

**CURRICULUM VITAE**  
**ALEJANDRA VASCO**

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Fort Worth Botanic Garden | Botanical Research Institute of Texas (BRIT)  
1700 University Dr., Fort Worth, TX 76107-3400 USA  
Phone: (1) 817 773 0803  
E-mail: [avasvog@gmail.com](mailto:avasvog@gmail.com)  
<https://brit.org/about-us/staff/avasvog/>  
<https://www.researchgate.net/profile/Alejandra-Vasco>

**I EDUCATION**

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- Ph.D. in Biology (2010).** City University of New York (CUNY)/ The New York Botanical Garden.  
Dissertation Title: Systematics and Phylogeny of *Elaphoglossum* section *Lepidoglossa*  
(Dryopteridaceae). Advisor: Dr. Robbin C. Moran
- M.Phil. in Biology (2007).** City University of New York (CUNY)/ The New York Botanical Garden.  
Advisor: Dr. Robbin C. Moran
- B. S. in Biology (2002).** University of Antioquia, Biology Department. Medellín, Colombia.  
Advisor: Dr. Ricardo Callejas

**II PROFESSIONAL APPOINTMENTS**

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- Research Botanist.* 2017–present. Botanical Research Institute of Texas, Fort Worth, Texas, USA.  
*Adjoint Professor* 2017–2020. University of Texas Arlington, Department of Biology, Arlington,  
Texas, USA.
- Associate member of the Graduate Faculty* 2017–2023. Texas Christian University, Fort Worth,  
Texas, USA.
- Assistant Professor.* 2015–2017. Department of Botany, Biology Institute, National Autonomous  
University of Mexico, Mexico City.
- Postdoctoral Research Associate.* 2014–2015. Biology Institute, National Autonomous University  
of Mexico, Mexico City. “Leaf anatomy in the *Elaphoglossum petiolatum* group”.  
Supervisor: Dr. Teresa Terrazas.
- Postdoctoral Research Associate.* 2010–2013. The New York Botanical Garden. “Leaf  
development and phylogeny of the fern group *Elaphoglossum* section *Squamipedia*  
(Dryopteridaceae)”. Supervisors: Drs. Barbara Ambrose and Robbin Moran.
- Research assistant.* 2007–2009. The New York Botanical Garden. “Monographic revision and  
phylogeny of the fern genus *Megalastrum* (Dryopteridaceae)”. Supervisor: Dr. Robbin  
Moran.
- Herbarium Curatorial Assistant.* 2004–2007. The New York Botanical Garden New York, USA.  
*Adjunct Teacher.* 2003. School of Natural and Exact Sciences, University of Antioquia. Colombia.  
*Herbarium Curatorial Assistant.* 2002–2004. University of Antioquia’s Herbarium (HUA),  
Colombia.

## III PUBLICATIONS

**Peer Reviewed Publications**

- Matos, F.B., & **Vasco, A.** 2022. *Elaphoglossum matogrossense* (Dryopteridaceae), a new and threatened species from Chapada dos Guimarães, Mato Grosso, Brazil. *Kew Bulletin*. Available online: <https://doi.org/10.1007/s12225-022-10043-2>
- Quaresma A., Zartman C.E., Piedade M.T F., Wittmann F., Jardim M.A.G., Irumé M.V., Benavides A.M., Freitas L., Toledo J.J., Boelter C. R., Obermüller F., Duque A.J., Klein V.P., Mari M.L. G., Schöngart J., Arenas E., Pos E.T., **Vasco A.**, Ek R., Plantenga F.D.M., Duivenvoorden J.F., Biesmeijer K., Bender I.M. A., ter Steege H. 2022. The Amazon Epiphyte Network: A First Glimpse Into Continental-Scale Patterns of Amazonian Vascular Epiphyte Assemblages. *Frontiers in Forests and Global Change* 5. <https://www.frontiersin.org/articles/10.3389/ffgc.2022.828759>
- Rodríguez-Pelayo, C., Ambrose, B.A., **Vasco, A.**, Alzate, J.F., Pabón-Mora, N. 2022. Tracking ancestral flowering integrators: evolution and expression of *PEBP* genes in lycophytes and ferns. *International Journal of Plant Sciences* 183: <https://doi.org/10.1086/719575>
- Rodríguez-Pelayo, C., Ambrose, B.A., **Vasco, A.**, Alzate, J.F., Pabón-Mora, N. 2022. Evolution and expression of *LEAFY* genes in ferns and lycophytes. *EvoDevo* 13, 2 (2022). <https://doi.org/10.1186/s13227-021-00188-9>
- Martínez-Becerril; A.G., Solano, E.; **Vasco, A.** 2021. Spore morphology of the Mexican species of the *Elaphoglossum petiolatum* complex (Dryopteridaceae). *Brittonia* 73: 131-142 <https://doi.org/10.1007/s12228-020-09643-8>
- Breinholt, J.W., S.B. Carey, G.P. Tiley, E.C. Davis, L. Endara, S.F. McDaniel, L.G. Neves, E.B. Sessa, M. von Konrat, S. Chantanaorrapint, S. Fawcett, S.M. Ickert-Bond, P.H. Labiak, J. Larraín, M. Lehnert, L.R. Lewis, N.S. Nagalingum, N. Patel, S.A. Rensing, W. Testo, **A. Vasco**, J.C. Villarreal, E.W. Williams, & J.G. Burleigh. 2021. A target enrichment probe set for resolving the flagellate land plant tree of life. *Applications in Plant Sciences* 9: e11406. <https://doi.org/10.1002/aps3.11406>
- Hernández-Hernández, B.; Tapia-López, R.; Ambrose, B.A.; **Vasco, A.** 2021. *R2R3-MYB* gene evolution in plants, incorporating ferns into the story. *International Journal of Plant Sciences* 182(1): 1–8. <https://doi.org/10.1086/710579>
- Aragón-Raygoza, A.; **Vasco, A.**; Blilou, I.; Herrera-Estrella, L.; Cruz-Ramírez, A. 2020. Development and cell cycle activity of the root apical meristem in the fern *Ceratopteris richardii*. *Genes*: 11, 1455. <https://doi.org/10.3390/genes11121455>
- Vasco, A.**; Ambrose, B.A. 2020. Simple and divided leaves in ferns: Exploring the genetic basis for leaf morphology differences in the genus *Elaphoglossum* (Dryopteridaceae). *International Journal of Molecular Sciences* 21, 5180. <https://doi.org/10.3390/ijms21155180>
- Cruz, R.; Melo-de-Pinna, G.F.A.; **Vasco, A.**; Prado, J.; Ambrose, B.A. 2020. *Class I KNOX* is related to determinacy during the leaf development of the fern *Mickelia scandens* (Dryopteridaceae). *International Journal of Molecular Sciences* 21, 4295. <https://doi.org/10.3390/ijms21124295>
- Zumajo-Cardona, C., **Vasco, A.** & Ambrose, B.A. 2019. The evolution of the *KANADI* gene family and leaf development in lycophytes and ferns. *Plants* 8 (9), 313. <https://doi.org/10.3390/plants8090313>
- Matos, F., **Vasco, A.** & Moran, R.C. 2018. *Elaphoglossum doanense* and *E. tonduzii*: new members of *Elaphoglossum* sect. *Squamipedia* (Dryopteridaceae) and their significance for inferring the evolution of rhizome habit and nest-forming leaves within the genus. *International Journal of Plant Sciences* 179: 296–313. <https://doi.org/10.1086/696687>

