

MARIO E. MUSCARELLA

Department of Plant Biology, University of Illinois at Urbana-Champaign

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EDUCATION

- Indiana University** *Aug 2012 – Jun 2016*
Biology, Ph.D.; Evolution, Ecology & Behavior Program
- Michigan State University** *June 2010 – Aug 2012*
Microbiology & Molecular Genetics
Ecology and Evolutionary Biology
- Armstrong State University** *Aug 2004 – May 2008*
Biology, Summa Cum Laude, B.S.

EXPERIENCE

- Postdoctoral Research Associate** *August 2016 – Present*
University of Illinois Urbana, IL
O'Dwyer Lab: Theoretical Ecology, Microbial Ecology, Traits Based Ecology, Phylogenetic Patterns
- Graduate Research Assistant** *June 2010 – July 2016*
Indiana University Bloomington, IN
Lennon Lab: Aquatic Microbial Ecology, Molecular and Ecological Strategies of Resource Utilization; Interactions between Microbes and Molecules
- Associate Instructor** *January 2013 – May 2015*
Indiana University Bloomington, IN
Courses Taught: Quantitative Biodiversity; Environmental Microbiology; Introductory Biology Lab
- Graduate Teaching Assistant** *June 2011 – August 2012*
Michigan State University East Lansing, MI
Courses Taught: Microbial Metagenomics; Cells and Molecules Lab; Introductory Microbiology Lab
- Research Technician** *June 2008 – June 2010*
University of Georgia Marine Institute Sapelo Island, GA
Booth Lab: Georgia Coastal Ecosystems LTER, & Sapelo Island Microbial Observatory

PUBLICATIONS

- Muscarella ME**, O'Dwyer JP (In Review) Ecological insights from the evolutionary history of microbial innovations. bioRxiv preprint available, DOI: <https://doi.org/10.1101/220939>
- Lennon JT, **Muscarella ME**, Placella SA, Lehmkuhl, BK (In Review) Relic DNA contributes minimally to estimates of microbial diversity. bioRxiv preprint available, DOI: <https://doi.org/10.1101/131284>
- Aanderud ZT, Saurey S, Ball BA, Wall DH, Barrett JE, **Muscarella ME**, Griffin NA, Virginia RA, Adams BJ (In Review) Stoichiometric shifts in soil C:N:P promotes bacterial taxa dominance, maintains biodiversity, and deconstructs community assemblages
- Long H, Sung W, Kucukyildirim S, Williams E, Miller S, Guo W, Patterson C, Gregory C, Strauss C, Stone C, Berne C, Kysela D, Shoemaker WR, **Muscarella ME**, Luo H, Lennon JT, Brun YV, Lynch M (2018) Evolutionary determinants of genome-wide nucleotide composition. *Nature Ecology & Evolution*
- Peralta AL, **Muscarella ME**, Mathews JW (2017) Lingering land use legacies after different wetland restoration strategies. *Elementa: Science of the Anthropocene*

Kuo V, Shoemaker WR, **Muscarella ME**, Lennon JT (2017) Whole-genome sequence of the soil bacterium *Micrococcus* sp. KBS0714. *Genome announcements*, 5 (32):e00697-17

Kelly PT, Bell T, Reisinger AJ, Spanbauer T, Bortolotti L, Brentrup J, Briseno-Avena C, Dong X, Flanagan A, Follett E, Grosse J, Guy-Haim T, Holgerson MA, Hovel R, Luo J, Millette N, Mine A, **Muscarella ME**, Oliver S, Smith H (2017) Ecological Dissertations in the Aquatic Sciences (Eco-DAS): An effective networking and professional development opportunity for early career aquatic scientists. *Limnology and Oceanography Bulletin*, 26(2):25-30

Guy-Haim T, Alexander H, Bell TW, Bier RL, Bortolotti LE, Briseno-Avena C, Dong X, Flanagan AM, Grosse J, Grossmann L, Hasnain S, Hovel R, Johnston CA, Miller DR, **Muscarella ME**, Noto AE, Reisinger AJ, Smith HJ, Stamieszkin K (2017) What are the type, direction, and strength of species, community, and ecosystem responses to warming in aquatic mesocosm studies and their dependency on experimental characteristics? A systematic review protocol. *Environmental Evidence*, 6(1):6

