

JENNIFER DOYLE ROCCA

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TARGETED RESEARCH INTERESTS

Microbial community ecology, assembly mechanisms that determine microbiome response to community coalescence, predator-prey interactions, stressor impacts on microbiome structure and function.

EDUCATION

- PhD Ecology, GDPE, Colorado State University** 2015
Advisor: Dr. Matthew D. Wallenstein
Dissertation: *Unraveling drivers of microbial community assembly & impacts on microbial function*
- MA Plant Biology, University of Texas at Austin** 2010
Advisor: Dr. Christine V Hawkes
Thesis: *Functional Response of the Soil Microbial Community to Forecasted Rainfall Shifts*
- B.S. Botany, University of Florida, Gainesville, FL** 2002
Advisors: Dr. Douglas Soltis, Dr. Pamela Soltis

APPOINTMENTS

- Postdoctoral Associate, Duke University** 2016 - Present
Supervisor: Dr. Emily Bernhardt
Understand assembly mechanisms during microbial community & environmental mixing.
- Research Assistant, University of Florida** 2010 - 11
Supervisor: Dr. Michelle Mack
Examined openness of N-cycle along soil catenas in Kruger NP, South Africa.
- Research Assistant, University of Texas at Austin** 2010
Supervisors: Drs. Christine Hawkes and Thomas Juenger
Analyzed mycorrhizal fungi associated with switchgrass across a precipitation gradient.
- Research Assistant, Marine Biological Laboratory, Woods Hole MA** 2004 - 07
Supervisors: Dr. Mitch Sogin, Hilary Morrison and David Mark Welch.
Methods development of multiplexing 454; and assessed estuarine microbial community structure as influenced by hurricane flooding, and separately, thermal impacts of power plants.
- Molecular Lab Technician, Soltis Lab, FLMNH, University of Florida** 2002 - 03
Supervisors: Drs. Douglas and Pamela Soltis, Matthew Gitzendanner
*Cloned, sequenced, and edited ITS, ETS regions for examining parallel evolution of recently speciated allotetraploids in the genus *Tragopogon* (Asteraceae).*

PUBLICATIONS

- Rocca, JD**, Simonin, M., Blaszczak, J.R., Ernakovich, J.G., Gibbons, S.M., Midani, F.S., Washburne, A.D. 2018. The Microbiome Stress Project: Towards a global meta-analysis of environmental stressors and their effects on microbial communities. *Frontiers in Microbiology*. doi.org/10.3389/fmicb.2018.03272.