- Pérez-Atilano, Y., Sánchez, A., Terrazas, T. & **Vasco, A.** 2017. Morphological and anatomical analysis of the *Myriopteris lendigera* (Pteridaceae) complex in Mexico. *Brittonia* 70: 40–59. <https://doi.org/10.1007/s12228-017-9496-y>
- Testo, W., Sundue, M. & **Vasco, A.** 2017. *Diplazium* hybrids involving *D. plantaginifolium* and *D. ternatum* from Mexico and Central America. *Brittonia* 69 (3): 295–306. <https://doi.org/10.1007/s12228-017-9476-2>
- Reyes-Rivera, J., Rodríguez-Alonso, G., Petrone, E., **Vasco, A.**, Vergara-Silva, F., Shishkova, S. & Terrazas, T. 2017. Expression of the knotted homeobox genes in the cactaceae cambial zone suggests their involvement in wood development. *Frontiers in Plant Science*. <https://doi.org/10.3389/fpls.2017.00218>
- PPG I. 2016. A community-derived classification for extant lycophytes and ferns. *Journal of Systematics and Evolution* 54: 563–603. <https://doi.org/10.1111/jse.12229>
- Vasco, A.**, Smalls, T. L., Graham, S. W., Cooper, E. D., Wong, G.K-S., Stevenson, D. W., Moran, R. C. & Ambrose, B. A. 2016. Challenging the paradigms of leaf evolution: *Class III HD-Zips* in ferns and lycophytes. *New Phytologist* 212 (3): 745–758. <https://doi.org/10.1111/nph.14075>
- Ambrose, B. A. & **Vasco, A.** 2016. Bringing the multicellular fern meristem into focus. *New Phytologist* 210 (3): 790-793. <https://doi.org/10.1111/nph.13825>
- Mynssen, C. M., **Vasco, A.**, Moran, R.C., Sylestre, L.S. & Rouhan. G. 2016. *Desmophlebiaceae* and *Desmophlebium*: A new family and genus of Eupolypod II ferns. *Taxon* 65 (1): 19-34. <https://doi.org/10.12705/651.2>
- Matos, F. & **Vasco, A.** 2015. *Elaphoglossum fendleri* (Dryopteridaceae), a new species of *Elaphoglossum* sect. *Lepidoglossa* from Venezuela, and the identity of *Elaphoglossum ornatum*. *Brittonia* 67 (2): 144–149. <https://doi.org/10.1007/s12228-015-9371-7>
- Vasco, A.**, Lóriga, J., Rouhan, G., Ambrose, B. A. & Moran, R.C. 2015. Divided leaves in the genus *Elaphoglossum* (Dryopteridaceae): A phylogeny of *Elaphoglossum* section *Squamipedia*. *Systematic Botany* 40 (1): 46-55. <https://doi.org/10.1600/036364415X686323>
- Montoya-González, J., **Vasco, A.**, Hoyos-Figueroa, F., Osorio-Cadavid, N., Marín-Agudelo, A. & Jaramillo- Bustamante, J.C. Obstrucción intestinal por semillas de *Vasconcellea*: reporte de tres casos y revisión de la literatura. *Iatreia* 28(3): 318-324. <https://doi.org/10.17533/udea.iatreia.v28n3a10>
- Vasco, A.**, Thadeo, M., Conover, M. & Daly, D. 2014. Preparation of samples for leaf architecture studies, a method for mounting cleared leaves. *Applications in Plant Sciences* 2(9). <https://doi.org/10.3732/apps.1400038>
- Loriga, J., **Vasco, A.**, Regalado, L., Heinrichs, J. & Moran, R.C. 2014. Phylogeny and classification of the Cuban species of *Elaphoglossum* (Dryopteridaceae), with description of *Elaphoglossum* sect. *Wrightiana* sect. nov. *Plant Systematics and Evolution* 300(5): 937-951. <https://doi.org/10.1007/s00606-013-0933-4>
- Vasco, A.**, Mickel, J.T. & Moran, R.C. 2013. Taxonomic revision of the Neotropical species of *Elaphoglossum* sect. *Squamipedia* (Dryopteridaceae). *Annals of the Missouri Botanical Garden* 99 (2): 244-286. <https://doi.org/10.3417/2012038>
- Vasco, A.**, Moran, R.C. & Ambrose, B.A. 2013. The morphology, evolution and development of fern leaves. Invited Review. *Frontiers in Plant Science* 4. doi: 10.3389/fpls.2013.00345
- Wheeler, Q.D., S. Knapp, D.W. Stevenson, J. Stevenson, S.D. Blum, B.M. Boom, G.G. Borisy, J.L. Buizer, M.R. De Carvalho, A. Cibrian, M.J. Donoghue, V. Doyle, E. M. Gerson, C.H. Graham, P. Graves, S. J. Graves, R. P. Guralnick, A. L. Hamilton, J. Hanken, W. Law, D.L. Lipscomb, T. E. Lovejoy, H. Miller, J.S. Miller, S. Naeem, M.J. Novacek, L.M. Page, N.I. Platnick, H. Porter-Morgan, P.H. Raven, M.A. Solis, A. G. Valdecasas, S. Van Der Leeuw, **A. Vasco**, N.

