

Erin A. Mordecai

Biology Department · University of North Carolina · Chapel Hill, NC 27599

Tel: (678) 517-3976 · Email: Mordecai@unc.edu

<https://sites.google.com/site/erinmordecai/>

Education

Ph.D. in Ecology, December 2012, *University of California Santa Barbara*

B.S. in Mathematical Biology, *Summa cum laude*, May 2007, *University of Georgia*

Research Appointments

NSF Postdoctoral Research Fellowship in Biology (January 2013 – present)

Program area: Intersection of Biology and Mathematical and Physical Sciences and Engineering

University of North Carolina and North Carolina State University

Research: Community ecology of infectious diseases: mechanisms maintaining pathogen and host diversity (Advisors: Charles Mitchell and Kevin Gross)

Graduate Research (September 2007 – December 2012)

University of California Santa Barbara

Dissertation: Consequences of pathogen spillover for plant diversity in invaded grasslands (Advisors: Jonathan Levine and Kevin Lafferty)

Undergraduate Research (May 2002 – May 2003)

University of Georgia

Honors Thesis: Incidence and impact of a leaf spot disease in a natural population of *Polygonatum biflorum* (Advisor: Ron Pulliam)

Research Interests

Pathogen effects on plant species diversity

Maintenance of parasite and pathogen diversity

Consequences of climate change for host-pathogen dynamics

Peer-Reviewed Publications

Mordecai, E.A. Despite spillover, a shared pathogen promotes native plant persistence in a cheatgrass-invaded grassland (in press at *Ecology*). <http://dx.doi.org/10.1890/13-0086.1>

Mordecai, E.A. 2013. Consequences of pathogen spillover for cheatgrass-invaded grasslands: coexistence, competitive exclusion, or priority effects. *American Naturalist* 181(6): 737-747. <http://www.jstor.org/stable/10.1086/670190>

Mordecai, E.A., K. Paaijmans, C. Balzer, T. Ben-Horin, E. De Moor, L. Johnson, A. McNally, S. Pawar, S. Ryan, T. Smith, K. Lafferty. 2013. Optimal temperature for

malaria transmission is dramatically lower than previously predicted. *Ecology Letters* 16: 22-30. <http://dx.doi.org/10.1111/ele.12015>

Mordecai, E.A. 2012. Soil moisture and fungi affect seed survival in California grassland annual plants *PLoS ONE* 7(6): e39083. <http://dx.doi.org/10.1371/journal.pone.0039083>

Mordecai, E.A. 2011. Pathogen impacts on plant communities: unifying theory, concepts, and empirical work. *Ecological Monographs* 81(3): 429-441. **Faculty of 1000 Recommended.** <http://dx.doi.org/10.1890/10-2241.1>

Viola, D.V., **E.A. Mordecai**, S.A. Sistla, A.G. Jaramillo, G.S. Gosnell, L.K. Albertson, B.J. Cardinale, and J.M. Levine. 2010. Competition–defense tradeoffs and the maintenance of plant diversity. *Proceedings of the National Academy of Sciences* 104(40): 17217-17222. <http://dx.doi.org/10.1073/pnas.1007745107>

Warren, R.J., **E.A. Mordecai**. 2010. Soil moisture mediated interaction between *Polygonatum biflorum* and leaf spot disease. *Plant Ecology* 209: 1-9. <http://dx.doi.org/10.1007/s11258-009-9713-1>

Lafferty, K. D., S. Allesina, M. Arim, C. J. Briggs, G. DeLeo, A. P. Dobson, J. A. Dunne, P. T. Johnson, A. M. Kuris, D. J. Marcogliese, N. D. Martinez, J. Memmott, P. A. Marquet, J. P. McLaughlin, **E. A. Mordecai**, M. Pascual, R. Poulin, and D. W. Thieltges. 2008. Parasites in food webs: the ultimate missing links. *Ecology Letters* 11: 533-546. <http://dx.doi.org/10.1111/j.1461-0248.2008.01174.x>

Publications in Review and in Preparation (available upon request)

In review or submitted:

Mordecai, E.A. Pathogen impacts on plant diversity in variable environments (in review at *Ecology*).