- Avellan, A., Simonin, M., McGivney, E., Bossa, N., Spielman-Sun, E., **JD Rocca**, Bernhardt, E.S., Geitner, N.K., Unrine, J.M., Wiesner, M.R., Lowry, G.V. 2018. Gold nanoparticle biodissolution by a freshwater macrophyte and its associated microbiome. *Nature Nanotech.* doi.org/ 10.1038/s41565-018-0231-y.
- Simonin, M., Colman, B.P., Tang, W., Judy, J.D., Anderson, S.M., Bergemann, C.M., **JD Rocca**, Unrine, J.M., Cassar, N., Bernhardt, E.S. 2018. Plant and Microbial Responses to Repeated Cu(OH)₂ Nanopesticide Exposures Under Different Fertilization Levels in an Agro-Ecosystem. *Frontiers in Microbiology.* doi.org/10.3389/fmicb.2018.01769.
- Hall, E.K., Bernhardt, E.S., Bier, R.L., Bradford, M.A., Boot, C.M., Cotner, J.B., del Giorgio, P.A., Evans, S.E., Graham, E.B., Jones, S.E., Lennon, J.T., Locey, K.J., Nemergut, D., Osborne, B.B., **JD Rocca**, Schimel, J.P., Waldrop, M.P., Wallenstein, M.D. 2018. Understanding how microbiomes influence the systems they inhabit. *Nature Microbiology.*
- Ramirez, KS, CG Knight, M de Hollander, FQ Brearley, B Constantinides, A Cotton, S Creer, TW Crowther, J Davison, M Delgado-Baquerizo, E Dorrepaal, DR Elliott, G Fox, RI Griffiths, C Hale, K Hartman, A Houlden, DL Jones, EJ Krab, FT Maestre, KL McGuire, S Monteux, CH Orr, WH van der Putten, IS Roberts, DA Robinson, **JD Rocca**, J Rowntree, K Schlaeppli, M Shepherd, BK Singh, AL Straathof, JM Bhatnagar, C Thion, M van der Heijden, FT de Vries. 2017. Detecting macroecological patterns in bacterial communities across independent studies of global soils. *Nature Microbiology* doi.org/10.1038/s41564-017-0062-x.
- Hawkes CV, BG Waring, **JD Rocca**, SN Kivlin. 2017. Historical climate controls soil respiration responses to current soil moisture. *PNAS* doi: 10.1073/pnas.1620811114.
- Rocca, JD**, EK Hall, JT Lennon, SE Evans, MP Waldrop, JB Cotner, DR Nemergut, EB Graham, MD Wallenstein. 2014. Relationships between protein-encoding gene abundance and corresponding process are commonly assumed yet rarely observed. *ISME J* doi:10.1038/ismej.2014.252.
- Bell, CW, BE Fricks, **JD Rocca**, JM Steinweg, SK McMahan, MD Wallenstein. 2013. High-throughput fluorometric measurement of potential soil extracellular enzyme activities. *Journal of Visualized Experiments*, www.jove.com/video/50961/high-throughput-fluorometric-measurement-potential-soil-extracellular.
- Bell, CW, Y. Carrillo, CM Boot, **JD Rocca**, E. Pendall, MD Wallenstein. 2013. Rhizosphere stoichiometry: are C:N:P ratios of plants, soils, and enzymes conserved at the plant species-level? *New Phytologist*.
- Hawkes, CV, SN Kivlin, **JD Rocca**, V Huguet, MA Thomsen, KB Suttle. 2010. Fungal response to altered precipitation. *Global Change Biology*.
- Amaral-Zettler, LA, **JD Rocca**, M.G. LaMontagne, MR Dennett, and RJ Gast. 2008. Changes in microbial community structure in the wake of Hurricanes Katrina and Rita. *Environmental Science and Technology*, 42 (24): 9072-9078.
- Kovarik, A, J.C. Pires, A. Leitch, K. Y. Lim, A. Sherwood, R. Matyasek, **J. Rocca**, D. Soltis, P. Soltis. 2005. Rapid concerted evolution of nuclear ribosomal DNA in two *Tragopogon* allopolyploids of recent and recurrent origin. *Genetics*, 169(2):931-944.
- Mavrodiev, E.V., M. Tancig, A. Sherwood, M. Gitzendanner, **J. Rocca**, P. Soltis, D. Soltis. 2005. Phylogeny of *Tragopogon* L. (Asteraceae) based on internal and external transcribed spacer sequence data. *International Journal of Plant Science*, 166(1):117-133.

MANUSCRIPTS IN REVIEW

Rocca, JD, M Simonin, JP Wright, ES Bernhardt. *In Review*. Rare microbial taxa emerge when communities collide: freshwater and marine microbiome responses to experimental mixing. doi.org/10.1101/550756.

INVITED WORKING GROUPS

British Ecological Society's Plant-Soil-Ecosystems Working Group (Manchester UK) 2015
USGS Powell Center for Synthesis and Analysis: Next Generation of Ecosystem Indicators Working Group (Fort Collins CO) 2012

GRANTS & AWARDS

National Science Foundation SG Population & Community Ecology Program (\$200,000): 2018-19
Microbial Community Coalescence: Disentangling Assembly Processes during Aquatic Mixing
Joint Genome Institute Certified Metagenomics User 2019
Amazon EC2 Award for Computational Access (\$1000) 2017
Duke Postdoctoral Award for Professional Development (\$1000) 2017
ESA Soil Ecology Section Student Travel Stipend (\$500) 2015
Francis Clark Soil Biology Scholarship (\$1700) 2014
NREL/ESS Graduate Student Travel Grant (\$500) 2012
Plateau Wildlife Ecolab Research Grant (PI, \$8,247) 2008-10
Fungal Environmental Sampling Information Network (FESIN) Travel Award 2009
University of Texas at Austin Linda Escobar Travel Fellowship 2008
University of Texas at Austin Diversity Fellowship 2007-08

INVITED PRESENTATIONS

Rocca, JD, M Simonin, A Washburne, J Wright, ES Bernhardt. 2019. Does initial community similarity drive the outcome of microbial community coalescence during seawater intrusion? East Carolina University Biology Seminar, Greenville, NC USA.
Rocca, JD, MD Smith, MD Wallenstein. 2015. Understanding community assembly through phylogenetic relationships among soil bacteria. SoGES Microbial Ecology Symposium, Fort Collins, CO, USA.
Rocca, JD and MD Wallenstein. 2013. Do gene abundances in DNA or mRNA predict rates of corresponding process? Argonne Metagenomic Conference, Chicago, IL, USA.