- Vermeulen, J. Vogel, R.L. Walls, E.O. Wilson & J.B. Woolley. 2012. Mapping the biosphere: exploring species to understand the origin, organization and sustainability of biodiversity. *Systematics and Biodiversity*, 10 (1), 1-20
- Sundue, M., **Vasco, A.** & Moran, R.C. 2011. Cryptochlorophyllous spores in ferns: Nongreen spores that contain chlorophyll. *International Journal of Plant Sciences*, 172 (9): 1110-1119. <https://doi.org/10.1086/662071>
- Vasco, A.** 2011. Taxonomic revision of *Elaphoglossum* subsection *Muscosa* (Dryopteridaceae). *Blumea* 56(2): 165-202. <https://doi.org/10.3767/000651911X592722>
- Benavides, A.M., **Vasco, A.**, Duque, A. J. & Duivenvoorden, J.F. 2011. Association of vascular epiphytes with landscape units and phorophytes in humid lowland forests of Colombian Amazonia. *Journal of Tropical Ecology* 27: 223-237 (Science 2011Editor's Choice, 332: 641-642). <https://doi.org/10.1017/S0266467410000726>
- Vasco, A.**, Moran, R.C. & Rouhan, G. 2009. Monograph of the *Elaphoglossum ciliatum* group (Dryopteridaceae). *Brittonia* 61 (3): 241-272. <https://doi.org/10.1007/s12228-009-9075-y>.
- Vasco, A.**, Moran R.C. & Rouhan, G. 2009. Circumscription and phylogeny of the *Elaphoglossum ciliatum* group (*E. sect. Lepidoglossa*, Dryopteridaceae) based on cpDNA sequences. *Taxon* 58 (3): 825-834. <https://doi.org/10.1002/tax.583011>
- Vasco, A.** 2006. *Elaphoglossum gemmatum* (Elaphoglossaceae), a new proliferous species from Colombia. *Brittonia* 58 (1): 1-3. [https://doi.org/10.1663/0007-196X\(2006\)58\[1:EGEANS\]2.0.CO;2](https://doi.org/10.1663/0007-196X(2006)58[1:EGEANS]2.0.CO;2)
- Benavides, A.M., Duque, A. J., Duivenvoorden, J. F., **Vasco, A.** & Callejas, R. 2005. A first quantitative census of vascular epiphytes in rain forests of Colombian Amazonia. *Biodiversity and Conservation* 14: 739-758. <https://doi.org/10.1007/s10531-004-3920-9>

### **Non-peer Reviewed Publications**

#### *Book Chapters*

- Vasco, A.** & Ocegüera-Figueroa A. F. 2016. Análisis de inferencia bayesiana con secuencias de ADN empleando el programa Beast2. In: Mata-López, R., A. N. Castañeda S., E. A. García, T., M. H. Escandón, M. B. Mendoza-Garfias y I. P. Cervantes Aguilar. (Coords.). *Manual de Prácticas de Sistemática Molecular y Bioinformática*. Las Pressas de Ciencias, Facultad de Ciencias, UNAM. México. Video: <https://youtu.be/2qCiFt4RUUk>
- Vasco, A.** 2011. *Elaphoglossum*. In: Flora De Antioquia, Catalog of Vascular Plants. Vol. 2. List of Vascular Plants of the Department of Antioquia. Programa Expedición Antioquia 2013. Pages 157 – 163. ([http://www.missouribotanicalgarden.org/Portals/0/staff/PDFs/ortiz/OrtizR2011Menispermaceae\\_Ant.pdf](http://www.missouribotanicalgarden.org/Portals/0/staff/PDFs/ortiz/OrtizR2011Menispermaceae_Ant.pdf))

#### *Book Reviews*

- Vasco, A.** 2008. Helechos arborescentes de Guatemala: distribución, diversidad, usos y manejo, by Mario Véliz and Jorge Vargas. *American Fern Journal* 98 (3): 178.

#### *Others*

- Vasco, A.**, Matos, F.B., Sundue, M. 2021. Robbin C. Moran, Fern and Lycophyte Curator- an Appreciation. *The Botanical Review* 87: 151-166. <https://doi.org/10.1007/s12229-021-09254-2>
- Miller J. S. & **Vasco, A.** 2012. Robbin C. Moran—recipient of the 2011 Peter Raven Award. *Systematic Botany* 37: 5–6.

#### IV ELECTRONIC MEDIA

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- Vasco, A.**, R.C. Moran & M. Tulig (2008 and ongoing). *Elaphoglossum* pages: A web-based monograph of the fern genus *Elaphoglossum*. [sweetgum.nybg.org/elaphoglossum](http://sweetgum.nybg.org/elaphoglossum)
- Vasco, A.** & R.C. Moran & M. Tulig (2008 and ongoing). *Megalastrum*: an electronic monograph. [sweetgum.nybg.org/megalastrum](http://sweetgum.nybg.org/megalastrum)

#### V OUTREACH

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- Seminar: Ferns of Colombia: stories from the field. Fort Worth Botanic Garden and Botanical Research Institute of Texas. Fort Worth, 20 September 2022.
- Podcast: The botanist who collects ferns for the science of the future. Entrespecies, a podcast that seeks to answer the question of how human beings connect with nature through interviews, narrations, and sound explorations. <https://www.elespectador.com/ciencia/la-botanica-colombiana-que-colecta-helechos-para-la-ciencia-del-futuro/>. Aired 1 Sept 2022.
- Seminar: Ferns of Colombia: stories from the field. Eagle Hill Institute, Maine, USA. 25 August 2022.
- Live: Botany Live: The Ferns of Colombia. A celebration of the 50 years of the Medellín Botanic Garden. <https://youtu.be/wCMMIZtYzRo>. 10 August 2022 (In Spanish).
- Talk: Stories that Google will never tell you: Stories of the fern life cycle! Minute 37:30 on <https://youtu.be/m693Isnzs-I>. Published 22 March 2021. (In Spanish).
- Article: Ferns represented at the Botany meetings: Reflecting on 2017 and looking forward to 2018. *The Fiddlehead Forum*, the American Fern Society Newsletter.
- Talk: The debate of the origin of ferns and flowering plants: <https://youtu.be/OnOnCxMMzLY>. Short video from the National Autonomous University of Mexico website about our research on fern leaf development. Published 12 February 2017. (In Spanish).

