Sarah Mathews
Curriculum Vitae

Professor and Shirley C. Tucker in Plant Systematics
Department of Biological Sciences
Louisiana State University
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APPOINTMENTS

Louisiana State University, Baton Rouge, LA, Department of Biology, Professor and Shirley C Tucker Chair in Plant Systematics (2019-)
Australian National Herbarium, Commonwealth Scientific and Industrial Research Organisation, Canberra, Senior Research Scientist (2014-2019), Team Leader (2015-2019), Visiting Scientist (2019-2020)
The Australian National University, Canberra, Research School of Biology, Honorary Associate Professor (2015-2020)
Harvard University, Department of Organismic and Evolutionary Biology, Sargent Fellow of the Arnold Arboretum (2003-2013), Lecturer (2007-2009), Associate (2013-)
University of Missouri-Columbia, Division of Biological Sciences, Assistant Professor (2000-2003)
Harvard University, Department of Organismic and Evolutionary Biology, NSF Postdoctoral Fellow in Biosciences Related to the Environment (1995-1997), Postdoctoral Fellow (1997-2000),

EDUCATION

Ph.D. (1995), M. S. (1990), Montana State University, Biological Sciences
B. S. (1980), Colorado State University, Botany and Plant Pathology

AWARDS/HONORS

Shirley C. Tucker Endowed Chair, Louisiana State University (2019)
Fellow, American Association for the Advancement of Science (Elected 2016)
Melinda F. Denton Memorial Lecture, University of Washington (2009)

PAST GRANT SUPPORT

The Centre for Biodiversity Analysis: “Genomic diversity in Australian Palms”, Ignition grant: $10,000, 2016-2017 (Co-PI with postdoctoral fellow Bee Gunn).
NSF: IOS-1416825, Plant Genome Research Program: “Comparative genomics of a species radiation: sequencing the apple tribe”, 2014-2016, $300,000 (Lead PI).
NSF: DEB-1020868: “Biogeographical and ecological diversification of trees across the Indonesian

archipelago: developing indigenous leadership in biodiversity informatics." 2008-2015, $380,000. (Co-PI with Lead PI Campbell O. Webb).
NSF: EF-0629890: "Collaborative Research: Gymnosperms on the Tree of Life: Resolving the phylogeny of seed plants", 2006-2013, $665,505 (Lead PI).
NSF: DEB-0215780: "Phylogeny of Orobanchaceae sensu lato inferred from phytochromes and other data: implications for the evolution of parasitism", 2002-2005, $260,000 (PI).
NSF: IBN-0214449: "Adaptive evolution in the photoreceptor phytochrome A and its role in the ecological success of the first angiosperms", 2002-2005, $300,000 (PI).
University of Missouri Research Board: "Evolution and expression of phytochrome genes in parasites", 2003, $42,000 (PI).
NSF: DEB-9806397: "Duplicate genes and plant phylogeny", 1998-2001, $260,000 (Co-PI with PI Michael J Donoghue).
NSF: Postdoctoral Research Award in Biosciences Related to the Environment: "The evolution of phytochrome genes in early-diverging angiosperms", 1995-1997, $160,000 (PI).
American Society of Plant Taxonomists Graduate Student Research Award, 1994
Montana DOE/EPSCoR Graduate Trainee in Energy, Montana State University, 1993-1994
Sigma Xi Grant-in-Aid-of-Research Award, Montana State University, 1988

CURRENT GRANT SUPPORT

The Centre for Biodiversity Analysis: "Developing hyRAD-X capabilities in the CBA for population genomics and identification of cryptic species: a high-throughput tissue to SNP pipeline, tested in *Monotoca* (Ericaceae)", 2018-2019 (with Lead PIs Todd McLay, CSIRO and Kevin Murray, ANU)
CSIRO Environomics Future Science Platforms and The Centre for Biodiversity Analysis: "The biodiversity diversity informatics platform: An integrative predictive tool for spatial modelling of biodiversity over space and time", 2018-2020, (with Co-PIs Craig Moritz, ANU, and Juanita Arrieta-Rodriguez, CSIRO).
CSIRO SynBio Future Science Platforms: "In vitro resynthesis of the lichen symbosis as a useful system for synthetic biology", 2017-2020, $755, 044 (Co-PI with Cécile Gueidan).
CSIRO Environomics Future Science Platforms: "Rapid assessment of environmental stress for key Australian plant groups", 2017-2020, $69,704 (Lead PI).
ABRS: NTRGP-154: "An eFlora treatment for Australian *Hibiscus* and novel genomic markers for addressing taxonomic challenges in Malvaceae sensu lato", 2017-2020, $856,346 AUD (Lead PI).

