



**Jacob S. Suissa, PhD**  
**Structure • Function • Evolution**

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[Website](#)

EDUCATION

**Ph.D.** in Organismic and Evolutionary Biology 2017–2022  
Harvard University, Graduate School of Arts and Science Cambridge, MA

**B.S.** in Plant Biology, *magna cum laude* 2012–2015  
The University of Vermont, College of Agriculture and Life Sciences Burlington, VT.

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RESEARCH STATEMENT

I am a plant evolutionary biologist focused on how plants construct their bodies, how they function, and how they have evolved across deep time. Broadly, I explore how diverse phenotypic traits evolved and function in a whole-plant context. I answer these questions using ferns, one of the oldest and most diverse groups of land plants. My research philosophy is that deep insights on the evolution of key innovations or diverse traits can be made by integrating comprehensive phylogenetic analyses across thousands of species, with targeted anatomical, physiological, genomic, and developmental investigation of key organisms.

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ACADEMIC APPOINTMENTS

- NSF Postdoctoral Fellow**, Cornell University and the Boyce Thompson Institute Aug 2022–May 2024  
Advisor: Dr. Fay-Wei Li and Dr. Corrie Moreau  
Thesis: *The evolution of nectaries in non-flowering plants*
- Visiting Professor**, Pratt Institute, Graduate Architecture and Urban Design Program Aug 2022–Dec 2022  
Course: Field Ecology I, Plants and People
- Doctoral Fellow of the Arnold Arboretum**, Harvard University Aug 2017–May 2022  
Advisor: Dr. William E. Friedman  
Thesis: *The structure, function, and evolution of the fern vascular system*
- Independent Research Fellow**, The Smithsonian Institution NMNH Jan 2017–Aug 2017  
Advisor: Dr. Elizabeth Zimmer  
Project: *Revealing the evolutionary history of the *Isoëtes occidentalis* complex*
- Research Technician**, The University of Vermont Jan 2016–May 2016  
Advisor: Dr. David Barrington  
Project: *Molecular systematics of two fern families*
- Independent Research Fellow**, University of Hawaii, Manoa Aug 2015–Dec 2015  
Advisor: Dr. Kasey Barton  
Project: *Variation in prickly poppy resistance to non-native generalist caterpillars*
- Independent Research Fellow**, The University of Vermont May 2015–Aug 2015  
Advisor: Dr. David Barrington  
Project: *Morphological survey of aquatic fungi in Northeastern Vermont*
- Independent Research Fellow**, The University of Vermont Oct 2014–Apr 2015  
Advisor: Dr. Mark Starrett  
Project: *Effects of Fluoride on *Dracaena* cultivars*

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## PUBLICATIONS

12. **Suissa, J. S.**, Agbleke, A. A., and Friedman, W.E. (2023) A bump in the node: the hydraulic implications of rhizomatous growth. [\*American Journal of Botany\*](#).
11. **Suissa, J. S.**, Preisler, Y., Watkins, J.E., and McCulloch, L.A. (2022). Vulnerability Segmentation in Ferns and Its Implications on Their Survival During Drought. [\*American Fern Journal\*](#). 112(4), 336–353.
10. **Suissa, J.S.**, and Friedman, W.E. Rapid diversification of vascular architecture characterized the Carboniferous fern radiation. (2022). [\*Proceedings of the Royal Society B\*](#). 289(1973), 20212209
9. **Suissa, J.S.** Fern fronds that move like pine cones: advanced humidity-driven motion in fertile leaflets of a widespread fern species. (2022). [\*Annals of Botany\*](#). 129(5), 519-528
8. **Suissa, J. S.**, Sylvia P. Kinoshian, Peter W. Schafran, Jay Bolin, W. Carl Taylor, Elizabeth A. Zimmer. (2021). Homoploid hybrids, allopolyploids, and high ploidy levels characterize the evolutionary history of a western North American quillwort (*Isoetes*) complex. [\*Molecular Phylogenetics and Evolution\*](#).
7. **Suissa, J.S.**, and Friedman, W.E. (2021). From cells to stems: the effects of primary vascular construction on drought-induced embolism resistance in fern rhizomes. [\*New Phytologist\*](#). 232(6), 2238-2253.
6. **Suissa, J. S.**, Sundue, M. A., Testo, W. L. (2021). Mountains, Climate and Niche Heterogeneity Explain Global Patterns of Fern Diversity. [\*Journal of Biogeography\*](#). 48(6), 1296–1308.
5. **Suissa, J. S.**, Sundue, M. A. (2021). Diversity patterns of neotropical ferns: Revisiting Tryon's centers of richness and endemism. [\*American Fern Journal\*](#). 110(4), 211–232.
4. **Suissa, J.S.** (2020). Polycyclic solenostele, a new synapomorphy for *Pteris* sect. *Litobrochia*. [\*American Fern Journal\*](#). 110(3), 127–138.
3. **Suissa, J. S.**, and Green, W. A. (2020). CO<sub>2</sub> starvation experiments provide support for the carbon-limited hypothesis on the evolution of CAM-like photosynthesis in *Isoetes*. [\*Annals of Botany\*](#). 127(1), 135–141.
2. Kinoshian, S. P., and **Suissa, J.S.** (2020). The mothers of Pteridology. [\*American Fern Journal\*](#). 110(1), 3–19.
1. **Suissa, J. S.**, and Barton, K.E. (2018). Intraspecific and interspecific variation in prickly poppy resistance to non-native generalist caterpillars. [\*Botanical Sciences\*](#). 96(2), 168–179.

