Charles Kevin Boyce

Professor, Earth & Planetary Sciences
Prof. (by courtesy) of Earth System Science, Biology
Stanford University

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Education

Harvard University	Ph.D., Paleontology	2001
California Institute of Technology	B.S. (with honors), Biology	1995
California Institute of Technology	B.S. (with honors), Literature	1995

Professional Experience

Professor of Earth & Planetary Sciences	Stanford University	2023-
Professor of Geological Sciences	Stanford University	2018-2022
Department Chair, GS/EPS	Stanford University	2020-2023
Associate Professor	Stanford University	2013-2018
Associate Professor	University of Chicago	2010-2013
Assistant Professor	University of Chicago	2003-2010
National Research Council Associate	NASA Astrobiology Institute	2001-2003

Professional Activity

Member, Nominating committee, International Palaeontological Association	2025-2026
Guest member, Editorial committee, Annual Review of Earth & Planetary Sciences	2025
Reviewing Editor, PNAS Nexus	2024-
Member, Ethics Committee, Paleontological Society	2023-2026
Liaison, RISE-Respectful Inclusive Scientific Events, Geological Society of America	2023-
Editor, Paleobiology	2018-2024
Associate editor, Paleobiology	2011-2018
Member, Fellows Committee, Paleontological Society (Chair, 2018, 2019)	2017-2019
Member, W. S. Cooper Award Committee, Ecological Society of America	2014-2016
Member, Strimple Award Committee, Paleontological Society	2012-2015
Member, Beamline Advisory Team, X-ray scanning microscope, NSLS II	2008-2010
Chair, Paleobotanical Section, Botanical Society of America	2006-2007
Member, Moseley Award committee, Botanical Society of America	2004-2006
Research Associate, Geology, Field Museum of Natural History	2004-
Member, Cookson Award committee, Botanical Society of America	2003
Predoctoral Fellow, Carnegie Geophysical Laboratory	1999-2001

Professional Recognition

Interview subject, Caltech Heritage Project	2024
Phillips Lecture in Paleoscience, University of Illinois Urbana-Champaign	2022
Klepser Distinguished Lecture, University of Tennessee	2015
MacArthur Fellow, MacArthur Foundation	2013-2018
W. S. Cooper Award of the Ecological Society of America	2012
Charles Schuchert Award for excellence and promise in paleontology	2011
Fellow, Paleontological Society	2011-
Carnegie Geophysical Laboratory Postdoctoral Fellowship (declined)	2001
National Science Foundation Graduate Fellowship	1996-1999

Updated April 2026

Professional Affiliations

Botanical Society of America, Geological Society of America, International Organization of Palaeobotany, International Palaeontological Association, Paleontological Society.

Professional Outreach

Leader, Prehistoric Tree Walk, Canopy/Palo Alto Junior Museum and Zoo	2024
Scientific advisor, Dinosaur Garden, Palo Alto Junior Museum and Zoo	2017-2023
Scientific advisor, Hopscotch Girls "Science! STEM Sticker Adventure" book	2018
Extended advisor, Paleobiology Hall exhibit renovation, Smithsonian NMNH	2014-2015

Podcast interviews: Generation Anthropocene, Jax & Phoebe Make a Planet, The Mushroom Hour, Palaeocast, Signals of Change.