#### V MEDIA COVERAGE

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- Article: El Espectador (one of the most widely read newspapers in Colombia): “The botanist that helps Colombia to know its great diversity of ferns” <https://www.elespectador.com/ciencia/la-botanica-que-le-ayuda-a-colombia-a-conocer-su-gran-diversidad-de-helechos/>. Published 28 Nov 2022 (In Spanish)
- Article: Forbes.com “Scientists Racing Against Time to Document Colombian Fern Species” <https://www.forbes.com/sites/andrewwright/2022/05/22/scientists-racing-against-time-to-document-colombian-fern-species/?sh=75b3c17b465f>. Published 22 May 2022.
- Radio segment: NPR Kera news “Fort Worth Researchers Awarded Grant to Study Blueberries & Ferns — But COVID May Slow Their Work” <https://www.keranews.org/2021-02-05/fort-worth-researchers-awarded-grant-to-study-blueberries-ferns-but-covid-may-slow-their-work>. Published 5 Feb 2021
- Article: New data on the development and evolution of leaves, *Boletín Academia Mexicana de Ciencias*, 003, 2017. <http://www.comunicacion.amc.edu.mx/comunicados/nuevos-datos-acerca-del-desarrollo-y-la-evolucion-de-las-hojas>. Published in the Bulletin of the Mexican Academy of Sciences, and in the Mexican Newspaper “La Jornada” about our research on leaf evolution and development. Published 6 January 2017. (In Spanish)

- Article: Evolutionary biology explains the diversity in seedless vascular plants  
<http://www.conacytprensa.mx/index.php/ciencia/mundo-vivo/10003-biologia-evolutiva-para-entender-la-diversidad-en-plantas-vasculares-sin-semilla-nota-de-la-reunion-de-la-amc>. Published in the Mexican National Council of Science and Technology (CONACYT) on-line journal. Published 5 September 2016. (In Spanish)
- Editor choice: Elucidating epiphytic diversity, *Science* 2011, Editor's Choice, 332: 641-642. Note about our paper on Amazonian epiphytes, in the section of the Editor choice of the journal *Science*.

#### VI GRANTS, FELLOWSHIPS, AND AWARDS

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- National Science Foundation Research Grant (DEB-2045319). 2021-2025. "PurSUiT: Collaborative Research: Accelerating Lineage Discovery to Document Neotropical Fern Diversity" PI. (736,105 US Dollars)
- Texas Parks and Wildlife, License Plate Grant, 2021-2021. "Delineating the Species Identity of the State Threatened Rock Quillwort (*Isoetes lithophila* N. Pfeiffer)". PI. (16,000 US Dollars)
- Western National Parks Association 2020-2023. "Unveiling a potential new species of California Jewelflower endemic to Pinnacles National Park". Co-PI (10,000 US Dollars)
- National Science Foundation, Advancing Digitization of Biological Collections (ADBC) program (ADBC-1802270). 2018-2021. "Digitization TCN: Collaborative Research: The Pteridological Collections Consortium: An integrative approach to pteridophyte diversity over the last 420 million years" PI. (59,221 US Dollars)
- CONACYT (Mexican National Council of Science and Technology), Support for the Strengthening and Development of Scientific and Technological Infrastructure. 2016. "Establishment of the Laboratory of Functional Genomics and Systems for the Study of the Economic and Cultural Diversity of Mexico". Co-PI (400.000 US Dollars)
- National Autonomous University of Mexico, Program UNAM-DGAPA-PAPIIT (IA201416) Research Grant. 2016-2017. "Evolutionary history and diversity of the hiperdiverse genus of tropical ferns *Elaphoglossum* (Dryopteridaceae) in Mexico" (50.000 US Dollars)
- FAPERJ (Foundation for Research Support of the State of Rio de Janeiro, Brazil). 2016-2017. "Morphological and phylogenetic diversification in *Diplazium* (Athuriaceae) in the Neotropical region" In conjunction with Dr. Claudine Mynssen from the Rio de Janeiro Botanical Garden. (7.000 US Dollars)
- CONACYT (Mexican National Council of Science and Technology), Academic Internships for Foreigner Researchers. 2014-2015. Research in collaboration with Dr. Teresa Terrazas, (24.000 US Dollars)
- National Science Foundation Research Grant (DEB-1020443). 2010-2013. "Taxonomic Revision, Phylogenetic Analysis, and Leaf Evolution in *Elaphoglossum* sect. *Squamipedia* (Dryopteridaceae)". Collaborative proposal with Drs. Robbin Moran and Barbara Ambrose as PIs. (337.499 US Dollars)
- City University of New York, Doctoral Program, Student Research Grant. 2006 & 2008.
- Explorers Club, exploration fund grant. 2007. "Systematics of *Elaphoglossum* subsection *Muscosa*: what does a group of tropical ferns tell about Andean biogeography?" Award to cover part of the costs to do fieldwork in Colombia and Venezuela.
- Cuatrecasas Award, US National Herbarium. 2007. "Monograph and phylogenetic study of *Elaphoglossum* subsection *Muscosa* (Dryopteridaceae)". Award to visit the US National Herbarium for two weeks.

Delzie Demaree Travel Award. 2007. Award to attend the 53<sup>rd</sup> Annual Systematics Symposium at the Missouri Botanical Garden and visit the MO herbarium.

City University of New York, Graduate Center, Sue Rosenberg Zalk Student Travel and Research Fund. 2006, 2007, 2008, and 2009

Lehman College, Department of Biological Sciences, City University of New York. 2004. Funds for laboratory and field supplies.

TROPENBOS International Foundation. 2001-2002. Undergraduate Research in Biodiversity Grant. Floristic composition and distribution of vascular epiphytes in the Chiribiquete National Park, Colombian Amazonia.

#### VII ABSTRACTS PUBLISHED AND PRESENTATIONS IN CONGRESSES

(last 5 years, a complete list is available upon request)

