

# Curriculum Vitae

WESTON TESTO

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## RESEARCH INTERESTS

I am broadly interested in studying the diversity of plants in the American tropics, with a focus on ferns and lycophytes. I am especially interested in understanding how geography, historical processes, and reticulate evolutionary processes have contributed to extant fern and lycophyte diversity and using innovative approaches to document and describe this diversity. My research integrates field work, natural history collections, cytology, phylogenomics, morphology, and taxonomy to address these questions and promote an improved resolution of plant evolution. Specific taxonomic groups and geographic areas of interest include the clubmosses (Lycopodiaceae), the spleenworts (Aspleniaceae), the twin-sorus ferns (*Diplazium*), the tropical Andes, and the Greater Antilles.

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## EDUCATION

### 2012 – 2017. University of Vermont, Burlington, Vermont

Ph.D. in Plant Biology

Major Professor: Dr. David Barrington.

Dissertation: *Devonian origin and Cenozoic radiation in the clubmosses (Lycopodiaceae)*

### 2008- 2012. Colgate University, Hamilton, New York

B. A. in Biology, *magna cum laude*

Advisor: Dr. James Watkins, Jr.

Honors thesis: *Effects of temperature and calcium availability on growth of the hart's-tongue fern*

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## RESEARCH APPOINTMENTS

### 2018–Present Postdoctoral Research Associate

University of Florida, Gainesville, Florida

Supervisor: Dr. Emily Sessa

Project: *Building a comprehensive evolutionary history of flagellate plants*

### 2013–2017 NSF Graduate Research Fellow

University of Vermont, Burlington, Vermont

Supervisor: Dr. David Barrington

*Principal project: Hybridization and polyploidy as drivers of species diversification and niche evolution during rapid radiations*

### 2009–2012 Colgate Summer Research Fellow

Colgate University, Hamilton, New York & Sarapiquí, Provincia de Heredia, Costa Rica

Supervisor: Dr. James Watkins, Jr.

*Principal project: Evolution of drought tolerance in tropical ferns*

### 2008–2012 Research Assistant

Colgate University, Hamilton, New York

Supervisor: Dr. James Watkins, Jr.

*Principal project: Climate change and rarity in the hart's-tongue fern (*Asplenium scolopendrium*)*

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## TEACHING EXPERIENCE

- 2019 Teaching Assistant & Invited Instructor:** *Tropical ferns and lycophytes*  
Organization for Tropical Studies, Costa Rica  
*Assisted in course coordination, field-based portion of course, gave lectures on plant morphology, ecology, and systematics. (Graduate course; two weeks)*
- 2018 Course Instructor:** *Taxonomía e identificación de helechos de la República Dominicana*  
Universidad Autónoma de Santo Domingo, Dominican Republic  
*Developed course syllabus, led field-based short course for local university students in fern identification, morphology, taxonomy, and ecology. Course in Spanish. (Undergraduate course; one week)*
- 2018 Course Instructor:** *Local flora of north Florida*  
University of Florida, USA  
*Developed course syllabus, created class plans, taught lab- and field-based classes in plant identification and taxonomy, administered quizzes and exams, grading. (Undergraduate course; one semester)*
- 2017 Course Instructor:** *Morfología y sistemática de helechos neotropicales*  
Universidad Pedagógica y Tecnológica, Colombia  
Co-instructors: Alexandre Salino & Michael Sundue.  
*Organized group workshops and field lab sessions; instructed students on plant morphology and identification of tropical ferns and lycophytes. Course in Spanish. (Graduate course, one week)*
- 2017 Teaching Assistant:** *Tropical plant systematics*  
University of Vermont, USA (course offered in Costa Rica)  
*Organized group field trips, taught plant systematics, species and family identification, and herbarium specimen collection. (Undergraduate course, two weeks)*
- 2013 Teaching Assistant:** *Plant systematics*  
– University of Vermont, USA
- 2016** *Organized and conducted field trips, developed lab curriculum, taught plant systematics and morphology, administered and graded assignments. (Undergraduate course, 5 semesters total)*
- 2015 Invited Faculty:** *Tropical ecology in a changing world*  
Organization for Tropical Studies, Costa Rica  
*Developed and lead two field-based research projects with twelve students; gave lectures on plant diversity and global climate change. (Undergraduate course, one week)*
- 2015 Teaching Assistant:** *Tropical ferns and lycophytes*  
Organization for Tropical Studies, Costa Rica  
*Assisted in course coordination, field-based portion of course, gave lectures on plant morphology, ecology, and systematics. (Graduate course; two weeks)*
- 2014 Guest Lecturer:** *LANDS Semester*  
University of Vermont, USA  
*Developed and led field-based lectures on plant diversity and conservation (Undergraduate course, 3 lectures)*
- 2013 Teaching Assistant:** *Morphology and evolution of vascular plants*  
University of Vermont, USA  
*Developed lab modules for studying plant morphology, instructed students in histological techniques and microscopy, gave lectures on plant morphology and evolution.*
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## REFEREED PUBLICATIONS

