Kenneth G. Karol

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Molecular Systematics Studies
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Education

Ph.D., Plant Biology. 2004. University of Maryland, College Park, MD

Bachelor of Science, Botany. 1992. University of Wisconsin, Madison, WI

Professional Experience

Assistant Curator. 2007-Present. Cullman Program, The New York Botanical Garden, Bronx, NY

Doctoral Faculty. 2007-Present. City University of New York, Plant Sciences Ph.D. Subprogram, Lehman College, Bronx, NY

Guest Faculty. 2008-Present. Biology, Sarah Lawrence College, Bronxville, NY

Chair - Phycological Section, Botanical Society of America. 2006-Present.

Postdoctoral Fellow. 2006-2007. National Institutes of Health - National Research Service Award, Genomics/Biology, University of Washington, Seattle, WA

LBNA Guest Researcher. 2005-present. Department of Energy Joint Genome Institute, Walnut Creek, CA Appointment runs concurrently with ongoing genome projects.

Research Associate (post-doc). 2004-2006. US National Science Foundation Tree of Life Program, Biology, University of Washington, Seattle, WA

Graduate Student. 1998-2004. Cell Biology and Molecular Genetics, University of Maryland, College Park, MD

Research Assistant. 1999-2003. US National Science Foundation PEET Program, University of Maryland, College Park, MD

Graduate Admissions Committee. 2001 & 2002. Cell Biology and Molecular Genetics, University of Maryland, College Park, MD

Executive Committee. 1999-2000. Green Plant Phylogeny Research Coordination Group

Biological Research Technician. 1997-1998. Laboratory of Molecular Systematics, National Museum of Natural History, Smithsonian Institution, Washington, DC

Contract Researcher. 1997. Laboratory of Molecular Systematics, National Museum of Natural History, Smithsonian Institution, Smithsonian Institution, Washington, DC

Research Technician. 1993-1996. Biological Sciences, DePaul University, Chicago, IL

Visiting Scientist. 1995. Paleobotany, Université des Sciences et Techniques du Languedoc, Montpellier, France

Research Technician III. 1993. Zoology, University of Wisconsin-Madison, Madison, WI

Research Technician II. 1991-1993. Botany, University of Wisconsin-Madison, Madison, WI

Teaching Experience

Guest Faculty. 2008. Principles of Botany, Biology 3709R. Sarah Lawrence College, Bronxville, NY

Guest Lecturer. 2006. Inferring Phylogenies, Genetics 570 (Instructor: J. Felsenstein). University of Washington, Seattle, WA

Guest Lecturer. 2006. Phycology: Introduction to Algae, Biology 446 (Instructors: R..J. Waaland & R.A. Cattolico). University of Washington, Seattle, WA

Graduate Teaching Assistant. 1998-1999. Plant Biology 101, University of Maryland, College Park, MD

Instructor. 1998. Segundo Curso en Técnicas de Genética Molecular para la Conservación y Uso de la Biodiversidad, Centro Internacional de Agricultura Tropical (CIAT), Palmira, Colombia

Teaching Assistant. 1996. Phycology 361/461, DePaul University, Chicago, IL

Undergraduate Independent Research Mentor. 1998-2003. University of Maryland, College Park, MD

Awards and Honors

National Institutes of Health - National Research Service Award. 2006-2007. Genomics/Biology, University of Washington, Seattle, WA

AAAS/Science Sponsored Membership. 2004-2006. AAAS/Science Program for Excellence in Science. Nominated by the Dean of the Graduate School, University of Washington, Seattle, WA

Graduate School Dean's Fellowship. 2002-2003. University of Maryland, College Park, MD

College Travel Award. 2001, 2002. University of Maryland, College Park, MD

Jacob K. Goldhaber Travel Award. 2000. University of Maryland, College Park, MD

Hoshaw Travel Award - Phycological Society of America. 2000. San Diego, CA

National Museum of Natural History Graduate Fellowship. 1999. Smithsonian Institution, Washington, DC

International Botanical Congress - Green Plant Phylogeny Research Coordination Group Travel Award. 1999.

Cell Biology and Molecular Genetics Outstanding Teaching Assistant. 1998-1999. University of Maryland, College Park, MD

Personal Recognition for Ingenuity, Drive and Excellence (PRIDE) Award. 1998. Smithsonian Institution, Washington, DC

Visiting Fellowship. February-March 1996. University of New South Wales, Sydney, Australia.