POSTDOCTORAL ASSOCIATES/VISITING SCIENTESTS

Kim McBreen (2001-2003)
Jonathan Bennett (2002-2004)
Joel McNeal (2005-2007)
Mark Beilstein (2006-2009)
Hardeep Rai (2007-2010)
Nathalie Nagalingum (2007-2009)
Mark Clements (2008-2010)
Cary Pirone-Davies (2011-2013)
Jeff DaCosta (2014-2017)
Todd McLay (2017-2020)
Prof. Zhiduan Chen, Chinese Academy of Sciences, Beijing (2015)
Dr. Limin Lu, Chinese Academy of Sciences, Beijing (2015)

Berenice Villegas-Ramirez, M.Sc. candidate, Université Montpellier (2013-2014)
Dr. Susan Offner, Science Teacher, Lexington High School, Lexington, MA (2011-2012)
Dr. Markus Ruhsam, 2010, Royal Botanic Garden Edinburgh (2010)
Dr. Shuguang Jian, 2009, Chinese Academy of Sciences (2009)
Prof. Dorothy Shippen, sabbatical visitor, Texas A&M University (2008-2009)
Kate Hertweck, Ph.D. candidate, University of Missouri, Columbia (2009)
Eric Von Wettberg, Ph.D. candidate, Brown University (2003)

PhD THESIS COMMITTEES (student, thesis advisor, institution)

Lagomarsino, Laura (C. Davis, Harvard University)
Fay-Wei Li (K. Pryer, Duke University)
Lachezar Nikolav, (C. Davis, Harvard University)
Joshua Puzey, (E. Kramer, Harvard University)
Cheng-Chiang Wu (E. Kramer, Harvard University)
Daniel Fulop (E. Kramer, Harvard University)
Angelina Ballerini (E. Kramer, Harvard University)
Brad Ruhfel (C. Davis, Harvard University)
George Chiang (K. Donohue, Harvard University)
Mark Beilstein, (E. Kellogg, U. of Missouri-St. Louis)
Casey Dillman, (T. Holtsford, U. of Missouri-Columbia)
Alex Esmon, (E. Liscum, U. of Missouri-Columbia)
Holly Shugart, (R. Cocroft, U. of Missouri-Columbia)
Sherry Ellberg, (T. Holtsford, U. of Missouri-Columbia)
Gordon Burleigh, (T. Holtsford, U. of Missouri-Columbia)
Rainee Kaczorowski, (T. Holtsford, U. of Missouri-Columbia)
Ester Stroh, (T. Holtsford, U. of Missouri-Columbia)

UNDERGRADUATE OR POSTGRADUATE STUDENTS/HIGH SCHOOL INTERNS

Undergraduate theses supervised
Rocky Tsai, Harvard University

Undergraduate Research Training
Alexander Begg (2017); Jessie Knot (2015); Joshua Cofsky (2012); Will Skinner, Sameer Tyagi, Eric Schultz, Genny Mathews (2009-2010); Cindy Liu, Emma Banay, Sharon Jin, Amy Nguyen Vo (2008-2009); Kim Shafer, Osub Ahmed, Harold Wu (2007-2008); Amanda Fredericks, Yan Yan Mao (2006/2007); Stephanie Stuart (2004-2005); Emily Anderson, Christina Li, Firth McEachern (2005-2006); Julia Berthet (2005-2005); Devon Castillo, Angelico Razon (2004-2005); Benjamin Tseng, Daniel Sachs (2003-2004); Beth Lesniak, (2002-2003); Emily Bryant, Melissa Rugen, Jana U'Ren, Erica Erwin (2001-2002); Lisa Racki, Christina SooHoo, Elisa Freeman (1997-1999)

High School Summer Interns
Mark Chonofsky, Lexington High School, Lexington, MA (2008, 2009)
Noah Eakman, Inglemoor High School, Kenmore, WA (2009)

PROFESSIONAL SOCIETIES

American Society for the Advancement of Science
American Society of Plant Biologists
American Society of Plant Taxonomists
Australasian Systematic Botany Society
Botanical Society of America
Society of Systematic Biologists
Sigma Xi

COMMITTEES/SERVICE

Associate Editor, *Genes*|*Genomes*|*Genetics* (2017-)
Editorial Board, *The Plant Cell*, consulting editor (December 2017-)
Board of Advisors, *New Phytologist* (2013-)
Editorial Board, BMC *Evolutionary Biology* (2011-2015)
Rotating Program Officer, National Science Foundation (2011-2012)
iPlant Collaborative "Tree Biology" Team (2010-2013)
Associate Editor, *BMC Evolutionary Biology* (2008-2011)
NSF Site Visitor, Plant Genome Research Program projects (2005, 2008)
NSF sponsored workshop: Where to Next with the Tree of Life? (2008)
Committee of Visitors, NSF Plant Genome Research Program (2004)
NSF Review Panels (DEB, IOS, PGRP), (2001, 2003, 2005, 2014)
Editorial Board, *Systematic Biology* (2000-2005)

REVIEWS

Scientific Journals

American Journal of Botany, American Naturalist, Annals of Botany, Biochemical Genetics, Biochemical Systematics and Ecology, Biology Letters, BMC Evolutionary Biology, BMC Genomics, Canadian Journal of Botany, Cladistics, Conservation Genetics, Evolution, Frontiers in Plant Science, Genetics, Integrative and Comparative Biology, International Journal of Plant Sciences, Journal of Molecular Evolution, Molecular Biology and Evolution, Molecular Ecology, Molecular Phylogenetics and Evolution, Nature, Nature Communications, Nature Genetics, New Phytologist, Plant Cell, Plant Cell and Environment, Plant Journal, Plant Physiology, Plant Systematics and Evolution, PLOS Genetics, PLOS One, Proceedings of the National Academy of Sciences USA, Scientific Reports, Sida, Systematic Biology, Systematic Botany, Taxon, The Plant Journal, Tree Physiology, Trends in Plant Science