# Invited symposium or round table; \* presented by the indicated co-author; ^ undergrad student

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- Vasco, A.**, Testo, W., Lóriga, J., Martínez-Becerril, A.G., Rodríguez, A., Matos, F.B., Moran, R.C., Rouhan, G., Sessa, E., Burleigh, G. Phylogenomics and historical perspectives in the fern genus *Elaphoglossum* (Dryopteridaceae). In: *Botany 2021 online* (Botanical Society of America Annual Meeting). July 19-23.
- Martínez-Becerril, A.G. & **Vasco, A.** Disentangling the systematics of the *Elaphoglossum petiolatum* complex (Dryopteridaceae). In: *Botany 2021 online* (Botanical Society of America Annual Meeting). July 19-23. \*Wherry Award for best presentation at the Pteridological Section.
- Vasco, A.** & Testo, W. 2021. The fern genus *Elaphoglossum*, insights on their habit evolution. First Colombian Symposium of Epiphytes. Medellín Botanical Garden. Online: <https://youtu.be/Bvyam3qqEag> (In Spanish: 1:08-1:26)
- Rehman, T. F., Lane, J.\*, Bordelon, A., & **Vasco, A.** 2020. Digitization of a pteridophyte herbarium: A method to curate and inform fern and lycophyte research in Texas. Texas Plant Conservation Conference, online. August 13 & 14. (<https://pteridophytes.berkeley.edu/digitization-of-a-pteridophyte-herbarium-at-brit/>)
- Cruz, R.\*; Melo-de-Pinna, G.F.A.; **Vasco, A.**; Prado, J.; Ambrose, B.A. 2020. Evolution of leaf meristems in ferns. First Brazilian Symposium of Systematic and Evolution of Plants, online. August 9.
- Hernández-Hernández, B<sup>^</sup>, Tapia-Lopez, R., Ambrose, Barbara, **Vasco, A.** 2020. *R2R3-MYB* gene evolution in plants, incorporating ferns into the story. In: *Botany 2020 online* (Botanical Society of America Annual Meeting). July 27-31.
- Rodríguez, C., **Vasco, A.**, Ambrose, B.A. & Pabon-Mora, N. 2019. Understanding the contribution of *LFY* and *PEBP* flowering genes to fern leaf dimorphism. In: *Botany 2019* (Botanical Society of America Annual Meeting). Tucson, Arizona, July 29-31.
- Robertson, J., Sundue, M., Doyle, V., **Vasco, A.** & Matos, F. 2019. Phylogenetic analyses identify a novel clade of epibiotic fungi restricted to ferns (Poster). In: *Botany 2019* (Botanical Society of America Annual Meeting). Tucson, Arizona, July 29.
- DuFresne, L.<sup>^</sup> & **Vasco, A.** 2019. Studying natural history collections to understand the ferns and lycophytes of the Dallas-Fort Worth Metroplex (Poster). In: *Botany 2019* (Botanical Society of America Annual Meeting). Tucson, Arizona, July 29.
- Vasco, A.**<sup>#</sup> 2018. The fern genus *Elaphoglossum*: systematics and molecular genetics of leaf development. In: IAPT Early career investigator symposium: Systematics in Latin America. XII Latin-American Botanical Congress. Quito, Ecuador, Oct 21-28.

- DuFresne, L.\*<sup>^</sup> & **Vasco, A.** 2018. Studying natural history collections to understand the ferns and lycophytes of the Dallas-Fort Worth Metroplex. Texas Plant Conservation Conference. Fort Worth, Texas, September 19-21.
- Vasco, A.**, Ambrose, B. & Moran, R. 2018. The fern genus *Elaphoglossum*: systematics and molecular genetics of leaf development. In: *Botany 2018* (Botanical Society of America Annual Meeting). Rochester, Minnesota, July 21-25.
- Vasco, A.**, Watkins, E. & Moran R. (Organizers). 2018. Biology of Isoetales: A Colloquium in honor of Carl W. Taylor. In: *Botany 2018* (Botanical Society of America Annual Meeting). Rochester, Minnesota, July 21-25.
- Vasco, A.**<sup>#</sup> 2017. Molecular genetics of leaf development in the genus of ferns *Elaphoglossum*. In: XVII National Congress on Plant Biochemistry and Molecular Biology. X Joint Mexico - U.S. Symposium. Puerto Vallarta, Mexico, November 13-17.
- Vasco, A.** 2017. Fern leaf evolution and development: building better models from fern leaf diversity. In: IX Latin American Society for Developmental Biology. Medellin, Colombia, October 9-13.
- Vasco, A.**<sup>#</sup> 2017. Studying fern leaf evolution and development to better understand the evolution of form and function in land plants. Symposium: Evolution, biology, and conservation of ferns and lycophytes. In: 68th Brazilian Botanical Congress. Rio de Janeiro, Brazil August 20-25.
- Vasco, A.** & Ambrose, B.A. 2017. Leaf evolution and development: building better models from fern leaf diversity. In: *Botany 2017* (Botanical Society of America Annual Meeting). Fort Worth, Texas, July 24-28. \* Wherry Award for best presentation at the Pteridological Section.
- Vasco, A.**<sup>#</sup> & Ambrose, B.A. 2016. Integrating evolutionary and developmental biology to understand the diversity of seedless vascular plants. Symposium: Evolution, biology, and conservation of lycophytes and ferns: advances, case studies, and perspectives. In: XX Congreso Mexicano de Botánica. Mexico City, México. September 4-9.
- Pérez-Atilano, Y.\*<sup>,</sup> Sánchez, A., Terrazas, T., **Vasco, A.** 2016. Morphological and anatomical analysis of the *Myriopteris lendigera* (Pteridaceae) complex in Mexico. In: XX Congreso Mexicano de Botánica. Mexico City, México. September 4-9.
- Martínez Becerril, A. G. & **Vasco, A.** 2016. Evolutionary history and diversity of the genus *Elaphoglossum* (Dryopteridaceae) in Mexico (Poster). In: XX Congreso Mexicano de Botánica. Mexico City, México. September 4-9.
- Vasquez Pérez, E., Adame, G. & **Vasco, A.** 2016. Lycophytes and ferns of the Nuevo Zoquiapan municipality, Sierra Norte de Oaxaca (Poster). In: XX Congreso Mexicano de Botánica. Mexico City, México. September 4-9.
- Vázquez Alonso, M., Rojas, B. & **Vasco, A.** 2016. Lycophytes and ferns of the Botanical Garden of the Soconusco region, Chiapas, Mexico (Poster). En: XX Congreso Mexicano de Botánica. Mexico City, México. September e 4-9.
- Torres Colín, R., Sundue, M., Testo, W. & **Vasco, A.** 2016. Lycophytes and ferns of the Sierra de Juárez and adjacent areas (Ixtlán District, Oaxaca, Mexico): A digital florula (Poster). In: XX Congreso Mexicano de Botánica. Mexico City, México. September 4-9.
- Ambrose, B.A.\*<sup>#</sup>, **Vasco, A.** 2016. *Equisetum* morphology: An evo-devo perspective. In: *Botany 2016* (Botanical Society of America Annual Meeting). Savannah, Georgia, USA. July 30-August 3.
- Vasco, A.**, Ambrose, B.A. 2016. Evolution and development of leaves, the story that lycophytes and ferns tell. In: Evolution 2016. Austin, Texas, USA. June 17-21.