Professional Service

Reviewer: American Journal of Botany; American Journal of Science; American Mineralogist; American Naturalist; Annals of Botany; Applications in Plant Sciences; Biogeosciences; BMC Evolutionary Biology Reviews; Canadian Journal of Microbiology; Chemical Geology; Current Biology; Development; Earth & Planetary Science Letters; Earth Science Reviews; Ecological Monographs; Frontiers in Ecology & Evolution; Geobiology; Geochemistry, Geophysics, Geosystems; Geochimica et Cosmochimica Acta; Geological Journal; Geological Society of America Bulletin; Geology; Geophysical Research Letters; International Journal of Plant Science; Journal of Biogeography; Journal of Geology; Journal of the International Association of Wood Anatomists; Journal of Magnetic Resonance; Journal of Paleontology; Journal of Theoretical Biology; Nature Communications; Nature Ecology & Evolution; Naturwissenschaften; New Phytologist; Organic Geochemistry; Palaeogeography, Palaeoclimatology, Palaeoecology; Palaeontology; Palaios; Paleobiology; Paleontological Research; Plant, Cell & Environment; Plant Physiology; Planta; Proceedings of the National Academy of Sciences; Review of Palaeobotany & Palynology; Science; Science Advances; Trends in Plant Science.

Proposal reviewer and/or panelist: Advanced Light Source, LBNL; American Chemical Society; NASA Exobiology; NASA FINESST; NSF Earth Sciences; NSF Geobiology and Low-Temperature Geochemistry; Natural Environment Research Council, UK.

University Service

Stanford University

Faculty Search Committee (Chair), Earth & Planetary Sciences	2023-2024
Director of Graduate Studies, Geological Sciences	2019-2020
Acting Chair, Geological Sciences	2019
Associate Chair, Geological Sciences	2017-2019
Junior Faculty Mentor, School of Earth Sciences/Doerr School of Sustainability	2019-
Faculty Search Committee (Chair), Geological Sciences	2017-2018
Committee on Graduate Studies, Stanford University	2016-2018
Undergraduate Curriculum Committee, Geological Sciences	2015-2017
Departmental seminar organizer, Geological Sciences	2014-2016
Graduate Admissions Committee, Geological Sciences	2013-2015
Geobiology Faculty Search Committee, School of Earth Sciences	2013-2014

Member or chair, 8 faculty appointment or promotion committees

University of Chicago

Faculty Appointments Committee, Geophysical Sciences	2012-2013
Hinds Fund Fellowship Committee, Committee on Evolutionary Biology	2011-2012
Departmental Chair Search Committee (Chair), Geophysical Sciences	2011-2012
Faculty Appointments Committee, Committee on Evolutionary Biology	2011-2013
Fluids Faculty Search Committee, Geophysical Sciences	2011-2012
Chamberlin Postdoctoral Fellow Search Committee, Chair	2009-2010
Departmental Chair Search Committee, Geophysical Sciences	2008-2009
Graduate Admissions Committee, Committee on Evolutionary Biology	2005-2008
Noon Balloon Faculty Seminar (Czar), Geophysical Sciences	2004-2007
Evaluation Committee, Crerar Undergraduate Science Writing Prize	2004-2011

External Institutional Service

Curator evaluation committee, Field Museum of Natural History	2024-2025

Teaching Experience

Stanford University

EPS 305	Invisible curriculum
EPS/EarthSys 128/228, Bio148/228	Evolution of Terrestrial Ecosystems
EPS/EarthSys 205	Fundamentals of Geobiology
EPS/Bio 206	Topics in Organismal Paleobiology
Past topics: Biological fluid flow, Vertebrate evolution, Paleobotany, Insect evolution, Soil Biology	
EPS/EarthSys 208	Topics in Geobiology
ESF 22/22A	Emergence of Evolution from Global Exploration
OSPMadrid 93	Darwin, Wallace, Bates—Biogeography & the Age of Discovery

University of Chicago

GEOS 13200	Historical Geology
GEOS 32500	Evolutionary History of Terrestrial Ecosystems
GEOS 34600	Chemical Information in the Sedimentary and Fossil Records
GEOS 39711	Paleobotany

Student Supervision (including research topic and student single-authored thesis publications)

Stanford University

Hannah Ratcliff (pre-candidacy student)

Seamus Callaghan (post-candidacy student)

Evolution of terrestriality in arachnids

Andrés Baresch (Ph.D. 2022)

Evolution of plant physiology from the lamina perspective

Sandra Schachat (Ph.D. 2021; co-advised with Jonathan Payne)

Winged insects and insect wings: geological, ecological, and functional context

Michael D'Antonio (Ph.D. 2021)

The structure and growth of arborescent lycopsids

D'Antonio, M. P. 2023. Atypical tracheid organization in proximal wood of late Paleozoic *Sigillaria approximata* Fontaine et White (Lycopsida). Botanical Journal of the Linnean Society: boad028.