Muscarella ME, Jones SE, Lennon JT (2016) Species sorting along a subsidy gradient alters bacterial community stability. *Ecology*, 97(8):2034-2043

Shoemaker WR*, **Muscarella ME***, Lennon JT (2015) Genome sequence of the soil bacterium *Janthinobacterium* sp. KBS071. *Genome Announcements*, 3(3):e00689-15

Muscarella ME, Bird KC, Larsen ML, Placella SA, Lennon JT (2014) Phosphorus resource heterogeneity affects the structure and function of microbial food webs. *Aquatic Microbial Ecology*, 73(3):259-272

Lennon JT, Hamilton SK, **Muscarella ME**, Grandy AS, Wickings K, Jones SE (2013) A source of terrestrial organic carbon to investigate the browning of aquatic ecosystems. *PLoS ONE*, 8(10):e75771

Awong-Taylor J, Craven K, Griffiths L, Bass C, **Muscarella ME** (2008) Comparison of biochemical and molecular methods for the identification of bacterial isolates associated with failed loggerhead sea turtle eggs. *Journal of Applied Microbiology*, 104:1244-1251

Craven KS, Awong-Taylor J, Griffiths L, Bass C, **Muscarella ME** (2007) Identification of bacterial isolates from unhatched loggerhead (*Caretta caretta*) sea turtle eggs in Georgia, USA. *Marine Turtle Newsletter*, 115:9-11

(* co-first authors)

PUBLICATIONS IN PREP (DRAFTS AVAILABLE)

Muscarella ME, Lennon JT (In Prep) Trait-based approach to bacterial growth efficiency.

Muscarella ME, Boot CM, Broeckling C, Lennon JT (In Prep) Organic matter diversity structures aquatic bacterial communities.

GRANTS

NSF Doctoral Dissertation Improvement Grant \$19,004 2015 – 2017

DISSERTATION RESEARCH: Metabolic Resource Partitioning: Scaling Microbial Physiology from Individual Activity to Ecosystem Function

Indiana Academy of Sciences Senior Research Grant \$2,200 2014 – 2015

Metabolic Fate of Terrestrial Carbon Resources: Anabolic vs. Catabolic Processes

Huron Mountain Wildlife Foundation Grant Renewal \$3,299 2012 – 2014

Browning of Freshwater Ecosystems: Will Terrestrial Carbon Loading Alter the Diversity and Function of Aquatic Microbial Communities?

Huron Mountain Wildlife Foundation \$5,600

2011 – 2012

Browning of Freshwater Ecosystems: Will Terrestrial Carbon Loading Alter the Diversity and Function of Aquatic Microbial Communities?

HONORS AND AWARDS

Floyd Microbiology Summer Fellowship \$2000

2013 – 2014

Department of Biology, Indiana University, Bloomington, IN

Floyd Microbiology Travel Award \$300

2012

Department of Biology, Indiana University, Bloomington, IN

University Distinguished Fellowship

2010

Graduate School, Michigan State University, East Lansing, MI

Early Start Fellowship

2010

College of Natural Sciences, Michigan State University, East Lansing, MI

Les Davenport Award

2008

Biology Department, Armstrong State University. Savannah, GA

ASB Research Award in Microbiology

2008

Presented at the 69th Annual Association of Southeastern Biologists Conference
Best Paper Presentation in the Area of Microbiology