- Ambrose, B.A.\* #, Smalls, T., **Vasco, A.** 2015. Evolution and development in lycophytes and ferns; Symposium: A Broader view for Plant EvoDevo: novel approaches for diverse model systems. In: *Abstracts of Botany 2015* (Botanical Society of America Annual Meeting). Edmonton, Alberta, Canadá. July 25-29.
- Vasco, A.** #, Smalls, T., Moran, R.C., Ambrose, B.A. 2015. *Class III HD Zip* and *Class I Knox* angiosperm leaf genes, the history that ferns tell. Symposium: Evolution and development in ferns and lycophytes: case studies and perspectives. In: Next Generation Pteridology: An International Conference on Lycophyte and Fern Research. Washington DC, USA. June 1-5.
- Ambrose, B.A.\* #, Smalls, T., **Vasco, A.** 2015. Evolution and development in lycophytes and ferns. Symposium: Evolution and development in ferns and lycophytes: case studies and perspectives. In: Next Generation Pteridology: An International Conference on Lycophyte and Fern Research. Washington DC, USA. June 1-5.
- Moran, R.C.\* #, Rouhan, G., Sundue, M., Schuettelpelz, E., Garrison-Hanks, J., **Vasco, A.**, Labiak, P., Prado, J. 2015. Diversity and biogeography of *Megalastrum* (Dryopteridaceae). Symposium: Biogeographic Patterns and Processes of Speciation and Hybridization in spore-bearing plants. In: Next Generation Pteridology: An International Conference on Lycophyte and Fern Research. Washington DC, USA. June 1-5.
- Perez-Atilano, Y.\* #, Sanchez, A., Terrazas, T., **Vasco, A.** 2015. Morphological and anatomical analysis of complex *Myriopteris lendigera* (Pteridaceae) in Mexico. In: Next Generation Pteridology: An International Conference on Lycophyte and Fern Research. Washington DC, USA. June 1-5.
- Mynssen, C., **Vasco, A.**, Moran, R.C., Rouhan, G. 2015. Contribution to the phylogeny of neotropical *Diplazium* (Athyriaceae). In: Next Generation Pteridology: An International Conference on Lycophyte and Fern Research. Washington DC, USA. June 1-5.

#### VIII INVITED TALKS (excluding meetings and congresses)

(last 5 years, a complete list is available upon request)

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- October 2022. Colombia, a country of ferns. Travel stories. Biology Institute, National University of Colombia, Bogotá, Colombia (seminar in Spanish).
- April 2022. WeDigBio2022, Spotlight on Fern Research: Exploring Colombia one fern at a time. Botanical Research Institute of Texas, USA.
- November 2021. International Seminar on Diversity, Ecology, and Conservation of Pteridophytes organized by the University of Veracruz, Mexico. "Phylogenomics and evolutionary history of the fern genus *Elaphoglossum* (Dryopteridaceae)" (virtual, seminar in Spanish). Online: <https://youtu.be/yf4in5tAi4Y> (min 49:30- 1:23:00).
- October 2021. Botanical Institute of the Northeast, Argentina. "Taxonomic history and Phylogenomics of the fern genus *Elaphoglossum*" (virtual, seminar in Spanish).
- April 2021. WeDigBio2021, Spotlight on Herbarium Research: Epiphytes! The New York Botanical Garden, Bronx, NY, USA. Online: <https://youtu.be/jvCsWFkdOAw> (min 15-32).
- March 2021. Exploring the evolution and genetic basis for leaf morphology differences in the fern genus *Elaphoglossum*. Plant Biology Department Seminar, University of Vermont.
- February 2021. From the field to the lab, leaf evolution and development in the fern genus *Elaphoglossum*. Botany Lunch seminar series, University of California Berkley.
- October 2020. Stories of ferns and leaves. Federal University of Santa Catarina (Brazil). Biology Graduate School. Online: [https://youtu.be/R\\_B-NCK50gw](https://youtu.be/R_B-NCK50gw) (In Portuguese).

- August 2020. Epiphytic ferns in Colombia. Panel of Colombian Epiphyte Experts. Medellin Botanical Garden. Online: <https://youtu.be/x7mchtGeXVQ> (In Spanish: min 41-57).
- May 2020. Stories of ferns and leaves. Graduate School of Mexico (Colegio de Posgraduados, Mexico). Online: <https://youtu.be/Gsi9jL0oOT0> (In Spanish).
- October 2019. Getting to know the native ferns of the DFW metroplex. Southwestern Fern Society. Dallas, USA.
- February 2019. A journey filled with ferns. Collin County Community College. Dallas, USA.
- February 2018. A journey filled with ferns. Southwestern Fern Society. Dallas, USA.
- October 2017. Leaf evolution and development, the tale that ferns tell. Colombian network of Evolutionary Biology. Medellin, Colombia (In Spanish).
- September 2017. How to press ferns. Texas Gulf Coast Fern Society, Houston, USA.
- September 2017. We all love flowers, but what about leaves? Leaf evolution and development in ferns. Botanical Research Institute of Texas, Brown bag lunchtime series. Fort Worth, Texas, USA.
- August 2016. Science and humanism II: Integrating evolutionary and developmental biology to understand the diversity in vascular seedless plants. Mexican Academy of Sciences. Mexico City, Mexico. <https://youtu.be/ciZ5ValHzlg> (In Spanish, 2:30-3:15 hrs)
- August 2016. Frontiers of knowledge in plant biology: Integrating evolutionary and developmental biology to understand the diversity in vascular seedless plants. Facultad de Ciencias. National Autonomous University of Mexico. Ciudad de Mexico, Mexico. <https://youtu.be/gocURvpZ3Kw> (In Spanish)
- June 2016. Leaf evolution and development, the history that seedless vascular plants tell. LANGEBIO (Laboratorio Nacional de Genómica para la Biodiversidad), Cinvestav, Irapuato, México (In Spanish)
- May 2016. Lycophytes and Ferns of Mexico. Texas Gulf Coast Fern Society, Houston, USA.
- April 2016. A look at basic approaches to understand diversity: Integrating evolutionary and developmental biology to understand the diversity in vascular seedless plants. Autonomous University of Chapingo, Texcoco, México (In Spanish)
- June 2015. Evolution and development in lycophytes and ferns. 13th Smithsonian Botanical Symposium, Smithsonian National Museum of Natural History, Washington DC, USA
- February 2015. Systematics, evolution, and development of ferns and lycophytes: case studies and perspectives. National Autonomous University of Mexico, México (Seminar given in Spanish)

## IX HONORS

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- Chair of the Pteridological Section, Botanical Society of America (2020-2023).
- Member of the Scientific Committee of the Colombian network of Evolutionary Biology, Colombia. 2015-2020 (<https://issuu.com/boletincolevol>).
- Associate Editor: Systematic Botany (2015-present); Revista Mexicana de Biodiversidad (2016-present); Botanical Sciences (2019-present), Rodriguésia (2020- present), American Fern Journal (2021-present)
- National Researcher Level I, CONACYT (Mexican National Council of Science and Technology), México. 2016-2018.
- Honorary Curator of the New York Botanical Garden, New York, USA. 2014-2015 & 2016-2017.
- Oliver Hazard Perry Fellowship. The New York Botanical Garden Graduate Studies Program. Research assistantship that covers tuition and stipend for five years to carry out PhD. studies. August 2004-December 2009

Huygens Scholarships Program Nuffic: Netherlands Organization for International Cooperation in Higher Education. Scholarship covering tuition and stipend to spend three months at the Amsterdam University. May- July 2003

Best student in the Biology program. Awarded fellowship for the Master's program at the University of Antioquia. Medellín, Colombia. Declined. 2002

Best advanced student in the Biology program. Tuition fellowship to finish the bachelor's in science. University of Antioquia. Medellín, Colombia. 1999

#### X TEACHING EXPERIENCE

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**Ferns and lycophytes of Colombia: Modern and traditional tools for their study.** Workshop for undergrad students as part of the XI Colombian Botanical Conference, Meta University, Villavicencio, Colombia. November 4 and 5, 2022 (16 hours).