Thesis committee member: Ellen Schaal, Caitlin Keating-Bitonti, Matthew Winnick, Richard Stockey, Will Gearty, Jeremy Caves, Tyler Kukla, Stepfan Huntsman, Jood Al Aswad, Emily Ellefson, Kemi Ashing-Giwa, Susannah Herz, Nidhi Patel, Jack Riley, Leah Kahn, Brena Araujo Cedraz

Thesis examination chair: Simon Wong, Graham Dow, Kelli Davies, Daniel Ibarra, Hsiao-Tieh Hsu, James Russell, Taylor Martin, Max Segnitz, Andy Yu-Ting Liu, Claire Anderson, Elana Chan, Joel Erberich

Undergraduate pre-major adviser: 8 students

One high school intern

University of Chicago

Marites Villarosa Garcia (Ph.D. 2017; co-advised with Michael Foote)

The morphological diversity of coccolithophores across environments, geographic space, and geologic time

Kathryn Larson (Ph.D. 2012)

The evolutionary and biogeographic consequences of fruit form evolution in Fagales

Larson-Johnson, K. 2023. Wind variability limits the potential influence of fruit morphology and descent rate on dispersal in the winged fruits of *Carpinus* (Betulaceae). Review of Palaeobotany & Palynology 310: 104829.

Larson-Johnson, K. 2016. Field observations of *Carpinus* (Betulaceae) demonstrate high dispersal asymmetry and inform migration simulations with implications for times of rapid climate change. International Journal of Plant Sciences 177: 389-399.

Larson-Johnson, K. 2016. Phylogenetic investigation of the complex evolutionary history of dispersal mode and diversification rates across living and fossil Fagales. New Phytologist 209: 418-435.

Hilary Christensen (Ph.D. 2012)

Mammalian adaptation to herbivory in the aftermath of the K/T extinction

Christensen, H. B. 2014. Similar associations of tooth microwear and morphology indicate similar diet across marsupial and placental mammals. PLoS ONE 9: e102789.

Andrew Leslie (Ph.D. 2010)

Forms follow functions: Exploring the evolution of morphological diversity in seed plant reproductive structures

Leslie, A. B. 2011. Predation and protection in the macroevolutionary history of conifer cones. Proceedings of the Royal Society of London B 278: 3003-3008.

Leslie, A. B. 2011. Shifting functional roles and the evolution of conifer pollen-producing and seed-producing cones. Paleobiology 37: 587-602.

Leslie, A. B. 2010. Flotation preferentially selects saccate pollen during conifer pollination. New Phytologist 188: 273-279.

Leslie, A. B. 2008. Interpreting the function of saccate pollen in ancient conifers and other seed plants. International journal of plant sciences 169: 1038-1045.

Mark Gorman (M.S. 2013) Earliest record of insect herbivory found on Carboniferous leaves

Andrés Baresch (M.S. 2013) Simulating water use efficiency along an altitudinal gradient

Thesis committee member: Michael Glotter, Sam Miller, Matt Nelsen, Marie Hoerner, Lauren Sallan, David Bapst, Tyler Mason, Christina Belanger, Josh Miller, Leila Zajac, Rebecca Terry, David Sunderlin, Carl Simpson, Andy Simpson

Undergraduate senior theses: Benjamin Casterline, Persephone Ma

Six high school interns (including five honors theses)