University Bookstore Academic Excellence Award. 1991-1992. University of Wisconsin, Madison, WI

US National Science Foundation - Research Experience for Undergraduates, Systematics. 1990, 1992. (PIs, T.J. Givnish & K.J. Sytsma), University of Wisconsin, Madison, WI

Publications — Peer Reviewed Journals (*contributed equally to this work)

Casanova, M.T. & K.G. Karol. 2008. Monoecious *Nitella* species (Characeae, Charophyta) from south-eastern mainland Australia including *Nitella paludigena* sp. nov. *Aust. Syst. Bot*. 21: 201-216.

Hall, J.D., K.G. Karol, R.M. McCourt & C.F. Delwiche. 2008. Phylogeny of the conjugating green algae based on chloroplast and mitochondrial nucleotide sequence data. *J. Phycol*., 44: 467-477.

Duplessis*, M.R., K.G. Karol*, E.T. Adman, L.Y.S. Choi, M.A. Jacobs & R.A. Cattolico. 2007. Chloroplast His-to-Asp signal transduction: a potential mechanism for plastid gene regulation in *Heterosigma akashiwo* (Raphidophyceae). *BMC Evol. Biol*., 7:70.

Casanova, M.T., M.D. de Winton, K.G. Karol & J.S. Clayton. 2007. *Nitella hookeri* A. Braun (Characeae, Charophyta) in New Zealand and Australia: implications for endemism, speciation and biogeography. *Charophytes*, 1: 2-18.

Roper, J., S.K. Hanson, P.G. Wolf, K.G. Karol, D.F. Mandoli, K.D.E. Everett, J. Kuehl & J.L. Boore. 2007. The complete plastid genome sequence of *Angiopteris evecta* (G. Forst.) Hoffm. *Amer. Fern J*., 97: 95-106.

Hausner, G., R. Olsen, I. Johnson, D. Simon, E.R. Sanders, K.G. Karol, R.M. McCourt & S. Zimmerly. 2006. Origin and evolution of the chloroplast *trnK* (*matK*) intron: a model for evolution of group II intron RNA structures. *Mol. Biol. Evol*., 23: 380-391.

Drummond, C.S., J. Hall, K.G. Karol, C.F. Delwiche & R.M. McCourt. 2005. Phylogeny of *Spirogyra* and *Sirogonium* (Zygnematophyceae) based on *rbcL* sequence data. *J. Phycol*., 41: 1055-1064.

Wolf, P.G., K.G. Karol, D.F. Mandoli, J. Kuehl, K. Arumuganathan, M.W. Ellis, B.D. Mishler, D.G. Kelch, R.G. Olmstead & J.L. Boore. 2005. The first complete chloroplast genome sequence of a lycophyte, *Huperzia lucidula* (Lycopodiaceae): implications for land plant phylogeny. *Gene*, 350: 117-128.

McCourt, R.M., C.F. Delwiche & K.G. Karol. 2004. Charophyte algae and land plant origins. *TREE* 19: 661-666.

Sanders, E.R., K.G. Karol & R.M. McCourt. 2003. Occurrence of *matK* in a *trnK* group II intron in charophyte green algae, and phylogeny of the Characeae. *Amer. J. Bot.*, 90: 628-633.

Whitlock, B.A., K.G. Karol & W.S. Alverson. 2003. Chloroplast DNA sequences confirm the placement of the enigmatic *Oceanopapaver* within Grewioideae (Malvaceae s.l., formerly Tiliaceae). *Int. J. Plant Sci.*, 64: 35-41.

Delwiche, C.F., K.G. Karol, M.T. Cimino & K.J. Sytsma. 2002. Phylogeny of the genus *Coleochaete* and related taxa based on the chloroplast gene *rbcL*. *J. Phycol.*, 38: 394-403.

Karol, K.G., R.M. McCourt, M.T. Cimino & C.F. Delwiche. 2001. The closest living relatives of land plants. *Science*, 294: 2351-2353.

Karol, K.G., Y. Suh, G.E. Schatz & E.A. Zimmer. 2000. Molecular evidence for the phylogenetic position of *Takhtajania* in the Winteraceae: inference from nuclear ribosomal and chloroplast gene spacer sequences. *Ann. Mo. Bot. Gard.*, 87: 414-432.