Granting Agencies & Publishers

US National Science Foundation; US Department of Agriculture; University of Missouri Research Board; Israel Science Foundation; Dutch NWO Large Investment Programme; American Philosophical Society; Sinauer Associates; University Grants Committee, Hong Kong; German Research Foundation

SYMPOSIA/MEETINGS ORGANIZED

"Cancer, Whales, and Robots – New Ways to Sense Biological Environments" (with O. Berry), CSIRO Cutting Edge Symposium (2018)

"Building our Botanical Capital" (co-organizer), Annual Conference of the Australasian Systematic Botany Society (2015)

"Colloquium: Emerging results from studies of gymnosperms on the tree of life I", Botanical Society of America (2010)

"Symposium: Emerging results from studies of gymnosperms on the tree of life II", Botanical Society of America (2010)

"Gathering the twigs and branches: reconstructing the gymnosperm tree of life" (with N. Nagalingum), 12th International Palynological Congress and 8th International Organisation of Palaeobotany Conference, Bonn, Germany (2008)

"Phylogeny Informs Biology", (with C. Davis), 4th Annual Plant Biology Symposium, Harvard University (2008)

INVITED PRESENTATIONS

Presentations at Major Symposia:

2018 Rapid detection of plant stress. In "Cancer, Whales, and Robots - New Ways to Sense Biological Environments, Hobart, Tasmania

2018 Inferring the evolutionary history of the far-red high irradiance response in seed plants. What data, and how many, do we need to reconstruct the evolution of a function? In "International Symposium on Plant Photobiology", Matsue, Japan

2017 Old specimens and ancient genes. In "Genomics and collections: from adaptation to macroevolution", Canberra, Australia

2017 Investigating diploid and polyploid genomes to discover genes associated with polyploid advantage, in "Plant Genomics" at the Global Biodiversity Genomics Conference, Washington DC

2016 Molecular evolution of phytochromes in green plants, at the Gordon Research Conference on "Photosensory Molecules and Signal Transduction", Galveston, TX

2015 Evo-devo in gymnosperm clades - the tremendous potential of old and new tools, in "A Broader view for Plant EvoDevo: novel approaches for diverse model systems", Botanical Society of America, Edmonton, AB

2015 Nuclear phylogenomics of the seed plants, in "Botany 2015 Colloquium: Phylogenomics and the 1000 plants (1KP) initiative", Botanical Society of America, Edmonton, AB

2014 Phytochrome evolution during the transition to land, in "Evolution of Light Sensing Systems in Photosynthetic Eukaryotes", 16th International Congress on Photobiology, Córdoba, Argentina

2012 Nuclear phylogenomics of seed plants, in "Growing the Next Generation in Plant Genomics", Botanical Society of America, Columbus, OH

2010 Conifer diversity: insights from phylogenetic studies, in "Ecology and Evolution of Conifers: A symposium on the occasion of the presentation of Aljos Farjon's 'A Handbook of the World's Conifers', June 11th, 2010, Pinetum Blijdenstein, Hilversum, The Netherlands

2009 Molecular evidence on the phylogenetic position of flowering plants and the implications for the evolution of floral biology, in "Darwin and the Evolution of Flowers", The Royal Society, London

2009 Phytochrome evolution, in the Keystone Symposium: "Plant Sensing, Response and Adaptation to the Environment", Big Sky, MT

2008 Phytochrome phylogenetic trees: What are they telling us? Twenty-fifth Annual Missouri Symposium: Plant Photobiology, Columbia, MO

2007 Adaptive evolution in phytochrome photoreceptors: plants meet the challenge of life in the shade. Lausanne Genomics Days, Lausanne, Switzerland

2006 The evolution of phytochrome-mediated seedling development in seed plants. In “The Comparative - Phylogenetic Method of Reconstructing Evolutionary History”, Botanical Society of America, Chico, CA
2006 Arabidopsis thaliana as a tool for investigating sequence divergence in heterologous species in “The Radcliffe Workshop on the Ecological Genetics of Arabidopsis thaliana”, Cambridge, MA
2006 Tests of the hypothesis that innovation in phytochrome A provided an adaptive advantage to early flowering plants, in “Plants and the light environment”, International Symposium on Plant Photobiology 2006, Paris, France
2005 Evidence for a link between molecular adaptation and the origin of the function of phytochrome A in angiosperms, Special ASPB Plant Genetics Meeting, Snowbird UT
2004 Photoreceptor evolution in green and nongreen plants. In "Molecules and Biodiversity", Genomes and Evolution, Penn State University
2002 Adaptive evolution in the photosensory domain of phytochrome A in early-diverging angiosperms. In "Molecular Genetics and Ecology of Plant Adaptation", Vancouver BC
1999 Early events in the angiosperm radiation: evidence from two phytochrome gene pairs. In “Current Perspectives on Basal Angiosperms: Molecular and Developmental Aspects.” 16th International Botanical Conference, St. Louis, MO
1996 Phytochromes: Evolution of a photoreceptor system in plants. In “Evolution of Plants: From Molecules to Characters.” Society for Molecular Biology and Evolution, Tucson, AZ