Faculty Recognition Award

2007

Biology Department, Armstrong State University. Savannah, GA

SYMPOSIA AND WORKING GROUPS

2018 Microorganisms and organic carbon in the marine subsurface

Center for Dark Energy Biosphere Investigations, Knoxville, Tennessee

2016 Eco-DAS XII: Ecological Dissertations in the Aquatic Sciences, Honolulu, HI

2016 Predicting the Response of Host-associated Microbiomes to Disturbance

Santa Fe Institute Working Group, Santa Fe, NM

2016 Ramon Margalef Summer Colloquia

Microbes in a Changing World: Diversity and Biogeochemistry, Barcelona, Spain

WORKSHOPS

2013 Software Carpentry Workshop, Bloomington IN

2012 DOM Fluorescence Workshop, INSTAAR, Boulder CO

2010 Mothur Software Workshop, Detroit MI

SERVICE

Reviewer

Journals: *Aquatic Ecology*, *Aquatic Microbial Ecology*, *Environmental Microbiology*,
Environmental Science & Technology, *ISME*, *L&O Letters*, *Microbial Ecology*,
Science of the Total Environment

Books: *Processes in Microbial Ecology*, Kirchman (2012)

Committee Member

University of Illinois: *Research Scientist Search Committee*

Michigan State University: *MMG Grad Committee*

Indiana University: *IU Biology GRW Transportation*

Outreach

Jim Holland Summer Enrichment Program (Indiana University): *Stream Health & Micro-Invertebrate Assessment* (2012 – 2016)

Wonderlab Science Museum (Bloomington, IN): *Good Microbes Exhibit* (2012 – 2014)

Women in STM (Indiana University): *Stream Micro-Invertebrate Assessment* (2012)

Professional Society Leadership

Graduate Student Liaison for Microbial Ecology Section, ESA (2013 – 2015)

Symposium Moderator

Turn and Face the Strain: Changing Signatures of Niche Processes in Disease and Community Diversity
Ecological Society of America Annual Meeting. Portland, OR (2017)

Conference Co-Organizer

2015 Midwest Ecology and Evolution Conference. Bloomington, IN

Course Development

Quantitative Biodiversity (2015, Indiana University)

repo: <https://github.com/quantitativebiodiversity>

website: <http://documentup.com/QuantitativeBiodiversity/QuantitativeBiodiversity>

PROFESSIONAL AFFILIATIONS

Ecological Society of America

Association for the Sciences of Limnology and Oceanography

Great Lakes Ecological Observatory Network

INVITED SEMINARS

Muscarella ME (2015) Microbes and resources: individuals, communities, and ecosystem function.
Program in Ecology, Evolution, and Conservation Biology, University of Illinois at Urbana-Champaign.

INVITED LECTURES

Muscarella ME (2017) Stochastic Models in Evolutionary Ecology. Theoretical Biology & Models (IB 494),
University of Illinois at Urbana-Champaign.

CONTRIBUTED PRESENTATIONS

Wisnoski, NI, **Muscarella ME**, Lennon JT (2018) Dispersal across ecosystem boundaries influences bacterial diversity and function in lakes. Association for the Sciences of Limnology and Oceanography. Victoria, British Columbia.

Muscarella ME, O'Dwyer JP (2017) A Phylogenetic Framework for Trait Innovation and Selection in Microbial Communities. Ecological Society of America Annual Meeting, Portland OR.

Peralta AL, **Muscarella ME** (2017) How can we manage microbial functions to restore ecosystem services in human-dominated landscapes? Ecological Society of America Annual Meeting, Portland OR.

Locey KJ, Lennon JT, Larsen ML, **Muscarella ME**, Jones SE (2017) Spatiotemporal effects of microbial seed banks on community structure. Ecological Society of America Annual Meeting, Portland OR.

Muscarella ME, Lennon JT (2015) Bacterial growth efficiency: do consumer and resource diversity influence the fate of carbon in aquatic ecosystems? Ecological Society of America 100th Annual Meeting, Baltimore MD.

Muscarella ME, Locey KJ, Nevo E, Raz S, Lennon JT (2014) Microbial community assembly at Evolution Canyon: Does dormancy dilute the effects of dispersal and filtering? Ecological Society of America 99th Annual Meeting, Sacramento CA.

Muscarella ME, Bird KC, Larsen ML, Placella SA, Lennon JT (2014) Phosphorus resource heterogeneity affects the structure and function of microbial food webs. Association for the Sciences of Limnology and Oceanography, Portland OR.