External service

Doctoral thesis committee member: Annie Mailloux, Rutgers University

Thesis rapporteur: Camille Le Scao (Ph.D. 2024), Paris Cité University

Undergraduate research supervision: Catriona Breasley, University of St. Andrews

Postdoctoral Supervision

Stanford University

Jessica Orozco (2025-2027) Plant non-structural carbohydrates and survivorship of mass extinction
Kathryn Larson (2014-2016) Evolution of wind-dispersed fruits
Matthew Nelsen (2014-2016) Evolution of fungal metabolisms

University of Chicago

Jung-Eun Lee (2009-2010) Feedbacks between plant evolution and climate

Research Publications (*-indicates student or postdoctoral advisee)

81. Zhou, W., F. Li, D. Li, M. Wan, F. Liu, J. Pšenička, J. Bek, **C. K. Boyce**, J. Wang. Submitted. Heterochirality in a 298-million-year-old twining fern genus.
80. D'Antonio, M. P., **C. K. Boyce**, M. P. Donovan, F. Herrera. 2026. A shoot at the root: unique development and evolution of the stigmarian apical meristem. Proceedings of the Royal Society of London B 293: 20252863.
79. D'Antonio, M. P.*, **C. K. Boyce**. 2026. Structural and physiological constraints on arborescent lycopsid establishment and growth. New Phytologist 249: 1606-1617.
78. Zhou, W., W. Sun, T. Wang, D. Li, J. Pšenička, C. Hill, **C. K. Boyce**, J. Wang. 2025. Earliest evolution of stipules among vascular plants documented in the late Paleozoic stem group of Marattiales. BMC Biology 23:357.
77. Wong, M. L., A. Prabhu, C. M. O'D. Alexander, H. J. Cleaves, G. Cody, G. Hystad, M. Bermanec, W. Bleeker, **C. K. Boyce**, A. Corpolongo, A. D. Czaja, S. Das, R. R. Gaines, D. D. Gregory, J. A. Jaszczak, E. J. Javaux, J. Jodder, A. H. Knoll, M. J. Van Kranendonk, K. Maloney, N. Noffke, R. Rainbird, E. Slaughter, E. Stueeken, R. Summons, F. Westall, J. Wiemann, S. Xiao, R. M. Hazen. 2025. Organic geochemical evidence for life in Archean rocks identified by pyrolysis-GC-MS and supervised machine learning. Proceedings of the National Academy of Sciences 122: e2514534122.
76. Callaghan, S.*, **C. K Boyce**. 2025. Which arthropods have feet and why? Addressing an argument for aquatic fossil scorpions. Palaeontology 68: e70020.
75. Nelsen, M. P., H. T. Lumbsch, **C. K Boyce**. 2025. The *Geosiphon-Nostoc* symbiosis: recent elaboration or remnant of an enduring association? Annals of Botany.
74. Li, F., D. Li, J. V. Frojdová, J. Pšenička, **C. K. Boyce**, Jun Wang, W. Zhou. 2025. Climbing habit confirmed in the early Permian zygopterid fern *Nemejcopteris haiwangii* and its palaeoecological significance. Palaeogeography, Palaeoclimatology, Palaeoecology 675: 113101.
73. **Boyce, C. K.,** M. P. Nelsen. 2025. Terrestrialization: towards a shared framework for ecosystem evolution. Paleobiology 1-21.
72. D'Antonio, M. P.*, C. M. Breasley*, J. Wang, **C. K. Boyce**. 2024. *Stigmaria*: on the substrate before in the substrate. Palaeoworld 33: 925-936.
71. **Boyce, C. K.** 2023. Evolution of terrestrial herbivory: nutrient stoichiometry, body size, and dietary diversity. Frontiers in Ecology & Evolution 11: 1304831.
70. Nelsen, M. P., C. S. Moreau, **C. K. Boyce**, R. H. Ree. 2023. Macroecological diversification of ants is linked to angiosperm evolution. Evolution Letters 7: 79-87.
69. Schachat, S. R.*, J. L. Payne, **C. K. Boyce**. 2023. Linking host plants to damage types in the fossil record of insect herbivory. Paleobiology 49: 232-258.
68. **Boyce**, **C. K.,** D. E. Ibarra, M. P. D'Antonio*. 2023. What we talk about when we talk about the long-term carbon cycle. New Phytologist 237: 1550-1557.
67. D'Antonio, M. P.*, D. E. Ibarra, **C. K. Boyce**. 2023. The preservation of cause and effect in the rock record. Paleobiology 49: 204-214.