**Biology of Ferns and Lycophytes.** Co-taught with: Dr. Robbin C. Moran. Humboldt Field Research Institute, Steuben, Maine, USA. August 21 – 27, 2022 (40 hours)

**Tropical Ferns and Lycophytes.** Graduate Level. Organization for Tropical Studies (OTS), Universidad de Costa Rica. June 7-23, 2022 (140 hours).

**Modern and traditional tools for the study of ferns and lycophytes.** Graduate Level. National School of Tropical Botany, Rio de Janeiro Botanical Garden. November 1-10, 2021 (60 hours, virtual).

**The wild world of ferns.** Adult Education Class. Botanical Research Institute of Texas. January 23, 2021 (2 hours, virtual)

**Seedless Vascular Plants.** Undergrad Level. Invited 2-hour lecture for the BIOL 3427 Plant Science, University of Texas at Arlington. November 7, 2019.

**Tropical Ferns and Lycophytes.** Graduate Level. Organization for Tropical Studies (OTS), Universidad de Costa Rica. January 3-19, 2019 (140 hours).

**Modern and traditional tools for the study of ferns: from field work to taxonomy and developmental biology.** Graduate Level. National School of Tropical Botany, Rio de Janeiro Botanical Garden. August 28-September 1, 2017 (40 hours).

**Biology and Evolution of Plants.** Undergrad Level. Faculty of Sciences, Biology, National Autonomous University of Mexico. Fall and Spring, 2016 and 2017, Spring 2018 (96 hours/semester)

**Tropical Ferns and Lycophytes.** Graduate Level. Organization for Tropical Studies (OTS), Universidad de Costa Rica. January 6-22, 2017 (140 hours).

**Evolutionary biology in non-model organisms.** Graduate Level. Graduate Program in Biological Sciences at the National Autonomous University of Mexico. October 17- November 11, 2016 (64 hours).

**Molecular Systematics.** Graduate Level. Graduate Program in Biological Sciences at the National Autonomous University of Mexico. January-June 2016 (64 hours).

**Biology and Evolution of Vascular Seedless Plants: Ferns and lycophytes.** Graduate Level. Graduate Program in Biological Sciences at the National Autonomous University of Mexico. August 10-28, 2015 (64 hours).

**Tropical Ferns and Lycophytes.** Graduate Level. Organization for Tropical Studies (OTS), Universidad de Costa Rica. January 7-22, 2015 (140 hours).

- Evolutionary biology in non-model organisms.** Graduate Level. Graduate Program in Biological Sciences at the National Autonomous University of Mexico. September 29- October 27, 2014 (64 hours).
- Biology and Evolution of Vascular Seedless Plants: Ferns and lycophytes.** Graduate Level. Graduate Program in Biological Sciences at the National Autonomous University of Mexico. August 11-29, 2014 (64 hours).
- Biology and Systematics of Ferns and Lycophytes.** Undergraduate Level. Universidad de Antioquia, Colombia. June 4-10, 2011 (40 hours)
- Taxonomy and Systematics of Ferns and Lycophytes.** Undergraduate Level. Universidad Católica de Quito, Ecuador. May 12-31, 2011 (70 hours)
- Workshop on assembling and analyzing morphological data.** Graduate Level. One week workshop as part of the Biological Systematics by Professor J. Rachlin. Department of Biology, Lehman College, CUNY. Bronx, USA. May 2006 and April 2007 (25 hours)
- Teaching Assistant: Taxonomy of Ferns and Lycophytes.** Teacher: Dr. Jefferson Prado. IV Colombian Botanical Conference, Medellín, Colombia. April 19-21, 2007 (25 hours)
- Teaching Assistant: Biology of Ferns and Lycophytes.** Teacher: Dr. Robbin C. Moran. Humboldt Field Research Institute, Steuben, Maine, USA. August 21 – 27, 2005 (40 hours)
- General Biology and Laboratory.** Undergraduate Level School of Natural and Exact Sciences University of Antioquia. Medellín, Colombia. Jan-Dec 2003 (112 hours)
- Teaching Assistant. Vascular Plant Morphology.** School of Natural and Exact Sciences, University of Antioquia. Medellín, Colombia. August- December 2001
- Teaching Assistant. Vascular Plant Taxonomy.** School of Natural and Exact Sciences, University of Antioquia. Medellín, Colombia. January- July 2000
- Teaching Assistant. General Botany.** School of Natural and Exact Sciences, University of Antioquia. Medellín, Colombia. Jan- December 1999

## XI STUDENT MENTORING

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### **PhD**

**Advisor.** Ana Gabriela Martinez. Systematics of the Mexican species of the *Elaphoglossum petiolatum* complex. National Autonomous University of Mexico. Expected date of defense February 2023.

### **Master**

**Co-advisor.** Susana Vega-Betancur. The genus *Selaginella* in Antioquia (Colombia). Biology Institute, University of Antioquia, Colombia. Expected date of defense July 2023.

**Co-advisor.** Carolina Rodriguez. *LEAFY* and *PEBP* floral genes expression in lycophytes and ferns. Biology Institute, University of Antioquia, Colombia. Defense May 7, 2021.

### **Bachelor**

**Co-advisor.** Laura Lucía Vargas. *Elaphoglossum* section *Lepidoglossa* of the department of Cundinamarca, Colombia. National University of Colombia. Defense Jul 5, 2022.

**Co-advisor.** Susana Vega-Betancur. The genus *Selaginella* in the Department of Antioquia, Colombia. University of Antioquia, Colombia. Defense Dec 17, 2019.

**Co-advisor.** Eulalia Vásquez Perez, Eulalia. Licofitas y helechos del Municipio de Nuevo Zoquiapan, Sierra Norte de Oaxaca. Universidad de la Sierra Juárez (in progress, expected July 2023)

*Co-advisor.* Brenda Hernández. *Asymmetric leaves 1 and 2* genes in ferns. National Autonomous University of Mexico. Defense Jun 14, 2019.