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## FELLOWSHIPS, AWARDS, AND GRANTS

<b>NSF Postdoctoral Research Fellowship</b> <i>NSF</i> (\$138,000)	2022	<i>Huyck Biological Research Station</i> (\$1000)
<b>EMBO Postdoctoral Research Fellowship</b> <i>EMBO</i> ( <i>Honorable mention</i> )	2021	<b>Graduate Research Grant</b> <i>Harvard University Herbaria</i> (\$2500)
<b>Kaplan Award Comparative Morphology</b> <i>BSA</i> ( <i>Honorable mention</i> )	2021	<b>Undergraduate Research Fellowship</b> <i>The University of Vermont</i> (\$5000)
<b>Outreach Initiative Award</b> <i>European Society for Evolutionary Biology</i> (\$2100)	2021	<b>W.H. Darrow Horticulture Prize</b> <i>The University of Vermont</i>
<b>Graduate Student Research Award</b> <i>New England Botanical Club</i> (\$2,556)	2020	<b>Seymour Horticultural Prize</b> <i>The University of Vermont</i>
<b>Student Sustainability Grant</b> <i>Harvard University</i> (\$5000)	2019	<b>Lewis Ralph Jones Award</b> <i>The University of Vermont</i>
<b>Graduate Student Research Award</b> <i>Society of Systematic Biologists</i> (\$2000)	2018	<b>Collegiate Scholars Award</b> <i>American Society for Horticultural Science</i>
<b>Graduate Student Research Grant</b> <i>American Society of Plant Taxonomists</i> (\$1000)	2018	<b>Outstanding Horticultural Student Award</b> <i>American Society for Horticultural Science</i>
<b>Huyck Research Grant</b>	2018	<b>Undergraduate Academic Scholarship</b> <i>Burlington Garden Club</i> (\$1000)

<b>Rachel Butterworth Dietz Scholarship</b> <i>The Boston Flower Exchange</i> (\$5000)	2015	<i>Perennial Plant Association</i> (\$1000)	
<b>Aplin, Bennett, Holzer Scholarships</b> <i>The University of Vermont</i> (\$2000)	2014	<b>Undergraduate Research Grant</b> <i>The University of Vermont</i> (\$1000)	2013
<b>National Scholarship Award</b>	2014	<b>Undergraduate Scholarship</b> <i>New England Farm and Garden Assoc.</i> (\$6000)	2013

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### TEACHING EXPERIENCE

<b>Instructor of Record:</b> <i>Tropical Plant Systematics</i> The University of Vermont, Department of Plant Biology			January 2023
<b>Invited Lecturer:</b> <i>Plant Systematics</i> (Invited lecture: Introduction to seed-free plants) Cornell University, Division of Plant Biology			Fall 2022
<b>Teaching Fellow:</b> <i>Plant Diversity and Evolution</i> Harvard University, Department of Organismic and Evolutionary Biology			Spring 2022
<b>Invited Lecturer:</b> <i>Plant Biology</i> (Invited lecture: Introduction to ferns) Swarthmore College, Biology Department			Fall 2021
<b>Teaching Fellow:</b> <i>Biology of Fungi</i> Harvard University, Department of Organismic and Evolutionary Biology			Fall 2020
<b>Teaching Fellow:</b> <i>Biology of Plants</i> Harvard University, Department of Organismic and Evolutionary Biology			Spring 2020
<b>Teaching Fellow:</b> <i>Plant Diversity and Evolution</i> Harvard University, Department of Organismic and Evolutionary Biology			Spring 2019
<b>Teaching Fellow:</b> <i>Tropical Plant Systematics in Costa Rica</i> The University of Vermont			Winter 2019
<b>Instructor of Record:</b> Ferns of the Arnold Arboretum Short course Arnold Arboretum of Harvard University			Summer 2017–2021
<b>Teaching Fellow:</b> <i>Biology of Fungi</i> Harvard University, Department of Organismic and Evolutionary Biology.			Fall 2018
<b>Teaching Assistant:</b> <i>Home and Garden Horticulture</i> The University of Vermont, Plant and Soil Science Department			Fall 2014