66. Schachat, S. R.*, P. Goldstein, R. DeSalle, D. Bobo, **C. K. Boyce**, J. L. Payne, C. C. Labandeira. 2023. Illusion of flight? Absence, evidence, and the age of winged insects. Biological Journal of the Linnean Society 138: 143–168.
65. **Boyce, C. K.,** D. E. Ibarra, M. P. Nelsen, M. P. D'Antonio*. 2023. Nitrogen-based symbioses, phosphorous availability, and accounting for Mesozoic increases in terrestrial productivity. Geobiology 21: 86-101.
64. Nelsen, M. P.*, **C. K. Boyce**. 2022. What to do with *Prototaxites*? International Journal of Plant Sciences 183: 556-565.
63. Zhou W., D. Li, J. Pšenička, **C. K. Boyce**, S. Wang, J. Wang. 2022. *Diodonopteris virgulata* sp. nov., a climbing fern from the early Permian Wuda Tuff Flora and its palaeoecology. Review of Palaeobotany and Palynology 304: 104699.
62. Pšenička, J., W. Zhou, **C. K. Boyce**, J. V. Frojdová, J. Bek, S. Opluštil, J. Wang. 2022. Two new leptosporangiate ferns from *in situ* volcanic ash of the Whetstone Horizon (Kladno Formation, Pennsylvanian), Pilsen Basin, Czech Republic. Review of Palaeobotany and Palynology 299: 104608.
61. Ielpi, A., M. G. A. Lapôtre, M. R. Gibling, **C. K. Boyce**. 2022. Meandering rivers before and across the rise of land plants. Nature Reviews Earth & Environment: s43017-021-00249-6.
60. Schachat, S. R.*, J. L. Payne, **C. K. Boyce**, C. C. Labandeira. 2022. Generating and testing hypotheses about the fossil record of insect herbivory with a theoretical ecospace. Review of Palaeobotany and Palynology 297: 104564.
59. D'Antonio, M. P.*, **C. K. Boyce**, W. Zhou, H. W. Pfefferkorn, J. Wang. 2021. Primary tissues dominated ground-level trunk diameter in *Sigillaria*: evidence from the Wuda Tuff, Inner Mongolia. Journal of the Geological Society: jgs2021-021.
58. D'Antonio, M. P.*, **C. K. Boyce**. 2021. Secondary phloem in arborescent lycopsids. New Phytologist 232: 967-972.
57. Zhou, W., J. Pšenička, J. Bek, M. Wan, **C. K. Boyce**, J. Wang. 2021. A new anachoropterid fern from the Asselian (Cisuralian) Wuda Tuff Flora. Review of Palaeobotany & Palynology 294: 104346.
56. D'Antonio, M. P.*, **C. K. Boyce**, J. Wang. 2021. Two new species of *Sigillaria* Brongniart from the Wuda Tuff (Asselian: Inner Mongolia, China) and their implications for lepidodendrid life history reconstruction. Review of Palaeobotany & Palynology 294: 104203.
55. Schachat, S. R.*, **C. K. Boyce**, J. L. Payne, D. Lentink. 2021. Lepidoptera demonstrate the relevance of Murray's Law to circulatory systems with tidal flow. BMC Biology 19:204.
54. Zhou, W., D'Antonio, M. P.*, **C. K. Boyce**, J. Wang. 2021. An upright psaroniaceous stump and two surrounding pecopteroids from the early Permian Wuda Tuff Flora. PalaeoWorld 30: 451-460
53. Théroux-Rancourt, G., A. B. Roddy, J. M. Earles, **C. K. Boyce**, M. A. Zwieniecki, M. E. Gilbert, D. Tholen, A. J. McElrone, K. A. Simonin, C. R. Brodersen. 2021. Maximum CO_2 diffusion inside leaves is limited by the scaling of cell size and genome size. Proceedings of the Royal Society of London B 288: 20203145.
52. D'Antonio, M. P.*, **C. K. Boyce**. 2020. Arborescent lycopsid periderm production was limited. New Phytologist 228: 741-751.
51. Nelsen, M. P., R. Lücking, **C. K Boyce**, H. T. Lumbsch, R. H. Ree. 2020. The macroevolutionary dynamics of symbiotic and phenotypic diversification in lichens. Proceedings of the National Academy of Sciences 117: 21495-21503.
50. D'Antonio, M. P.*, Ibarra, D. E., **C. K. Boyce**. 2020. Land plant evolution decreased, rather than increased, weathering rates. Geology 48: 29-33.
49. Nelsen, M. P., R. Lücking, **C. K. Boyce**, H. T. Lumbsch, R. H. Ree. 2020. No support for the emergence of lichens prior to the evolution of vascular plants. Geobiology 18: 3-13.