Departmental Seminars:

2018 Monash University, Melbourne; Royal Botanic Garden, Sydney; Louisiana State University
2016 Institute of Botany, Chinese Academy of Sciences, Beijing
2015 The Australian National University
2014 Centre for Biodiversity Analysis, Australian National University
2013 Oxford University; University of Michigan; Natural History Museum London; Centre for Australian National Biodiversity Research; Ohio University
2012 Smithsonian Institution Botany Department; Chicago Field Museum
2011 Yale University; Rancho Santa Ana Botanical Garden; UC Berkeley Plant and Microbial Sciences; UC Berkeley Botany Lunch; UC Davis; Smithsonian Institution PhyloPizza Series
2010 Duke University; University of Lausanne; University of Geneva; University of Zurich; Max Planck Institute for Developmental Biology; University of Adelaide
2008 New York Botanical Garden; University of Adelaide
2007 Dartmouth College; University of Freiburg
2006 Harvard University, Old Dominion University
2004 Royal Botanic Garden, Sydney; University of New Hampshire
2003 University of British Columbia
2002 Southern Illinois University
2001 University of Missouri-St. Louis; Brown University; University of Minnesota; Harvard University
2000 University of Maine-Orono
1999 University of Missouri-Columbia
1998 Harvard University Herbaria; University of Massachusetts-Amherst; Simmons College; University of Michigan
1997 University of Maryland

FIELD RESEARCH

North Queensland, Australia (2019), Changbai Shan, China (2016), Papua New Guinea (2010), Sumatra (2008), New Caledonia (2004)

OUTREACH/NON-UNIVERSITY TEACHING

Co-Instructor, DNA Barcoding & Biodiversity Informatics, Herbarium Bogoriense, Botany Division, Indonesian Institute of Sciences, Cibinong, West Java, Indonesia (2015)
Co-Instructor, Plant Diversity in Gymnosperms – a workshop for middle school teachers, New York Botanical Garden (2010)
Co-Instructor, Gymnosperm Tree of Life – a workshop for middle and high school teachers, Fairchild Tropical Botanical Garden (2010)
Instructor, Plant Molecular Systematic Training Course, Herbarium Bogoriense, Botany Division, Indonesian Institute of Sciences, Cibinong, West Java, Indonesia (2008)
Women in Technology Summit for undergraduate women, Harvard University (2007)
Melrose Veterans' Memorial Middle School Math and Science Days, Melrose MA (2004, 2005)

PUBLISHED JOURNAL ARTICLES

1. Sundaram M, Donoghue MJ, Beaulieu JM, Farjon A, Filer D, **Mathews S**, Jetz W, Leslie AS. Accumulation over evolutionary time as a major cause of conifer biodiversity hotspots. *Accepted at Proceedings of the Royal Society B.*
2. Leslie AS, Beaulieu J, Holman G, Campbell CS, Mei W, Raubeson LA, **Mathews S** (2018) An overview of extant conifer evolution from the perspective of the fossil record. *American Journal of Botany* 105(9): 1531-1544. https://doi.org/10.1002/ajb2.1143. 29 August.
3. Dean GH, Asmarayani R, Ardiyani M, Santika Y, Triono T, **Mathews S**, Webb CO (2018) Recommendations for generating DNA sequence data in labs with limited molecular biology resources: lessons from a barcoding project in Indonesia. *Applications in Plant Sciences* https://doi.org/10.1002/aps3.1167. 13 July.
4. Forest F, Baloch E, Brummitt NA, Bachman S, Moat J, Ickert-Bond S, Hollingsworth PM, Liston A, Little DP, **Mathews S**, Rai H, Rydin C, Stevenson DW, Thomas P, Buerki S (2018) Gymnosperms on the EDGE. *Scientific Reports* 8: 6053. doi:10.1038/s41598-018-24365-4
5. Lu L, Mao L, Yang T, Ye J, Liu B, Li H, Sun M, Miller JT, **Mathews S**, Hu H, Niu Y, Peng D, Chen Y, Smith SA, Chen M, Xiang K, Le CT, Dang VC, Lu A, Soltis PS, Soltis DE, Li J, Chen Z (2018) Evolutionary history of the angiosperm flora of China. *Nature* 554: 234-238. doi:10.1038/nature25485
6. Godfree RC, Marshall DM, Young AG, Miller CH, **Mathews S** (2017) Empirical evidence of fixed and homeostatic patterns of polyploid advantage in a keystone grass exposed to drought and heat stress. *Royal Society Open Science* 4(11): 170934. 22 November.
7. Latvis M, Jacobs SJ, Mortimer SME, Richards M, Blischak PD, **Mathews S**, Tank DC (2017) Primers for *Castilleja* and their utility across Orobanchaceae: II. Single-copy nuclear loci. *Applications in Plant Sciences* 5(9): 1700038.
8. Latvis M, Mortimer SME, Morales-Briones DF, Torpey S, Uribe-Convers S, Jacobs SJ, **Mathews S**, Tank DC (2017) Primers for *Castilleja* and their utility across Orobanchaceae: I. Chloroplast primers. *Applications in Plant Sciences* 5(9): 1700020.
9. Holman GH, Del Tredici P, Havill N, Lee NS, Cronn R, **Mathews S**, Raubeson LA, Campbell CS (2017) A new species and introgression in eastern Asian hemlocks (Pinaceae: *Tsuga*). *Systematic Botany* 42(4):733-746. 18 December.