Johnson, L.R., Ben-Horin, T., Lafferty, K.D., McNally, A., **Mordecai, E.A.**, Paaijmans, K.P., Pawar, S., Ryan, S.J. Understanding uncertainty in temperature effects on vector-borne disease: A Bayesian approach (submitted to *Ecology*; [arXiv:1310.5110](https://arxiv.org/abs/1310.5110)).

Ryan, S.J., McNally, A., Johnson, L.R., Ben-Horin, T., Paaijmans, K.P., **Mordecai, E.A.**, Lafferty, K.D. Rising suitability, declining severity: climate change and shifting malaria transmissibility in Africa (submitted to *Nature Communications*).

Anticipated October submissions:

Seabloom, E.W., Borer, E.T., Gross, K., Kendig, A., Lacroix, C., Mitchell, C.E., **Mordecai, E.A.**, Power, A.G. Disease and community ecology synthesis: New directions for the ecology of multi-pathogen communities (for *Ecology Letters*).

Kendig, A.E., **E.A. Mordecai**, J. HilleRisLambers, J.M. Levine. Effects of temporal variability on coexistence in a serpentine annual plant community (in revision for *Ecosphere*).

Book Chapters and Other Publications

Johnson, L.R., Lafferty, K.D., McNally, A., **Mordecai, E.A.**, Paaijmans, K.P., Pawar, S., Ryan, S.J. “Mapping the Distribution of Malaria: current approaches and future directions” in *Infectious Disease Modeling*. John Wiley, in press.

E.A. Mordecai. 2011. Mathematica Demonstration: “Pathogen spillover affects coexistence of competing host species,”
<http://demonstrations.wolfram.com/PathogenSpilloverAffectsCoexistenceOfCompetingHostSpecies/>.

Research Grants and Fellowships

- 2012 NSF Mathematical Biology Postdoctoral Fellowship (\$123,000)
- 2012 NSF Doctoral Dissertation Improvement Grant (\$12,654)
- 2012 UCSB Graduate Division Dissertation Fellowship (\$6,000)
- 2011 Broida-Hirschfelder Award (\$8,000)
- 2011 UCSB Dean’s Fellowship (\$18,000)
- 2011 Leal Ann Kerry Mertes Scholarship (\$2,000)
- 2011 UCSB Affiliates Graduate Dissertation Fellowship (\$3,000)
- 2011 UCSB Academic Senate Doctoral Student Travel Grant (\$685)
- 2010 Luce Environmental Science to Solutions Fellowship (\$6,000, plus funding for a working group at NCEAS)
- 2010 Susan Worster Research Grant (\$6,000)
- 2008 Mildred E. Mathias Graduate Student Research Grant (\$2,300)
- 2007 UCSB Ecology, Evolution, and Marine Biology department fellowship (\$18,000)
- 2005 University of Georgia Foundation Fellowship (\$25,500)
- 2003 University of Georgia Bernard Ramsey Fellowship (\$12,000)

Professional Presentations

- 2014 *Accepted invitation*. Causes and consequences of virus diversity in grassland communities. Organized Oral Session: “Managing Disease-Structured Ecosystems.” *Ecological Society of America*, Sacramento, CA.
- 2013 *Invited*. Nonlinear responses of disease to environmental change. Curriculum for Ecology and Evolution, *University of North Carolina at Chapel Hill*.
- 2013 Despite spillover, a shared pathogen promotes native plant persistence in a cheatgrass-invaded grassland. *Ecological Society of America*, Minneapolis, MN.
- 2012 Competition-colonization tradeoffs and trematode coexistence. *Ecological Society of America*, Portland, Oregon.