- 32 Noben, S., **Testo, W. L.**, Karger, D. N., Kluge, J., Salazar, L., Lehnert, M., Quandt, D., and Kessler, M. What determines species-abundance patterns in fern communities? *Journal of Plant Ecology*, in review.
- 31 Cámara-Leret, R., Frodin, D. G., [...], **Testo, W. L.**, et al. [91 authors]. Unraveling New Guinea's plant megadiversity. *Science*, in review.
- 30 **Testo, W. L.**, Field, A. R., Sessa, E. B., and Sundue, M. A. 2019. Phylogenetic and morphological analyses support the resurrection of *Dendroconche* and the recognition of two new genera in Polypodiaceae subfamily Microsoroideae. *Systematic Botany*, in press.
- 29 **Testo, W. L.** 2019. (2691) Proposal to conserve the name *Asplenium erosum* (Aspleniaceae) with a conserved type. *Taxon*. in press.
- 28 Kuo, L. Y., Chang, Y. H., Huang, Y. H., **Testo, W. L.**, Ebihara, A., Rouhan, G., Quintanilla, L. G., Watkins, J. E., Huang, Y. M., and Li, F. W. 2019. A global phylogeny of *Stegnogramma* ferns (Thelypteridaceae): generic and sectional revision, historical biogeography and evolution of leaf architecture. *Cladistics* DOI: 10.1111/cla.12399.
- 27 **Testo, W. L.**, Sessa, E. B., and Barrington, D. 2019. The rise of the Andes promoted rapid diversification in Neotropical *Phlegmariurus* (Lycopodiaceae). *New Phytologist* 222: 604–613.
- 26 **Testo, W. L.**, Field, A.R., and Barrington, D. 2018. Overcoming among-lineage rate heterogeneity to infer the biogeography and divergence times of the clubmoss family Lycopodiaceae. *Journal of Biogeography* 45: 1929v1941.
- 25 Wolf, P. G., Robinson, T. A., Johnson, M. G., Sundue, M. A., **Testo, W. L.**, and Rothfels, C. J. 2018. Target sequence capture of nuclear-encoded genes for phylogenetic analysis in ferns. *Applications in Plant Sciences* 6: e01148
- 24 **Testo, W. L.** and Sundue, M. A. 2018. Are rates of species diversification and body size evolution coupled in the ferns? *American Journal of Botany* 105: 1–11.
- 23 **Testo, W. L.**, Øllgaard, B., Field, A. R., Almeida, T., Kessler, M., and Barrington, D. 2018. Phylogenetic systematics, morphological evolution, and natural groups in Neotropical *Phlegmariurus* (Lycopodiaceae). *Molecular Phylogenetics and Evolution* 125: 1–13.
- 22 **Testo, W. L.** 2018. Novelties in Costa Rican *Pityrogramma*: a new species and a new hybrid from the Osa Peninsula. *American Fern Journal* 108: 27–33.
- 21 Mahley, J., Pittermann, J., Rowe, N., Baer, A., Watkins, J.E., Schuettpelz, E., Wheeler, J., Mehltreter, K., Windham, M., **Testo, W. L.**, and Beck, J. 2018. Geometry, allometry and biomechanics of fern leaf petioles: their significance for the evolution of functional and ecological diversity within the Pteridaceae. *Frontiers in Plant Science* 9: 197–208.
- 20 Schmitt, M., Mehltreter, K., Sundue, M., **Testo W.L.**, Watanabe, T., and Jansen, S. 2017. The evolution of aluminum accumulation in ferns and lycophytes. *American Journal of Botany* 104: 573–583.
- 19 **Testo, W. L.**, Sundue, M., and Vasco, A. 2017. *Diplazium* hybrids involving *D. plantaginifolium* and *D. ternatum* from Mexico and Central America. *Brittonia* 69: 295–306.
- 18 **Testo, W. L.** 2017. *Phlegmariurus lehnertii*, a new name for *Phlegmariurus lancifolius* (Lycopodiaceae). *Phytotaxa* 297: 289–290.
- 17 **Testo, W. L.** and Sundue, M., 2016. A 4000-species dataset provides new insight into the evolution of ferns. *Molecular Phylogenetics and Evolution*, 105:200–211.
- 16 Schuettpelz, E., Schneider, H., [...], **Testo, W. L.**, et al. [94 authors]. 2016. A community-derived classification for extant ferns and lycophytes. *Journal of Systematics and Evolution* 54: 563–603.
- 15 **Testo, W.L.**, A.V. Gilman, and A Haines. 2016. *Huperzia continentalis*, a new gemmiferous clubmoss segregated from *Huperzia haleakalae*. *Systematic Botany* 41: 894–901.
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## REFEREED PUBLICATIONS (CONT.)