10. Leslie AB, Beaulieu JM, **Mathews S** (2017) Variation in seed size is structured by dispersal syndrome and cone morphology in conifers and other non-flowering seed plants. *New Phytologist* 216: 429-437, doi: 10.1111/nph.14456.
11. Lu L, Cox CJ, **Mathews S**, Wang W, Wen J, Chen Z (2017) Optimal data partitioning, multispecies coalescent and Bayesian concordance resolve early divergences of the grape family (Vitaceae) *Cladistics* 34: 57-77, doi: 10.1111/cla.12191. 6 February.
12. Rockwell NC, Martin SS, Li F-W, **Mathews S**, Lagarias JC (2017) The phycocyanobilin chromophore of streptophyte algal phytochromes is synthesized by HY2. *New Phytologist* 214: 1145-1157. doi: 10.1111/nph.14422.
13. Gernandt DS, Holman G, Campbell CS, Parks M, Cronn R, **Mathews S**, Liston A, Stockey RA, Rothwell GW (2016) Phylogenetics of extant and fossil Pinaceae using implied character weighting and model-based methods. *Canadian Journal of Botany* **884**: 863-884.
14. Li FW, **Mathews S** (2016) Evolutionary aspects of plant photoreceptors. *Journal of Plant Research* **129** (2): 115-122. *Invited review*.
15. Pirone-Davies C, Prior N, von Aderkas P, Smith D, Hardie D, Freidman WE, **Mathews S** (2016) Insights from the pollination drop proteome and the ovule transcriptome of *Cephalotaxus* at the time of pollination drop production. *Annals of Botany* **117**(6): 973-984.
16. Li FW, Rothfels CJ, Melkonian M, Villarreal JC, Stevenson DW, Graham SW, Wong GKS, **Mathews S**, Pryer KM (2015) The origin and evolution of phototropins. *Frontiers in Plant Science* **6**: 637
17. Li FW, Melkonian M, Rothfels CJ, Villarreal JC, Stevenson DW, Graham SW, Wong GKS, Pryer KP, **Mathews S** (2015) Phytochrome diversity in green plants and the origin of canonical phytochromes. *Nature Communications* **6**: 7852 *Highlighted by Faculty of 1000.*
18. Ruhsam M, Rai HS, **Mathews S**, Ross GT, Graham SW, Raubeson LA, Mei W, Thomas P, Gardner M, Ennos RA, Hollingsworth PM (2015) Does complete plastid genome sequencing improve species discrimination and phylogenetic resolution in *Araucaria*? *Molecular Ecology Resources* **15**: 1067-1078. doi: 10.1111/1755-0998.12375.
19. Hertweck KL, Kinney MS, Stuart SA, Maurin O, **Mathews S**, Chase MW, Gandolfo MA, Pires JC (2015) Phylogenetics, divergence times, and diversification from three genomic partitions in monocots. *Botanical Journal of the Linnean Society* 178: 375-393.
20. Lagomarsino LP, Antonelli A, Muchhala N, Timmermann A, **Mathews S**, & Davis CC (2014) Phylogeny, classification, and fruit evolution of the species-rich neotropical bellflowers (Campanulaceae: Lobelioideae). *American Journal of Botany* **101** (12): 2097-2112.
21. Wickett NJ, Mirarab S, Nguyen N, Warnow T, Carpenter E, Matasci N, Ayyampalayam S, Barker MS, Burleigh JG, Gitzendanner MA, Ruhfel BR, Wafula E, Der JP, Graham SW, **Mathews S**, Melkonian M, Soltis DE, Soltis PS, Miles NW, Rothfels CJ, Pokorny L, Shaw AJ, DeGironimo L, Stevenson DW, Surek B, Villarreal JC, Roure B, Philippe H, dePamphilis CW, Chen T, Deyholos MK, Baucom RS, Kutchan TM, Augustin MM, Wang J, Zhang Y, Tian ZJ, Yan ZX, Wu XL, Sun X, Wong GKS, & Leebens-Mack J (2014) Phylotranscriptomic analysis of the origin and early diversification of land plants. *Proceedings of the National Academy of Sciences, USA* **111** (45): E4859-E4868.
22. Matasci N, Hung LH, Yan Z, Carpenter EJ, Wickett NJ, Mirarab S, Nguyen N, Warnow T, Ayyampalayam S, Barker M, Burleigh JG, Gitzendanner MA, Wafula E, Der JP, DePamphilis CW, Roure B, Philippe H, Ruhfel BR, Miles NW, Graham SW, **Mathews S**, Surek B, Melkonian M, & Soltis DE (2014) Data access for the 1,000 plants (1KP) project. *GigaScience* **3**: 17.
23. Li FW, Villarreal JC, Kelly S, Rothfels CJ, Melkonian M, Frangedakis E, Ruhsam M, Sigel EM, Der JP, Pittermann J, Burge DO, Pokornyk L, Larsson A, Chen T, Weststrand S, Thomas P, Carpenter E, Zhang Y, Tian ZJ, Chen L, Yan ZX, Zhu Y, Sun X, Wang J, Stevenson DW, Crandall-Stotler BJ, Shaw AJ, Deyholos MK, Soltis DE, Graham SW, Windham MD, Langdale JA, Wong GKS, **Mathews S**, & Pryer

