Curriculum Vitae – Sarah Mathews

Professional Address: Australian National Herbarium, CSIRO National Research Collections Australia, GPO 1700, Canberra ACT 2601
http://scholar.google.com/citations?user=qRYzu3sAAAAJ&hl=en
http://www.researcherid.com/rid/A-6513-2015

APPOINTMENTS

Senior Research Scientist: Australian National Herbarium, CSIRO, Canberra ACT, 2014-
Honorary Associate Professor: The Australian National University, Canberra, ACT, 2015-2020
Associate: Department of Organismic & Evolutionary Biology, Harvard University Herbaria, Cambridge, MA, 2014-2017
Sargent Fellow: Arnold Arboretum of Harvard University, Cambridge, MA, 2003-2013
Program Officer: Division of Environmental Biology, National Science Foundation, Arlington, VA, 2011-2012
Lecturer: Organismic & Evolutionary Biology, Harvard University, 2007-2009
Assistant Professor: Division of Biological Sciences, University of Missouri-Columbia, 2000-2003
Postdoctoral Fellow, Department of Organismic & Evolutionary Biology, Harvard University Herbaria, Cambridge, MA, 1997-2000
National Science Foundation Postdoctoral Fellow in Biosciences Related to the Environment, Department of Organismic & Evolutionary Biology, Harvard University Herbaria, Cambridge, MA 1995-1997

EDUCATION

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

JOURNAL ARTICLES

1. Latvis M, Mortimer SME, Morales-Briones DF, Torpey S, Uribe-Convers S, Jacobs SJ, **Mathews S**, Tank DC. (2017) Targeting the most variable parts of the plastome using genomic data: primers for *Castilleja* and their utility across Orobanchaceae. *Accepted at Applications in Plant Science*.
2. Holman GH, Del Tredici P, Havill N, Lee NS, Cronn R, **Mathews S**, Raubeson LA, Campbell CS. A new species and introgression in eastern Asian hemlocks (Pinaceae: *Tsuga*). *Accepted at Systematic Botany*.
3. 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* doi: 10.1111/nph.14456.
4. Rockwell NC, Martin SS, Li F-W, **Mathews S**, Lagarias JC. The phycocyanobilin chromophore of streptophyte algal phytochromes is synthesized by HY2 (2017). *New Phytologist* 214: 1145-1157. doi: 10.1111/nph.14422.
5. Lu L, Cox CJ, **Mathews S**, Wang W, Wen J, Chen Z. Concatenated data analyses and the multi-species coalescent resolve conflicting trees for the diversification of major lineages in the grape family (Vitaceae). *Cladistics* doi: 10.1111/cla.12191.
6. 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.
7. Li FW, **Mathews S** (2016). Evolutionary aspects of plant photoreceptors. *Journal of Plant Research* **129** (2): 115-122. *Invited review*.

8. 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.
9. 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
10. 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.*
11. 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.
12. 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.
13. 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.
14. 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.
15. 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.
16. 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.
17. 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.
18. 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.
19. **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.
20. **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.

21. 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.
22. 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.
23. 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.*
24. **Mathews S.** 2010. Evolutionary studies illuminate the structural-functional model of plant phytochromes. *Invited review. Plant Cell* 22: 4-16.
25. **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.
26. **Mathews S**. 2009. Phylogenetic relationships among seed plants: persistent questions and the limits of molecular data. *American Journal of Botany* 96: 228-236.
27. 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.
28. 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.
29. **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.
30. 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.
31. Burleigh JG, and **Mathews S**. 2007a. Among-locus variation in the inference of seed plant phylogeny. International Journal of Plant Sciences 168: 111-124.
32. Burleigh JG, and **Mathews S**. 2007b. Assessing systematic error in the inference of seed plant phylogeny. *International Journal of Plant Sciences* 168: 125-135.
33. Bennett, JR, and **Mathews S**. 2006. Phylogeny of the parasitic plant family Orobanchaceae inferred from phytochrome A. *American Journal of Botany* 93: 1039-1051.
34. **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.
35. 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.
36. **Mathews S**. 2005. Phytochrome evolution in green and nongreen plants. *Journal of Heredity* 96: 1-8.
37. 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.