- 14 Sessa, E. B., **Testo, W. L.** and Watkins, J. E., 2016. On the widespread capacity for, and functional significance of, extreme inbreeding in ferns. *New Phytologist*, 211:1108–1119.
- 13 Sundue, M. and **Testo, W. L.**, 2016. *Parapolystichum novoguineense* (comb. nov.; Dryopteridaceae) from New Guinea. *Phytotaxa*, 243:193–196.
- 12 Field, A. R., **W.L. Testo**, P.D. Bostock, J.A.M. Holtum, M. Waycott, and A. Thornhill. 2016. Phylogenetic phylogenetics and the morphology of the Lycopodiaceae subfamily Huperzioidae supports three genera: *Huperzia*, *Phlegmariurus* and *Phylloglossum*. *Molecular Phylogenetics and Evolution* 94:635–657.
- 11 Sundue, M.A., **W.L. Testo**, and T.A. Ranker. 2015. Morphological innovation, ecological opportunity, and the radiation of a major vascular epiphyte lineage. *Evolution* 69:2482–2495.
- 10 A.V. Gilman and **W.L. Testo**. 2015. Use of gemmae characters to identify North American *Huperzia* (Lycopodiaceae). *American Fern Journal* 105:145–161.
- 9 **Testo, W.L.** and L. B. Gerdes. 2015. An unusual form of *Huperzia selago* (Lycopodiaceae) and its implications for gemma homology in the genus. *American Fern Journal* 105:123–126.
- 8 **Testo, W.L.**, J.E. Watkins, J. Pittermann, and R. Momin. 2015. *Pteris ×caridadiae* (Pteridaceae), a new hybrid fern from Costa Rica. *Brittonia*, 67:138–143.
- 7 **Testo, W.L.**, J.E. Watkins, and D.S. Barrington. 2015. Gender-biased hybridization in North American *Dryopteris*: Reconciling patterns of inheritance and reproductive biology. *New Phytologist* 206, 785–795.
6. **Testo, W.L.**, M.S. Grasso, and D.S. Barrington. 2014. Beyond antheridiogens: chemical competition between gametophytes of *Polypodium appalachianum* and *Polypodium virginianum*. *Journal of the Torrey Botanical Society* 13:302–312.
- 5 **Testo, W.L.** and M.A. Sundue. 2014. Primary hemiepiphytism in *Colysis ampla* (Polypodiaceae) provides new insight into the evolution of growth habit in ferns. *International Journal of Plant Sciences* 175: 526–536.
- 4 **Testo, W.L.** and J.E. Watkins, Jr. 2013. Understanding mechanisms of rarity in pteridophytes: competition and climate change threaten the rare fern *Asplenium scolopendrium* var. *americanum*. *American Journal of Botany* 100: 2261–2270.
- 3 **Testo, W.L.** and J.E. Watkins, Jr. 2012. Influence of plant size on the ecophysiology of the epiphytic fern *Asplenium auritum* from Costa Rica. *American Journal of Botany* 99 :1840–1846.
- 2 **Testo, W.L.** and J.E. Watkins Jr. 2011. Comparative development and gametophyte morphology of the hart's-tongue fern, *Asplenium scolopendrium* L. *Journal of the Torrey Botanical Society* 138:400–408.
- 1 Watkins Jr., J.E., **W.L. Testo** and R. Merkhofer. 2011. In situ gametophyte morphology of the tropical epiphyte *Oleandra articulata*. *American Fern Journal* 101:50–56. 2011.