SELECTED PRESENTATIONS

Rocca, JD, M Simonin, A Washburne, J Wright, ES Bernhardt. 2018. Moving in tandem or mere coincidence: Searching for evidence of community cohesion in microbial coalescence experiments. Ecological Society of America Annual Meeting, New Orleans, LA, USA.

- Rocca, JD**, M Simonin, F Midani, J Blaszcak, A Washburne. 2017. The Microbiome Stress Project: A database for identifying stressor impacts on microbial community structure across multiple environments. EcotoxicoMic 2017 – First International Conference on Microbial Ecotoxicology, Lyon, France.
- Rocca, JD**, M Simonin, A Washburne, J Wright, ES Bernhardt. 2017. Microbial cage matching: Community merging during seawater intrusion. Ecological Society of America Annual Meeting, Portland, OR, USA.
- Rocca, JD**, ES Bernhardt. 2017. Microbial Cage Matching: Community merging during seawater intrusion. Duke Nicholas School – UPE Seminar, Durham, NC USA.
- Rocca, JD**, ES Bernhardt. 2017. Salt Intrusion Cage Match: Community Coalescence of Freshwater and Marine Microorganisms. Triangle Microbial Ecology Super Group, Chapel Hill, NC, USA.
- Rocca, JD**, MD Smith, MD Wallenstein. 2015. Phylogenetic Scale Matters: broad assessment of dispersion obscures fine-scale assembly patterns in soil bacterial communities. Ecological Society of America 100, Baltimore, MD, USA.
- Rocca, JD**, MD Wallenstein. 2015. A novel driver of microbial function? Impact of plant water soluble leachate on soil bacterial structure and function. Soil Ecology Society of America, Colorado Springs, CO, USA.
- Rocca, JD** and MD Wallenstein. 2014. Climate impacts on belowground via shifts in plant chemistry permeating the soil profile. Ecological Society of America, Sacramento, CA, USA.
- Rocca, JD**, MD Wallenstein, E.K. Hall. 2014. Gene abundance and function: Is there a correlation? Front Range Ecological Symposium – GDPE.
- Rocca, JD**, BG Waring, E. Brodie, Hawkes, CV 2012. Soil bacterial community composition is affected by historical precipitation. Argonne Metagenomic Conference, Chicago, IL, USA.
- Rocca, JD** and Hawkes, CV 2009. Fungal community composition and function are directly influenced by altered timing of precipitation. Mycological Society of America/Botanical Society of America Joint Meeting. Snowbird, UT, USA.

TEACHING

Durham School of Science and Mathematics – Microbial Enzymes Project	2017
ESS311: Ecosystem Ecology (Colorado State)	2015
BIO206L: Structure & Function of Organisms (UT)	2009, 10
BIO205L: Laboratory Experiments in Cellular and Molecular Biology (UT)	2009
BIO301M: Ecology, Evolution & Society: Teaching Assistant (UT)	2008

PROFESSIONAL SERVICE and MEMBERSHIP

Panel Reviewer: Department of Energy EES Review Panel – Terrestrial/Aquatic Interfaces	2018
Peer Reviewer: Aquatic Microbial Ecology, Biogeochemistry, Ecological Applications, Environmental Microbiology, Environmental Science & Technology, Frontiers in Microbiology, Microbial Ecology, Oikos, PeerJ	
Springer's Biogeochemistry Certificate of Excellence in Reviewing	2016

NREL/ESS Travel Grant Award, Program Director	2013, 14
FRSES, GDPE, Coordinating Committee	2012
Member: Ecological Society of America, International Society for Microbial Ecology	

MENTORING

Karen Jin, undergraduate, Duke University	2018-2019
Lindy Pittman, undergraduate, Duke University	2018
Lauren Mancini, lab technician, Colorado State University	2012
Misha Blizard, undergraduate, University of Texas at Austin	2008-2009
Yana Sorokin, lab technician, University of Texas at Austin	2009
Terrence Reid, lab technician, University of Texas at Austin	2008

PUBLIC OUTREACH

Regional Science Olympiad Tournament (Div. A – Elementary School)	2019
Scientific Outreach at Central Park School for Children, Durham, NC	2017
Colorado Science & Engineering Fair, Judge	2012, 13
Odyssey of the Mind, Judge and Mentor	2013
SUPER Program, NREL, Lecturer	2013, 14
Explore UT volunteer program	2009, 10
Research Experience for Undergraduates, ESI, Univ. Texas at Austin, Mentor	2009, 10
Women in Science Austin Museum Day, Ladybird Johnson Wildflower Center	2010

Last updated: May 2019