KM (2014) Horizontal transfer of an adaptive chimeric photoreceptor from bryophytes to ferns. *Proceedings of the National Academy of Sciences, USA* **111** (18): 6672-6677.

24. McNeal J, Bennett JR, JR Wolfe JR, and **Mathews S** (2013) Phylogeny of Orobanchaceae inferred from five genes resolves the earliest split between hemi- and holoparasites. *American Journal of Botany* 100: 971-983.
25. Xi Z, Ruhfel BR, Schaefer H, Amorim A, Sugumaran M, Wurdack KJ, Stevens PF, **Mathews S***, and Davis CC* (2012) Phylogenomics and *a posteriori* data partitioning resolve the Cretaceous angiosperm radiation Malpighiales. *Proceedings of the National Academy of Sciences, USA*, 109: 17519-17524. * Co-corresponding authors.
26. **Mathews S,** Kramer EM (2012) Genetic perspectives on a Russian doll, or taking the ovule from naked to nested. Invited Tansley Review for *New Phytologist* 194: 910-923.
27. **Mathews S**, Tremonte D (2012) Tests of the link between functional innovation and positive selection at phytochrome A. The phylogenetic distribution of far-red high irradiance responses in seedling development. *International Journal of Plant Sciences* 173(6): 662-672.
28. Leslie, A. B, J. M. Beaulieu, P. R. Crane, Donoghue MJ, and **Mathews S** (2012) Divergent evolutionary dynamics among Northern and Southern Hemisphere conifers. *Proceedings of the National Academy of Sciences, USA*, 109: 16217-16221.
29. Nagalingum NS, Marshall CR, Quental TB, Rai HS, Little DP, and **Mathews S** (2011) Recent synchronous radiation of a living fossil. *Science* 334(6057): 796-799.
30. Beilstein MA, Nagalingum NS, Clements MD, Manchester SR, and **Mathews S** (2010) Dated molecular phylogenies indicate a Miocene origin for *Arabidopsis thaliana*. *Proceedings of the National Academy of Sciences, USA* 107 (43): 18724-18727. *This paper was highlighted by Faculty of 1000 and identified in November 2011 by Thomson Reuters Essential Science IndicatorsSM as a featured New Hot Paper in the field of Plant & Animal Science, as one of the most-cited papers in this discipline published in the previous two years.*
31. **Mathews S** (2010) Evolutionary studies illuminate the structural-functional model of plant phytochromes. *Invited review. Plant Cell* 22: 4-16.
32. **Mathews S**, Clements MD, and Beilstein MA (2010) A duplicate gene rooting of seed plants and the phylogenetic position of flowering plants. *Philosophical Transactions of the Royal Society Series B* 365: 383-395.
33. **Mathews S** (2009) Phylogenetic relationships among seed plants: persistent questions and the limits of molecular data. *American Journal of Botany* 96: 228-236.
34. Kolmos EM, Nowak M, Werner M, Fischer K, Schwarz G, **Mathews S**, Schoof H, Nagy F, Bujnicki JM, and Davis SJ (2009) Integrating ELF4 into the circadian system through combined structural and functional studies. *HFSP Journal* 3(5): 350-366.
35. Beilstein MA, Al-Shehbaz IA, **Mathews S**, and Kellogg EA (2008) Brassicaceae phylogeny inferred from phytochrome A and *ndh*F sequence data: tribes and trichomes revisited. *American Journal of Botany* 95: 1307-1327.
36. **Mathews S**, and McBreen K (2008) Phylogenetic relationships of B-related phytochromes in the Brassicaceae: Redundancy and the persistence of phytochrome D. *Molecular Phylogenetics and Evolution* 49: 411-433.
37. Saarela JM, Rai HS, Doyle JA, Endress PK, **Mathews S**, Marchant AD, Briggs BG, and Graham SW (2007) Hydatellaceae identified as a new branch near the base of the angiosperm phylogenetic tree. *Nature* 446: 312-315.
38. Burleigh JG, and **Mathews S** (2007a) Among-locus variation in the inference of seed plant phylogeny. International Journal of Plant Sciences 168: 111-124.
39. Burleigh JG, and **Mathews S** (2007b) Assessing systematic error in the inference of seed plant phylogeny. *International Journal of Plant Sciences* 168: 125-135.