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## INVITED TALKS & SEMINARS

- 2019 **IAPT Early Career Investigator Program: Life at the Edge. Botany 2019, Tucson, Arizona, USA.** *Into the trees and back again: major ecological shifts drive the radiation of Neotropical Phlegmariurus.*
  - 2019 **Florida Museum of Natural History Seminar Series, Gainesville, Florida, USA.** *Out of the Carboniferous and up the Andes: unraveling the ancient origin and recent radiation of the clubmosses.*
  - 2018 **Universidad Autónoma de Santo Domingo, Santo Domingo, Dominican Republic.** *Situación actual en el estudio de helechos neotropicales.*
  - 2018 **XII Congreso Latinoamericano de Botánica, Quito, Ecuador.** *Diversificación y taxonomía de los licopodios en los Andes.*
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## INVITED TALKS & SEMINARS (CONT.)

- 2018** Harvard University Herbaria, Harvard University, Cambridge, Massachusetts, USA. *Diversification of the clubmosses in the high Andes.*
- 2017** IX Congreso Colombiano de Botánica, Tunja, Colombia. *Diversificación de Phlegmariurus (Lycopodiaceae) en los Andes.*
- 2016** XX Congreso Mexicano de Botánica, Ciudad de México, México. *Filogenia y diversificación de Phlegmariurus (Lycopodiaceae) y las afinidades de las especies mexicanas.*
- 2015** Zurich Institute of Systematic Botany, Zurich, Switzerland. *A new look at diversification in the ferns.*
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## CONTRIBUTED TALKS AND POSTERS

\*DENOTES PRESENTING AUTHORSHIP; †DENOTES POSTERS

- 2019** Botany 2019, Tucson, Arizona, USA. *Cleaning up (some) of a mess: two new genera and another resurrected in the Polypodiaceae subfamily Microsoroideae\**
- 2019** Botany 2019, Tucson, Arizona, USA. *Reticulate evolution and biogeography in ferns and lycophytes - a colloquium honoring Dr. David Barrington\* (colloquium organizer)*
- 2019** Botany 2019, Tucson, Arizona, USA. *Morphology and sequence data resolve the Diplazium praestans mystery*
- 2019** Botany 2019, Tucson, Arizona, USA. *Evolutionary history of Asplenium in Africa*
- 2019** Botany 2019, Tucson, Arizona, USA. *Global patterns of fern diversification*
- 2018** Botany 2018, Rochester, Minnesota, USA. *Phylogenetic systematics, morphological evolution, and natural groups in Neotropical Phlegmariurus (Lycopodiaceae)\**
- 2018** Botany 2018, Rochester, Minnesota, USA. *Are rates of species diversification and body size evolution coupled in the ferns?*
- 2018** Botany 2018, Rochester, Minnesota, USA. *Historical biogeography of the fern family Blechnaceae*
- 2018** Botany 2018, Rochester, Minnesota, USA. *The rise of the Andes promoted rapid diversification in Neotropical Phlegmariurus (Lycopodiaceae)\**
- 2018** Building Botanical Bridges Conference, Havana, Cuba. *Nuevos conceptos en la taxonomía de los licopodios y la importancia de los jardines botánicos en su conservación\**
- 2017** Botany 2017, Savannah, Georgia, USA. *Polyploidy does not influence rates of diversification across the fern phylogeny\**
- 2015** Next Generation Pteridology, Smithsonian Institute, Washington, DC, USA. *Do habitat shifts lead to an increase in diversification rate in the Dryopteridaceae?*
- 2015** Next Generation Pteridology, Smithsonian Institute, Washington, DC, USA. *Molecular and morphological systematics of the Lycopodiaceae subfamily Huperzioidae: a case for the genera Huperzia, Phlegmariurus, and Phylloglossum\**
- 2015** Next Generation Pteridology, Smithsonian Institute, Washington, DC, USA. *Biogeographic patterns and processes of speciation in the Polypodiaceae\**
- 2015** Next Generation Pteridology, Smithsonian Institute, Washington, DC, USA. *A new look at the diversification in the ferns\**
- 2014** Botany 2014, Boise, Idaho, USA. *Exploring patterns of gender-biased hybridization in the North American wood ferns: insights from gametophyte breeding systems\**
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## CONTRIBUTED TALKS AND POSTERS (CONT.)