Muscarella ME, Bird KC, Larsen ML, Placella SA, Lennon JT (2014) Phosphorus resource heterogeneity affects the structure and function of microbial food webs. Midwest Ecology and Evolution Conference, Dayton OH.

Muscarella ME, Jones SE, Lennon JT (2013) Species Sorting Along a Subsidy Gradient Affects Community Stability. Ecological Society of America 98th Annual Meeting, Minneapolis MN.

Muscarella ME, Jones SE, Lennon JT (2013) Life in brown waters: Aquatic bacteria respond to increased terrestrial carbon loading. Midwest Ecology and Evolution Conference, South Bend, IN.

Lennon JT, **Muscarella ME**, Jones SE (2013) Bacteria and browning: implications of terrestrial carbon subsidies for aquatic ecosystems. Association for the Sciences of Limnology and Oceanography, New Orleans, LA.

Muscarella ME, Jones SE, Lennon JT (2013) Life in brown waters: Aquatic bacterial responses to increased terrestrial carbon loading. Association for the Sciences of Limnology and Oceanography, New Orleans, LA

Muscarella ME, Jones SE, Lennon JT (2012) Life in brown waters: Aquatic bacteria respond to increased terrestrial carbon loading. LTER All Scientists Meeting, Estes Park, CO.

Booth MG, Gifford S, Doherty M, **Muscarella M**, and Moran MA (2010) Expression of two carbon metabolism genes identified thorough transcriptomic analysis of estuarine bacterial communities of Sapelo Island, GA, U.S.A. International Society of Microbial Ecology Conference, Seattle, WA.

Doherty M, Poretsky R, **Muscarella ME**, Moran MA, Booth MG (2009) Tracking Metabolism of an Important Terrestrial Carbon Source by Marine Bacterioplankton. Coastal and Estuarine Research Federation 20th Biennial Conference. Portland, OR.

Muscarella M, Awong-Taylor J, Zettler J (2009) The Inability of Pathogenic and Nonpathogenic Strains of Escherichia coli to Survive in Coastal Beach Sand. 2009 Annual Conference of the Southeastern Branch American Society for Microbiology. Savannah, GA.

Muscarella M, Awong-Taylor J (2008) Role of Curli Fibers in the Adhesion of Escherichia coli O157:H7 to Bean Sprouts. American Society for Microbiology 108th Annual Meeting. Boston, MA.

Muscarella M, Awong-Taylor J, Zettler J (2008) The Potential for Pathogenic and non-pathogenic Escherichia coli to Survive in Beach Sand from Tybee Island, GA. Association of Southeastern Biologists 69th Annual Meeting. Spartanburg, SC.

Muscarella M, Awong-Taylor J (2008) A Method to Compare the Effectiveness of Different Washes on Removal Rates of E. coli from Plant Roots. Southern Regional Honors Council 36th Annual Conference. Birmingham, AL.

Griffiths L, Bass C, **Muscarella M**, Awong-Taylor J, Craven K (2006) Using Traditional and Molecular Techniques to Determine if Microbial Contamination Plays a Role in Embryonic Death of Loggerhead Sea Turtle Eggs. Florida Academy of Sciences 70th Annual Meeting. Melbourne, FL

ACADEMIC ADVISORS

James P. O'Dwyer University of Illinois (Postdoc)

Jay T. Lennon, Indiana University (Ph.D.)

Judy Awong-Taylor, Armstrong State University (B.S.)

MENTEES

Undergraduate Students:

Belen Muniz (*University of Illinois* 2017)

Mollie Carrison (*Indiana University* 2015 – 2016)

Rachel Ferrill (*Transylvania University* 2015)

Xia Meng Howey (*Indiana University* 2012 – 2014)

High School Students:

Dakayla Calhoun (*Shortridge International Baccalaureate High School, Indianapolis, IN* 2015)

Nick Nelson (*Bishop Noll Institute, Hammond, IN* 2012)