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### TEACHING AWARDS

Biology of Fungi, Harvard University <b>Distinction in Teach award</b>			Spring 2022
Biology of Fungi, Harvard University <b>Derek C. Bok Award for Excellence in Graduate Student Teaching award</b> <b>Distinction in Teaching award</b>			Fall 2021
Biology of Plants Harvard University <b>Extraordinary Teaching in Extraordinary Times Teaching Fellow award</b>			Spring 2020
Home and Garden Horticulture, The University of Vermont <b>Outstanding Teaching-Assistant Award</b>			Fall 2014

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### STUDENT MENTEES

<b>Emileen Flores (Undergraduate Student Cornell University)</b> Undergraduate research mentee Project title: <i>The Evolution of nectaries in non-flowering plants</i>			2022
<b>Sydney Colón (Undergraduate Student Cornell University)</b>			2022

Undergraduate research mentee Project title: <i>The Evolution of nectaries in non-flowering plants</i>	
<b>Arianna Lord (PhD Student Harvard University)</b>	2022
Organismic and Evolutionary Biology Qualifying Exam Mentee	
<b>Katherine Angier (PhD Student Harvard University)</b>	2022
Organismic and Evolutionary Biology Qualifying Exam Mentee	
<b>Makaleh Smith (Undergraduate, The New School College)</b>	2021–2022
Harvard University E3 Undergraduate Research Intern. Project title: <i>The Evolution of fertile-sterile leaf dimorphism in two fern families</i>	
<b>Skylah Reis (Undergraduate Harvard University)</b>	2019–2020
Harvard Undergraduate Research Intern Project title: <i>The evolution of vessels in the invasive fern: <i>Lygodium microphyllum</i></i>	
<b>Paul Cervantes (Undergraduate Harvard University)</b>	2019–2020
Project title: <i>The evolution of vascular architecture in ferns</i>	

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### INVITED PRESENTATIONS

<b>Boyce Thompson Institute</b>	2022
Breaking Ground Discussion Series Title: <i>The Fascinating World of Ferns</i>	
<b>Smithsonian National Museum of Natural History</b>	2022
Botany Webinar Series Title: <i>Exploring the fern vascular system from past to present</i>	
<b>Finger Lakes Native Plant Society</b>	2022
Monthly Meeting Series Title: <i>Movement without muscles: the independent innovation of hygromorphy in a widespread fern</i>	
<b>Nantucket Biodiversity Initiative</b>	2022
Science Showcase Keynote Address Title: <i>Democratizing the Study of Plant Biology</i>	
<b>New England Botanical Club, Virtual</b>	2022
22nd Winter Warmth by Watching from Wherever the Work of Worthy Winners Title: <i>Untangling the Elaborate Evolution of the Fern Vascular System</i>	
<b>Botanical Society of America Annual Meeting, Tucson, Arizona</b>	2019
Reticulate evolution and biogeography in ferns and lycophytes - a colloquium honoring Dr. Barrington. Title: <i>Global patterns of fern diversification</i> <a href="#">Presentation</a>	
<b>Edmund Niles Huyck Preserve Rensselaerville, New York.</b>	2018
Research Lecture Series. Title: <i>CAM-like photosynthesis in an aquatic lycophyte</i>	
<b>Botanical Society of America Annual Meeting, Rochester, Minnesota</b>	2018
Biology of Isoetales, a colloquium in honor of Dr. W. Carl Taylor. Title: <i>Revealing the evolutionary history of Isoëtes from the Pacific Northwest</i>	
<b>Arnold Arboretum of Harvard University, Boston, Massachusetts</b>	2017
Research Lecture Series Title: <i>Reticulate Evolution and Cryptic Parentage in North American Isoëtes</i>	

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### PRESENTATIONS AND POSTERS

\*Denotes presenting authorship; †Denotes poster

<b>Botanical Society of America Annual Meeting, Anchorage, Alaska*</b>	2022
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*The hydraulic implications of rhizomatous growth and the homorhizic habit*