38. 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.
39. 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.
40. **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.
41. 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.
42. 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.
43. 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.
44. **Mathews S**, Spangler RE, Mason-Gamer RJ, Kellogg EA. 2002. Phylogeny of Andropogoneae inferred from phytochrome B, GBSSI, and ndhF. International Journal of Plant Sciences 163: 441-450.
45. Grass Phylogeny Working Group. 2001. Phylogeny and subfamilial classification of the Poaceae. *Annals of the Missouri Botanical Garden* 88: 373-457.
46. 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.
47. **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.
48. 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.
49. **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.
50. **Mathews S**, Donoghue MJ. 1999. The root of angiosperm phylogeny inferred from duplicate phytochrome genes. *Science* 286: 947-950.
51. **Mathews S**, Lavin M. 1998. A biosystematic study of *Castilleja crista-galli*: an allopolyploid origin reexamined. Systematic Botany 23: 213-230.
52. 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.
53. 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.
54. **Mathews S**, and Sharrock RA. 1997. Phytochrome gene diversity. *Invited Review*. *Plant, Cell & Environment* 20: 666-671.
55. **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.
56. **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.
57. ClackTS, **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.

58. 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

59. 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.
60. 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.
61. **Mathews S**. 2005. Analytical methods for studying the evolution of paralogs using duplicate gene data sets. Methods in Enzymology. 365: 724-745.
62. **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).

SUBMITTED

63. 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, Chen M, Xiang K, le CT, Dang VC, Lu A, Soltis PS, Soltis DE, Li J, Chen Z. Evolutionary history of the angiosperm flora of China. *In revision*.
64. Latvis M, Jacobs SJ, Mortimer SME, Richards M, Blischak PD, **Mathews S**, Tank DC. Primers for single-copy nuclear loci in *Castilleja* and their utility across Orobanchaceae. *Submitted*.
65. Leslie AS, Donoghue MJ, Beaulieu JM, Farjon A, Filer D, Holman G, Campbell CS, Mei W, Raubeson LA, **Mathews S**, Jetz W. Disparate macroevolutionary underpinnings of global conifer diversity hotspots. *In revision.*
66. Godfree RC, Marshall DM, Young AG, **Mathews S**. Polyploid advantage and cytogeography in a keystone grass species is linked to reproductive homeostasis and morphological fixity during climate extremes. *In review.*
67. 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. Gymnosperms on the EDGE. *In review*.
68. Hao G-Y, **Mathews S**, Rockwell FE, Saladin B, Wüest RO, Zimmermann NE, Holbrook NM. The dilemma of being a deciduous conifer in a modern world. *In revision*.

NOT REFEREED

69. 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.
70. **Mathews S** (2014) Algae hold clues to eukaryotic origins of plant phytochromes. *Proceedings of the National Academy of Sciences, USA* **111** (44): 15608-15609.
71. **Mathews S**. 2006. Seeing the light. News and Views article. *Nature Genetics* 38: 606-608.

INVITED PRESENTATIONS

Presentations at Major Symposia/Named lectures (20):

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", Botany 2015, Edmonton, AB

2015 Nuclear phylogenomics of the seed plants, in "Botany 2015 Colloquium: Phylogenomics and the 1000 plants (1KP) initiative", Botany 2015, 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", Botany 2012, Columbus, Ohio

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 Using comparative analyses and model organisms to test for adaptive change. Melinda F. Denton Memorial Lecture, Department of Biology, University of Washington

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

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", Botany 2006, 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 Plant Photobiology Meeting, 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, Missouri

1996 Phytochromes: Evolution of a photoreceptor system in plants. In "Evolution of Plants: From Molecules to Characters." Society for Molecular Biology and Evolution, Tucson, Arizona

Departmental Seminars (45):

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

MEDIA COVERAGE

Neochrome Horizontal Gene Transfer

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

RESEARCH SUPPORT

Current

CSIRO Future Science Platforms (SynBio): "In vitro resynthesis of the lichen symbosis as a useful system for synthetic biology". 7/2017-6/2019, $755, 044 (Co-PI with Cécile Gueidan).

CSIRO Future Science Platforms (Environomics): "Rapid assessment of environmental stress for key Australian plant groups". 7/2017-6/2019, $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". 7/2017-6/2019, $856,346 AUD (Lead PI).

Past

NSF: IOS-1416825, Plant Genome Research Program: "Comparative genomics of a species radiation: sequencing the apple tribe". 01/01/14-12/31/16, $300,000 (Lead PI).

NSF: DEB-1020868: "Biogeographical and ecological diversification of trees across the Indonesian archipelago: developing indigenous leadership in biodiversity informatics." 09/01/10-08/31/2015, $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". 10/01/06 to 09/30/13, $665,505 (Lead PI).

NSF: DEB-0215780: "Phylogeny of Orobanchaceae sensu lato inferred from phytochromes and other data: implications for the evolution of parasitism". 9/2002 – 8/2005, $260,000 (PI).

NSF: IBN-0214449: "Adaptive evolution in the photoreceptor phytochrome A and its role in the ecological success of the first angiosperms". 9/2002-8/2005, $300,000 (PI).