McCourt, R.M., K.G. Karol, J. Bell, M.F. Wojciechowski, K. Helm-Bychowski, A. Grajewska, N. Park & R.W. Howshaw. 2000. Phylogeny of the Zygnematales and Desmidiales (Chlorophyta: Charophyceae) based on *rbcL* sequences. *J. Phycol.*, 36: 747-758.

Cimino, M.T., K.G. Karol & C.F. Delwiche. 2000. An artifact in the SSU rDNA sequence of *Chaetosphaeridium globosum* (Chlorophyta: Charophyceae). *J. Phycol.*, 36: 440-442.

Karol, K.G., J.E. Rodman, E. Conti & K.J. Sytsma. 1999. Nucleotide sequence of *rbcL* and phylogenetic relationships of *Setchellanthus caeruleus* (Setchellanthaceae). *Taxon*, 48: 303-315.

McCourt, R.M., K.G. Karol, M.T. Casanova & M. Feist. 1999. Monophyly of genera and species of Characeae based on *rbcL* sequences, with special reference to Australian and European *Lychnothamnus barbatus* (Characeae: Charophyceae). *Aust. J. Bot.*, 47 361-369.

Rodman, J.E., P.S. Soltis, D.E. Soltis, K.J. Sytsma & K.G. Karol. 1998. Parallel evolution of glucosinolate biosynthesis inferred from congruent nuclear and plastid gene phylogenies. *Amer. J. Bot.*, 85: 997-1006.

Alverson, W.S., K.G. Karol, D.A. Baum, M.W. Chase, S.M. Swensen, R.M. McCourt & K.J. Sytsma. 1998. Circumscription of the Malvales and relationships to other Rosids: evidence from *rbcL* sequence data. *Amer. J. Bot.*, 85: 876-887.

Morton, C.M., S.C. Mori, G.T. Prance, K.G. Karol & M.W. Chase. 1997. Phylogenetic relationships of Lecythidaceae: A cladistic analysis using *rbcL* sequence and morphological data. *Amer. J. Bot.*, 84: 530-540.

Morton, C.M., K.G. Karol & M.W. Chase. 1997. Taxonomic affinities of *Physena* (Physenaceae) and *Asteropeia* (Theaceae). *Bot. Rev.*, 63: 231-239.

Park, N.E., K.G. Karol & R.M. McCourt. 1996. Phylogeny of *Gonatozygon* and *Genicularia* (Gonatozygaceae, Desmidiales) based on *rbcL* sequences. *Eur. J. Phyco.*, 31: 309-313.

Rodman, J.E., K.G. Karol, R.A. Price & K.J. Sytsma. 1996. Molecules, morphology, and Dahlgren's expanded order Capparales. *Syst. Bot.*, 21: 289-307.

McCourt, R.M., K.G. Karol, M. Guerlesquin & M. Feist. 1996. Phylogeny of extant genera in the family Characeae (Charales, Charophyceae) based on *rbcL* sequences and morphology. *Amer. J. Bot.*, 83: 125-131.

McCourt, R.M., K.G. Karol, S. Kaplan & R.W. Hoshaw. 1995. Using *rbcL* sequences to test hypotheses of chloroplast and thallus evolution in conjugating green algae (Zygnematales; Charophyceae). *J. Phycol.*, 31: 989-995.

Rodman, J.E., K.G. Karol, R.A. Price, E. Conti & K.J. Sytsma. 1993. Nucleotide sequences of *rbcL* confirm the capparalean affinity of the Australian endemic Gyrostemonaceae. *Aust. Syst. Bot.*, 7: 57-69.

Rodman, J.E., R.A. Price, K.G. Karol, E. Conti, K.J. Sytsma & J. Palmer. 1993. Nucleotide sequences of the *rbcL* gene indicate monophyly of mustard oil plants. *Ann. Mo. Bot. Gard.*, 80: 686-699.

Chase, M.W., D.E. Soltis, R.G. Olmstead, D. Morgan, D.H. Les, B.D. Mishler, M.R. Duvall, R.A. Price, H.G. Hills, Y. Qiu, K.A. Kron, J.H. Rettig, E. Conti, J.D. Palmer, J.R. Manhart, K.J. Sytsma, H.J. Michaels, W.J. Kress, K.G. Karol, W.D. Clark, M. Hedren, B.S. Gaut, R.K. Jensen, K. Kim, C.F. Wimpee, J.F. Smith, G.R. Furnier, S.H. Strauss, Q. Xiang, G.M. Plunkett, P.M. Soltis, S. Swensen, S.E. Williams, P.A. Gadek, C.J. Quinn, L.E. Eguiarte, E. Golenberg, G.H. Learn, Jr., S.W. Graham, S.C.H. Barrett, S. Dayanandan & V.A. Albert. 1993. Phylogenetics of seed plants: an analysis of nucleotide sequences from the plastid gene *rbcL*. *Ann. Mo. Bot. Gard.*, 80: 528-580.

