (American Society of Plant Taxonomists)	April 2021
Botanical Society of America Graduate Student Research Award	May 2020

## Teaching and Mentorship

**Research Technician Mentor** **Spring 2022 – Present**

Mentoring research technician in the Specht lab on research related to developing tissue culture in *Musa* and *Costus*, generating knockout and overexpression lines of candidate fusion genes.

**Participant, Planning Your Teaching-as-Research Project** **Summer 2022**

Completed a 6 week course in designing and implementing a Teaching-as-Research Project.

**CU Graduate Student Instructor: BIOMG 1350** **Fall 2019 – Spring 2023**

Lead three active learning discussion sections per week with groups of approximately 20 students, lecturing and discussing various experiments pertinent to course material. Managed review sessions prior to exams, lecturing on unclear material and answering student's questions about course material. Promoted to head TA for Spring 2020: redesigned course content to for both in person and virtual teaching,

**Undergraduate Research Mentor** **Fall 2019 – Present**

Mentoring and supervising undergraduate students pursuing individual research projects pertaining to *Musa* tissue culture, comparative morphology of Zingiberales floral development & an undergraduate honors thesis characterizing *Costus* fusion gene expression.

**Lab Tour Coordinator, Expanding Your Horizons Conference** **April 2023**

Designed a three part lab tour of the L.H. Bailery Herbarium, Plant Morphology Lab and MinION sequencing facilities at the Specht Lab for 9<sup>th</sup> grade girls.

**Instructor: Judy's Day 'Plants Have Families Too!' Online Course** **August 2020**

Assisted in designing and running twice weekly virtual classes for children ages 8-12. Generated course materials and taught students how to identify 12 plant families commonly found in Ithaca.

**Workshop Coordinator, Virtual Expanding Your Horizons Conference** **April 2020**

Designed a workshop titled 'Museum Mysteries' for 9<sup>th</sup> grade girls. After transitioning to online, redesigned the workshop to an online, 'Virtual Plant' website.

**Participant, Building Mentoring Skills for an Academic Career** **Spring 2020**

Completed an 8 week course in skills for mentoring students in a research setting.

**CU Herbarium Internship Instructor: Introduction to DNA Extraction** **Summer 2019**

Designed and ran three day course on DNA extraction methods and quality analysis of extracted samples from both fresh and herbarium plant tissue.

**Volunteer, Big Red Barn Kid's Science Day**

**May 2019, 2023**

Designed and presented a teaching module on plant-pollinator relationships for children ages 4 – 12.

**EYH Buddy, Expanding Your Horizons Conference**

**April 2019, 2022**

Engage with and supervise girls attending the EYH conference at Cornell; check in conference attendants and direct groups to workshops around the Cornell campus.