48. Zhou, W., D. Li, J. Pšenička, **C. K. Boyce**, J. Wang. 2019. A left-handed fern twiner in an early Permian swamp forest. Current Biology. 29: R1172-R1173.
47. Ibarra, D. E., J. K. Caves, A. Bachan, A. Baresch*, K. V. Lau, D. L. Thomas, J. E. Lee, **C. K. Boyce**, C. P. Chamberlain. 2019. Modeling the consequences of land plant evolution on silicate weathering. American Journal of Science 319: 1-43.
46. **Boyce, C. K.**, M. A. Zwieniecki. 2019. The prospects for whole-plant physiology in fossils. New Phytologist 223: 40-49.
45. Baresch, A.*, C. Crifò, **C. K. Boyce**. 2019. Competition for epidermal space in the evolution of leaves with high physiological rates. New Phytologist 221: 628-639.
44. **Boyce, C. K.**, W. A. DiMichele. 2018. Fast or slow for the arborescent lycopsids? New Phytologist 218: 891-893.
43. Schachat, S. R.*, C. C. Labandeira, M. R. Saltzman, B. D. Cramer, J. L. Payne, **C. K. Boyce**. 2018. Phanerozoic pO_2 and the early evolution of terrestrial animals. Proceedings of the Royal Society of London B 285: 20172631.
42. Théroux-Rancourt, G., J. M. Earles, M. E. Gilbert, M. A. Zwieniecki, **C. K. Boyce**, A. J. McElrone, C. R. Brodersen. 2017. The bias of a 2D view: Comparing 2D and 3D mesophyll surface area estimates using non-invasive imaging. New Phytologist 215: 1609-1622.
41. **Boyce, C. K.**, Y. Fan, M. A. Zwieniecki. 2017. Did trees grow up to the light, up to the wind, or down to the water? – How modern high productivity colors perception of early plant evolution. New Phytologist 215: 552-557.
40. **Boyce, C. K.**, J. E. Lee. 2017. Plant evolution and climate over geological timescales. Annual Review of Earth & Planetary Sciences 45: 61-87.
39. Zwieniecki, M. A., K. S. Haaning, **C. K. Boyce**, K. H. Jensen. 2016. Stomatal design principles in synthetic and real leaves. Journal of the Royal Society Interface 13: 20160535.
38. Nelsen, M. P.*, W. A. DiMichele, S. E. Peters, **C. K. Boyce**. 2016. Delayed fungal evolution did not cause the Paleozoic peak in coal production. Proceedings of the National Academy of Sciences USA 113: 2442-2447.
37. **Boyce, C. K.**, W. A. DiMichele. 2016. Arborescent lycopsid productivity and lifespan: Constraining the possibilities. Review of Palaeobotany & Palynology 227: 97-110.
36. Zwieniecki, M. A., **C. K. Boyce**. 2014. The role of cellulose fibers in *Gnetum gnemon* leaf hydraulics. International Journal of Plant Sciences 175:1054-1061.
35. Zwieniecki, M. A., **C. K. Boyce**. 2014. Evolution of a unique anatomical precision in angiosperm leaf venation lifts constraints on vascular plant ecology. Proceedings of the Royal Society of London B 281: 20132829.
34. Lee, J.-E., C. Frankenberg, C. van der Tol, J. A. Berry, L. Guanter, **C. K. Boyce**, J. B. Fisher, E. Morrow, J. R. Worden, S. Asefi, G. Badgley, S. Saatchi. 2013. Forest productivity and water stress in Amazonia: observations from GOSAT chlorophyll fluorescence. Proceedings of the Royal Society of London B 280: 20130171.
33. **Boyce, C. K.**, M. A. Zwieniecki. 2012. Leaf fossil record suggests limited influence of atmospheric CO_2 on terrestrial productivity prior to angiosperm evolution. Proceedings of the National Academy of Sciences USA 109: 10403-10408.
32. Lee, J.-E., B. R. Lintner, J. D. Neelin, X. Jiang, P. Gentine, **C. K. Boyce**, J. B. Fisher, J. T. Perron, T. L. Kubar, J. Lee, J. Worden. 2012. Reduction of tropical land region precipitation variability via transpiration. Geophysical Research Letters 39: L19704.
31. **Boyce, C. K.**, A. B. Leslie. 2012. The paleontological context of angiosperm vegetative evolution. International Journal of Plant Sciences 173: 561-568.

