

## Curriculum Vitae

### Peter W. Schafran, PhD

Boyce Thompson Institute  
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### Education

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#### Old Dominion University (Norfolk, VA)

2014-2019

Ph.D. Ecological Sciences

Dissertation: Molecular systematics of *Isoetes* (Isoëtaceae) in eastern North America

#### Old Dominion University

2010-2014

M.S. Biology

Thesis: The ethnobotany of *Pistacia eurycarpa* Yalt. in Iraqi-Kurdistan: its uses, chemical composition, and anti-biotic activity of its resin

#### Old Dominion University

2006-2010

B.S. Biology with honors

### Research

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#### Boyce Thompson Institute (Ithaca, NY)

2020-2025

NSF Plant Genome Research Program postdoctoral fellow. Advisor: Dr. Fay-Wei Li

- Projects: Evolution of hornwort genomes over 300 million years

#### National Museum of Natural History (Washington, DC)

2015-2019

Research associate. Advisor: Dr. Elizabeth Zimmer

- Project: Systematics of polyploid *Isoetes* of eastern North America

#### Old Dominion University

2016

Asst. Manager of Blackwater Ecologic Preserve

- Organized research and management activities between students, VA Dept. of Conservation, VA Dept. of Forestry, and Zuni Hunt Club
- Oversaw tree inventory and establishment of permanent research plots

Research assistant for Dr. Lytton Musselman 2010-2014

- Provided literature review, field work, and copyediting for books on wild edible plants of the eastern US, and plants of the Bible and Quran

Research assistant for Dr. Gary Schafran and environmental engineering graduate students 2003-2008

- Conducted field and lab work for various projects related to drinking and wastewater management

**Wildlands Engineering, Inc. (Charlotte, NC)** 2012-2019

Plant identification consultant

- Identified plants and their abundances in permanent plots during a wetland restoration

**Environmental and Economic Consultants, Inc. (Virginia Beach, VA)** 2004-2009

Water quality consultant

- Measured nitrogen, phosphorus, and trace element composition of water samples

## Teaching

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**Boyce Thompson Institute** 2021,

REU research mentor 2023, 2024

- Guided students in designing and completing research projects related to hornwort evolutionary genomics

**Eremid Genomics (Kannapolis, NC)** 2024

Instructor, Illumina Next Generation Sequencing Workshop

- Taught a week-long workshop for eight undergraduate students on using next-generation sequence data for chloroplast phylogenomics

**Eagle Hill Institute (Steuben, ME)** 2022, 2024

Instructor, "An Introduction to Quillworts"

- Taught 5-day online courses about history, ecology, evolution, and identification of *Isoetes*

**Murray State University (Murray, KY) and Ball State University (Muncie, IN)** 2021,

- Trained a total of eight students in DNA extraction and next-generation sequencing library preparation in the lab of Dr. Suman Neupane 2022, 2024

**Old Dominion University**

Instructor, BIOL 340 (Field Botany) 2014, 2019

- Designed and taught field-based courses on identification of plants and plant communities in southeastern Virginia

Teaching assistant, BIOL 111 (Environmental Science) 2014

Teaching assistant, BIOL 308 (Botany) 2014

Teaching assistant, BIOL 115 (General Biology) 2013

**SUNY-ESF Cranberry Lake Biological Station (Cranberry Lake, NY)**

Teaching assistant, EFB 327 (Adirondack Flora) 2012-2014

**University of Iraq-Sulaimani (Sulaymaniyah, Iraq)**

Visiting professor, BOT 232 (Botany and the Environment) and BOT 233 (Introduction to Plant Identification) 2013

- Designed and taught courses about the role of plants in the environment and human societies (BOT 232), and identification of plants and plant communities of the Kurdistan region of Iraq (BOT 233)

Visiting lecturer, BOT 233 2012

**Mentees**

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**Boyce Thompson Institute**

Alexander Fenlon (Arizona State University Tempe) 2024

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Isabel Smalley (University of Minnesota Duluth)	2023
Isa Johnson (Ohio Wesleyan University)	2021

### **National Museum of Natural History**

Patty Chan (Cornell University), Mikhaila Bennett (Howard University), and Destiny Waag (Old Dominion University)	2018
Jacob Suissa (Harvard University)	2017
Katherine Wu (Mount St. Mary's University)	2016

### **Old Dominion University**

Lauren Heyd	2016-2021
Isaiah Amos, Toni Dotterer, John Grocholl, and Elisabeth Kana-Huisa	2016
Ellie Rudasi	2015
Joe Keenan	2014