- 2014 **Botany 2014, Boise, Idaho, USA.** *Fern hemiepiphytes: a bridge between terrestrial and epiphytic species?*
- 2014 **Botany 2014, Boise, Idaho, USA.** *Mating systems in ferns: frequencies, functional significance, and phylogenetic signal?*
- 2013 **Botany 2013, New Orleans, Louisiana, USA.** *Allelopathy and gametophyte competition in North American Polypodium species: ecological and evolutionary considerations\**
- 2013 **Botany 2012, Columbus, Ohio, USA.** *Gametophyte ecology of the American hart's-tongue fern: mechanisms of rarity\**
- 2011 **XVIII International Botanical Congress, Melbourne, Australia.** *Gametophyte ecology of the American hart's-tongue fern\*<sup>1</sup>*
- 2011 **National Undergraduate Research Conference, Ithaca, New York, USA.** *Gametophyte ecology of the American hart's-tongue fern\**
- 2010 **Botany 2010, Providence, Rhode Island, USA.** *Gametophyte development of the American hart's-tongue fern\*<sup>1</sup>*
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## FELLOWSHIPS AND GRANTS AWARDED

- 2016 **Doctoral Dissertation Improvement Grant** *National Science Foundation* (\$18,526)
- 2015 **Graduate Research Award** *American Society of Plant Taxonomists* (\$800)
- 2015 **Graduate Research Award** *New England Botanical Club* (\$585)
- 2014 **Huyck Research Grant** *Edmund Niles Huyck Nature Preserve and Biological Research Station* (\$1420)
- 2013 **CALS Travel Grant** *University of Vermont* (\$800)
- 2013 **Huyck Research Grant** *Edmund Niles Huyck Nature Preserve and Biological Research Station* (\$1733)
- 2013 **Graduate Research Fellowship** *National Science Foundation* (\$94,000)
- 2012 **Huyck Research Grant** *Edmund Niles Huyck Nature Preserve and Biological Research Station* (\$1300)
- 2011 **Summer Research Assistantship Grant** *Colgate University* (\$4000)
- 2010 **Summer Research Assistantship Grant** *Colgate University* (\$2800)
- 2009 **Bliss J. Youcker Endowed Scholarship** *Colgate University* (\$1500)
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## HONORS AND DISTINCTIONS

- 2012 **Edgar T. Wherry Award**, *Botanical Society of America*
- 2012 **Charles Oberheim Memorial Award**, *Colgate University*
- 2012 **Young Botanist Award**, *Botanical Society of America*
- 2011 **Trimmer Writing Award**, *Colgate University*
- 2011 **Honorable Mention, Barry M. Goldwater Scholarship**
- 2011 **George E. Stevenson Award for Expository Speaking**, *Colgate University*
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## HONORS AND DISTINCTIONS (CONT.)

- 2010** George E. Stevenson Award for Expository Speaking, *Colgate University*
- 2010** Undergraduate Student Research Award, *Botanical Society of America*
- 2008** Dean's Award for Academic Excellence, *Colgate University (Five semesters)*
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## RELEVANT SERVICE

- 2013– Manuscript reviewer:** *Acta Botánica Mexicana, Acta Physiologiae Plantarum, American Fern Journal, American Journal of Botany, Annals of Botany, Annals of the Missouri Botanical Garden, Botany, Brittonia, Canadian Journal of Botany, Diversity and Distributions, Evolution, Functional Ecology, Genome Biology and Evolution, Global and Planetary Change, International Journal of Plant Sciences, Journal of Biogeography, Molecular Biology and Evolution, Nature, New Phytologist, Oecologia, Phytokeys, Phytotaxa, PLoS One, Proceedings B, Rodriguesia, Science, Systematic Botany, Taxon, Tropical Conservation Science.*
- 2015– Associate Editor:** *Frontiers in Plant Sciences, Tropical Conservation Science*
- 2011– Natural History Guide:** *E.N. Huyck Preserve and Research Station, Rensselaerville, New York, USA*  
*Led several short hikes and discusses local geology, botany, and habitat diversity*
- 2010– Contributor:** *Fiddlehead Forum, Myosotis Messenger (popular-style scientific society publications)*
- 2010– Mentor:** *PlantingScience, Botanical Society of America.*  
*Interacted with high school students to provide guidance necessary for completion of two six-week advanced science projects*
- 2014 Committee Member:** *Red Rocks Park Planning Subcommittee, South Burlington, Vermont, USA*  
*Provide assessments of natural communities, survey rare plant species, and co-draft management plan for popular city park*
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## PROFESSIONAL SOCIETY MEMBERSHIP

American Botanical Society  
American Fern Society  
American Society of Plant Taxonomists  
Asociación Latinoamericana de Pteridología  
New England Botanical Club  
Torrey Botanical Society

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