30. Leslie, A. B., **C. K. Boyce**. 2012. Ovule function and the evolution of angiosperm reproductive innovations. International Journal of Plant Sciences 173: 640-648.
29. Lee, J.-E, B. R. Lintner, **C. K. Boyce**, P. J. Lawrence. 2011. Land use change exacerbates tropical South American drought by sea surface temperature variability. Geophysical Research Letters 38: L19706.
28. **Boyce, C. K.**, J.-E. Lee*. 2011. Could land plant evolution have fed the marine revolution? Paleontological Research 15: 100-105.
27. Nicotra, A. B., A. Leigh, **C. K. Boyce**, C. S. Jones, K. J. Niklas, D. Royer, and H. Tsukaya. 2011. The evolution and functional significance of leaf shape in the angiosperms. Functional Plant Biology 38: 535-552.
26. Leigh, A., M. A. Zwieniecki, F. E. Rockwell, **C. K. Boyce**, A. B. Nicotra, N. M. Holbrook. 2011. Structural and hydraulic correlates of heterophylly in *Ginkgo biloba* L. New Phytologist 189: 459-470.
25. †**Boyce, C. K.**, J.-E. Lee*, T. S. Feild, T. J. Brodribb, M. A. Zwieniecki. 2010. Angiosperms helped put the rain in the rainforests: The impact of plant physiological evolution on tropical biodiversity. Annals of the Missouri Botanical Gardens 97: 527-540.