*Co-advisor.* Carolina Rodriguez. Genetic control of dimorphic leaves in ferns. University of Antioquia, Colombia. Defense, Nov 28, 2017.

*Advisor.* Jorge Arias. Morphology and anatomy of Eupolypoid II ferns. National Autonomous University of Mexico. Defense, May 18, 2017.

### **Graduate committee member**

#### **PhD**

Cruz, Rafael. Leaf Ontogeny in Dryopteridaceae, under the continuous morphological approach of Agnes Arber. PhD in Biology. University of Sao Paulo, Brazil. 2014-2018.

#### **Master**

Petrone, Emilio. Functional Inferences of dimorphic wood through transcriptome analysis in Cactaceae. Master's in Sciences, National Autonomous University of Mexico. Defense, Feb 21, 2018.

#### **Bachelor**

Bravo, William. Ferns and Fern Allies of the Forest Reserve Bijagual, Boyaca, Colombia. Pedagogical and Technological University of Colombia, Tunja, Colombia. April 2013.

### **Thesis defense committee**

#### **PhD**

Aragón, Alejandro A. Exploring root development in ferns as an approach to assess their evolution in vascular plants - Morphological and gene expression analysis of the root apical meristem in *Ceratopteris richardii*. PhD in Integrative Biology, Center for Research and Advanced Studies of the National Polytechnic Institute of Mexico (CINVESTAV). July 9, 2021.

Matos, Fernando B. Systematic Studies of *Elaphoglossum* section Polytrichia (Dryopteridaceae). PhD in Plant Sciences, City University of New York / The New York Botanical Garden. July 20, 2015.

#### **Master**

Rativa, Cristian Camilo. Taxonomic revision of the family Cyatheaceae Kaulf. for the department of Quindío, Colombia. Quindío University, Colombia. Dec 1, 2022.

Reis, Atilés. Taxonomy of the *Asplenium serratum* complex (Aspleniaceae) in the Brazilian Atlantic Forest. Federal University of Rio de Janeiro, National Museum. Graduate Program in Biological Sciences (Botany). Aug 30, 2022.

Bastos, Luiza M. Conservation biology of *Pteris congesta* (Pteridaceae): an endemic and endangered species. Graduate Program in Botany, National School of Tropical Botany, Rio de Janeiro Botanical Garden Research Institute. June 29, 2021.

Yáñez, Marisela. Phylogeny of the genus *Strophocactus* (Cactaceae). National Autonomous University of Mexico. March 29, 2017.

Gonzalez-Ramirez, Ixchel Sarahí. Diversity of Cretaceous fossil conifers in the state of Chiapas, Mexico. National Autonomous University of Mexico. March 10, 2017.

Maussan-Pérez, Ana Isabel. Density of veins in leaves of the Miocene fossil localities of San Esteban Tizatlán, Tlaxcala and Ixtapa, Chiapas, a method for use as a possible tool in paleoclimatic interpretations. National Autonomous University of Mexico. October 20, 2015.

Benitez-Villaseñor, Adriana. The floral structure diversification of pentamer Eudicots. National Autonomous University of Mexico. October 15, 2015.

**Academic Internship director:**

Undergrad student (summer Intern) Iván Rosales from University of Texas Arlington, USA. June-August 2019.

Undergrad student (summer Intern) Lani DuFresne from Rice University, USA. June- August 2018.

Undergrad student (summer Intern) Eulalia Pérez Vásquez from the Universidad de la Sierra Juárez, Ixtlan, Oaxaca. August- September 2015.

Undergrad student (Summer Intern) Christian Adolfo Lopez from the University of Panama, Panama. July 15 to August 28, 2015.

Visiting Professor Gabriel Gonzales Adame from the Universidad de la Sierra Juárez, Ixtlan, Oaxaca, August 2015.

Master's student Josmaily Lóriga from the Institute of Ecology and Systematics of Havana, Cuba. August- November 2012

Summer Intern Ana Kudla, under the NSF program "Research Opportunities for Undergrads". May-July 2010

Summer Intern Maya Smith, under the NSF program "Research Opportunities for Undergrads". May-July 2009

XII OTHER ACTIVITIES

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**Review services:** Actualidades Biológicas (2011, 2012), American Fern Journal (2011, 2016, 2017, 2019, 2020, 2021), Annals of the Brazilian Academy of Sciences (2017), Annals of the Missouri Botanical Garden (2019), Biological Journal of the Linnean Society (2022), Blumea (2010), Bonplandia (2011), Botanica Complutensis (2021), Botanical Journal of the Linnean Society (2021), Botanical Sciences (2014, 2015, 2021), Brittonia (2005, 2014, 2016, 2019), Cladistics (2014), Darwiniana (2008), Flora (2015, 2020), Flora de Colombia (2015), Frontiers in Plant Science (2019), International Journal of Plant Sciences (2017), International Journal of Tropical Biology and Conservation (2017), Journal of the Botanical Research Institute of Texas (2021), Journal of the Torrey Botanical Society (2011), Molecular Systematics and Evolution (2017), Phytotaxa (2012, 2018), PLOS One (2014), Revista Ecuatoriana de Botánica (2021), Revista Mexicana de Biodiversidad (2016, 2017), Rodriguésia (2015), Scientific Reports (2019), Systematic Botany (2012, 2013, 2015, 2016, 2017, 2018)

**Grant Reviewer:**

Proposal Reviewer, National Science Foundation, Division of Environmental Biology, USA. October 2021

Full Proposal Review Panel, National Science Foundation, Division of Environmental Biology, USA. February 2021

Proposal Reviewer, National Science Foundation, Division of Environmental Biology, USA. October 2017

Technical Committee for Project Evaluation, Foundation for the Promotion of Research and Technology, Bogotá, Colombia. May 2018, September 2015, November 2014, and August 2013

Abstract reviewer on Developmental Biology, VIII Colombian Congress of Botany, 2015.

Committee for the Development of Research (Codi), Region specific problems, University of Antioquia, Medellin, Colombia. October 2014

Committee for the Development of Research (Codi), Natural Sciences, University of Antioquia, Medellin, Colombia. February 2013.

**Field Work:**

Brazil: 2010, 2014, 2017

Colombia: more than 10 expeditions between 2001 and 2021

Costa Rica: 2001, 2007, 2015, 2017, 2019

Ecuador: 2010, 2013, 2018

Mexico: More than 5 expeditions between 2013 and 2016

United States: More than 5 expeditions between 2004 and 2018

Venezuela: 2008

**Professional Societies Member:** American Fern Society, American Society of Plant Taxonomists, Botanical Society of America, Colombian Botanical Association, International Association of Plant Taxonomists, Society of Herbarium Curators.

**July 2022**