University of Missouri Research Board: "Evolution and expression of phytochrome genes in parasites". 6/01-5/03, $42,000 (PI).

NSF: DEB-9806397: "Duplicate genes and plant phylogeny". 7/1/98-6/30/01, $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". 9/95-8/97, $160,000 (PI).

AWARDS

Elected Fellow of AAAS, 2016

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

<u>Outreach and non-university teaching</u>

Co-Instructor, DNA Barcoding & Biodiversity Informatics, Herbarium Bogoriense, Botany Division, Indonesian Institute of Sciences, Cibinong, West Java, Indonesia, 3-5 February 2015

Instructor, Plant Molecular Systematic Training Course, Herbarium Bogoriense, Botany Division, Indonesian Institute of Sciences, Cibinong, West Java, Indonesia, October 24-30, 2008

Judge, Lexington High School Science and Engineering Fair, 2007

Presenter, Melrose Veterans' Memorial Middle School Math and Science Days, 2004, 2005

<u>Postdoctoral Advisees (9)</u>

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, 2011-2013
Jeff DaCosta, 2014-

PhD Thesis Committees (Thesis advisor, institution) (17)
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)

Visiting scientists hosted

Prof. Zhiduan Chen, Dr. Limin Lu, Chinese Academy of Sciences, Beijing (2015)
Berenice Villegas-Ramirez, M.Sc. candidate, Université Montpellier (2013-2014)
Dr. Susan Offner, Lexington High School, Lexington, MA (2011-2012)
Dr. Markus Ruhsam, 2010, Royal Botanic Garden Edinburgh
Dr. Shuguang Jian, 2009, Chinese Academy of Sciences
Prof. Dorothy Shippen, sabbatical visitor, 2008/2009, Texas A&M University
Kate Hertweck, Ph.D. candidate, 2009, University of Missouri, Columbia
Mark Beilstein, Ph.D. candidate, 2007, University of Missouri, St. Louis
Eric Von Wettberg, Ph.D. candidate, 2003, Brown University

SOCIETY MEMBERSHIPS

American Society for the Advancement of Science
American Society of Plant Biologists
Botanical Society of America
Society of Systematic Biologists

PROFESSIONAL SERVICE

Editorial

Board of Advisors: New Phytologist 1 January 2013-

Editorial Board: BMC Evolutionary Biology 2011-
Associate Editor: BMC Evolutionary Biology 2008-2011
Editorial Board: Systematic Biology 2000-2005

Journal Reviews

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

Proposal Reviews – 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 Associcates; University Grants Committee, Hong Kong; German Research Foundation

Professional Societies

Organizer of "Colloquium: Emerging results from studies of gymnosperms on the tree of life I", Botany 2010, Providence, RI

Organizer of "Symposium: Emerging results from studies of gymnosperms on the tree of life II", Botany 2010, Providence, RI

Co-organizer of "Gathering the twigs and branches: reconstructing the gymnosperm tree of life", 12th International Palynological Congress and 8th International Organisation of Palaeobotany Conference, Bonn, Germany, 2008.

Judge, Cooley Award, American Society of Plant Taxonomists, 2007

Judge, Best student/post-doc paper, Society for the Study of Evolution, 2002

Review Panels, Workshops, Site Visits

Programme Review, Botany, King Saud University, Riyadh, Saudi Arabia, 2017

NSF workshop to promote partnerships with Indonesian funding bodies for the Dimensions of Biodiversity Program, 2/2013

iPlant Collaborative "Tree Biology" Team, 2010-2013

iPlant Collaborative Workshops: "Grand Challenge Workshop" on "Assembling the Tree of Life to Enable the Plant Sciences" and "iPTOL Data Assembly Workshop", 11/2008, 11/2009

NSF Site Visits to evaluate Plant Genome Program projects, 10/2008, 12/2005

NSF sponsored workshop: Where to Next with the Tree of Life? Washington, DC, 4/2008,

National Science Foundation Proposal Review Panels, 12/2001; 9/2003; 1/2005; 5/2014

Committee of Visitors to evaluate National Science Foundation's Plant Genome Program, 8/2004

Departmental/University Service

Team Leader, molecular sciences team, Australian National Herbarium

Advisor to Harvard University iGEM team, 2009, 2010

Organizer of Harvard University Herbaria Seminar Series, 2008-2009
Co-organizer (with C. C. Davis) of the 4th Annual Plant Biology Symposium, Harvard University
Panel Speaker, Women in Technology Summit for undergraduate women, Harvard University, 2007
Graduate Affairs Committee, Division of Biological Sciences, University of Missouri, 2001-2003.
Divisional Council, Division of Biological Sciences, University of Missouri, 2002-2003.