    †*Recipient of the W. S. Cooper Award of the Ecological Society of America*
24. **Boyce, C. K.**, M. Abrecht, D. Zhou, P.U.P.A. Gilbert. 2010. X-ray photoelectron emission spectromicroscopic analysis of arborescent lycopsid cell wall composition and Carboniferous coal ball preservation. International Journal of Coal Geology 83: 146-153.
23. Lee, J.-E.*, **C. K. Boyce**. 2010. Impact of the hydraulic capacity of plants on water and carbon fluxes in tropical South America. Journal of Geophysical Research 115: D23123.
22. **Boyce, C. K.**, C. L. Hotton. 2010. *Prototaxites* was not a taphonomic artifact. American Journal of Botany 79: 1073.
21. **Boyce, C. K.**, J.-E. Lee*. 2010. An exceptional role for flowering plant physiology in the expansion of tropical rainforests and biodiversity. Proceedings of the Royal Society of London B 277: 3437-3443.
20. **Boyce, C. K.** 2010. The evolution of plant development in paleontological context. Current Opinion in Plant Biology 13: 102-107.
19. Hobbie, E. A., **C. K. Boyce**. 2010. Carbon sources for the Paleozoic giant fungus *Prototaxites* inferred from modern analogues. Proceedings of the Royal Society of London B 277: 2149-2156.
18. **Boyce, C. K.**, T. J. Brodribb, T. S. Feild, M. A. Zwieniecki. 2009. Angiosperm leaf vein evolution was physiologically and environmentally transformative. Proceedings of the Royal Society of London B 276: 1771-1776.
17. **Boyce, C. K.** 2009. Seeing the forest with the leaves—clues to canopy placement from leaf fossil size and venation characteristics. Geobiology 7: 192-199.
16. **Boyce, C. K.** 2008. The fossil record of plant physiology and development—What leaves can tell us. Paleontological Society Papers 14: 133-146.
15. **Boyce, C. K.** 2008. How green was *Cooksonia*? -- the importance of size in understanding the early evolution of physiology in the vascular plant lineage. Paleobiology 34: 179-194.
14. **Boyce, C. K.**, C. L. Hotton, M. L. Fogel, G. D. Cody, R. M. Hazen, A. H. Knoll, F. M. Hueber. 2007. Devonian landscape heterogeneity recorded by a giant fungus. Geology 35: 399-402.
13. **Boyce, C. K.** 2007. Mechanisms of laminar growth in morphologically convergent leaves and flower petals. International Journal of Plant Science 168: 1151-1156.
12. Zwieniecki, M. A., H. Stone, A. Leigh, **C. K. Boyce**, N. M. Holbrook. 2006. Hydraulic design of pine needles: one-dimensional optimization for single-vein leaves. Plant, Cell & Environment 29: 803-809.
11. **Boyce, C. K.** 2005. The evolutionary history of roots and leaves. Pp. 479-499 *in* N. M. Holbrook & M. A. Zweiniecki, eds. Vascular transport in plants. Elsevier Sciences/Academic Press.

10. **Boyce, C. K.** 2005. Patterns of segregation and convergence in the evolution of fern and seed plant leaf morphologies. Paleobiology 31: 117-140.
9. Zwieniecki, M. A., **C. K. Boyce**, N. M. Holbrook. 2004. Functional design space of single veined leaves: role of tissue hydraulic properties in constraining leaf size and shape. Annals of Botany 94: 507-513.
8. **Boyce, C. K.**, M. A. Zwieniecki, G. D. Cody, C. Jacobsen, S. Wirick, A. H. Knoll, N. M. Holbrook. 2004. Evolution of xylem lignification and hydrogel transport regulation. Proceedings of the National Academy of Sciences USA 101: 17555-17558.
7. Zwieniecki, M. A., **C. K. Boyce**, N. M. Holbrook. 2004. Hydraulic limitations imposed by crown placement determine final size and shape of *Quercus rubra* L. leaves. Plant, Cell & Environment 27: 357-365.
6. **Boyce, C. K.**, G. D. Cody, M. L. Fogel, R.M. Hazen, C. M. O'D. Alexander, A. H. Knoll. 2003. Chemical evidence for cell wall lignification and the evolution of tracheids in Early Devonian plants. International Journal of Plant Sciences 164: 691-702.
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