### **Publications**

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<b>Schafran, P.W.</b> , D.A. Hauser, J.M. Nelson, X. Xu, L.A. Mueller, et al. Pan-phylum genomes of hornworts revealed conserved autosomes but dynamic accessory and sex chromosomes. <i>Nature Plants</i> , in press.	2025
Peñaloza-Bojacá G., J.G. Burleigh, A. Maciel-Silva, D.C. Cargill, D. Bell, E.B. Sessa, F.-W. Li, S.F. McDaniel, E.C. Davis, L. Endara, N.S. Allen, <b>P. Schafran</b> , S. Chantanaorrapint, J. Duckett, S. Pressel, C. Solís-Lemus, K. Renzaglia, J.C. Villarreal. Ancient reticulation and incomplete lineage sorting at the dawn of hornwort diversification and a Carboniferous origin of the pyrenoid. <i>Annals of Botany</i> , in review.	2025
Lafferty, D.J., T.A. Robison, A. Gunadi, <b>P.W. Schafran</b> , L.H. Gunn, et al. Biolistics-mediated transformation of hornworts and its application to study pyrenoid protein localization. <i>Journal of Experimental Biology</i> erae243.	2024
Lane, C., Y. Al Shoffe, <b>P. Schafran</b> , F.-W. Li, J. Kao-Kniffin, and C.B. Watkins. Amplicon sequencing and shotgun metagenomics reveal functional impacts of	2024

aminoethoxyvinylglycine-mediated ripening and cold storage on the microbiome of 'NY1' apples. *Postharvest Biology and Technology* 213: 112969.

**Schafran, P.W.**, F.-W. Li and C.J. Rothfels. PURC v2.0: a program for improved sequence inference for polyploid phylogenetics and other manifestations of the multiple-copy problem. In: Van de Peer, Y. (ed.) *Polyploidy: Methods and Protocols*. *Methods in Molecular Biology*. Springer, New York, NY. 2023

Hisanaga, T., S. Wu, **P.W. Schafran**, E. Axelsson, S. Akimcheva, et al. The ancestral chromatin landscape of land plants. *New Phytologist*. doi:10.1111/nph.19311 2023

Chatterjee, P., **P.W. Schafran**, F.-W. Li and J.C. Meeks. Nostoc Talks Back: Temporal Patterns of Differential Gene Expression During Establishment of *Anthoceros-Nostoc* Symbiosis. *Molecular Plant-Microbe Interactions* 35(10): 917–932. 2022

Marchant, D.B., G. Chen, S. Cai, F. Chen, **P.W. Schafran**, et al. Dynamic genome evolution in a model fern. *Nature Plants* 8: 1038–1051 2022

Suissa, J.S., S.P. Kinosian, **P.W. Schafran**, J.F. Bolin, W. Carl Taylor and E.A. Zimmer. Homoploid hybrids, allopolyploids, and high ploidy levels characterize the evolutionary history of a western North American quillwort (*Isoetes*) complex. *Molecular Phylogenetics and Evolution* 166: 107332. 2021

Musselman, L.J. and **P.W. Schafran**. *Edible Plants of the Carolinas: a Forager's Companion*. UNC Press, Chapel Hill, NC. 2021

**Schafran, P.W.**, L.J. Musselman, and A.S. Weakley. Isoetaceae. In: Weakley A.S. and Southeastern Flora Team (eds.): *Flora of the Southeastern United States*. University of North Carolina Herbarium, North Carolina Botanical Garden, Chapel Hill, NC. 2019

- Schafran, P.W.**, E.A. Zimmer, W.C. Taylor and L.J. Musselman. A whole chloroplast genome phylogeny of the diploid species of *Isoetes* (Isoëtaceae, Lycopodiophyta) in the southeastern United States. *Castanea* 83(2): 224–235. 2018
- Bray, R.D., **P.W. Schafran** and L.J. Musselman. Interesting, provocative, and enigmatic: morphological observations on southeastern quillworts (*Isoetes*, Isoetaceae, Lycopodiophyta). *Castanea* 83(2): 263–269. 2018
- Schafran, P.W.**, G. Johnson, W.C. Taylor, E.A. Zimmer and L.J. Musselman. Low-copy nuclear markers in *Isoetes* L. (Isoëtaceae, Lycopodiophyta) identified with transcriptomes. *Applications in Plant Sciences* 6(4): e1142. 2018
- Bolin, J.F., C.L. Hartwig, **P.W. Schafran** and S. Komarnytsky. Application of DNA flow cytometry to aid species delimitation in *Isoetes*. *Castanea* 83(1): 38–47. 2018
- Schafran, P.W.**, S.W. Leonard, R.D. Bray, W.C. Taylor and L.J. Musselman. *Isoetes mississippiensis*: a new quillwort from Mississippi, USA. *Phytokeys* 74: 97–106. 2016