Gadek, P.A., C.J. Quinn, J.E. Rodman, K.G. Karol, E. Conti, R.A. Price & E.S. Fernando. 1992. Affinities of the Australian endemic Akaniaceae: New evidence from *rbcL* sequences. *Aust. Syst. Bot.*, 5: 717-724.

Publications — Book Chapters

Karol, K.G. & M.T. Casanova. 2007. Klebsormidiales, Coleochaetales and other early diverging lineages of the Charophyta, in: *Algae of Australia: Introduction*, pp. 356-362. McCarthy, P.M. & A.E. Orchard (eds.). Australian Biological Resources Study, Canberra; CSIRO Publishing, Melbourne.

Feist, M., N. Grambast-Fessard, M. Guerlesquin, K.G. Karol, H.-N. Lu, R.M. McCourt, Q.-F. Wang & S.-Z. Zhang. 2005. Protista (Charophyta). in: *Treatise on Invertebrate Paleontology*, Part B, Vol. 1. Geological Society of America and the University of Kansas Press.

Chapman, R.L., M.A. Buchheim, C.F. Delwiche, T. Friedl, V.A.R. Huss, K.G. Karol, L.A. Lewis, J. Manhart, R.M. McCourt, J.L. Olsen & D.A. Waters. 1998. Molecular systematics of the green algae, in: *Molecular Systematics of Plants II*, pp. 508-540. Soltis, D.E., P.S. Soltis & J.J. Doyle (eds.). Klewer Academic Publishers, Boston.

McCourt, R.M., S.T. Meiers, K.G. Karol & R.L. Chapman. 1996. Molecular systematics of the Charales, in: *Cytology, Genetics and Molecular Biology of the Algae*, pp. 323-336. Chaudhary, B.R. & S.B. Agrawal (eds.). SPB Academic Publishing, Amsterdam.

Invited Papers

Karol, K.G. 2007. Genes, gyrogonites and genomes: What they reveal about the evolution of green plants. University of Washington, Seattle, WA

Karol, K.G. 2004. Phylogenetic studies in the Characeae: the closest living relatives of land plants. University of California, Berkeley, CA

Karol, K.G. 2002. Phylogenetic studies in the Characeae: the closest living relatives of land plants. *Harvard University Herbarium Seminar Series*, Harvard University, Cambridge, MA

Karol, K.G., McCourt, R.M., Feist, M. & C.F. Delwiche. 2002. Estimating divergence times within the Charophyta: a Bayesian approach using fossil and DNA sequence data. *Green Algal Conquests of the Land: Many Conquests, One Victory?* Botany 2002, PSA Symposium, Madison, WI

McCourt, R.M., Karol, K.G. & C.F. Delwiche. 2002. The roots of land plants: recent research on early-diverging lineages in the evolution of higher drier algae**.** *Green Algal Conquests of the Land: Many Conquests, One Victory?* Botany 2002, PSA Symposium, Madison, WI

Delwiche, C.F., Karol, K.G. & R.M. McCourt. 2002. One small step: why did the charophytes have the right stuff? *Green Algal Conquests of the Land: Many Conquests, One Victory?* Botany 2002, PSA Symposium, Madison, WI

Karol, K.G., R.M. McCourt, V. Proctor, M. Feist & C.F. Delwiche. 2000. Preliminary molecular analyses of tribe Nitelleae (Characeae) using *rbcL* sequence data. *The Third International Symposium on Extant and Fossil Charophytes,* Nanjing, Peoples Republic of China

Public Service

Reviewer of manuscripts and grant proposals – *Annals of Botany, European Journal of Phycology, Evolution, International Journal of Plant Sciences, Journal of Phycology, Molecular Biology and Evolution, Molecular Phylogenetics and Evolution, Phycologia, Systematic Biology,* and the US National Science Foundation.

Societies

American Association for the Advancement of Science

Botanical Society of America

International Research Group on Charophytes

Sigma Xi

Society of Systematic Biologists