40. Bennett, JR, and **Mathews S** (2006) Phylogeny of the parasitic plant family Orobanchaceae inferred from phytochrome A. *American Journal of Botany* 93: 1039-1051.
41. **Mathews S** (2006) Phytochrome-mediated development in land plants: red light sensing evolves to meet the challenges of changing light environments. *Invited review. Molecular Ecology* 15: 3483-3503.
42. Theuri J, Phelps-Durr T, **Mathews S**, Birchler J (2005) A comparative study of retrotransposons in the centromeric regions of A and B chromosomes of maize. *Cytogenetic and Genome Research* 110: 203-208.
43. **Mathews S** (2005) Phytochrome evolution in green and nongreen plants. *Journal of Heredity* 96: 1-8.
44. Burleigh JG, and **Mathews S** (2004) Phylogenetic signal in nucleotide data from seed plants: implications for resolving the seed plant tree of life. American Journal of Botany 91: 1599-1613.
45. Davis CC, Fritsch PW, Bell CD, **Mathews S** (2004) High latitude Tertiary migrations of an exclusively tropical clade: evidence from Malpighiaceae. *International Journal of Plant Sciences* 165 (4): S107-S121.
46. Provan J, Biss PM, McMeel D, and **Mathews S** (2004) Universal primers for the amplification of chloroplast microsatellites in grasses (Poaceae). Molecular Ecology Notes 4: 262-264.
47. **Mathews S**, Burleigh JG, and Donoghue MJ (2003) Adaptive evolution in the photosensory domain of phytochrome A in early angiosperms. *Molecular Biology and Evolution* 20: 1087-1097.
48. Davis CC, Bell CD, Fritsch PW, and **Mathews S** (2002a) Phylogeny of *Acridocarpus-Brachylophon* (Malpighiaceae): implications for tertiary tropical floras and Afroasian biogeography. *Evolution*. 56: 2395-2405.
49. Davis CC, Bell CD, **Mathews S**, and Donoghue MJ (2002b) Laurasian migration explains Gondwanan disjunctions: evidence from Malpighiaceae. *Proceedings of the National Academy of Sciences USA* 99: 6833-6837.
50. Zanis MJ, Soltis DE, Soltis PS, **Mathews S**, and Donoghue MJ (2002) The root of the angiosperms revisited. *Proceedings of the National Academy of Sciences USA* 99: 6848-6853.
51. **Mathews S**, Spangler RE, Mason-Gamer RJ, Kellogg EA (2002) Phylogeny of Andropogoneae inferred from phytochrome B, GBSSI, and *ndh*F. International Journal of Plant Sciences 163: 441-450.
52. Grass Phylogeny Working Group (2001) Phylogeny and subfamilial classification of the Poaceae. *Annals of the Missouri Botanical Garden* 88: 373-457.
53. Simmons MP, Clevenger CC, Savolainen V, Archer RH**, Mathews S**, and Doyle JJ (2001) Phylogeny of the Celastraceae inferred from phytochrome B and morphology. *American Journal of Botany* 88: 313-325.
54. **Mathews S**, Donoghue MJ (2000) Basal angiosperm phylogeny inferred from duplicate phytochromes A and C. International Journal of Plant Sciences 161(6 Suppl.): S41-S55.
55. Clark LG, Kobayashi M, **Mathews S**, Spangler R, and Kellogg EA (2000) The Puelioideae, A New Subfamily of Poaceae. *Systematic Botany* 25(2): 181-187.
56. **Mathews S**, Tsai RC, and Kellogg EA (2000) Phylogenetic structure in the grass family (Poaceae): evidence from the nuclear gene phytochrome B. *American Journal of Botany* 87: 96-107.
57. **Mathews S**, Donoghue MJ (1999) The root of angiosperm phylogeny inferred from duplicate phytochrome genes. *Science* 286: 947-950.
58. **Mathews S**, Lavin M (1998) A biosystematic study of *Castilleja crista-galli*: an allopolyploid origin reexamined. *Systematic Botany* 23: 213-230.
59. Donoghue MJ, **Mathews S** (1998) Duplicate genes and the root of the angiosperms, with a preliminary analysis of phytochrome genes. *Molecular Phylogenetics and Evolution* 9: 489-500.
60. Lavin M, Eshbaugh E, Hu J-M, **Mathews S**, and Sharrock RA (1998) Monophyletic subgroups of the tribe Millettieae (Leguminosae) as revealed by phytochrome nucleotide sequence data. *American Journal of Botany* 85: 412-433.

61. **Mathews S**, and Sharrock RA (1997) Phytochrome gene diversity. *Invited Review*. *Plant, Cell & Environment* 20: 666-671.
62. **Mathews S**, and Sharrock RA (1996) The phytochrome gene family in grasses (Poaceae): a phylogeny and evidence that grasses have a subset of the loci found in dicot angiosperms. *Molecular Biology and Evolution* 13: 1141-1150.
63. **Mathews S**, Lavin M, and Sharrock RA (1995) Evolution of the phytochrome gene family and its utility for phylogenetic analyses of angiosperms. *Annals of the Missouri Botanical Garden* 82: 296-321.
64. Clack TS, **Mathews S**, and Sharrock RA (1994) The phytochrome apoprotein family in *Arabidopsis* is encoded by five genes: the sequences and expression of *PHYD* and *PHYE*. *Plant Molecular Biology* 25: 413-427.
65. Lavin M, **Mathews S**, and Hughes C (1991) Chloroplast variation in *Gliricidia* (Leguminosae): intraspecific phylogeny and tokogeny. *American Journal of Botany* 78: 1576-1585.