- 2012 Malaria transmission: It's cooler than you think. *UCSB Ecology, Evolution, and Marine Biology Graduate Student Symposium*, Santa Barbara, California.
- 2011 Consequences of pathogen spillover for plant species diversity. *Ecological Society of America*, Austin, Texas.
- 2011 Malaria transmission: It's cooler than you think. *Ecology and Evolution of Infectious Diseases Conference*, Santa Barbara, California.
- 2010 Do exotic grasses mediate plant-pathogen dynamics in California grasslands? *Mildred E. Mathias Symposium*, Bodega Bay, California.
- 2009 Pathogen effects on plant diversity in a variable environment. *Ecological Society of America*, Albuquerque, New Mexico.
- 2009 Pathogen effects on plant diversity in a variable environment. *UCSB Ecology, Evolution, and Marine Biology Graduate Student Symposium*, Santa Barbara, California.

Teaching Assistantships at the University of California Santa Barbara

- 2011 *Field Approaches to Terrestrial Plant and Ecosystem Ecology*
- 2011 *Ecology of Disease*
- 2010 *Introduction to Biology Lab II*
- 2010 *Introduction to Ecology*
- 2009 *Introduction to Ecology*
- 2009 *Ecology of Disease*
- 2008 *Field Approaches to Terrestrial Plant and Ecosystem Ecology*
- 2008 *Ecology of Disease*

Professional Experience

- 2013- **Research mentor** for graduate student. Working with a mathematical biology graduate student on modeling the temperature-dependence of vector-borne diseases.
- 2010-2012 **Working group leader**, Malaria and Climate Change, National Center for Ecological Analysis and Synthesis (NCEAS), Santa Barbara, CA.
- 2010-2012 **Research mentor** for undergraduate student. Conducted a field experiment to test the mechanisms that maintain diversity for salt marsh parasites with an undergraduate and a graduate student.
- 2011 **Workshop participant**, Ecology and Evolution of Infectious Diseases, University of California Santa Barbara.

- 2011 **Research mentor** for high school student through the UCSB Research Mentorship Program. Mentored a high school student conducting an independent research project on snail parasites in Carpinteria salt marsh.
- 2009 **Research mentor** for an NSF REU student. Built and parameterized a storage effect model with an undergraduate student.
- 2009 **Workshop participant**, Ecology and Evolution of Infectious Diseases, University of Georgia, Athens, GA.
- 2007-2009 **Working group participant**, Parasites in Food Webs, National Center for Ecological Analysis and Synthesis (NCEAS), Santa Barbara, CA.

Professional Society Memberships and Service

Member of Ecological Society of America.

Reviewer for the National Science Foundation, *Ecology Letters*, *Proceedings of the Royal Society B*, *Journal of Ecology*, *Trends in Ecology and Evolution*, *PLoS ONE*, *BMC Ecology*, *EcoHealth*, *Ecosphere*, *Ecological Research*, *BioSystems*, *Conservation Physiology*, and the Graduate Women in Science Fellowship.

Associate reviewer for Faculty of 1000.

References

Jonathan M. Levine, Professor, Institute of Integrative Biology, Swiss Federal Institute of Technology (ETH Zurich), Universitätsstrasse 16, CH-8092 Zurich, Switzerland, jonathan.levine@env.ethz.ch, +41 44 632-6301

Kevin D. Lafferty, Channel Islands Field Station, USGS, Western Ecological Research Center c/o Marine Science Institute, University of California, Santa Barbara, CA 93106, kevin.lafferty@lifesci.ucsb.edu, (805) 893-8778

Charles E. Mitchell, Associate Professor, Department of Biology, University of North Carolina at Chapel Hill, CB# 3280, University of North Carolina, Chapel Hill, NC 27599, mitchell@bio.unc.edu, (919) 843-7745

Kevin Gross, Associate Professor, Department of Statistics, North Carolina State University, Raleigh, NC 27695, gross@stat.ncsu.edu, (919) 513-4690