<b>Botanical Society of America Annual Meeting, Anchorage, Alaska*</b>	2022
<i>Rapid diversification of vascular architecture underlies the carboniferous fern radiation</i>	
<b>Botanical Society of America Annual Meeting, Virtual*</b>	2021
<i>From cells to stems: the effects of primary vascular construction on drought-induced embolism in fern rhizomes</i> <a href="#">Presentation</a>	
<b>Botanical Society of America Annual Meeting, Virtual*†</b>	2021
<i>Fern fronds that move like pine cones: humidity-driven motion in <i>Onoclea sensibilis</i> L.</i>	
<b>Botanical Society of America Annual Meeting, Virtual*</b>	2020
<i>Low atmospheric CO<sub>2</sub> induces nocturnal carbon accumulation in <i>Isoetes</i>*</i> <a href="#">Presentation</a>	
<b>Botanical Society of America Annual Meeting, Virtual</b>	2020
<i>Revealing the origins of a reticulate complex in the genus <i>Isoetes</i>.</i>	
<b>Botanical Society of America Annual Meeting, Tucson, Arizona</b>	2020
<i>Fronds in high places: large-scale integrative analyses explain global patterns of fern diversity</i>	
<b>The University of Vermont Student Research Symposium, Burlington, VT*†</b>	2015
<i>Diversity of Aquatic Fungi in Northeastern Vermont†</i>	
<b>The University of Vermont Student Research Symposium, Burlington, VT*</b>	2014
<i>Effects of Fluoride on <i>Dracaena</i> cultivars</i>	

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#### BROADER IMPACTS, OUTREACH, & PROFESSIONAL COMMITMENTS

<b>Co-founder of <a href="#">Let's Botinize</a>, Democratizing the study of plant biology</b>	2020–onward
Science Education non-profit focused on democratizing the study of plant biology through engaging photography and thoughtfully produced videos.	
<ul style="list-style-type: none"> <li>- Ithaca Science Center ‘<i>Science Connection</i>’ children’s workshop (October 2022)</li> <li>- Harvard Museum of Science and Culture Earth Day Event (April 2021)</li> <li>- Tree tour for the Boston Society of Landscape Architects (March 2022)</li> <li>- Podcast invited speakers ‘People are Plants Too’ (March 2022)</li> <li>- Discovery Channel Collaboration ‘Botany Bites’ (2022, recurring)</li> <li>- Podcast invited speakers: ‘Nature of Nantucket’ (June 2022)</li> </ul>	
<b>The Evergreen School’s Scientist of the Month</b>	2017–onwards
- Host scientific discussions with middle school students, with the goal of demystifying science.	
<b>Member of Cornell SIPS Diversity, Equity, and Inclusion Committee</b>	2022
- Engage in committee meetings and develop initiatives to create inclusivity and equity in academia.	
<b>Cornell University <i>Insectapalooza</i></b>	2022
- Public outreach event. Taught kids and adults about ant-plant interactions!	
<b>Science Communication Workshop Leader Botanical Society of America Conference</b>	2022
- Let a workshop on effective science communication at the Botany conference in Anchorage Alaska.	
<b>Mentor for Arnold Arboretum Young Scientists</b>	2022
- Mentored underserved Boston Public School students and helped teach them about nature and plant biology in the Arnold Arboretum.	
<b>Graduate student mentor for qualifying exam</b>	2021–2022
- Help first- and second-year graduate students plan, prepare, and study for their qualifying exam.	
<b>Creator and mentor of <i>Plant Short Courses</i></b>	2021
- Helped develop and lead short courses through the Arnold Arboretum landscape for local high school students from the Academia Margarita Muñiz.	
<b>Co-founder of Emerging Scientists: Mentorship Program</b>	2022

- Semester long research program aimed to provide support and mentorship for high school students from historically marginalized communities.
- Member of OEB Department Diversity, Inclusion, and Belonging [Committee](#)** 2020–2022
- Engage in committee meetings and develop initiatives to create inclusivity and equity in academia.
- American Fern Society student representative** 2020–2022
- Attend meetings and make decisions on the progress and future of the society.
- Founding member of Native plants at Harvard: Ecosystem, Education, and Community** 2019
- Created ecologically mindful landscape designs and planting schemes on campus.
- Harvard Museum of Natural History Fungus Fair coordinator** 2018 & 2020
- Coordinated undergraduate student seminars and Q&A for the public attendees of the Fungus Fair.
- Department Representative for the Graduate Student Council of Harvard University** 2018
- Attended meetings and made decisions on graduate student life on Harvard University.
- Harvard Museum of Natural History Darwin’s Experiments Short course instructor** 2017
- Chaired a table and discussed aspects of Darwin’s experience on plants with the general public.
- American Society of Plant Biologist (ASPB): Master’s in Plant Science Team mentor** 2017–2021
- Mentor groups of middle/high school per semester on projects relating to aspects of plant biology.