BOOK CHAPTERS/REFEREED CONFERENCE PAPERS

66. Li Fay-Wei, **Mathews S** (2019) Phylogenetic methods to study light signaling. Pp 265-276 in: *Phytochromes: Methods and Protocols, Methods in Molecular Biology,* vol 2026. https://doi.org/10.1007/978-1-4939-9612-4_21.
67. Davis CC, **Mathews S** (2019) Origin and Evolution of Land Plants. Oxford Bibliographies. https://10.1093/OBO/9780199941728-0119. 24 April.
68. Duvall M, **Mathews S**, Mohammad NA, and Russell T (2006) Placing the monocots; conflicting signal from trigenomic analyses. In Monocots: comparative biology and evolution, vol. 1, 77-88. (Eds. J. T. Columbus, E. A. Friar, C. W. Hamilton, J. M. Porter, L. M. Prince, and M. G. Simpson), Rancho Santa Ana Botanic Garden, Claremont, California.
69. Sharrock RA, **Mathews S** (2006) Phytochrome genes in higher plants: structure, expression, and evolution. Pp. 99-129 in: Photomorphogenesis in Plants and Bacteria (Eds. E. Schafer and F. Nagy), Kluwer, Dordrecht, The Netherlands.
70. **Mathews S** (2005) Analytical methods for studying the evolution of paralogs using duplicate gene data sets. Methods in Enzymology. 365: 724-745.
71. **Mathews S** (2004) The study of ancient adaptation: A case study of a phytochrome gene pair from early-diverging angiosperms. Pp. 143-152 in The Molecular Genetics and Ecology of Plant Adaptation, Q. Cronk, I. E. P. Taylor, eds (National Research Council of Canada Research Press).

NOT REFEREED

72. Davis CC, Xi Z, and **Mathews S** (2014) Plastid phylogenomics and green plant phylogeny: almost full circle but not quite there. *BMC Biology* **12** (1): 11.
73. **Mathews S** (2014) Algae hold clues to eukaryotic origins of plant phytochromes. *Proceedings of the National Academy of Sciences, USA* **111** (44): 15608-15609.
74. **Mathews S**. 2006. Seeing the light. News and Views article. *Nature Genetics* 38: 606-608.

MEDIA COVERAGE

Neochrome Horizontal Gene Transfer (Li et al. 2014)
https://blogs.scientificamerican.com/artful-amoeba/ferns-stole-rare-gene-from-unlikely-source/
http://www.cell.com/current-biology/pdf/S0960-9822(14)00480-1.pdf
http://www.nature.com/nrg/journal/v15/n6/full/nrg3739.html

https://www.nytimes.com/2014/04/17/science/plants-that-practice-genetic-engineering.html?_r=0
Conifer Diversification (Leslie et al. 2012)
http://www.sciencedaily.com/releases/2012/10/121004141757.htm
Cycad Diversification (Nagalingum et al. 2011)
http://www.npr.org/2011/10/20/141566753/living-fossils-just-a-branch-on-cycad-family-tree
http://www.abc.net.au/science/articles/2011/10/21/3344101.htm
ABC Science Twitter (@abcscience)
10/21/11 11:37 AM
News: Modern cycads didn't live during time of the #dinosaurs.
#fossils #evolution goo.gl/fb/hWddr
http://www.abc.net.au/news/2011-10-21/cycads-not-so-ancient2c-research-finds/3591888
http://www.cosmosmagazine.com/news/4876/cycads-are-not-dinosaur-plants-after-all
http://blogs.discovermagazine.com/notrocketscience/2011/10/20/%E2%80%9Cliving-fossil%E2%80%9D-cycad-plants-are-actually-evolution%E2%80%99s-comeback-kings/
http://science.kqed.org/quest/2011/10/20/cycads-no-longer-living-fossils/
http://www.smh.com.au/environment/new-cycads-on-the-block-plants-only-10-million-years-old-20111021-1mb43.html
http://www.australiangeographic.com.au/journal/cycads-not-around-when-dinosaurs-roamed-study-says.htm
http://www.physorg.com/news/2011-10-long-held-belief-debunked-cycad-dinosaur.html
http://news.ninemsn.com.au/article.aspx?id=8363332
http://www.australianews.com.au/story?cityid=d1de82e1-fce9-4f45-9541-79d83e888155&storyid=b8ba605c-4c2d-44a8-a376-03cbd70a82d5
Position of Hydatellaceae (Saarela et al. 2007):
http://www.underwatertimes.com/news.php?article_id=91083160475
http://www.bgci.org/resources/news/0340/
Rooting of the Angiosperm Phylogeny (Mathews & Donoghue 1999)
http://www.nytimes.com/1999/10/29/us/biologists-find-progenitors-of-earth-s-flowering-plants.html?n=Top%2fNews%2fScience%2fTopics%2fEvolution