### **Invited Talks**

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- Repeated evolution of dioicy and sex chromosomes in hornworts (Anthocerotophyta). 2024  
International Plant and Animal Genomes Conference 32. San Diego, CA
- Hornworts: introduction and genomics. 2023  
Cornell Rubisco Workshop. Ithaca, NY
- Unraveling reticulate evolution of *Isoetes* in eastern North America. 2019  
Plant Biology weekly seminar. Duke University, Durham, NC
- Unrecognized genetic diversity in polyploid *Isoetes* revealed with PacBio DNA sequencing. 2018  
Biology of Isoetales, a colloquium in honor of Dr. W. Carl Taylor.  
Botanical Society of America Annual Meeting. Rochester, MN

Towards a phylogeny of *Isoetes* in the southeastern United States. 2016  
QuillCon II, a symposium on *Isoetes*.  
Association of Southeastern Biologists Annual Meeting. Concord, NC

### **Presentations**

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Twelve high-quality genomes highlight genomic diversity across the hornworts. 2020  
Botanical Society of America Annual Meeting. Virtual.

High-throughput flow cytometry and DNA sequencing identifies over 20 potential new 2019  
*Isoetes* (Isoetaceae, Lycopodiophyta) species in the southeastern US.  
Association of Southeastern Biologists Annual Meeting. Memphis, TN.

The *Isoetes flaccida* complex in the southeastern United States: unrecognized species 2018  
diversity in southern Georgia and northern Florida.  
Smithsonian Botanical Symposium. Washington, DC.

Restoration and maintenance of the Northernmost Longleaf Pine Community, 2016  
Blackwater Ecological Preserve, Isle of Wight Co., VA.  
2016 Biennial Longleaf Conference. Savannah, GA.

Molecular phylogeny of diploid *Isoetes* (Isoetaceae, Lycophyta) in the southeastern 2016  
United States based on low-copy nuclear markers and whole chloroplast genomes.  
Botanical Society of America Annual Meeting. Savannah, GA.

The ethnobotany of *Pistacia eurycarpa* in Iraqi-Kurdistan: its chemical composition and 2014  
anti-microbial activity.  
Society of Economic Botany and Society of Ethnobiology Annual Meeting. Cherokee,  
NC.

Systematics of *Isoetes* (Isoetaceae, Lycophyta) in the southeastern United States. 2014  
Association of Southeastern Biologists Annual Meeting. Spartanburg, SC.

The ethnobotany of qazwan (*Pistacia eurycarpa*) in Iraqi-Kurdistan. 2013  
Plant Life of Southwest Asia Symposium. Edinburgh, Scotland, UK.

What is the true identity of Tuckahoe? 2012  
Association of Southeastern Biologists Annual Meeting. Athens, Georgia.

### **Awards**

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NSF Postdoctoral Research Fellowship	2021-2024
Smithsonian Institution Predoctoral Fellowship	2018
Washington Field Biologists' Club research grant	2017
Old Dominion University Nick Savage scholarship	2017
American Society of Plant Taxonomists W. Hardy Ashbaugh graduate student award	2017
Native Orchid Conference Fred Case grant	2016
Southern Appalachian Botanical Society Outstanding Student Presentation award	2016
Smithsonian Institution GRAD Fellowship	2015
Old Dominion University Kirk student research award	2015
Old Dominion University Howard and Vivian Marshall scholarship	2015
Association of Southeastern Biologists graduate student support award	2014
ODU Biology Graduate Student Organization Symposium, 1 <sup>st</sup> place presentation	2014

### **Service**

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#### **Southern Appalachian Botanical Society**

Student representative to the executive committee 2017-2019

#### **Botanical Society of America, ODU Student Chapter**

President 2014-2016

Treasurer 2013-2014

Community Outreach 2013

#### **Biology Graduate Student Organization (ODU)**

Vice President 2014-2015

### **Outreach**

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**Various Locations** 2021



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Gave four public lectures at bookstores in North Carolina in conjunction with the publication of “Edible Wild Plants of the Carolinas”

**Blackwater Ecologic Preserve (Zuni, VA)**

2010-2019

Led approximately 20 tours with a total of 200-300 participants, for members of the public to learn about ecology of the longleaf pine ecosystem, rare plants of southeastern Virginia, and conservation efforts of VA Dept. of Conservation and Recreation and Old Dominion University

**Mt. Cuba Center (Hockessin, DE)**

2017

Co-led a workshop on making aperitifs and bitters from eastern North American plants

**Norfolk Botanical Garden (Norfolk, VA)**

2013

Taught a workshop with about 12 participants on common edible plants of southeastern Virginia

**Virginia Master Naturalists (Virginia Beach, VA)**

2013

Gave a lecture on mycology and common fungi identification

**With Good Reason Radio (Charlottesville, VA)**

2012

Assisted in recording episode, “Foraging for Cocktails”